

A38 Derby Junctions

TR010022

Volume 6

6.1 Environmental Statement

**Chapter 12(a) – People and
Communities**

Regulation 5(2)(a)

Planning Act 2008

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

March 2020

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms
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6.1 Environmental Statement
Chapter 12(a) People and Communities

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12. People and Communities

12.1. Introduction and competent expert evidence

- 12.1.1. This chapter assesses the potential people and communities impacts associated with the construction and operation of the Scheme, following the methodology set out in Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 6: Land Use (Highways Agency, 2001), Part 8: Pedestrians, Cyclists, Equestrians and Community Effects (Highways Agency, 1993), Part 9: Vehicle Travellers (Highways Agency, 1993) and associated Interim Advice Notes (IANs), as well as good practice from other assessments of comparable transport schemes.
- 12.1.2. This chapter details the methodology followed for the assessment, summarises the regulatory and policy framework related to people and communities, and describes the existing environment in the area surrounding the Scheme. Following this, the design and mitigation measures proposed to manage and minimise potential impacts are specified, after which residual effects of the Scheme are presented. We also provide details of any assumptions and limitations made during the assessment.
- 12.1.3. This people and communities assessment is supported by Appendices 12.1 and 12.2 [TR010022/APP/6.3] as follows:
- Appendix 12.1: A38 Walking, Cycling and Horse Riding Assessment (Highways England, 2019).
 - Appendix 12.2: Human Health. An assessment of the direct and indirect effects of the Scheme on human health is included within this appendix. In order to assess potential human health effects, consideration has been given to a number of assessments reported within this Environmental Statement (ES) that have principally been undertaken in isolation, namely: air quality, landscape and visual, noise and vibration, road drainage and the water environment, and climate.
- 12.1.4. All figures cited within this chapter are included within ES Volume 2 [TR010022/APP/6.2].
- 12.1.5. This chapter of the ES has been prepared by competent experts with relevant and appropriate experience. The technical lead for the people and communities assessment has 18 years of relevant work experience and is a Royal Town Planning Institute (RTPI) Associate - further details are provided in Appendix 1.1 [TR010022/APP/6.3].

12.2. Legislative and policy framework

- 12.2.1. As discussed in Chapter 1: Introduction, the primary basis for deciding whether or not to grant a Development Consent Order (DCO) is the National Policy Statement for National Networks (NPSNN) (Department for Transport (DfT), 2014) which, at Sections 4 and 5, sets out policies to guide how DCO applications will be decided and how the impacts of national networks infrastructure should be considered. Table 12.1 identifies the NPSNN policies relevant to the people

and communities assessment and where in this ES chapter information is provided to address these policy requirements.

Table 12.1: Relevant NPSNN policies for the people and communities assessment

Relevant NPSNN para. ref.	Requirement of the NPSNN	Location where information addresses policy requirements
3.17	The Government expects applicants to use reasonable endeavours to address the needs of cyclists and pedestrians in the design of new schemes. The Government also expects applicants to identify opportunities to invest in infrastructure in locations where the national road network severs communities and acts as a barrier to cycling and walking, by correcting historic problems, retrofitting the latest solutions and ensuring that it is easy and safe for cyclists to use junctions.	Refer to Sections 12.9 and 12.10 (also refer to Figures 12.3a – 12.3c [TR010022/APP/6.2]).
5.165 – 5.167	The applicant should identify existing and proposed land uses near the project, any effects of replacing an existing development or use of the site with the proposed project or preventing a development or use on a neighbouring site from continuing.	Refer to Sections 12.6 and 12.10.
5.174	The Secretary of State should not grant consent for development on existing open space, sports and recreational buildings unless there is surplus or excess land or the benefits of the project outweigh the loss of those facilities.	Refer to Sections 12.9 and 12.10.
5.180	Applicants are expected to take appropriate mitigation measures to address adverse effects on coastal access, National Trails, other public rights of way and open access land and, where appropriate, to consider what opportunities there may be to improve access.	Refer to Section 12.9 (also refer to Figures 12.3a – 12.3c [TR010022/APP/6.2]).
5.203 – 5.205	Applicants should have regard to the policies set out in local plans and consult with the relevant highway authority and local planning authority on the assessment of transport impacts. Applicants should consider reasonable opportunities to support other transport modes in developing infrastructure. The applicant should provide evidence that as part of the project they have used reasonable endeavours to address any existing severance issues that act as a barrier to non-motorised users.	Refer to Sections 12.6, 12.9 and 12.10.
5.206	For road and rail developments, if a development is subject to EIA and is likely to have significant environmental impacts arising from impacts on transport networks, the applicant's environmental statement should describe those impacts and mitigating commitments.	Refer to Sections 12.8 and 12.9.

12.2.2. Other relevant policies have been considered as part of the people and communities assessment where these have informed the identification of receptors and resources and their sensitivity; the assessment methodology; the potential for significant environmental effects; and required mitigation. These policies include:

- National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2019): NPPF and supporting Planning Practice Guidance (PPG) (Ministry of Housing, Communities and Local Government, 2017) sections on ‘health & well-being’ and ‘open spaces, sports and recreational facilities, public rights of way and local green spaces’ which support the application of NPPF policies. In accordance with the NPPF, the NPSNN policies relating to the applicant’s assessment are the primary source of policy guidance regarding this assessment.
- The Countryside and Rights of Way Act (2000) (CRoW Act) legislation is considered in the assessment. The CRoW Act regulates public rights of way and open access land and ensures access to them.
- Health and Social Care Act (2012): In terms of human health legislation, the Health and Social Care Act 2012 was introduced following the Health and Social Care Bill 2011 and outlines the Secretary of State’s duty to promote and improve the National Health Service (NHS), in pursuit of a number of key aims, which include:
 - An improvement in the quality of services.
 - A reduction in health inequalities.
 - The promotion of autonomy for General Practitioners (GPs) and health centres.
 - Improvements to the treatments and services offered to patients.

The document focuses on the regulation of the NHS at a national and local level, and also promotes changes such as the abolition of NHS Trusts, support for the production of Joint Strategic Needs Assessments (JSNA), and establishment of Health and Well-being boards at a local authority level. These boards would be established for the purpose of advancing the health and well-being of people within each local authority area and aim to “encourage persons who arrange for the provision of any health or social care services in that area to work in an integrated manner”.

- Derby City Local Plan – Part 1 Core Strategy (2017) (Derby City Council (DCiC), 2017).
- Derby Local Transport Plan (LTP3) (2011 - 2026) (DCiC, 2011).
- Rights of Way Improvement Plan for the City of Derby 2014 – 2017 (DCiC, 2014).
- The Derbyshire Rights of Way Improvement Plan (RoWIP) 2007 - 2012 (including the Statement of Action 2013 - 2017 (Derbyshire Country Council (DCC), 2013)).
- Erewash Core Strategy (March 2014) (Erewash Borough Council (EBC), 2014), noting that there are some policies saved from the previous 2005 Local Plan (EBC, 2014), Policies 3, 12 and 16.
- Derbyshire Local Transport Plan LYP3 (2011 - 2026) (DCC, 2011).
- Highways England Delivery Plan 2015 – 2020 (Highways England, 2015).

- 12.2.3. These policies outline the importance of safeguarding public rights of ways and open spaces, as well as recreational buildings for communities. These policies also identify the need for a community severance and amenity assessment to assess development impacts on pedestrians, equestrians and cyclists (PEC) due to variables such as pollution, natural environment and general amenity.
- 12.2.4. In terms of motorised travel, policy leans towards sustainable transport modes and local policy highlights the importance on separating local and long distance traffic to reduce delays and congestion in the area.

12.3. Assessment methodology

- 12.3.1. The assessment methodology follows that set out in DMRB guidance, namely DMRB Volume 11, Section 3, Part 6: Land Use (Highways Agency, 2001), Part 8: Pedestrians, Cyclists, Equestrians and Community Effects (Highways Agency, 1993), Part 9: Vehicle Travellers (Highways Agency, 1993a), associated IANs, and good practice from other assessments undertaken on comparable transport schemes.
- 12.3.2. For some aspects of the assessment there is no specific guidance for the determination of impacts and effect significance. In these cases, potential effects arising from the Scheme have been assessed using professional judgement of suitably qualified and experienced specialists, making use of assessment methodologies applied to previous major highway infrastructure schemes. Where possible, the assessment is based upon DMRB guidance.
- 12.3.3. In accordance with the overall EIA methodology for assessing effect significance, conclusions have been made by assessing the sensitivity of people and communities resources and receptors to the impacts that would be likely to arise as a result of the Scheme (construction and operation).
- 12.3.4. The sections below detail how sensitivity of people and community receptors, and how impact magnitude and effect significance, have been defined.

Sensitivity

Pedestrians, Equestrians and Cyclists (PEC)

- 12.3.5. A public right of way (PRoW) is defined as the legal right possessed by the public to pass along linear routes over land at all times. PRoW includes footpaths, cycle routes, bridleways, restricted byways and roads used as public paths.
- 12.3.6. There is no specific guidance within DMRB guidance in terms of how to assess the sensitivity of PEC facilities to temporary disruption and closure or permanent modification. Accordingly, the criteria detailed in Table 12.2 have been applied in the assessment, which have been developed based upon the professional judgement of suitably qualified and experienced specialists, and have been applied in the assessments of other Highways England infrastructure development projects.

Table 12.2: Sensitivity of PEC routes to temporary or permanent change

Sensitivity	Descriptions
Very high	<ul style="list-style-type: none"> Key routes used by pedestrians, equestrians and cyclists. Routes record very high numbers of PEC journeys and/or connect communities with employment land uses and other services with a direct and convenient PEC route. Routes are important since they offer opportunities to meet sustainable transport and public health objectives through active travel modes rather than private car use. Any interruption of these would inconvenience many people and could cause people to switch from active modes to private car use. Routes regularly used by vulnerable travellers such as the elderly, school children and people with disabilities, who may be disproportionately affected by small changes in the baseline due to potentially different needs.
High	<ul style="list-style-type: none"> National or regional trails and routes likely to be used for recreation that record high use. The sensitivity of these routes is judged to be high because of the number of people affected and effects upon regional leisure. Crossing points on busy roads for PEC (roads with more than 8,000 vehicles per day) which may not currently record high use, but for which limited alternatives are available. These points are sensitive because disruption to these may affect the convenience or safety of journeys for PECs.
Medium	<ul style="list-style-type: none"> Public rights of way and other routes close to communities which are used mainly for recreational purposes (for example dog walking), but for which alternative routes can be taken. These routes are likely to link to a wider network of routes to provide options for longer, recreational journeys. It is likely that direct and efficient journeys are not the priority for the majority of people using these routes so they would be more tolerant of disruptions and diversions. However, people are likely to be sensitive to changes to the amenity and character of the overall route.
Low	<ul style="list-style-type: none"> Routes which have fallen into disuse such as through past severance or which are scarcely used because they do not currently offer a meaningful route for either utility or recreational purposes. Whilst these routes would not be sensitive in terms of disruption from development proposals, they may present opportunities for enhancement if existing barriers or poor amenity can be overcome through development proposals.

Motorised users – view from the road

12.3.7. In assessing the views of motorised users, there is a need to understand driver sensitivity to changes in the landscape and views from the road. This relates both to the speed at which the landscape is viewed and also the ability of drivers to concentrate on the road while travelling, particularly during periods of construction. Taking into account the prevailing conditions at Kingsway junction, Markeaton junction and Little Eaton junction (in terms of the surrounding landscape and the ability of drivers to concentrate on the road while travelling), travellers on the A38 are considered to have a low sensitivity to changes in views from the road (based upon professional judgement).

Motorised users - driver stress

12.3.8. As detailed in DMRB Volume 11, Section 3, Part 9 – Vehicle Travellers (Highways Agency, 1993), driver stress can be defined as the adverse mental and physiological effects experienced by a driver while travelling along a road network. Driver stress has four main components that are considered in the assessment:

- **Frustration:** Frustration is caused by a driver's inability to drive at a speed consistent with their wishes in relation to the general standard of the road. It increases as speed falls in relation to expectations and may be due to high flow levels, roadworks, or difficulties in overtaking slower moving traffic. Congestion can lead to frustration by creating a situation in which the driver does not feel in control, especially when they wish to arrive at a destination by a particular time, but are held up by traffic congestion whose duration cannot be determined.
- **Fear of potential accidents:** The fear of accidents can become particularly acute in adverse weather conditions when spray from vehicles reduces visibility. Adverse weather conditions, coupled with the limited sight distances caused by the scale and mass of Heavy Goods Vehicles (HGVs), makes driving and overtaking more stressful and risky, and therefore increases the fear of accidents.
- **Uncertainty relating to the route:** Road uncertainty is caused primarily by signing that is inadequate for purpose.
- **Traveller care:** The assessment of drivers' stress needs to consider traveller care and whether sufficient traveller care facilities are provided.

12.3.9. The level of driver stress is dependent upon the driver's experience and driving skills, knowledge of the route being taken, health and temperament. Factors to consider include:

- Lane flow.
- Travel speed.
- Junction frequency.
- Road surface characteristics.
- Road layout and geometry.

12.3.10. For the purposes of the driver stress assessment, relative levels of value (sensitivity) have not been assigned to motorised users. It is assumed that all drivers have similar sensitivity in relation to drivers' stress.

Community and private assets

12.3.11. With regard to private assets, for the purposes of this assessment and in the absence of guidance within DMRB, the sensitivity or value of community and private resources and receptors has been defined using the criteria detailed in Table 12.3 which are based upon professional judgement of suitably qualified and experienced specialists and which have been applied in the assessments of other infrastructure development projects.

Table 12.3: Sensitivity criteria - community and private assets

Sensitivity	Description
High	<ul style="list-style-type: none"> Residential, commercial or industrial buildings Buildings used by the community e.g. schools, community halls Community land that attracts users nationally e.g. national parks Designated public open space Religious sites and cemeteries
Medium	<ul style="list-style-type: none"> Residential, commercial or industrial land e.g. gardens Land used by the community on a regional scale, e.g. country parks, forests and other land managed in such a way as to attract visitors from a regional catchment
Low	<ul style="list-style-type: none"> Derelict or unoccupied buildings or land Locally used community land e.g. local parks and playing fields

12.3.12. The criteria in Table 12.3 are for guidance only; the sensitivity of a community facility may also be affected by the sensitivity of its users. For example, children, the elderly and those with a physical or mental disability are considered to be more sensitive to the loss of community facilities than other members of the public.

Impact magnitude and significance of effect

Pedestrians and cyclists

12.3.13. The assessment of effects on PECs concentrates on changes in amenity, journey length and severance. Amenity is defined as the relative pleasantness of a journey. The assessment is, therefore, concerned with changes in the degree and duration of people's exposure to traffic (safety, noise, air quality etc.), the impact of the Scheme on PEC journey lengths, plus any additional visual intrusion as associated with the Scheme. As such, the criteria detailed in Table 12.4 (significance of effects) have been developed as based upon professional judgement of suitably qualified and experienced specialists, and which have been applied in the assessments of other Highways England infrastructure development projects.

Table 12.4: Criteria for assessing the significance of effects on PECs

Significance	Description
Large adverse	<ul style="list-style-type: none"> Direct impact on, or severance of, a route used by pedestrians, cyclists or equestrians, resulting in a substantial and permanent loss of amenity and use (PEC facilities of high to very high sensitivity).
Moderate adverse	<ul style="list-style-type: none"> Introduction of new need to cross a highway for a previously uninterrupted route, or the introduction of new highway in close proximity to a route which was previously tranquil in character. The changes would not cause a significant extension of journey, but would cause loss of amenity, convenience or substantially alter the character of the route. Temporary severance to routes that are used by high numbers of pedestrians, cyclists or equestrians (during construction activities).
Minor adverse	<ul style="list-style-type: none"> No direct permanent impact, but some loss of amenity. Temporary disruption to routes or short-term loss of amenity (e.g. short-term disruption and diversions to PEC routes during construction activities).
No change	<ul style="list-style-type: none"> No significant change to route used by pedestrians, cyclists, or equestrians.
Minor beneficial	<ul style="list-style-type: none"> An improved at-grade crossing facility or other provision on an existing route that improves the amenity or convenience for PEC, for example the introduction of a traffic island or pelican crossing.
Moderate beneficial	<ul style="list-style-type: none"> Introduction of a new crossing or other facility on an existing PEC route that is likely to encourage more use due to improved amenity and convenience or perception of safety, for example, a new cycle lane, grade separated crossing or replacement of grass verge with pavement.
Large beneficial	<ul style="list-style-type: none"> Provision of a permanent new route useful for PEC where previously there was no route or access was very hazardous or perceived to be hazardous such that PEC did not regularly use the route.

12.3.14. For the purposes of this assessment, effects are considered to be significant where the effect is assessed as being moderate or large (adverse or beneficial).

Motorised users - driver stress

12.3.15. As an indicator of the magnitude of drivers' stress and frustration, DMRB Volume 11, Section 3, Part 9 (Highways Agency, 1993) tabulates the relationship between average peak hourly flow per lane and average journey speed, in order to describe the magnitude of drivers' stress on a three point scale: low, moderate and high (see Table 12.5).

Table 12.5: Descriptive scale for driver stress calculations - magnitude of impact

For dual carriageway roads			
Average peak hourly flow (per lane, in flow units/ hr)	Average journey speed (km/ hr)		
	Under 60	60 – 80	Over 80
Under 1,200	High*	Moderate	Low
1,200 – 1,600	High	Moderate	Moderate
Over 1,600	High	High	High
For single carriageway roads			
Average peak hourly flow (per lane, in flow units/ hr)	Average journey speed (km/ hr)		
	Under 50	50 – 70	Over 70
Under 600	High*	Moderate	Low
600 – 800	High	Moderate	Moderate
Over 800	High	High	High

Note: (50km/hr = 31mph; 60km/hr = 37mph; 70km/hr = 43mph; 80km/hr = 50mph)

* Moderate in urban areas

- 12.3.16. A judgement as to the overall significance of effect for drivers' stress has been made in accordance with Table 12.6, as developed by professional judgement of suitably qualified and experienced specialists and which have been applied in the assessments of other Highways England infrastructure development projects.

Table 12.6: Drivers' stress significance of effect

Significance of effect	Description
Very large (beneficial or adverse)	<ul style="list-style-type: none"> Where there would be a very major increase or reduction in driver stress resulting from the Scheme as compared to the Do-Minimum.
Large (beneficial or adverse)	<ul style="list-style-type: none"> Where there is a major increase or reduction in driver stress resulting from the Scheme as compared to the Do-Minimum.
Moderate (beneficial or adverse)	<ul style="list-style-type: none"> Where there is a moderate increase or reduction in driver stress resulting from the Scheme as compared to Do-Minimum.
Slight (beneficial or adverse)	<ul style="list-style-type: none"> Where there is a minor increase or reduction in driver stress resulting from the Scheme as compared to the base year and Do-Minimum.
Neutral	<ul style="list-style-type: none"> Where no effects on driver stress is anticipated from the Scheme, or where the beneficial and adverse effects are considered balanced.

12.3.17. In calculating existing and future levels of driver stress on the road network, traffic flows have been compared between the Do Minimum (without the Scheme) and Do Something (with the Scheme) scenarios. In accordance with DMRB guidance (Highways Agency, 1993), the worst year in the 15 years after the Scheme opens has been considered in the assessment, which is represented by year 2039, this having the highest forecast vehicle flows.

12.3.18. For the purposes of this assessment, effects are considered to be significant where the effect is assessed as being moderate, large or very large (adverse or beneficial).

Motorised users – view from the road

12.3.19. Views from the road are defined as the extent to which travellers are exposed to the different types of scenery through which a route passes. Aspects considered include:

- The types of scenery or the landscape character.
- The extent to which travellers may be able to view the scene.
- The quality of landscape.
- Features of particular interest or prominence in the view.

12.3.20. In accordance with DMRB Volume 11, Section 3, Part 9 (Highways Agency, 1993), there are four categories which have been used to assess the traveller's ability to see the surrounding landscape as follows:

- **No view:** Road is in deep cutting or contained by earth bunds, environmental barriers or adjacent structures.
- **Restricted view:** There are frequent cuttings or structures blocking the view.
- **Intermittent view:** The road is generally at ground level, but with shallow cuttings or barriers at intervals.
- **Open view:** The view extends over many miles, or is only restricted by existing landscape features.

12.3.21. There are no established criteria to define the magnitude of impact that a Scheme has on traveller views. Therefore, professional judgement has been used to define the magnitude of impact based on a three point scale, namely: low, medium and high (adverse or beneficial).

12.3.22. The level of an effect on views from the road experienced by motorised users has been calculated based on the sensitivity of the receptor (refer to para. 12.3.7) and the magnitude of the impact (refer to para. 12.3.21). The levels of effect have been described using a five point scale: negligible, minor, slight, moderate and major (adverse or beneficial).

12.3.23. Effects of moderate and major (beneficial or adverse) are considered to be significant. The method of assessment has been developed by professional judgement and has been applied in the assessments of other Highways England infrastructure development projects.

Private assets and community land

12.3.24. The assessment takes account of guidance as detailed in DMRB Volume 11, Section 3, Part 6 Land Use (Highways Agency, 2001) which identifies residential, commercial, industrial and other properties at risk of demolition or land-take. There is no specific guidance within DMRB in terms of assessing the significance of such effects. As such, the significance of effects as associated with private assets has been assessed using the criteria detailed in Table 12.7 which have been developed using professional judgement of suitably qualified and experienced specialists and which have been applied in the assessments of other Highways England infrastructure development projects.

