Levelling Up Fund Application Form

This form is for bidding entities, applying for funding from the Levelling Up Fund (LUF) across the UK. Prior to completing the application form, applicants should read the LUF Technical Note.

The Levelling Up Fund Prospectus is available here.

The level of detail you provide in the Application Form should be in proportion to the amount of funding that you are requesting. For example, bids for more than £10m should provide considerably more information than bids for less than £10m.

Specifically, for larger transport projects requesting between £20m and £50m, bidding entities may submit the Application Form or if available an Outline Business Case (OBC) or Full Business Case (FBC). Further detail on requirements for larger transport projects is provided in the Technical Note.

One application form should be completed per bid.

Applicant & Bid Information

Local authority name / Applicant name(s)*: Newark and Sherwood District Council (NSDC)

**If the bid is a joint bid, please enter the names of all participating local authorities / organisations and specify the lead authority*

Bid Manager Name and position: Matt Lamb, Director – Planning & Growth

Name and position of officer with day-today responsibility for delivering the proposed scheme.

Contact telephone number: **01636 655 842** **Email address:** **matt.lamb@newark-sherwooddc.gov.uk**

Postal address: **Newark and Sherwood District Council, Castle House, Great North Road, Newark, NG24 1BY**

Nominated Local Authority Single Point of Contact:

Tim Dawson

Lead Practitioner - Infrastructure | Newark & Sherwood District Council

Tel: 01636 655769. Tim.Dawson@newark-sherwooddc.gov.uk

Senior Responsible Officer contact details: Matt Lamb, Director – Planning & Growth. Email: matt.lamb@newark-sherwooddc.gov.uk. Tel. 01636 655 842

Chief Finance Officer contact details: Sanjiv Kohli, CPFA, ACA, Deputy Chief Executive, Director of Resources, S151 Officer. Sanjiv.Kohli@newark-sherwooddc.gov.uk, Tel. 01636655303

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Country:

☒ **England**

☐ **Scotland**

☐ **Wales**

☐ **Northern Ireland**

Please provide the name of any consultancy companies involved in the preparation of the bid**:**

Tetra Tech, Savills and Urban and Civic

For bids from **Northern Ireland applicants** please confirm type of organisation

☐ Northern Ireland Executive	☐ Third Sector
☐ Public Sector Body	☐ Private Sector
☐ District Council	**Other (please state)**

PART 1 GATEWAY CRITERIA Failure to meet the criteria below will result in an application not being taken forward in this funding round	
1a Gateway Criteria for **<u>all</u> bids** Please tick the box to confirm that your bid includes plans for some LUF expenditure in 2021-22 *Please ensure that you evidenced this in the financial case / profile.*	☒ Yes ☐ No
1b Gateway Criteria for private and third sector organisations in **Northern Ireland bids only** (i) Please confirm that you have attached last two years of audited accounts.	☐ Yes ☐ No
(ii) **Northern Ireland bids only** Please provide evidence of the delivery team having experience of delivering two capital projects of similar size and scale in the last five years. (Limit 250 words)	

PART 2 EQUALITY AND DIVERSITY ANALYSIS

2a Please describe how equalities impacts of your proposal have been considered, the relevant affected groups based on protected characteristics, and any measures you propose to implement in response to these impacts. (500 words)

The SLR is identified as a key piece of infrastructure in the Council's Development Plan (2011 & 2019), Community Plan (2018 & 2020), and Newark Towns Deal (2021). Preparation of the former required that all policies were subject to appraisal against the Integrated Impacts Assessment (IIA). The IIA incorporates a Sustainability Appraisal, Strategic Environmental Assessment, Equalities Impact Assessment (EqIA) and Health Impact Assessment (HIA).

The EqIA demonstrates that the District Council is fulfilling the requirements of the Public Sector Equality Duty contained in section 149 of the Equality Act 2010. IIA Objective 18 specifically addresses matters relating to equality being intended 'To ensure that there is equality of opportunity and that no individuals or groups are disadvantaged or discriminated against because of race, sex, disability, religion or belief, sexual orientation, gender reassignment, maternity and pregnancy, marriage or civil partnership, age, or social inequality'. IIA Objectives 2 (Health) and 5 (Sustainable Communities) are allied to this, addressing respective matters of improving health/reducing health inequalities and ensuring that development is focused in sustainable locations where community facilities and services, housing and employment uses are integrated, promoting social cohesion and interaction, and facilitating healthy lifestyles.

Policies relating to delivery of the SLR, including safeguarding its approved route (Spatial Policy 7) all scored positively supporting the objectives (+) or providing a potentially significant beneficial impact (++). By association therefore, the proposal to provide funding for the delivery of the remaining stages of the SLR is considered to support and/or have significant beneficial impacts on the local community. Maximising the potential opportunities for sustainable transport choices to be made by all, alleviating congestion, and ensuring that major development is well located for convenient access by non-car modes can help support equality of opportunity.

When authorities submit a bid for funding to the UKG, as part of the Government's commitment to greater openness in the public sector under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, they must also publish a version excluding any commercially sensitive information on their own website within five working days of the announcement of successful bids by UKG. UKG reserves the right to deem the bid as non-compliant if this is not adhered to.
Please specify the weblink where this bid will be published: https://democracy.newark-sherwooddc.gov.uk/ieListDocuments.aspx?CId=141&MId=610

PART 3 BID SUMMARY	
3a Please specify the type of bid you are submitting	☒ Single Bid (one project) ☐ Package Bid (up to 3 multiple complimentary projects)
3b Please provide an overview of the bid proposal. (Limit 500 words).	

LUF of £20 million is sought for the completion of the Southern Link Road (SLR) connecting the A46 at Farndon to the A1 at Balderton. The SLR is critical to delivery of the Land South Strategic Urban Extension (SUE) known as Middlebeck, one of three SUEs around Newark.

The SLR is an identified strategic priority (Core Strategy, Community Plan, Town Investment Plan) and is supported by the community and key stakeholders.

The site master developer is Urban&Civic (U&C). The site is c280 hectares in size and outline consent has been granted for the construction of up to 3,150 dwellings; two local centres including retail and commercial premises, a 60 bed care home, a primary school, day nurseries/crèches, multi-use community buildings including a medical centre; and a mixed use commercial estate of up to 50 hectares comprising up to 2million sq.ft of employment space (Class B1, B2 and B8).

The Middlebeck masterplan provides for c178 net acres for residential development. Based on average densities a likely forecast of 2,651 homes will be delivered, within the overall consented allocation of up to 3,150 homes. For the avoidance of doubt delivery of 2651 units across the Middlebeck development is assumed.

Phase 1 of the SLR is substantively complete and has unlocked, with the assistance of previous Homes England (HE) loan support, 600 homes, a new primary school and open space.

The remaining SLR has been substantively designed and costed, with a funding gap the principal barrier to delivery. The SLR represents a significant up front cost (75% of the costs servicing the development are required upfront and before progressing beyond Phase 1), one which is disproportionate to allow the Middlebeck development alone to reasonably and viably absorb its delivery. **The costs of the remainder of the SLR cannot be supported by the development without substantial additional public grant, alongside private match from the master developer.** This is accepted, in principle, by a range of public sector partners including the LEP, Nottinghamshire County Council, and Homes England. The LUF will address the only remaining barrier to full SLR delivery.

Public grant commitment has already been secured (£12m). Alongside expected Homes England loan facility (decision pending) LUF funding is the final requirement to unlock a further 2,051 homes, 5000 jobs, and new community spaces and facilities. The development will create new country parks, amenity open spaces, sports and community facilities, ecological habitat areas; pedestrian and cycle networks; and sustainable drainage measures.

Funding will also provide accepted highway mitigation for the ongoing delivery of the Fernwood SUE, itself providing an additional 3,500 homes, 15ha of employment land, and associated local centres and recreational open space.

Moreover, the SLR will also support the development of projects identified in Newark's Towns Deal, with the SLR being one of ten identified projects as transformational for the town.

The SLR has the benefit of the technical and planning framework in place and its delivery is subject only to the outcome of this LUF submission to close the funding gap.

3c Please set out the value of capital grant being requested from UK Government (UKG) (£). This should align with the financial case:		£20 million
3d Please specify the proportion of funding requested for each of the Fund's three investment themes	Regeneration and town centre	50%
	Cultural	0%
	Transport	50%

PART 4 STRATEGIC FIT

4.1 Member of Parliament Endorsement (GB Only)

See technical note section 5 for Role of MP in bidding and Table 1 for further guidance.

4.1a Have any MPs formally endorsed this bid? If so confirm name and constituency. Please ensure you have attached the MP's endorsement letter.	☒ Yes ☐ No

Robert Jenrick, Conservative MP for Newark Annex X

4.2 Stakeholder Engagement and Support

See technical note Table 1 for further guidance.

4.2a Describe what engagement you have undertaken with local stakeholders and the community (communities, civic society, private sector and local businesses) to inform your bid and what support you have from them**.** (Limit 500 words)

The SLR has been subject a range of consultations and discussions over many years, including statutory (plan-making and planning application processes) and non-statutory (resident surveys). It's delivery is also supported by a range of public and private sector organisations due to its importance for the Growth and ambition of Newark and how the town will position itself in the future to make significant local, regional and national contributions through its growth, skills, and regeneration agendas.

The SLR is identified as a key piece of infrastructure in the NSDC Core Strategy (2011) and Amended Core Strategy (2019). Area Policy NAP 4 specifically states that the District Council will require the provision of the SLR. The importance of the SLR to the delivery of the Core Strategy is identified with its construction required at an early stage of the SUE development. Both iterations of the plan were subject to statutory periods of public consultation and engagement with relevant stakeholders prior to examination. The planning application process itself also benefit from engagement and comment.

In addition to the statutory planning process the issue of congestion and need for new road investment has been identified in the Council's residents survey (2018) and public consultation as part of the development of the Newark Towns Fund and associated Town Investment Plan (TIP) (2020). The SLR is one of 10 priority projects identified in the Newark Town Deal Heads of Terms (executed with government in April 2021). All projects are cumulatively required to level-up the Town, allowing residents and businesses (new and existing) to fulfil their potential under 4 pillars of intervention (1. Business, Education and Skills; 2. Connectivity; 3. Town Centre Regeneration; 4). Town Centre Residential offer).

SLR is further identified in NSDC Community Plan 2020-2023 as a project promoting the delivery of inclusive and sustainable economic growth. The plan was developed utilising a number of resident consultation exercises, most notably the aforementioned District-wide residents' survey (2018) which attracted 11,224 responses. This was

supplemented in 2020 with the Towns Fund Consultation survey. Together, it is clear that road and transport infrastructure improvements remain a top priority.

Finally the SLR, its associated development, the development it supports (including Fernwood), and its role in providing alternative traffic movements for users and alleviating congestion are supported by a range of organisations. This includes the LEP, Nottinghamshire Country Council, HE, all nearby Town and Parish Councils (Newark, Farndon, Fernwood, Balderton), the Newark Towns Board, and Newark Business Club (who represent over 100 businesses). Letter of support from these organisation are provided in Annexes O-S, V and W and minutes of the April Newark Towns Board in Annex U.

U&C, as master developer, as required to deliver the SLR and associated whole site infrastructure. Such infrastructure has received planning consent and technical sign-off at various stages.

4.2b Are any aspects of your proposal controversial or not supported by the whole community? Please provide a brief summary, including any campaigns or particular groups in support or opposition? (Limit 250 words)

As detailed at 4.2a, the project has political, community, and public authority support. During the consultation and public hearing exercises for the Local Development Framework identified above there were no aspects of the proposal that proved controversial or not supported by the whole community.

To the contrary, concerns and lack of support stem from the current failure to deliver the full SLR. The SLR has been an integral component of the town's growth plans since 2006. Multiple updates since, from the Core Strategy (2011 & 2019), Community Plan (2020), and Newark Town Investment Plan (2020), reveal the wider community need and expectation for the SLR, both locally and strategically. Continued delay in unlocking funding will likely lead to further frustration.

Support for the SLR delivery is most recently demonstrated in the letters/minutes of support accompanying this submission from local, regional, and national stakeholders including Newark Town Council, Balderton Parish Council, Farndon Parish Council, Fernwood Parish Council, and Newark Towns board, Newark business club, Nottinghamshire County Council, and the D2N2 LEP (Annex O-S).

4.2c Where the bidding local authority does not have the statutory responsibility for the delivery of projects, have you appended a letter from the responsible authority or body confirming their support? **Annex E**	☒ Yes ☐ No ☐ N/A
For Northern Ireland transport bids, have you appended a letter of support from the relevant district council	☐ Yes ☐ No ☒ N/A

4.3 The Case for Investment

See technical note Table 1 for further guidance.

4.3a Please provide evidence of the local challenges/barriers to growth and context that the bid is seeking to respond to. (Limit 500 words)

Policy and strategy identify Newark's challenges (Local Development Framework and evidence base, the Economic Growth & Recovery Strategy (2022-26), and Newark Town Investment Plan).

Housing Delivery

Growth Point made clear an intent for Newark to growth via a SUE's. As with any SUE, delivery takes time and requires significant up-front infrastructure. Until such a time as key site infrastructure is unlocked, there remain challenges to delivery.

The 2015 Strategic Housing Market Assessment (SHMA) identifies an OAN for new housing of 454 dwellings per annum. More recent MCHLG methodology estimates c510 dwellings per annum.

An average of 358 dwellings were delivered each year between 2014 and 2019, well below that required. Whilst delivery across the District has ensured a 5 year land supply there remains specific challenge in Newark. This constrained delivery is linked to the non-delivery of the SLR upon which two of the three allocated SUE sites are reliant (Middlebeck and Fernwood). For Fernwood planning permissions were granted on the basis that the full SLR would be delivered as 'committed development'.

Congestion

Congestion is well known. Transport work for the Local Development Framework and evidence base for the A46 Newark Northern Bypass (see National Road Investment Strategy 2) identify the importance of reducing journey time delays around Newark. There is public expectation that traffic congestion will be addressed through both the SLR and A46 schemes (Residents Survey 2018 and Towns Fund Survey 2020).

A failure to complete the SLR would demonstrably lead to queuing within the town, to the detriment of the highways network, users, and ultimately the ability of the town to realise its potential and ambitions in terms of up/re-skilling, learning potential, town centre vibrancy, and business opportunities (from clustering to start-ups) as captured in the Government-endorsed Newark Town Investment Plan. Do-nothing is not a viable option. Moreover, no SLR would equally mean no associated growth.

Commercial Space

Outer Newark specialises in Logistics with the proportion of jobs in the sector being three times the concentration level observed in the region for the sector. This is a result of the excellent strategic road connectivity at Newark.

Newark and Sherwood contains around 7.6 million square feet of industrial space of which 60% is logistic space and 34% is specialised industrial space. The area experiences low vacancies of 0.5% which have remained stable over the past year. As a result, rents have also grown by 4.1% over the past year. This shows a potential

constraint on the supply side with roughly 74,000 square feet being delivered over the past three years.

The SLR unlocks a well serviced employment site for logistics and advance manufacturing supporting further job growth. The site is subject to interest from a significant occupier (subject to an NDA as discussions continue), with the SLR critical to this interest.

4.3b Explain why Government investment is needed (what is the market failure)? (Limit 250 words)

The SLR is transport infrastructure providing a public good. It is unavoidably available to all and is non-excludable in supply. Once provided, it matters little how many people enjoy it, making it non-rivalrous in demand and therefore difficult to supply on a commercial basis.

The Middlebeck Project Financial Summary, Cost Estimates (Annex T and G) and well developed nature of the scheme demonstrate the significant up front infrastructure costs to deliver the scheme. The scale and timings of these costs means that it would be unviable for any developer to deliver without some loan and grant support. The total cost of the SLR is £92.5m (including £21.7 for SLR Phase 1 which is now completed along with £1.9m spent design and technical approvals for the remainder) of which £84.1m is apportioned to the residential development and £8.4m to the commercial development. £84.1 m for the residential element equates to an offsite highway cost per unit of around £32,000 (typical S106 contributions for highways is circa 3,000 per unit).

[redacted].U&C have a track record of delivery with schemes of this size and nature.

U&C, NSDC, the D2N2 LEP, and HE have worked in partnership to develop an appropriate funding package. LUF grant is demonstrably required as a final funding commitment to deliver the SLR.

4.3c Please set out a clear explanation on what you are proposing to invest in and why the proposed interventions in the bid will address those challenges and barriers with evidence to support that explanation. As part of this, we would expect to understand the rationale for the location. (Limit 500 words)

LUF of £20 million is sought to fund the completion of the SLR connecting the A46 at Farndon to the A1 at Balderton, and associated infrastructure. Phase 1 of the SLR is substantially complete and has unlocked land for the development of 600 homes.

Completion of the remainder of the SLR will unlock an additional 2,051 homes, 5000 jobs, and new sports and community facilities. It will also support the ongoing delivery of the Fernwood SUE (an additional 3,500 homes and 15 ha of employment land). It will reduce congestion, improve air quality, and ultimately form part of the identified package of measures to deliver on the ambitious and transformative plans within the

Government-supported Newark Towns Investment Plan. Completion of the SLR will provide an alternative route south of the town connecting the A46 to the A1 essentially forming the 'missing link' of an outer loop road encircling Newark on Trent. This will also have benefits, if implemented in advance (which is forecast should this LUF bid be successful), in assisting with traffic management for the town throughout any implementation period for the A46 Newark Northern Bypass.

The remaining SLR has been designed (save for additional design checking at the A46 and A1) and costed at £70.9m and cannot be supported by the development without substantial additional public grant. The LEP and NSDC have already committed grant funding to the project, set out in 6.1a below. The £20m LUF grant will close the funding gap, allowing whole road delivery. U&C are also in the process of applying for infrastructure loan funding from Homes England to support their contribution on similar terms to those successfully achieved for the delivery of the completed Phase 1 SLR and a number of other U&C sites.

U&C, utilising the grant and loan commitments, will deliver the SLR in its entirety including any costs risks.

The delivery of the SLR with LUF will remove the most significant barrier to housing delivery and congestion in Newark, allowing greater and accelerated housing delivery, the latter made possible via a second point of sales at both ends of the SLR.

LUF is required to fill the current viability gap of the SLR. The technical and planning framework is in place, deliverability is now only a question of funding.

4.3d For Transport Bids: Have you provided an Option Assessment Report (OAR) Justification provided in **Annex F**	☐ Yes ☒ No

4.3e Please explain how you will deliver the outputs and confirm how results are likely to flow from the interventions. This should be demonstrated through a well-evidenced *Theory of Change*. Further guidance on producing a Theory of Change can be found within HM Treasury's Magenta Book (page 24, section 2.2.1) and MHCLG's appraisal guidance. (Limit 500 words)

The proposal uses public funding to reduce travel barriers and congestion in Newark by improving additional highway infrastructure south of Newark. This is intended to improve travel reliability in the area and act as a catalyst to support economic growth and unlock up to 5,551 additional residential units in Newark. The proposal focuses on providing a public good that the market is failing to provide due to the reasons listed in section 4.3b above. Provision of the SLR, as part of a package of intervention measures across the town, will raise aspirations and opportunities through the projects and programs identified in the NSDC Community Plan and Newark Town Investment Plan.

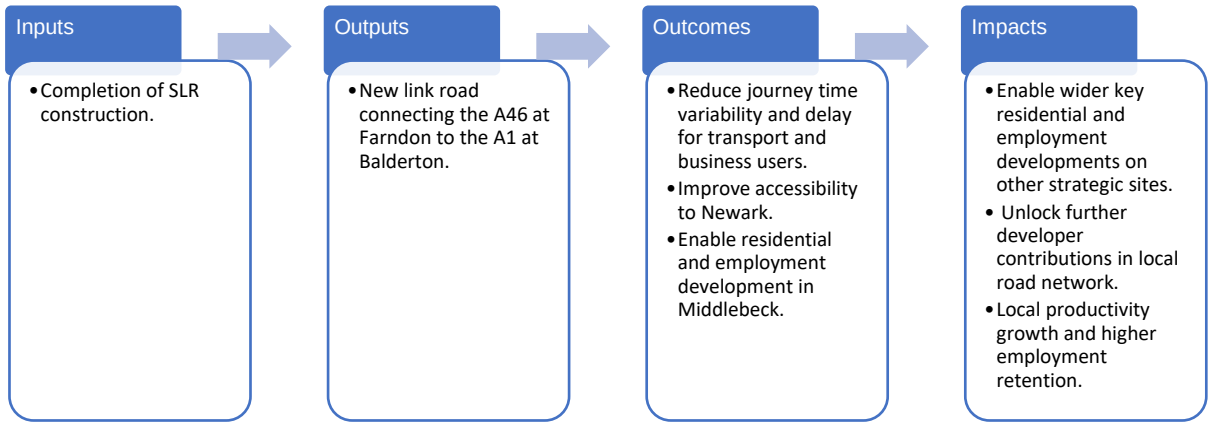
The causal chain of the events that are expected to bring the change are the following:

1. LUF will be invested on the provision of new road infrastructure allowing completion of the SLR.
2. Subsequent private sector funding will be invested in the completion of the SLR
3. Additional residential and commercial growth will be also unlocked by the completion of the SLR as per Middlebeck's planning permission and adjacent strategic sites also relying on the SLR.
4. The total package of new road infrastructure is expected to contribute to the reduction of travel barriers currently experienced in Newark by providing alternative road links.
5. This will improve air quality, reduce journey times and improve reliability on the road network.
6. The improved journey times and reliability will result in accessibility changes for local business making them more productive while making the commercial properties more attractive and improving rental values. This will be alongside wider planned delivery of the A46 Newark Northern Bypass
7. Higher local employment retention and creation, attraction of new labour and improved property market function will contribute to local productivity growth and support local economic growth ambitions.
8. Creating a physical, economic, and place-making environment for the town to deliver wider program and project aspirations as detailed in the Community Plan and Newark Town Investment Plan.

The key partners in this proposal will be: NSDC, U&C, LEP, NCC, HE, Balderton Parish Council, Newark Town Council; local businesses and developers. This intervention is anticipated to have positive and wide-ranging impacts on local residents, employees, businesses and developers.

The assumptions of the above theory of change are based on evidence around transport infrastructure, regeneration, and employment growth. This intervention also has synergies with other policies aiming at housing delivery, economic development, environmental sustainability and developer contributions.

The theory of change is also illustrated in the diagram below which distinguishes input, outputs, outcomes and impacts as per the Magenta Book.



4.4 Alignment with the local and national context

See technical note Table 1 for further guidance.

4.4a Explain how your bid aligns to and supports relevant local strategies (such as Local Plans, local economic strategies or Local Transport Plans) and local objectives for investment, improving infrastructure and levelling up. (Limit 500 words)

The SLR and the development of the Middlebeck SUE is specifically identified as a strategic priority within the Councils Amended Core Strategy (2019), Community Plan (2020), and Newark Towns Investment Plan (2020) and associated Newark Towns Deal (2021). Congestion within and around Newark remains a key concern at a local, regional, and national level. At a local level this is captured in the NSDC Residents Survey (2018), Community Plan (2020), and Towns Fund Survey (2020). Regionally and nationally congestion around Newark is identified by Midlands Connect, the Midlands Engine, and via the national Road Investment Strategy 2 (2020).

Completion of the SLR will demonstrably unlock all of the benefits of the Middlebeck development. It is a scheme fully supported by Nottinghamshire County Council as the local Highway Authority who identifies it as a strategic infrastructure improvement required to accommodate growth in the district up to 2026 within the Nottinghamshire Local Transport Plan 2011-2026. Highways England also accept its importance in unlocking development, growth, and its support locally.

In policy terms Newark Amended Core Strategy PolicyNAP 4 requires the provision of the Newark Southern Link Road (SLR) linking the A46 at Farndon to the A1 at Balderton. Policy NAP 4 also states that planning permission will not be granted for any development which would inhibit the implementation of this scheme.

The SLR is a developer-led scheme and its delivery is a conditional requirement of outline planning permission (10/01586/OUTM) which was granted in November 2011 for development of Land South of Newark. Full planning permission was subsequently granted for the SLR in September 2016 (16/01199/FUL).

In accordance with EAST guidance, the SLR fits very well / compliments other policies affecting Newark and Nottinghamshire as shown above.

The SLR also complements Highways England and Local Transport Plan Objectives by adding resilience to the existing network, by providing access to the growth point area destinations, enabling the delivery of the entire consented development and the associated economic activity and by mitigating the impacts of the development on the local highway network and existing communities.

Completion of the SLR will provide an alternative route south of the town connecting the A46 to the A1. The completed SLR will provide direct access for development of the Land South of Newark strategic site as well as indirect access for development of the Land around Fernwood strategic site, thereby helping to remove traffic from key routes through Newark and alleviating traffic congestion at key junctions. Therefore, the bid aligns with and supports Policies NAP 1, NAP 2A, NAP 2C and NAP 4 of the Newark & Sherwood District Amended Core Strategy DPD.

This will benefit wider regeneration plans being funded through the 'Towns Fund' in the town centre by helping to reduce traffic flows and improve air quality, thereby complying with Policy NAP 1 of the Amended Core Strategy DPD which sets objectives to protect the historic environment of Newark and promote a competitive and healthy town centre.

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4.4b Explain how the bid aligns to and supports the UK Government policy objectives, legal and statutory commitments, such as delivering Net Zero carbon emissions and improving air quality. Bids for transport projects in particular should clearly explain their carbon benefits. (Limit 250 words)

Build Back Better (2021) Plan for growth builds on the foundations of the Industrial Strategy, giving great weight to the importance of investing in infrastructure. The Levelling Up Fund, targeting regeneration of struggling towns in all parts of the UK, is therefore key to unlocking infrastructure schemes such as the SLR, which in turn will facilitate economic growth and deliver much needed new homes.

The Net Zero (2019) initiative is to reduce the UK's net emissions of greenhouse gases by 100% relative to 1990 levels by 2050. Allied to this, NSDC has declared a Climate Emergency. While the SLR will help deliver planned growth in the area, it is also essential for reducing congestion across the local road network, therefore reducing carbon emissions and improving air quality (detailed and evidenced in Section 5). The supporting TUBA appraisal forecasts a core scenario carbon cost saving of £1.0 million over the 60 year appraisal period, equivalent to a reduction of nearly 32,000 tonnes of CO2.

Middlebeck will deliver c. 178 acres of green infrastructure and public open space along with significant walking and cycling connectivity, which contribute to government objectives set out in A Green Future (2018), Gear Change (2020). Carbon savings (greenhouse gases), due to vehicle emission reductions, have been calculated using DfT TUBA appraisal software. The TUBA appraisal forecasts a reduction of nearly 32,000 tonnes of CO2 over a sixty year appraisal. This is due to more efficient traffic routing in Newark due to the completed Southern Link Road.

4.4c Where applicable explain how the bid complements / or aligns to and supports other investments from different funding streams. (Limit 250 words)

<u>Existing/Well advanced grant and loan for the SLR</u>

LUF would supplement ongoing HE negotiations[1] for additional and recycled loan facility. LUF is the only remaining funding obstacle to completing the SLR given already committed grant from the LEP (£7m) and NSDC (£5m).

<u>Delivery Acceleration</u>

[1] U&C are in the process of applying for infrastructure loan funding from Homes England to support their contribution on similar terms to those successfully achieved for the delivery of the completed Phase 1 SLR and a number of other U&C sites.

Phase 1 was supported by a HE loan which accelerated road delivery and therefore house builder interest. Three house builders are on-site delivering, allowing the 1FE Primary School to also be accelerated (opening September 2021).

Supporting additional development – Fernwood SUE and Newark Town Investment Plan

Fernwood is reliant on the SLR delivery to mitigate highway impacts. The accelerated delivery of the SLR is supported by Larkfleet Homes and Barrat/David Wilson Homes.

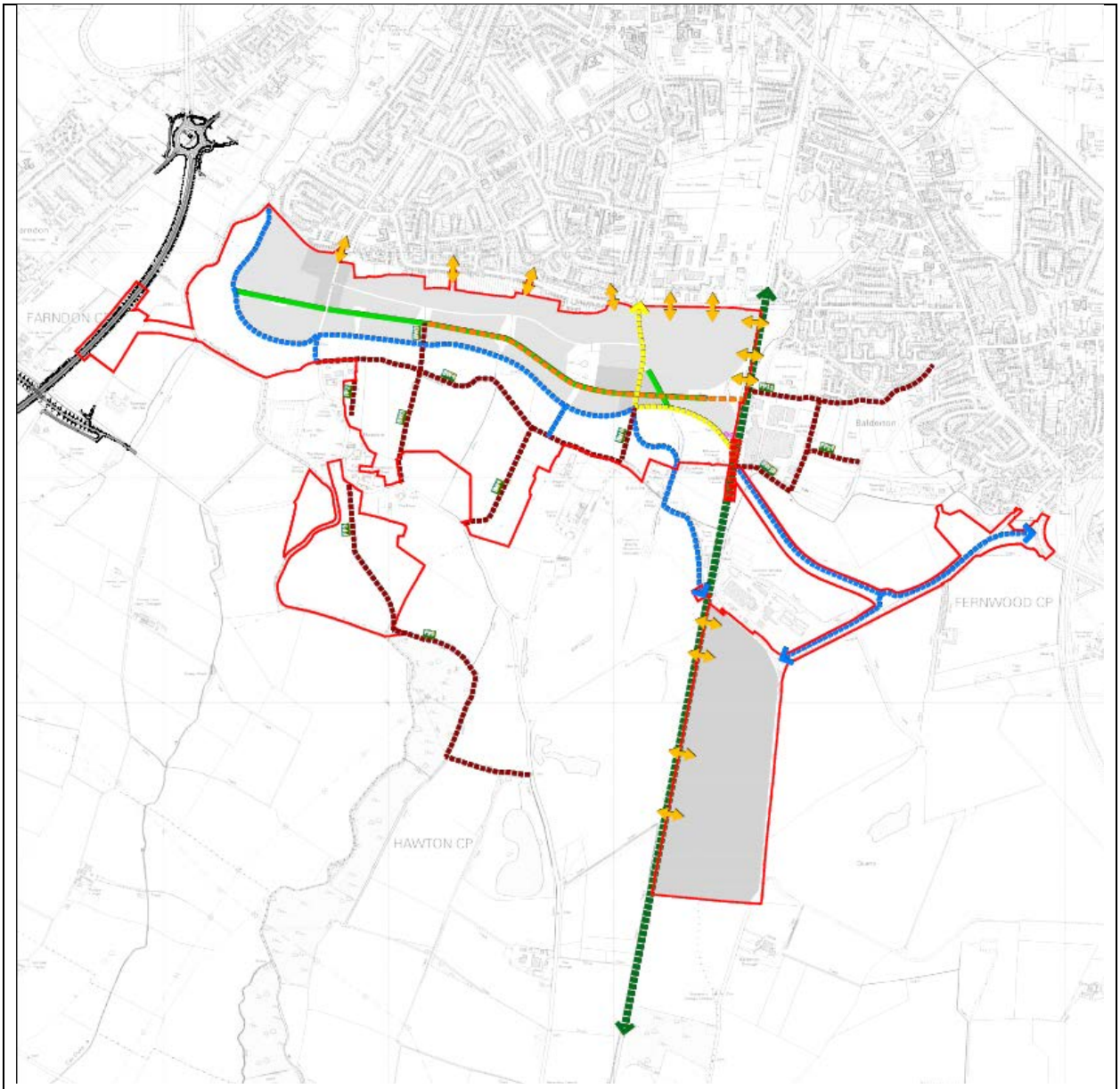
The SLR will support the Newark Town Investment Plan (TIP) and associated £25m Newark Towns Deal.

