A38 Derby Junctions
TR010022
5.2 Annex K: S47 Consultation Material

Regulation 5(2)(q)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Volume 5

April 2019

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning
(Applications: Prescribed
Forms and Procedure)
Regulations 2009

A38 Derby Junctions

Development Consent Order 202 [ ]

5.2 Consultation Report Annex K

S47 Consultation Material

Regulation Number	Regulation 5(2)(q)
Planning Inspectorate Scheme Reference	TR010022
Application Document Reference	5.2 Consultation Report Annex K
Author	A38 Derby Junctions Project Team, Highways England

Version	Date	Status of Version
1	April 2019	DCO Application

Annex K Content

1. Statutory Consultation Brochure
2. Statutory Public Consultation Flyer
3. Statutory Consultation Exhibition Display Banners
4. Kingsway Junction Scheme Plan
5. Little Eaton Junction Scheme Plan
6. Markeaton Junction Scheme Plan
7. Statutory Consultation Poster
8. Preliminary Environmental Information Report
9. Preliminary Environmental Information Non-Technical Summary
10. Statutory Consultation Questionnaire
11. Development Consent Order Leaflet
12. S47 Notice – Derby Telegraph 6th of September 2018

highways england

A38 Derby Junctions Scheme

Statutory Public Consultation

Share your views



7 September to 18 October 2018


The Eagle Market

Investing in your roads

Highways England is a Government owned company. We are responsible for the operation, maintenance and improvements of England's strategic road network of motorways and major A roads.

At Highways England we believe in a connected country and our network makes these connections happen. We strive to improve our major roads and motorways - engineering the future to keep people moving today and moving better tomorrow. We want to make sure all our major roads are more dependable, durable and most importantly, safe. That's why we're delivering £15 billion of investment on our network – the largest investment in a generation.

The A38 Derby Junctions scheme is a critical part of this investment and will improve journeys between Birmingham, Derby and the M1 at junction 28, which is great news for the local and regional economy.

Following the public consultation held in 2015, the preferred route for the scheme was announced in January 2018.

This scheme is categorised as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008. As such, we are required to make an application for a Development Consent Order (DCO) to obtain planning permission to construct the scheme.

Consultation

This consultation is a statutory one. It has been designed to give the community and other stakeholders an opportunity to comment on the proposed design for the scheme. It is being held in accordance with the Planning Act 2008.

In designing this consultation we have worked closely with the local authorities in the area. We have defined how we will approach it in a Statement of Community Consultation (the SoCC) and this can be found on our webpage, www.highwaysengland.co.uk/A38-Derby-Junctions. We have also published a statutory notice under Section 48 of the Planning Act 2008 in various newspapers (local and national) to ensure that the wider public is aware of it, and the proposed scheme.

This consultation brochure provides information about what we are consulting on. A response form has also been published, which will allow you to share your views. The latter is also available online at **www.highwaysengland.co.uk/A38-Derby-Junctions.**

Your feedback is essential to this consultation as it will enable us to improve the scheme before we start the planning process.

How to respond

We'd like to hear what you think of our proposals, so please share your views, any concerns, ideas or local knowledge that you may have. The consultation will run for 6 weeks, from Friday 7 September to Thursday 18 October 2018 and there are several ways you can tell us what you think.

- Complete the online form by following the link to our consultation page at: www.highwaysengland.co.uk/A38-Derby-Junctions
- Fill in and return one of the response forms we have provided. You can return these by posting them to FREEPOST A38 DERBY JUNCTIONS or can leave the forms at any of our public consultation events.
- Email a scanned copy of the response form to: A38derbyjunctions@highwaysengland.co.uk

To support the consultation and to give you the opportunity to find out more about our proposals, we're holding 8 public exhibition events. The dates, times and venues for these events can be found on the next page.

Please remember to submit any feedback you have by 11.59pm on Thursday 18 October 2018.



Public exhibition events

One of the best ways to find out more about our proposals is to come to one of our public consultation events. Here you'll be able to find out more about the scheme and speak to members of the project team who will be happy to answer any questions you may have.

The events will be held at the following venues on the dates and times indicated.

A portable induction loop system will be available at all exhibition events to assist those who are hard of hearing, and a British Sign Language interpreter will be available where indicated below.

Dates	Location
Friday 7 September 2pm – 8pm **Saturday 8 September** 10am – 4pm A British Sign Language interpreter will be available	**University of Derby Enterprise Centre** Bridge Street, Derby, DE1 3LD
Wednesday 12 September 12 noon – 8pm	**Breadsall Priory** Moor Road, Morley, Derby, DE7 6DL
Thursday 13 September 12 noon – 8pm	**Haslams (The Venue), Derby RFC** Haslams Lane, Darley Abbey, Derby, DE22 1EB
Saturday 15 September 2.30pm – 8pm	**Breadsall Memorial Hall** Brookside Road, Breadsall, Derby, DE21 5LR
Tuesday 18 September 10am – 1pm and 3.30pm – 7pm	**Allestree Memorial Hall,** 1 Cornhill, Allestree, Derby, DE22 2GG
Wednesday 19 September 3.30pm – 8pm	**Little Eaton Village Hall** Vicarage Lane, Little Eaton, Derby, DE21 5EA
Saturday 22 September 10am – 4pm A British Sign Language interpreter will be available	**Brackensdale Primary School** Walthamstow Drive, Derby, DE22 4BS

Scheme location plan



Why do we need this scheme?

The A38 is an important route from Birmingham to Derby and through to the M1 at junction 28.

Where it passes through Derby, long distance traffic interacts with a large volume of vehicles making local journeys. These interactions create congestion and delays at the following 3 existing roundabout junctions to the west and north of Derby city centre:

- A38/A5111 Kingsway roundabout
- A38/A52 Markeaton roundabout
- A38/A61 Little Eaton roundabout

Highways England is committed to resolving these issues. After delivering improvement schemes at Little Eaton and Markeaton roundabouts in 2014/2015 to reduce congestion in the short term, we have been developing longer term plans to resolve the traffic problems more permanently.

The scheme's objectives

The Government's strategic vision for the road network is to make journeys better in the Midlands by operating, maintaining and improving major A roads and motorways, through a programme of investment to ensure that the region's roads are fit for now and the future.

The specific objectives of the A38 Derby Junctions scheme are to:

- Reduce congestion and improve the reliability of journey times between Birmingham, Derby and the M1

- Help facilitate regional development and growth in Derby City and its surrounding
- Improve safety for all road users, and for those people living near the junctions
- Connect people by maintaining existing facilities (eg crossings and ramps etc) or providing new means for cyclists, pedestrians and disabled users to cross the road.

The preferred route

Following the consultation in Spring 2015, Highways England developed the options taking into account comments and issues raised. The preferred route was announced in January 2018. More information on the previous consultation and the preferred route announcement is available to view at **www.highwaysengland.co.uk/A38-Derby-Junctions**

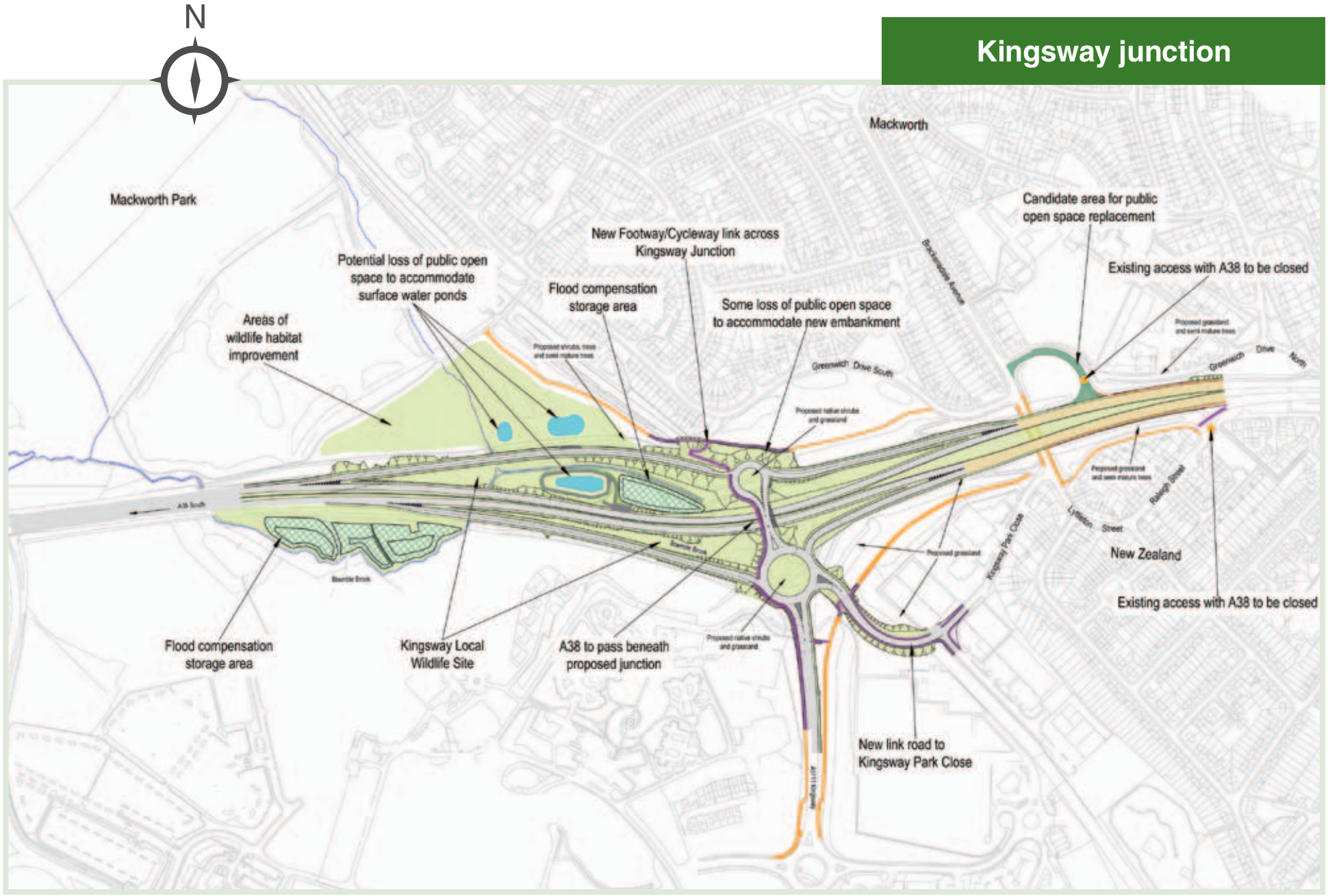
The key features of the preferred route are to:

- Lower the A38 to pass underneath the modified Kingsway and Markeaton junctions
- Widen the A38 to 3 lanes in each direction between the Kingsway and Kedleston Road junctions
- Build 2 new bridges to carry the A38 traffic over the modified roundabout at Little Eaton junction

Now the scheme has been refined, we'd like to share with you our proposals for each junction.



Kingsway junction



Key features of our proposed design: Kingsway junction

The A38 will be lowered to pass underneath the modified junction in a new underpass with 2 new roundabouts and a new bridge to carry traffic over the lowered A38. New slip roads will be built between the lowered A38 and the new ground level roundabouts to allow people to join and leave the A38 and use the local roads.

The A38 will be widened to 3 lanes in each direction between the Kingsway junction and Markeaton junction, with the speed limit increased from 40mph to 50mph.

Pedestrians, cyclists and non-motorised users
Pedestrian and cycle routes will be improved at the junction. Existing cyclist and pedestrian routes and crossing points will be retained. A new pedestrian and cycle route will be provided across the new bridge in the centre of the junction to link the residential areas west of the A38 with the A5111 and the Kingsway Retail Park.



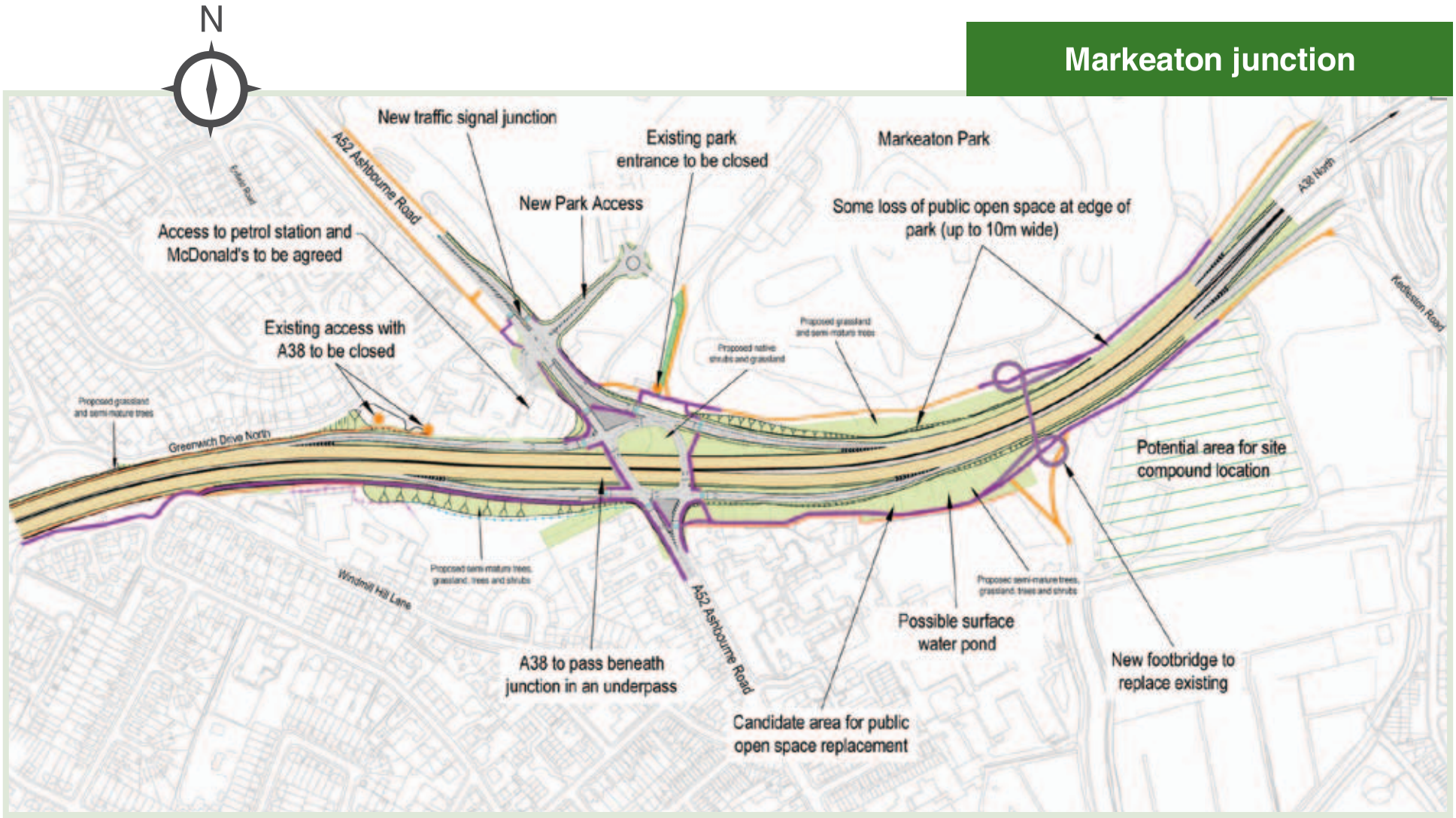
Changes to local access
For safety reasons, there will no longer be access to or from the A38 at the Brackensdale Avenue and Raleigh Street junctions. Instead there will be access from Kingsway Park Close. This option impacts less on the local community in particular the properties on Greenwich Drive South and the area of public open space. It also provides a more direct access to the A38 for commercial traffic using the Kingsway Industrial Park, so keeping the larger vehicles away from residential areas.

Other impacts
Habitats within the designated Local Wildlife Site at the existing Kingsway junction will be lost as the new A38 route passes through the centre of the existing junction. Proposals for replacement habitats are being developed with local stakeholders.

There will be some loss of public open space from Mackworth Park and next to Greenwich Drive South to accommodate the northern roundabout. Proposals for replacement public open space are being developed with Derby City Council.

We would like your thoughts on whether noise or visual barriers should be provided between Kingsway and Markeaton junctions and what types of barrier should be used (eg timber fence etc). More information about types of barriers that can be considered can be found on page 17.

Markeaton junction



Key features of our proposed design: Markeaton junction

The A38 will be lowered to pass underneath a modified signalised roundabout, in a new underpass with 2 new bridges to carry the A52 traffic across the lowered A38. New slip roads will be built between the lowered A38 and the new ground level roundabout to allow people to join and leave the A38 and use the local roads.

The A38 will be widened to 3 lanes in each direction between Markeaton junction and Kedleston Road, with the speed limit increased from 40mph to 50mph.

Pedestrians, cyclists and non-motorised users
We believe the best way to get pedestrians and cyclists safely across the junction is to provide signal controlled crossings around it.

The existing pedestrian footbridge over the A38 will be replaced. A new bridge will provide improved access for all pedestrian, cyclist and disabled users though.



The existing cyclist and pedestrian routes and crossing points will be retained except for the uncontrolled crossing point between Thurcroft Close and Greenwich Drive North. We are proposing to remove this crossing point for safety reasons. Alternative routes will be via Brackensdale Avenue or the new signal-controlled crossings at Markeaton junction.

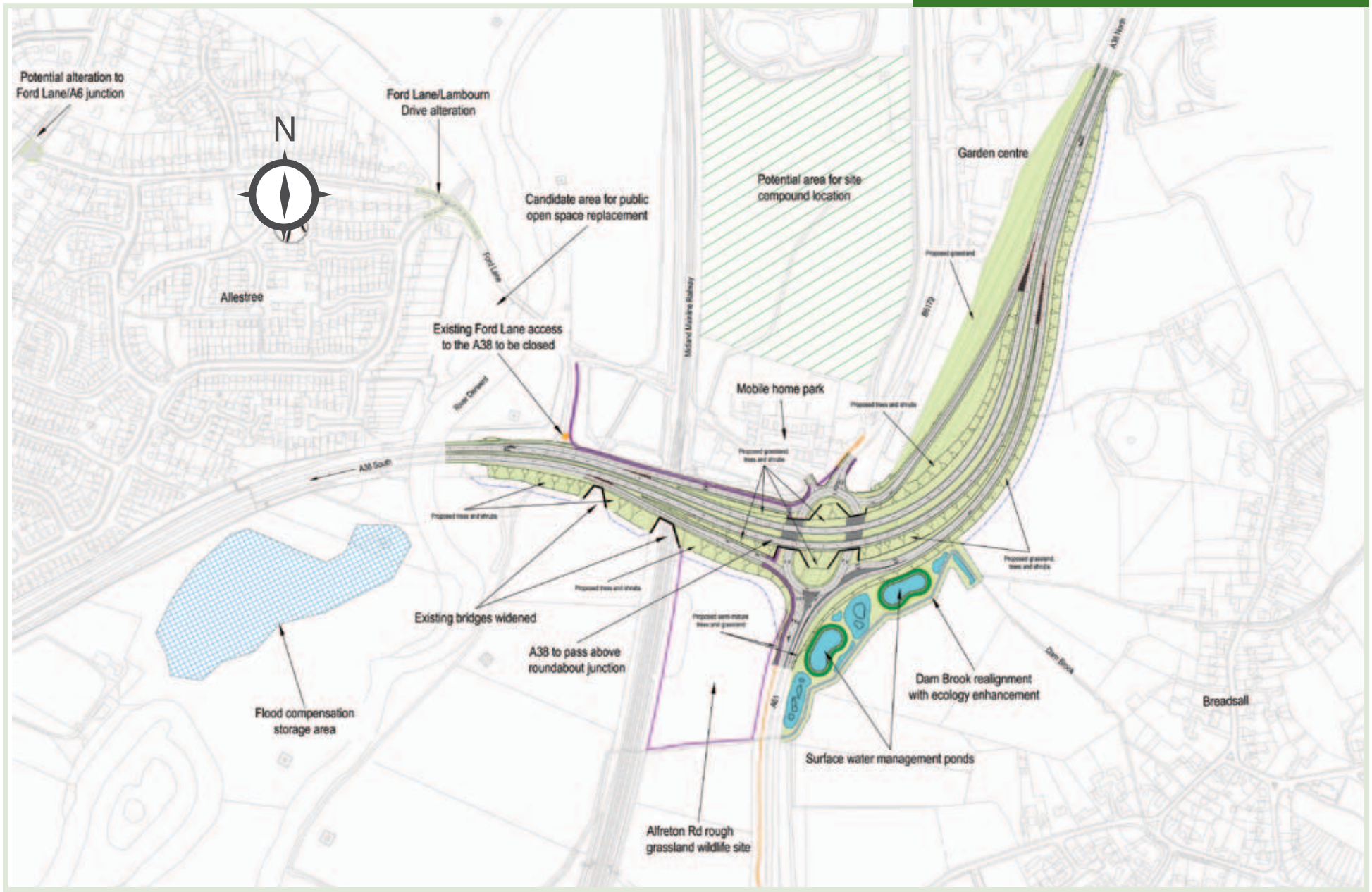
Changes to local access
A revised access will be provided to Sutton Close and 2 properties on Ashbourne Road.

The existing entrance to Markeaton Park from the roundabout will be closed. An improved entrance and exit to the park will be provided from the A52. This will be at a new signalised junction which will also change the way people currently access the petrol station and McDonalds. The specific access arrangements to the petrol station and McDonald's from the A38 are being discussed with the businesses and are yet to be finalised.

For safety reasons vehicle access to and from the A38 at Enfield Road will be closed permanently.

Other impacts
There will be some minor loss of land from Markeaton Park as well as the loss of a small number of trees next to the A38. However, we aim to replace this with public open space with land that becomes vacant following the removal of the properties on Queensway.

Little Eaton junction



Key features of our proposed design: Little Eaton junction

Two new bridges will be built to carry the A38 traffic over the new roundabout on a flyover which will separate traffic using the A38. The existing roundabout will be extended to the south and new slip roads will be built to allow road users to join and leave the A38 and other local roads. The dedicated A38 to A61 southbound segregated lane will be retained. The existing bridge over the railway will be widened to carry the new southbound A38 carriageway. The existing national speed limit on the A38 will be kept, although an advisory 50mph limit will be displayed on the bend through the junction. A tighter bend minimises the footprint of the junction and the impact on local communities.

Pedestrians, cyclists and non-motorised users
All existing footways and cycleways will be maintained. Where necessary they will be re-routed around the new roundabout. Signal controlled crossings will be provided for users to cross the slip roads.

Changes to local access
For safety reasons vehicle access to and from the A38 at Ford Lane will be closed permanently. Access to the local business Talbot Turf will be via Ford Lane from the A6 Duffield Road. This is likely to require minor alterations to the layout of the junction between Ford Lane and Lambourn Drive. The final form of any changes to the junction will be agreed with Derby City Council.



Other impacts
Part of the existing River Derwent floodplain will be lost due to the new junction. We propose to replace it with a compensation area to the west of the River Derwent. There will be no increase in flood risk to the surrounding area.

There will be a change to the landscape and some visual impact for residents along Ford Lane (including those living in the mobile home park) and those in Breadsall village in the opening area due to loss of existing vegetation, however this will reduce over time as proposed replacement landscaping planting establishes.

Elements still under consideration
As a consequence of closing the Ford Lane access to the A38, we are currently exploring with Derby City Council whether any alterations are required to the Ford Lane junction with A6 Duffield Road. This could include local widening of the junction or installing traffic signals. The changes will be agreed with Derby City Council who manage the A6 and Ford Lane.

The extent of street lighting to be provided on the flyover is also still being assessed.

Environmental barriers, along the main A38, are being considered on the approaches to the junction. These barriers could be timber, made of synthetic materials or created using earth bunds. Assessments are continuing on which form of barrier will be most effective, but we welcome your views on this. More information about types of barriers that can be considered can be found on page 17.

Proposed land requirements for the scheme overall

As part of the process of applying for a Development Consent Order (DCO) we are consulting on the proposed areas of land required for the development of the scheme. Both that which is needed permanently for the new junctions, and land that will be required temporarily, for example for construction compounds and working space.

We are doing this before we submit our DCO application and are working with affected landowners to understand and best mitigate for any impact that this may have on them and their businesses and properties.

Further information can be found on the Planning Inspectorate (PINS) website at **http://infrastructure.planningportal.gov.uk.**



Impacts on the environment

We always look to minimise the potential effects of road building, operation and maintenance on the environment and we seek to work in as sustainable a way as possible.

We are currently carrying out our assessments to understand the potential environment impacts and subsequent effects of the scheme. This includes identifying what we can do to reduce any impacts our work may have.

We have summarised the expected impact of our proposals in a Preliminary Environmental Information Report (PEIR). This document, along with a non-technical summary of the PEIR can be found on our webpage (www.highwaysengland.co.uk/A38-Derby-Junctions), at any of the public consultation events, or at any of the consultation deposit points (see list on page 20).

These documents contain preliminary information about the environmental impacts of the scheme. These findings will be developed further in an Environmental Statement as the scheme progresses, reflecting the evolution of the scheme design, informed by the feedback from this consultation, and the ongoing Environmental Impact Assessment process.

An Environmental Statement, presenting the full results of the Environmental Impact Assessment, will be submitted with our application for a development consent order.

Environmental impacts of the scheme: what we consider

	What we will do	Why we will do it
Air quality *This considers the health related issues for local and regional air quality and the global issues of climate change*	■ Identify measures to control and reduce construction dust and emissions ■ Model and assess the impacts of the scheme on air quality during construction and after the road is open	■ To reduce the air quality effects of scheme construction ■ To understand the effect of the scheme, including potential air quality improvements
Noise *This considers the impact of the scheme traffic flow, noise and vibration levels*	■ Identify measures to control and reduce construction noise impacts, such as restricted hours of work ■ Install noise barriers where appropriate	■ To reduce the adverse effects of scheme construction ■ To mitigate potential increases in levels of traffic noise caused by the scheme
Cultural Heritage *This considers the impact of the scheme on archaeological sites, historic buildings and landscapes.*	■ Carry out archaeological investigations in advance of construction ■ Design the scheme sensitively in relation to known heritage features ■ Preserve archaeological remains by recording findings and features where applicable	■ To avoid or reduce impacts to known archaeological remains historic buildings and landscapes where possible ■ To deal sensitively with unknown archaeological remains, which may be uncovered during scheme construction
Landscape and visual impact *This considers the impact of the scheme on the local landscape and on the quality of views from properties nearby*	■ Seek to integrate the road and associated structures into the landscape through sensitive design, including alignment, earth modelling and planting ■ Plant trees and shrubs in keeping with the local landscape character	■ To optimise the fit of the scheme into the landscape where practicable ■ To mitigate potential impacts to views, local landscape character and features
Climate *This considers the impact that the construction and operation of the scheme could have on future climate change*	■ Quantify greenhouse gas (GHG) emissions across the lifecycle of the scheme (construction, operation use, maintenance) ■ Consider the operational resilience of the scheme to the impacts of future climate change	■ To identify the impact the proposed scheme may have on the UK Government meeting its GHG reduction targets ■ To identify opportunities to mitigate GHG emissions ■ To identify mitigation measures to reduce disruption to future operations caused by climate change

continued overleaf

Environmental impacts of the scheme: what we consider

	What we will do	Why we will do it
Biodiversity *This considers the impact of the scheme on ecologically important sites, protected species and the potential impact on sensitive species such as Great Crested Newts.*	■ Protect specific bird nesting and breeding sites and programme certain construction activities to avoid or reduce disturbances ■ Incorporate infrastructure, fencing and planting to guide animals under, over and away from road where appropriate ■ Enhance and / or create replacement habitats as required	■ To avoid or reduce the impact of the scheme on important habitats and protected species such as bats, badgers and birds
The water environment *This considers the impact of the scheme traffic flow, noise and vibration levels*	■ Develop measures to reduce the risk of water pollution during construction ■ Create ponds and shallow channels (swales), where appropriate	■ To help slow the flow of surface water from the road to the surrounding environment and prevent inadvertent discharges of silt and pollutants into watercourses ■ To prevent flood risk arising from the scheme
Geology and soils *This considers the impact of the scheme on soil quality and the disturbance of any contaminated land.*	■ Develop a soil management strategy ■ Carry out site investigations to identify potentially contaminated land	■ To avoid or reduce impacts to known archaeological remains historic buildings and landscapes where possible ■ To deal sensitively with unknown archaeological remains, which may be uncovered during scheme construction
Materials and waste *This considers the impact of the scheme on the local landscape and on the quality of views from properties nearby*	■ Investigate the potential for locally-sourced construction materials ■ Design for materials reuse where practicable	■ To limit the carbon footprint of the scheme ■ To reduce the number of construction traffic movements
People & communities *This considers safety, journey time, congestion and accessibility for everyone along the route. In addition, it looks at the effect of the scheme during construction and once it is built.*	■ Consider alternative routes and crossing points where the scheme would affect routes used by pedestrians, cyclists and equestrians ■ Provide alternative access routes for farmers as appropriate ■ Restore land to appropriate uses where applicable	■ To avoid or reduce diversions or severance of public rights of way and other routes ■ To mitigate the potential impact of the scheme on access or use of community facilities, as well as on local homes, businesses, potential developments and agricultural land

Potential barrier types

Barriers, screening against noise and the look of the new road, can be used to help reduce the impact of the scheme. We have included some indication of where barriers might be used on this scheme on a visualisation video which has been put together for this scheme. This has been done for illustrative purposes only. The video can be found by following the links on our webpage, **www.highwaysengland.co.uk/A38-Derby-Junctions.**

We would like your thoughts on whether noise and visual barriers should be provided though and what types should be used.

The location, space available and visual impact need to be taken into account when considering which form of barrier should be used. The types of barrier that could be used on this scheme could be as shown below.

Further details about the impact of each type of barrier can be found in the Preliminary Environment Information Report, which can be found at the deposit points, consultation events or read or downloaded from our webpage, **www.highwaysengland.co.uk/A38-Derby-Junctions.**

Timber barrier

These would provide visual screening and would be effective in mitigating noise. In some situations, the barriers can sometimes be considered to be visually intrusive.



Timber barrier with climbing vegetation

These are similar to the solid barrier above, but supplemented with appropriate landscape planting. This will grow up the fence to give a more natural looking appearance over time.



Earth bunds

These can provide visual screening and reduce noise levels. Bunds are not as effective as reducing noise as the timber barriers though and they require a lot of land. They could be used at Little Eaton between Breadsall and the A38 to provide screening of the A38 southbound diverge slip road and the A61 southbound link road.



Public open space

The scheme will result in the permanent loss of some designated public open space at Kingsway junction and Markeaton junction. We are proposing to provide replacement public open space at Kingsway and Markeaton junctions using a combination of:

- the area vacated by the buildings removed on Queensway and Ashbourne Road
- and areas of the existing A38 and slip roads at Brackensdale Avenue and Raleigh Street

The locations of the affected public open space and candidate sites for replacement are shown on the individual junction maps on pages 8, 10 and 12.

We welcome your thoughts on whether you would support provision of replacement public open space off Ford Lane, as well as your ideas of other potential replacement options. Questions in the feedback form give you the opportunity to comment on the proposals relating to public open space.



Incorporating your views

We need your help to understand how we can further optimise the design at each of the 3 junctions, and in doing that minimise any impact that the scheme may have.

The response form that accompanies this consultation will ask you for your opinion on things like:

- The location of pedestrian and cyclist crossings
- The need for noise and or visual barriers along the scheme and the type of barriers you think we should use
- The need for screening barriers at Little Eaton junction
- The impact on areas of public open space, and how this can be best mitigated for
- The wider environmental impact of the scheme, and how else we could reduce this.

It is important that you share your views so that they are taken into consideration as we develop the scheme.

What happens next?

This is your opportunity to give your views on our proposal. If, after reading this booklet, you have further questions or would like to find out more, please come to one of our exhibition events, details of which are available at the front of this brochure. You can also:

- Visit our website at: www.highwaysengland.co.uk/A38-Derby-Junctions
- Email us at: A38derbyjunctions@highwaysengland.co.uk
- Call us on: 0300 123 5000.
- Write to us at:

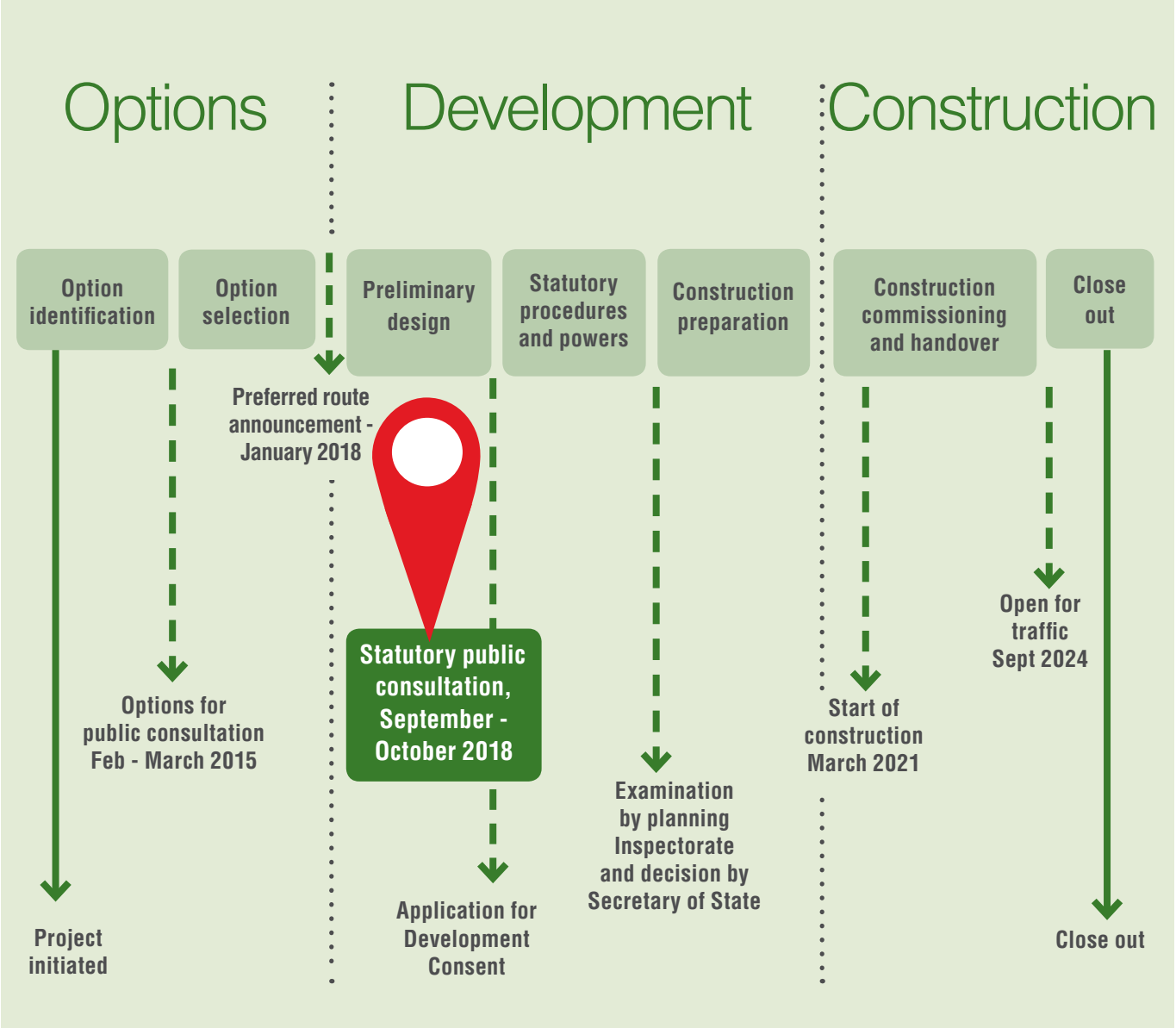
FREEPOST A38 DERBY JUNCTIONS

When you are ready to give us your views please fill in and send us your completed consultation questionnaire. You can complete it online, or download and print it from our website.

The statutory consultation will close at 11:59pm on Thursday 18 October 2018.

Once the consultation has closed we'll analyse your feedback, consider all suggestions made, and respond to it in the report we prepare on the consultation.

Your views will help the Secretary of State for Transport make a decision on our application. The stages of scheme development are explained by the diagram below.



Further information

Log onto our webpage: www.highwaysengland.co.uk/A38-Derby-Junctions to find the following supporting information.

- The Preliminary Environmental Impact Report (PEIR)
- A non technical summary of the PEIR
- A 3D visualisation of the scheme proposals

Paper consultation brochures along with all consultation materials will be available at the following deposit locations from 7 September to 18 October 2018.

Allestree Library

Park Farm Centre, Park Farm Drive, Derby, DE22 2QN

Opening times:

Monday – closed
Tuesday 10am – 5pm
Wednesday – closed
Thursday 10am – 7pm
Friday 10am – 5pm
Saturday 10am – 1pm
Sunday – closed

Breadsall Village Shop

2 Rectory Lane, Breadsall, Derby, DE21 5LL

Opening times:

Monday to Friday 07:15 – 18:30
Saturday 07:45 – 18:00
Sunday 08:30 – 14:00

Riverside Library

Council House, Corporation Street, Derby, DE1 2FS

Opening times:

Monday to Friday 8:30am – 5pm
Saturday – 9am – 1pm
Sunday – closed

Derbyshire County Council Offices

County Hall, Matlock, DE4 3AG

Opening times:

Monday to Friday 9am – 5pm
Saturday – closed
Sunday – closed

Etwall Library

Main Street, Etwall, Derby, DE65 6LP

Opening times:

Monday 2pm – 7pm
Tuesday closed
Wednesday – 10am – 5pm
Thursday 2pm – 7pm
Friday closed
Saturday – closed
Sunday – closed

Little Eaton Post Office

(within the Co-operative)

160 Alfreton Road, Little Eaton, Derby, DE21 5DE

Opening times:

Monday to Friday 9am– 5:30pm
Saturday 9am – 11pm
Sunday – closed

Mackworth Library

Prince Charles Avenue, Mackworth, Derby, DE22 4BG

Opening times:

Monday 10am – 5pm
Tuesday 1pm– 5pm
Wednesday – closed
Thursday 1pm – 5pm
Friday – closed
Saturday 10am – 1pm
Sunday – closed

Mickleover Library

Holly End Road, Derby, DE3 0EA

Opening times:

Monday – closed
Tuesday 10am – 15pm
Wednesday – closed
Thursday 10am – 7pm
Friday 10am – 5pm
Saturday 10am – 1pm
Sunday – closed

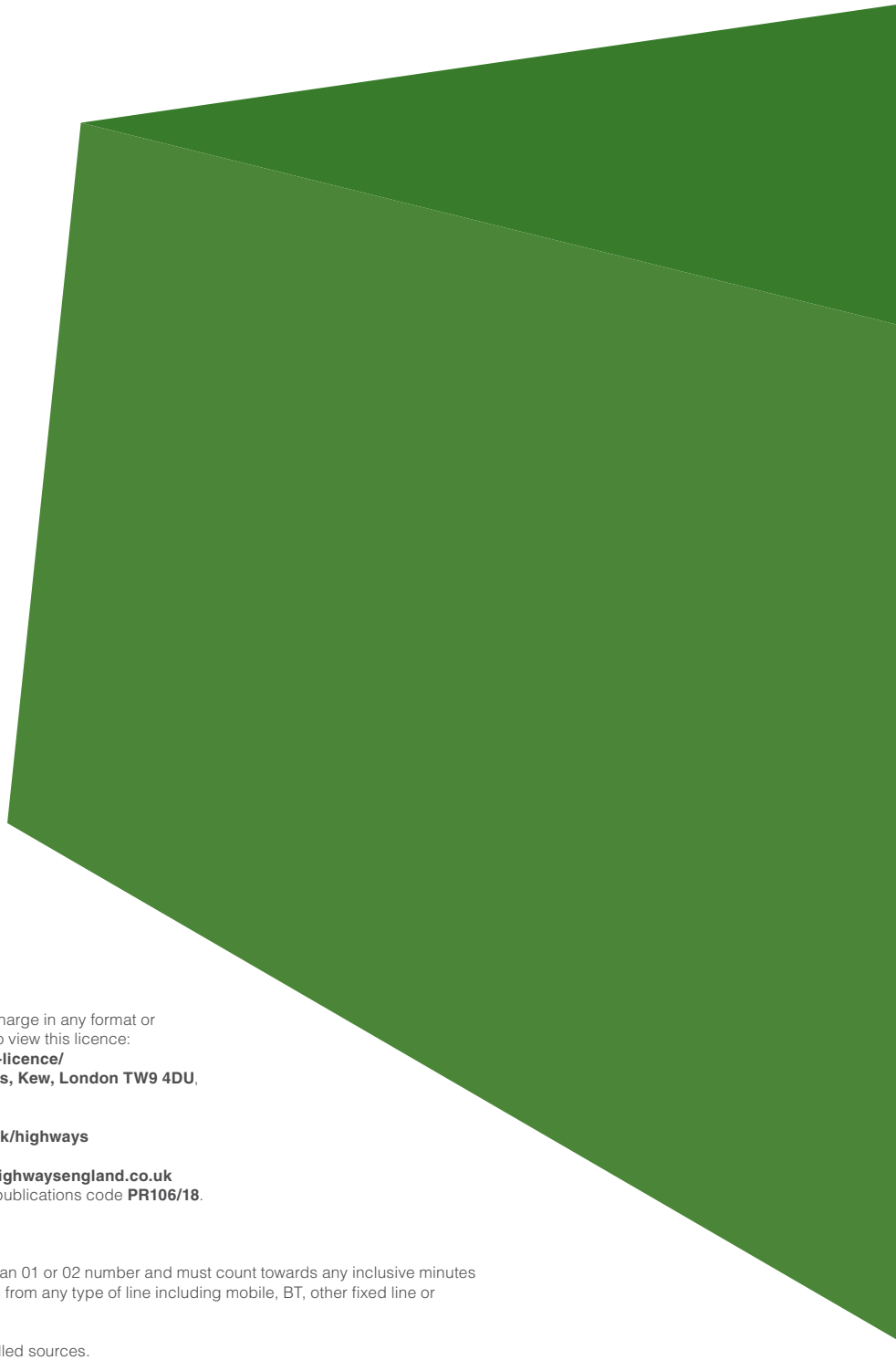
Contact us

If you wish to contact us, you can reach us in the following ways:

- Email us at: A38derbyjunctions@highwaysengland.co.uk
- Website: www.highwaysengland.co.uk/A38-Derby-Junctions (you can register on this page, to receive email updates as the scheme progresses)
- Post
  A38 Derby Junctions Project,
  Highways England, Floor 5,
  Two Colmore Square,
  38 Colmore Circus,
  Birmingham,
  B4 6BN.
- Telephone: 0300 123 5000

Notes

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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This document is also available on our website at **www.gov.uk/highways**

If you have any enquiries about this publication email **info@highwaysengland.co.uk** or call **0300 123 5000***. Please quote the Highways England publications code **PR106/18**.

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A38 Derby Junctions scheme
Public consultation
7 September to 18 October 2018

Highways England is the government owned company, responsible for the operation, maintenance and improvements of England's strategic road network of motorways and major A roads.

We will be consulting on improvements to the A38 through Derby this autumn. This leaflet is designed to tell you what we are consulting on, when and how you can get involved.

Why is the scheme needed?

At Highways England we believe in a connected country and our network makes these connections happen. We strive to improve our major roads and motorways - engineering the future to keep people moving today and moving better tomorrow. We want to make sure all our major roads are more dependable, durable and most importantly, safe. That's why we're delivering £15 billion of investment on our network – the largest investment in a generation.

The A38 Derby Junctions scheme is a critical part of this investment. Where the road passes through Derby, long distance traffic travelling between Birmingham and the M1 at junction 28, interacts with a large volume of vehicles making local journeys and this causes congestion and delays at the Kingsway, Markeaton and Little Eaton roundabout junctions.

What are we consulting on?

Following on from the preferred route announcement that was made in January 2018, we're now consulting on the more detailed plans to replace the Kingsway, Markeaton and Little Eaton roundabout junctions with two underpasses and a flyover. We have produced a consultation brochure and a questionnaire to help you understand more about what we are proposing, and allow you to have your say on elements like pedestrian and cyclist access and environmental mitigation measures. These documents, along with some other supporting materials, will be available on our webpage, **www.highwaysengland.co.uk/A38-Derby-Junctions,** from 7 September, or to pick up from a number of deposit points around Derby (see list overleaf) from the same date.

We will also be holding a number of public exhibitions where you can find out more about our proposals and talk to members of our team about them. The details of these events can also be found overleaf.

Public consultation events

Date: Friday 7 September 2pm – 8pm **Location:** University of Derby Enterprise Centre, Bridge Street, Derby, DE1 3LD A British Sign Language interpreter will be available	**Date and time:** Saturday 15 September 2.30pm – 8pm **Location:** Breadsall Memorial Hall Brookside Rd, Breadsall, Derby, DE21 5LR
Date: Saturday 8 September 10am – 4pm **Location:** University of Derby Enterprise Centre, Bridge Street, Derby, DE1 3LD A British Sign Language interpreter will be available	**Date:** Tuesday 18 September 10am – 1pm and 3.30pm – 7pm **Location:** Allestree Memorial Hall, 1 Cornhill, Allestree Derby, DE22 2GG
Date: Wednesday 12 September 12 noon – 8pm **Location:** Breadsall Priory Moor Road, Morley, Derby, DE7 6DL	**Date:** Wednesday 19 September 3.30pm – 8pm **Location:** Little Eaton Village Hall Vicarage Lane, Little Eaton, Derby, DE21 5EA
Date: Thursday 13 September 12 noon – 8pm **Location:** Haslams (The Venue), Derby RFC Haslams Lane, Darley Abbey, Derby, DE22 1EB	**Date:** Saturday 22 September 10am – 4pm **Location:** Brackensdale Primary School Walthamstow Drive, Derby, DE22 4BS A British Sign Language interpreter will be available

How to get involved

We'd like to hear what you think of our proposals, so please pick up a consultation brochure or look at the details online, and share your views, any concerns, ideas or local knowledge that you may have before the consultation closes on Thursday 18 October 2018. The materials to support this consultation can also be viewed at the following deposit points for the duration of the consultation, during their normal opening hours:

Deposit points

Allestree Library, Park Farm Centre, Park Farm Drive Derby, DE22 2QN	**Etwall Librray, Main Street, Etwall Derby, DE65 6LP**
Breadsall Village Shop, 2 Rectory Lane, Breadsall Derby, DE21 5LL	**Little Eaton Post Office (within the Co-operative), 160 Alfreton Road, Little Eaton, Derby, DE21 5DE**
Riverside Library, Council House, Corporation Street Derby, DE1 2FS	**Mackworth Library, Prince Charles Avenue Mackworth, Derby, DE22 4BG**
Derbyshire County Council offices, County Hall Matlock, DE4 3AG	**Mickleover Library, Holly End Road Derby, DE3 0EA**

Please remember to submit any feedback you have by 11.59pm on Thursday 18 October

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highways england

A38 Derby Junctions

Statutory public consultation exhibition 2018

Welcome



Highways England - Creative 8ED18 0048

A38 Derby Junctions scheme

Statutory public consultation exhibition 2018

Why do we need the scheme?

The A38 is an important route connecting Birmingham to Derby and through to the M1 at junction 28.

Where the road passes through Derby, long distance traffic interacts with a large volume of vehicles making local journeys. These interactions create congestion and delays at the following three existing roundabout junctions to the west and north of Derby city centre:

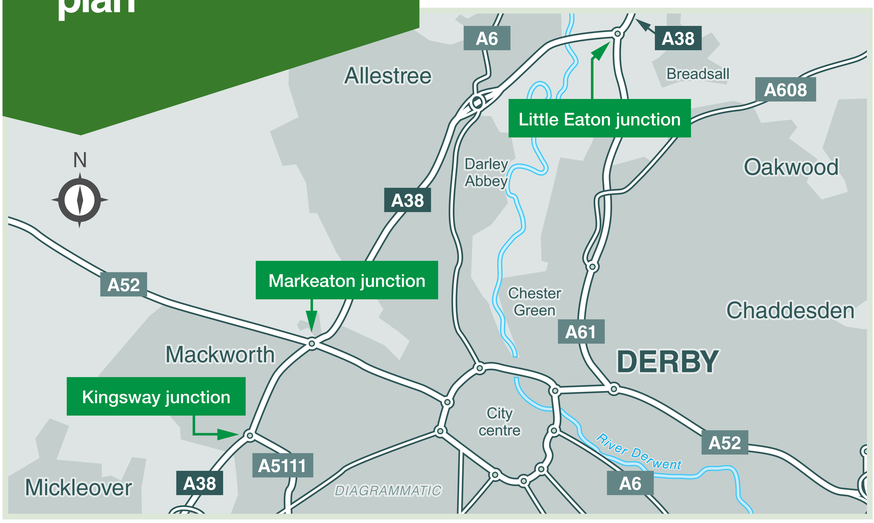
This consultation is focused on elements such as:

The proposed locations of pedestrian and cyclist crossings

- The need for noise and/or visual barriers along the scheme and the type of barriers you think we should use
- The need for screening barriers at Little Eaton junction
- The impact on areas of public open space
- The wider environmental impact of the sheme, and how else we could reduce this.

It is important that you share your views so that they are taken into consideration as we develop the scheme.

Scheme location plan



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A38 Derby Junctions scheme

Statutory public consultation exhibition 2018

Reducing congestion, improving reliability and safety, and facilitating regional growth

Through delivering our proposed improvements, we intend to:

- Reduce congestion and improve the reliability of journey times between Birmingham, Derby and the M1
- Help facilitate regional development and growth
- Improve safety for all road users, and for those people living near the junctions
- Connect people by maintaining existing crossings and ramps or provide new means for cyclists, pedestrians and disabled users to cross the road.



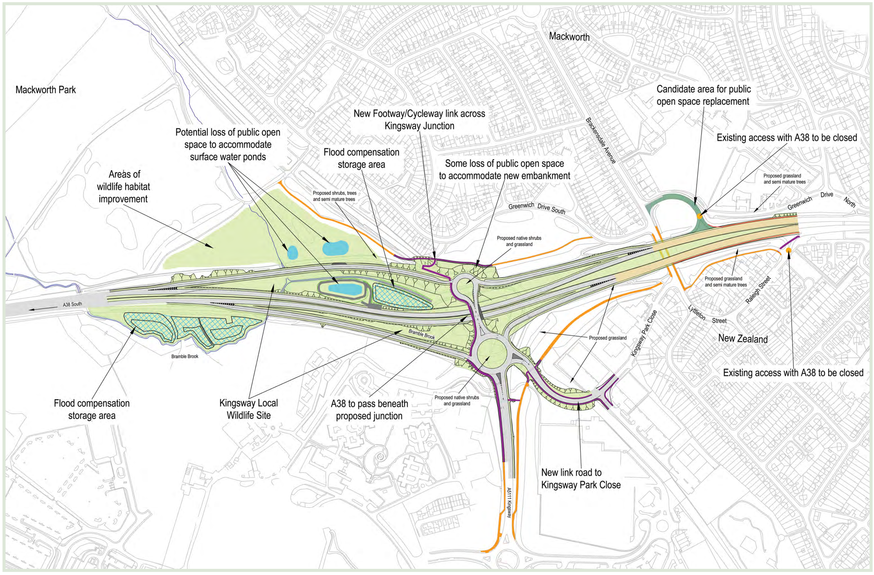


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A38 Derby Junctions scheme

Statutory public consultation exhibition 2018

Kingsway junction: key features



- The A38 will be lowered to pass underneath the modified junction in a new underpass with 2 new roundabouts and a new bridge to carry traffic over the lowered A38.
- New slip roads will be built between the lowered A38 and the new ground level roundabouts to allow people to join and leave the A38 and use the local roads.
- The A38 will be widened to 3 lanes in each direction between the Kingsway junction and Markeaton junction, with the speed limit increased from 40mph to 50mph.
- A new pedestrian and cycle route will be provided across the new bridge in the centre of the junction to link the residential areas west of the A38 with the A5111 and the Kingsway Retail Park.
- For safety reasons, there will no longer be access to or from the A38 at the Brackensdale Avenue and Raleigh Street junctions.
- Habitats within the designated Local Wildlife Site will be lost as the new A38 route will pass through the centre of the existing junction. However, proposals for replacement areas are being developed.
- There will be some loss of public open space from Mackworth Park and next to Greenwich Drive South to accommodate the northern roundabout.

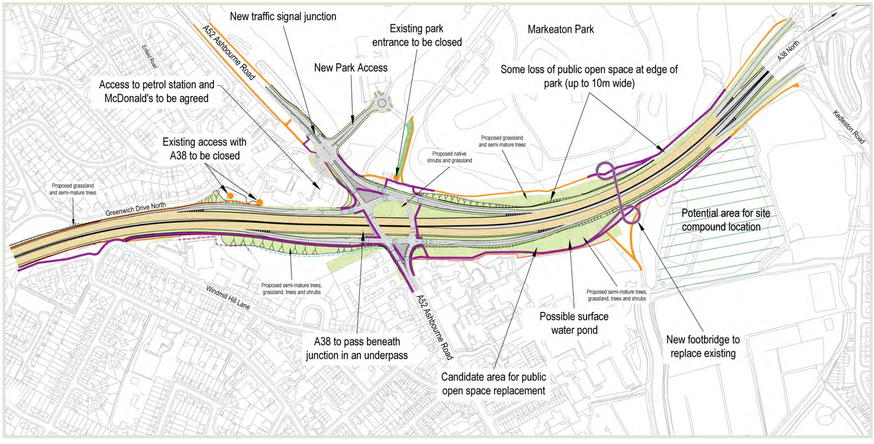
We would like your thoughts on whether barriers should be provided between Kingsway and Markeaton junctions and what types of barrier should be used.

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A38 Derby Junctions scheme

Statutory public consultation exhibition 2018

Markeaton junction: key features



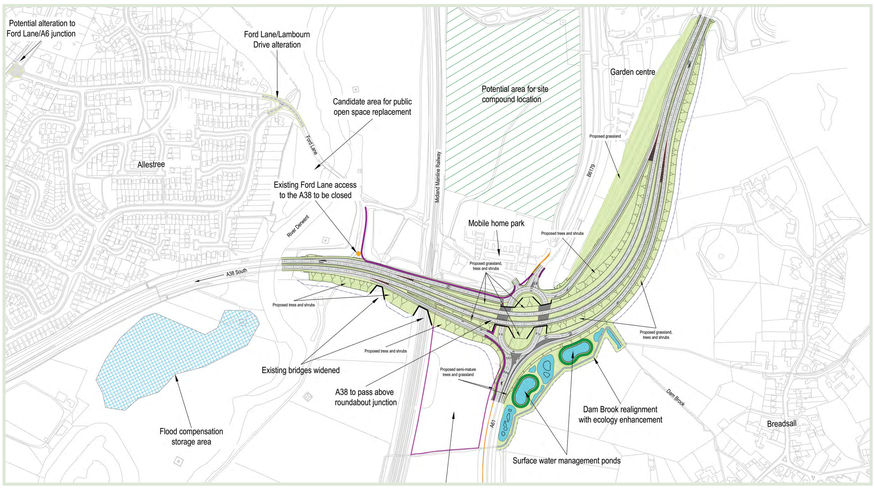
- The A38 will be lowered to pass underneath a modified signalised roundabout, in a new underpass with two new bridges to carry the A52 traffic across the lowered A38.
- New slip roads will be built between the lowered A38 and the new ground level roundabout to allow people to join and leave the A38 and use the local roads.
- The A38 will be widened to three lanes in each direction between Markeaton junction and Kedleston Road junction
- There will be signal controlled crossings around the new junction.
- There will be a new pedestrian footbridge over the A38 that provides improved access for all pedestrian, cyclist and disabled users.
- The uncontrolled pedestrian and cyclist crossing point between Thurcroft Close and Greenwich Drive North will be removed.
- There will be changes to the way you access Sutton Close, two properties on Ashbourne Road, Markeaton Park, the existing petrol station and McDonalds.
- For safety reasons vehicle access to and from the A38 at Enfield Road will be closed permanently.
- A small amount of land will be lost from Markeaton Park, and a small number of trees next to the A38 will be removed. However, proposals for replacement areas are being developed.

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A38 Derby Junctions scheme

Statutory public consultation exhibition 2018

Little Eaton junction: key features



- Two new bridges will be built to carry the A38 traffic over the new roundabout on a flyover.
- The existing roundabout will be extended to the south and new slip roads will be built. The dedicated A38 to A61 southbound segregated lane will be kept.
- The existing bridge over the railway will be widened to carry the new southbound A38 carriageway.
- The existing national speed limit on the A38 will be kept, although an advisory 50mph limit will be displayed on the bend through the junction.
- All existing footways and cycleways will be maintained. Signal controlled crossings will be provided for users to cross the slip roads.
- Access to and from the A38 at Ford Lane will be closed permanently.
- Part of the existing River Derwent floodplain will be lost due to the new junction, but we'll replace it with a compensation area to the west of the River Derwent. There will be no increase in flood risk.
- The area will look different particularly in the short term due to the loss of existing plants and trees, but the impact of this will reduce over time as proposed replacement landscaping planting establishes.
- Environmental barriers, along the main A38, are being considered on the approaches to the junction. These barriers could be timber, synthetic or earth bunds. Assessments are continuing on which form of barrier will be most effective, but we welcome your views on this.

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A38 Derby Junctions scheme

Statutory public consultation exhibition 2018

Environmental impact

We always look to minimise the potential effects of road building, operation and maintenance on the environment and we seek to work in as sustainable a way as possible.

We are currently carrying out assessments to understand the potential environmental impacts and subsequent effects of the scheme. This includes identifying what we can do to reduce any impacts our work might have.

We have summarised the expected impact of our proposals in a Preliminary Environmental Information Report (PEIR).

This document, along with a non-technical summary of the PEIR can be found on our webpage (www.highwaysengland.co.uk/A38-Derby-Junctions), or can be read at this exhibition or any of the consultation deposit points.





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A38 Derby Junctions scheme

Statutory public consultation exhibition 2018

Different types of noise and visual barriers

One of the things we'd really value your input on is the use of noise and/or visual barriers around the scheme – specifically whether they are needed, and, if they are, what types you think should be used. The types of barrier that could be used are shown below.



Timber barrier

These would provide visual screening and would be effective in reducing noise. In some situations, the barriers can be considered to be visually intrusive though.

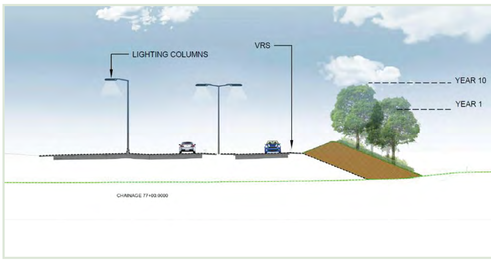


Timber barrier with climbing vegetation

These are similar to the solid timber barriers described above, but they're supplemented with appropriate landscape planting. This will grow up the fence to give a more natural looking appearance over time.

Earth bunds

These can provide visual screening and reduce noise levels. Bunds are not as effective at reducing noise as the timber barriers described above though, and they require a lot of land. They could be used at Little Eaton between Breadsall and the A38 to provide screening of the A38 southbound diverge slip road and the A61 southbound link road.



The location, space available and visual impact need to be taken into account when considering which form of barrier should be used.

Further details about the impact of each type of barrier can be found in the Preliminary Environment Information Report.

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A38 Derby Junctions scheme

Statutory public consultation exhibition 2018

Scheme construction

If development consent for the proposed scheme is granted, construction of the main works would be expected to start in 2021, with the scheme being fully open to traffic in 2024.

Once the scheme proposals are finalised, a traffic management plan will be drawn up, together with a construction phase plan. This will detail exactly how the works will be undertaken and how local traffic will be managed.
We take the impact of construction very seriously, and will closely consider the effect that it might have on both local communities and the environment at all stages of the development, planning and decision-making process.
We will work closely with local communities, relevant local authorities, environmental bodies and major employers as our work progresses into the construction phase.

We will also develop a Construction Environmental Management Plan (CEMP), which will actively consider the impact that our works will have on the following elements:

- noise
- air quality
- landscape and visual impacts
- nature and conservation
- drainage
- geology
- materials

More information about the impact that the proposed scheme may have on these elements can be found in our Preliminary Environmental Impact Report (PEIR).



Highways England – Creative B1MR18_0352

A38 Derby Junctions scheme

Statutory public consultation exhibition 2018

What happens next?

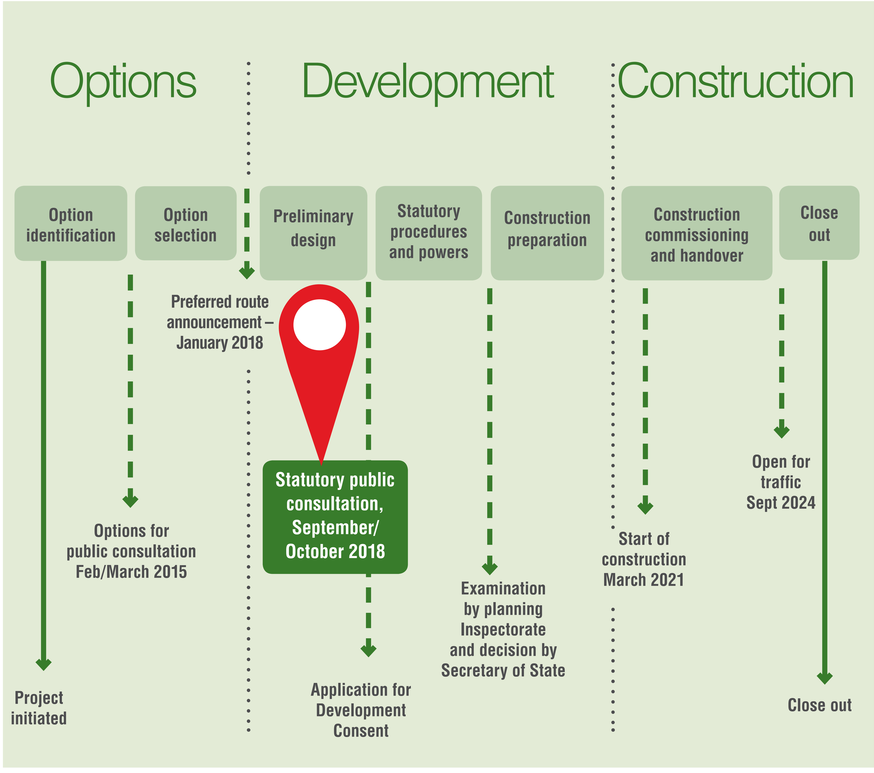
Please make sure you take the opportunity to have your say as part of this consultation.
When you are ready please complete the questionnaire we have provided. This can be filled in and left with us at today's event, or posted back to us for free by sending it to:

FREEPOST A38 DERBY JUNCTIONS

If you would prefer to you can also fill in the questionnaire online by following the links on our webpage: **www.highwaysengland.co.uk/A38-Derby-Junctions**

Remember the statutory public consultation will close at midnight on Thursday 18 October 2018.

The process for this scheme's development is explained in the diagram below.



More information about the process can be found on the Planning Inspectorate's website, https://infrastructure.planninginspectorate.gov.uk

Highways England – Creative B/HM18_0352

Mackworth Park

Mackworth

Areas of wildlife habitat improvement

Potential loss of public open space to accommodate surface water ponds

Flood compensation storage area

New Footway/Cycleway link across Kingsway Junction

Some loss of public open space to accommodate new embankment

Candidate area for public open space replacement

Existing access with A38 to be closed

Proposed shrubs, trees and semi mature trees

Proposed native shrubs and grassland

Proposed grassland and semi mature trees

Proposed grassland

Bramble Brook

Flood compensation storage area

Kingsway Local Wildlife Site

A38 to pass beneath proposed junction

New link road to Kingsway Park Close

Existing access with A38 to be closed

A38 South

A38

Brackenside Avenue

Greenwich Drive South

Greenwich Drive North

Kingsway Park Close

Lyttleton Street

Raleigh Street

New Zealand

A5111 Kingsway

Key

- NEW ROAD
- NEW ROAD - 3 LANES
- ATTENUATION POND
- SIGNALISED CROSSING
- UNSIGNALISED CROSSING
- EARTHWORKS
- FOOTWAY / CYCLEWAY & PAVED AREAS
- EXISTING FOOTWAY / CYCLEWAY
- ROAD FEATURES
- POTENTIAL NOISE BARRIER
- TIMBER PALISADE FENCE
- SECURITY FENCE
- POST & 4 RAIL FENCE
- EXISTING ROAD ACCESS TO BE CLOSED

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Revision Details	By / Check	Date	Suffix	

Purpose of issue

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Highways England
Major Projects
Piccadilly Gate
Store Street
Manchester
M1 2WD

Working on behalf of highways england

Project Title

A38 DERBY JUNCTIONS

Drawing Title

KINGSWAY JUNCTION CONSULTATION BROCHURE DRAWING

Designed	Drawn	Checked	Approved	Date
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Internal Project No. 60533462	Suitability S0
Scale @ A1 1:1000	Zone A38/A5111 Kingsway

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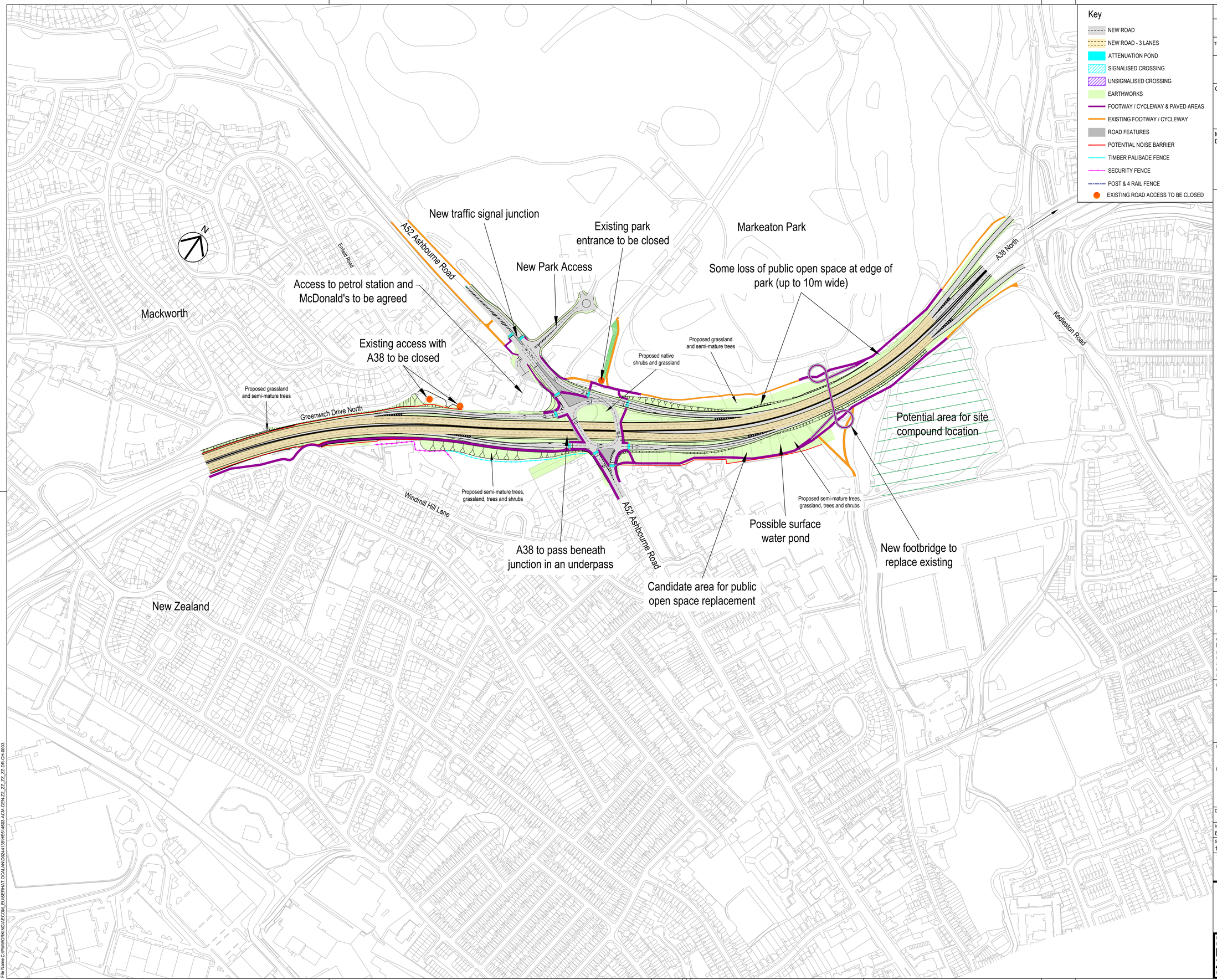
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Rev P01.3

Plot Date: 29 August 2018 10:26:43
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Key

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- NEW ROAD - 3 LANES
- ATTENUATION POND
- SIGNALISED CROSSING
- UNSIGNALISED CROSSING
- EARTHWORKS
- FOOTWAY / CYCLEWAY & PAVED AREAS
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Working on behalf of highways england

Project Title

A38 DERBY JUNCTIONS

Drawing Title

MARKEATON JUNCTION CONSULTATION BROCHURE DRAWING

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Internal Project No. 60533462	Suitability S0
Scale @ A1 1:1000	Zone A38/A52 Markeaton

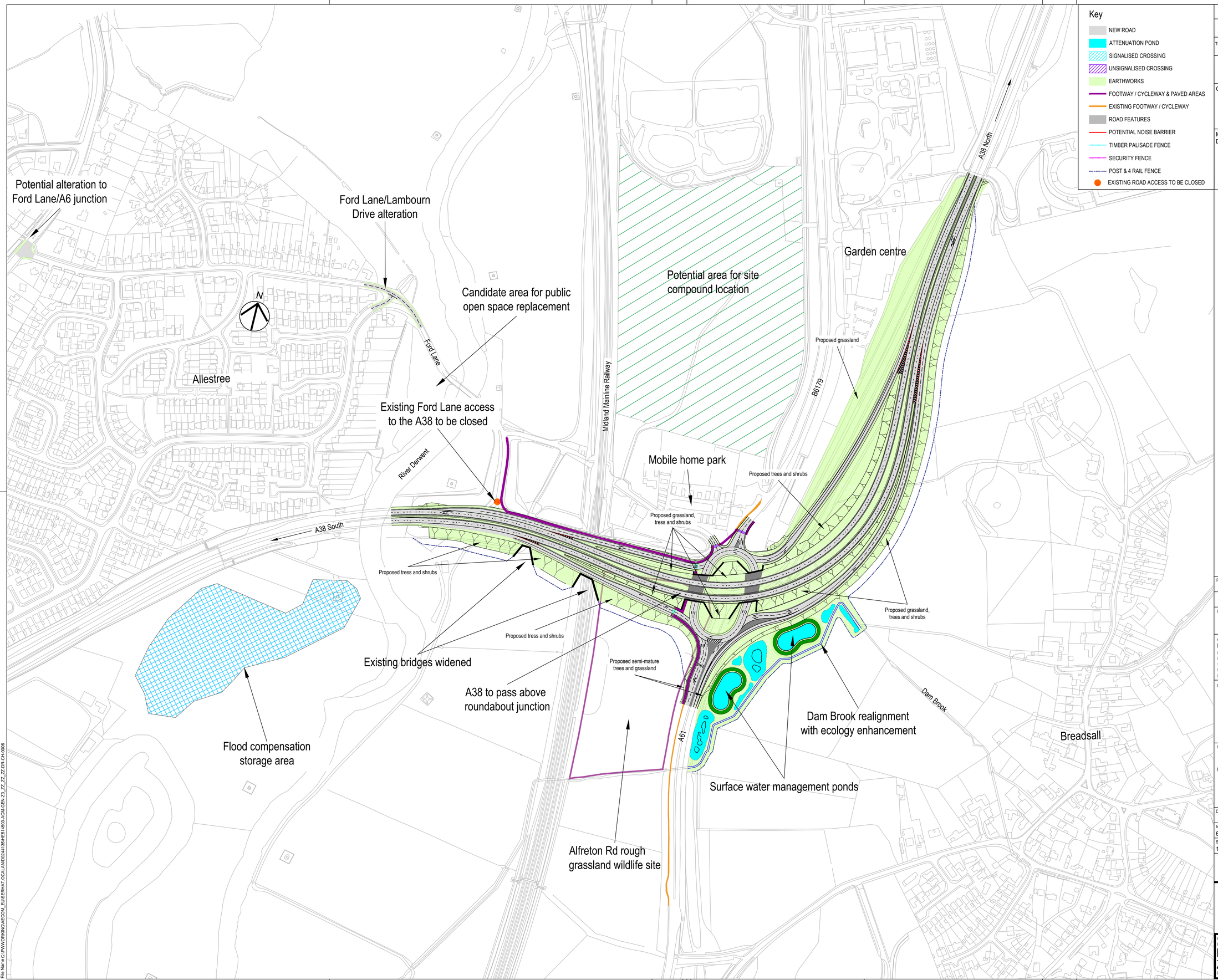
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Working on behalf of highways england

Project Title

A38 DERBY JUNCTIONS

Drawing Title

LITTLE EATON JUNCTION CONSULTATION BROCHURE DRAWING

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A38 Derby junctions scheme

Public consultation
7 September to 18 October 2018



The A38 is an important route from Birmingham to Derby and through to the M1 at junction 28.

Where the road passes through Derby, long distance traffic interacts with a large volume of vehicles making local journeys. This causes congestion and delays at the following three existing roundabout junctions:

- A38/A5111 Kingsway roundabout
- A38/A52 Markeaton roundabout
- A38/A61 Little Eaton roundabout

We're consulting on plans to replace these junctions and have produced a consultation brochure and questionnaire to help you understand more about what we are proposing, and allow you to have your say on elements like pedestrian and cyclist access and environmental mitigation measures.

Please pick up a copy of the brochure and response form or visit our webpage, **www.highwaysengland.co.uk/A38-Derby-Junctions,** for more information or to take part online.

BHM18_0349

A38 Derby Junctions

Preliminary Environmental Information Report

Report Number: HE514503-ACM-EGN-A38_SW_PR_ZZ-RP-LE-0001 P02 S4
July 2018

A38 Derby Junctions

Preliminary Environmental Information Report

Report No: HE514503-ACM-EGN-A38_SW_PR_ZZ-RP-LE-0001 P02 S4

July 2018

Revision	Current Status	Date	Prepared By	Reviewed By	Approved By
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P01	S3	29.05.2018	Marlene Segre/ Simon Wild	Simon Wild	Andy Wilson
P02	S4	30.07.2018	Marlene Segre/ Simon Wild	Simon Wild	Andy Wilson

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Owner	Highways England
Distribution	All Present in the consultation list
Document Status	For approval

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This document is updated at least every Stage.

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P01	29.05.2018	Draft final PEI Report	Marlene Segre/ Simon Wild
P02	30.07.2018	Final PEI Report	Marlene Segre/ Simon Wild

Record of Issue

Version	Status	Author	Date	Checked	Date	Approver	Date	Authorised for Issue	Date
P01	S0	MS/ SW	30.04.2018	AW	30.04.2018	AW	30.04.2018	AW	30.04.2018
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P02	S4	MS/ SW	30.07.2018	AW	30.07.2018	AW	30.07.2018	AW	30.07.2018

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Approvals

Name	Signature	Title	Date of Issue	Version
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Standard codes for suitability models and documents See BS1192:2007 Table 5 for further details					
Revision	Status	Description	Revision	Status	Description
P01.01 etc. to Pnn.nn etc.	S0	Initial status or WIP	P01.1 etc. to Pnn.nn etc.	D1	Costing
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P01 to Pnn	S2	Information	P01.1 etc. to Pnn.nn etc.	D3	Contractor Design
P01 to Pnn	S3	Review & Comment	P01.1 etc. to Pnn.nn etc	D4	Manufacture/ Procurement
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P01 to Pnn	S6	PIM Authorization	C01 to Cnn	CR	As Construction Record
P01 to Pnn	S7	AIM Authorization			

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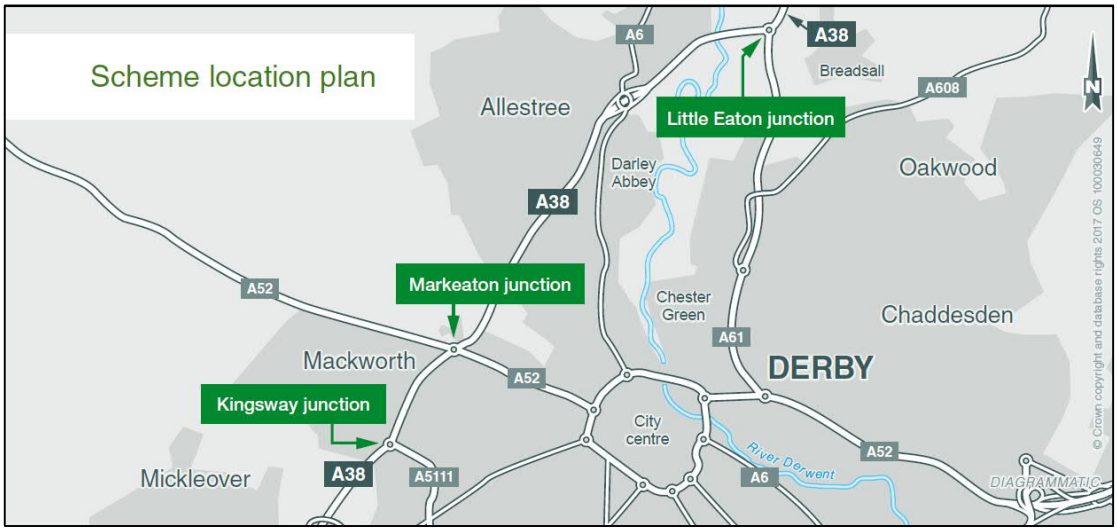
1 INTRODUCTION

1.1 Overview and Need for the Proposed Scheme

1.1.1 The A38 is the strategic route from Birmingham, through Derby, to the M1 at junction 28 which carries significant volumes of north-south long-distance traffic. Where the A38 passes through the western and northern parts of Derby, local intra-urban trips cross the A38 on roads into the city or use the A38 to travel around Derby. The interaction between strategic and local trips results in delays at the three at-grade roundabout junctions on the A38, namely (see Figure 1.1):

- A38/ A5111 Kingsway junction;
- A38/ A52 Markeaton junction; and
- A38/ A61 Little Eaton junction.

Figure 1.1: A38 Derby Junctions – Location Plan



1.1.2 Derby and its immediate surrounding area are expected to accommodate significant housing and employment growth. As a result, the traffic demands on the A38 through Derby are forecast to grow quicker than the national average. Consequently, existing delays at the three at-grade roundabout junctions on the A38 are anticipated to worsen due to increasing levels of traffic.

1.1.3 The A38 Derby Junctions scheme (referred to herein as the proposed scheme) comprises the grade separation of Kingsway junction, Markeaton junction and Little Eaton junction which are the three remaining at-grade junctions on the A38 between the M6 Toll and the M1.

1.1.4 The proposed scheme objectives are as follows:

- Economy:
  - To reduce delays and increase reliability of journeys on the strategic corridor.
  - Assist in bringing forward development and regeneration opportunities in the surrounding area and immediately adjacent to the scheme.
  - To minimise traffic disruption due to construction works and incidents.
  - To achieve optimal whole-life cost taking into account future maintenance, operation and disruption to users.

- Environment:
  - To minimise impacts on both the natural and built environment, including designated landscape/ biodiversity features.
  - To seek to mitigate impacts on air quality or noise.
  - To ensure effective measures are in place to protect watercourses from pollutant spillage on the highway.
  - To investigate and to encourage the use of environmentally friendly operations and products throughout the project life cycle.
- Society:
  - To improve the safety for all road users.
  - To manage the safety for road workers in accordance with the requirements of GD04/12 – Standard for the Safety Risk Assessment on the Strategic Road Network and the Health and Safety at Work 1974 Act to be So Far As Is Reasonably Practicable (SFAIRP).
  - To improve safety for residents in the vicinity of the junctions.
  - To facilitate integration with other transport modes where applicable.
  - To ensure a consistent high standard of signing relating to the junctions.
  - To reduce severance by maintaining or providing appropriate facilities for crossing, and travelling along the route for non-motorised users (NMUs).
- Public Accounts:
  - To be affordable and represent High Value for Money according to Department for Transport (DfT) appraisal criteria.
- Scheme-specific:
  - Improve integration by supporting the local transport plan.
  - Facilitate regional development and growth in Derby City and its surrounding areas and increase capacity of the strategic road network to absorb growth.

1.1.5 Highways England's high-level objectives for the proposed scheme include improving economic competitiveness, the environment and quality of life by reducing congestion in the surrounding urban areas and on the A38 inter-regional road. In addition, it is considered that the proposed scheme would increase the capacity of the strategic road network and facilitate housing and employment growth within Derby City. The overarching objective is to deliver a proposed scheme that is affordable and delivers high value for money.

1.2 The Purpose of the Report

1.2.1 This document is a Preliminary Environmental Information Report (PEI Report) which presents a description of the proposed scheme, the likely significant environmental effects associated with the proposed scheme based on the preliminary environmental information available at the time of PEI Report publication, measures to avoid or reduce such effects and the alternatives considered. This document has been prepared to support consultees in developing an informed view of the likely significant environmental effects of the proposed scheme.

1.2.2 We are continuing to gather environmental information to identify the potential impacts of the proposed scheme, and developing measures to avoid or reduce adverse impacts - a process known as environmental impact assessment (EIA).The results of the full EIA will be presented in an Environmental Statement which will be submitted with the required Development Consent Order (DCO) application.

1.2.3 This PEI Report has been prepared to assist consultees in understanding the potential impacts of the proposed scheme and the mitigation measures currently proposed and/ or being considered. It forms part of the consultation material provided for the statutory consultation process under the Planning Act 2008 (as amended, including by The Highway and Railway (Nationally Significant Infrastructure Project) Order 2013) (PA 2008). Further details are provided in Section 1.8 (Next Steps).

1.3 Legislative and Policy Framework

Planning Act 2008

1.3.1 The proposed scheme is defined as a Nationally Significant Infrastructure Project (NSIP) under Section 14(1)(h) and Section 22 of the PA 2008 by virtue of the fact that:

a) It comprises the construction of a highway;
b) The highway to be constructed is wholly in England;
c) The Secretary of State is the highway authority for the highway; and
d) The speed limit for any class of vehicle on the highway is to be 50 miles per hour (mph) or greater, and the area for the construction of the highway is greater than 12.5 hectares (ha).

1.3.2 In accordance with the legislation, a DCO is required to allow the construction and operation of the proposed scheme.

The EIA Regulations

1.3.3 The proposed scheme is considered to be 'EIA development' and specifically a Schedule 2 Regulation 3(1) Part 10 (f) (construction of roads) development and will therefore be subject to an EIA which will be reported within an Environmental Statement, pursuant to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations).

1.3.4 In accordance with Regulation 8(1)(b) of the EIA Regulations, Highways England has notified the Secretary of State for Transport (Secretary of State) in a letter to the Planning Inspectorate (The Inspectorate) dated 15 March 2018 that an Environmental Statement presenting the findings of the EIA will be submitted with the DCO application.

1.3.5 An EIA Scoping Report (Highways England, 2018b) was submitted to The Inspectorate on 15 March 2018 and can be viewed at the following link:

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010022/TR010022-000036-38DY%20-%20Scoping%20Report.pdf

1.3.6 The Inspectorate reviewed and consulted on the EIA Scoping Report and published a Scoping Opinion on 25th April 2018 which can be viewed at the following link:

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010022/TR010022-000040-38DY%20-%20Scoping%20Opinion_.pdf

1.3.7 Highways England acknowledges the comments of The Inspectorate given within the Scoping Opinion and also notes the comments provided by the statutory consultees to The Inspectorate in Appendix 2 to the Scoping Opinion along with the late consultation responses published on 26th April 2018. Both the Scoping Opinion and the comments from the consultees have been considered in undertaking the ongoing EIA and in preparing this PEI Report.

1.3.8 Highways England is maintaining ongoing dialogue with The Inspectorate and other relevant statutory stakeholders in relation to the scope of EIA in order to ensure that the scope of the EIA is proportionate and meets the requirements of the EIA Regulations. The scope of the EIA for each topic has been agreed with the relevant statutory stakeholders via the Scoping Report and subsequent discussions and will be confirmed in the Environmental Statement.

The Decision Maker, Planning Policy and Green Belt

1.3.9 The Localism Act 2011 provided the authority for the Secretary of State to be responsible for the processing of DCO applications for NSIPs, with the power to appoint The Inspectorate. In its role, The Inspectorate will examine the DCO application for the proposed scheme and then will make a recommendation to the Secretary of State who will then decide whether to grant a DCO.

1.3.10 In accordance with section 104(2) of the PA 2008, the Secretary of State is required to have regard to the relevant National Policy Statement (NPS), amongst other matters, when deciding whether or not to grant a DCO. The relevant NPS for the proposed scheme is the National Policy Statement for National Networks (NPSNN) (DfT, 2014).

1.3.11 The Secretary of State will also consider other important and relevant national and local planning policy. The National Planning Policy Framework (NPPF) published in March 2012 (Department for Communities and Local Government, 2012) is relevant national planning policy.

1.3.12 Little Eaton junction is located in an area of Green Belt. Within Erewash the Nottingham-Derby Green Belt includes the area to the east of the River Derwent. Erewash Borough Council's (EBC) Core Strategy, 2014 Policy 3: Green Belt states, *"the principle of the Nottingham-Derby Green Belt will be retained*" which in the context of the proposed scheme includes "*the statutory purposes of the Green Belt and maintaining the strategic openness of the Green Belt*".

1.3.13 The NPPF sets out guidance covering development within the Green Belt - it defines those forms of development that are considered to be 'appropriate' and 'inappropriate' within Green Belt. The NPFF advises that 'local transport infrastructure' is an 'appropriate' form of development in the Green Belt providing the need for a Green Belt location has been demonstrated, the openness of the Green Belt is preserved and that there is no conflict with the purpose of including that land within Green Belt. These issues are dealt with in turn below as related to the proposed scheme:

- **Need:** As an existing form of linear infrastructure with existing parts of highway within the Green Belt, the A38 is part of the established strategic road network. In this respect, it is not possible or appropriate to consider a proposed scheme location outside of the Green Belt, as the proposed scheme proposals seek to

improve and enhance the existing network. It is therefore inevitable that parts of the proposed scheme require a location within the Green Belt;

- **Openness:** By its very nature a linear infrastructure scheme does not have the same potential impacts as a scheme of 'built' development, with the latter being more likely to impact upon the wider openness of the Green Belt by virtue of the massing and height of new buildings. The proposed scheme design has been developed to minimise the outward intrusion of new highway into existing open areas of Green Belt – the proposed scheme design will be further developed such that the proposed scheme impacts upon Green Belt openness are minimised;
- **Conflict:** The five purposes of the Green Belt are: i) to check the unrestricted sprawl of large built-up areas; ii) to prevent neighbouring towns merging into one another; iii) to assist in safeguarding the countryside from encroachment; iv) to preserve the setting and special character of historic towns; and v) to assist in urban regeneration, by encouraging the recycling of derelict and other urban land. Taking into account the nature of the proposed scheme, there is considered to be no material conflict with these five purposes of the Green Belt.

1.3.14 The local planning policy relevant to the proposed scheme consists of the following adopted plans:

- City of Derby Local Plan Review (2006) (Derby City Council, 2006);
- Derby City Local Plan – Part 1 Core Strategy (2017) (Derby City Council, 2017);
- Derby Local Transport Plan LTP3 (2011 - 2026) (Derby City Council, 2011);
- Erewash Core Strategy (March 2014) (Erewash Borough Council, 2014), noting that there are some policies saved from the previous 2005 Local Plan (Erewash Borough Council, 2014);
- Derbyshire Local Transport Plan (2011 - 2026) (Derbyshire Country Council, 2011).

1.3.15 The EIA Scoping Report submitted to The Inspectorate described the national and local planning policies relevant to the assessment with a summary provided for each environmental topic. These policies will be restated in the Environmental Statement. The purpose of considering relevant planning policy during the EIA is twofold:

a) To identify policy that could influence the sensitivity of receptors (and therefore the significance of effects) and any requirements for mitigation; and
b) To identify planning policy that could influence the methodology of the EIA. For example, a planning policy may require the assessment of a particular impact or the use of a particular methodology.

1.4 The Applicant

1.4.1 Highways England is the Applicant, and the Strategic Highways Company as defined in the Infrastructure Act 2015, and is charged with modernising and maintaining England's strategic road network, as well as running the network and keeping traffic moving.

1.5 Stakeholder Engagement

Context

1.5.1 Stakeholder engagement for the proposed scheme is based on the following principles:

a) Early and ongoing engagement to inform and influence the proposed scheme development process;

b) Seeking an appropriate level of feedback at each stage in the iterative design process and ensuring that comments received are taken into consideration;
c) Building of long term relationships with key stakeholders throughout the different stages of the proposed scheme to help better understand their views;
d) Where possible and practicable ensuring concerns are addressed; and
e) Ensuring appropriate statutory consultation is undertaken in accordance with requirements of the PA 2008 and associated guidance.

Consultation to Date

1.5.2 Non-statutory public consultation took place between February and March 2015. The purpose of this consultation was to seek feedback from stakeholders, including the local community, on the proposed scheme design and design options.

1.5.3 The responses to this consultation were considered in identifying the Preferred Route as documented in the consultation report (Highways England, 2016e) and the Preferred Route Announcement Brochure (Highways England, 2018a).

1.5.4 In addition to non-statutory public consultation, ongoing engagement has taken place between the project team and key stakeholders, including local landowners, applicable local councils, environmental bodies and heritage groups.

1.5.5 Working groups have been set up with key stakeholders associated with a number of technical disciplines, including biodiversity. These are advisory groups and allow the project team to work closely with stakeholders as the proposed scheme design develops. Stakeholder engagement activities undertaken for each of the technical topics considered herein are presented within Chapters 5 to 14 of this PEI Report.

1.5.6 Section 1.8 explains how this PEI Report forms part of the material provided for the statutory consultation on the proposed scheme, and how responses to the statutory consultation will be considered within the DCO application process.

1.6 Structure of this PEI Report

1.6.1 The main text of this PEI Report divides into four parts:

- Chapters 1 to 4 describe the proposed scheme, the alternatives considered and the approach taken to the EIA (including consideration of major events and health impacts);
- Chapters 5 to 14 present a preliminary assessment of the likely significant effects of the proposed scheme in relation to ten specialist topics covering particular aspects of the environment;
- Chapter 15 considers the potential inter-relationships between the topics covered in Chapters 5 to 14, and between the proposed scheme and other developments in the surrounding area, which together have the potential to generate cumulative effects;
- Chapter 16 presents a summary of the preliminary assessment of likely significant environmental effects.

1.6.2 The specialist topics covered in Chapters 5 to 14 of this PEI Report are:

- Chapter 5: Air quality;
- Chapter 6: Cultural heritage;
- Chapter 7: Landscape;
- Chapter 8: Biodiversity;
- Chapter 9: Geology and soils;
- Chapter 10: Materials;

- Chapter 11: Noise and vibration;
- Chapter 12: People and communities;
- Chapter 13: Road drainage and the water environment;
- Chapter 14: Climate.

1.6.3 A separate document has also been prepared to provide a non-technical summary of this PEI Report.

1.6.4 References, a glossary and a list of abbreviations are included at the end of this PEI Report.

1.6.5 Regulations 12 and 14, and Schedule 4 of the EIA Regulations set out the information which is to be included in the PEI Report. In accordance with Regulation 12 (2) (b), this PEI Report presents information which "*is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)*". Table 1.2 identifies where the information defined by Regulation 14(2) can be found within this PEI Report.

Table 1.2: Location of Information within this PEI Report

Specified Information	**Location within the PEI Report**
2) An environmental statement is a statement which includes at least– a) a description of the proposed development comprising information on the site, design, size and other relevant features of the development;	Chapter 2: The Proposed Scheme (also refer to Figures 1.2a/ b which show the provisional DCO application boundary)
b) a description of the likely significant effects of the proposed development on the environment;	Chapters 5 - 14
c) a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;	Chapters 5 - 14
d) a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;	Chapter 3: Assessment of Alternatives
e) a non-technical summary of the information referred to in subparagraphs (a) to (d); and	Non-technical Summary
f) any additional information specified in Schedule 4 relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.	Chapters 1 - 14

1.7 The EIA Team

1.7.1 The EIA Regulations require that the Environmental Statement is prepared by '*competent experts*'. The EIA is being undertaken by AECOM on behalf of Highways England. AECOM has been awarded the EIA Quality Mark from the Institute of Environmental Management and Assessment (IEMA), demonstrating competency in EIA and Environmental Statement preparation. At an individual level, the AECOM Environment Lead is a full member of IEMA, a Chartered Environmentalist (CEnv) and an IEMA Principal EIA Practitioner, whilst each technical discipline lead has relevant and appropriate experience and qualifications in their respective topics.