Table 12.7: Effect significance of direct impacts on private property (residential and non-residential) and associated land take

Effect significance	Criteria
Large adverse	<p>Residential: Demolition of the whole of a property or properties which would affect the quality of life in the neighbourhood* such that the loss of housing cannot be replaced in the locality.</p> <p>Non-Residential: Acquisition of the whole or a substantial portion of property and associated buildings, which may lead to closure of the business and a loss to the community which cannot be replaced in the locality.</p>
Moderate adverse	<p>Residential: The land-take/acquisition is sufficiently large so as to diminish the quality of life in the neighbourhood*, although some replacement can be made in the locality.</p> <p>Non-Residential: Acquisition is sufficiently large so as to result in increased management/operational difficulties for the business, or replacement site is in the locality.</p>
Slight adverse	<p>Residential: Part of the curtilage is acquired, resulting in a decreased enjoyment of the residence, which would not diminish the quality of life in the neighbourhood*, where replacement could be made in the locality.</p> <p>Non-Residential: A small portion of the property/land is acquired resulting in, at most, some slight management/operational difficulties for the business.</p>
<p>*A neighbourhood is defined as a district or community within a town or city. For this assessment a neighbourhood is therefore considered to consist of a ward area e.g. Mackworth, Mickleover, Littleover, Darley, Allestree, Abbey and Little Eaton and Stanley (refer to Figure 12.2 [TR010022/APP/6.2]).</p>	

12.3.25. The criteria provided in Table 12.7 is a guide to decision-making only, allowing for the application of professional judgement on a case by case basis.

12.3.26. For the purposes of the private property assessment, effects are considered to be significant where the effect is assessed as being moderate or large.

12.3.27. DMRB Volume 11, Section 3, Part 6, Land Use (Highways Agency, 2001) sets out the methodology for assessing the loss of land used by the community. The assessment relates to direct impacts on common land, town or village green, allotments and public open space. However, there is no specific guidance within DMRB in terms of assessing effect significance. As such, the significance of effects on land used by the community has been assessed using the criteria detailed in Table 12.8 which have been developed using professional judgement of suitably qualified and experienced specialists and which have been applied in assessments of other Highways England infrastructure development projects.

Table 12.8: Effect significance of direct impacts on community land

Effect significance	Criteria
Large adverse	Acquisition of the majority of land used by the community which cannot be replaced within the locality.
Moderate adverse	Community land take is sufficiently large (although not representing the majority) so as to diminish the quality of life in the neighbourhood.
Slight adverse	A small portion of community land take is required with little impact on the enjoyment of land used by the community and/or would temporarily diminish the quality of life in the neighbourhood.
Negligible	Negligible community land take with no overall impact on the enjoyment of the land and therefore quality of life in the neighbourhood.

12.3.28. For the purposes of the community land assessment, effects are considered to be significant where the effect is assessed as being moderate or large.

Development land and development allocations

12.3.29. DMRB Volume 11, Section 3, Part 6: Land Use (Highways Agency, 2001) sets out the methodology for assessing the effects on development land. This relates to the impact of a scheme on unimplemented planning permissions and development allocations in the local planning authority development designations.

12.3.30. There is no specific guidance within DMRB in terms of effect significance; therefore, effects have been assessed qualitatively herein using professional judgement.

12.3.31. The significance of effects upon development land has been determined through consideration of the relationship between the sensitivity of the receptor and the magnitude of change. This requires the consideration of Scheme requirements for the permanent take of development land which affects the development's viability. Where appropriate, the criteria outlined in Table 12.7 and 12.8 have been used to assist in determining the significance of such effects.

Community severance

- 12.3.32. There is a need to consider severance at a community level. This is concerned with the role of roads as a 'barrier' between different parts of a community, and the resulting distortion of journey patterns. DMRB (Highways Agency, 1993) defines community severance as 'the separation of residents from facilities and services they use within their community caused by new or improved roads or by changes in traffic flows'.
- 12.3.33. Significance criteria for community severance has been developed based upon guidance contained in DMRB Volume 11, Section 3, Part 8 (Highways Agency, 1993). New severance caused by increases in traffic levels is described on a three point scale: slight, moderate or severe. These criteria are further defined as follows:
- **Slight effects:** are likely to be experienced where journey patterns are generally maintained, but there would be some hindrance to movement.
 - **Moderate effects:** would be expected where some residents, particularly children and elderly people, are likely to be dissuaded from making trips. Other trips would be made longer or less attractive.
 - **Severe effects:** occur where people are likely to be deterred from making trips to an extent sufficient to induce a re-organisation of their habits. Alternatively, considerable hindrance would be caused to people trying to make their existing journeys.
- 12.3.34. For the purposes of the severance assessment, effects are considered to be significant where the effect is assessed as being moderate or severe.
- 12.3.35. Relief of severance (see Table 12.9) as a result of reductions in traffic levels is also described using the terms slight, moderate or substantial (beneficial). A negligible effect is defined as less than 10% change in traffic levels. Beneficial effects that are moderate or substantial are considered to be significant.

Table 12.9: Relief from Severance

Area	Level of Relief from Severance: % change to traffic flows		
	Slight	Moderate	Substantial
Built up Area	c.30%	30 - 60%	60%
Rural Area	60 - 75%	75 - 90%	90%

- 12.3.36. Severance issues as associated with PEC movements are considered under effects on PECs.

Human health

- 12.3.37. There is no consolidated methodology or practice for the assessment of the effects of highway schemes on human health; however, the scope of the assessment has been informed by existing Highways England guidance where relevant. This recognises the specific requirements of the NPSNN (DfT, 2014) for consideration of health, specifically within paragraphs 4.79 - 4.82 as well as the following guidance:

- Air quality: HA 207/07 (Highways Agency, 2007), IAN 185/15 (Highways England, 2015), IAN 175/13 (Highways Agency, 2013), IAN 174/13 (Highways Agency, 2013), IAN 170/12 (Highways Agency, 2012).
- Noise and vibration: HD 213/11 (Highways Agency, 2011), IAN 185/15 (Highways England, 2015).
- Road drainage and the water environment: Volume 11, Section 3, Part 10 HD45/09 (Highways Agency, 2009).

12.3.38. The health assessment presented herein considers the potential consequences for health and wellbeing from the construction and operation of the Scheme. In particular, it draws on information and conclusions contained within various assessments reported within this ES (namely: air quality, landscape and visual, noise and vibration, road drainage and the water environment, and climate) and other separate reports such as the Equalities Impact Assessment [TR010022/APP/6.8] and the Transport Assessment Report [TR010022/APP/7.3] produced in respect of the Scheme.

12.3.39. The geographical extent of the impacts considered within this assessment depends on the type of impacts and receptors. A qualitative assessment of the impact of the Scheme on the surrounding statistical wards has been undertaken. This assessment is a qualitative rather than a quantitative assessment due to the diverse nature of health determinants and health outcomes which are assessed. Although the assessment of human health effects describes the likely qualitative health outcomes, it is not possible to quantify the severity or extent of the effects which give rise to these impacts. As such, the potential health impacts during Scheme construction and operation have been categorised in accordance with Table 12.10, based on broad categories for the qualitative impacts identified. Where an impact is identified, actions would be recommended as appropriate to mitigate any negative impact on health, or opportunities to enhance health benefits.

Table 12.10: Human health impact categories

Impact category	Impact symbol	Description
Positive	+	A beneficial impact is identified
Neutral	0	No discernible health impact is identified
Negative	-	An adverse impact is identified
Uncertain	?	Where uncertainty exists as to the overall impact

12.3.40. Appendix 12.2 [TR010022/APP/6.3] provides additional details regarding the methodology and the assessment of effects on human health as set out within this chapter.

Scoping

- 12.3.41. The proposed scope of the people and communities assessment was detailed in the EIA Scoping Report (Highways England, 2018) submitted to The Inspectorate on 15 March 2018 (refer to Chapter 1: Introduction, para. 1.3.5).
- 12.3.42. An overview of the Inspectorate's Scoping Opinion (refer to Appendix 4.1 [TR010022/APP/6.3]) in relation to people and communities is presented in Table 12.11. Where the assessment has been undertaken in accordance with the Scoping Opinion point, the relevant ES section is provided. Where the point is not agreed with or not addressed, an explanation of why is provided.

Table 12.11: Scoping Opinion and response

Scoping Opinion	Where addressed within the ES
Planning Inspectorate	
The planning inspectorate does not consider that sufficient justification has been provided to scope out the assessment of effects on equestrians given the proximity of a bridleway to the Little Eaton junction.	An assessment of effects on equestrians is considered in Section 12.10.
The Applicant must ensure that the study area assessed is clearly defined and justified in the ES. The Applicant should seek to achieve agreement on the study area and receptors included within the assessment with consultees.	The study areas are defined and justified in Section 12.6. The study areas were agreed with the local planning authorities. Also refer to Figures 12.1a – 12.1d [TR010022/APP/6.2].
The ES should demonstrate how the transport modelling studies as described in DCC's response have informed the choice and assessment of the study area.	The transport modelling studies were used to determine the effects of the Scheme in relation to air quality and noise and vibration. These results are considered in the assessment on human health in Section 12.10. Refer to Chapter 5: Air Quality and Chapter 9: Noise and Vibration for further details of these assessments and the Transport Assessment Report [TR010022/APP/7.3] for details of the traffic model.
The ES should explain how the routes affected by the Proposed Development have been identified for the purposes of the assessment of community severance, accessibility and connectivity.	The study areas are defined and justified in Section 12.6, whilst Section 12.7 includes details of existing facilities.
The ES should clearly reference the information on changes to traffic flows on the road network used to inform the assessment of effects of the Proposed Development on people and communities.	Refer to Section 12.10.
It would be helpful to understand the effects of the Proposed Development, and to aid consultation, to include appropriate figures illustrating the baseline conditions within the ES. Receptors included within the assessment should be set within the context of	Refer to Section 12.7 and Figures 12.1a – 12.1d [TR010022/APP/6.2].

Scoping Opinion	Where addressed within the ES
the proposed DCO boundary and study area and labelled clearly.	
Where standard guidance is not used and professional judgement is applied this should be fully explained and justified in the ES.	Refer to Section 12.3.
The ES should explain the duration of temporary impacts, ensuring consistency with the other aspect assessments.	Section 12.10 provides details regarding the durations of temporary impacts.
The Inspectorate advises that the likely impacts on public transport users should be considered and DCC have provided advice and information relevant to this.	The information provided by DCC has been taken into consideration in Section 12.7 and consideration has been given to the effects on public transport when considering effects on motorised users in Section 12.8 and Section 12.10.
The study area for cumulative health effects should be defined and justified in the ES and agreed with relevant consultation bodies where appropriate.	Refer to Section 12.6. Study areas were agreed with the local planning authorities.
The ES should set out adopted significance criteria for the effects on Human Health.	Refer to Section 12.3.
Derbyshire County Council (DCC)	
An assessment of impacts on public transport usage in the areas as a result of the construction or completion phases of the scheme.	Consideration has been given to the effects on public transport when considering effects on motorised users in Section 12.8 and Section 12.10.
It is considered that the Environmental Statement should include a more extensive and robust assessment of the likely economic and regeneration benefits of the scheme, particularly in terms of quantifying these benefits in the context of likely jobs created and expenditure multipliers generated for the local economy in both the construction and operational phases of the scheme.	Addressed within the Planning Statement [TR010022/APP/7.2].
Public Health England	
We believe however that the summation of relevant issues into a specific section of the report provides a focus which ensures that public health is given adequate consideration. The section should summarise key information, risk assessments, proposed mitigation measures, conclusions and residual impacts, relating to human health.	Refer to Section 12.9 and Section 12.10.

Scoping Opinion	Where addressed within the ES
<p>There is evidence that, in some cases, perception of risk may have a greater impact on health than the hazard itself. A 2009 report, jointly published by Liverpool John Moores University and the HPA (Health Protection Agency), examined health risk perception and environmental problems using a number of case studies. As a point to consider, the report suggested: <i>“Estimation of community anxiety and stress should be included as part of every risk or impact assessment of proposed plans that involve a potential environmental hazard. This is true even when the physical health risks may be negligible.”</i> Public Health England (PHE) supports the inclusion of this information within EIAs as good practice.</p>	<p>Noted.</p>
Natural England	
<p>Natural England encourages any proposal to incorporate measures to help encourage people to access the countryside for quiet enjoyment. Measures such as reinstating existing footpaths together with the creation of new footpaths and bridleways are to be encouraged.</p>	<p>Refer to Section 12.9 for enhancement and mitigation measures relating to access.</p>
<p>The EIA should consider potential impacts on access land, public open land, rights of way and coastal access routes in the vicinity of the development. Appropriate mitigation measures should be incorporated for any adverse impacts. We also recommend reference to the relevant Right of Way Improvement Plans (ROWIP) to identify public rights of way within or adjacent to the proposed site.</p>	<p>Refer to Section 12.8 and Section 12.10 for the assessment of effects on public open space and public rights of way. Also refer to the Planning Statement [TR010022/APP/7.2]. DCiC and DCC Right of Way Improvement Plans have been considered - refer to Section 12.2.</p>

12.4. Consultation

12.4.1. A range of consultation activities have been undertaken in order to obtain details of existing PEC facilities, potential effects of the Scheme on PEC movements, Scheme effects upon public open space and mitigation proposals. Consultation activities undertaken include:

- Information relating to Scheme impacts and mitigation proposals regarding pedestrian and cyclist facilities and public open space was obtained via statutory consultation which ran from Friday 7 September 2018 to Thursday 18 October 2018 and which included public exhibitions across eight locations along the Scheme.
- Discussions with local authorities and local user groups as undertaken to inform the Walking, Cycling and Horse Riding Report (Highways England, 2019) (refer to Appendix 12.1 [TR010022/APP/6.3]).
- Discussions regarding pedestrian and cyclist facilities and mitigation proposals with the applicable local authorities.

- Consultation with affected landowners to discuss temporary use of land for construction purposes and local access provisions.
 - Discussions with DCiC regarding Scheme impacts upon public open space and replacement options (refer to Chapter 3: Scheme History and Assessment of Alternatives – Table 3.10 therein provides details of actions taken to reduce public open space losses and options investigated regarding replacement public open space offered in exchange).
- 12.4.2. The outcomes from these consultation activities have been used to inform the mitigation proposals as included in the Scheme design and discussed herein (refer to Section 12.9).
- 12.4.3. The Preliminary Environmental Information Report (PEIR) was published in September 2018 (Highways England, 2018) and presented the environmental information collected together with the preliminary findings of the assessment of likely significant environmental effects of the Scheme at the time. A summary of the comments which were received from statutory consultees regarding the PEIR is provided in Table 12.12. These comments have been taken into account during the preparation of this assessment.

Table 12.12: Consultation comments and response

Consultee comments	Outcome
DCiC	
The pedestrian crossing on the A5111 Kingsway requires pedestrians to cross 4 lanes, could this crossing be staggered or moved closer to the roundabout junction?	The crossing would be a controlled crossing to aid pedestrians and cyclists.
The pedestrian crossing across Kingsway Park Close is shown as an uncontrolled crossing and should be controlled.	The crossing is proposed to be a controlled toucan crossing.
We would like to better understand the detailed layout and treatment of Brackensdale Avenue. We would like to work with you to review opportunities for better cycle connections to Greenwich Drive North and to the pedestrian and cycle link under the A38.	Refer to Figure 12.3a and Figure 7.8a [TR010022/APP/6.2]. Brackensdale Avenue access to/from the A38 would be closed to traffic and the area appropriately landscaped, thus increasing the area of the existing informal open space. The pavement would be extended along Brackensdale Avenue to remove the need to cross a road. Due to the constraints of the bridge, there is little improvement that can be made to the shared footpath and cycleway which crosses under the A38.
The A38 northbound diverge to the new Kingsway junction is taken down to one lane at the new roundabout junction which would result in congestion if there is an obstruction in the single lane section of the carriageway. If changes are made to the layout at this point there would be implications for the pedestrian/cycle crossing point at this location.	Following a review of the Scheme design proposals in this area, no changes have been made to the lane structure of this diverge and thus there would be no implications for the uncontrolled pedestrian and cycle crossing proposals.

Consultee comments	Outcome
Consideration should be given to providing a footway on Ford Lane to access the proposed public open space and the Derwent Valley cycle route.	The existing carriageway associated with the left in, left out access onto the A38 from Ford Lane would be closed to vehicle access, appropriately landscaped and provided with facilities for pedestrians and cyclists to enable continued access to adjacent pedestrian and cyclist routes (refer to Figure 12.3c and Figure 7.8c [TR010022/APP/6.2]). However, a separate footway into the public open space to the west of the River Derwent would not be provided by the Scheme.
DCC	
It is considered that the forthcoming Environmental Statement should include a more extensive and robust assessment of the likely economic and regeneration benefits of the scheme, particularly in terms of quantifying these benefits in the context of likely jobs created and expenditure multipliers generated for the local economy in both the construction and operational phases.	Such an assessment is outside of the scope of the Environmental Statement - refer to the EIA Scoping Report (Highways England, 2018) and Inspectorate's Scoping Opinion (Appendix 4.1 [TR010022/APP/6.3]). The economic benefits of the Scheme are considered in the Planning Statement [TR010022/APP/7.2].
The County Council would want to stress the importance of ensuring connectivity and promotion of alternative transport is maintained and where possible improved. Any replacement of footpaths and cycle ways should be to an equal or improved quality.	Pedestrian and cyclist proposals are based on the fundamental premise that the Scheme design aims to include at least the level of provision that exists at present with enhanced provision where deemed appropriate and reasonable. New and replacement footpaths and cycleways would be constructed to current standards and would be of an equal or improved quality to the existing infrastructure.
DCC would wish to see the implementation of a pedestrian crossing near to Croft Lane access onto the A61.	It is beyond the scope of the Scheme to provide this crossing, although Highways England is considering alternative delivery mechanisms for facilities in this area.

12.4.4. In addition to the above, a wide range of comments regarding PEC facilities and Scheme impacts upon people and communities were received from members of the public. These comments, and how the Scheme has taken these into account, are detailed in the Consultation Report [TR010022/APP/5.1] and the Consultation Report appendices [TR010022/APP/5.2].

12.5. Assessment assumptions and limitations

12.5.1. Assumptions that have been made in undertaking the assessment of effects on people and communities include:

- This assessment is based upon the Scheme design and details regarding Scheme construction and operation as provided in Chapter 2: The Scheme.

- The assessment addresses direct impacts on commercial land in terms of land take. The transport impacts on business users are assessed in the Transport Assessment Report [TR010022/APP/7.3].
- The duration of temporary footpath and cycleway diversions and closures are estimated herein, but are subject to confirmation during the detailed design stage and following the appointment of the construction contractor. Where estimates are provided, this information is based upon the construction programme as detailed in Chapter 2: The Scheme, Section 2.6, Illustration 2.1. As indicated in Chapter 2: The Scheme, para. 2.6.93, it is assumed that the existing Markeaton footbridge would be removed, with a replacement footbridge being installed approximately one and a half years later. However, this is subject to review during the construction planning detailed design stage, with the aim of minimising the duration without a footbridge.

12.6. Study area

- 12.6.1. The study area for this assessment of people and community effects varies depending on the effect or type of resource being assessed - details are provided below (refer to Figures 12.1a – 12.1d) [TR010022/APP/6.2].
- 12.6.2. PECs: The study area for PECs includes all public rights of way, footways, cycleways and bridleways within 500m of the Scheme. This study area is considered appropriate for the assessment taking into account the location of the Scheme (mainly within an urban/semi-urban area with a large number of PEC routes), and the nature of the Scheme (which consists of an improvement to existing highway rather than a new section of road). Only PECs that are located within or in close proximity to the Scheme boundary would be impacted by the Scheme.
- 12.6.3. Motorised users: The assessment of motorised users considers two aspects:
- Driver stress: This considers road users within 500m of the Scheme, focusing on users of the A38 and those roads which converge at the existing A38 junctions.
 - Views from the road: The study area for the assessment of views from the road utilises the Zone of Theoretical Visibility (ZTV) as outlined in Chapter 7: Landscape and Visual Impact Assessment.
- 12.6.4. Private assets, land used by the community and development land: The study area for these assessments includes residential and commercial properties, areas of public open space and areas of allocated land within the Scheme boundary as these assets have the potential to be directly and indirectly impacted by the Scheme.
- 12.6.5. Community severance: The study area for community facilities and severance considers the direct and indirect impacts and effects of the Scheme on community facilities within 500m of the Scheme and the severance impacts associated with motorised users. The rationale for selecting a 500m buffer zone is that the existing A38 does not bisect the Wards of Derby, therefore, residents largely have access to community facilities within their ward and would not need

to access the A38 to access these facilities. It is, therefore, considered that a 500m buffer is sufficient for this aspect of the assessment.

- 12.6.6. Human health: The study area includes the seven wards that are within or directly border the Scheme, namely Mickleover, Littleover, Abbey, Mackworth, Darley, Allestree, and Little Eaton and Stanley – these wards are shown on Figure 12.2 [TR010022/APP/6.2].