Highway investment

Delivery of the SLR will complement investment in the Strategic Road Network, specifically the proposed upgrade of the A46 Newark Bypass under the Road Improvement Scheme. It is expected that if LUF funding is approved the SLR will be complete in advance of the A46 works, allowing a route as part of the traffic management solution during the construction phase(s).

4.4d Please explain how the bid aligns to and supports the Government's expectation that all local road projects will deliver or improve cycling and walking infrastructure and include bus priority measures (unless it can be shown that there is little or no need to do so). Cycling elements of proposals should follow the Government's cycling design guidance which sets out the standards required. (Limit 250 words)

The SLR to the east and the Middlebeck SUE incorporates significant walking and cycling infrastructure provision including shared walking and cycling routes adjacent to the SLR and connecting routes into Newark and controlled crossing facilities at key locations. In addition, the Middlebeck Development that comprises the Land South of Newark will deliver a comprehensive network of walking and cycling routes, including integration with Sustrans National Cycle Route 64 between Melton Mowbray and Lincoln, within the new development areas (as shown in the extract from the non-vehicular movement plan below). This sustainable transport infrastructure will be delivered in accordance with the outline planning permission to encourage sustainable travel.



In this regard the SLR scheme complies with the Government's expectation that local road projects will deliver or improve walking and cycling infrastructure.

PART 5 VALUE FOR MONEY

5.1 Appropriateness of data sources and evidence
See technical note Annex B and Table 1 for further guidance.

All costs and benefits must be compliant or in line with HMT's Green Book, DfT Transport Analysis Guidance and MHCLG Appraisal Guidance.

5.1a Please use up to date evidence to demonstrate the scale and significance of local problems and issues. (Limit 250 words)

Congestion

Transport assessment undertaken in June 2021 alongside work undertaken in support of the NSDC Local Plan and studies undertaken since to examine emerging major developments in the Newark area have identified that key road corridors are forecast to experience increasing journey time delays due to the cumulative effects of development traffic. In addition, without completion of the SLR there will be queuing at several junctions by the end of the plan period.

Without the SLR the levels of committed development will lead to increased delays and congestion (3,329 and 2,957 total delay hours in the AM and PM peaks respectively) across the surrounding road network with detrimental impacts in terms of journey times, delays and air quality.

Housing Delivery

NSDC's objectively assessed need for new housing was calculated to be 454 dwellings per annum. This increases to 510 dwellings per annum once the MHCLG updated methodology is used. Between 2014 and 2019 an average of 358 dwellings per annum was delivered. This results in a shortfall of either 480 or 760 dwellings over the past 5 years depending on the methodology used.

Commercial Space

Newark and Sherwood contains around 7.6 million square feet of industrial space of which 60% is logistic space and 34% is specialised industrial space. The area experiences low vacancies of 0.5% which have remained stable over the past year. As a result, rents have also grown by 4.1% over the past year. This shows a potential constraint on the supply side.

5.1b Bids should demonstrate the quality assurance of data analysis and evidence for explaining the scale and significance of local problems and issues. Please demonstrate how any data, surveys and evidence is robust, up to date and unbiased. (Limit 500 words)

This section demonstrates the quality assurance of data analysis and evidence for assessing the main local problems and issues as described in section 5.1a.

Congestion

The Newark Transport VISUM Model has been used to assess congestion and journey times. The VISUM transport model was used to advise the District-Wide Transport Study that was produced in support of the Council's Core Strategy. Since the model was originally created it has been updated twice by Tetra Tech in the course of assessment work commissioned by NSDC. A Local Model Validation Report (LMVR) was prepared to document the changes made and to demonstrate that the revised model validated in accordance with recommended best practice and that the model was 'fit for purpose' for use as a forecasting tool. Nottinghamshire County Council and Highways England have both agreed that the model is a suitable tool.

Through the provision of the SLR, additional highway capacity will be delivered to the south of Newark, offering alternative routes for future traffic and alleviating potential congestion that would occur in a scenario where the SLR is not delivered in full, particularly within the town centre.

Housing Delivery

The housing delivery is based on information provided by NSDC in terms of annual delivery over the latest five years for which information is available. The demand is based on NSDC's objectively assessed need for new housing as published in NSDC's 2015 Strategic Housing Market Assessment (SHMA). In addition, the MHCLG standard methodology has been also used for comparison as it is a more recent methodology. Finally, five years have been considered to take into account longer term trends and avoid any outliers.

Commercial

Savills have undertaken a commercial property market analysis for Newark based on recent information from 2021. Key indicators for commercial property have been used to assess the performance of the industrial property market in Newark. The analysis is based on data from the CoStar database for current supply and historic trends.

CoStar is the leading provider of commercial real estate information, analytics and online marketplaces in the UK. CoStar maintains offices throughout the U.S. and in Europe and Canada with a staff of over 3,700 worldwide, including the industry's largest professional research organisation. Glenigan is the trusted provider of UK and the Republic of Ireland construction project sales leads, market analysis, forecasting, and company intelligence. Glenigan data is often referenced in Parliament with the organisation also being a regular contributor to the media.

5.1c Please demonstrate that data and evidence chosen is appropriate to the area of influence of the interventions. (Limit 250 words)

Congestion

The Newark Transport VISUM Model has been used to assess congestion and journey times. The model was originally built by consultants acting on behalf of the developers promoting the Land South of Newark strategic development site. N&SDC purchased the right to use the VISUM model "to fulfil their statutory obligations". Since the model was originally created it has been updated twice in the course of assessment work commissioned by NSDC.

The model covers all of Newark town in detail and includes the A1 to the east and the A46 to the west, as well as a sizable part of the hinterland. The following diagram shows the detailed model network:

The model is well capable of representing trip rerouting in and around Newark as a result of the SLR scheme.

Housing Delivery

Housing delivery assessment covers NSDC, which is the lowest geography with housing supply and demand information publicly available. This makes it appropriate to the area of influence of the interventions as the SLR will improve Newark's road network.

Commercial
Savills have undertaken the commercial property market analysis for Newark based on recent information from 2020. This is also considered appropriate to the area of influence as stated above

5.2 Effectiveness of proposal in addressing problems

5.2a Please provide analysis and evidence to demonstrate how the proposal will address existing or anticipated future problems. Quantifiable impacts should usually be forecasted using a suitable model. (Limit 500 words)

Congestion
The Newark Transport Model has been used to forecast future highway trips for the year 2033. This has considered future planned developments and infrastructure in the modelled area using an up-to-date uncertainty log. Network summary statistics are presented in the total delay summary table below.

Scenario	A46 Status	SLR Status	Middlebeck Build Out	Total Delay (Hours)	
				AM	PM
1	As Existing	Partial	Partial	3329	2957
2		Complete	Partial	2946	2523
3		Complete	Full	3124	2886
4	Improvements Delivered	Partial	Partial	2734	3293
5		Complete	Partial	2511	2856
6		Complete	Full	2680	2965

It can be seen from the table that total delay in hours across the modelled network is reduced by the scheme in the forecast year. In the core scenario (no A46 improvement) delay is reduced by 12% and 15% in the AM and PM peaks respectively following completion of the SLR. With the addition of traffic from the full build out of Middlebeck the delay savings are reduced but the scheme still delivers delay reductions of 6% and 2% in the AM and PM peaks respectively offering an overall benefit to the local highway network within Newark.

Through the provision of the SLR, additional highway capacity will be delivered to the south of Newark, offering alternative routes for future traffic and alleviating potential congestion that would occur in a scenario where the SLR is not delivered in full, particularly within the town centre.

Housing Delivery

LUF would enable the delivery of Middlebeck's 2,051 houses. Middlebeck will contribute to resolving the current housing shortfall identified above with the delivery of above net additional homes.

Middlebeck provides significant support to the delivery of the D2N2 Strategic Economic Strategy. It supports the development of residential and employment premises and their subsequent occupancy. Whilst there is a degree of risk and uncertainty (see risk register) this is not considered significant given the underlying growth in Newark.

WSP on behalf of NSDC have previously estimated that Middlebeck will generate construction jobs for the building of 2,051 homes and associated commercial opportunities at the Newark SUE. The construction of the homes element alone of Middlebeck would generate a Net GVA contribution of £9.6 million for the jobs generated by building houses. The estimation of construction jobs and the associated GVA are based on ONS data and best practice. Further information is provided in Annex L.

Commercial Space

LUF would also enable the development of 50 hectares of employment land. This is estimated to provide high quality commercial space currently missing from Newark. This will contribute in increasing the industrial stock in the area. Once operational in operation the employment space is estimated to accommodate 2,400 jobs. The GVA associated with these jobs is estimated to be £37 million.

5.2b Please describe the robustness of the forecast assumptions, methodology and model outputs. Key factors to be covered include the quality of the analysis or model (in terms of its accuracy and functionality) (Limit 500 words)

Transport Analysis

The transport model has been validated and forecasting has used an updated uncertainty log, so the model itself is robust. Further robustness has been provided with a sensitivity test. The Core Scenario assumes that no improvements will be carried out at the A46. However, the A46 improvement scheme at Newark is being progressed. The sensitivity test models the SLR benefits if the A46 improvements go ahead. It shows higher benefits than the Core Scenario.

An assessment has also been undertaken of the A46 improvements whilst under construction, to show how the SLR will help to reduce congestion within Newark during the A46 construction phase.

Land Value Uplift

Middlebeck Land Value Uplift (LVU) is anticipated due to the change from agricultural to a more productive use including residential and commercial space. In order to estimate the land value uplift in the BCR model the scheme's residual land value for residential is used alongside local agricultural land value published by Savills (Farmland Value Survey - Value Table, March 2021). The commercial

land value uplift has been estimated by following the above approach and using the average industrial land values in Newark published by MHCLG (VOA Land Values 2019) instead of the residential residual land value.

The Residual Land Value is based on the following assumptions:

- Sales price (£ psf): [redacted]
- Construction cost (£psf): [redacted]
- Selling cost (% of sales price): [redacted]
- Housebuilder Gross Margin (% of sales price): [redacted]
- Purchasers costs (% of sales price): [redacted]

The estimates of LVU effects draw upon a wide range of research in to the land value impacts of major regeneration and infrastructure projects. These include both research by Savills for clients and academic and other major studies. This work finds that major infrastructure and regeneration schemes can be associated with net land value uplift effects. The modelling in the BCR model here has been tailored to the specific circumstances of the local area and projects. Consequently we believe that the forecasts are as robust as is possible given the uncertainties over the context and links between activities and impacts.

Further details on modelling assumptions are given in answer to question 5.4a.'

5.3 Economic costs of proposal

5.3a Please explain the economic costs of the bid. Costs should be consistent with the costs in the financial case, but adjusted for the economic case. This should include but not be limited to providing evidence of costs having been adjusted to an appropriate base year and that inflation has been included or taken into account. In addition, please provide detail that cost risks and uncertainty have been considered and adequately quantified. Optimism bias must also be included in the cost estimates in the economic case. (Limit 500 words)

The finance costs of the scheme are based on a costing exercise undertaken by Henry Riley LLP in May 2021 and is based on technically approved detail design drawings for the SLR. .More information on the cost estimation is provided in **Annex G**.

The main project costs are listed in the table below. These are shown in 2021 prices and refer to the remaining sections of the SLR not currently constructed, which includes the final section of the Newark Southern Link Road (SLR) between Hawton Road and the A46 Trunk Road at Farndon proposed to be funded by LUF.

Economic costs (bottom two lines) are based on 2010 prices and include an optimism bias of 3% as per WebTAG guidance. This reflects the fact that the technical and planning framework is already in place. A 60 year appraisal period has been used in estimating the NPV of costs and benefits.

Cost heading	Costs (£)
A46 - Hawton Road	£18,870,713
Hawton Road & Hawton – Bowbridge Lane	£14,869,779
A1 Roundabout-Staple Lane	£8,557,114
Employment access road	£7,783,835
Wider Site. Incl infrastructure &earthworks	£15,108,994
Total (excl inflation)	**£65,190,435**
Total (incl inflation)	**£70,852,555**
Total (2010 Prices)	**£55,447,446**
Total NPV incl Optimism Bias	**£52,684,678**

5.4 Analysis of monetised costs and benefits

5.4a Please describe how the economic benefits have been estimated. These must be categorised according to different impact. Depending on the nature of intervention, there could be land value uplift, air quality benefits, reduce journey times, support economic growth, support employment, or reduce carbon emissions. (Limit 750 words)

Transport Benefits

The bid is related to a transport scheme and has used the Transport User Benefits Appraisal (TUBA) tool. An Appraisal Summary Table (AST) (Annex H) has been used to summarise the quantitative and qualitative economic benefits. The Newark Transport VISUM Model has been used to model the scheme. TUBA has been used on the model outputs to estimate transport user benefits (journey time savings and vehicle operating costs).

Carbon Benefits

Carbon Benefits have been estimated directly from TUBA. This uses journey route changes and changes to vehicle speeds from the scheme, along with DfT fleet-mix predictions and vehicle emissions to calculate the amount of CO2 reduced in tonnes. This is then monetised using standardised values.

[redacted].

Total net additional benefits	Preferred Option (NPV, 2010 prices)
Wider LVU	£59,807,987
Transport Benefits	£46,790,000
Greenhouse Gasses (Carbon)	£1,015,000
Total benefits for the BCR	£107,612,987

The table above shows the NPV of the analysed SLR benefits. The numbers in the above table are rounded to the nearest £10,000.

5.4b Please complete Tab A and B on the **appended excel spreadsheet** to demonstrate your: (Annex I)

Tab A - Discounted total costs by funding source (£m)
Tab B – Discounted benefits by category (£m)

5.5 Value for money of proposal

5.5a Please provide a summary of the overall Value for Money of the proposal. This should include reporting of Benefit Cost Ratios. If a Benefit Cost Ratio (BCR) has been estimated there should be a clear explanation of how this is estimated ie a methodology note. Benefit Cost Ratios should be calculated in a way that is consistent with HMT's Green Book. For non-transport bids it should be consistent with MHCLG's appraisal guidance. For bids requesting funding for transport projects this should be consistent with DfT Transport Analysis Guidance. (Limit 500 words)

The SLR demonstrates a significant positive benefit cost ratio as shown below. The key impact of the SLR is transport and air quality benefits alongside Middlebeck's LVU due to acting as an enabling infrastructure. In this way the SLR contributes to Newark's economic growth.

The table below shows the calculation process of the BCR which is consistent with HMT's Green Book, DfT and MHCLG's appraisal guidance and uses the formula set out in the LUF FAQs. The approach used to estimate the benefits is set out in section 5.4a above. The table below also considers the benefits under the 'business-as-usual' scenario. However, without LUF the development of SLR and Middlebeck will stall. Therefore, there are no anticipated benefit or costs under the 'business-as-usual' scenario. The cost estimation is also based on an Optimism Bias of 3% as stated above.

Total net additional benefits	Preferred Option (NPV, 2010 prices)
Benefits for the BCR	
Land value uplift (LVU) (Residential and Commercial)	£59,807,987

Transport Benefits	£46,790,000
Carbon Benefits	£1,015,000
Total benefits for the BCR (A)	**£107,612,987**
Costs	
LUF cost/funding (B)	£15,944,674
Co-funding LEP and NSDC (C)	£8,360,905
Total cost (LFU + Co-funding) (D)	**£24,305,579**
Private sector cost (E)	**£28,379,099**
BCR calculation formula (A-E) / D	**3.3**

The proposal's BCR is 3.3 which shows that for every £1 of public money spent there is a monetised benefit of £3.3. The numbers in the above table are rounded to the nearest £10,000.

5.5b Please describe what other non-monetised impacts the bid will have, and provide a summary of how these have been assessed. (Limit 250 words)

The non-monetised benefit the bid will have relate to supporting further housing and commercial development in Fernwood. This includes the delivery of 3,500 dwellings and 15ha of employment land. These dwellings referenced above assumes that the SLR is delivered in full and in doing so will support them by alleviating congestion generated by these additional dwellings.

In addition, air quality benefits are anticipated as a result of the SLR. Air quality benefits have been estimated using an ADMS-Roads model covering Newark on Trent. The model considers existing and predicted traffic flows, vehicle speeds and HGV content. Emission factors for the baseline and projected 'Do Minimum' and 'Do Something' scenarios have been calculated using the Emission Factor Toolkit (EFT) Version 10.1 (August 2020).

Background concentrations were considered to ensure that pollutant sources other than traffic were represented appropriately. Background sources of pollutants include industrial, domestic and rail emissions within the vicinity of the study area. Background concentrations used within the assessment were determined with reference to the IAQM Guidance and Technical Guidance (TG) (16).

The ADMS Model has predicted concentrations of NO2, PM10 and PM2.5 at relevant receptor locations adjacent to roads likely to be affected by the development. Only receptors close to roads where there is predicted to be a change in emissions were assessed. More information is provided in Annex M.

5.5c Please provide a summary assessment of risks and uncertainties that could affect the overall Value for Money of the bid. (Limit 250 words)

A detailed risk assessment has been developed (Annex K). The key risks that could affect the overall Value for Money of the bid are:

- Late delivery delay as a result of delayed discharging pre-commencement conditions
- Cost risk associated with tenders received in Q1 2022 may be in excess of project budget and may require the Project Team to consider value engineering opportunities prior to commencement.
- Market Volatility - ongoing volatility in construction market in respect of cost and availability of materials and resources may result in either cost increases or programme delays

The above risks are mitigated with the use of optimism bias as described above' In addition a contingency of 5% is also applied in project cost to mitigate any cost risks and market volatility.

The A46 improvement scheme combined with SLR is anticipated to deliver enhanced transport benefits. However the scheme currently presents a level of uncertainty. The Value for Money analysis excludes this scheme to mitigate any uncertainties.

5.5d For transport bids, we would expect the Appraisal Summary Table, to be completed to enable a full range of transport impacts to be considered. Other material supporting the assessment of the scheme described in this section should be appended to your bid.

The Appraisal Summary Table shows the benefits of the scheme in isolation of the dis-benefits accrued by the full Middlebeck development as per WebTAG guidance. However, the dis-benefits are also captured in the BCR analysis.

PART 6 DELIVERABILITY

6.1 Financial

See technical note Table 1 for further guidance.

6.1a Please summarise below your financial ask of the LUF, and what if any local and third party contributions have been secured (please note that a minimum local (public or private sector) contribution of 10% of the bid costs is encouraged). Please also note that a contribution will be expected from private sector stakeholders, such as developers, if they stand to benefit from a specific bid (Limit 250 words)

Levelling Up Funding (LUF) of £20 million is sought to fund the completion of the Southern Link Road (SLR) connecting the A46 at Farndon to the A1 at Balderton, and associated infrastructure. All funding contributions are identified in the table below.

	Completed Phase 1 SLR(£m)	Remaining SLR(£m)	Combined (£m)
LEP (Public Grant)	1.0	6.0	7.0
NSDC (Public Grant)	-	5.0	5.0
Total public contributions secured	**1.0**	**11.0**	**12.0**
U&C (Private Contribution)[2]	20.7 (95%)	39.9 (56%)	60.5 (65%)
Total local & public contributions secured	**21.7**	**50.9**	**72.5**
LUF proposal	-	20.0	20.0
Total cost to complete the SLR	**21.7**	**70.9**	**92.5**

The completed Phase 1 cost of £21,679,396 includes £1,912,976 of design and technical approval costs already spent for delivery of the remaining SLR.

6.1b Please also complete Tabs C and D in the **appended excel spreadsheet**, setting out details of the costs and spend profile at the project and bid level in the format requested within the excel sheet. The funding detail should be as accurate as possible as it will form the basis for funding agreements. Please note that we would expect all funding provided from the Fund to be spent by 31 March 2024, and, exceptionally, into 2024-25 for larger schemes.

Annex I

6.1c Please confirm if the bid will be part funded through other third-party funding (public or private sector). If so, please include	☒ Yes ☐ No

[2] U&C are in the process of applying for infrastructure loan funding from Homes England to support their contribution on similar terms to those successfully achieved for the delivery of the completed Phase 1 SLR and a number of other U&C sites.

evidence (i.e. letters, contractual commitments) to show how any third-party contributions are being secured, the level of commitment and when they will become available. The UKG may accept the provision of land from third parties as part of the local contribution towards scheme costs. Where relevant, bidders should provide evidence in the form of an attached letter from an independent valuer to verify the true market value of the land.	

6.1d Please explain what if any funding gaps there are, or what further work needs to be done to secure third party funding contributions. (Limit 250 words)

Current calculations for the cost of delivering the SLR stand at £70.9 million. LUF alongside committed grants from LEP and NSDC will close SLR's existing funding gap as shown in section 6.1a

6.1e Please list any other funding applications you have made for this scheme or variants thereof and the outcome of these applications, including any reasons for rejection. (Limit 250 words)

NSDC applied for Housing Infrastructure Fund in 2017 seeking [redacted] for the completion of the SLR and associated infrastructure at Middlebeck.

Limited feedback was received on this submission, although it is the Council's understanding that this bid was deemed unsuccessful largely due to the economic model used for assessing bids not accurately accounting for the scheme's phasing and subsequent IRR. Similarly, low land-value uplifts, relative to other parts of the country had an adverse impact on the scheme. It was also intimated that the bid should have gone for the 'Forward Fund' instead of the 'Marginal Viability Fund'.

A submission was also made to Highways England's Growth and Housing Fund in 2016 of which the outcome was reliant on success of the Housing Infrastructure Fund application.

U&C are currently in the process of applying for infrastructure loan funding from Homes England to support their contribution on similar terms to those successfully achieved for the delivery of the completed Phase 1 SLR and a number of other U&C sites.

6.1f Please provide information on margins and contingencies that have been allowed for and the rationale behind them. (Limit 250 words)

Allowance for margins and contingencies have been incorporated to allow for issues with the construction supplier market, procurement of service; external drivers for contingency and design and specifications. A Risk Register accompanies the application.

The scheme is within the existing highway boundary in all areas and therefore a high level of confidence is attributed to the scheme costs and contingency. External drivers for contingency are considered in the Risk Register with a risk allowance of 5% being used for this purpose. This is considered as an acceptable contingency used in similar projects by U&C.

Early engagement with suppliers will increase visibility of the scheme at an early stage. This will better inform supplier cost estimates for delivery in a manner that is competitive at the point of bidding. Procuring from U&C's suppliers will focus the scheme with a select group approved suppliers to encourage accurate and high quality understanding of requirements.

[redacted]

6.1g Please set out below, what the main financial risks are and how they will be mitigated, including how cost overruns will be dealt with and shared between non-UKG funding partners. (you should cross refer to the Risk Register). (Limit 500 words)

The main financial risks are listed in the table below alongside mitigation measures. Further detail is provided in the risk register (Annex K). The main financial risks are failure to obtain LUF grant, sot risks associated with the contractors' response and market volatility in terms of costs. Apart from individual mitigation measures set out below for each risk a 5% contingency has also been included in the cost estimates.

Risk	**Mitigation**
LUF Funding - Failure to obtain LUF funding resulting in delays to delivery of SLR	LUF application submitted jointly by all Stakeholders. Discussions ongoing with Homes England and other public sector partners to explore external intervention. NSDC and NCC have pledged further grant (£7m total) to the full delivery of the SLR.
Cost Risk - Tenders received in Q1 2022 may be in excess of project budget and may require the Project Team to consider value engineering opportunities prior to commencement.	Continue in early contractor engagement to obtain programme and cost advice. Contingency included within Cost Plan to cover elements of cost risk within the project.
Market Volatility - ongoing volatility in construction market in respect of cost	Continue in early contractor engagement to obtain programme and

and availability of materials and resources may result in either cost increases or programme delays	cost advice. Contingency included within Cost Plan to cover elements of cost risk within the project.

The Risk Register (Annex K) has been produced by the project team. The Risk Register includes scoring of the risk both before and after mitigation considerations. It also identifies the owner of each risk. Cost overruns following the procurement process will be are passed on to the appointed contractor.

6.2 Commercial

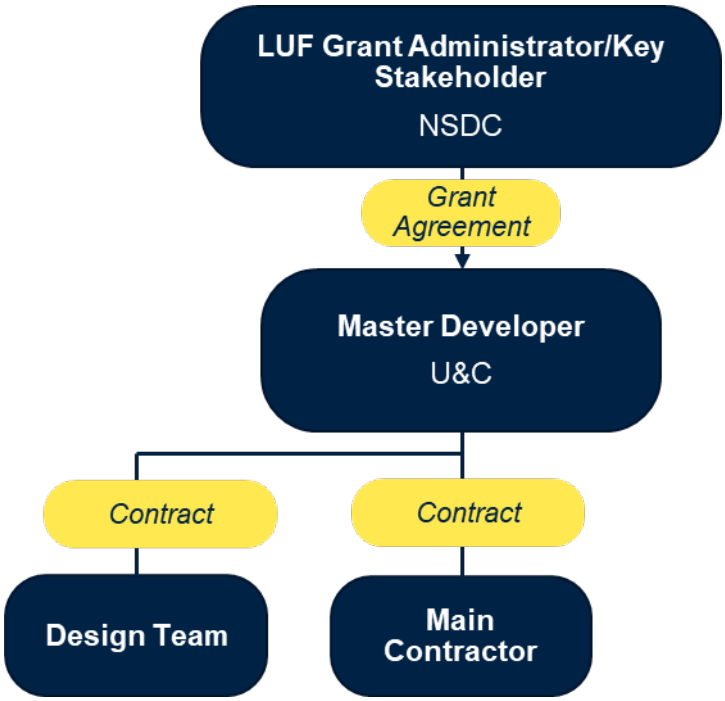
See technical note Section 4 and Table 1 for further guidance.

6.2a Please summarise your commercial structure, risk allocation and procurement strategy which sets out the rationale for the strategy selected and other options considered and discounted. The procurement route should also be set out with an explanation as to why it is appropriate for a bid of the scale and nature submitted.

Please note - all procurements must be made in accordance with all relevant legal requirements. Applicants must describe their approach to ensuring full compliance in order to discharge their legal duties. (Limit 500 words)

Commercial Structure

The scheme will be managed by U&C as the master developer. The LUF Grant will be managed by NSDC who will monitor all developer activity against agreed milestones and a delivery programme. The main contractor will be procured by U&C following this process.



Procurement Route

The proposed strategy is to adopt a Single Stage Design and Build with a list of contractors being shortlisted following a Pre-Qualification process.

A list of contractors will be identified based on U&C established working relationships along with HE and NCC recommendations. Contractors will be invited to submit a Pre-Qualification Questionnaire (PQQ) which will assess; Financial Stability, Health & Safety Performance, Management structure and Experience and Resource proposed to successfully deliver the Works.

Following scoring of the PQQs, the highest scoring contractors will be invited to submit Contractor's Proposals for the Works inclusive of Cost, Time and Delivery submissions based on tendering information forming the Employer's Requirements. A minimum of three contractors will be invited to submit Contractor's Proposals.

The returns from tenderers will be scored at and ultimate recommendation for award based on this return. This approach will allow the contractors to demonstrate their ability to deliver value for the project in all respects. Fig. 1 identifies the stages proposed in order to select the most appropriate contractor for the works.

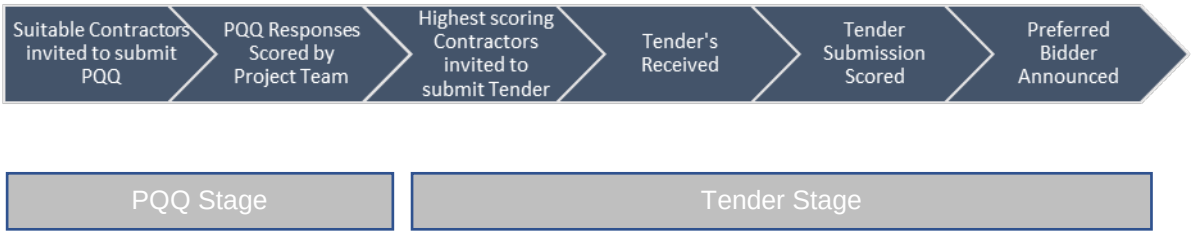


Fig.1 – Procurement Process

It is envisaged that the contract will be based on a bespoke Infrastructure Contract, utilised across many of U&C developments and projects.

Each Contractor will be issued with a full set of tender documents comprising of drawings, performance specifications, reports, surveys, required services and construction information to allow them to produce a cost for designing and construction accommodation that delivers the project to meet the Employer's Requirements.

Contractors will have a six week period to produce their Contractor's Proposals for each element of the works. This time frame will allow the contractor to visit the site, fully interrogate the Employer's Requirements, attend a mid-tender interview, obtain compliant costs for materials and specialised works and reduce the potential for provisional sums being included in the submission.

Each response will be reviewed to ensure parity and costs will be interrogated to determine the most economically advantageous tender is identified.

<u>Tender Review and Award</u>

Tender submissions received will be reviewed by the Director of Project Management and Project Manager and a recommendation for award made based on previously agreed selection criteria.

All points of clarification will have been assessed prior to review to ensure all information and pricing is transparent and comparable.

A period of two weeks will be included to review and assess Tender Returns submitted, and nominate a preferred contractor.

Risk Allocation

Under the bespoke Infrastructure Contract proposed, the risk allocation is clear in that substantial risks on both programme and cost are passed on to the contractor.

6.3 Management

See technical note Section 4 and Table 1 for further guidance

Delivery Plan: Places are asked to submit a delivery plan which demonstrates:

- Clear milestones, key dependencies and interfaces, resource requirements, task durations and contingency.
- An understanding of the roles and responsibilities, skills, capability, or capacity needed.
- Arrangements for managing any delivery partners and the plan for benefits realisation.
- Engagement of developers/ occupiers (where needed)
- The strategy for managing stakeholders and considering their interests and influences.
- Confirmation of any powers or consents needed, and statutory approvals eg Planning permission and details of information of ownership or agreements of land/ assets needed to deliver the bid with evidence
- Please also list any powers / consents etc needed/ obtained, details of date acquired, challenge period (if applicable) and date of expiry of powers and conditions attached to them.