1.8 Next Steps

1.8.1 As noted at Section 1.2, this PEI Report has been prepared to support consultees in developing an informed view of the likely significant environmental effects of the proposed scheme.

1.8.2 A six week consultation on the proposed scheme runs from Friday 7th September 2018 to the end of Thursday 18th October 2018 to enable people to review the proposals and provide feedback. Highways England invites comments on the proposed scheme and the environmental issues addressed in this PEI Report.

1.8.3 Further details on the consultation and downloadable copies of the full PEI Report, the non-technical summary of the PEI Report, the consultation booklet and response form and further information on the proposed scheme can be downloaded at:

www.highwaysengland.co.uk/A38-Derby-Junctions

1.8.4 To support the consultation a series of events are being held where people will be able to view information on the proposed scheme, speak to members of the project team and provide responses to the consultation.

1.8.5 Copies of the consultation documents are also available for viewing at a number of locations. Full details of the consultation events and locations where copies of the consultation documents can be viewed are available in the Statement of Community Consultation (SoCC) which is available on the project website (see link above).

1.8.6 Responses to the consultation can be made by completing the response form online or by email or letter using any of the following addresses (responses should be returned by the end of 18th October 2018):

- Online: www.highwaysengland.co.uk/A38-Derby-Junctions
- Email: A38derbyjunctions@highwaysengland.co.uk
- Freepost address: A38 Derby Junctions Project, Highways England, Floor 5, 2 Colmore Square, 38 Colmore Circus, Birmingham, B4 6BN.

1.8.7 Following the consultation, Highways England will review all of the responses received. Comments will be taken into account when considering the need for further assessment or modification to the proposed scheme design or mitigation measures.

1.8.8 The comments received will also be used to produce a Consultation Report in accordance with section 37 of the PA 2008, which will be submitted to The Inspectorate with the DCO application. The Consultation Report will summarise the views and comments received, and outline how regard has been had to those comments in the proposed scheme design and the EIA.

1.8.9 Following submission of the DCO application, The Inspectorate will consider, on behalf of the Secretary of State, whether the application should be accepted for examination. If the application is accepted, consultees including the general public will then be able to make relevant representations about the proposed scheme and its potential impacts. The documents accompanying the DCO application will be publicly available on The Inspectorate's website, and consultees will be able to submit comments to The Inspectorate. These comments will then be considered as part of the examination into the DCO application. Following examination, The Inspectorate will make a recommendation to the Secretary of State, who will then decide whether to grant a DCO.

1.8.10 If the DCO is granted, construction is planned to start in 2021 with the proposed scheme due to open to traffic in 2024[1].

[1] Noted that junctions may be sequentially opened, with all junctions being operational in 2024 – however, the first full year during which all junctions would be fully operational would be 2025

2 THE PROPOSED SCHEME

2.1 Project Location

2.1.1 The proposed scheme is located on the A38 in Derby – the A38 being the principal route from Birmingham to Derby and the M1 at junction 28. The proposed scheme proposes to grade-separate the three junctions along the A38 through Derby; namely the junctions at Kingsway (NGR: SK 327 360), Markeaton (NGR: SK 334 369) and Little Eaton (NGR: SK 364 399). These three junctions span an approximate distance of 5.5km along the A38 to the west and north of Derby (see Figure 1.1).

2.1.2 The proposed scheme passes through the administrative areas of Derby City Council (DCiC), Erewash Borough Council (EBC) and Derbyshire County Council (DCC).

2.1.3 Kingsway junction and Markeaton junction are located in a predominantly urban environment, with a mixture of residential housing, commercial, retail, health care and educational establishments. There are a number of public open spaces in the vicinity of the junctions, namely Mackworth Park, open space adjacent to Greenwich Drive South, Markeaton Park and Mill Pond.

2.1.4 Little Eaton junction is set in a semi-rural environment, with the Ford Farm Mobile Home Park, the property Fourways, commercial and retail facilities located to the north of the existing junction. The Derby Garden Centre occupies the space between the A38 and the B6179 to the north of the junction (accessed off the B6179). The eastern edge of Breadsall village is located approximately 400m to the south-east of the existing junction, whilst the southern edge of Little Eaton village is located approximately 900m to the north of the junction. The A38 to the west of the existing junction crosses over the River Derwent and the Sheffield to Derby railway.

2.1.5 The land likely to be required temporarily and/ or permanently for the construction, operation and maintenance of the proposed scheme is shown in Figures 1.2a/ 1.2b. It is important to note that the land required may eventually be slightly less than shown due to design and construction methodology development. The maximum area of land likely to be required has therefore been assessed. A more detailed explanation of the study area and the provisional DCO application boundary is provided in Section 4.2.

2.2 Description of Proposed Scheme

2.2.1 It is proposed to grade-separate the three junctions along the A38 through Derby; namely the junctions at Kingsway, Markeaton and Little Eaton. Refer to Figures 2.1, 2.2 and 2.3 for existing junction layouts and Figures 2.4, 2.5 and 2.6 for proposed scheme layout plans.

2.2.2 Details of the proposed scheme design are provided below, whilst Chapter 3 (Assessment of Alternatives) provides details of the various alternatives that have been considered prior to the selection of the proposed scheme design.

2.2.3 The proposed scheme would operate with a speed limit of 50mph through Kingsway and Markeaton junctions and as far northwards as Kedleston Road. Through Little Eaton junction the speed limit would be 70mph, with an advisory speed of 50mph. The existing national speed limit between Little Eaton junction and Kedleston Road would be retained (i.e. 70mph).

2.2.4 Grade separation of the three A38 Derby junctions would provide journey time benefits to all vehicles, including those travelling along this strategic route during off-peak periods. This is because vehicles travelling through on the A38 trunk road would not need to decelerate, negotiate each of the three roundabouts, stop at traffic signals (when they are at a red phase), and then accelerate back to normal cruising speeds. The time saving derived from grade separation accumulated across all three junctions, would improve the average journey time for all vehicles travelling through on the A38 trunk road. There would also be benefits to many local trips (including buses), which would result from the overall increase in the capacity of these junctions and resolve conflicts between local traffic and strategic movements using the A38. The proposed scheme also offers the potential to remove conflicts between NMUs and vehicles using the A38 to the benefit of both.

2.2.5 The land potentially required temporarily and/ or permanently for the construction, operation and maintenance of the proposed scheme (hereafter referred to as the provisional DCO application boundary) is shown in Figures 1.2a/ b. It is important to note that the provisional DCO application boundary may be subject to change, but currently captures what is thought to be a reasonable worst-case land take.

Kingsway Junction

2.2.6 The proposed Kingsway junction (refer to Figure 2.4) would comprise a dumb-bell roundabout arrangement and linkages at existing ground level, with the A38 passing beneath in an underpass (the low point of the proposed mainline A38 would be approximately 6.5m below the level of the existing roundabout). The existing A38 carriageways would form the northbound and southbound slip roads. The proposed improvement would be predominantly on-line with local access provided by a side road link to Kingsway Park Close from the eastern dumbbell roundabout. The proposed speed limit would be 50mph through the junction, with the national speed limit (70mph) to the south (the current speed limit through the junction is 40mph and 60mph south of the existing roundabout).

2.2.7 In addition to grade-separation of the existing A38/ A5111 Kingsway junction (with the A38 mainline passing beneath the bridge connecting the new roundabouts), the number of lanes on the A38 between Kingsway junction and the A38/ A52 Markeaton junction would be increased from two to three lanes in each direction. Two existing bridges over Brackensdale Avenue would be widened to cater for the provision of the additional lane on each carriageway. The existing accesses from the A38 onto Brackensdale Avenue and Raleigh Street would be closed. The existing carriageway associated with the left in/ left out access onto the A38 from Brackensdale Avenue would thus be made redundant by the proposed scheme.

2.2.8 The proposed Kingsway junction would be provided with appropriate lighting – including potential lighting of the mainline A38 (currently anticipated to be approximately 12m high light-emitting diode (LED) luminaires). Lighting would tie in with existing lighting outside the proposed scheme boundary as applicable.

2.2.9 Existing culverts on Bramble Brook would be replaced or extended as required. Drainage attenuation for the additional paved area would be provided, as would provisions for additional flood storage (refer to Chapter 13: Road Drainage and Water Environment and Table 2.2).

2.2.10 NMU facilities would be provided at the proposed Kingsway junction – these would be as detailed in para. 2.2.48.

2.2.11 The proposed scheme footprint at Kingsway junction would require permanent land take from an area of public open space adjacent to Greenwich Drive South (approximately 1,345m^2). Placement of a highway runoff attenuation pond within Mackworth Park (refer to Figure 2.4) may also be considered to represent a loss of public open space (approximately 2,480m^2) although this is subject to further evaluation. Given the loss of public open space at Kingsway junction (and Markeaton junction – refer to para. 2.2.23), there would be a requirement for public open space replacement/ exchange. It is proposed that replacement public open space for the proposed scheme would be provided, using in part the area vacated by the buildings to be demolished on Queensway and areas of the existing A38 at Markeaton that would be downgraded.

2.2.12 Figure 1.2a illustrates highway improvement works to the south of Kingsway junction (where the A38 passes beneath the slip road that connects with the A516). Such works are geographically separated from the main proposed scheme works, and would comprise signage works within the existing highway verges.

Markeaton Junction

2.2.13 The proposed Markeaton junction (refer to Figure 2.5) would comprise an enlarged two-bridge roundabout at existing ground level with the A38 passing beneath in an underpass to the south-east of the existing roundabout (maximum depth approximately 7.6m below existing ground levels) with slip roads connecting the A38 to the new roundabout. Large retaining walls would be constructed between the A38 and the slip roads to reduce the footprint of the junction. The northbound merge slip road would be approximately on the line of the existing northbound carriageway adjacent to Markeaton Park.

2.2.14 In addition to grade-separation of the existing A38/ A52 Markeaton junction, additional lanes are proposed in both directions between the Markeaton and Kedleston Road junctions and through Markeaton junction on the southbound carriageway. The existing footbridge to the north of the junction would be demolished and replaced in the same location (extended to allow for the additional A38 carriageways). The existing access from the A38 onto Enfield Road would be closed.

2.2.15 The proposed Markeaton junction would be provided with appropriate lighting – including lighting of the mainline A38 (currently anticipated to be approximately 12m high LED luminaires). Lighting would tie in with existing lighting outside the proposed scheme boundary as applicable.

2.2.16 The proposed scheme would involve the demolition of 15 detached residential properties on Queensway and the demolition of two semi-detached properties on the A52 Ashbourne Road. The existing access to Sutton Close off Ashbourne Road would also be closed, and thus a revised access further to the east on Ashbourne Road would be provided which would require land from a further four residential properties.

2.2.17 Markeaton junction would be signalised at all four ground level approaches, namely the A38 northbound off-slip; the A52 eastbound approach; the A38 southbound off-slip; and the A52 westbound approach.

2.2.18 A large existing culvert (Markeaton Lake Culvert) beneath the A38 connecting Markeaton Lake with Mill Pond would remain in situ and would not need to be extended. The Markeaton Lake culvert currently receives highway drainage from the A38. Pumping of surface water from the proposed A38 underpass and drainage from existing and additional paved areas would be attenuated to HD33/06 (Surface and Subsurface Drainage Systems for Highways (Highways Agency, 2006)) as a minimum. Drainage from the proposed scheme would outfall on the downstream side of Markeaton Lake culvert which subsequently discharges into Mill Pond. Drainage attenuation for the additional paved area would be provided. A pumping station is proposed adjacent to the A38 southbound off-slip.

2.2.19 The proposed speed limit would be 50mph through and to each side of the junction (the A38 through the existing junction is subject to a 40mph speed limit), terminating just north of the Kedleston Road slip roads from where the national speed limit would be retained.

2.2.20 The existing access into Markeaton Park from Markeaton junction would need to be closed (although it would be retained for emergency vehicle access) – it is thus proposed that the existing park exit onto the A52 would be reconfigured to create a new park access together with some rearrangements of the park's internal road infrastructure.

2.2.21 The proposed scheme would result in the loss of access to McDonald's restaurant and the Esso petrol station off the A38 northbound carriageway to the south of the junction – alternative access provisions are currently being investigated.

2.2.22 NMU facilities would be provided at the proposed Markeaton junction – these would be as detailed in para. 2.2.48.

2.2.23 An area of approximately 4,990m^2 of public open space would be permanently lost to the proposed scheme at Markeaton junction. Given the loss of public open space at Markeaton (and Kingsway junction – refer to para. 2.2.11), there would be a requirement for public open space replacement/ exchange. It is proposed that replacement public open space for the proposed scheme would be provided, using in part the area vacated by the buildings to be demolished on Queensway and areas of the existing A38 at Markeaton that would be downgraded. Such proposals have been agreed in principle with DCiC, with the exchange public open space being integrated with the NMU facilities connecting the A52 Ashbourne Road with the proposed new footbridge. As detailed in para. 2.2.52, should it prove problematic to find adequate public open space exchange land at Markeaton junction, alternative exchange public open space options are being explored, including land to the east of Allestree off Ford Lane (on the western bank of the River Derwent).

2.2.24 Figure 1.2a illustrates highway improvement works to the north of Kedleston junction. Such works are geographically separated from the main proposed scheme works, and would comprise signage works within the existing highway verges, and potential works to the highway barriers.

Little Eaton Junction

2.2.25 The proposed Little Eaton junction (refer to Figure 2.6) would comprise an enlarged roundabout at existing ground level with the A38 passing above on two roundabout overbridges to the east and south of the existing roundabout. The existing

northbound carriageway would form the northbound slip roads. Commencing at the southern tie in, the proposed A38 would swing to the south of the existing A38 immediately after crossing the River Derwent Bridge, which would not be affected, and would pass over a Flood Relief Arch/ Accommodation Bridge which would be extended. Continuing north the existing railway bridge would be extended to the south to carry the widened A38 cross section. The existing northbound carriageway would be retained on the railway bridge and form the northbound diverge slip road.

2.2.26 The A38 would then pass over the two new roundabout bridges on an embankment (up to approximately 10.8m higher than existing ground level and approximately 9.2m above the existing carriageway level) before continuing to the west of the existing A38 and re-joining the existing A38 alignment immediately south of the Water Treatment Works Accommodation Bridge, which would not be affected.

2.2.27 The junction with Ford Lane, from the existing A38 between the Flood Relief Arch/ Accommodation Bridge and the railway bridge, would be closed for safety reasons. In order to enable access into the turf production site to the south of the existing A38 (via the Flood Relief Arch/ Accommodation Bridge), it is proposed that turf vehicles would use Ford Lane to access the A38 via the A6 Duffield Road. Such access arrangements would also enable Severn Trent Water to access their facilities in the vicinity of the River Derwent.

2.2.28 A short section of Dam Brook located adjacent to the east of the existing A38 would need to be diverted. Drainage attenuation for the additional paved area would be provided, as would potential provisions for additional floodplain compensation (refer to Chapter 13: Road Drainage and Water Environment and Table 2.2).

2.2.29 The proposed Little Eaton junction would be provided with appropriate lighting – including potential lighting of the mainline A38 (currently anticipated to be approximately 12m high LED luminaires). However, options are currently being investigated that would avoid the need for lighting columns along the proposed mainline A38 embankment. Lighting provided would tie in with existing lighting outside the proposed scheme boundary as applicable.

2.2.30 The proposed speed limit would be 70mph, although there would be an advisory speed limit of 50mph for a length of approximately 600m through the proposed junction in both directions.

2.2.31 Appropriate NMU facilities would be provided at the proposed Little Eaton junction – these would be as detailed in para. 2.2.48.

2.2.32 Proposed scheme implementation would necessitate a reconfiguration of the Ford Lane junction with the A6 (Duffield Road) located approximately 1km to the north of the A6 junction with the A38. Here there would be a need to undertake limited kerb widening, with the works being undertaken within the existing highway boundary. Such works are required due to traffic flow changes at this junction due to the stopping up of the Ford Lane junction with the A38.

2.2.33 Figure 1.2b illustrates highway improvement works to the south of Little Eaton junction (to the south of where the A38 crosses the River Derwent), as well as works at two locations to the north of the junction. Such works are geographically separated from the main proposed scheme works, and would comprise signage works within the existing highway verges.

Highway Design

2.2.34 The following highway design principles have been applied during the development of the proposed scheme:

- The design is based on good practice, as embodied in the Design Manual for Roads and Bridges (DMRB);
- An 'earthworks balance' has been sought to minimise the import and/ or export earthworks materials to/ from the site;
- Environmental mitigation features have been integrated into the proposed scheme design to minimise potential adverse impacts.

2.2.35 The new A38 carriageway would be formed of three lane carriageways in each direction at Kingsway junction and Markeaton junction and two lane carriageways in each direction at Little Eaton junction (each lane comprising 3.65m wide running lanes), with typically a 2.5 - 3.5 m verge. The verge width would be increased as required to provide the appropriate unobstructed visibility around curves. Further localised increases in verge width to accommodate highway features such as signs, vehicle restraint systems, and communication equipment have been included where required.

2.2.36 The central reserve width would be 2.5m as a minimum, although this would be increased as required to provide the appropriate visibility around curves.

2.2.37 As part of the network resilience and future proofing of the proposed scheme, it is currently proposed to install a ducting network along the length of the proposed scheme for telecommunications networks.

2.2.38 Vehicle restraint systems would be provided in accordance with the required standards. For the majority of the length of the proposed scheme, there would be a concrete vertical safety barrier along the central reserve.

2.2.39 The existing CCTV monitoring coverage at the three junctions would be replicated on the new junction layouts. Further details of the equipment will become available as the proposed scheme design evolves.

Lighting and Signage

2.2.40 Street lighting is an important consideration within the proposed scheme design and its application will be subject to good practice associated with any appropriate safety assessments.

2.2.41 Lighting would be required at the three junctions and applicable sections of the proposed scheme. The lighting used would be appropriate for the proposed scheme; approximately 12m high LED luminaires are currently anticipated to be used which would tie in with existing lighting outside the proposed scheme boundary as applicable. As detailed in para. 2.2.29, options are being investigated that would avoid the need for lighting columns along the proposed mainline A38 embankment at Little Eaton junction. Lighting requirements will be confirmed in the Environmental Statement.

2.2.42 A signage strategy is being developed in consultation with DCiC and the A38 Managing Agent Contractor (Highways England). The proposed signing strategy seeks to integrate the proposed junctions into the existing road network. This would be achieved by providing consistency and continuity of signing across local authority

boundaries and within the A38 trunk road. The proposed signing strategy also supports the proposed scheme's objectives of reducing accidents and congestion and relieving development pressures in the area. The achievement of these objectives would be facilitated by providing clear routing that makes the best use of the existing highway network, eliminating conflicting signs and improving driver information.

2.2.43 The proposed signing strategy is based on existing signs and existing destinations. In some cases this would result in new signs with a number of destinations. Due to limited verge widths and the requirement for large retaining walls, along with complex merge/ lane drop arrangements on the proposed scheme, in some instances the most appropriate signing arrangement would be to provide gantry mounted direction signs. As such, up to seven gantries are currently proposed along the proposed scheme section between Kingsway junction and Markeaton junction and approaches.

Drainage and Flooding

2.2.44 Details of the proposed drainage are being developed in discussions with the Environment Agency and DCiC as applicable.

2.2.45 The proposed scheme would be provided with a suitable drainage design system that would likely include hybrid ponds i.e. flow balancing and vegetative treatment for runoff, including spillage containment at the front end wherever necessary. Outfalls would be provided to local watercourses, with flow rates limited in accordance with Environment Agency requirements. Attenuation features are currently proposed at Kingsway junction (attenuation ponds both within the scheme junction and adjacent to the new A38 within Mackworth Park - refer to Figure 2.4), at Markeaton junction (attenuation pond within part of the area vacated by the buildings to be demolished at Queensway, together with a pump station to pumping surface water from the proposed A38 underpass and drainage from existing and additional paved areas - refer to Figure 2.5), and at Little Eaton junction (attenuation pond to the east of the A61 - refer to Figure 2.6). The proposed drainage system design is subject to further revision and design, and will be confirmed in the Environmental Statement.

2.2.46 The proposed scheme crosses areas that are at potential risk from flooding, namely at Kingsway junction and at Little Eaton junction. In order to manage such risks, flood mitigation measures as detailed in Table 2.2 are being investigated (also refer to Figure 1.2a/ b) – flood mitigation provisions will be confirmed in the Environmental Statement.

Table 2.2: Flood Risk Mitigation/ Storage Options

Junction	Proposals/ Options
Kingsway junction	Bramble Brook flows through a depression in the centre of the junction relative to the existing carriageway level - the onward culvert from the junction has a restricted capacity resulting in the low lying areas of the junction forming an informal flood storage area. This provides flood risk benefits to the urbanised area of Derby downstream of the junction, although the risk of fluvial flooding from Bramble Brook is considered to be high. To mitigate potential flood risks associated with Bramble Brook, options being explored include a flood storage area within the

Junction	Proposals/ Options
	proposed scheme footprint, as well as potential flood storage areas to the south-west of the proposed scheme within the Kingsway hospital site (see Figure 1.2a). The positioning of flood storage areas adjacent to Bramble Brook within the Kingsway hospital site are currently being discussed with the site developers.
Little Eaton junction	The Environment Agency Flood map data indicates that Little Eaton junction is located within the extent of the extreme flood outline, known as Flood Zone 2, with the western elements falling within or adjacent to Flood Zone 3. In order to mitigate flood risks at Little Eaton junction it will be necessary to provide a suitable flood risk mitigation strategy which may take the format of the following: • Provision of flood storage area(s)/ flood compensation area(s) – potential flood mitigation areas being investigated are illustrated in Figure 1.2b. This includes areas to the north and south of A38 crossing of the River Derwent. At present the preferred option is to provide a floodplain compensation area to the south of the A38 and to the west of the River Derwent – refer to the outline indicative details as below. 

Public Rights of Way

2.2.47 NMU proposals are based on the fundamental premise that the proposed scheme design aims to include at least the level of NMU provision that exists at present with enhanced provision where deemed appropriate and reasonable. In undertaking the design of proposed NMU facilities, the requirements of the Equality Act 2010 have been considered where required in order to take appropriate account of the needs of disabled users.

2.2.48 Given the nature of the proposed scheme, a number of existing public rights of way (PRoWs) would be impacted. To mitigate such effects, the proposed scheme design includes the following NMU provisions (subject to review and confirmation):

- Kingsway junction:
  - National Cycle Route NR54/ NR68/ RR66 would be subject to a minor diversion due to the need to acquire a small section of public open space for the proposed western roundabout embankment. The route prior to and after the minor diversion would be unaffected;
  - A new NMU route would be provided across Kingsway junction from Mackworth Park. This new route would link Mackworth from Greenwich Drive South to the A5111 Kingsway;
  - A crossing of Brackensdale Avenue would be provided at the A38 underbridge (the two existing bridges over Brackensdale Avenue would be widened to cater for the provision of the additional lane on each carriageway);
  - An uncontrolled crossing would be provided on the proposed link road from Kingsway junction (eastern roundabout) to Kingsway Park Close;
  - The uncontrolled pedestrian crossing of the A38 from Greenwich Drive North to Thurcroft Close would be closed, with an alternative route being available either at Kingsway junction or Markeaton junction;
  - Uncontrolled crossings of side roads would be provided at Raleigh Street and Thurcroft Close on the eastern side of the A38;
  - All other existing NMU routes would be retained.
- Markeaton junction:
  - Controlled (toucan) crossings would be provided on all arms of Markeaton junction;
  - The existing Markeaton Park footbridge to the north of the junction would be demolished and replaced in the same location (extended to allow for the additional A38 carriageways);
  - All existing NMU routes would be retained, including provision of a footpath/ cycleway from the A52 to the proposed replacement footbridge.
- Little Eaton junction:
  - NR54 would cross the new proposed southern slip roads (using controlled toucan crossing) and use the bridge to pass under the main A38. An uncontrolled crossing would be provided from the section of the NR54 that runs along the B6179 to provide access to the other side of the road;
  - The footpath/ cycleway (FP No. 23) from Ford Lane to the junction along the northern side of the A38 would be retained;
  - The Derwent Valley Heritage Way/ FP No. 7 would pass beneath the A38 via the Flood Relief Arch which would be extended;
  - Breadsall FP No. 3 would be subject to a minor diversion outside the new fence line and join the A61 where an uncontrolled crossing would be provided (subject to ongoing review);
  - All other existing NMU routes would be retained.

Environmental Masterplan

2.2.49 In addition to the NMU facilities as detailed above, the proposed scheme design includes a number of other environmental mitigation provisions. Such provisions will be confirmed within an Environmental Masterplan (EMP) that will be included in the Environmental Statement. Features that will be included within the EMP include the following:

- **Retaining walls:** Use of retaining walls to minimise land-take requirements as well as reduce views of the traffic on the proposed scheme and reduce noise

levels to the surrounding area (e.g. along sections of the proposed scheme through Markeaton junction);

- **Noise mitigation and barriers:** The proposed scheme would have low noise surface throughout. Noise barriers are being considered along either side of the A38 between Kingsway junction and Markeaton junction (height to be determined). A noise barrier located along the proposed scheme boundary with the Royal Deaf School at Markeaton junction is also being considered (height to be determined). These potential noise barriers are shown on Figures 2.4 and 2.5 for illustrative purposes and are subject to confirmation. The requirement for such noise barriers in these and other locations will be confirmed following further noise modelling, and taking into account comments received during statutory public consultation;
- **Environmental barriers:** Environmental barriers at Little Eaton junction are being considered along the northbound mainline A38 in the vicinity of the Ford Lane Mobile Home Park, and along the southbound mainline A38 and associated slip-road as the proposed scheme traverses Breadsall. These potential barriers are shown on Figure 2.6 for illustrative purposes and are subject to confirmation. The requirement for such barriers, their type, format and height will be confirmed following further assessments, taking into account comments received during statutory public consultation. Barrier options being considered include timber fences, and/ or earth bunding;
- **Landscape planting:** Provision of suitable landscape planting that incorporates grassland, tree and shrubs that aim to integrate the proposed scheme with the surrounding environment, as well as providing a range of ecological functions;
- **Restoration of downgraded carriageway:** Downgrading and landscaping of redundant sections of existing carriageways. This includes the existing carriageway associated with the left in/ left out access onto the A38 from Brackensdale Avenue, a small section of existing carriageway associated with the existing northbound A38 from Markeaton junction, the existing carriageway associated with the left in/ left out access onto the A38 from Ford Lane and a section of existing A38 mainline carriageway located to the north of Little Eaton junction;
- **Drainage attention:** Provision of a highway runoff drainage system that would appropriately collect and treat highway runoff (including provisions for emergency spillages – refer to paras. 2.2.44 - 45);
- **Flood mitigation:** Provision of flood storage areas at Kingsway junction (flood storage area within the proposed scheme footprint, plus storage areas within the Kingsway hospital site) to mitigate proposed scheme effects on flooding, plus a floodplain compensation area at Little Eaton junction (south of the A38 and to the west of the River Derwent) to compensate for the loss of floodplain due to the proposed scheme (refer to Table 2.2 for details);
- **Ecological mitigation/ compensation:** In order to comply with Highways England policy, the proposed scheme aims to deliver no net-loss in biodiversity through mitigation and enhancement measures using areas within the proposed scheme boundary. If no net-loss using areas within the proposed scheme boundary cannot be achieved, opportunities are being explored for the creation and/ or enhancement of habitats off-site. A number of candidate sites for such ecological enhancement are included within the provisional DCO application boundary – this includes Mackworth Park, areas within the Kingsway Hospital site, areas within Markeaton Park (in the vicinity of Markeaton Lake), areas around Mill Pond, and areas in the vicinity of the A38 crossing of the River Derwent (refer to Figures 1.2a/ 1.2b and Chapter 8: Biodiversity).

2.2.50 The measures included in the EMP are considered to be embedded within the proposed scheme design and as such are assumed to be in place prior to the assessment of any long-term operational environmental impacts/ effects.

2.2.51 The details of the EMP will be further developed as the proposed scheme design progresses, and will be confirmed within the Environmental Statement.

Public Open Space Exchange Land

2.2.52 Paras. 2.2.11 and 2.2.23 indicate that the proposed scheme would result in the permanent loss of designated public open space. It is proposed that replacement public open space would be provided using part of the area vacated by the buildings demolished on Queensway and areas of the existing A38 at Markeaton that would be downgraded – such proposals have been agreed in principle with DCiC, with the exchange public open space being integrated with proposed NMU facilities that would connect the A52 Ashbourne Road with the proposed new footbridge. Should it prove problematic to find adequate public open space exchange land at Markeaton junction, there may be an option to provide exchange public open space to the east of Allestree off Ford Lane (on the western bank of the River Derwent). Other public open space options are also being explored.

2.3 Construction

Construction Activities

2.3.1 Proposed scheme construction activities are anticipated to require the following activities: installation and use of temporary offices, construction compounds, material storage areas and worksites; installation and use of temporary accesses and haul routes; demolition of existing structures, removal of existing infrastructure; vegetation clearance and soil removal; ground and excavation works; piling; proposed scheme construction activities, routing of services and utilities.

2.3.2 The indicative likely site boundaries shown in Figure 1.2a/ 1.2b allow for temporary traffic management areas, temporary working and storage areas, material stockpiles, haul roads, and provision for site compounds to be used during the construction of the proposed scheme. However, these may be subject to change as a more detailed understanding of the construction methodology develops.

Construction Programme

2.3.3 Construction is planned to start in early 2021, with the proposed scheme due to open to traffic in 2024.

2.3.4 The construction programme assumes that the works would occur at all three junctions simultaneously, although the programme would be split into a number of different phases to coordinate the works at each junction in a manner that would, where possible, enable effective materials re-use and minimise disruption.

2.3.5 The construction strategy is being investigated and developed further with contractor input – this includes the investigation of junction construction sequencing in a manner that minimises road user disruption and construction programme duration. Further details regarding the main phases of the construction programme will be provided in the Environmental Statement.

Construction Compounds and Material Storage

2.3.6 The main construction compound is likely to be located to the north of Little Eaton junction on an area previously used for landfilling. Primary access to the proposed main compound would be off the B6179 (access options are currently being investigated). The main site compound would include temporary site offices, parking, and construction staff welfare facilities.

2.3.7 Various stockpile areas would also be required for topsoil and other materials that need to be retained on site for re-use within the proposed works. These would be located along the proposed scheme within the provisional DCO application boundary. Topsoil stockpiles would generally be located at the perimeter of working areas so that they would also screen the works from the public. The stockpiles would be approximately 2m to 3m in height, and may be sown with grass seed to reduce their visual impact should they be present for extended periods. The footprints of the areas used for construction purposes would generally be returned to their former use following completion of the construction works.

2.3.8 Table 2.3 provides details of the sites included within the provisional DCO application boundary that may be required and used during the proposed scheme construction phase (also refer to Figures 1.2a/ 1.2b).

Table 2.3: Sites for Potential Use during Proposed Scheme Construction

Junction	Candidate Sites
Kingsway junction	• Area adjacent to Brackensdale Avenue access – potential satellite construction compound
Markeaton junction	• Area in the Territorial Army base – potential excavated material storage area • Utilities corridor along the edge of Markeaton Park • Area owned by Derby University located to the east of Mill Ponds - potential construction compound
Little Eaton junction	• Former landfill site located to the north of Little Eaton junction, bounded by the North Midland railway line to the west and the B6179 (Alfreton Road) to the east – proposed construction compound • Areas adjacent and east of Little Eaton junction - potential excavated material storage areas

2.3.9 The exact locations and extents of the compound areas/ soil storage areas will be refined during ongoing definition of the construction approach and when finalised will be fully assessed and reported in the Environmental Statement.

Haul and Access Routes (on-site)

2.3.10 A temporary bridge would be required over the ditch running adjacent to the B6179 Alfreton Road (route of the former Derby Canal) to provide access into the proposed main construction compound. To minimise adverse impacts, this bridge would traverse the ditch and not impact on water flows.

2.3.11 Generally, construction plant would travel along the proposed scheme using the footprint of the proposed embankments and cuttings. However, a haul road for earthmoving equipment such as dump trucks would also be required to access the

potential flood storage/ ecological compensation areas within the Kingsway hospital site (to provide access onto Northmead Drive and the A516 Uttoxeter New Road). A further haul route would be needed to access the proposed floodplain compensation area located to the west of the River Derwent and south the A38 at Little Eaton junction. The haul route would enable construction vehicle access to the A38 via Duffield Road and the Abbey Hill junction. Haul routes would be constructed from site won fill. Haul road maintenance and dust control measures would be adopted. Haul routes would be reinstated to their former use upon completion of the proposed scheme construction phase.

2.3.12 With regard to the proposed floodplain compensation area located to the west of the River Derwent and south the A38 at Little Eaton junction, options for material haulage are subject to further investigation. Rather than material haulage by vehicle, options are being explored for mechanical transfer of excavated material e.g. conveyor belt transfer of material from the excavation area, under the River Derwent bridge to Ford Lane, followed by road haulage to Little Eaton material storage areas for storage/ reuse.

Construction Traffic (off-site)

2.3.13 Where possible, material excavated at the Kingsway and Markeaton junctions would be used to construct the embankments for the proposed embankment at Little Eaton junction; however, there would be some surplus material that would need to be transported during off-peak periods along the A38 for re-use off-site.

2.3.14 There is also the potential that small quantities of contaminated material would be encountered at Kingsway junction that would need to be transported off-site to licensed waste management facilities.

2.3.15 Other construction traffic would consist of vehicles delivering the products required for the construction of the proposed scheme, including concrete, bitumen, aggregates, pipes and steel. Some deliveries would arrive as abnormal loads, such as large construction plant.

Existing A38 During Construction

2.3.16 Appropriate traffic management measures would be put in place to ensure that traffic flows on the existing A38 and other local roads would be maintained during the construction phase, whilst allowing safe working at the interface between the existing road network and the proposed scheme.

Plant and Equipment

2.3.17 Construction of the proposed scheme would require a large quantity of plant and equipment. The high volume of earth to be moved would require large excavators, dump trucks, dozers, compactors plus graders, bowsers and stabilising plant. Plant numbers will be determined by the construction methodology and reported in the Environmental Statement.

Construction Methods

2.3.18 The construction of the proposed scheme would use typical construction techniques associated with major infrastructure projects – this includes site clearance, excavations, piling.

Utilities

2.3.19 Construction of the proposed scheme would require the diversion, relocation and/ or protection of existing utility assets – this includes water, wastewater, electricity, gas and telecommunications. It is likely that most of the required diversions would be done as part of an enabling or advanced works phase, prior to the main phases of construction.

2.3.20 A proposed utilities corridor along the southern edge of Markeaton Park has been proposed for utilities diversions prior to the main phases of construction at this junction. This area would be appropriately restored upon completion of the works in consultation with DCiC.

2.3.21 The proposed main construction compound for the proposed scheme would require new 'temporary' utility connections or stand-alone provision where direct connections are not viable, for the provision of water, sewerage disposal, electricity and telecommunications.

2.3.22 Further consultation with utility asset suppliers/ owners/ managers will be undertaken in order to finalise the required utility solutions.

Demolition and Removal of Redundant A38 Sections

2.3.23 The proposed scheme would require the demolition of 15 detached residential properties on Queensway and the demolition of two semi-detached properties on the A52 Ashbourne Road. The existing access to Sutton Close off Ashbourne Road would also be closed, and thus a revised access would be provided which would require land from a further four residential properties.

2.3.24 A number of sections of existing road would be made redundant by the proposed scheme – this includes the existing carriageway associated with the left in/ left out access onto the A38 from Brackensdale Avenue, a small section of existing carriageway associated with the existing northbound A38 from Markeaton junction, the existing carriageway associated with the left in/ left out access onto the A38 from Ford Lane and a section of existing A38 mainline carriageway located to the north of the Little Eaton junction. Existing surface layers ('blacktop') may be broken-up for transportation off-site, with the areas then being appropriately landscaped, or alternatively the existing surface layers may be broken up, left in situ, and the areas then landscaped.

Excavated Materials

2.3.25 The total cut volume associated with the proposed scheme is currently estimated to be approximately 130,000m^3, whilst the estimated fill requirement totals approximately 474,900m^3 (spread over an approximate 3.5 year construction programme) – such figures are subject to review and change.

2.3.26 Whilst material generated at Kingsway junction and Markeaton junction is likely to be reused at Little Eaton junction (subject to quality characteristics), it is apparent that a net import of fill material would be required to construct the proposed scheme.

2.3.27 It is proposed that materials excavated from the potential flood storage areas at the Kingsway hospital site (approximately 7,500m^3) would either be reused by the Kingsway hospital site developer, or reused elsewhere within the proposed scheme

footprint (subject to quality characteristics).

2.3.28 Material excavated from the proposed floodplain compensation area south of the A38 and to the west of the River Derwent at Little Eaton junction (approximately 36,000m^3) would be transported to a material storage area for potential reuse within proposed A38 embankment at Little Eaton junction (subject to quality characteristics).

2.3.29 Reuse of excavated material would minimise the need to transport material on the highway network to landfill sites. This would minimise the environmental impacts associated with the construction of the proposed scheme, particularly in relation to air quality and noise impacts of construction traffic on people and communities living along potential off-site excavated materials disposal routes. This strategy would also help reduce greenhouse gas emissions during the proposed scheme construction phase.

2.3.30 The approach to materials management is considered further in Chapter 10: Materials.

Construction Environmental Management Plan

2.3.31 The construction of the proposed scheme would be subject to measures and procedures defined within a Construction Environmental Management Plan (CEMP). This would include the implementation of industry standard practices and control measures to appropriately manage potential environmental impacts that could arise during the construction works (such as the control of dust and noise, and approaches to waste management on site).

2.3.32 An outline CEMP will be prepared as part of the development of the construction methodology (which will be included within the Environmental Statement), whilst measures to be included within the outline CEMP will be defined in part by the requirements for mitigation which arise from the technical assessments within the EIA. This PEI Report discusses proposed mitigation measures to be included in the CEMP as appropriate in relation to the preliminary assessments as reported herein.

2.3.33 The technical assessments to be presented in the Environmental Statement will take account of the mitigation measures detailed within the outline CEMP as 'embedded mitigation'.

Decommissioning of Proposed Scheme and Components

2.3.34 It is highly unlikely that the proposed scheme would be demolished after its design life as the road would have become an integral part of nationally important infrastructure. In the unlikely event of the proposed scheme needs to be demolished, this would be part of the relevant statutory process at that time, including EIA as appropriate. Demolition of the proposed scheme is not, therefore, considered further in this PEI Report and has been scoped out of the EIA.

2.4 Traffic Effects

Construction Phase

2.4.1 Traffic management would be required during the construction programme, noting that construction activities would occur at all three junctions simultaneously, with the programme being split into a number of different phases to coordinate the works at each junction. Traffic management plans are provisional at this stage and would be

developed further by the construction contractor, once appointed. These traffic management plans are expected to require reduced speed limits applied to specific links adjacent to the construction sites, temporary junction traffic signals, potential changes to turning priorities, and closures to slip roads.

2.4.2 Such traffic management proposals would inevitably affect junction traffic performance, and would increase travel times and distances for diverted trips. The overall strategy would be to maintain the A38 journey times as much as possible in order to discourage drivers from switching their routes onto local roads. Modelling undertaken to date indicates that, in many of the traffic management scenarios, a lot of the journeys along the A38 would be quicker during the construction period than before construction started. However, during the most active construction phases, traffic management would increase the A38 journey time through this section of the A38 by approximately 2 minutes. Journeys on some radial routes would also be longer. The size of the increase in journey times would depend upon the radial route considered and the specific phase of traffic management being implemented.

2.4.3 Traffic management proposals will be detailed in the Environmental Statement, together with an assessment of potential construction phase environmental effects.

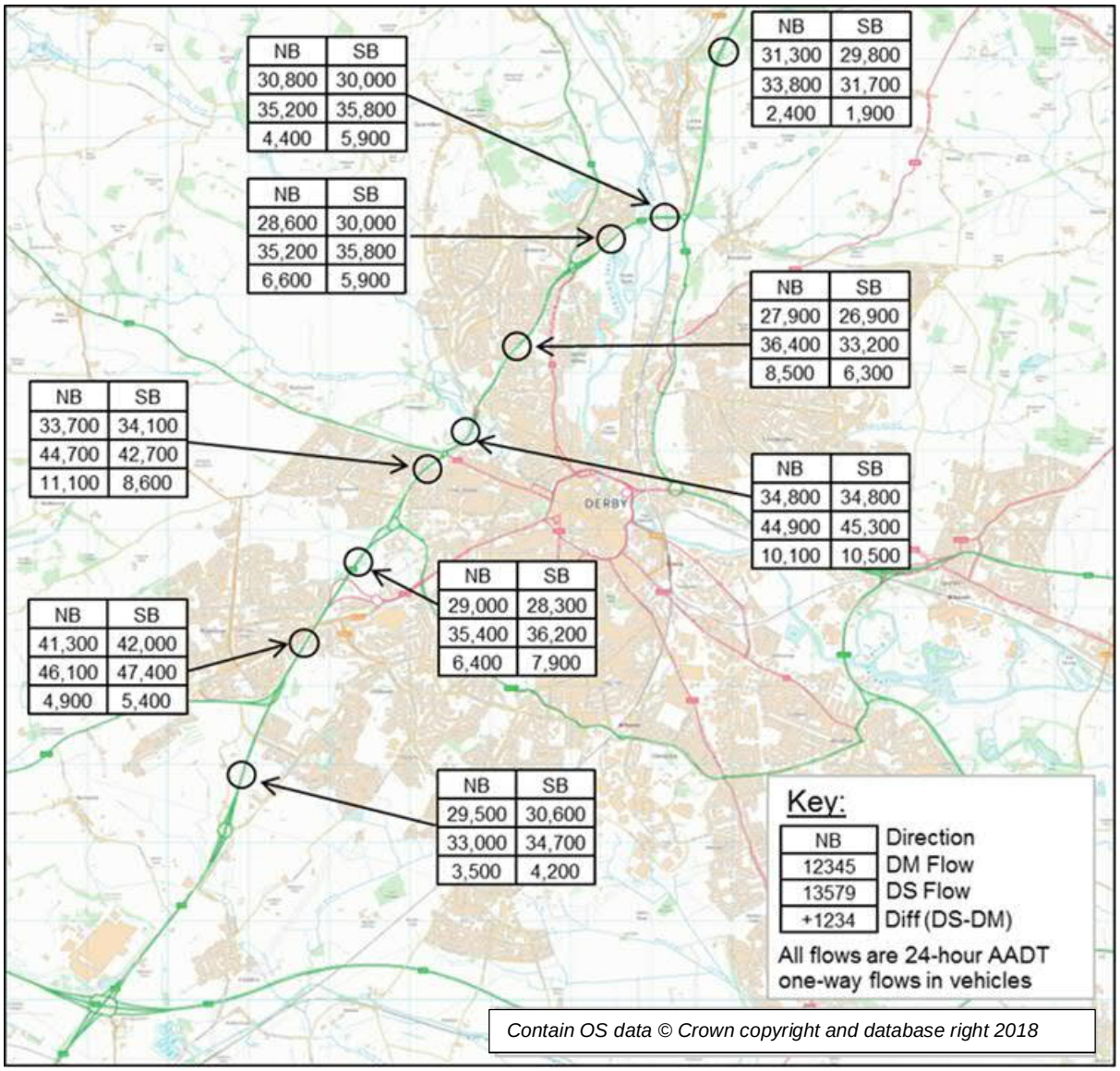
Operational Phase

2.4.4 Traffic modelling has been undertaken to assess the impact of the proposed scheme on the surrounding road network, road safety, vehicle movements and travel times. Traffic data and forecast model outputs have been used during the propose scheme design, and have generated the data to enable the assessment of proposed scheme effects upon water quality, air quality and noise (as reported in Chapters 5 and 11 respectively).

2.4.5 Traffic flows have been forecast for 2024 (the expected proposed scheme opening year) and for 2039 (15 years after the proposed scheme opening year). The highway design is based on the 2039 traffic forecasts, which include trips generated by the development sites as identified in the Derby City, Erewash, South Derbyshire and Amber Valley Local Plans.

2.4.6 Forecast daily traffic flows along the A38 strategic road without (DM) and with the proposed scheme (DS), are provided in Figure 2.7 (for year of proposed scheme opening in 2024).

Figure 2.7: DM and DS Daily Traffic Flows – Year of Proposed Scheme Opening (2024)

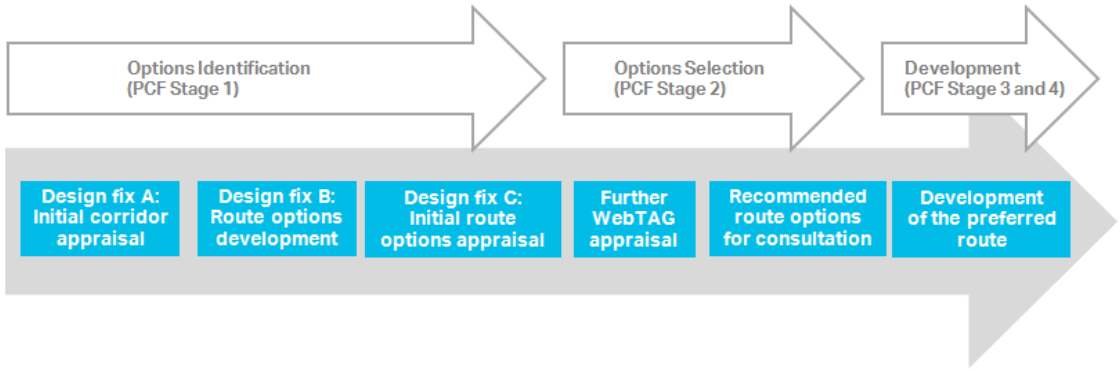


3 CONSIDERATION OF ALTERNATIVES

3.1.1 This chapter presents a brief history of the A38 Derby Junctions scheme and the main alternatives that have been developed and considered; ultimately resulting in the definition of the proposed scheme as detailed in Chapter 2: The Proposed Scheme.

3.1.2 The process of option identification and selection undertaken for the proposed scheme is summarised in Section 3.3. This process has followed the Highways England Project Control Framework (PCF) stages as shown in Figure 3.1 (noting that the proposed scheme development is now progressing through PCF Stage 3).

Figure 3.1: Option Identification and Selection Process



3.2 Scheme History

3.2.1 In April 2001 the Highways Agency[2] undertook a Road Based Study (RBS) to consider options for dealing with congestion and safety, environmental impacts, economic, accessibility and integration problems as associated with the three roundabout junctions on the A38 through Derby (namely Kingsway junction, Markeaton junction and Little Eaton junction). A public consultation on various short-term (interim) and long-term options was held in July 2002, with the RBS being issued in October 2002. The RBS recommended that the long term improvements should involve grade-separation of each of the three junctions.

3.2.2 Between 2002 and 2013 development of proposals to grade separate the A38 junctions through Derby went through a series of stops and restarts that included a range of option studies and public consultation events.

3.2.3 The A38 Derby Junctions scheme remained on hold until 2013 when it was announced as part of the Government's 2013 spending review. Thereafter in January 2014, the Highways Agency commissioned a review of the proposed scheme status and to identify the work required to take the A38 Derby Junctions scheme to the next development stage. The scope of the review included re-examining the traffic problems and confirming if a solution was required; reviewing the options considered; determining the work required in the next stage, along with programmes and budgets; providing an indicative update of the economics appraisal and procurement strategies. The purpose of the review was to enable the Highways Agency to consider the entry of the A38 Derby Junctions scheme into the planned programme

[2] Highways Agency was replaced by Highways England in April 2015. The Secretary of State appointed Highways England (the "Licence holder") as a strategic highways company by way of an Order in accordance with Section 1 of the Infrastructure Act 2015. The Licence came into force on 1 April 2015.

of improvement works.

3.2.4 Following completion of the review, AECOM was awarded the contract by the Highways Agency on 14 July 2014 to provide design services for the A38 Derby Junctions scheme to take the scheme through PCF Stage 2 to Preferred Route Announcement.

3.2.5 Since AECOM was commissioned in 2014, the government launched its first 'Road Investment Strategy' (RIS) (DfT, 2015) which set out an ambitious, long term programme for motorways and major roads with the stable funding needed to plan ahead effectively. The RIS announced 127 major schemes to be delivered over the course of the first Road Period (2015/ 16 to 2019/ 20), one of which was the A38 Derby Junctions scheme (referred to as "*replacement of three roundabouts on the A38 in Derby with grade-separated interchanges, raising the A38 in the East Midlands to Expressway standard and removing congestion*").

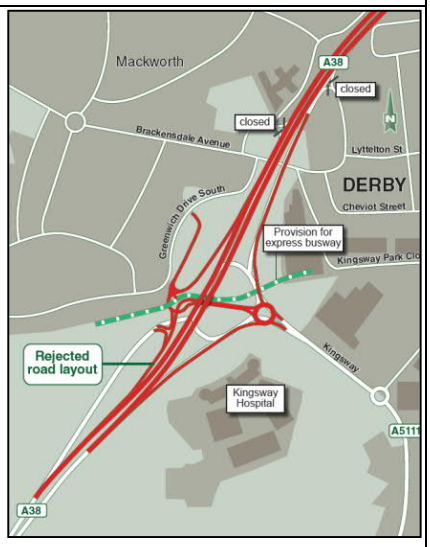
3.2.6 Following the Preferred Route Announcement on 31 January 2018, AECOM is now progressing the proposed scheme through PCF Stage 3 which will ultimately result in a DCO application.

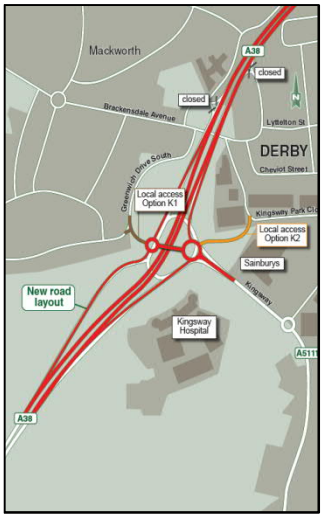
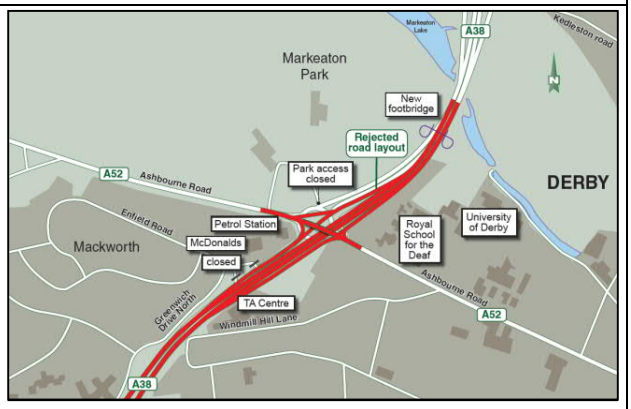
3.3 Selection of Proposed Scheme

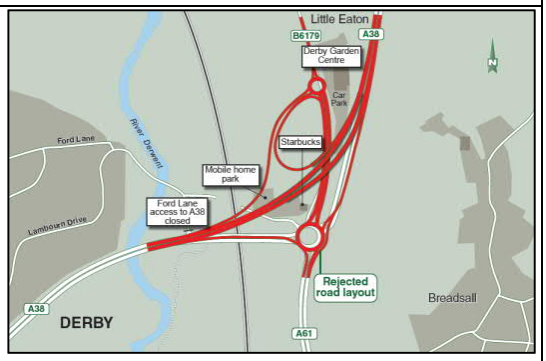
Proposed Scheme Options (2002 - 2009) and Preferred Solutions

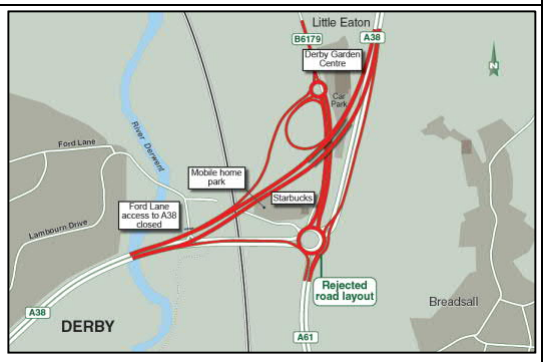
3.3.1 Given the history of the A38 Derby Junctions scheme, a wide range of alternatives have been developed, considered and assessed during the period 2002 and 2009 (covering PCF Stages 1 and 2). A summary of the main options that were presented during 2002 and 2003 public consultation events are summarised in Table 3.1, together with details as to why options were discounted, and which options were taken forward as the preferred options (together with associated reasons).

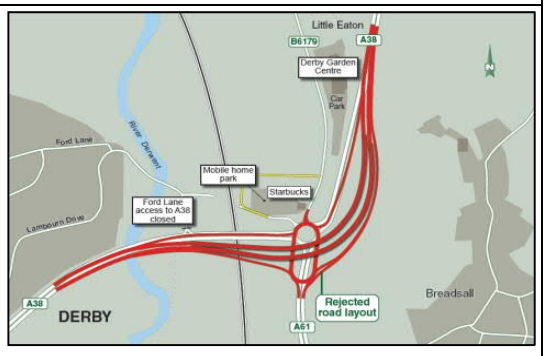
Table 3.1: Main A38 Derby Junctions Scheme Options Considered (2002 - 2009) and Preferred Solutions

Junction	Options Considered
Kingsway Junction	**Option 1:** This option emerged as the preferred option when the scheme was taken to public consultation in 2002. Here the A38 passed through the junction on embankment over the A5111, with roundabouts providing local access. However, this option was not taken forward due to: • Difficulties with the alignment of the A5111 and the impact of the large A38 embankment; • High visual impact due to the A38 passing over the junction on an embankment; • Higher construction costs and greater environmental impacts compared to the preferred option (see Option 2). 
	Option 2: This option was selected as the preferred option - key features being as follows:

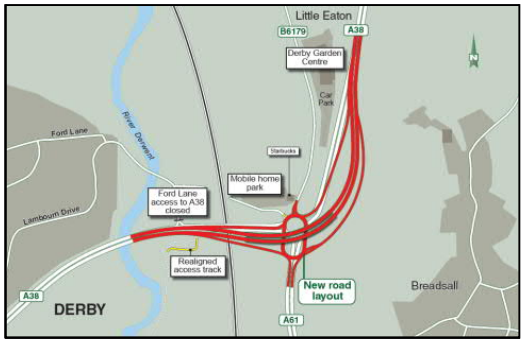
Junction	Options Considered
	• The A38 would be lowered to pass underneath the existing roundabout in a new underpass; • Construction of two new roundabouts and a new bridge at existing ground level to carry traffic across the lowered A38; • Existing A38 carriageways would generally be converted into the junction slip roads; • A38 widening to three lanes in each direction between Kingsway junction and Kedleston Road; • Speed limit increased from 40mph to 50mph. This option essentially remains the preferred option, although the scheme design has evolved in terms of local access linkages (i.e. use of local access Option K2 rather than Option K1 – refer to para. 3.3.10). 
Markeaton Junction	**Option 1:** The plan shows the option which emerged as the preferred option when the scheme was taken to public consultation in 2002. Further study identified that the design could not accommodate predicted traffic flows. As a result, the single bridge option was rejected and replaced with a two bridge roundabout which became Option 4. 
	Option 2: This option was rejected following the 2002 public consultation. The option entailed moving the A38 westwards away from Queensway at the expense of taking a stretch of land from Markeaton Park as well as the potential loss of the filling station and land where the McDonald's restaurant is located. This option was rejected due to unacceptable impacts upon Markeaton Park.
	Option 3: This option entailed putting the A38 on an embankment with a "flyover" arrangement. This option was rejected on the grounds of the high visual impact created by the embankment and retaining walls.
	Option 4: This option was selected as the preferred option. Key features being: • A38 lowered to pass underneath the existing roundabout in an underpass; • Construction of two new bridges to carry the A52 and roundabout traffic across the lowered A38; • Speed limit increased 

<table>
<tr><th>Junction</th><th>Options Considered</th></tr>
<tr><td></td><td>from 40 to 50 mph;
• A38 widened to three lanes in each direction between Kingsway junction and Kedleston Road;
• Access to Esso petrol station and McDonald's restaurant modified, with access on the A38 being closed and a revised access provided on the A52;
• Construction of new slip roads to permit all turning movements;
• Existing Markeaton Park entrance closed. Improved park access from the A52.
This option remains the preferred option, although it has been subject to a number of minor design evolutions, whilst signalisation of the junction requires some further refinements to the junction geometry.</td></tr>
<tr><td>Little Eaton Junction</td><td>A wide range of options were considered for Little Eaton junction prior to 2002 – these options were distilled down to the options illustrated below which were presented during the 2003 public consultation.
Option 1: This option would entail the A38 passing on embankment to the north of the existing Little Eaton junction. This option was not progressed following the 2003 consultation events due to low support from the public and stakeholders, and impacts on both local residents and commercial premises.
 

Option 2: This option entailed the A38 passing on embankment to the north of the existing Little Eaton junction (similar to Option 1). This option was not progressed following the 2002 consultation events due to low support from the public and stakeholders, and impacts on local residents and commercial premises.
 

Option 3: This option would position the A38 on embankment to the south of the existing A38 alignment. This option was identified as the preferred option in that land take outside the existing highway boundary would be minimised and there would no direct impacts on the Ford Farm Mobile Home Park or the Derby Garden Centre.
 

Option 3 was subsequently refined and emerged as the preferred option – reasons being that the revised layout:
• Provides a more compact footprint;</td></tr>
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Junction	Options Considered
	• Reduces impacts on the River Derwent floodplain and the Derwent Valley Mills World Heritage Site; • Reduces both construction costs and traffic disruption during construction; • Retains existing access arrangements to Ford Lane and the Starbuck's site. A slightly revised Option 3 layout was presented during public consultation events held in 2015. 

A38 Derby Junctions Scheme Development (post-2015)

3.3.2 Development of the A38 Derby Junctions scheme recommenced in July 2014 (still at PCF Stage 2), building upon the preferred options as detailed in Table 3.1.

3.3.3 Non-statutory public consultation was carried out in February and March 2015. This involved a two day exhibition in central Derby and supplementary exhibitions held in Breadsall, Little Eaton and Mackworth. The purpose of these consultation events was to illustrate how the scheme had developed since the previous public consultation events held in 2002 and 2003.

3.3.4 As a result of the 2015 consultation, members of the public and consultees were encouraged to provide suggestions for any alternative solutions. Several alternative options were received from consultees - these ranged from amendments to the presented junction options, to complete alternative schemes and alignments. All alternative scheme options received were subsequently considered under a two-stage assessment process, comprising the following:

i. An initial sifting assessment; and
ii. Options passing initial sifting were then subject to the more detailed qualitative assessment.

3.3.5 The purpose of the initial sifting assessment was to identify those options that were potentially viable and worthy of further consideration. The initial sifting assessment entailed a preliminary examination of each alternative option using information as provided by the consultee and the application of assessment methods detailed in the DfT's web-based Transport Analysis Guidance (WebTAG) - The Transport Appraisal Process (DfT, 2014). The performance of the various alternatives were assessed against the following criteria:

- Scheme objectives (refer to para. 1.1.4[3]);
- Deliverability; and
- Feasibility.

3.3.6 Alternative options had to achieve a baseline score against each of these criteria in order to pass the initial sift. The sifting assessment included the options published for

[3] Noted that the scheme objectives as detailed in para. 1.1.4 are essentially the same as those used during the option selection process

the public consultation events in order to form a baseline. Alternative options were then compared to the relevant base-lined published option, combination of options or the whole scheme, as appropriate.

3.3.7 Alternative options that passed the initial sift were subsequently subjected to further assessment - this further assessment entailed the analysis of:

- Costs estimates;
- Engineering assessment;
- Environmental assessment; and
- Traffic and economics assessment.

3.3.8 The further assessment considered alternative options at Kingsway junction and Little Eaton junction as follows:

- Kingsway junction:
  - Presented Junction Layout with Option K1 (see Figure 3.1);
  - Presented Junction Layout with Option K2 (see Figure 2.4);
  - Mr Jennison's alternative with Option K1 (see Figure 3.2).
- Little Eaton junction:
  - Option 2 (as described in Table 3.1 and see Figure 3.3);
  - Option 3A (see Figure 3.4);
  - Southern Sweep (see Figure 3.5).

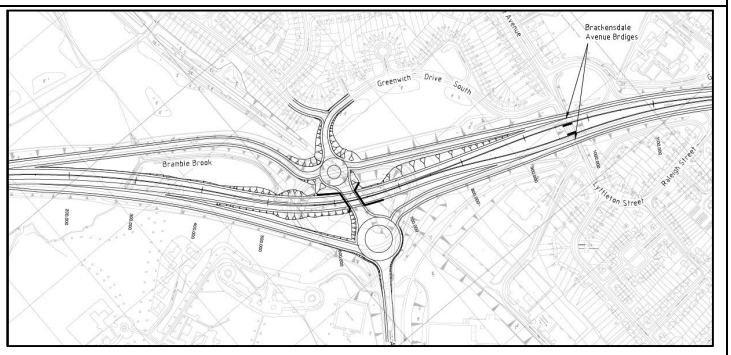
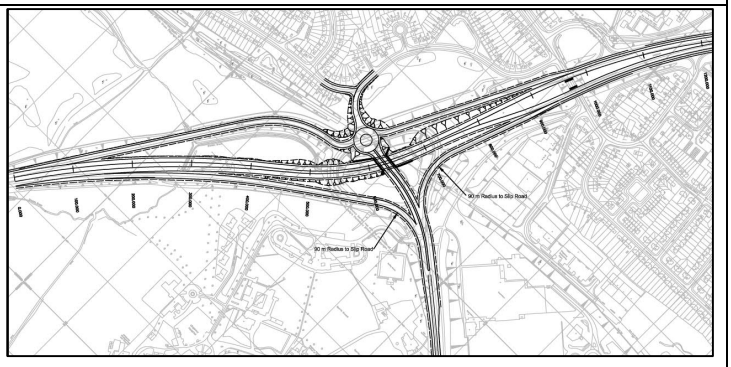
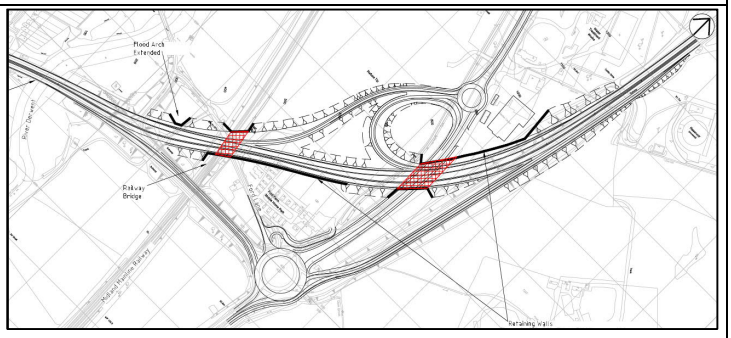
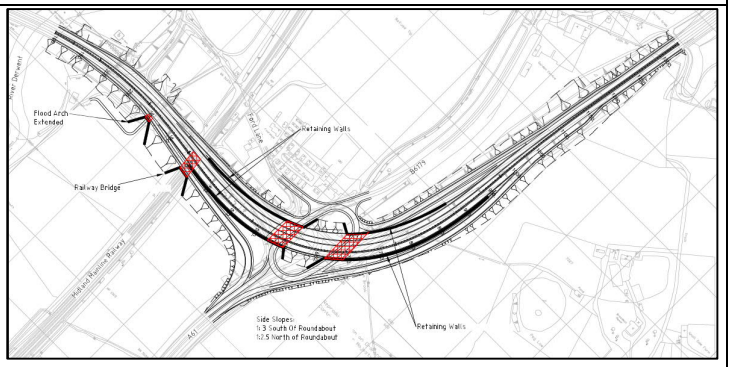
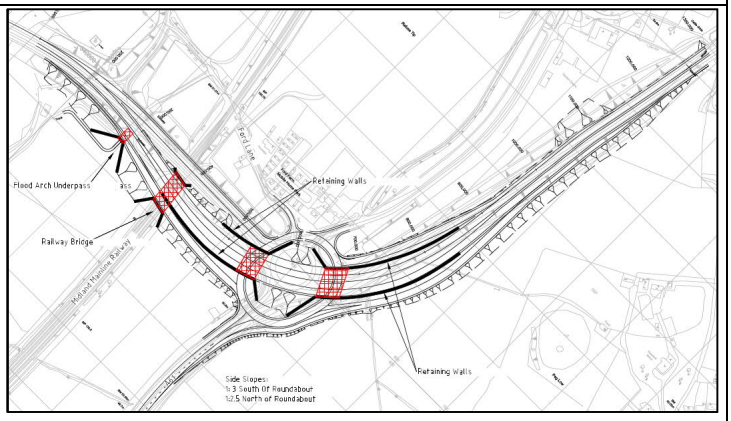
Figure No:	**Options Considered by Further Assessment**
Figure 3.1: Presented Junction Layout with Option K1	
Figure 3.2: Mr Jennison's alternative with Option K1	

Figure No:	Options Considered by Further Assessment
Figure 3.3: Option 2	
Figure 3.4: Option 3a	
Figure 3.5: Southern Sweep	

3.3.9 Whilst some alternative options for Markeaton junction were received (e.g. tunnel from south of Kingsway junction to the north of Markeaton junction; new trunk road from A38/ A50 Toyota junction to north of Little Eaton junction), none of these passed the initial sifting process and were thus excluded from further assessment.

3.3.10 The assessment involved the initial appraisal of the alternative options as presented at the 2015 public consultation events (referred to as the Presented Junction Layout for Kingsway junction (see Figure 3.1), and the Presented Option at Little Eaton junction (see Figure 2.6)), and then the absolute and relative performance of the alternative). The main assessment findings are detailed below[4]:

- **Kingsway junction:** Based upon the results of the costs estimates, engineering, environmental and traffic and economics assessments, Option K2 was identified

[4] Refer to: i) Alternative Options Assessment – Kingsway, Report Number: 47071319-URS-06-RP-RD-014-3F (Highways England, 2016c) and ii) Options Assessment – Little Eaton, Report Number: 47071319-URS-06-RP-RD-013-6F (Highways England, 2016b).

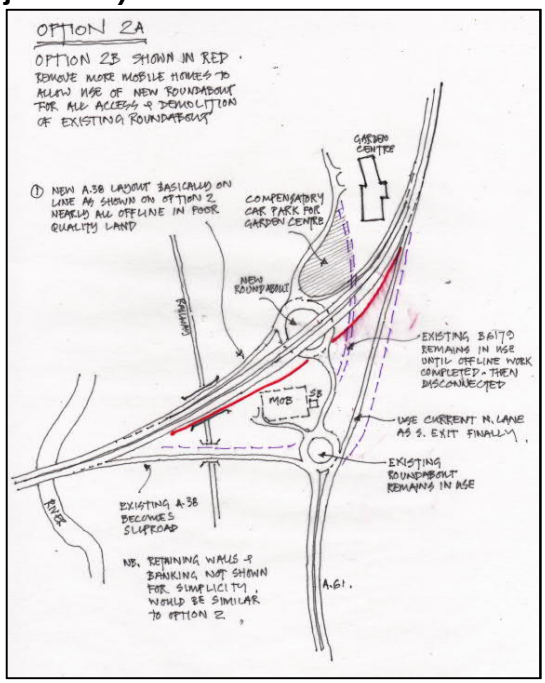
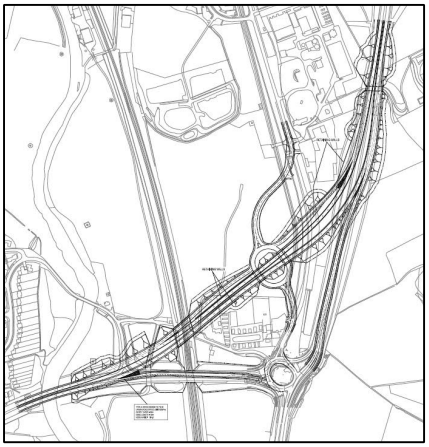
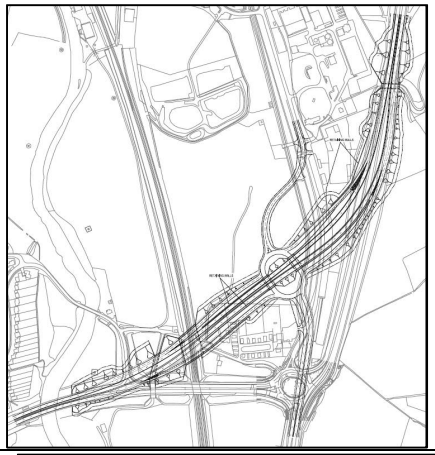
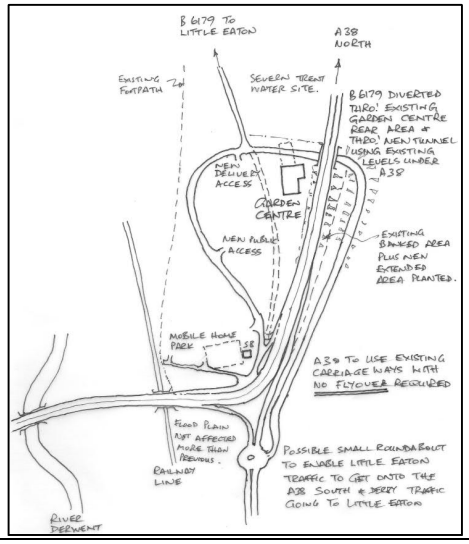
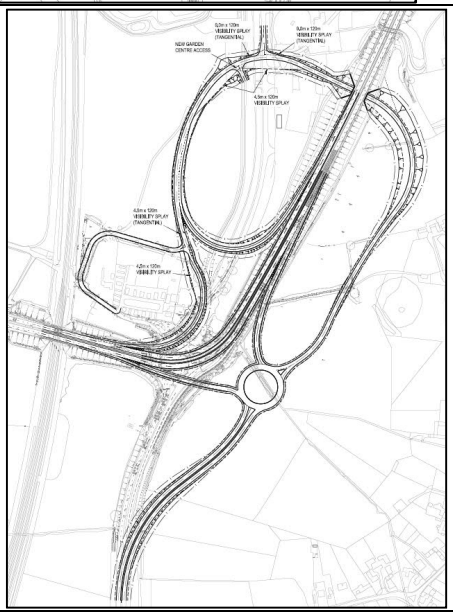
as being preferred as it performed better in terms of engineering and traffic and economics, whilst it would reduce long-term impacts upon an area of public open space, and reduce traffic severance issues along Greenwich Drive South. The Mr Jennison's Option ranked lowest in each category. Based on the assessment of the options, it was recommended that Option K2 was progressed with the Presented Junction Layout as the preferred option for grade separation of Kingsway junction. Option K2 has thus been integrated into the proposed scheme design as illustrated in Figure 2.4 and as described in Chapter 2: The Proposed Scheme.

- **Little Eaton junction:** The assessment considered the various Little Eaton junction options in terms of cost estimates, engineering, environmental and traffic/ economic considerations, with each option being compared to the Presented Option. This comparison indicated that while the Presented Option may not rank highest in each category or sub-category, in overall terms the Presented Option performed the best. However, there were areas where the Presented Option would have a potentially greater impact than the alternative options and thus detailed mitigation strategies should be developed for each of these aspects in conjunction with key stakeholders. Based on the assessment of the options, it was recommended that the Presented Option was progressed as the preferred option for grade separation of Little Eaton junction. In order to minimise the impact of the Presented Option, particularly in terms of design geometry, noise, permanent land use, nature conservation and flood risk, it was highlighted that it would be important that appropriate mitigation measures are considered as part of the ongoing scheme assessment and incorporated into the final scheme design.

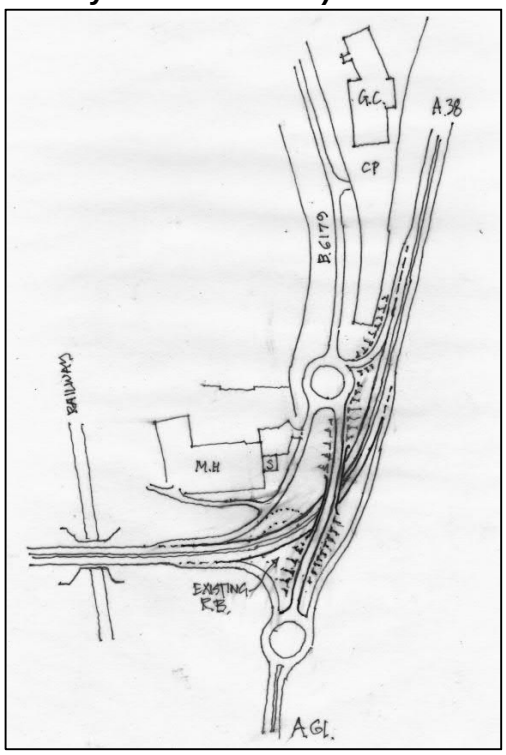
Further Options Assessments

3.3.11 Following the alternative options assessment as detailed above, further alternative options for Little Eaton junction were received from local residents in March 2016 (Options 2A and 2B), May 2016 (Option X) and June 2016 (Option X1) – refer to Table 3.2. These options were reviewed by the road design team who developed some of the options taking into account applicable highway design standards (also refer to Table 3.2) (note that an engineering interpretation drawing for Option X1 was not prepared as the option was not considered to support the scheme objectives).

Table 3.3: Alternative Little Eaton Junction Designs Received in 2016 and Engineering Interpretations subjected to Sifting Analysis

Option Received	Engineering Interpretation
Options 2A & 2B (A38 embankment moved to north of existing Little Eaton junction) 	**Option 2A**[5]  **Option 2B** 
Option X (link road from B6179 to A61 in tunnel under A38) 	

[5] Variants of Option 2A were developed for assessment purposes – namely a variant where the southbound entry slip was realigned for geometric reasons and a variant with a single bridge at the junction.

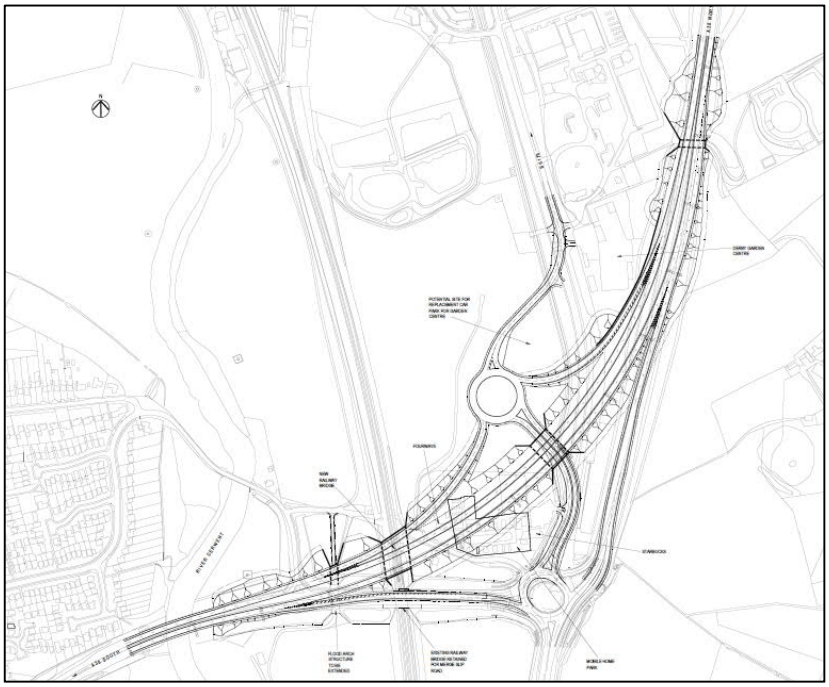
Option Received	Engineering Interpretation
Option X1 (link from the B6179 to A61 on a flyover above A38)[6] 	Engineering interpretation not prepared as alternative option did not support the scheme objectives.

3.3.12 These options were subject to the initial sifting assessment as described in para. 3.3.4 - the results of which indicated that none of these options passed initial sifting as they would not perform satisfactorily in terms of supporting the achievement of the defined scheme objectives, whilst they presented a number of technical challenges affecting the option feasibility. These options were thus not subjected to further assessment (Report No: 47071319-URS-06-RP-RDN-024-1F Highways England, 2016).

3.3.13 Subsequent to the above, a meeting took place on 19 January 2017 between the Transport Minister, the MP for Mid-Derbyshire (which includes Little Eaton and Breadsall), Highways England, Breadsall Parish Council and AECOM. The purpose of the meeting was to hear the concerns of the residents of Breadsall village in relation to the proposed improvements to Little Eaton junction. Following the meeting, it was decided to further assess an option that would result in the A38 being re-aligned to the north side of the existing roundabout. The project team considered the best alternative options as previously discounted, and defined Option 2C to be the best alternative option – see Figure 3.6.

[6] Engineering interpretation drawing for Option X1 was not prepared as the option was not considered to support defined scheme objectives

Figure 3.6: Alternative Option 2C



3.3.14 Option 2C was developed with the assumption that the Ford Farm Mobile Home Park and its residents would be relocated with the existing mobile home park being demolished, whilst the property Fourways and its associated businesses would also be acquired and demolished, plus the provision of a replacement car park area for the Derby Garden Centre. Option 2C was then compared to the preferred option in terms of engineering, traffic and economics, environment, stakeholders and land.

3.3.15 The initial feasibility assessment indicated that Option 2C had a number of advantages over the preferred option in terms of engineering design and potential environmental impacts on Breadsall village (in terms of noise, air quality and visual intrusion). It would also reduce the impact on agricultural land within the designated green belt. However, the main disadvantages of Option 2C would be the impacts on the property Fourways (and associated businesses) and the mobile home park; the societal impacts to the residents; and the increased scheme construction costs.

3.3.16 Given the above, Option 2C was not considered to be preferable to the preferred option, such that the PRA was announced on the 31st January 2018 resulting in the preferred option becoming the proposed scheme.

3.4 Development of the Proposed Scheme

3.4.1 Following the PRA, the proposed scheme is now progressing through the DCO application stage (PCF Stage 3) (refer to Figure 3.1). There is the potential that the proposed scheme design as presented herein will be further developed and refined. Any such design evolutions will be reported in the Environmental Statement which will be prepared to support the DCO application. The Environmental Statement will also include details of alternatives considered and the reasoning for the selection of the chosen option (as detailed above).

3.5 Appraisal of Options Presented for Consultation

3.5.1 At the statutory consultation events that will take place between 7th September 2018

to the end of Thursday 18th October 2018, the public are being asked to pass comment upon a number of potential options, namely:

- The need for noise barriers on both sides of the A38 between Kingsway junction and Markeaton junction;
- Public open space exchange land options;
- Closure of the existing uncontrolled pedestrian crossing of the A38 between Thurcroft Close and Greenwich Drive North;
- Options regarding new pedestrian and cyclist facilities;
- The requirement for visual screening barriers on the approaches to Little Eaton junction;
- Whether people have any suggestions of potential additional impacts or benefits that they think should be included in our assessments.

3.5.2 The public consultation outcomes will be evaluated and will assist in the further development of the proposed scheme design which will be confirmed and assessed within the Environmental Statement.

4 ENVIRONMENTAL ASSESSMENT METHODOLOGY

4.1 General Approach

The National Policy Statement - National Networks

4.1.1 The National Policy Statement for National Networks (NPSNN) published in 2014 (DfT, 2014) sets out the need for and the Government's policies to deliver Nationally Significant Infrastructure Projects (NSIPs) on the national road and rail networks in England. The NPSNN is used by the Secretary of State as the primary basis for making decisions on DCO applications for NSIPs.

4.1.2 Given the proposed scheme is a road network NSIP, the EIA approach adopted is in accordance with the NPSNN. In particular, the EIA adheres to the methodology requirements cited within NPSNN Section 5: Generic Impacts. Mitigation measures will be developed in accordance with the mitigation requirements also set out in Section 5 of the NPSNN.

The Design Manual for Roads and Bridges

4.1.3 Guidance published by the Government for the preparation of environmental assessments of proposed road schemes is contained in the Design Manual for Roads and Bridges (DMRB) Volume 11 (Highways Agency, 2007). This sets out both the general process and the methods for assessing individual environmental topics. This PEI Report adheres to Interim Advice Note (IAN) 125/15 Environmental Assessment Update (Highways England, 2015), which provides a new structure of DMRB Volume 11.

4.1.4 DMRB Volume 11 advises on the environmental topics to be included in an EIA, and the methods to be used in the assessment for each of those topics. The topics identified in Section 5 to 14 of this PEI Report are those required by DMRB and by the EIA Regulations (refer to para. 1.3.3).

4.1.5 The EIA being undertaken adheres to the most up-to-date, relevant guidance contained in DMRB and Highways England IANs. The methodologies used for the preliminary assessments for individual topics in this PEI Report are based on those provided in the EIA Scoping Report, having regard to the current stage of the assessment. Should any revisions to IANs or DMRB be issued between the PEI Report and reporting of the EIA in the Environmental Statement, they will be adopted where appropriate, provided that it is reasonable to do so within the programme and governance for the project. Any changes in environmental legislation, such as the technical requirements under the EIA Regulations, will be accommodated within the Environmental Statement as relevant.

Other Studies

4.1.6 The following will be prepared as standalone documents submitted with the DCO application:

- **Heritage Impact Assessment (HIA):** A HIA will be prepared in parallel with the EIA. HIA is recommended by the International Council on Monuments and Sites (ICOMOS) for development which affects cultural World Heritage properties, in order to evaluate effectively the potential impact of development upon the Outstanding Universal Value (OUV), integrity and authenticity of the WHS, and to

inform the proposed scheme design and mitigation. The HIA will be undertaken alongside the EIA and will focus on the impact of the proposed scheme on the OUV of the Derwent Valley Mills World Heritage Site and the attributes that convey the OUV.

- **Water Framework Directive Report:** A Water Framework Directive (WFD) Assessment will be undertaken and a WFD compliance assessment report produced alongside the Environmental Statement. This report will consider the extent to which the proposed scheme could impact on the current and future target WFD status of applicable water bodies (e.g. Bramble Brook, the River Derwent). Where potential adverse effects are identified, an assessment of these will inform what mitigation measures need to be incorporated into the design and construction methods of the proposed scheme to remove or minimise the effect. The results will be presented in the Environmental Statement.
- **Flood Risk Assessment (FRA):** The road drainage and water environment assessment will be supported by FRAs that will detail how the proposed scheme could influence local flooding and the measures integrated within the proposed scheme design that aims to avoid significant flooding effects.
- **Habitat Regulations Assessment (HRA):** As indicated in Chapter 8: Biodiversity, there are no international designated ecological sites (e.g. Special Areas of Conservation (SAC)) within 30km of the proposed scheme cited for bat interest, whilst there are no other international designated sites within 2km of the proposed scheme. It is, therefore, considered unlikely that the proposed scheme would have an adverse effect upon the integrity of any European sites of International importance. Therefore, a Habitat Regulations Assessment (HRA) is not required to support the DCO application for the proposed scheme, although an HRA Screening report will be prepared to confirm this preliminary assessment.
- **Planning Statement:** The Planning Statement will include assessments as related to pubic open space and exchange land provisions, as well as a green belt assessment.

4.2 Study Area and Site Boundary

4.2.1 The study area assessed for the PEI Report for each environmental topic is described in each relevant topic chapter (refer to Chapters 5 to 14). The study area is based on the draft DCO application boundary (hereafter referred to as the proposed site boundary) presented in the EIA Scoping Report dated March 2018 (Figures 1.2a/ b therein).

4.2.2 The proposed scheme boundaries as shown in Figure 1.2a/ 1.2b illustrate that the site boundary as assessed within this PEI Report is similar to that as presented in the EIA Scoping Report. However, the boundary has been amended as follows:

- Area added to the west of Mill Pond to include a potential construction compound (refer to Table 2.3).

4.2.3 The proposed site boundary (refer to Figures 1.2a/ 1.2b) comprises land anticipated to be potentially required temporarily and/ or permanently for the construction, operation and maintenance of the proposed scheme at the time of preparation of the PEI Report.

4.2.4 The EIA and Environmental Statement will be based on the final site boundary presented in the DCO application.

4.3 Existing Baseline and Future Conditions

4.3.1 In order to identify the effects of the proposed scheme on the environment, it is important to understand the environment that would be affected by the proposed scheme (the 'baseline conditions'). Understanding the baseline allows the measurement of changes that would be caused by the proposed scheme.

4.3.2 The baseline conditions are not necessarily the same as those that exist at the current time; they are the conditions that would exist in the absence of the proposed scheme either (a) at the time that construction is expected to start, for impacts arising from construction or, (b) at the time that the proposed scheme is expected to open to traffic, for impacts arising from the operation of the proposed scheme. Therefore, the identification of baseline conditions involves predicting changes that are likely to happen in the intervening period, for reasons unrelated to the proposed scheme. This will entail taking current conditions and committed development into consideration and using experience and professional judgment to predict what the baseline conditions might look like prior to start of proposed scheme construction and operation.

4.3.3 This PEI Report presents baseline information representing the understanding at the time of writing. This baseline will become further developed as additional surveys are undertaken and data obtained, and will be presented in the Environmental Statement.

4.4 Potential Significant Effects and Mitigation

Defining Assessment Years and Scenarios

4.4.1 The assessment of effects involves comparing a scenario with the proposed scheme against one without the proposed scheme over time. The absence and presence of the proposed scheme are referred to as the 'Do Minimum' and 'Do Something' scenarios respectively. The 'Do Minimum' scenario represents the future baseline with minimal interventions and without new infrastructure as associated with the proposed scheme.

4.4.2 Depending on the topic, the predicted effects detailed in this PEI Report (and in the Environmental Statement) are assessed for the 'Do Minimum' and 'Do Something' scenarios in the baseline year (assumed to be the year of opening, 2024 for the purposes of the Environmental Statement) and a future assessment year (assumed to be 15 years after opening, namely 2039).

4.4.3 Demolition of the proposed scheme has been scoped out of the EIA on the basis that the road would become an integral part of national infrastructure and would not be decommissioned (refer to para. 2.3.34).

Identifying Potential Effects

4.4.4 The EIA Regulations require: "The description of the likely significant effects" of the proposed scheme on the environment, covering "the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development". The PEI Report provides a preliminary view on likely significant effects, which will be refined during the ongoing EIA and proposed scheme design process.

Assessing Significance

4.4.5 The significance of an environmental effect is typically a function of the 'value' or 'sensitivity' of the receptor and the 'magnitude' or 'scale' of the impact.

4.4.6 DMRB Volume 11, Section 2, Part 5 HA 205/08 'Assessment and Management of Environmental Effects' (Highways Agency, 2008) provides advice on typical descriptors of environmental value, magnitude of change and significance of effects. Table 4.1 to Table 4.4 reproduce these descriptors and demonstrate how the significance of effect category can be derived. Assessments against these criteria have been made on the basis of professional judgement.

Table 4.1: Environmental Value (or Sensitivity) and Typical Descriptors

Value	Typical Descriptors
Very high	Very high importance and rarity, international scale and very limited potential for substitution.
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	High or medium importance and rarity, regional scale, limited potential for substitution.
Low (or lower)	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

Table 4.2: Magnitude of Change and Typical Descriptors

Magnitude of Change	Typical Descriptors
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse).
	Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (Adverse).
	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse).
	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse).
	Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).

Magnitude of Change	Typical Descriptors
No Change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

4.4.7 Table 4.3 demonstrates how combining the environmental value of the resource or receptor with the magnitude of change/ impact produces a significance of effect category.

Table 4.3: Significance of Effects Matrix

	Value/ Sensitivity of Receptor				
Magnitude of Change	**Very High**	**High**	**Medium**	**Low**	**Negligible**
Major	Very Large	Large/ Very Large	Moderate /Large	Moderate	Slight
Moderate	Large/ Very Large	Moderate/ Large	Moderate	Slight	Neutral
Minor	Moderate/ Large	Moderate	Slight	Neutral	Neutral
Negligible	Slight	Slight	Neutral	Neutral	Neutral
No Change	Neutral	Neutral	Neutral	Neutral	Neutral

4.4.8 DMRB recognises "the approach to assigning significance of effect relies on reasoned argument, professional judgement and taking on board the advice and views of appropriate organisations. For some disciplines, predicted effects may be compared with quantitative thresholds and scales in determining significance. Assigning each effect to one of the five significance categories enables different topic issues to be placed upon the same scale, in order to assist the decision-making process at whatever stage the project is at within that process".

4.4.9 Table 4.4 illustrates how the DMRB describes the significance of effect categories. In arriving at the significance of effect, the assessor will also consider whether they are direct, indirect, secondary, cumulative, short, medium or long-term, permanent or temporary, positive or negative.

Table 4.4: Descriptors of the Significance of Effect Categories

Significance Category	Typical Descriptors of Effect
Very large	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change (e.g. loss or severe damage to key characteristics) in a site or feature of local importance may also enter this category.

Significance Category	Typical Descriptors of Effect
Large	These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	These beneficial or adverse effects may be important, but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
Slight	These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision making process, but are important in enhancing the subsequent design of the project.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

4.4.10 Effects determined to be slight or neutral are not deemed to be significant, and as such will not be reported in detail herein or in the Environmental Statement and will not require specific mitigation. The exception to this is where the combination of multiple slight effects has the potential to lead to a significant (i.e. moderate or above) cumulative effect.

4.4.11 Not all of the environmental topics will use the above criteria or approach. For example, some topics do not use a matrix based approach but instead use numerical values to identify impacts (e.g. noise and vibration) and some topics do not have agreed methods of assessment or scales of measurement for either value or sensitivity (e.g. geology and soils). Therefore, each environmental topic specialist will use the information provided above, their topic specific guidance as well as their professional judgement to assess the significance of potential effects. However, irrespective of the criteria or approach that a topic requires, the descriptors of effect significance listed in Table 4.4 will be used.

4.4.12 Further topic-specific details of the methodology used for determining effect significance are presented in Chapters 6 to 16 of the EIA Scoping Report (see https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010022/TR010022-000036-38DY%20-%20Scoping%20Report.pdf).

Mitigation Measures, Enhancements and Residual Effects

4.4.13 The EIA will take into account any design measures that have been incorporated into the proposed scheme design (embedded mitigation measures), as well as any standard construction/ operational management activities that the proposed scheme will implement (e.g. through the CEMP and routine operational phase management practices) and in accordance with the NPSNN.

4.4.14 Highways England is committed to including mitigation measures as necessary to address potentially significant adverse environmental effects identified during the EIA process as far as reasonably practicable. Mitigation of potentially significant adverse environmental effects (including, where appropriate, any proposed monitoring arrangements) will be an iterative part of the proposed scheme design development following the hierarchy below:

- **Avoidance:** incorporate measures to avoid the effect, for example, alternative design options or modifying the proposed scheme programme to avoid environmentally sensitive periods.
- **Reduction:** incorporate measures to lessen the effect, for example, fencing off sensitive areas during construction and implementing a CEMP to reduce the potential impacts from construction activities.
- **Mitigation/ Remediation:** where it is not possible to avoid or reduce a significant effect, then offsetting measures should be considered. For example, the provision of replacement of habitat to replace that lost to the proposed scheme or remediation such as the clean-up of contaminated soils.
- **Enhancement:** where possible enhancement measures will be incorporated into the proposed scheme design. Enhancement measures are considered to be over and above any avoidance, mitigation and compensation measures required to remove the adverse impacts of the proposed scheme.

4.4.15 The individual technical chapters presented within this PEI Report identify the measures considered to be required to mitigate potentially significant adverse effects, some of which are to be incorporated into the proposed scheme design. Effects that remain after mitigation are referred to as residual effects. The assessment of the significance of residual effects after mitigation, remediation and/ or enhancement is the key outcome of the EIA and will be reported in the Environmental Statement.

Construction and Operational Effects

4.4.16 The EIA considers impacts during the construction and operation of the proposed scheme. The construction phase assessment addresses both the temporary activities involved in building the proposed scheme and the subsequent permanent presence of the proposed scheme once constructed (including loss of habitats, land-take etc.). Where relevant, these temporary and permanent effects are described separately herein. The operational assessment considers the situation when the proposed scheme is being used by traffic.

Assessment of In-combination and Cumulative Effects

4.4.17 Cumulative effects are the result of multiple impacts on environmental receptors or resources during proposed scheme construction and/ or operation. There are principally two types of cumulative impact:

- The combined action of a number of different environmental topic specific impacts due to the proposed scheme acting upon a single resource/ receptor (in combination impacts);
- The combined action of a number of different projects, cumulatively with the project being assessed, on a single resource/ receptor (cumulative impacts).