12.7. Baseline conditions

- 12.7.1. The Scheme is located in the county of Derbyshire, which has an estimated population of 791,966, with 358,550 dwellings and 29,500 local businesses across an area of 255,100ha¹.
- 12.7.2. Kingsway junction and Markeaton junction are located within the local authority area of DCiC, passing through or directly adjacent to the wards of Mickleover, Littleover, Mackworth, Abbey, Darley and Allestree (refer to Figure 12.2 [TR010022/APP/6.2]). The surrounding area is predominantly urban in nature, with large areas of residential properties, commercial properties and public open space.
- 12.7.3. Little Eaton junction is within the local authority area of EBC, passing through the ward of Little Eaton and Stanley (refer to Figure 12.2 [TR010022/APP/6.2]). The surrounding area is largely semi-rural on the urban edge of Derby. The junction is surrounded by agricultural fields with a number of isolated commercial properties (including Starbucks and the Derby Garden Centre) and the Ford Farm Mobile Home Park to the north. There is an area of woodland within the Scheme boundary to the east of the A38 and an area to the west of the River Derwent off Ford Lane (north of the A38) designated as public open space (refer to Figure 12.1c [TR010022/APP/6.2]).

Pedestrians, equestrians and cyclists (PECs)

- 12.7.4. An understanding of the PEC baseline conditions was obtained through desk-based study, site visits, surveys and consultations.
- 12.7.5. A PEC survey was undertaken on a bank holiday Sunday 24 August 2014, with an additional survey carried out Tuesday, 4 November 2014 (Highways England, 2015). The surveys took place over a 12 hour period between the hours of 07:00 and 19:00. A further PEC survey was undertaken in June 2018 during a weekday and weekend (refer to Appendix 12.1 [TR010022/APP/6.3]). These surveys were carried out on footpaths, cycleways, bridleways and national trails that cross the three A38 junctions, or facilitate movement between them. An overview of the PEC routes within 500m of the Scheme boundary is illustrated in Figures 12.1a – 12.1d [TR010022/APP/6.2]. These PEC routes are described in Table 12.13, together with details from the PEC 2018 survey and an analysis of their sensitivity in accordance with Table 12.2.

¹ (<https://observatory.derbyshire.gov.uk/IAS/Custom/Pages/People/Peopleandplace.aspx> accessed 15/03/19)

Table 12.13: Sensitivity of PEC routes

PEC routes	Details (refer to Figures 12.1a – 12.1d [TR010022/APP/6.2])	2018 PEC survey results* – number of movements	Sensitivity (as per Table 12.2)
Kingsway junction			
National Cycle Route (NR) NR54 and NR68	NR54/NR68 is a shared cycle and pedestrian facility that follows the route of the disused railway at Mickleover, to the west of Kingsway junction before running parallel to the A38 across open land and joining Greenwich Drive South and then Brackensdale Avenue where it passes under the A38 and links with the local cycle track that approaches from the south, on the eastern side of the A38 before running down Radbourne Street.	Weekday – 103 pedestrians, 94 cyclists Weekend – 91 pedestrians, 66 cyclists	High
Regional Cycle Route (RR) 66	RR66 follows the same route as NR54/NR68 along the route of the disused railway to the west of Kingsway junction before running parallel to the A38 across open land and joining Greenwich Drive South and then through the Brackensdale Avenue underbridge. The route then travels to the east side of the A38 towards Markeaton junction via a mixture of off carriageway links, Raleigh Street, Thurcroft Close and shared cycle and pedestrian facilities.	Weekday – 970 pedestrians, 117 cyclists Weekend – 557 pedestrians, 128 cyclists	High
Brackensdale Avenue underbridge	This serves as a major link for pedestrians and cyclists between the areas to the east of the A38 and the Mackworth Estate to the west of the A38.	Weekday – 177 pedestrians, 66 cyclists Weekend – 116 pedestrians, 32 cyclists	Very high
Uncontrolled pedestrian crossing	There is an existing uncontrolled pedestrian crossing facility from Greenwich Drive North to Thurcroft Close.	Weekday – 834 pedestrians, 233 cyclists Weekend – 588 pedestrians, 121 cyclists	Medium
Non-designated footway and cycle track (east of A38 Kingsway)	The route connects to the A5111 and is separated from the A38 carriageway by a grass verge. This route runs parallel and remote from the A38 and connects with the local network at Brackensdale Avenue. Connecting into the cycle track is a permissive route into Sainsbury's supermarket for both pedestrians and cyclists. This route is anticipated to be increasingly used by residents of sequential developments at the former Kingsway hospital site, especially by school aged children and parents to and from Brackensdale Infant School and Brackensdale Junior School.	Weekday – 834 pedestrians, 233 cyclists Weekend – 588 pedestrians, 121 cyclists	Very High

PEC routes	Details (refer to Figures 12.1a – 12.1d [TR010022/APP/6.2])	2018 PEC survey results* – number of movements	Sensitivity (as per Table 12.2)
Markeaton junction			
RR66	As details above, RR66 uses shared cycle and pedestrian facilities located on the east side of the A38 to Markeaton junction. This route crosses the A52 using a zebra crossing on the A52 east arm, and then runs via the Queensway service road, passing the Markeaton Park footbridge, eventually joining Kedleston Road via the use of a shared cycle and pedestrian link. The route then travels along Kedleston Road to the west.	None available	High
Pedestrian crossings and cycle tracks at Markeaton junction	The southern, western and eastern arms of Markeaton junction are furnished with pedestrian facilities on both sides of the carriageway and there is an uncontrolled pedestrian crossing on the A52 west arm, a zebra crossing on the A52 east arm, and signal controlled crossings on both the A38 arms of the junction.	Weekday – 833 pedestrians, 206 cyclists Weekend – 731 pedestrians, 186 cyclists PEC counts were taken at the crossing facilities on all arms of Markeaton junction	Very High
A38 entry slip/RR66	The top of the entry slip to the A38 southbound is not signalised, therefore, all crossing facilities are uncontrolled between the various traffic islands.	Weekday – 635 pedestrians, 204 cyclists Weekend – 484 pedestrians, 82 cyclists	High
A38 exit slip/RR66	The top of the exit slip from the A38 northbound is signal controlled and cycle track users cross via two controlled crossing points.	Weekday – 483 pedestrians, 135 cyclists Weekend – 446 pedestrians, 66 cyclists	High
Markeaton Park footbridge/Bonnie Prince Charlie Walk	The Markeaton Park footbridge is located to the north of Markeaton junction and provides pedestrian and cycle access over the A38 between Markeaton Park and the shared cycle and pedestrian facilities on the eastern side of the A38. The footbridge follows the route of the 'Bonnie Prince Charlie Walk' National Trail.	Weekday – 362 pedestrians, 118 cyclists Weekend – 251 pedestrians, 80 cyclists	High
Kedleston Road	Kedleston Road is furnished with a pedestrian footway on the northern side of the carriageway and a segregated cycle route on the southern side of the carriageway (Regional Cycle Route 66 as detailed above). A number of cycle and pedestrian routes access Kedleston Road from Markeaton Park to the west of the bridge structure and a signed cycle route accesses Kedleston Road in the vicinity of Broadway and crosses onto the southern side of Kedleston Road via an uncontrolled crossing facility.	Weekday – 714 pedestrians, 181 cyclists Weekend – 524 pedestrians, 72 cyclists	High

PEC routes	Details (refer to Figures 12.1a – 12.1d [TR010022/APP/6.2])	2018 PEC survey results* – number of movements	Sensitivity (as per Table 12.2)
Little Eaton junction			
NCR54	NR54 runs from Stourport to Little Eaton, forming a 91 mile route. The Derby leg of the route roughly follows the line of the River Derwent. It approaches Little Eaton junction via the shared cycle and pedestrian facility on the A61, traversing the A38 roundabout via a controlled crossing facility across the western A38 arm of the roundabout, and then travels to Little Eaton via a combined cycle and pedestrian facility that runs along the B6179.	Weekday – 30 pedestrians, 186 cyclists Weekend – 54 pedestrians, 38 cyclists	Medium
Derwent Valley Heritage Way/ Breadsall FP7	The Derwent Valley Heritage Way forms a 51 mile route from Ladybower Reservoir in the Peak District to Derwent Mouth near Shardlow. It runs along the B6179 shared cycle and pedestrian facility and then westwards from Little Eaton junction, along the northern verge of the A38 before descending down the side of the A38 to cross under the A38 through the Flood Relief Arch and then continues south on the route of Breadsall FP7.	Weekday – 15 pedestrians, 1 cyclists Weekend – 35 pedestrians, 1 cyclists PEC counts were taken on Breadsall FP7 where it meets the A38	Medium
Breadsall FP No. 1, 2, 3 and 4	There is a network of public footpaths to the south and east of Little Eaton junction. FP No. 2 joins FP3 which abuts the A38 to the east of junction where no crossing facilities are provided.	Weekday – 0 pedestrians, 0 cyclists Weekend – 1 pedestrians, 0 cyclists	Low
Ford Lane/ Shared path A38 Breadsall FP No. 23	FP No. 23 follows a path along the edge of the northbound A38 carriageway to Little Eaton junction. The footpath also joins Little Eaton FP No. 17 to the east of the railway line. PEC counts from the top of the steps where Breadsall FP No. 23 joins the A38 shared path.	Weekday – 30 pedestrians, 68 cyclists Weekend – 54 pedestrians, 38 cyclists	Medium
Breadsall BW No. 18 and Little Eaton BW No. 29	These bridleways are located at the northernmost end of the proposed works, linking Little Eaton and Breadsall.	Weekday – 14 pedestrians, 3 cyclists Weekend – 15 pedestrians, 2 cyclists PEC counts taken approximately 650m north of Little Eaton junction. No equestrian activity recorded.	Medium

*refer to Appendix 12.1 [TR010022/APP/6.3]

Motorised users

Driver stress

- 12.7.6. 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 between approximately 56,000 and 60,500 vehicles a day in 2015 (between Brackensdale Avenue (north of Kingsway junction) and Markeaton 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.
- 12.7.7. To assess the existing level of driver stress (frustration and fear of potential accidents) for motorised users, Table 12.14 sets out the predicted driver stress levels based on the methodology set out in Section 12.3.

Table 12.14: Baseline Driver Stress

Road section	Average Speed (km/ hr)	Baseline road classification	Predicted traffic flows per hour (peak) per lane	Driver stress level
A38 south of Kingsway junction	NB – 98	Dual carriageway	NB – 1179	Low
	SB – 97		SB – 1030	Low
B5111 Kingsway east of Kingsway junction	EB – 55	Single carriageway	EB – 910	High
	WB – 56		WB – 499	Moderate
A38 Kingsway between Kingsway and Markeaton junctions	NB – 52	Dual carriageway	NB – 1360	High
	SB – 41		SB – 1450	High
A52 Ashbourne Road north of Markeaton junction	EB – 40	Single carriageway	EB – 861	High
	WB – 56		WB – 778	Moderate
A52 Ashbourne Road south of Markeaton junction	EB – 33	Single carriageway	EB – 693	High
	WB – 31		WB – 822	High
A38 Queensway east of Markeaton junction	NB – 61	Dual carriageway	NB – 1388	Moderate
	SB – 53		SB – 1281	Moderate
A38 Palm Court junction west of Little Eaton junction	EB – 85	Dual carriageway	EB – 1247	Moderate
	WB – 92		WB – 1139	Low
A61 south of Little Eaton junction	NB – 55	Dual carriageway	NB – 919	Moderate
	SB – 89		SB – 716	Low
A38 north of Little Eaton junction	NB – 98	Dual carriageway	NB – 1252	Moderate
	SB – 86		SB – 1365	Moderate
B6179 Alfreton Road north of Little Eaton junction	NB – 39	Single carriageway	NB – 402	Moderate
	SB – 41		SB – 387	Moderate

NB – northbound SB – southbound EB - eastbound WB – westbound

- 12.7.8. The levels of driver stress outlined in Table 12.14 are used as a starting point in the consideration of driver stress as these figures do not take into account journey length and accident rates.
- 12.7.9. Delays and congestion along the A38 increase journey times for motorised users, with a fear of accidents elevating driver stress levels. Slow moving traffic, especially on the approaches 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 following the construction of the Pinch Point schemes at Markeaton junction and Little Eaton junction that were completed in 2015 (refer to Chapter 2: The Scheme, para. 2.3.6), traffic problems remain unresolved. 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.
- 12.7.10. The existing A38 displays clear and visible signage that is in keeping with Highways England standards. This reduces uncertainty of route for drivers along the A38. With regard to traveller care facilities, there is a McDonald's restaurant and Esso petrol station off the A38 northbound carriageway to the south of Markeaton junction. There is also a Starbucks café located to the north-west of Little Eaton junction which is accessed off the B6179.

Views from the road

- 12.7.11. The Scheme passes through a combination of urban and semi-rural areas (refer to para. 12.7.2 and para. 12.7.3).
- 12.7.12. Driver views of Kingsway junction are obtained principally from the A38 and A5111, generally where drivers meet or cross the junction. Views from the A5111 are heavily filtered by built form and intervening woodland along the highway. Views are also available in places from surrounding minor roads, including Greenwich Drive South and Brackensdale Avenue in Mackworth. However, built form and vegetation tend to limit the availability of views resulting in restricted views.
- 12.7.13. Between Kingsway and Markeaton junctions, driver's views along the A38 immediately north of the junction are restricted to the corridors of the A38, with the carriageway screened by existing vegetation. This opens out to views of open grass verges, mature trees and shrubs with views of nearby residential and commercial properties. These views are limited by built form and do not extend beyond the closest properties resulting in restricted views.
- 12.7.14. Views of Markeaton junction are obtained principally from the A38 and A52, as these two roads cross at the junction. Views are also available in places from surrounding minor roads. However, built form and vegetation limit the availability of views. Intermittent views of Markeaton Park and Mill Pond public open space are available through the junction.

- 12.7.15. For the majority of the route between Markeaton junction and Little Eaton junction, motorised users experience restricted views limited to the corridors of the A38, although there are intermittent views of nearby residential areas towards Little Eaton junction.
- 12.7.16. Views of Little Eaton junction are obtained principally from the A38 and A61, generally where drivers meet or cross the junction. Views from the A6 and A61 are heavily filtered by built form and intervening woodland along the highways. Views are also available in places from minor roads and farm tracks, including Croft Lane in Breadsall. However, built form and vegetation tend to limit the availability of views, resulting in intermittent views.

Public transport

- 12.7.17. There are a number of bus services which utilise the A38 junctions as detailed below.

Kingsway and Markeaton junctions

- 12.7.18. The only bus route which uses Kingsway junction is the Notts and Derby Bus Company (NDBC) Service 55 which is a circular route to Kedleston Road Campus via Abbey Lodge student village. The only other bus route that passes in proximity to Kingsway junction is the Arriva No. 8 service, Derby and Mackworth Circular which passes under the A38 on Brackensdale Avenue.
- 12.7.19. There are a number of bus routes which run through or near to Markeaton junction, namely:
- Trentbarton – Swift service: Derby to Uttoxeter via Ashbourne.
 - Arriva – Route 9: Derby City Centre to Radbourne Lane via Markeaton Park.
 - NDBC - Uni-bus Route 4: Kedleston Road Campus to Markeaton Street Campus via Markeaton Park and Ride.
 - NDBC – Uni-bus routes 6 (Kedleston Road Campus to Derby Station via Derby City Centre) and 7 (Kedleston Road Campus Circular) and .
 - NDBC – School Route 403 (Hilton to St Benedict’s School via Mickleover).
 - NDBC – X52: Nottingham to Alton Towers via Ashbourne.
 - NDBC – 55: Kedleston Road Campus circular route via Abbey Lodge Student Accommodation.

- 12.7.20. Bus services travelling along the A52 Ashbourne Road to and from Derby city centre using Markeaton junction currently experience high levels of congestion as traffic travelling from east to west on the A38 can obstruct Markeaton roundabout at peak times. This can result in increased journey times and delays for passengers.

Little Eaton junction

- 12.7.21. There are a number of bus routes which run through Little Eaton junction, namely:
- Trentbarton – Amberline: Derby to Hucknall via Alfreton Road (B6179).
 - Trentbarton – Comet: Derby to Chesterfield via the A38.
 - Trentbarton – Route 7.1: Derby to Belper via Alfreton Road.

- Trentbarton – Routes 9.1 and 9.3: Derby to Mansfield via the A38.
- Trentbarton – Route 6.X: Derby to Belper via the A38.
- NDBC – School Bus 302: Spondon to Saint Benedict Catholic Voluntary Academy via Breadsall.

12.7.22. Bus services approaching the junction from the north via Alfreton Road can experience difficulty entering the roundabout as this is the only entry to the roundabout which is not signalised and there are large volumes of through traffic which use the A38. This can result in increased journey times and delays for passengers. Difficulty entering the junction also has the potential to result in a risk of accidents with traffic travelling around the roundabout at high speed.

Private assets and community land

Kingsway and Markeaton junctions

12.7.23. There are a number of areas of public open space in the vicinity of Kingsway and Markeaton junctions, namely Mackworth Park and land adjacent to Greenwich Drive South to the west of the A38 at Kingsway junction, and Markeaton Park to the west and Mill Pond to the east of the A38 at Markeaton junction (refer to Figure 12.1a and 12.1b [TR010022/APP/6.2]). The area between Mackworth Park and the public open space off Greenwich Drive South is defined as proposed public open space² and covers the former railway line (refer to Figure 12.1a [TR010022/APP/6.2]) (covers the Mickleover Railway Cutting Local Wildlife Site (LWS) – refer to Chapter 8: Biodiversity). There are also a number of informal open spaces in the vicinity of the junctions, such as an area off Kew Gardens to the north-west of Greenwich Drive North, an area at the Brackensdale Avenue access onto the A38, a grassed area between Greenwich Drive North and the A38, and an area of open space at the Enfield Road access to the A38.

12.7.24. Land use around Kingsway and Markeaton junction is of an urban nature. The existing Kingsway junction lies west of Kingsway Retail Park which includes a Sainsbury's superstore and other retail units. The Kingsway hospital site is located to the south-east of the junction and is undergoing sequential redevelopment. The main hospital in Derby is the Royal Derby Hospital located approximately 600m from the junction on Uttoxeter New Road, and is also the location of Derbyshire Children's Hospital and Derby medical school. Three miles from the city centre, the hospital can be accessed from a number of routes with easy access from the wider area via Kingsway junction.

12.7.25. Land located east and west of the A38, between Kingsway and Markeaton junction is largely residential. Brackensdale Primary School is located west of the access slip road from the A38 onto Brackensdale Avenue. The catchment area for this school is located east and west of the A38. Other primary schools in the area include Markeaton, Lawn and Ashgate Schools. There are three senior school catchment areas, Murray Park Community, Bemrose School and Allestree

² The land is currently proposed public open space under saved policy L4 of the Derby Local Plan Review, albeit that this is to be reviewed by DCIC as part of the preparation of the emerging Derby City Local Plan (Part 2).

Woodlands School, within 500m of Kingsway and Markeaton junctions. Directly adjacent to the Brackensdale Primary School is the Sanctuary Extra Care retirement home.

- 12.7.26. The Esso petrol station and McDonalds fast food outlet are located on the south-west side of Markeaton junction with access from the A38 northbound and from A52 Ashbourne Road. An Army Reserves Centre is located to the south of the junction, off Windmill Hill Lane. North of Markeaton junction, along the east side of the A38, are a number of residential properties (Queensway), behind which is the Royal School for the Deaf and the University of Derby, Markeaton Campus. The main Derby University Campus is located to the north-west of Kedleston Road junction.
- 12.7.27. Other potentially sensitive land uses include a number of local wildlife sites, namely Bramble Brook, the Kingsway roundabout and Mickleover Railway Cutting at Kingsway junction, the Markeaton Brook system and Markeaton Park at Markeaton junction (refer to Chapter 8: Biodiversity).

Little Eaton junction

- 12.7.28. There is an area of public open space off Ford Lane to the west of the River Derwent (refer to Figure 12.1b [TR010022/APP/6.2]).
- 12.7.29. At Little Eaton junction there is a garden centre located to the west of the A38 and north of the junction (accessed off Alfreton Road). A Starbucks cafe, Ford Farm Mobile Home Park and a haulage business, are located north-west of the existing roundabout. The A38 together with the Midland Mainline railway line and the River Derwent separates the villages of Breadsall to the east and Allestree to the west.
- 12.7.30. Little Eaton junction lies east of the Derwent Valley Mills World Heritage Site (refer to Chapter 6: Cultural Heritage), which comprises the River Derwent valley, associated mills and other structures and buildings of historical importance, though there are no specific buildings of heritage importance in this section of the World Heritage Site intersected by the A38. Land to the east of Little Eaton junction is designated as green belt.
- 12.7.31. A number of land parcels in private ownership, including those used for agricultural purposes, are located adjacent to the Scheme at Little Eaton junction – impacts upon agricultural soils and agricultural farm holdings are considered in Chapter 10: Geology and Soils and are thus not repeated here.

Human health

- 12.7.32. This section provides a human health profile for the study area surrounding the Scheme (refer to Figure 12.2 [TR010022/APP/6.2]), focusing on key indicators identified by Public Health England at ward level, including a comparison with national averages. Indicators considered to be relevant to potential health impacts of the Scheme for each ward area have been identified - these are outlined in Table 12.15 along with the national average for these health statistics.
- 12.7.33. Table 12.15 illustrates that in six out of seven of the identified wards, the proportion of the population with general health of bad or very bad is lower than

the national average. The only ward with a general health classification of bad or very bad which is greater than the national average is Abbey.