6.3a Please summarise the delivery plan, with reference to the above (Limit 500 words)

Key milestones are:

- LUF Outcome – September 2021
- Commence with A1 Roundabout Technical Design – May 2021
- A1 Roundabout Technical Design Submission – November 2021
- A46 Design Review – November 2021
- Archaeological Investigations – November 2021 – June 2022
- Contractor Procurement – November 2021 – February 2022
- Contractor Appointment – March 2022
- Construction Commencement – July 2022
- Construction Completion Phase 2 SLR – **March 2024**
- Housebuilding Commencement – June 2023

- First Residential Occupations (Phase 2) – March 2024
- Construction Completion Phase 3 SLR – **September 2026**

Further information alongside the full programme is provided in the Delivery Plan (Annex J)

Roles and Responsibilities

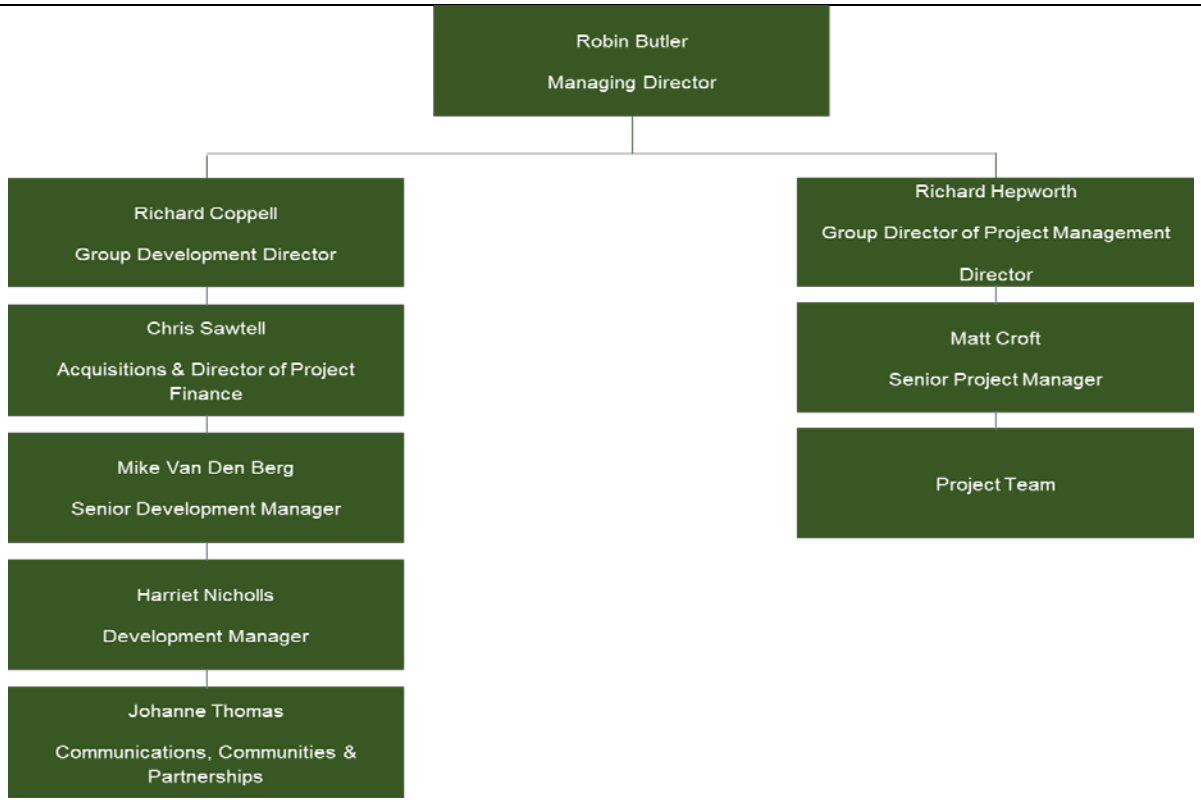
U&C will work with Nottinghamshire County Council (LHA) and NSDC as accountable body. Regular project meetings will maintain overview of identified risks. NSDC and project delivery partners will review and report on a quarterly basis based on the grant offer agreement.

As the Accountable Body, NSDC will withhold funding if the project delivery expectations, defined in the grant agreement are not met within the agreed funding period. As detailed above the SLR will be procured and delivered by U&C, who have a strong track record of large scale infrastructure delivery on strategic urban extension sites.

Internal governance and reporting is linked to monthly reviews of the progress towards key funding milestones, which requires regular and close contact with the U&C team. Milestones for release of monies, linked to the stages of the Outline Delivery Plan, will be agreed. Quarterly returns would then be provided to the agreed Government Department or organisation (it is currently the LEP with respect to existing grant, which will be mirrored with LUF and NSDC grant contributions) to robustly record both progress and spend.

Managing Delivery Partners
The scheme will be managed by Urban and Civic Projects Ltd (UCPL), a company wholly owned by Urban and Civic PLC and employed by the Group Company to deliver project management services across all Urban and Civic PLC developments. The LUF Grant will be managed by NSDC who will monitor all developer activity against agreed milestones and a robust delivery programme.

The below organogram shows the master developer proposed structure for this scheme with further resource being made available from within the team as and when required.



Powers and Consents

NSDC and U&C have been working closely NCC and Highways England (HE) to develop the technical design for Phase 2 & 3.

The technical design approval from Highways England had been obtained though is now required to be re-visited given the passage of time. A time allocation has been included within the programme of which is not anticipated to affect the overall completion date of the project.

The technical and planning framework is largely in place, deliverability is now only a question of funding. In short the remainder of the SLR and associated infrastructure is poised for delivery in the very short term. Work is now continuing to add to the detail to allow construction for the procurement to commence to meet the target start on site date of Q3 2022.

The delivery of the SLR is in an extremely strong position and can commence on site Q3 2022.

6.3b Has a delivery plan been appended to your bid? (Annex J)	☒ Yes ☐ No
6.3c Can you demonstrate ability to begin delivery on the ground in 2021-22?	☒ Yes

	☐ No

6.3e Risk Management: Places are asked to set out a detailed risk assessment which sets out (word limit 500 words not including the risk register):

- the barriers and level of risk to the delivery of your bid
- appropriate and effective arrangements for managing and mitigating these risk
- a clear understanding on roles / responsibilities for risk

A detailed risk assessment has been undertaken and it is summarised in the risk register (Annex K). The key risks to the delivery of the bid alongside mitigation measures are set out in the table below.

Risk	**Mitigation**
LUF Funding - Failure to obtain LUF funding resulting in delays to delivery of SLR	LUF application submitted jointly by all Stakeholders. Discussions ongoing with Homes England and other public sector partners to explore external intervention. NSDC and NCC have pledged further grant (£7m total) to the full delivery of the SLR.
Utilities - Agreement from WPD to 132kvA overhead cables diversion and programme. If updated quotation, cost and programme is not agreed this could result in delays to delivery	WPD proposal obtained. Further dialogue with WPD to commence following submission of LUF application in order to update quotation received in 2017
KP2 / 3 Flood Model - discharge of Conditions 20 (Flood Compensation), 21 (Flood Mitigation and 41 (River Devon Floodplain) outstanding with Environment Agency.	Further dialogue is ongoing with the Environment Agency and formal response to Pre-App received. Consultant Team developing response to be submitted.
Archaeology - Potential for extent of archaeological mitigation to increase	U&C have carried out initial geophysical surveys across the Phase 2 and 3 extent and currently working through the archaeological management plans with NSDC
Planning - delay in discharging pre-commencement conditions	Maintain planning tracker to ensure all pre-commencement and pre-completion documentation is submitted to NSDC in a timely manner. Continue dialogue with planning officers
Highways England / Road Space - Night time working restrictions, total road closures, traffic management design, diversion routes, traffic	Ensure ongoing dialogue early with Highways England to understand wider strategic road network constraints and programme impacts

embargo restrictions. All required for approvals prior to works start date on the A46.	
Cost Risk - Tenders received in Q1 2022 may be in excess of project budget and may require the Project Team to consider value engineering opportunities prior to commencement.	Continue in early contractor engagement to obtain programme and cost advice. Contingency included within Cost Plan to cover elements of cost risk within the project.
Contractor - Single contractor unable to carry out entirety of works due to not being on Highways England approved contractor list	Carry out procurement process with suppliers on Highways England approved supplier list to allow for single contractor appointment and responsibility
Market Volatility - ongoing volatility in construction market in respect of cost and availability of materials and resources may result in either cost increases or programme delays	Continue in early contractor engagement to obtain programme and cost advice. Contingency included within Cost Plan to cover elements of cost risk within the project.

The risk register also provides the owner of each risk.

6.3f Has a risk register been appended to your bid? (Annex K)	☒ Yes ☐ No

6.3g Please evidence your track record and past experience of delivering schemes of a similar scale and type (Limit 250 words)

U&C are a well-established developer recently been acquired by Wellcome Trust. The acquisition consolidated U&C's position as the number one master developer in the UK when their shares were delisted on the 21st of January 2021.

The development of the SLR is a part of a much larger, long term project which at completion will encompasses 2,651 new homes, 2 primary schools, 31 hectares of employment space, 2,900 m.sq of community facilities and 17 acres of sports facilities. Independently of Wellcome Trust, Urban&Civic have a significant portfolio of projects of a similar scale and type of that which the development of the SLR is part of. These are listed below:

- Priors Hall – Northamptonshire
  - 4,320 new homes, 3 primary schools, 1 secondary school, 12.6 acres of employment space, 1 district centre and 2 local centres
  - Status: In delivery
- Houlton - Rugby

- 6,200 homes, 3 primary schools, 1 secondary school, 16 hectares of employment floorspace, 1 district centre, 2 local centres
- Status: In delivery

- Wintringham – St Neots
  - 2,800 homes, 2 primary schools, 63,500 m.sq of employment floorspace
  - Status: In delivery
- Waterbeach Barracks – Cambridgeshire
  - 6,500 new homes, 3 primary schools, 1 secondary school, 24 hectares of formal outdoor space and sports pitches.
  - Status: In delivery
- Manydown – Basingstoke
  - 3,500 new homes, 2 primary schools, 2 local centres
  - Status: In Planning
- Alconbury Weald - Cambridgeshire
  - 6,500 new homes, 3 primary schools, 3 local/district centres, 1 secondary school
  - Status: In delivery

6.3h Assurance: We will require Chief Financial Officer confirmation that adequate assurance systems are in place.

For larger transport projects (between £20m - £50m) please provide evidence of an integrated assurance and approval plan. This should include details around planned health checks or gateway reviews. (Limit 250 words)

NSDC, through the Section 151 Officer, will be accountable for proper use and administration of funding in accordance with MHCLG guidance. Council accounts are subject to annual audit.

The use of funding will be subject to the usual local authority checks and balances – including the financial duties and rules which require councils to act prudently in spending.

Responsibilities include (but not limited to):

- Ensuring the decisions/activities relating to the application of funds conform with legal requirements
- Ensuring that funds are used in accordance with the conditions placed on the grant.
- Ensuring that funds are used appropriately.
- Ensuring decisions at formal meetings are recorded
- Annual independent audit undertaken, instructed by NSDC as the Accountable Body.

As a minimum, agreements between the District Council and the Developer will include:

- Details of the project and outputs to be delivered in a specified timescale
- Arrangements for payment (up front or in arrears, quarterly or other)
- Arrangements to suspend or claw-back funding in the event of non-delivery or

mismanagement
- Monitoring requirements, including metrics and frequency of reporting
- Publicity obligations/arrangements

The agreement will be signed by the Chief Finance Officer of the Developer and by the Section 151 Officer of the District Council.

Assurance will be provided by the submission by the Project Lead of a signed monitoring return to the Section 151 officer. Assurance will mirror the Newark Towns Fund Assurance Framework (June 2021).

6.4 Monitoring and Evaluation

See technical note Section 4 and Table 1 for further guidance.

6.4a Monitoring and Evaluation Plan: Please set out proportionate plans for M&E which should include (1000 word limit):

- Bid level M&E objectives and research questions
- Outline of bid level M&E approach
- Overview of key metrics for M&E (covering inputs, outputs, outcomes and impacts), informed by bid objectives and Theory of Change. Please complete Tabs E and F on the appended excel spreadsheet
- Resourcing and governance arrangements for bid level M&E

Monitoring & Evaluation

NSDC will require, should LUF be successful, a formal Monitoring and Evaluation Plan to be finalised with all project funders. NSDC will retain a Project Sponsor and accountable body role (much like at present with LEP grant for the scheme) and will host and provide regular funder and milestone updates to Homes England, Highways England, the LEP, and NCC.

The monitoring and Evaluation Plan will address the following:

- Scheme build
- Delivered scheme
- Costs
- Scheme objectives
- Travel demand
- Travel times and reliability
- Impacts on the economy
- Carbon impacts

A summary of the measures that will be monitored as defined in the DfT standard measure requirements is displayed in the following table

Measure	Data to be used	Rationale for inclusion	Data collection methods	Frequency of data collection
Scheme build	Quarterly monitoring reports & Programme assessment Risk register	Knowledge - determine whether project management procedures in place were successful.	Minutes from Project Board meetings and site project meetings.	Monthly up to completion of project.
Delivered scheme	End Project Report, Lessons Learned Report and Post-Project Review Plan	Accountability - Assess scheme delivery and identify any changes to the scope and design of original submission.	Discussions with Site Manager and Project Manager for the scheme.	Once – following completion of scheme construction phase.
Costs	Quarterly monitoring reports / audits	Accountability - To identify any variance or risk associated with original project submission	Cost spreadsheets	Quarterly and end of year audits
Impacts on the economy	Data on employment levels, house prices and rental values.	Accountability / Knowledge - To assess whether the scheme has had a positive impact on the local economy.	Planning applications submitted in local area. Rental value estimateS vs actual House price value estimates vs actual	One and five years after scheme opening.
Carbon	Traffic flows and vehicular speeds from key town centre routes. Use of DfT carbon toolkit (WebTAG)	Accountability / Knowledge - To assess impact of scheme on carbon.	Automatic traffic counters and use of Traffic Master (GPS data). Spreadsheet toolkit	Pre and post opening of full scheme.

Evaluation Milestones and Outputs

As is usual practice, reporting of impacts in the Monitoring and Evaluation Plan will take place both 12 months after opening and five years post opening.

One Year After Evaluation Study:
This report will focus on the immediate impacts of the SLR. The report will include:

- A detailed description of the built scheme, with final out-turn scheme costs and identification of any changes (if any) that were made to the scheme after final funding approval was granted.
- Public and stakeholder feedback, including media coverage

- Journey time indicators to see if the new scheme has resulted in an improved reliability and journey times for vehicles, including public transport.
- A ‘snap shot’ of economic performance of the town including house prices, rental rates and employment availability.

Five Year After Evaluation Study:
This report will assess whether there have been long term positive impacts on journey times and the prosperity of the town.

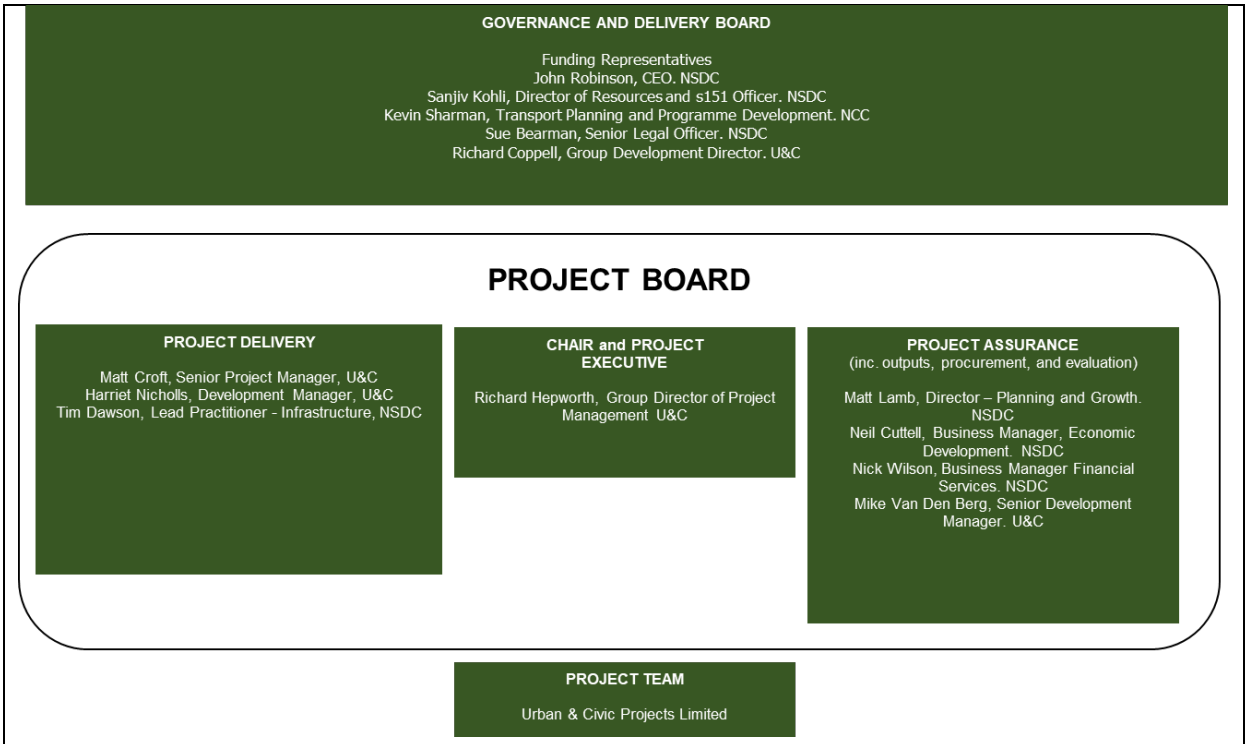
- Evidence from the local planning authority will be collected and used to build up a picture of the level and type of development that has taken place along and in the vicinity of the SLR.
- The study will re-examine any significant issues that were raised at the One Year After Evaluation Study.

Resourcing and Governance

NSDC is well-versed in grant monitoring and propose to do so in accordance with the terms of the grant offer, mirroring Government’s requirements. A new governance structure is proposed for assurance purposes in order to streamline monitoring and approval processes, providing a single process for any change controls, thus simplifying the monitoring process across multiple grant facilities and funders.

The Governance Board will consist of the developer and the public funding bodies. It’s role will be to meet biannually to 1) hold the developer to account for the delivery of a single set of agreed outcomes 2) to approve the use and disbursement of public funding contributions and 3) to consider and agree circumstances in which any recycling of funding is required.

A Delivery Board will meet quarterly. The Delivery Board’s role will be to oversee the project delivery and it is envisaged that it would create such support groups as it finds necessary to ensure the efficient delivery for the scheme including but not limited to groups to coordinate project support (Planning, Highways, Economic Development, Urban and Civic) and project assurance.



In addition to governance pre and post constructing monitoring is proposed as follows:

Stage	Task	Cost
Pre-construction data collection	Pre-scheme monitoring	£5k
Year 1 post opening data collection	Collection of data	£8k
Year 1 report	Production of report and submission to DfT	£5k
Year 5 data collection	Collection of data	£8k
Year 5 report	Production of report and submission to DfT	£5k

PART 7 DECLARATIONS

7.1 Senior Responsible Owner Declaration

As Senior Responsible Owner for Newark Constituency LUF Bid I hereby submit this request for approval to UKG on behalf of NSDC and confirm that I have the necessary authority to do so. I confirm that NSDC will have all the necessary statutory powers and other relevant consents in place to ensure the planned timescales in the application can be realised.

Name: Matt Lamb	Signed: 

7.2 Chief Finance Officer Declaration
As Chief Finance Officer for [*name of organisation*] I declare that the scheme cost estimates quoted in this bid are accurate to the best of my knowledge and that [*name of organisation*] - has allocated sufficient budget to deliver this scheme on the basis of its proposed funding contribution - accepts responsibility for meeting any costs over and above the UKG contribution requested, including potential cost overruns and the underwriting of any funding contributions expected from third parties - accepts responsibility for meeting any ongoing revenue requirements in relation to the scheme - accepts that no further increase in UKG funding will be considered beyond the maximum contribution requested and that no UKG funding will be provided after 2024-25 - confirm that the authority commits to ensure successful bids will deliver value for money or best value. - confirms that the authority has the necessary governance / assurance arrangements in place and that all legal and other statutory obligations and consents will be adhered to.

Name: Sanjiv Kohli	Signed: 

7.3 Data Protection
Please note that the The Ministry of Housing, Communities and Local Government (MHCLG) is a data controller for all Levelling Up Fund related personal data collected with the relevant forms submitted to MHCLG, and the control and processing of Personal Data.

The Department, and its contractors where relevant, may process the Personal Data that it collects from you, and use the information provided as part of the application to the Department for funding from the Levelling Up Fund, as well as in accordance with its privacy policies. For the purposes of assessing your bid the Department may need to share your Personal Data with other Government departments and departments in the Devolved Administrations and by submitting this form you are agreeing to your Personal Data being used in this way.

Any information you provide will be kept securely and destroyed within 7 years of the application process completing.

You can find more information about how the Department deals with your data here.

ANNEXES A-C Excluded as the submission refers to a single bid

ANNEX D - Check List Great Britain Local Authorities

Questions	Y/N	Comments
4.1a Member of Parliament support		
MPs have the option of providing formal written support for one bid which they see as a priority. Have you appended a letter from the MP to support this case?	Y	Letter from Robert Jenrick, Conservative MP for Newark
Part 4.2 Stakeholder Engagement and Support		
Where the bidding local authority does not have responsibility for the delivery of projects, have you appended a letter from the responsible authority or body confirming their support?	Y	Letter from NCC Annex N
Part 4.3 The Case for Investment		
For Transport Bids: Have you provided an Option Assessment Report (OAR)	N	Justification provided in Annex F
Part 6.1 Financial		
Have you appended copies of confirmed match funding?		
The UKG may accept the provision of land from third parties as part of the local contribution towards scheme costs. Please provide evidence in the form of a letter from an independent valuer to verify the true market value of the land. Have you appended a letter to support this case?	N	N/A
Part 6.3 Management		
Has a delivery plan been appended to your bid?	Y	Annex J
Has a letter relating to land acquisition been appended?	N	N/A
Have you attached a copy of your Risk Register?	Y	Annex K

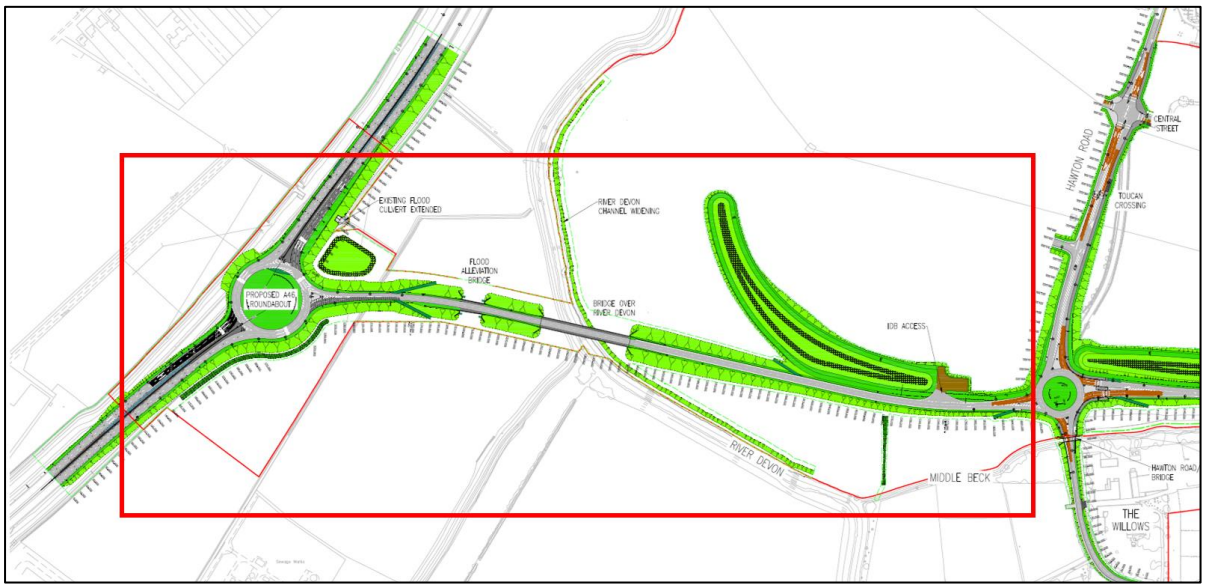
4.3d For Transport Bids: Have you provided an Option Assessment Report (OAR)

Response:

No, an Option Assessment Report (OAR) has not been provided with this submission.

This application relates to funding for the final section of the Newark Southern Link Road (SLR) between Hawton Road and the A46 Trunk Road at Farndon as shown bounded by the red box in **Image 1** below and comprising of approximately 900m of new single carriageway road, a new priority roundabout onto the A46(T), a new bridge over the River Devon and a Flood Alleviation bridge. The alignment of this section of the SLR is essentially straight between Hawton Road and the A46(T) joining the two in the shortest distance possible.

Image 1: Section of the SLR that funding is being sought for



The entire SLR route extends from the A46(T) at Farndon at its western end to the A1(T) at Balderton at its eastern end, with intermediate at-grade junctions with Hawton Road, Bowbridge Lane and Staple Lane. The concept of the SLR was initially established through the Newark and Sherwood DC Local Plan process in 2010. The SLR was identified as strategic highway infrastructure required to facilitate new residential and commercial development to the south of the town. The SLR is fundamentally a development access road that also helps to alleviate existing and forecast traffic congestion within the town by providing an alternative route, thereby reducing the need for traffic to pass through the town. outline planning permission (10/01586/OUTM) was granted for the SLR in November 2011 as part of a development comprising up to 3,150 dwellings, two local centres, two primary schools, multi-use community buildings including a medical centre and a mixed-use commercial estate comprising 50 hectares of employment uses (class B1, B2 and B8). Full planning permission was granted for the SLR in September 2016 (16/01199/FUL). Technical approval for the SLR has subsequently been granted, subject to a design check and update to the A46(T) roundabout design to reflect recent changes to highway design standards, and subject to agreement with Nottinghamshire County Council on the details of the eastern roundabout junction onto the B6326. Work to resolve the final outstanding aspects of the technical approval process will be undertaken in parallel with construction of the final stage of the SLR and is not a critical path issue that will delay its delivery.

An Option Assessment Report (OAR) therefore does not exist for the SLR because the scheme has evolved through the planning process and forms part of an extant planning permission for significant new residential and commercial development to the south of Newark. The section of the SLR that this funding bid relates to will be delivered in accordance with the extant planning permission and there is therefore no requirement to consider alternative options.

Appraisal Summary Table

Date produced:	15th June 2021

Contact:	
Name	
Organisation	Tetra Tech
Role	Promoter/Official

Name of scheme:	Newark Southern Link Road Levelling Up Fund Bid
Description of scheme:	Construction of the western section of the Newark Southern Link Road, which will provide a link between Hawton Road and the A46.

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Journey time savings accrue to users due to reduced journey times. Journey time savings and vehicle operating costs have been assessed using TUBA software over a sixty year appraisal.	Value of journey time changes(£): £ 29,713,000 Net journey time changes (£) 0 to 2min: £ 10,934,000 / 2 to 5min: £ 14,657,000 / > 5min: £ 4,125,000		£ 35,742,000	
	Reliability impact on Business users	Not assessed				
	Regeneration	Not assessed				
	Wider Impacts	Land Value Uplift as well as Wider Land Value Uplifts (residential and comercial) have been assessed.	Land Value Uplift is anticipated as the SLR will unlock the development of residential units in Middlebeck. Therefore, the land value uplift is the result of land use change from agriculture to residential and commercial, which are considered as more productive use.		£ 59,807,987	
Environmental	Noise	Not Assessed				
	Air Quality	The Southern Link Road is expected have a positive impact in the reduction of exposure to pollutants across the road network in Newark-on-Trent. Whilst there will be some areas which are predicted to have an minor adverse effect on air quality, such as the areas surrounding the Southern Link Road, and the A46 (where there is less residential exposure) this is balanced by the benefits along the town center and arterial routes where there is more residential exposure. This reduction in exposure to pollutants will have both health and related financial benefits.	The 2033 assessment of the effect of emissions from traffic associated with the scheme, has determined that the maximum predicted increase in the annual average exposure to NO2 at any existing receptor is likely to be 0.46 µg/m3 at 76 Beacon Hill Road (R23). The predicted long-term NO2 concentrations at all existing receptors are well below 60 µg/m3 in all scenarios. Therefore, it is unlikely there will be any exceedances for the short-term NO2 AQO at all existing receptors as outlined in LAQM TG16 technical guidance. For PM10, the maximum predicted increase in the annual average exposure is likely to be 0.27 µg/m3 at 76 Beacon Hill Road (R23). For PM2.5, the maximum predicted increase in the annual average exposure is likely to be 0.15 µg/m3 at 76 Beacon Hill Road (R23).	The impact description of the effects of changes in traffic flow as a result of the Southern Link Road, with respect to NO2, PM10 and PM2.5 exposure, is determined to range from a 'negligible increase' to a 'negligible decrease' at all existing receptors.		
	Greenhouse gases	From TUBA. The scheme will result in a reduction of nearly 32,000 tonnes of CO2 over a sixty year appraisal. This is due to a more efficient routing in Newark due to the completed Southern Link Road.	Change in non-traded carbon over 60y (CO2e): -31,739 tonnes Change in traded carbon over 60y (CO2e): -11 tonnes		£ 1,381,000	
	Landscape	Not assessed				
	Townscape	Not assessed				
	Historic Environment	Not assessed				
	Biodiversity	Not assessed				
	Water Environment	Not assessed				
Social	Commuting and Other users	Journey time savings accrue to users due to reduced journey times. Journey time savings and vehicle operating costs have been assessed using TUBA software over a sixty year appraisal.	Value of journey time changes(£): £ 45,942,000 Net journey time changes (£) 0 to 2min: £ 15,383,000 / 2 to 5min: £ 23,980,000 / > 5min: £ 6,579,000		£ 47,660,000	
	Reliability impact on Commuting and Other users	Not assessed				
	Physical activity	Not assessed				
	Journey quality	Not assessed				
	Accidents	Not assessed				
	Security	Not assessed				
	Access to services	Not assessed				
	Affordability	Not assessed				
	Severance	Not assessed				
	Option and non-use values	Not assessed				
Public Accounts	Cost to Broad Transport Budget	The scheme will require public capital investment for construction. Local government funding contributions (LEP and NSDC), and private sector funding (developers) will be available to part fund the overall cost of the scheme.	LUF cost / funding: £ 15,944,673.70 LEP and NSDC co-funding : (not included in TUBA) £ 8,360,905.32		£ 24,305,579	
	Indirect Tax Revenues	The scheme will result in a decrease in indirect tax revenue over the life of the scheme. This is due to a decrease in fuel consumption with the scheme in place, caused by changes in the distance and speeds travelled by vehicles.			£ 2,844,000	

Newark South – Levelling Up Fund Delivery Plan (SLR)

Urban&Civic

NEWARK & SHERWOOD DISTRICT COUNCIL

Nottinghamshire County Council

SLR Delivery Plan

Summary of Levelling Up Fund Application

LUF of £20 million is sought for the completion of the Southern Link Road (SLR) connecting the A46 at Farndon to the A1 at Balderton. The SLR is critical to delivery of the Land South Strategic Urban Extension (SUE) known as Middlebeck, one of three SUEs around Newark.

The site master developer is Urban&Civic (U&C). The site is c280 hectares in size and outline consent has been granted for the construction of up to 3,150 dwellings; two local centres including retail and commercial premises, a 60 bed care home, a primary school, day nurseries/crèches, multi-use community buildings including a medical centre; and a mixed use commercial estate of up to 50 hectares comprising up to 2million sq.ft of employment space (Class B1, B2 and B8).

Phase 1 of the SLR is substantively complete and has unlocked, with the assistance of previous Homes England (HE) loan support, 600 homes, a new primary school and open space.

The remaining SLR has been substantively designed and costed, with a funding gap the principal barrier to delivery.

The costs of the remainder of the SLR cannot be supported by the development without substantial additional public grant, alongside private match from the master developer, U&C.

U&C

Summary of Levelling Up Fund Application

A significant proportion of the Phase 1 infrastructure has been delivered to date by way of strategic procurement of the SLR Phase 1, completion of key roads forming Phase 1, drainage installation and utility connections.

Four housebuilders are currently delivering dwellings on site with a total of 542 dwellings consented and in delivery with 278 occupations at June 2021.

Phase 1 of the Primary School will open in September 2021 along with the completion of key areas of green infrastructure and play areas.

Phase 1 will continue in its delivery for the forthcoming years with delivery of a 66 bed Care Home (planning application submitted) and further dwellings.

Community Engagement and Local Partnerships are key to U&C and a strong community has been formed at Middlebeck.