4.4.18 Further details on the scope of the cumulative effects assessment are provided in Chapter 15 (Assessment of Cumulative Effects).

4.5 Major Accidents and Disasters

Background

4.5.1 The 2017 EIA Regulations introduced a requirement to consider major accidents and disasters. The general scope of the requisite assessment covers:

- Vulnerability of the project to risks of major accidents and/ or disasters that are relevant to the project (subsequently referred to as major events); and
- Any consequential significant environmental effects from those major events.

Methodology

4.5.2 The assessment will:

- Apply professional judgement in consultation with Highways England to develop project specific definitions of major events;
- Identify any major events that are relevant to and can affect the proposed scheme;
- Where major events are identified, describe the expected significant effects arising from the vulnerability of the proposed development to major accidents or disasters that are relevant to the project;
- Report the conclusions of this assessment within the individual environmental topics (as applicable); and
- Clearly describe any assumed mitigation measures and details of the preparedness for and proposed response to such emergencies, to provide an evidence base to support the conclusions and demonstrate that likely effects have been mitigated/ managed to an acceptable level.

4.5.3 The potential receptors of effects resulting from major events and any consequences for receptors will be reported in the relevant Environmental Statement topic chapter as required.

4.5.4 The methodology adopted for the assessment is described in the EIA Scoping Report which is available at the link given in Chapter 1 (refer to para. 1.3.5).

Preliminary Assessment

4.5.5 The proposed scheme is being designed in accordance with applicable current design standards, whilst the design also takes appropriate allowances for potential climate change (e.g. the design of the proposed scheme drainage systems, and flood risk mitigation features). Thus whilst significant effects associated with major events are not currently anticipated, this will be considered further and reported in the Environmental Statement.

4.6 Human Health

Scope of Assessment

4.6.1 There is no consolidated methodology or accepted good practice for this topic, however, the NPSNN (paragraph 4.81) defines how significance of effects are to be determined and the scope of the assessment is covered by existing Highways England guidance. The assessment to be undertaken as part of the EIA will address health in the first instance by utilising individual guidance for air quality, noise and vibration, road drainage and the water environment and people and community effects. To enable overall health conclusions to be drawn, a qualitative assessment

of information collated via the topic assessments will then be undertaken and presented within the Environmental Statement. Potential health effects associated with specific issues will also be reported within the relevant Environmental Statement topic chapters.

Preliminary Assessment

4.6.2 Taking into account the preliminary assessment results as related to air quality, noise and vibration, road drainage and the water environment and people and community effects as presented within this PEI Report, it is not currently considered that the proposed scheme would have any significant effects with regard to human health. However, this will be considered further and reported in the Environmental Statement.

5 AIR QUALITY

5.1 Introduction

5.1.1 This chapter presents the findings of a preliminary assessment of the potential effects of the proposed scheme on air quality. Receptors that are sensitive to air quality include public exposure receptors (these are sensitive locations where relevant exposure for the air quality criteria being assessed could occur e.g. residential properties or schools), and nationally and internationally designated ecological sites.

5.1.2 This chapter is supported by Figure 5.1. A full discussion of the legislative framework and the air quality impact assessment methodology for the full EIA is provided in Chapter 6 of the EIA Scoping Report (refer to para. 4.4.12). In summary, the process of scoping identified that the construction and/ or operation of the proposed scheme could result in the following:

- Fugitive dust emissions associated with construction related activities; and
- Emissions of nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$) due to road traffic during the construction and operational phases of the proposed scheme.

5.1.3 The assessment is being undertaken in accordance with best practice guidance and standards relating to the identification, assessment and evaluation of air quality effects associated with highway-based improvements.

5.2 Stakeholder Engagement

5.2.1 Statutory and non-statutory bodies have been engaged as part of the assessment process to obtain background data, information and records concerning air quality within the defined study area, and to develop the assessment scope.

5.2.2 Following receipt of the EIA Scoping Opinion in April 2018, the scope of the air quality assessment is being reviewed and modified (as necessary).

5.2.3 Consultation will continue with DCiC Environmental Health Officers (EHO) through the EIA process to: further refine the adopted study area (described below); discuss the magnitude of predicted impacts and the significance of effects on air quality; and agree appropriate mitigation measures. Consultation with DCiC is also being undertaken regarding the Council's plans to develop and implement a potential Clean Air Zone (CAZ) within Derby.

5.3 Assessment Assumptions and Limitations

5.3.1 Air quality monitoring data have been obtained from local authorities and scheme-specific studies (refer to Section 5.5). The local operational air quality assessment uses the latest Defra local air quality management tools and guidance, and Highways England tools and guidance that was available at the time the assessment was undertaken, with the predictions having been checked against the most recently available local air quality monitoring data.

5.3.2 At this stage, details of the construction traffic, construction schedule, construction methodology and plant requirements are not yet confirmed. Therefore, for this preliminary assessment a qualitative construction air quality assessment has been carried out, based on the application of best practicable means to minimise air quality issues. An further assessment of potential construction phase air quality impacts will

be undertaken and reported in the Environmental Statement.

5.3.3 A detailed operational air quality assessment will be included within the Environmental Statement which will be based on detailed traffic modelling data, and which will consider the whole of the affected road network. In this PEI Report potential air quality effects are described based on the currently available traffic data and proposed scheme design, focusing upon the affected road network where there is greatest potential for changes in air quality due to the proposed scheme. Further refinements to both the traffic data and proposed scheme design are anticipated for the Environmental Statement. Given the above, the preliminary air quality assessment results as presented herein are subject to change.

5.3.4 As detailed in para. 5.2.3, DCiC has plans to develop and implement a potential CAZ within Derby. Details regarding the potential CAZ are not yet available. When such details become available, the implications for the proposed scheme construction and operation will be considered. Findings will be reported within the Environmental Statement.

5.4 Study Area

5.4.1 The assessment of construction phase traffic effects (typically Heavy Goods Vehicles (HGV) assessment and traffic management assessment) and operational phase traffic effects (local operational assessment) uses a study area of 200m around roads likely to be affected by the proposed scheme. This is due to the effect of pollutants from road traffic reducing with distance from the point of release, and beyond 200m these are likely to have reduced to a concentration equivalent to background concentrations (Highways Agency, 2007).

5.4.2 Individual sensitive receptors (within or outside Air Quality Management Areas (AQMAs)) are studied in the local operational assessment at distances of up to 200m. The air quality study area for the construction phase HGV and traffic management assessments consider the proposed scheme, and those routes where the proposed scheme is predicted to have an impact. Affected roads have been identified by comparing estimated traffic data with the proposed scheme (Do Something) and without the proposed scheme (Do Minimum) against the local air quality screening criteria presented in DMRB, which are as follows:

a) Road alignment will change by 5m or more; or
b) Annual average daily traffic (AADT) flows will change by 1,000 or more; or
c) Heavy duty vehicles (HDV) (vehicles greater than 3.5 tonnes, including buses and coaches) flows will change by 200 AADT or more; or
d) Daily average speeds will change by 10km/hr or more; or
e) Peak hour speed will change by 20km/hr or more.

5.4.3 These criteria are used to identify whether significant changes in air quality might occur. If a criterion is not met or exceeded, then a significant change in air quality is not anticipated. However, if a criterion is met, this does not automatically mean that a significant effect is anticipated, but that further evaluation is required to understand the potential for significant effects.

5.5 Baseline Conditions

5.5.1 Baseline air quality data and sensitivity receptor data for the study area have been gathered from the following sources:

a) Boundaries of AQMAs;
b) Local Authority monitoring data;
c) Highways England monitoring data;
d) Defra air pollution background concentration maps;
e) Locations of human health receptors (residential properties, schools, hospitals and elderly care homes) from Ordnance Survey (OS) base mapping; and
f) Boundaries of relevant designated ecological sites.

5.5.2 There is one AQMA within the study area considered herein, designated 'Derby NO_2 AQMA No.1: Ring Roads' (refer to Figure 5.1). This AQMA encompasses the inner and outer ring-roads in the city, as well as some sections of radial roads and the entire length of Osmaston Road. The modelled roads within this AQMA include the A516 (Uttoxeter New Road) and the length of A5111 between the A516 and A5250.

5.5.3 Information on areas exceeding EU limit value thresholds (40µg/m^3 for annual mean NO_2) is available from Defra's Pollution Climate Mapping (PCM) Model. This model provides 'road contributed' concentrations of pollutants, including annual mean NO_2. The length of the A38 throughout the whole study area is exceeding the limit value in the base year of 2015 based on 2015 roadside NO_2 concentrations modelled by the Defra PCM model. However, by the proposed scheme opening year of 2024, no links within the study area are predicted to exceed 40µg/m^3.

5.5.4 DCiC recorded exceedances of the annual mean NO_2 Air Quality Strategy (AQS) objective at 11 monitoring locations in 2015 – all of which are located in the Ring Roads AQMA, and one of which (DT35) is located within the study area considered herein, on the A516 Uttoxeter New Road (DCiC, 2016). Annual mean concentrations within 10% of an exceedance were also recorded at two monitoring locations within the study area considered herein, namely: at DT37 and DT40, also on the A516 Uttoxeter New Road. No other local authorities reported exceedances or near-exceedances at monitoring locations in the air quality study area considered herein.

5.5.5 In addition to local authority data, Highways England commissioned a passive diffusion tube monitoring programme along the proposed scheme in 2013. A network of 33 NO_2 monitors were established to supplement air quality data available from local authority sources and data gaps in relation to the proposed scheme and adjacent routes (refer to Figure 5.1). An additional six monitoring locations were added to the network in June 2014 as a result of measured exceedances in the NO_2 objective, providing greater coverage of applicable AQMAs. Markeaton junction and Little Eaton junction were modified as part of the Pinch Point Programme – such works took place during 2014, with the works being completed in early 2015. These construction works had the potential to affect monitoring results during 2014 due to on-going construction activities and associated active traffic management - as a result, a further year of monitoring took place to obtain a full year of NO_2 monitoring data post the Pinch Point works (i.e. February 2015 – February 2016).

5.5.6 Exceedances of the annual mean NO_2 AQS objective were recorded at eight monitoring locations within the study area considered herein in 2015. Two of these locations were within the AQMA, at the junction between the A5111 and the A516, and on the A516 at Royal Derby Hospital. The remaining six exceedances were recorded at Uttoxeter Road close to its bridge over the A38, on the A5111 Manor Road, at the junction between the A52 and the A38, and alongside the A38 between Kingsway junction and Kedleston Road.

5.5.7 Estimates of background pollutant concentrations in the UK are available for 0.6 mile (1km) grid squares throughout the UK up to the year 2030, based on baseline data available for 2015. The projected 2015 background concentrations for NO_2 and PM_{10} for the grid squares through which the proposed scheme would pass are all below the relevant air quality objectives. Background NO_2 concentrations range from 16.6µg/m^3 to 34.6µg/m^3, whilst PM_{10} concentrations range from 13.2µg/m^3 to 16.1µg/m^3, and $PM_{2.5}$ range from 9.3µg/m^3 to 11.2µg/m^3. By the 2024 proposed scheme opening year background concentrations are predicted to reduce, with NO_2 concentrations ranging from 9.1µg/m^3 to 14.0µg/m^3, PM_{10} concentrations from 12.7µg/m^3 to 15.4µg/m^3 and $PM_{2.5}$ concentrations from 8.5µg/m^3 to 10.4µg/m^3.

5.5.8 There are no designated ecological sites in the air quality study area considered herein. The closest designated ecological sites are: Morley Brick Pits SSSI (approximately 0.6km to the east of the study area); Breadsall Railway Cutting SSSI (approximately 1.7km east of the study area); and Kedleston Park SSSI (approximately 2.5km west of the study area).

5.6 Potential Impacts

5.6.1 Mitigation measures being incorporated in the design and construction of the proposed scheme are set out in Section 5.7. Prior to implementation of the mitigation, the proposed scheme has the potential to affect local air quality (positively or negatively), both during construction and once in operation, in the following ways:

a) There could be increased emissions of dust during construction of the proposed scheme from dust-raising activities on site;
b) Air quality could be affected by emissions associated with non-road mobile machinery (NRMM) undertaking construction works;
c) Air quality could be affected by changes in traffic flows, speeds or composition during construction, as a result of temporary traffic management measures; and
d) Once operational, by changes in vehicle activity (flows, speeds and composition) and changes in distance between sources of emissions and sensitive receptors as a result of the proposed scheme.

5.6.2 These four sources of potential air quality impacts are discussed in turn below.

Construction Dust Emissions

5.6.3 During the proposed scheme construction phase, there is the potential for adverse impacts from dust emissions from construction activities at sensitive receptors within the vicinity of construction activities.

5.6.4 The types of activities with the potential to generate dust during the proposed scheme construction phase include:

- Movement of vehicles;
- Enabling works (e.g. vegetation clearance);
- Earthworks;
- Demolition (e.g. buildings, concrete bases and footings);
- Excavation and installation of drains and communication ducts;
- Construction of retaining walls;
- Surfacing works;
- Central reserve works;
- Installation of verge furniture and planting vegetation; and
- Stock piling/ storage.

5.6.5 There are a number of sensitive receptors within 200m of the proposed construction works and thus mitigation measures would be required in these locations in order to reduce the risk of potential dust impacts (refer to Section 5.7).

5.6.6 Around Kingsway junction, there are approximately 100 residential receptors within 200m to the west of the junction on Greenwich Drive South and Fulham Road, and the Kingsway Hospital site to the south. Brackensdale Infant and Junior School is located on Walthamstow Road to the west of the A38.

5.6.7 Around Markeaton junction there are approximately 30 receptors to the west within 200m on Enfield Road, Greenwich Drive North, and Haringay Gardens. To the south there are approximately 60 residential receptors within 200m on Windmill Hill Lane, Ashbourne Road and Sutton Close. To the east there is the Royal School for the Deaf on Ashbourne Road.

5.6.8 Around Little Eaton junction there is a mobile home park containing approximately 30 residential receptors within 200m to the north of the junction on Ford Lane.

5.6.9 Details of the construction phase dust mitigation measures likely to be required are provided in Section 5.7.

Construction Phase NO_x and PM_{10} Emissions

5.6.10 During the proposed scheme construction phase, there is the potential for adverse impacts at sensitive receptors due to the NO_x and PM_{10} emissions from NRMM undertaking construction work.

5.6.11 Sensitive receptors within 200m of the proposed construction works are detailed above. Mitigation measures would be required in these locations in order to reduce the risk of possible NO_x and PM_{10} impacts (refer to Section 5.7).

5.6.12 The criterion for an affected route in relation to construction HGV traffic is a change of more than 200 HGVs per day. Detailed information on likely HGV movements is not currently available. However, due to the nature of the proposed scheme it is likely there would be additional HGV movements exceeding 200 vehicles/day on some parts of the surrounding road network for some of the construction period, potentially for more than 6 months. Therefore, there exists the potential for adverse impacts at sensitive receptors due to the NO_x and PM_{10} emissions from vehicles travelling to and from the construction site transporting materials, plant, and labour.

5.6.13 Primary access to the proposed main construction compound at Little Eaton would be via the B6179 Alfreton Road, so additional HGV movements are expected on this section of road towards Little Eaton junction. From here, generally, construction vehicles would travel along the proposed scheme using the proposed scheme footprint and the existing A38. Additionally, haul roads would be required through the Kingsway Hospital site to provide access to proposed flood storage areas, as well as use of an existing access track the west of the River Derwent to provide access to a proposed floodplain compensation area. Further afield, construction vehicles are anticipated to be restricted to existing major roads - these include the A38, A61, A52, A6, A516, A5111. Impacts would be expected to lessen with increasing distance away from the proposed scheme.

5.6.14 In addition to the sensitive receptors located within 200m of the proposed construction works as detailed above, the following sensitive receptors located within

200m of potential construction vehicle routes could potentially experience adverse effects:

- Residential receptors east of Kingsway junction: a school, and two hospital buildings on and around the A516 Uttoxeter New Road east of the A38. Residential receptors east of the A5111 Manor Road;
- Mickleover: Residential receptors west of the A38 south of Kingsway junction. Residential receptors and a school north of the A516 west of the A38;
- Littleover: Residential receptors and a school east of the A38 south of Kingsway junction. Residential receptors west of the A5111 Manor Road;
- Mackworth: Residential receptors and two schools to the west of the A38 between Kingsway and Markeaton junctions. Residential receptors and two schools to the east of the A38 between Kingsway and Markeaton junctions. Residential receptors around the A52 west of the A38. Residential receptors and two schools around the A52 east of the A38;
- Darley Abbey: Residential receptors and two schools to the east of the A38 between Abbey Hill and Little Eaton junctions. Approximately 300 residential receptors and three schools to the west of the A6. Approximately 500 residential receptors and two school to the east of the A6;
- Allestree: Residential receptors to the west of the A38 between Abbey Hill and Little Eaton junctions. Approximately 200 residential receptors to the west of the A6 Duffield Road north of Abbey Hill junction. Approximately 400 residential receptors and a university building to the west of the A38 between Kedleston Road and Abbey Hill junction;
- Little Eaton: Residential receptors and a school on and around the B6179 Alfreton Road.

5.6.15 Details of potential construction phase mitigation measures targeting NRMM and construction traffic emissions are detailed in Section 5.7.

5.6.16 Further assessment of the impacts due to construction related traffic will be undertaken and included in the Environmental Statement. The level of assessment required will depend on the total construction vehicle requirements and associated management practices proposed by the construction contractor.

Construction Phase Traffic Management

5.6.17 Traffic management plans are expected to require reduced speed limits applied to specific links adjacent to the construction sites, temporary junction traffic signals, potential changes to turning priorities, and closures to slip roads. During the proposed scheme construction phase, there is the potential for adverse impacts at sensitive receptors due to changes in traffic flows, as a result of such temporary traffic management measures if these changes in flows exceed the DMRB criteria. If changes of this magnitude are anticipated, then an assessment of these effects will be undertaken. Adverse impacts may arise due to:

- Increased flows on existing roads due to speed restrictions, lane and slip road closures, and vehicle re-routing on the road network resulting in increased NO_x and PM_{10} concentrations at sensitive receptors;
- Diverted flows onto temporary routes or junctions that result in changes in the distances between sources of emissions and air quality sensitive receptors.

5.6.18 Potential air quality impacts associated with temporary traffic management proposals will be assessed and confirmed in the Environmental Statement using information provided by a construction contractor.

Operational Phase

5.6.19 Considering the relevant road traffic pollutants and comparing these against AQS objectives, it is considered that national assessments have demonstrated that there is no risk of carbon monoxide, 1,3-butadiene, benzene, lead and sulphur dioxide concentrations exceeding the relevant UK AQS objectives due to emissions from traffic anywhere in the UK. These pollutants have not been considered further herein as they are very unlikely to be present at levels which would represent potential significant impacts due to the proposed scheme.

5.6.20 On this basis, changes to the annual average and hourly NO_2 concentrations, and annual average PM_{10} and $PM_{2.5}$ concentrations, are the focus for the air quality assessment for public exposure (i.e. residential properties).

5.6.21 For the consideration of hourly mean NO_2 concentrations, research projects completed on behalf of Defra and the devolved administrations (Laxen and Marner, 2003; AEAT, 2008) have concluded that the hourly average NO_2 objective is unlikely to be exceeded if annual average concentrations are predicted to be less than 60µg/m^3. Therefore, this assessment evaluates the likelihood of exceeding the hourly average NO_2 objective by comparing predicted annual average NO_2 concentrations at all receptors to an annual average equivalent threshold of 60µg/m^3 NO_2. Where predicted concentrations are below this value, it can be concluded that the hourly average NO_2 objective (200µg/m^3 NO_2 not more than 18 times per year) is likely to be achieved.

5.6.22 The proposed scheme would result in changes in traffic on a number of links on and around the proposed scheme that meet or exceed the local air quality screening criteria presented in DMRB, and set out in para. 5.4.2. Therefore, there exists the potential for adverse effects to the annual average NO_2 concentrations at sensitive receptors close to these links.

5.6.23 Because of the absence of designated ecological sites in the study area considered herein (as identified in para. 5.5.8 – also refer to Chapter 8: Biodiversity), no risk is identified of exceedances of the critical level for NO_x for the protection of vegetation (30µg/m^3) or baseline critical loads for nitrogen deposition for the proposed scheme.

5.7 Design, Mitigation and Enhancement Measures

Construction

5.7.1 As indicated in para. 2.3.31, construction of the proposed scheme would be subject to measures and procedures defined within a CEMP. This would include industry standard practices and control measures to appropriately manage potential environmental impacts that could arise during the construction works – this would include measures to control dust where adverse effects on sensitive receptors might occur. There are a number of residential properties within 200m of the proposed scheme, therefore, it is likely that such mitigation measures would be required across the majority of the construction area.

5.7.2 The Institute of Air Quality Management (IAQM) guidance on the assessment of dust from demolition and construction (IAQM, 2017) provides the following examples of dust mitigation measures which may be included within the CEMP:

- Develop and implement a series of dust management measures and monitoring

measures (e.g. visual inspections);
- Fully enclose site or specific operations where there is a high risk of dust production and the site is active for an extensive period;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; and
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site) where reasonably practicable.

5.7.3 Air quality impacts due to NRMM and construction vehicles would be mitigated using standard industry mitigation measures, such as those presented by the IAQM guidance on the assessment of dust from demolition and construction, for example:

- All construction plant would use fuel equivalent to ultra-low sulphur diesel (ULSD) where possible;
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable; and
- Detail the routes that construction vehicles should take within the contractor's CEMP – restricting such vehicles to the major roads in the vicinity of the proposed scheme would help restrict the potential for air quality impacts.

5.7.4 The final selection of the most appropriate mitigation measures, including those related to construction phase NRMM and HGV movements, will be considered and confirmed in the Environmental Statement taking advice from a construction contractor (noting that an outline CEMP will be prepared as part of the development of the construction methodology which will be included within the Environmental Statement).

Operation

5.7.5 The results of this preliminary air quality impact assessment are presented below.

5.8 Assessment of Effects

5.8.1 The effects have been assessed following consideration of the potential impacts outlined in Section 5.6 and Section 5.7.

Construction Phase Dust Assessment

5.8.2 There is a risk of temporary adverse impacts from dust emissions to occur at sensitive receptors located close to the proposed scheme during the construction works. These receptors are located in residential areas to the west of Kingsway junction (~100 receptors), to the south and west of Markeaton junction (~90 receptors), and within the mobile home park to the north of Little Eaton junction (~30 receptors).

5.8.3 Site specific mitigation measures may be necessary to avoid significant temporary effects on air quality during the construction works. These measures will be set out in the CEMP for the proposed scheme. Adoption of such measures would minimise the risk of significant adverse dust effects and statutory nuisance issues during construction.

Construction Phase HGV Assessment

5.8.4 Detailed information on likely HGV movements during the construction phase is not currently available. However, due to the nature of the proposed scheme large amounts of materials would be required to be transported. Therefore, it is likely there

would be additional HGV movements exceeding 200 vehicles/day on some parts of the surrounding road network, during some stages of the construction phase. Therefore, there is potential for adverse impacts at sensitive receptors due to the emissions from these vehicles.

5.8.5 HGV routes are expected to involve a section of the B6179 Alfreton Road towards Little Eaton junction (associated with access into the potential main construction compound) and the A38 itself. There are sensitive receptors along these routes. These receptors are considered to be at a higher risk of air quality impact due to HGV movement in the event that HGV numbers along these routes are above the DMRB criteria for an extended period.

5.8.6 Further work will be undertaken to characterise air quality impacts from this source during the EIA, if construction phase estimated HGV numbers are above the DMRB criteria of 200 vehicles/ day for an extended period (i.e. more than six months).

Construction Phase Traffic Management Assessment

5.8.7 The proposed scheme would require works to the existing road network. Temporary traffic management would be in place to minimise disruption and traffic re-routing throughout the construction phase.

5.8.8 There is a risk of adverse impacts due to construction phase traffic management during construction. Receptors located along links with anticipated increases in traffic flows during each stage of construction may be affected.

5.8.9 Further air quality work will be required and reported within the Environmental Statement regarding the potential air quality effects associated with construction phase temporary traffic management.

Local Operational Air Quality Assessment

5.8.10 All the locations that have been considered within the air quality study area considered herein are anticipated to meet relevant air quality objectives for annual mean NO_2, PM_{10} and $PM_{2.5}$ in the proposed scheme opening year of 2024 both with the proposed scheme (DS) and without the proposed scheme (DM). This is due to improvements in background concentrations and reductions in emissions from vehicles as cleaner vehicles enter the fleet leading to improvements in air quality over time.

5.8.11 All annual mean concentrations of NO_2 are predicted to be below the annual average equivalent threshold 60µg/m^3. Exceedances of the hourly mean NO_2 objective are, therefore, not anticipated.

5.8.12 Predicted changes in PM_{10} concentrations range from -1.4 to +2.7 µg/m^3 and the maximum predicted with proposed scheme concentration is 29.1µg/m^3 which is well below the annual mean objective of 40µg/m^3. Therefore, significant effects on air quality due to PM_{10} are not anticipated.

5.8.13 With a maximum $PM_{2.5}$ background concentration in the proposed scheme opening year of 10.4µg/m^3 and a maximum PM_{10} contribution from the proposed scheme of +2.7µg/m^3 (which $PM_{2.5}$ is a fraction of), total concentrations of $PM_{2.5}$ are anticipated to be well below the objective value of 25µg/m^3.

5.8.14 Anticipated changes in annual mean NO_2 as a result of the proposed scheme are

discussed by location within the study area in the following paragraphs:

- At Kingsway junction some small and medium worsenings of air quality are anticipated alongside the A5111 between the A38 and the A516 due to increased traffic flow on this link;
- Some small improvements of air quality are anticipated on the A516 north-east of the junction with A5111 due to decreased traffic flow on this link;
- Mixed effects are anticipated in the area alongside the A38 at the southern end of the study area at Kingsway junction. Traffic flow is predicted to increase on the A38 in this area, but decrease on the Uttoxeter Road and the interplay of these two factors is anticipated to lead to small worsenings in air quality in this area, with small improvements seen very close to the Uttoxeter Road;
- Mixed effects are anticipated in the area alongside the A38 between Kingsway and Markeaton junctions. Large increases in traffic flow along the A38 are expected in this area, leading to some small worsenings of air quality. However, in some cases, this is offset by the closure of junctions between smaller residential roads and the A38 leading to reductions in flow on these residential roads. Therefore, small and medium improvements in air quality are anticipated at properties on Thurcroft Close, Raleigh Street, Greenwich Drive North, Kensal Rise, Haringay Gardens and Enfield Road;
- Due to predicted increased traffic flow on the A52, coupled with decreased congestion at Markeaton junction between the A52 and A38, mixed effects are anticipated in this area with both small improvements in air quality very close to the junction and small worsenings in air quality further along the A52 in both directions;
- Traffic flows are anticipated to increase on the A38 between Kedleston Road and Little Eaton junction. This is anticipated to result in some small and medium worsenings of air quality at residential properties alongside this stretch of road, in Allestree and Darley;
- At Moor End Farm there are anticipated to be some small worsenings of air quality due to an increase in traffic flow on the A38 north of Little Eaton junction;
- In Little Eaton there are anticipated to be some small worsenings of air quality due to an increase in traffic flow on Duffield Road and Alfreton Road;
- There would be an easing of congestion at Little Eaton junction as through traffic would no longer have to stop and use the roundabout. Small and medium improvements in air quality are, therefore, expected at the mobile home park to the north of the junction.

Operational Impacts – Local Air Quality Compliance Risk Assessment

5.8.15 The results of the local air quality operational assessment have been used to determine compliance risks with the EU Air Quality Directive, following guidance set out within IAN 175/13 (Highways Agency, 2013).

5.8.16 A comparison between the outcome of the local air quality operational assessment and those links reported by Defra to the European Commission has found that there are no areas anticipated to be non-compliant with the limit value within the air quality study area considered herein for the proposed scheme in the opening year of 2024.

5.8.17 This indicates that there is no risk of non-compliance with the EU Air Quality Directive for the proposed scheme and thus an Air Quality Action Plan (AQAP) is not expected to be required. The air quality compliance risk assessment will be updated and reported in the Environmental Statement.

5.9 Summary of Preliminary Assessment

5.9.1 This preliminary air quality impact assessment has indicated the following:

- There is a risk of temporary adverse impacts from dust emissions to occur at sensitive receptors located close to the proposed scheme during the construction phase. With the effective implementation of applicable mitigation measures (refer to Section 5.7), no likely significant effects are anticipated;
- There is a risk of temporary adverse impacts from HGV emissions at sensitive receptors close to the proposed scheme and the routes of the HGVs during the construction phase. Information on predicted HGV movements will be used to assess the potential significance of effects, which will be reported within the Environmental Statement;
- There is a risk of temporary adverse air quality impacts due to construction phase traffic management during construction – such effects will be assessed and reported within the Environmental Statement;
- Some adverse air quality operational effects are predicted during proposed scheme operation at some locations, namely: close to the A5111 between the A38 and the A516, close to the A38 near Uttoxeter Road, close to the A38 between Kingsway and Markeaton junctions, close to the A52, close to the A38 in Allestree and Darley, and in the vicinity of Moor End Farm at Little Eaton. However, no locations within the study area considered herein are expected to experience concentrations above the annual mean NO_2 UK AQS objective. Therefore, air quality effects are not anticipated to be significant during proposed scheme operation.

6 CULTURAL HERITAGE

6.1 Introduction

6.1.1 This chapter presents a preliminary assessment of the potential effects of the proposed scheme on cultural heritage – namely archaeological remains, historic buildings and the historic landscape. It considers the known heritage baseline, alongside a consideration of potential changes ('impacts') on heritage assets that may occur due to the construction and operation of the proposed scheme and the resultant potential effects.

6.1.2 This chapter is supported by Figures 6.1 and 6.2. A full discussion of the legislative framework and cultural heritage impact assessment methodology for the full EIA is provided in Chapter 7 of the EIA Scoping Report (refer to para. 4.4.12).

6.1.3 Part of the proposed scheme lies within the boundary of the Derwent Valley Mills World Heritage Site (DVMWHS). Therefore, a separate Heritage Impact Assessment (HIA) will be prepared in parallel with the EIA. HIA is recommended by ICOMOS for development which affects cultural World Heritage Sites (WHS) in order to evaluate effectively the potential impact of development upon the Outstanding Universal Values (OUVs), integrity and authenticity of the WHS, and to inform the proposed scheme design and mitigation.

6.1.4 The HIA for the DVMWHS will focus on the impact of the proposed scheme on the OUV and the attributes that convey the OUV. The HIA will be summarised in the Environmental Statement, with the full HIA being included within an appendix. The EIA will consider impacts on the DVMWHS, informed by the HIA, and will assess the significance of effects on individual, or where appropriate, groups of designated and non-designated heritage assets that contribute to the OUV. The preparation of both the EIA and the HIA will be closely coordinated, and both reports will draw upon the same historic environment baseline.

6.2 Stakeholder Engagement

6.2.1 Statutory and non-statutory bodies have been engaged as part of the early assessment process to obtain background datasets and information about known heritage assets within the defined study area, and to identify where further information may be required.

6.2.2 Consultation will continue with experts from Historic England, DCC, DCiC and the relevant Borough Council during the EIA and HIA process to further refine the adopted study area; discuss our findings regarding the magnitude of predicted impacts and significance of effects, and to seek approval regarding proposed baseline surveys and appropriate mitigation measures.

6.3 Assessment Assumptions and Limitations

6.3.1 It is noted that the study area for this preliminary assessment (as indicated in Figures 6.1 and 6.2) focuses upon the proposed scheme main works, and thus excludes consideration of potential works within candidate sites for construction, ecological mitigation/ compensation areas, and flood storage/ floodplain compensation areas given that works required in these areas are subject to confirmation. The study area will be amended as applicable for the EIA to be reported in the Environmental Statement.

6.3.2 This preliminary assessment is based on baseline and proposed scheme design information available at the time of writing this PEI Report. A full assessment will be undertaken as part of the EIA and HIA and reported in the Environmental Statement to be submitted with the DCO application.

6.3.3 Fields located on farmland close to the existing Little Eaton junction are not considered to have been previously impacted by development, as are some discrete locations adjacent to Kingsway junction and Markeaton junction. Some locations at Little Eaton junction have been subject to archaeological investigation, whilst additional surveys (borehole assessment, geophysical survey and trial trench evaluation) are proposed at Kingsway junction, Markeaton junction and Little Eaton junction in order to assess archaeological impacts associated with proposed/ potential land-take. The results of the archaeological surveys will be taken into account during the EIA and will be reported in the Environmental Statement.

6.4 Study Area

6.4.1 The study area for the identification of cultural heritage assets that could potentially be affected by the proposed scheme extends to 500m from the proposed scheme work (refer to para. 6.3.1). A flexible approach is being taken for the identification of high value assets or assets which convey the OUV of the DVMWHS in order to capture potential impacts upon the WHS setting. For these assets, the study area extends up to or beyond 1km from the proposed scheme boundary.

6.5 Baseline Conditions

6.5.1 The proposed scheme would be constructed within or close to the existing A38 highway on land largely previously disturbed, although at Little Eaton junction there are areas of agricultural land that have not been previously developed and where there is thus potential for physical direct impacts upon unknown buried archaeological remains. There are also discrete areas of potentially undisturbed land adjacent to Kingsway junction and Markeaton junction which thus have the potential for unknown buried archaeological remains.

6.5.2 A list of heritage assets that are present within the currently defined study area is contained within Appendix 6.1. The following is a list of statutorily protected and other designated assets within the study area (refer to Figures 6.1 and 6.2):

- DVMWHS (including buffer area) that crosses the Little Eaton junction study area (A41);
- Six listed buildings that are all grade II listed. Little Eaton junction - 23, Rectory Lane (A35), Rose Cottage Shamrock Cottage (A36), and Breadsall Manor (A37); and at Kingsway/ Markeaton junctions - 161, Ashbourne Road (A30), 193 and 195, Ashbourne Road (A31), Conservatory in Markeaton Park (A32);
- Three conservation areas, namely Breadsall Conservation Area (A61), Friar Gate Conservation Area (A62), and Leylands Estate Conservation Area (A63); and
- Eleven locally listed buildings that are on the City of Derby Local List are all located within the Kingsway/ Markeaton junctions study area (Manchester Road Maltings, Ashbourne Road, Derby (A26), Wagon & Horses Public House, No. 149 Ashbourne Road, Derby (A27), Gates and railings to former church, Ashbourne Road, Derby (A28), Former home for Penitent Females, Bass Street, Derby (A29), St Barnabas Church, Radbourne Street, Derby (A44), Cast iron sign, 191 Ashbourne Road, Derby (A45), Former malthouse, brewery and

vinegar works, Sherwin Street/ Kedleston Road (A46), Markeaton Primary School, Bromley Street, Derby (A47), Kingsway Hospital Nurses Home, Uttoxeter Road, Derby (A53), Cast iron pillar box, Brackensdale Avenue, Mackworth, Derby (A54), and Britannia Mills, Markeaton Street/ Mackworth Street, Derby (A55).

6.5.3 The following paragraphs provide an outline of the known cultural heritage resources that are within the vicinity of the proposed scheme; a more detailed and fully referenced narrative will be provided within the Environmental Statement.

Prehistoric Period

6.5.4 Within the study area there is a lack of evidence for occupation or settlement dating to the prehistoric period. However, the presence of isolated findspots of prehistoric material suggests a low level of activity during this period. Finds of this period include a flint knife from Allestree (A1), polished axe heads within the Kingsway/ Markeaton junctions study area (A2, A3), and an undated possible ring ditch (A59) to the south of Little Eaton junction. Peg Low (A60), located to the north-east of Little Eaton junction, appears to be a natural feature, although prior to an investigation carried out in the late 1930s, it was considered to be a possible prehistoric burial mound.

6.5.5 The floodplain of the River Derwent, including its tributaries and former channels that cross the Little Eaton junction study area, the floodplain of Markeaton Brook/ Markeaton Lake, and Bramble Brook, all have the potential to contain buried archaeological remains of prehistoric and later date, including palaeo-environmental deposits of archaeological interest (A4).

Roman Period

6.5.6 The projected line of a Roman road that linked the Roman forts at Rocester, Derby and Broxtowe (A5) crosses the study area to the north of Markeaton Park. To the north-east and just outside of the Little Eaton junction study area a section of Ryknild Street follows the alignment of Moor Road at Breadsall. To the west of the River Derwent there is a postulated road that ran between Buxton and Derby. Evidence of Roman occupation is sparse, although at Little Eaton junction there is a topographic reference to a possible site of a Roman camp (A7), and further south is a findspot of a Roman coin (A6).

Early Medieval and Medieval Periods

6.5.7 Derby has its origins in the early medieval period. In AD 874 the Vikings renamed the settlement from Northworthy to Derby. Recent archaeological evidence would suggest that the Vikings and Anglo-Saxons probably co-existed. However, there are no remains relating to this early period that are known from the study area.

6.5.8 The suburb of Mackworth includes the township of Markeaton. During the medieval period Mackworth was a freehold estate held by the De Mackworth family. The manor of Mackworth is described in the Domesday Survey and was associated with Markeaton Park.

6.5.9 Medieval features relating to its former rural farming origins, including the site of Markeaton medieval deep park (A8) and fossilised ridge and furrow (A10) from the former Markeaton medieval village in Markeaton Park. It is possible that some of the historic roads and field boundaries within the study area also have their origins in the

medieval period. Markeaton Hall may have been a medieval manor house before it was re-built as a country house in the post-medieval period (A11). The former Mackworth Mills, on Markeaton Street, may have been the location of a watermill that is noted in historic references dating to 1272 (A12).

6.5.10 Breadsall is recorded in various historic documents dating to the 11th century. In 1002 the settlement was known as Bregdeshale and in 1004 it was referred to as Braegesheale. The Domesday Survey records the early settlement as consisting of five carucates, two ploughs, 21 villans and seven bordars having eight ploughs.

6.5.11 Breadsall Conservation Area includes two listed buildings that are of medieval date, but just outside of the study area, namely The Old Hall (NHLE1328833) and the Church of All Saints (NHLE 1328833). A series of medieval lynchets representing the remains of former field systems are recorded to the west of Camp Wood (A9).

6.5.12 The parish of Allestree is also mentioned in the Domesday survey and is referred to as the hamlet of the manor of Markeaton which was held by the Earl of Chester.

Post-medieval and Modern Periods

6.5.13 During the Civil War of 1642 - 1646 Derby was garrisoned by Parliamentary troops commanded by Sir John Gell, who was appointed Governor of the town in 1643.

6.5.14 In 1717 Derby was the site of the first water powered silk mill in Britain. Numerous other mills were developed in the area including that of Darley Abbey (within the DVMWHS) which was constructed in 1783.

6.5.15 At the beginning of the 18th century local roads were improved under the turnpike system, including the Derby to Brassington (via Hulland Way) turnpike road (A18) and Derby to Hurdlow (via Ashbourne) turnpike road (A19). From the later 18th century transportation links were developed to improve communications with the wider region. This helped to foster the industrial development of the city and the surrounding villages. The Little Eaton branch of the Derby Canal was opened in 1795 (A13) to move coal and stone from mines and collieries (Denby and Kilburn pits) to the Derby Canal Wharf. Evidence of the canal can still be seen near the B6179 Alfreton Road.

6.5.16 The Little Eaton Tramway (A14) opened in 1793 and consisted of a main line from the canal wharf at Little Eaton to the pits at Smithy Houses. Under the direction of Benjamin Outram, the tramway was completed in May 1795.

6.5.17 Breadsall village contains a number of listed buildings and historic buildings from the 18th and 19th centuries that are within or close to the Breadsall Conservation Area, this includes 23 Rectory Lane (A35), Rose Cottage Shamrock Cottage (A36), Breadsall Manor (A37) and Manor Cottage (A33).

6.5.18 Markeaton Park was created by William Emes of Bowbridge Fields in the 1770s (A10) on land previously occupied by part of the original village. It contained a number of buildings and structures, including a country house (demolished in 1964) (A11) and a conservatory (A32). The 1887 1st edition Ordnance Survey (OS) map shows a lodge (A39) and an icehouse (A23) which are no longer marked on the modern OS map. During the late 20th century, DCiC purchased a further 211 acres of land to facilitate the expansion of the public park.

6.5.19 The 18th and 19th centuries saw the birth and development of the industrial factory system, when new types of buildings were built to accommodate new technologies, and new methods of working were introduced to stream-line manufacturing. Factory owners pioneered the provision of improved housing and working conditions for their employees. DVMWHS (A41) was inscribed onto the World Heritage list in 2001 as representing an industrial landscape of historical and technological interest. It covers a 15 mile stretch of the Lower Derwent Valley and incorporates the historic textile areas of Cromford, Belper, Milford, Darley Abbey and Derby.

6.5.20 Industrial expansion continued into the 19th century. At this time Derby was emerging as an engineering centre, partly influenced by the establishment of the North Midland Railway Company in 1840. A number of historic railways are present within the study area, including the Great Northern Railway (Derbyshire and North Staffordshire Extension) (A16) at Kingsway/ Markeaton and the North Midland Railway (A15) at Little Eaton.

6.5.21 During the mid- to late 19th century Derby expanded and enveloped villages that were originally on the periphery of the town. Surviving elements of this expansion include the grade II listed buildings at 161 Ashbourne Road (A30) and 193 - 195 Ashbourne Road (A31), and the locally listed Wagon and Horse Public House at 149 Ashbourne Road (A27).

6.5.22 Local industries, including the brewing industry expanded to increased demand from an expanded population. Manchester Brewery on Ashbourne Road was established in 1848 (now demolished) (A25). A small two-storey brewhouse (A24) which served the Gallant Hussar pubic house was built on Noel Street in the late 1860s (now demolished). A former malthouse, brewery and vinegar works on Sherwin Street/ Kedleston Road (A46) was built in the late 1870s. Manchester Road Maltings (A26) was a former malthouse that was associated with the nearby Manchester Brewery.

6.5.23 At Kingsway, Thornhill Park (A48) and Thornhill villa (A49), that date to c.1821, became the core of medical facilities that developed at the site during the later 19th and 20th centuries, including the Borough Lunatic Asylum (A50) and Kingsway Hospital Nurses Home (A53).

6.5.24 In the 20th century the further expansion of Derby followed the Local Government Boundary Commission recommendations (1968) when the city boundary was modified to take in large parts of the rural district. Assets that date to the 20th century include a cast iron pillar box on Brackensdale Avenue (A54); Britannia Mills, a hosiery mill that was built in 1912 on the site of an earlier mill (A55); and Markeaton Primary School, Bromley Street (A47).

6.5.25 During World War II Markeaton Park was turned into a military base (A58), and the Luftwaffe targeted the engineering and munitions works in the city, including the Rolls Royce factory. Raids were carried out from 1940 to 1942, and the city was defended by a series of gun emplacements, barrage balloons and decoy sites. Within the Kingsway/ Markeaton study area is the site of a World War II heavy anti-aircraft battery (A56), and spigot mortar base (A57).

Historic Landscape

6.5.26 There are two non-designated parks and gardens within the study area, comprising Markeaton Park and the former Thornhill Park. Markeaton Park (A10) is a landscape

park that was associated with Markeaton Hall, and was created in the 1770s by William Emes. It became a public park in the 1960s. The former Thornhill Park (A48) was a park that was associated with a villa at Thornhill (A49) that was built in 1821 (part of Kingsway Hospital grounds).

6.5.27 The proposed scheme lies within the Derbyshire Historic Landscape Survey Character Assessment Area (Barnatt et al. 2000).

Kingsway Junction and Markeaton Junction

6.5.28 The Derbyshire Historic Landscape Character (HLC) Assessment shows that the study area at Kingsway junction and Markeaton junction is composed of the following HLC types:

- Settlement and development at Derby since the 1st edition OS map (HDR766). HLC type: Post-1880s Settlement (post-medieval to modern);
- Markeaton Park, Queensway, Derby (HDR5524). HLC type: Parks and Gardens (post-medieval);
- Fields east of Murray Park School, Mickleover, Derby (HDR5786). HLC type: Small Irregular Fields (medieval to post-medieval), (replacing medieval open fields);
- Fields west of Kingsway Hospital, Derby (HDR5781). HLC type: Small Irregular Fields (medieval to post-medieval);
- Kingsway Hospital, Derby (HDR5779). HLC type: Hospitals (post-medieval to modern), (replacing small irregular fields of medieval to post-medieval date);
- Royal School for the Deaf, Ashbourne Road, Derby (HDR5521). HLC type: Educational (modern), (replacing small irregular fields of medieval to post-medieval date, and other parkland, post-medieval to modern date); and
- Playing fields, Queensway, Derby (HDR5523). HLC type: Other Parkland (modern), (replacing small irregular fields, medieval to post-medieval date, and parks and gardens of post-medieval date).

Little Eaton Junction

6.5.29 This study area at Little Eaton junction is composed of the following HLC types:

- Historic water treatment works along Alfreton Road (DCCHER reference - HDR3475). HLC type: Pre-1880s industrial complex;
- Fields north of Breadsall (HDR6211). HLC type: Large Irregular Fields (post-medieval to modern date);
- Garden centre along Alfreton Road (HDR3476). HLC type: Commercial and Retail. Modern date (post-1971);
- Land north of Little Eaton Junction (HDR3473). HLC type: Rough Grassland/ Scrub, (land that appears as scrub on modern aerial photographs and that has been used as a refuse tip);
- Mobile home park at Ford Lane, Little Eaton (HDR3472). HLC type: Other Parkland (modern 1912 to 2002). Replacing Pre-1880s settlement and small irregular fields of medieval to post-medieval date;
- Fields around Allestree Ford Bridge, Abbey Hill (HDR3159). HLC type: Small Irregular Fields (modern). Fields have been altered by the construction of numerous roads through the area;
- Fields west of Alfreton Road, Breadsall (HDR3151). HLC type: Planned Enclosure containing ridge and furrow (post-medieval), (replacing medieval open fields). Some boundary loss following the construction of the A38 trunk road;
- Settlement and development at Derby since the 1st edition OS map (HDR766).

HLC type: Post-1880s Settlement (post-medieval to modern);

- Fields along Alfreton Road, Breadsall (HDR3154). HLC type: Small Regular Fields (post-medieval), (replacing medieval open fields); and
- Fields north of Breadsall (HDR6208). HLC type: Other Plantation (modern, 1990 to 2012), (replacing small regular fields of post-medieval date).

6.5.30 The proposed scheme at Little Eaton junction passes through the DVMWHS (A41). The WHS occupies the Derwent Valley and is bound to the east by the North Midlands Railway. The River Derwent was significant to the industrial development of the valley, and upstream from Derby it contains a series of 18th and 19th century cotton mills and an industrial landscape of high historical and technological significance. The part of the WHS in the vicinity within the study area at Little Eaton junction is characterised by the River Derwent that runs to the west of the existing junction, expansive views of the Derwent Valley, the appreciable topography of the surrounding rural landscape, and early transportation links (e.g. the former canal and the railway line).

6.6 Potential Impacts

6.6.1 Construction and operation of the proposed scheme would result in a range of changes to the historic environment. These changes have the potential to impact on individual heritage assets; the attributes of OUV of the WHS; and on the OUV of the WHS as a whole. These impacts may be positive, negative or a combination of both.

6.6.2 Construction impacts are those associated with the construction of the proposed scheme, including the presence of infrastructure once built. Operational impacts result from the use and maintenance of the proposed road once built.

6.6.3 Impacts can be considered in terms of whether they are direct (as a direct consequence of the road) or indirect (such as access to an asset); and in terms of their duration (short, medium long term). Impacts on the setting of cultural heritage assets could arise during both construction and/ or operation of the proposed scheme.

6.6.4 Potential cultural heritage impacts identified during this preliminary assessment associated with the proposed scheme construction and operation are detailed below:

- Potential direct physical impact on potential unknown archaeological remains (**A4**), including remains of geoarchaeological interest that may be present in buried palaeo-channels, or deeply stratified alluvial deposits within the floodplain of Bramble Brook.
- Impact the upstanding and buried remains of the dismantled, 19th century, Great Northern Railway line (Derbyshire and North Staffordshire Extension) (**A16**).
- Physical direct impact on potential unknown archaeological remains (**A4**), including remains of geoarchaeological interest that may be present in buried palaeo-channels, or deeply stratified alluvial deposits within the floodplain of Markeaton Brook.
- Reconfiguration of Markeaton junction would have a direct physical impact upon the Markeaton Park boundary wall (**A40**) which is a distinctive element of the streetscape and park.
- The proposed statutory utility diversion corridor at Markeaton Park (**A10**) has the potential to affect the former landscape park that was associated with Markeaton Hall, impact the buried remains of the now demolished Markeaton Hall lodge (**A39**), and impact an original driveway into the park (now a pedestrian access). In addition, aerial photographs from July 1945 indicate that buildings associated

with Markeaton Park Army Camp were located close to the park entrance. It is thus likely that the remains of these buildings and other defensive structures belonging to its wartime use will survive within the footprint of the proposed utilities diversion corridor.

- The potential construction compound at Markeaton to the east of Mill Pond has the potential to impact upon the former landscape park associated with Markeaton Hall Park (**A39**) where earthworks or buried remains associated with the park may survive.
- The requirement to close the existing Markeaton Park entrance and reconfigure the existing park exit would alter the approach to Markeaton Park (**A10**), a key element of its setting. The entrance is a key element that contributes towards the significance of the park. In addition, during the construction phase, the park would experience noise and visual intrusions associated with construction activities.
- Physical direct impact on potential unknown archaeological remains (**A4**) – this includes impacts upon remains of geoarchaeological interest that may be present in buried palaeo-channels, or deeply stratified alluvial deposits within the River Derwent floodplain and in undeveloped farmland.
- Direct physical impact upon the historic landscape character, comprising two historic landscape types 'Planned Enclosure containing ridge and furrow' (fields west of Alfreton Road, Breadsall, (HDR3151)); and 'Small Regular Fields' of post-medieval date (fields along Alfreton Road, (HDR3154)).
- The proposed scheme impact on the DVMWHS (**A41**) would largely be limited to the area that is currently occupied by the existing A38. During construction there would be temporary impacts as a result of an increase in visual and noise intrusions due to construction activities. The proposed scheme would also result in a slightly greater development footprint encroaching into the World Heritage Site, including development of a proposed floodplain compensation area to the west of the River Derwent. The reconfiguration of the junction, the creation of a fly over on an embankment and the associated additional land-take would directly impact on the setting of the World Heritage Site. The operation of the proposed scheme would have limited impacts on the DVMWHS (**A41**) due to the existence of the existing A38 and the provision of an appropriate landscape planting design.
- Construction of the proposed new infrastructure (road, embankments and road structures) would bring the road closer to Breadsall village and would impact the setting of the designated Breadsall Conservation Area (**A61**) (particularly views out of and towards), Breadsall Manor (**A37**) and the former Ford Farm (**A38**). In addition, construction activities would result in temporary visual and noise impacts. Operation of the proposed scheme would result in traffic moving closer to Breadsall village and thus would impact the setting of the designated Breadsall Conservation Area (**A61**), Breadsall Manor (**A37**) and the former Ford Farm (**A38**).

6.7 Design, Mitigation and Enhancement Measures

6.7.1 A number of measures are proposed that aim to minimise/ avoid the potential for significant cultural heritage effects – measures currently defined include :

- As indicated in para. 2.3.31, construction of the proposed scheme would be subject to measures and procedures defined within a CEMP. This would include industry standard practices and control measures to appropriately manage potential environmental impacts that could arise during the construction works (such as the control of dust, noise, visual intrusion). Mitigation measures included within the CEMP would minimise temporary impacts during construction

activities, and thus minimise disturbance effects upon heritage assets in the vicinity of the proposed scheme.

- As indicated in Section 6.6, the proposed scheme would impact upon the existing Markeaton Park boundary wall. As such, the proposed scheme would require the relocation and reinstatement of the park boundary wall – such works would be undertaken following discussion and agreement with DCiC. Similarly actions to be undertaken during and following works within the proposed statutory utility diversion corridor would also be discussed and agreed with DCiC.
- The results of the planned archaeological surveys will be used during the preparation of the Environmental Statement to inform an appropriate archaeological mitigation strategy implemented during the proposed scheme construction phase. This strategy may comprise preservation in situ (where appropriate and feasible), archaeological watching brief, detailed excavation, archaeological trial trenching, test pitting, detailed geo-archaeological investigation, archaeological topographic survey, and historic building recording (photography) to Historic England standards. The strategy would also be applied to historic landscape features. The proposed strategy will be discussed and agreed with applicable cultural heritage stakeholders.
- The proposed scheme would be provided with an appropriate landscape design, incorporating grassland, tree and shrub planting (refer to Chapter 7: Landscape and Visual Effects). The proposed landscape design will be further developed to take particular account of key heritage assets in the vicinity of the proposed scheme (Markeaton Park, Breadsall Manor, DVMWHS and the Breadsall Conservation Area).

6.7.2 The Environmental Statement will describe in detail mitigation measures embedded within the proposed scheme design and specific measures designed to address cultural heritage effects. Appropriate cross referencing will be made between specific impacts on heritage assets and the accompanying mitigation strategies.

6.8 Assessment of Effects

6.8.1 The proposed scheme has the potential to impact upon a number of statutory and non-statutory, designated and non-designated heritage assets. With the implementation of appropriate mitigation measures, and taking into account impact avoidance measures included in the proposed scheme design, this preliminary assessment has identified the following potential cultural heritage effects during construction and operation of the proposed scheme:

- A slight adverse effect on the DVMWHS (short and long term);
- Neutral effects on ten heritage assets, including potential archaeological and palaeo-environmental deposits along the River Derwent floodplain (A4), Markeaton Park (A10), Markeaton Park boundary wall (A40), Leylands Estate conservation Area (A63), the dismantled Derbyshire and North Staffordshire Extension Railway (A16), and the Derby to Hurdlow turnpike road (A19), Breadsall Manor (A37), Breadsall Conservation Area (A61), Ford Farm (A38), and features that contribute to the historic landscape character at Little Eaton.

6.8.2 The impact of the proposed scheme on these cultural heritage assets will be reconsidered during the preparation of the Environmental Statement, taking into account the results of archaeological investigation works.

6.9 Summary of Preliminary Assessment

6.9.1 This preliminary cultural heritage assessment indicates that with appropriate proposed scheme design and adoption of a bespoke archaeological mitigation strategy, significant effects upon cultural heritage assets are not anticipated during proposed scheme construction and operation.

7 LANDSCAPE AND VISUAL

7.1 Introduction

7.1.1 This chapter presents the preliminary findings of an assessment into the potential proposed scheme landscape and visual effects. For the purposes of this landscape and visual impact assessment (LVIA), a clear distinction is drawn between landscape and visual impacts as follows:

- **Landscape Impacts:** These relate to direct impacts of the proposed scheme upon the physical characteristics or components of the landscape which form its character (e.g. landform, vegetation, and buildings) and indirect impacts arising from changed perception of the landscape or its value;
- **Visual Impacts:** These relate to the changes arising from the proposed scheme to individual 'receptors' views of the landscape or townscape (e.g. local residents or passing motorists).

7.1.2 This chapter is supported by Figures 7.1 to 7.4. A full discussion of the legislative framework and the LVIA methodology for the full EIA is provided in Chapter 8 of the EIA Scoping Report (refer to para. 4.4.12). The assessment is being undertaken in accordance with best practice guidance and standards Highway England, DMRB, Interim Advice Note 135/10 (Highway Agency, 2010) and Guidelines for Landscape and Visual Impact Assessment Version 3 (GLVIA3) (Landscape Institute and IEMA 2013), relating to the identification, assessment and evaluation of landscape and visual effects associated with highway-based improvements.

7.2 Stakeholder Engagement

7.2.1 Statutory and non-statutory bodies have been engaged as part of the assessment process to obtain background data, information and records concerning landscape designations and agreeing viewpoints within the defined study areas (refer to Section 7.4), in addition to developing the assessment scope.

7.2.2 Following receipt of the EIA Scoping Opinion the scope of the landscape and visual assessment has been reviewed and modified (as necessary) to take account of any additional requirements stipulated by the Planning Inspectorate.

7.2.3 Consultation will continue with Natural England, and local councils though the EIA process to: further refine the adopted study areas; discuss the magnitude of predicted impacts and the significance of landscape and visual effects; and agree appropriate mitigation measures.

7.3 Assessment Assumptions and Limitations

7.3.1 The information presented in this chapter reflects that obtained and evaluated at the time of reporting, and is based on an emerging design for the proposed scheme and the maximum likely extents of land take required for its construction and operation.

7.3.2 The findings of the preliminary assessment may be subject to change as the design of the proposed scheme is developed and refined through the EIA and consultation processes, and as further research and investigative surveys are undertaken to fully understand its potential effects.

7.4 Study Area

7.4.1 Guidance given in DMRB Volume 11 Section 3 Part 5 (Annex III) (Highways Agency, 1993), although superseded by IAN 135/10, suggests a 1km study area corridor,

broadening to capture areas within the Zone of Theoretical Visibility (ZTV) sitting outside of the 1km with capacity to experience significant effects as a result of the proposed scheme. This approach is commonly adopted for highways projects and has been adopted in this LVIA.

7.4.2 In the case of the proposed scheme, the study area of the assessment has been defined by a combination of IAN 135/10 guidance, professional judgement and field survey verification.

7.5 Landscape Character Baseline Conditions

7.5.1 The three junctions encompass urban areas of Derby and rural landscape adjacent to the urban edge. At a national level Natural England has defined a series of National Character Areas (NCAs) for England. The study area encompasses, from south to north:

- NCA Profile: 68 Needwood & South Derbyshire Claylands;
- NCA Profile: 50 Derbyshire Peak Fringe and Lower Derwent.

7.5.2 Landscape character assessment is a hierarchical process descending from national to regional to local scale and ultimately to scheme-specific studies. It is unlikely that the alterations to the A38 junctions would have any significant effects on the character of these NCAs. This is because the key landscape characteristics are regional, and small-scale local alterations would be unlikely to result in a significant effect over the entire NCA. Therefore, this preliminary LVIA only provides a high level overview of them.

7.5.3 At a county level DCC has published in 2014 ‘The Landscape Character of Derbyshire’ (DCC, 2014). The assessment was undertaken to underpin landscape planning, policy and decision making within the county and assist in the delivery of the specific measures established in the European Landscape Convention (ELC). The landscape of Derbyshire has been refined into 39 Landscape Character Types (LCTs), defined as broad tracts of landscape that convey a unity of character derived from their inclusion within specific NCAs.

7.5.4 Landscape Character Areas (LCAs) plus the Derby City ward boundaries are shown on Figure 7.3 (Landscape Character).

7.5.5 The land surrounding Kingsway junction is classed entirely as an Urban LCA and urban landscape type, with the closest area of residential housing lying to the north-west of the junction in Mackworth. There is, however, an extensive area of open land to the south-west of the junction, with further open land to the south. There is also a small area of open amenity grassland to the immediate west of the A38, north of the junction.

7.5.6 Markeaton junction is surrounded to the south and east by an urban landscape, the urban area to the south of the junction being dominated by residential development. Land to the west of the A38 at Markeaton junction, includes Markeaton Park and falls within the Needwood and South Derbyshire Claylands LCA incorporating the Estate Farmlands LCT, with the Riverside Meadows LCT further to the north.

7.5.7 The landscape surrounding Little Eaton junction falls within the Peak Fringe and Lower Derwent LCA incorporating the Riverside Meadows LCT, with the Wooded Valleys LCT to the east and, where the A38 approaches Allestree, an urban landscape area to the west. The River Derwent valley lies to the west of the junction,

and lies within an area designated as the Derwent Valley Mills World Heritage Site which is an international designation. A buffer zone for the Derwent Valley Mills World Heritage Site, which appears on the EBC Local Plan, is located on the River Derwent floodplain, close to Little Eaton junction. The village of Breadsall, part of which is a Conservation Area, lies to the south and east of the junction.

7.5.8 In summary, within the 'The Landscape Character of Derbyshire' 2013, the study area encompasses, from south to north the following:

- Needwood & South Derbyshire Claylands: Riverside Meadows LCT;
- Needwood & South Derbyshire Claylands: Settled Farmlands LCT;
- Needwood & South Derbyshire Claylands: Estate Farmlands LCT;
- Peak Fringe and Lower Derwent: Wooded Slopes and Valleys LCT; and
- Peak Fringe and Lower Derwent: Riverside Meadows LCT.

7.5.9 At a Derby City level, DCiC has undertaken a townscape assessment of each ward within the city which adds detail to those areas referred to as urban in the 'The Landscape Character of Derbyshire' (DCC, 2014). These present information about the built environment and about what makes up an area's identity. The study area encompasses, from south to north: Mickleover, Littleover, Mackworth, Derwent, Allestree, Darley and Oakwood. Brief details of the DCiC townscape assessments are provided below;

- **Mickleover:** Much of the Mickleover area can be characterised as a mature suburb, with a historic centre, strong character areas, larger properties and low densities. Properties are generally detached or semi-detached;
- **Littleover:** The village centre and surrounding inter war areas could be described as a mature residential suburb, with mainly semi-detached and detached properties, tree lined streets, large gardens and low development densities;
- **Mackworth:** The Mackworth Estate area of the ward is characterised by post war, low density, semi-detached properties, interspersed with large areas of incidental open space. The incidental open space provides a green corridor linking Mackworth Park and Markeaton Park;
- **Derwent:** The ward contains a mixture of residential and commercial uses and open space. The housing was mainly built during the inter war and post war periods. Two of the most recognisable buildings in the ward are the Revive Health Living Centre, adjacent to St Alban's Catholic Church, on Roe Farm Lane and the 1930s Art Deco inspired Blue Boy Public House on Wiltshire Road;
- **Allestree:** The townscape in the more northern areas of the ward has the feel of a mature residential suburb, with a mix of property types, larger gardens and low densities. There is a conservation area containing a number of listed buildings and buildings of historic importance;
- **Darley:** Darley has some very important heritage features. There are five conservation areas within the ward, including Strutts Park, the Leylands Estate, Little Chester, Friar Gate and Darley Abbey which is part of the Lower Derwent Valley Mills World Heritage Site. There are three Scheduled Ancient Monuments located within the ward. There are also many other listed buildings in the ward that are associated with the industrial heritage of the area. Development layouts and street patterns are diverse across the area ranging from the tight knit, grid based terraces off Kedleston Road and Chester Green to the much more open and less regimented pattern around Broadway;
- **Oakwood:** The townscape across the majority of the ward is very similar in character, identified by red brick, detached properties and a suburban feel.

However, the majority of properties have relatively small gardens, leading to a higher than city average housing density across the ward.

7.5.10 Part of the study area west of Little Eaton junction lies within the Derwent Valley Mills World Heritage Site. Whilst this area is considered within Chapter 6: Cultural Heritage, it is identified as part of the landscape section, as it has a wider setting in the landscape and contains important elements in determining the landscape character baseline of the surrounding landscape.

7.6 Visual Baseline Conditions

7.6.1 Assessment of value of views forms a component of the LVIA baseline and is required to establish sensitivity. Value of views is typically more subjective and may vary from viewer to viewer, however, factors to be considered include views of or from heritage assets, designated landscapes/ views, or named or promoted views found in guidebooks and/ or tourist literature.

7.6.2 For the Kingsway and Markeaton junctions views are predominantly in close proximity to the proposed scheme, including from the residential areas of Mackworth and Markeaton and Markeaton Park. The majority of views are within 1km of the proposed scheme and include a baseline which is heavily influenced by the existing A38 highway corridor. At Little Eaton junction, views are obtained from a wider area, including locations at up to 2km distant. There are views from the edge of Allestree, from the residential Ford Farm Mobile Home Park to the west of the existing junction and from the western edge of Breadsall village.

7.6.3 Views are also obtained from PRoW within the Derwent Valley floor including from the Derwent Valley Heritage Trail and from the PRoW on the Breadsall Moor/ Little Eaton hillside.

7.6.4 Viewpoints have been recorded from a total of 18 locations (see Figure 7.1) which were selected to represent a range of location types and viewing distances. Some viewpoints have been scoped out of the assessment, due to the distance from the proposed scheme, intervening built form, topography (see Figure 7.2) and vegetation.

7.7 Value of the Environmental and Resource Receptors

7.7.1 Under GLVIA3, value of landscape resources is a function of the factors listed below, which may be encompassed within a designation of landscape value:

- Landscape quality;
- Scenic quality;
- Rarity;
- Representativeness;
- Conservation interest;
- Recreation value;
- Perceptual aspects; and
- Associations.

7.7.2 The LVIA assesses landscape value based on these criteria and by reference to landscape designations within the study area. An overview of landscape designations is provided below (also refer to Figure 7.4).

International and National Designations

7.7.3 The study area includes part of the Derwent Valley Mills World Heritage Site - the World Heritage Site designation is primarily cultural heritage based, relating to the industrial revolution, rather than landscape focused. Kedleston Hall registered park and garden lies in the west of the study area. There are no other international or national designations of landscape quality or value within the study area.

Local Landscape Designation

7.7.4 Conservation Areas, whilst not specific landscape designations, reflect landscape and architectural quality and are relevant to development proposals which may impact upon them. The study area encompasses a number of Derby City Conservation Areas, based on former village centres:

- Darley Abbey;
- Mickleover conservation Area;
- Spondon Conservation Area;
- Allestree Conservation Area;
- Markeaton Conservation Area.

7.7.5 EBC has designated Conservation Areas at Breadsall which is located within the study area.

7.7.6 There are no other local landscape designations within the study area.

7.7.7 DCC has identified Areas of Multiple Environmental Sensitivity (AMES) across the county based on various environmental input indicators. These are areas where two or more of the environmental input indicators (historic, ecological or visual unity) within the landscape were determined as significant. An area of Primary Sensitivity lies just to the north of Markeaton junction, which means that all three of the environmental input indicators are determined as significant. The majority of the study area around Little Eaton junction falls within an area of Secondary Sensitivity which means that two of the environmental input indicators are determined as significant (i.e. ecological and visual sensitivity).

7.7.8 Land adjacent to Little Eaton junction is designated as green belt. Green belt is a designation of landscape value related primarily to openness between settlements rather than an indication of landscape quality. Kingsway junction sits within the Mickleover/ Mackworth Green Wedge. Green wedges are a DCiC designation that indicates landscape value based on open space between suburbs. It does not necessarily indicate landscape quality.

7.8 Summary of Landscape and Visual Amenity Sensitivity

7.8.1 The value/ susceptibility and sensitivity of the landscape at each junction is provided in Table 7.1, whilst Table 7.2 summarises value/ susceptibility and the sensitivity of the visual receptors/ viewers who have views of each junction.

7.8.2 Susceptibility relates to the landscape's susceptibility to change arising from the specific proposal and is defined in the Guidelines for Landscape and Visual Impact Assessment (GLVIA3) as "*the ability of the landscape receptor (whether it be the overall character or quality/ condition of a particular landscape type or area, or an individual element and/ or feature, or a particular aesthetic and perceptual aspect) to accommodate the proposed development without undue consequences for the*

maintenance of the baseline situation…" (paragraph 5.40). In paragraph 5.43 it states that "*Judgements about susceptibility of landscape receptors to change should be recorded on a verbal scale (for example high, medium or low)…*"

Table 7.1: Summary of Value, Susceptibility and Sensitivity of Landscape Receptors to the Proposed Scheme

Kingsway Junction				
Receptor	**Value**	**Stage**	**Susceptibility**	**Sensitivity**
Abbey, Littleover, Mackworth and Mickleover wards	Low	Construction	Low	Low
		Year 1 of Operation	Low	Low
		Year 15 of Operation	Low	Low
Needwood and South Derbyshire Claylands LCA	Low	Construction	Medium	Medium
		Year 1 of Operation	Low	Low
		Year 15 of Operation	Low	Low
Markeaton Junction				
Receptor	**Value**	**Stage**	**Susceptibility**	**Sensitivity**
Allestree, Darley and Mackworth wards	Low	Construction	Low	Low
		Year 1 of Operation	Low	Low
		Year 15 of Operation	Low	Low
Needwood and South Derbyshire Claylands LCA	Low	Construction	Medium	Medium
		Year 1 of Operation	Low	Low
		Year 15 of Operation	Low	Low
Little Eaton Junction				
Receptor	**Value**	**Stage**	**Susceptibility**	**Sensitivity**
Allestree, Darley, Derwent and Oakwood wards	Medium	Construction	Low	Low
		Year 1 of Operation	Low	Low
		Year 15 of Operation	Low	Low
Derbyshire Peak Fringe and Lower Derwent LCA	Medium	Construction	Medium	Medium
		Year 1 of Operation	Low	Low
		Year 15 of Operation	Low	Low

Table 7.2: Summary of Value of View, Susceptibility and Sensitivity of Visual Receptors to the Proposed Scheme (refer to Figure 7.1 for viewpoints)

Kingsway Junction				
Receptor	**Value**	**Stage**	**Susceptibility**	**Sensitivity**
Viewpoint 15 (junction of Brackensdale Avenue and slip road to northbound A38)	Low	Construction	Medium	Low
		Year 1 of Operation	Low	Low
		Year 15 of Operation	Low	Low
Viewpoint 17 (A5111 Kingsway at Kingsway Retail Park)	Very low	Construction	Low	Very low
		Year 1 of Operation	Very low	Very low
		Year 15 of Operation	Very low	Very low
Viewpoint 18 (NR54 within Greenwich Drive South public open space)	Medium	Construction	High	High
		Year 1 of Operation	High	High
		Year 15 of Operation	High	High
Markeaton Junction				
Receptor	**Value**	**Stage**	**Susceptibility**	**Sensitivity**
Viewpoint 12A (Bonnie Prince Charlie Walk as it crosses the A38 on a footbridge – looking north)	Low	Construction	Low	Low
		Year 1 of Operation	Very low	Very low
		Year 15 of Operation	Very low	Very low
Viewpoint 12B (Bonnie Prince Charlie Walk as it crosses the A38 on a footbridge – looking south)	Low	Construction	Low	Low
		Year 1 of Operation	Low	Low
		Year 15 of Operation	Low	Low
Viewpoint 13 (Bonnie Prince Charlie Walk as it crosses Markeaton Park)	High	Construction	Medium	Medium
		Year 1 of Operation	Medium	Medium
		Year 15 of Operation	Medium	Medium
Viewpoint 14 (junction of Ashbourne Road and Pybus Street)	Low	Construction	Medium	Low
		Year 1 of Operation	Low	Low
		Year 15 of Operation	Low	Low
Little Eaton Junction				
Receptor	**Value**	**Stage**	**Susceptibility**	**Sensitivity**
Viewpoint 3 (Moor Road at the junction with Breadsall Footpath 10)	Medium	Construction	Medium	Medium
	Medium	Year 1 of Operation	Low	Low
	Medium	Year 15 of Operation	Low	Low
Viewpoint 4 (viewpoint from edge of Breadsall on Breadsall Footpath 2)	Medium	Construction	Medium	Medium
	Medium	Year 1 of Operation	Medium	Medium
	Medium	Year 15 of Operation	Medium	Medium
Viewpoint 6 (view from Derwent Valley Heritage Way at Breadsall Footpath 7)	High	Construction	High	High
	High	Year 1 of Operation	Medium	High
	High	Year 15 of Operation	Medium	High

7.9 Potential Impacts

7.9.1 Interactions between Kingsway, Markeaton and Little Eaton junctions and landscape receptors would potentially occur in two ways: i) through direct loss of landscape elements, or ii) through additions which change landscape character.

7.9.2 Kingsway junction is located on land to the west of Derby City centre. The immediate surroundings of Kingsway junction are a mix of existing highway, residential housing, public open space and retail/ industrial estates. Implementation of the proposed scheme at Kingsway junction would involve some loss of characteristic landscape elements, including some public open space and trees.

7.9.3 The Markeaton junction is located on land to the north-west of Derby City centre. The immediate surroundings of Markeaton junction are a mix of existing highway, public open space, residential housing and educational facilities. Implementation of the proposed scheme at Markeaton junction would involve a loss of characteristic landscape elements such as public open space and trees.

7.9.4 Little Eaton junction is located on land to the north of Derby City centre. The immediate surroundings of the junction comprise a mix of existing highway, farmland and limited residential housing (including the Ford Farm Mobile Home Park) and commercial/ retail premises. Implementation of the proposed scheme would constitute a loss of characteristic landscape elements such as agricultural farmland and trees.

7.9.5 Indirect effects of the proposed scheme at the proposed junctions on landscape character would mostly be dependent on inter-visibility. There may be a very small-scale shift in perception of the landscape in limited areas due to the slightly increased scale of highway infrastructure; however, this is likely to be localised given the presence of the existing A38.

7.9.6 Changes in views may give rise to adverse or beneficial visual effects through obstruction in views, alteration of the components of the view and through the opening up of new views by the removal of screening.

7.9.7 The potential main visual impacts likely to arise from the proposed scheme are listed below:

- Temporary impacts arising from construction, including machinery and vehicles required to clear vegetation, strip and store soils and construct the proposed scheme. For the purposes of this assessment it is assumed that construction activity would have a duration of approximately 3.5 years;
- Impacts during Year 1 arising from views of the completed junctions and vehicles using them; and
- Long term/ permanent impacts arising from views of the completed junctions and vehicles using them – assessed at Year 15. For the purposes of this LVIA, it is assumed that the new junctions are permanent.

7.10 Design, Mitigation and Enhancement Measures

7.10.1 Environmental considerations have been taken into account during the development of the proposed scheme design. Actions that have been taken that have contributed to avoiding and/ or reducing potential landscape and visual effects include the following:

- Minimising building demolition requirements along the proposed scheme

alignment, and minimising land-take requirements outside the existing highway boundary;

- Minimising land-take from Markeaton Park, including impacts upon trees (noting that the position of the Markeaton footbridge was amended such that it largely occupies the footprint of the current footbridge in order to minimise tree loss);
- The proposed scheme design includes an appropriate landscape design which incorporates tree and shrub planting. This landscape design will be further developed during the EIA. In particular the future development of the landscape design will take account of the ecological mitigation requirements as detailed in Chapter 8: Biodiversity and heritage features as detailed in Chapter 6: Cultural Heritage, whilst the landscape design team will also canvas the options of applicable local resident groups. The landscape design will aim to retain and incorporate existing trees and scrub within the proposed scheme footprint;
- Environmental barriers at Little Eaton junction are being considered along the northbound mainline A38 in the vicinity of the Ford Lane Mobile Home Park, and along the southbound mainline A38 and associated slip-road as the proposed scheme traverses Breadsall. These potential barriers are shown on Figure 2.6 for illustrative purposes and are subject to confirmation. The requirement for such barriers, their type, format and height will be confirmed following further assessments, taking into account comments received during statutory public consultation. Barrier options being considered include timber fences and/ or earth bunding;
- As indicated in para. 2.3.31, construction of the proposed scheme would be subject to measures and procedures defined within a CEMP. The CEMP would include a range of best practice measures associated with mitigating potential environmental impacts e.g. limiting construction lighting and signage to that which is absolutely necessary to reduce additional visual clutter and minimise effects on both landscape character and visual amenity.

7.10.2 The impact avoidance and mitigation measures as detailed above have been taken into account during the preliminary assessment of potential impacts and effects.

7.11 Assessment of Effects

7.11.1 The proposed scheme has the potential to generate a range of landscape and visual impacts which change over time. The preliminary assessment findings will be subject to on-going review and will be confirmed in the Environmental Statement.

Construction

7.11.2 During proposed scheme construction, the landscape effects in the vicinity of each junction are anticipated to be negligible to minor adverse. However, effects upon some viewpoints during proposed scheme construction have the potential to range from negligible to major adverse, depending on the receptor sensitivity and the predicted impact magnitude.

7.11.3 The significance of landscape effects during construction of the proposed scheme are summarised in Table 7.3, whilst the significance of effects on visual amenity during construction of the proposed scheme are summarised in Table 7.4.

Table 7.3: Significance of Landscape Effects Arising from Proposed Scheme Construction

Kingsway Junction		
Receptor	**Stage**	**Significance**
Abbey, Littleover, Mackworth and Mickleover wards	Construction	Negligible
Needwood and South Derbyshire Claylands LCA	Construction	Negligible
Markeaton Junction		
Receptor	**Stage**	**Significance**
Allestree, Darley and Mackworth wards	Construction	Negligible
Needwood and South Derbyshire Claylands LCA	Construction	Negligible
Little Eaton Junction		
Receptor	**Stage**	**Significance**
Allestree, Darley, Derwent and Oakwood wards	Construction	Negligible
Derbyshire Peak Fringe and Lower Derwent LCA	Construction	Minor

Table 7.4: Significance of Visual Effects Arising from Proposed Scheme Construction (refer to Figure 7.1 for viewpoints)

Kingsway Junction		
Receptor	**Stage**	**Significance**
Viewpoint 15 (junction of Brackensdale Avenue and slip road to northbound A38)	Construction	Negligible
Viewpoint 17 (A5111 Kingsway at Kingsway Retail Park)	Construction	Negligible
Viewpoint 18 (NR54 within Greenwich Drive South public open space)	Construction	Major
Markeaton Junction		
Receptor	**Stage**	**Significance**
Viewpoint 12A (Bonnie Prince Charlie Walk as it crosses the A38 on a footbridge – looking north)	Construction	Negligible
Viewpoint 12B (Bonnie Prince Charlie Walk as it crosses the A38 on a footbridge – looking south)	Construction	Minor
Viewpoint 13 (Bonnie Prince Charlie Walk as it crosses Markeaton Park)	Construction	Minor
Viewpoint 14 (junction of Ashbourne Road and Pybus Street)	Construction	Negligible
Little Eaton Junction		
Receptor	**Stage**	**Significance**
Viewpoint 3 (Moor Road at the junction with Breadsall Footpath 10)	Construction	Negligible
Viewpoint 4 (viewpoint from edge of Breadsall on Breadsall Footpath 2)	Construction	Minor
Viewpoint 6 (view from Derwent Valley Heritage Way at Breadsall Footpath 7)	Construction	Moderate

Operation

7.11.4 During operation of the proposed scheme, landscape effects at Kingsway junction and Markeaton junction are anticipated to be negligible (Year 1 and Year 15), whilst at Little Eaton junction landscape effects are predicted to be negligible or minor adverse at proposed scheme opening (Year 1), reducing to be negligible following maturation of the proposed scheme landscape mitigation (Year 15).

7.11.5 During proposed scheme operation, visual amenity effects at Kingsway junction are predicted to range from negligible to major adverse at proposed scheme opening (Year 1), reducing to be negligible to moderate adverse following maturation of the proposed scheme landscape mitigation (Year 15). At Markeaton junction visual effects are predicted to range from negligible to minor adverse at proposed scheme opening (Year 1) and following maturation of the proposed scheme landscape mitigation (Year 15). At Little Eaton junction, visual effects are predicted to be negligible to major at proposed scheme opening (Year 1), reducing to be negligible to minor adverse following maturation of the proposed scheme landscape mitigation (Year 15).

7.11.6 The significance of landscape effects during proposed scheme operation are summarised in Table 7.5, whilst the significance of effects on visual amenity are summarised in Table 7.6.

Table 7.5: Significance of Landscape Effects Arising from Proposed Scheme Operation

Kingsway Junction		
Receptor	**Stage**	**Significance**
Abbey, Littleover, Mackworth and Mickleover wards	Year 1 of Operation	Negligible
	Year 15 of Operation	Negligible
Needwood and South Derbyshire Claylands LCA	Year 1 of Operation	Negligible
	Year 15 of Operation	Negligible
Markeaton Junction		
Receptor	**Stage**	**Significance**
Allestree, Darley and Mackworth wards	Year 1 of Operation	Negligible
	Year 15 of Operation	Negligible
Needwood and South Derbyshire Claylands LCA	Year 1 of Operation	Negligible
	Year 15 of Operation	Negligible
Little Eaton Junction		
Receptor	**Stage**	**Significance**
Allestree, Darley, Derwent and Oakwood wards	Year 1 of Operation	Negligible
	Year 15 of Operation	Negligible
Derbyshire Peak Fringe and Lower Derwent LCA	Year 1 of Operation	Minor
	Year 15 of Operation	Negligible

Table 7.6: Significance of Visual Effects Arising from Proposed Scheme Operation (refer to Figure 7.1 for viewpoints)

Kingsway Junction		
Receptor	**Stage**	**Significance**
Viewpoint 15 (junction of Brackensdale Avenue and slip road to northbound A38)	Year 1 of Operation	Negligible
	Year 15 of Operation	Negligible
Viewpoint 17 (A5111 Kingsway at Kingsway Retail Park)	Year 1 of Operation	Negligible
	Year 15 of Operation	Negligible
Viewpoint 18 (NR54 within Greenwich Drive South public open space)	Year 1 of Operation	Major
	Year 15 of Operation	Moderate
Markeaton Junction		
Receptor	**Stage**	**Significance**
Viewpoint 12A (Bonnie Prince Charlie Walk as it crosses the A38 on a footbridge – looking north)	Year 1 of Operation	Negligible
	Year 15 of Operation	Negligible
Viewpoint 12B (Bonnie Prince Charlie Walk as it crosses the A38 on a footbridge – looking south)	Year 1 of Operation	Minor
	Year 15 of Operation	Minor
Viewpoint 13 (Bonnie Prince Charlie Walk as it crosses Markeaton Park)	Year 1 of Operation	Minor
	Year 15 of Operation	Negligible
Viewpoint 14 (junction of Ashbourne Road and Pybus Street)	Year 1 of Operation	Negligible
	Year 15 of Operation	Negligible
Little Eaton Junction		
Receptor	**Stage**	**Significance**
Viewpoint 3 (Moor Road at the junction with Breadsall Footpath 10)	Year 1 of Operation	Negligible
	Year 15 of Operation	Negligible
Viewpoint 4 (viewpoint from edge of Breadsall on Breadsall Footpath 2)	Year 1 of Operation	Moderate (summer)/ Minor (winter)
	Year 15 of Operation	Minor (summer)/ Negligible (winter)
Viewpoint 6 (view from Derwent Valley Heritage Way at Breadsall Footpath 7)	Year 1 of Operation	Major
	Year 15 of Operation	Minor

8 BIODIVERSITY

8.1 Introduction

8.1.1 This chapter presents the findings of a preliminary assessment of the potential effects of the proposed scheme on biodiversity. Biodiversity is the term used to describe all plant and animal life in a particular area (habitat).

8.1.2 This chapter is supported by Figures 8.1 to 8.10. A full discussion of the legislative framework and the biodiversity impact assessment methodology for the full EIA is provided in Chapter 9 of the EIA Scoping Report (refer to para. 4.4.12).

8.1.3 The process of scoping identified the following construction and/ or operation effects associated with the proposed scheme on ecological features (designated/ non-designated sites, habitats and species):

- Effects on non-statutory designated and non-designated sites of ecological importance;
- Direct loss and severance of wildlife habitats through land take with potential to affect various species;
- The killing, injuring and/ or disturbance of species from construction and operational activities;
- Indirect effects on habitats and species from noise, watercourse pollution and/ or sedimentation, dust and/ or air quality, lighting, increased human disturbance, and introduction of invasive non-native species.

8.1.4 The assessment has been undertaken in accordance with best practice guidance and standards relating to the identification, assessment and evaluation of effects on biodiversity associated with highway-based improvements. The assessment is supported by a series of baseline surveys (refer to Section 8.5).

8.2 Stakeholder Engagement

8.2.1 Consultation with statutory and non-statutory consultees commenced in 2014 regarding the ecological survey approach for the proposed scheme with the following key ecology stakeholders: DCiC; DCC; Derbyshire Wildlife Trust; Environment Agency; Highways England Area 7 Management; Natural England. Additional consultation meetings have been held from 2015 through 2018 where the findings from ecology surveys have been provided and early stage engagement opportunities sought for mitigation and enhancement options. Consultation meetings are ongoing and will continue throughout 2018 to further inform the biodiversity impact assessment process.

8.3 Assessment Assumptions and Limitations

8.3.1 The information presented in this chapter reflects that obtained and evaluated at the time of reporting. It is based on the proposed scheme design as shown on Figures 2.4, 2.5 and 2.6 and the maximum likely extents of land take required for its construction and operation (as per Figures 1.2a and 1.2b).

8.3.2 Due to the absence of full ecological survey data and the final proposed scheme design, the assessment has assumed a worst case that all habitats within the proposed scheme footprint would likely be lost as a consequence of its construction.

8.3.3 The proposed utilities diversion route in Markeaton Park (refer to para. 2.3.20) would require some tree removal. The extent of which is yet to be confirmed. It is assumed

that the area used would be returned to the park after works completion, with applicable planting (no trees) and service access rights.

8.3.4 It is assumed that the potential construction compound at Little Eaton junction would avoid impacts upon boundary vegetation and areas of biodiversity interest. A temporary crossing structure would be installed to enable access over the former Derby Canal to avoid any direct effects on the feature.

8.3.5 At the time of this preliminary assessment, an Extended Phase 1 Habitat Survey had not been undertaken at the potential construction compound at Markeaton junction. A desk study review thus informed this assessment. It is assumed that any potential impacts to ecological features of interest would be avoided or mitigated for accordingly.

8.3.6 The objective of the proposed scheme is to ensure no net loss in biodiversity. It is assumed that this would be achieved within the current red line boundary. A number of candidate sites for ecological mitigation/ compensation have been identified with assistance from stakeholders, namely (refer to para. 2.2.49 and Figures 1.2a/ 1.2b):

- Areas within Mackworth Park;
- Areas within the Kingsway Hospital site;
- Areas within Markeaton Park (in the vicinity of Markeaton Lake);
- Areas around Mill Pond;
- Areas east and west of the River Derwent to the north and south of the A38.

8.3.7 The watercourses to be directly impacted by the proposed scheme are Bramble Brook and Dam Brook. It is assumed that ecological mitigation measures would be incorporated into the watercourse designs and that Water Framework Directive (WFD) objectives would be met.

8.3.8 Proposed road sign locations (isolated red line boundary areas outside of the main scheme footprint - as shown on Figure 8.7 and 8.8) are assumed to have minimal impacts on biodiversity associated. Works would be temporary during the construction phase to install new road signs within the existing highway boundary. There would be minimal vegetation clearance, whilst work activities would be localised and considered non-licensable, and therefore would not require verification surveys in 2018 to support the assessment. Pre-construction survey checks by an Ecological Clerk of Works would be carried out as part of the CEMP.

8.3.9 The nature conservation value assigned to ecological features potentially affected by the proposed scheme reflects their known or potential status and distribution within the defined study area (as described in Section 8.4).

8.3.10 The potential effects on biodiversity due to the proposed scheme have been assessed in the absence of detailed design mitigation measures. The findings of this preliminary assessment may be subject to change as the design of the proposed scheme is developed and refined through the EIA and consultation process, and as further surveys are undertaken to fully understand potential effects and specify any associated mitigation requirements.

8.4 Study Area

8.4.1 The study area has been defined by determining a ‘zone of influence’ (ZoI), encompassing the distance over which relevant ecological features could experience potential significant biodiversity effects due to the proposed scheme. This informed

the area for baseline data collection. The distance extends beyond the project site, for example where there are ecological or hydrological links beyond the proposed scheme boundary. Defining the ZoI is an iterative process and the extent varies depending on the ecological feature concerned.

8.4.2 The following summarises the study areas that have been used (with more detail provide in Appendix 8.1). These areas include land within the proposed scheme boundary plus:

- Desk study area:
  - Up to 30km from proposed scheme boundary for sites designated at an international level for bats;
  - Up to 2km from proposed scheme boundary for all other statutory and non-statutory designated sites and non-designated sites of interest;
  - Up to 2km from proposed scheme for protected and notable habitats and species;
  - Up to 2km for watercourses;
  - Up to 500m for ponds.

  (Note: Air quality modelling on other schemes has indicated that most of the nitrogen oxides (NOx) which have the potential to affect the composition of vegetation occur within 200m of the highway. Also, those sites located up to 2km downstream of the proposed scheme are considered most vulnerable).
- Field survey areas:
  - Up to 50m from proposed scheme boundary for notable Phase 1 habitats;
  - Up to 500m from proposed scheme boundary for great crested newts;
  - Up to 50m from proposed scheme boundary for reptiles;
  - Up to 50m from proposed scheme boundary for badger (extended up to 500m from proposed scheme boundary (where access allowed) to check those badger sett records identified from the desk study data search);
  - Up to 250m from proposed scheme boundary for water vole and otter;
  - Up to 50m from proposed scheme boundary for bat roosts and notable foraging/ commuting habitat;
  - Up to 500m from proposed scheme boundary for breeding birds (although habitats within 50m of proposed scheme are given greater emphasis);
  - Wet grassland habitat to the south-west of Little Eaton junction only for wintering birds;
  - At least 50m from proposed scheme boundary for white-clawed crayfish (this study area was extended further where necessary to take into account a 100 – 200 m sampling site within a 500m section of any particular watercourse);
  - Up to 50m from proposed scheme boundary for terrestrial invertebrates;
  - Up to 250m from proposed scheme boundary for aquatic macroinvertebrates.

8.4.3 As the proposed scheme design develops, the study areas proposed will be reviewed and will be confirmed and reported in the Environmental Statement.

8.5 Baseline Conditions

8.5.1 The following tasks have been undertaken to establish the nature conservation designations and protected and notable habitats and species (ecological features) that exist within the adopted study areas:

- A review of relevant legislation, planning policy and guidance concerning nature

conservation and enhancement;

- Desk-based review of ecological records and biodiversity action plans from information sources including the Multi-Agency Geographic Information for Countryside (MAGIC) website and Derbyshire Wildlife Trust Biological Records;
- A review of records pertaining to non-native controlled weed species;
- A review of information resulting from surveys undertaken for the following:
  - 2015/16 baseline surveys and reports (Appendix 8.1): Extended Phase 1 habitat survey, breeding birds, great crested newts, reptiles, botanical survey, badgers, terrestrial invertebrates, water vole and otter, river habitat and river corridor survey, white-clawed crayfish, aquatic macro-invertebrates, bats, wintering birds;
  - 2016/17 baseline surveys (to be published): Wintering Birds, Extended Phase 1 Habitat Survey, Breeding Birds, Great Crested Newts, Reptiles, botanical survey, badger territory analysis, water vole and otters, white-clawed crayfish, aquatic macro-invertebrates, bat trapping and radio-tracking, tree climbing bat assessment, bat roost survey (buildings and structures), bat activity survey.

8.5.2 Additional ecology surveys are programmed for 2018, namely surveys for: flora, river habitat, reptiles, badger, water vole, otter, bats (roosting), white-clawed crayfish, terrestrial invertebrates and aquatic macroinvertebrates. The results of completed ecological surveys will be presented in the Environmental Statement and will be used to inform the biodiversity impact assessment.

8.5.3 A no net loss biodiversity assessment is also proposed to quantify the ecological value of the existing development relative to that of the proposed scheme. The aim would be to deliver no net-loss in biodiversity through mitigation, compensation and enhancement measures using areas within the provisional DCO application boundary.

Nature Conservation Designations

8.5.4 The desk-based review has confirmed that:

- There are no European designated sites with bats as a qualifying feature within 30km of the proposed scheme boundary; and impact pathways (i.e. habitat or hydrological links) exists in regards to flight paths or feeding areas of birds from the proposed scheme to an SPA or Ramsar within 30km (see Figure 8.1);
- There are no other international designated sites within 2km of the proposed scheme (see Figure 8.1);
- There are no national or local statutory designated sites located within or directly adjacent to the proposed scheme;
- There is one national statutory designated site (Site of Special Scientific Interest (SSSI)) (Kedleston Park SSSI) and two local statutory designated sites (Local Nature Reserves (LNRs)) within 2km of Kingsway/ Markeaton junction (Mickelover Meadows LNR, Darley and Nutwood LNR) and one national statutory designated site (SSSI) (Breadsall Railway Cutting SSSI) and four local statutory designated sites (LNRs) within 2km of Little Eaton junction (Allestree Park LNR, Darley and Nutwood LNR, Breadsall Railway Cutting LNR and Chaddesden Woods and Lime Lane Wood LNR);
- There are six non-statutory designated sites (Local Wildlife Sites (LWSs)) located within or directly adjacent to the proposed scheme boundary at Kingsway/ Markeaton junctions (A38 Roundabout LWS, Bramble Brook and Margins LWS, Markeaton Park LWS, Markeaton Brook System LWS, Mickleover

Railway Cutting LWS, and Mickleover Railway Cutting LWS). There are 12 other non-statutory designated sites (LWSs) located within 2km of the proposed scheme boundary at Kingsway/ Markeaton junctions;

- There are two non-statutory designated LWSs located within or directly adjacent to the proposed scheme at Little Eaton junction (Alfreton Road Rough Grassland LWS and River Derwent LWS). There are 33 other non-statutory designated sites (LWSs) located within 2km of the proposed scheme boundary at Little Eaton junction;
- There is one non-designated site (potential Local Wildlife Sites (PLWS) or site of interest reported by Derbyshire Wildlife Trust) adjacent to the proposed scheme at Markeaton junction (Broadway Stream DE056/3). There are 15 other non-designated sites located within 2km of Kingsway/ Markeaton junctions.
- There are six non-designated sites located within or directly adjacent to the proposed scheme boundary (A38 Scrub, Ford Lane Field LWS, Des Lane Brook Course, Boosemoor Brook, Plantation and Old Derby Canal). There are 24 other non-designated sites located within 2km of Little Eaton junction.