- 12.7.34. Table 12.15 also illustrates five of the seven wards surrounding the Scheme have a higher proportion of residents with a limiting long-term illness or disability than the national average.

Table 12.15: Human health profile within the study area by ward

Local health indicator	Derbyshire wards							England
	Mickleover	Littleover	Mackworth	Abbey	Allestree	Darley	Little Eaton & Stanley	
Population	14,307	14,761	14,849	15,709	13,566	15,219	4,502	55,268,067
Indicators:								
General health - bad or very bad (%)	4.3	4	3.7	6.7	3.7	5.2	4.3	5.5
Limiting long term illness or disability (%)	18.1	14.5	19	19.7	19	16.6	18.2	17.6
Pensioners living alone (%)	29.1	26.4	30.2	42.1	30.2	42.2	26.6	31.5
Obese adults (%)	21.5	19.3	20.1	22.1	20.1	15.5	23.1	24.1
Obese children (reception year) (%)	7	7.6	4.9	9.7	4.9	6.3	7.9	9.3
Emergency hospital admissions for CHD (SAR)	88.9	95.7	94.3	112.3	94.3	102.4	63.5	100
Emergency hospital admissions for Stroke (SAR)	96.3	96.4	104.3	83	104.3	114	91.7	100
Emergency hospital admissions for chronic obstructive pulmonary disease (SAR)	59.5	77.1	30.2	146.4	30.2	117.3	38.5	100
Incidence of cancer (SIR**)	87	85.3	83.4	107.4	83.4	102.2	92.3	100
Hospital stays for alcohol related harm (SAR)	86.1	81.4	80.1	121.5	80.1	129.1	75	100
Life expectancy at birth - males, 2011 - 2015 (years)	82.7	81.5	83.4	76.2	83.4	76	81.3	79.4
Life expectancy at birth - females, 2011 - 2015 (years)	87	85.8	88	83.9	88	81.4	86.6	83.1

Local health indicator	Derbyshire wards							England
	Mickleover	Littleover	Mackworth	Abbey	Allestree	Darley	Little Eaton & Stanley	
Deaths from all cancer, all ages (SMR ^{***})	69	72.2	77.5	133.6	77.5	122.1	86.3	100
Deaths from coronary heart disease, all ages (SMR)	111.1	98.4	74.2	115.4	74.2	108	103.1	100
Deaths from stroke, all ages (SMR)	84.9	90.1	52.1	56.6	52.1	124.7	72.8	100
Deaths from respiratory diseases, all ages (SMR)	71.1	85.7	66.7	112.2	66.7	126.5	71.8	100

SIR: Standardised Incidence Ratio: The ratio of the observed number of incidences in a ward to the number expected if the ward had the same age specific rates as England

SAR: Standardised Admissions Ratio: The ratio of the observed number of admissions in a ward to the number expected if the ward had the same age-specific rates as England

SMR: Standardised Mortality Ratio: The ratio of the observed number of deaths in a ward to the number expected if the ward had the same age specific rates as England

Future Baseline

- 12.7.35. As detailed within Chapter 4: Environmental Impact Assessment Methodology, in order to identify the effects of the Scheme on people and communities, it is important to understand the baseline at the year of construction and the future baseline at year of Scheme opening/operation, as these may be different from those that currently exist. Such changes could alter the sensitivity of existing environmental receptors, as well as introduce new sensitive receptors.

Construction Year Baseline 2020

- 12.7.36. The baseline details as reported in the sections above describes the people and communities features as they are currently (2018/2019). Preliminary works associated with the Scheme are anticipated to start in late 2020, subject to securing a DCO (refer to Chapter 2: The Scheme, Section 2.6), with the main construction works starting in 2021.
- 12.7.37. The majority of the land that would be impacted by the Scheme (and in its vicinity) at Kingsway junction and Markeaton junction comprise the existing A38 highway and other highway infrastructure, as well as surrounding residential areas and areas of public open space. At Little Eaton junction, the majority of the land that would be impacted by the Scheme (and in its vicinity) comprises agricultural land as well as the existing A38 highway and other highway infrastructure, plus residential and commercial areas. As such, environmental baseline conditions are not anticipated to change significantly by 2020 from the conditions as detailed above. However, as detailed in Chapter 15: Assessment of Cumulative Effects, a number of development projects are ongoing, or are planned, that have the potential to change baseline conditions. Whilst these are not likely to significantly change baseline conditions within the study area, the following key changes are anticipated by the construction baseline year (2020) (the number in brackets refers to the development numbers as detailed in Appendix 15.2 [TR010022/APP/6.3]):
- A new footpath with Mackworth Park (No 5) will be operational.
 - The development at Radbourne Lane (Langley Country Park) (No 48) will have been completed. Developments within the Mackworth College site (No 6), within the Kingsway hospital site (No 21) and land north of Mansfield Road (Breadsall) (No 39/47) will be further progressed.
 - The NHS carpark for 600 cars located to the west of Kingsway Hospital and north of Northmead Drive (No 22) will have been fully developed and will be operational.
 - Residential developments at Hackwood Farm (No 29/41), land south of Mansfield Road (Breadsall) (No 40), and land at Kedleston Road (No 50) are anticipated to have been started with resultant land clearance.
- 12.7.38. Other minor developments in the vicinity of the Scheme which are considered to have been completed by late 2020, and thus will be part of the prevailing baseline, are detailed in Appendix 15.2 [TR010022/APP/6.3].

- 12.7.39. It is anticipated that the various developments as detailed above will not significantly change the prevailing environmental conditions within the Scheme boundary, nor baseline conditions within the defined people and communities study area.

Opening Year 2024

- 12.7.40. It is not possible to accurately predict baseline environmental conditions for the year of Scheme opening (2024); however, it is anticipated that baseline conditions in the vicinity of the Scheme and within the associated people and communities study area will largely be the same as at 2020, although most of the developments as detailed in Appendix 15.2 [TR010022/APP/6.3] are anticipated to have been completed by 2024. In addition, urban pressures associated with an increased population may result in the further expansion of the built environment.
- 12.7.41. Planned future developments have been taken into consideration during the assessment. For example, changes in future traffic baseline flows have been modelled both with and without the Scheme taking into account future development patterns (refer to the Transport Assessment Report [TR010022/APP/7.3]). Modelling outcomes have been used in order to determine the potential effect of Scheme opening on the environment surrounding the Scheme e.g. noise, air quality, severance, water quality effects, biodiversity.

15 Years after opening baseline (2039)

- 12.7.42. Predicting baseline environmental conditions 15 years after Scheme opening (2039) is not possible given the uncertainties regarding area development proposals. However, areas immediately surrounding the Scheme are largely already developed, or are areas with designated protection (e.g. public open space, World Heritage Site, green belt) such that significant development changes are not anticipated. Nevertheless, a wide range of long term potential future development proposals have been taken into account by the traffic modelling used to support the assessment (both with and without the Scheme) (refer to the Transport Assessment Report [TR010022/APP/7.3]). Modelling outcomes have been used in order to determine the potential effect of Scheme operation activities on the environment surrounding the Scheme e.g. noise, air quality, driver stress, severance, water quality effects, biodiversity.
- 12.7.43. The assessment of driver stress utilises the traffic data for 15 years after Scheme opening (2039), as this year is considered to be the worst year for traffic volumes in the first 15 years of operation. The traffic numbers for future baseline 2039 are presented in Tables 12.16 and 12.17.

12.8. Potential impacts

12.8.1. Mitigation measures incorporated into the Scheme design and measures to be taken to manage potential impacts upon local people and communities during Scheme construction are set out in Section 12.9. Prior to implementation of such mitigation measures, the Scheme has the potential to affect people and communities (both positively and negatively), both during construction and once in operation, in the following ways.

Construction

Pedestrians and cyclists

12.8.2. With regards to PECs, potential impacts during the Scheme construction phase include:

- Temporary land take and disruption, resulting in closure or diversion of footpaths and cycleways during Scheme construction activities. The existing Markeaton footbridge to the north of Markeaton junction would be demolished and replaced in the same location – however, there would be a period of approximately one and half years when there would be no footbridge (this is subject to review during the construction planning detailed design stage, with the aim of minimising the duration without a footbridge). In addition, strengthening works to the bridge over the River Derwent on Ford Lane (to the west of Little Eaton junction) may be needed during the Scheme construction phase. A strengthening assessment would be carried out which may indicate that no or limited works are needed, although in the worst-case the bridge may need to be closed for up to three months.
- Permanent land take to accommodate the Scheme resulting in the closure and diversion of footpaths and cycleways.
- Temporary disruption to footpaths and cycleways during construction works resulting in the severance of access to community facilities, loss of amenity due to noise, air quality or visual effects associated with Scheme construction activities. Visual effects upon users of footpath and cycleway routes are considered in Chapter 7: Landscape and Visual Impact Assessment.

Motorised users

12.8.3. With regards to motorised users, potential impacts during the Scheme construction phase include:

- Temporary increase in driver stress during the Scheme construction period due to changes in traffic flows and construction phase traffic management measures.
- Permanent change in traffic movements due to closures of existing accesses onto and from the existing A38 (e.g. Brackensdale Avenue, Raleigh Street, Enfield Road and Ford Lane).
- Temporary change to driver views due to the presence of construction activities and plant.
- Temporary disruption to bus routes and users of public transport.

Private assets

12.8.4. With regards to residential and commercial properties, potential impacts during the construction phase include:

- Temporary and permanent loss of curtilage land from the industrial units located along Kingsway Park Close.
- Temporary and permanent loss of land managed as grassland from the Army Reserves Centre located to the south of Markeaton junction, off Windmill Hill Lane.
- Permanent loss of the existing entry into McDonalds and the Esso petrol station from the A38 northbound carriageway which would be closed - such loss of entry into the site from the A38 would occur during the construction phase, noting that entry to the site would still be available via the A52, whilst the Scheme would provide an exit onto the new A38 diverge slip road).
- Demolition of 17 residential properties at Markeaton junction, namely 15 detached properties on Queensway and two semi-detached properties on the A52 Ashbourne Road.
- Permanent loss of land from four residential properties on Sutton Close and Ashbourne Road (east) to provide continued access for residential properties on Sutton Close and Ashbourne Road.
- Temporary use of former landfill area at Little Eaton junction as a construction compound.
- Temporary use of a wooded area located to the north-west of Little Eaton junction owned by the Derby Garden Centre for utilities diversion works.

12.8.5. Impacts upon agricultural land are considered in Chapter 10: Geology and Soils and thus such impacts are not repeated here.

Development land

12.8.6. With regards to development land, potential impacts during the Scheme construction phase include the use of allocated development land within the Kingsway hospital site for the creation of flood storage areas and associated ecological mitigation (noting that such land uses have been discussed and agreed with the site owners and developers).

Community land and severance

12.8.7. With regards to community facilities and public open space, potential impacts during the Scheme construction and operation phases include:

- Temporary use of public open space within Mackworth Park associated with construction of a buried highway runoff attenuation tank and the associated outfall to a tributary of Bramble Brook (refer to Chapter 13: Road Drainage and the Water Environment).
- Temporary use of public open space within Markeaton Park as a utilities diversion route and for construction access purposes, as well as works to reconfigure the park access arrangements.

- Temporary use of public open space at Mill Pond for construction access purposes.
- Permanent loss of approximately 7,788m² (0.78ha) of public open space (including proposed public open space) (refer to Chapter 2: The Scheme, para. 2.5.8 and para. 2.5.23) - approximately 2,050m² at Kingsway junction (associated with losses from the western end of Mackworth Park, from the public open space adjacent to Greenwich Drive South, plus losses from the area of proposed public open space associated with Mickleover railway cutting) and approximately 5,738m² at Markeaton junction (associated with losses of public open space within Markeaton Park and at Mill Pond) (refer to Figures 2.8 and 2.9 [TR010022/APP/6.2]).
- Ecological mitigation works within Markeaton Park to create a new species rich grassland, plus minor ecological mitigation works within Mackworth Park and at Mill Pond, and within a woodland area at Markeaton junction owned by the University of Derby (refer to Chapter 8: Biodiversity).
- Temporary use of land within the Royal School of the Deaf for construction access purposes, and reconfiguration of the school access.
- Permanent loss of land from the Royal School of the Deaf, including a disused access, land along the A52 Ashbourne Road and an area currently used as a sensory garden.
- Temporary disruption for motorised vehicles accessing the Royal School of the Deaf due to temporary traffic management measures on the A38.
- Temporary use of areas in current use as informal open space i.e. land adjacent to the Brackensdale Avenue access onto the A38, land adjacent to Greenwich Drive North, and land adjacent to Thurcroft Close/Windmill Hill Lane – such areas would be impacted during the construction phase with some associated tree clearance, whilst there would also be some permanent land losses.
- The permanent closure of the existing access into Markeaton Park from Markeaton junction (although it would be retained for emergency vehicle access) and the reconfiguration of the existing park exit onto Ashbourne Road to create a park entrance and exit, together with some rearrangements of the park's internal road infrastructure and the park boundary wall.

Human health

12.8.8. Potential impacts on human health determinants during Scheme construction include:

- Effects on access to key services and social infrastructure, such as health facilities and education facilities arising from temporary changes in journey length and congestion during Scheme construction.
- Effects on access to public open space resulting from the temporary and permanent loss of public open space and temporary closure and diversion of footpaths and cycleways.
- Temporary changes in air quality, noise and neighbourhood amenity resulting from construction activities on physical and mental health.

- Temporary effects on health resulting from a change in accessibility and active travel resulting from temporary and permanent changes to footpaths and cycleways.
- Temporary change in access to work and training in the local area during Scheme construction due to employment resulting from the Scheme and temporary changes in the journey length of motorised users.
- Temporary changes in community severance resulting from changes in journey length for motorised users and changes in traffic flows which could impact on social cohesion.

Operation

Pedestrians and cyclists

12.8.9. With regards to pedestrians and cyclists, potential impacts during Scheme operation include:

- Permanent changes in journey length and amenity for pedestrians and cyclists.
- Permanent change to severance resulting from new footpath and cycleway routes and facilities.
- Permanent change in amenity for pedestrians and cyclists due to noise, air quality and visual effects associated with Scheme operation.

Motorised users

12.8.10. With regards to motorised users, potential impacts during Scheme operation include:

- Permanent change in driver stress due to changes to traffic flows, congestion and safety.
- Permanent changes to driver views from the road.
- Permanent benefits to bus routes and users of public transport due to reductions in congestion and delays.

Private assets

12.8.11. Direct impacts upon private assets are not anticipated during Scheme operation.

Community land and severance

12.8.12. Direct impacts upon community facilities are not anticipated during Scheme operation. With regards to indirect impacts upon community facilities, potential impacts during Scheme operation include changes in severance as a result of permanent changes to motorised user routes and routes used by pedestrians and cyclists.

Human health

12.8.13. Potential impacts on human health determinants during Scheme operation include:

- Effects on access to key services and social infrastructure such as health facilities and education facilities, arising from permanent changes in journey length and congestion for both motorised users and pedestrians/cyclists.
- Effects on access to public open space resulting from the provision of replacement areas of public open space and permanent changes to footpath and cycleway routes.
- Permanent changes in air quality, noise and neighbourhood amenity resulting from Scheme operation on physical and mental health.
- Permanent effects on health from a change in accessibility and active travel resulting from permanent changes to pedestrian and cyclist facilities.
- Permanent change to access to work and training in the local area due to permanent changes in journey length for motorised users and pedestrians and cyclists.
- Permanent changes in community severance resulting from changes in journey length for motorised users and pedestrians and cyclists and changes in traffic flows which could impact on social cohesion.
- Potential impacts on health resulting from climate change impacts associated with Scheme operation.

12.9. Design, mitigation and enhancement measures

12.9.1. Where possible, proportionate measures to avoid or minimise impacts on people and community facilities have been embedded within the Scheme design (refer to Chapter 2: The Scheme). Measures taken to avoid or minimise Scheme impacts include the following:

- As detailed in Chapter 3: Scheme History and Assessment of Alternatives, Section 3.2, the link road from Kingsway junction to Kingsway Park Close was included in the Scheme design rather than the original proposal of a link road from the junction onto Greenwich Drive South. The link road to Kingsway Park Close was selected as it would reduce long-term impacts upon the area of public open space adjacent to Greenwich Drive South, as well as reduce traffic severance issues.
- As detailed in Chapter 3: Scheme History and Assessment of Alternatives, Section 3.3, Table 3.10, since the Preferred Route Announcement the Scheme design has been developed in a manner that aims to minimise losses of public open space.

Construction

12.9.2. During the construction of the Scheme, a number of measures would be put in place to reduce potential impacts upon people and communities as follows:

- As detailed in Chapter 2: The Scheme, Section 2.5, construction of the Scheme would be subject to measures and procedures as defined within the Outline Environmental Management Plan (OEMP) for the Scheme (refer to Appendix 2.1 [TR010022/APP/6.3]). This OEMP includes a range of measures associated with mitigating potential environmental impacts during Scheme construction. The measures detailed within the OEMP would be developed into a Construction Environmental Management Plan (CEMP), which would be prepared and implemented by the selected construction contractor (refer to Chapter 2: The Scheme, para. 2.6.107). The CEMP would set out the environmental mitigation requirements during Scheme construction and also the project level expectations on how the Scheme would be constructed.
- A Traffic Management Plan (TMP) would be prepared and implemented by the construction contractor (based upon the TMP provided in Appendix 2.3 [TR010022/APP/6.3]) – this would define measures to be used by the construction contractor to reduce the impacts from construction traffic, including measures to reduce worker vehicle movements and to reduce HGV movements, particularly at peak periods. HGV deliveries of construction materials would be made in a 12 hour period between 7am and 7pm other than in exceptional circumstances, whilst HGV deliveries would only access the Scheme construction sites via the following main highway corridors: A38 north, A61 south, A6 north, A52 west, A5111 Kingsway, A38 south (refer to Figures 2.11a to 2.11c [TR010022/APP/6.2] and Chapter 2: The Scheme, Section 2.6).
- Planning of the Scheme construction works would be undertaken in order to minimise the need to close and divert footpaths and cycleway facilities, and minimise closures and diversion durations. Where the closure of public footpaths and cycle routes would be required, safe and appropriate alternative means of access would be provided to ensure access would be maintained at all times in order to minimise temporary severance. The construction contractor would agree temporary diversion routes in advance with DCiC, EBC and DCC as applicable. Appropriate signage for all closures and diversion of footpaths and cycleways would be used to inform pedestrians and cyclists, with sufficient notice of such closures and diversions being provided.
- Bus routes would be taken into consideration when defining temporary diversions and temporary traffic management - the construction contractor would discuss and agree temporary diversion routes in advance with DCiC, EBC and DCC as applicable in order to limit impacts on passengers.
- During the Scheme 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.). This would include the appointment of a Community

Relations Manager (CRM) responsible for leading engagement with affected communities. A Highways England Scheme web-page would be set up to provide up-to-date construction and community liaison information. It is envisaged that the web-page would provide updates regarding construction progress, details of areas affected by construction, and mitigation in place to reduce adverse effects. The communication approaches would help drivers and local residents to plan their journeys and take account of potential disruption due to Scheme construction, as well as provide local residents with details of construction phase activities. In addition, the Highways England Customer Contact Centre (HECCC) would also be available to deal with queries from the public. This includes an information line staffed by Highways England at all times. A complaint management system would be in place, in line with systems used by Highways England on other major infrastructure projects. Any complaints would be investigated and appropriate action taken as required. The complainant would be provided with a response outlining the results of the investigation and any action taken.

- The contractor would liaise with the Royal School for the Deaf during the Scheme construction phase regarding school access. If access issues become apparent, the contractor would investigate development of a school drop off for cars at the end of Markeaton Street at the back of the school, within land owned by Derby University. Any such arrangements would be undertaken by agreement between affected parties. In addition, due to Scheme impacts upon the school sensory garden, a replacement sensory garden would be developed within the existing school grounds prior to the start of the construction works (in agreement with the deaf school). A rearranged school access off the A52 would also be created.

Operation

- 12.9.3. The Scheme design includes a number of embedded mitigation measures that aim to avoid and minimise effects upon people and communities during Scheme operation. Details are provided in the sections below. Mitigation measures embedded in the Scheme design are illustrated on the Environmental Masterplans in Figures 2.12a to 2.12h [TR010022/APP/6.2] (also refer to the Environmental Mitigation Schedule provided in Appendix 2.2 [TR010022/APP/6.3]).

Pedestrians and cyclists

- 12.9.4. During the development of the design, the following measures have been incorporated into the Scheme design to reduce impacts on pedestrians and cyclists (refer to Figures 12.3a to 12.3c [TR010022/APP/6.2]):

- 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 Kingsway junction western roundabout embankment. A controlled crossing would be provided on Brackensdale Avenue (east of the A38) 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). A controlled crossing would be provided on Kingsway Park Close.