The above demonstrates the level of investment already committed by U&C, which will continue into further phases of delivery, subject to delivery of the SLR.

Middlebeck - Phase 1

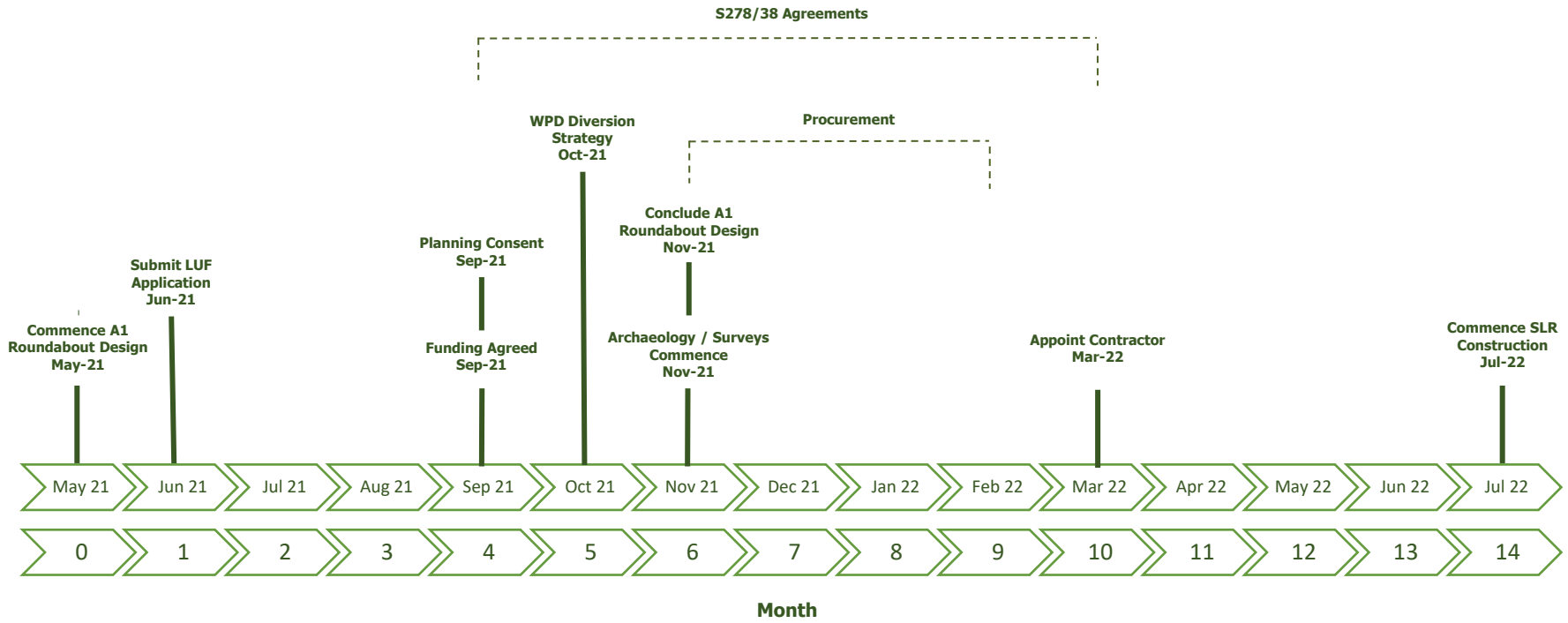
Milestones

Middlebeck, Newark – Phase 2 & 3 SLR Pre-Contract Programme

The following slides set out the programme for delivery of the SLR with the following key assumptions:

- LUF Application Submitted – June 2021
- LUF Application Outcome – September 2021
- Commence with A1 Roundabout Technical Design – May 2021
- A1 Roundabout Technical Design Submission – November 2021
- A46 Design Review – November 2021
- Archaeological Investigations – November 2021 – June 2022
- Contractor Procurement – November 2021 – February 2022
- Contractor Appointment – March 2022
- Construction Commencement – July 2022
- Construction Completion (Phase 2 SLR) – **March 2024 (LUF funding expended)**
- Housebuilding Commencement – June 2023
- First Residential Occupations (Phase 2) – March 2024
- Construction Completion (Phase 3 SLR) – Q3 2026

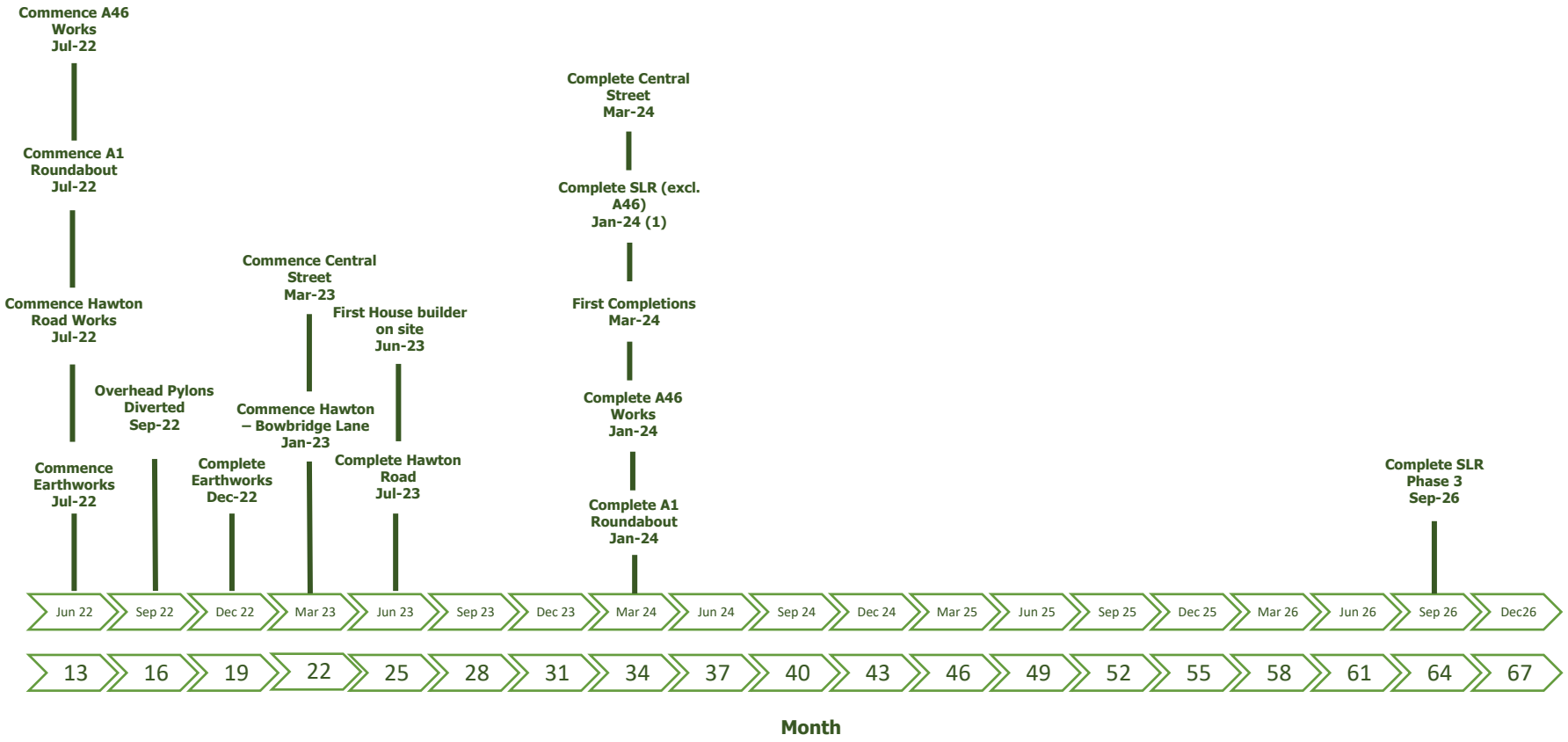
Phase 2 & 3 SLR Pre-Contract Programme



Phase 2 & 3 SLR – High Level Programme assuming September 2021

Updated June 2021

Phase 2 & 3 SLR Post-Contract Programme



Phase 2 & 3 SLR – High Level Programme assuming September 2021

Updated June 2021

Newark South - Phase 2 & 3 SLR (Assuming Funding Q3 2021)

Urban&Civic plc

ID	Task Name	Responsible	Duration	Start	Finish
1	**Funding**		**0 wks**	**Fri 24/09/21**	**Fri 24/09/21**
2	Milestone - Funding Granted	Homes England	0 wks	Fri 24/09/21	Fri 24/09/21
3	**Planning**				
4	Flood Risk Assessment - Approval	EA	19 wks	Mon 05/04/21	Fri 13/08/21
5	RMA - Hawton Road	NSDC	6 wks	Mon 16/08/21	Fri 24/09/21
6	FPA - Hawton Road Dry Access	NSDC	6 wks	Mon 16/08/21	Fri 24/09/21
7	NMA - P2/3 Southern Link Road	NSDC	6 wks	Mon 16/08/21	Fri 24/09/21
8	Milestone - Planning Consent	NSDC	0 wks	Fri 24/09/21	Fri 24/09/21
9	**Legal**				
10	S6 Agreement	Gowlings	26 wks	Mon 27/09/21	Fri 25/03/22
11	S278/38 Agreement	Gowlings	26 wks	Mon 27/09/21	Fri 25/03/22
12	**Surveys**				
13	**Archaeology**		**32 wks**	**Mon 27/09/21**	**Fri 06/05/22**
14	Agree WSI's	U&C / NSDC	6 wks	Mon 27/09/21	Fri 05/11/21
15	Archaeological Investigations	OA	26 wks	Mon 08/11/21	Fri 06/05/22
16	**Geo-Environmental**		**8 wks**	**Mon 25/10/21**	**Fri 17/12/21**
17	Geo-Environmental Works & Report	Shadbolt	8 wks	Mon 25/10/21	Fri 17/12/21
18	**Ecology**		**36 wks**	**Mon 25/10/21**	**Fri 01/07/22**
19	Update Ecology Surveys	Watermans	8 wks	Mon 25/10/21	Fri 17/12/21
20	Update Badger Survey	Watermans	4 wks	Mon 25/10/21	Fri 19/11/21
21	Agree Badger Sett Location	Watermans	8 wks	Mon 22/11/21	Fri 14/01/22
22	Sett Monitoring	Watermans	10 wks	Mon 22/11/21	Fri 28/01/22
23	Badger Licence Application	Watermans	8 wks	Mon 17/01/22	Fri 11/03/22
24	Badger Licence Approval	Watermans	4 wks	Mon 14/03/22	Fri 08/04/22
25	Creating of new Setts	Watermans	8 wks	Mon 11/04/22	Fri 03/06/22
26	Sett Closure	Watermans	4 wks	Mon 06/06/22	Fri 01/07/22
27	**Vegetation Clearance**		**12 wks**	**Mon 27/09/21**	**Fri 17/12/21**
28	Vegetation Clearance	TBC	12 wks	Mon 27/09/21	Fri 17/12/21
29	**Procurement (Single Stage D&B)**				
30	Prepare Tender Documents	U&C	6 wks	Mon 27/09/21	Fri 05/11/21
31	Issue Tender Documents	U&C	0 wks	Fri 05/11/21	Fri 05/11/21
32	Tender Period	U&C	10 wks	Mon 08/11/21	Fri 14/01/22
33	Tender Returns	U&C	0 wks	Fri 14/01/22	Fri 14/01/22
34	Milestone - Tender Analysis & Recommendation	U&C	4 wks	Mon 17/01/22	Fri 11/02/22
35	Contract Execution - Advanced Works / PCSA	U&C	4 wks	Mon 14/02/22	Fri 11/03/22
36	Contract Execution - Construction Works	M&R	4 wks	Tue 10/05/22	Mon 06/06/22
37	Milestone - Contract Execution	M&R	0 wks	Mon 06/06/22	Mon 06/06/22
38	**Consents / Agreements**				
39	Flood Defence Consents	Contractor	10 wks	Mon 14/03/22	Fri 20/05/22
40	Environmental Permits	Contractor	10 wks	Mon 14/03/22	Fri 20/05/22
41	Develop Highways England Series 1000	Contractor	10 wks	Mon 14/03/22	Fri 20/05/22
42	Agree Programme / Methodology with HE	Contractor	10 wks	Mon 14/03/22	Fri 20/05/22
43	**Design**		**39 wks**	**Mon 17/05/21**	**Fri 11/02/22**
44	A1 Roundabout Design	SLR	26 wks	Mon 17/05/21	Fri 12/11/21
45	A1 Roundabout - Technical Approvals	SLR / NCC	12 wks	Mon 15/11/21	Fri 04/02/22
46	OPA Engagement / Agreement	U&C / CLH	26 wks	Mon 17/05/21	Fri 12/11/21
47	A1 Roundabout - S278/38 Agreement	U&C / NCC	12 wks	Mon 15/11/21	Fri 04/02/22
48	A46 Design Review	SLR	9 wks	Mon 17/05/21	Fri 16/07/21
49	A46 Design Updates (if required)	SLR / HE	16 wks	Mon 19/07/21	Fri 05/11/21
50	HE Approval (if required)	HE	14 wks	Mon 08/11/21	Fri 11/02/22
51	**Construction**				
52	Mobilisation	TBC	4 wks	Tue 07/06/22	Mon 04/07/22
53	Milestone - Start on Site	TBC	0 wks	Tue 05/07/22	Tue 05/07/22
54	Bulk Earthworks	TBC	26 wks	Tue 05/07/22	Mon 02/01/23
55	Hawton Road - Construction	TBC	52 wks	Tue 05/07/22	Mon 03/07/23
56	Phase 2 SLR - Construction	TBC	52 wks	Tue 09/09/25	Mon 07/09/26
57	A1 Roundabout - Construction (Earliest Start on Site)	TBC	78 wks	Tue 05/07/22	Mon 01/01/24
58	A46 Roundabout - Construction	TBC	78 wks	Mon 11/07/22	Fri 05/01/24
59	Milestone - Construction Completion	TBC	0 wks	Mon 01/01/24	Mon 01/01/24
60	**Utility Diversions**				
61	Agree 132 KvA Cable Strategy	WPD	4 wks	Mon 27/09/21	Fri 22/10/21
62	132 kvA Diversions - Accept WPD Proposal	U&C	0 wks	Fri 22/10/21	Fri 22/10/21
63	132 KvA Diversions (Minimum 9 Months Lead In)	WPD	39 wks	Mon 25/10/21	Fri 22/07/22
64	132 KvA Diversions (Diversion Works)	WPD	8 wks	Mon 25/07/22	Fri 16/09/22
65	33 KvA Diversions	WPD	16 wks	Wed 06/07/22	Tue 25/10/22
66	Gas Diversions	Cadent	16 wks	Wed 06/07/22	Tue 25/10/22
67	Water Diversions	STW	16 wks	Wed 06/07/22	Tue 25/10/22
68	BT Diversions	BT	16 wks	Wed 06/07/22	Tue 25/10/22
69	**Housing Delivery**		**69.2 wks**	**Tue 03/01/23**	**Tue 30/04/24**
70	Development Plot Works	U&C	24 wks	Tue 03/01/23	Mon 19/06/23
71	Milestone - Housing Delivery Commence	TBC	0 wks	Tue 20/06/23	Tue 20/06/23
72	First Occupations	TBC	0 wks	Tue 30/04/24	Tue 30/04/24
73					

Roles and Responsibilities

Roles and Responsibilities

U&C will work with the local highway authority, Nottinghamshire County Council and Newark and Sherwood District Council to prepare and submit to the DfT a Monitoring and Evaluation Plan using the DfT guidance for 'standard monitoring'. This will set out an appropriate level of monitoring and evaluation arrangements in order that the DfT can access whether the investment has provided value for money and whether the scheme, once operational, has met its objectives.

Regular project meetings will maintain overview of identified risks. NSDC and project delivery partners will review and report on a quarterly basis based on the grant offer agreement.

As the Accountable Body, NSDC will withhold funding if the project delivery expectations, defined in the grant agreement are not met within the agreed funding period.

As detailed above the SLR will be procured and delivered by U&C, who have a strong track record of large scale infrastructure delivery on strategic urban extension sites.

Internal governance and reporting is linked to monthly reviews of the progress towards key funding milestones, which requires regular and close contact with the U&C team. Milestones for release of monies, linked to the stages of the Outline Delivery Plan, will be agreed. Quarterly returns would then be provided to the agreed Government Department or organisation (it is currently the LEP with respect to existing grant) to robustly record both progress and spend.

A governance structure will be established to aid in the successful delivery of the project and outcomes, of which is identified on the following slides.

Roles and Responsibilities

As a landowner, promoter and master developer U&C understand the importance of good project management to facilitate successful delivery. U&C own or have the stewardship of over 11,050 acres of land and 33,000 consented and submitted homes across the country. They have the industry expertise and stature to deliver large scale urban extensions and new housing conurbations. Their business model focuses on large infrastructure delivery and placemaking to create new communities. At the heart of what they do is working partnerships with all stakeholders to provide a quality platform for our housebuilding partners.

U&C take a rigorous approach to infrastructure procurement through a competitive framework and detailed competition. U&C are able to use their considerable experience with large scale infrastructure projects to ensure that they work with the best delivery partners and achieve excellent value for money. U&C proactively encourage SME engagement, apprenticeships and use of local labour within infrastructure delivery. This may be through direct procurement or contractual clauses for second and third team supply chain members.

The working processes of the core project team have evolved over time through experience of projects with the same scale and parameters to be found at Newark. The U&C core delivery team is outlined on the following page.

Governance Structure

GOVERNANCE AND DELIVERY BOARD

Funding Representatives
John Robinson, CEO. NSDC
Sanjiv Kohli, Director of Resources and s151 Officer. NSDC
Kevin Sharman, Transport Planning and Programme Development. NCC
Sue Bearman, Senior Legal Officer. NSDC
Richard Coppell, Group Development Director. U&C

PROJECT BOARD

PROJECT DELIVERY

Matt Croft, Senior Project Manager, U&C
Harriet Nicholls, Development Manager, U&C
Tim Dawson, Lead Practitioner - Infrastructure, NSDC

CHAIR and PROJECT EXECUTIVE

Richard Hepworth, Group Director of Project Management U&C

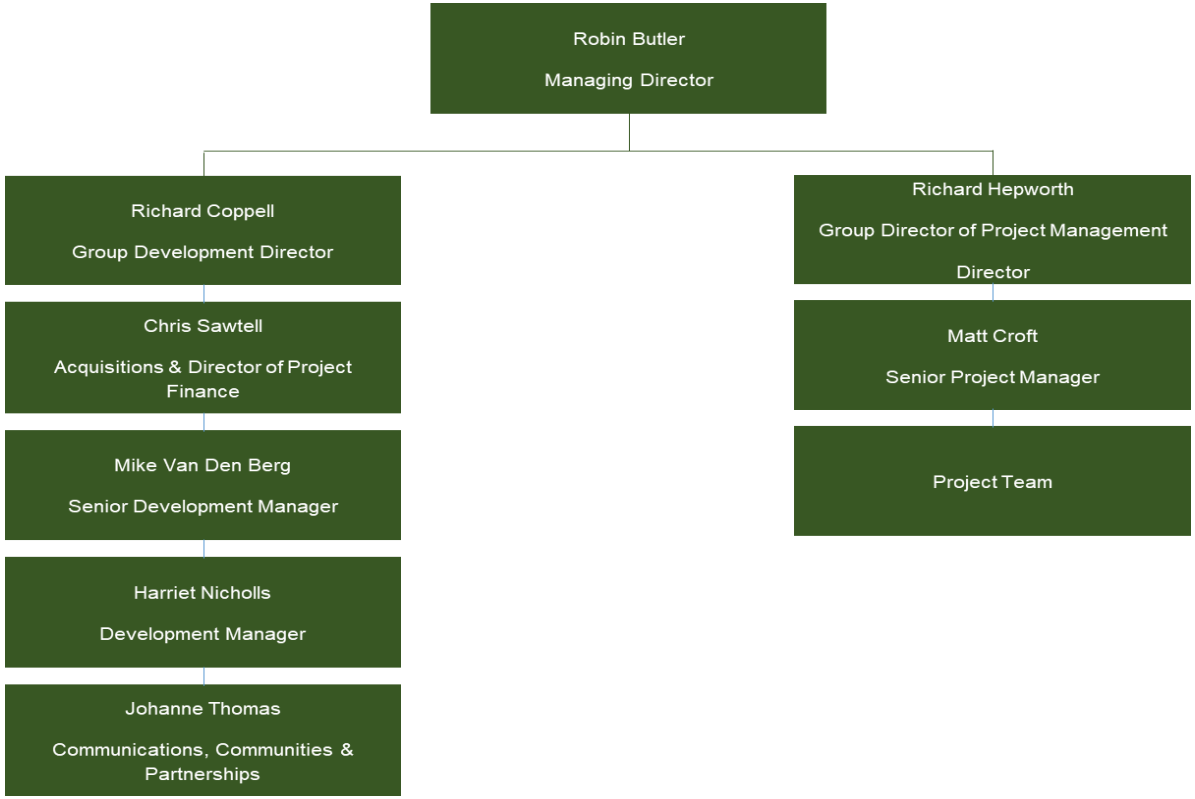
PROJECT ASSURANCE
(inc. outputs, procurement, and evaluation)

Matt Lamb, Director – Planning and Growth. NSDC
Neil Cuttell, Business Manager, Economic Development. NSDC
Nick Wilson, Business Manager Financial Services. NSDC
Mike Van Den Berg, Senior Development Manager. U&C

PROJECT TEAM

Urban & Civic Projects Limited

Roles and Responsibilities



Confirmation of powers or consents

Confirmation of powers or consents

Newark and Sherwood District Council (NSDC) with Urban & Civic (U&C) have been working closely alongside Nottinghamshire County Council (NCC) and Highways England (HE) to develop the technical design for Phase 2 & 3 since March 2016 and have achieved full Technical Approval from NCC.

The technical design approval from Highways England had been obtained though is now required to be re-visited given the passage of time. A time allocation has been included within the programme for this although this will not affect overall completion date of the project.

The technical and planning framework is largely in place, deliverability is now only a question of funding. In short the remainder of the SLR and associated infrastructure is poised for delivery in the very short term. Work is now continuing to add to the detail to allow construction for the procurement to commence to meet the target start on site date of Q3 2022.

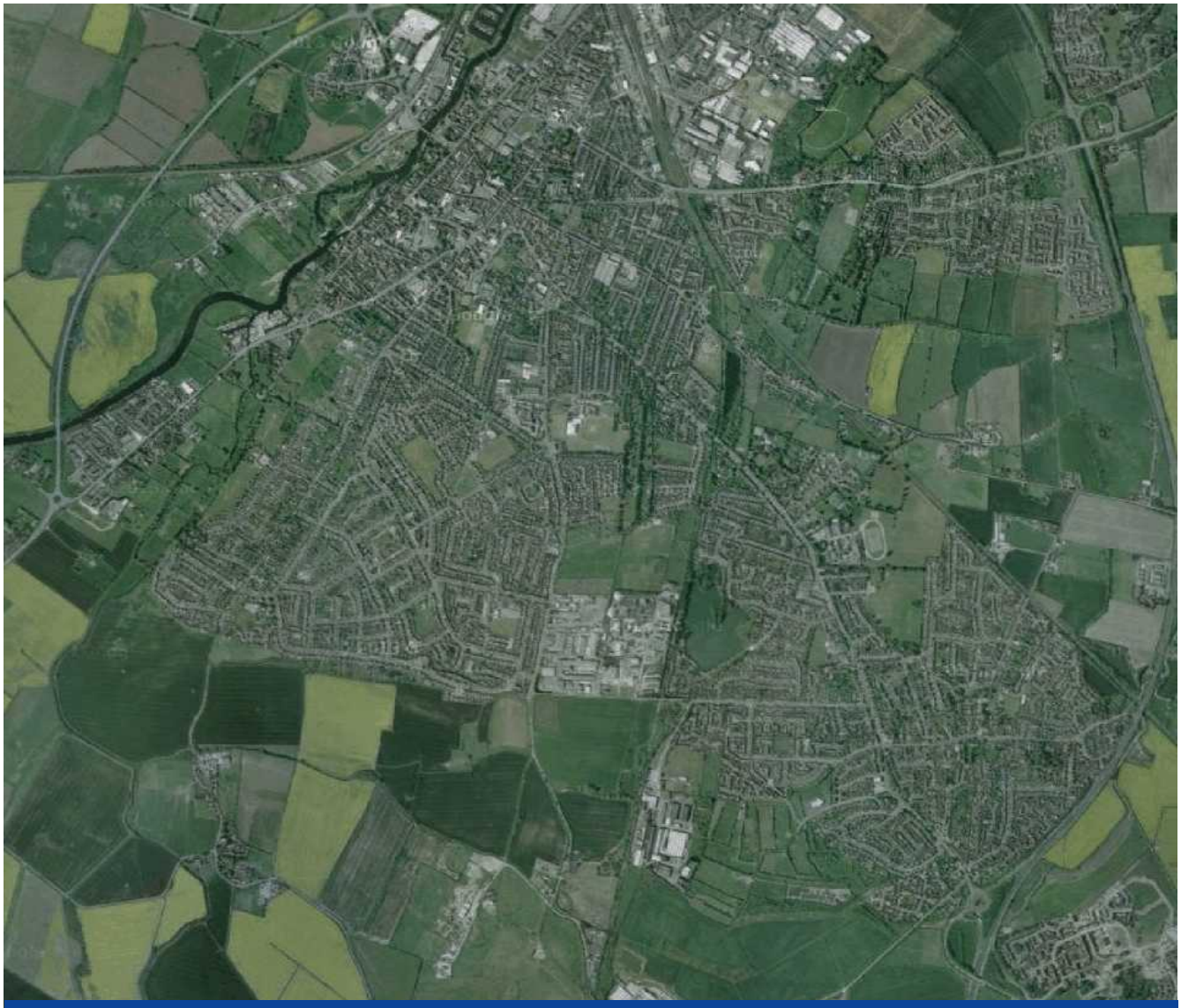
The delivery of the SLR is in an extremely strong position and can commence on site Q3 2022.

List of powers or consents

List of powers or consents

Power or Consent Required	Reference	Status
Outline Planning Consent	14/01978/OUTM	✓
Highways Technical Approval – Nottinghamshire County Council	VIA/NSB/HW01020	✓
Highways Technical Approval – Highways England (*)	N/A	×
Detailed Planning Permission (Highways)	14/01978/OUTM	✓
S106 Agreement	14/01978/OUTM	✓

(*) Although already technically approved a further A46 Technical Submission is required to be submitted to Highways England again as DMRB Standards have been revised.



UNITED BY OUR DIFFERENCE

WSP

NEWARK SOUTHERN LINK ROAD

STRATEGIC AND ECONOMIC CASE

11/02/2015

Quality Management

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks	Draft	Final		
Date		13/02/215		
Prepared by	S Purohit / S Tearle	S Purohit / S Tearle		
Signature				
Checked by	M Clements	M Clements		
Signature				
Authorised by	S Statham	S Statham		
Signature				
Project number	70009916	70009916		
Report number	01	02		
File reference	P:\70009916 - Newark Southern Link Road\C Documents\Reports\70009916 Newark Southern Link Road.docx			

NEWARK SOUTHERN LINK ROAD

STRATEGIC AND ECONOMIC CASE

11/02/2015

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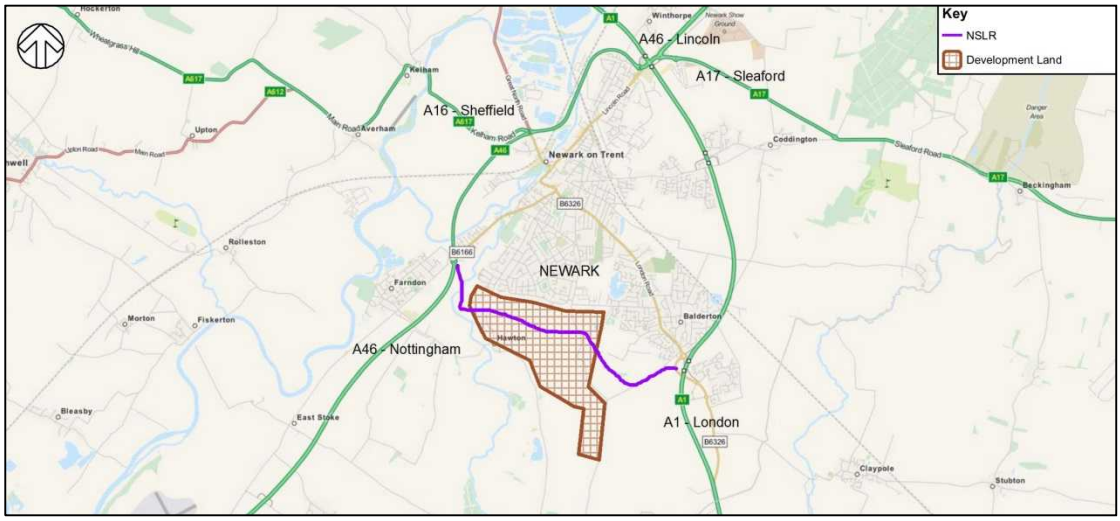
Table of Contents

1 Strategic Case

1.1 Scheme Context

1.1.1 Newark is a market town in Nottinghamshire. The 2011 Census data recorded a population of 37,084. It is served by the A1 and the A46. It is situated 22 miles (40mins) north east of Nottingham, 18 miles (30mins) south west of Lincoln and 19 miles (37mins) east of Mansfield. Newark comes under the authority of the Newark and Sherwood District Council.



1.1.2 The ‘Newark and Sherwood Local Development Framework: Core Strategy’ published in March 2011, ‘identifies Newark as a Sub-Regional Centre and reaffirms its status as a Growth Point. The LDF proposes that the Newark Urban Area will have significant levels of growth with 70% of the overall District housing growth and the majority of the Newark Area's employment land requirement, between 80 to 87 hectares, to be provided during the plan period.’

1.1.3 Newark has been earmarked for significant development in the southern area of the town. A precursor to this development is a scheme to develop and construct the Southern Link Road, linking the A1 to the A46. This will provide the main transport access route through the new earmarked development site.

1.1.4 Outline planning permission has been granted to Catesby Estates (Residential) Ltd to build up to 3,150 dwellings; a 60 bed residential care home; two local centres including retail and commercial premises; 2 primary school education facilities; a medical centre and a mixed use commercial estate of up to 50 hectares. This includes permission to construct the Southern Link Road to provide vehicular, pedestrian and cyclist access to the development site.

1.1.5 In short, the current highway network is insufficient to manage the targeted growth and redevelopment at the Newark Growth Point. Without the construction of the Newark Southern Link Road, the permitted and comprehensive development of mixed uses will be undeliverable.

1.2 Identified problems and objectives of the option

1.2.1 This section will highlight the problems in the delivery of the Newark Southern Link Road (NSLR) and also states its objectives.

1.2.2 Without the NSRL there will be:

- No access for vehicles, pedestrians and cyclists to the development.
- Insufficient highway capacity to mitigate the full growth of the development.

1.2.3 These insufficiencies in access and mitigation measures will cause major issues for the delivery of the development.

1.2.4 In order to resolve the identified problems, the NSLR primary objectives are:

- To facilitate access to the development for vehicles, pedestrians and cyclists.
- To provide mitigate the impact of the Land South of Newark (LSN) development.