8.5.5 Appendix 8.2 presents details of statutory, non-statutory and non-designated sites located within 2km of the proposed scheme, their provisional importance evaluation, and which are scoped in or potentially to be scoped out of the ecology impact assessment (also refer to Figures 8.2 and 8.3).

Habitats

8.5.6 Habitats identified as being present within the adopted study areas are summarised below (also refer to Figure 8.4 and 8.5) and provided in Appendix 8.3, which includes their provisional evaluation:

- Semi-natural broad-leaved woodland and scattered broad-leaved trees;
- Broadleaved plantation woodland;
- Mixed plantation woodland;
- Dense and scattered scrub;
- Semi-improved neutral grassland;
- Poor semi-improved grassland;
- Marshy grassland;
- Improved grassland and arable;
- Tall ruderal;
- Standing water and associated inundation vegetation;
- Running water;
- Amenity grassland;
- Hard standing and bare ground;
- Buildings;
- Hedgerows.

8.5.7 Those habitats considered to be of at least Local importance are scoped into this assessment. However, it should be noted that all habitats identified will be scoped further as part of the biodiversity no net loss assessment for the proposed scheme that will accompany the Environmental Statement. A habitat conditions assessment has been carried out across the proposed scheme footprint in order to perform a biodiversity no net loss assessment.

Invasive Plant Species

8.5.8 Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) covers the control

of invasive plants and animals. Invasive plant species recorded within or adjacent to the proposed scheme boundary include (refer to Figures 8.4, 8.5, 8.9 and 8.10):

- Japanese knotweed *Fallopia japonica*;
- Giant knotweed *Fallopia Sachalinensis*;
- Himalayan balsam *Impatiens glandulifera*;
- Variegated yellow archangel *Lamiastrum galeobdolon*;
- New Zealand pigmyweed;
- Cherry laurel and snowberry (although not listed on Schedule 9 species, these species are listed on the Great Britain Invasive Non-Native Species Secretariat).

Flora and Fauna Species

8.5.9 There were no notable flora species recorded on or within 50m of the proposed scheme boundary, from the Extended Phase 1 habitat and botanical surveys carried out to date, which require individual valuation or assessment.

8.5.10 Protected and notable fauna species identified as present, or considered to have the potential to be present, during field surveys conducted up to the end of 2017, are:

- Toads: at ponds located in proximity to Markeaton junction;
- Bats: roosting, foraging and commuting;
- Badgers: active setts noted at various locations;
- Water vole: in the vicinity of Little Eaton junction;
- Otter: varied activity on the watercourses across the proposed scheme;
- Breeding and wintering birds: typical assemblages of farmland and urban fringe species, including barn owl, little-ringed plover and lapwing;
- White-clawed crayfish: recorded in Dam Brook (1 individual) (the invasive American signal crayfish was noted at two locations);
- Terrestrial and aquatic invertebrates (data from 2015 only): moderate assemblages recorded at sample locations, including localised records of Nationally Scarce hoverfly species.

8.5.11 Refer to Appendix 8.4 for further details on fauna species, and their provisional importance evaluation. Also refer to Figures 8.4 and 8.5 for notable species records and Figures 8.9 and 8.10 for identified/ currently known ecological constraints (excludes details of confidential information). Those species considered to be of at least Local importance have been scoped into this assessment.

8.6 Potential Impacts

8.6.1 A summary of potential impacts on identified ecological features within the ZoI is provided in Appendix 8.5 with further details provided below.

Construction Phase

Designated and Non-Designated Sites

Statutory Designated Sites

8.6.2 There would be no direct impacts predicted on statutory designated sites given that there are no statutory designated sites within or adjacent to the proposed scheme. There is, however, the potential for indirect impacts due to dust emissions and/ or interception of ground or surface water, on the following statutory designated sites from construction activities:

- Kedleston Park SSSI (located approximately 1.9km north-west of proposed

scheme boundary at Markeaton junction – connections via Markeaton Brook);
- Darley and Nutwood LNR (located approximately 0.15km to the south of proposed scheme at Little Eaton junction);
- Allestree Park LNR (located approximately 0.2km to the west of proposed scheme at Little Eaton junction);
- Mickelover Meadows LNR (located approximately 0.7km to the west of proposed scheme at Kingsway junction – connected via Mickelover Railway Cutting LWS).

8.6.3 There are considered to be no potential impacts from construction activities to the following statutory designated sites from construction activities as there are no hydrological or habitat links identified between the proposed scheme and these sites:

- Breadsall Railway Cutting SSSI (located approximately 1.5km to the south-east of Little Eaton junction);
- Chaddesden Wood and Lime Lane Wood LNR (located approximately 1.6km to the east of Little Eaton junction).

Non-Statutory Designated Sites

8.6.4 There would be direct impacts on the following non-statutory designated sites as a result of habitat loss from construction activities:

- A38 Roundabout LWS (located within proposed scheme boundary at Kingsway junction – 100% of the LWS habitat would be permanently lost);
- Markeaton Park LWS (located adjacent to proposed scheme at Markeaton junction - widening of the A38 and utilities diversion route may result in some habitat being temporarily and/ or permanently lost);
- Potentially Mickleover Railway Cutting LWS (located adjacent to proposed scheme at Kingsway junction – approximately area of loss to be confirmed; currently assumed that it would be protected);
- Alfreton Road Grassland LWS (located within proposed scheme boundary at Little Eaton junction – approximately 25% of the LWS habitat would be permanently lost).

8.6.5 There would be the potential for indirect impacts due to dust emissions and/ or interception of ground or surface water, on the following non-statutory designated sites from construction activities:

- Markeaton Park LWS and Markeaton Brook System LWS (located adjacent to proposed scheme at Markeaton junction);
- Bramble Brook and Margins LWS and Mickleover Railway Cutting LWS (located adjacent to proposed scheme at Kingsway junction);
- Alfreton Road Grassland LWS and the River Derwent LWS (located within or adjacent to proposed scheme at Little Eaton junction);
- Osierbed and Gravelpit Woods LWS; Markeaton Lane Meadow LWS; Kedleston Road Marsh LWS; Kedleston Road Hedge LWS; Mackworth Brook LWS (located ≥200m from proposed scheme at Kingsway and Markeaton junction);
- Burley Hill Farm Scrub and Grassland LWS; Camp Wood, Little Eaton LWS; Watermeadows Ditch LWS; Peckwash Mills LWS; Darley Park LWS; Ferriby Brook and Dam Brook LWS; Breadsall Priory Golf Course LWS; Moor Plantation and Drum Hill LWS; and Drum Hill fields LWS (located ≥100m from proposed scheme at Little Eaton junction).

8.6.6 The following non-statutory designated sites have the potential to be scoped out of the assessment due to there being no apparent habitat or hydrological links (segregated by roads and residential development) and their distance from the

proposed scheme (>200m in terms of potential air quality or noise effects on biodiversity):

- Beach Wood LWS; Friargate station LWS; Mickleover – Etwall Trail (Derby) LWS; Inglewood Avenue Meadow LWS; Radbourne Lane Hedge LWS; Bunkers Wood LWS; Woodlands School Hedges LWS (located >200m from the proposed scheme at Kingsway and Markeaton junction);
- Breadsall Disused Railway LWS; Hatherings Wood, Little Eaton LWS; Beech Wood LWS; Moor Road fields LWS; Porters Lane Hedge LWS; Woodlands School Hedges LWS; Porters Lane Pond LWS; Horsley Carr LWS; Eaton Park Wood LWS; Burley Wood LWS; High View South Community School Nature Reserve LWS; Whitaker Lane Woodland LWS; Breadsall Railway Cutting LWS; Great Farley's Wood LWS; and The Warren Coxbench LWS (located >200m from the proposed scheme at Little Eaton junction).

8.6.7 Whether the above sites can be scoped out of the assessment will be confirmed following further water, air quality and noise assessments.

Non-Designated Sites

8.6.8 There would be direct impacts predicted on Ford Lane Field Site of Interest, which has been identified as a potential ecological enhancement area at Little Eaton junction. Impacts would aim to be beneficial to assist with achieving no net loss or potentially net gains on biodiversity across the proposed scheme.

8.6.9 It is assumed that A38 Scrub DE05.03, which is located to the north of the potential floodplain compensation area at Little Eaton junction, would be retained and not directly impacted by construction activities – this is subject to ongoing review.

8.6.10 There would be potential indirect impacts due to dust emissions and/ or interception of ground or surface water, on the following non-designated sites from construction activities:

- Land off Kingsway PLWS; All Saints Churchyard; Markeaton Brook System; Lower Vicarwood Pond; Lower Vicarwood Pond 2; Broadway Stream (located ≥200m from the proposed scheme boundary at Kingsway and Markeaton junctions);
- A38 Scrub DE05.03; Des Lane Brook Course DE/3; Plantation ER017/3; Boosemoor Brook ER018/3; and Old Derby Canal ER003/3 (located within or adjacent to proposed scheme at Little Eaton junction);
- Marsh Area Breadsall PLWS; A6 Bank PLWS; Holme Nook Ponds; Mill Plantation PLWS; Haslams Lane Brook Course; Little Eaton Acid Grassland PLWS; Ferriby Brook PLWS; Breadsall Moor Grassland PLWS; River Derwent Duffield Bridge AV122/3; Broomfield hedge PLWS (located ≥100m from proposed scheme at Little Eaton junction).

8.6.11 The following non-designated sites have the potential to be scoped out of the assessment due to there being no apparent habitat or hydrological links (segregated by roads and residential development) and their distance from the proposed scheme (>200m in terms of potential air quality or noise effects on biodiversity):

- King Street PLWS; Old Cemetery; Littleover Brook; Rykneld Recreation Ground; Bunkers Grassland – Derby; Hackword Farm Pond; Old Hall Wood; Gold Lane; Richmond Close; Hell Brook & Hell Brook Copse (located >200m from proposed scheme at Kingsway and Markeaton junctions);
- Croft Wood PLWS; The Slip ER007/3; Rigger Quarry PLWS; Manor Farm

Pasture; Waste Land, Duffield AV120/3; St Edmunds Churchyard DE088/3; Garage Pond ER187/3; Outwoods PLWS; Embankment, little Eaton ER125/3; Home Farm Pond ER015/3; Broomfield College grasslands PLWS; Daypark Quarry AV030/3; Bank plantation Horsley; Castle Wood Coxbench (located >200m from proposed scheme at Little Eaton junction).

8.6.12 Whether the above sites can be scoped out of the assessment will be confirmed following further water, air quality and noise assessments.

Habitats

8.6.13 Potential direct impacts upon habitats during the construction phase would result in permanent and temporary habitat losses as follows:

- Woodland (semi-natural broadleaved woodland within the A38 Kingsway islands; mixed plantation woodland within the central reservation at Kingsway junction; and broadleaved plantation on the embankments of the A38 at Little Eaton junction);
- Grassland (semi-improved neutral grassland at all junctions; and improved and poor semi-improved grassland at Little Eaton junction);
- Arable land (at Little Eaton junction);
- Hedgerows (primarily species poor and one species rich at Little Eaton junction);
- Buildings at Queensway (at Markeaton junction);
- Watercourses (Bramble Brook at Kingsway junction and Dan Brook at Little Eaton junction);
- Smaller areas of scrub, tall ruderal habitat and trees at various locations.

8.6.14 The proposed scheme design aims to avoid veteran trees along the southern boundary of the Markeaton Park LWS. However, some trees would be lost due to the replacement of the Markeaton footbridge, as well as use of the utilities corridor as detailed in para. 2.3.20. Tree loss within Markeaton Park will be quantified and reported within the Environmental Statement.

8.6.15 Species-rich grassland in association with A38 Kingsway Roundabout LWS would be lost.

8.6.16 The temporary use of land for construction purposes (e.g. compounds, haul roads and storage areas) are currently being investigated and would be located so as to avoid adverse impacts or damage to important habitats as far as is reasonably practicable.

8.6.17 The identification of candidate ecological enhancement sites adjacent to the proposed scheme would aim to deliver no net loss, or potentially net gains, in biodiversity, which in turn would benefit species locally.

Species

8.6.18 There is potential for the proposed scheme to impact on the following species during construction:

- **Toads** at Markeaton junction as a result of habitat loss and potential killing/ injury/ disturbance from construction activities: Some terrestrial habitat of potential value to toads, including on the road embankments, may be directly impacted by the proposed scheme. Without mitigation there is a risk that this may lead to the harm of any toads which may be present;
- **Potentially reptiles** at Little Eaton junction. Presence/ likely absence is to be confirmed following surveys in 2018;

- **Badgers** at Kingsway junction and Little Eaton junction as a result of habitat loss (loss of setts and destruction/ severance of foraging and commuting habitat) and potential killing/ injury/ disturbance from construction activities: Main setts are assumed to be avoided, however, outlier setts at Kingsway junction and Little Eaton junction would be lost along with some associated foraging and commuting habitat;
- **Potentially water vole** at Little Eaton junction (previously identified on Watermeadows ditch in 2015 >50m from the proposed scheme boundary): Presence/ likely absence is to be confirmed following surveys in 2018;
- **Potentially otter** (known presence of foraging and commuting otter across all watercourses surveyed in 2015): Presence/ likely absence to be confirmed following surveys in 2018;
- **Bats (roosting)** as a result of loss of roosts and potentially harm or disturbance from construction activities: Presence to be confirmed following completion of surveys in 2018. Bat roosts currently confirmed at 1) a Queensway property which would be lost due to the proposed scheme (common pipistrelle and whiskered bat, occasional or transient roost); 2) trees at Markeaton junction (within Markeaton park and around Mill Ponds) which would be potentially impacted or disturbed (occasional or transient roost of common bat species identified in 2015); Flood Arch bridge at Little Eaton junction, which would be extended to the south (a small day roost used by both soprano and common pipistrelle bats); and the River Derwent bridge at Little Eaton junction which would not be directly impacted but may be disturbed by adjacent construction activities (mixed species maternity/ satellite roost);
- **Bats (foraging and commuting)** as a result of habitat loss (destruction and severance of foraging and commuting habitat) and harm or disturbance from construction activities: Key bat activity hotspots identified in 2017 within Markeaton Park and along the River Derwent (north and south of the A38) as well as to the north of the Flood Arch bridge at Little Eaton and Markeaton Park;
- **Breeding birds (Barn owl)** at Little Eaton junction as a result of habitat loss and potentially harm or disturbance from construction activities: Two barn owl nest sites identified in 2015; however, they were confirmed as inactive in 2017. There is potential for these nests to be reoccupied and the nest sites to be disturbed or displaced. Arable farmland would be lost, however, there extensive alternative habitat are available to the east;
- **Breeding birds (notable farmland bird assemblage)** at Little Eaton junction as a result of habitat loss (pastoral/ arable land) and potentially harm or disturbance from construction activities: The pastoral land and arable land to the east of the A38 supports a number of notable farmland species, including yellowhammer, yellow wagtail, linnet, reed bunting and skylark. However, it is relevant that these species were typically recorded >100m from the proposed scheme boundary. The proposed scheme would result in the loss of the shelterbelt currently running parallel to the east of the A38 and the western extent of the adjacent fields, which may disturb birds using the adjacent field;
- **Breeding birds (notable breeding bird assemblage)** using scrub habitat within a potential construction compound at Little Eaton junction as a result of habitat loss (pastoral/ arable land) and potentially harm or disturbance from construction activities: The siting of temporary land requirements for construction are currently being developed and would be located so as to avoid adverse impacts or damage to likely important habitats as far as is reasonably practicable;
- **Breeding birds (lapwing, little ringed plover and oystercatcher)** to the south-west of Little Eaton junction as a result of habitat loss (pastoral/ arable land) and potentially harm or disturbance from construction activities: The flooded pastoral

land located south-west of Little Eaton junction supports waders and waterfowl, with lapwing confirmed as breeding in this location. Little ringed plover and oystercatcher were also potentially nesting close to the proposed scheme. The new road alignment would result in the loss of the northern part of this field, and the associated shelterbelt which runs parallel to the present A38, and has potential to result in negative disturbance impacts on breeding lapwing, and potentially nesting little ringed plover and oystercatcher;

- **Wintering birds (including lapwing and teal)** on the flooded field south-west of Little Eaton junction as a result of habitat loss (pastoral/ arable land) and potentially disturbance from construction activities: The flooded pastoral land located south-west of Little Eaton junction supports species of wintering waders and waterfowl, notably lapwing and teal, although the assemblage does not meet criteria for national or county importance. The proposed scheme alignment would result in the loss of the northern part of this field, and the associated shelterbelt which runs parallel to the present A38, and has potential to result in a negative effect on local wintering bird populations;
- **Potentially white-clawed crayfish** at Little Eaton junction (remnant population identified in 2015 however signal crayfish identified downstream of the weir on Dam Brook in 2017): Presence/ likely absence to be confirmed following completion of surveys in 2018;
- **Terrestrial invertebrates** (including notable species recorded at various locations in association with semi-improved grassland habitats in 2015): Presence/ likely absence to be confirmed following completion of surveys in 2018;
- **Aquatic invertebrates** (regionally important species recorded in Dam Brook, Markeaton Brook and the River Derwent in 2015): Presence/ likely absence to be confirmed following completion of surveys in 2018.

8.6.19 The potential impacts on the above species will require further assessment and will be reported in the Environmental Statement.

Operational Phase

Designated and Non-Designated Sites

Statutory Designated Sites

8.6.20 There is potential for indirect effects as a result of altered surface water run-off on the following statutory designated sites during proposed scheme operation:

- Kedleston Park SSSI;
- Allestree Park LNR.

8.6.21 Allestree Park LNR is located approximately 0.2km to the west of the proposed scheme at Little Eaton junction by the proposed isolated road works on Ford Lane. The site is >200m from the main line scheme and considered to not be impacted by operational traffic emissions/ changes in air quality. Similarly due to the magnitude of the distance separating them from the site, no other statutorily designated sites are likely to be impacted by alterations in air quality as a result of the proposed scheme. This will be confirmed during the air quality assessment to be reported in the Environmental Statement.

Non-Statutory Designated Sites

8.6.22 There is potential for indirect effects as a result of altered surface water run-off and/ or damage/ disturbance from salt spray/ emissions on the following non-statutory

designated sites during proposed scheme operation:

- Markeaton Park LWS and Markeaton Brook System LWS (located adjacent to proposed scheme at Markeaton junction);
- Bramble Brook and Margins LWS and Mickleover Railway Cutting LWS (located adjacent to proposed scheme at Kingsway junction);
- Alfreton Road Grassland LWS and the River Derwent LWS (located within or adjacent to proposed scheme at Little Eaton junction);
- Osierbed and Gravelpit Woods LWS; Markeaton Lane Meadow LWS; Kedleston Road Marsh LWS; Kedleston Road Hedge LWS; Mackworth Brook LWS (located ≥200m from proposed scheme at Kingsway and Markeaton junction);
- Burley Hill Farm Scrub and Grassland LWS; Camp Wood, Little Eaton LWS; Watermeadows Ditch LWS; Peckwash Mills LWS; Darley Park LWS; Ferriby Brook and Dam Brook LWS; Breadsall Priory Golf Course LWS; Moor plantation and Drum Hill LWS; and Drum Hill fields LWS (located ≥100m from proposed scheme at Little Eaton junction).

8.6.23 The potential impacts on the above non-statutory designated sites will require further assessment and will be reported in the Environmental Statement.

Non-designated Sites

8.6.24 There is potential for indirect effects as a result of altered surface water run-off and/ or damage/ disturbance from salt spray/ emissions on the following non-designated sites during proposed scheme operation:

- Land off Kingsway PLWS; All Saints Churchyard; Markeaton Brook System; Lower Vicarwood Pond; Lower Vicarwood Pond 2; Broadway Stream (located ≥200m from proposed scheme boundary at Kingsway and Markeaton junctions);
- A38 Scrub DE05.03; Ford Lane Field; Des Lane Brook Course DE/3; Plantation ER017/3; Boosemoor Brook ER018/3; and Old Derby Canal ER003/3 (located within or adjacent to proposed scheme boundary at Little Eaton junction);
- Marsh Area Breadsall PLWS; A6 Bank PLWS; Holme Nook Ponds; Mill Plantation PLWS; Haslams Lane Brook Course; Little Eaton Acid Grassland PLWS; Ferriby Brook PLWS; Breadsall Moor Grassland PLWS; River Derwent Duffield Bridge AV122/3; Broomfield hedge PLWS (located ≥100m from the proposed scheme boundary at Little Eaton junction).

8.6.25 The potential impacts on the above non-designated sites will require further assessment and will be reported in the Environmental Statement.

Habitats

8.6.26 Operational impacts on habitats may include surface water run-off and damage/ disturbance from salt spray/ emissions on retained habitats adjacent to the proposed scheme. This will require further assessment and will be reported in the Environmental Statement.

Species

8.6.27 There is potential for the proposed scheme to impact on the following species during operation:

- **Toads** at Markeaton junction as a result of surface water run-off and/ or harm through collision with motor vehicles or animals becoming trapped in the site drainage;
- **Potentially reptiles** at Little Eaton junction. Presence/ likely absence is to be

confirmed following completion of surveys in 2018;

- **Badgers** at Kingsway junction and Little Eaton junction as a result of harm through collision with motor vehicles and disturbance through increased flood events/ change in hydrology;
- **Potentially water vole** at Little Eaton junction (previously identified on Watermeadows ditch in 2015 >50m from the proposed scheme boundary) as a result of surface water run-off. Presence/ likely absence is to be confirmed following completion of surveys in 2018;
- **Potentially otter** (known presence of foraging and commuting otter across all watercourses surveyed in 2015) through collision with motor vehicles or becoming trapped in drain outfalls. Presence/ likely absence is to be confirmed following completion of surveys in 2018;
- **Bats (roosting, foraging and commuting)** as a result of harm through accidental collision with motor vehicles and light impacts on roosts and foraging and commuting corridors;
- **Breeding birds** as a result of mortality due to accidental collision with traffic and reduced population size and breeding success due to traffic noise and visual disturbance;
- **Wintering birds (including lapwing and teal)** to the south-west of Little Eaton junction as a result of mortality due to accidental collision with traffic and reduced population size due to traffic noise and visual disturbance. Removal of the shelterbelt to the south-west of the existing A38 would potentially expose birds to the risk of collision with road vehicles and/ or disturbance. The existing shelterbelt is considered to be acting as a screen/ barrier for birds;
- **Potentially white-clawed crayfish** at Little Eaton junction (remnant population identified in 2015, however, signal crayfish identified downstream of the weir on Dam Brook in 2017). Presence/ likely absence is to be confirmed following completion of surveys in 2018;
- **Terrestrial invertebrates** (including notable species recorded at various locations in association with semi-improved grassland habitats in 2015). Presence/ likely absence is to be confirmed following completion of surveys in 2018;
- **Aquatic invertebrates** (regionally notable species recorded in Dam Brook, Markeaton Brook and the River Derwent in 2015). Presence/ likely absence is to be confirmed following completion of surveys in 2018.

8.6.28 The potential impacts on the above species will require further assessment and will be reported in the Environmental Statement.

8.7 Design, Mitigation and Enhancement Measures

8.7.1 Environmental considerations have been taken into account during the development of the proposed scheme design, in order to avoid and/ or reduce potential impacts on biodiversity. This iterative approach has led to a range of mitigation measures capable of reducing the magnitude of impacts being embedded within the proposed scheme design or captured within the proposed construction practices. However, given the status of the proposed scheme design and ongoing ecological surveys, the assessment of proposed scheme effects upon biodiversity is also ongoing. As such, the mitigation measures needed to reduce biodiversity effects are still under development. Nevertheless, the sections below provide a range of mitigation measures currently under consideration.

8.7.2 The Highways England Biodiversity Plan states that by 2020, Highways England will aim to reduce no net loss of biodiversity and that by 2040 it will deliver a net gain in

biodiversity. In addition, the Road Investment Strategy states that by 2020, the company must deliver a reduction in biodiversity loss by 2020, no net loss of biodiversity by 2025 and biodiversity net gain by 2040. These objectives will be implemented as far as reasonably practicable to do so when designing the proposed scheme and its associated mitigation, and when considering options for additional ecological enhancements that could be delivered as a result of the proposed scheme. The main objective of the proposed scheme is to ensure no net loss of biodiversity. The no net loss in biodiversity assessment will assist in delivering this objective.

8.7.3 Monitoring and mitigation measures will be discussed with the relevant stakeholders as the proposed scheme design continues to develop – such stakeholders will be given the opportunity to provide comment as part of on-going consultation. As part of the mitigation design for the proposed scheme, where required, monitoring measures will be proposed to assess the effectiveness of the mitigation proposals.

Designated and Non-Designated Sites

8.7.4 The following mitigation and enhancement measures are under consideration in relation to designated and non-designated sites, to reduce the effect of potentially significant construction and operational impacts (where applicable):

- Pollution prevention control measures would be in place and standard best practice measures to control construction dust which would be implemented through the CEMP;
- Opportunities would be explored for the translocation of grassland habitats from the A38 Roundabout LWS and Alfreton Road Grassland LWS to off-site receptor areas, potentially located adjacent to the proposed scheme at Mackworth Park, and associated habitat enhancements;
- Design of the proposed scheme aims to minimise land take and loss of veteran trees within Markeaton Park LWS (for which the LWS site is designated) to ensure functional integrity of the site remains;
- A large existing culvert (Markeaton Lake Culvert) beneath the A38 connecting Markeaton Lake with Mill Pond would remain in situ and would not need to be extended, avoiding direct impacts to Markeaton Brook System LWS;
- Design of the proposed scheme would aim to avoid habitat loss associated with the Mickelover Railway Cutting to ensure functional integrity of the site remains;
- The proposed scheme design would aim to avoid removal of habitat in association with the A38 Scrub DE05.03 Site of Interest. Any temporary habitat loss adjacent to the site (as a result of a potential haul route by construction traffic under the River Derwent bridge) would be re-instated;
- The proposed scheme design has identified Ford Lane (located adjacent to the proposed scheme) for potential ecological restoration;
- Operational runoff would be appropriately managed in accordance with the drainage strategy (refer to Chapter 13: Road Drainage and Water Environment);
- In order to provide additional mitigation and protection of Mill Pond (part of Markeaton Brook System LWS) during operation, a downstream defender is to be included within the road drainage design (refer to Chapter 13: Road Drainage and Water Environment).

Habitats

8.7.5 The following mitigation and enhancement measures are under consideration in relation to habitats, to reduce the effect of potentially significant construction and

operational impacts (where applicable):

- Pollution prevention control measures would be in place and standard best practice measures to control construction dust which would be implemented through the CEMP;
- Retention of habitats and on-site soft-landscaping. Areas identified within the boundaries of the proposed scheme for soft-landscaping would be used to contribute to the replacement of those habitats lost to construction;
- It is the aim that the proposed scheme be mitigated within the proposed scheme boundary to deliver no net loss of biodiversity, if necessary using the candidate sites for ecological mitigation/ compensation areas as identified in para. 8.3.6 (in consultation with stakeholders);
- Translocation of habitats. Selective translocation of grassland turves, for example, from the A38 Roundabout LWS to habitat creation areas would, wherever possible, be undertaken within the proposed scheme boundary;
- Retention of felled trees as ecological features. Any veteran trees that may be felled would be used to provide dead wood habitats for saproxylic (dead wood loving) species. All felled trees would be retained on site as whole boughs and trunks;
- Habitat creation and enhancement of watercourses. Watercourse channels would be enhanced where possible where they flow through the proposed scheme. Specific enhancement measures will be explored further during the environmental assessment. Additional watercourse and associated riparian habitat would aim to be created to compensate for habitat lost from culverting works. The Water Framework Directive is applicable to Markeaton Brook, which forms part of the Humber River Basin Management Plan (RBMP). Habitat creation or improvements would therefore be sought to maximise gains to the water environment, particularly at Markeaton Brook;
- Planting of field margins and species-rich hedgerows. Options to include field margins into the landscape design strategy for the proposed scheme would be explored, particularly adjacent to retained arable habitat linking the proposed scheme to the wider landscape. Replacement of species-poor hedgerows through planting of species-rich hedgerows would aim to be undertaken at the earliest opportunity to enable rapid establishment of these linear habitat features and promote wildlife dispersal alongside the proposed scheme;
- Biodiversity no net loss assessment. This assessment would inform refinement of the mitigation strategy in terms of the type and extent of habitats to be replaced/ recreated, such that the proposed scheme would achieve at least no net loss in biodiversity, and potentially a net gain in biodiversity;
- Enhancing the wildlife corridor and ecosystem function of the proposed scheme. Landscape design plans would aim to maximise the green infrastructure corridor and enable movement of wildlife across the proposed scheme into the wider landscape. This would aim to minimise fragmentation and enable connectivity across the proposed scheme through: retaining areas of existing habitat where possible; creating and planting new habitats to replace those lost to construction; and enhancing new and existing habitats. This would ultimately benefit local wildlife in the long term and assist in meeting objectives set within the LBAP and Highways England Biodiversity Plan. Different planting regimes would also be considered to accommodate changes in future climate conditions, allowing species distributions to adapt;
- Appropriate road treatments would be in place to minimise impacts from salt spray e.g. calcium magnesium acetate which is a low corrosion, and more environmentally sensitive alternative to road salt.

Species

8.7.6 The following mitigation and enhancement measures are under consideration in relation to species, to reduce the effect of potentially significant construction and operational impacts (where applicable):

- **Pollution prevention:** Control measures would be in place and standard best practice measures to control construction dust, implemented through the CEMP;
- **Toads:** Opportunities would be explored to provide compensation planting and enhance habitat for amphibians through appropriate landscape design and habitat creation across the proposed scheme. This would include consideration of appropriate Sustainable Drainage Systems (SUDs) and pond designs, provision of hibernacula and log piles, and provision of appropriate grassland planting and associated management. Opportunities would also be considered for the provision off-site mitigation west of Kingsway junction at Mackworth Park, potentially enhancing the local distributions of amphibian species. Destructive searches of suitable refugia for toads at Markeaton junction would be undertaken and individuals translocated to a suitable receptor site. Additionally, silt fencing used to protect water quality of Markeaton Lake and Mill Pond would also restrict toads from re-entering the working construction area.
- **Reptiles:** If mitigation measures are required to reduce any construction impact to reptiles (if present), the following measures will be explored: removal of vegetation avoiding sensitive period (e.g. winter hibernating months); replacement planting providing suitable optimal habitat for reptiles; provision of green corridors.
- **Badger:** Appropriate planting would be incorporated into the landscape design to account for loss of foraging resources. No loss of any main setts is proposed. An appropriate mitigation strategy would be implemented in line with Natural England licensing requirements (where necessary). Pre-construction badger surveys would be undertaken. Measures to minimise disturbance through appropriate buffer zones would be in place. Implementation of embedded mitigation would avoid significant impacts on foraging/ commuting badgers during construction. Badger fencing would be installed. Effective fencing/ would be beneficial for the local badger population and the public. As per DMRB, it is sensible to adopt an integrated approach where a tunnel/ underpass is to be constructed for other species; consideration of any tunnels/ underpasses would be made.
- **Water vole:** Pre-construction surveys would be undertaken to assess any changes in distribution and mitigation measures implemented accordingly.
- **Otter:** Pre-construction surveys would be undertaken to establish any change in distribution and any new holt sites; thus minimising risk of harm to otter. Measures to minimise noise, lighting and vibration disturbance to dispersing otter within and directly adjacent to the proposed scheme would be implemented through the CEMP. Potential otter dispersal corridors would also be maintained e.g. at least one side of the watercourse being available at any one time during construction. Standard pollution prevention controls would also be implemented to minimise any potential impact on otter food source. Otter fencing would be incorporated within the design in line with DMRB guidance. Road safety is also an important consideration and can be improved by discouraging wild animals from crossing the carriageway. Drain outfalls would be designed to prevent otters entering the proposed scheme and becoming trapped.
- **Bats (roosting, foraging and commuting):** Mitigation would be in line with Natural England licence requirements. Measures would be implemented to minimise construction impacts on bats e.g. buffer zones around retained roost

sites and appropriate timing of works under Natural England European Protected Species Mitigation Licence (EPSML) where applicable. Pre-construction surveys would be undertaken to reconfirm roost status and mitigation would also be implemented to minimise impacts in accordance with Natural England licence. Installation of bat boxes across the proposed scheme would be explored to mitigate for lost roost sites and enhance the site with regards to bats. To compensate for habitat losses, provision would be made for the creation and enhancement of habitats of value to foraging and commuting bats at both on- and off-site mitigation areas associated with the proposed scheme of equivalent size and value to foraging bats. Linear habitat features including hedgerows would be incorporated into the landscape design to enhance ecological connectivity within and across the proposed scheme, and into the wider landscape. Opportunities for further reducing construction impacts on foraging and commuting bats through the provision of advance planting and the phasing of vegetation clearance would also be explored. Measures would be implemented to minimise impacts on foraging and commuting bats e.g. through limited night-time working and/ or reducing lighting within habitats of value to bats. Planting, including linear features across the proposed scheme, would be undertaken to compensate for that lost. Dense and interspersed planting to facilitate bats continuing to use the flyway across the A38 at Markeaton would aim to be incorporated into the landscape design. Review of lighting strategy - the impacts on bats can be minimised e.g. low pressure sodium lamps instead of high pressure sodium or mercury lamps can be used. Brightness would be as low as legally possible and the times during which the lighting is to be used limited to provide some dark periods. Lighting would be directed to where it is needed to avoid any horizontal light spillage and disturbance to foraging, commuting and roosting bats. Any upward lighting would be minimal to avoid light pollution. Limiting the height of lighting columns and directing light at a low level would reduce the ecological impact of lighting on bats.

- **Breeding birds:** The compensatory habitat to be created for the notable farmland and wading birds would provide alternative foraging habitat for barn owl. To compensate for the loss of habitat, vegetation of local provenance would be planted, representing species which provide nesting and/ or food resources for birds, particularly for those Amber and Red List species, such as song thrush and dunnock. This may include seed-bearing species, and should be similar to those lost where possible. To compensate for the loss of nesting habitat for some species (predominantly cavity nesters), bird nest boxes would be installed within, or close to, the proposed scheme boundary (e.g. open-fronted and small-hole boxes). Consultation with an experienced ornithologist will determine the most appropriate location of these boxes. Vegetation clearance would aim to avoid the nesting bird period i.e. March to September (inclusive). If the nesting bird season cannot be avoided then nesting bird checks would be undertaken by an ornithologist prior to any vegetation removal. Appropriate buffer zones would be put in place until the nest is no longer in use. A pre-construction survey would be undertaken by a Schedule 1 bird licence holder to determine the presence of barn owl. Appropriate buffer zones would be in place during construction should barn owls be present as advised by an ornithologist. Barn owl boxes i.e. alternative nesting sites, to be installed further away from the proposed scheme, but within their likely territorial range in advance of construction works commencing. Measures would also be in place to ensure barn owls are not disturbed during construction. An ornithologist would advise on the appropriate distance which must be maintained between construction works and active barn owl nests. There is pastoral/ arable land to the east within the wider landscape available for farmland birds; however, a dense band of shelterbelt would look to

be planted running parallel to the east of the new A38 alignment to ensure that birds using the farmland, such as yellow wagtail and skylark, are screened from the road traffic. Compensatory habitat planting would also be created i.e. field margins. Temporary screening would be in place during construction to minimise disturbance to the farmland bird assemblage. Bird monitoring surveys would be undertaken during construction to ensure effectiveness of mitigation in place. Alternative nest sites for lapwing and little ringed plover (and other waders such as oystercatcher) would be provided. This could include creating a permanent flooded area with nesting spits in fields to the south. A new dense band of shelterbelt would be planted running parallel to the south of the new A38 alignment to ensure birds using the pastoral land, such as lapwing, are screened from the traffic. At Kingsway and Markeaton junctions, the new road realignment would diverge only slightly from its current position. It is likely that the present shelterbelt and hedgerow features along the A38 at Markeaton Park and the hospital grassland would remain intact, and this would effectively screen common nesting birds from traffic. Mitigation would reduce barn owl mortalities resulting from collisions with road vehicles through appropriate siting of nesting sites/ boxes and screen fencing. Replacement planting of the shelterbelt to the east and south west of Little Eaton junction would minimise risk of birds (i.e. farmland birds, lapwing and little ringed plover) colliding with road traffic. Replacement planting of the shelterbelt to the east and south west of Little Eaton junction would minimise risk of birds (i.e. farmland birds, lapwing and little ringed plover) being disturbed from traffic (noise and visual).

- **Wintering birds:** Alternative wetland/ permanent flooded area could be created. A new dense band of shelterbelt would be planted running parallel to the south of the new A38 alignment to screen birds using the land (such as lapwing and teal) from traffic to minimise disturbance once the shelterbelt has matured. Temporary screening would be in place during construction to minimise disturbance to wintering birds. Bird monitoring surveys would be undertaken during construction to ensure effectiveness of mitigation in place. Major works in the north of the flooded field would be timed where possible for the end of the summer/ early autumn (i.e. late September/ October) as this was the period when no target species were recorded using the field.
- **White-clawed crayfish:** Pre-construction surveys would be undertaken to establish any change in distribution. Natural England licences would be in place to minimise risk of killing/ injuring/ disturbing white-clawed crayfish (if present in the upstream section of Dam Brook). However, it is assumed that all of Markeaton Brook including downstream of Markeaton Lake is potentially carrying crayfish plague spores. Machinery used in these waterbodies and then in other waterbodies/ courses may transfer these spores. Any machinery or other equipment that is to be used in Markeaton Brook (including excavators, pumps, waders, traps and/ or nets) must be thoroughly cleaned in accordance with a biosecurity protocol before use in other waterbodies to minimise spread of crayfish plague spores. If material has to be excavated from any watercourse with signal crayfish, there is the potential for movement of crayfish in excavated spoil, so additional biosecurity measures would be necessary if excavated material from the watercourse has to be transported to another location. If mitigation measures are required to reduce any operational impact to white-clawed crayfish (if present), appropriate management of operational runoff will be explored.
- **Terrestrial Invertebrates:** Habitat creation would be undertaken to compensate for habitats lost at a ratio of least on a 1:1. Opportunities for enhancing habitat would be explored e.g. road side verges, varied topography and log piles. Felled trees would be retained on site as whole boughs and trunks which would benefit

invertebrates. Plant species planted would be beneficial for notable species. Potential translocation of grassland habitat to off-site mitigation areas from the A38 Roundabout LWS at Kingsway may also be beneficial for invertebrate species.

- **Aquatic Invertebrates:** Pollution prevention control measures would be implemented alongside standard best practice measures to control construction dust, implemented through the CEMP.

8.8 Assessment of Effects

8.8.1 In the absence of mitigation, there is the potential for significant biodiversity effects to be generated as a result of the proposed scheme construction and operation activities. These effects range from impacts to habitats and individual species with differing levels of importance. As such, a range of mitigation measures as detailed in Section 8.7 would be implemented.

8.8.2 It is the aim that the proposed scheme could be fully mitigated within the proposed scheme boundary to deliver no net loss of biodiversity, if necessary using the candidate sites for ecological mitigation/ compensation areas as identified in para. 8.3.6 (in consultation with stakeholders).

8.8.3 Appendix 8.5 provides a summary of the initial assessment of effects on biodiversity. This indicates that through implementation of the mitigation measures as detailed in Section 8.7, in the short to medium term there is the potential for the following significant residual effects:

- Up to a moderate significant adverse effect (up to the County or Unitary Authority level) on habitats, particularly on woodlands, until replacement habitat establishes;
- Up to a moderate significant adverse effect (up to the County or Unitary Authority level) on foraging and commuting bats and birds (particularly on common nesting birds) until habitat establishes.

8.8.4 However, in the long term, when planting and new habitats have become established and mitigation is maintained and managed, the only likely significant residual effects of the proposed scheme with regard to nature conservation would relate to the A38 Roundabout LWS at Kingsway junction and the Alfreton Road Grassland LWS at Little Eaton junction. The significance of the adverse effects on both these features would be moderate (at the County or Unitary Authority level). This would be due to complete loss of the A38 Roundabout LWS at Kingsway junction and the partial-loss (approximately 25%) of Alfreton Road Grassland LWS at Little Eaton junction. Given the further mitigation and enhancement measures proposed (see Section 8.7) which would improve the wildlife corridor function of the proposed scheme relative to the existing scheme, it is anticipated that overall the proposed scheme would not have an adverse effect (at the Local level) on nature conservation in the medium to long term. This will be confirmed and reported in the Environmental Statement, taking into account the findings of the ecology surveys being undertaken in 2018.

9 GEOLOGY AND SOILS

9.1.1 This chapter presents the findings of a preliminary assessment of the potential effects of the proposed scheme on geology and soils. This chapter also outlines proposed design and other measures to help mitigate potential effects.

9.1.2 This chapter is supported by Figures 9.1 to 9.3. A full discussion of the legislative framework and the geology and soils impact assessment methodology for the EIA is provided in Chapter 10 of the EIA Scoping Report (refer to para. 4.4.12).

9.2 Stakeholder Engagement

9.2.1 Statutory and non-statutory bodies have been engaged as part of the assessment process to obtain background data, information and to develop the assessment scope.

9.2.2 Following receipt of the EIA Scoping Opinion in April 2018, the scope of the geology and soils assessment has been reviewed and modified (as necessary) to take into account any additional requirements stipulated by the Planning Inspectorate.

9.3 Assessment Assumptions and Limitations

9.3.1 The information presented in this chapter reflects that obtained and evaluated at the time of reporting, and is based on an emerging design for the proposed scheme and the maximum likely extents of land take required for its construction and operation.

9.3.2 The proposed scheme construction and operational maintenance phases would be undertaken in a manner that appropriately protects the health and safety of workers (legal compliance requirement), whilst the proposed scheme would use materials that are appropriate for the identified ground conditions. As such, construction/ operational/ maintenance workers and construction materials have been scoped out of the assessment.

9.3.3 The assessment presented herein has been based on information obtained from the Environment Agency, British Geological Society (BGS), Envirocheck Report and other available sources including the following:

- AECOM (2017) A38 Derby Junctions, Ground Investigation Report, HE514503-ACM-VGT-A38_SW_PR_ZZ-RP-GE-0001 P01.02 S3.

9.4 Study Area

9.4.1 The study area for the geology and soils assessment comprises the proposed scheme footprint and up to a buffer of 500m from each junction. The assessment of the impacts has been extended to important offsite features in the vicinity of the proposed scheme where necessary.

9.5 Baseline Conditions

Published Geology

9.5.1 The BGS Onshore GeoIndex and BGS 1:50,000 Scale Solid and Drift (Sheet 125) for Derby map indicates that the proposed scheme is underlain by the following geological conditions:

- Kingsway junction:
  - The junction is underlain by a thin strip of Alluvium – Clay, Silt, Sand and Gravel associated with Bramble Brook, aligned south-west to north-east

through the centre of the junction. The bedrock geology comprises the Tarporley Siltstone Formation – Mudstone and Siltstone.

- Markeaton junction:
  - The junction is not underlain by superficial deposits. However, there are superficial deposits of the Allenton Terrace Deposits – Sand and Gravel to the north-east of the junction. The bedrock geology at the junction comprises of the Gunthorpe Member – Mudstone in the southern half and the Tarporley Siltstone Formation – Mudstone and Siltstone.
- Little Eaton junction:
  - The junction is underlain by superficial deposits of Alluvium – Clay, Silt, Sand and Gravel. The bedrock geology at the junction comprises the Morridge Formation – Mudstone, Siltstone and Sandstone.

Encountered Ground Conditions

9.5.2 An intrusive investigation was undertaken by ESG (now SOCOTEC) and supervised by AECOM in 2016 at Kingsway, Markeaton and Little Eaton junctions. The sections below presents a summary of the ground conditions encountered at each junction during the investigation. This information is based on data contained within the Ground Investigation Factual Report prepared by ESG.

9.5.3 The ground conditions encountered at Kingsway junction, Markeaton junction and Little Eaton junction during the 2016 ground investigation are summarised in Table 9.1.

Table 9.1: Summary of Encountered Strata

Strata	Top of Strata (m bgl)		Depth to Base (m bgl)		Thickness (m)	
	Min	Max	Min	Max	Min	Max
Kingsway Junction						
Topsoil	0.00	0.00	0.20	0.40	0.20	0.40
Made Ground	0.20	0.40	0.50	>20.50	0.30	>20.30
Alluvium (Clay and Silt)	0.20	5.20	1.20	6.80	0.50	5.15
Bedrock (Siltstone, Mudstone and Sandstone)	1.20	9.00	>5.45	>35.00	>0.95	>30.80
Markeaton Junction						
Topsoil	0.00	0.00	0.20	0.40	0.20	0.40
Made Ground	0.00	0.40	0.50	4.50	0.50	4.50
Alluvium (Clay, Silt, Sand & Gravel)	0.00	2.50	1.40	12.00	0.90	11.80
Bedrock (Siltstone, Mudstone and Sandstone)	1.00	12.00	>3.00	>30.20	>1.00	>26.56
Little Eaton Junction						
Topsoil	0.00	0.00	0.20	0.50	0.20	0.40
Made Ground	0.00	0.50	0.30	2.45	0.10	2.25
Alluvium (Clay, Silt, Sand & Gravel)	0.20	2.45	0.60	11.20	0.40	9.50
Bedrock (Siltstone, Mudstone and Sandstone)	3.10	11.20	>3.20	>30.15	>0.10	>22.15

Mining and Mineral Resources

9.5.4 Mining and mineral resource details for each junction are as follows:

- Kingsway junction:
  - Rowditch Brick Works which has ceased to operate is located approximately 190m to the east of the Kingsway junction. The site was an opencast quarry extracting common clay and shale.
- Markeaton junction:
  - Rowditch Brick Works which has ceased to operate is located approximately 25m to the east of the Markeaton junction. The site was an opencast quarry extracting common clay and shale.
- Little Eaton junction:
  - Breadsall Gravel Pit which has ceased to operate is located approximately 270m to the north-east of the Little Eaton junction. The site was an opencast quarry extracting sand and gravel.

Geologically Designated Sites

9.5.5 There are no Local Geological Sites (formerly Regionally Important Geological Sites (RIGS)) within the defined study area.

Agricultural Land and Soils

9.5.6 There are no areas in agricultural use in the vicinity of Kingsway junction or Markeaton junction – thus effects upon agricultural soils for these junctions has been scoped out of the assessment.

9.5.7 Agricultural soils are present at Little Eaton junction – as such an agricultural land classification (ALC) quality investigation was undertaken in 2015 covering the proposed scheme footprint. This investigation indicated that agricultural soils in the vicinity of the Little Eaton junction are predominantly of ALC subgrades 3a and 3b[7] (refer to Figure 9.3). A further ALC survey is proposed at Little Eaton junction to cover areas required for the proposed scheme that were not surveyed in 2015.

Hydrogeology

Kingsway Junction

9.5.8 The superficial deposits underlying the Kingsway junction is classified by the Environment Agency as a Secondary 'A' Aquifer. The bedrock deposits underlie the junction are classified as Secondary 'B' Aquifers (Mercia Mudstone Group Mudstone) and as a Secondary Undifferentiated Aquifer (Mercia Mudstone Group Siltstone Dolomitic).

9.5.9 The underlying groundwater body is within the "Derwent – Secondary Combined" catchment. The current quantitative quality (2016 assessment) of the groundwater body is classed as 'Good' by the Environment Agency. The chemical quality of the groundwater body was last accessed in 2016 and classed as 'Poor', with an objective of a 'Good' classification by 2027.

9.5.10 The Groundwater Vulnerability Zone Maps indicates that Kingsway junction is not

[7] Best and most versatile agricultural land is defined as land in grades 1, 2 and 3a of the ALC

within an area of groundwater vulnerability. There are no groundwater abstraction licenses within 500m of the proposed scheme. In addition, there are no groundwater source protection zones within 500m of the proposed scheme.

9.5.11 Groundwater monitoring at Kingsway junction was undertaken between November 2016 and October 2017. Table 9.2 summarises the monitored groundwater levels in Made Ground and natural strata.

Table 9.2: Summary of Groundwater Ranges at Kingsway Junction

Strata Screened	Average Monitored Groundwater Level Range (m bgl)	Average Monitored Groundwater Level Range (m AOD)
Made Ground (Historic Landfill)	3.88 - 8.54	65.18 - 7.00
Natural Strata	2.46 - 12.31	64.61 - 70.54

Markeaton Junction

9.5.12 The superficial Alluvium deposit at the Markeaton junction is classified by the Environment Agency as a Secondary A Aquifer. The Mercia Mudstone underlying the Site is classified by the Environment Agency as Secondary 'B' Aquifers (Mercia Mudstone Group Mudstone) and as a Secondary Undifferentiated Aquifer (Mercia Mudstone Group Siltstone Dolomitic).

9.5.13 The Groundwater Vulnerability Zone Maps indicates that Markeaton junction is located between an area of high-vulnerability (to the east) and an area of intermediate-vulnerability (to the north). The area of high vulnerability refers to the Alluvium, while the area of intermediate vulnerability is associated with River Terrace Deposits.

9.5.14 The underlying groundwater body is within the "Derwent – Secondary Combined" catchment. The current quantitative quality (2016 assessment) of the groundwater body is classed as 'Good' by the Environment Agency. The chemical quality of the groundwater body was last accessed in 2016 and classed as 'Poor', with an objective of a 'Good' classification by 2027.

9.5.15 There are no groundwater abstraction licenses within 500m of the proposed scheme. In addition, there are no groundwater source protection zones within 500m of the proposed scheme.

9.5.16 Historic boreholes indicated that the groundwater level to be present between approximately 2.5m and 6.0m below ground level (bgl) in the vicinity of the junction at the time of the investigations.

9.5.17 Groundwater monitoring at Markeaton junction was undertaken between November 2016 and March 2018. Table 9.3 shows the monitored groundwater levels within the Alluvium and Mercia Mudstone.

Table 9.3: Summary of Groundwater Level Ranges at Markeaton Junction

Average Monitored Groundwater Level Range (m bgl)	Average Monitored Groundwater Level Range (m AOD)	Strata Screened
1.09 - 10.44	56.51 - 66.83	Made Ground/ Alluvium/ Mercia Mudstone

Little Eaton Junction

9.5.18 The Environment Agency classifies the bedrock (Morridge Formation – Mudstone, Siltstone and Sandstone) and the superficial Alluvium deposits at the junction as Secondary 'A' Aquifers. The Environment Agency Groundwater Vulnerability Map (Sheet 23) indicates that the Little Eaton junction is situated on land that classifies the soil as high vulnerability (Class H2 soil), suggesting that the soil has a low attenuation potential for pollutants, and that it drains rapidly. To the west of the junction, the classification alters to that of medium vulnerability (Class I1 soil), indicating that it could possibly transmit a wide range of pollutants.

9.5.19 Past borehole records indicate standing groundwater level ranged from between 0.5m and 2.5m bgl at the time of the investigations. However, applicable boreholes were located some distance from the junction itself.

9.5.20 The underlying groundwater body is within the "Derwent – Secondary Combined" catchment. The current quantitative quality (2016 assessment) of the groundwater body is classed as 'Good' by the Environment Agency. The chemical quality of the groundwater body was last accessed in 2016 and classed as 'Poor', with an objective of a 'Good' classification by 2027.

9.5.21 The majority of the area of Little Eaton junction overlies Zone III of a Source Protection Zone (SPZ) for groundwater abstraction – refer to para. 13.5.17 which indicates that the SPZ run parallel to the River Derwent and are associated with now disused filter tunnels that were historically used for drinking water abstraction.

9.5.22 Groundwater monitoring at Little Eaton junction was undertaken between November 2016 and October 2017. Table 9.4 summarises the monitored groundwater levels within the Alluvium and Mudstone (Morridge Formation).

Table 9.4: Summary of Groundwater Level Ranges at Little Eaton Junction

Strata Screened	Average Monitored Groundwater Level Range (m bgl)	Average Monitored Groundwater Level Range (m AOD)	Strata Screened
Alluvium	0.42 - 3.70	48.83 - 49.41	Alluvium
Mudstone (Morridge Formation)	0.7	48.88	Alluvium

Hydrology

Kingsway Junction

9.5.23 Bramble Brook is present within and immediately to the south of Kingsway junction and within the proposed scheme footprint. Bramble Brook is partly culverted in the area of the junction. Bramble Brook flows in a northerly direction towards the junction, then turning towards an easterly direction.

9.5.24 The proposed scheme falls within the Markeaton Brook from Mackworth Brook to Derwent river catchment. In 2016 the catchment was classed as having a Moderate Ecological quality and a Good Chemical quality, both of which have an Objective of Good by 2027.

Markeaton Junction

9.5.25 Markeaton Lake is located approximately 125m to the north of the junction, on the

western side of the A38. Mill Pond is present on the eastern side of the A38.

9.5.26 The proposed scheme falls within the Markeaton Brook from Mackworth Brook to Derwent river catchment. In 2016 the catchment was classed as having a Moderate Ecological quality and a Good Chemical quality, both of which have an Objective of Good by 2027.

9.5.27 Other unnamed surface watercourses are present further to the north of the junction.

Little Eaton Junction

9.5.28 Dam Brook/ Boosemoor Brook flows towards the junction and along the eastern boundary to the current junction, heading in a southerly direction. The River Derwent is located to the east of the junction, with the A38 crossing over the river. At this location the river is aligned in a north-south orientation.

9.5.29 The water within the River Derwent flows in a southerly direction. The current ecological quality and the 2015 predicted ecological quality of this section of the River Derwent are both classified by the Environment Agency as 'moderate'. The proposed scheme falls within the Derwent from Bottle Brook to Trent catchment. The catchments ecological quality is Moderate and the chemical quality is Good in 2016.

Unexploded Ordnance (UXO) Risk Assessment

9.5.30 A Detailed UXO Risk Assessment was undertaken by 1st Line Defence on the 14th July 2016 for land in the vicinity of Markeaton junction due to the presence of the Territorial Army base (46 Signal Squadron - located to the south of the junction, off Windmill Hill Lane) and given that Markeaton Park was home to an army camp during WWII. The report indicated that there is a Low Risk of German dropped UXO in the vicinity of the junction, with the risk of Allied Military UXO varying from Low Risk to Medium Risk dependant on the location.

Land Contamination

Historical Land Uses and Potential Source of Contamination

9.5.31 The following information has been obtained from the Envirocheck Report and the Environment Agency website (refer to Figures 9.1 to 9.2):

- Kingsway junction:
  - Rowditch Tip to the east of the proposed scheme operated by Par Development Limited between 1990 and 1991. First shown as Refuse Tip on maps between 1967 and 1972. The current license holder is J Sainsbury PLC and Leigh Interests PLC. Accepted the following wastes: inert; industrial; commercial; household; special waste and liquid sludge;
  - The route of a dismantled railway line is noted as a historic landfill. The historic landfill is called 'Disused Railway Cutting and Tunnel off Station Road' and was operated by Northern Land Agriculture Improvements Limited. This site received inert waste between 31 August 1981 and 31 March 1993;
  - Two pollution incidents to controlled waters in 1998 and 1999, involving milk flow into drains classed as Major and an accidental spillage of diesel into Markeaton Brook classed as a Minor incident;
  - A 2005 ground investigation identified that the embankments contained Made Ground of old road surface materials and foundry sand with high

concentrations of lead, iron and Total Petroleum Hydrocarbons (TPHs).

- Markeaton junction:
  - Discharge consent north of junction for sewerage and surface water by Severn Trent Water Ltd;
  - Mackworth Service Station (ESSO) adjacent to the junction. Permitted status under Local Authority Pollution and Prevention Controls;
  - Inactive car painters and sprayers on Queensway;
  - Two pollution incidents to controlled waters, Category 3 Minor Incidents, occurred in 1995 and 1999;
  - Historical landfill located approximately 100m north of the proposed scheme, licenses to Tarmac National Construction between 1982 and 1984 for inert waste; and
  - Historical landfill some 175m east of the proposed scheme, licensed to the Royal School of Deaf between 1978 and 1982 for inert, industrial and commercial waste.
- Little Eaton junction:
  - Located within a nitrate vulnerable zone (NVZ);
  - Five pollution incidents to controlled waters between 1996 and 1999 classed as Minor to Significant Incidents diesel, milk, a dead cow and a blockage in a ditch upside of railway line;
  - Substantiated pollution incident register entry for soils and clay and vehicle and vehicle parts pollutants in May 2008. Significant impact to land occurred some 150m north-west of the junction;
  - Licensed Waste Management Facility (landfill) some 250m north-west, of the junction operational since 1977 licensed to take construction and demolition wastes;
  - Water reclamation works some 300m from the junction – has a Planning Hazardous Substance Consent;
  - Road Haulage Service and a Commercial Vehicle Dealers are 'Active' approximately 150m to the north-west of the junction;
  - Alignment of the former Derby Canal crosses Little Eaton junction; and
  - Ground investigation undertaken in 2012 noted a hydrocarbon odour in one of the exploratory holes. Gas monitoring indicated the presence of low concentrations of carbon dioxide and methane.

Human Health Risk Assessment

9.5.32 A Human Health Risk Assessment was undertaken by AECOM and reported in the 2017 Ground Investigation Report. Key findings are summarised below.

- Kingsway junction:
  - The Tier 1 Screening of soil samples did not identify any exceedances of metal, inorganic or organic determinands when compared against the corresponding Generic Assessment Criteria (GAC) (commercial/ industrial end use) value. Therefore, considered that for the development of the proposed scheme, the risk to human health from metal, inorganic and organic determinands is negligible;
  - Four trial pits located within the former landfill were terminated at depths between 1m and 2m bgl due to suspected asbestos. Forty samples taken in Made Ground from ground level to 7.5m were tested for asbestos. Asbestos in the form of free fibres (chrysotile, amosite and crocidolite) and lagging was identified in seven of the samples. It is estimated that approximately

6,000m^3 of asbestos containing materials require excavation due to the proposed scheme.

- Markeaton junction:
  - The Tier 1 Screening of soil samples did not identify any exceedances in metal, organic or inorganic determinands when compared against their corresponding GAC (commercial/ industrial end use) value. Therefore, considered that for the development of the proposed scheme, the risk to human health from metal, inorganic and organic determinands is negligible;
  - Nineteen soils samples taken from Made Ground and Natural Strata between ground level to a depth of 3m bgl were tested for asbestos identification. Chrysotile (free fibres) was identified in two of the nineteen samples, one from Made Ground at BM03 (0.5m bgl) located on land to the south of Markeaton roundabout and one within the Natural Strata of BM13 (0.5m bgl) located near the former miniature railway.
- Little Eaton junction:
  - The Tier 1 Screening of soil samples did not identify any exceedances in metal, organic or inorganic determinands when compared against their corresponding GAC (commercial/ industrial end use) value. Therefore, it is considered that for the development of the proposed scheme, the risk to human health from metal, inorganic and organic determinands is negligible;
  - Three soil samples taken from ground level to 3.0m bgl were tested for asbestos identification. The samples were taken from Topsoil, Made Ground and Natural Strata. No asbestos was identified in any of the samples analysed.

Controlled Waters Risk Assessment

Critical Receptors

9.5.33 The critical controlled waters receptors along the proposed scheme are as follows:

- Kingsway junction:
  - Secondary A Aquifer of superficial deposits and Secondary 'B' Aquifer of the Mercia Mudstone;
  - River Derwent (approximately 2.5km to the north-east);
  - Bramble Brook (approximately 200m east of landfill).
- Markeaton junction:
  - Secondary A Aquifer of superficial deposits and Secondary 'B' Aquifer of the Mercia Mudstone;
  - Markeaton Lake (approximately 400m north-east), fed by Markeaton Brook.
- Little Eaton junction:
  - Secondary 'A' Aquifers of Alluvium (superficial) and Morridge Formation (bedrock);
  - Located within a Total Catchment Zone 3 Groundwater Source Protection Zone;
  - Outer Zone (Zone 2) and Inner Zone (Zone 3) are located to the west of the junction, with the source protection borehole location approximately 500m to the north of the junction;
  - River Derwent located approximately 400m to the west of the junction. The river is abstracted for potable water supply by Severn Trent Water.

Detailed Quantitative Risk Assessment (DQRA)

9.5.34 Following the completion of the controlled waters risk assessment and subsequent DQRA, no organic contaminants were identified as potential risks to controlled waters at any of the three junctions.

9.5.35 The results of the DQRA indicate that there are potential risks to controlled waters from chromium hexavalent, copper, cyanide, lead, nickel, zinc and ammoniacal nitrogen at Kingsway junction.

9.5.36 At the Markeaton junction, potential risks to controlled waters were identified from cadmium, copper, lead, zinc, chromium hexavalent and cyanide.

9.5.37 The DQRA undertaken for Little Eaton junction indicates there are potential risks to controlled waters from cadmium and selenium. The determinands identified at elevated concentrations in leachate and groundwater will be from both Made Ground and natural materials, with the exception of those determinands identified at the former landfill at Kingsway junction.

Ground Gas Risk Assessment

9.5.38 A ground gas risk assessment was undertaken as part of the A38 Derby Junction Ground Investigation Report, the findings are summarised below:

- Kingsway junction:
  - Kingsway (within the landfill) has been classified as a Characteristic Situation 3 (Moderate Risk) and Kingsway junction (outside of the landfill) has been classified as a Characteristic Situation 1 (Very Low Risk);
  - Based on the oxygen data recorded at the junctions, it was concluded that there is potential risk to construction workers entering excavations or other enclosed spaces at Kingsway junction (landfill area);
  - Within the historical landfill area, there is risk of explosion or asphyxiation due to methane for construction workers working in confined spaces and excavations;
  - The concentrations of carbon dioxide recorded both outside and inside of the historic landfill area were sufficient to exceed the 8 hour long term occupational exposure limit (OEL) and 10 minute OEL. Therefore, it is concluded that there may be a risk to construction workers entering confined spaces across the area of the Kingsway junction from carbon dioxide;
  - Risk due to short term or prolonged exposure to carbon monoxide is considered not to be present outside of the historic landfill area, but it is considered present;
  - There is considered to be a risk from prolonged exposure to hydrogen sulphide within the historical landfill area. The risk due to short term or prolonged exposure to hydrogen sulphide is considered not to be present outside of the historic landfill.
- Markeaton junction:
  - Markeaton junction has been classified as a Characteristic Situation 1 (Very Low Risk);
  - The risk from methane is considered to be low. However, ventilation should be provided in confined spaces as the recorded concentration was close to 0.25% v/v;
  - It is concluded that there may be a risk to construction workers entering confined spaces across the area of the Markeaton junction from carbon

dioxide;
- There is considered there is a negligible risk from carbon monoxide;
- The risk due to short term or prolonged exposure to hydrogen sulphide is considered not to be present.

- Little Eaton junction:
  - Little Eaton junction has been classified as a Characteristic Situation 2 (Low Risk);
  - Based on the oxygen data recorded at the junctions, it was concluded that there is potential risk to construction workers entering excavations or other enclosed spaces;
  - It is considered that there is low risk from methane to construction workers working in confined spaces and excavations at the junction. However, ventilation should be provided in confined spaces as the recorded concentration was above 0.25% v/v;
  - It is concluded that there may be a risk to construction workers entering confined spaces across the area of the Little Eaton junction from carbon dioxide;
  - There is considered there is a low risk from carbon monoxide;
  - The risk due to short term or prolonged exposure to hydrogen sulphide is considered not to be present.

Geotechnical Assessment

9.5.39 A Geotechnical Risk Register was undertaken as part of the A38 Derby Junctions Ground Investigation Report. The possible risks identified in this Risk Register are summarised below:

- Soft/ compressible ground (embankment on alluvium material and historic route of Derby Canal);
- Soft ground (cutting at Kingsway junction);
- Soft/ compressible ground (structures at Markeaton and Kingsway junctions);
- Depth to suitable bearing stratum for structure foundations greater than anticipated (all three junctions);
- Rockhead/ hard stratum at shallower depth than expected (all three junctions);
- Fault disturbed ground (Kingsway and Markeaton junctions);
- Soft/ unsuitable material at pavement formation level (all three junctions);
- Potential risk to long term ground heaving due to deep cutting into Mercia Mudstone (over-consolidated) on the new road formation (all three junctions);
- Shallow groundwater levels (cutting and structure – Markeaton junction);
- Shallow groundwater levels (embankment and structures within the River Derwent floodplain);
- Artesian groundwater (Kingsway and Little Eaton junctions);
- Contamination material at former landfill site (Kingsway junction);
- Contamination material at filling station (Markeaton junction);
- Contamination material at former landfill site (Little Eaton junction);
- Contamination material at historic route of Derby Canal (Little Eaton junction);
- Potential contaminants present in groundwater (all three junctions);
- Contaminated material in two boreholes within Markeaton Park;
- Ground chemistry/ solution features (all three junctions);
- Proportions of acceptable/ unacceptable material from cuttings different to predicted (all three junctions);
- Presence of Made Ground, including old road surface and foundry sand (all three junctions);

- Made Ground material at former landfill (Kingsway junction);
- Flooding adjacent to earthworks (River Derwent floodplain);
- Existing earthwork defects (all three junctions);
- Existing structure foundations (all three junctions);
- Existing services, in particular those installed after previous studies (all three junctions);
- Potential ground instability during construction works (all three junctions); and
- Potential for UXO to be disturbed during construction at Markeaton junction.

9.6 Potential Impacts

Construction Phase

9.6.1 In relation to potentially contaminative land uses, the following adverse impacts could potentially arise as a result of proposed scheme construction:

- Mobilising existing contamination in soil and groundwater as a result of ground disturbance and de-watering during construction;
- Increasing the potential for contaminants in unsaturated soils to leach into groundwater in open excavations during construction;
- Increasing the potential for contaminated surface run off to migrate to surface water and groundwater receptors as a result of leaching from uncovered stockpiles;
- Introducing new sources of contamination, such as fuels, chemicals and oils used during construction activities; and
- Creating preferential pathways for the migration of soil contamination and gases, for example along new below ground service routes, service ducts and as a result of dewatering.

9.6.2 The preliminary assessment has concluded that such effects have the potential to affect human, ecological and controlled water receptors, and are likely to inform the continued design-development of the proposed scheme.

9.6.3 With regard to existing geological and soil resources, construction has the potential to result in the following adverse impacts:

- Degradation of soil resources from the compaction of soil due to heavy construction vehicle movement, changes in topography, exacerbation of erosion through the handling and storage of soils, or ground stability impacts;
- The permanent loss of agricultural soils of ALC subgrade 3a at Little Eaton junction;
- The generation of waste soils that cannot be reused on the proposed scheme, requiring offsite disposal as waste; and
- The sterilisation of mineral resources.

9.6.4 Some, albeit limited, potential exists for construction to result in beneficial impacts through the following;

- Creation of a new geological features or attributes, for example through fresh exposure of a geological sequence in a road cutting;
- Removal or treatment of contaminated soil, with the effect that existing adverse effects on receptors are removed; and
- A reduction in soil erosion through improved drainage.

Operational Phase

9.6.5 No potential adverse impacts are likely to result from the long term operation of the proposed scheme, other than the potential risk from controlled waters or geology and soils to be affected by spillages arising from road accidents or faulty vehicles. However, agricultural land quality within the potential flood compensation area at Little Eaton may decrease with time due to an increase in the frequency and duration of flooding.

9.6.6 Should beneficial impacts be identified during the construction phase, it is expected that some of these could continue into the operational phase, for example the removal or treatment of contaminated soil would provide a benefit in future years.

9.7 Design, Mitigation and Enhancement Measures

9.7.1 Mitigation by design has been the primary consideration in development of the proposed scheme. Opportunities have been taken to avoid geological, geomorphological and hydrogeological constraints.

Construction Phase

9.7.2 As indicated in para. 2.3.31, construction of the proposed scheme would be subject to measures and procedures defined within a CEMP that would contain measures to ensure compliance with relevant standards and legislation. The CEMP would set out the environmental mitigation requirements and also the project level expectations on how the proposed scheme would be constructed. Measures contained within the CEMP would be designed to limit the possibility for dispersal and accidental releases of potential contaminants, soil derived dusts and uncontrolled run-off to occur during construction. For example the CEMP would set out how material would be excavated, segregated and stockpiled to minimise the possibility for run-off, soil quality degradation and wind dispersal of dusts. The CEMP would also establish procedures for dealing with unexpected soil or groundwater contamination that may be encountered.

9.7.3 Defra (Department for Environment, Food and Rural Affairs) has worked with the Department for Trade and Industry to develop a Code of Practise for Sustainable Use and Management of Soils on Construction Sites (2009). The Code of Practice, which would be adopted, covers the following:

- Identification of soil resources at an early stage in the development process;
- A better level of soil management during project implementation, including sustainable use of surplus soil;
- Maintenance of soil quality and function both on and off site;
- Avoidance of soil compaction and erosion (with consequent reduction in flooding and water pollution); and
- An improved knowledge and understanding of soil at all levels in the construction industry, including soil amelioration techniques.

9.7.4 Measures for adoption and implementation are likely to include the following (and which would be included in the CEMP):

- Handling of topsoil and subsoil in a manner to retain their potential for plant growth including careful stripping, segregation and placement for reuse (where possible) as part of landscaping, earthworks or any areas of agricultural handback;

- The characterisation and disposal of waste soils as either Hazardous or Non-Hazardous waste;
- Minimisation of compaction of underlying soils from construction plant, and routine testing of soils during ground works to confirm material suitability for use;
- Groundwater level controls (as necessary);
- Adequate fuel/ chemical storage facilities e.g. bunded tanks, hard standing and associated emergency response/ spillage control procedures;
- The use of well-maintained plant and associated emergency response/ spillage control procedures;
- The implementation of an Asbestos Management Plan to ensure asbestos can be identified, removed and disposed of in a legally compliant manner; and
- The covered storage of contaminated material on sheeting to minimise the potential for leachate and run off from the stockpile being generated.

9.7.5 The following risk mitigation measures are recommended to support the proposed works at Markeaton junction: site specific UXO awareness briefings to all personnel conducting intrusive works (all works) and UXO specialist presence on site to support shallow intrusive works (shallow intrusive works).

9.7.6 Construction activities would be undertaken by the appointed contractor in accordance with industry best practise and in line with measures set out in the contractors CEMP, with emphasis placed on ensuring legal compliance and managing risks to construction workers.

9.7.7 All materials proposed for re-use would be required to meet risk-based acceptability criteria. Soils would be protected from accidental contamination during storage and transit. Methods of soil handling and storage, including measures to prevent erosion by wind and surface water, would be detailed in a method statement that would be prepared prior to the commencement of construction activities.

9.7.8 The re-use of excavated soils during construction would be governed by a Materials Management Plan (MMP) developed in accordance with CL:AIRE Code of Practise which is a voluntary framework for excavated materials management and re-use. Following this framework would result in a level of information being generated sufficient to demonstrate that excavated material has been re-used appropriately and is suitable for its intended use. It demonstrates that unsuitable material or waste has not been used in the development. The MMP details the procedures and measures that would be taken to classify, track, store, reuse and dispose of all excavated materials that would be encountered during the construction phase.

9.7.9 Where there is a requirement to dispose of surplus soils off site as waste, the material would be characterised to determine firstly whether it is Hazardous or Non-Hazardous waste in accordance with the Environment Agency's Technical Guidance WM3 (Environment Agency, 2015). Once this is established, the appropriate disposal facility would be determined through Waste Acceptance Criteria (WAC) analysis as required.

Operational Phase

9.7.10 The prevention of pollution to controlled waters would be achieved via the mitigation measures presented in Chapter 13: Road Drainage and Water Environment.

9.7.11 Potential risks posed to maintenance workers would be mitigated through adherence to appropriate site and task specific health and safety documentation.

9.7.12 It is expected that any spillages following road accidents would be routinely handled and managed by Highways England. Any potential operational effects on controlled waters during the operational phase would be addressed via the mitigation measures presented in Chapter 13: Road Drainage and Water Environment.

9.8 Assessment of Effects

9.8.1 The preliminary assessment indicates that, subject to the implementation of the above standard best practise mitigation measures, there is low likelihood for the proposed scheme to result in significant adverse effects with respect to geology and soils.

9.8.2 An ALC survey undertaken at Little Eaton indicates that agricultural land of subgrades 3a and 3b would be lost, although total losses of best and most versatile agricultural land (i.e. grades 1, 2 and 3a) are not anticipated to be significant.

10 MATERIALS

10.1.1 This chapter presents the preliminary findings of an assessment into the potential effects of the proposed scheme in relation to material resources and waste arisings. The approach to the materials assessment and the methods being used to identify potentially significant effects are set out in Chapter 11 of the EIA Scoping Report (refer to para. 4.4.12).

10.1.2 For the purpose of this PEI Report, materials are defined as comprising:

- The use of material resources; and
- The generation and management of waste.

10.1.3 Material resources are defined by Interim Advice Note (IAN) 153/11 (Highways Agency, 2011) as "*the materials and construction products required for the construction, improvement and maintenance of the trunk road network. Material resources include primary raw materials such as aggregates and minerals, and manufactured construction products*".

10.1.4 Waste is defined as per the Waste Framework Directive (2008/98/EC) as "*any substance or object which the holder discards or intends or is required to discard*".

10.1.5 The proposed scheme would aim to prioritise waste prevention, followed by preparing for re-use, recycling, recovery and lastly disposal to landfill as per the internationally recognised waste hierarchy (refer to Figure 10.1).



Figure 10.1: Waste Hierarchy

10.1.6 This PEI Report has been written in accordance with IAN 153/11 (Highways Agency, 2011) which is intended for the "*identification of impacts associated with materials resource use and waste arisings*" for construction, improvement and maintenance projects and is relevant guidance for the proposed scheme.

10.2 Stakeholder Engagement

10.2.1 Statutory and non-statutory bodies have been engaged as part of the assessment process to obtain background data, information and to develop the assessment scope.

10.2.2 Following receipt of the EIA Scoping Opinion in April 2018, the scope of the materials assessment has been reviewed and modified (as necessary) to take into account any additional requirements stipulated by the Planning Inspectorate. In summary these

include:

- A formal study area will be described and justified in the Environmental Statement. Consultation will continue through the EIA process to: further refine the adopted study area (refer to Section 10.4); discuss the magnitude of predicted impacts and the significance of effects of materials usage and waste produced as part of the proposed scheme; and agree appropriate mitigation measures.

10.3 Assessment Assumptions and Limitations

10.3.1 The information presented in this chapter reflects that obtained and evaluated at the time of reporting, and is based on an emerging design for the proposed scheme and the maximum likely extents of land take required for its construction and operation.

10.3.2 Data on the waste generated by the proposed scheme and materials required to construct the proposed scheme are not currently available. This information will be generated as the proposed scheme design continues to develop.

10.4 Study Area

10.4.1 The study area comprises the provisional DCO application boundary (refer to Figure 1.2a and 1.2b) and the wider region (East Midlands) within which waste management facilities are located and from where construction materials may be sourced.

10.5 Baseline Conditions

10.5.1 Baseline information consists of the current capacity of the waste infrastructure and waste generation in the waste disposal authority area (Derbyshire), and in the wider East Midlands planning region.

10.5.2 Information on baseline waste conditions has been collected from sources including local planning documents published by DCC and DCiC and data on waste facility capacity published by the Environment Agency.

10.5.3 The Towards a Statistical Basis for the Waste Plan report (DDC and DCiC, 2013) provides data on projected waste arisings as shown in Table 10.1.

Table 10.1: Waste Arisings Data Provided in the Towards a Statistical Basis for the Waste Plan report (DDC and DCiC, 2013)

Waste Type	Arisings at baseline 2009/ 2010	Arisings 2015/ 2016	Arisings 2021/ 2022	Arisings 2025/ 2026	Arisings 2029/ 2030
Commercial and Industrial (C&I) waste	1,072,186	1,126,878	1,126,878	1,126,878	1,126,878
Construction and Demolition (C&D) waste	2,931,306	3,080,833	3,080,833	3,080,833	3,080,833
Hazardous waste	126,280	126,280	126,280	126,280	126,280

10.5.4 The Environment Agency's Waste Management for England 2016 data (published in 2017, updated 2018) (Environment Agency, 2017) includes the following information regarding waste sent to landfills in 2016 and remaining landfill capacity in Derbyshire, and in the wider East Midlands region (refer to Table 10.2 and 10.3).

Table 10.2: Derbyshire Landfill Inputs and Capacity 2016

Landfill Type	Inputs (000 tonnes)	Capacity (000m^3)
Hazardous Merchant	-	-
Hazardous Restricted	-	-
Non Hazardous with SNRHW* cell	305	6,244
Non Hazardous	177	3,114
Non Hazardous Restricted	-	-
Inert	79	814
Total	561	10,172
*Some non-hazardous sites can accept some Stable Non-Reactive Hazardous Wastes (SNRHW) into a dedicated cell, but this is usually a small part of the overall capacity of the site.		

Table 10.3: East Midlands Landfill Inputs and Capacity 2016

Landfill Type	Inputs (000 tonnes)	Capacity (000m^3)
Hazardous Merchant	132	1,040
Hazardous Restricted	-	-
Non Hazardous with SNRHW* cell	624	19,119
Non Hazardous	1,137	16,360
Non Hazardous Restricted	58	3,564
Inert	2,222	23,524
Total	4,173	63,608
*Some non-hazardous sites can accept some Stable Non-Reactive Hazardous Wastes (SNRHW) into a dedicated cell, but this is usually a small part of the overall capacity of the site.		

10.5.5 Baseline information on nationwide demand data for material resources has been collected for the key raw materials: aggregates, concrete, asphalt and steel, as shown in Table 10.4.

Table 10.4: UK Demand for Material Resources

Material	UK Demand (tonnes, year)	Source
Steel	10.90 million tonnes (2016)	International Steel Statistics Bureau (2016)
Aggregates of which:	225 million tonnes (2015)	Mineral Products Association (2016)
• Crushed rock	• 104 million tonnes	
• Sand & gravel - land won	• 46 million tonnes	
• Sand & gravel - marine	• 12 million tonnes	
• Recycled & secondary	• 63 million tonnes	
Asphalt	24 million tonnes (2015)	
Concrete of which:	81 million tonnes (2015)	
• Ready-mixed concrete	• 54 million tonnes	
• Concrete products	• 27 million tonnes	

10.6 Potential Impacts

10.6.1 A preliminary assessment of the type and magnitude of impacts likely to arise during the construction and operational phases of the proposed scheme, and the significance of effect(s) (prior to mitigation measures) has been undertaken, in accordance with methodology presented in the EIA Scoping Report and based on current available information. However, at present there is insufficient information to estimate the quantities of waste that is likely to be generated, or the quantities of materials that are likely to be required to construct the proposed scheme.

10.6.2 For surplus materials and waste, the potential environmental effects are associated with the production, movement, transport, processing, and disposal of arisings from construction sites.

10.6.3 Table 10.5 summarises the types of materials used and waste that may potentially be generated during the proposed scheme construction and operation.

Table 10.5: Potential Material Use and Waste Arisings

Project Activity	Material Use	Material and Waste Generation
Site remediation/ preparation/ earthworks	• Fill material for construction purposes • Primary and secondary/ recycled aggregates for ground stabilisation • Stripped topsoil and subsoil	• Surplus excavated materials • Stripped topsoil and subsoil • Contaminated soils • Waste arising from the clearance of vegetation
Demolition	• Materials are not required for demolition works.	• Waste arisings from the demolition of existing buildings or structures
Site construction	Construction materials including: • Concrete • Asphalt and bituminous material • Cement bound granular material • Well graded granular material • Precast concrete kerb • Timber • Plywood • Cementitious grout • Reinforcing steel • Reinforcing fabric • Geotextile • Geo-composite drainage system • Pipe bedding aggregate • Filter drain material	• Packaging from materials delivered to site • Excess and broken/ damaged construction materials • Existing highway infrastructure and technology as removed by excavation works • Waste oils from construction vehicles • Construction worker wastes
Operation and maintenance	• Routine maintenance of infrastructure and technology including surfacing asphalt and servicing of electronic equipment	• Waste arising during operation and maintenance expected to be minimal

10.6.4 For most highways schemes, the largest quantities of waste and materials are generally those associated with earthworks, especially in those cases where a balance between excavation (cut) and material placement (fill) cannot be achieved.

10.6.5 The proposed scheme design is currently being progressed to optimise the requirements for cut and fill and where possible this will be minimised to reduce the import and export of materials and waste. The proposed scheme design aims to achieve a cut-fill balance as far as practical. However, the total cut volume is currently estimated to be approximately 130,000m^3, whilst the estimated fill requirement totals approximately 474,900m^3. These figures will be updated and reported in the Environmental Statement. Whilst material generated at Kingsway junction and Markeaton junction is likely to be reused at Little Eaton junction (subject to quality characteristics), it is apparent that a net import of fill material would be required to construct the proposed scheme. There are a wealth of mineral sources within the Derbyshire region, such that materials required for the proposed scheme could be sourced locally in order to minimise material travel distances.

10.6.6 Material use and waste generation is expected to be very small during operation of the proposed scheme. Routine maintenance would include gully emptying and litter collection. Periodically, maintenance activities such as resurfacing would be required. Waste arising from these maintenance activities is expected to be generally the same (in both type and quantity) to that generated by the existing road; and the wastes would be managed using established procedures and facilities that are used across the strategic highway network. For these reasons, materials and waste during the proposed scheme operational phase has been scoped out of the EIA.

10.6.7 Prior to mitigation, the potential impacts of the proposed scheme with regards to material resources and waste arisings include:

- Temporary reduction in material resources available within relevant markets;
- Effects that on-site generated materials (e.g. soils) and waste arisings have on the existing capacity of waste management facilities.

10.7 Design, Mitigation and Enhancement Measures

10.7.1 The following mitigation measures would be considered and implemented during the proposed scheme design and construction phases:

- Waste arisings would where possible be prevented and designed out;
- Opportunities to re-use material resources would be sought;
- Opportunities to support the circular economy would be considered.

10.7.2 As indicated in para. 2.3.31, construction of the proposed scheme would be subject to measures and procedures defined within a CEMP. The CEMP would include a Site Waste Management Plan, whilst proposals for the handling of excavated materials would be in accordance with the CL:AIRE Definition of Waste Code of Practice (CL:AIRE, 2008).

10.7.3 Excavation would be required to form cuttings at Kingsway junction and Markeaton junction, whilst material would be required at Little Eaton junction to form the mainline A38 embankment. The proposed scheme design aims to balance these requirements as far as practicable in order to minimise the amount of surplus excavated material that would need to be either imported or exported from the proposed scheme, although overall the scheme is currently anticipated to require a net requirement to import material (refer to para. 10.6.5). This regard to material reuse opportunities, the following measures are identified:

- Material excavated at Kingsway and Markeaton junctions would be reused for

the formation of the Little Eaton embankment where possible (subject to quality characteristics and construction programme constraints), thus reducing requirements for material importation and surplus material disposal;

- Excavation (approximately 7,800m^3) would be required to form flood storage areas at Kingsway junction within the Kingsway hospital site (refer to Table 2.2). There is the opportunity that such excavated materials could be reused as part of the ongoing hospital site redevelopment – interim discussions have been held with the site development contractor. Such material reuse would avoid such material being taken off site;
- A floodplain compensation area is proposed at Little Eaton junction, with the preferred option being an area to the south of the A38 and to the west of the River Derwent (refer to Table 2.2). Approximately 36,000m^3 of material is estimated to require excavation to create this area. An option being explored is whether such excavated material could be reused to assist with the formation of the proposed Little Eaton junction embankment (subject to excavated material characteristics).

10.8 Assessment of Effects

10.8.1 The existing landfill capacity in the East Midlands (of all types) has been determined, from Environment Agency data, as being approximately 63.6 million m^3.

10.8.2 Given the relatively large landfill capacity in East Midlands and the potential for the reuse of most of the excavated material (either on site or off site), it is considered unlikely that the proposed scheme would result in a significant reduction in the available landfill capacity in the wider region, and hence significant effects are not anticipated.

10.8.3 Although the quantities of material used for construction are not yet available, it is anticipated that these quantities would represent only a very small proportion of the overall UK demand for construction materials. It is, therefore, considered unlikely that the proposed scheme would result in a significant reduction in the availability of construction materials within the regional or national market.

11 NOISE AND VIBRATION

11.1 Introduction

11.1.1 This chapter presents the findings of a preliminary assessment of the potential effects of the proposed scheme on noise and vibration.

11.1.2 This chapter is supported by Figures 11.1a and 11b. A full discussion of the legislative framework and the noise and vibration impact assessment methodology for the full EIA is provided in Chapter 12 of the EIA Scoping Report (refer to para. 4.4.12).

11.1.3 The assessment to date has been undertaken following the methodology for a 'scoping' assessment, as described in DMRB Volume 11, Section 3, Part 7, HD 213/11 Revision 1 (Highways Agency, 2011) with due regard to the requirements of the NPSNN (DfT, 2014), the NPPF (Department for Communities and Local Government, 2012) and the aims of the Noise Policy Statement for England (NPSE) (Defra, 2010). A 'detailed' assessment will be undertaken as part of the EIA and reported within the Environmental Statement, based on the methodology provided in the EIA Scoping Report.

11.1.4 Noise impacts on ecologically sensitive receptors are considered as part of the biodiversity assessment (see Chapter 8: Biodiversity).

11.2 Stakeholder Engagement

11.2.1 The Environmental Health Department at both DCiC (Kingsway junction and Markeaton junction) and EBC (Little Eaton junction) have been consulted with regard to the noise assessment. They have advised they have no specific concerns regarding noise complaints in the area or specific sensitive receptors beyond those already identified.

11.2.2 DCiC and EBC do not have a specific policy regarding construction noise other than the adoption of standard working hours: 07:30 - 18:00 weekdays, 08:00 - 13:00 Saturdays with no working on Sundays and bank holidays. Their preference is to deal with major construction projects through the use of best practical means based on the guidance in BS 5228 (BSI, 2014), and a Construction Noise and Vibration Management Plan, rather than setting specific limits or requiring a Section 61 application for prior consent. Public liaison was emphasised as a key aspect of any such management plan.

11.2.3 The relevant highway authorities for the Important Areas (as defined in The Environmental Noise (England) Regulations 2006 (as amended 2008, 2009, 2010)) not under Highways England control were contacted with regard to any proposed noise mitigation measures. DCiC and DCC did not advise of any proposed noise mitigation measures for Important Areas within their administrative areas. Defra was also contacted directly, and confirmed that no specific noise mitigation actions had been recorded. It is understood that DCiC is currently developing a Local Noise Plan for their Important Areas, therefore further discussions with DCiC will be carried out as part of the assessment for inclusion within the Environmental Statement.

11.2.4 A site visit to the Royal School for the Deaf site was undertaken in October 2016 to understand the use and potential noise sensitivity of the various buildings on the site.

11.3 Assessment Assumptions and Limitations

11.3.1 At this stage, details of the construction traffic, construction schedule, construction methodology and plant requirements are not yet confirmed. Therefore, for this preliminary assessment a qualitative construction noise and vibration assessment has been carried out, based on the application of best practicable means to minimise noise and vibration levels. A quantitative assessment of noise and vibration impacts arising from construction works will be undertaken as part of the EIA and reported within the Environmental Statement.

11.3.2 The detailed operational noise and vibration assessment will be included in the Environmental Statement which will be based on detailed traffic modelling data. In this PEI Report potential increases/ decreases in traffic noise levels are described based on the currently available traffic data and proposed scheme design. Further refinements to both the traffic data and proposed scheme design are anticipated for the Environmental Statement. In addition, as detailed in Section 11.7, a number of noise barriers are being considered for inclusion in the scheme design - the requirement for such barriers will be confirmed following further noise modelling, taking into account comments received during statutory public consultation. The operational preliminary noise assessment included herein does not take account of potential noise barriers. Given the above, the noise data as presented herein are subject to change.

11.3.3 Due to the large size of the traffic model and available assessment timescales, the manual judgement of speed banding data has been limited in scope. At the A61 south of Little Eaton junction, modelled speeds have been used rather than speed bands, as it is considered that they better represent the anticipated changes in traffic speed due to the proposed scheme.

11.3.4 The information on existing road surfacing is dependent on the accuracy of the data in the Highways England Highways Agency Pavement Management System (HAPMS) database. Information on future road resurfacing plans in the area is based on the current maintenance proposals. These proposals will be confirmed as part of the assessment included within the Environmental Statement. Changes to the re-surfacing plans would affect the outcome of the noise assessment, in particular at Little Eaton junction.

11.3.5 The Highways England HAPMS database contains details of one existing noise barrier on the northbound A38 off slip at the A6 junction - no height information was available, therefore, a height of 2m has been assumed based on a visual inspection. Paper drawings of the original noise barrier locations at Bardens Drive/ Ferrers Way and Keddleston Road have been provided by the maintenance contractor, rather than electronic plans, therefore, the location of these existing barriers has been estimated in the noise model from these paper drawings. None of these existing barriers are critical to the outcome of the noise assessment.

11.3.6 As detailed in para. 5.2.3, DCiC has plans to develop and implement a potential CAZ within Derby. Details regarding the potential CAZ are not yet available. When such details become available, the implications for the proposed scheme construction and operation will be considered. Findings will be reported within the Environmental Statement.

11.4 Study Area

11.4.1 The study area has been defined in accordance with guidance given in DMRB which aims to identify any potentially significant effects of the proposed scheme.

11.4.2 The study area for the qualitative assessment of construction phase noise and vibration impacts has been focussed on the closest identified receptors to the various works areas.

11.4.3 The study area for the quantitative assessment of operational phase noise impacts comprises an area extending to 1km from the proposed scheme and the existing A38 replaced by the proposed scheme. Existing roads beyond 1km which are expected to undergo a potentially significant change in traffic noise are also considered.

11.4.4 The proposed scheme, the 1km study area, and sensitive receptors within the study area are shown in Figures 11.1a and 11.1b.

11.4.5 The vast majority of potentially sensitive receptors are residential properties. A total of over 12,000 residential properties have been identified within the 1km study area based on Ordnance Survey (OS) address base data.

11.4.6 Within 1km of Kingsway junction and Markeaton junction are various residential suburbs of Derby, including Mackworth to the west and New Zealand to the east. A new development of predominantly housing is currently being constructed to the south-east of the Kingsway junction on the Kingsway Hospital site. This development would be in place by the proposed scheme opening year - detailed layout plans are available for the development and these have been included in the assessment. A total of 17 residential properties would be demolished to the north-east of Markeaton junction as part of the proposed scheme (refer to para. 2.3.23) – as such these have not been included in the noise assessment.

11.4.7 The eastern edge of the suburb of Allestree falls within the 1km study area of Little Eaton junction, whilst the Ford Farm Mobile Home Park is located directly off the junction and the villages of Breadsall and Little Eaton are located to the south-east and north respectively.

11.4.8 A number of developments, in addition to development on the Kingsway Hospital site, are proposed in the vicinity of the junctions – refer to Chapter 15: Assessment of Cumulative Effects. Of these, two would introduce new potentially sensitive residential receptors within the 1km study areas, although they would be fairly remote from the proposed scheme, namely:

- Site of Mackworth College: development of up to 221 new houses, associated facilities and open space; and
- Land north-west of Mansfield Road, Breadsall Hilltop: development of up to 230 new houses.

11.4.9 With regard to non-residential receptors, a total of 23 educational buildings have been identified within the 1km Kingsway junction and Markeaton junction study area, the closest of which is the Royal School for the Deaf located immediately to the east of Markeaton junction (beyond the residential properties on Queensway that would be demolished by the proposed scheme). A number of the buildings within the Royal School for the Deaf are also understood to be used for residential purposes. A total of two schools have been identified in the Little Eaton junction 1km study area, though these are both remote from the proposed scheme.

11.4.10 A total of three hospitals have been identified within 1km of Kingsway junction and Markeaton junction. No hospitals have been identified within 1km of the Little Eaton junction.

11.4.11 A total of four places of worship have been identified within 1km of Kingsway junction and Markeaton junction, none of which are in close proximity to the proposed scheme. Four places of worship have been identified within the 1km study area of Little Eaton junction.

11.4.12 No designated areas (AONB, National Park, SAC, SPA, SSSI, SAM) have been identified within the 1km study areas. However, the Derwent Valley Mills World Heritage Site runs in a north-south direction to the west of Little Eaton junction (refer to Chapter 6: Cultural Heritage). A number of public rights of way (PRoW) fall within the 1km study areas, mainly in the vicinity of Little Eaton junction (refer to Chapter 12: People and Communities).

11.4.13 A number of public open spaces, as designated by DCiC fall within the 1km study areas. The closest of which to the proposed scheme is an area immediately west of Kingsway junction to the east and south of Greenwich Drive South in Mackworth, and Markeaton Park located immediately adjacent to Markeaton junction.