- The uncontrolled pedestrian crossing of the A38 from Greenwich Drive North to Thurcroft Close would be closed permanently, with alternative routes being available either via Brackensdale Avenue 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 footpath and cycleway routes would be retained.
- Markeaton junction:
 - Closure and realignment of the existing footpath and cycleway (Route of RR66) from Raleigh Street to the A52, east of the A38. The combined footway and cycleway would be widened to 3m with clear signage.
 - Controlled (toucan) crossings would be provided on all arms of Markeaton junction.
 - Controlled crossings would be provided on the A52 west of the Esso garage to provide access into Markeaton Park from the west.
 - Construction of a new footbridge to cross the A38 to Markeaton Park in the location of the existing Markeaton footbridge which would be demolished to accommodate the Scheme.
 - Realignment of the existing footpath and cycleway (Route of RR66) from the A52 to Kedleston Road. The combined footway and cycleway would be widened to 3m with clear signage. The combined footpath and cycleway would pass through an area of replacement public open space offered in exchange at Queensway (refer to para. 12.9.7), thus linking Ashbourne Road and the new Markeaton footbridge.
 - All other existing footpath and cycleway routes would be retained.
- Little Eaton junction:
 - The existing carriageway associated with the left in, left out access onto the A38 from Ford Lane (located between the River Derwent bridge and the bridge over the Midland Mainline railway line) would be closed to vehicle access, appropriately landscaped and provided with facilities for pedestrians and cyclists to enable continued access to adjacent pedestrian and cyclist routes.
 - Controlled crossings for pedestrians and cyclists installed on the new A38 southern slip roads. A dual footway and cycleway 3m wide would be constructed between these crossings to allow NR54 and pedestrians and cyclists to pass beneath the main carriageway of the A38.
 - An uncontrolled crossing would be provided from the section of the NR54 that runs along the B6179 to provide access across the road.
 - Breadsall FP No. 3 would be subject to a minor diversion outside the new fence line and join Breadsall FP No.1.
 - All other existing footpath and cycleway routes would be retained.

- 12.9.5. Footpath and cycleway proposals are based on the fundamental premise that the Scheme design aims to include at least the level of provision that exists at present with enhanced provision where deemed appropriate and reasonable (refer to para. 12.9.4). In undertaking the design of proposed footpath and cycleway 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.

Motorised users

- 12.9.6. During the development of the Scheme design, the following measures have been incorporated into the Scheme design in order to reduce impacts on motorised users:

- Closure of vehicle exit and entry points onto the A38 via Brackensdale Avenue, Raleigh Street, Enfield Road and Ford Lane to improve the safety of motorised users.
- A new lane in either direction along the A38 between Kingsway junction and Kedleston Road junction, and an increased speed limit from 40mph to 50mph through this section of the Scheme to minimise impacts on driver stress and severance.
- The speed limit at Little Eaton junction would be 70mph, although there would be an advisory speed limit of 50mph for a length of approximately 600m through the junction in both directions to improve safety for all road users.
- Grade separation of the junctions to improve safety and reduce the accident clusters that occur at the existing at-grade roundabouts. For motorised travellers, safety measures include, but are not limited to, signage and signalling, vehicle restraint systems, and central reserves providing appropriate visibility.

Community facilities and private assets

- 12.9.7. During the development of the Scheme design, the following measures have been incorporated to reduce impacts on community facilities and private assets:

- Due to the loss of public open space (total area of 7,788m²), there is a requirement to provide replacement public open space offered in exchange that is equal to or greater than the area of public open space lost to the Scheme. It is proposed that replacement public open space for the Scheme would be provided using the area vacated by the buildings to be demolished on Queensway, areas of the existing A38 at Markeaton junction that would be removed and landscaped, plus the area occupied by the Brackensdale access that would no longer be needed due to the Scheme (total area of 7,832m²) – refer to Figures 2.8 and 2.9 [TR010022/APP/6.2]. As such, the area of replacement public open space offered in exchange would be approximately 44m² larger than the public open space losses associated with the Scheme. The replacement public open space offered in exchange at Queensway would be appropriately landscaped to create a green link for pedestrians and cyclists from the A52 Ashbourne Road to the new Markeaton footbridge. Similarly the replacement public open space offered in exchange on the edge of Markeaton Park would be landscape integrated with the other

sections of the park, whilst the Brackensdale Avenue access would be landscaped and integrated with the adjacent informal open space. The use of the Queensway area for replacement public open space has been agreed in principle with DCiC. The Planning Statement [TR010022/APP/7.2] includes an analysis of public open space losses and details regarding the merits of the replacement public open space offered in exchange.

- The Scheme would result in the loss of the direct access into McDonald's restaurant and the Esso petrol station off the A38 northbound carriageway to the south of Markeaton junction. It is proposed that access to McDonald's and the petrol station would use the revised access and exit off the A52 (a signalised junction with the new Markeaton Park access), whilst the Scheme would also provide an exit onto the A38 diverge slip road.
- Areas of informal open space used temporarily during the construction phase between Kingsway junction and Markeaton junction would be appropriately landscaped. Landscaping details are provided in Chapter 7: Landscape and Visual Impact Assessment (also refer to Figure 7.8a to 7.8c [TR010022/APP/6.2]).
- The existing access into Markeaton Park from Markeaton junction would be closed – it is proposed that the existing park exit onto the A52 would be reconfigured to create a new signalised park access. As detailed in para. 12.9.4, the signalised junction would assist pedestrians and cyclists to access the park. Park access arrangements have been discussed and agreed with DCiC.
- Sites used temporarily during the Scheme construction phase would be appropriately restored and returned to the applicable land owner. Landscaping details are provided in Chapter 7: Landscape and Visual Impact Assessment. The Army Reserves Centre and the owners of the Little Eaton construction compound have been consulted in order to confirm Scheme use of these sites. Similarly land at the Royal School for the Deaf used temporarily during the construction phase would be appropriately restored and landscaped. Mitigation measures applicable to agricultural holdings are detailed in Chapter 10: Geology and Soils.
- Landowners that would be directly affected by demolition and land-take would be eligible for appropriate compensation in accordance with established compensation procedures.

Development land

- 12.9.8. During the development of the Scheme design, discussions have been held with the owners and developers of the Kingsway hospital site to south-east of Kingsway junction regarding the use of their site adjacent to Bramble Brook for the creation of flood storage areas and associated ecological mitigation planting. Such plans integrate with the developer's green wedge development proposals within the site which involve the creation of allotments, football pitch, multi-use games area (MUGA), a new attenuation pond, extension of an existing attenuation pond, toddler and junior play area and associated infrastructure and landscape planting (refer to Chapter 15: Assessment of Cumulative Effects).

Enhancement measures

12.9.9. The following enhancement opportunities have been included within the Scheme design:

- A new shared footpath and cycleway would be provided across Kingsway junction from Mackworth Park, linking Mackworth from Greenwich Drive South to the A5111 Kingsway.
- A new footpath with occasional seating would be provided around the perimeter of the flood storage areas adjacent to Bramble Brook within the Kingsway hospital development site (refer to para. 12.9.8).

12.10. Assessment of likely significant effects

Pedestrians and cyclists

Construction

12.10.1. Changes to journey times, local travel patterns, and uncertainty of route for walkers and cyclists would arise through the temporary closure and diversions of PRow required to construct the Scheme. Temporary closures and appropriate diversions of footpaths and cycleways within the Scheme boundary would be agreed with DCiC, EBC and DCC, as appropriate, prior to their implementation. Pedestrians and cyclist would be given advanced warning of these works. It is, therefore, anticipated that effects on pedestrians and cyclists during Scheme construction would be temporary minor adverse, which is not significant.

12.10.2. There are three exceptions to this as follows (all of which would result in significant adverse temporary severance effects):

- There would be temporary severance of a shared footway and cycleway to the east of Kingsway junction during construction of the link road between Kingsway junction and Kingsway Park Close. This route has a very high sensitivity to disruption due to the high number of users. It is considered that temporary alternative routes would substantially increase journey lengths (>500m) and potentially dissuade users from making this journey. It is, therefore, anticipated that there would be a temporary moderate adverse effect on pedestrians and cyclists using this route.
- There would be a temporary absence of a footbridge at Markeaton for a period of approximately one and half years between the demolition of the existing bridge and construction of the replacement bridge (this is subject to review during the construction planning detailed design stage, with the aim of minimising the duration without a footbridge). This would result in increased severance for pedestrian and cyclist access to Markeaton Park, with alternative routes being diversions via Markeaton junction and Kedleston Road, both resulting in maximum diversions of approximately 500m. The absence of the footbridge would also temporarily sever the national trail 'Bonnie Prince Charlie Walk'. It is considered that temporary alternative routes could increase journey lengths, resulting in a temporary moderate adverse effect on users of the footbridge and national trail.

- The bridge over the River Derwent on Ford Lane to the west of Little Eaton junction may need strengthening works during the Scheme construction phase. A strengthening assessment would be undertaken which may indicate that no or limited works are needed and thus bridge use by pedestrians and cyclists would be unaffected. However, in the worst-case the bridge may need to be closed for up to three months. Such a closure would require cyclists to access the A38 via the Palm Court junction, although no alternative routes would be available for pedestrians. It is considered that should there be a need to temporarily close the River Derwent bridge on Ford Lane, that this would result in a temporary moderate adverse effect on pedestrians and cyclists.

Operation

- 12.10.3. Figures 12.3a - 12.3c [TR010022/APP/6.2] illustrate the proposed pedestrian and cyclist facilities included within the Scheme design – further details are provided in the sections below.

Kingsway and Markeaton junctions

- 12.10.4. The footway and cycleway to the west of Kingsway junction which provides a route for NR54, NR68 and RR66 would be realigned as part of the Scheme - this would result in a change in journey length of approximately 10m which is not a material change in journey length. No change in severance or amenity is anticipated as a result of the realignment. It is, therefore, considered that there would be an effect of no change for pedestrians and cyclists using this route.
- 12.10.5. A new shared footway and cycleway (approximately 3m in width) crossing Kingsway junction would be provided as part of the Scheme (refer to para. 12.9.9) (refer to Figure 12.3a [TR010022/APP/6.2]). This new route would allow pedestrians and cyclists to cross the southbound entry and northbound exit slip roads of the A38 via two uncontrolled crossings. This new route would tie into the existing local, regional and national cycling networks on either side of Kingsway junction providing a new pedestrian and cyclist connection across the A38. The route would provide a new pedestrian and cyclist route across the A38 improving connectivity between Mackworth and the Kingsway Retail Park, the Kingsway hospital site and Derby Royal Hospital, as well as connecting the new residential estate within the Kingsway hospital site with Mackworth Park, thus improving connectivity to areas of public open space. The new route would reduce journey lengths by approximately 525m (distance of approximately 250m rather than approximately 775m) and reduce severance. It is, therefore, considered that this would result in a permanent moderate beneficial effect on pedestrians and cyclists, which is considered to be significant.
- 12.10.6. The new link road to Kingsway Park Close from Kingsway junction would sever an existing shared footway and cycleway. A controlled crossing would be provided to assist pedestrians and cyclists to safely cross this road. The existing footway is well used by pedestrians and cyclists, with more than 1,000 pedestrians and cyclists recorded using this route on a weekday. Annual Average Daily Traffic (AADT) flows for this road are anticipated to be relatively low, at approximately 5,000 - 6,000 vehicles per day. A new controlled crossing on

Brackensdale Avenue would also provide improved crossing facilities for pedestrians and cyclists using the existing shared footway and cycleway linking into the regional and national cycle network (NR54, NR68 and RR66). The overall effect on pedestrians and cyclists using this route is considered to be minor adverse, which is not significant.

- 12.10.7. The vehicle exit and entry points onto the A38 at Brackensdale Avenue, Raleigh Street and Enfield Road would be closed and new short sections of footway or shared footway and cycleway would be constructed linking into the existing pedestrian and cyclist facilities. This would remove the need for pedestrians and cyclists to cross these roads, improving safety with no material effect on journey length (<5m). The effect on pedestrians and cyclists is considered to be minor beneficial, which is not significant.
- 12.10.8. The uncontrolled at-grade crossing on the A38 connecting Thurcroft Close and Greenwich Drive North would be closed due to safety concerns. The existing crossing was originally put in place to serve two bus stops which are no longer in use. The A38 Walking, Cycling & Horse-Riding Assessment Report (refer to Appendix 12.1 [TR010022/APP/6.3]) reports that this crossing has now become a route to access Brackensdale Primary School. This crossing is considered to be a dangerous route for pedestrians and cyclists with many already utilising alternative routes. The closure of this crossing would add up to a maximum of approximately 670m to the length of a journey between Thurcroft Close and Greenwich Drive North (via the existing underpass at Brackensdale Avenue). It is noted that the majority of pedestrian and cyclist journeys would not be extended by >500m, as the actual change in journey length would depend upon the origin and destination of each trip. For pedestrians and cyclists accessing Brackensdale School, the diversion via Brackensdale Avenue would result in an increase in journey length of approximately 40m resulting in a 30 second diversion (based on an average walking speed; 1.4m per second). This diversion would provide a much safer route for pedestrians and cyclists improving the amenity of the journey.
- 12.10.9. As detailed in Chapter 3: Scheme History and Assessment of Alternatives, Section 3.3, Table 3.10, during statutory consultation the public were asked whether they agreed with the proposed closure of the existing uncontrolled pedestrian crossing of the A38 between Thurcroft Close and Greenwich Drive North and whether they would use the alternative access proposals. The majority of respondents supported the closure of the uncontrolled pedestrian crossing, with respondents stating that they would use the alternative routes provided. Though the maximum diversion distance has the potential to qualify as a moderate adverse effect (in accordance with Table 12.4), taking into account the current unsafe nature of the crossing, level of usage and the actual likely diversion length (<500m), it is considered that the closure of this uncontrolled crossing of the A38 would result in a permanent minor adverse effect for the majority of users, which is not significant.
- 12.10.10. The existing footway and cycleway (RR66) to the east of the A38 to the north and south of Markeaton junction between Raleigh Street and Kedleston Road would be realigned to accommodate the alignment of the A38 and new slip roads. This

realignment would move pedestrians and cyclists further from the A38 main carriageway. To the north of Markeaton junction the footway and cycle route would be located within an area of replacement public open space which would be subject to appropriate landscape planting (refer to Figure 7.8b [TR010022/APP/6.2]). This would improve the amenity of the route. This realignment would result in a small change in journey length of up to 20m. The existing zebra crossings on the eastern arm of the A52 Ashbourne Road would be replaced with two signalised crossings. This would result in an increased perception of safety and encourage the increased use of this route. The effect on pedestrians and cyclists is, therefore, considered to be moderate beneficial, which is significant.

- 12.10.11. The existing Markeaton footbridge which provides a grade separated crossing of the A38 north of Markeaton junction would be replaced by a new footbridge on the same alignment (widened to cater for the provision of the additional lane on each carriageway). This would result in an effect of no change to journey length and thus no effect on pedestrians and cyclists during Scheme operation.
- 12.10.12. New controlled crossings on the A52 Ashbourne Road west of Markeaton junction would replace an existing uncontrolled crossing. This is anticipated to reduce severance, providing an improved at-grade crossing and safer route for pedestrians and cyclists to access Markeaton Park. The effect on pedestrians and cyclists during Scheme operation is considered to be minor beneficial, which is not significant.
- 12.10.13. Pedestrians and cyclists using the signalised crossings to move east to west across Markeaton junction would experience an increase in journey length of approximately 10m, which is not a material change in journey length. The signalised crossings would be located on the A38 entry and exit slip roads rather than crossing the main A38 carriageway. This is anticipated to result in a slight improvement in amenity. These changes are anticipated to result in a minor beneficial effect on pedestrians and cyclists, which is not significant.

Little Eaton junction

- 12.10.14. The loss of the existing footway and cycleway to the north-west of the junction connecting to Ford Lane would be replaced by a new footway and cycleway. The closure of the Ford Lane exit and entry onto the A38 (located between the River Derwent bridge and the bridge over the Midland Mainline railway line) may encourage additional use by pedestrians and cyclists through improvements in perceived safety and amenity given that the closed Ford Lane access would be appropriately landscaped (refer to Figure 7.8c [TR010022/APP/6.2]). This is anticipated to have a minor beneficial effect on pedestrians and cyclists, which is not significant.
- 12.10.15. The inclusion of two controlled crossings to cross the entry and exit slip roads to the west of the new junction and a linking shared (3m wide) footway and cycleway would be provided to maintain the route of NR54 through Little Eaton junction. The grade separation of the junction would improve the amenity of this route as pedestrians and cyclists would no longer be required to cross the A38 mainline carriageway. The change in journey length would be negligible, though

severance would be reduced as traffic flows would be reduced on the slip roads in comparison to the A38 mainline carriageway. It is, therefore, anticipated that this would result in a minor beneficial change for pedestrians and cyclists, which is not significant.

- 12.10.16. Breadsall FP3 currently ends at the A38 carriageway to the east of Little Eaton junction with no crossing facilities provided, with the onward route blocked by a safety barrier and traffic flows on the A38 (refer to Figure 12.1c [TR010022/APP/6.2]). Construction of the new A38 embankment and A61 slip road would require Breadsall FP3 to be permanently diverted, with the footpath being extended by a length of approximately 370m to join Breadsall FP1 (with the diversion following the realigned Dam Brook). This footpath extension would create a circular route and tie Breadsall FP3 into the wider network of PRoW around Little Eaton junction. The extension of this route has the potential to encourage the use of this PRoW (baseline PEC counts recorded one pedestrian using this route - refer to Table 12.13). It is therefore, anticipated that the footpath extension would result in a minor beneficial effect, which is not significant.
- 12.10.17. The Scheme would not result in any changes to the designated bridleway Breadsall BW18 and Little Eaton BW 29, whilst no new infrastructure would be constructed in proximity to these PRoW. It is, therefore, anticipated that Scheme operation would result in an effect of no change for equestrians.

Motorised users - driver stress

Construction

- 12.10.18. It is anticipated that there would be an increase in driver stress within the study area during the Scheme construction phase. This would be due to the presence of construction traffic on the A38 and surrounding roads, construction activities taking place directly adjacent to and within the A38 carriageway, as well as construction traffic management measures. This would lead to potential temporary increases in congestion, resulting in frustration amongst vehicular travellers. The use of traffic management measures such as temporary road and lane closures, are also anticipated to result in some route uncertainty for some drivers. An increase in driver frustration coupled with driver uncertainty has the potential to result in a temporary increased risk of accidents, although the measures as detailed in the TMP (provided in Appendix 2.3 [TR010022/APP/6.3]) aim to minimise such risks.
- 12.10.19. Where possible, the TMP (provided in Appendix 2.3 [TR010022/APP/6.3]) aims to maintain journey times on the A38 to minimise disruption to users of this strategic route (refer to Chapter 2: The Scheme, Section 2.6). Traffic modelling of the various construction phases has been undertaken which indicates that with the appropriate design of construction phase traffic management systems, existing journey times along the A38 could be maintained. However, during the most active Scheme construction phases, traffic management has the potential to increase the A38 journey time through this section of the A38 by approximately two minutes. Journeys on some radial routes could 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.

- 12.10.20. Mitigation measures set out in the TMP (provided in Appendix 2.3 [TR010022/APP/6.3] would enable motorised users to be aware of disruptions ahead of time to help them plan their routes and journeys accordingly, with clear signage mitigating the impact on route uncertainty.
- 12.10.21. Overall it is assessed that there would be a temporary slight adverse effect on driver stress levels during Scheme construction (related to the three components causing driver stress, namely frustration, fear of accidents and uncertainty of route) – this would be the case for motorised users and users of public transport. Such effects are not considered to be significant.

Operation

- 12.10.22. As detailed in Chapter 2: The Scheme, para. 2.1.5, operation of the Scheme would result in reduced journey times for those using the A38 and the surrounding local network. The Scheme would also save a predicted 1,396 personal injury collisions over a period of 60 years – as detailed in Chapter 2: The Scheme, para. 2.1.7, this would include savings of eight fatal casualties and 135 serious casualties (i.e. saving of 143 killed and seriously injured) (refer to the Transport Assessment Report [TR010022/APP/7.3]). The Scheme would also include a clear display of signs at and between each junction designed in accordance with Traffic Signs Regulations, to assist drivers with route certainty.

Kingsway and Markeaton junctions

- 12.10.23. The A38 would be realigned vertically to pass beneath the new junctions at Kingsway and Markeaton which would allow free flowing traffic on the A38 through the grade-separated junctions and remove conflicts between local traffic and long-distance traffic movements. An additional lane would be added to the northbound and southbound carriageways between Kingsway junction and Kedleston junction, providing three lanes in each direction. The speed limit at and between these junctions would be increased from 40mph to 50mph, returning to the national speed limit south of Kingsway junction and north of Kedleston Road junction. The closure of existing local entry and exit accesses onto the A38 at Brackensdale Avenue, Enfield Avenue, Raleigh Street and the entry onto the A38 from the Esso petrol station and McDonalds would further separate local traffic from the A38. It is considered that these measures would reduce the risk of accidents as local traffic would be separated from the A38, with access to the A38 only via entry and exit slip roads to the grade separated junctions. This would improve the certainty of route and reduce fear of accidents. It is also considered that free flowing traffic at a greater speed limit would reduce congestion and driver frustration.
- 12.10.24. Motorised users on the A38 and A52 would still be able to gain access to the existing traveller care facilities (McDonalds and Esso petrol station), although this would require northbound motorised users to leave the A38 via the new slip road at Markeaton junction and access these facilities via the A52. This is a minor detour and is not anticipated to deter the use of these facilities.
- 12.10.25. Controlled crossings would be installed at Markeaton junction on the A52 Ashbourne Road to the east and west of the junction and across the A38 entry and exit slip roads. This would reduce conflicts between vehicles and reduce the

risk of accidents involving pedestrians and cyclists, thus resulting in reduced fear of accidents.