1.2.5 The planned link road will join the A1 to the A46, forming a single carriageway highway, which the allocated development land surrounds. The NSLR will provide access and mitigation for the development, and thus enabling the development to be achieved.

1.3 Scale of impact

1.3.1 Without the NSLR, the planned development would not be accommodated as the full impacts of the development cannot be mitigated.

1.3.2 The consequence of the NSLR not being constructed will have severe impacts on the development and the targets for the Newark and Sherwood Core Strategy, being:

- No access to the development site, thus making the development undeliverable.
- Targets set in the Newark and Sherwood Core Strategy to provide 70% of overall district housing growth and 80-87 hectares of employment land (including the southern growth point) will not be achieved.

1.3.3 As there are 3,150 dwellings and 50 hectares of employment land, the NSLR will provide the appropriate highway access infrastructure to a significant proportion of the planned growth, the delivery of which would be put in doubt without the provision of the NSLR.

1.3.4 The NSLR will fully addresses the identified problem with any undesirable consequences mitigated appropriately.

1.4 Fit with wider transport and government objectives

1.4.1 The HM Treasury published their *Plan for Growth 2011* in which it plans to put the UK on a path to sustainable, long-term economic growth. A key objective set was to invest in infrastructure. This supportive attitude towards infrastructure investment for economic gains fits with the objectives of the NSLR as there will be a much improved accessibility and mitigation for the planned development which will drive economic growth.

1.4.2 Chapter 4 of the Nottinghamshire Local Transport Plan 2011-2026 outlines their strategy, which is to 'provide a reliable, resilient transport system which supports a thriving economy and growth'. Below are the three relevant strategy objectives, and how the NSLR integrates with them:

1) Making best use of our existing transport networks

The A1 and A46 are the main highway arteries into Newark. The addition of the NSLR will add resilience to the existing network. E.g. If there is a collision on the A1 then the NSLR provides a diversion route to the A46.

2) **Transport's role in regeneration initiatives**

Whilst not located in a regeneration area, it will provide access for vehicles, pedestrians and cyclists to the growth point area destinations. It will enable the delivery of the entire consented development and the associated economic activity.

3) **Improving connectivity to inter-urban, regional and international networks, primarily by public transport**

The NSLR will mitigate the impacts of the development on the highway network and as a result will maintain the level of connectivity with the inter-urban and regional networks by public transport.

1.4.3 This has demonstrated the NSLR satisfies or compliments these three Local Transport Plan objectives.

1.4.4 The *Core Strategy* states its Newark area objective (NA O1) 'to manage growth in and around Newark Urban Area (Newark, Balderton and Fernwood) and ensure that housing and employment growth are developed alongside appropriate infrastructure and facilities'. Housing and employment targets for the Newark Growth Point have been outlined in the Core Strategy as follows:

- Housing: 70% of the overall district housing has been assigned to the Growth Point.
- Employment land: 80 to 87 hectares are to be provided in the planned period.

1.4.5 As there are 3,150 dwellings and 50 hectares of employment land, the NSLR will provide the appropriate highway access infrastructure to a significant proportion of the planned growth.

1.4.6 In accordance with EAST guidance, the NSLR fits very well / complements other policies affecting Newark, and will help to deliver the *Newark and Sherwood Core Strategy.*

1.5 Key uncertainties

1.5.1 The usual uncertainties surrounding a link road proposal have been addressed and are outlined below:

- Outline planning permission has been granted to all of the land uses including the NSLR.
- The land in which the link road will be built is in control of the developer, removing the any need for compulsory purchase orders.
- Detailed design is nearing completion and there is a full understanding of utilities required.

1.5.2 The only uncertainty that remains is:

- If the wider economy is to downturn then the planned development may be stalled.

1.6 Degree of consensus over outcomes

1.6.1 The proposal has been subject to consultation through the planning application process and a consensus on the outcomes agreed. Through this process there has been consultation

with the public, statutory stakeholders, and Nottinghamshire County Council (NCC) as the highway authority. All the stakeholders have come to the consensus that the delivery of the development including the NSLR can be accommodate and is acceptable subject to various planning conditions that are attached the granted Outline Planning Permission.

2 Economic Case

2.1 Introduction

2.1.1 As set out in the Strategic Case the main objectives of the NSLR is to provide access to and mitigate the impacts of the Land South of Newark (LSN) development. The economic case will take into consideration TAG Unit A2.3 Transport Appraisal in the Context of Dependent Development and follow the principles of the four steps to determine the economic case for public investment in the NSLR:

- Step 1: Determine the quantity of new housing that should be regarded as dependent on a transport scheme.
- Step 2: Identify the minimum transport scheme required to restore a reasonable level of service
- Step 3: Assess the transport user benefit of the scheme in isolation (without the proposed development)
- Step 4: Assess the benefits of the dependent housing development assuming the transport scheme is provided.

2.1.2 The structure of the Economic Case will be in line with the assessment Steps.

2.2 Step 1

2.2.1 The Transport Assessment (TA) associated with the planning application undertook detailed analysis of key junctions which was audited and accepted by NCC as the highway authority and Highways Agency (HA) to be acceptable subject to conditions being attached the planning approval.

2.2.2 On the 20th January 2015 Special Planning Committee changed the conditions associated with the planning application of the site; in relation to the NSLR the condition was set for it to be finished by the completion of the **1,250th housing unit**. The committee report highlighted that this had been tested and modelled as part of the Transport Assessment (TA) and this indicated that road network would be able to cope with this level of completion. In other words that the TA had demonstrated the highway network could operate to a reasonable level of service with the delivery of 1250 houses.

2.2.3 As a result based on the evidence set out in the Transport Assessment and Planning Committee Report it is considered that the level of development that is reliant on the provision of the NSLR totals 1900 housing units (3150 houses minus 1250 houses).

2.3 Step 2

2.3.1 As part of this step of the assessment the appropriate transport scheme needs to be identified.

2.3.2 As set out in the strategic case the key objective of the NSLR is to enable vehicular access to the development site. In this context the NSLR objective of mitigating the impact of the development site is consequential to the provision of access.

2.3.3 The Transport Assessment associated with LSN assessed the impact so the NSLR in detail, this TA was audited and scrutinised by NCC and the HA as the respective highway

authorities. NCC and the HA recommended the application for approval subject to various conditions which includes the provision of the NSLR. As a result both the local and strategic Highway Authorities agree that the NSLR is an appropriate transport scheme to ensure a reasonable level of service on the road network with the full development in place based on the analysis contained within the TA.

2.4 Step 3

2.4.1 At this stage the benefit of the transport scheme in isolation needs to be assessed in consideration of TAG Unit A2.3. In line with the TAG Unit this means analysing the following scenarios:

- Without the dependent housing and without the NSLR; and
- Without the dependent housing and with the NSLR

2.4.2 These development scenarios have been modelled by White Young Green (WYG) in a recently validated diversion of the Newark-on-Trent VISUM model. A cordon of this network has been extracted to ensure that the assessment is based on the impacts of the development and the scheme is locally assessed. All the scenarios include all other committed developments and transport schemes. The model has only been constructed for AM and PM peak hours; therefore the BCR produced is a peak period BCR and does not include any benefits accrued outside of these time periods.

2.4.3 As the scheme is a new link road and not installing signalised junctions the impact of this is to limit to benefits generated, increasing the robustness of the BCR.

General Assumptions

2.4.4 The general assumptions that have been used in the assessment are set out below:

- All costs and benefits have been deflated to 2010 prices and discounted over a 60 year appraisal period, 3.5% for the first 30 years and 3.0% thereafter unless otherwise stated;
- Although the scheme is through the detailed design stage and there is a high level of certainty of key areas such land, planning and statutory power requirements, Optimism Bias will still be applied at 44%.
- The average value of time working and on-working trips based on webTAG table A1.3.2 have been used;
- Heavies' matrix has been all working trips as per OGV 1 and OGV 2 in the webTAG databook.
- Lights matrix has been split between commuting, working and other proposition in accordance with webTAG DataBook Table A1.3.4 for the relevant peak periods for cars.
- The opening year of the scheme is 2017 and the assessed for a period of 60 years, no traffic growth is assumed for the period post 2017. The effect of this is to limit the benefits of the scheme.
- Each peak hour period lasts for 3 hours.

Sensitivity Tests

2.4.5 It should be noted that the model without the dependent development and with and without the NSLR contains all other committed developments. The growth between the 2014 and opening year model of 2017 has been compared to the TEMPRO Growth to see if it is comparable.

Time Period	2014 Base Model	2017 Forecast No Development with NSLR	Model Growth	2014-2017 TEMPRO Growth	Adjustment to Benefits
AM Peak	7542	8891	1.18	1.0635	0.90
PM Peak	8196	9506	1.16	1.0646	0.92

2.4.6 The growth in the model is in excess of TEMPRO, as a result an adjustment factor has been derived to be applied to the benefits generated by the scheme to develop a 'Constrained' and 'Unconstrained' growth core BCRs. In the interests of developing a robust BCR the AM Peak adjustment of 0.90 has been applied to the benefits accrued in the AM and PM peaks.

2.4.7 On the 'Constrained' and 'Unconstrained' BCRs two sensitivity test will be applied Sensitivity tests will be run on the core BCR, one assuming costs increase by 30% and one assuming benefits are no realised and are reduced by 30%.

Treatment of Developer Contributions

2.4.8 In the BCR calculations according to webTAG the developer contributions are supposed to be put into the TEE and PA tables as negative values. However as the developer contribution is far in excess of the public sector contribution paragraph 2.8.11 of TAG unit A1.1 applies and states:

"The NPV is a useful metric where schemes or options do not impact on the 'Broad Transport Budget' or where they generate significant revenues that accrue to the 'Broad Transport Budget', offsetting investment and operating costs in the PVC. This can lead to a negative cost estimate and, therefore, a negative BCR, which can be difficult to interpret and makes comparison of schemes or options difficult. However, the major drawback of the NPV is that it does not represent the relativity of benefits and costs and, therefore, its use is limited when making value for money judgements within a constrained budget."

2.4.9 In this context and based on DfT advice, the PA table includes under Local Government Funding the investment costs contains the total developer and public sector budget values. The developer contributions are then included as a negative value under the Central Government Funding: Transport section. In the TEE table the developer contributions are shown as a negative benefit under the Private sector provider impacts. The treatment of the developer contributions in this manner enables a value for money judgement within the constrained budget.

Benefit Cost Ratios

2.4.10 The table below summarises the BCRs produced utilising the above assumptions, the PA, TEE and AMCB tables are contained in Appendix A.

Scheme Costs

Financial Sponsor	2014 Prices	2010 Prices	2010 Prices with 44% Optimism Bias	
Local Authority	£2,500,000	£2,322,340.92	£3,344,170.92	
Local Growth Fund	£7,000,000	£6,502,554.58	£9,363,678.59	
Total Public Sector Cost		£8,824,895.49	£12,707,849.51	(Net Present Value of Cost)

BCR Calculations

Benefit Cost Ratio Summary Table Including Sensitivity Tests			
Present Value of Cost	£12,707,849.51	Present Value of Cost	£12,707,849.51
Unconstrained Growth		**Constrained Growth**	
Present Value Benefits	£5,798,560.71	Present Value Benefits	£5,231,187.76
Net Present Value	-£6,909,288.80	**Net Present Value**	-£7,476,661.76
Benefit Cost Ratio	0.5	**Benefit Cost Ratio**	0.4
Sensitivity Tests			
Cost Increase of 30% Test			
Unconstrained Growth		**Constrained Growth**	
Present Value of Costs	£ 16,520,204.37	Present Value of Costs	£ 16,520,204.37
Benefit Cost Ratio	0.4	Benefit Cost Ratio	0.3
Benefit Reduction of 30% Test			
Unconstrained Growth		**Constrained Growth**	
Present Value of Benefits	£ 4,058,992.50	Present Value of Benefits	£ 3,661,831.43
Benefit Cost Ratio	0.3	Benefit Cost Ratio	0.3

2.4.11 Following advice from the DfT the figure for third party/developer contributions has been added to the local government funding investment costs box, and has then be included in the Developer Contributions box as a negative figure in the Public Accounts table. This has the net effect of zeroing this element of the costs. The reason for doing so, and not strictly following WebTAG guidance, was because in this case the developer contributions are significantly higher than the public sector input and hence resulted in a negative cost. This had the effect of benefits actually resulting in a negative BCR.

2.4.12 In accordance with WebTAG guidance the developer contribution was included in the appropriate line in the TEE table (as seen in Appendix A). This has had the effect of significantly reducing the PVB because only costs to the developer have been included; no benefits. In reality the developer will realise a significant financial return on the investment in the road through the land value increase it will release. However, the exact figure for this benefit cannot be known for this assessment because it is commercially sensitive information retained by the developer.

2.4.13 Because only costs and no benefits to the developer have been included in the TEE table, this results in a low BCR of less than 1. However, purely for illustrative purposes an

approximation for a land value increase has been calculated using a figure of £850 per sqm (a value used by WSP in previous similar studies); which results in a PVB of £116m (this figure has been used and claimed as part of the wider economic benefits presented later in this business case). The results of adding this benefit to the TEE table are presented below.

Benefit Cost Ratio Summary Table Including Sensitivity Tests			
Net Present Value of Cost	£12,707,849.51	Net Present Value of Cost	£12,707,849.51
Unconstrained Growth		**Constrained Growth**	
Benefits	£122,476,911.77	Benefits	£110,492,888.40
New Present Value	£109,769,062.26	**Net Present Value**	£97,785,038.89
Benefit Cost Ratio	9.6	**Benefit Cost Ratio**	8.7
Sensitivity Tests			
Cost Increase of 30% Test			
Unconstrained Growth		**Constrained Growth**	
Net Present Value of Costs	£ 16,520,204.37	Net Present Value of Costs	£ 16,520,204.37
Benefit Cost Ratio	7.4	Benefit Cost Ratio	6.7
Benefit Reduction of 30% Test			
Unconstrained Growth		**Constrained Growth**	
Net Present Value of Benefits	£ 85,733,838.24	Net Present Value of Benefits	£ 77,345,021.88
Benefit Cost Ratio	6.7	Benefit Cost Ratio	6.1

2.4.14 As can be seen, even with a very rough approximation for land value increase the scheme now shows an extremely positive BCR result.

2.4.15 As set out in the strategic case, the primary objective is to provide access to the Land South of Newark and to mitigate its impact. The impact of this is to release the economic benefits of the housing and employment land associated with jobs and construction.

2.5 Step 4

2.5.1 The objective of Step 4 is to quantify the economic impact of the LSN dependent development on the NSLR. In order to do this the approach of quantifying the GVA impacts of the dependent development including those associated with the construction of the road has been calculated.

2.5.2 The development of residential and employment premises and their subsequent occupancy are contingent on factors additional to the NSLR. The link road makes the area accessible and enables development at a rate of build out and occupancy. Whilst there is a degree of risk and uncertainty this is not considered significant given the underlying growth in Newark as discussed in the strategic case.

2.5.3 The assumptions used to generate the Net GVA contributions were as follows. Gross jobs were calculated and then a multiplier of '0.3' was applied to reflect the effects of the supply chain expenditure by business and consumption expenditure by employees. The same multiplier was then applied to reflect the further effect on the supply chain. These were added together to create a residual net figure of jobs. Then a multiplier value of '0.7' was applied to reflect the proportion of jobs taken up by local residents and a multiplier of '0.5'

was applied to reflect the proportion of jobs new to the area. This final net figure of jobs multiplied by the average annual salary for Newark & Sherwood, which was £21,365.54 (ONS, 2010 prices) gave an annual salary investment figure. This figure was discounted over the appropriate years giving a Net GVA contribution.

2.5.4 The construction of the NSLR itself will also generate construction jobs. Based on the assumption that Infrastructure generates 22.2 jobs per £1m construction spend/year the construction of the link road (current cumulative investment cost of £35 million and a two and a half year construction programme) will generate a £2 million (£2,205,254) Net GVA contribution.*

2.5.5 The delivery of the NSLR will generate construction jobs for the building of 1,900 homes (In addition to the 1250 homes approved to be built without the NSLR) and the associated commercial opportunities at the Newark SUE. The assumption that commercial development generates 26.4 jobs per £1m construction spend/year the construction of the homes element alone of the SUE would generate a Net GVA contribution of £9.6 million (£9,670,630.04 – 2010 prices) for the jobs generated by building houses** and £37 million (£37,242,452.64 – 2010 prices) for the jobs generated through commercial opportunities.***

2.5.6 Based on estimates provided by the principal developer involved (average build costs in the order of £850 per square metre for an average house of 120 sq. and a 9 year construction programme) would generate a Net GVA contribution of £116 million (£116,678,351.06 – 2010 prices).****

2.5.7 The GVA benefit stream profiled over the appropriate persistence time period (15 years) and discounted to 2015 values in the Departments base year (2010) provide the following net present values:

NPV Breakdown	**NPV of GVA Contribution**
*NPV of cumulative total GVA contribution for NSLR net construction jobs (2015 – 2017)	£2,205,254.26
**NPV of cumulative total GVA for net housing construction jobs (2023 – 2032)	£9,670,630.04
***NPV of cumulative total GVA for net permanent jobs (2023 – 2032)	£37,242,452.64
****NPV of cumulative total GVA for net housing contribution (2023 – 2032)	£116,678,351.06
Net Present Value of GVA contribution (2015/16 – 2032)	**£165,796,688.00**

APPENDIX A

Analysis of Monetised Costs and Benefits

Constrained Growth BCR

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality		*(15)*
Physical Activity		*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£3,593,342.25	*(1a)*
Economic Efficiency: Consumer Users (Other)	£4,855,312.37	*(1b)*
Economic Efficiency: Business Users and Providers	-£3,217,466.86	*(5)*
Wider Public Finances (Indirect Taxation Revenues)		*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£5,231,187.76	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£12,707,849.51	*(10)*
Present Value of Costs (see notes) (PVC)	£12,707,849.51	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	-£7,476,661.76	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	0.4	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Analysis of Monetised Costs and Benefits

Unconstrained Growth BCR

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality		*(15)*
Physical Activity		*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£3,983,075.00	*(1a)*
Economic Efficiency: Consumer Users (Other)	£5,381,918.00	*(1b)*
Economic Efficiency: Business Users and Providers	-£3,566,432.29	*(5)*
Wider Public Finances (Indirect Taxation Revenues)		*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£5,798,560.71	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£12,707,849.51	*(10)*
Present Value of Costs (see notes) (PVC)	£12,707,849.51	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	-£6,909,288.80	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	0.5	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Economic Efficiency of the Transport System (TEE)

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ 3,983,075.00					
Vehicle operating costs						
User charges						
During Construction & Maintenance						
COMMUTING	£ 3,983,075.00	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ 5,381,918.00					
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ 5,381,918.00	*(1b)*				

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time	£ 20,400,126.00							
Vehicle operating costs								
User charges								
During Construction & Maintenance								
Subtotal	£ 20,400,126.00	*(2)*						
Private sector provider impacts						**Freight**	**Passengers**	
Revenue								
Operating costs								
Investment costs	-£23,966,558.29							
Grant/subsidy								
Subtotal	-£ 23,966,558.29	*(3)*						
Other business impacts								
Developer contributions		*(4)*						
NET BUSINESS IMPACT	-£ 3,566,432.29	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£5,798,560.71	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue						
Operating Costs						
Investment Costs	£27,310,729.22					
Developer and Other Contributions						
Grant/Subsidy Payments						
NET IMPACT	£27,310,729.22	*(7)*				
Central Government Funding: Transport						
Revenue						
Operating costs						
Investment Costs	£9,363,678.59					
Developer and Other Contributions	-£23,966,558.29					
Grant/Subsidy Payments						
NET IMPACT	-£14,602,879.70	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues		*(9)*				
TOTALS						
Broad Transport Budget	£12,707,849.51	*(10) = (7) + (8)*				
Wider Public Finances		*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Analysis of Monetised Costs and Benefits (With Potential Developer Benefits)

Constrained Growth BCR

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality		*(15)*
Physical Activity		*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£3,593,342.25	*(1a)*
Economic Efficiency: Consumer Users (Other)	£4,855,312.37	*(1b)*
Economic Efficiency: Business Users and Providers	£102,044,233.78	*(5)*
Wider Public Finances (Indirect Taxation Revenues)		*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£110,492,888.40	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£12,707,849.51	*(10)*
Present Value of Costs (see notes) (PVC)	£12,707,849.51	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	£97,785,038.89	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	8.7	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Analysis of Monetised Costs and Benefits (With Potential Developer Benefits)

Unconstrained Growth BCR

Noise		*(12)*
Local Air Quality		*(13)*
Greenhouse Gases		*(14)*
Journey Quality		*(15)*
Physical Activity		*(16)*
Accidents		*(17)*
Economic Efficiency: Consumer Users (Commuting)	£3,983,075.00	*(1a)*
Economic Efficiency: Consumer Users (Other)	£5,381,918.00	*(1b)*
Economic Efficiency: Business Users and Providers	£113,111,918.77	*(5)*
Wider Public Finances (Indirect Taxation Revenues)		*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	£122,476,911.77	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	£12,707,849.51	*(10)*
Present Value of Costs (see notes) (PVC)	£12,707,849.51	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	£109,769,062.26	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	9.6	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Economic Efficiency of the Transport System (TEE) **(With Potential Developer Benefits)**

Non-business: Commuting	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ 3,983,075.00					
Vehicle operating costs						
User charges						
During Construction & Maintenance						
COMMUTING	£ 3,983,075.00	*(1a)*				

Non-business: Other	**ALL MODES**		**ROAD**	**BUS and COACH**	**RAIL**	**OTHER**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	£ 5,381,918.00					
Vehicle operating costs						
User charges						
During Construction & Maintenance						
NET NON-BUSINESS BENEFITS: OTHER	£ 5,381,918.00	*(1b)*				

Business							
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**
Travel time	£ 20,400,126.00						
Vehicle operating costs							
User charges							
During Construction & Maintenance							
Subtotal	£ 20,400,126.00	*(2)*					
Private sector provider impacts						**Freight**	**Passengers**
Revenue	£116,678,351.06						
Operating costs							
Investment costs	-£23,966,558.29						
Grant/subsidy							
Subtotal	£ 92,711,792.77	*(3)*					
Other business impacts							
Developer contributions		*(4)*					
NET BUSINESS IMPACT	£113,111,918.77	*(5) = (2) + (3) + (4)*					

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	£122,476,911.77	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table (With Potential Developer Benefits)

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue						
Operating Costs						
Investment Costs	£3,344,170.92					
Developer and Other Contributions	£23,966,558.29					
Grant/Subsidy Payments						
NET IMPACT	£27,310,729.22	*(7)*				
Central Government Funding: Transport						
Revenue						
Operating costs						
Investment Costs	£9,363,678.59					
Developer and Other Contributions	-£23,966,558.29					
Grant/Subsidy Payments						
NET IMPACT	-£14,602,879.70	*(8)*				
Central Government Funding: Non-Transport						
Indirect Tax Revenues		*(9)*				
TOTALS						
Broad Transport Budget	£12,707,849.51	*(10) = (7) + (8)*				
Wider Public Finances		*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.

All entries are discounted present values in 2010 prices and values.

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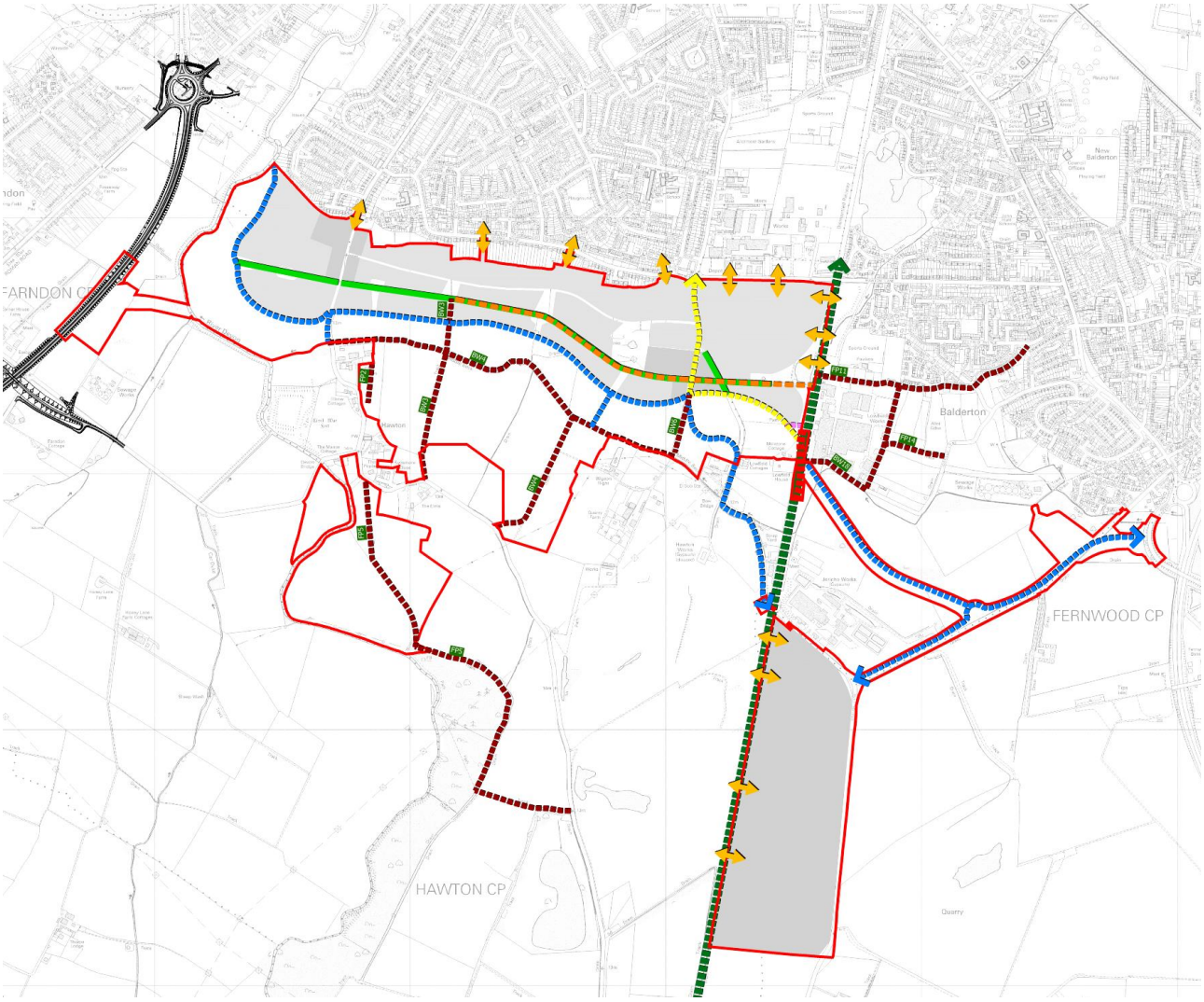
Newark Southern Link Road



Air Quality Assessment

784-B029236
11th June 2021

PRESENTED TO

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DOCUMENT CONTROL

Document:	**Air Quality Assessment**
Project:	Newark Southern Link Road
Client:	Newark & Sherwood District Council
Job Number:	784-B029236
File Origin:	O:\Acoustics Air Quality and Noise\Fee Earning Projects

Revision:	**-**	**Status:**	**First Issue**
Date:	11th June 2021		
Prepared by: Donald Towler-Tinlin Environmental Scientist		**Checked by** Matthew Smith Principal Environmental Consultant	**Approved By:** Nigel Mann Director
Description of revision: First Issue			

Revision:	**1**	**Status:**	**Second Issue**
Date:	14th June 2021		
Prepared by: Donald Towler-Tinlin Environmental Scientist		**Checked by** Matthew Smith Principal Environmental Consultant	**Approved By:** Nigel Mann Director
Description of revision:			

Revision:		**Status:**	
Date:			
Prepared by:		**Checked by:**	**Approved By:**
Description of revision:			

EXECUTIVE SUMMARY

This report presents the findings of an air quality assessment undertaken to assess road traffic emissions in support of a bid to the Levelling Up Fund for the delivery of the western section of the Newark Southern Link Road (SLR) to provide a new roundabout junction onto the A46(T) and the western section of the SLR thereby forming a continuous road link between the A46(T) and the A1(T) to the south of Newark.

Construction Phase

The potential effects during the demolition and construction phases include fugitive dust emissions from site activities, such as earthworks, construction and trackout. The impacts during the operational phase take into account exhaust emissions from additional road traffic generated due to the Southern Link Road.

During the construction phase, site specific mitigation measures detailed within this assessment will be implemented. With these mitigation measures in place, the effects from the construction phase are not predicted to be significant.

Operational Phase

Scenario 1 – No Improvements made to A46

An operational year assessment for 2033 traffic emissions has been undertaken to assess the effects of the Southern Link Road. The impacts during the operational phase take into account exhaust emissions from additional road traffic generated due to the completion of the Southern Link Road.

The long-term (annual) assessment of the impact description of the effects associated with the Southern Link Road, with respect to NO_2, PM_{10} and $PM_{2.5}$ exposure. The impact description of the Southern Link Road is determined to range between 'negligible increase' to a 'negligible decrease' for all identified existing sensitive receptors with regards to NO_2, PM_{10} and $PM_{2.5}$.

Scenario 2 – Improvements Completed on A46

An operational year assessment for 2033 traffic emissions has been undertaken to assess the effects of the Southern Link Road. The impacts during the operational phase take into account exhaust emissions from additional road traffic generated due to the completion of the Southern Link Road.

The long-term (annual) assessment of the impact description of the effects associated with the Southern Link Road, with respect to NO_2, PM_{10} and $PM_{2.5}$ exposure. The impact description of the Southern Link Road is determined to range between 'negligible increase' to a 'negligible decrease' for all identified existing sensitive receptors with regards to NO_2, PM_{10} and $PM_{2.5}$.

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
AADT	Annual Average Daily Traffic
ADMS	Atmospheric Dispersion Modelling Software
AQAL	the Air Quality Assessment Level
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Standards
CHP	Combined Heat and Power
CL	Critical Level
CO	Carbon Monoxide
DEFRA	Department for Environment Food & Rural Affairs
EAL	Environmental Assessment Limits
EC	European Commission
EFT	The Emissions Factors Toolkit
EPUK	Environmental Protection UK
EU	European Union
EPAQS	The Expert Panel on Air Quality Standards
IAQM	The Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
NGR	The United Kingdom National Grid Reference
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
PC	Process Contribution
MHCLG	the Ministry for Housing, Communities and Local Government
NPPF	The National Planning Policy Framework
OS	the UK Ordnance Survey
PEC	Predicted Environment Concentration
PPG	Planning Policy Guidance
PPS	Planning Policy Statements
SAC	Special Areas of Conservation
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
VOC	Volatile organic compounds
WHO	World Health Organization
UK	The United Kingdom

1.0 INTRODUCTION

This report presents the findings of an air quality assessment undertaken to assess road traffic emissions in support of a bid to the Levelling Up Fund for the delivery of the western section of the Newark Southern Link Road (SLR) to provide a new roundabout junction onto the A46(T) and the western section of the SLR thereby forming a continuous road link between the A46(T) and the A1(T) to the south of Newark.

1.1 SITE LOCATION

The central Grid Reference is approximately 478697, 351657. The application site is bounded to the north by agricultural land and residential properties, to the east by agricultural land and the A1, the south by agricultural land, and to the west by the A46, agricultural land and residential properties.

Reference should be made to **Figure 1-1** for a map of the application site and surrounding area.