11.4.14 A total of six Important Areas are located along the A38 within the 1km study areas (8006, 8005, 11628*, 11627, 7976 and 8245* as illustrated on Figure 11.1a and 11.1b), two of which extend along the A6 and A52 respectively (8245* and 11628*). In the absence of the proposed scheme, Highways England has made an initial assessment of the feasibility of mitigation for these Important Areas which considers resurfacing with low noise surfacing and noise barriers.

11.5 Baseline Conditions

Existing Noise Barriers

11.5.1 The maintenance contractor for the A38 through Derby (Highways England) has provided details of a total of three sections of existing noise barrier along the relevant length of the A38. In addition, one section of barrier was identified in the Highways England HAPMS database.

11.5.2 Two sections of 2m high noise barrier are located on the west side of the A38 to the south of the A6 junction - these barriers are included in the traffic noise model, but are both outside the 1km study area.

11.5.3 Two short sections of 1.8m high noise barrier are located to the east and west of the A38 to the north of Kedleston Road overbridge. These are located within the 1km study area and are identified on Figure 11.1a.

11.5.4 No changes to these existing noise barriers are planned as part of the proposed scheme as they are located beyond the proposed scheme extents.

Existing/ Future Low Noise Surfacing

11.5.5 Highways England hold information on the existing surfacing on the roads for which they are responsible (A38 and A516) in their HAPMS database. This has been used to identify areas of existing ‘thin surfacing’, which is designated as a ‘low noise’ surface - these broadly consist of:

- A516 from the A38 to Manor Park Way junction;

- A38 mainline northbound and southbound south of Kingsway junction extending almost to the A516 junction;
- A38 northbound Kingsway junction to Markeaton junction (partial);
- A38 northbound and southbound between Markeaton junction and the A6 junction;
- Short sections of the A38 eastbound and westbound to the west of Little Eaton junction (partial); and
- A38 northbound short section south of Morley Lane and A38 southbound section north of Morley Lane (partial).

11.5.6 Where low noise surfacing only exists on part of the carriageway, the low noise surface correction has been applied within the noise model if the majority of the carriageway has a low noise surface i.e. two lanes out of three, or if there are only two lanes if the low noise surface is on the inside lane where a higher volume of traffic is concentrated.

11.5.7 In addition, the maintenance contractor has provided details of the location of resurfacing with a new low noise surface planned on behalf of Highways England before the 2024 proposed scheme opening year - these areas broadly consist of:

- A38 northbound and southbound south of Kingsway junction to A516 junction;
- A38 southbound, Kingsway junction to Raleigh Street sliproad;
- A38 southbound north of Kedleston Road overbridge to A6 junction; and
- A38 northbound Markeaton junction to Little Eaton junction.

11.5.8 By 2039, 15 years after proposed scheme opening, it is assumed that Highways England will have resurfaced all the roads for which they are responsible with new low noise surfacing i.e. the A38 and A516 throughout the noise study area.

11.5.9 In accordance with the guidance in DMRB, existing low noise surfacing is assigned a correction of -2.5dB at speeds ≥75km/hr, and new low noise surfacing a correction of -3.5dB at speeds ≥75km/hr. At speeds below 75km/hr low noise surfacing is assigned the same correction as a standard surface of -1dB.

11.5.10 All other roads included in the detailed quantitative noise modelling are assumed to be standard hot rolled asphalt (HRA) in all scenarios. The road surface correction for standard HRA surfacing is -1dB at speeds <75km/hr and -0.5dB at speeds ≥75km/hr.

Baseline Noise Survey

11.5.11 A baseline noise survey was completed in June 2015. The purpose of the baseline noise survey was to assist with developing an understanding of the general noise climate along the proposed scheme. For example, to identify if any other local noise sources (other than road traffic) are present and contribute significantly to the local noise climate.

11.5.12 The results of the baseline survey have also been used in the assessment of noise impacts during the construction phase of the works. In addition, the results of the baseline noise survey have been used as part of a verification exercise for the traffic noise prediction modelling. The traffic noise model has been used to predict traffic noise levels at the 2015 monitoring locations, with the predicted and measured levels being compared. The aim of this process is to demonstrate that the noise model is giving a sensible range of results across the whole of the study area. An exact match would not be expected for a variety of reasons, for example,

the noise predictions are based on typical weekday traffic conditions over a year, not the exact traffic conditions during the few weeks or hours of noise monitoring; the prediction method is designed to be conservative in terms of the effect of wind direction whereas the wind direction is likely to vary throughout the monitoring period; in addition the noise predictions only consider road traffic noise, whereas the measurements include all ambient noise sources.

11.5.13 Noise monitoring locations are detailed on Figure 11.1a and 11.1b – these locations were chosen to focus on some of the very closest receptors to the proposed scheme. In addition, a number of residential properties in Breadsall village were also included, located between approximately 200m and 425m from the existing A38.

11.5.14 A mixture of long-term (LT) unattended monitoring over a number of weeks, and short-term (ST) daytime 3 hour monitoring was completed.

11.5.15 A summary of the noise monitoring results is provided in Table 11.1, which details the range of measured noise levels for the long-term monitoring sites and a comparison with predicted traffic noise levels.

Table 11.1: Baseline Noise Monitoring 2015 (for locations refer to Figures 11.1a and 11.1b)

Ref.	Description	ST/ LT	Measured		Predicted	
			Day Range	Night Range	Day	Night
			$L_{A10,18h}$ dB	$L_{Aeq,8h}$ dB	$L_{A10,18h}$ dB	$L_{Aeq,8h}$ dB
M1	Kingsway Hospital	ST	63.5	-	65.1	59.2
M2	Greenwich Drive South	LT	59.8 - 61.0	52.3 - 55.3	63.2	56.4
M3	Lyttleton Street	LT	53.9 - 55.0	50.2 - 51.4	60.0	54.4
M4	Greenwich Drive North	LT	65.5 - 70.0	58.4 - 65.4	71.6	64.5
M5	Radbourne Road	LT	62.0 - 65.3	56.5 - 60.7	64.4	58.0
M6	Territorial Army Site (rear of Windmill Hill Lane)	LT	58.9 - 63.6	52.5 - 59.0	63.0	57.1
M7	Queensway	LT	52.3 - 57.1	49.1 - 53.7	58.8	53.0
M8	Markeaton Park	ST	71.4	-	71.1	64.2
M9	Mobile Home Park	ST	56.5	-	62.6	56.3
M10	Breadsall north	LT	51.5 - 61.5	50.2 - 56.2	63.1	56.2
M11	Breadsall centre	LT	47.9 - 58.3	48.8 - 54.1	58.1	52.0
M12	Breadsall south	LT	48.6 - 58.6	46.4 - 52.1	58.1	51.9
M13	Footpath Breadsall	ST	47.9	-	61.4	55.0

11.5.16 As would be expected, the highest measured and predicted noise levels were

recorded at locations very close to the existing A38 with an unobstructed view of the road - such as M4 and M8. M7 was also close to the A38, but the monitoring location was in the rear garden of the property, well shielded from the A38 by the property and a number of garden sheds. Noise levels at M5 were also rather lower than would be expected given the proximity of the A38, however, again the monitoring location was well shielded by a garden wall, fence and shed.

11.5.17 At the majority of monitoring locations the predicted daytime $L_{A10,18h}$ and night-time $L_{Aeq,8h}$ noise levels match very well with the upper range of the measured levels, within around 2dB. The noise prediction methodology is designed to be conservative, therefore, this is as would be expected.

11.5.18 The measured levels at the long-term monitoring sites in Breadsall M10, M11 and M12 illustrate the increasing impact weather conditions have on measured noise levels at increasing distances from a major road. At these three sites the range of measured daytime $L_{A10,18h}$ levels was 10dB, whereas at the other long-term sites closer to the existing A38, the range over the monitoring period was rather smaller. Comparison of the measured noise levels with the wind direction data illustrates that there is a general correlation between wind direction and measured noise levels in Breadsall. Days when the wind was mainly from the west, south-west or north-west (i.e. from the direction of the A38 and A61 towards the village) tend to correspond to days when noise levels were highest. Conversely days when the wind was mainly from a southerly, northerly or easterly direction tend to correspond to days when noise levels were lowest.

11.5.19 The match between measured and predicted levels is not as good at M3 and two of the short-term sites M9 and M13, where the predicted levels were rather higher than the monitoring data.

11.5.20 At M3 the predicted daytime $L_{A10,18h}$ levels are around 5dB above the upper range of the measured levels. At night the match is closer with predicted levels being around 3dB above the upper range of measured levels. Local conditions in the rear garden of the property and the proximity of boundary fences is potentially the source of the mismatch in this area.

11.5.21 The short-term noise measurements at M9 and M13 are inherently more likely to differ from the predicted level as the measurements provide only a brief snapshot of conditions over three hours on a single day. The long-term noise monitoring at the closest long-term site in Breadsall (M11) was on-going during the short-term measurements at M9 and M13. Comparison of the results indicates that noise levels at M11 were also very low during the short-term monitoring period, more than 10dB below the upper range for M11, which correlates very well with the predicted daytime levels. The wind direction was predominantly from a northerly direction during the short-term monitoring, minimising the contribution from the A38 and A61 at these locations. It is, therefore, concluded that the timing of the measurements corresponded with very low noise levels from the A38, predominantly due to the wind direction, and that it is likely that short-term monitoring on a day with the wind blowing towards the monitoring locations from the A38/ A61 would result in a much better correlation with the predicted levels.

11.5.22 Overall, the comparisons provide confidence that the noise model developed to estimate the noise impacts of the proposed scheme is robust.

Do Minimum 2024 and 2039

11.5.23 Based on the initial assessment completed to date, the vast majority of residential buildings would experience a negligible (0.1 - 2.9 dB) increase in daytime and night-time traffic noise levels from 2024 to 2039, in the absence of the proposed scheme. This is to be expected as in the absence of the proposed scheme traffic flows are generally predicted to increase slightly over time.

11.5.24 In some areas localised changes in traffic conditions or resurfacing between 2024 and 2039 are anticipated to result in a minor noise level increase, no change or a negligible reduction at a small proportion of properties in the absence of the proposed scheme.

11.5.25 All the non-residential receptor buildings, the Derwent Valley Mills World Heritage Site and the various public open spaces are anticipated to experience a negligible increase or negligible decrease in traffic noise levels from DM 2024 to DM 2039, in the absence of the proposed scheme.

11.6 Potential Impacts

Construction

11.6.1 The main construction activities with the potential for noise and/ or vibration impacts are likely to take place during site clearance, earthworks, retaining wall construction and road construction works, as well as the construction of bridges and related construction traffic. Information is being obtained from a construction contractor regarding construction phasing, construction activities and associated plant requirements which will assist during the construction phase noise and vibration impact assessment to be presented within the Environmental Statement. As detailed in para. 11.3.1, a qualitative construction noise and vibration assessment has been carried out and presented herein (refer to Section 11.8).

Operation

11.6.2 The operation of the proposed scheme would result in both beneficial and adverse permanent traffic noise impacts. The proposed scheme would bring the road closer to some receptors, and further away from others. In addition, changes in traffic flows on surrounding roads are also anticipated due to the proposed scheme, in particular due to the closure of a number of existing accesses onto/ off the A38 which would result in local re-routing of traffic.

11.6.3 As detailed in para. 11.3.2, this PEI Report presents details of potential increases/ decreases in traffic noise levels as based on the currently available traffic data and proposed scheme design details. Further refinements to both the traffic data and proposed scheme design are anticipated which will be taken into account and presented in the Environmental Statement. In addition, as detailed in Section 11.7, a number of noise barriers are being considered for inclusion in the scheme design. The requirement for such noise barriers will be confirmed following further noise modelling, taking into account comments received during statutory public consultation. Thus the operational noise data as presented herein are preliminary and subject to change.

11.7 Design, Mitigation and Enhancement Measures

11.7.1 As indicated in para. 2.3.31, construction of the proposed scheme would be subject

to measures and procedures defined within a CEMP. The CEMP would include a range of best practice measures associated with mitigating potential noise and vibration impacts - such measures are described below:

- Selection of quiet and low vibration equipment;
- Review of construction programme and methodology to consider low noise/ low vibration methods (including non-vibratory compaction plant and low vibration piling methods, where required);
- Optimal location of equipment on site to minimise noise disturbance;
- The provision of acoustic enclosures to static plant, where necessary;
- Use of less intrusive alarms, such as broadband vehicle reversing warnings; and
- Local screening of equipment and employment of perimeter hoarding.

11.7.2 During the proposed scheme construction phase, appropriate mechanisms to communicate with local residents would be set up to highlight potential periods of noisy activities (e.g. web-based, newsletters, newspapers, radio announcements etc.). An appropriate communication strategy will be developed during the DCO application stage. An information web-page would be provided and kept up-to-date on the Highways England website to reflect construction and community liaison requirements. It is envisaged that the web-page would provide up-to-date information on the progress of the construction works, areas affected by construction, mitigation in place to reduce adverse effects, information regarding planned construction works (including any proposed works outside normal hours) and works recently completed. Residents would be provided with a point of contact for any queries or complaints. Such a communication strategy would minimise the likelihood of complaints.

11.7.3 Based on the current programme routine night-time and weekend working is not anticipated, although this is subject to on-going review (noting that some specific construction works are likely to require works outside of normal hours). Standard working hours as recommended by DCiC and EBC would be adhered to where possible.

11.7.4 Mitigation has been incorporated into the proposed scheme design in the form of low-noise surfacing across the extent of proposed scheme. DMRB guidance advises that an additional benefit from low noise surfacing should only be assumed in noise predictions where speeds are 75km/hr or above. For the majority of the proposed scheme extents, the anticipated traffic speed on the A38 would be less than 75km/hr. Therefore, no benefit from the low noise surfacing has been assumed on these sections within the noise predictions. In reality, there is not a sharp cut off in the effectiveness of low noise surfacing at 75km/hr and some benefit is likely to be realised at lower speeds.

11.7.5 The proposed scheme design at Kingsway junction and Markeaton junction would place the A38 mainline in deep cuttings which would assist in mitigating noise effects. The existing A38 mainline at Kingsway junction would be reused as sliproads which have much lower traffic flows than the existing mainline.

11.7.6 Specific requirements for noise barriers are subject to confirmation. However, as detailed in para. 2.2.49, noise barriers are being considered along either side of the A38 between Kingsway junction and Markeaton junction, as is a noise barrier located along the proposed scheme boundary with the Royal Deaf School at Markeaton junction (heights and form to be determined). These potential noise barriers are shown on Figures 2.4 and 2.5 for illustrative purposes and are subject to

confirmation. Environmental barriers at Little Eaton junction are also being considered along the northbound mainline A38 in the vicinity of the Ford Lane Mobile Home Park, and along the southbound mainline A38 and associated slip-road as the proposed scheme traverses Breadsall. These potential barriers are shown on Figure 2.6 for illustrative purposes and are subject to confirmation. The requirement for such barriers, their type, format and height will be confirmed following further assessments, taking into account comments received during statutory public consultation.

11.7.7 The operational noise assessment to be included within the Environmental Statement will be updated with the revised scheme design evolutions and traffic data and firm proposals for additional noise mitigation developed and assessed. As such, the noise impacts and effects as detailed herein exclude such potential noise mitigation provisions.

11.8 Assessment of Effects

Construction

11.8.1 At this stage of proposed scheme design development, details regarding likely construction works are not available, although works such as site clearance, earthworks, bridge construction, retaining wall construction, carriageway surfacing and landscaping would be required. At this stage routine weekend or night works are not anticipated.

11.8.2 Ground improvement works, which could involve the use of vibratory rollers would be required in the areas of new embankment at Kingsway junction and Little Eaton junction. A number of areas of vibro stone columns may also be required at Little Easton junction. Piling of the new bridges at Kingsway junction and Little Eaton junction and three extensions to existing bridges would also likely to be bored or Continuous Flight Auger (CFA) piling, which would be preferable in terms of vibration impacts as compared to driven piling. The retaining walls at Markeaton junction are also likely to require bored piles, whilst sheet piling of temporary works at the bridges is considered likely.

11.8.3 The risk of vibration induced building damage during the proposed scheme construction phase is considered to be very low. The risk of significant annoyance effects due to construction vibration would be limited to the very closest receptors. However, construction noise impacts are likely to extend over a much wider area. At Kingsway junction and Markeaton junction existing residential properties and the Royal School for the Deaf would be in very close proximity to the proposed scheme construction works. The Kingsway Hospital site, the Derby University Markeaton Street Campus and the Brackensdale Junior/ Infant School would also be in reasonably close proximity. At Little Eaton junction the closest receptors to the proposed scheme construction activities would be the Ford Farm Mobile Home Park, a minimum of approximately 35m from the proposed scheme, the edge of Allestree and the very closest properties within Breadsall village at around 90m and 150m away from the proposed scheme respectively. Given the close proximity of some receptors to the proposed scheme construction works, there would be the potential for significant adverse effects at some receptors due to construction noise.

11.8.4 With regard to construction traffic, the limited information available indicates that the likely volume of HGV traffic generated by the material haulage works would result in

no more than a negligible (0.1 - 0.9 dB) increase in road traffic noise from the existing A38, which would not be classed as a significant adverse effect. However, this is subject to further review following receipt of details regarding construction HGV numbers.

11.8.5 As more detailed information becomes available regarding construction activities, the preliminary assessment presented herein will be updated, and the results reported in the Environmental Statement.

Operation

Kingsway Junction and Markeaton Junction

11.8.6 At Kingsway junction the placement of the A38 mainline within a cutting through the centre of the existing junction, and the reuse of the existing mainline as the sliproads, is generally anticipated to result in a reduction in traffic noise levels in 2024 (first year of proposed scheme opening) at the closest residential properties to the west on Greenwich Drive South, and the associated public open space. To the east of Kingsway junction, a minor traffic increase on the A5111, combined with the impact of the proposed scheme, is anticipated to result in a mainly negligible increase in traffic noise levels in 2024 at the Kingsway Hospital site and associated new development, with some areas expected to experience a minor increase. At Kingsway junction the main potential adverse noise impact would be on Kingsway Park Close which is currently a cul de sac leading to a small industrial estate. With the proposed scheme in place, the existing road would be extended south/ west to form a connection link from Brackensdale Avenue through to the new Kingsway junction roundabout. As a result, minor increases in traffic noise levels are anticipated in 2024 at the rear/ side facade of properties which back onto Kingsway Park Close.

11.8.7 On the A38 mainline between Kingsway junction and Markeaton junctions, the increase in traffic noise levels is generally anticipated to be minor in 2024. This would be due to the widening of the A38 and increased traffic on the A38 with the proposed scheme in operation. Minor increases are not normally considered to be significant; however, in this area very close to the A38, existing traffic noise levels are already high and therefore minor increases can be classed as significant. The only location in this area that is anticipated to undergo a reduction in traffic noise in 2024 is in the vicinity of the sliproads at the existing Brackensdale Avenue access, which would be removed by the proposed scheme.

11.8.8 At Markeaton junction, a negligible to moderate reduction in traffic noise levels is anticipated in 2024 at Markeaton Park as the A38 would be relocated further east in cutting. Further away from the A38 within the park, a negligible increase is anticipated due to the general increase in traffic on the A52 and the A38. A corresponding increase in traffic noise levels in 2024 is anticipated to the east of Markeaton junction with minor and moderate increases anticipated at residential properties close to the junction, resulting in some potentially significant adverse noise effects in this area. The Royal School for the Deaf is anticipated to experience a minor to major increase in traffic noise levels in 2024, therefore a potential significant adverse effect is anticipated here. This would be due to the relocation of the A38 closer to the school and the removal of the shielding currently provided by the properties on Queensway, which would be demolished by the proposed scheme.

Further east a minor increase is anticipated in 2024 at the Derby University Markeaton Street campus.

11.8.9 Away from the proposed A38 mainline, re-routing of traffic accessing the A38 via a number of local roads within Mackworth is anticipated to result in minor noise increases in 2024 at residential properties and a number of schools, places of worship and areas of public open space. Similarly on the eastern side of the A38 in New Zealand, local roads are anticipated to experience a range of negligible and minor noise increases and decreases in 2024 due to local traffic re-routing.

Little Eaton Junction

11.8.10 At Little Eaton junction, the Ford Farm Mobile Home Park is generally anticipated to experience a minor reduction in noise levels in 2024 as it is currently in very close proximity to the existing junction. Noise levels would reduce given that the proposed Little Eaton junction would be slightly further away from the mobile home park with the proposed scheme in place. In Allestree the closure of the Ford Lane junction is anticipated to reduce traffic flows in 2024 in the eastern half of the housing estate, though a corresponding increase is anticipated in the western half of the estate as traffic would access the A6 to join the A38 at the existing A6 junction. The magnitude of the change is anticipated to be negligible at the majority of properties.

11.8.11 In Little Eaton village the majority of residential receptors are anticipated to experience a negligible increase in noise levels in 2024 due to the slight increase in traffic on the A38 north of the proposed scheme, where speeds and surfacing would be unchanged in 2024. In addition, traffic flows on Alfreton Road and Duffield Road through the village are anticipated to increase with the proposed scheme in place as the reduction in congestion at Little Eaton junction would make these more attractive routes to the A38. A minor increase in noise levels is anticipated along Duffield Road, compared to a negligible increase on Alfreton Road, due to the much lower Do Minimum flows on Duffield Road.

11.8.12 A short section of the A61 immediately to the south of Little Eaton junction would be replaced as part of the proposed scheme, delivering noise benefits in 2024 via the use of a new low noise surface However, further south a minor increase in traffic noise levels on the A61 is anticipated, due to the increase in traffic flows and speeds caused by the reduction in congestion with the proposed scheme in place. This would contribute to the anticipated negligible increase in traffic noise at the majority of properties in Breadsall, along with the slight increase in traffic flows through the village on Croft Lane/ Brookside Road. A minor increase in traffic noise levels in 2024 is anticipated at a small number of properties in Breadsall.

11.9 Summary of Preliminary Assessment

11.9.1 This preliminary construction assessment indicates the following:

- The risk of vibration induced building damage during the proposed scheme construction phase is considered to be very low. The risk of significant vibration annoyance effects due to construction vibration would be limited to the very closest receptors;
- Given the close proximity of some receptors to the proposed scheme construction works, there would be the potential for significant adverse effects at some receptors due to construction noise;
- Construction traffic is not currently anticipated to result in a significant adverse

noise effect;

- At Kingsway junction the main potential adverse noise impact would be on Kingsway Park Close where minor increases in traffic noise levels (2024) are anticipated;
- On the A38 mainline between Kingsway junction and Markeaton junctions, minor noise increases are anticipated which are potentially significant given that existing traffic noise levels are already high (2024);
- At Markeaton junction, increases in traffic noise levels (2024) are anticipated to the east of the junction with minor and moderate increases anticipated at residential properties close to the junction, resulting in some potentially significant adverse noise effects. The Royal School for the Deaf is anticipated to experience a minor to major increase in traffic noise levels (2024), representing a potential significant adverse effect;
- At Little Eaton junction, the majority of residential receptors within Little Eaton village are anticipated to experience a negligible increase in noise levels (2024), although a minor noise level increase is anticipated along Duffield Road. A minor increase in traffic noise levels on the A61 is anticipated - this would contribute to the anticipated negligible increase in traffic noise at the majority of properties in Breadsall, whilst the slight increase in traffic flows through the village on Croft Lane/ Brookside Road is anticipated to result in a minor increase in traffic noise levels (2024) at a small number of properties in Breadsall.

11.9.2 As detailed in para. 11.7.7, the noise impacts and effects as detailed above exclude potential barrier mitigation provisions. Information obtained by this preliminary noise assessment will assist the analysis of barrier requirements which will be confirmed within the Environmental Statement.

12 PEOPLE AND COMMUNITIES

12.1 Introduction

12.1.1 This chapter presents a preliminary assessment of the potential effects of the proposed scheme on people and communities, both during construction and operation. This chapter includes consideration of potential impacts with regard to:

- Non-motorised users (NMUs) (pedestrians and cyclists);
- Motorised users (drivers and passengers of public and private transport);
- Agricultural land and individual farm holdings;
- Private assets (residential and commercial properties);
- Community facilities and severance including the loss of public open space;
- Development land.

12.2 Stakeholder Engagement

12.2.1 A range of organisations have been consulted with regards to the proposed scheme NMU facilities, namely DCiC, DCC, Derby Cycling Group, SUSTRANS Derby Area, Ramblers Association, Peak and North Footpaths Society, Highways England, and Little Eaton Reference Group. Consultation with interested parties is ongoing.

12.2.2 Contact with potentially affected land owners was initially made in 2014 to provide an update regarding the proposed scheme and where applicable to gain land access for various environmental surveys. More formal consultations by telephone and face-to-face meetings have been undertaken to gather additional information on land and access activities and to understand any issues which have the potential to influence the proposed scheme design. With regard to properties and agricultural land, a number of visits to potential impacted land parcels have been undertaken and will continue as the environmental assessment progresses.

12.3 Assessment Assumptions and Limitations

12.3.1 This preliminary assessment is based on baseline and proposed scheme design information available at the time of writing this PEI Report. A full assessment will be undertaken as part of the EIA which will be reported in the Environmental Statement to be submitted with the DCO application.

12.3.2 The findings of the preliminary assessment may be subject to change as the design of the proposed scheme is developed and refined through the EIA and consultation processes. The preliminary assessment findings will also need to be refined as land parcels for construction areas, flood storage and ecological mitigation areas are confirmed.

12.3.3 Whilst this chapter includes outline proposals for designated public open space exchange land (refer to para. 2.2.52), these will be further developed and confirmed in the Environmental Statement.

12.3.4 The assessment of driver stress has been undertaken qualitatively herein, given that the defined DMRB methodology whilst appropriate for linear transportation schemes is not wholly appropriate for junction improvements.

12.4 Study Area

12.4.1 The study area for the people and communities assessment varies depending on the effect or type of resource being assessed – study areas used are as follows:

- **NMUs:** the study area includes the proposed scheme boundary and all NMU facilities and land in community use within 500m of the proposed scheme;
- **Motorised users (vehicle traveller views):** the study area extends to the visual envelope which represents the extent of views from, as well as to, the A38 (Kingsway junction, Markeaton junction and Little Eaton junction) and an approximate 2km wide buffer zone either side of the centreline of the trunk road. The visual envelope is defined in DMRB Volume 11, Section 3, Part 5, Annex III (Highways Agency, 1993) as the area of land from which there is a view of any part of the proposed works, its structures or the traffic which will use it;
- **Agricultural land and private assets:** the study area extends to 250m from the proposed scheme boundary to capture land directly impacted by the proposed scheme;
- **Community effects:** study area requirements are not defined in the DMRB. Therefore, a buffer zone of 250m from the proposed scheme is considered suitable. This encompasses potential community facilities in the vicinity of the A38 and any desire lines associated with them;
- **Development land:** the study area used comprises the proposed scheme boundary and the extent of land plots that traverse the proposed scheme boundary.

12.5 Baseline Conditions

Overview

12.5.1 The proposed scheme is located in County of Derbyshire within the jurisdictions of DCiC (Kingsway junction and Markeaton junction) and EBC (Little Eaton junction). The three junctions are located around the main settlement of Derby which has a population of approximately 248,752[8] and which provides the main centre for services and community facilities in the area.

Non-motorised Users

12.5.2 There is a comprehensive network of designated PRoW, cycleways and footways in the study area connecting the suburbs and wards of Derby as well as connecting with national routes (as shown in Figures 12.1 and 12.2). It is noted that a new footpath/ cycleway is being constructed within Mackworth Park that will connect the Varsity Grange housing development with National Cycle Routes (NCR) 54/ 68.

12.5.3 The connected Little Eaton Bridleway 29 and Breadsall Bridleway 18 run from Little Eaton to Breadsall. The bridleway passes under the A38 along the northern boundary of the proposed scheme footprint. There are no other bridleways within 500m of the proposed scheme.

12.5.4 There are a number of NCRs and Regional Routes (RR) in close proximity to Kingsway junction, namely NCR54, NCR68 and RR66. These three cycle routes follow the same route along a disused railway north of Mackworth Park to meet the A38 just south of Kingsway junction. From here the NCRs continue north parallel to the northbound carriageway of the A38, before crossing under the carriageway on Brackensdale Avenue and continuing north parallel with the southbound A38 carriageway. NCR54 and NCR68 turn east towards the city centre, with RR66 continuing north parallel to the A38, crossing the A52 Ashbourne Road on a zebra

[8] Based on 2011 Census data as reported on the DCiC website

crossing at Markeaton junction. NCR 66 continues north before leaving the A38 via the slip road, to continue west along Kedleston Road towards Allestree.

12.5.5 To the east of Kingsway junction there is a designated cycle route running south along A5111 Kingsway to Uttoxeter New Road. There are a number of recommended unmarked on-road cycle routes promoted by DCiC in close proximity to Kingsway and Markeaton junctions which provide links to Mackworth and Markeaton Parks.

12.5.6 An existing footbridge north of Markeaton junction provides pedestrian access across the A38 into Markeaton Park following the route of the 'Bonnie Prince Charlie Walk' National Trail. There are various routes within Markeaton Park which provide pedestrian and cycle access.

12.5.7 NCR 54 runs along the A61 south of Little Eaton junction, crossing the A38 to the west of the junction and continuing north along the B6179. There is also a short section of footway designated for cyclists and pedestrians extending westwards from the A38 roundabout, along the northern edge of the A38 and continuing along Ford Lane. The Derwent Heritage Valley Way, the route of an 89km walking route, crosses under the A38 via the Flood Relief Arch/ Accommodation Bridge within the boundary of the proposed scheme, approximately 85m west of the Midland Mainline Railway. Another three designated footpaths converge on the road network close to the existing Little Eaton junction.

Motorised Users

12.5.8 The main travellers on the A38 are motorised vehicles travelling between Birmingham and Derby, as well as users moving between Derby and the M1 junction 28. The two-way Annual Average Daily Traffic (AADT) flows along the A38 have been recorded as being approximately 57,000 vehicles a day in 2015 (between Markeaton junction and Brackensdale Avenue, north of Kingsway junction). The 2015 AADT flows on the A38 over the River Derwent bridge to the west of Little Eaton junction have been recorded as approximately 46,000 vehicles per day.

12.5.9 Long delays along the A38 result in increased journey times and the fear of accidents. Slow moving traffic especially on the approach to congested junctions means that drivers have to brake suddenly which can potentially cause accidents. Drivers may also fear accidents occurring as a result of the impatience displayed by other drivers. It should be noted that although the situation on the A38 has improved somewhat after the construction of the 'Pinch Point' schemes at Markeaton junction and Little Eaton junction in 2015, the traffic problems have not been resolved. Travellers often avoid the heavily trafficked A38 as journey times are still long, thus increasing driver stress which can be manifested in drivers taking risks. The existing A38 displays clear and visible signage that is in keeping with Highways England standards.

12.5.10 The proposed scheme passes through a combination of urban and rural areas. Drivers' views along the A38 between Kingsway junction and Markeaton junction comprises a mixture of open grass verges, mature trees and shrubs. On the approach to Markeaton junction, the landscape opens out to views of residential and commercial properties with Markeaton Park positioned to the west of the Markeaton junction. For most of the route between Markeaton junction and Little Eaton junction, drivers' views are restricted to the corridors of the A38, although there are intermittent views of nearby residential areas.

Agricultural Land and Holdings

12.5.11 The only agricultural land within or adjacent to the proposed scheme is at Little Eaton junction.

12.5.12 An agricultural soil survey and agricultural farm holding impact survey was undertaken in 2015 (Reading Agricultural Consultants, 2015). The agricultural land to the south and east of Little Eaton junction falls within the ownership of nine individuals, six of which have so far been surveyed. A further soil survey and an agricultural farm holding impact update survey is planned for 2018. Grassland uses predominate, including arable grassland rotation, horse grazing and amenity turf production. Areas of primarily deciduous woodland are present to the north-east of the junction and west of the River Derwent. Available information regarding the Agricultural Land Classification (ALC) of the land that would potentially be impacted by the proposed scheme is presented in Chapter 9: Geology and Soils.

Private Assets

Residential Properties

12.5.13 Markeaton and Kingsway junctions are located within a largely residential area with residential properties located on either side of the A38 between the two junctions in the wards of Allestree and Mackworth. Residential properties are located on Queensway, within the boundary of the proposed scheme, accessed from the A52, Ashbourne Road, east of Markeaton junction. Annie Sutton & Hoult Memorial Houses, retirement properties are located on Sutton Close off the A52, Ashbourne Road. Properties are charity-owned providing homes for the elderly.

12.5.14 There is also a new residential development south of Kingsway junction within the former Manor/ Kingsway Hospital site, accessed via Cherry Tree Close. This site is subject to ongoing development.

12.5.15 The ward of Allestree and village of Breadsall are located within the 250m study area surrounding Little Eaton junction. Ford Farm Mobile Home Park and the property Fourways are located to the north of the junction accessed off Ford Lane.

Business Premises

12.5.16 The following commercial properties are present within the 250m study area at the time of writing:

- Kingsway junction: Commercial and light industrial units to the north-east of the junction – including commercial units on Kingsway Park Close and retail premises within the Kingsway Retail Park (including Sainsbury's, Homebase, Currys/ PC World, Marks and Spencer, Next, Boots, TK Maxx. Argos, Hobbycraft, Smyths Toys, Halfords, Poundland, ScS, Harveys, Pets at Home, Costa, Greggs and Subway);
- Markeaton junction: McDonald's Restaurant and an Esso petrol station located off the A38 northbound carriageway to the south of the junction; and
- Little Eaton junction:
    - R F Freeberne Plant Haulage Services located on Ford Lane;
    - Starbucks Coffee Shop and Subway restaurant located to the north of the junction, accessed off the B6179;
    - Derby Garden Centre (Blue Diamond) and associated shops north of the junction;

- A former refuse tip to the west of the B6179, Alfreton Road opposite the garden centre;
- Severn Trent Water treatment works off the B6179, Alfreton Road;
- David Ray Commercials, specialist used van and car dealer, accessed off Ford Lane.

Community Facilities and Severance

12.5.17 The following community facilities are present within the 250m study area:

- Kingsway junction:
  - The Sanctuary Extra Care - Greenwich Gardens on Greenwich Drive North (supported retirement home);
  - Brackensdale Infant and Junior School located on Walthamstow Road to the west of the A38;
  - Mackworth Park (public open space);
  - Public open space adjacent to Greenwich Drive South.
- Markeaton junction:
  - Markeaton Park to the north of the junction (public open space);
  - Public open space associated with Mill ponds (south of the A38);
  - University of Derby buildings off Markeaton Street;
  - Mill Dam allotments, Markeaton Street;
  - The Royal School for the Deaf located to the east of Markeaton junction and accessed off the A52, Ashbourne Road;
  - Territorial Army base (46 Signal Squadron) located to the south of the junction, off Windmill Hill Lane.
- Little Eaton junction:
  - Derwent Valley Mills World Heritage Site; and
  - Derwent Valley Heritage Way, long distance footpath.

Development Land

12.5.18 Development land includes land allocations as set out in the Derby City Local Plan (2017), current planning applications and developments with existing permissions. Such land has been considered within Chapter 15: Assessment of Cumulative Effects. There are a number of land parcels within the proposed scheme boundary that are covered by planning applications and which are thus anticipated to be subject to future development – this includes the following:

- Land within the scheme footprint within the Kingsway Hospital site is covered by planning applications that relate to the phased development of residential houses, retail units, business units, open space, infrastructure. However, consultation with the site developers indicated that the areas potentially required by the proposed scheme would not impact upon site development proposals;
- Queensway buildings – some of the buildings located on Queensway have planning applications that relate to their future development. Given that the Queensway properties would be demolished by the proposed scheme, Highways England is consulting with affected property owners to ensure that they understand the proposed scheme implications.

12.6 Potential Impacts

12.6.1 Mitigation measures incorporated into the proposed scheme design are set out in Section 12.7, together with actions that would be undertaken during the proposed scheme construction phase to minimise impacts upon people and communities.

Non-motorised users

12.6.2 With regards to NMUs, potential impacts during the proposed scheme construction and operation phases include:

- Temporary land take/ disruption resulting in closure and/ or diversion of PRoW during construction activities;
- Permanent land take to accommodate the proposed scheme resulting in the diversion of PRoW;
- Provision of new facilities for walking and cycling;
- Reducing severance and improving the connectivity of PRoW; and
- Noise, air quality and/ or visual effects associated with construction activities.

Motorised Users

12.6.3 With regards to motorised users, potential impacts during the proposed scheme construction and operation phases include:

- Temporary increase in driver stress during the construction period with potential increased in congestion and driver uncertainty;
- Permanent decreases in driver stress and severance during proposed scheme operation as a result of reduced congestion and improved journey time (including benefits for users of bus services);
- Permanent closure of existing accesses onto and from the existing A38 (Brackensdale Avenue, Raleigh Street, Enfield Road and Ford Lane); and
- Widened views of the surrounding countryside at Little Eaton junction during proposed scheme operation due to the elevation of the carriageway.

Agricultural Land and Holdings

12.6.4 With regards to agricultural land and holdings at Little Eaton junction, potential impacts during the construction and operation phases include:

- Temporary loss of agricultural land during the construction phase (includes construction of potential floodplain compensation area and use of areas for construction purposes);
- Permanent loss of agricultural land to accommodate the proposed scheme (with potential knock on effects for land holding viability); and
- Disruption to holding access tracks.

Private Assets

12.6.5 With regards to residential and commercial properties, as well as community facilities and public open space, potential impacts during the construction and operation phases include:

- Use of land within the Kingsway hospital site for flood storage and/ or ecological compensation;
- Loss of curtilage from industrial premises along Kingsway Park Close and land to rear of retail premises;
- Loss of land managed as grassland from the territorial army base;

- Loss of the existing access to McDonalds and the Esso petrol station from the A38 northbound carriageway which would be closed;
- Minor loss of land from the Royal School for the Deaf;
- Demolition of 17 residential properties at Markeaton junction, namely, 15 detached properties on Queensway and two semi-detached properties on the A52, Ashbourne Road;
- Potential use of land owned by Derby University at Markeaton junction for a construction compound;
- Potential use of former landfill area at Little Eaton junction as a construction compound; and
- Potential use of private land at Little Eaton junction for ecological enhancements.

Community Facilities and Severance

12.6.6 With regards to community facilities and public open space, potential impacts during the construction and operation phases include:

- Potential ecological enhancement activities within Mackworth Park, Markeaton Park, Mill Pond;
- Loss of approximately 6,325m^2 (0.63ha) of public open space - approximately 1,345m^2 at Kingsway junction (noting that placement of a highway runoff attenuation pond within Mackworth Park (refer to Figure 2.4) may also be considered to represent a loss of public open space - area of approximately 2,480m^2) and approximately 4,980m^2 at Markeaton junction; and
- Temporary use of land within Markeaton Park as a utilities diversion route. Area to be reinstated following completion of the works;
- The existing access into Markeaton Park from Markeaton junction would need to be closed (although it would be retained for emergency vehicle access) – it is proposed that the existing park exit onto the A52 would be reconfigured to create a new park access together with some rearrangements of the park's internal road infrastructure.

12.7 Design, Mitigation and Enhancement Measures

12.7.1 The proposed scheme design includes a number measures that aim to reduce or mitigate effects upon people and communities (including severance) as presented in Section 2.2. In particular, the following mitigation measures are proposed:

- Given the nature of the proposed scheme, a number of existing PRoWs would be impacted. To mitigate such effects, the proposed scheme design includes the following NMU provisions and considerations:
  - NMU proposals are based on the fundamental premise that the proposed scheme design aims to include at least the level of NMU provision that exists at present with enhanced provision where deemed appropriate and reasonable.
  - In undertaking the design of proposed NMU facilities, the requirements of the Equality Act 2010 have been considered where required in order to take appropriate account of the needs of disabled users. Details of proposed NMU facilities are provided in para. 2.2.48 which includes a replacement footbridge at Markeaton Park;
- It is proposed that replacement public open space losses associated with the proposed scheme would be provided using part of the area vacated by the buildings demolished on Queensway. Should this land not be sufficient, further options for public open space are being explored, including land to the east of Allestree off Ford Lane (on the western bank of the River Derwent);

- The proposed scheme would result in the loss of access to McDonald's Restaurant and the Esso petrol station off the A38 northbound carriageway to the south of the junction. Discussions with affected parties are ongoing regarding appropriate access arrangements (e.g. including access off the A52 Ashbourne Road and/ or maintaining access directly off the A38) – such arrangements will be confirmed during the DCO application stage;
- The existing access into Markeaton Park from Markeaton junction would be closed – it is thus proposed that the existing park exit onto the A52 would be reconfigured to create a new park access. Details regarding the reconfiguration of the park access, including the re-location of a section of the Markeaton Park boundary wall, will be considered during the DCO application stage in consultation with DCiC and the DCC Conservation Officer;
- The junction with Ford Lane, from the existing A38 between the Flood Relief Arch/ Accommodation Bridge and the railway bridge, would be closed for safety reasons. In order to enable access into the turf production site to the south of the existing A38 (via the Flood Relief Arch/ Accommodation Bridge), it is proposed that turf vehicles would use Ford Lane to access the A38 via the A6 Duffield Road. Such access arrangements would also enable Severn Trent Water to access their facilities in the vicinity of the River Derwent.

12.7.2 During the construction phase of the proposed scheme, a number of measures would be put in place to reduce potential impacts upon people and communities as follows:

- As indicated in para. 2.3.31, construction of the proposed scheme would be subject to measures and procedures defined within a CEMP. The CEMP would include a range of best practice measures associated with mitigating potential environmental impacts and nuisance to local people and communities;
- Planning of the proposed scheme construction works would be undertaken in order to minimise the need to close/ divert NMU facilities, and minimise closure/ diversion durations. Should closure be needed, safe and appropriate alternative means of access would be provided to ensure access is maintained at all times in order to avoid temporary severance. Temporary diversions would need to be agreed in advance with DCiC and DCC as applicable. Appropriate signage for all NMU closures/ diversions would be used to inform NMUs, with sufficient notice of such closures/ diversions being provided;
- Sites used temporarily during the construction phase would be appropriately restored and returned to the applicable land owner;
- The construction contractor would define the requirements relating to traffic management during the construction phase and would agree and implement a Traffic Management Plan. The Traffic Management Plan would take account of local public and business access requirements in order to reduce severance and disruption to local traffic movements. Measures to minimise transportation disruption for users for the Royal School for the Deaf located to the east of Markeaton junction are currently being investigated;
- During the construction phase appropriate mechanisms to communicate with local residents would be set up to highlight potential periods of disruption (e.g. web-based, newsletters, newspapers, radio announcements etc.). An information web-page would be provided and kept up-to-date on the Highways England website to reflect construction and community liaison requirements. It is envisaged that the web-page would provide up-to-date information on the progress of the construction works, areas affected by construction, mitigation in place to reduce adverse effects, information regarding planned construction works and works recently completed. These communication approaches would help drivers to plan their journeys and take account of potential disruption due

to proposed scheme construction.

12.7.3 It is noted that any landowners that are directly affected by demolition and land-take, would be eligible for appropriate compensation in accordance with established compensation procedures.

12.8 Assessment of Effects

12.8.1 Taking into account the mitigation measures detailed in Section 12.7, effects of the proposed scheme on people and the community are detailed in the sections below.

Non-motorised Users

12.8.2 The Markeaton Park footbridge would be demolished resulting in temporary severance of the Bonnie Prince Charlie Walk until the new footbridge was available. This would potentially result in a significant severance effect. However, with the provision of temporary NMU diversions, the significance of the effect would be reduced.

12.8.3 Whilst other NMU facilities would be affected during the construction phase, given the availability of alternative route diversions, the effects are not anticipated to be significant.

12.8.4 Proposed scheme operation would result in significant beneficial effects on NMUs as a result of improvements to existing NMU facilities that could encourage more use due to improved amenity/ convenience or perception of safety.

Motorised Users

Driver Stress

12.8.5 Construction of the proposed scheme may result in temporary adverse effects on motorised users as a result of reduced speed limits and traffic management leading to increased congestion and route uncertainty. However, with appropriate traffic management and signage, such effects are not anticipated to be significant.

12.8.6 The operation of the proposed scheme is likely to result in significant beneficial effects at each of the three junctions in terms of reducing driver stress. The proposed scheme would largely separate local and long distance traffic resulting in a reduction in congestion and conflicts with NMUs, thus resulting in reduced frustration fear of accidents and greater certainty of the route ahead.

Driver Views

12.8.7 Construction of the proposed scheme would result in unavoidable adverse effects on views from the road at each junction. However, such effects would be temporary and are not anticipated to be significant.

12.8.8 Operation of the proposed scheme would result in restricted views from the road at Kingsway junction and Markeaton junction, with intermittent and open views where underpasses are proposed. Motorised users using Little Eaton junction would experience some open views of the surrounding area. The effect on driver views is not anticipated to be significant at any of the junctions.

Bus Users

12.8.9 Whilst there would be potential adverse effects on bus users during the construction phase due to reduced speed limits and traffic management leading to increased congestion, proposed scheme operation is anticipated to have a potential significant beneficial effect for users of local buses due to improved journey times and journey reliability.

Agricultural Land and Holdings

12.8.10 Proposed scheme construction would have a potential adverse effect on a number of land holdings adjacent to Little Eaton junction due to loss of direct access onto the A38 and the loss of land (temporary and permanent). The site engaged in commercial agriculture (i.e. the turf production site) is not anticipated to be significantly affected given that turf vehicles could use Ford Lane to access the A38 via the A6 Duffield Road, although access through the Flood Arch/ Accommodation bridge may be restricted during some construction works.

12.8.11 The site proposed for the potential floodplain compensation area, and areas that may be used for construction purposes, would be adversely impacted during the construction phase, although such areas would largely be appropriately restored and returned to landowners. The area used for the potential floodplain compensation area would be returned to the owner for continued agricultural use, although affected land would be subject to increased flood incidences.

Private Assets

12.8.12 The construction of the proposed scheme may temporarily disrupt access and result in amenity effects on assets where these lie in proximity to construction activities. It is anticipated that there would be a significant adverse effect on a number of private assets during construction of the proposed scheme, namely the 17 residential properties located on Queensway and the A52 Ashbourne Road that would be demolished to accommodate the proposed scheme, and four residential properties that would require land take to accommodate the reconfigured access to Sutton Close off Ashbourne Road.

12.8.13 Private land used during the construction for construction compounds, for flood storage, and/ or ecological enhancements would be impacted during the construction phase, although they would be returned to landowners during proposed scheme operation. Beneficial effects are anticipated in areas used for ecological enhancement.

12.8.14 No significant adverse effects on private assets are anticipated during proposed scheme operation.

Community Facilities and Severance

12.8.15 The construction of the proposed scheme would result in a temporary adverse effect on community connectivity, causing severance as a result of the closure of a number of accesses and exits onto the A38 from local roads. This is not anticipated to be significant given the availability of alternative routes, although closure of the Ford Lane access may have a temporary significant effect until former users become accustomed to the alternative access arrangements.

12.8.16 Potentially significant adverse effects due to the loss of public open space would be compensated via to the provision of suitable exchange land (refer to para. 2.2.52)

such that residual effects would not be significant.

12.8.17 Some locations within Mackworth Park, Markeaton Park and Mill Pond would be impacted during the construction phase resulting in potential temporary adverse effects. However, such areas would be appropriately restored such that significant operational effects would be avoided. Beneficial effects are anticipated in areas used for ecological enhancement.

12.8.18 Operation of the proposed scheme would result in a significant beneficial effect on community connectivity as it would reduce severance caused by the existing traffic congestion.

12.9 Summary of Preliminary Assessment

12.9.1 Preliminary construction assessment:

- Construction of the proposed scheme would result in likely significant temporary adverse effect on NMUs as a result of Markeaton Park footbridge (which carries the Bonnie Prince Charlie Walk) demolition;
- Construction of the proposed scheme would result in likely significant permanent adverse effect on residential properties at Markeaton junction as a result of demolition and land-take;
- Closure of the Ford Lane access may have a temporary significant effect until former users become accustomed to the alternative access arrangements; and
- Construction of the proposed scheme may result in significant adverse effects upon some land holdings at Little Eaton junction (due to temporary and/ or permanent land-take).

12.9.2 Preliminary operational assessment:

- Operation of the proposed scheme would result in likely significant beneficial effects on NMUs as a result of improvements in amenity, connectivity and perception of safety;
- Operation of the proposed scheme would result in likely significant beneficial effects on motorised users as a result of reductions in driver stress;
- Operation of the proposed scheme anticipated to have a potential significant beneficial effect for users of local buses due to improved journey times and journey reliability; and
- Operation of the proposed scheme would result in likely significant beneficial effects on community connectivity as a result of a reduction in severance caused by existing traffic.

13 ROAD DRAINAGE AND WATER ENVIRONMENT

13.1 Introduction

13.1.1 This chapter presents the findings of a preliminary assessment of the potential effects of the proposed scheme on surface water, groundwater, flood risk and hydromorphology of water bodies.

13.1.2 This chapter is supported by Figures 13.1 and 13.5. A full discussion of the legislative framework and water environment impact assessment methodology for the full EIA is provided in Chapter 14 of the EIA Scoping Report (refer to para. 4.4.12).

13.1.3 The objective of the preliminary assessment is to identify any potentially significant effects upon road drainage and the water environment that are likely to arise from construction and/ or operation of the proposed scheme.

13.1.4 The assessment is being undertaken in accordance with best practice guidance and standards relating to the identification, assessment and evaluation of water environment effects associated with highways-based improvements.

13.2 Stakeholder Engagement

13.2.1 Discussions have been held with DCiC, the Environment Agency and DCC with regards to flood risk and the drainage design for the proposed scheme, as applicable. DCiC and the Environment Agency have been consulted upon flood risk assessments prepared for Kingsway junction and Little Eaton junction. Consultation with DCiC regarding flood storage areas at Kingsway junction are going, as is consultation with the Environment Agency with regard to the results of flood risk modelling and proposed floodplain compensation at Little Eaton junction.

13.3 Assessment Assumptions and Limitations

13.3.1 The information presented in this chapter reflects that obtained and evaluated at the time of reporting and is based on the current design for the proposed scheme and the maximum likely effects of land take required for its construction and operation.

13.3.2 It is assumed that flood water storage areas would be provided at Kingsway junction (refer to Table 2.2) and that a floodplain compensation area would be provided in the vicinity of Little Eaton junction. Outline proposals for these features have therefore been assumed to be embedded within the proposed scheme design (refer to Section 13.7).

13.3.3 The findings of the preliminary assessment may be subject to change as the design of the proposed scheme is developed and refined through the EIA and consultation processes.

13.4 Study Area

13.4.1 The process of scoping identified that a 1km study area around the proposed scheme boundary would be appropriate to identify any potential effects on the water environment. Within this study area the known surface water features and their attributes have been identified, the extent of known flood risk has been determined and the current groundwater conditions described. In addition, factors such as historical contamination that may influence the hydrology of the study area have also been considered.

13.4.2 Water features located outside the study area, but immediately within its surrounds

have been included where it appears that there is hydraulic connectivity to features within the study area and the possibility that they could be significantly affected by the proposed scheme. Professional judgement has been applied to identify the extent to which such features are included.

13.4.3 The flood risk study area comprises Environment Agency Flood Zones along the watercourses that may be affected by the proposed scheme. The Environment Agency designates flood risk zones on the basis of the annual probability of a flood event to occur as follows:

- Zone 1 is less than 0.1% annual probability of flood risk (i.e. a very low risk of flooding);
- Zone 2 is between 0.1 to 1 % annual probability of flood risk (i.e. a low risk of flooding;
- Zone 3 is more than a 1% annual probability of flood risk (i.e. a medium risk of flooding).

13.5 Baseline Conditions

13.5.1 The following tasks have been undertaken to establish baseline conditions that exist within the adopted water environment study area:

- A review of relevant legislation, planning policy and guidance concerning the surface water, groundwater and hydromorphology of water bodies;
- A desk-based review of water resource records obtained from third party sources including: the Environment Agency, DCiC, Severn Trent Water (STW), Ordnance survey mapping and other web-based resources;
- A review of published studies undertaken to inform scheme optioneering and selection;
- Site visits undertaken in 2015, 2016, 2017 and 2018 to allow water receptors in the area to be assessed in terms of their character and morphology and their connectivity to the proposed scheme;
- Review of available water and sediment sampling data;
- Water hardness testing of water samples taken from upstream and downstream of the A38 culvert at Markeaton (2015);
- Topographic survey, including 13 channel cross-section surveys within the River Derwent (2017).

13.5.2 Surface and groundwater resources in the vicinity of the proposed scheme are shown in Figures 13.1 to 13.5 and described in the sections below.

Surface Water

13.5.3 The study area lies within the Humber River Basin District, Derwent Derbyshire management catchment, as set out within the Humber River Basin Management Plan (RBMP) (Environment Agency, 2015).

13.5.4 The following surface water bodies have been identified within the study area (refer to Figure 13.1 to 13.3):

- Bramble Brook: an ordinary watercourse, flowing through Kingsway junction;
- Markeaton Brook: an ordinary watercourse, flowing under the A38 north of Markeaton junction;
- Mackworth Brook: and ordinary watercourse north-west of Markeaton junction;
- Markeaton Lake: within Markeaton Park, northwest of Markeaton junction;
- Mill Pond: east of the A38, north of Markeaton junction;

- River Derwent: a Main River, flowing in a generally north-south direction, west, north and south of the A38 at Little Eaton junction;
- Dam Brook: an ordinary watercourse and tributary of the River Derwent, flowing under the A38 south of Little Eaton junction;
- Boosemoor Brook: an ordinary watercourse with a confluence with Dam Brook north-east of Little Eaton junction.

13.5.5 Bramble Brook is an ordinary watercourse and has no Water Framework Directive (WFD) waterbody identification (ID). The Environment Agency holds no water quality data for the brook itself, therefore, in WFD terms, Bramble Brook is considered to be part of the receiving waterbody, which in this case is Markeaton Brook, within the reach from Mackworth Brook to the River Derwent (WFD ID GB104028052). In the Humber River Basin Management Plan (RBMP), the receiving waterbody is classified as being of moderate ecological status and good chemical status in 2016, with objectives for these to be good by 2027.

13.5.6 Markeaton Brook forms part of the heavily modified Markeaton Brook system. The section of Markeaton Brook that passes beneath the A38 closest to Markeaton junction is classified as an ordinary watercourse and is not classified under the WFD. However, further to the north-east, another channel of Markeaton Brook is classified as a 'main river'. In the RBMP (Environment Agency, 2015), Markeaton Brook from its source to Mackworth Brook is classified as having moderate ecological and good chemical status in 2016, with an objective of achieving good overall and ecological potential status by 2027.

13.5.7 The reach of the River Derwent in the vicinity of Little Eaton junction is part of the WFD water body with ID GB104028053240 - 'River Derwent from Bottle Brook to River Trent'. This waterbody is classified as being of good chemical and moderate ecological status in 2016. The WFD objectives for this waterbody are the same as the current classification i.e. no improvement is expected, but nor should there be any deterioration.

13.5.8 The Environment Agency does not hold water quality data for either Dam Brook or Boosemoor Brook, which are both ordinary watercourses. These watercourses do not have their own WFD waterbody IDs so in WFD terms are considered to be part of the River Derwent. Dam Brook has been known in the past to support a small population of white-clawed crayfish (refer to Chapter 8: Biodiversity).

13.5.9 The Environment Agency holds no records of surface water abstractions within the study area at Kingsway and Markeaton junctions. At Little Eaton junction, records indicate that there are four surface water abstractions located along the River Derwent in the vicinity of the proposed scheme. These relate to the spray irrigation system by Talbot Turf Supplies, whilst approximately 600m north of the junction there are two licences held by STW for potable water abstractions from the River Derwent (refer to Figure 13.3).

13.5.10 Little Eaton junction is within a surface water safeguard zone i.e. an '*area in which the use of certain substances must be carefully managed to prevent the pollution of raw water sources that are used to provide drinking water*'. In this instance the substances of concern are pesticides, the use of which must be managed to facilitate the safe abstraction of drinking water by STW.

Groundwater

13.5.11 At Kingsway and Markeaton junctions, the bedrock underlying the proposed scheme comprises strata of the Mercia Mudstone Group and the Tarporley Siltstone Formation (siltstone, mudstone and sandstone).

13.5.12 At Kingsway junction, the bedrock is overlain by topsoil and made-ground, with a strip of alluvium running through the junction, associated with Bramble Brook. At Markeaton junction, made-ground overlies the bedrock at the junction whilst north-east of the junction, the bedrock is overlain by river terrace deposits and alluvium.

13.5.13 At Little Eaton junction, the bedrock comprises the Millstone Grit Group (mudstone, siltstone and sandstone) overlain by sand and gravel, alluvium and made-ground.

13.5.14 According to the Environment Agency's groundwater mapping, the bedrock aquifer designation at Kingsway and Markeaton junctions is Secondary B and at Little Eaton junction is Secondary A. Superficial deposits associated with Bramble Brook at Kingsway junction, to the north of Markeaton junction and at Little Eaton junction are all designated as Secondary A aquifer.

13.5.15 There are no groundwater abstractions within the study area at Kingsway and Markeaton junctions and neither junction is within a groundwater Source Protection Zone (SPZ) or a Nitrate Vulnerable Zone.

13.5.16 Little Eaton junction is within a Total Catchment (Zone 3) SPZ (defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source). There are two records of groundwater abstractions within the study area, one of which relates to an abstraction of groundwater for horticultural watering (licence number: 03/28/46/0046) by Derby Garden Centre north of Little Eaton junction and the other to abstraction of groundwater for general farming and domestic use (licence number: 03/28/46/0006).

13.5.17 The A38 to the west of Little Eaton junction passes through both Outer and Inner groundwater Source Protection Zones (SPZ). These run parallel to the River Derwent and are associated with now disused filter tunnels that were historically used for drinking water abstraction.

Flood Risk Baseline

13.5.18 The flood risk baseline is based on publically available information including Environment Agency Interactive Maps (online), the DCiC Strategic Flood Risk Assessment (SFRA) and consultation with the Environment Agency and with DCiC.

13.5.19 At Kingsway junction, the Environment Agency flood risk mapping indicates that the junction is within Flood Zone 1 and thus at very low risk of river flooding from Bramble Brook. However, as an ordinary watercourse, the brook comes under local authority jurisdiction and is not mapped accurately for river flooding by the Environment Agency. DCiC local knowledge and modelling indicates that there are flood risk and storage issues at Kingsway junction. The DCiC Level 1 SFRA Review undertaken in April 2013 identified that Bramble Brook through Kingsway junction is actually located within Flood Zone 3 and, as such, the risk of fluvial flooding from Bramble Brook is considered to be high. Environment Agency flood risk maps also suggest that there is a high risk of surface water flooding in places.

13.5.20 Markeaton junction is within Flood Zone 1, classified as having a 'low' risk of flooding from main river fluvial or tidal sources, with an associated annual probability of less than the 1 in 1,000 year return period. The junction is also at a low risk of surface water flooding.

13.5.21 Little Eaton junction is mainly located within Flood Zone 2, with the western elements of the proposed scheme falling within or adjacent to Flood Zone 3. Land to the west of the junction is shown on flood maps to be at high risk of river flooding, while land to the east is at low risk. Land to the south of the junction is generally mapped as being at high risk of flooding from surface water, while land to the east is low to high risk of surface water flooding.

Sites of Ecological Importance

13.5.22 As detailed in Chapter 8 (Biodiversity), there are a number of statutory and non-statutory designated sites of ecological importance within the vicinity of the proposed scheme, some of which are designated on the basis of water-dependent habitats or have a hydraulic connection to the proposed scheme site. These are:

- Mickleover Railway Cutting LWS (Site Code DE004) is located within approximately 50m of the site boundary at Kingsway junction and designated for its habitat mosaic. The LWS appears to have hydrological links to the site;
- Bramble Brook and Margins LWS (Site Code DE014) is located adjacent to Kingsway junction and is designated for its secondary broad-leaved woodland;
- Markeaton Brook System LWS (Site Code DE003) is located within 50m of the site boundary at Markeaton junction. The LWS is designated for its invertebrate assemblage (including white-clawed crayfish *Austropotamobius pallipes*);
- Alfreton Road Grassland LWS (Site Code ER002) located to the south of A38 at Little Eaton junction. The site is designated for its floodplain grassland which is semi-improved;
- The River Derwent LWS (Site Code DE007) located adjacent to the western boundary of Little Eaton junction. The site is designated for its flowing water, river and associated streams;
- Watermeadows Ditch LWS (Site Code DE047) located within approximately 600m, and to the south of Little Eaton junction. The site is designated for its standing open water and has hydrological links to the site through connecting watercourses;
- Nooney's Pond LWS (Site Code DE033) located approximately 750m south of Little Eaton junction. The site is designated for its standing open water and has hydrological links to the site through connecting watercourses.

13.5.23 Further details of these and other statutory and non-statutory designated ecological sites are provided in Chapter 8: Biodiversity.

13.6 Potential Impacts

13.6.1 Mitigation measures being incorporated into the proposed scheme design and measures that would be undertaken during the proposed scheme construction phase are set out in Section 13.7. Without implementation of such mitigation measures, potential impacts (both positive and negative) associated with the construction and operation of the proposed scheme would be as outlined below.

13.6.2 Potential impacts arising from the construction of the proposed scheme (in the absence of effective mitigation) are:

a) Risks to the water environment due to:

- Excavation and the subsequent deposition of soils, sediment or other construction materials which may enter water bodies and cause pollution;
- Spillage of fuels or other contaminating liquids, which may enter water bodies and cause pollution;
- Temporary physical modifications which interrupt the natural passage of surface and sub-surface water flows; and
- Mobilisation of contaminants following disturbance of contaminated ground or groundwater, or through uncontrolled site runoff.

b) Risks to groundwater associated with cuttings or foundations due to:

- Contamination risk to the underlying aquifers;
- Temporary dewatering, for example during cutting construction at Kingsway and Markeaton junctions, leading to changes to groundwater flow; and
- Release or leaching of substances (e.g. cement or grout) used during construction which may negatively impact groundwater quality.

c) Potential for an increase in flood risk due to:

- Construction work taking place within the floodplain;
- Phased construction work may temporarily impact on the function of the floodplain;
- Temporary and/ or permanent deposition of excavated material may impact on existing flood flow paths or flood storage areas; and
- Construction activities within the floodplain which could result in an increase in flood risk elsewhere.

13.6.3 Details of ground conditions, including the likelihood of encountering contaminated ground or groundwater during the proposed scheme construction phase, is provided in Chapter 9: Geology and Soils.

13.6.4 Potential impacts on the water environment during proposed scheme operation are:

- Effects on surface water arising from vehicle-derived pollutants e.g. oils from fuel combustion/ accidental spillages, and salts or herbicides from road maintenance;
- Direct physical and hydromorphological impacts from watercourse crossings and other hydraulically linked surface water features with potential for direct effects on the biological, chemical and physical WFD parameters for both surface waters and groundwater bodies;
- Permanent dewatering of the cutting at Markeaton junction, which has the potential to depress local groundwater levels;
- Pumping of surface water and groundwater required for the operation of the cutting at Markeaton junction, which could cause changes in flows;
- Discharges from new sections of highway that have the potential to increase flood risk for receptors downstream; and
- Any road structures, highways cuttings, embankments or other landscaping features constructed in the floodplain which have the potential to alter flood flows and increase flood risk.

13.7 Design, Mitigation and Enhancement Measures

13.7.1 The following sections contain details of measures included in the proposed scheme design and best practice techniques (comprising legal requirements and construction guidance) which would be implemented in order to mitigate and/ or manage, as far as is practicable, potential impacts to the water environment due to the proposed scheme construction and operation.

Construction Phase

13.7.2 As indicated in para. 2.3.31, construction of the proposed scheme would be subject to measures and procedures defined within a CEMP. The CEMP would include a range of measures to mitigate potential impacts on the water environment. Such measures would accord with legal compliance and good practice guidance when working with or around sensitive water resources. The CEMP would include relevant water environment mitigation measures as taken from applicable Guidance for Pollution preventions (GPP) documents (http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/guidance-for-pollution-prevention-gpps-full-list/).

13.7.3 During the proposed scheme construction phase, any discharges to surface water would require discharge consent. The conditions attached to any such consent, and limits on oils, suspended solids and other pollutants, would need to be adhered to by the selected construction contractor. Works undertaken above or within 8m of a Main river would also require an environmental permit from the Environment Agency; works that would affect an Ordinary water course would require consent from the Lead Local Flood Authority (LLFA).

13.7.4 At Kingsway junction and Little Eaton junction, there would be a requirement to protect construction plant, materials and construction workers from impacts due to potential flooding. Such measures would include, for example, locating construction compounds and storage areas outside of areas susceptible to flooding and having in place emergency flood response procedures. The implementation of such measures would also avoid any potential pollution of local watercourses by construction materials in the event of flooding. In addition, the construction programme would enable recommended flood storage areas to be installed at Kingsway junction and the floodplain compensation area at Little Eaton junction at the start of the construction phase.

Operational Phase

13.7.5 The proposed scheme design requires the diversion of Bramble Brook at Kingsway junction and of Dam Brook at Little Eaton junction. Outline channel design requirements for these watercourse diversions will be confirmed during the EIA, but will ensure that existing flow conditions within the channels are maintained and not significantly impacted by such diversions – as such significant adverse impacts on channel flooding characteristics would be avoided. The ecological function of these channels (refer to Chapter 8: Biodiversity) will be taken into account during the design of these channel diversions.

13.7.6 The proposed scheme would create an increase in impermeable area at each of the three junctions which in turn would give rise to an increase in road run-off. As described in Chapter 2: The Proposed Scheme, a suitable highway drainage system would be installed to manage surface water and which would replace the existing pavement and drainage collection systems (refer to para. 2.2.45). The highway drainage system would be designed and constructed in compliance with DMRB and the Manual of Contract Document for Highways Works (MCHW). Surface water would outfall to local watercourses, with flow rates limited in accordance with Environment Agency requirements. Surface water runoff rates from the new highway arrangement would be controlled to the appropriate rates using Sustainable Drainage

Systems (SuDS), taking account of potential climate change.

13.7.7 Hybrid attenuation ponds are currently proposed at all three junctions. These would provide flow balancing and would provide vegetative treatment of run-off to remove suspended solids and soluble metals. Two attenuation ponds are proposed at Kingsway junction, one at Markeaton junction and two at Little Eaton junction (refer to Figures 2.4, 2.5 and 2.6).

13.7.8 The DMRB Volume 11 Section 3 Part 10 HD45/09 (Highways Agency, 2009) provides methods to assess potential pollution impacts from routine road runoff (Method A) and to assess the risk of a pollution incident occurring in the event of an accidental spillage (Spillage Risk Assessment (Method D)). Both methods have been applied to each of the three junctions using the Highways Agency Water Risk Assessment Tool (HAWRAT), which have been used to inform the highway drainage design. An updated HAWRAT assessment will be undertaken and reported in the ES, taking account of the latest traffic data.

13.7.9 The attenuation ponds would also provide for spillage containment wherever necessary. Whilst routine operation of the proposed scheme would not include any activities that are likely to generate contaminants that could pose significant risk to controlled waters, there would be potential for environmental risks associated with spillages due to road accidents or faulty vehicles. To mitigate the impacts on controlled waters during the proposed scheme operation stage, the highway drainage system would incorporate appropriate measures to minimise impacts associated with accidents and spillages. In addition, any spillages following road accidents would be routinely managed by Highways England which is responsible for the maintenance of trunk road assets with the Area 7 East Midlands Region.

13.7.10 At Markeaton, the low point of the proposed new dual carriageway would be lower than the existing drainage outfall level and the Markeaton Lake level. A pumping station would therefore be required to drain the proposed scheme. This would be designed to accommodate a 1 in 100 year storm event with climate change without flooding the carriageway. The pumping station would be fitted with fail-safes including electrical supply being provided from two different sources and possibly an emergency generator.

13.7.11 Flood Risk Assessments (FRAs) have previously been prepared, although these will need to be updated during the EIA. However, work on flood risks at Kingsway junction and Little Eaton junction are going, taking into account climate change as agreed with the Environment Agency and DCiC, as applicable. The flood risk modelling undertaken to date indicates that at Kingsway junction, there is a requirement for flood storage provision. Options being explored include a flood storage area within the proposed scheme footprint, as well as potential flood storage areas to the south-west of the proposed scheme within the Kingsway hospital site (see Figure 1.2a and refer to Table 2.2). The positioning of flood storage areas adjacent to Bramble Brook within the Kingsway hospital site are being discussed with the site developers.

13.7.12 In order to mitigate flood risks at Little Eaton junction, it will be necessary to provide a suitable flood risk mitigation strategy. Options are currently being explored, although at present the preferred option is to provide a floodplain compensation area to the south of the A38 and to the west of the River Derwent – refer to Table

2.2. This would be created by excavation of approximately 36,000m^3 of material, which may be reused within the proposed new embankment at Little Eaton junction. Such outline flood mitigation provisions are being discussed with the Environment Agency.

13.7.13 Flood storage provision and floodplain compensation areas will be confirmed during the EIA in consultation with DCiC and the Environment Agency as applicable and reported in the ES.

13.7.14 Water Framework Directive (WFD) Assessments were prepared previously for Kingsway junction and Little Eaton junction. The WFD assessments considered potential risks to waterbodies at Kingsway junction (Bramble Brook) and Little Eaton junction (the River Derwent and Dam Brook), and identified potential water environment mitigation measures and enhancements for inclusion in subsequent scheme planning and designs. WFD assessments were screened out for Markeaton junction given that the proposals would only affect designed drainage through a small part of the Derwent floodplain, without direct or significant impact on watercourses. Of the three affected waterbodies, only the River Derwent through Derby has specific WFD monitoring and status classifications within the Humber River Basin Management Plan. Bramble Brook and Dam Brook are not independent WFD waterbodies, but the WFD applies to all inland waters, so local effects on these WFD tributaries was also assessed and included in the environmental scheme planning. No major impacts on WFD objectives were identified at any site or watercourse, although the Environment Agency concurred that WFD impact assessments need to be updated as the proposed scheme design progresses, and that the proposed scheme should be viewed as an opportunity to make improvements to the water environment. During the EIA, the previous WFD Assessments will be updated and will consider the realignment and culvert alterations on Bramble Brook, diversions of Dam Brook, impacts on the River Derwent, and associated monitoring strategies. Any specific mitigation measures will be included in the proposed scheme design.

13.8 Assessment of Effects

13.8.1 The effects of the proposed scheme on water resources have been assessed following consideration of the potential impacts as outlined in Section 13.6, taking into account the mitigation measures described in Section 13.7.

13.8.2 Tables 13.1 and 13.2 summarise the potential effects (both temporary and permanent) of the proposed scheme construction and operational phases on water environment receptors within the study area, together with a summary of mitigation measures to be provided.

13.9 Summary of Preliminary Assessment

13.9.1 This preliminary assessment indicates that with adherence to best practice construction procedures, provision of an appropriate surface water management system and with a suitable flood management strategy at Kingsway junction and Little Eaton junction, there would be no significant effects on water resources either during proposed scheme construction or operation.

Table 13.1: Summary of Potential Water Environment Effects Arising from Construction of the Proposed Scheme

Attribute	Receptor	Receptor importance/ sensitivity	Potential impacts (without mitigation)	Mitigation (embedded into the design or assumed management practices)	Likely significant effect?
Surface water quality	Bramble Brook	Medium	Adverse impact on water quality due to runoff from working areas, or accidental spillage or uncontrolled surface runoff.	Best practice construction methods implemented through CEMP. Appropriate design of culverting works (Bramble Brook and Dam Brook)	No
	Markeaton Lake and Mill Pond	High			
	Dam Brook	High			
	River Derwent	High			
	Surface water abstractions (River Derwent)	High			
Surface water flow	Bramble Brook	Medium	Adverse impact on surface water flows during culverting and/ or diversion works. Potential for reduction in flows, interruption of flow path – due to blockages or discharges.	Best practice construction methods implemented through CEMP. Appropriate design of culverting and diversion works (Bramble Brook, Dam Brook).	No
	Bramble Brook floodplain	High			
	Markeaton Lake and Mill Pond	High			
	Dam Brook	High			
	River Derwent floodplain	High			
Conveyance of flow (fluvial flood risk)	Bramble Brook	High	Adverse impact on flood storage due to construction works within floodplain	Floodwater storage provision in place prior to start of works. Appropriate culvert design (Bramble Brook).	No
	River Derwent	High			
Groundwater quality	Groundwater in bedrock and superficial aquifers	Medium	Adverse impact on water quality due to accidental spillages or encountering potentially contaminated material.	Best practice construction methods implemented through CEMP.	No
	Groundwater abstractions (Little Eaton)	High			
Groundwater flows	Groundwater in bedrock and superficial aquifers (Secondary A aquifers)	Medium	Interruption of groundwater flows and/ or adverse impact on groundwater levels due to construction works below natural groundwater level.	Best practice construction methods implemented through CEMP.	No
	Groundwater abstractions (Little Eaton)	High			

Table 13.2: Summary of Potential Water Environment Effects Arising During from Operation of the Proposed Scheme

Attribute	Receptor	Receptor importance/ sensitivity	Potential impacts (without mitigation)	Mitigation	Likely significant effect?
Surface water quality	Bramble Brook	Medium	Adverse impact on water quality due to routine runoff from road and/ or accidental spillages.	Drainage design to incorporate SuDS including attenuation ponds to reduce suspended solids and soluble metals in road drainage.	No
	Markeaton Lake and Mill pond	High			
	Dam Brook	High			
	River Derwent	High			
	Surface water abstractions (River Derwent)	High			
Surface water flows	Bramble Brook	Medium	Increased flows due to increased runoff from road (increase in impermeable area).	Drainage design to incorporate SuDS including attenuation ponds, to allow discharge rates to surface watercourses to be managed. There would be no exacerbation of flooding due to increased runoff from the road.	No
	Dam Brook	High			
	River Derwent	High			
Floodplain storage	Bramble Brook floodplain	High	Loss of flood storage due to proposed scheme requiring land take from floodplain.	Flood storage areas to be provided.	No
	River Derwent floodplain	High		Floodplain compensation area to be provided.	
Groundwater quality	Groundwater in bedrock and superficial aquifers (Secondary A aquifers)	Medium	Adverse impact on water quality due to routine runoff from road and/ or accidental spillages.	Drainage design to incorporate SuDS including attenuation ponds.	No
	Groundwater abstractions (Little Eaton)	High			
Groundwater flows	Groundwater in bedrock and superficial aquifers (Secondary A aquifers)	Medium	Adverse impacts on groundwater flows or levels due to structures below groundwater levels.	Drainage design to incorporate SuDS including attenuation ponds.	No
	Groundwater abstractions (Little Eaton	High			

14 CLIMATE

14.1 Introduction

14.1.1 This chapter presents the findings of a preliminary assessment of the potential effects of the proposed scheme on climate and considers the likely impacts of future climate change on the resilience of the proposed scheme.

14.1.2 A full discussion of the legislative framework and the climate assessment methodology for the full EIA is provided in Chapter 15 of the EIA Scoping Report (refer to para. 4.4.12).

14.1.3 This chapter is divided into two separate aspects:

- **Greenhouse gas (GHG) impact assessment:** To understand the effects on the climate of GHG emissions arising from the proposed scheme, including how the proposed scheme would affect the ability of the UK Government to meet its carbon reduction plan targets and to identify measures to mitigate this impact; and
- **Climate change resilience assessment:** To evaluate the resilience of the proposed scheme to climate change impacts, including how the proposed scheme design takes into account the projected impacts of climate.

14.1.4 For purposes of clarity, this chapter addresses each of the two climate topic assessments separately.

14.1.5 As stated in the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) Synthesis Report (IPCC, 2015), mitigation (i.e. reducing GHG emissions) and adaptation (i.e. responding to climate change impacts) are complementary approaches to reducing risks of climate change impacts over different timescales. Mitigation, in the short-term and medium-term, can substantially reduce climate change impacts in the latter decades of the 21st century. Benefits from adaptation can be realised now to address current risks, and can be realised in the future to address emerging risks. Innovation and investments in environmentally sound infrastructure and technologies can both reduce GHG emissions and enhance resilience to future climate change.

14.2 Stakeholder Engagement

14.2.1 DCC, DCiC and the Environment Agency will be consulted further as the climate assessment progresses. The Environment Agency may wish to understand the impact on national carbon budget targets, while DCC and DCiC may wish to understand how the proposed scheme complies with their local climate change strategies.

14.2.2 Consultation will continue through the EIA process to: further refine the adopted study areas (as described below); discuss the magnitude of predicted impacts and the significance of effects on climate and agree appropriate mitigation measures.

14.3 Assessment Assumptions and Limitations

14.3.1 The GHG assessment methodology assumes that the following information is available:

- Proposed scheme design details (construction materials quantities/ volumes and processes);
- Proposed scheme design operational energy use; and

- Projected maintenance and replacement schedule for the life of the proposed scheme.

14.3.2 All assumptions and limitations, including any exclusions, together with assumptions for choices and criteria leading to exclusion of input and output data are being documented as part of the assessment. Where relevant data are not available, and suitable approximations or assumptions cannot be applied, qualitative analysis will be undertaken.

14.3.3 Climate change, by its very nature, is associated with a range of assumptions and limitations. To overcome these issues, current climate change data and science is being incorporated into the assessment, and proven effective approaches undertaken for similar project types are being replicated. All limitations and assumptions will be made clear in the full EIA chapter to be included in the Environmental Statement.

14.3.4 Limitations associated with the approach taken for the climate change impact and resilience assessments relate to uncertainties inherent within UK Climate Change Projections (UKCP09 data or UKCP18 if this available at the time of assessment).

14.3.5 Assessments being made in relation to climate change risk and impact likelihood and severity rely on professional judgement and evidence gathered through other EIA discipline assessments.

14.4 Study Area

GHG Impact Assessment

14.4.1 The GHG assessment study area covers all GHG emissions arising over the lifecycle of the proposed scheme, excluding emissions from 'decommissioning', from the three junctions that comprise the proposed scheme. The assessment includes direct GHG emissions arising from activities within the proposed scheme's boundary and indirect emissions embedded within the materials as a result of their production. It also includes indirect GHG emissions arising from the transportation of materials to the site and waste transported from the site.

Climate Resilience Assessment

14.4.2 For the climate resilience assessment, the study area is the proposed scheme boundary.

14.5 Baseline Conditions

GHG Impact Assessment

14.5.1 The baseline for the GHG impact assessment will be a "business as usual" scenario whereby the proposed scheme does not go ahead. As such there are associated GHG emissions from use and maintenance of the existing road. In addition, the greenfield land itself will be acting as a GHG emissions sink. Accordingly, the baseline will include an estimation of the size of this GHG emissions sink so that effects associated with expected land use changes through the proposed scheme will be included within the assessment.

Climate Resilience Assessment

14.5.2 The proposed scheme area may already be susceptible to surface water run-off and

flooding, and the impacts of high temperature, high winds and other weather types. These are being assessed as part of the climate study. Construction of the proposed scheme has the potential to increase surface water run-off during periods of heavy precipitation given that it would reduce the amount of bare land, soil and vegetation ground coverage.

14.5.3 The Local Climate Impacts Profile for Derby (LCLIP) (DCiC, 2011) analyses the impact that climate change and severe weather has had on DCiC and its related services and activities. As recorded in the LCLIP, between 2000 and 2010, a total of 60 severe weather events negatively impacted Derby, with each of these having varying degrees of consequence. The most commonly recorded events were associated with flooding and heavy rains, followed by high winds, storms, freezing temperatures and heavy snow.

14.5.4 Evidence suggests that the number of severe weather events is increasing, with intense rainfall events occurring more frequently over the LCLIP analysis period. Heavy snow and strong winds are also noted as severe weather events known to cause disruption.

14.5.5 Specifically relating to highways, flooding, snow and ice have been the biggest weather-related issues recorded over the ten year LCLIP analysis period. Flooding on major roads into the city on numerous occasions has resulted in accessibility problems and has created extra workload for Derbyshire Fire and Rescue by, for example, rescuing stranded motorists. Storms have resulted in a large numbers of fallen trees and freezing temperatures, whilst heavy snow has caused disruption and road accidents.

14.5.6 The Met Office baseline climate averages for Derby (Met Office) show that for the period 1981 - 2010, the mean maximum daily temperature was 13.4°C, with July being the warmest month on average (mean maximum daily temperature of 21.3°C) and January being the coldest month on average (mean maximum daily temperature of 6.6°C). Mean annual rainfall levels were 709.4mm, with October being the wettest month on average (71.2mm of rainfall on average for the month) and February being the driest month on average (47.2mm of rainfall on average for the month).

14.5.7 UKCP09 (Met Office, 2009) projections for the East Midlands suggest that, by the 2050s (2040 - 2069), the region will experience an increase in summer mean temperature of around 2.5°C, and of winter temperatures of around 2.2°C compared to the 1961 - 1990 baseline records. For the same time period, winter mean precipitation is expected to increase by up to 14% and summer mean precipitation is expected to decrease by 16%.

14.5.8 A review of all available and relevant information sources has been undertaken to establish baseline data and current understanding with regards to climate change and extreme weather risks.

14.6 Potential Impacts

GHG Impact Assessment

14.6.1 The environmental impacts from GHG emissions occur at a global level with targets for their reduction being set at a UK national level. The receptor for GHG emissions for this assessment is defined as the UK National GHG Inventory as well as the GHG reduction targets set by the UK government.

14.6.2 There is good scientific evidence to show that our climate is changing because of emissions of GHG resulting from human activity, with global consequences. By the very nature of any transport infrastructure development, no matter the nature or level of mitigation measures implemented, GHGs will be emitted as materials are used and construction activity occurs.

14.6.3 The proposed scheme comprises a major road development project which would involve the use of construction materials and activities (including changes in land use). On this basis, all lifecycle stages have been scoped in for the lifecycle GHG assessment, with the exception of decommissioning.

14.6.4 The 'decommissioning' stage was not included in the assessment as the decommissioning or renewal of the infrastructure comprising the proposed scheme is not reasonably foreseeable (refer to para. 2.3.34). It is anticipated that whilst the proposed scheme has a design life in practice, it will be maintained beyond this timeframe and therefore including the GHG emissions associated with its demolition/ decommissioning is not realistic or relevant.

14.6.5 Potential GHG emission sources arising during each lifecycle stage of the proposed scheme are detailed in Table 14.1.

Table 14.1: Key GHG Emissions Sources

Lifecycle Stage	Activity	Primary Emission Sources
Pre-construction stage	• Enabling works	• Vehicles and fuel use for generators on site • Workers travelling to and from the proposed scheme site
	• Land clearance	• Loss of carbon sink
Product stage	• Raw material extraction and manufacturing of products required to build the proposed scheme*	• Embodied GHG emissions
Construction process stage	• On-site construction activity including emissions from construction compounds • Transport of construction materials (where these are not included in embodied GHG emissions) • Transport of construction workers	• GHG emissions from plant and vehicle use
	• Disposal of any waste generated by the construction processes	• GHG emissions from disposal of waste
Operation stage	• Operation of associated lighting, overhead gantries etc.	• GHG emissions from energy and fuel use
	• Maintenance including re-surfacing	• Embodied emissions associated with re-surfacing materials
Use	• Vehicles using the road	• Emissions from vehicle fuel use

* Does not include transport unless by exception – see construction process stage

Climate Resilience Assessment

14.6.6 The proposed scheme area may be vulnerable to a range of climate risks, including an increased frequency and severity of prolonged and/ or heavy precipitation events, prolonged droughts and heatwaves, a greater frequency of very hot days, and an increased risk of storms. Warmer temperatures may also mean that the risks associated with ice and snow will decrease over time, but retaining the ability to respond to these events will remain important.

14.6.7 The proposed scheme itself is identified as having the potential to be vulnerable to a range of climate risks. These include, but are not limited to:

- Material deterioration due to high temperatures leading to deterioration of structures and pavements such as softening, deformation and cracking;
- Overheating of electrical equipment, such as information and communication systems;
- Health and safety risks to road users and employees as a result of changing temperatures;
- Increased frequency of fog episodes which may reduce visibility and access;
- Changes in travel patterns of network users;
- Longer vegetation growing seasons leading to a reduction in soil moisture and/ or increased tree leaf coverage with an increased magnitude and frequency of storm events which could result in tree fall and increased maintenance and management requirements;
- Damage to roads from periods of heavy rainfall;
- Flood risk on the network and damage to drainage systems with the potential for increased runoff from adjacent land contributing to surface water flooding;
- Health and safety risks to road users and employees as a result of reduced visibility and standing water originating from prolonged and/ or heavy precipitation and storms;
- Increased slope instability as a result of prolonged/ heavy precipitation leading to subsidence;
- Pollution as a result of surface runoff;
- Increased wind speeds leading to damage of structures and associated health and safety risks to network users;
- Storm damage to structures and other assets;
- Inaccessible network during extreme weather events; and,
- Reduced pavement and asset deterioration (over time) from less exposure to freezing, snow and ice, along with a reduced need for winter maintenance and a reduction in health and safety risks.

14.6.8 The risk assessment being undertaken considers the likelihood of a hazard occurring that could result in an impact on the infrastructure and assets associated with the proposed scheme. The assessment of likelihood and consequence of impact considers existing or embedded resilience measures already in place or in development for infrastructure and assets. The risk assessment will identify the need for any additional resilience measures to protect against the effects of climate change where more significant risks are identified.

14.6.9 A series of flood risk assessments (FRAs) are being undertaken to model the potential impacts faced by the proposed scheme. These assessments consider the worst case scenario according to the latest Environment Agency (2016) guidelines (https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances), utilising the upper end allowance category for the 2080s time period (2070 - 2115).

The FRA being undertaken for the Little Eaton junction is based on design hydrology that applies a 50% increase in flows for a 1% Annual Exceedance Probability (AEP) event. This is because the River Derwent is classed as 'Main River'. As the Kingsway junction is predominantly an urban catchment, and Bramble Brook is classed as an 'Ordinary Watercourse', a direct rainfall integrated model approach is being adopted. The design hydrology is based on a 40% increase in rainfall intensity for a 1% AEP event. More information can be found within Chapter 13: Road Drainage and Water Environment.

14.7 Design, Mitigation and Enhancement Measures

GHG Impact Assessment

14.7.1 Mitigation measures as related to the proposed scheme are being identified with the aim of reducing GHG emissions across the lifecycle of the proposed scheme. Mitigating measures being considered include:

- Construction activities would be undertaken by the appointed contractor in accordance with industry best practice, and in line with measures set out in the CEMP (refer to para. 2.3.31);
- Specification of alternative materials with lower embodied GHG emissions; and
- Use of low carbon design specifications, such as energy-efficient lighting and durable construction materials to reduce maintenance and replacement cycles.

14.7.2 The selection of appropriate mitigation measures during construction and operation of the proposed scheme will be developed together with the proposed scheme design and confirmed in the Environmental Statement.

Climate Resilience Assessment

14.7.3 A number of mitigation and adaptation measures are being considered to address potential climate resilience risks of the proposed scheme. For example, a floodplain compensation area is being proposed at Little Eaton junction, while flood storage areas are being considered at Kingsway junction (refer to Table 2.2).

14.8 Assessment of Effects

GHG Assessment

14.8.1 The NPSNN (DfT, 2014) states that it is unlikely that the impact of a single road development, such as the proposed scheme, will affect the UK's ability to meet its overarching binding GHG reduction targets. However, as the UK's trajectory to this overall target is defined by a series of five year carbon budgets, it is also important to assess the GHG impact of the proposed scheme against these budgets.

14.8.2 The Government's national carbon reduction strategy (provided in the Carbon Plan 2011 (Department of Energy & Climate Change (DECC), 2011) provides a plan for the UK to meet its carbon reduction targets. While the Government is legally bound to meet the commitments set out in this plan, any increase in GHG emissions as a result of the proposed scheme would not necessarily result in the proposed scheme being refused consent unless the increase causes a materially significant effect.

14.8.3 While the NPSNN does not specify significance criteria for GHG emissions, it does highlight the document 'Investing in Britain's Future' (HT Treasury, 2013) which states that the programme of investment planned for the UK Strategic Road Network

(SRN) would equate to below 0.1% of average annual carbon emissions allowed in the fourth carbon budget. This needs to be considered in the context of other policy around an increase in the use of electric vehicles and the decarbonisation of the national electricity grid.

14.8.4 The GHG impacts of the proposed scheme should also be put into the wider context of the UK SRN. The length of the proposed scheme represents less than 0.1% of the 4,400 mile UK SRN (DfT 2017). Therefore, although it is important that the relative GHG impacts of the proposed scheme is considered so that mitigation measures can be integrated into the proposed scheme design, the overall GHG increase is expected to be minimal when considered in the national context.

14.8.5 Of all the lifecycle stages scoped into the assessment and shown in Table 14.1, the embodied carbon associated with materials use is likely to be the biggest contributor to the carbon footprint of the proposed scheme. Materials such as steel, concrete and bitumen can have high embodied carbon contents depending on the specifications used. The assessment to be included in the Environmental Statement will identify the materials used and calculate the associated carbon emissions from their production as well as transport to site.

14.8.6 The Environmental Statement will provide a comparison of the total GHG emissions from the construction and maintenance of the proposed scheme with national level carbon budgets and the associated five year reduction targets.

14.8.7 To put the impact of the proposed scheme into context, total GHG emissions will also be compared against other new road schemes within the UK SRN to benchmark GHG performance.

14.8.8 The five year carbon budgets and associated carbon reduction targets will already account for a proportion of carbon emissions resulting from the existing road network. The purpose of the GHG assessment is therefore to understand what additional emissions would arise as a result of the proposed scheme in additional to those already predicted. GHG impacts from ‘additional’ road use will therefore be assessed by comparing a business as usual baseline (i.e. where the proposed scheme is not built) against road use for the proposed scheme. It should be noted, however, that not all journeys made on the new road would result in additional emissions to the associated carbon budget as it is likely that a proportion of these journeys would have been made anyway via different routes. In order to overcome this and provide a comparison, a number of scenarios will be used, with the assessment conducted on this basis.

Climate Resilience Assessment

14.8.9 The proposed scheme itself has been identified as being vulnerable to a range of climate risks during its use and its resilience to these impacts will be assessed on an ongoing basis as the design develops and further data becomes available. The Environmental Statement will provide the outputs of the ongoing climate resilience assessment identifying the key impacts on the proposed scheme and appropriate measures that will be implemented to mitigate these.

14.8.10 The proposed scheme will be inherently designed to minimise the impacts of climate change on future use as far as is reasonably feasible. Potential impacts as a result of more extreme temperature fluctuations, an increase in the frequency of

storms and the risk of more flash flooding would be mitigated through the design of the proposed scheme, and the selection of materials used for its construction and operational procedures. Proposed scheme drainage for example will be designed to be resilient to the increase in predicted levels of precipitation, whilst materials specification considers the ability of the product to withstand a wide range of temperature scenarios.

14.9 Summary of Preliminary Assessment

14.9.1 Whilst there is no specified significance criteria currently published in relation to Highways England projects, the likely GHG hotspot is the embodied carbon associated with raw material use. Mitigation options are being considered to reduce the impact of this hotspot on the proposed scheme's effect on the national carbon budget. Based on the information available, the expected design, mitigation and enhancement measures set out above and the preliminary assessment undertaken to date, it is anticipated that the full GHG assessment undertaken as part of the Environmental Statement will comply with the NPSNN, namely that it is unlikely that the impact of the proposed scheme would affect the UK's ability to meet its overarching binding GHG reduction targets.

14.9.2 Based on the information available, the expected proposed scheme design, mitigation and enhancement measures set out herein, and the preliminary assessment undertaken to date, no likely significant effects around the resilience of the proposed scheme to climate change are anticipated.

15 ASSESSMENT OF CUMULATIVE EFFECTS

15.1 Introduction

15.1.1 This chapter considers the following:

- **Cumulative effects (also known as inter-project effects):** the effects of other developments in the vicinity of the proposed scheme which are proposed, under construction or have been consented, which when combined with the effects of the proposed scheme may have an incremental significant effect;
- **In-combination effects**: the combined effects from the proposed scheme on a single receptor from a number of individual environmental impacts, for example noise, dust and visual.

15.1.2 The following sub-sections consider each of these types of effect in turn and summarise the approach that is being used for their assessment. Given that the assessments for these types of effect are undertaken towards the end of the EIA process, when other topic assessments have been well progressed and data relating to other developments in the vicinity is confirmed, it is not possible to identify likely significant cumulative effects with confidence at this stage.

15.2 Cumulative Effects

Methodology

15.2.1 The Planning Inspectorate's Advice Note 17 (Planning Inspectorate, 2015) on the assessment of cumulative effects identifies a four stage approach, as follows:

- Stage 1: Establish the project's zone of influence (ZoI) and identify a long list of 'other development' (the 'development schedule');
- Stage 2: Identify a shortlist of 'other development' for the cumulative impact assessment;
- Stage 3: Information gathering; and
- Stage 4: Assessment.