Little Eaton junction

12.10.26. The A38 would be realigned vertically to pass over the new Little Eaton junction which would allow free flowing on the A38 through the junction. Closure of exits and accesses onto the A38 from Ford Lane (west) would further separate local traffic from the A38, resulting in a reduced fear of accidents.

12.10.27. Motorised users would still be able to gain access to the Starbucks café off the B6179 Alfreton Road using the grade-separated junction. This is the route which is currently taken by motorised users, and therefore this is not anticipated to deter use of these traveller care facilities. The separation of local and regional traffic and signalisation of the roundabout is anticipated to reduce the risk of accidents when using the B6179 access onto the roundabout, thereby reducing driver stress.

Driver stress levels

12.10.28. To assess the level of change in driver stress levels (frustration and fear of potential accidents) for drivers using the Scheme, Table 12.16 sets out the predicted driver stress level for sections of the new A38 for two scenarios, 'with the Scheme' and 'without the Scheme', using the method set out in Section 12.3.

Table 12.16: Assessment of effects of driver stress for users of the A38

Road section	Baseline road classification	Predicted traffic flows per hour (peak) per lane - without Scheme 2039	Average Speed (km/hr) - without Scheme 2039	Driver stress level without Scheme 2039	Predicted traffic flows per hour (peak) per lane - with Scheme 2039	Average Speed (km/hr) - with Scheme 2039	Driver stress level with Scheme 2039	Change in driver stress level
A38 south of Kingsway junction	Dual Carriageway	NB - 1260	95	Moderate	1755	71	High	Increase
		SB – 1226	92	Moderate	1700	76	High	Increase
A38 Kingsway between Kingsway and Markeaton junctions	Dual Carriageway	NB - 1365	52	High	1388	29	High	No change
		SB – 1641	36	High	1334	53	High	No change
A38 Queensway east of Markeaton junction	Dual Carriageway	NB – 1469	61	Moderate	1397	50	High	Increase
		SB – 1428	48	High	1397	52	High	No change
A38 Palm Court junction west of Little Eaton junction	Dual Carriageway	EB – 1378	81	Moderate	1689	43	High	Increase
		WB – 1346	86	Moderate	1701	80	High	Increase
A38 north of Little Eaton junction	Dual Carriageway	NB – 1428	92	Moderate	1697	81	High	Increase
		SB - 1551	73	Moderate	1804	75	High	Increase

NB = Northbound, SB= Southbound, EB= Eastbound, WB=Westbound

- 12.10.29. While the assessment presented in Table 12.16 predicts an increase or no change in driver stress, this does not take into consideration that traffic using these routes would no longer be required to reduce their speed or stop to pass through three signalised junctions. Therefore, taking this into consideration, it is anticipated that motorised users would experience a reduction in stress due to reduced congestion, increased journey reliability and shorter journey times. The Transport Assessment Report [TR010022/APP/7.3] reports that between 8:00am and 9:00am peak hour largest modelled decreases in total journey time along the A38 northbound would be six minutes 44 seconds in 2039, whilst the largest decrease in total journey time along the A38 southbound would be 9 minutes 25 seconds in 2039 during the 0800 – 0900 hours peak time period. Based on the information outlined above and in Table 12.16, it is, therefore, considered that the Scheme would have a moderate beneficial effect on driver stress for motorised vehicles using the A38 through the Scheme which is significant, and a slight beneficial effect for those travelling through the Scheme including the Scheme approaches.
- 12.10.30. To assess the level of change in driver stress levels (frustration and fear of potential accidents) for drivers using roads surrounding the Scheme, Table 12.17 sets out the predicted driver stress level for each of the roads that intersect at the existing junctions for two scenarios, 'with the Scheme' and 'without the Scheme', using the method set out in Section 12.6.

Table 12.17: Assessment of effects of driver stress on the surrounding roads

Road	Baseline road classification	Predicted traffic flows per hour (peak) per lane - without Scheme 2039	Average Speed (km/hr) - without Scheme 2039	Driver stress level without Scheme 2039	Predicted traffic flows per hour (peak) per lane - with Scheme 2039	Average Speed (km/hr) - with Scheme 2039	Driver stress level with Scheme 2039	Change in driver stress level
B5111 Kingsway	Single Carriageway	EB – 852	54	High	1216	56	High	No change
		WB – 338	58	Moderate	1183	56	High	Increase
A52 Ashbourne Road north of Markeaton junction	Single Carriageway	EB – 1011	36	High	906	33	High	No change
		WB – 799	55	Moderate	982	39	High	Increase
A52 Ashbourne Road south of Markeaton junction	Single Carriageway	EB – 722	32	High	914	25	High	No change
		WB - 706	31	High	827	35	High	No change
A61	Dual Carriageway	SB - 995	54	High	955	71	High	No change
		NB - 794	89	Moderate	870	91	High	Increase
B6179 Alfreton Road	Single Carriageway	NB - 333	40	Moderate	530	40	Moderate	No change
		SB - 488	41	Moderate	511	42	Moderate	No change

NB = Northbound, SB= Southbound, WB= Westbound, EB= Eastbound

- 12.10.31. While the assessment presented in Table 12.17 predicts an increase or no change in driver stress for users of the surrounding roads, the assessment does not take into account the reduced traffic numbers using the roundabouts at the three junctions. The majority of traffic would pass under or over these junctions on the A38, therefore traffic would move more freely through the junctions resulting in reduced congestion and improved journey reliability. This would result in a reduction in driver stress for the majority of surrounding routes. Overall it is anticipated that the Scheme would result in a slight beneficial effect on driver stress for users of surrounding roads, which is not significant.
- 12.10.32. However, the westbound carriageway of the B5111 Kingsway is anticipated to experience an increase in traffic during peak hours of more than 800 vehicles per hour as a result of the Scheme. Though it is likely that these vehicles would travel through the junction more quickly, there is the potential for increased congestion on this route. It is, therefore, anticipated that users of this route may experience an increase in driver stress resulting in a slight adverse effect, which is not significant.

Public Transport

- 12.10.33. During Scheme operation it is considered that users of public transport would experience minor changes to the location of bus stops and bus shelters around Markeaton Park and on Brackensdale Avenue, with the greatest distance for relocation being less than approximately 30m from existing facilities. Relocation of these assets is not anticipated to impact on users or their access to bus stops and shelters.
- 12.10.34. It is considered that the Scheme would not result in any changes to existing bus routes or timetabling, as all buses would be able to continue to use their existing routes with only minor changes to distances due to the new road layout. Bus routes using and traversing the A38 would benefit from the Scheme due to reduced congestion with the potential for improvements to the reliability of journey times. The Scheme is thus anticipated to have a slight beneficial effect on the users of public transport, which is not significant.

Driver views

Construction

- 12.10.35. During Scheme construction, there would be a change in driver views at each junction and adjacent sections of the A38 where construction activities would be taking place (e.g. machinery, vegetation clearance, earthworks, demolition, temporary signage and construction works etc.). Generally, views from the road would remain largely as recorded for the baseline (refer to Section 12.7), although partially obscured in some areas. Some traffic may be diverted onto new or temporary sections of the A38, or new routes due to road and lane closures, whilst some sections along the A38 would experience vegetation clearance - thus some motorised users would experience new or altered views.

- 12.10.36. It is anticipated that with the mitigation features as detailed in Section 12.9, that during the Scheme construction phase there would be an unavoidable adverse impact on views from the road of moderate magnitude at each junction.
- 12.10.37. As outlined in Section 12.3, motorised users are considered to be tolerant to interruptions to views from the road as associated with construction works and, therefore, have a low sensitivity. It is, therefore, considered that Scheme construction would result in a temporary minor adverse effect on views from the road at each junction, which is not significant.

Operation

Kingsway and Markeaton junctions

- 12.10.38. The route of the A38 would pass underneath Kingsway and Markeaton junctions in deep cuttings with no views experienced as the vehicles pass underneath. The roundabouts at Markeaton and Kingsway junctions, as well as the section of the A38 between the junctions, would reach existing ground levels, however, noise barriers (approximately 1.5m high) would be constructed on both sides of the new A38 between the bridge over Brackensdale Avenue and Markeaton junction, whilst an approximate 4m high noise barrier would be placed along the boundary of the Royal School for the Deaf. Such barriers would restrict some views of the surrounding area. As views from the road are currently limited by existing vegetation and adjacent residential and commercial properties, the change in view is considered to result in a low magnitude impact.
- 12.10.39. Given that the sensitivity to change for motorised users is low, the reduction in views through Kingsway and Markeaton junctions is considered to have a permanent slight adverse effect on driver views, which is not significant.

Little Eaton junction

- 12.10.40. The A38 would pass through Little Eaton junction on embankment, although approximately 2.5m high noise and visual screening barriers would be provided along the northbound mainline A38 in the vicinity of the Ford Lane Mobile Home Park, and along the southbound mainline A38 and diverge slip-road as the Scheme passes Breadsall. These barriers would screen some driver views from the Scheme to the surrounding areas, resulting in limited views (views are currently intermittent). Where the junction is at ground level, views would be restricted by the A38 embankment. The change in view is considered to result in a low magnitude impact.
- 12.10.41. Due to the low sensitivity of motorised users to changes in view, it is considered that this would result in a slight adverse effect, which is not significant.

Private Assets

Construction

Kingsway and Markeaton junctions

- 12.10.42. There would be no demolition of private property required to facilitate the Scheme at Kingsway junction. Some land parcels required during Scheme construction at Kingsway junction are owned by DCiC (e.g. within Mackworth Park, and the

public open space adjacent to Greenwich Drive South) and Kier Partnership Homes Limited (the Kingsway hospital site). The use of these land parcels and other community facilities are considered under the assessment of effects on community facilities and development land.

- 12.10.43. Construction of the link road from Kingsway junction to Kingsway Park Close would result in the temporary (approximately 2,990m²) and permanent (approximately 3,788m²) loss of curtilage land from Sainsbury's as well as a small portion of permanent land take from three other business on Kingsway Park Close. These land losses represents a small portion of the total land plot areas and are not anticipated to result in operational difficulties for the affected businesses. It is, therefore, anticipated that such land take would result in a slight adverse effect on the effected businesses, which are not significant.
- 12.10.44. Construction of the retaining walls and noise barriers between Kingsway junction and Markeaton junction, and the rerouting of the existing pedestrian and cycle routes would require temporary (approximately 5,764m²) and permanent (approximately 6,100m²) land take from the Army Reserves Centre. Parts of the area would also be used during the Scheme construction phase for material storage and construction worker welfare facilities. The permanent land loss represents approximately 47% of the open space owned by the centre. The majority of the permanent land losses would be outside of the fenced perimeter of the centre. Such losses have been discussed with the centre. Overall, it is anticipated that land take (temporary and permanent) from the Army Reserves Centre would result in a slight adverse effect on the property, which is not significant.
- 12.10.45. The Scheme would result in the permanent loss of the existing entry into McDonalds and the Esso petrol station from the A38 northbound carriageway which would be closed. To gain access to these facilities, vehicles would use the revised access off the A52 (via a signalised junction with the new Markeaton Park access), with an exit provided onto the new A38 diverge slip road. This would be a minor detour and is not anticipated to deter the use of these driver facilities. As such, it is anticipated that the Scheme would have a slight adverse effect on these businesses (which would continue into Scheme operation), which is not significant.
- 12.10.46. In order to accommodate the construction of the Scheme at Markeaton junction, a total of 17 residential properties would require demolition and acquisition of the surrounding land, namely: 15 detached properties on Queensway and two semi-detached properties on the A52 Ashbourne Road. Following the demolition of the properties at Queensway, the site would be used as a lay-down area for materials storage and for construction worker welfare facilities during the construction phase. Due to the high sensitivity of residential properties, the loss of these properties would result in a locally large adverse (significant) effect on directly affected parties³. However, in the context of the neighbourhood area (the ward

³ It is noted that landowners that would be directly affected by demolition and land-take, would be eligible for appropriate compensation in accordance with established compensation procedures.

of Mackworth) and considering the isolated nature of the properties on Queensway (separated from other residential areas by the A38 and the Royal School of the Deaf), it is considered that the loss of these residential properties would not affect the quality of life in the neighbourhood and the loss of this housing could be replaced in the locality (noting the numerous other residential developments taking place in the vicinity of the Scheme – refer to Chapter 15: Assessment of Cumulative Effects). The loss of residential properties is, therefore, considered to be a permanent slight adverse effect at the neighbourhood scale, which is not significant.

- 12.10.47. The existing access to properties on Sutton Close, off Ashbourne Road would be lost as a result of the Scheme. In order to maintain access to these properties, a revised access would be built as part of the Scheme. This would result in the permanent loss of curtilage land from four residential properties. This would decrease the enjoyment of these residences. Therefore, it is anticipated that the loss of this land would result in a permanent slight adverse effect, which is not significant (this effect would continue into Scheme operation).
- 12.10.48. The Scheme would not result in the demolition of any commercial properties within the study area at Kingsway junction and Markeaton junction.

Little Eaton junction

- 12.10.49. The construction of the Scheme at Little Eaton junction would result in temporary and permanent loss of agricultural land - the effects associated with such impacts are considered in Chapter 10: Geology and Soils and thus are not repeated here.
- 12.10.50. An area of private land to the north of the A38 (former landfill site) would be required temporarily to accommodate a construction compound. This compound would be established during pre-construction works and be maintained for the duration of the construction period. This land is currently being used as part of an inert waste recycling facility and would be required on a temporary basis only. Use of the site as a construction compound has been discussed and agreed with the landowner. Following completion of Scheme construction, the construction compound would be removed and the affected land returned to the landowner following appropriate restoration. A temporary bridge would be required over the ditch running adjacent to the B6179 Alfreton Road (the former Derby Canal) to provide access into the construction compound. The foundations of the temporary bridge structure would be installed back from the edge of the ditch in order to minimise disturbance and adverse impacts on the former Derby Canal (see Chapter 2: The Scheme para. 2.6.101). Installation of the access would require some tree clearance. Therefore, following completion of Scheme construction the affected area would be appropriately restored and replanted. Overall, it is considered that use of this land as a construction compound would have a slight adverse effect, which is not significant.

- 12.10.51. A wooded area located to the north-west of Little Eaton junction owned by the Derby Garden Centre would be affected by utilities diversion works. Such works would be temporary, but would require some tree clearance. Following completion of the utility works, the area affected would be appropriately landscaped. Given that the area is not actively used by the garden centre, such works are not considered to have an adverse effect on this land parcel.

Operation

- 12.10.52. There would be no direct impacts on private assets during operation of the Scheme.

Development land

Construction

- 12.10.53. The Kingsway hospital site is undergoing sequential development – refer to Chapter 15: Assessment of Cumulative Effects for details. Approximately 1ha of this site adjacent to Bramble Brook would be used to construct three flood storage areas (refer to Chapter 2: The Scheme, Table 2.1). These flood storage areas would be appropriately landscaped to create a wetland habitat (refer to the Environmental Masterplan presented in Figure 2.12a [TR010022/APP/6.2]).

- 12.10.54. The placement of flood storage areas adjacent to Bramble Brook within the Kingsway hospital site has been discussed and agreed with the site owners and developers. A perimeter footpath with occasional seating would be provided around the flood storage areas traversing Bramble Brook (refer to the Environmental Masterplan presented in Figure 2.12a [TR010022/APP/6.2]). Such provisions have been discussed and agreed with the land owners and developers. Following the construction works, the areas used would be returned to the landowners. The area required to accommodate these works is allocated as a green wedge. It is considered that the use of this area for flood storage, wetland habitat and perimeter footpath would support the use of the area as a green wedge, as it has the potential to enhance the ecology and amenity of the site. It is considered that the Scheme would have a slight beneficial effect on the Kingsway hospital site.

- 12.10.55. There are no other areas within the Scheme boundary under development that would be impacted by the Scheme.

Operation

- 12.10.56. No direct impacts on development land are anticipated during operation of the Scheme.

Community facilities

Construction

- 12.10.57. Some land within Mackworth Park would be used temporarily during the construction phase associated with construction of an underground highway drainage tank and an associated outfall to a tributary of Bramble Brook (refer to Chapter 13: Road Drainage and the Water Environment). Following completion of these works, the areas affected would be appropriately landscaped (refer to

Figure 7.8a [TR010022/APP/6.2]) and returned to public open space use. Such works are considered to result in a temporary slight adverse effect during the construction phase, which is not significant.

- 12.10.58. Land to the north of the A38 within Markeaton Park would be used temporarily during the construction phase associated with a utilities diversion route and for construction access purposes, whilst the existing park access/exit and internal roads would be reconfigured. Following completion of these works, the areas affected would be appropriately landscaped (refer to Figure 7.8b [TR010022/APP/6.2]) and returned to public open space use. Such works are considered to result in a slight temporary adverse effect during the construction phase, which is not significant.
- 12.10.59. Some areas of public open space at Mill Pond would be used temporarily during the construction phase for construction access purposes. Following completion of these works, the areas affected would be appropriately landscaped (refer to Figure 7.8b [TR010022/APP/6.2]) and returned to public open space use. Such works are considered to result in a temporary slight adverse effect during the construction phase, which is not significant.
- 12.10.60. Some areas of public open space would be permanently lost as a result of the Scheme at Kingsway junction and Markeaton junction (total of approximately 7,788m² (0.78ha)). These areas of public open space include Mackworth Park, land adjacent to Greenwich Drive South and an area of proposed public space associated with Mickleover railway cutting (see Figure 2.8 [TR010022/APP/6.2]) (approximately 2,050m² <1.2% of the public open space associated with these areas), whilst there would also be permanent losses at Markeaton Park and at Mill Pond (total approximately 5,738m²) (losses at Markeaton Park would be <0.4% of the park's total area, whilst losses at Mill Pond would be approximately 8.5% of the available public open space) (refer to Figure 2.9 [TR010022/APP/6.2]). Such permanent losses in public open space represent a small portion of the public open space available in the vicinity of these junctions. Whilst such losses are not anticipated to impact upon the public enjoyment of these public open space areas, there would be a requirement for the Scheme to provide replacement public open space offered in exchange. It is proposed that replacement public open space for the Scheme would be provided using the area vacated by the buildings to be demolished on Queensway, areas of the existing A38 at Markeaton that would be removed and landscaped, and former Brackensdale access – this replacement public open space offered in exchange has a combined area of approximately 7,832m². Thus, on balance the Scheme would provide a net increase in public open space (approximately 44m²).
- 12.10.61. The replacement public open space at Queensway would be integrated with facilities for pedestrians and cyclists connecting the A52 Ashbourne Road with the proposed new Markeaton footbridge (refer to Environmental Masterplan Figure 2.12c [TR010022/APP/6.2]). The use of this area for replacement public open space has been discussed and agreed in principle with DCiC. The Planning Statement [TR010022/APP/7.2] includes an analysis of public open space losses and details regarding the merits of the replacement public open space offered in exchange.

- 12.10.62. The area of proposed replacement public open space at Queensway would be used during the construction phase for construction access purposes, as well as for material storage and construction worker welfare facilities (refer to Figure 2.11b [TR010022/APP/6.2]). Thus replacement public open space would not be provided prior to the loss of public open space at the start of the Scheme construction phase. This is not anticipated to affect the quality of life in the local neighbourhoods due to the nearby availability of extensive areas of public open space.
- 12.10.63. With the appropriate provision of replacement public open space offered in exchange, there would be no long term public open space effect during the Scheme operational phase, although there would be a temporary slight adverse effect during the Scheme construction phase, which is not significant.
- 12.10.64. In addition to the impacts upon public open space as detailed above, a number of land parcels owned by DCiC and accessible for informal public use would be permanently and temporarily impacted during the Scheme construction phase as follows:
- The informal open space adjacent to the access to the A38 at Brackensdale Avenue would be used as a satellite compound for material storage and welfare facilities during the Scheme construction phase (existing vegetation adjacent to Brackensdale Avenue would be retained) (refer to Figure 2.11a [TR010022/APP/6.2]).
 - The informal open spaces adjacent to Greenwich Drive North and Thurcroft Close/Windmill Hill Lane would be impacted during the construction phase, with associated tree clearance (temporary and permanent land losses).
- 12.10.65. These impacts are not anticipated to affect the quality of life in the neighbourhood due to the nearby availability of extensive areas of public open space. In addition, as detailed in Section 12.9, the existing access from the A38 onto Brackensdale Avenue would be closed for safety reasons – this redundant section of highway would be appropriately landscaped and become replacement public open space (refer to Figure 7.8a [TR010022/APP/6.2]). Overall, the effects associated with temporary and permanent losses of informal open space are anticipated to be slight adverse, and therefore not significant.
- 12.10.66. As detailed in Chapter 8: Biodiversity, in order to provide mitigation for ecological impacts associated with the Scheme, ecological mitigation works are proposed within public open space within Mackworth Park, Markeaton Park, Mill Pond, as well as within the Kingsway hospital site (refer to Chapter 8: Biodiversity for details). In addition, as detailed in Chapter 8: Biodiversity, an area within Markeaton Park would be used to create a new area of species rich grassland (refer to Environmental Masterplan Figure 2.12d [TR010022/APP/6.2]) – such planting would mitigate some the Scheme ecological effects, but would also enhance the environments within this area of public open space. Such ecological mitigation works would mean that some parts of Markeaton Park would not be available until the works have been completed. Therefore, there is anticipated to be temporary minor adverse effect on the amenity of the park during the construction phase, which is not significant. Ecological works within Mackworth

Park and Mill Pond would not result in such areas being unavailable for public use. Ecological mitigation works would also be undertaken in a woodland at Markeaton junction owned by the University of Derby – refer to Chapter 8: Biodiversity for details. Such works are minor and thus there would be no effects on this land parcel.