Figure 1-1. Satellite Image of Site and Surrounding Area

Google Imagery (2021)

1.2 CONTEXT

The primary source of the air quality associated with the proposed scheme is from vehicle movements, associated with the completion of the Newark Southern Link Road. The traffic data generated by the development (provided by Tetra Tech Ltd) has been assessed at the surrounding sensitive receptors and proposed sensitive receptors.

The following assessment stages have been undertaken as part of this assessment:

- Baseline evaluation;

- Assessment of potential air quality impacts during the construction phase;
- Assessment of potential air quality impacts during the operational phase; and,
- Identification of mitigation measures (as required).

The results of the assessment are detailed in the following sections of this report.

The construction phase assessment considers the potential effects of dust and particulate emissions from site activities and materials movement using a qualitative risk assessment method based on the Institute of Air Quality Management's (IAQM) 'Guidance on the Assessment of Dust from Demolition and Construction' document, published in 2014.

The assessment of the potential air quality impacts that are associated with the operational phase has focused on the predicted impact of changes in ambient nitrogen dioxide (NO_2) and particulate matter with an aerodynamic diameter of less than 10 µm (PM_{10}) and less than 2.5 µm ($PM_{2.5}$) as a result of the development at key local receptor locations. The changes have been referenced to EU air quality limits and UK air quality objectives and the magnitude and impact description of the changes have been referenced to non-statutory guidance issued by the IAQM and Environmental Protection UK (EPUK).

1.3 REPORT STRUCTURE

Following this introductory section, the remainder of this report is structured as follows:

- Section 2: Policy and Legislative Context
- Section 3: Assessment Methodology
- Section 4: Baseline Conditions
- Section 5: Assessment of Air Quality Impacts – Construction Phase
- Section 6: Assessment of Air Quality Impacts – Operational Phase
- Section 7: Mitigation
- Section 8: Conclusions

All technical Appendices are included at the end of this report for information.

2.0 POLICY AND LEGISLATIVE CONTEXT

2.1 DOCUMENTS CONSULTED

The following documents were consulted during the undertaking of this assessment:

Legislation and Best Practice Guidance

- National Planning Policy Framework, Ministry for Housing, Communities and Local Government, Revised February 2019;
- Planning Practice Guidance: Air Quality, Ministry for Housing, Communities and Local Government, November 2019;
- The Air Quality Standards Regulations (Amendments), 2016;
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Defra, 2007;
- The Environment Act, 1995;
- Local Air Quality Management Technical Guidance LAQM.TG16, Defra, 2021;
- Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, LA 105 Air quality, Highways England, November 2019;
- Land-Use Planning & Development Control: Planning for Air Quality, EPUK & IAQM, 2017;
- Guidance on the Assessment of Dust from Demolition and Construction, IAQM, 2014;
- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.0), IAQM, May 2020; and,
- Ecological Assessment of Air Quality Impacts, CIEEM, January 2021.

Websites Consulted

- Google maps (maps.google.co.uk);
- The UK National Air Quality Archive (www.airquality.co.uk);
- Department for Transport Matrix (www.dft.go.uk/matrix);
- emapsite.com;
- Multi-Agency Geographic Information for the Countryside (http://magic.defra.gov.uk/);
- Planning Practice Guidance (http://planningguidance.planningportal.gov.uk/); and,
- Newark & Sherwood District Council (https://www.newark-sherwooddc.gov.uk/).

Site Specific Reference Documents

- Newark & Sherwood District Council, 2020 Air Quality Annual Status Report; and,
- Newark & Sherwood District Council: Amended Core Strategy (Adopted March 2019).

2.2 AIR QUALITY LEGISLATIVE FRAMEWORK

European Legislation

European air quality legislation is consolidated under Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidates previous legislation which was designed to deal with specific pollutants in a

consistent manner and provides new air quality objectives for fine particulates. The consolidated Directives include:

- **Directive 1999/30/EC** – the First Air Quality "Daughter" Directive – sets ambient air limit values for NO_2 and oxides of nitrogen, sulphur dioxide, lead and PM_{10};
- **Directive 2000/69/EC** – the Second Air Quality "Daughter" Directive – sets ambient air limit values for benzene and carbon monoxide; and,
- **Directive 2002/3/EC** – the Third Air Quality "Daughter" Directive – seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.

The fourth daughter Directive was not included within the consolidation and is described as:

- **Directive 2004/107/EC** – sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

The European Commission (EC) Directive Limits, outlined above, have been transposed in the UK through the Air Quality Standards Regulations. In the UK responsibility for meeting ambient air quality limit values is devolved to the national administrations in Scotland, Wales and Northern Ireland.

The European Union (Withdrawal) Act 2018 (EUWA) provides a new framework for the continuity of 'retained EU law' in the UK. EU Directives no longer have to be implemented by the UK except to any extent agreed or decided by the UK unilaterally.

EUWA retains the domestic effect of EU Directives to the extent already implemented in UK law, by preserving the relevant domestic implementing legislation enacted in UK law before ‘Implementation Period’ completion day. Though the EU Directives are not retained, following the UK’s departure from the EU, the EUWA converts the current framework of Air Quality targets, however the role that the EU instructions were party to are lost.

UK Legislation

The Air Quality Standards Regulations (Amendments 2016) seek to simplify air quality regulation and provide a new transposition of the Air Quality Framework Directive, First, Second and Third Daughter Directives and also transpose the Fourth Daughter Directive within the UK. The Air Quality Limit Values are transposed into the updated Regulations as Air Quality Standards, with attainment dates in line with the European Directives. SI 2010 No. 1001, Part 7 Regulation 31 extends powers, under Section 85(5) of the Environment Act (1995), for the Secretary of State to give directions to Local Authorities (LAs) for the implementation of these Directives.

The UK Air Quality Strategy is the method for implementation of the air quality limit values in England, Scotland, Wales and Northern Ireland and provides a framework for improving air quality and protecting human health from the effects of pollution.

For each nominated pollutant, the Air Quality Strategy sets clear, measurable, outdoor air quality standards and target dates by which these must be achieved; the combined standard and target date is referred to as the Air Quality Objective (AQO) for that pollutant. Adopted national standards are based on the recommendations of

the Expert Panel on Air Quality Standards (EPAQS) and have been translated into a set of Statutory Objectives within the Air Quality (England) Regulations (2000) SI 928, and subsequent amendments.

The AQOs for pollutants included within the Air Quality Strategy and assessed as part of the scope of this report are presented in **Table 2-1** and **Table 2-2** along with European Commission (EC) Directive Limits and World Health Organisation (WHO) Guidelines. The ecological levels are based on WHO and CLRTAP (Convention on Long-range Transboundary Air Pollution) guidance.

Table 2-1. Air Quality Standards, Objectives, Limits and Target Values

Pollutant	Applies	Objective	Concentration Measured as[10]	Date to be achieved and maintained thereafter	European Obligations	Date to be achieved and maintained thereafter	New or existing
PM_{10}	UK	50µg/m^3 by end of 2004 (max 35 exceedances a year)	24-hour Mean	1st January 2005	50µg/m^3 by end of 2004 (max 35 exceedances a year)	1st January 2005	Retain Existing
	UK	40µg/m^3 by end of 2004	Annual Mean	1st January 2005	40µg/m^3	1st January 2005	
$PM_{2.5}$	UK	25µg/m^3	Annual Mean	31st December 2010	25µg/m^3	1st January 2010	Retain Existing
NO_2	UK	200µg/m^3 not to be exceeded more than 18 times a year	1-Hour Mean	31st December 2005	200µg/m^3 not to be exceeded more than 18 times a year	1st January 2010	Retain Existing
	UK	40µg/m^3	Annual Mean	31st December 2005	40µg/m^3	1st January 2010	

Table 2-2. Ecological Air Quality Standards, Objectives, Limit and Target Values

Pollutant	Applies	Objective	Concentration Measured as
NO_X	UK	30µg/m^3	Annual Mean

Within the context of this assessment, the annual mean objectives are those against which facades of residential receptors will be assessed and the short-term objectives apply to all other receptor locations, where people may be exposed over a short duration, both residential and non-residential such as using gardens, balconies, walking along streets, using playgrounds, footpaths or external areas of employment uses.

Local Air Quality Management

Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves assessing present and likely future air quality against the AQOs. If it is predicted that levels at the façade of buildings where members of the public are regularly present (normally residential properties) are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA).

2.3 PLANNING AND POLICY GUIDANCE

National Policy

The National Planning Policy Framework (NPPF), revised February 2019, principally brings together and summarises the suite of Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) which previously guided planning policy making. The NPPF (para. 181) states that:

> *'Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas or Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic or travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan'.*

The Planning Practice Guidance (PPG) web-based resource was updated by the Ministry for Housing, Communities and Local Government (MHCLG) on 1st November 2019 to support the National Planning Policy Framework and make it more accessible. A review of PPG: Air Quality identified the following guidance (Paragraph: 001 Reference ID: 32-001-20191101):

> *"The 2008 Ambient Air Quality Directive sets legally binding limits for concentrations in outdoor air of major air pollutants that affect public health such as particulate matter (PM10 and PM2.5) and nitrogen dioxide (NO2).*
>
> *The UK also has national emission reduction commitments for overall UK emissions of 5 damaging air pollutants:*
>
> - *fine particulate matter ($PM_{2.5}$);*
> - *ammonia (NH_3);*
> - *nitrogen oxides (NO_x);*
> - *sulphur dioxide (SO_2); and*
> - *non-methane volatile organic compounds (NMVOCs).*
>
> *As well as having direct effects on public health, habitats and biodiversity, these pollutants can combine in the atmosphere to form ozone, a harmful air pollutant (and potent greenhouse gas) which can be transported great distances by weather systems. Odour and dust can also be a planning concern, for example, because of the effect on local amenity."*

Local Policy

Following a review of the Newark & Sherwood District Council Amended Core Strategy (adopted March 2019), no policies concerning air quality were identified.

3.0 ASSESSMENT METHODOLOGY

The potential environmental effects of the operational phase of the Southern Link Road have been identified as proposed vehicle movements. The significance of potential environmental effects is assessed according to the latest guidance produced by EPUK and IAQM in January 2017 '*Land-Use Planning & Development Control: Planning for Air Quality*' and May 2020 '*A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites*'.

The methodology used to determine the potential air quality effects of the construction phase of the Southern Link Road has been derived from the IAQM '*Guidance on the Assessment of the Impacts of Dust from Demolition and Construction'* document and is summarised in Section 5.

3.1 DETERMINING IMPACT DESCRIPTION OF THE AIR QUALITY EFFECTS

The impact description of the effects during the operational phase of the development is based on the latest guidance produced by EPUK and IAQM in January 2017. The guidance provides a basis for a consistent approach that could be used by all parties associated with the planning process to professionally judge the overall impact description of the air quality effects based on severity of air quality impacts.

The following rationale is used in determining the severity of the air quality effects at individual receptors:

1. The change in concentration of air pollutants, air quality effects, are quantified and evaluated in the context of AQOs. The effects are provided as a percentage of the Air Quality Objective (AQO), which may be an AQO, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)';
2. The absolute concentrations are also considered in terms of the AQO and are divided into categories for long term concentration. The categories are based on the sensitivity of the individual receptor in terms of harm potential. The degree of harm potential to change increases as absolute concentrations are close to or above the AQO;
3. Severity of the effect is described as qualitative descriptors; negligible, slight, moderate or substantial, by taking into account in combination the harm potential and air quality effect. This means that a small increase at a receptor which is already close to or above the AQO will have higher severity compared to a relatively large change at a receptor which is significantly below the AQO;
4. The effects can be adverse when pollutant concentrations increase or beneficial when concentrations decrease as a result of development;
5. The judgement of overall impact description of the effects is then based on severity of effects on all the individual receptors considered; and,
6. Where a development is not resulting in any change in emissions itself, the impact description of effect is based on the effect of surrounding sources on new residents or users of the development, i.e., will they be exposed to levels above the AQO.

Table 3-1. Impact Descriptors for Individual Receptors

Long term average concentration at receptor in assessment year	% Change in concentration relative to AQO			
	1	2-5	6-10	>10
≤75% of AQO	Negligible	Negligible	Slight	Moderate
76-94% of AQO	Negligible	Slight	Moderate	Moderate
95-102% of AQO	Slight	Moderate	Moderate	Substantial
103-109 of AQO	Moderate	Moderate	Substantial	Substantial
≥110 of AQO	Moderate	Substantial	Substantial	Substantial

In accordance with explanation note 2 of Table 6.3 of the EPUK & IAQM guidance, the Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5%, will be described as Negligible.

4.0 BASELINE CONDITIONS

4.1 AIR QUALITY REVIEW

This section provides a review of the existing air quality in the vicinity of the application site in order to provide a benchmark against which to assess potential air quality impacts of the Southern Link Road. Baseline air quality in the vicinity of the application site has been defined from several sources, as described in the following sections.

Local Air Quality Management (LAQM)

As required under section 82 of the Environment Act 1995, Newark and Sherwood District Council (NSDC) has undertaken an ongoing exercise to review and assess air quality within its area of jurisdiction. The assessments have indicated that concentrations of NO_2 are not above the relevant AQOs at any locations of relevant public exposure within the Borough. Therefore, NSDC has no designated any Air Quality Management Area (AQMAs).

Air Quality Monitoring

Monitoring of air quality within NSDC has been undertaken through non-automatic monitoring methods in 2019. These have been reviewed in order to provide an indication of existing air quality in the area surrounding the application site. It is understood that NSDC used to operate an automatic monitoring station, however the monitoring unit was struck by a vehicle in 2018, and is yet to be replaced. The most recent monitoring data within NSDC was undertaken during 2019.

Non - Automatic Monitoring

Newark and Sherwood District Council operated a network of 13 passive diffusion tubes in 2019. The closest diffusion tube is diffusion tube 4N, which is located on Hawthorne Crescent, Farndon , approximately 533 m west of the development site. The most recently available diffusion tube data is from 2019 which is presented in **Table 4-1**.

Table 4-1. Monitored Annual Mean NO_2 Concentrations at Diffusion Tubes

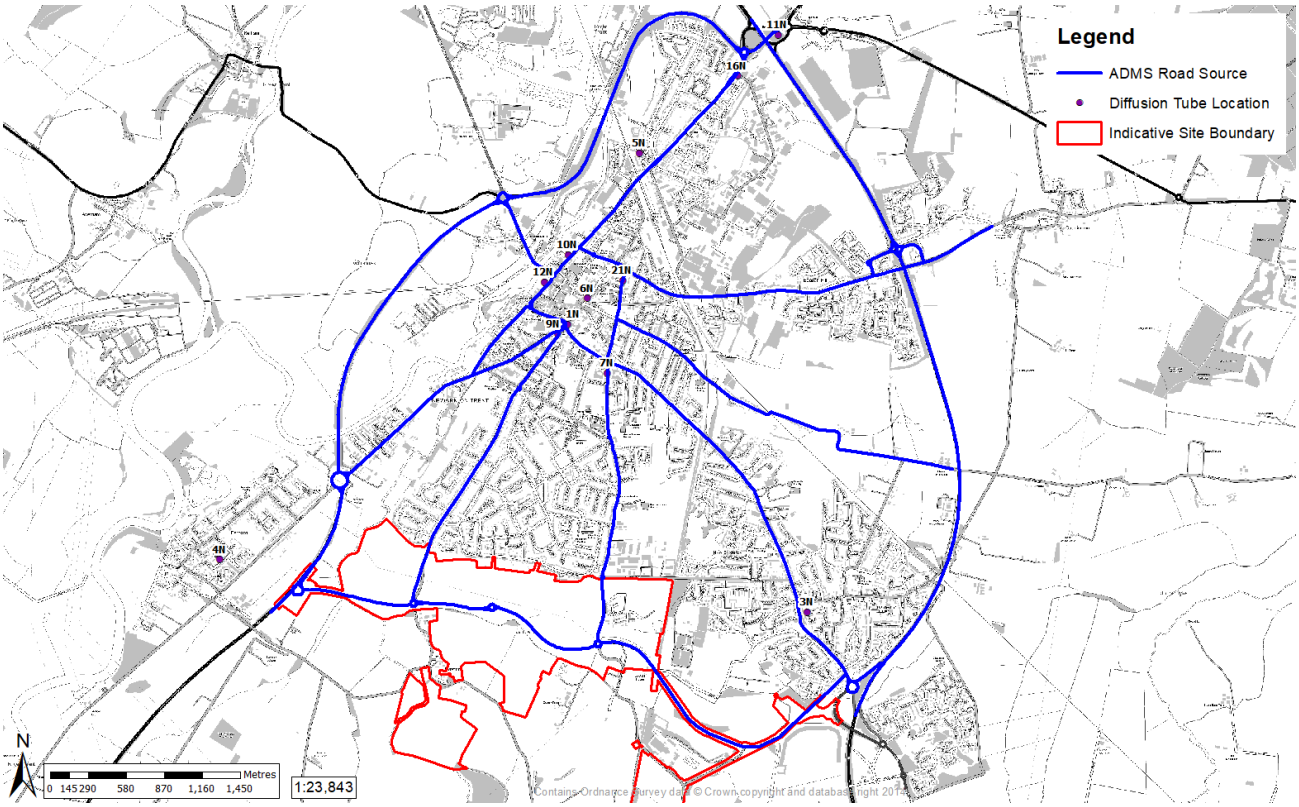
Site ID	Location	Site Type	Distance from Kerb (m)	Inlet Height (m)	Monitored 2019 Annual Mean NO_2 Concentration ($\mu g/m^3$)
1N	FADS, Cartergate	Roadside	2.0	2.0	31.2
3N	Orchard Way Balderton	Suburban	1.0	2.0	16.4
4N	Hawthorne Crescent Farndon	Suburban	2.0	2.0	14.4
5N	Winthorpe Rd/Northern Rd	Roadside	1.0	2.0	29.0
6N	War Memorial Appleton Gate	Urban centre	2.0	2.0	21.2
7N	Bowbridge Rd	Kerbside	1.0	2.0	28.5
9N	Albert St	Roadside	1.0	2.0	27.9
10N	Handley Court	Urban background	1.0	2.0	20.6
11N	The Lodge	Urban background	N/A	2.0	30.3
12N	Newark Castle	Urban centre	5.0	2.0	18.5

16N	Brunel Drive/Lincoln Road	Roadside	2.0	2.0	35.4
21N	Friary Road	Roadside	1.0	2.0	25.1

As indicated in **Table 4-1**, all diffusion tubes located within the Air Quality Assessment area monitored annual average NO_2 concentrations below the AQO for NO_2 (40 µg/m^3 annual mean) during 2019.

It should be noted that as part of the model verification a review of diffusion tubes locations and monitoring heights was undertaken. As part of this process, the locations and monitoring heights were adjusted following desk-based review using Google Maps.

Figure 4-1. Local Authority Monitoring Locations

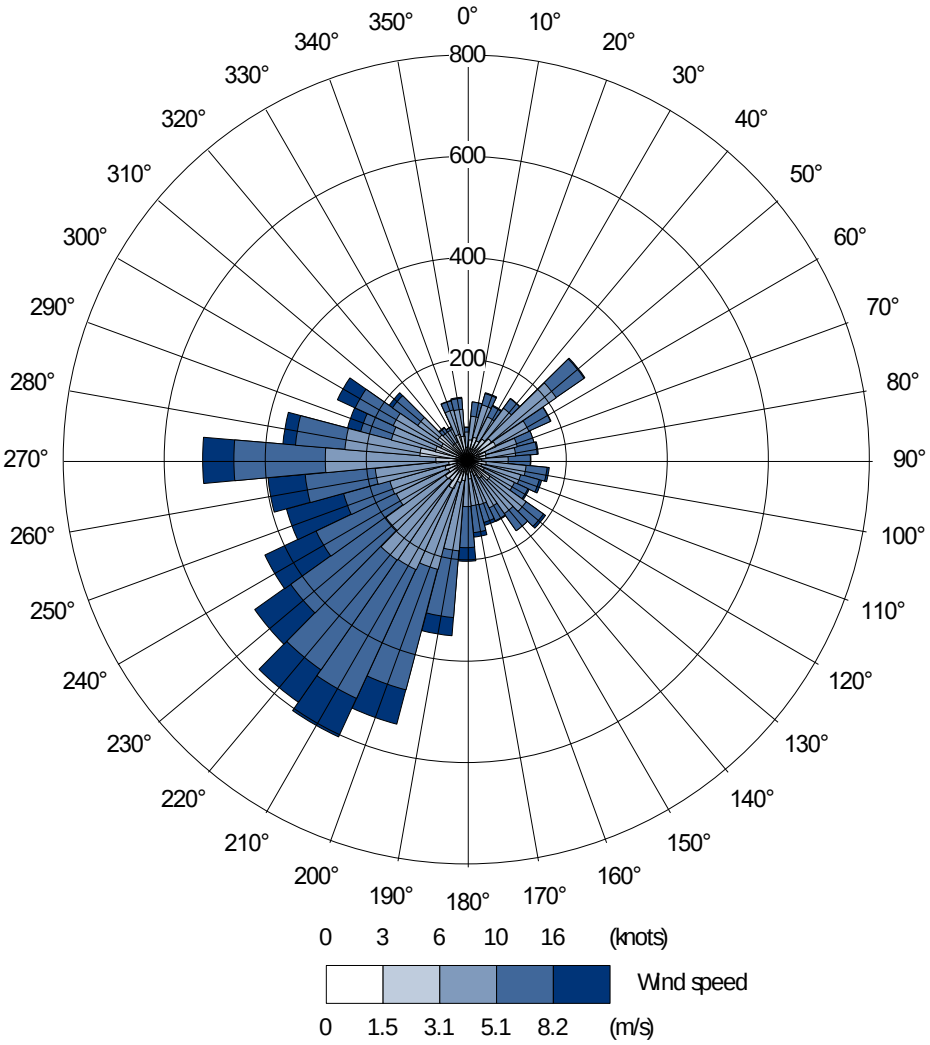


4.2 METEOROLOGY

Meteorological conditions have significant influence over air pollutant concentrations and dispersion. Pollutant levels can vary significantly from hour to hour as well as day to day, thus any air quality predictions need to be based on detailed meteorological data. The ADMS (Atmospheric Dispersion Modelling System) model calculates the dispersion of pollutants on an hourly basis using a year of local meteorological data.

The 2019 meteorological data used in the assessment is derived from East Midlands Airport Meteorological Station. This is the nearest meteorological station, which is considered representative of the application site, with all the complete parameters necessary for the ADMS model. Reference should be made to **Figure 4-2** for an illustration of the prevalent wind conditions at East Midlands Airport Meteorological Station site.

Figure 4-2. East Midlands Airport 2019 Wind Rose



4.3 EMISSION SOURCES

A desktop assessment has identified that traffic movements are likely to be the most significant local source of pollutants affecting the site and its surroundings. The principal traffic derived pollutants likely to impact local receptors are NO_2, PM_{10} and $PM_{2.5}$.

The assessment has therefore modelled all roads within the immediate vicinity of the application site which are considered likely to experience significant changes in traffic flow as a result of the proposed development. Reference should be made to **Figure A-1** for a graphical representation of the traffic data utilised within the ADMS Roads 5.0 model.

It should be noted that the pollutant contribution of minor roads and rail sources that are not included within the dispersion model is considered to be accounted for via the use of background air quality levels.

4.4 SENSITIVE RECEPTORS

Receptors that are considered as part of the air quality assessment are primarily those existing receptors that are situated along routes predicted to experience significant changes in traffic flow as a result of the Southern Link Road.

The existing receptor locations are summarised in **Table 4-2** and the spatial locations of all of the receptors are illustrated in **Figure 4-3**.

Table 4-2. Modelled Sensitive Receptor Locations

Existing Sensitive Receptor		X	Y	Receptor Height (m)
R1	20 Wheatsheaf Avenue	481096	355799	1.5
R2	24 Robert Dukeson Avenue	480744	356029	1.5
R3	65 Alexander Avenue	480508	355937	1.5
R4	7 Waters Edge, Kings Sconce Avenue	480168	355030	1.5
R5	34 Sandhills Close	479326	354535	1.5
R6	Andreas, Great North Road	479499	354420	1.5
R7	2 Manners Road	479518	354297	1.5
R8	Castle View Court, Mather Road	479613	354166	1.5
R9	1 Bar Gate	479777	354117	4.0
R10	19 Bar Gate	479813	354159	1.5
R11	29 North Gate	479938	354290	1.5
R12	162 North Gate	480266	354621	1.5
R13	19 Apple Tree	480502	354937	1.5
R14	1 Lincoln Road	480550	354976	1.5
R15	31 Linseed Avenue	481078	355583	1.5
R16	Premier Inn Newark	481135	355677	1.5
R17	11 Bryans Close	482269	354630	1.5
R18	70 Newark Road	482361	354334	1.5
R19	Greenfield Close Care Home	482499	354170	1.5
R20	37 Cannon Close	482305	354224	1.5
R21	157 Beacon Hill Road	482198	354109	1.5
R22	77 Beacon Hill	481687	353958	1.5
R23	76 Beacon Hill Road	480963	353895	1.5
R24	66 Esther Varney Place	480682	353934	1.5
R25	2 Sleaford Road	480307	354120	1.5
R26	1 Friary Road	480294	354069	1.5
R27	24 Queens Court	480138	354210	1.5
R28	13 Queens Court	480075	354234	1.5
R29	62 Barnby Gate	480239	353715	1.5
R30	Newark College	480241	353910	1.5
R31	181 Barnby Gate	480702	353496	1.5
R32	Barnby Road Academy	480876	353293	1.5
R33	Edinburgh Lodge, Barnby Road	481361	353025	1.5
R34	Green Bank Lodge, Barnby Road	482741	352626	1.5

R35	27 Bayford Drive	482548	353486	1.5
R36	Greenways Newark Road	482503	354035	1.5
R37	35 Edgehill Drive	482436	353832	1.5
R38	Field House Farm, Coddington Road	482745	352209	1.5
R39	Bridgeholme Cottage, Coddington Road	482819	351994	1.5
R40	144 Main Street	482644	351704	1.5
R41	22 Southfield	482078	351031	1.5
R42	7 Bilton Close	481959	351027	1.5
R43	233 London Road	481621	351564	1.5
R44	196 London Road	481546	351730	1.5
R45	2 Glebe Park	481200	352559	1.5
R46	89 London Road	480692	353060	1.5
R47	2 Cottage Homes, London Road	480169	353423	1.5
R48	2 Bowbridge Road	480151	353359	1.5
R49	115 Bowbridge Road	480167	353021	1.5
R50	120 Bowbridge Road	480186	352748	1.5
R51	Hawtonville Children's Centre	480229	352393	1.5
R52	254 Bowbridge Road	480102	351784	1.5
R53	7 Tannington Grove	480131	351434	1.5
R54	Millstone Cottage Bowbridge Lane	480464	351082	1.5
R55	The Willows, Newark Road	478754	351432	1.5
R56	205 Hawton Road	478812	352013	1.5
R57	1 Hawton Road	479471	353168	1.5
R58	12 Newark Court, Boundary Road	479498	353215	1.5
R59	14 Alert Street	479761	353603	1.5
R60	3 London Road	479847	353675	1.5
R61	Travelodge Newark	479812	353684	1.5
R62	4 Portland Street	479756	353645	1.5
R63	6 Victoria Street	479192	353343	1.5
R64	1 Mill Gate	479169	353362	1.5
R65	1 The Waterfront	479078	353275	1.5
R66	67 Farndon Road	478683	352988	1.5
R67	149 Farndon Road	478257	352578	1.5
R68	31 The Ivies	478153	352838	1.5
R69	Farndon Fields Farm, Fosse Way	478196	352330	1.5
R70	4 Mill Gate	479530	353835	1.5
R71	37 Lombard Street	479610	353777	1.5
R72	30 Castle Gate	479595	353898	1.5
R73	1 Castle Gate	479760	354050	1.5

The locations of the receptor are identified on **Figure 4-3**.

4.5 ECOLOGICAL RECEPTORS

Air quality impacts associated with the proposed re-development have the potential to impact on receptors of ecological sensitivity within the vicinity of the site. The IAQM guidance on 'Air Quality Impacts on Designated Nature Conservation Sites' (2020) outlines the types of designated nature sites within 2 km of the proposed scheme which require air quality assessment. These are inclusive of;

- Sites of Special Scientific Interest (SSSIs);
- Special Areas of Conservation (SACs);
- Special Protection Areas (SPAs);
- Ramsar Sites;
- Areas of Special Scientific Interest (ASSIs);
- National Nature Reserves (NNRs);
- Local Nature Reserves (LNRs);
- Local Wildlife Sites (LWSs); and,
- Areas of Ancient Woodland (AW).

The Conservation of Habitats and Species Regulations (2019) additionally requires competent authorities to review planning applications and consents that have the potential to impact on European designated sites (e.g. Special Protection Areas).

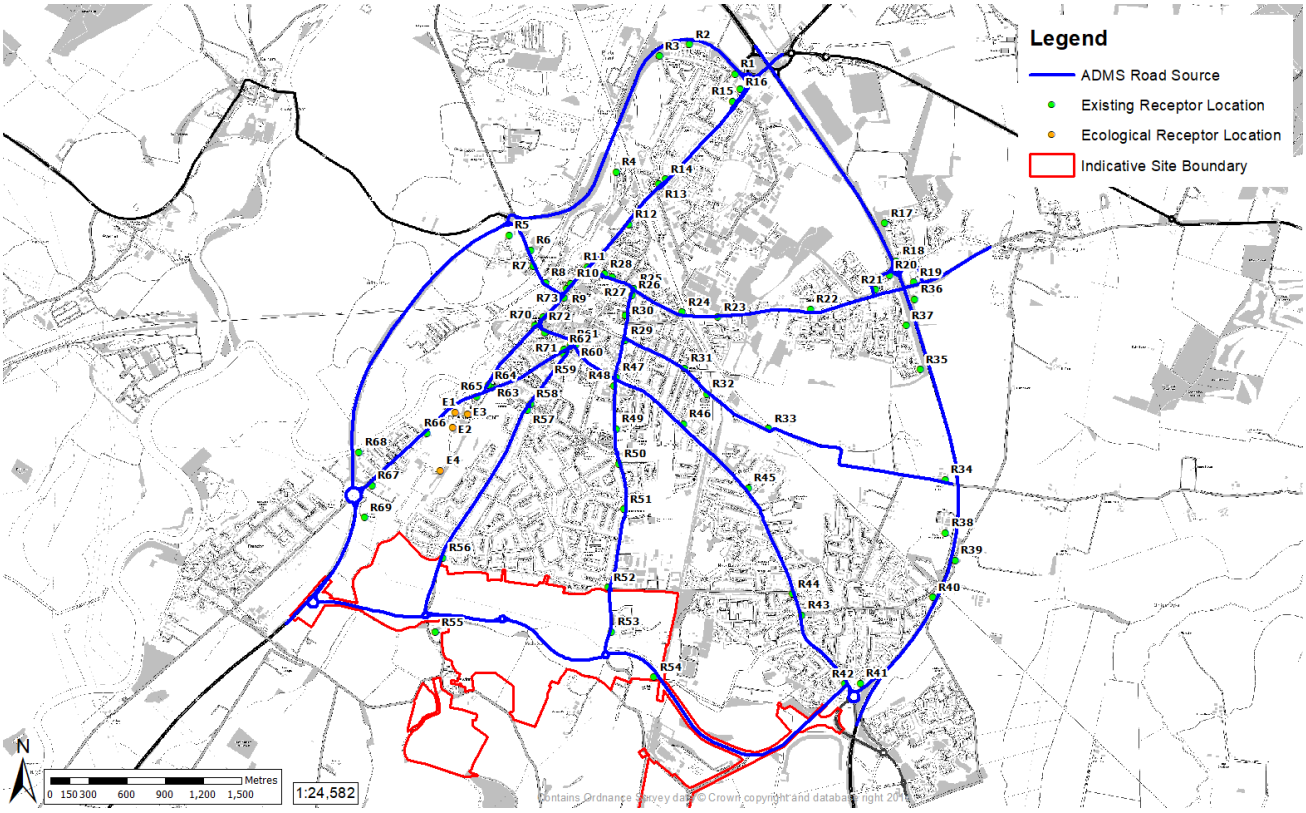
A study was undertaken to identify any statutory designated sites of ecological or nature conservation importance within the extents of the dispersion modelling assessment. This was completed using the Multi-Agency Geographic Information for the Countryside (MAGIC) web-based interactive mapping service, which draws together information on key environmental schemes and designations. Following a search, the following ecological receptors were identified:

Table 4-3. Ecological Sensitive Receptor Locations

Site ID	Site	Designation	UK NGR (m)		Distance from Nearest Affected Road (m)
			X	Y	
E1	Devon Park Pastures	LNR	478908	353151	50
E2	Devon Park Pastures	LNR	478886	353034	123
E3	Devon Park Pastures	LNR	479004	353135	115
E4	Devon Park Pastures	LNR	478793	352695	307

It should be noted that the IAQM Guidance only requires the assessment of ecological receptors which are located within 200 m of the affected road network. Therefore, ecological receptor E4 has been scoped out of this assessment.