15.2.2 This approach has been adopted for the assessment, alongside consideration of guidance set out within DMRB Volume 11, Section 2 Part 5: Assessment and Management of Environmental Effects (HA205/08) (Highways Agency, 2008).

15.2.3 The assessment of cumulative effects arising from the proposed scheme in combination with other proposed schemes (inter-project effects) is based upon a review of current planning applications as well as a study of planning and policy documents.

15.2.4 The cumulative study for the proposed scheme is currently at Stage 1 and is focussed on the identification of relevant developments and land allocations within the ZoI which have the potential to generate potentially significant cumulative effects. Details of developments are currently being collated and placed on an initial long-list (the development schedule) which identifies the size, type and location of each development. These long-list developments are being reviewed to assess their potential temporal and spatial interactions with the proposed scheme in order to identify whether they should be scoped into the cumulative assessment.

15.2.5 Table 15.1 explains the current rationale for the extent of each ZoI, noting that these ZoIs are subject to review and which will be confirmed within the Environmental Statement.

Table 15.1: ZoI Extents for Assessment of Potential Cumulative Impacts

Environmental Topic	Zone of Influence (ZoI)
Air Quality	**Construction:** The ZoI will be 200m from construction activities for construction dust and emissions. A ZoI for construction traffic will be determined based on a review of other development proposals and their construction programmes. **Operation:** The 'affected roads' within the detailed traffic model define the ZoI. As the operational phase traffic data includes traffic associated with other developments, the air quality impact assessment to be included in the Environmental Statement will inherently be a cumulative impact assessment.
Cultural Heritage	**Construction and Operation:** The ZoI extends to 500m from the proposed scheme work. A flexible approach is being taken for the identification of high value assets or assets which convey the OUV of the Derwent Valley Mills World Heritage Site in order to capture potential impact upon the WHS setting. For these assets, the ZoI extends up to or beyond 1km from the proposed scheme boundary, taking into account the Zone of Theoretical Visibility defined within the Landscape and Visual Impact Assessment (see below).
Landscape and Visual	**Construction and Operation:** 1km study area corridor, broadening to capture areas within the Zone of Theoretical Visibility (ZTV) sitting outside of the 1km with capacity to experience significant effects as a result of the proposed scheme.
Biodiversity	**Construction and Operation:** 2km from proposed site boundary based on proximity to statutory designated sites. The ZoI for assessment purposes varies according to specific biodiversity receptors, is informed by SSSI risk zones and for species by Natural England and best practice guidance from the Chartered Institute of Ecology and Environmental Management and other sources.
Geology and Soils	**Construction and Operation:** The study area for the geology and soils comprises the proposed scheme footprint and up to a buffer of 500m from each junction. The assessment of the impacts has been extended to important offsite features in the vicinity of the proposed scheme where necessary.
Materials	**Construction:** The ZoI comprises the proposed scheme footprint and the region within which waste management facilities are located and from where construction materials may be sourced. **Operation:** Operational phase waste management issues are scoped out of the assessment.

Environmental Topic	Zone of Influence (ZoI)
Noise and Vibration	**Construction:** The construction noise and vibration ZoI is defined by proximity of closest identified receptors to the A38 construction works, following which an appropriate buffer will be established around receptors. **Operation:** The operational noise and vibration ZoI is defined by other cumulative developments which will be included in the traffic model that will accompany the application. Thus the noise impact assessment to be included in the Environmental Statement will inherently be a cumulative impact assessment.
People and Communities	**Construction and Operation:** The ZoI extends to a maximum distance of 2km wide from the proposed scheme.
Road Drainage and the Water Environment	**Construction and Operation:** The ZoI has been defined by the surface water body catchments of identified watercourses, taking into account the groundwater body and groundwater source protection zones. The ZoI covers a 1km study area around the proposed scheme boundary. Water features located outside the ZoI, but immediately within its surrounds may be considered such water features appear to be in hydraulic connectivity to features within the study area. Professional judgement has been applied to identify the extent to which such features are included.
Climate	**Construction and Operation:** The ZoI covers all greenhouse gas emissions arising during proposed scheme construction and operation.

Initial Findings

15.2.6 Based on a review of the initial long list of developments and allocations, a number of developments are currently considered to have the potential to generate cumulative impacts with the proposed scheme based on their temporal scope, location and/ or scale and nature, including:

- **Site of Mackworth College:** Phased housing development. Up to 221 houses, plus community facilities and access and open space.
- **Developments at Kingsway Hospital:** Phased development comprising approx. 600 houses, retail units, business units, open space, infrastructure.
- **Land south of Mansfield Road, Breadsall Hilltop, Derby (between Porters Lane and Lime Lane):** Residential development of up to 250 dwellings, together with means of access, public open space, drainage attenuation and landscaping.
- **Land north-west of Mansfield Road, Breadsall Hilltop:** Residential development (up to 230 dwellings) and associated works including means of access.
- **Our City Our River:** Construction of new flood defences through Derby city centre, south of the A38 covering a 9.5km long section of the River Derwent. An Environmental Statement for the proposed development has been prepared.
- **East Midlands Gateway Rail Freight Interchange:** Defined as a NSIP. Located at the M1 J24/ A50/ A6/ A42 Interchanges near to Lockington (approximately 16km to the south of Kingsway junction). An Environmental Statement for the proposed development has been prepared.
- **East Midlands Intermodal Park (EMIP):** Defined as a NSIP. An intermodal

terminal to move goods between rail and road, which will include container handling equipment and storage facilities. Located to the south of the A38 junction with the A50 (approximately 7.5km to the south of Kingsway junction).

15.2.7 It should be noted that the long list is subject to ongoing review and update, and thus further developments may be scoped into or out of the cumulative assessment.

15.2.8 Consideration is also being given to the inclusion of other Highways England schemes as part of the cumulative effects assessment. It should be noted that schemes which will have a preferred route announcement before the application has been submitted for the proposed scheme, and whose scheduled year of opening is before that for proposed scheme, will be included as part of the baseline (i.e. it is assumed that they will be operational before the proposed scheme), and therefore will not be included in the cumulative effects assessment for the operational phase. The assessment will, however, take account of potential cumulative impacts which may occur during the construction phase, based on the anticipated construction timescales for these developments, as applicable.

Next Steps

15.2.9 The initial long-list (development schedule) will be further refined (aided by consultation with the relevant local planning authorities) to ensure that all development with the potential to result in potentially significant cumulative effects when considered together with the proposed scheme is taken into account by each of the environmental topic specialists.

15.2.10 At Stage 2, any developments not having potential to result in likely significant cumulative effects will be excluded, following discussion with the local planning authorities and consideration by the environmental topic specialists.

15.2.11 Stage 3 will involve the collation of information relating to the short-listed schemes, including the design and location, programme for construction, operation and demolition, and any environmental assessments carried out.

15.2.12 Stage 4 will involve the assessment and identification of potentially significant cumulative effects in combination with the proposed scheme.

15.2.13 The Environmental Statement will report the results of the assessment with particular consideration given to any significant cumulative effects that are identified, and the need for mitigation. These effects will be reported within a cumulative effects chapter.

15.3 In-combination Effects

15.3.1 The combined effects of different environmental impacts from the proposed scheme on a single receptor are determined when the environmental assessments for the separate environmental topics have been completed, and as such this data is not available at this stage.

15.3.2 There is potential for both adverse and beneficial in-combination effects associated with the proposed scheme, for example, combined noise, severance and visual impacts on receptors in close proximity. The likelihood of in-combination significant effects will be reported in the Environmental Statement, following completion of the individual environmental topic assessments.

16 SUMMARY OF EFFECTS

16.1.1 Chapters 5 - 15 herein present preliminary assessments for individual EIA topics. Each assessment provides a preliminary assessment of the likely significant effects which is summarised in Table 16.1.

Table 16.1: Summary of Preliminary Assessment of Likely Significant Environmental Effects*

Topic	Construction Stage	Operational Stage
Air Quality	No likely significant effects anticipated.	No likely significant effects anticipated.
Cultural Heritage	No likely significant effects anticipated.	No likely significant effects anticipated.
Landscape and Visual	• Likely temporary **adverse** visual effects from within Greenwich Drive public open space at Kingsway junction. • Likely temporary **adverse** visual effects for users of the Derwent Valley Heritage Way at Little Eaton junction.	• Likely **adverse** visual effects from within Greenwich Drive public open space at Kingsway junction (Year 1 and 15). • Likely **adverse** visual effects from the edge of Breadsall at Little Eaton junction (Year 1). • Likely **adverse** visual effects for users of the Derwent Valley Heritage Way at Little Eaton junction (Year 1).
Biodiversity	• Likely moderate significant **adverse** effect on the A38 Roundabout LWS (at the County or Unitary Authority level). • Likely moderate significant **adverse** effect on the Alfreton Road Grassland LWS (at the County or Unitary Authority level). • Short to medium term likely up to a moderate significant **adverse** effect (up to the County or Unitary Authority level) on habitats, particularly on woodlands, until replacement habitat establishes (thus effects not likely to be significant in the long term). • Short to medium term likely up to a moderate significant **adverse** effect (up to the County or Unitary Authority level) on foraging and commuting bats and birds (particularly on common nesting birds) until habitat establishes (thus effects not likely to be significant in the long term).	• Likely moderate significant **adverse** effect on the A38 Roundabout LWS (at the County or Unitary Authority level). • Likely moderate significant **adverse** effect on the Alfreton Road Grassland LWS (at the County or Unitary Authority level). • Short to medium term likely up to a moderate significant **adverse** effect (up to the County or Unitary Authority level) on habitats, particularly on woodlands, until replacement habitat establishes (thus effects not likely to be significant in the long term). • Short to medium term likely up to a moderate significant **adverse** effect (up to the County or Unitary Authority level) on foraging and commuting bats and birds (particularly on common nesting birds) until habitat establishes (thus effects not likely to be significant in the long term).
Noise and Vibration	• Likely risk of significant **adverse** vibration annoyance effects at receptors closest to the works. • Likely significant **adverse** construction noise effects at receptors closest to the works.	• Likely **adverse** noise impact on Kingsway Park Close. • Likely **adverse** noise impact on A38 mainline between Kingsway junction and Markeaton junction. • Likely significant **adverse** noise effects in the vicinity of Markeaton junction, including upon the Royal School for the Deaf.
Geology and Soils	No likely significant effects anticipated.	No likely significant effects anticipated.
Road Drainage and the Water Environment	No likely significant effects anticipated.	No likely significant effects anticipated.

Topic	Construction Stage	Operational Stage
Materials	No likely significant effects anticipated.	No likely significant effects anticipated.
People and Communities	• Likely **adverse** effect on users of Markeaton Park footbridge (which carries the Bonnie Prince Charlie Walk) until provision of replacement footbridge. • Likely **adverse** effect due to demolition of 15 detached properties on Queensway and two semi-detached properties on the A52 (Ashbourne Road). • Likely **adverse** effect due to closure of Ford Lane access. • Likely **adverse** effects upon some agricultural land holdings at Little Eaton junction due to temporary and/ or permanent land-take.	• Likely **beneficial** effects for walkers and cyclists as a result of improvements in amenity, connectivity and perception of safety. • Likely **beneficial** effects for motorists due to reductions in stress. • Likely **beneficial** effect for users of local buses due to improved journey times and journey reliability. • Likely **beneficial** effects on community severance, as a result of a reduction in severance caused by existing traffic.
Major Accidents and Disasters	No likely significant effects anticipated.	No likely significant effects anticipated.
Climate	No likely significant effects anticipated.	No likely significant effects anticipated.
Human Health	No likely significant effects anticipated.	No likely significant effects anticipated.

*Note - after inclusion of the proposed mitigation measures

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GLOSSARY

AADT	Annual Average Daily Traffic is a measure used in transportation engineering and is the number of vehicles that will use a new or improved road on an average day.
AQMA	Places where air quality objectives are not likely to be achieved. Where an AQMA is declared, the local authority is obliged to produce an Action Plan in pursuit of the achievement of the air quality objectives.
CEMP	A site specific plan developed to ensure that appropriate environmental management practices are followed during the construction phase of a project.
Conservation Area	An area of special environmental or historic interest or importance, of which the character or appearance is protected (Section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990).
Cumulative Effects	Effects upon the environment that result from the incremental impact of an action when added to other past, present or reasonably foreseeable actions. Each impact by itself may not be significant but can become a significant effect when combined with other impacts.
Department for Transport	Government department responsible for the transport network in England, and for aspects of the transport network in the devolved administrations.
Design Manual for Roads and Bridges	A series of 15 volumes that provide standards, advice notes and other published documents relating to the design, assessment and operation of trunk roads, including motorways in the United Kingdom, and, with some amendments, the Republic of Ireland.
Development Consent Order	The means of applying for consent to undertake a Nationally Significant Infrastructure Project (NSIP). NSIPs include, for example, major energy and transport projects.
Proposed Draft DCO Site Boundary	Land anticipated to be required temporarily and/or permanently for the construction, operation and maintenance of the proposed scheme.
EIA	Environmental Impact Assessment. A process by which information about environmental effects of a proposed development is collected, assessed and used to inform decision making. For certain projects, EIA is a statutory requirement.
Environmental effect	The consequence of an action (impact) upon the environment such as the decline of a breeding bird population as a result of the removal of hedgerows and trees.
Environmental impact	The change in the environment from a development such as the removal of a hedgerow.
Environmental Statement	A document produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations to report the results of an EIA.
Flood Zone Three	This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
Flood Zone Two	This zone comprises land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year.
Grade Separated Junction	A junction where the conflicting traffic flows are kept apart, usually by means of a bridge or tunnel.

Mitigation	Measures including any process, activity, or design to avoid, reduce, remedy or compensate for negative environmental impacts or effects of a development
NSIP	Nationally Significant Infrastructure Projects (NSIP) are large scale developments such as certain new harbours, power generating stations (including wind farms), highways developments and electricity transmission lines, which require a type of consent known as 'development consent' under procedures governed by the Planning Act 2008 (and amended by the Localism Act 2011).
PEI	PEI is defined in the EIA Regulations as: 'information referred to in Part 1 of Schedule 4 (information for inclusion in environmental statements) which – (a) has been compiled by the applicant; and (b) is reasonably required to assess the environmental effects of the development (and of any associated development).'
Principal Aquifer	These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.
Receptor	A component of the natural or man-made environment that is affected by an impact, including people.
Scheduled monument	A 'nationally important' archaeological site or historic building, given protection against unauthorised change and included in the Schedule of Monuments kept by the Secretary of State for Culture, Media and Sport. The protection given to scheduled monuments is given under the Ancient Monuments and Archaeological Areas Act 1979.
Secondary A aquifer	These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.
Secondary B aquifer	These are predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
Setting	The surroundings within which a heritage asset is experienced and any element which contributes to the understanding of its significance.
Source Protection Zone	Source Protection Zones (SPZ) show the risk of contamination from any activities that might cause pollution to groundwater sources such as wells, boreholes and springs used for public water supplies. The closer the activity, the greater the risk. SPZs can comprise of up to three main zones (inner, outer and total catchment). A fourth zone of special interest can also occasionally be applied to a groundwater source.
Statement of Outstanding Universal Value	To be included on the UNESCO World Heritage List, sites must be deemed to be of 'outstanding universal value'. OUV is 'cultural and/ or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity'. The Statement of Outstanding Universal Value shall be the basis for the future protection and management of the property.
Sustainable drainage systems	Sustainable drainage systems (SuDS) comprises a natural approach to the management of drainage. SuDS aim to slow and holding back water that runs off a site, allowing natural processes to break pollutants down.

Vehicle Restraint Systems	System installed on a road to provide a level of containment for an errant vehicle such as a safety barrier.
Water Framework Directive	The Water Framework Directive (WFD) introduced a new system for monitoring and classifying the quality of surface and ground waters. The Directive requires that Environmental Objectives be set for all surface waters and groundwater to enable them to achieve Good Ecological Potential/Status by a defined date.
World Heritage Site	A site inscribed by UNESCO because of its Outstanding Universal Value under the terms of the UNESCO World Heritage Convention.

ABBREVIATIONS

AADT	Annual Average Daily Traffic
AEP	Annual Exceedance Probability
ALC	Agricultural Land Classification
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
AMES	Areas of Multiple Environmental Sensitivity
ARN	Affected Road Network
BAP	Biodiversity Action Plan
BS	British Standard
BSI	British Standard Institution
CAZ	Clean Air Zone
CEMP	Construction Environmental Management Plan
CFA	Continuous Flight Auger
CO_2	Carbon Dioxide
CL:AIRE	Contaminated land: Applications in Real Environments
CRTN	Calculation of Road Traffic Noise
dB	Decibel
DCADCC	Development Control Archaeologist for Derbyshire County Council
DCiC	Derby City Council
DCC	Derbyshire County Council
DCO	Development Consent Order
DECC	Department of Energy & Climate Change
Defra	Department for the Environment Food and Rural Affairs
DfT	Department for Transport
DCLG	Department for Communities and Local Government
DM	Do Minimum
DTM	Digital Terrain Model
DMRB	Design Manual For Roads and Bridges
DS	Do Something
EAR	Environmental Assessment Report
EBC	Erewash Borough Council
EC	European Community
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
ELC	European Landscape Convention
EPD	Environmental Product Declarations
ESA	Environmentally Sensitive Area
EU	European Union
GAC	Generic Assessment Criteria
GCN	Great Crested Newt
GVZ	Groundwater Vulnerability Zone
HAPMS	Highways Agency Pavement Management System
HAWRAT	Highways Agency Water Risk Assessment Tool
HE	Historic England
HGV	Heavy Goods Vehicle
HER	Historical Environment Record
HRA	Habitat Regulations Assessment
IAN	Interim Advice Note
IEEM	Institute of Ecological and Environmental Management
IEMA	Institute of Environmental Management and Assessment
IPCC	Intergovernmental Panel on Climate Change
LAQM	Local Air Quality Management
LCA	Landscape Character Areas

LCLIP	Local Climate Impacts Profile for Derby
LCT	Landscape Character Type
LNR	Local Nature Reserve
LPA	Local Planning Authority
LPACO	Local Planning Authority Conservation Officer
LTT	Long Term Trend
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
MAGIC	Multi-agency Geographic Information Centre
mAOD	Metres Above Ordnance Datum
MMP	Materials Management Plan
NCA	National Character Area
NMU	Non-Motorised User
NNNPS	National Networks National Policy Statement
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NPPF	National Planning Policy Framework
NPSE	National Policy Statement for England
NRMM	Non-road Mobile Machinery
NSIP	Nationally Significant Infrastructure Project
NVZ	Nitrate Vulnerable Zone
OEL	Occupational Exposure Limit
PCF	Project Control Framework
PEI	Preliminary Environmental Information
PINS	Planning Inspectorate
PM	Particulate Matter
PCM	Pollution Climate Mapping
PPS	Planning Policy Statement
PRoW	Public Rights of Way
PLWS	Potential Local Wildlife Site
RIGS	Regionally Important Geological Sites
SAC	Special Area of Conservation
SAM	Scheduled Ancient Monument
SFAIRP	So Far As Is Reasonably Practicable
SGAR	Stage Gate Assessment Review
SPA	Special Protection Area
SPZ	Source Protection Zone
SRO	Senior Responsible Owner
SSSI	Site of Special Scientific Interest
STW	Severn Trent Water
SuDS	Sustainable drainage systems
SWMP	Site Waste Management Plan
TAG	Transport Analysis Guidance
TPH	Total Petroleum Hydrocarbons
UK	United Kingdom
WAC	Waste Acceptance Criteria
WebTAG	Transport Analysis Guidance Website
WFD	Water Framework Directive
VE	Visual Envelope
ZTV	Zone of Theoretical Visibility
ZVI	Zone of Visual Influence

APPENDIX 6.1: GAZETTEER OF HERITAGE ASSETS

Appendix 6.1: Gazetteer of Heritage Assets (refer to Figures 6.1 and 6.2) (to be updated and reported in the Environmental Statement)

Reference numbers are SMR numbers, National Monuments Records (prefixed ID) or from Historic England National Heritage List Entry (prefixed NHLE)

Asset Number	Reference	Junction	Site Type	Description	Period	Value
A1	32403	Little Eaton	Findspot	Neolithic flint knife found in garden of Cobwebs, Chester Avenue, Allestree, in May 1957.	Prehistoric	Negligible
A2	18943; ID313380	Kingsway/ Markeaton	Findspot	Polished stone axehead found at 130 Radbourne Street, Derby, c. 1959	Prehistoric	Negligible
A3	18986; ID608154	Kingsway/ Markeaton	Findspot	Polished greenstone axe found whilst topsoiling for Allestree link road in 1983 (find spot location probably incorrect)	Prehistoric	Negligible
A4	-	Kingsway/ Markeaton, Little Eaton	Buried deposits	**Archaeological and palaeo-environmental deposits along River Derwent floodplain** Potential buried remains, including buried deposits of palaeo-environmental interest along the River Derwent floodplain, Markeaton Brook, Bramble Brook and their tributaries, including in-filled palaeo-channels.	Prehistoric to Modern	Medium
A5	32054, 99020	Kingsway/ Markeaton	Road	**Roman Road (course of), Rocester/Derby/Broxtowe, through Derby City** Possible route through Derby of the Roman road joining the forts at Rocester, Derby and Broxtowe	Roman	Low
A6	32380	Kingsway/ Markeaton	Findspot	Denarius of Galienus Valerius Maximus (292-305) dug up in garden *c.*1904	Roman	Negligible
A7	22325	Little Eaton	Temporary camp?	**Camp Wood, Little Eaton** An early C19 reference to a Roman camp at Breadsall is said to refer to Camp Wood at Little Eaton, although no evidence has been found. Quarrying activity may have destroyed any former evidence of a Roman Camp.	Roman	Negligible
A8	32823	Kingsway/ Markeaton	Deer park	**Site of Markeaton medieval deer park, Derby** The site of a former medieval deer park. It lies to the NE of what is now known as Markeaton Park. The site is now under a large housing estate & the University of Derby grounds, but many of the former boundaries are still traceable.	Medieval	Negligible
A9	22328; ID313704	Little Eaton	Lynchet	**Lynchets west of Camp Wood, Little Eaton** A series of lynchets were noted in or before 1967.	Medieval to Post-medieval	Low
A10	32359	Kingsway/ Markeaton	Ridge and furrow, Landscaped park, Public park	**Markeaton Park, Markeaton, Derby** Landscape park associated with Markeaton Hall created in the 1770s by William Emes; part became a public park in *c.*1964. Fossilised ridge and furrow from the former Markeaton medieval village can be discerned amidst Emes' landscaping.	Medieval, Post-medieval to Modern	Low
A11	32358	Kingsway/ Markeaton	Manor house, Country house	**Site of Markeaton Hall, Markeaton, Derby** Site of country house built 1754-55, on or near the site of an earlier hall. Demolished 1964.	Medieval, Post-medieval to Modern	Low
A12	32135	Kingsway/ Markeaton	Mill pond, Corn mill, Watermill, Colour mill	**Former Markeaton Mills, Markeaton Street, Derby** Colour works founded after corn milling ceased on the site before 1818. All that remains of a once extensive colour grinding mill is the large mill pond, its feeder and outfall adjoining the brook course. A survey of 1737 currently provides the earliest evidence of a watermill on this site, although it is possible that one of the three watermills recorded on Markeaton Brook in 1272 also stood in this area.	Medieval, Post-medieval to Modern	Low
A13	99010	Little Eaton	Canal	**Derby Canal, Little Eaton branch** Canal that was opened in 1795.	Post-medieval	Low
A14	22311	Little Eaton	Tramway	**Little Eaton Tramway (route of)** The route of the Little Eaton Tramway is visible as a raised embankment. It was opened in 1793 and closed in 1908.	Post-medieval	Low

Asset Number	Reference	Junction	Site Type	Description	Period	Value
A15	99032	Little Eaton	Railway	**The North Midland Railway** Railway largely constructed between 1837 and 1838 and opened in July 1840.	Post-medieval	Low
A16	99013	Kingsway/ Little Eaton	Railway, Earthwork	**Derbyshire & North Staffordshire Extension (dismantled), Great Northern Railway** Railway line opened 1878; out of use by 1964 and now dismantled. Part now forms some of the Great Northern Greenway countryside trail for walkers and cyclists. Remnants of the Great Northern Railway embankment were located during an archaeological evaluation in advance of housing development at Alfreton Road.	Post-medieval	Negligible
A17	17307	Little Eaton	Railway station, Station Masters House	**Site of Breadsall Railway Station and the station house, off Station Road, Breadsall** Site of a railway station and station house of 1878, demolished, but some remains were uncovered as part of the Great Northern Greenway countryside trail.	Post-medieval	Negligible
A18	99046	Kingsway/ Markeaton	Toll road	**Derby to Brassington (via Hulland Ward) turnpike road** One of the earliest turnpike roads in Derbyshire, sanctioned by an Act of 1738. Built with the understanding that the road from Manchester would be extended S to complete the link across the Peak District.	Post-medieval	Negligible
A19	99045	Kingsway/ Markeaton	Toll road	**Derby to Hurdlow (via Ashbourne) turnpike road** One of the earliest turnpike roads in Derbyshire, sanctioned by an Act of 1738.	Post-medieval	Negligible
A20	32500	Kingsway/ Markeaton	Brickyard	**Site of brickyard, Slack Lane, Derby** Brickyard in operation until about 1900.	Post-medieval	Negligible
A21	32501	Kingsway/ Markeaton	Brickyard	**Site of brickyard, Bright Street, Derby** Brickyard in operation until about 1900.	Post-medieval	Negligible
A22	32620	Kingsway/ Markeaton	Brickyard	**Site of brickyard, Slack Lane, Derby** Brickyard in operation by 1852.	Post-medieval	Negligible
A23	32470	Kingsway/ Markeaton	Icehouse	**Site of icehouse, Markeaton Hall, Derby** Approximate site of an icehouse shown on late C19 & early C20 maps.	Post-medieval	Negligible
A24	32121	Kingsway/ Markeaton	Brewhouse	**Site of Brewhouse, Noel Street, Derby** Brewhouse built in the late 1860s. Small two storey brewhouse which served the Gallant Hussar Public House on the street corner. Exact location not known at present.	Post-medieval	Negligible
A25	32120	Kingsway/ Markeaton	Brewery	**Site of Manchester Brewery, Ashbourne Road, Derby** Site of a brewery established in 1848, but now demolished.	Post-medieval	Negligible
A26	32652	Kingsway/ Markeaton	Maltings	**Manchester Road Maltings, Ashbourne Road, Derby** Former malthouse complex associated with the nearby Manchester Brewery; a couple of buildings of the 1880s survive. On the City of Derby Local List.	Post-medieval	Low
A27	32785	Kingsway/ Markeaton	Public house	**Wagon & Horses Public House, No. 149 Ashbourne Road, Derby** A pub established by 1833. On the City of Derby Local List.	Post-medieval	Low
A28	32653	Kingsway/ Markeaton	Gate, Railings	**Gates and railings to former church, Ashbourne Road, Derby** Ornate gates and railings to former church along Ashbourne Road at the corner with Surrey Street. A chapel is shown on the site on the 2nd ed. 25"O.S. map, so was presumably built sometime between *c.*1880 & 1899, when the 1st ed. was revised. The railings may be of the same date. On the City of Derby Local List.	Post-medieval	Low
A29	32542	Kingsway/ Markeaton	Cottage home	**Former home for Penitent Females, Bass Street, Derby** Former Home for Penitent Females designed by George Henry Sheffield; built 1866-68, and extended 1993 as apartments. On the City of Derby Local List.	Post-medieval	Low
A30	NHLE1215688; 32181	Kingsway/ Markeaton	Toll house	**161, Ashbourne Road** Listed Building, grade II Early C19. Originally a toll house.	Post-medieval	Medium
A31	NHLE1215689	Kingsway/ Markeaton	Cottage	**193 and 195, Ashbourne Road** Listed Building, grade II Early C19. A pair of modest cottages	Post-medieval	Medium

Asset Number	Reference	Junction	Site Type	Description	Period	Value
A32	NLHE1230498; 32462	Kingsway/ Markeaton	Conservatory	**Conservatory in Markeaton Park** Listed Building, grade II Conservatory. Late C18 possibly designed by Joseph Pickford of Derby for the Mundy family.	Post-medieval	Medium
A33	17318	Little Eaton	House	**Manor Cottage, 39 Rectory Lane, Breadsall** A small late C18 house with major C20 extensions.	Post-medieval	Low
A34	22313	Little Eaton	Waterworks	**Waterworks, Alfreton Road, Little Eaton** Waterworks established in 1848 off Alfreton Road. The works were enlarged in the C20. A building of 1848 survives.	Post-medieval	Low
A35	NHLE1205253	Little Eaton	Cottage	**23, Rectory Lane** Listed Building, grade II Cottage. Probably early C17. Timber-framed, encased in C20 in cement render.	Post-medieval	Medium
A36	NHLE1328832	Little Eaton	Farmhouse	**Rose Cottage Shamrock Cottage** Listed Building, grade II Farmhouse, now two cottages. Probably early C17. Timber-framed with painted brick noggin.	Post-medieval	Medium
A37	NHLE1141233	Little Eaton	Rectory	**Breadsall Manor** Listed Building, grade II Rectory, now private house. Early C19. Red brick	Post-medieval	Medium
A38	-	Little Eaton	Farm building	**Ford Farm** Farmhouse and associated structures (boundary wall and gate pillar) that are originally shown on historic O.S map. The building is now re-used as a coffee house. Dates from at least mid- C19, it is double fronted with a central doorway of two storeys and two bays. Heavily altered.	Post-medieval	Low
A39	-	Kingsway/ Markeaton	Lodge	**Buried remains of lodge at Markeaton Park S entrance** The remains of a lodge that is shown on O.S. maps, but that has since been demolished.	Post-medieval	Negligible
A40	-	Kingsway/ Markeaton	Boundary wall	**Markeaton Park boundary wall** Wall of indeterminable date possibly relocated to present position late C20. Forms the southern boundary to Markeaton Park. It is a stone wall of squared tooled sandstone with segmental coping stones.	Post-medieval to Modern	Low
A41	-	Kingsway/ Markeaton, Little Eaton	World Heritage Site	**Derwent Valley Mills World Heritage Site** The World Heritage Site occupies the Derwent Valley and is bound to the east by the North Midlands Railway. Running through the heart of the site is the River Derwent which was key to the industrial development of the valley. The Derwent Valley, upstream from Derby on the southern edge of the Pennines, contains a series of C18 and C19 cotton mills and an industrial landscape of high historical and technological significance.	Post-medieval	Very High
A42	32104	Little Eaton	Ford, Bridge	**Ford, Allestree Ford Bridge, Allestree, Derby** Ford through the Derwent replaced by a bridge in the early C20.	Post-medieval to Modern	Negligible
A43	32158	Kingsway/ Markeaton	Silk mill	**Former Ashbourne Road Mills, Payne Street, Derby** Former silk mill built 1850s. Small two storey brick building with slate roof. This is all that survives of a silk mill built by John & William Rickard in the 1850s.	Post-medieval to Modern	Low
A44	32569	Kingsway/ Markeaton	Church, Font	**St Barnabas Church, Radbourne Street, Derby** Church built 1880 - 1903, designed by Arthur Coke-Hill; early font (medieval to post-medieval) allegedly from Dale Abbey. On the City of Derby Local List.	Post-medieval to Modern	Low
A45	32364	Kingsway/ Markeaton	Plaque	**Cast iron sign, 191 Ashbourne Road, Derby** C19/early C20 cast iron sign attached to building. On the City of Derby Local List.	Post-medieval to Modern	Low

Asset Number	Reference	Junction	Site Type	Description	Period	Value
A46	32122	Kingsway/ Markeaton	Malt house, Brewery, Vinegar brewery	**Former malthouse, brewery and vinegar works, Sherwin Street/ Kedleston Road** Malthouse built in late 1870s, with most buildings erected 1906; now a residential home for the elderly. On the City of Derby Local List.	Post-medieval to Modern	Low
A47	32780	Kingsway/ Markeaton	Primary school	**Markeaton Primary School, Bromley Street, Derby** Early C20 red brick school building. On City of Derby Local List.	Post-medieval to Modern	Low
A48	32315	Kingsway/ Markeaton	Landscape park	**Thornhill Park (former), Kingsway, Derby** Park created *c.*?1821.	Post-medieval to Modern	Negligible
A49	32314	Kingsway/ Markeaton	Country house, Psychiatric hospital	**Thornhill, Kingsway, Derby** Villa built 1821; later incorporated into Derby Lunatic Asylum.	Post-medieval to Modern	Low
A50	32581	Kingsway/ Markeaton	Psychiatric hospital	**Borough Lunatic Asylum, Uttoxeter Road, Rough Heanor, Derby** Institution built in stages from 1884 to 1914; designed by B S Jacobs of Hull.	Post-medieval to Modern	Low
A51	32357	Kingsway/ Markeaton	Farm	**Site of Humbleton Farm, Mackworth, Derby** Farm established following Parliamentary Enclosure in 1763, built over in *c.*1950.	Post-medieval to Modern	Negligible
A52	32582	Kingsway/ Markeaton	House	**Kingsway House, Uttoxeter Road, Rough Heanor, Derby** House built 1936-38, by C H Aslin.	Modern	Low
A53	32583	Kingsway/ Markeaton	Nurses hostel	**Kingsway Hospital Nurses Home, Uttoxeter Road, Derby** 1930s nurses home by George Morley Eaton. On the City of Derby Local List.	Modern	Low
A54	32812	Kingsway/ Markeaton	Pillar box	**Cast iron pillar box, Brackensdale Avenue, Mackworth, Derby** Edward VIII cast iron pillar box, one of only 271 in the country. On the City of Derby Local List.	Modern	Low
A55	18978	Kingsway/ Markeaton	Hosiery factory	**Britannia Mills, Markeaton Street/Mackworth Street, Derby** Hosiery mill built in 1912 on the site of an earlier mill and now used as part of Derby University. On the City of Derby Local List.	Modern	Low
A56	ID1473097	Kingsway/ Markeaton	Heavy anti-aircraft battery	**The site of a WW2 heavy anti-aircraft battery at Markeaton** It was listed as unarmed in 1942, and had been manned by 319 Battery of the 68th Royal Artillery Regiment in 1940.	Modern	Negligible
A57	ID1423384	Kingsway/ Markeaton	Spigot mortar emplacement	**The site of a WW2 spigot mortar base** Site of WW2 mortar base, 50 yards N of the old railway bridge, Kingsway, Derby.	Modern	Negligible
A58	ID1412127	Kingsway/ Markeaton	Army camp	**Army Camp 1901 - 2000** Markeaton Park was an army camp for the No 1 Young Soldiers Training Centre.	Modern	Negligible
A59	17321	Little Eaton	Ring ditch ?	**Possible Ring Ditch, *c.*400 m East of Holme Nook, Breadsall** Cropmark suggestive of a ring ditch identified on an aerial photograph of *c.*2006.	Unknown	Medium
A60	17303	Little Eaton	Natural feature	**Peg Low, Breadsall** Mound originally assumed to have been a barrow but, following excavation in the 1930s, now thought to be a natural feature.	Unknown	Negligible
A61	DDR7043	Little Eaton	Conservation area	**Breadsall Conservation Area**	n/a	Medium
A62	DDR7269	Kingsway/ Markeaton	Conservation area	**Friar Gate Conservation Area**	n/a	Medium
A63	DDR7270	Kingsway/ Markeaton	Conservation area	**Leylands Estate Conservation Area**	n/a	Medium

APPENDIX 8.1: SUMMARY OF ECOLOGICAL STUDIES AND SURVEYS CARRIED OUT (TO END OF 2017)

Appendix 8.1: Summary of Ecological Studies and Surveys Carried Out (to the end of 2017)

Study/ Survey	Survey Date	Study Area	Description	Report Reference[9]
Desk study	January 2015	International statutory designated sites up to 30km from the 2015 proposed scheme boundary[10] for sites designated at an international level for bats. All other statutory and non-statutory designated sites and non-designated sites of interest, and protected / notable species records up to 2km from the 2015 proposed scheme boundary.	A desk-based study with Derbyshire Wildlife Trust and other specialist groups, to identify international, national and other statutory designated sites, non-statutory local sites and non-designated sites of interest within proximity to the proposed scheme. Online resources also reviewed.	47071319-URS-05-RP-EN-003
Extended Phase 1	January/ February 2015	Up to 50m from the 2015 proposed scheme boundary	Extended Phase 1 habitat survey to map habitat types, and assess the potential for protected species and/or habitats or species groups of nature conservation importance to occur on and within close proximity to the 2015 proposed scheme. Included an assessment of features on and adjacent to the 2015 proposed scheme site for bat roost potential. The location and extent of invasive plant species was also recorded as part of these vegetation surveys.	47071319-URS-05-RP-EN-003
Breeding bird surveys	April, May and June 2015	Up to 500m from the 2015 proposed scheme boundary (although habitats within 50m of the 2015 proposed scheme were given greater emphasis)	Breeding bird surveys to specifically identify any notable / Schedule 1 bird species or assemblages of bird species within the extent or immediate vicinity of the 2015 proposed scheme.	47071319-URS-05-RP-EN-008
Great crested newt surveys	mid-April to May 2015	Up to 500m from the 2015 proposed scheme boundary	Great crested newt survey of ponds located within 500m of the 2015 proposed scheme to determine the presence/likely absence of great crested newts.	47071319-URS-05-RP-EN-009
Reptile surveys	June 2015	Up to 50m from the 2015 proposed scheme boundary	Reptile surveys at discrete locations that were considered to be potentially suitable to support this species group.	47071319-URS-05-RP-EN-010
Botanical survey	June 2015	Up to 50m from the 2015 proposed scheme boundary	Botanical survey of selected areas of grassland, hedgerows and other habitats comprising broadleaved woodland, plantation, scrub, ditch and standing water.	47071319-URS-05-RP-EN011
Badger surveys	January 2015	Up to 50m from the 2015 proposed scheme boundary (extended up to 500m from the proposed scheme boundary (where access allowed) to check those badger records identified from the desk study data search).	Badger survey also included ongoing monitoring in the 2015 ecology survey season to determine the presence of badger setts, and other badger field signs, across the proposed scheme.	47071319-URS-05-RP-EN-012
Terrestrial invertebrate surveys	June and August 2015	Up to 50m from the 2015 proposed scheme boundary for terrestrial invertebrates	Terrestrial invertebrate survey of selective areas of suitable habitat within and adjacent to the proposed scheme.	47071319-URS-05-RP-EN-013
Water vole and otter surveys	March and May 2015	Up to 250m from the 2015 proposed scheme boundary	Water vole and otter surveys on watercourses within and adjacent to the proposed scheme considered suitable to support these species groups.	47071319-URS-05-RP-EN-014
River habitat and river corridor survey	May 2015	Up 500m from the 2015 proposed scheme boundary	River habitat and river corridor survey of watercourses that may be crossed or potentially directly impacted by the proposed scheme.	47071319-URS-05-RP-EN-015
White-clawed	July and August	At least 50m from the 2015 proposed	White-clawed crayfish surveys on watercourses identified as potentially suitable	47071319-URS-05-RP-

[9] Refer to report for details on methodology used.
[10] The 2015/2016/2017 proposed scheme boundary is referred to as / where applicable .The 'proposed scheme boundary' otherwise refers to the 2018 proposed scheme boundary which this preliminary environmental information report is based on.

Study/ Survey	Survey Date	Study Area	Description	Report Reference[9]
crayfish surveys	2015	scheme boundary (extended further where necessary to take into account a 100 - 200 m sampling site within a 500 m section of watercourse)	to support this species group.	EN-017
Aquatic macro-invertebrate survey	Spring, Summer and Autumn 2015	Up to 250m from the 2015 proposed scheme boundary for aquatic macroinvertebrates	Aquatic macro-invertebrate survey on watercourses that would be most likely affected by the proposed scheme.	47071319-URS-05-RP-EN-018
Bat surveys	May to September 2015	Up to 50m from the 2015 proposed scheme boundary	Bat surveys on trees and structures, which were identified as having potential to support roosting bats during the Extended Phase 1, to determine the presence/likely absence of bats roosting. Bat activity surveys, comprising walked transect and static detector surveys, and bat trapping surveys, were also undertaken across the proposed scheme.	47071319-URS-05-RP-EN-020
Wintering bird surveys	September 2015 to March 2016	Targeted areas within and adjacent to the 2015 proposed scheme boundary only up to 100m	Wintering bird surveys to identify any notable wetland bird species or assemblages within the extent of the proposed scheme.	47071319-URS-05-RP-EN-022
Updated Desk Study	September 2016	Statutory and non-statutory designated sites and non-designated sites of interest 2km from the 2016 proposed scheme boundary.	An updated desk study was carried out for the proposed scheme, plus 19 additional sites identified as potential flood compensation; borrow pits; construction compounds; and/or ecological compensation areas.	47071319-URS-05-TN-EN-023
Extended Phase 1 Habitat Survey	September/October 2016	Up to 50m from the boundary of each of the 19 additional sites identified beyond the 2016 proposed scheme boundary.	Extended Phase 1 habitat surveys were carried out across 19 additional sites identified as potential flood compensation; borrow pits; construction compounds; and/or ecological compensation areas.	47071319-URS-05-TN-EN-023
Wintering Bird Survey	September 2016 to March 2017	Targeted areas within and adjacent to the 2016/17 proposed scheme boundary up to 100m.	Wintering bird surveys to identify any notable wetland bird species or assemblages within the extent of additional sites, which were not previously surveyed.	To be published
Extended Phase 1 Habitat Survey	February to June 2017	Up to 50m from the 2017 proposed scheme boundary.	Extended Phase 1 habitat survey to resurvey the habitats previously surveyed in 2015 and 2016, and survey new areas identified in 2017 as a result of proposed scheme boundary changes. This defined the scope of surveys for 2017 (as listed below).	To be published
Breeding Bird Survey	March to July 2017	Up to 50m from the 2017 proposed scheme boundary (Only 50m in comparison to 500m. The 2017 surveys were an update to the 2015 surveys. The surveys in 2015 were based on the road development (with potentially further ranging impacts). The additional sites, which concern storage areas, flood compensation/ecological compensation areas, were considered to not have as wider scale impacts. Schedule 1 species were however regarded adjacent to the sites).	As the 2015 breeding bird survey results were approaching 2 years old, those areas with the highest potential for breeding birds were resurveyed in 2017 to provide an update to determine whether the breeding bird assemblage remained comparable to that identified in 2015. Furthermore additional areas (for potential construction compounds, flood storage and ecological compensation) were added to the proposed scheme boundary, and required a full suite of breeding bird surveys in 2017.	To be published
Great Crested Newt Survey	Mid-April to May 2017	Up to 500m from the 2017 proposed scheme boundary	Great crested newt survey of ponds located within 500m of the 2017 proposed scheme to determine the presence/likely absence of great crested newts. New ponds identified which were not previously surveyed. Additionally, although a negative result in 2015, age of data was approaching 3 breeding seasons old and recommended to be updated.	To be published

Study/ Survey	Survey Date	Study Area	Description	Report Reference[9]
Reptile Survey	September to October 2017	Targeted areas within and adjacent to the 2017 proposed scheme boundary up to 100m	Reptile surveys at discrete locations that were considered to be potentially suitable to support this species group which were not previously surveyed in 2015. The new grassland habitats within Sites 8, 10 and 19 were identified to have potential to support reptile populations.	To be published
Botanical Survey	July 2017	Targeted areas within and adjacent to the 2017 proposed scheme boundary up to 50m	Resurvey of A38 Roundabout LWS and Alfreton Road Grassland LWS given the data from 2015 was approaching 2 years old. Survey of the A38 Scrub Site of Interest, a new designated site and area of woodland identified in 2017 due to proposed scheme boundary changes. Updated vegetation survey of species-rich areas and seven new grassland areas identified in 2017 due to proposed scheme boundary changes. One new hedgerow H8 species-rich also identified for further survey.	To be published
Badger Territory Analysis	January to February 2017	Up to 50m from the 2017 proposed scheme boundary (extended up to 500m from the proposed scheme boundary (where access allowed) to check those badger records identified from the desk study data search).	Updated badger survey and territory analysis based on the 2017 proposed scheme boundary.	To be published
Water Vole and Otter Survey	May to September 2017	Up to 250m from the 2017 proposed scheme boundary.	As the 2015 water voles survey results were approaching 2 years old, it was recommended that these waterbodies are re-surveyed. Lower reaches of Bramble Brook, upper and lower reaches of the River Derwent, lower reaches of Watermeadows Ditch, Bottle Brook and Pb1 were new watercourses / stretches of watercourse identified for survey as a result of proposed scheme boundary changes.	To be published
White-clawed Crayfish Survey	July 2017	At least 50m from the 2017 proposed scheme boundary at Little Eaton only (extended further where necessary to take into account a 100 - 200 m sampling site within a 500 m section of watercourse).	In 2015 AECOM recorded white-clawed crayfish on the Dam Brook. Potential for this species to be present within other watercourses and waterbodies which exist within or adjacent to the proposed scheme at Little Eaton Junction only. Data approaching 2 years old therefore updated survey recommended. As a result of the AECOM 2015 survey findings and the close proximity of signal crayfish further white-clawed crayfish surveys in the Markeaton and Kingsway junctions were not considered necessary and were discounted from further survey in 2017 Bottle Brook was a new watercourse not previously surveyed in 2015.	To be published
Aquatic Macro-invertebrate Survey	May and November 2017	Targeted areas from the 2017 proposed scheme boundary up to 250m.	Bottle Brook was a new watercourse identified as a result of proposed scheme boundary changes and subject to spring, summer and autumn aquatic macroinvertebrate surveys.	To be published
Bat Trapping and Radio-tracking	June and September 2017	Targeted areas within and adjacent to the 2017 proposed scheme boundary at Markeaton.	Targeted bat trapping and radio-tracking surveys on tree roosting bat species within and adjacent to the proposed scheme boundary at Markeaton (Markeaton Park and Mill Ponds). Also carried out to assist with determining population dynamics given high habitat valuation for bats at Markeaton.	To be published
Tree Climbing Bat Assessment	March to July 2017	Up to 50m from the 2017 proposed scheme boundary.	PRF assessment on trees with potential to be impacted by the proposed scheme, and not previously surveyed in 2015.	To be published

Study/ Survey	Survey Date	Study Area	Description	Report Reference[9]
Bat Roost Survey – Buildings and Structures	February to September 2017	Up to 50m from the 2017 proposed scheme boundary (confirmed roosts only or new features not previously surveyed in 2015)	External and internal survey assessments for the 17 residential properties at the Markeaton junction section of the proposed scheme, and subsequent dusk emergence and dawn re-entry surveys (where required). Bat roost presence / absence surveys for confirmed roost sites at buildings sand structures identified from the 2015 and 2016. This was to aim to gain up to date and more detailed survey information to further characterise the roosts, to support the ecological impact assessment of the scheme and feed into any potential draft licence applications. Dusk emergence / dawn return surveys recommended for the new potential roost features identified during the 2017 PRF assessment with potential to be impacted by the proposed scheme, and not previously surveyed in 2015.	To be published
Bat Activity Survey	April to October 2017	Up to 50m from the 2017 proposed scheme boundary.	Significant change in habitat suitability for bats recorded in 2017; in comparison to 2015. This was based on the bat survey results from 2015, desk study data records, and updated survey guidance. • Kingsway – Low (requiring spring, summer and autumn transects); • Markeaton – Moderate to High (recommended for bat trapping and radio tracking and transects alongside the Kingsway surveys); • Little Eaton – Moderate value (requiring monthly transect surveys April to October).	To be published

APPENDIX 8.2: DESIGNATED AND NON-DESIGNATED SITES

Table 8.2.1: Statutory Designated Sites within 2km of Kingsway and Markeaton Junctions (see Figure 8.2)

Site Name	Designation(s)	Reason for Designation	*Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of the Assessment (Reasoning)
Kedleston Park	Site of Special Scientific Interest (SSSI)	Rich and diverse deadwood invertebrate fauna which is primarily dependent upon the large number of mature and over-mature beech and pedunculate oak trees.	UK or National	SSSI denoting a protected area in the United Kingdom which is legally protected.	Approx. 1.9km north-west of proposed scheme boundary (Markeaton junction)	Scoped in (statutory designated site and proximity to proposed scheme)
Mickleover Meadows	Local Nature Reserve (LNR)	Diverse habitat mosaic	County or Unitary Authority	Local nature reserve designated by Derbyshire and/ or the local authority.	Approx. 0.7km west of proposed scheme boundary (Kingsway junction)	Scoped in (statutory designated site and proximity to proposed scheme)
Darley and Nutwood	LNR	Habitats include grassland being invaded by scrub and woodland which includes an area of ancient woodland.	County or Unitary Authority	Local nature reserve designated by Derbyshire and/ or the local authority.	Approx. 1.5km north-east of proposed scheme boundary (Markeaton junction)	Scoped in (statutory designated site and proximity to proposed scheme – see Table 8.2.4)

*Importance (or Value) is based on a hierarchical geographical approach used to assigning conservation resource importance as based upon IAN 130/10 and CIEEM 2016 guidance. This is provisional at this stage with full reasoning / rationale to be given within the ES.

Table 8.2.2: Non-statutory Designated Sites within 2km of Kingsway and Markeaton Junctions (see Figure 8.2)

Site Name	Designation(s)	Reason for Designation	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of the Assessment (Reasoning)
A38 Roundabout	Local Wildlife Site (LWS)	Semi-improved neutral grassland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Within proposed scheme boundary	Scoped in (within proposed scheme boundary)
Mickleover Railway Cutting	LWS	Habitat mosaic	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Adjacent to proposed scheme boundary continuing up to 0.8km west of proposed scheme boundary	Scoped in (adjacent to proposed scheme boundary)
Markeaton Brook System	LWS	Invertebrate assemblage (including white-clawed crayfish)	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features. Markeaton Brook is also a Water Framework Directive (WFD) waterbody.	Within proposed scheme boundary continuing up to 0.8km south-east of the scheme boundary and 1.2 km north of proposed scheme boundary	Scoped in (within proposed scheme boundary)
Bramble Brook and Margins	LWS	Secondary broad-leaved woodland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Adjacent to and within proposed scheme boundary	Scoped in (within proposed scheme boundary)
Markeaton Park	LWS	Wood pasture and Parks	County or	LWS designated in Derbyshire and	Directly adjacent to the north	Scoped in (adjacent to proposed

Site Name	Designation(s)	Reason for Designation	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of the Assessment (Reasoning)
		including veteran trees (BAP habitat – Wood pasture)	Unitary Authority	may include LBAP or HABAP 2002 features.	and west of proposed scheme boundary	scheme boundary)
Osierbed and Gravelpit Woods	LWS	Secondary broad-leaf wet woodland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.3km north west of proposed scheme boundary	Scoped in (Wet wood linked to Markeaton Brook System)
Markeaton Lane Meadow	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.4km north of proposed scheme boundary	Scoped in (Meadow adjacent to Markeaton Brook System)
Kedleston Road Marsh	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.8km north of proposed scheme boundary	Scoped in (adjacent to Markeaton Brook System)
Beech Wood	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.5km north east of proposed scheme boundary	Potentially scoped out*
Friargate Station	LWS	Presence of Red data book (RDB) species (BAP habitat – Open mosaic)	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.8km east of proposed scheme boundary	Potentially scoped out*
Kedleston Road Hedge	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.8km north of proposed scheme boundary	Scoped in (adjacent to Markeaton Brook System)
River Derwent	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.1km east of proposed scheme boundary	Scoped in (see Table 8.2.5)
Mickleover – Etwall Trail (Derby)	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.3km west of proposed scheme boundary	Potentially scoped out*
Mackworth Brook	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.4km west of proposed scheme boundary	Scoped in (adjacent to Markeaton Brook System)
Inglewood Avenue Meadow	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.5km west of proposed scheme boundary	Potentially scoped out*
Radbourne Lane Hedge	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.5km west of proposed scheme boundary	Potentially scoped out*
Bunkers Wood	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP	Approx. 1.3km south of proposed scheme boundary	Potentially scoped out*

Site Name	Designation(s)	Reason for Designation	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of the Assessment (Reasoning)
				2002 features.		
Woodlands School Hedges	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.8km north of proposed scheme boundary	Potentially scoped out*
Darley and Nutwood	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.5km north-east of proposed scheme boundary	See Darley and Nutwood LNR above

(LWS: Local Wildlife Site with designation numbers)

* No apparent habitat or hydrological links; segregated by residential development; and located >200m in terms of potential effects from air quality

Table 8.2.3: Non-Designated Sites of Interest within 2km of Kingsway and Markeaton Junctions (see Figure 8.2)

Site Name	Category (with DWT ref. no when available)	Reason for Designation	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of Assessment (Reasoning)
Land off Kingsway	Potential Local Wildlife Site (PLWS) (DE115 and (R6541)	Running water and small pond	Up to County or Unitary Authority	PLWS in Derbyshire (yet to be fully assessed)	Approx. 0.2km east of proposed scheme boundary	Scoped in (nitrogen oxides (NOx) have the potential to affect the composition of vegetation occur within 200m of the highway)
King Street	PLWS (DE072/3)	No information	Up to County or Unitary Authority	PLWS in Derbyshire (yet to be fully assessed)	Approx. 0.9km east of proposed scheme boundary	Potentially scoped out*
Old Cemetery	DE081/3	Not assessed	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1.0km east of proposed scheme boundary	Potentially scoped out*
All Saints Churchyard	AV015/3	Not assessed	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1.3km west of proposed scheme boundary	Scoped in (habitat and hydrological links via Mackworth Brook)
Littleover Brook	DE073/3	Not assessed	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1.3km south east of proposed scheme boundary	Potentially scoped out*
Rykneld Recreation Ground	DE087/3	Not assessed	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1.4km south east of proposed scheme boundary	Potentially scoped out*
Bunkers Grassland - Derby	PLWS	No information	Up to County or Unitary Authority	PLWS in Derbyshire (yet to be fully assessed)	Approx. 1.1km south of proposed scheme boundary	Potentially scoped out*
Hackwood Farm Pond	DE071/3	No information	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1.6km west of proposed scheme boundary	Potentially scoped out*
Markeaton Brook	AV017/3	No information	Up to County or	Local areas of ecological interest	Approx. 1.8km south of	Scoped in (hydrological links via

Site Name	Category (with DWT ref. no when available)	Reason for Designation	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of Assessment (Reasoning)
			Unitary Authority	(yet to be fully assessed)	proposed scheme boundary	Markeaton Brook System)
Old Hall Wood	DE082/3	Not assessed	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1.2km south of proposed scheme boundary	Potentially scoped out*
Gold Lane	AV009/3	No information (BAP habitat adjacent – Traditional Orchard)	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1.8km west of proposed scheme boundary	Potentially scoped out*
Richmond Close	PLWS	No information	Up to County or Unitary Authority	PLWS in Derbyshire (yet to be fully assessed)	Approx. 1.6km south of proposed scheme boundary	Potentially scoped out*
Lower Vicarwood Pond 2	AV010/3	No information	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1.9km north west of proposed scheme boundary	Scoped in (habitat and hydrological links via Kedleston Park and Markeaton Brook)
Hell Brook & Hell Brook Copse	PLWS	No information	Up to County or Unitary Authority	PLWS in Derbyshire (yet to be fully assessed)	Approx. 1.4km south of proposed scheme boundary	Potentially scoped out*
Lower Vicarwood Pond	AV013/3	No information	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 2.0km north west of proposed scheme boundary	Scoped in (habitat and hydrological links via Kedleston Park and Markeaton Brook)
Broadway Stream	DE056/3	No information	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Adjacent to Markeaton junction	Scoped in (due to proximity to the proposed scheme)

* No apparent habitat or hydrological links; segregated by residential development; and located >200m in terms of potential effects from air quality

Table 8.2.4: Statutory Designated Sites within 2km of Little Eaton Junction (see Figure 8.3)

Site Name	Designation(s)	Reason for Designation	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of Assessment (Reasoning)
Breadsall Railway Cutting	LNR, SSSI	Unimproved grassland. Calcareous, neutral and acidic grassland. Diverse butterfly population.	UK or National	SSSI denoting a protected area in the United Kingdom which is legally protected.	Approx. 1.5km south east of proposed scheme boundary	Scoped in (statutory designated site and proximity to proposed scheme)
Allestree Park	LNR	Parkland, veteran trees, secondary woodland and open water	County or Unitary Authority	Local nature reserve designated by Derbyshire and/ or the local authority.	Approx. 0.2km west of proposed scheme boundary	Scoped in (statutory designated site and proximity to the scheme. Nitrogen oxides (NOx) have the potential to affect the composition of vegetation occur within 200m of the highway).

Site Name	Designation(s)	Reason for Designation	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of Assessment (Reasoning)
Darley and Nutwood	LNR	Habitats include grassland being invaded by scrub and woodland which includes an area of ancient woodland.	County or Unitary Authority	Local nature reserve designated by Derbyshire and/ or the local authority.	Approx. 0.15km m south of proposed scheme boundary	Scoped in (statutory designated site and proximity to proposed scheme)
Chaddesden Wood and Lime Lane Wood	LNR	Ancient semi-natural oak woodland	County or Unitary Authority	Local nature reserve designated by Derbyshire and/ or the local authority.	Approx. 1.6km east of proposed scheme boundary	Scoped in (statutory designated site and proximity to proposed scheme)

Table 8.2.5: Non-statutory Designated Sites within 2km of Little Eaton Junction (see Figure 8.3)

Site Name	Designation(s)	Reason for Designation	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of Assessment (Reasoning)
Alfreton Road Rough Grassland	LWS	Floodplain grassland semi-improved	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Within proposed scheme boundary.	Scoped in (within proposed scheme boundary)
River Derwent	LWS	Flowing water, river and associated streams	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Within proposed scheme boundary.	Scoped in (adjacent to proposed scheme boundary)
Allestree Park	LWS	Unimproved neutral grassland (BAP habitat – Wood pasture)	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.2km west of proposed scheme boundary.	Scoped in (see Table 8.2.4)
Darley and Nutwood	LWS	Neutral grassland and ancient woodland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.15km south of proposed scheme boundary	Scoped in (see Table 8.2.4)
Burley Hill Farm Scrub and Grassland	LWS	Unimproved acid grassland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1km west of Little Eaton junction boundary	Scoped in (hydrological links to the proposed scheme via the River Derwent)
Breadsall Disused Railway	LWS	Unimproved neutral grassland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.3km south east of Little Eaton junction boundary	Potentially scoped out*
Hatherings Wood, Little Eaton	LWS	Secondary broadleaved woodland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.6km north of Little Eaton junction boundary	Potentially scoped out*
Camp Wood, Little Eaton	LWS	Secondary broad-leaved woodland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.3km east of Little Eaton junction boundary	Scoped in (habitat links and proximity to the proposed scheme)

Site Name	Designation(s)	Reason for Designation	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of Assessment (Reasoning)
Watermeadows ditch	LWS	Standing open water	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.4km south of Little Eaton junction boundary	Scoped in (hydrological links to the proposed scheme via Watermeadows ditch)
Peckwash Mills	LWS	Secondary broadleaved woodland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.4km north of the Little Eaton junction boundary.	Scoped in (habitat and hydrological connectivity via the River Derwent)
Nooney's Pond	LWS	Standing open water	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.7km south of Little Eaton junction boundary	Scoped in (hydrological links via Watermeadows Ditch)
Darley Park	LWS	Wood Pasture and Parkland (BAP habitat – Wood pasture)	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.7km south of Little Eaton junction Site boundary	Scoped in (habitat and hydrological connectivity via the River Derwent)
Beech Wood	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx.1.0km south-west of Little Eaton junction boundary.	Potentially scoped out*
Drum Hill Fields, Breadsall Moor	LWS	Unimproved acid grassland (BAP habitat – Lowland heathland)	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.1km north-east of Little Eaton junction boundary.	Scoped in (habitat links to the proposed scheme)
Ferriby Brook and Dam Brook	LWS (Includes PLWS (ER R6599 and ER009/3)	Secondary broad-leaved woodland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.2km east of Little Eaton junction boundary	Scoped in (hydrological links via Dam Brook)
Moor Road fields	LWS	Semi-improved neutral grassland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.2km east of Little Eaton junction boundary	Potentially scoped out*
Porter's Lane Hedge	LWS	Hedgerow	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.2km south east of Little Eaton junction boundary	Potentially scoped out*
Woodlands School Hedges	LWS	Hedgerow	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.2km west of Little Eaton junction boundary.	Potentially scoped out*
Breadsall Priory Golf Course	LWS	Wood-pasture and parks	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.2km north east of Little Eaton junction Site boundary	Scoped in (habitat and hydrological links via Boosemoor Brook)
Porter's Lane Pond	LWS	Standing open water	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.4km south east of Little Eaton junction boundary	Potentially scoped out*
Horsley Carr	LWS	Ancient woodland plantation-mixed	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or	Approx. 0.6km north-east of Little Eaton junction boundary.	Potentially scoped out*

Site Name	Designation(s)	Reason for Designation	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of Assessment (Reasoning)
				HABAP 2002 features.		
Moor plantation & Drum Hill	LWS	Secondary broadleaved woodland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.25km north-east of Little Eaton junction boundary.	Scoped in (habitat links via Drum Hill Fields, Breadsall Moor LWS)
Eatonpark Wood	LWS	Secondary broadleaved woodland (BAP habitat – Wood pasture)	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 0.8km north of Little Eaton junction boundary.	Potentially scoped out*
Burley Wood	LWS	Ancient-woodland plantation-broadleaved	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	1.5km west of Little Eaton junction boundary.	Potentially scoped out*
High View South Community School Nature Reserve	LWS	Unimproved neutral grassland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.5km south east of Little Eaton junction boundary	Potentially scoped out*
Whittaker Lane Woodland	LWS	Secondary broadleaved woodland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.1km north of Little Eaton junction boundary	Potentially scoped out*
Breadsall Railway Cutting	LWS	Unimproved neutral grassland	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.6km m south of Little Eaton junction boundary	Potentially scoped out*
Chaddesden Wood and Lime Lane Wood	LWS	Ancient semi-natural oak woodland (BAP habitat – Traditional orchard)	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.6km east of proposed scheme boundary	Scoped in (see Table 8.24)
Kedleston Road Hedge	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx.1.7km south-west of proposed scheme boundary	Scoped in (see Table 8.22)
Markeaton Park	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx.1.8km south-west of proposed scheme boundary	Scoped in (see Table 8.2.2)
Markeaton Lane Meadow	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx.1.8km south-west of proposed scheme boundary	Scoped in (see Table 8.2.2)
Kedleston Road Marsh	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx.1.8km south-west of proposed scheme boundary	Scoped in (see Table 8.2.2)
Great Farley's Wood	LWS	Ancient semi-natural woodland-mixed (BAP habitat –	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx. 1.75km north of proposed scheme boundary	Potentially scoped out*

Site Name	Designation(s)	Reason for Designation	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of Assessment (Reasoning)
		Traditional orchard)				
Markeaton Brook System	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx.2.0km south-west of proposed scheme boundary	Scoped in (see Table 8.2.2)
The Warren, Coxbench LWS	LWS	No information	County or Unitary Authority	LWS designated in Derbyshire and may include LBAP or HABAP 2002 features.	Approx.1.5km north of proposed scheme boundary	Potentially scoped out*

* No apparent habitat or hydrological links; segregated by residential development; and located >200m in terms of potential effects from air quality

Table 8.2.6: Non-designated Sites of Interest within 2km of Little Eaton Junction (see Figure 8.3)

Site Name	Category (with DWT Ref. No when available)	Reason for Consideration	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of Assessment (Reasoning)
A38 Scrub	DE050/3	Not assessed	Up to County or Unitary Authority	Local area of ecological interest (yet to be fully assessed)	Within proposed scheme boundary	Scoped in (within the proposed scheme boundary)
Ford Lane Field	Site recorded as a PLWS in 2015 by DWT but not in 2016. AV Grassland (no designation number)	Semi-improved acid grassland, needs survey	Up to County or Unitary Authority	Local area of ecological interest (previously a PLWS)	Within the proposed scheme boundary	Scoped in (within the proposed scheme boundary)
Des Lane Brook Course	DE/3	Not assessed	Up to County or Unitary Authority	Local area of ecological interest (yet to be fully assessed)	To the west of proposed scheme boundary	Scoped in (habitat and hydrological links via the River Derwent)
Boosemoor Brook	ER018/3	Not assessed	Up to County or Unitary Authority	Local area of ecological interest (yet to be fully assessed)	Adjacent to the east of proposed scheme boundary	Scoped in (habitat and hydrological links)
Plantation	ER017/3	Not assessed	Up to County or Unitary Authority	Local area of ecological interest (yet to be fully assessed)	Adjacent to proposed scheme boundary	Scoped in (adjacent to the proposed scheme)
Old Derby Canal	ER003/3	Not assessed	Up to County or Unitary Authority	Local area of ecological interest (yet to be fully assessed)	Adjacent to the south of proposed scheme boundary	Scoped in (adjacent to the proposed scheme)

Site Name	Category (with DWT Ref. No when available)	Reason for Consideration	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of Assessment (Reasoning)
Croft Wood	PLWS ER004	Secondary woodland	Up to County or Unitary Authority	PLWS in Derbyshire	Approx. 0.3km south of proposed scheme boundary	Potentially scoped out*
Marsh area, Breadsall	PLWS ER001	Swamp	Up to County or Unitary Authority	PLWS in Derbyshire	Approx. 0.2km south of proposed scheme boundary	Scoped in (In the same field as the proposed scheme; hydrological links with Watermeadows ditch)
The Slip	ER007/3	Not assessed	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 0.9km east of proposed scheme boundary	Potentially scoped out*
A6 Bank	PLWS DE R6335	Semi-improved grassland	Up to County or Unitary Authority	PLWS in Derbyshire	Approx. 0.3km west of proposed scheme boundary	Scoped in (habitat connectivity via Des Lane Brook course).
Holme Nook Ponds	PLWS DE R6440	Open water	Up to County or Unitary Authority	PLWS in Derbyshire	Approx. within 0.25km south of proposed scheme boundary	Scoped in (habitat and hydrological links via the River Derwent)
Rigga Quarry	PLWS	No information	Up to County or Unitary Authority	PLWS in Derbyshire (yet to be fully assessed)	Approx. 1km north west of proposed scheme boundary	Potentially scoped out*
Manor Farm Pasture	PLWS ER R6496	Acid grassland	Up to County or Unitary Authority	PLWS in Derbyshire	Approx. within 0.4km south east of proposed scheme boundary	Potentially scoped out*
Waste Land, Duffield	AV120/3	No information	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1.5km north west of proposed scheme boundary	Potentially scoped out*
St Edmunds Churchyard	DE088/3	Not assessed	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 0.5km west of proposed scheme boundary	Potentially scoped out*
Garage Pond	ER187/3	Not assessed	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 0.6km south east of proposed scheme boundary	Potentially scoped out*
Mill Plantation	PLWS ER008	Secondary woodland	Up to County or Unitary Authority	PLWS in Derbyshire	Approx. within 0.7km east of proposed scheme boundary	Scoped in (hydrological links via Dam Brook)
Outwoods	PLWS	No information	Up to County or Unitary Authority	PLWS in Derbyshire (yet to be fully assessed)	Approx. 1.25km south of proposed scheme boundary	Potentially scoped out*
Haslams Lane Brook course	Haslams	No information	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1km south of Little Eaton junction	Scoped in (hydrological links via River Derwent and Watermeadows ditch)
Embankment, Little Eaton	ER125/3	Not assessed	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully	Approx. 0.6km north east of proposed scheme boundary	Potentially scoped out*

Site Name	Category (with DWT Ref. No when available)	Reason for Consideration	Importance (or Value)	Rationale for Importance	Relationship to Scheme	Scoped Into or Out of Assessment (Reasoning)
				assessed)		
Little Eaton Acid Grassland	PLWS	No information	Up to County or Unitary Authority	PLWS in Derbyshire (yet to be fully assessed)	Approx. 0.05km north east of the Little Eaton junction	Scoped in (close proximity to the proposed scheme. Nitrogen oxides (NOx) have the potential to affect the composition of vegetation occur within 200m of the highway)
Ferriby Brook	PLWS	No information	Up to County or Unitary Authority	PLWS in Derbyshire (yet to be fully assessed)	Approx. 1.1km east of proposed scheme boundary	Scoped in (hydrological links via Dam Brook)
Home Farm Pond	ER015/3	No information	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1.3km north of proposed scheme boundary	Potentially scoped out*
Breadsall Moor Grassland	PLWS	No information	Up to County or Unitary Authority	PLWS in Derbyshire (yet to be fully assessed)	Approx. 0.4km north east of proposed scheme boundary	Scoped in (habitat links via Drumhill Fields, Breadsall Moor LWS)
River Derwent, Duffield Bridge	AV122/3	No information	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1.9km north of proposed scheme boundary	Scoped in (hydrological links via the River Derwent)
Broomfield Hedge	PLWS ER R6600	Ancient hedge	Up to County or Unitary Authority	PLWS in Derbyshire	Approx. 1.5km east of proposed scheme boundary	Scoped in (hydrological links via Dam Brook)
Broomfield College grasslands	PLWS	No information	Up to County or Unitary Authority	PLWS in Derbyshire (yet to be fully assessed)	Approx. 1.8km east of proposed scheme boundary	Potentially scoped out*
Daypark Quarry	AV030/3	No information	Up to County or Unitary Authority	Local areas of ecological interest (yet to be fully assessed)	Approx. 1.4km north of proposed scheme boundary	Potentially scoped out*
Bank plantation Horsley	PLWS	No information	Up to County or Unitary Authority	PLWS in Derbyshire	Approx. 1.9km north of proposed scheme boundary	Potentially scoped out*
Castle Wood Coxbench	PLWS AV038/3	No information	Up to County or Unitary Authority	PLWS in Derbyshire	Approx. 1.1km north of proposed scheme boundary	Potentially scoped out*

* No apparent habitat or hydrological links; segregated by residential development; and located >200m in terms of potential effects from air quality

APPENDIX 8.3: ECOLOGICAL FEATURES - HABITATS

Appendix 8.3: Ecological Features - Habitats

Ecological Feature – Habitats	Importance (or Value)	Rationale for Importance	Surveys Undertaken in 2015	Surveys Undertaken in 2016	Surveys Undertaken in 2017	Surveys for 2018
Semi-natural broad-leaved woodland and scattered broad-leaved trees	Up to County or Unitary Authority	LBAP habitats and habitats of principal importance; HABP 2002 and National Character Area profile.	Extended Phase 1 habitat survey in 2015; botanical survey in 2015; and river habitat and river corridor survey in 2015	Extended Phase 1 habitat survey in 2016	Extended Phase 1 habitat survey in 2017 across the proposed scheme; botanical survey of species-rich grassland areas and new habitat areas (including semi-improved grassland, woodland and hedgerows) identified from proposed scheme boundary changes in 2017.	Extended Phase 1 habitat survey of the proposed construction compound at Markeaton junction (which has not been previously surveyed); selective updates to botanical survey data from 2015; further botanical survey of the restored landfill site at Little Eaton following the botanical survey in 2017; and river habitat survey of those watercourses to be directly impacted / diverted by the proposed scheme (Dam Brook and Bramble Brook).
Semi-improved neutral grassland						
Standing water and associated inundation vegetation						
Running water						
Hedgerows						
Broadleaved plantation woodland	Local	Some LBAP habitats and habitats of principal importance; however, have low ecological value.				
Coniferous plantation						
Mixed plantation woodland						
Poor semi-improved grassland						
Improved grassland and arable						
Marshy grassland						
Dense and scattered scrub	Site	No notable or protected habitats. Common habitats found within the surrounding area, of limited ecological interest.				
Tall ruderal						
Amenity grassland						
Hard standing and bare ground						
Buildings						

APPENDIX 8.4: ECOLOGICAL FEATURES - SPECIES

Appendix 8.4: Ecological Feature – Species

Ecological Feature – Species	Importance (or Value)	Rationale for Importance	Surveys Undertaken in 2015	Surveys Undertaken 2016	Surveys Undertaken in 2017	Surveys for 2018
Flora species	N/A (Currently scoped out)	N/A (Currently scoped out)	Botanical survey in 2015	None	Botanical survey of species-rich grassland areas and new habitat areas (including semi-improved grassland, woodland and hedgerows) identified from proposed scheme boundary changes in 2017.	Selective updates to botanical survey data from 2015; and further botanical survey of the restored landfill site at Little Eaton following the botanical survey in 2017.
Great crested newts	N/A (Scoped out)	N/A (Scoped out)	Great crested newt survey in 2015; and desk study with Derbyshire Wildlife Trust (DWT).	A review of waterbodies within 500m of additional sites was carried out in 2016; and updated desk study with DWT.	A review of waterbodies within 500m of 2017 proposed scheme boundary; and great crested newt survey in 2017 across proposed scheme.	None
Toads	Local	LBAP species and a species of principal importance.	Great crested newt survey in 2015; and desk study with DWT.	A review of waterbodies within 500m of additional sites was carried out in 2016; and updated desk study with DWT.	A review of waterbodies within 500m of 2017 proposed scheme boundary; and great crested newt survey in 2017 across proposed scheme.	None
Reptiles	Up to County or Unitary Authority	LBAP species and a species of principal importance.	Reptile survey in 2015; and desk study.	As part of the extended Phase 1 habitat survey of additional sites in 2016, an assessment of habitats was made for their potential to support reptiles.	Extended Phase 1 habitat survey based on 2017 proposed scheme boundary; and reptile survey of selected sites. (Partially completed)	Complete reptile surveys at Site 10 and 19.
Badger	Local	Listed on HABP 2002, but not rare.	Badger survey in 2015 and monitoring throughout the 2015 ecological survey season; and desk study.	Partial badger survey as part of extended Phase 1 habitat survey in 2016 at additional sites.	Updated badger survey based on 2017 proposed scheme boundary; and badger territory analysis.	Updated characterisation of setts potentially impacted by the scheme to inform licencing; and desk study data.
Water vole	Up to County or Unitary Authority	HABAP 2002 species. Water Vole Species Action Plan 2005-2010.	Water vole survey in 2015; and desk study.	As part of the extended Phase 1 habitat survey of additional sites in 2016, an assessment of habitats was made for their potential to support water vole.	Extended Phase 1 habitat survey based on 2017 proposed scheme boundary; updated water vole survey of waterbodies surveyed in 2015; and water vole survey of new stretches of watercourse identified in 2017. (Partially completed)	Complete surveys at Little Eaton junction section of the proposed scheme (drain Pb1, Watermeadows Ditch, Dam Brook and the River Derwent).
Otter	Up to County or Unitary Authority	LBAP species; species of principal importance; and HABAP 2002 species.	Otter survey in 2015; and desk study.	As part of the extended Phase 1 habitat survey of additional sites in 2016, an assessment of habitats was made for their potential to support otter.	Extended Phase 1 habitat survey based on 2017 proposed scheme boundary; otter survey of waterbodies surveyed in 2015; and otter survey of new stretches of watercourse identified in 2017. (Partially completed)	Complete surveys at Little Eaton junction section of the proposed scheme (Dam Brook and Watermeadows Ditch).

Ecological Feature – Species	Importance (or Value)	Rationale for Importance	Surveys Undertaken in 2015	Surveys Undertaken 2016	Surveys Undertaken in 2017	Surveys for 2018
Bats – Roosting (all species)	Up to County or Unitary Authority	Rarer species nationally (Wray, 2010), present roosting. Common species also present roosting and are listed on LBAP, HABAP 2002 and are species of principal importance.	Bat roost surveys in 2015 (each built structure and tree within the proposed scheme boundary was assessed in-line with then current guidance from the Bat Conservation Trust (BCT) (Hundt, 2012). Between May and September 2015 dusk emergence and/or dawn re-entry surveys and/or thermal imaging surveys were undertaken at those built structures identified by the preceding bat roost potential survey as having potential to support roosting); and desk study.	As part of the extended Phase 1 habitat survey of additional sites in 2016, an assessment of habitats was made for their potential to support bats.	Bat surveys in 2017 (external and internal survey assessments for the 17 residential properties at the Markeaton junction section of the proposed scheme, and subsequent dusk emergence and dawn re-entry surveys. Bat roost presence / absence surveys for confirmed roost sites at buildings and structures identified from the 2015 and 2016. Tree climbing of new potential roost features based on the proposed scheme boundary); and desk study. (Partially completed)	Update of 2015 bat survey data; complete bat surveys at Markeaton and Little Eaton junction (buildings and trees); and potentially further updated characterisation surveys of identified bat roosts to support licences.
Bats – Foraging and Commuting (all species)	Up to County or Unitary Authority (Kingsway and Markeaton junction roadside habitat – Local; Markeaton Park – up to County; and Little Eaton junction up to County).	Rarer species nationally (Wray, 2010), present foraging and commuting. Common species also present foraging and commuting and are listed on LBAP, HABAP 2002 and are species of principal importance.	Bat activity surveys in 2015 – (activity surveys within and in the immediate vicinity of the proposed scheme were based on Hundt 2012 guidance. May, June and July transects); and desk study.	As part of the extended Phase 1 habitat survey of additional sites in 2016, an assessment of habitats was made for their potential to support bats.	Bat activity surveys in 2017 – (activity surveys within and in the immediate vicinity of the proposed scheme were based on Collins, 2016 guidance); bat trapping and radio-tracking; and desk study.	None
Birds – Breeding	Local	Presence of Barn owls, a Schedule 1 species, and lapwing at Little Eaton. Notable farmland birds and lapwing also at Little Eaton - BoCC Red or Amber list species; species of principal importance; and LBAP	Breeding bird surveys in 2015 (conducted across the proposed scheme to assess the conservation importance of the local bird assemblage and to identify habitat of importance to members of this species group); and	As part of the extended Phase 1 habitat survey of additional sites in 2016, an assessment of habitats was made for their potential to support breeding birds.	Selective updates across the proposed scheme based on the 2017 proposed scheme boundary; and full suite of breeding bird surveys at selected sites.	None

Ecological Feature – Species	Importance (or Value)	Rationale for Importance	Surveys Undertaken in 2015	Surveys Undertaken 2016	Surveys Undertaken in 2017	Surveys for 2018
		species.	desk study.			
Birds – Wintering	Local	No wintering bird population on site approached the 1% level of the national population, which would have constituted a nationally significant wintering bird population. Lapwing BoCC Redlist; species of principal importance; and LBAP species. Teal BoCC Amber list.	Wintering bird surveys in 2015/16 (conducted at Alfreton Road grassland LWS and Talbot Turf to the south west of Little Eaton junction) and desk study.	Wintering bird surveys of additional sites.	Update of 2015/16 wintering bird survey data at Little Eaton in 2017/18. (Results yet to be analysed and reported)	None
White-clawed crayfish	Up to County or Unitary Authority	Potential remnant local population at Dam Brook likely to represent critical component of the wider population. LBAP species.	White-clawed crayfish survey in 2015; and desk study.	As part of the extended Phase 1 habitat survey of additional sites in 2016, an assessment of habitats was made for their potential to support white-clawed crayfish.	Extended Phase 1 habitat survey based on 2017 proposed scheme boundary; an assessment of habitats was made for their potential to support white-clawed crayfish; and updated white-clawed crayfish surveys at Little Eaton. (Partially completed)	Further presence/absence survey on Dam Brook upstream of the A38/A61 roundabout to determine the likely impact of the proposed scheme on any remnant white-clawed crayfish populations which may be located upstream of the weir at this location.
Terrestrial invertebrates	Up to County or Unitary Authority	An assemblage of notable terrestrial invertebrate species was recorded in selective grassland areas.	Terrestrial invertebrate survey in 2015; and desk study.	As part of the extended Phase 1 habitat survey of additional sites in 2016, an assessment of habitats was made for their potential to support terrestrial invertebrates.	Extended Phase 1 habitat survey based on 2017 proposed scheme boundary; an assessment of habitats was made for their potential to support terrestrial invertebrates.	Selective update of the 2015 terrestrial invertebrate survey data; and terrestrial invertebrate survey (June, July and August) of the proposed construction compound at Little Eaton.
Aquatic macroinvertebrates	Up to County or Unitary Authority	Some regionally notable species recorded.	Aquatic invertebrate survey in 2015; and desk study.	As part of the extended Phase 1 habitat survey of the Additional Sites in 2016, an assessment of habitats was made for their potential to support aquatic invertebrates.	Extended Phase 1 habitat survey based on 2017 proposed scheme boundary; and aquatic invertebrate survey of Bottle Brook at Little Eaton junction.	Update of 2015 aquatic macroinvertebrate survey data (Markeaton Brook, Bramble Brook, River Derwent, Dam Brook).

APPENDIX 8.5: SUMMARY OF POTENTIAL SIGNIFICANCE OF ECOLOGICAL EFFECTS

Appendix 8.5: Summary of Potential Significance of Ecological Effects (Preliminary Assessment)

Designated Site / Habitat / Species	Ecological Feature	Importance (Value)	Potential Impact (Construction)	Mitigation & Enhancement Measures	Significance of Effect	Potential Impact (Operation)	Mitigation & Enhancement Measures	Significance of Effect
Statutory designated Sites	Kedleston Park SSSI	UK or National	Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Not significant (neutral)**	Surface water run-off	See Section 8.7.	**Not significant (neutral)**
	Breadsall Railway Cutting SSSI	UK or National	None	-	**Not significant (neutral)**	-	-	**Not significant (neutral)**
	Mickleover Meadows LNR	County or Unitary Authority	Disturbance through particulate loading/ pollution surface runoff from construction one	See Section 8.7.	**Not significant (neutral)**	-	-	**Not significant (neutral)**
	Darley and Nutwood LNR	County or Unitary Authority	Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Not significant (neutral)**	-	-	**Not significant (neutral)**
	Allestree Park LNR	County or Unitary Authority	Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Not significant (neutral)**	Surface water run-off and damage/ disturbance from salt spray/ emissions on habitats within 200m of proposed scheme boundary.	See Section 8.7.	**Not significant (neutral)**
	Chaddesden Wood and Lime Lane Wood LNR	County or Unitary Authority	None	-	**Not significant (neutral)**	-	-	**Not significant (neutral)**
Non-statutory designated sites	A38 Roundabout LWS	County or Unitary Authority	Habitat loss	See Section 8.7.	**Potentially up to a moderate significant negative effect**	-	-	**Not significant (neutral)**
	Bramble Brook and Margins LWS	County or Unitary Authority	Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Not significant (neutral)**	Surface water run-off and damage/ disturbance from salt spray/ emissions on habitats adjacent to proposed scheme boundary.	See Section 8.7.	**Not significant (neutral)**
	Markeaton Park LWS	County or Unitary Authority	Habitat loss Disturbance through particulate loading/ pollution surface runoff	See Section 8.7.	**Not significant (neutral)**	Surface water run-off and damage/ disturbance from salt spray/ emissions on	See Section 8.7.	**Not significant (neutral)**

Designated Site / Habitat / Species	Ecological Feature	Importance (Value)	Potential Impact (Construction)	Mitigation & Enhancement Measures	Significance of Effect	Potential Impact (Operation)	Mitigation & Enhancement Measures	Significance of Effect
			from construction			habitats adjacent to proposed scheme boundary		
	Markeaton Brook System LWS	County or Unitary Authority	Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Not significant (neutral)**	Surface water run-off and damage/ disturbance from salt spray/ emissions on habitats adjacent to proposed scheme boundary	See Section 8.7.	**Not significant (neutral). Potential for slight significant positive effect once mitigation has been implemented.**
	Mickleover Railway Cutting LWS	County or Unitary Authority	Habitat loss Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Not significant (neutral)**	Surface water run-off and damage/ disturbance from salt spray/ emissions on retained habitats adjacent to proposed scheme boundary	See Section 8.7.	**Not significant (neutral)**
	Osierbed and Gravelpit Woods LWS; Markeaton Lane Meadow LWS; Kedleston Road Marsh LWS; Kedleston Road Hedge LWS; Mackworth Brook LWS.	County or Unitary Authority	Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Not significant (neutral)**	Surface water run-off	See Section 8.7.	**Not significant (neutral)**
	Beach Wood LWS; Friargate station LWS; Mickleover – Etwall Trail (Derby) LWS; Inglewood Avenue Meadow LWS; Radbourne Lane Hedge LWS; Bunkers Wood LWS; Woodlands School Hedges LWS.	County or Unitary Authority	None	-	**Not significant (neutral)**	None	-	**Not significant (neutral)**
	Alfreton Road Grassland LWS	County or Unitary Authority	Habitat loss Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Potentially up to a moderate significant negative effect**	Surface water run-off and damage/ disturbance from salt spray/ emissions on retained habitats adjacent to proposed scheme boundary.	See Section 8.7.	**Not significant (neutral)**

Designated Site / Habitat / Species	Ecological Feature	Importance (Value)	Potential Impact (Construction)	Mitigation & Enhancement Measures	Significance of Effect	Potential Impact (Operation)	Mitigation & Enhancement Measures	Significance of Effect
	The River Derwent LWS	County or Unitary Authority	Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.		Surface water run-off and damage/ disturbance from salt spray/ emissions on retained habitats adjacent to proposed scheme boundary.	See Section 8.7.	**Not significant (neutral)**
	Allestree Park LWS; Darley and Nutwood LWS; and Chaddesden Wood and Lime Lane Wood LWS	County or Unitary Authority	Designated sites overlap with statutory designated sites. See above.					
	Burley Hill Farm Scrub and Grassland LWS; Camp Wood, Little Eaton LWS; Watermeadows Ditch LWS; Peckwash Mills LWS; Darley Park LWS; Drum Hill Fields LWS; Ferriby Brook and Dam Brook LWS; Breadsall Priory Golf Course LWS; Moor plantation and Drum Hill LWS	County or Unitary Authority	Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Not significant (neutral)**	Surface water run-off	See Section 8.7.	**Not significant (neutral)**
	Breadsall Disused Railway LWS; Hatherings Wood, Little Eaton LWS; Beech Wood LWS; Moor Road fields LWS; Porters Lane Hedge LWS; Woodlands School Hedges LWS; Porters Lane Pond LWS; Horsley Carr LWS; Eaton Park Wood LWS; Burley Wood LWS; High View South Community School Nature Reserve LWS; Whitaker Lane Woodland LWS; Breadsall Railway Cutting LWS; Great Farley's Wood LWS; and The Warren Coxbench LWS.	County or Unitary Authority	None	-	**Not significant (neutral)**	None	-	**Not significant (neutral)**
Non-designated sites of interest	Land off Kingsway PLWS	Up to County / Unitary Authority	Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Not significant (neutral)**	Surface water run-off and damage/ disturbance from salt spray/ emissions on	See Section 8.7.	**Not significant (neutral)**

Designated Site / Habitat / Species	Ecological Feature	Importance (Value)	Potential Impact (Construction)	Mitigation & Enhancement Measures	Significance of Effect	Potential Impact (Operation)	Mitigation & Enhancement Measures	Significance of Effect
						retained habitats adjacent to proposed scheme boundary.		
	All Saints Churchyard; Markeaton Brook System; Lower Vicarwood Pond; Lower Vicarwood Pond 2; Broadway Stream.	Up to County / Unitary Authority	Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Not significant (neutral)**	Surface water run-off	See Section 8.7.	**Not significant (neutral)**
	King Street PLWS; Old Cemetery; Littleover Brook; Rykneld Recreation Ground; Bunkers Grassland – Derby; Hackword Farm Pond; Old Hall Wood; Gold Lane; Richmond Close; Hell Brook & Hell Brook Copse	Up to County / Unitary Authority	-	-	**Not significant (neutral)**	-	-	**Not significant (neutral)**
	A38 Scrub DE05.03	Up to County or Unitary Authority	Habitat loss Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Not significant (neutral)**	Surface water run-off and damage/ disturbance from salt spray/ emissions on retained habitats adjacent to proposed scheme boundary.	See Section 8.7.	**Not significant (neutral)**
	Ford Lane Field	Up to County or Unitary Authority	Habitat loss Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Potentially up to a slight significant beneficial effect.**	Surface water run-off and damage/ disturbance from salt spray/ emissions on retained habitats adjacent to proposed scheme boundary.	See Section 8.7.	**Not significant (neutral)**
	Des Lane Brook Course DE/3; Boosemoor Brook ER018/3; Plantation ER017/3; Old Derby Canal ER003/3; Marsh Area Breadsall PLWS; A6 Bank PLWS Holme Nook Ponds; Mill Plantation PLWS; Haslams Lane Brook Course; Little	Up to County or Unitary Authority	Disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Not significant (neutral)**	-	See Section 8.7.	