- 12.10.67. An area of approximately 1,555m² of land owned by the Royal School for the Deaf would be required permanently, some of which would be integrated with the replacement public open space offered in exchange at Queensway. Such permanent land losses represent approximately 5% of the school area. This loss of land includes land along the A52 Ashbourne Road, an unused access into the school from Queensway, as well as the school's sensory garden. In addition, there would be some temporary use of land within Royal School of the Deaf for construction access purposes (including access to construct the 4m high noise barrier along the school boundary with the replacement public open space at Queensway), as well as land needed for the reconfiguration of the school access. Areas within the school grounds used temporarily would be appropriately restored and landscaped. The school also has concerns regarding disruption for motorised vehicles accessing the school due to temporary traffic management measures on the A38 during the construction phase. These impacts have been discussed with the school. As detailed in Section 12.9, prior to the start of the construction works, the sensory garden would be relocated elsewhere within the school grounds, in agreement with the deaf school. As detailed in Section 12.9, the contractor would liaise with the Royal School for the Deaf during the Scheme construction phase regarding school access. If access issues become apparent, the contractor would investigate development of a school drop off for cars at the end of Markeaton Street at the back of the school, within land owned by Derby University. Any such arrangements would be undertaken by agreement between affected parties. Taking into account these impacts, overall it is considered that the school would experience a temporary slight adverse effect, which is not significant.
- 12.10.68. The Scheme would not result in the loss of public open space or impact upon any community facilities at Little Eaton junction.

Operation

- 12.10.69. As detailed in Chapter 8: Biodiversity, in order to mitigate for ecological impacts associated with the Scheme, ecological mitigation works are proposed within public open space within Mackworth Park, Markeaton Park, Mill Pond, as well as within the Kingsway hospital site (refer to Chapter 8: Biodiversity for details). Such ecological mitigation works within these areas have the potential to add to the amenity of these areas of public open space, especially the creation of an area of species rich grassland within Markeaton Park (refer to Environmental Masterplan Figure 2.12d [TR010022/APP/6.2]). Therefore, it is anticipated that there would be a permanent minor beneficial effect on the amenity of these public open spaces, which is not significant.
- 12.10.70. No other impacts on community facilities are anticipated during Scheme operation.

Community severance

Construction

12.10.71. The construction of the Scheme would result in changes to traffic flows on the route of the A38 and surrounding roads, such that it would have a potential impact on severance in relation to motorised users (including users of public transport accessing community resources in the study area). Issues associated with severance of public access routes (e.g. pedestrians and cyclists) are considered above under the section on pedestrians and cyclists.

Kingsway and Markeaton junctions

12.10.72. Construction of the Scheme would result in a permanent change in motorised user routes, resulting from the closure of a number of local accesses and exits onto the A38 from local roads (Brackensdale Avenue, Raleigh Street and Enfield Road). These closures and the inclusion of grade separated junctions would remove conflicts between local traffic and long-distance traffic movements, thus improving capacity on the A38 and reducing congestion which would increase journey reliability, and reduce severance as caused by existing traffic congestion. Given the availability of alternative routes, and the location of community facilities within each ward, construction works at Kingsway junction and Markeaton junction are anticipated to result in a permanent slight adverse severance effect for users of these local accesses, which is not significant (effects associated with closure of local accesses would continue into the Scheme operational phase, but would reduce with time as motorists become accustomed to the new access arrangements).

12.10.73. Construction of the Scheme has the potential to disrupt journeys to the Royal School for the Deaf. As detailed in Section 12.9, the contractor would liaise with the Royal School for the Deaf during the Scheme construction phase regarding school access, and if access issues become apparent, the contractor would investigate development of a school drop off for cars at the end of Markeaton Street at the back of the school, within land owned by Derby University. Taking into account the sensitivity of the users of this facility, and the temporary nature of these works, it is considered that construction of the Scheme would result in a temporary slight adverse severance effect, which is not significant.

12.10.74. The use of temporary traffic management measures during the Scheme construction phase would result in temporary changes to journey length and reliability for users of public transport. Bus routes would be taken into consideration when agreeing diversions and temporary traffic management requirements with DCiC, EBC and DCC (as applicable) prior to construction in order to limit impacts on these users. Journey patterns are anticipated to be maintained, although there would be some delays to movement. It is, therefore, anticipated that users of the bus route using Brackensdale Avenue and Markeaton junction would experience temporary slight adverse severance during the Scheme construction phase, which is not significant.

Little Eaton junction

- 12.10.75. At Little Eaton junction, the Ford Lane junction with the A38 would be permanently closed to traffic for safety reasons (located between the River Derwent bridge and the bridge over the Midland Mainline railway line). Closure of the Ford Lane access would increase local traffic journey times for those currently using this access point from and onto the A38. The number of journeys on this route without the Scheme is anticipated to be on average approximately 2,700 vehicles a day travelling towards Allestree from the A38 northbound and approximately 430 vehicles joining the northbound A38 from this access. Traffic using this route would need to use an alternative route via Palm Court junction, along the A6 Duffield Road and then local roads into Allestree to the east of the A6. Scheme implementation would necessitate a minor reconfiguration and signalisation of the Ford Lane junction with the A6 Duffield Road (e.g. limited kerb realignment, with the works being undertaken within the existing highway boundary). Traffic travelling north to the A38 from Allestree, would divert via Palm Court junction and experience an increase in journey length up to a maximum of 2.9km. Those motorised users travelling north on the A38 to Allestree (which makes up the majority of trips using this route) would exit the A38 at Palm Court junction. In the majority of cases this would be a reduction in journey length, but a potential increase in journey time. It is not considered that closure of the Ford Lane access would dissuade users from making trips, and due to the low use of this route to access the A38, the diversion is considered to have a permanent slight adverse severance effect, which is not significant.
- 12.10.76. The use of temporary traffic management measures during the Scheme construction phase would result in temporary changes to journey length and reliability for users of public transport. Bus routes would be taken into consideration when agreeing diversions and temporary traffic management with DCiC, EBC and DCC (as applicable) prior to construction in order to limit impacts on these users. Journey patterns are anticipated to be maintained, although there would be some delays to movement. It is, therefore, anticipated that users of the bus routes using Little Eaton junction would experience a temporary slight adverse severance effect, which is not significant.

Operation

- 12.10.77. The operation of the Scheme would result in changes to traffic flows on the A38 and surrounding roads such that it would have a potential impact on severance in relation to motorised users (including users of public transport accessing community resources in the study area). Table 12.18 presents a comparison of AADT flow scenarios with the Scheme and without the Scheme in 2039, in terms of percentage change in traffic flows. The year 2039 is considered to be the worst year for traffic volumes in the first 15 years of Scheme operation. Data on traffic flows have been taken from traffic forecasts reported in the Transport Assessment Report [TR010022/APP/7.3].
- 12.10.78. Based on this percentage change for each road section, Table 12.18 identifies whether there is likely to be an increase or relief from severance at each junction as experienced by motorised users of the Scheme and surrounding routes.

Table 12.18: Change in degree of severance arising from change in traffic levels

Route	Carriageway	24-hour Annual Average Daily Traffic (AADT) two-way flows in vehicles*				Increase or relief from severance	Significance of effect
		Do-minimum	Do-something	Change in traffic flows	Percentage change in traffic flows		
Kingsway and Markeaton junctions							
A38 south of Kingsway junction (main carriageway)	NB	29,010	35,380	6,370	22%	Increase	Slight
	SB	28,270	36,200	7,930	28%	Increase	Slight
A38/A516 junction entry/exit slip roads	NB	12,240	10,750	-1,490	-12%	Relief	Slight
	SB	13,760	11,250	-2,510	-18%	Relief	Slight
A5111 Kingsway	EB	12,120	15,820	3,700	31%	Increase	Moderate
	WB	8,280	17,870	9,590	116%	Increase	Severe
Kingsway Park Close	NB	970	4,590	3,620	373%	Increase	Severe
	SB	690	5,170	4,480	649%	Increase	Severe
Uttoxeter New Road	NB	23,440	24,220	780	3%	Increase	Negligible
	SB	25,680	24,700	-980	-4%	Relief	Negligible
A38 between Markeaton and Kingsway junctions (main carriageway)	NB	33,660	44,740	11,080	33%	Increase	Moderate
	SB	34,100	42,740	8,640	25%	Increase	Slight
Brackensdale Avenue (main route)	EB	5,220	5,030	-190	-4%	Relief	Negligible
	WB	5,050	5,690	640	13%	Increase	Slight
Prince Charles Way	EB	3,570	4,280	710	20%	Increase	Slight
	WB	4,530	5,300	770	17%	Increase	Slight

Route	Carriageway	24-hour Annual Average Daily Traffic (AADT) two-way flows in vehicles*				Increase or relief from severance	Significance of effect
		Do-minimum	Do-something	Change in traffic flows	Percentage change in traffic flows		
A52 west of Markeaton junction	EB	11,370	11,110	-260	-2%	Relief	Negligible
	WB	11,390	12,700	1,310	12%	Increase	Slight
A52 east of Markeaton junction	EB	10,260	11,470	1,210	12%	Increase	Slight
	WB	10,940	10,710	-230	-2%	Relief	Negligible
A38 between Markeaton junction and Kedleston Road (main carriageway)	NB	34,810	44,900	10,090	29%	Increase	Slight
	SB	34,780	45,260	10,480	30%	Increase	Moderate
Kedleston Road east	EB	7,680	7,620	-60	-1%	Relief	Negligible
	WB	9,720	10,460	740	8%	Increase	Negligible
Kedleston Road west	EB	11,650	12,330	680	6%	Increase	Negligible
	WB	10,450	9,890	-560	-5%	Relief	Negligible
Little Eaton junction							
A38 Palm Court junction west of Little Eaton junction	NB	28,560	35,160	6,600	23%	Increase	Slight
	SB	29,960	35,810	5,850	20%	Increase	Slight
Duffield Road North of Palm Court junction	NB	12,390	12,710	320	3%	Increase	Negligible
	SB	9,770	11,310	1,540	16%	Increase	Slight
Duffield Road south of Palm Court junction	NB	6,160	5,600	-560	-9%	Relief	Negligible
	SB	5,060	5,710	650	13%	Increase	Slight
B6179 Alfreton Road	NB	5,310	6,550	1,240	23%	Increase	Slight
	SB	5,070	5,620	550	11%	Increase	Slight

Route	Carriageway	24-hour Annual Average Daily Traffic (AADT) two-way flows in vehicles*				Increase or relief from severance	Significance of effect
		Do-minimum	Do-something	Change in traffic flows	Percentage change in traffic flows		
A38 North of Little Eaton junction (main carriageway)	NB	31,340	34,900	3,560	11%	Increase	Slight
	SB	32,840	35,820	2,980	9%	Increase	Negligible
A61 south of Little Eaton junction	NB	22,010	23,550	1,540	7%	Increase	Negligible
	SB	23,810	22,900	-910	-4%	Relief	Negligible

*Core scenario traffic forecast

NB – Northbound; SB – Southbound; EB – Eastbound; WB – Westbound

Kingsway and Markeaton junctions

- 12.10.79. Table 12.18 indicates that motorised users using the new Kingsway Park Close exit at Kingsway junction would experience an increase in traffic using this route (373% northbound and 649% southbound). The percentage increase in traffic flows appears high due to the low number of users of this road without the Scheme (currently <1,000 users in each direction per day). Kingsway Park Close is currently a cul-de-sac, used to access a number of commercial and industrial properties only. The annual average daily traffic is anticipated to increase by approximately 3,600 – 4,500 vehicles a day. Though this is a severe increase in traffic levels compared to the baseline, this volume of traffic is not considered to deter residents from using this route. The link road would also provide improved access to those businesses located on Kingsway Park Close. It is anticipated that users of these routes would experience a permanent slight adverse effect on severance, which is not significant.
- 12.10.80. Traffic travelling westbound on the A5111 Kingsway would experience on average a 116% increase in vehicles - this may result in some hindrance to movement and may dissuade some users from making vehicle trips via this route. However, there are a number of alternative routes such as exiting the A38 at the previous A38/A416 junction which would experience a reduction in traffic numbers with the Scheme. It is, therefore, anticipated that users of this route would experience a permanent slight adverse effect on severance, which is not significant.
- 12.10.81. The grade separation of the A38 would provide a free flowing route for motorised users. This would result in an increase in motorised users using this route, whilst reducing severance on the surrounding routes (including the A61, A52 and local roads such as Prince Charles Avenue and Brackensdale Avenue). Despite an increase in AADT by up to 30% in both directions between Kingsway junction and Markeaton junction, the total journey time along the A38 northbound would be 6 minutes 44 seconds in 2039, whilst the largest decrease in total journey time along the A38 southbound would be 9 minutes 25 seconds in 2039 during the 0800 – 0900 hours peak time period. Therefore, the Scheme is anticipated to result in a permanent slight beneficial severance effect, which is not significant.

Little Eaton junction

- 12.10.82. The Scheme would generally result in a slight increase in traffic flows at Little Eaton junction. However, the grade separation of this junction would result in improved movement through the junction and an overall reduction in severance for motorised users, including users of public transport. Therefore, the Scheme is anticipated to result in a permanent slight beneficial severance effect, which is not significant.
- 12.10.83. Existing vehicle routes would remain largely unchanged with the Scheme, and therefore, the Scheme would not result in permanent significant effects on community severance at Little Eaton junction.

Human health

Construction

Access to healthcare services and other social infrastructure

- 12.10.84. During the Scheme construction phase, traffic using the A38 and the surrounding roads would be restricted through traffic management (such as lane closures). The provision of mitigation measures (refer to Section 12.9) would ensure that access to existing facilities remains possible. The effect on local community assets as a determinant of human health during the Scheme construction phase is assessed to be neutral (0).

Access to open space and nature

- 12.10.85. An area of approximately 7,788m² (0.78ha) of public open space (including proposed public open space) would be permanently lost as a result of the Scheme at Kingsway junction and Markeaton junction. In addition, some areas of public open space would also be temporarily inaccessible during the construction phase – refer to paras. 12.10.57 to 12.10.59. The areas of public open space that would be temporarily and permanently lost to facilitate the construction and operation of the Scheme are on the fringes of much larger areas of public open space. It is, therefore, anticipated that such loss of land would not impact on the use of the remaining public open space. In addition, replacement public open space offered in exchange would be provided for permanent public open space losses, greater than the area permanently lost due to the Scheme (net surplus of approximately 44m²).
- 12.10.86. Temporary changes in journey time, local travel patterns and the certainty of route for pedestrians and cyclists would arise as a result of the temporary closure and diversion of footpaths and cycleways, including the temporary loss of Markeaton footbridge which provides access to Markeaton Park. Through the provision of the mitigation measures as detailed in Section 12.9 (such as temporary diversions to PRowS), access to open and natural spaces during the Scheme construction phase would be maintained and thus the effect on human health is assessed to be neutral (0).

Air quality, noise and neighbourhood amenity

- 12.10.87. There is potential for residents in close proximity to Scheme construction activities to be affected by worsening air quality or noise due to construction activities and construction traffic.
- 12.10.88. Chapter 5: Air Quality indicates that properties within 200m of the Scheme construction site boundary are expected to experience a slight adverse impact from dust soiling and increased PM₁₀ (particulate matter with an aerodynamic diameter of 10 microns or less) concentrations due to dust emissions from Scheme construction activities. In addition, some receptors would also experience an increase in nitrogen dioxide (NO₂) and PM₁₀ concentrations, whilst others would experience a decrease, however, overall, there would be a slight deterioration in local air quality at properties within the air quality study area, but this deterioration would be temporary during the Scheme construction phase. Chapter 5: Air Quality and the OEMP (refer to Appendix 2.1 [TR010022/APP/6.3])

define a range of best practice mitigation measures in order to minimise Scheme construction air quality effects upon.

- 12.10.89. Construction works and traffic noise from additional vehicle movements including HGVs would increase noise and vibration impacts at nearby noise sensitive receptors. Chapter 9: Noise and Vibration concludes that significant adverse construction noise and/or vibration annoyance effects are anticipated at the closest receptors to the Scheme between Kingsway junction and Kedleston Road junction, at the Ford Farm Mobile Home Site, the northern edge of Breadsall and adjacent to the Scheme works at the floodplain compensation area to the west of Little Eaton junction. These effects are temporary in nature often linked to a specific construction activities. In addition, significant construction traffic effects are anticipated in a small number of locations during some construction phase traffic management scenarios.
- 12.10.90. To ensure that noise and vibration effects are minimised, a range of best practice mitigation measures are detailed in Chapter 9: Noise and Vibration and within the OEMP (refer to Appendix 2.1 [TR010022/APP/6.3]). These mitigation measures would be set out in the contractor's CEMP (within a Noise and Vibration Management Plan) and implemented for the duration of the Scheme construction phase.
- 12.10.91. During Scheme construction, changes to journey times, local travel patterns, and certainty of route for pedestrians and cyclists would arise from the temporary and permanent closure and diversions of PRowS. Prior to construction, as detailed in Section 12.9, diversion routes would be agreed with the appropriate local authorities to minimise disruption for those requiring access to community facilities and local public open space.
- 12.10.92. Potential impacts on air quality, noise and neighbourhood amenity would be managed through the use of Best Practicable Means (BPM) as defined within the OEMP (refer to Appendix 2.1 [TR010022/APP/6.3]). As a result, the effect of the Scheme on air quality, noise and neighbourhood amenity as a determinant of human health during Scheme construction is assessed to be negative for the closest receptors.

Accessibility and active travel

- 12.10.93. During Scheme construction, changes to journey times, local travel patterns, and certainty of route for pedestrians and cyclists would arise from the temporary closure and diversions of PRowS through direct land take and provision of access routes required for Scheme construction.
- 12.10.94. Construction traffic may impact on journeys made by pedestrians and cyclists in the local area. However, the effects would be minimised through measures set out within the OEMP (refer to Appendix 2.1 [TR010022/APP/6.3]) and implementation of the TMP (refer to Appendix 2.3 [TR010022/APP/6.3]).
- 12.10.95. Mitigation measures as detailed in Section 12.9 would minimise disruption and, therefore, the effect of the Scheme on accessibility and active travel as a determinant of human health during Scheme construction is assessed to be neutral (0).

Access to work and training

- 12.10.96. Construction of the Scheme is anticipated to provide net additional employment opportunities in the local area. Therefore, the effect of the Scheme on access to work and training as a determinant of human health during the Scheme construction phase is assessed to be positive (+).

Social cohesion and lifetime neighbourhoods

- 12.10.97. During the Scheme construction phase, temporary severance issues may occur due to disruption to existing road usage and pedestrian and cyclist facilities. Through mitigation measures as detailed in Section 12.9, the effect of the Scheme on social cohesion and lifetime neighbourhoods (refer to Department for Communities and Local Government, 2011) as a determinant of human health is assessed to be neutral (0).

Operation

Access to healthcare services and other social infrastructure

- 12.10.98. During the Scheme operational phase, the provision of grade-separated junctions at Kingsway, Markeaton and Little Eaton junctions would reduce congestion, thereby reducing journey times and severance experienced when accessing Derby Royal Hospital and Kingsway Hospital from the north. Improved access to healthcare is an essential component of creating sustainable and healthy communities. Reduced severance and improved access to local healthcare services facilitated by the Scheme is assessed to have a positive effect on human health (+) for residents in the study area.

Access to open space and nature

- 12.10.99. All pedestrian and cyclist facilities which provide access to public open spaces that would be lost as a result of the Scheme would be replaced with like for like or improved facilities. New pedestrian and cyclist facilities would be built as part of the Scheme providing improved connectivity to areas of public open space. The effect of the Scheme on accessibility and active travel as a determinant of human health during Scheme operation is assessed as having a positive (+) effect on human health for residents in the study area.

Air quality, noise and neighbourhood amenity

- 12.10.100. The Scheme has been designed to minimise impacts on air quality, noise and amenity. The new A38 mainline through Kingsway junction and Markeaton junction would be in an underpass below the level of the existing junctions, screening traffic from nearby sensitive receptors. The use of low noise thin surfacing and the installation of noise barriers at key locations would also minimise the levels of noise experienced by the local communities.
- 12.10.101. Chapter 5: Air Quality indicates that all air quality objectives and limit values are predicted to be achieved in the Scheme opening year (2024). With the Scheme in operation, some receptors would experience an increase in NO₂ and PM₁₀ concentrations, whilst others would experience a decrease, however, overall, there would be a slight improvement in local air quality at properties within the study area.