Figure 4-3. Sensitive Receptor Locations



5.0 ASSESSMENT OF AIR QUALITY IMPACTS - CONSTRUCTION PHASE

5.1 POLLUTANT SOURCES

The main emissions during construction are likely to be dust and particulate matter generated during earth moving (particularly during dry months) or from construction materials. The main potential effects of dust and particulate matter are:

- Visual - dust plume, reduced visibility, coating and soiling of surfaces leading to annoyance, loss of amenity, the need to clean surfaces;
- Physical and/or chemical contamination and corrosion of artefacts;
- Coating of vegetation and soil contamination; and,
- Health effects due to inhalation e.g. asthma or irritation of the eyes.

A number of other factors such as the amount of precipitation and other meteorological conditions will also greatly influence the amount of particulate matter generated.

Construction activities can give rise to short-term elevated dust/PM_{10} concentrations in neighbouring areas. This may arise from vehicle movements, soiling of the public highway, demolition or windblown stockpiles.

5.2 PARTICULATE MATTER (PM_{10})

The UK Air Quality Standards seek to control the health implications of respirable PM_{10}. However, the majority of particles released from construction will be greater than this in size.

Construction works on site have the potential to elevate localised PM_{10} concentrations in the area. On this basis, mitigation measures should still be taken to minimise these emissions as part of good site practice.

5.3 DUST

Particles greater than 10µm are likely to settle out relatively quickly and may cause annoyance due to their soiling capability. Although there are no formal standards or criteria for nuisance caused by deposited particles, the IAQM 'Guidance on Monitoring in the Vicinity of Demolition and Construction Sites' (October 2018) and the Environment Agency Technical Guidance Note (TGN) M17 states that dust is usually compared with a 'complaints likely' guideline of 200mg/m^2/day. Therefore, a deposition rate of 200mg/m^2/day is often presented as a threshold for serious nuisance though this is usually only applied to long term exposure as people are generally more tolerant of dust for a short or defined period. Significant nuisance is likely when the dust coverage of surfaces is visible in contrast with adjacent clean areas, especially when it happens regularly. Severe dust nuisance occurs when the dust is perceptible without a clean reference surface.

Construction activities have the potential to suspend dust, which could result in annoyance of residents surrounding the site. Measures will be taken to minimise the emissions of dust as part of good site practice.

Recommended mitigation measures proportionate to the risk associated with the development and based on best practice guidance are discussed in the following sections.

5.4 METHODOLOGY

The construction phase assessment utilises the IAQM Guidance on the Assessment of Dust from Demolition and Construction document published in February 2014.

Four construction processes are considered; these are demolition, earthworks, construction and trackout. For each of these phases, the impact description of the potential dust impacts is derived following the determination of a dust emission magnitude and the distance of activities to the nearest sensitive receptor, therefore assessing worst case impacts. A full explanation of the methodology is contained in Appendix A.

5.5 ASSESSMENT RESULTS

Based on the methodology detailed in Appendix A, the scale of the anticipated works has determined the potential dust emission magnitude for each process, as presented in the **Table 5-1** below.

Table 5-1. Dust Emission Magnitude

Construction Process	Site Criteria	Dust Emission Magnitude
Demolition	No demolition required	N/A
Earthworks	Total Site Area: >10,000 m^2	Large
Construction	Total Building Volume >100,000 m^3	Large
Trackout	Assumed >50 HDV outward movements in any one day	Large

The sensitivity of the surrounding area to each construction process has been determined following stage 2B of the IAQM guidance. The assessment has determined the area sensitivities as shown in the **Table 5-2**.

The sensitivity of the ecological receptors is considered not applicable within the construction phase assessment due to the distance from the application site which is greater than 500m. This is in accordance with Table 4 of the IAQM Guidance.

Table 5-2. Sensitivity of the Area

Source	Area Sensitivity					
	Dust Soiling	Site Sensitivity Criteria	Health Effects of PM_{10}	Site Sensitivity Criteria	Ecological	Site Sensitivity Criteria
Demolition	N/A	No demolition required	N/A	No demolition required	N/A	No demolition required
Earthworks	High	>100 Highly Sensitive Receptors within 50m	Low	Annual Mean of <24 ug/m^3 for PM_{10} >100 Highly Sensitive Receptors within 50m	N/A	>50 m from site boundary
Construction	High		Low		N/A	
Trackout	High	>100 Highly Sensitive Receptors within 50m of roads within 500m of site	Low	Annual Mean of <24 ug/m^3 for PM_{10} >100 Highly Sensitive Receptors within 50m of roads within 500m of site	N/A	>50 m from roads within 500 m from site boundary

The dust emission magnitude determined in **Table 5-1** has been combined with the sensitivity of the area determined in **Table 5-2**, to determine the risk of impacts prior to the implementation of appropriate mitigation measures. The potential impact significance of dust emissions associated with the development, without mitigation, is presented in **Table 5-3**.

Table 5-3. Impact Description of Construction Activities without Mitigation

Source	Summary Risk of Impacts Prior to Mitigation		
	Dust Soiling	Health Effects of PM_{10}	Ecological
Demolition	N/A	N/A	N/A
Earthworks	High	Low	N/A
Construction	High	Low	N/A
Trackout	High	Low	N/A

Appropriate mitigation measures are detailed and presented in Section 7. Following the adoption of these measures, the subsequent impact significance of the construction phase is not predicted to be significant.

6.0 ASSESSMENT OF AIR QUALITY IMPACTS - OPERATIONAL PHASE

In the context of the Southern Link Road, road traffic is identified as the dominant emission source that is likely to cause potential risk of exposure of air pollutants at receptors.

The operational phase assessment therefore consists of the quantified predictions of the change in NO_2, PM_{10} and $PM_{2.5}$ for the operational phase of the development due to changes in traffic movement. Predictions of air quality at the site have been undertaken for the operational phase of the development using ADMS Roads.

In accordance with the provided traffic data, the operational phase assessment has been undertaken with an assumed operational opening year of 2033 The assessment scenarios are therefore:

- 2019 Baseline = Existing Baseline Conditions (2019);

Scenario 1 – No Improvements made to A46

- 2033 "Do Minimum" = Baseline Conditions + Committed Development Flows; and,
- 2033 "Do Something" = Baseline Conditions + Committed Development Flows + Southern Link Road.

Scenario 2 – Improvements Completed on A46

- 2033 "Do Minimum" = Baseline Conditions + Committed Development Flows; and,
- 2033 "Do Something" = Baseline Conditions + Committed Development Flows + Southern Link Road.

6.1 EXISTING AND PREDICTED TRAFFIC FLOWS

Baseline 2019 traffic data, projected 2033 'Do Minimum' and 'Do Something' traffic data, and average vehicle speeds have been obtained for the operational phase assessment in the form of Annual Average Daily Traffic figures (AADT). Traffic data for all scenarios, inclusive of HGV numbers and average speeds have been provided by Tetra Tech Transport Consultants for all links.

Emission factors for the 2019 baseline and 2033 projected 'Do Minimum' and 'Do Something' scenarios have been calculated using the Emission Factor Toolkit (EFT) Version 10.1 (August 2020). The Emission Factor Toolkit (EFT) Version 10.1 (August 2020) projects only till 2030, therefore 2030 emissions have been utilised throughout the assessment for the operational year of 2033. It should be noted that emissions are predicted to reduce beyond 2030 to the proposed opening year of 2033, therefore a worst-case assessment has been undertaken.

A 50 m 20 km/hr slow down phase is included on each link at every junction and roundabout within the assessment. All of the roads within the dispersion model are illustrated in **Figure A-1**. Detailed traffic figures are provided in the **Table 6-1** and **Table 6-2**.

Table 6-1. Scenario 1 – No Improvements made to A46 – Traffic Data

Link	2019 Baseline			2033 Do Minimum			2033 Do Something		
	Speed	AADT	%HGV	Speed	AADT	%HGV	Speed	AADT	%HGV
Hawton Road	54	7616	2.8	54	9920	1.0	54	9718	1.1
B6166 Lombard Street	31	23633	9.2	30	27564	7.2	31	26785	7.2
B6166 Castle Gate	31	29272	8.5	31	29040	7.0	31	27961	7.7
B6326 Great North Road	58	23641	9.8	58	25189	7.3	58	23870	7.3
Mill Gate	40	4493	6.7	40	3829	9.6	40	4458	13.8
B6166 Farndon Road (East of Mill Gate)	42	14886	10.9	43	11935	18.0	43	11920	16.1
B6166 Farndon Road (West of Mill Gate)	57	25087	9.6	47	20416	18.8	48	16461	21.2
B6166 Bar Gate	44	29626	11.0	34	27946	8.1	34	27766	6.9
B6166 North Gate	47	19363	11.5	35	16775	8.0	35	16491	7.5
B6326 London Road (West of Bowbridge Road)	39	22487	8.1	39	21863	8.9	39	21930	7.8
Albert Street	44	6124	3.6	44	7163	1.2	44	7118	0.5
B6166 Lincoln Road	58	22348	12.7	58	24874	8.7	58	24695	8.2
Queens Road	50	19194	7.6	50	19929	6.8	50	19630	6.4
Sleaford Road	52	19979	8.5	49	23908	5.1	48	24372	5.3
Beacon Hill Road	54	24226	9.4	53	21510	10.0	53	26800	8.0
Connector Road - A1 to Beckingham Road (West)	48	4870	6.4	34	10160	15.1	29	9658	16.8
Connector Road - A1 to Beckingham Road (East)	48	5193	9.0	45	8691	21.3	45	8541	21.4
Beckingham Road (East of Cannon Close)	54	17940	8.9	50	30479	10.8	51	30726	11.0
Beckingham Road (East of Newark Road)	54	13986	9.7	54	26523	16.0	54	27092	16.2
Bowbridge Road (North of Boundary Road)	48	14655	50.3	47	20244	6.9	47	18214	5.2
Bowbridge Road (South of Boundary Road)	52	15809	4.7	51	16910	3.8	52	15172	3.9
Bowbridge Road (South of Hawton Lane)	54	6824	0.0	54	9433	0.1	54	11066	0.1
B62326 London Road (East of Bowbridge Road)	47	20656	4.1	44	24904	3.9	44	24642	3.5
B62326 London Road (North of Main Street)	46	19063	9.8	43	22462	8.7	44	22342	7.9
B62326 London Road (South of Main Street)	58	17309	12.0	58	21076	9.9	58	21151	8.9
Sherwood Avenue	44	20010	6.2	43	22290	6.5	43	22409	5.2
Barnby Gate	48	9839	4.8	46	8886	10.2	46	10040	4.6
Barnby Road	48	3931	18.5	47	8406	21.1	47	7275	14.7
Friary Road	46	15594	2.5	46	15322	2.3	46	15097	1.2
Newark LUF (West of Howton Road)	-	-	-	-	-	-	79	16730	10.9
Newark LUF (East of Howton Road)	-	-	-	64	10167	5.2	63	15944	10.8
Newark LUF (West of Bowbridge Road)	-	-	-	63	11778	4.5	63	16288	10.6
Staple Lane	48	6578	5.2	78	18439	3.6	77	17967	6.9
A46 With LUF (South of Farndon Road)	-	-	-	-	-	-	106	39709	19.2
A46 Without LUF (South of Farndon Road)	105	50320	18.9	105	42766	20.4	-	-	-
A46 (North of Farndon Road)	69	37788	20.4	76	33011	18.8	71	36742	16.9
A46 (East of Great North Road)	71	36342	26.2	75	41013	17.9	74	41380	17.7
A1 (South of Beacon Hill Road)	107	62906	35.0	99	81554	25.3	98	81029	25.3
A1 (North of Beacon Hill Road)	107	60775	35.3	99	81134	28.3	98	81216	24.2
A46 (East of Lincoln Road)	75	58475	29.5	74	60770	19.4	74	61242	18.9

Table 6-2. Scenario 2 – Improvements Completed on A46 – Traffic Data

Link	2019 Baseline			2033 Do Minimum			2033 Do Something		
	Speed	AADT	%HGV	Speed	AADT	%HGV	Speed	AADT	%HGV
Hawton Road	54	7616	2.8	54	10766	1.0	54	11680	0.9
B6166 Lombard Street	31	23633	9.2	31	26598	7.2	31	26103	6.8
B6166 Castle Gate	31	29272	8.5	32	27362	7.3	32	26815	7.1
B6326 Great North Road	58	23641	9.8	58	24740	8.8	58	24073	8.7
Mill Gate	40	4493	6.7	40	4540	11.4	39	5012	11.7
B6166 Farndon Road (East of Mill Gate)	42	14886	10.9	43	13059	15.8	43	12250	15.2
B6166 Farndon Road (West of Mill Gate)	57	25087	9.6	47	23121	17.0	48	17270	19.8
B6166 Bar Gate	44	29626	11.0	34	26410	7.8	34	25908	7.4
B6166 North Gate	47	19363	11.5	36	15689	5.1	36	15284	5.1
B6326 London Road (West of Bowbridge Road)	39	22487	8.1	39	22634	8.9	39	21555	6.7
Albert Street	44	6124	3.6	44	7447	1.0	44	7073	0.3
B6166 Lincoln Road	58	22348	12.7	58	19203	6.8	58	19428	6.8
Queens Road	50	19194	7.6	50	19757	8.1	50	19532	8.5
Sleaford Road	52	19979	8.5	50	22589	7.1	50	22866	7.8
Beacon Hill Road	54	24226	9.4	52	27070	9.2	52	26995	9.6
Connector Road - A1 to Beckingham Road (West)	48	4870	6.4	27	6691	14.1	29	6488	16.4
Connector Road - A1 to Beckingham Road (East)	48	5193	9.0	47	8646	10.5	46	9066	10.6
Beckingham Road (East of Cannon Close)	54	17940	8.9	52	27759	10.5	53	27332	11.2
Beckingham Road (East of Newark Road)	54	13986	9.7	54	23811	11.6	54	23039	12.5
Bowbridge Road (North of Boundary Road)	48	14655	50.3	47	17150	5.5	47	17472	3.6
Bowbridge Road (South of Boundary Road)	52	15809	4.7	52	15352	2.1	52	15307	4.1
Bowbridge Road (South of Hawton Lane)	54	6824	0.0	54	9231	0.0	54	10504	0.1
B62326 London Road (East of Bowbridge Road)	47	20656	4.1	44	24882	3.6	44	24515	2.5
B62326 London Road (North of Main Street)	46	19063	9.8	44	21997	7.6	45	21368	6.9
B62326 London Road (South of Main Street)	58	17309	12.0	58	20529	8.9	58	20551	7.9
Sherwood Avenue	44	20010	6.2	43	21016	5.1	44	21016	4.1
Barnby Gate	48	9839	4.8	47	8556	8.6	47	8257	5.3
Barnby Road	48	3931	18.5	48	7170	20.1	47	7342	10.8
Friary Road	46	15594	2.5	46	14962	2.3	47	15314	2.3
Newark LUF (West of Howton Road)	-	-	-	-	-	-	79	18101	10.0
Newark LUF (East of Howton Road)	-	-	-	64	9305	6.2	62	16565	10.2
Newark LUF (West of Bowbridge Road)	-	-	-	64	10699	5.4	63	15659	10.8
Staple Lane	48	6578	5.2	78	16273	3.9	77	18206	9.0
A46 With LUF (South of Farndon Road)	-	-	-	-	-	-	104	46138	20.3
A46 Without LUF (South of Farndon Road)	105	50320	18.9	105	47344	20.1	-	-	-
A46 (North of Farndon Road)	69	37788	20.4	91	46535	17.2	91	50123	16.5
A46 (East of Great North Road)	71	36342	26.2	91	51225	17.6	91	55428	17.4
A1 (South of Beacon Hill Road)	107	62906	35.0	99	79276	25.0	99	78504	25.7
A1 (North of Beacon Hill Road)	107	60775	35.3	99	80115	22.1	99	80175	26.4
A46 (East of Lincoln Road)	75	58475	29.5	79	27175	20.8	79	27624	20.4

6.2 BACKGROUND CONCENTRATIONS

The use of background concentrations within the modelling process ensures that pollutant sources other than traffic are represented appropriately. Background sources of pollutants include industrial, domestic and rail emissions within the vicinity of the study site. Several sources have been used to obtain representative background levels as discussed below.

The background concentrations used within the assessment have been determined with reference to the IAQM Guidance and Technical Guidance (TG) (16).

The IAQM Guidance states:

> "*A matter of judgement should take into account the background and future background air quality and whether it is likely to approach or exceed the value of the AQO.*"

Additionally, TG (16) states:

> "*Typically, only the process contributions from local sources are represented within an output by the dispersion model. In these circumstances, it is necessary to add an appropriate background concentration(s) to the modelled source contributions to derive the total pollutant concentrations.*"

Defra Published Background Concentrations for 2019

The background concentrations shown in **Table 6-3** were referenced from the UK National Air Quality Information Archive database based on the National Grid Co-ordinates of 1 x 1 km grid squares nearest to the application site. In May 2019, Defra issued revised 2018 based background maps for nitrogen oxide (NO_X), NO_2, PM_{10} and $PM_{2.5}$.

Table 6-3. Published Background Air Quality Levels (µg/m^3)

Receptor Location	2019			
	NO_X	NO_2	PM_{10}	$PM_{2.5}$
Local Authority Monitoring				
1N	16.63	12.36	14.11	8.79
7N	16.26	12.10	14.88	9.25
9N	16.63	12.36	14.11	8.79
10N	17.83	13.20	15.14	9.13
16N	22.30	16.13	17.85	10.19
21N	17.90	13.18	14.47	9.03
Existing Sensitive Receptors				
R1	22.30	16.13	17.85	10.19
R2	17.93	13.29	17.48	9.95
R3	18.56	13.66	15.48	9.40
R4	18.56	13.66	15.48	9.40
R5	17.83	13.20	15.14	9.13
R6	17.83	13.20	15.14	9.13
R7	17.83	13.20	15.14	9.13
R8	17.83	13.20	15.14	9.13
R9	17.83	13.20	15.14	9.13

R10	17.83	13.20	15.14	9.13
R11	17.83	13.20	15.14	9.13
R12	17.90	13.18	14.47	9.03
R13	17.90	13.18	14.47	9.03
R14	17.90	13.18	14.47	9.03
R15	22.30	16.13	17.85	10.19
R16	22.30	16.13	17.85	10.19
R17	16.87	12.57	17.26	9.86
R18	16.87	12.57	17.26	9.86
R19	16.87	12.57	17.26	9.86
R20	16.87	12.57	17.26	9.86
R21	16.87	12.57	17.26	9.86
R22	14.02	10.58	15.34	8.98
R23	16.26	12.10	14.88	9.25
R24	16.26	12.10	14.88	9.25
R25	17.90	13.18	14.47	9.03
R26	17.90	13.18	14.47	9.03
R27	17.90	13.18	14.47	9.03
R28	17.90	13.18	14.47	9.03
R29	16.26	12.10	14.88	9.25
R30	16.26	12.10	14.88	9.25
R31	16.26	12.10	14.88	9.25
R32	16.26	12.10	14.88	9.25
R33	14.02	10.58	15.34	8.98
R34	14.95	11.28	18.22	9.96
R35	15.28	11.51	18.28	10.03
R36	16.87	12.57	17.26	9.86
R37	15.28	11.51	18.28	10.03
R38	14.95	11.28	18.22	9.96
R39	15.58	11.73	17.80	9.96
R40	15.58	11.73	17.80	9.96
R41	15.58	11.73	17.80	9.96
R42	12.97	9.88	14.66	8.73
R43	12.97	9.88	14.66	8.73
R44	12.97	9.88	14.66	8.73
R45	13.60	10.30	15.19	9.01
R46	16.26	12.10	14.88	9.25
R47	16.26	12.10	14.88	9.25
R48	16.26	12.10	14.88	9.25
R49	16.26	12.10	14.88	9.25
R50	13.30	10.10	14.28	8.76
R51	13.30	10.10	14.28	8.76
R52	12.14	9.28	15.83	8.89
R53	12.14	9.28	15.83	8.89
R54	12.14	9.28	15.83	8.89
R55	11.77	9.03	16.04	8.83
R56	14.85	11.20	15.51	9.07
R57	16.63	12.36	14.11	8.79
R58	16.63	12.36	14.11	8.79

R59	16.63	12.36	14.11	8.79
R60	16.63	12.36	14.11	8.79
R61	16.63	12.36	14.11	8.79
R62	16.63	12.36	14.11	8.79
R63	16.63	12.36	14.11	8.79
R64	16.63	12.36	14.11	8.79
R65	16.63	12.36	14.11	8.79
R66	14.85	11.20	15.51	9.07
R67	14.85	11.20	15.51	9.07
R68	14.85	11.20	15.51	9.07
R69	14.85	11.20	15.51	9.07
R70	16.63	12.36	14.11	8.79
R71	16.63	12.36	14.11	8.79
R72	16.63	12.36	14.11	8.79
R73	17.83	13.20	15.14	9.13
Ecological Sensitive Receptors				
E1	15.25	11.46	15.32	8.93
E2	15.25	11.46	15.32	8.93
E3	16.63	12.36	14.11	8.79

All the Defra background concentrations detailed in **Table 6-3** for 2019, show that the background levels are predicted to be below the relevant AQO within the study area.

A breakdown of the background source apportionment of NO_X concentrations at each monitoring location and receptor is shown in **Table 6-4**.

Table 6-4. Pollutant Source Apportionment of NO_X (µg/m^3)

Receptor Location	2019						
	Total NO_x	% of NO_x from Road Sources	% of NO_x from Industrial Sources	% of NO_x from Domestic Sources	% of NO_x from Aircraft Sources	% of NO_x from Rail Sources	% of NO_x from Other Sources
Local Authority Monitoring							
1N	16.63	23.61	8.08	10.95	0.00	2.91	54.45
7N	16.26	22.30	5.53	13.43	0.00	4.03	54.70
9N	16.63	23.61	8.08	10.95	0.00	2.91	54.45
10N	17.83	33.23	4.94	5.40	0.00	5.19	51.24
16N	22.30	42.76	8.48	3.80	0.00	2.36	42.60
21N	17.90	22.89	5.41	8.87	0.00	5.46	57.38
Existing Sensitive Receptors							
R1	22.30	42.76	8.48	3.80	0.00	2.36	42.60
R2	17.93	36.48	5.27	1.83	0.00	4.86	51.56
R3	18.56	31.26	4.91	4.69	0.00	6.99	52.15
R4	18.56	31.26	4.91	4.69	0.00	6.99	52.15
R5	17.83	33.23	4.94	5.40	0.00	5.19	51.24
R6	17.83	33.23	4.94	5.40	0.00	5.19	51.24
R7	17.83	33.23	4.94	5.40	0.00	5.19	51.24
R8	17.83	33.23	4.94	5.40	0.00	5.19	51.24
R9	17.83	33.23	4.94	5.40	0.00	5.19	51.24

R10	17.83	33.23	4.94	5.40	0.00	5.19	51.24
R11	17.83	33.23	4.94	5.40	0.00	5.19	51.24
R12	17.90	22.89	5.41	8.87	0.00	5.46	57.38
R13	17.90	22.89	5.41	8.87	0.00	5.46	57.38
R14	17.90	22.89	5.41	8.87	0.00	5.46	57.38
R15	22.30	42.76	8.48	3.80	0.00	2.36	42.60
R16	22.30	42.76	8.48	3.80	0.00	2.36	42.60
R17	16.87	34.01	5.48	4.32	0.00	1.86	54.33
R18	16.87	34.01	5.48	4.32	0.00	1.86	54.33
R19	16.87	34.01	5.48	4.32	0.00	1.86	54.33
R20	16.87	34.01	5.48	4.32	0.00	1.86	54.33
R21	16.87	34.01	5.48	4.32	0.00	1.86	54.33
R22	14.02	19.54	6.19	7.06	0.00	4.52	62.70
R23	16.26	22.30	5.53	13.43	0.00	4.03	54.70
R24	16.26	22.30	5.53	13.43	0.00	4.03	54.70
R25	17.90	22.89	5.41	8.87	0.00	5.46	57.38
R26	17.90	22.89	5.41	8.87	0.00	5.46	57.38
R27	17.90	22.89	5.41	8.87	0.00	5.46	57.38
R28	17.90	22.89	5.41	8.87	0.00	5.46	57.38
R29	16.26	22.30	5.53	13.43	0.00	4.03	54.70
R30	16.26	22.30	5.53	13.43	0.00	4.03	54.70
R31	16.26	22.30	5.53	13.43	0.00	4.03	54.70
R32	16.26	22.30	5.53	13.43	0.00	4.03	54.70
R33	14.02	19.54	6.19	7.06	0.00	4.52	62.70
R34	14.95	33.33	5.19	3.93	0.00	4.08	53.48
R35	15.28	33.85	5.41	4.23	0.00	2.41	54.11
R36	16.87	34.01	5.48	4.32	0.00	1.86	54.33
R37	15.28	33.85	5.41	4.23	0.00	2.41	54.11
R38	14.95	33.33	5.19	3.93	0.00	4.08	53.48
R39	15.58	36.90	4.77	4.51	0.00	3.83	50.00
R40	15.58	36.90	4.77	4.51	0.00	3.83	50.00
R41	15.58	36.90	4.77	4.51	0.00	3.83	50.00
R42	12.97	23.10	5.58	7.76	0.00	2.02	61.54
R43	12.97	23.10	5.58	7.76	0.00	2.02	61.54
R44	12.97	23.10	5.58	7.76	0.00	2.02	61.54
R45	13.60	20.35	5.80	8.65	0.00	4.71	60.48
R46	16.26	22.30	5.53	13.43	0.00	4.03	54.70
R47	16.26	22.30	5.53	13.43	0.00	4.03	54.70
R48	16.26	22.30	5.53	13.43	0.00	4.03	54.70
R49	16.26	22.30	5.53	13.43	0.00	4.03	54.70
R50	13.30	19.91	5.75	8.76	0.00	2.20	63.39
R51	13.30	19.91	5.75	8.76	0.00	2.20	63.39
R52	12.14	16.13	6.17	4.63	0.00	1.69	71.37
R53	12.14	16.13	6.17	4.63	0.00	1.69	71.37
R54	12.14	16.13	6.17	4.63	0.00	1.69	71.37
R55	11.77	18.95	6.70	3.69	0.00	1.97	68.69
R56	14.85	31.16	5.11	4.71	0.00	1.84	57.17
R57	16.63	23.61	8.08	10.95	0.00	2.91	54.45

R58	16.63	23.61	8.08	10.95	0.00	2.91	54.45
R59	16.63	23.61	8.08	10.95	0.00	2.91	54.45
R60	16.63	23.61	8.08	10.95	0.00	2.91	54.45
R61	16.63	23.61	8.08	10.95	0.00	2.91	54.45
R62	16.63	23.61	8.08	10.95	0.00	2.91	54.45
R63	16.63	23.61	8.08	10.95	0.00	2.91	54.45
R64	16.63	23.61	8.08	10.95	0.00	2.91	54.45
R65	16.63	23.61	8.08	10.95	0.00	2.91	54.45
R66	14.85	31.16	5.11	4.71	0.00	1.84	57.17
R67	14.85	31.16	5.11	4.71	0.00	1.84	57.17
R68	14.85	31.16	5.11	4.71	0.00	1.84	57.17
R69	14.85	31.16	5.11	4.71	0.00	1.84	57.17
R70	16.63	23.61	8.08	10.95	0.00	2.91	54.45
R71	16.63	23.61	8.08	10.95	0.00	2.91	54.45
R72	16.63	23.61	8.08	10.95	0.00	2.91	54.45
R73	17.83	33.23	4.94	5.40	0.00	5.19	51.24
Ecological Sensitive Receptors							
E1	15.25	27.37	5.18	3.28	0.00	4.69	59.48
E2	15.25	27.37	5.18	3.28	0.00	4.69	59.48
E3	16.63	23.61	8.08	10.95	0.00	2.91	54.45

Table 6-4 shows that the major background source of NO_X at the monitoring, sensitive receptor locations where sources have been identified are mainly comprised of road sources.

A review of the Defra background site has determined that they are in line with the Local Authority monitoring within NSDC.

Table 6-5 shows the background concentrations utilised within the assessment.

Table 6-5. Utilised Background Concentrations (µg/m^3)

Receptor Location	2019		Source
	NO_x	NO_2	
Local Authority Monitoring			
1N	16.63	12.36	Defra Background Maps
7N	16.26	12.10	
9N	16.63	12.36	
10N	17.83	13.20	
16N	22.30	16.13	
21N	17.90	13.18	
Existing Sensitive Receptors			
R1	22.30	16.13	Defra Background Maps
R2	17.93	13.29	
R3	18.56	13.66	
R4	18.56	13.66	
R5	17.83	13.20	
R6	17.83	13.20	
R7	17.83	13.20	

R8	17.83	13.20
R9	17.83	13.20
R10	17.83	13.20
R11	17.83	13.20
R12	17.90	13.18
R13	17.90	13.18
R14	17.90	13.18
R15	22.30	16.13
R16	22.30	16.13
R17	16.87	12.57
R18	16.87	12.57
R19	16.87	12.57
R20	16.87	12.57
R21	16.87	12.57
R22	14.02	10.58
R23	16.26	12.10
R24	16.26	12.10
R25	17.90	13.18
R26	17.90	13.18
R27	17.90	13.18
R28	17.90	13.18
R29	16.26	12.10
R30	16.26	12.10
R31	16.26	12.10
R32	16.26	12.10
R33	14.02	10.58
R34	14.95	11.28
R35	15.28	11.51
R36	16.87	12.57
R37	15.28	11.51
R38	14.95	11.28
R39	15.58	11.73
R40	15.58	11.73
R41	15.58	11.73
R42	12.97	9.88
R43	12.97	9.88
R44	12.97	9.88
R45	13.60	10.30
R46	16.26	12.10
R47	16.26	12.10
R48	16.26	12.10
R49	16.26	12.10
R50	13.30	10.10
R51	13.30	10.10
R52	12.14	9.28
R53	12.14	9.28
R54	12.14	9.28
R55	11.77	9.03
R56	14.85	11.20

R57	16.63	12.36	
R58	16.63	12.36	
R59	16.63	12.36	
R60	16.63	12.36	
R61	16.63	12.36	
R62	16.63	12.36	
R63	16.63	12.36	
R64	16.63	12.36	
R65	16.63	12.36	
R66	14.85	11.20	
R67	14.85	11.20	
R68	14.85	11.20	
R69	14.85	11.20	
R70	16.63	12.36	
R71	16.63	12.36	
R72	16.63	12.36	
R73	17.83	13.20	
Ecological Sensitive Receptors			
E1	16.68	-	APIS
E2	16.68	-	
E3	16.68	-	

6.3 MODEL VERIFICATION

Model verification involves the comparison of modelled data to monitored data in order to gain the best possible representation of current pollutant concentrations for the assessment years. The verification process is in general accordance with that contained in Section 7 of the TG16 guidance note and uses the most recently available diffusion tube monitoring data to best represent this.