Designated Site / Habitat / Species	Ecological Feature	Importance (Value)	Potential Impact (Construction)	Mitigation & Enhancement Measures	Significance of Effect	Potential Impact (Operation)	Mitigation & Enhancement Measures	Significance of Effect
	Eaton Acid Grassland PLWS; Ferriby Brook PLWS; Breadsall Moor Grassland PLWS; River Derwent Duffield Bridge AV122/3; Broomfield hedge PLWS							
	Croft Wood PLWS; The Slip ER007/3; Rigger Quarry PLWS; Manor Farm Pasture; Waste Land, Duffield AV120/3; St Edmunds Churchyard DE088/3; Garage Pond ER187/3; Outwoods PLWS; Embankment, little Eaton ER125/3; Home Farm Pond ER015/3; Broomfield College grasslands PLWS; Daypark Quarry AV030/3; Bank plantation Horsley; Castle Wood Coxbench	Up to County or Unitary Authority	-	See Section 8.7.	**Not significant (neutral)**	-	-	**Not significant (neutral)**
Habitat	Semi-natural broad-leaved woodland and scattered broad-leaved trees	Up to County or Unitary Authority	Habitat Loss and / or Potential disturbance through particulate loading/ pollution surface runoff from construction	See Section 8.7.	**Potentially up to a moderate significant adverse effect in the short to medium term** (particularly on woodlands until replacement habitat establishes); **no significant adverse effect (neutral) in the long term. Potential for a slight beneficial effect** in the long term (where net-gains may be achieved).	Surface water run-off and damage/ disturbance from salt spray/ emissions on retained habitats adjacent to proposed scheme.	See Section 8.7.	**Not significant (neutral)**
	Semi-improved neutral grassland							
	Standing water and associated inundation vegetation							
	Running water							
	Hedgerows							
	Broadleaved plantation woodland	Local						
	Coniferous plantation							
	Mixed plantation woodland							
	Poor semi-improved grassland							
	Improved grassland and arable							
	Marshy grassland							
Species	Toads	Local	Habitat loss Killing/ injury/ disturbance from construction	See Section 8.7.	**Not significant (neutral). Potential for a slight beneficial effect** in	Surface water run-off Killing/injury through collision with motor	See Section 8.7.	**Not significant (neutral)**

Designated Site / Habitat / Species	Ecological Feature	Importance (Value)	Potential Impact (Construction)	Mitigation & Enhancement Measures	Significance of Effect	Potential Impact (Operation)	Mitigation & Enhancement Measures	Significance of Effect
					the long term	vehicles		
	Reptiles	Up to County	Unknown	See Section 8.7.	**Not significant (neutral)**	Unknown	See Section 8.7.	**Not significant (neutral)**
	Badger	Local	Habitat loss (loss of setts and destruction / severance of foraging and commuting habitat) Killing/ injury/ disturbance from construction	See Section 8.7.	**Not significant (neutral)**	Killing/ injury through collision with motor vehicles Disturbance through increased flood events	See Section 8.7.	**Not significant (neutral). Potentially a slight significant beneficial effect** (once mitigation has been implemented)
	Water vole	Up to County or Unitary Authority	Killing/ injury/ disturbance from construction	See Section 8.7.	**Not significant (neutral)**	Surface water run-off	See Section 8.7.	**Not significant (neutral)**
	Otter	Up to County or Unitary Authority	Habitat loss (destruction and severance of foraging and commuting habitat). Killing/ injury/ disturbance from construction	See Section 8.7.	**Not significant (neutral)**	Killing/ injury through collision with motor vehicles or becoming trapped in drain outfalls	See Section 8.7.	**Potentially a slight significant beneficial effect** (once mitigation has been implemented)
	Bats - Roosting (all species)	Up to County or Unitary Authority	Loss of roosts. Killing/ injury/ disturbance from construction	See Section 8.7.	**Not significant (neutral)**	Killing/ injury/ through collision with motor vehicles Light impacts on roosts and foraging and commuting corridors	See Section 8.7.	**Not significant (neutral)**
	Bats - Foraging and Commuting (all species)	Up to County or Unitary Authority (Kingsway and Markeaton junction roadside habitat – Local; Markeaton Park – up to County; and Little Eaton junction up to County).	Habitat loss (destruction and severance of foraging and commuting habitat). Killing/ injury/ disturbance from construction	See Section 8.7.	**Potentially up to a moderate significant adverse effect in the short term** (until habitat establishes); **no significant adverse effect (neutral) in the medium to long term. Potential for a slight beneficial effect** in the long term (where enhancements are achieved)			

Designated Site / Habitat / Species	Ecological Feature	Importance (Value)	Potential Impact (Construction)	Mitigation & Enhancement Measures	Significance of Effect	Potential Impact (Operation)	Mitigation & Enhancement Measures	Significance of Effect
	Birds - Breeding	Local	Habitat loss Killing/ injury/ disturbance from construction	See Section 8.7.	**Potentially up to a slight significant adverse effect in the short term** (particularly on common nesting birds until habitat establishes); **no significant adverse effect (neutral) in the medium to long term. Potential for a slight beneficial effect** in the long term (where enhancements are achieved).	Mortality due to collision with traffic Reduced population size and breeding success due to traffic noise and visual disturbance	See Section 8.7.	**Not significant (neutral)**
	Birds - Wintering	Local	Habitat loss Killing/ injury/ disturbance from construction	See Section 8.7.	**Not significant (neutral)**	Mortality due to collision with traffic Reduced population size and breeding success due to traffic noise and visual disturbance	See Section 8.7.	**Not significant (neutral)**
	White-clawed Crayfish	Up to County or Unitary Authority	Unknown	See Section 8.7.	**Not significant (neutral)**	Unknown	See Section 8.7.	**Not significant (neutral)**
	Terrestrial Invertebrates	Up to County or Unitary Authority	Habitat loss Killing/ injury/ disturbance from construction	See Section 8.7.	**Not significant (neutral)**	Surface water run-off	See Section 8.7.	**Not significant (neutral)**
	Aquatic Invertebrates	Up to County or Unitary Authority	Killing/ injury/ disturbance from	See Section 8.7.	**Not significant (neutral)**	Surface water run-off	See Section 8.7.	**Not significant (neutral)**

FIGURES

FIGURES

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Figure 1.2a: Proposed DCO Application Boundary (Kingsway and Markeaton Junctions)

Markeaton Park – Ecological Mitigation Candidate Site

Utilities Corridor along edge of Markeaton Park

Markeaton Park – Reconfiguration of Park Access

Brackensdale Avenue Access – Potential Construction Satellite Compound

Potential Construction Compound and Associated Access

Mackworth Park – Ecological Mitigation Candidate Site

Mill Pond – Ecological Mitigation Candidate Site

Territorial Army Base – Potential Soil Storage Area

Bramble Brook – Flood Storage Candidate Site

Kingsway Hospital – Ecological Mitigation Candidate Sites

KEY

RED LINE BOUNDARY

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Revision Details	By / Check	Date	Suffix
First Issue	LE / AW	12/05/17	P01
Ecological enhancement site at Markeaton amended. OS mapping updated.	SO / AJW	12/02/18	P02
Ecological enhancement site at Markeaton amended. OS mapping updated.	SO / AJW	26/02/18	P03
Ecological enhancement site at Markeaton amended. OS mapping updated.	LE / AJW	01/05/18	P04
Ecological enhancement site at Markeaton amended. OS mapping updated.	SO / AW	01/05/18	P05

Purpose of issue: FOR REVIEW & COMMENT

Client: A38 Derby Junctions Project, Highways England, Floor 5, 2 Colmore Square, 38 Colmore Circus, Birmingham, B4 6BN

Working on behalf of: highways england

Project Title: A38 DERBY JUNCTIONS

Drawing Title: RED LINE BOUNDARY SHEET 1 OF 2

Designed	Drawn	Checked	Approved	Date
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Internal Project No.: 60533462

Suitability: S3

Scale @ A1: 1:5000

Zone: Whole Scheme

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Drawing Number: Highways England PIN HE514503 / Originator ACM / Volume LSI / Location A38_SW_PR_ZZ / Type DR / Role DC / Number 0001 / Rev P05

Plot Date: 01 May 2018 16:26:27
File Name:C:\PW\WORKING\AECOM_EU\SERIHAT-OC\LAN\D0324\24\HE514503-ACM-LSI-A38_SW_PR_ZZ-DR-OC-0001

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Figure 1.2b: Proposed DCO Application Boundary (Little Eaton Junction)

N

Candidate Site for Construction Compound

Flood Storage and Ecological Mitigation Candidate Sites

Construction Access

Flood Storage and Ecological Mitigation Candidate Sites

Potential Soil Storage and Dam Brook Diversion

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Revision Details	By / Check	Date	Suffix
First Issue	LE / AW	12/06/17	P01
Alfreton Rd access removed. Flood compensation area and storage compound amended	SO / AJW	12/02/18	P02
Alfreton Rd access removed. Flood compensation area and storage compound amended	LE / AJW	20/02/18	P03
Alfreton Rd access removed. Flood compensation area and storage compound amended	SO / AJW	20/02/18	P04

Purpose of issue: FOR REVIEW & COMMENT

Client: A38 Derby Junctions Project, Highways England, Floor 5, 2 Colmore Square, 38 Colmore Circus, Birmingham, B4 6BN

Working on behalf of: highways england

Project Title: A38 DERBY JUNCTIONS

Drawing Title: RED LINE BOUNDARY SHEET 2 OF 2

Designed	Drawn	Checked	Approved	Date
	SO	GS	AJW	20/02/18

Internal Project No.	Suitability
60533462	S3
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RED LINE BOUNDARY

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HE514503	ACM	LSI	DR DC 0002	P04
Location: A38_SW_PR_ZZ		Type	Role Number	

Plot Date: 20 February 2018 16:09:29
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NOTES

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A38 left in left out access - Brackensdale Avenue

A38 left in left out access - Raleigh Street

Greenwich Drive South

Brackensdale Avenue Underpass

Designated Public Open Space

Kingsway Park Close

Mackworth Park

A5111 Kingsway

Entrance to Kingsway Retail Park

Bramble Brook

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Job Title

A38
DERBY JUNCTIONS

Drawing Title

KINGSWAY JUNCTION
EXISTING ARRANGEMENTS

AECOM Internal Project Number		Zone / Mileage		Suitability
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Designed	Drawn	Stage 1 check	Stage 2 check	Approved
SW	GB		SW	SW
Scale at A1		Originated		Date
1:2500				09/05/2016

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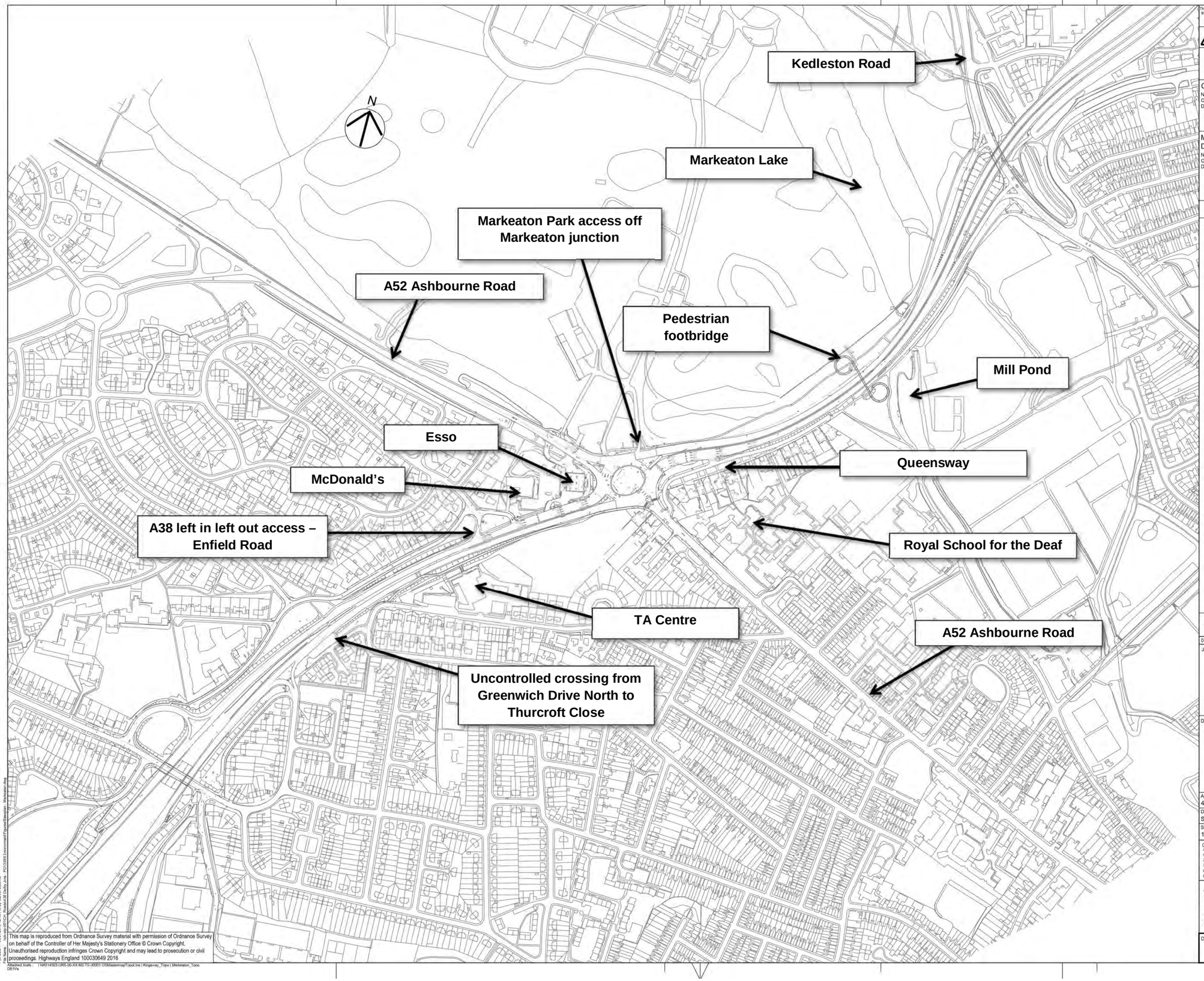
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Figure 2.1

Plot Date: 09/05/2016 1:52 PM By: Gareth Bloomer
File: C:\Users\gareth.bloomer\Desktop\A38 Derby Junctions_PC172902 Environment\Figures\Figure 2.1 - Kingsway.dwg
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0	DRAFT						

Job Title

A38
DERBY JUNCTIONS

Drawing Title

MARKEATON JUNCTION
EXISTING ARRANGEMENTS

AECOM Internal Project Number		Zone / Mileage		Suitability
47071319				W
Designed	Drawn	Stage 1 check	Stage 2 check	Approved
SW	GB		SW	SW
Scale at A1		Originated		Date
1:2500				09.05.2016

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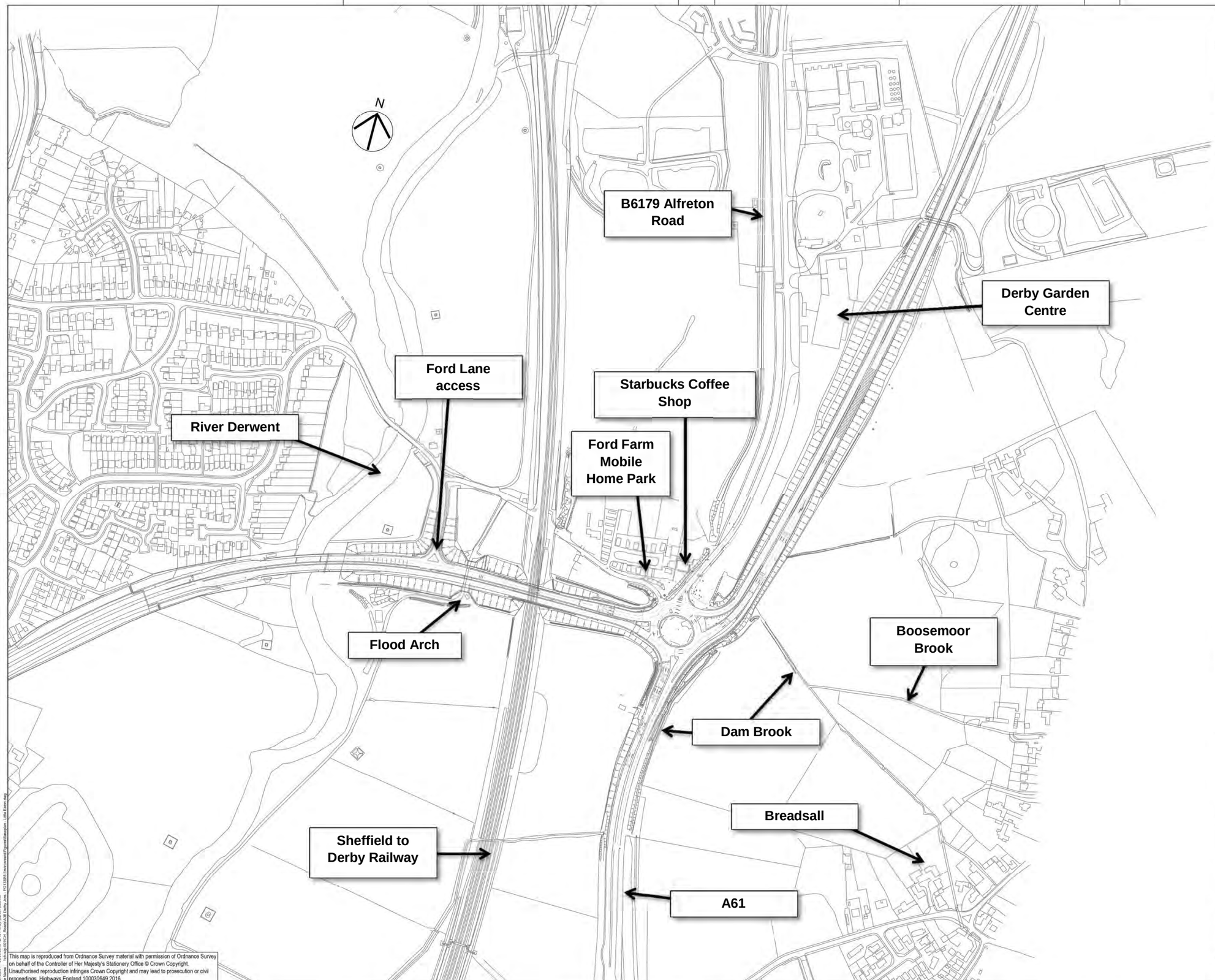
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Plot Date: 09/07/2016 12:49 PM By: Gareth Bourne
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Attached Xrefs: HA514503-URS-00-XX-M2-TS-00001 OSMastermapTopoLine | Kingsway_Topo | Markeaton_Topo
DB1Vs



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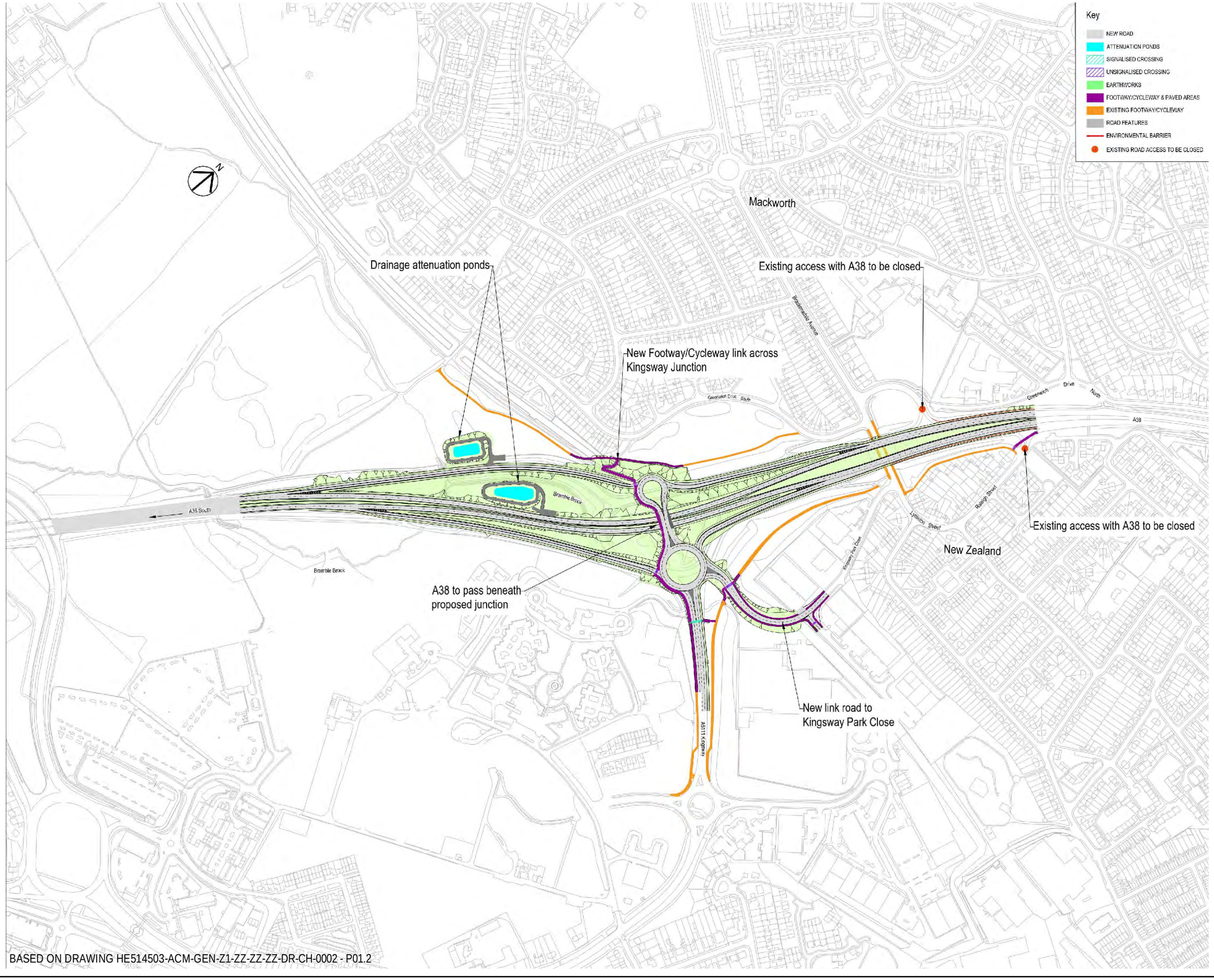
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Figure 2.3

Plot Date: 05/07/2016 12:49 PM By: Gareth Bloomer
File: Derby Junctions - Model/A38 Derby Junctions - 47071319 Environment/Figures/Mapping/A38 - Little Eaton.dwg
Attached Xrefs: | HA514503-URS-00-XX-M2-TS-00001 OSMastermapTopoLine | HA514503-URS-00-ZZ-M2-CE-0001-3eR_ProposedAlignment | Little_Eaton_Topo DBTVa



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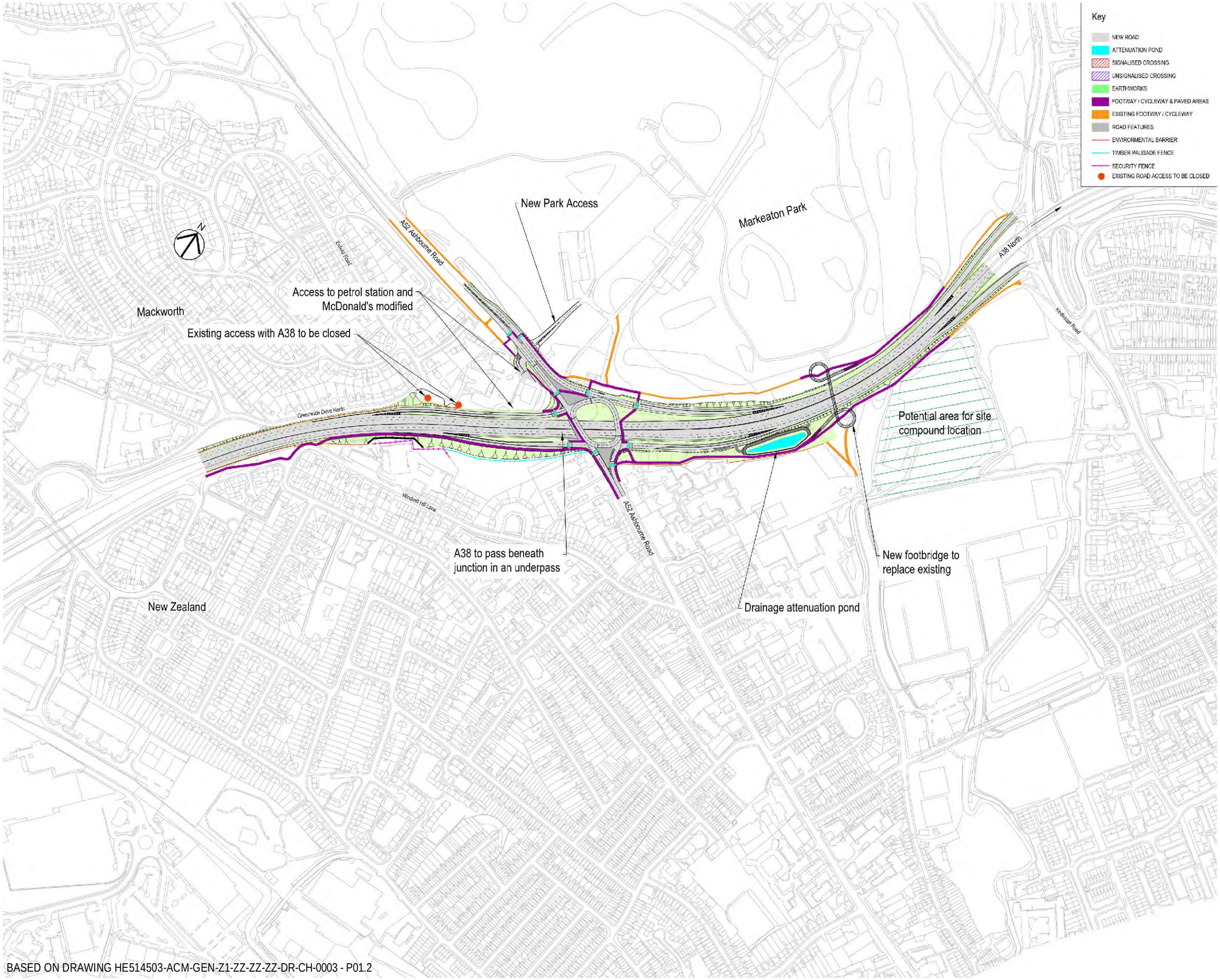
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Project Title: A38 DERBY JUNCTIONS

Drawing Title: MARKEATON JUNCTION CONSULTATION BROCHURE DRAWING

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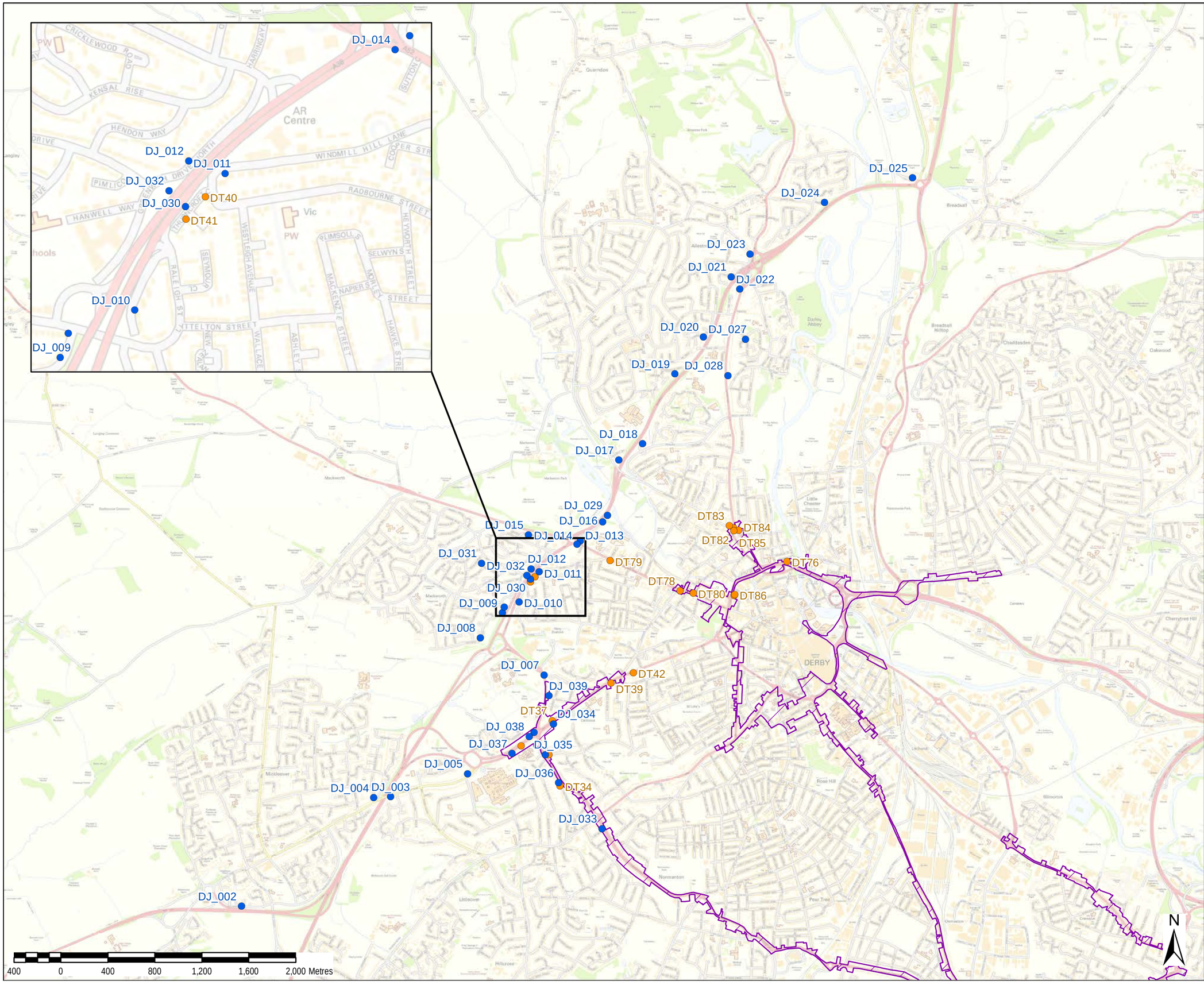
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LEGEND

- Highways England Monitoring
- Derby City Council Monitoring
- Air Quality Management Area
- Red Line Boundary

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4							
3							
2							
1							
0	FIRST ISSUE						
Rev #							
D	DRAFT						

Job Title

A38
DERBY JUNCTIONS

Drawing Title

AQMAs AND AIR QUALITY
MONITORING LOCATIONS

AECOM Internal Project Number	Zone/Mileage	Suitability
60471077		

Designed	Drawn	Stage 1 check	Stage 2 check	Approved
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Scale at A3	Originated	Date
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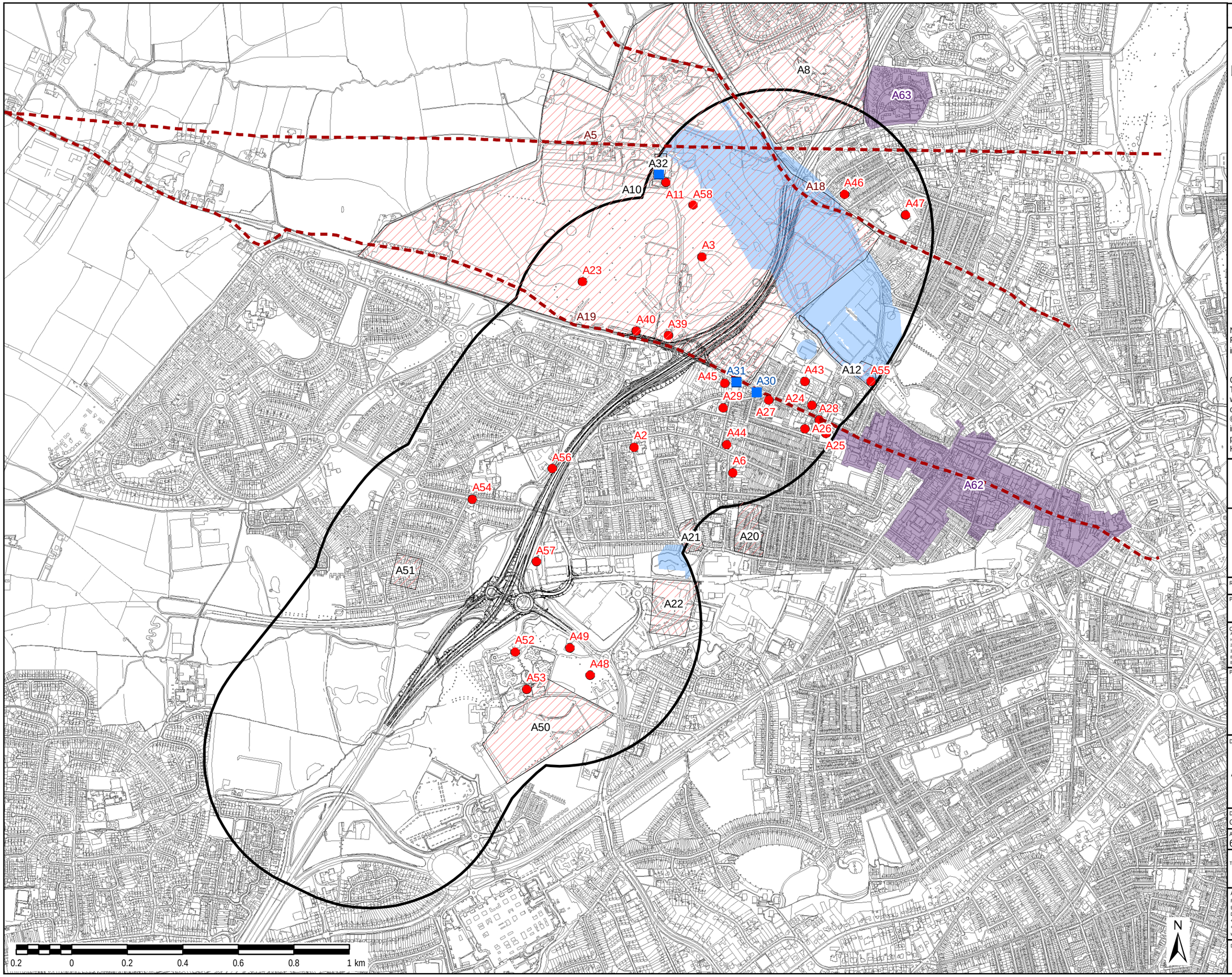
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FIGURE 5.1



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LEGEND

- Proposed Scheme
- 500m Study Area
- Listed Buildings
- Conservation Area
- Flood Plain (A4)
- Non-Designated Heritage Assets

Note
Figure illustrates proposed scheme design as detailed in Chapter 2: The Proposed Scheme

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Project Title: A38 DERBY JUNCTIONS

Drawing Title: LOCATION OF HERITAGE ASSETS AT PROPOSED KINGSWAY AND MARKEATON JUNCTIONS

Drawn	Checked	Approved	Date
GB	AC	SW	25/07/2018

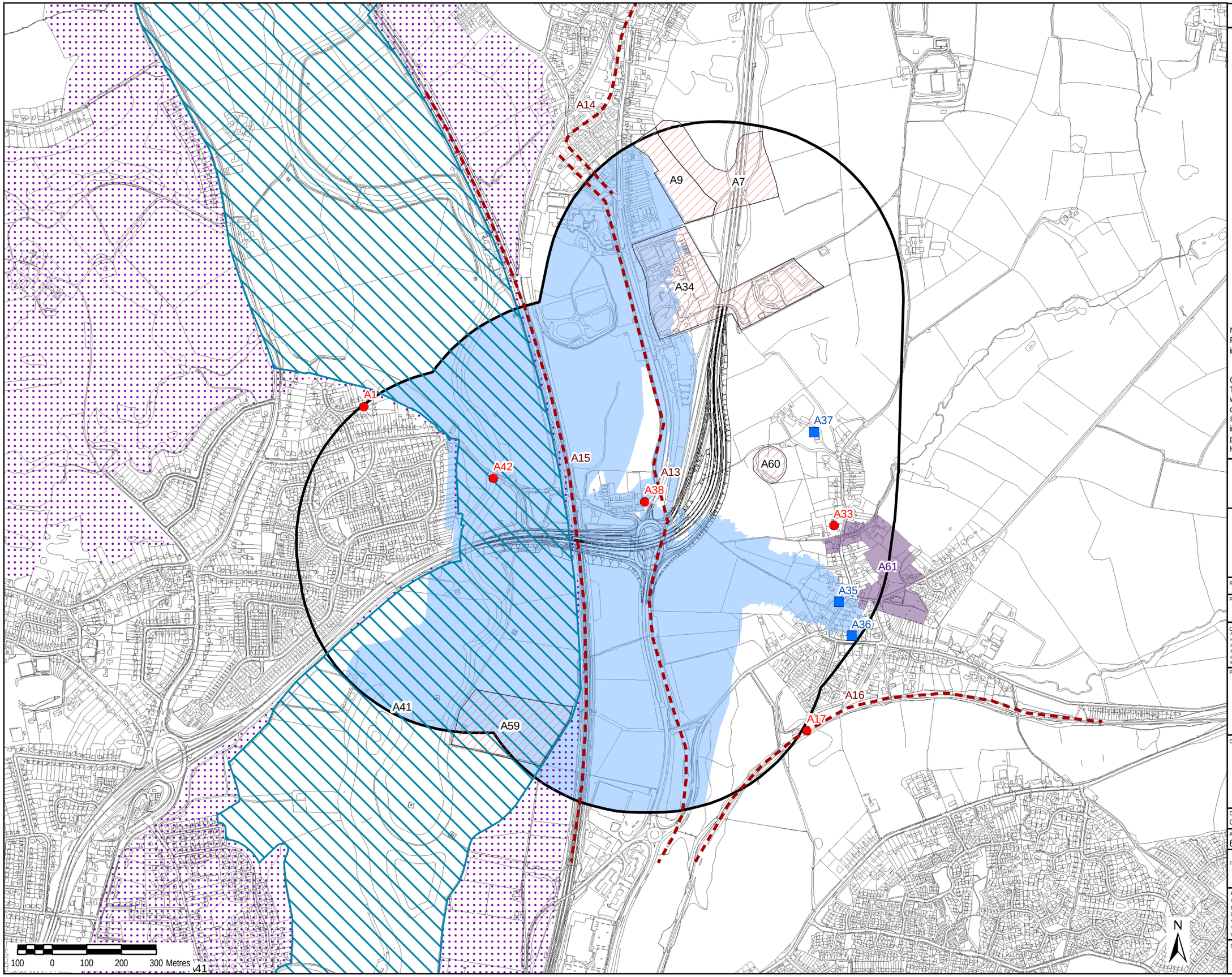
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Drawing Number	Rev
FIGURE 6.1	0

File Name:K:\Newprge\60533462 - A38 GIS\GIS\02_Maps\Heritage\Figure 6.1.mxd



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LEGEND

- Proposed Scheme
- 500m Study Area
- Listed Buildings
- Conservation Area
- Flood Plain (A4)
- Non-Designated Heritage Assets

World Heritage Site

- Derwent Valley Mills WHS Core Area (A41)
- Derwent Valley Mills WHS Buffer Zone

Note
Figure illustrates proposed scheme design as detailed in Chapter 2: The Proposed Scheme

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Highways Agency 100030649 2015.

Revision Details	By / Check	Check Date	Suffix

Purpose of Issue: FINAL

Client
A38 Derby Junctions Project
Highways England, Floor 5
2 Colmore Square
38 Colmore Circus
Birmingham
B4 6BN

Project Title: A38 DERBY JUNCTIONS

Drawing Title: LOCATION OF HERITAGE ASSETS AT PROPOSED LITTLE EATON JUNCTION

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AECOM Internal Project No.	Scale @ A3
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N

LITTLE EATON
QUARNDON
KEDLESTON HALL AND PARK
BREADSALL
ALLESTREE
DERBYSHIRE
DARLEY ABBEY
BREADSALL HILLTOP
OAKWOOD
MARKEATON
MARKEATON PARK
MACKWORTH
DERBY
DERBY CITY CENTRE
CHADDESDEN
ST LUKES
MICKLEOVER
A6
A61
A609
A38
A52
A5111
A516
A5250
A601
A5191
A614

LEGEND

- RLB
- Little Eaton 1km study area
- Markeaton 1km study area
- Kingsway 1km study area
- County boundary
- Viewpoint

Zone of Theoretical Visibility

- Visibility of lighting columns only
- Visibility of HGVs and lighting columns
- Visibility of cars, HGVs and lighting columns

Public Rights of Way

- Bridleway
- Byway Open to All
- Footpath
- Restricted Byway
- Temporarily Stopped Up

Long-Distance Footpaths

- Bonne Prince Charlie Walk
- Centenary Way
- Derwent Valley Heritage Way
- Midshires Way

National Cycle Routes

- National Route 54
- National Route 6
- National Route 672
- Regional Route 66

0 500 1,000 Meters

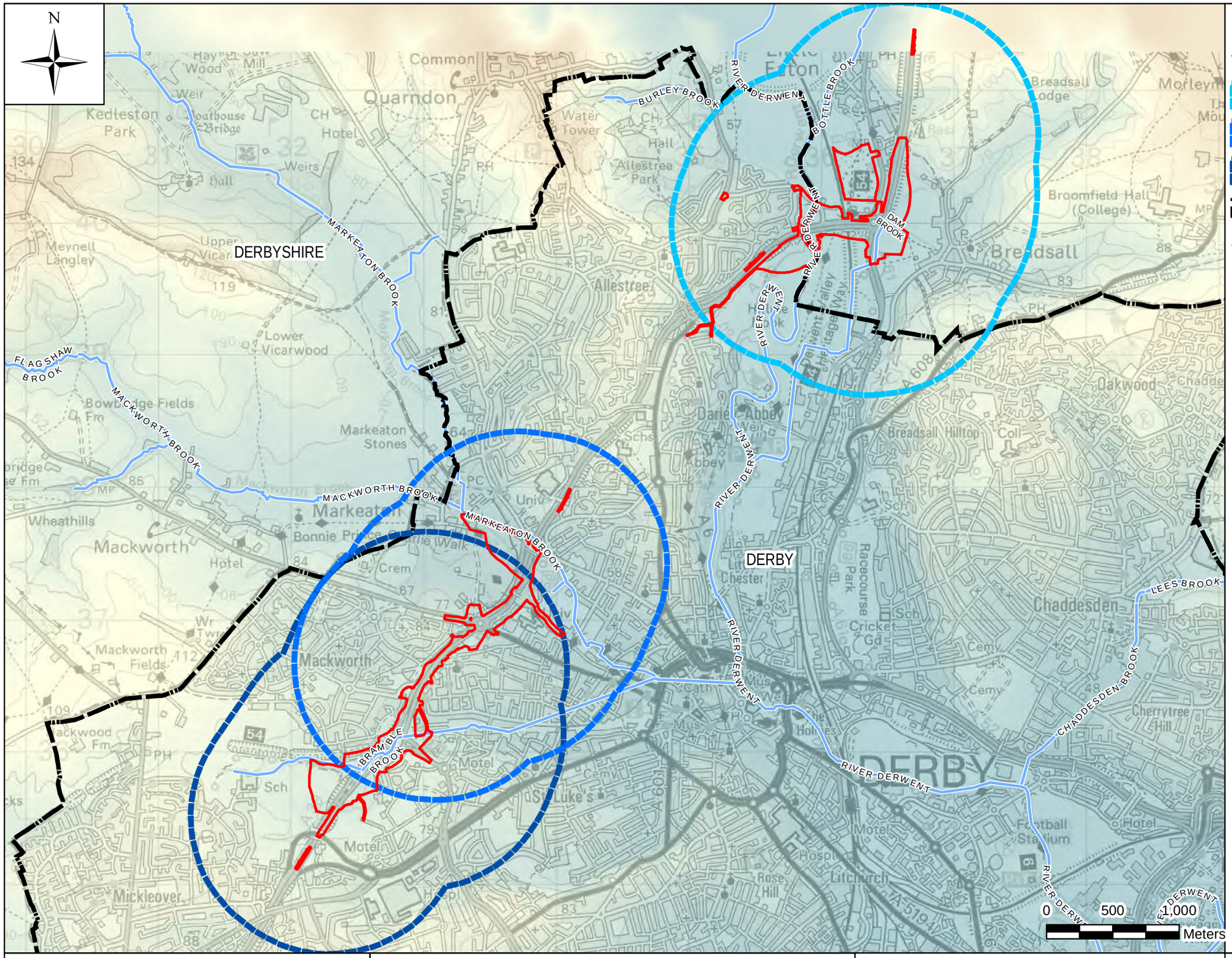
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Project:	A38 Derby Junctions
Title:	Figure 7.1 - Zone of Theoretical Visibility and Viewpoints

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LEGEND

- RLB
- Little Eaton 1km study area
- Markeaton 1km study area
- Kingsway 1km study area
- County boundary
- Rivers / watercourses

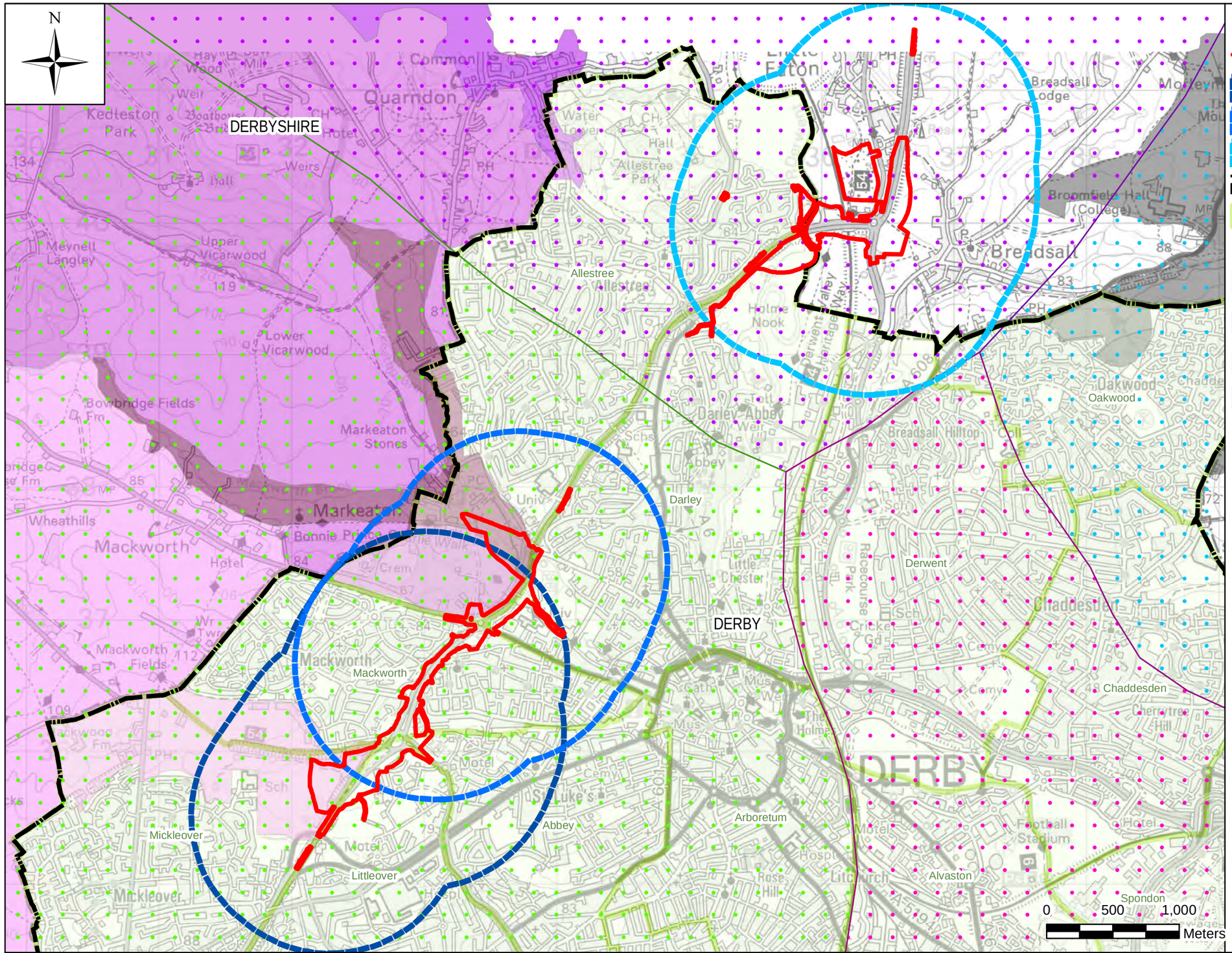
Topography

- Higher ground (up to 185.97m AOD)
- Lower ground (up to 35.1m AOD)

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Client: highways england — Highways England, Floor 5, Two Colmore Square, Birmingham, B4 6BN	Title: Figure 7.2 - Topography and Hydrology	AECOM — Royal Court, Basil Close, CHESTERFIELD S41 7SL; Tel: +44 (0) 1246 209221; Fax: +44 (0) 1246 209229; www.aecom.com	Design: RW / Drawn: RW
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LEGEND

- DCO boundary
- Kingsway 1km study area
- Markeaton 1km study area
- Little Eaton 1km study area
- County boundary
- Derby Townscape wards

National Character Areas

- NCA 38 - NOTTINGHAMSHIRE, DERBYSHIRE AND YORKSHIRE COALFIELD
- NCA 50 - DERBYSHIRE PEAK FRINGE AND LOWER DERWENT
- NCA 68 - NEEDWOOD AND SOUTH DERBYSHIRE CLAYLANDS
- NCA 69 TRENT VALLEY WASHLANDS

Derbyshire Peak Fringe and Lower Derwent LCA

- Gritstone Heaths and Commons LCT
- Riverside Meadows LCT
- Wooded Farmlands LCT
- Wooded Slopes and Valleys LCT

Needwood and South Derbyshire Claylands LCA

- Estate Farmlands LCT
- Riverside Meadows LCT
- Sandstone Slopes and Heaths LCT
- Settled Farmlands LCT
- Settled Plateau Farmlands LCT

Nottinghamshire, Derbyshire and Yorkshire Coalfield LCA

- Coalfield Village Farmlands LCT
- Plateau Estate Farmlands LCT

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Project: A38 Derby Junctions

Title: Figure 7.3 - Landscape Character

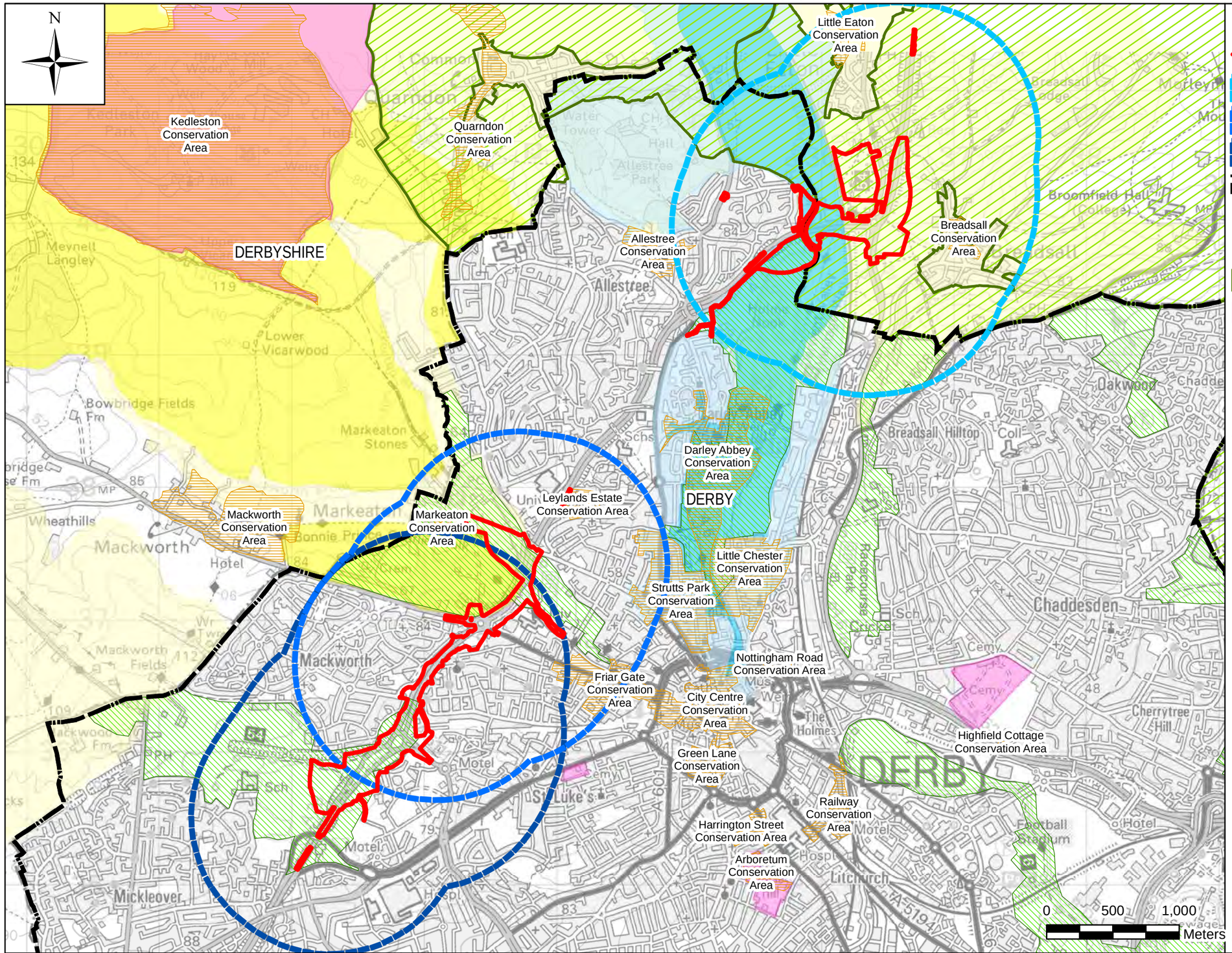
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LEGEND

- DCO boundary
- Little Eaton 1km study area
- Markeaton 1km study area
- Kingsway 1km study area
- County boundary
- Conservation Areas
- Green Wedge
- Green Belt
- Registered Park and Garden

World Heritage Site

- Derwent Valley Mills, Core Area
- Derwent Valley Mills, Buffer Zone

Areas of Multiple Environmental Sensitivity

Type

- Primary
- Secondary

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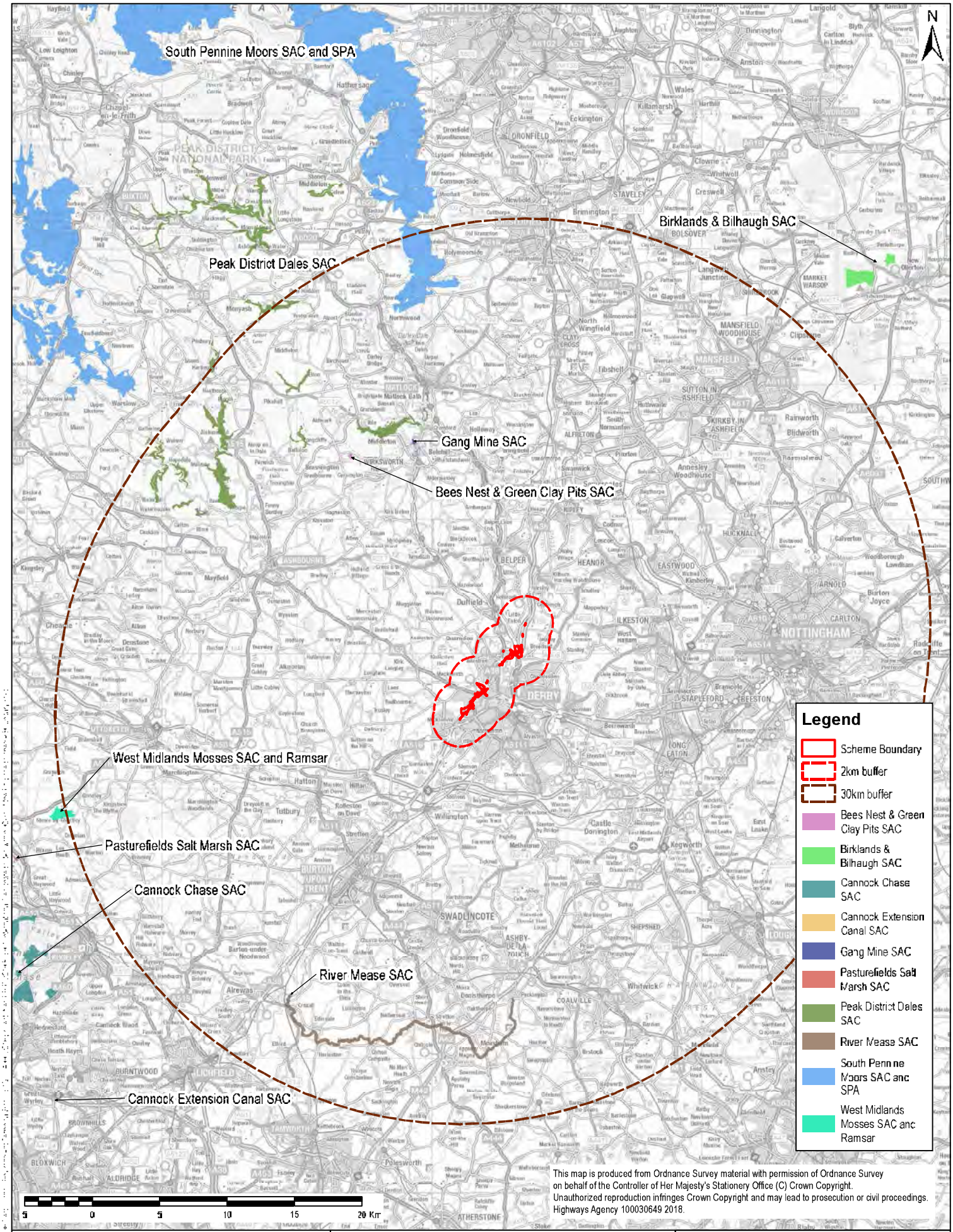
Project: A38 Derby Junctions

Title: Figure 7.4 - Landscape Designations

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Drawing Number: 60533462 - Figure 7.4 — A3



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Project Title/Drawing Title

A38 DERBY JUNCTIONS
INTERNATIONAL DESIGNATED SITES
WITHIN 30KM OF THE
PROPOSED SCHEME BOUNDARY

AECOM Internal Project Number
60533462

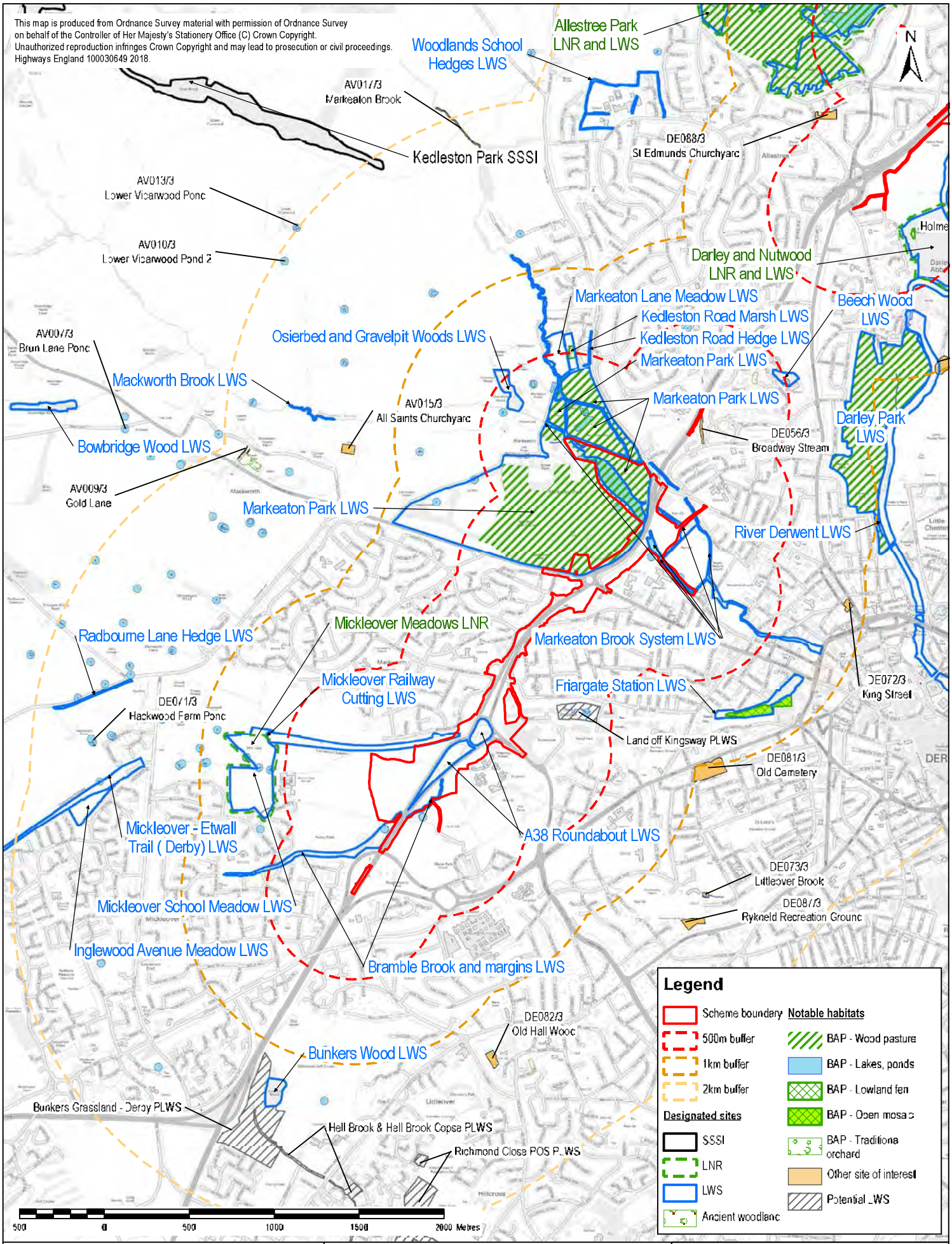
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Legend

Scheme boundary
500m buffer
1km buffer
2km buffer

Designated sites

SSSI
LNR
LWS
Ancient woodland

Notable habitats

BAP - Wood pasture
BAP - Lakes, ponds
BAP - Lowland fen
BAP - Open mosaic
BAP - Traditional orchard
Other site of interest
Potential LWS

Project Title/Drawing Title

A38 DERBY JUNCTIONS DESIGNATED SITES AND NOTABLE HABITATS WITHIN 2KM OF KINGSWAY AND MARKEATON JUNCTION

AECOM Internal Project Number
60533462

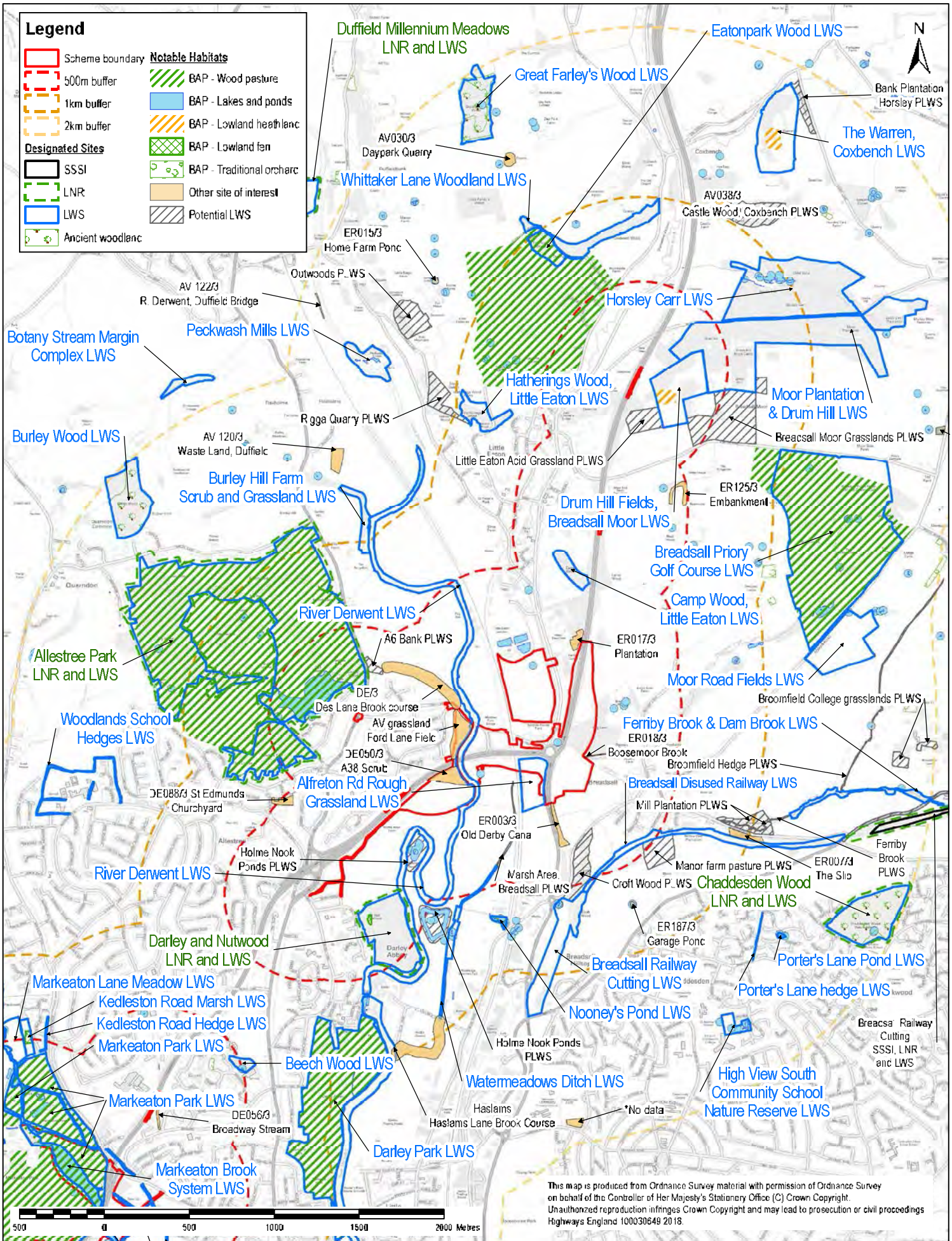
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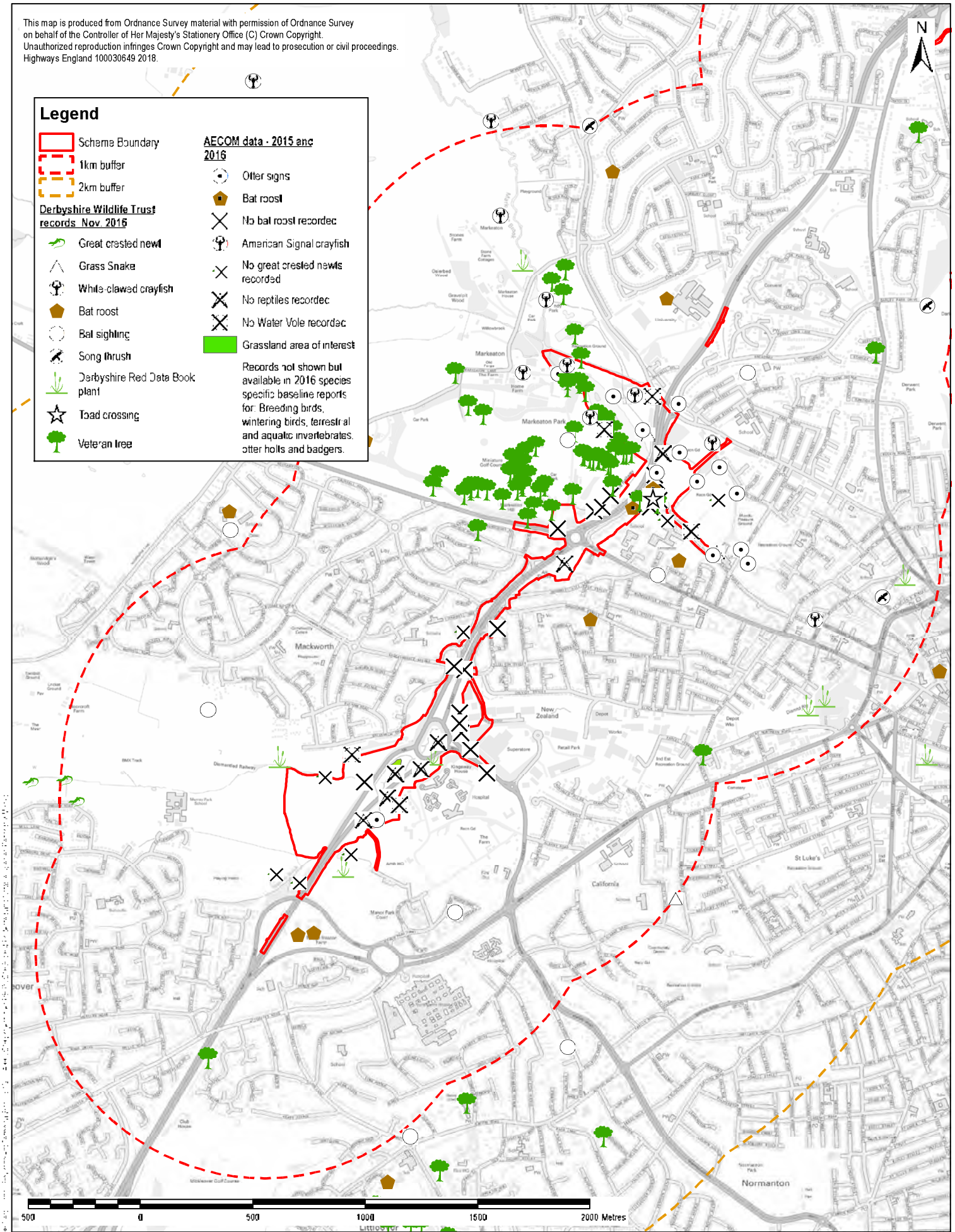
A38 DERBY JUNCTIONS DESIGNATED SITES AND NOTABLE HABITATS WITHIN 2KM OF LITTLE EATON JUNCTION

AECOM Internal Project Number 60533462		
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Project Title/Drawing Title

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KINGSWAY MARKEATON
PROTECTED AND NOTABLE SPECIES RECORDS

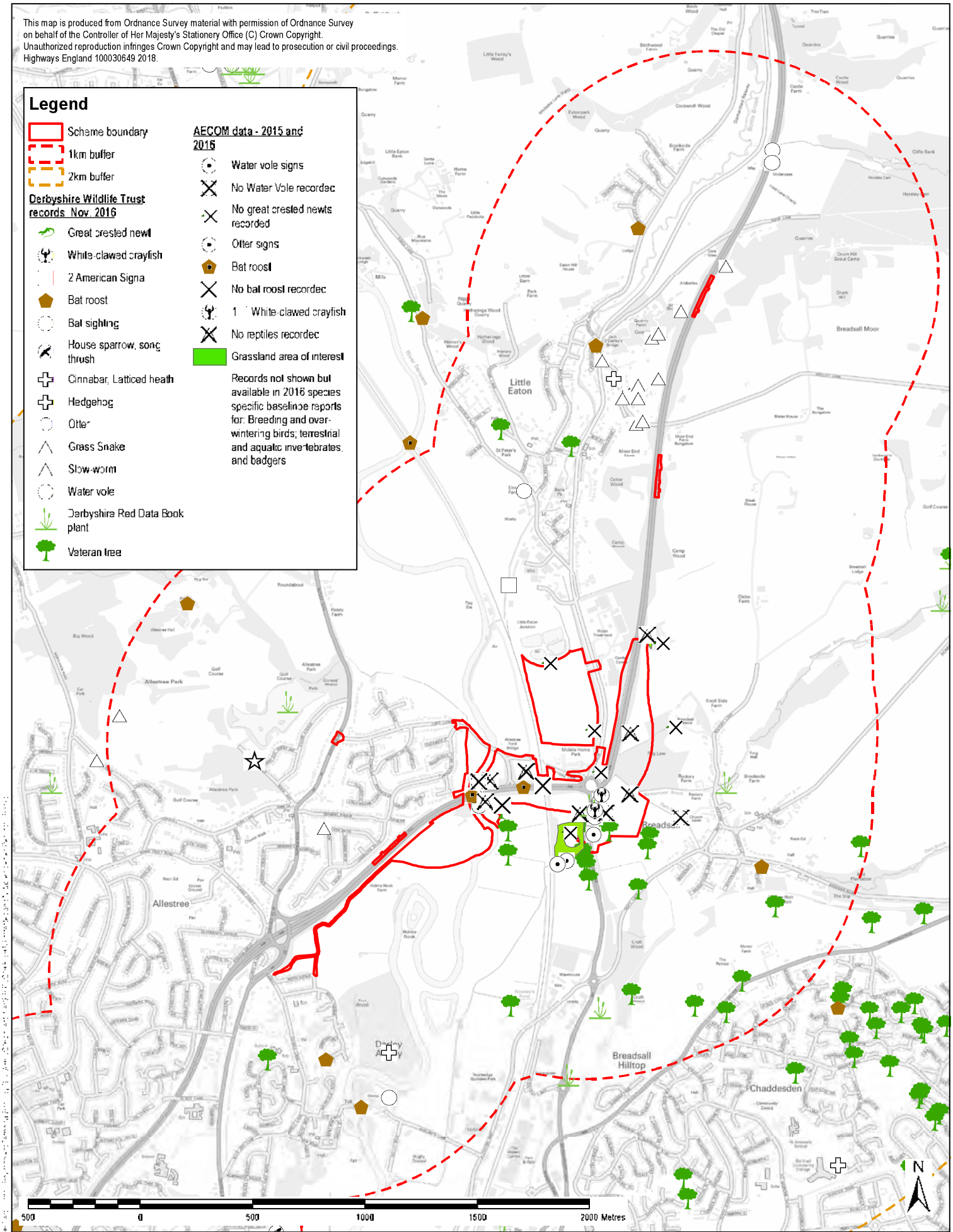
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Project Title/Drawing Title A38 DERBY JUNCTIONS LITTLE EATON PROTECTED AND NOTABLE SPECIES RECORDS	AECOM Internal Project Number 60533462	A38 Derby Junctions Project Highways England, Floor 5 2 Colmore Square 38 Colmore Circus Birmingham B4 6BN
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Legend



Project Title/Drawing Title

A38 DERBY JUNCTIONS
PHASE 1 HABITAT SURVEY
MAP LEGEND

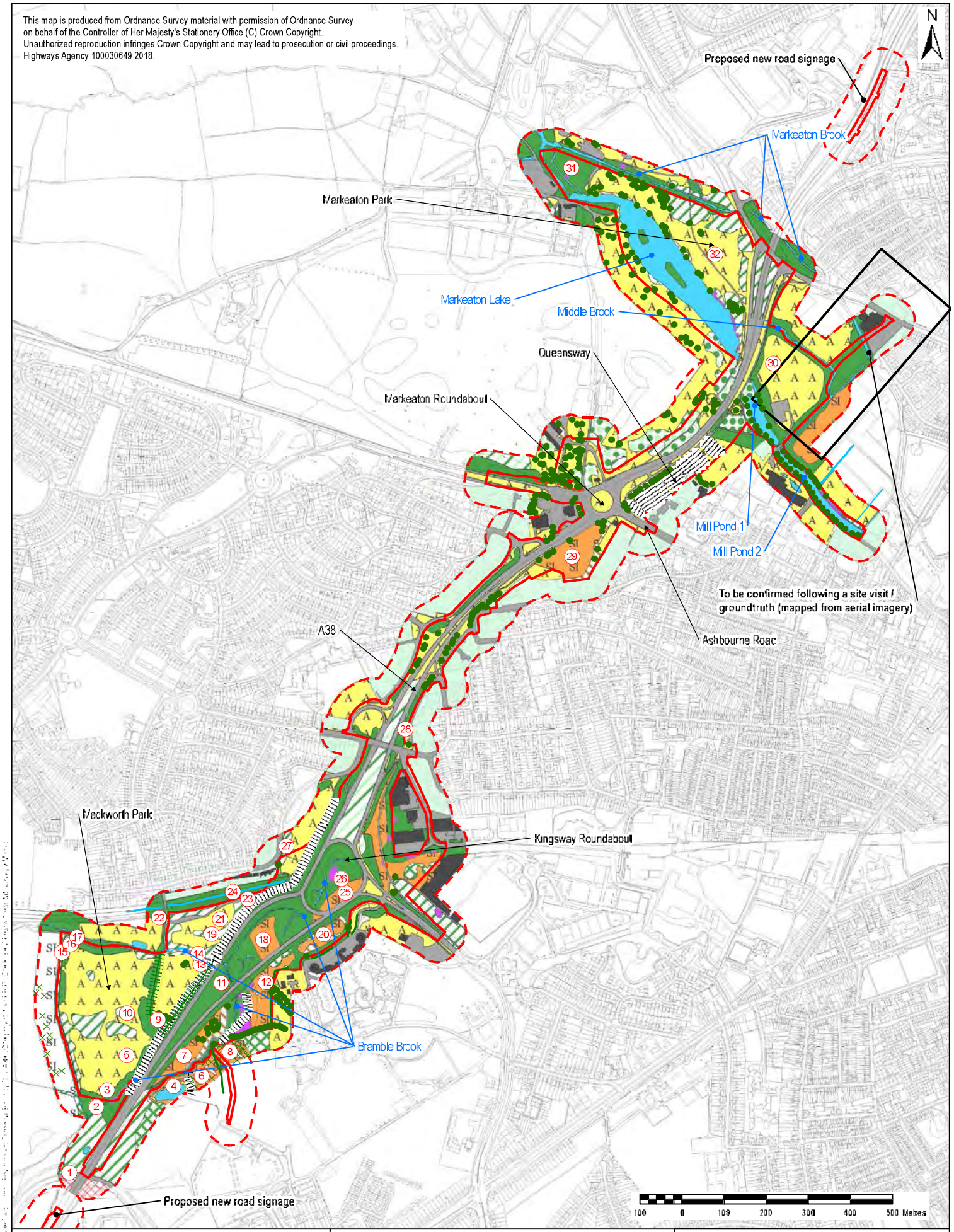
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Figure 8.6		1

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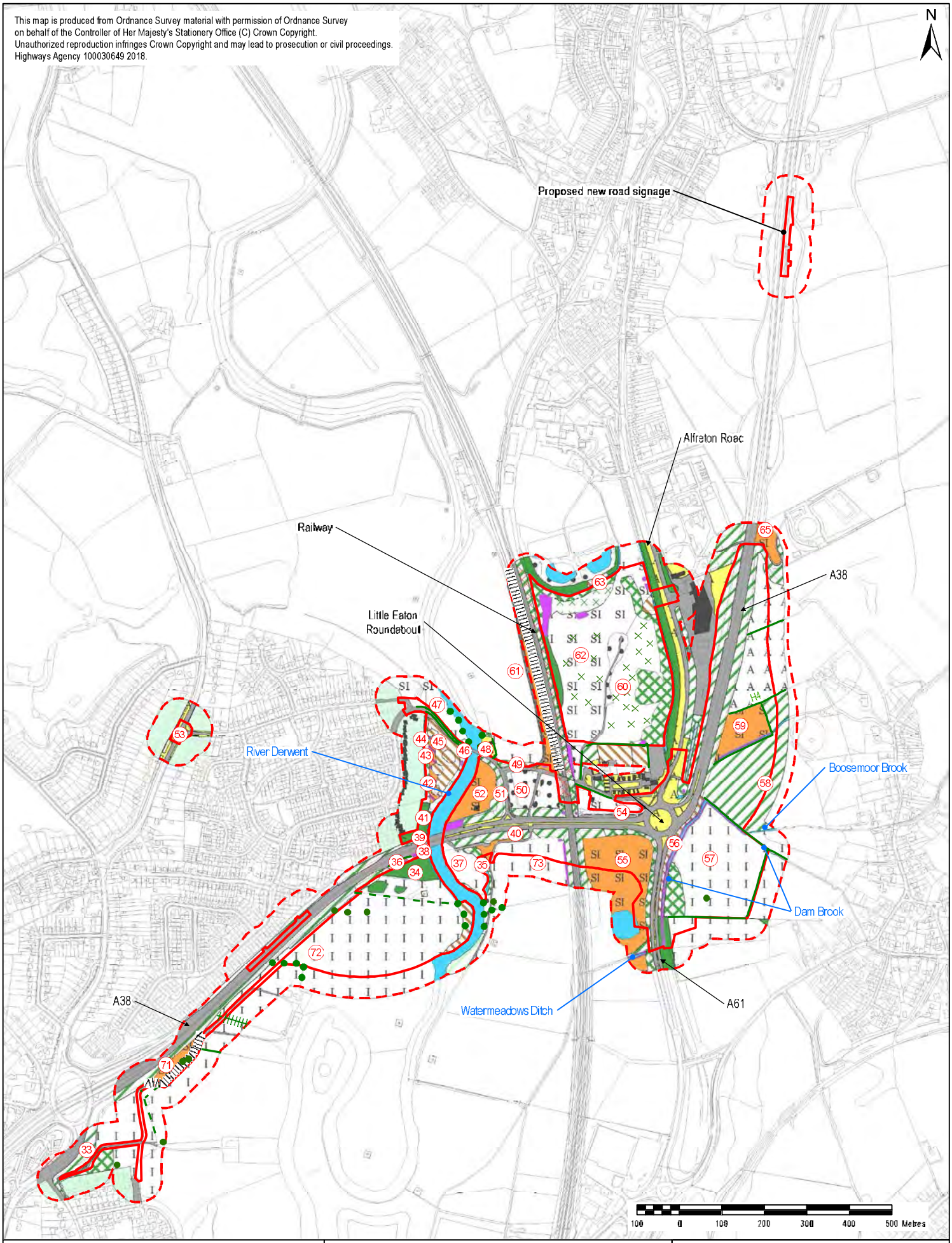
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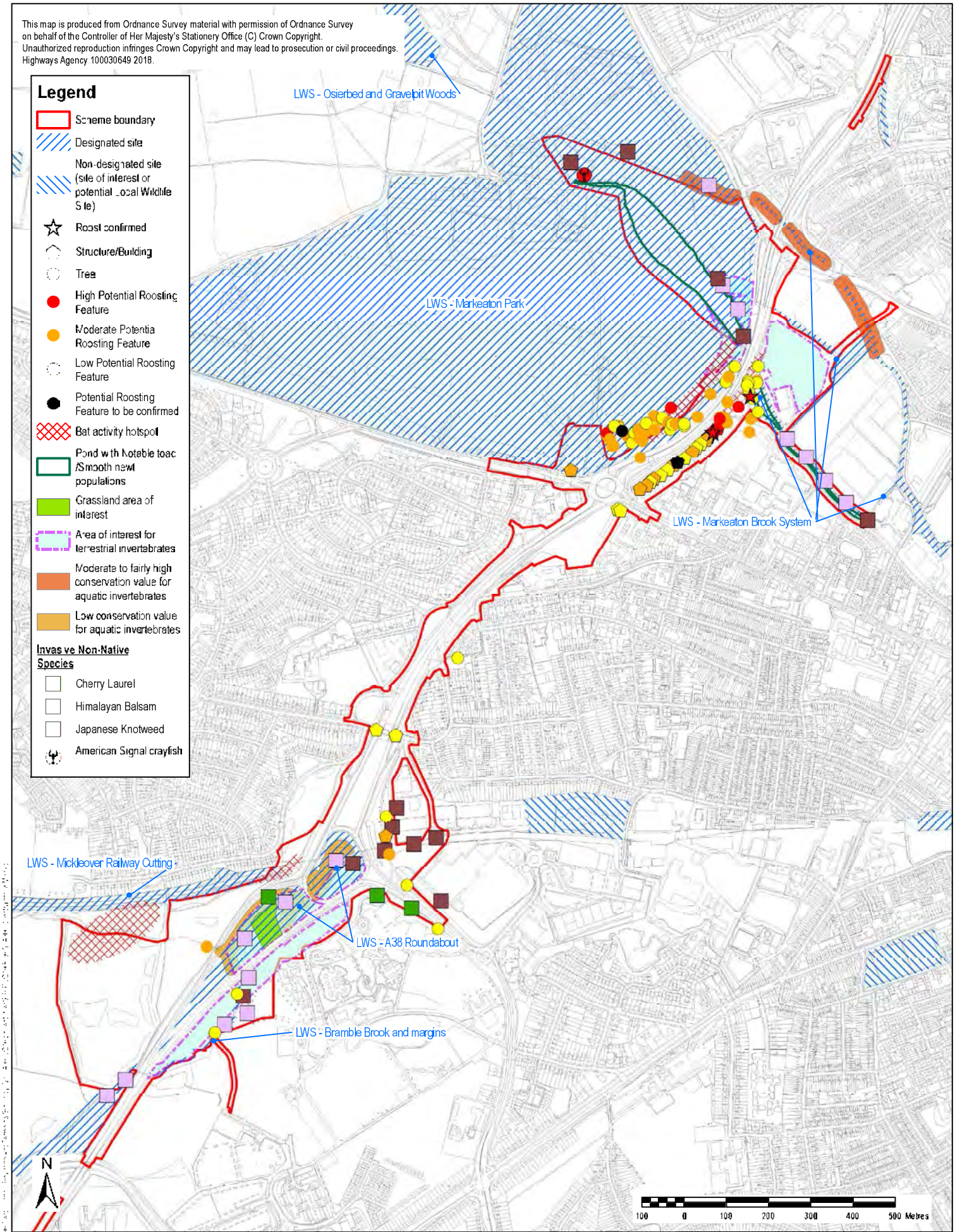
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Project Title/Drawing Title

ECOLOGICAL CONSTRAINTS PLAN KINGSWAY AND MARKEATON JUNCTION

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Figure 8.9		.