12.10.102. Chapter 9: Noise and Vibration indicates that as Scheme operation would resolve the existing congestion issues at these A38 junctions, traffic would be attracted to the area. As a result, the overall trend in the study area is for a slight increase in operational traffic flows, and therefore traffic noise. However, only one receptor, namely the Royal School for the Deaf, is anticipated to experience a moderate (significant) increase in traffic noise – this effect would be restricted to the worst affected façades of Lydia House which is used by boarding pupils during the week, and at the Karten building which is used for offices and meeting rooms. At all other school buildings the change in traffic noise levels is anticipated to be negligible or minor (not significant). In addition, reductions in operational traffic noise are anticipated in the vicinity of existing accesses onto the A38 which would be closed by the Scheme – this includes properties on Raleigh Street, Enfield Road and Ford Lane (three residential properties at Raleigh Street would experience a significant reduction in noise). Noise levels would also be reduced where the A38 would be realigned further away from receptors – this includes properties on Greenwich Drive South, within Markeaton Park and at the Ford Farm Mobile Home Park. Overall, the Scheme would result in a slight reduction in the overall number of residential buildings above the Significant Observed Adverse Effect Level (SOAEL) (the level above which significant adverse effects on health and quality of life occur) in the Scheme opening year (2024) and in the future assessment year (2039) during both the day and night.

12.10.103. In terms of neighbourhood amenity, it is considered that the Scheme would encourage walking and cycling through shared community spaces through the provision of replacement or improved pedestrian and cyclist facilities and the development of new connected areas of public open space. It is, therefore, considered that overall the effect of Scheme operation on air quality, noise and neighbourhood amenity as a determinant of human health would be positive (+).

Accessibility and active travel

12.10.104. All existing cycle routes directly and permanently affected by the Scheme would be realigned or rebuilt with no material change in journey length. A new combined pedestrian and cycle route across Kingsway junction would be provided as part of the Scheme and would link into the existing local and strategic cycle network, providing improved links between communities and areas of public open space.

12.10.105. The Scheme would mitigate conflicts between motorised users and pedestrian/cyclist movements and improve safety through the provision of additional signalised crossings and the closure of dangerous routes. The Transport Assessment Report [TR010022/APP/7.3] estimates that the Scheme would reduce Personal Injury Accidents by 1,396 over a 60 year period, fatal casualties reduced by 8, serious casualties reduced by 135 (i.e. saving of 142 killed or seriously injured).

12.10.106. During Scheme operation, new pedestrian and cyclist facilities would improve connectivity for pedestrians and cyclists at all of the junctions, increasing opportunities for active travel for all. The influence of the Scheme on accessibility and active travel as a determinant of health during operation is assessed to be positive (+) for residents in the study area.

Access to work and training

12.10.107. No direct impacts on employment are expected as a result of Scheme operation. However, operation of the Scheme may improve accessibility to local employment and training opportunities, with indirect benefits on mental health and well-being. Therefore, the influence of the Scheme on access to work and training as a determinant of health during Scheme operation is assessed to be positive (+) for residents in the study area.

Social cohesion and lifetime neighbourhoods

12.10.108. During the operational phase, the Scheme would reduce community severance along the A38 and on a number of surrounding roads, with free flowing traffic between the junctions reducing congestion and journey times. However, there would be a number of local routes that would experience diversions due to the closure of A38 accesses at Brackensdale Avenue, Raleigh Street, Enfield Road and Ford Lane and increases in traffic flows (such as along Kingsway Park Close).

12.10.109. The new footpath and cycleway route through Kingsway junction would reduce existing severance between communities. The closure of local vehicular accesses and the realignment of footpath and cycleway routes would improve amenity and the perception of safety for pedestrians and cyclists, encouraging greater use of these facilities.

12.10.110. The Scheme also has the potential to address lifetime neighbourhood principles. Street design and road maintenance has been found to be crucial to old people's ability and confidence in going outside. Whilst levels of social interaction can be influenced by a number of other factors, including the availability and quality of community facilities, open and play space, the influence of the Scheme on social cohesion and lifetime neighbourhoods as a determinant of human health during Scheme operation is assessed to be positive (+) for residents in the study area.

Climate change

12.10.111. During operation the Scheme may be vulnerable to impacts resulting from the changing climate, such as an increase in severe weather events, increased rainfall and temperatures. As identified in Chapter 14: Climate, based on the mitigation built into the Scheme design and management practices, UK climate projections (UKCP18), information from other environmental assessments reported within this ES, none of the potential effects associated with climate change would be significant.

- 12.10.112. Sustainable drainage systems would be embedded in the drainage design to control highway runoff rates, taking into account climate change. Similarly, flood risk mitigation strategies also take account of potential impacts associated with climate change. Details are provided in Chapter 13: Road Drainage and the Water Environment, as well as in the Road Drainage Strategy (Appendix 13.4 [TR010022/APP/6.3]) and the OEMP (refer to Appendix 2.1 [TR010022/APP/6.3]). These measures would reduce the impact of climate change on the Scheme, with none of the potential effects identified being significant.
- 12.10.113. The effect of the Scheme on climate and the resilience of the Scheme to climate change as a determinant of human health during Scheme operation are assessed to be neutral (0).
- 12.10.114. Further details of the human health assessment are provided in Appendix 12.2 [TR010022/APP/6.3].

12.11. Monitoring

- 12.11.1. The sections above identify potential significant adverse effects on pedestrians and cyclists due to the absence of Markeaton footbridge during the construction phase, construction phase severance of the shared footway and cycleway to the east of Kingsway junction, and construction phase severance due to potential closure of the River Derwent bridge on Ford Lane during strengthening works. Given that such effects would be temporary, and that no further mitigation is possible, no monitoring of these effects is proposed. The Scheme would also have a large adverse effect on residents affected by the demolition of residential properties on Queensway and Ashbourne Road – given the nature of such effects, monitoring is not appropriate.
- 12.11.2. The only other significant people and community effects associated with the Scheme are beneficial. As such, it is not considered necessary to undertake any associated monitoring.

12.12. Summary of assessment

- 12.12.1. A summary of the people and communities impact assessment is provided in Table 12.19 (include both significant and non-significant effects).

Table 12.19: People and communities - summary of effects

Receptor	Attribute	Receptor sensitivity	Impact description	Design and mitigation measures	Residual effect
New crossing of Kingsway junction	Change in journey length and amenity	High	Construction: n/a	Benefit provided by the Scheme.	Moderate beneficial
			Operation: A new shared footpath and cycleway across Kingsway junction from Mackworth Park, linking Mackworth from Greenwich Drive South to the A5111 Kingsway (shortening access by approximately 525m).		
PECs: NR54, NR68 and RR66	Change in journey length and amenity	High	Construction: Permanent severance of shared pedestrian and cycle route.	Construction of a permanent diversion (approximately +10m). Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC and DCC prior to construction.	Minor adverse
			Operation: Minor increase in journey length (+10m).	None required.	No change
PECs: Non-designated shared footway and cycleway (east of Kingsway junction)	Change in journey length and amenity	Very high	Construction: Temporary disruption to pedestrians and cyclists during construction. Temporary alternative routes could substantially increase journey lengths (>500m) and dissuade users from making this journey.	Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC and DCC prior to construction.	Moderate adverse
			Operation: Permanent requirement to cross a new minor road.	A controlled crossing would be provided to facilitate continued pedestrian and cyclist access.	Minor adverse

Receptor	Attribute	Receptor sensitivity	Impact description	Design and mitigation measures	Residual effect
PECs: Brackensdale Avenue underbridge	Change in journey length and amenity	Very high	Construction: Temporary disruption to pedestrians and cyclists for the duration of the widening of Brackensdale Avenue underbridge. Potential for a slight loss of amenity due to the proximity of construction activities.	Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC and DCC prior to construction.	Minor adverse
			Operation: Reduction in pedestrian and cyclist severance.	A controlled crossing would be provided on Brackensdale Avenue east of the A38. The existing footpath would be extended over the closed access road removing the need to cross a road.	Minor beneficial
PECs: Brackensdale Avenue, Raleigh Street and Enfield Road	Change in journey length and amenity	Medium	Construction: Temporary disruption to pedestrians and cyclists for the duration of the widening of Brackensdale Avenue underbridge. Potential for a slight loss of amenity due to the proximity of construction activities.	Closure of entry and exits onto the A38 to traffic. Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC and DCC prior to construction.	Minor adverse
			Operation: Reduction in pedestrian and cyclist severance. The Scheme would remove the need for pedestrians and cyclists to cross these roads.	New short sections of footway or shared footway and cycleway would be constructed linking into the existing footpath and cycleway facilities.	Minor beneficial
PECs: Uncontrolled pedestrian crossing	Change in journey length and amenity	Medium	Construction and operation: Permanent closure of the uncontrolled at grade crossing between Greenwich Drive North to Thurcroft Close.	None required as alternative safer routes are available to the north and south.	Minor adverse

Receptor	Attribute	Receptor sensitivity	Impact description	Design and mitigation measures	Residual effect
PECs: RR66 Brackensdale Avenue to Kedleston Road	Change in journey length and amenity	High	Construction: Temporary diversion during the construction phase has the potential to increase journey lengths. Potential for a slight loss of amenity from construction activities.	Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC and DCC prior to construction.	Minor adverse
			Operation: No material change in journey length. Improved amenity and perceived safety for pedestrians and cyclists.	Improvements to and permanent realignment of RR66 relocating the route further from the road through a new area of public open space at Queensway to the east of the A38. Two new signalised crossings on A52 Ashbourne Road.	Moderate beneficial
PECs: Markeaton junction crossing east to west	Change in journey length and amenity	High	Construction: Temporary diversion during the construction phase has the potential to increase journey lengths. Potential for a slight loss of amenity from construction activities.	Access across the junction would be maintained during construction. Temporary diversions would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC and DCC prior to construction.	Minor adverse
			Operation: Minor increase in journey length and improved perception of safety and amenity.	Replacement controlled crossings over A38 slip roads.	Minor beneficial
PECs: Uncontrolled crossing A52 Ashbourne Road (west)	Change in journey length and amenity	Medium	Construction: Temporary diversion during the construction phase has the potential to increase journey lengths. Potential for a slight loss of amenity from construction activities.	Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC and DCC prior to construction.	Minor adverse

Receptor	Attribute	Receptor sensitivity	Impact description	Design and mitigation measures	Residual effect
			Operation: Reduced pedestrian and cyclist severance and improved access to Markeaton Park.	Provision of a controlled crossing on A52 Ashbourne Road to replace uncontrolled crossing.	Minor beneficial
PECs: Markeaton Park footbridge/ Bonnie Prince Charlie Walk (National Route)	Change in journey length and amenity	High	Construction: Demolition of existing footbridge. Severance of pedestrian and cyclist route for approximately one and half years. Diversion routes may result in material changes in journey length and a perceived reduction in safety and amenity.	Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC and DCC prior to construction.	Moderate adverse
			Operation: There would be no direct impact on pedestrians and cyclists during operation.	A replacement footbridge would be constructed at the location of the existing footbridge.	No change
PECs: Ford Lane/A38 shared footpath and cycleway	Change in journey length and amenity	Medium	Construction: Temporary disruption to users during construction.	Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC and DCC prior to construction.	Minor adverse
			Operation: Closure of entry and exit to Ford Lane from the A38, with access appropriately landscaped.	None required.	Minor beneficial
PECs: Users of River Derwent bridge on Ford Lane	Change in journey length and amenity	Medium	Construction: Temporary bridge closure (worst-case three months) would require diversion route for cyclists, but no alternative access would be available for pedestrians.	Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC and DCC prior to construction.	Moderate adverse

Receptor	Attribute	Receptor sensitivity	Impact description	Design and mitigation measures	Residual effect
PECs: Derwent Valley Heritage Way/ Breadsall FP7	Change in journey length and amenity	Medium	Construction: Works to the Flood Relief Arch and the A38 mainline could result in temporary diversions. Potential for a slight loss of amenity from construction activities.	Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC prior to construction.	Minor adverse
			Operation: There would be no direct impact on pedestrians and cyclists during operation.	None required.	No change
PECs: Little Eaton FP17/ Breadsall FP No. 23	Change in journey length and amenity	Medium	Construction: Temporary closure of Little Eaton FP No.17 and Breadsall FP No. 23. Land used to accommodate construction compound (approximately 3.5 years).	Temporary closure of FP17 and FP23 and temporary diversion required for the duration of the construction phase. Temporary diversions would be agreed with DCiC, DCC and EBC prior to construction.	Minor adverse
			Operation: There would be no direct impact on pedestrians and cyclists during operation.	PRoW reopened on existing alignment.	No change
PECs: NCR54 (Little Eaton)	Change in journey length and amenity	Medium	Construction: NCR54 at Little Eaton junction would be subject to temporary diversions during the construction phase. Potential for a slight loss of amenity from construction activities.	Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC, DCC and EBC prior to construction.	Minor adverse
			Operation: Improve safety for pedestrians and cyclists during the operation of the Scheme, whilst there would be an improvement in overall amenity of the route. New provisions likely to encourage more use due to improved amenity/convenience or perception of safety.	Improved dual pedestrian, cycle route provided across the junction. Controlled crossings included on A38 southern slip roads.	Minor beneficial

Receptor	Attribute	Receptor sensitivity	Impact description	Design and mitigation measures	Residual effect
PECs: Breadsall FP 1, 2, 3 and 4	Change in journey length and amenity	Low	Construction: Loss of a section of Breadsall FP 3.	Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions. Temporary diversions would be agreed with DCiC prior to construction.	Minor adverse
			Operation: Improve amenity and perceived safety, diverting the route of the PRoW away from the road. Improved connectivity to FP1, 6 and 4 and local footways/cycleways.	The permanent diversion of Breadsall FP 3 with the footpath being extended by approximately 370m to join Breadsall FP 1 and the wider PRoW network.	Minor beneficial
PECs: Breadsall BW No. 18 and Little Eaton BW No. 29	Change in journey length and amenity	Medium	Construction: There would be no direct impact on these pedestrian and cyclist facilities, although there would be the potential for a slight loss of amenity from construction activities.	None required.	Minor adverse
			Operation: No impact on pedestrians and cyclists.	None required.	No change
Motorised users: A38 main carriageway	Driver stress	-	Construction: Temporary disruption motorised users resulting in increased congestion and uncertainty of journey route and length.	Traffic Management Plan (TMP) to be agreed with DCiC, DCC, EBC and emergency services prior to construction. Motorised users would be made aware of disruptions ahead of time.	Slight adverse
			Operation: Reduction in journey length, congestion and improved perception of safety.	Grade-separation of junctions, separating local and regional traffic. Closure of minor entry/exit accesses onto the A38 main carriageway.	Moderate beneficial for those using the A38 through the Scheme (slight beneficial for those travelling

Receptor	Attribute	Receptor sensitivity	Impact description	Design and mitigation measures	Residual effect
					through the Scheme including the Scheme approaches)
Motorised users: Surrounding routes	Driver stress	-	Construction: Temporary disruption motorised users resulting in increased congestion and uncertainty of journey route and length.	TMP to be agreed with DCiC, DCC, EBC and emergency services prior to construction. Motorised users would be made aware of disruptions ahead of time.	Slight adverse
			Operation: Reduction in journey length, congestion and improved perception of safety.	Grade-separation of junctions, separating local and regional traffic.	Slight beneficial
Motorised users: A5111 Kingsway	Driver stress	-	Construction: Temporary disruption motorised users resulting in increased congestion and uncertainty of journey route and length.	TMP to be agreed with DCiC, DCC, EBC and emergency services prior to construction. Motorised users would be made aware of disruptions ahead of time.	Slight adverse
			Operation: Increase in traffic during peak hours. Though it is likely that these vehicles would travel through the junction more quickly, there is the potential for increased congestion on this route.	Grade-separation of junctions, separating local and regional traffic.	Slight adverse
Motorised users: public transport	Driver stress	-	Construction: Temporary disruption to users of public transport resulting from increased congestion and uncertainty of journey route and length.	TMP to be agreed with DCiC, DCC, EBC and local bus operators prior to construction. Users of public transport would be made aware of disruptions to bus routes ahead of time.	Slight adverse

Receptor	Attribute	Receptor sensitivity	Impact description	Design and mitigation measures	Residual effect
			Operation: Reduction in congestion with the potential for improved reliability for journey times for users of public transport.	Grade-separation of junctions, separating local and regional traffic.	Slight beneficial
Motorised users	Views from the road	Low	Construction: Temporary reduction in amenity due to presence of construction activities.	None required.	Minor adverse
		Low	Operation: The openness of views from the road would be reduced at all junctions due to the use of cuttings at Kingsway and Markeaton and provision of screening to prevent views of the road at Little Eaton.	None required.	Slight adverse
Businesses adjacent to Kingsway Park Close	Private asset	Medium	Construction: Permanent loss of curtilage land for businesses adjacent to Kingsway Park Close.	None required.	Slight adverse
			Operation: No impact during operation.	None required.	No change
The Army Reserves Centre	Private asset	Medium	Construction: Temporary loss of curtilage land from The Army Reserves Centre, Markeaton junction.	None required.	Slight adverse
			Construction: Permanent loss of curtilage land from The Army Reserves Centre, Markeaton junction.	None required.	Slight adverse
			Operation: No impact during operation.	None required.	No change
Entrance to Esso and McDonalds	Private asset	Medium	Construction: Permanent closure of the existing entry to McDonalds and the Esso petrol station from the A38 northbound carriageway.	Revised access off the A52 incorporating a signalised junction with the new Markeaton Park access.	Slight adverse

Receptor	Attribute	Receptor sensitivity	Impact description	Design and mitigation measures	Residual effect
			Operation: Permanent closure of the existing entry to McDonalds and the Esso petrol station from the A38 northbound carriageway	Revised access off the A52 incorporating a signalised junction with the new Markeaton Park access.	Slight adverse
Residential properties: Queensway and Ashbourne Road	Private asset	High	Construction: Permanent loss of 17 residential properties and permanent loss of land occupied by residential properties.	None required.	Large adverse (although effect would be slight adverse at the neighbourhood scale)
			Operation: No impact during operation.	None required.	No change
Residential properties: Sutton Close	Private asset	High	Construction: Permanent loss of curtilage land from four residential properties with the potential to result in reduced enjoyment of these properties.	<ul style="list-style-type: none"> Minimise land take where appropriate. Landowners would be eligible for appropriate compensation. 	Slight adverse
			Operation: Permanent loss of curtilage land from four residential properties with the potential to result in reduced enjoyment of these properties.	None required.	Slight adverse
Former landfill site north of Little Eaton junction	Private asset	Low	Construction: Temporary loss of land required for use as a construction compound at Little Eaton junction.	Use of land agreed with the landowner. Land to be restored to existing condition or better on completion of construction.	No change
			Operation: No impact during operation	None required.	No change
Kingsway Hospital site	Development land	Low	Construction: Temporary use of land during construction. Enhanced amenity of area following works completion.	Inclusion of flood storage areas, wetland habitat and a perimeter footpath.	Minor beneficial
			Operation: No impact during operation	None required.	No change

Receptor	Attribute	Receptor sensitivity	Impact description	Design and mitigation measures	Residual effect
Public open space	Community facility	Low	Construction: Temporary loss of public open space at Markeaton Park, Mackworth Park and Mill Pond to accommodate utilities diversions and construction access.	Land to be appropriately landscaped following works completion.	Slight adverse
			Construction: Permanent loss of public open space at Mackworth Park, adjacent to Greenwich Drive South, proposed public open space associated with Mickleover railway cutting, Markeaton Park and Mill Pond.	None required – see operational phase mitigation.	Slight adverse
			Operation: Improvements to areas of public open space.	<ul style="list-style-type: none"> Provision of replacement public open space slightly greater in area than the area lost as a result of the Scheme. Landscaping and ecological mitigation of replacement public open space. 	Slight beneficial
Informal public open space	Community facility	Low	Construction: Temporary loss of informal public open space at Brackensdale Avenue, Greenwich Drive North, Thurcroft Close and Windmill Hill Lane to accommodate construction activities.	Land to be appropriately landscaped following works completion.	Slight adverse
			Operation: No impact during operation.	None required.	No change
Royal School for the Deaf	Community facility	High	Construction: Temporary loss of curtilage land to accommodate construction.	Land to be appropriately restored and landscaped.	Slight adverse
			Construction: Permanent loss of curtilage land including a sensory garden.	Sensory garden to be replaced as part of the Scheme.	Slight adverse
			Operation: No direct impact during operation.	None required.	No change

Receptor	Attribute	Receptor sensitivity	Impact description	Design and mitigation measures	Residual effect
Vehicular community severance	Motorised users	-	<p>Construction: Temporary and permanent disruptions to motorised users and pedestrians/cyclists a result of temporary increases in congestion, changes in journey route and length as a result on construction activities.</p>	<p>Pedestrian and cyclist access during construction would be planned and programmed to minimise disruption and access restrictions.</p> <p>TMP to be agreed with DCiC, DCC and emergency services prior to construction.</p>	Slight adverse
			<p>Operation: Grade separation would improve traffic movements through the junctions and result in an overall reduction in severance for motorised users, including users of public transport.</p> <p>Closure of local accesses onto A38 that started during the Scheme construction phase would continue into the Scheme operational phase, although impacts would reduce with time as motorists become accustomed to the new access arrangements.</p>	<p>None required.</p>	<p>Slight beneficial (improved traffic flows)</p> <p>Slight adverse (loss of access) – effect reducing with time</p>

12.13. References

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