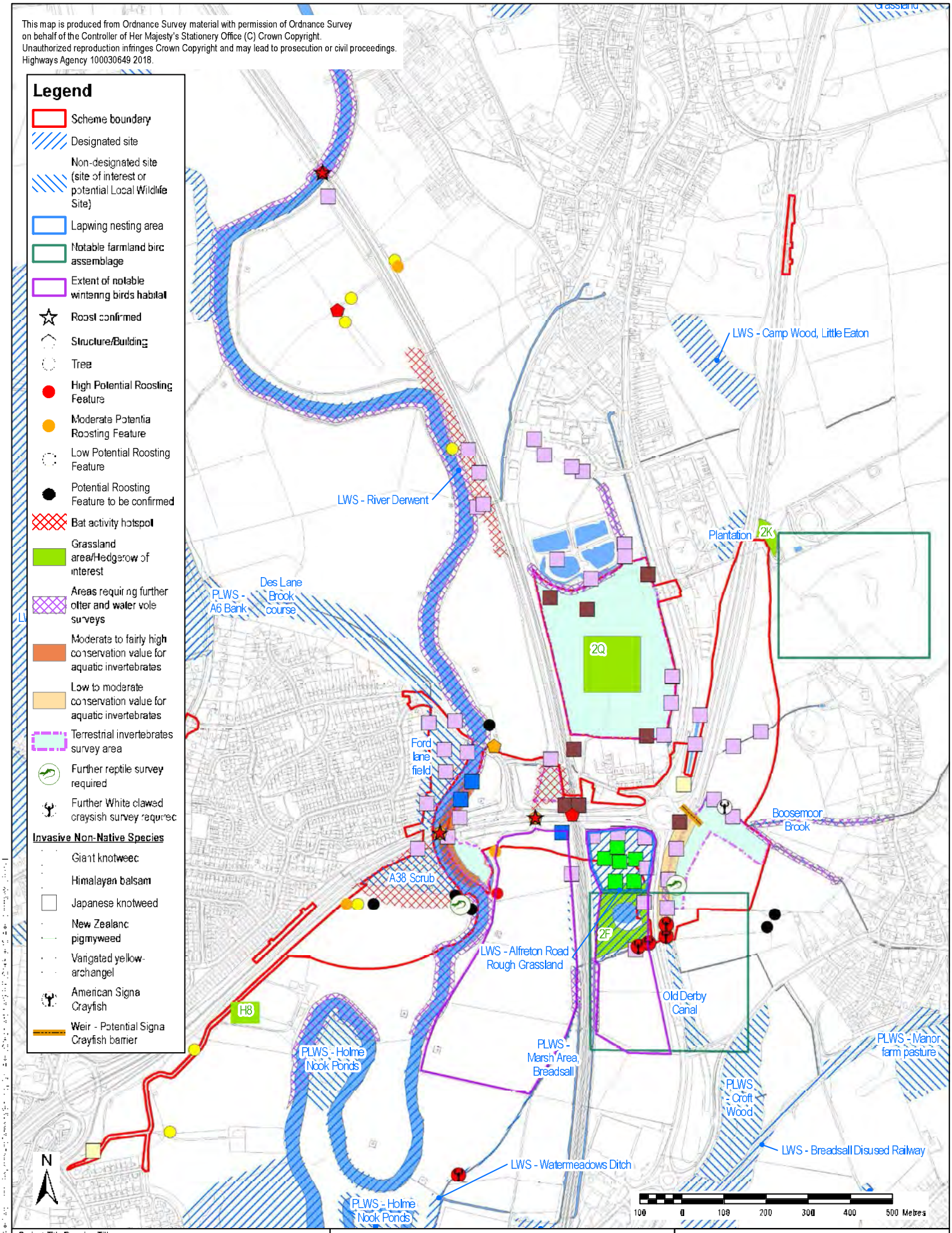
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LITTLE EATON JUNCTION

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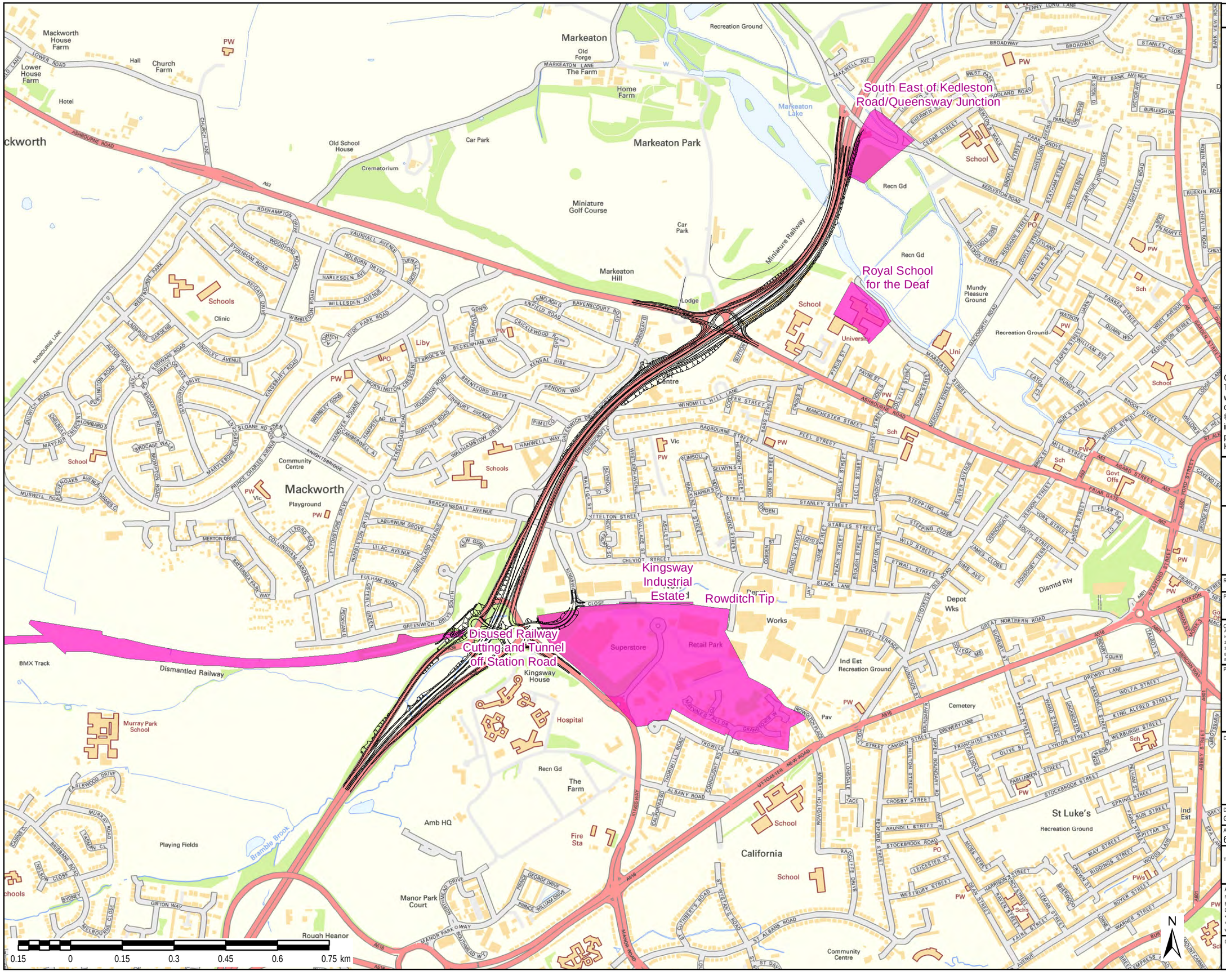
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Legend

- Proposed Scheme
- Historic Landfill Sites

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Purpose of Issue: FINAL

Client: A38 Derby Junctions Project, Highways England, Floor 5, 2 Colmore Square, 38 Colmore Circus, Birmingham, B4 6BN

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Project Title: A38 DERBY JUNCTIONS

Drawing Title: MARKEATON AND KINGSWAY HISTORIC LANDFILL SITES

Drawn	Checked	Approved	Date
GB	AC	SW	26/07/2018

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- Proposed Scheme
- Registered Landfill (Envirocheck)
- Historic Landfill Sites
- Authorised Landfill Sites

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Purpose of Issue: FINAL

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Project Title: A38 DERBY JUNCTIONS

Drawing Title: LITTLE EATON HISTORIC LANDFILL SITES

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GB	AC	SW	26/07/2018

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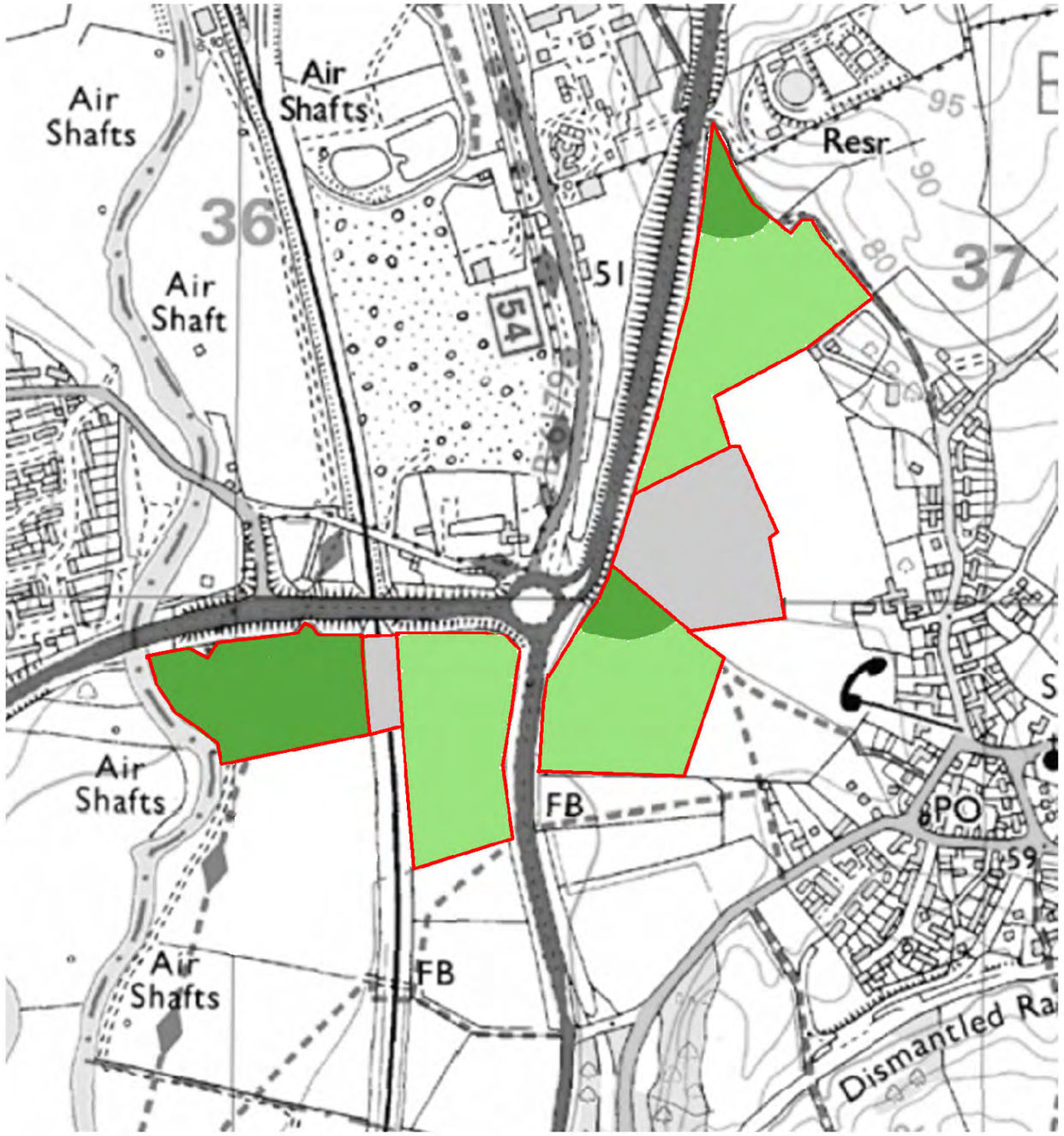
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Drawing Number: FIGURE 9.2
Rev: 0

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0.1 0 0.1 0.2 0.3 0.4 0.5 km

N



Grade 1 - excellent quality
Grade 2 - very good quality
Subgrade 3a - good quality
Best and most versatile land
Not Present
Subgrade 3b - moderate quality
Grade 4 - poor quality
Grade 5 - very poor quality

N

BASED ON FIGURE RAC 6542-2 FROM READING AGRICULTURAL CONSULTANTS

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Project Title: A38 DERBY JUNCTIONS

Drawing Title: AGRICULTURAL SOIL QUALITY AT LITTLE EATON JUNCTION

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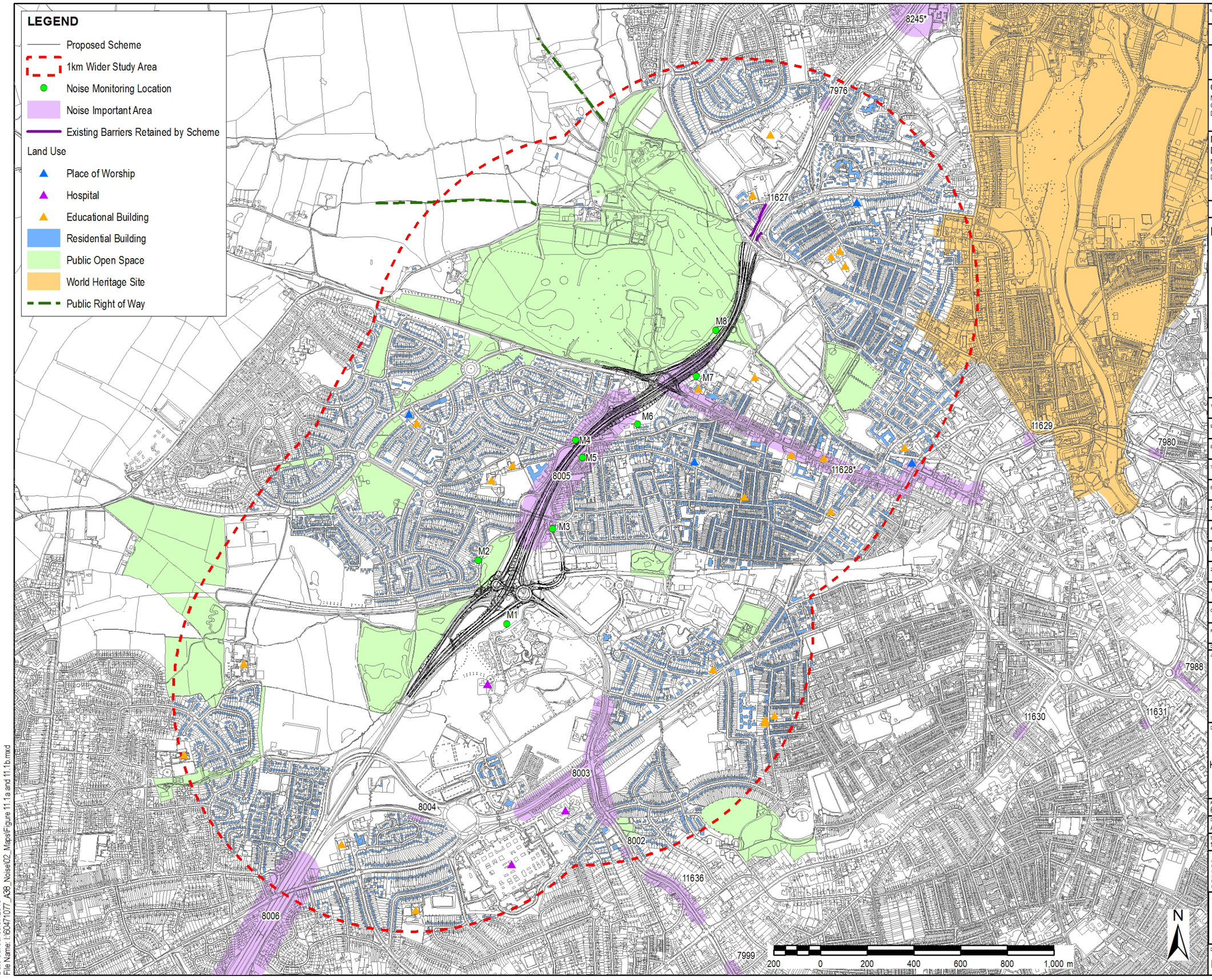
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5	Revision Details						
4	Revision Details						
3	Revision Details						
2	Revision Details						
1	Revision Details						
0	FIRST ISSUE						
D	DRAFT						

Job Title

A38
DERBY JUNCTIONS

Drawing Title

NOISE LOCATION PLAN
KINGSWAY JUNCTION AND MARKEATON JUNCTION

AECOM Internal Project Number	Zone/Mileage	Suitability
60533462		

Designed	Drawn	Stage 1 check	Stage 2 check	Approved
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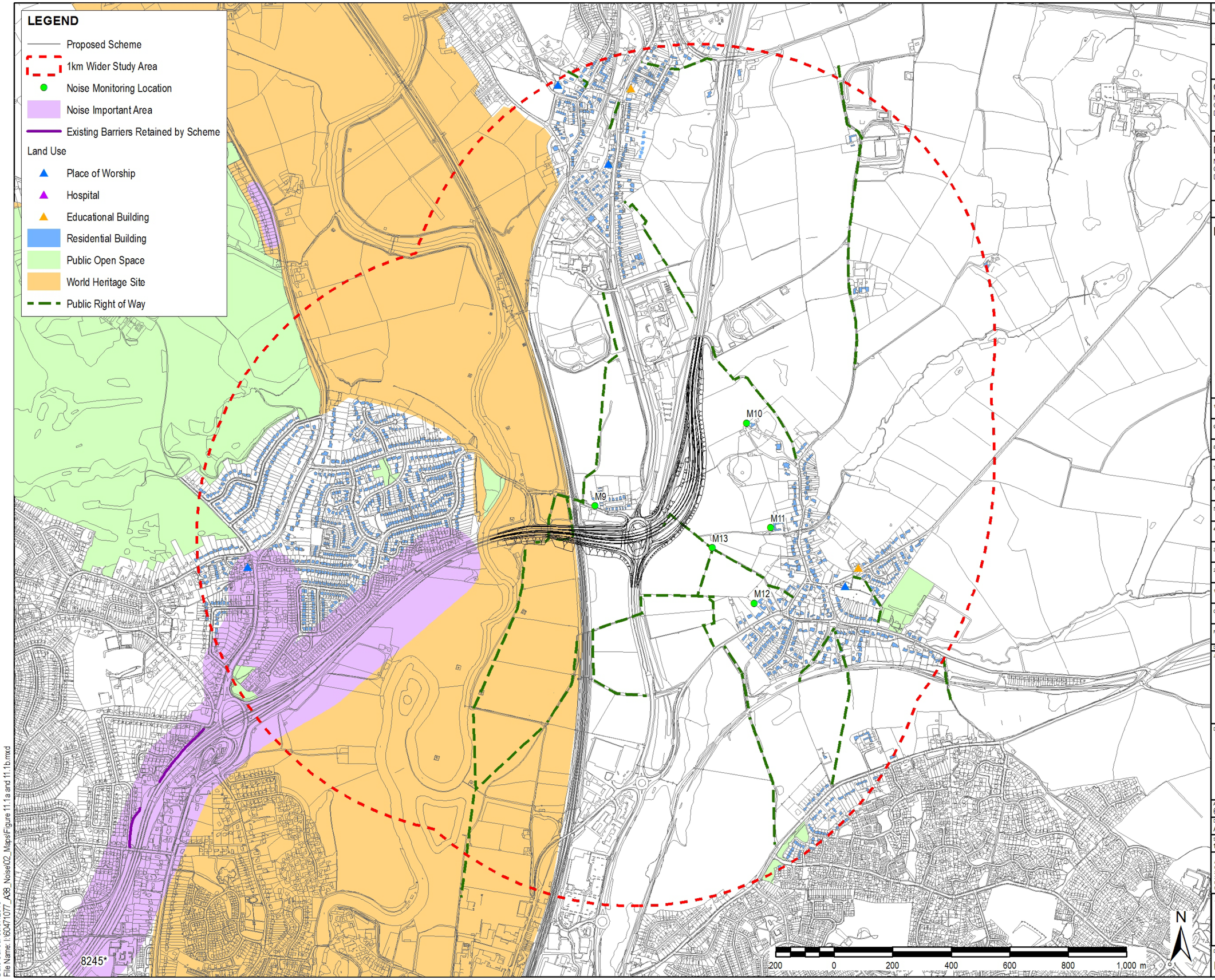
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FIGURE 11.1a

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1							
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Job Title

A38
DERBY JUNCTIONS

Drawing Title

NOISE LOCATION PLAN
LITTLE EATON JUNCTION

AECOM Internal Project Number		Zone/Mileage		Suitability
60533462				
Designed	Drawn	Stage 1 check	Stage 2 check	Approved
AECOM	SJ/GB	DH	SS	SS
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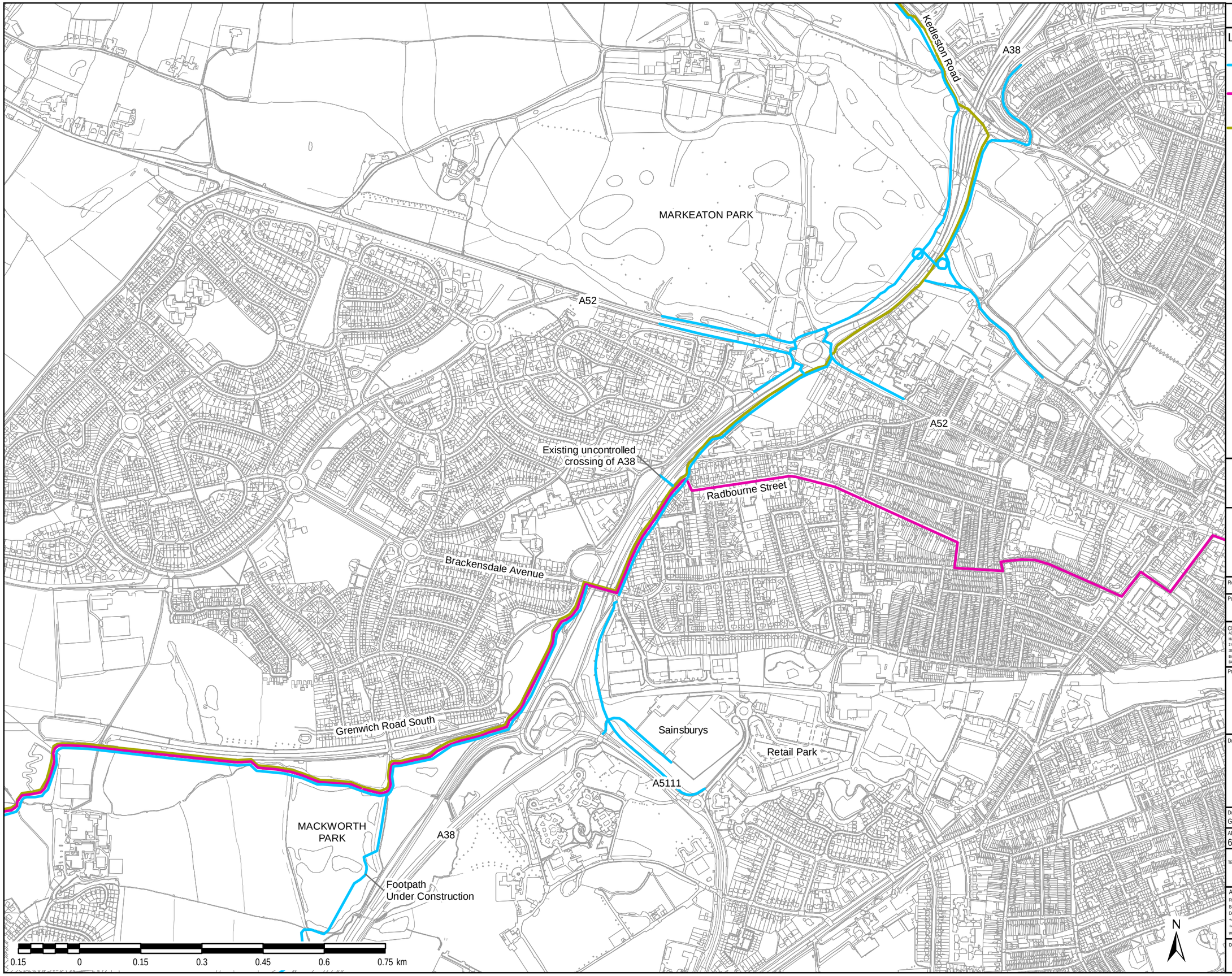
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FIGURE 11.1b

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Legend

- Footpath & Footway/Cycleway
- National Cycle Route 54 and 68
- Strategic or Regional Cycle Route 66

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Project Title: A38 DERBY JUNCTIONS

Drawing Title: KINGSWAY AND MARKEATON JUNCTIONS SIGNED NMU ROUTES

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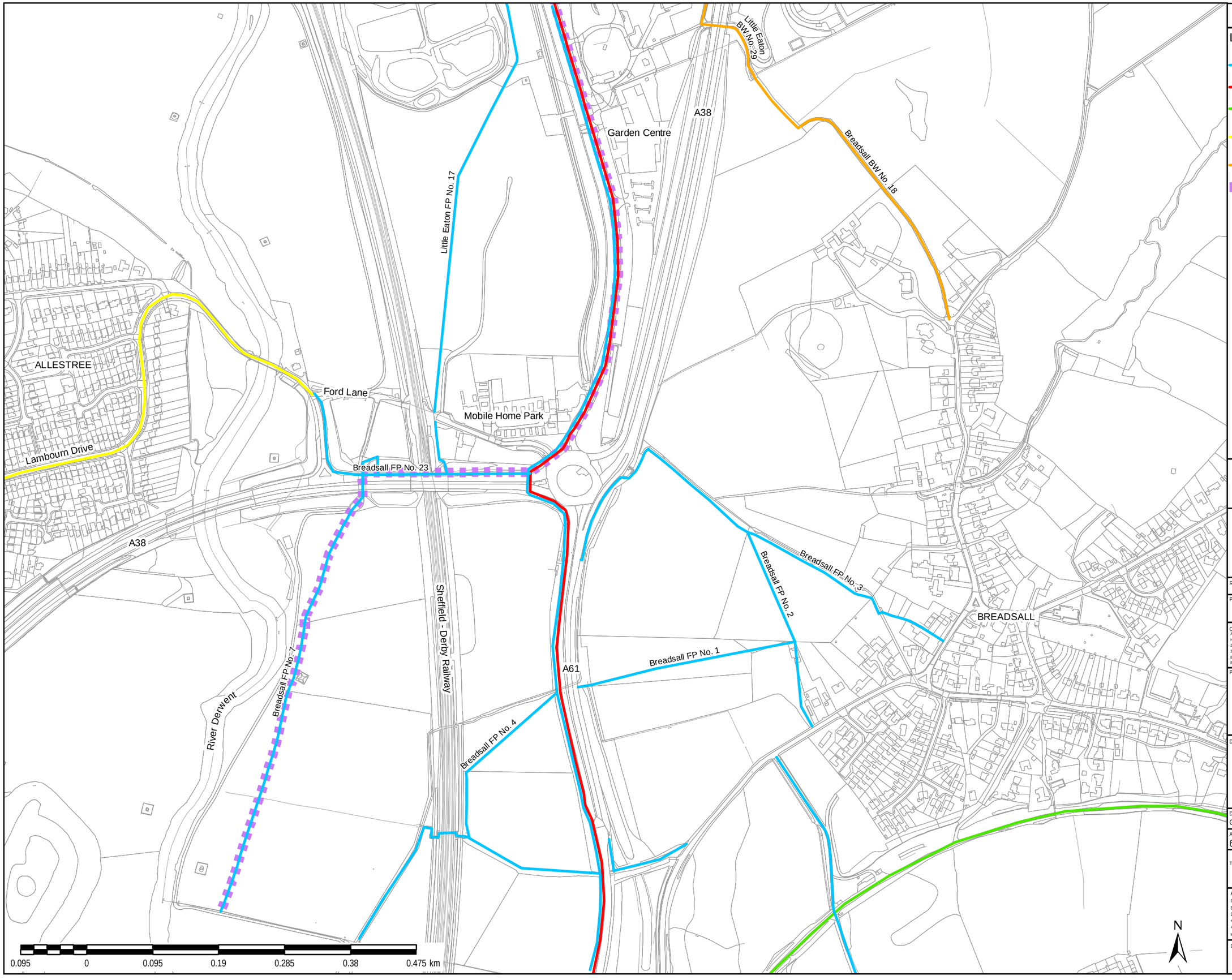
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FIGURE 12.1	0

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Legend

- Footpath & Footway/Cycleway
- National Cycle Route 54
- National Cycle Route 672
- Strategic or Regional Cycle Route
- Bridleway
- Derwent Valley Heritage Way

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Rev: 0

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N

Bramble Brook

100 0 100 200 300 400 500 Metres

Legend

- Scheme boundary
- Surface water
- Direction of flow

File Name:X:\Highways Agency\47071390 A38 Derby Jcns - Environment\TechnicalEcology\GIS_A38_2018\project_files\Scoping report Feb2018\Water\Fig 14_1 Surfaces water features_Kingsway_2018.mxd

Project Title/Drawing Title

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Markeaton Brook

Markeaton Lake

Mill Pond

100 0 100 200 300 400 500 Metres

Legend

- Scheme boundary
- Surface water features
- Direction of flow

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Project Title/Drawing Title

A38 DERBY JUNCTIONS SURFACE WATER FEATURES MARKEATON

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Boosemoor Brook

River Derwent

Dam Brook

100 0 100 200 300 400 500 Metres

Legend

- Scheme boundary
- Surface water abstraction
- Direction of flow
- Surface water features

File Name:X:\Highways Agency\47071390 A38 Derby Jcns - Environment\TechnicalEcology\GIS_A38_2018\project_files\Scoping report Feb2018\Water\Fig 14_3 Surfaces water features_Little Eaton Junction.mxd

Project Title/Drawing Title

A38 DERBY JUNCTIONS
SURFACE WATER FEATURES
LITTLE EATON

Project Number
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N

Legend

- Scheme boundary

Superficial Aquifers

- Secondary A Aquifer
- Secondary Undifferentiated
- Unproductive Strata

200 0 200 400 600 800 1000 Metres

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A38 DERBY JUNCTIONS GROUNDWATER VULNERABILITY KINGSWAY AND MARKEATON

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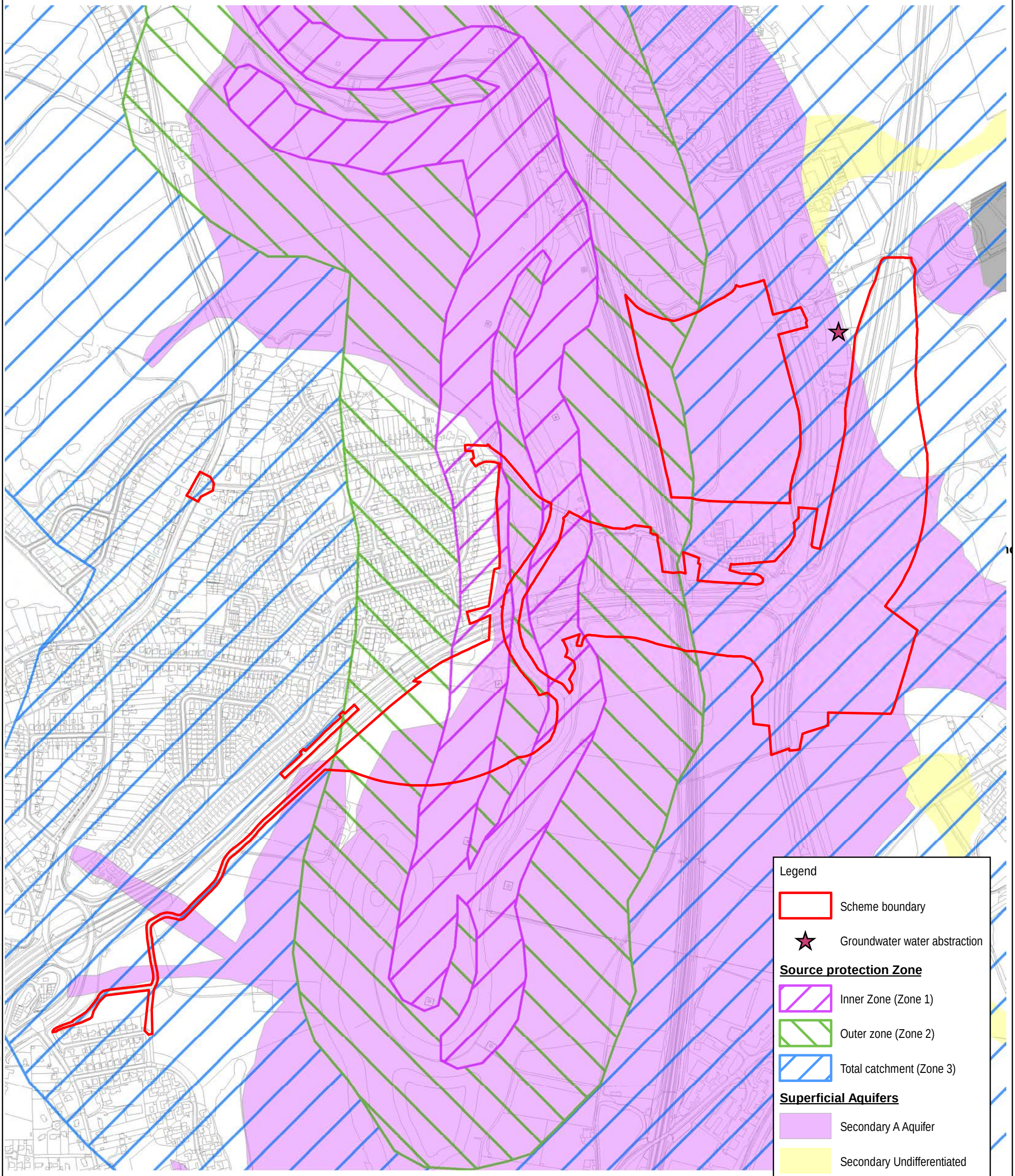
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Project Title/Drawing Title

A38 DERBY JUNCTIONS GROUNDWATER VULNERABILITY LITTLE EATON

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Date 26/07/2018	Scale @ A3 1:7,000	Purpose of issue FINAL
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A38 Derby Junctions

Preliminary Environmental Information Report

Non-Technical Summary

September 2018

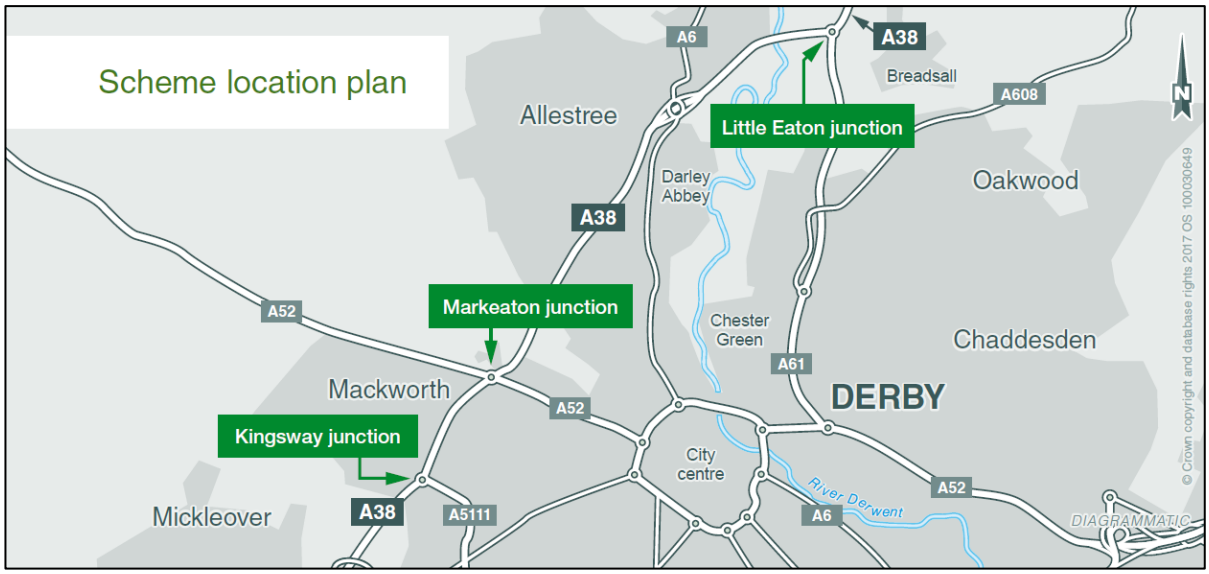
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Appendix A: Summary sheet and scheme drawings

Introduction

Highways England propose improving the 3 junctions along the A38 through Derby to separate local traffic from through traffic; namely the junctions at Kingsway, Markeaton and Little Eaton. These junctions span an approximate distance of 5.5km along the A38 to the west and north of Derby.



The scheme aims to improve Derby's economic competitiveness, the environment and quality of life by reducing congestion in the surrounding urban areas and on the A38. The scheme would increase the capacity of the strategic road network and assist housing and employment growth within Derby. The overarching objective is to deliver a scheme that is affordable and delivers high value for money.

This proposal is a 'Nationally Significant Infrastructure Project' under the Planning Act 2008, which means that an application will need to be made for permission to build and operate the scheme. The permission is called a Development Consent Order (DCO).

Before an application for a DCO is submitted, the local community and other stakeholders must be formally consulted on the proposal. This consultation must include a description of the scheme, the likely significant environmental effects based on the preliminary environmental information available at the time, the measures proposed to avoid or reduce such effects, and the alternatives that have been considered. This is to support consultees in developing an informed view of the likely significant environmental effects of the scheme.

As well as carrying out our consultation, we are continuing to gather environmental information, identifying the potential impacts of the scheme and developing measures to avoid, reduce or mitigate adverse impacts. This process is known as an Environmental Impact Assessment (EIA), which is required by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. The findings of the EIA will be reported in an Environmental Statement.

While the EIA is ongoing, the Preliminary Environmental Impact (PEI) Report has been developed for consultation and describes current environmental conditions and anticipated

effects of the scheme on the environment. This document provides a summary of the PEI Report in non-technical language. We are now seeking your comments on the scheme design and the information included within the PEI Report. Details of how you can provide comments, how consultation responses will be dealt with, and the next stages in the DCO application process are provided in the sections called “Consultation” and “Next steps” at the end of this document. The information in the PEI Report is preliminary and the findings will be developed further in the Environmental Statement to show the progression of the scheme design which will be informed by the feedback from consultation and the ongoing EIA. The Environmental Statement will present the full results from the EIA and will be submitted with the application for a DCO.

The proposed scheme

Kingsway and Markeaton junctions are located in a predominantly urban environment, with a mixture of residential housing, commercial, retail, health care and educational establishments. There are a number of public open spaces in the vicinity of the junctions, namely Mackworth Park, open space next to Greenwich Drive South, Markeaton Park and Mill pond. Little Eaton junction is set in a semi-rural environment, with the Ford Farm Mobile Home Park, the property Fourways, commercial and retail facilities located to the north of the existing junction. The Derby Garden Centre occupies the space between the A38 and the B6179 to the north of the junction (accessed off the B6179). The eastern edge of Breadsall village is located approximately 400m to the south-east of the existing junction, whilst the southern edge of Little Eaton village is located approximately 900m to the north of the junction. The A38 to the west of the existing Little Eaton junction crosses over the River Derwent and the railway that connects Derby with Sheffield.

It is proposed to improve these 3 junctions, with the new A38 passing through Kingsway and Markeaton junctions in underpasses, and passing over Little Eaton junction on a fly-over – refer to the scheme plans as presented in Appendix A at the back of this document.

Scheme details

The scheme would entail the following:

- Kingsway junction (refer to indicative junction plan in Appendix A):
  - A38 lowered to pass underneath the existing roundabout in a new underpass (low point of the mainline A38 would be approximately 6.5m below the level of the existing roundabout) with 2 new roundabouts and a new bridge at existing ground level to carry traffic over the lowered A38;
  - A38 widened to 3 lanes in each direction between Kingsway junction and Markeaton junction, with the speed limit increased from 40mph to 50mph;
  - Local access provided by a road link to Kingsway Park Close;
  - Closure of existing accesses from the A38 onto Brackensdale Avenue and Raleigh Street.

- Markeaton junction (refer to indicative junction plan in Appendix A):
  - A38 lowered to pass underneath the existing roundabout (maximum depth approximately 7.6m below existing ground level), in a new underpass with 2 new bridges to carry the A52 and signalised roundabout traffic across the lowered A38;
  - The A38 widened to 3 lanes in each direction between Markeaton junction and Kedleston Road, with the speed limit increased from 40mph to 50mph;
  - The existing entrance to Markeaton Park from the roundabout would be closed. An improved entrance and exit to the park would be provided from the A52 instead;
  - Access to the Esso petrol station and McDonald's would be modified;
  - The existing pedestrian footbridge over the A38 would be replaced with a new bridge that fully complies with current cyclist and wheelchair user requirements.
- Little Eaton junction (refer to indicative junction plan in Appendix A):
  - The A38 would be realigned to the south and east of the existing roundabout and built on an embankment. The existing roundabout would be extended to the south with new slip roads providing access onto and off the new A38, whilst the roundabout would enable connections to Ford Lane, the A61 and the B6179. Two new bridges would be built to carry the A38 traffic over the roundabout on a 'fly-over', this would separate the A38 through traffic from local traffic crossing, leaving and joining the A38;
  - The existing bridge over the railway would be widened to carry the southbound A38 carriageway. The existing part of the railway bridge would be kept for the northbound A38 carriageway;
  - Access to and from the A38 at Ford Lane would be closed for safety reasons;
  - The existing national speed limit on the A38 would be kept, although an advisory 50mph limit would be displayed on the bend through the junction;
  - All existing footways and cycleways would be retained and diverted around the roundabout.

If the Development Consent Order (DCO) application is approved, construction is planned to start in 2021, with the scheme being fully open to traffic in 2024.

Alternatives

Proposals for the improvement of the 3 junctions along the A38 through Derby have been the subject of extensive study since 2001. The process of options identification and route selection leading to the proposed scheme is summarised in Chapter 3 of the full Preliminary Environmental Impact (PEI) Report. The process has followed the stages:

- Option identification;
- Options appraisal and sifting to identify options to take forward for further appraisal;
- Selection of options which were taken to non-statutory public consultation in February and March 2015; and
- The selection of the Preferred Route which was announced in January 2018.

Options that have been assessed and rejected include placing the A38 mainline on fly-overs through Kingsway and Markeaton junctions, whilst at Little Eaton junction options rejected include those that would place the scheme to the north west of the existing junction.

The Preferred Route forms the basis of the scheme as described above and assessed within the PEI Report.

The applicant

Highways England is the Applicant, which is the Strategic Highways Company as defined in the Infrastructure Act 2015. Highways England is charged with modernising and maintaining England's strategic road network, as well as running the network and keeping traffic moving.

Environmental Impact Assessment (EIA)

Under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, the scheme is defined as being the type and scale of development that automatically requires an EIA. Accordingly, an EIA is being undertaken to meet the requirements of the relevant planning policy and legislation, and cover the effects of the scheme on the environment.

The EIA 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. The EIA does not consider scheme demolition given that the road would become an integral part of national infrastructure and would not be decommissioned.

During its construction, most of the scheme's potential adverse environmental impacts would be avoided or mitigated through the implementation of industry standard practice and control measures, which would be contained within a Construction Environmental Management Plan (CEMP).

Further work continues to be undertaken as part of the EIA process to confirm the preliminary findings presented below (and summarised in Table 1 within Appendix A). The final assessment of environmental impacts will be presented in the Environmental Statement that will be submitted with the application for a Development Consent Order. The Environmental Statement will also include an outline CEMP.

Air quality

Baseline

Air quality in the area around the scheme (including the section between Kingsway and Markeaton junctions) is currently affected by traffic using the A38 and the local road network. There is an Air Quality Management Area (AQMA) close to the scheme, namely the 'Derby nitrogen dioxide AQMA No.1: Ring Roads' which covers the inner and outer ring-roads in the city, as well as some sections of radial roads and the entire length of Osmaston Road. AQMAs are areas which the local authority has identified as requiring management to

achieve desired air quality objectives.

Construction

Without mitigation, construction of the scheme could temporarily impact air quality as a result of dust from construction activities (such as earth moving and excavations), and emissions from construction traffic, construction equipment and temporary traffic management. Mitigation measures would be included within the Construction Environmental Management Plan (CEMP) to control dust emissions, as well as measures to control the use of equipment, plant and construction traffic. These measures would minimise the temporary air quality impacts during the construction phase.

Operation

During scheme operation there could be impacts on air quality as a result of changes in vehicle flows along the scheme and the surrounding road network. However, no locations within the area assessed are expected to experience nitrogen dioxide concentrations above the annual mean nitrogen dioxide UK Air Quality Strategy (AQS) objective - thus nitrogen dioxide concentrations are predicted to be below levels considered to be of health concern. Therefore, significant air quality effects are not anticipated during scheme operation.

Summary of preliminary assessment

The preliminary air quality assessment indicates that with appropriate best practice construction procedures, no significant adverse effects are considered likely during scheme construction. Scheme operation would have an impact on air quality as a result of changes in vehicle flows, however, significant air quality effects are not anticipated. Refer to Table 1 in Appendix A for a summary of the preliminary assessment.

Cultural heritage

Baseline

Cultural heritage includes archaeology, historic buildings, structures and historic landscapes including parks and gardens. The scheme would cross an area with records of pre-historic, Roman and medieval features, as well as features associated with more modern times. Of note is that the scheme at Little Eaton junction partly lies within the boundary of the Derwent Valley Mills World Heritage Site (DVMWHS).

Construction and operation

The scheme would impact upon a number of heritage features. The implementation of appropriate mitigation measures and taking into account impact avoidance measures included in the scheme design, the following effects are predicted during construction and operation of the scheme:

- A slight adverse effect on the DVMWHS due to temporary visual and noise intrusions during the construction phase, whilst creation of the fly-over on embankment and the associated land-take would have a long term slight adverse effect on the setting of the World Heritage Site;
- Neutral effects on 10 heritage assets, including materials deposited in the geological past within the River Derwent floodplain, Markeaton Park, the Markeaton Park boundary

wall, Leylands Estate Conservation Area, the dismantled Derbyshire and North Staffordshire Extension Railway, the Derby to Hurdlow turnpike road, Breadsall Manor, Breadsall Conservation Area, Ford Farm, and features that contribute to the historic landscape character at Little Eaton.

Summary of preliminary assessment

The preliminary cultural heritage assessment has indicated that with appropriate scheme design, adoption of an archaeological mitigation strategy, and implementation of mitigation measures included within the Construction Environmental Management Plan (CEMP), no significant effects upon cultural heritage assets are anticipated during scheme construction or operation. Refer to Table 1 in Appendix A for a summary of the preliminary assessment.

Landscape and visual effects

Baseline

The scheme at Kingsway and Markeaton junctions would be situated within areas with a mixture of existing highways, residential housing, public open space, retail and industrial estates, and educational facilities. At Little Eaton junction the surrounding environment is more rural with a mixture of existing highways, farmland, limited residential housing and commercial and retail premises.

Construction

Construction activities have the potential to temporarily impact on local landscapes and on the views of users on public rights of way and local roads, and views from residential properties close to the scheme. Measures to mitigate potential impacts of construction activities include the sensitive siting of construction compounds, minimisation of construction lighting and minimising the loss of vegetation that screens views of the existing A38.

During scheme construction, the landscape effects at each junction are not anticipated to be significant. However, potentially significant visual effects during the construction phase have been identified from Greenwich Drive South public open space and views from the Derwent Valley Heritage Way.

Operation

The scheme would be provided with an appropriate landscape design which would incorporate tree and shrub planting. Environmental barriers at Little Eaton junction are being considered along the A38 next to the Ford Lane Mobile Home Park, and along the A38 and the slip-road to the A61 to screen the scheme from Breadsall. The requirement for environmental barriers, their type, format and height will be confirmed following further assessments, taking into account comments received during statutory public consultation.

During operation of the scheme, landscape effects at Kingsway, Markeaton and Little Eaton junctions are not predicted to be significant, noting that effects would reduce with time as the scheme landscape planting matures.

During scheme operation, some visual effects at Kingsway junction are predicted to be significant at scheme opening (e.g. views from within Greenwich Drive South public open space). However, such effects would reduce with time as the proposed landscape planting

matures. Visual effects at Markeaton junction are not predicted to be significant during scheme operation. At Little Eaton junction, some visual effects are predicted to be significant at scheme opening (views at the edge of Breadsall and views from the Derwent Valley Heritage Way), although such effects would reduce to non-significant levels with time as the proposed landscape planting matures.

Summary of preliminary assessment

The preliminary landscape and visual assessment indicates that scheme construction and operation is not anticipated to generate significant landscape effects. However, scheme construction and operation has the potential to generate a number of potentially significant visual effects at Kingsway junction and Little Eaton junction. Such effects would reduce with time as the scheme landscape planting matures. Refer to Table 1 in Appendix A for a summary of the preliminary assessment.

Biodiversity

Baseline

Whilst there are no nationally important designated ecological sites in the vicinity of the scheme, there are a number of locally important sites – this includes 6 non-statutory designated sites (Local Wildlife Sites) located within or directly next to the scheme boundary at Kingsway and Markeaton junctions, and 2 non-statutory designated Local Wildlife Sites located within or directly next to the scheme at Little Eaton junction. In addition, habitats in the vicinity of the scheme are used by a range of protected ecological species – this includes badgers, water voles, otters, bats, birds, terrestrial invertebrates (such as butterflies) and aquatic invertebrates (such as white-clawed crayfish).

Construction

Construction activities would have a direct impact on the following sites:

- A38 Roundabout Local Wildlife Site (which is located within the scheme boundary at Kingsway junction): 100% of the Local Wildlife Site habitat would be permanently lost;
- Markeaton Park Local Wildlife Site (located next to the scheme at Markeaton junction): widening of the A38 and utilities diversion route may result in some habitat being temporarily or permanently lost;
- Alfreton Road Grassland Local Wildlife Site (located within the scheme boundary at Little Eaton junction): approximately 25% of the Local Wildlife Site habitat would be permanently lost.

Construction activities would also result in the loss of some ecological habitats, including trees and woodland, grassland, arable land, hedgerows and some watercourses, as well as potentially impacting upon protected ecological species. A range of mitigation measures would be implemented through the Construction Environmental Management Plan (CEMP) during the construction phase – this includes pollution prevention measures to control surface water run-off during rain events and measures to control construction dust. In addition, opportunities to retain vegetation would be explored, whilst replacement habitats would be included within the proposed landscape design. It is the aim that the scheme would be mitigated within the scheme boundary such that there would be no overall loss of

biodiversity. In order to achieve this, a number of locations have been identified which may be used for additional ecological planting and habitat creation – these areas are located within Mackworth Park, the Kingsway Hospital site, Markeaton Park, Mill Pond, and areas to the east and west of the River Derwent.

Operation

During scheme operation, local ecological habitats could be impacted due to altered surface water run-off patterns, whilst some species may be vulnerable to accidental collisions with traffic and disturbance due to vehicles using the new carriageway. As such, a range of mitigation measures will be included within the scheme design – this includes provision of a suitable highway runoff drainage system and suitable fencing to prevent species such as badgers gaining access onto the road.

Summary of preliminary assessment

The preliminary biodiversity assessment indicates that the scheme has the potential to have significant effects upon the A38 Roundabout Local Wildlife Site at Kingsway junction and the Alfreton Road Grassland Local Wildlife Site at Little Eaton junction. In addition, there are potential significant effects upon some habitats such as woodlands, plus effects upon foraging and commuting bats and birds, although such effects would not be significant in the long term when planting and new habitats have become established. Given the mitigation and enhancement measures proposed, which would improve ecological conditions along the scheme, the scheme is not anticipated to have an overall adverse effect on nature conservation in the medium to long term. Refer to Table 1 in Appendix A for a summary of the preliminary assessment.

Noise and vibration

Baseline

As would be expected, the noise levels near to the scheme are dominated by road traffic noise from the existing A38.

Construction

During the scheme construction phase, temporary noise and vibration impacts may occur due to construction activities as well as construction traffic. Construction traffic is not anticipated to result in a significant adverse noise effect. However, given the close proximity of some properties to proposed construction works, there is the potential for temporary significant adverse noise effects. The risk of vibration causing building damage is considered to be very low, although there could be a risk that construction works would result in temporary significant vibration annoyance at properties closest to some construction activities. As such, measures would be included within the Construction Environmental Management Plan (CEMP) to reduce noise and vibration impacts. This includes the selection of quiet and low vibration equipment; positioning of construction equipment to minimise noise disturbance; use of acoustic enclosures for noisy equipment; and use of noise screens and perimeter hoarding.

Operation

The operation of the scheme would result in both beneficial and adverse traffic noise impacts given that the scheme would bring the road closer to some properties, and further away from others. In addition, changes in traffic flows on surrounding roads are also anticipated due to the scheme, in particular due to the closure of a number of existing accesses onto and off the A38 which would result in local re-routing of traffic.

At Kingsway junction the main potential adverse noise impact would be on Kingsway Park Close where minor increases in traffic noise levels are anticipated. On the A38 mainline between Kingsway and Markeaton junctions, minor noise increases are anticipated which are potentially significant given that existing traffic noise levels are already high. Specifically at Markeaton junction, increases in traffic noise levels are anticipated to the east of the junction with minor and moderate increases anticipated at residential properties close to the junction, resulting in some potentially significant adverse noise effects. The Royal School for the Deaf is anticipated to experience a minor to major increase in traffic noise levels, representing a potential significant adverse effect. At Little Eaton junction, the majority of residential properties within Little Eaton village are anticipated to experience a negligible increase in noise levels, although a minor noise level increase is anticipated along Duffield Road. A minor increase in traffic noise levels on the A61 is also anticipated. There is an anticipated negligible increase in traffic noise at the majority of residential properties in Breadsall, although a slight increase in traffic flows on Croft Lane and Brookside Road is anticipated to result in a minor increase in traffic noise levels at a small number of properties. Given the potential for noise effects, a number of potential noise barriers are being considered for inclusion in the scheme design, whilst the scheme would be provided with a low noise surface throughout.

Summary of preliminary assessment

The preliminary noise and vibration assessment indicates that there is a risk of significant noise effects at properties closest to construction activities, as well as potentially significant vibration annoyance effects. During scheme operation there are likely adverse noise impacts on Kingsway Park Close, along the A38 mainline between Kingsway and Markeaton junctions, and near Markeaton junction, including upon the Royal School for the Deaf. Significant noise effects are not anticipated at Breadsall or Little Eaton. Further work is ongoing to determine whether noise barriers would be effective in reducing potential adverse noise effects. Refer to Table 1 in Appendix A for a summary of the preliminary assessment.

Geology and soils

Baseline

The underlying geology across the scheme comprises of mudstone, siltstone and sandstone. Overlying deposits include alluviums, clay, silts, sands and gravels. Limited areas of historic fill material have been identified in areas of previous and existing development and along existing highways. A number of possible sources of contamination have been identified, including a former tip and disused railway at Kingsway junction; the petrol station at Markeaton junction; a licenced waste management facility, former tip and the alignment of the former Derby Canal at Little Eaton junction. Agricultural soils are present in areas surrounding Little Eaton junction.

Construction

Without mitigation and the implementation of adequate control measures, there is the potential for contaminants from identified contamination sources to enter groundwater, should they be disturbed during scheme construction. The Construction Environmental Management Plan (CEMP) would include measures for the identification, treatment, re-use and management of excavated materials generated during the construction works. Measures would also be included to limit the potential for dispersal and accidental releases of potential contaminants, dusts from soil and uncontrolled surface water run-off to occur during construction. The CEMP would also establish procedures for dealing with unexpected soil or groundwater contamination that may be encountered.

Operation

Operation of the scheme would not include any activities that are likely to have a significant effect upon geology and soils.

Summary of preliminary assessment

The preliminary soils and geology assessment indicates that with implementation of best practice management procedures, no significant adverse effects are considered likely during the construction and operation of the scheme. Refer to Table 1 in Appendix A for a summary of the preliminary assessment.

Road drainage and the water environment

Baseline

The main surface water features close to the scheme are Bramble Brook, Markeaton Brook, Mackworth Brook, Markeaton Lake, Mill Pond, the River Derwent, Dam Brook and Boosemoor Brook. The scheme would require the realignment of sections of Bramble Brook and Dam Brook, and would cross parts of the River Derwent floodplain. The majority of the scheme would be built in areas with no or very low probability of flooding, although flood risks have been identified at Kingsway junction (associated with Bramble Brook) and at Little Eaton junction (associated with the River Derwent and Dam Brook).

Construction

Without mitigation, proposed construction activities could impact upon surface water quality and flows, as well as impact upon groundwater quality and flows. Impacts upon surface water and groundwater could result from accidental spillages or sediment run-off causing pollution and risk of contamination to surface water and groundwater, localised disruption to groundwater levels and worsening flood risk. Thus the Construction Environmental Management Plan (CEMP) would include measures to mitigate potential adverse effects on surface watercourses during construction. This would include measures to tackle emergency spillages, and appropriate procedures for managing storage areas and material stockpiles. Potential effects on groundwater would also be mitigated through adherence to the CEMP, whilst the scheme is being designed to minimise impacts on groundwater flows. Measures would also be put in place to ensure that flood risks at Kingsway junction and Little Eaton junction would be appropriately managed.

Operation

During scheme operation, road run-off during rain events could result in flooding and cause pollution impacts on surface water and groundwater. As such, a road drainage system would be provided which would collect highway runoff, with water being discharged into ponds located at each junction which would treat the run-off before allowing water flow into local watercourses.

In order to ensure that the scheme does not have an adverse effect upon local flooding, flood storage areas would be provided at Kingsway junction, whilst at Little Eaton junction it is proposed to provide a floodplain compensation area to the south of the A38 (to the west of the River Derwent). Such outline flood mitigation provisions are being discussed with Derby City Council and the Environment Agency.

Summary of preliminary assessment

The preliminary road drainage and water environment assessment indicates that with implementation of best practice construction procedures, provision of a surface water drainage management system and with a suitable flood management strategy at Kingsway and Little Eaton junctions, there would be no significant effects on water resources either during scheme construction or operation. Refer to Table 1 in Appendix A for a summary of the preliminary assessment.

Materials

Construction

The scheme design aims to balance the amount of material excavated (cut) and material placement (fill). However, it is currently estimated that approximately 130,000m^3 of material would be excavated during the construction phase, whilst approximately 475,000m^3 of material may be required to build the scheme. Whilst material excavated at Kingsway and Markeaton junctions is likely to be reused at Little Eaton junction (subject to quality characteristics), it is apparent that additional materials would need to be transported to the site in order to construct the scheme. There are a wealth of mineral sources within the Derbyshire region, such that materials required for the scheme could be sourced locally in order to minimise material travel distances.

Given the relatively large landfill capacity in the East Midlands and the potential for the reuse of excavated material (either on site or off site), it is considered unlikely that the scheme would result in a significant reduction in the available landfill capacity, and hence significant effects are not anticipated.

The quantities of material needed for construction purposes are anticipated to be very small when compared to the overall UK demand for construction materials. Therefore, scheme construction would not result in a significant reduction in the availability of construction materials.

Operation

Material use and waste generation is expected to be very small during operation of the scheme, with no significant effects expected.

Summary of preliminary assessment

The preliminary materials assessment indicates that significant effects with respect to materials and waste are not anticipated during scheme construction or operation. Refer to Table 1 in Appendix A for a summary of the preliminary assessment.

People and communities

Baseline

The 3 junctions are located around the main settlement of Derby which provides the main centre for services and community facilities in the area. There is a comprehensive network of Public Rights of Way, cycleways and footways in the vicinity of the scheme connecting the suburbs and wards of Derby as well as connecting with national routes. There are a number of community facilities close to the scheme, notably including Mackworth Park, Markeaton Park, Mill ponds, plus local education and public health facilities. The existing A38 divides local communities, whilst for drivers, regular traffic delays and related journey uncertainties lead to driver stress.

Construction

A number of mitigation measures would be used during the construction phase to minimise impacts upon local people – this includes use of diversions and signs for temporary footpath and cycleway closures; implementation of traffic management plans to minimise traffic disruption; and communication with local residents to highlight potential periods of disruption. However, even with such measures, potentially significant effects would be as follows:

- Likely significant temporary adverse effect on users of Markeaton Park footbridge (which carries the Bonnie Prince Charlie Walk) due to footbridge demolition (until a replacement footbridge is installed);
- Likely significant permanent adverse effect on residential properties at Markeaton junction as a result of demolition and land-take (15 detached properties on Queensway and 2 semi-detached properties on the A52 Ashbourne Road would need to be demolished);
- Local residents would no longer be able to use the Ford Lane access; and
- Construction of the scheme may result in significant adverse effects upon some agricultural land holdings at Little Eaton junction (due to temporary or permanent land-take).

Operation

The scheme includes a number of measures to minimise potential effects upon local people and communities – this includes: the provision of facilities for walkers and cyclists; provision of exchange land to compensate for the loss of public open space at Kingsway and Markeaton junctions (approximately 0.63 hectares); reconfiguration of access arrangements for the McDonald's Restaurant and the Esso petrol station; alterations to the Markeaton Park access; and allowing occasional vehicles from Talbot Turf to use Ford Lane to access the A38 via the A6 Duffield Road. With these mitigation measures in place, the following potentially significant effects have been identified during scheme operation:

- Likely significant beneficial effects for walkers and cyclists due to new and improved facilities;
- Likely significant beneficial effects for motorists due to reductions in stress due to reductions in traffic congestion;
- Potential significant beneficial effects for users of local buses due to improved journey times and journey reliability; and
- Likely significant beneficial effects on community divisions, as a result of the scheme reducing traffic congestion.

With regard to public open space losses, it is proposed that replacement public open space is provided primarily using part of the area vacated by the buildings demolished on Queensway.

Summary of preliminary assessment

The preliminary people and communities assessment indicates that scheme construction has to the potential to generate a number of potential significant temporary effects due to demolition of the Markeaton Park footbridge, demolition of residential buildings at Queensway and Ashbourne Road, closure of Ford Lane access, plus temporary and permanent land take from agricultural holdings at Little Eaton junction. During scheme operation, potentially significant beneficial effects have been identified for walkers and cyclists, motorists, users of local buses and for communities that are currently divided due to the A38. Refer to Table 1 in Appendix A for a summary of the preliminary assessment.

Preliminary assessment of other topics

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 require the assessment of additional technical topics, which are being addressed in the EIA and which will be reported in full in the Environmental Statement.

A human health assessment will consider potential scheme impacts on noise, air quality and people and communities. No significant human health impacts are anticipated.

The vulnerability of the scheme to major accidents or disasters would be mitigated by the design of the scheme. No significant adverse effects are anticipated.

Climate is being addressed by the assessment of likely impacts of greenhouse gas emissions and the resilience of the scheme to cope with extreme weather events associated with climate change. No significant adverse effects are anticipated.

As part of the ongoing EIA work, we are continuing to consider mitigation measures, and where appropriate, any proposed monitoring arrangements.

Cumulative effects

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

- The combined effects from the scheme on single locations or properties from a number of individual environmental impacts, for example noise, dust and visual impacts;
- The effects of other developments close to the scheme which are proposed, under

construction or have been consented, which when combined with the effects of the scheme may have an incremental significant effect.

The cumulative effects assessment will be reported in the Environmental Statement.

Consultation

This non-technical summary of the Preliminary Environmental Impact (PEI) Report has been prepared to help those potentially affected or interested in the scheme to understand the environmental setting and currently anticipated impacts of the scheme on the environment.

Table 1 within Appendix A includes a summary of the likely significant environmental effects associated with the scheme as identified within the PEI Report. These considerations can be taken into account in your responses to the consultation – refer to the section below on how to provide your comments. Your feedback from the consultation will inform our continuing development of the scheme design (see section below).

Next steps

Following the consultation period, a Consultation Report will be produced to summarise the views and comments received, and outline how they have been taken into consideration in refining the scheme design. Highways England will include this report as part of the Development Consent Order (DCO) application which is planned for submission in the 2019. The Planning Inspectorate (PINS) will decide whether the application meets the required standards to proceed to examination.

If the application for a DCO is accepted by PINS, interested parties will then be able to make relevant representations to PINS about the scheme and its potential impacts. Following examination, PINS will make a recommendation to the Secretary of State, who will then decide whether to grant a DCO. If the application is approved, work on the scheme is expected to start in 2021, with the scheme being fully open to traffic in 2024.

If you would like any further information on the DCO application process, you can visit the PINS website:

https://infrastructure.planninginspectorate.gov.uk/

All consultation material, including a full summary of the scheme, copies of supporting project documents and an online questionnaire will be provided on a dedicated website consultation page. Links to this page will be provided from the existing Highways England project web page:

www.highwaysengland.co.uk/A38-Derby-Junctions

APPENDIX A: Summary sheet and scheme drawings

Contents:

Table 1: Summary of preliminary assessment of likely significant environmental effects

Indicative scheme design – Kingsway junction

Indicative scheme design – Markeaton junction

Indicative scheme design – Little Eaton junction

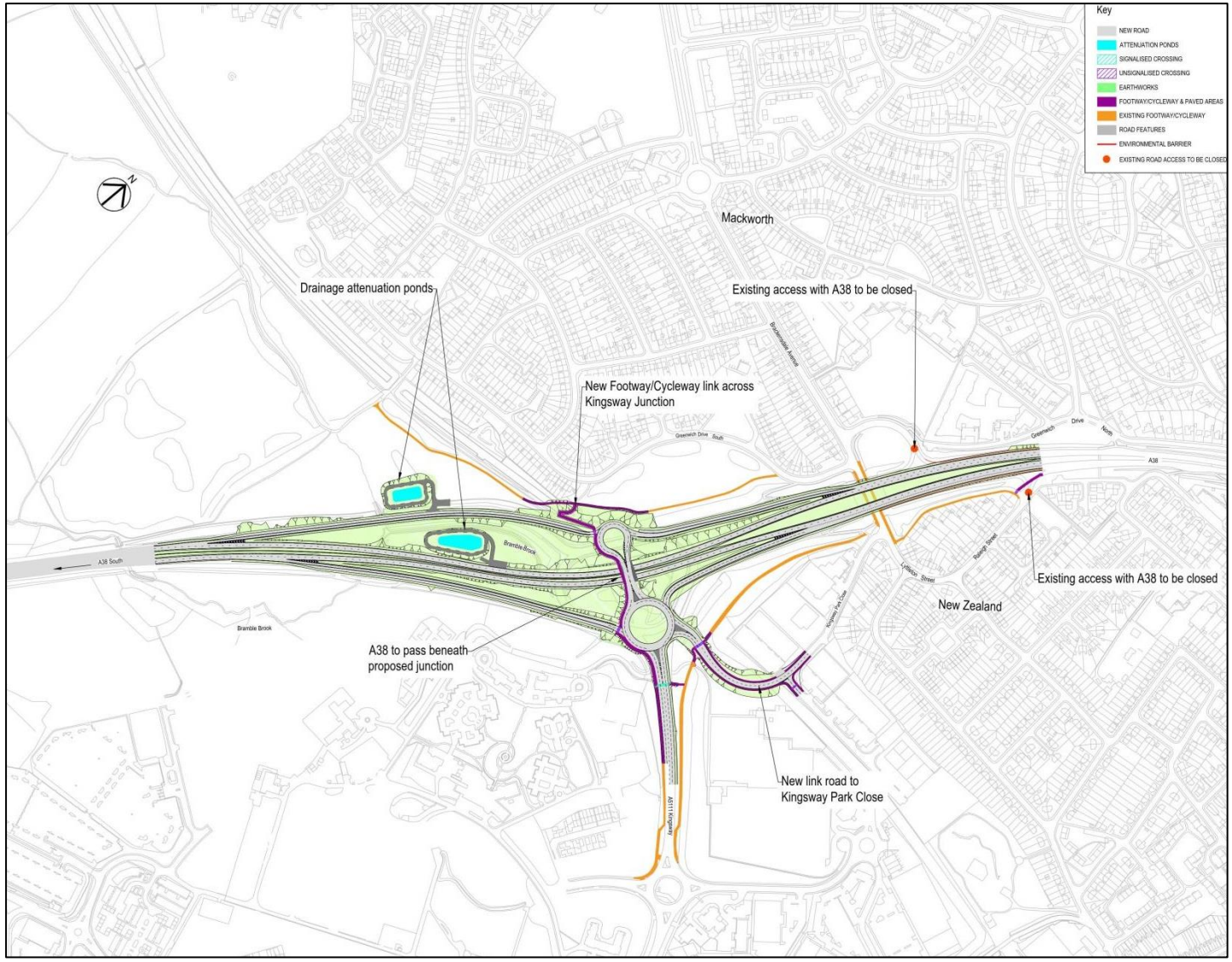
Table 1: Summary of preliminary assessment of likely significant environmental effects*

Topic	Construction stage	Operational stage
Air quality	No likely significant effects anticipated.	No likely significant effects anticipated.
Cultural heritage	No likely significant effects anticipated.	No likely significant effects anticipated.
Landscape and visual impacts	• Likely temporary **adverse** visual effects from within Greenwich Drive South public open space at Kingsway junction. • Likely temporary **adverse** visual effects for users of the Derwent Valley Heritage Way at Little Eaton junction.	• Likely **adverse** visual effects from within Greenwich Drive South public open space at Kingsway junction. • Likely **adverse** visual effects from the edge of Breadsall at Little Eaton junction upon scheme opening (effects not likely to be significant in the long term). • Likely **adverse** visual effects for users of the Derwent Valley Heritage Way at Little Eaton junction upon scheme opening (effects not likely to be significant in the long term).
Biodiversity	• Likely significant **adverse** effect on the A38 Roundabout Local Wildlife Site and the Alfreton Road Grassland Local Wildlife Site. • Short to medium term likely significant **adverse** effect on habitats, particularly on woodlands, until replacement habitat establishes (thus effects not likely to be significant in the long term). • Short to medium term likely significant **adverse** effect on foraging and commuting bats and birds (particularly on common nesting birds) until habitat establishes (thus effects not likely to be significant in the long term).	• Likely significant **adverse** effect on the A38 Roundabout Local Wildlife Site and the Alfreton Road Grassland Local Wildlife Site. • Short to medium term likely significant **adverse** effect on habitats, particularly on woodlands, until replacement habitat establishes (thus effects not likely to be significant in the long term). • Short to medium term likely significant **adverse** effect on foraging and commuting bats and birds (particularly on common nesting birds) until habitat establishes (thus effects not likely to be significant in the long term).
Noise and vibration	• Likely risk of significant **adverse** vibration annoyance effects at receptors closest to construction activities. • Likely significant **adverse** construction noise effects at receptors closest to the works.	• Like **adverse** noise impact on Kingsway Park Close. • Likely **adverse** noise impact on A38 mainline between Kingsway and Markeaton junctions. • Likely significant **adverse** noise effects in the vicinity of Markeaton junction, including upon the Royal School for the Deaf.
Geology and soils	No likely significant effects anticipated.	No likely significant effects anticipated.

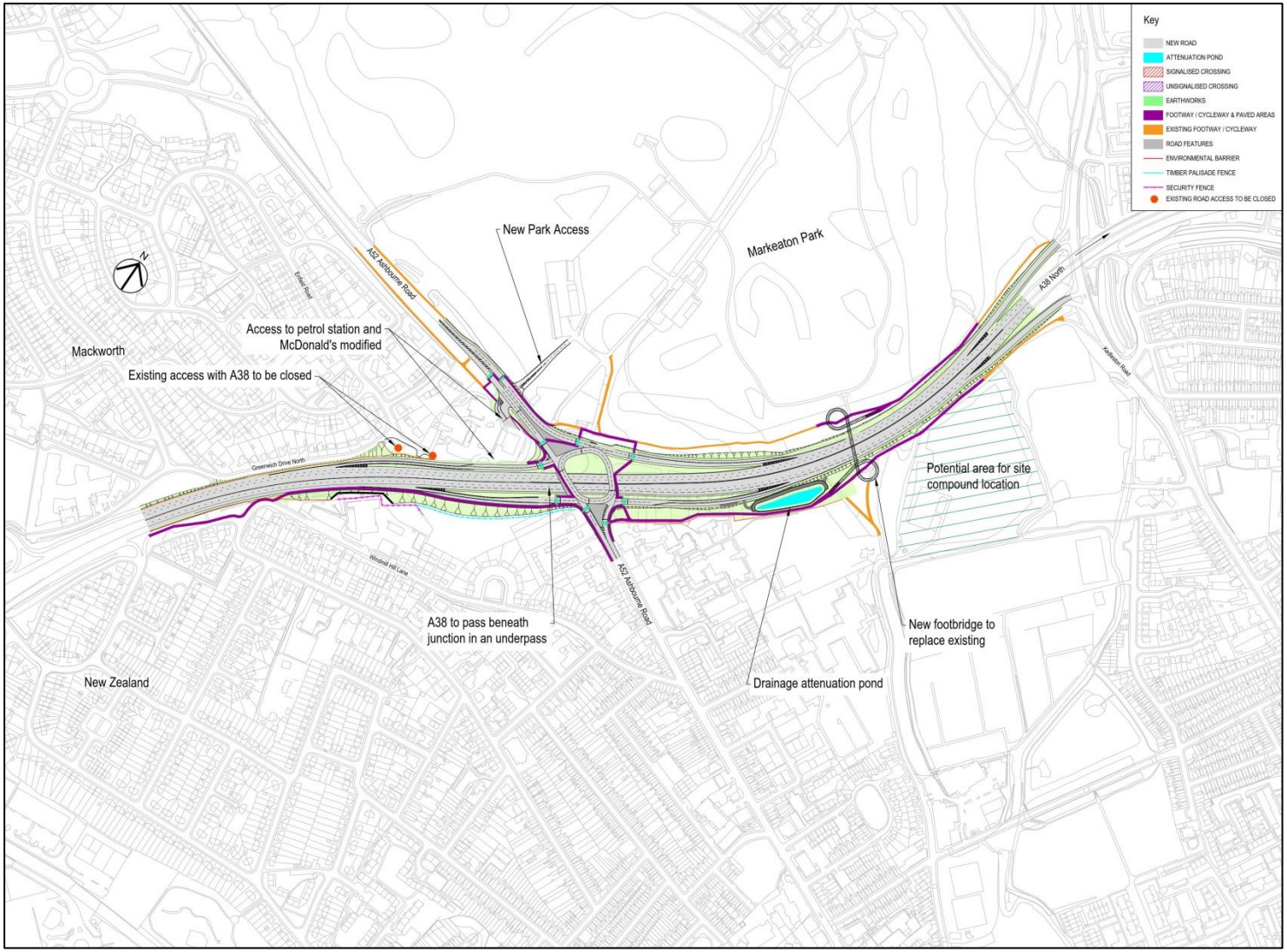
Topic	Construction stage	Operational stage
Road drainage and the water environment	No likely significant effects anticipated.	No likely significant effects anticipated.
Materials	No likely significant effects anticipated.	No likely significant effects anticipated.
People and communities	• Likely **adverse** effect on users of Markeaton Park footbridge (which carries the Bonnie Prince Charlie Walk) until provision of a replacement footbridge. • Likely **adverse** effect due to demolition of 15 detached properties on Queensway and 2 semi-detached properties on the A52 (Ashbourne Road). • Likely **adverse** effect due to closure of Ford Lane access. • Likely **adverse** effects upon some agricultural land holdings at Little Eaton junction due to temporary or permanent land-take.	• Likely **beneficial** effects for walkers and cyclists due to improved facilities. • Likely **beneficial** effects for motorists due to reductions in stress due to reductions in traffic congestion. • Likely **beneficial** effect for users of local buses due to improved journey times and journey reliability. • Likely **beneficial** effects on community divisions, as a result of the scheme reducing traffic congestion.
Major accidents and disasters	No likely significant effects anticipated.	No likely significant effects anticipated.
Climate	No likely significant effects anticipated.	No likely significant effects anticipated.
Human health	No likely significant effects anticipated.	No likely significant effects anticipated.

*Note - after inclusion of proposed mitigation measures

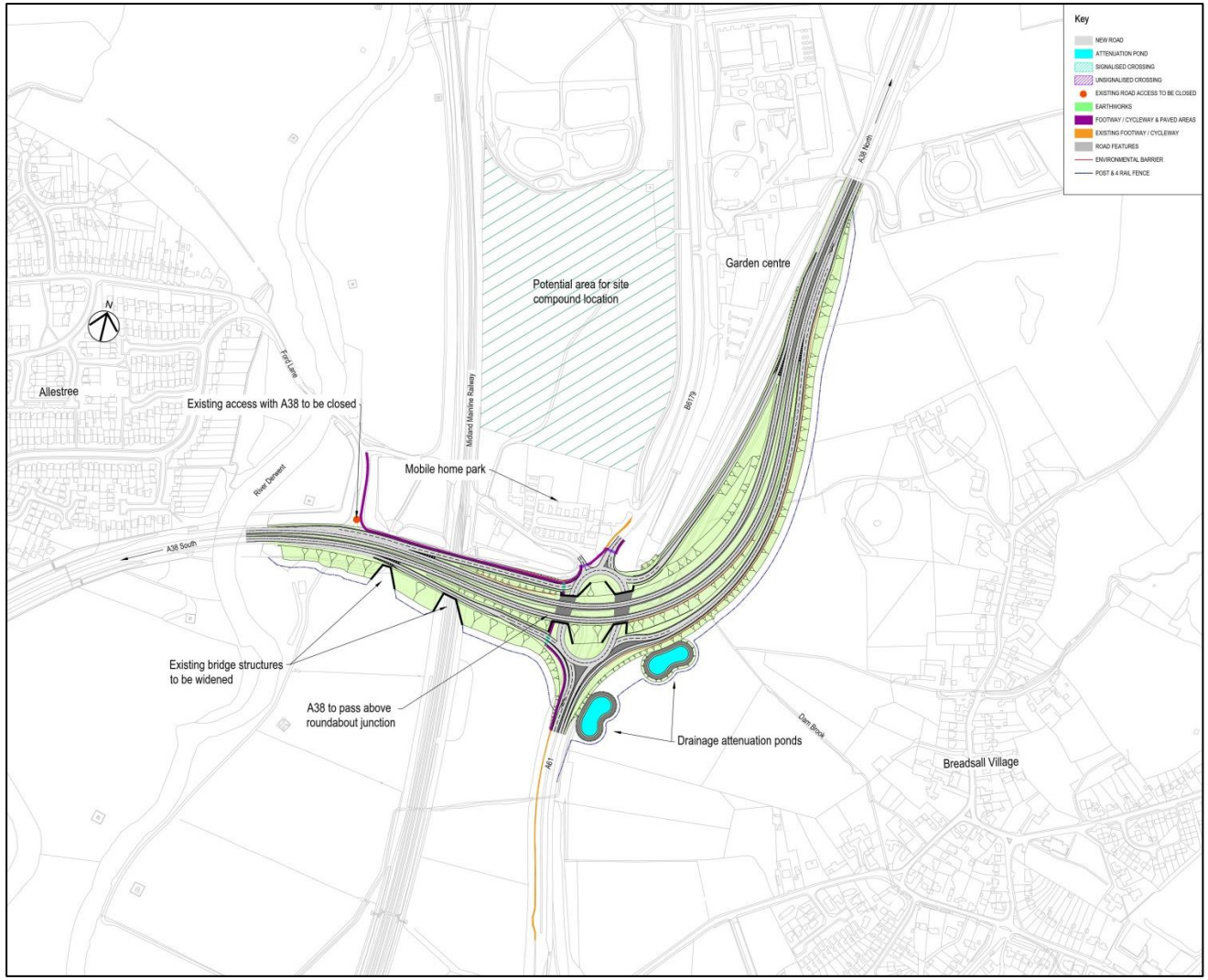
Indicative scheme design – Kingsway junction



Indicative scheme design – Markeaton junction



Indicative scheme design – Little Eaton junction



A38 Derby Junctions Scheme

Statutory Public Consultation

Public consultation response form

7 September to 18 October 2018

We want to understand your views on our proposals to improve the Kingsway, Markeaton and Little Eaton junctions on the A38 through Derby.

This form has been designed to help you provide your feedback. We recommend that you read the accompanying consultation brochure and the other supporting consultation documents before you complete it. You may also wish to attend one of the public exhibitions that are being held during the consultation period. Details of the events being held can be found in the brochure, or on our webpage: **www.highwaysengland.co.uk/A38-Derby-Junctions**

When you are ready, please complete the questionnaire, you can do this in a number of ways:

- **Online:** follow the links to our consultation page from www.highwaysengland.co.uk/A38-Derby-Junctions
- **By post:** Send this completed form to 'FREEPOST A38 DERBY JUNCTIONS'
- **By email:** scan a copy of your completed form and email it to, A38DerbyJunctions@highwaysengland.co.uk

The consultation will run for 6 weeks, beginning on 7 September 2018. It will close at 11.59pm on 18 October 2018.

The questionnaire is split into 4 parts: a section about you, a section about the scheme as a whole, a section about the specific junctions, and finally a section about the consultation process.

Part 1: About you

Please provide us with your name and address. If you'd prefer to stay anonymous, please just provide your postcode – this is needed for the purpose of data analysis.

Your name _____

Your address _____

Postcode _____

If you would like us to update you on the outcome of the consultation and the next stages in the project, please give us your email address below.

Email address _____

If you are responding on behalf of an organisation, please tell us the name of the organisation and your role in it.

Name of Organisation _____

Your role in the organisation _____

1. How does the A38 Derby junctions scheme affect you? **(please tick all that apply)**

[ ] I'm a local resident (lives within 2 miles of one of the junctions)
[ ] I'm a business owner (business address within 2 miles of one of the junctions)
[ ] I'm employed locally (within 2 miles of one of the junctions)
[ ] I'm a landowner (within the area of land proposed for the scheme)
[ ] I regularly travel through the area using a private vehicle
[ ] I regularly travel through the area in a commercial vehicle
[ ] Other **(please state)**

_____

2. How frequently do you use the A38 through Derby? **(please tick all that apply)**

[ ] 5+ days a week [ ] 2-4 days a week [ ] Weekly
[ ] Monthly [ ] Less often [ ] Never

3. What times of day do you normally use this route? **(please tick all that apply)**

[ ] Weekday peak periods (morning or evening rush hours)
[ ] Weekday daytime
[ ] Evenings / nights
[ ] Weekends

4. How do you normally travel through the A38 through Derby **(select all that apply)**

[ ] Car/van [ ] HGV / LGV [ ] Bus [ ] Motorcycle
[ ] On foot [ ] Bicycle [ ] Other **(please state)**

_____

Part 2: The scheme as a whole

5. To what extent do you agree that the 3 junctions on the A38 in Derby need improving?

[ ] Strongly agree
[ ] Agree
[ ] Neither agree nor disagree
[ ] Disagree
[ ] Strongly disagree
[ ] Don't know

6. How well do you think the proposed scheme addresses Highways England objectives? **(please tick all that apply)**

Objective	Very well	Well	Neither	Not well	Not at all well	Don't know
Reduce congestion at the 3 junctions on the A38						
Improve reliability of journey times when travelling on the A38						
Support future development in the area						
Maintain road safety						
Connect people by maintaining or providing appropriate pedestrian/cyclist facilities for crossing and travelling along the road						
Minimise or reduce the impact on the environment, including air quality and noise						

7. The Preliminary Environment Information Report which has been published alongside the consultation brochure, outlines the potential impact of the scheme and what we propose to do in response. Is there anything you think we have missed, or should additionally consider in our assessments?

8. After reading the consultation brochure and Preliminary Environment Information Report, and providing your responses to the questions asked, do you have any other comments on our proposals for the A38 Derby Junctions scheme?

Part 3: Questions about the specific junctions

Kingsway junction

Details of our proposals can be found on pages 8 - 12 of the consultation brochure and in the Preliminary Environment Information Report (PEIR).

9. Do you have any comments regarding whether noise barriers should be provided along both sides of the A38 mainline between Kingsway junction and Windmill Hill Lane, and the type of barrier? Details of the noise barriers can be found in the consultation brochure and the PEIR.

10. Areas of public open space land will be lost from Mackworth Park and next to Greenwich Drive South, as a result of the scheme. We are providing replacement areas and have included suggestions in the brochure. Do you have any comments regarding these potential sites?

11. In addition to maintaining the existing pedestrian and cyclist routes and crossing points, we are providing new facilities. Do you have any comments regarding the facilities we are providing for pedestrians and cyclists?

12. Do you have any other comments on our proposals for Kingsway junction?

Markeaton junction

Details of our proposals can be found on pages 8 - 12 of the consultation brochure and in the Preliminary Environment Information Report (PEIR).

13. Do you have any comments regarding whether noise barriers should be provided along both sides of the A38 mainline between Windmill Hill Lane and Markeaton junction, and the type of barrier? Details of the noise barriers can be found in the consultation brochure and the PEIR.

14. Areas of public open space land will be lost from the edge of Markeaton Park as a result of the scheme. We are providing replacement areas and have included suggestions in the brochure. Do you have any comments regarding these potential sites?

15. It is proposed to close the existing uncontrolled pedestrian crossing of the A38 between Thurcroft Close and Greenwich Drive North, for safety reasons. Alternative routes will be via Brackensdale Avenue or the new controlled crossings at Markeaton junction. Do you have any comments on this proposal? Would you use the new facilities? If not, why not?

16. Do you have any other comments regarding the facilities we are providing for pedestrians and cyclists around Markeaton junction?

17. Do you have any other comments on our proposals for Markeaton junction?

Little Eaton junction

Details of our proposals can be found on pages 8 - 12 of the consultation brochure and in the Preliminary Environment Information Report (PEIR).

18. Do you have any comments about our proposed environmental mitigation proposals in the form of environmental screening / barriers at the Little Eaton junction? Details of the screening can be found in the consultation brochure and the PEIR.

I would prefer:

- **[ ]** No screening
- **[ ]** Timber barrier
- **[ ]** Timber barrier with climbing vegetation
- **[ ]** Earth bunds
- **[ ]** No preference
- **[ ]** Other **(Please use the space below to offer any additional comments or explain your choice)**

19. In addition to maintaining the existing pedestrian and cyclist routes and crossing points, we are providing new facilities. Do you have any comments regarding the facilities we are providing for pedestrians and cyclists around Little Eaton junction?

Part 4: The consultation

20. How did you hear about this consultation? **(please tick all that apply)**

[ ] Letter / Flyer through the door **[ ]** Poster / public notice
[ ] Local radio / local media coverage
[ ] Newspaper advert **[ ]** Word of mouth
[ ] Highways England website
[ ] Social media
[ ] Other **(please state)** _____

21. Did you attend a consultation event?

[ ] Yes **[ ]** No

General Data Protection Regulations

On 25 May 2018, the General Data Protection Regulations (GDPR) came into force. This legislation requires Highways England to explain to consultees, stakeholders and customers how their personal data will be used and stored.

Highways England adheres to the Government's Consultation Principles, the Planning Act 2008 and the Highways Act 1980 as required, and may collect personal data to help shape development of highways schemes. Personal data collected for the A38 Derby Junctions scheme will be processed and retained by Highways England and its appointed contractors until the scheme is complete.

Under the GDPR regulations you have the right to request the following information from us:

1. Right of access to the data (Subject Access Request);
2. Right for the rectification of errors;
3. Right to erasure of personal data – this is not an absolute right under the legislation;

Right to restrict processing or to object to processing and Right to data portability.

If, at any point, Highways England plans to process the personal data we hold for a purpose other than that for which it was originally collected, we will provide you with information about what that other purpose is. This will be done prior to any further processing taking place. The extra information will include any relevant further information as referred to above, including the right to object to that further processing. You have the right to lodge a complaint with the supervisory authority, the Information Commissioners Office. If you'd like more information about how we manage data, or a copy of our privacy notice, please contact DataProtectionAdvice@Highwaysengland.co.uk

Notes

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

Contact us

If you wish to contact us, you can reach us in the following ways:

Email us at: A38derbyjunctions@highwaysengland.co.uk
Website: www.highwaysengland.co.uk/A38-Derby-Junctions (you can register on this page, to receive email updates as the scheme progresses)

Telephone: 0300 123 5000

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This document is also available on our website at **www.gov.uk/highways**

If you have any enquiries about this publication email **info@highwaysengland.co.uk** or call **0300 123 5000***. Please quote the Highways England publications code **PR107/18**.

Highways England Creative BHM18_0351

*Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls. These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone. Calls may be recorded or monitored.

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Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ
Highways England Company Limited registered in England and Wales number 09346363

What is Development Consent?

The Planning Act 2008 established the legal framework for applying for, examining and determining planning applications for Nationally Significant Infrastructure Projects (NSIP).

Under the Planning Act, a Development Consent Order (DCO) is the means of obtaining permission to construct and maintain developments categorised as NSIPs. This includes energy, transport, water and waste projects.

Some of our major road improvement proposals are classed as NSIPs. Before we submit a DCO application to the Planning Inspectorate, we hold consultations as part of our wider engagement activity. This is in addition to the request for representations and the examination of the application that the Planning Inspectorate organises once an application has been accepted.

For more information about the planning process for Nationally Significant Infrastructure projects, please visit: *https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes*

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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This document is also available on our website at **www.highways.gov.uk.**

If you have any enquiries about this publication email **info@highwaysengland.co.uk** or call **0300 123 5000***.

Please quote the Highways England publications code **PR72/17**.

Highways England creative job number BHM17_0198.

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Development consent for our major road schemes





The local community can raise any concerns they have about our proposals via the consultation.

How do I have my say?

We consult with relevant local authorities, anyone with an interest in the land, and statutory consultees, such as the Environment Agency. We prepare a statement, in consultation with relevant local authorities, on how we will consult people living in the vicinity of the land, and then carry out that consultation.

We advertise locally and nationally to ensure people are aware of consultations that affect them and how they can take part. Highways England sometimes carries out consultation in stages so that feedback from our customers, local communities and stakeholders can influence the type, geographical route and design of the project that we take forward.

Customers, stakeholders and the local community can raise any concerns they have about our proposals via the consultation.

Some of our major road improvement proposals are classed as Nationally Significant Infrastructure Projects (NSIPs)

To ensure transparency, we publish a consultation report to set out how we have considered responses following each round of consultation. A consultation report will be included in our application to the Planning Inspectorate for the DCO.

How does it work?

On receiving and accepting an application, the Planning Inspectorate carries out the examination. During this stage, people who have registered to have their say are invited to provide more details of their views in writing. Careful consideration is given by the Examining Authority to all the important and relevant matters, including any Local Impact Reports received by local authorities, representations of all interested parties, any evidence submitted and answers provided to questions set out in writing and explained at hearings.

The Planning Inspectorate maintains a public register of applications received and members of the public are able to examine applications and accompanying documents, as well as reports of pre-application consultations.

The Planning Inspectorate manages the examination of applications, including deciding the principal issues to be examined. It has the discretion to decide whether cross-examination of evidence should take place at hearings. At the end of an examination, the Planning Inspectorate prepares a report on the application to the relevant Secretary of State, including a recommendation on whether to grant development consent. The Secretary of State then makes the decision on whether to grant or refuse development consent.

HIGHWAYS AD BOOKING

Date: 06/09/2018

Penna Ref : 628715000001 GPC Code : GPC/00172344

Publication : Derby Eve Telegraph (Northclif

Business

Public Notices

highways england

Notice of consultation
A38 Derby Junctions Scheme
Section 47 Planning Act 2008
Notice publicising a Statement of Community Consultation

Highways England is planning to replace three roundabout junctions with two underpasses and a flyover on the A38 through Derby and provide road widening between Kingsway and Kedleston Road junctions. The project aims to support the smooth flow of traffic, encourage economic growth and make the network safer. These three junctions are namely;

A38/A61 Little Eaton roundabout
A38/A52 Markeaton roundabout
A38/A5111 Kingsway roundabout

We intend to make an application to the Planning Inspectorate under Section 37 of The Planning Act 2008 for a Development Consent Order to authorise construction of the scheme.

Before making our application we must produce a document called the Statement of Community Consultation setting out how we will consult the local community about our proposals. We also must make this statement available for inspection by the public and publish this notice stating where and when the statement can be inspected. We then must carry out the consultation in accordance with the statement.

This notice contains a summary of the consultation details. However, full details of the consultation can be found in the Statement of Community Consultation. This can be viewed along with our consultation materials, online at www.highwaysengland.co.uk/A38-Derby-Junctions or at the following deposit locations from the start of our consultation period (7 September 2018) until the 18 October 2018.

Deposit Location	Opening times
Allestree Library Park Farm Centre Park Farm Drive Derby DE22 2QN	Monday – closed Tuesday 10am – 5pm Wednesday – closed Thursday 10am – 7pm Friday 10am – 5pm Saturday 10am – 1pm Sunday – closed
Breadsall Village Shop 2 Rectory Lane Breadsall Derby DE21 5LL	Monday to Friday 7.15am – 6.30pm Saturday 7:45am – 6pm Sunday 8.30am – 2pm
Riverside Library Council House Corporation Street Derby DE1 2FS	Monday to Friday 8:30am – 5pm Saturday – 9am – 1pm Sunday – closed
Derbyshire County Council offices County Hall Matlock DE4 3AG	Monday to Friday 9am – 5pm Saturday – closed Sunday – closed
Etwall Libray Main St Etwall Derby DE65 6LP	Monday 2pm – 7pm Tuesday closed Wednesday – 10am – 5pm Thursday 2pm – 7pm Friday closed Saturday – closed Sunday – closed
Little Eaton Post Office (within the Co-operative), 160 Alfreton Road Little Eaton Derby DE21 5DE	Monday to Friday 9am – 5:30pm Saturday 9am – 1pm Sunday – closed
Mackworth Library Prince Charles Avenue Mackworth Derby DE22 4BG	Monday 10am – 5pm Tuesday 1pm – 5pm Wednesday – closed Thursday 1pm – 5pm Friday – closed Saturday 10am – 1pm Sunday – closed
Mickleover Library Holly End Road Derby DE3 0EA	Monday – closed Tuesday 10am – 5pm Wednesday – closed Thursday 10am – 7pm Friday 10am – 5pm Saturday 10am – 1pm Sunday – closed

You can also view our consultation materials at our consultation events where you can speak with the project team and share your views. Consultation events will be held at the following venues during the consultation period:

Public Consultation Events

University of Derby Enterprise Centre*
Bridge Street, Derby, DE1 3LD
Friday 7 September, 2pm –8pm
Saturday 8 September, 10am – 4pm

Breadsall Priory
Moor Road, Morley, Derby, DE7 6DL
Wednesday 12 September, midday – 8pm

Haslams (The Venue), Derby RFC
Haslams Lane, Darley Abbey,
Derby, E22 1EB
Thursday 13 September, midday – 8pm

Breadsall Memorial Hall
Brookside Rd, Breadsall,
Derby DE21 5LR
Saturday 15 September, 2:30pm – 8pm

Allestree Memorial Hall,
1 Cornhill, Allestree Derby, DE22 2GG
Tuesday 18 September,
10am – 1pm & 15.30pm – 7pm

Little Eaton Village Hall
Vicarage Lane, Little Eaton,
Derby, DE21 5EA
Wednesday 19 September, 3.30pm – 8pm

Brackensdale Primary School*
Walthamstow Drive, Derby, DE22 4BS
Saturday 22 September, 10am – 4pm

* The Enterprise Centre and Brackensdale Primary School events will include a British sign language interpreter, and a portable Loop system will be available at all exhibition events for the hard of hearing.

The scheme is an Environmental Impact Assessment development, which means a Preliminary Environmental Information (PEI) Report (to describe the environmental effects of the scheme) has been produced and is being consulted on alongside the other consultation documents. It also means that an Environmental Statement will be produced and submitted with the application in due course.

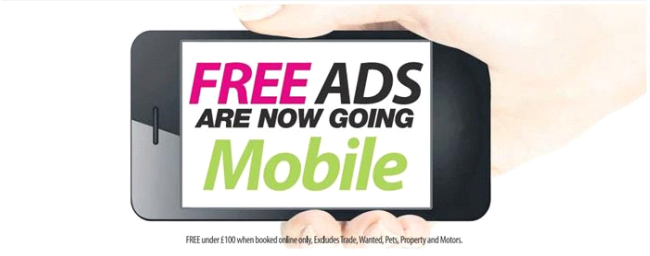
Contact the team by

Email: A38DerbyJunctions@highwaysengland.co.uk
Write:
A38 Derby Junctions Scheme
Highways England, Floor 5
Two Colmore Square
38 Colmore Circus
Birmingham, B4 6BN

Telephone: 0300 123 5000
(Monday to Friday 9am -5pm)

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ
Highways England Company Limited registered in England and Wales number 09346363

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highways england

SECTION 48 PLANNING ACT 2008
REGULATION 4 OF THE INFRASTRUCTURE PLANNING
(APPLICATIONS: PRESCRIBED FORMS AND PROCEDURE) REGULATIONS 2009
A38 DERBY JUNCTIONS SCHEME
NOTICE PUBLICISING A PROPOSED APPLICATION FOR A DEVELOPMENT CONSENT ORDER

HIGHWAYS ENGLAND COMPANY LIMITED of Bridge House, 1 Walnut Tree Close, Guildford, GU1 4LZ ("the Applicant") proposes to make an application ("the Application") under Section 37 of the Planning Act 2008 to the Secretary of State for Transport for a Development Consent Order.

The Application is for the proposed A38 Derby Junctions Scheme in Derby, Derbyshire, England

The scheme's main proposal in summary is:

To replace three roundabout junctions with two underpasses and a flyover on the A38 through Derby and provide road widening between Kingsway and Kedleston Road junctions. The project aims to support the smooth flow of traffic, encourage economic growth and make the network safer. These three junctions are namely;

- A38/A61 Little Eaton roundabout
- A38/A52 Markeaton roundabout
- A38/A5111 Kingsway roundabout

In addition, any necessary rights and powers will be sought to ensure delivery of the Scheme, including compulsory acquisition.

The scheme is an Environmental Impact Assessment development ("EIA development"), as defined by The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. An Environmental Statement will be submitted as part of the Application. Preliminary Environmental Information ("PEI") forms part of the consultation material.

Consultation on the proposals will take place from 7 September to 18 October 2018. Copies of the consultation materials - including documents, plans and maps showing the nature and location of the proposed development and the PEI - will be available for inspection free of charge from 7 September to 18 October 2018 at the following locations and times:

Location	Opening times
Allestree Library Park Farm Centre Park Farm Drive Derby DE22 2QN	Monday – closed Tuesday 10am – 5pm Wednesday – closed Thursday 10am – 7pm Friday 10am – 5pm Saturday 10am – 1pm Sunday – closed
Breadsall Village Shop 2 Rectory Lane Breadsall Derby DE21 5LL	Monday to Friday 7.15am – 6.30pm Saturday 7.45am – 6pm Sunday 8.30am – 2pm
Riverside Library Council House Corporation Street Derby DE1 2FS	Monday to Friday 8.30am – 5pm Saturday – 9am – 1pm Sunday – closed
Derbyshire County Council offices County Hall Matlock DE4 3AG	Monday to Friday 9am – 5pm Saturday – closed Sunday – closed
Etwall Libray Main St Etwall Derby DE65 6LP	Monday 2pm – 7pm Tuesday closed Wednesday – 10am – 5pm Thursday 2pm – 7pm Friday closed Saturday – closed Sunday – closed
Little Eaton Post Office (within the Co-operative) 160 Alfreton Road Little Eaton Derby DE21 5DE	Monday to Friday 9am – 5.30pm Saturday 9am – 1pm Sunday – closed
Mackworth Library Prince Charles Avenue Mackworth Derby DE22 4BG	Monday 10am – 5pm Tuesday 1pm – 5pm Wednesday – closed Thursday 1pm – 5pm Friday – closed Saturday 10am – 1pm Sunday – closed
Mickleover Library Holly End Road Derby DE3 0EA	Monday – closed Tuesday 10am – 5pm Wednesday – closed Thursday 10am – 7pm Friday 10am – 5pm Saturday 10am – 1pm Sunday – closed

Copies of the consultation materials also will be available online free of charge from 7 September 2018 at be www.highwaysengland.co.uk/A38-Derby-Junctions.

Copies of the consultation materials may be requested during the consultation period from Highways England using the e-mail address, postal address or telephone number provided below.

A CD containing the materials can be also provided free of charge.

Any person may comment on the proposals or otherwise respond to this publicity. Responses must be received between 7 September and 18 October 2018. A consultation feedback form is available as part of the consultation materials. When providing your response, please include your name and address or, if you would prefer your comments to be anonymous, your postcode only. Please also confirm the nature of your interest in the scheme. Please supply any response to:

- Email address:
  A38derbyjunctions@highwaysengland.co.uk
- Postal Address:
  A38 Derby Junction Scheme
  Highways England, Floor 5
  Two Colmore Square
  38 Colmore Circus
  Birmingham, B4 6BN
- Tel: +44 (0) 300 123 5000

Responses must be received no later than 11.59pm on 18 October - or, if later, 28 days from the date of this notice.

Highways England will consider and have regard to all responses when developing the Application for a Development Consent Order once the consultation has closed. Responses will form the basis of a Consultation Report that will be one of the factors taken into consideration by the Secretary of State when deciding whether the Application can be accepted for examination. Therefore, in providing any comment, it should be borne in mind that the substance of it may be communicated to others as part of the Consultation Report.

If you would like further information about this notice, the consultation or the scheme, please contact the project team by using one of the contact methods provided above.

Paul Nagra
Project Manager
Highways England

06 September 2018

Derby City Council

ADVERTISEMENT RELATING TO THE DISPOSAL OF OPEN SPACE

BY A LOCAL AUTHORITY

DERBY CITY COUNCIL

SECTION 123 (2a) LOCAL GOVERNMENT ACT 1972

DISPOSAL OF PUBLIC OPEN SPACE LAND OFF CENTURIAN WALK, DERBY, DE1 3RD

Notice is hereby given that Derby City Council intends to dispose of Public Open Space land.

A drawing showing the location of the land may be inspected at Derby City Council's office at the Council House, Corporation Street, Derby, DE1 2FS from 8.30am to 5.00pm Monday to Friday (excluding public holidays).

Objections or comments should be made in writing and addressed to: The Director of Legal and Democratic Services, Derby City Council, Council House, Corporation Street, Derby, DE1 2FS

To be received no later than 20th September 2018

Dated 6th September 2018

DERBYSHIRE COUNTY COUNCIL
TEMPORARY FOOTPATH CLOSURE
PUBLIC FOOTPATH NO.2 (PART) SHIPLEY

WHEN: 14 September 2018 to 31 December 2018

WHERE: Close Public Footpath No.2 (Part) Shipley from its junction with Old Coppice Side for a distance of 82 metres.

REASON: To allow for public safety whilst construction works are undertaken adjacent to the footpath.

ALTERNATIVE ROUTE: From the north-east, along the pavement on Old Coppice Side and down the left hand side of The Country Park Tavern, following the Heras fenced route to join back up with Shipley Footpath No.2 Vice versa from the south-west.

Access will be maintained, whenever reasonably possible, on the affected length of footpath. The footpath will re-open as soon as the work is finished. This may be earlier than advertised.

Derbyshire County Council apologises for any inconvenience caused while work takes place. Anyone needing further information should ring Call Derbyshire 01629 533190.

The County Council intends to make an Order under Section 14 of the Road Traffic Regulation Act 1984 (as amended) to prohibit its use by traffic.

Mike Ashworth, Strategic Director - Economy, Transport and Environment, County Hall, MATLOCK DE4 3AG