The verification process consists of using the monitoring data and the published background air quality data in the UK National Air Quality Information Archive to calculate the road traffic contribution of NO_X at the monitoring locations. Outputs from the ADMS Roads model are provided as predicted road traffic contribution NO_X emissions. These are converted into predicted roadside contribution NO_2 exposure at the relevant receptor locations based on the updated approach to deriving NO_2 from NO_X for road traffic sources published in Local Air Quality Management TG16. The calculation was derived using the NO_X to NO_2 worksheet in the online LAQM tools website hosted by Defra. **Table 6-6** summarises the final model/monitored data correlation following the application of the model correction factor.

Table 6-6. Comparison of Roadside Modelling & Monitoring Results for NO_2

Monitoring Location	NO_2 µg/m^3		
	Monitored NO_2	**Modelled NO_2**	**Difference (%)**
1N	31.20	28.91	-7.33
7N	28.50	30.61	7.41
9N	27.90	25.69	-7.91
10N	20.60	22.01	6.83
16N	35.40	35.70	0.83

21N	25.10	25.89	3.13

The final model produced data at the monitoring locations to within 10% of the monitoring results at all of the verification points, as recommended by TG16 guidance.

The final verification model correlation coefficient (representing the model uncertainty) is 1.00. This was achieved by applying a model correction factor of 2.05 to roadside predicted NO_X concentrations before converting to NO_2. This figure demonstrates that the model predictions were in line with the road traffic emissions at the monitoring locations.

6.4 ADMS-ROADS MODEL INPUTS

Table 6-7. Summary of ADMS Roads Model Inputs

Parameter	Description	Input Value
Chemistry	A facility within ADMS-Roads to calculate the chemical reactions in the atmosphere between Nitric Oxide (NO), NO_2, Ozone (O_3) and Volatile organic compounds (VOCs).	No atmospheric chemistry parameters included
Meteorology	Representative meteorological data from a local source	**East Midlands Airport 2019 Meteorological Station**, hourly sequential data
Surface Roughness	A setting to define the surface roughness of the model area based upon its location.	**1.0m** representing a typical surface roughness for **Cities and Woodlands** was used for the Site **0.5m** representing a typical surface roughness for **Parkland, Open Suburbia** for the met. Measurement site.
Latitude	Allows the location of the model area to be set	United Kingdom = **53.0**
Monin-Obukhov Length	This allows a measure of the stability of the atmosphere within the model area to be specified depending upon its character.	Cities and Large Towns = **30m** was used for the Site Mixed Urban/Industrial = **30m** was used for the met. Measurement site.
Elevation of Road	Allows the height of the road link above ground level to be specified.	All other road links were set at ground level = **0m**.
Road Width	Allows the width of the road link to be specified.	Road width used depended on data obtained from OS map data for the specific road link
Topography	This enables complex terrain data to be included within the model in order to account for turbulence and plume spread effects of topography	No topographical information used
Time Varied Emissions	This enables daily, weekly or monthly variations in emissions to be applied to road sources	No time varied emissions used
Road Type	Allows the effect of different types of roads to be assessed.	**Urban (Not London)** settings were used for the relevant links
Road Speeds	Enables individual road speeds to be added for each road link	Based on national speed limits
Canyon Height	Allows the model to take account turbulent flow patterns occurring inside a street with relatively tall buildings on both sides, known as a “street canyon”.	No canyons used within the model
Road Source Emissions	Road source emission rates are calculated from traffic flow data using the in-built EFT database of traffic emission factors.	The **EFT** Version **10.1 (2020)** dataset was used.
Year	Predicted EFT emissions rates depend on the year of emission.	**2019** data for verification and baseline Operational Phase Assessment. **2030** data for the 2033 Operational Phase Traffic Assessment.

6.5 ADMS MODELLING RESULTS

6.5.1 Traffic Assessment

The ADMS Model has predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ at relevant receptor locations adjacent to roads likely to be affected by the development, as summarised in the following tables. Only receptors close to roads where there is predicted to be a change in emissions have been assessed.

6.5.2 Assessment Scenarios

For the operational year of 2033, assessment of the effects of emissions from the proposed traffic associated with the scheme, has been undertaken using the Emissions Factor Toolkit (EFT) 2030 emissions rates which take into account of the rate of reduction in emission from road vehicles into the future with the following factors:

- 2019 Baseline = Existing Baseline Conditions (2019);

Scenario 1 – No Improvements made to A46

- 2033 "Do Minimum" = Baseline Conditions + Committed Development Flows; and,
- 2033 "Do Something" = Baseline Conditions + Committed Development Flows + Southern Link Road.

Scenario 2 – Improvements Completed on A46

- 2033 "Do Minimum" = Baseline Conditions + Committed Development Flows; and,
- 2033 "Do Something" = Baseline Conditions + Committed Development Flows + Southern Link Road.

Additionally, a sensitivity, theoretical, test has been undertaken in Appendix C assuming no improvements in vehicle emissions between the baseline year of 2019 and the opening year of 2033.

6.5.3 Operational Traffic Assessment

6.5.3.1 Scenario 1 – No Improvements made to A46

Nitrogen Dioxide

Table 6-8 presents a summary of the predicted change in NO_2 concentrations at relevant receptor locations, due to changes in traffic flow associated with the Southern Link Road, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table 6-8. Predicted Annual Average Concentrations of NO_2 at Receptor Locations

Receptor		NO_2 ($\mu g/m^3$)			
		2019 Baseline	2033 Do Minimum	2033 Do Something	Development Contribution
R1	20 Wheatsheaf Avenue	26.11	18.61	18.62	0.01
R2	24 Robert Dukeson Avenue	19.93	14.93	14.95	0.02
R3	65 Alexander Avenue	19.01	14.98	14.99	0.01
R4	7 Waters Edge, Kings Sconce Avenue	16.90	14.47	14.47	<0.01
R5	34 Sandhills Close	19.07	14.59	14.64	0.05
R6	Andreas, Great North Road	21.62	15.60	15.51	-0.09
R7	2 Manners Road	21.07	15.46	15.37	-0.09

R8	Castle View Court, Mather Road	25.30	16.78	16.62	-0.16
R9	1 Bar Gate	28.86	17.55	17.41	-0.14
R10	19 Bar Gate	29.06	17.87	17.73	-0.14
R11	29 North Gate	33.44	18.53	18.35	-0.18
R12	162 North Gate	21.09	15.32	15.27	-0.05
R13	19 Apple Tree	22.51	15.51	15.45	-0.06
R14	1 Lincoln Road	23.24	15.95	15.90	-0.05
R15	31 Linseed Avenue	22.99	18.00	17.98	-0.02
R16	Premier Inn Newark	25.29	18.54	18.52	-0.02
R17	11 Bryans Close	21.15	14.85	14.85	<0.01
R18	70 Newark Road	33.87	18.79	18.75	-0.04
R19	Greenfield Close Care Home	23.49	16.51	16.51	<0.01
R20	37 Cannon Close	20.11	15.24	15.28	0.04
R21	157 Beacon Hill Road	19.37	15.68	15.75	0.07
R22	77 Beacon Hill	16.92	12.27	12.55	0.28
R23	76 Beacon Hill Road	22.01	14.78	15.24	0.46
R24	66 Esther Varney Place	19.19	14.39	14.45	0.06
R25	2 Sleaford Road	40.75	22.25	22.33	0.08
R26	1 Friary Road	25.25	16.91	16.78	-0.13
R27	24 Queens Court	22.32	15.90	15.83	-0.07
R28	13 Queens Court	28.25	17.72	17.60	-0.12
R29	62 Barnby Gate	24.80	16.31	16.13	-0.18
R30	Newark College	17.72	13.79	13.75	-0.04
R31	181 Barnby Gate	17.36	13.77	13.76	-0.01
R32	Barnby Road Academy	14.69	13.22	13.07	-0.15
R33	Edinburgh Lodge, Barnby Road	13.54	12.02	11.78	-0.24
R34	Green Bank Lodge, Barnby Road	16.94	13.12	12.96	-0.16
R35	27 Bayford Drive	17.17	12.97	12.95	-0.02
R36	Greenways Newark Road	24.92	15.98	15.95	-0.03
R37	35 Edgehill Drive	16.98	12.96	12.95	-0.01
R38	Field House Farm, Coddington Road	16.79	12.70	12.68	-0.02
R39	Bridgeholme Cottage, Coddington Road	27.70	15.92	15.87	-0.05
R40	144 Main Street	25.08	15.21	15.16	-0.05
R41	22 Southfield	27.43	16.15	16.10	-0.05
R42	7 Bilton Close	19.15	13.57	13.66	0.09
R43	233 London Road	22.56	14.07	13.97	-0.10
R44	196 London Road	15.49	11.82	11.78	-0.04
R45	2 Glebe Park	15.85	12.37	12.33	-0.04
R46	89 London Road	18.48	14.44	14.40	-0.04
R47	2 Cottage Homes, London Road	37.42	19.68	19.32	-0.36
R48	2 Bowbridge Road	29.04	15.36	15.03	-0.33
R49	115 Bowbridge Road	26.44	14.89	14.58	-0.31
R50	120 Bowbridge Road	15.26	11.68	11.53	-0.15
R51	Hawtonville Children's Centre	14.41	11.49	11.36	-0.13
R52	254 Bowbridge Road	14.88	11.12	11.01	-0.11
R53	7 Tannington Grove	11.44	10.32	10.48	0.16
R54	Millstone Cottage Bowbridge Lane	10.41	9.95	9.96	0.01
R55	The Willows, Newark Road	9.51	9.22	9.37	0.15
R56	205 Hawton Road	14.22	12.32	12.32	<0.01

R57	1 Hawton Road	16.57	13.81	13.78	-0.03
R58	12 Newark Court, Boundary Road	19.33	14.78	14.72	-0.06
R59	14 Alert Street	20.07	14.64	14.57	-0.07
R60	3 London Road	35.05	19.53	19.31	-0.22
R61	Travelodge Newark	29.84	17.91	17.75	-0.16
R62	4 Portland Street	23.19	15.37	15.28	-0.09
R63	6 Victoria Street	21.46	14.75	14.69	-0.06
R64	1 Mill Gate	17.99	13.87	13.93	0.06
R65	1 The Waterfront	21.68	15.10	14.69	-0.41
R66	67 Farndon Road	18.78	13.39	13.04	-0.35
R67	149 Farndon Road	20.70	13.63	13.27	-0.36
R68	31 The Ivies	17.91	12.66	12.74	0.08
R69	Farndon Fields Farm, Fosse Way	17.68	12.62	11.67	-0.95
R70	4 Mill Gate	18.95	14.24	14.38	0.14
R71	37 Lombard Street	21.02	15.06	14.97	-0.09
R72	30 Castle Gate	28.67	17.11	17.02	-0.09
R73	1 Castle Gate	34.13	19.21	19.09	-0.12
Annual Mean AQO		**40 µg/m^3**			

All modelled existing receptors are predicted to be below the AQO for NO_2 in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table 6-8**, the maximum predicted increase in annual average exposure to NO_2 at any existing receptor, due to changes in traffic movements associated with the Southern Link Road is likely to be 0.46 µg/m^3 at 76 Beacon Hill Road (R23).

The predicted long-term NO_2 concentrations at all existing receptors are well below 60 µg/m^3 in all scenarios. Therefore, it is unlikely there will be any exceedances for the short-term NO_2 AQO at all modelled receptors as outlined in LAQM TG16 technical guidance.

Figure 6-1 and **Figure 6-2** below illustrate the Total Long Term Annual Average Nitrogen Dioxide (NO_2) Concentration and contribution at the Southern Link Road (µg/m^3).

Figure 6-1. Annual Average Long-Term Nitrogen Dioxide (NO_2) Contribution as a Result of the Newark Southern Link Road ($\mu g/m^3$)

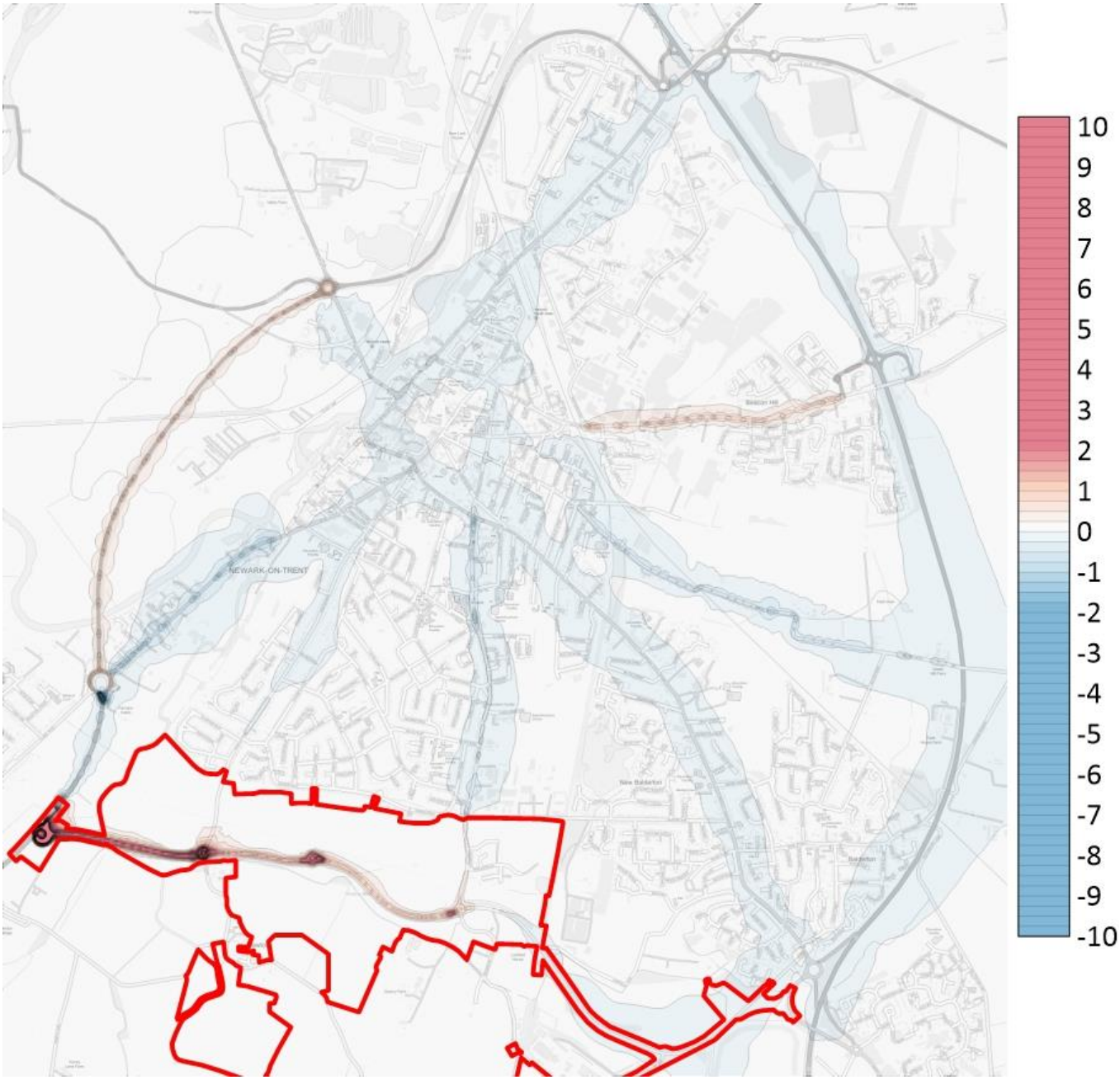
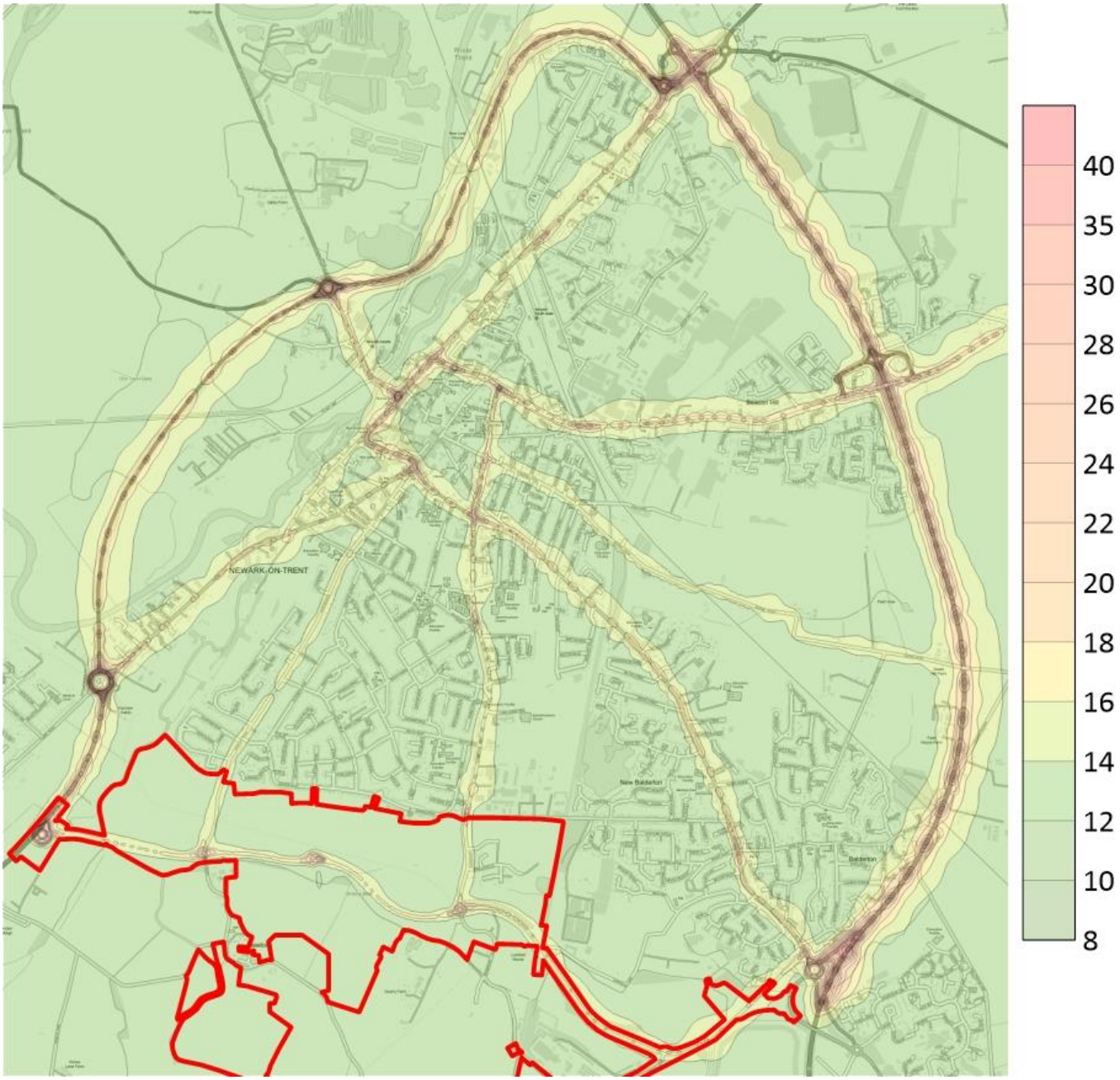


Figure 6-2. Total Long Term Annual Average Nitrogen Dioxide (NO_2) Concentration Across the Study Area ($\mu g/m^3$)



The impact description of changes in traffic flow associated with the Southern Link Road with respect to annual mean NO_2 exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table 6-9**.

Table 6-9. Impact Description of Effects at Key Receptors (NO_2)

Impact Description of NO_2 Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	0.01	0.02	0%	≤75% of AQO	Negligible Increase
R2	0.02	0.05	0%	≤75% of AQO	Negligible Increase
R3	0.01	0.02	0%	≤75% of AQO	Negligible Increase
R4	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R5	0.05	0.12	0%	≤75% of AQO	Negligible Increase
R6	-0.09	-0.22	0%	≤75% of AQO	Negligible Decrease
R7	-0.09	-0.22	0%	≤75% of AQO	Negligible Decrease
R8	-0.16	-0.40	0%	≤75% of AQO	Negligible Decrease
R9	-0.14	-0.35	0%	≤75% of AQO	Negligible Decrease
R10	-0.14	-0.35	0%	≤75% of AQO	Negligible Decrease
R11	-0.18	-0.45	0%	≤75% of AQO	Negligible Decrease
R12	-0.05	-0.12	0%	≤75% of AQO	Negligible Decrease
R13	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R14	-0.05	-0.12	0%	≤75% of AQO	Negligible Decrease
R15	-0.02	-0.05	0%	≤75% of AQO	Negligible Decrease
R16	-0.02	-0.05	0%	≤75% of AQO	Negligible Decrease
R17	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R18	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R19	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R20	0.04	0.10	0%	≤75% of AQO	Negligible Increase
R21	0.07	0.17	0%	≤75% of AQO	Negligible Increase
R22	0.28	0.70	1%	≤75% of AQO	Negligible Increase
R23	0.46	1.15	1%	≤75% of AQO	Negligible Increase
R24	0.06	0.15	0%	≤75% of AQO	Negligible Increase

R25	0.08	0.20	0%	≤75% of AQO	Negligible Increase
R26	-0.13	-0.32	0%	≤75% of AQO	Negligible Decrease
R27	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
R28	-0.12	-0.30	0%	≤75% of AQO	Negligible Decrease
R29	-0.18	-0.45	0%	≤75% of AQO	Negligible Decrease
R30	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R31	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R32	-0.15	-0.37	0%	≤75% of AQO	Negligible Decrease
R33	-0.24	-0.60	1%	≤75% of AQO	Negligible Decrease
R34	-0.16	-0.40	0%	≤75% of AQO	Negligible Decrease
R35	-0.02	-0.05	0%	≤75% of AQO	Negligible Decrease
R36	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R37	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R38	-0.02	-0.05	0%	≤75% of AQO	Negligible Decrease
R39	-0.05	-0.12	0%	≤75% of AQO	Negligible Decrease
R40	-0.05	-0.12	0%	≤75% of AQO	Negligible Decrease
R41	-0.05	-0.12	0%	≤75% of AQO	Negligible Decrease
R42	0.09	0.22	0%	≤75% of AQO	Negligible Increase
R43	-0.10	-0.25	0%	≤75% of AQO	Negligible Decrease
R44	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R45	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R46	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R47	-0.36	-0.90	1%	≤75% of AQO	Negligible Decrease
R48	-0.33	-0.82	1%	≤75% of AQO	Negligible Decrease
R49	-0.31	-0.77	1%	≤75% of AQO	Negligible Decrease
R50	-0.15	-0.37	0%	≤75% of AQO	Negligible Decrease
R51	-0.13	-0.32	0%	≤75% of AQO	Negligible Decrease
R52	-0.11	-0.27	0%	≤75% of AQO	Negligible Decrease
R53	0.16	0.40	0%	≤75% of AQO	Negligible Increase

R54	0.01	0.02	0%	≤75% of AQO	Negligible Increase
R55	0.15	0.37	0%	≤75% of AQO	Negligible Increase
R56	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R57	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R58	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R59	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
R60	-0.22	-0.55	1%	≤75% of AQO	Negligible Decrease
R61	-0.16	-0.40	0%	≤75% of AQO	Negligible Decrease
R62	-0.09	-0.22	0%	≤75% of AQO	Negligible Decrease
R63	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R64	0.06	0.15	0%	≤75% of AQO	Negligible Increase
R65	-0.41	-1.02	1%	≤75% of AQO	Negligible Decrease
R66	-0.35	-0.87	1%	≤75% of AQO	Negligible Decrease
R67	-0.36	-0.90	1%	≤75% of AQO	Negligible Decrease
R68	0.08	0.20	0%	≤75% of AQO	Negligible Increase
R69	-0.95	-2.37	2-5%	≤75% of AQO	Negligible Decrease
R70	0.14	0.35	0%	≤75% of AQO	Negligible Increase
R71	-0.09	-0.22	0%	≤75% of AQO	Negligible Decrease
R72	-0.09	-0.22	0%	≤75% of AQO	Negligible Decrease
R73	-0.12	-0.30	0%	≤75% of AQO	Negligible Decrease

+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.

The impact description of the effects of changes in traffic flow as a result of the Southern Link Road, with respect to NO_2 exposure for existing receptors, is determined to be:

- 'Negligible Increase' at 21 Receptors; and,
- 'Negligible Decrease' at 52 Receptors.

This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

Particulate Matter (PM_{10})

Table 6-10 presents a summary of the predicted change in annual mean PM_{10} concentrations at relevant receptor locations, due to changes in traffic flow associated with the Southern Link Road, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table 6-10. Predicted Annual Average Concentrations of PM_{10} at Receptor Locations

Receptor		PM_{10} (µg/m^3)			
		2019 Baseline	2033 Do Minimum	2033 Do Something	Development Contribution
R1	20 Wheatsheaf Avenue	19.64	19.45	19.44	-0.01
R2	24 Robert Dukeson Avenue	18.99	18.84	18.84	<0.01
R3	65 Alexander Avenue	16.69	16.57	16.57	<0.01
R4	7 Waters Edge, Kings Sconce Avenue	16.16	16.09	16.09	<0.01
R5	34 Sandhills Close	16.16	15.98	16.00	0.02
R6	Andreas, Great North Road	16.88	16.74	16.68	-0.06
R7	2 Manners Road	16.76	16.64	16.58	-0.06
R8	Castle View Court, Mather Road	17.65	17.48	17.37	-0.11
R9	1 Bar Gate	17.51	17.14	17.08	-0.06
R10	19 Bar Gate	18.01	17.55	17.48	-0.07
R11	29 North Gate	18.05	17.47	17.41	-0.06
R12	162 North Gate	15.98	15.65	15.62	-0.03
R13	19 Apple Tree	15.86	15.59	15.57	-0.02
R14	1 Lincoln Road	16.04	15.88	15.85	-0.03
R15	31 Linseed Avenue	19.08	19.00	18.98	-0.02
R16	Premier Inn Newark	19.29	19.17	19.14	-0.03
R17	11 Bryans Close	19.21	19.38	19.26	-0.12
R18	70 Newark Road	22.36	22.83	22.68	-0.15
R19	Greenfield Close Care Home	19.67	20.26	20.26	0.00
R20	37 Cannon Close	18.90	19.25	19.23	-0.02
R21	157 Beacon Hill Road	18.56	19.02	19.05	0.03
R22	77 Beacon Hill	16.63	16.47	16.63	0.16
R23	76 Beacon Hill Road	16.89	16.62	16.90	0.28
R24	66 Esther Varney Place	16.23	16.23	16.26	0.03
R25	2 Sleaford Road	18.56	18.46	18.49	0.03
R26	1 Friary Road	16.41	16.26	16.21	-0.05
R27	24 Queens Court	16.09	15.97	15.94	-0.03
R28	13 Queens Court	16.65	16.45	16.41	-0.04
R29	62 Barnby Gate	16.81	16.77	16.72	-0.05
R30	Newark College	15.92	15.85	15.81	-0.04
R31	181 Barnby Gate	15.89	15.91	15.87	-0.04
R32	Barnby Road Academy	15.36	15.60	15.49	-0.11
R33	Edinburgh Lodge, Barnby Road	15.90	16.28	16.11	-0.17
R34	Green Bank Lodge, Barnby Road	19.43	19.68	19.57	-0.11
R35	27 Bayford Drive	19.54	19.57	19.56	-0.01
R36	Greenways Newark Road	20.10	20.25	20.23	-0.02
R37	35 Edgehill Drive	19.49	19.53	19.52	-0.01
R38	Field House Farm, Coddington Road	19.44	19.46	19.45	-0.01
R39	Bridgeholme Cottage, Coddington Road	21.55	21.61	21.59	-0.02
R40	144 Main Street	20.89	20.93	20.91	-0.02
R41	22 Southfield	21.05	21.13	21.11	-0.02
R42	7 Bilton Close	16.38	16.84	16.86	0.02
R43	233 London Road	16.39	16.47	16.44	-0.03
R44	196 London Road	15.72	15.81	15.78	-0.03

R45	2 Glebe Park	16.27	16.40	16.38	-0.02
R46	89 London Road	16.12	16.25	16.22	-0.03
R47	2 Cottage Homes, London Road	18.49	18.18	18.05	-0.13
R48	2 Bowbridge Road	17.15	16.45	16.31	-0.14
R49	115 Bowbridge Road	17.52	16.58	16.37	-0.21
R50	120 Bowbridge Road	15.24	15.20	15.12	-0.08
R51	Hawtonville Children's Centre	15.14	15.13	15.06	-0.07
R52	254 Bowbridge Road	16.65	16.65	16.61	-0.04
R53	7 Tannington Grove	16.25	16.43	16.53	0.10
R54	Millstone Cottage Bowbridge Lane	16.04	16.26	16.29	0.03
R55	The Willows, Newark Road	16.13	16.16	16.24	0.08
R56	205 Hawton Road	16.11	16.19	16.18	-0.01
R57	1 Hawton Road	14.79	14.84	14.82	-0.02
R58	12 Newark Court, Boundary Road	15.19	15.24	15.22	-0.02
R59	14 Alert Street	15.41	15.33	15.29	-0.04
R60	3 London Road	17.39	17.17	17.09	-0.08
R61	Travelodge Newark	16.62	16.54	16.48	-0.06
R62	4 Portland Street	15.97	15.77	15.72	-0.05
R63	6 Victoria Street	15.79	15.57	15.51	-0.06
R64	1 Mill Gate	15.13	15.00	15.02	0.02
R65	1 The Waterfront	16.04	15.89	15.64	-0.25
R66	67 Farndon Road	17.07	16.93	16.72	-0.21
R67	149 Farndon Road	17.13	16.87	16.66	-0.21
R68	31 The Ivies	16.92	16.63	16.66	0.03
R69	Farndon Fields Farm, Fosse Way	16.70	16.47	15.77	-0.70
R70	4 Mill Gate	15.15	15.04	15.09	0.05
R71	37 Lombard Street	15.52	15.48	15.45	-0.03
R72	30 Castle Gate	16.82	16.52	16.48	-0.04
R73	1 Castle Gate	18.17	17.76	17.70	-0.06
Annual Mean AQO		**40 µg/m³**			

All modelled existing receptors are predicted to be below the AQO for PM_{10} in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table 6-10**, the maximum predicted increase in annual average exposure to PM_{10} at any existing receptor, due to changes in traffic movements associated with the Southern Link Road is 0.27 µg/m³ at 76 Beacon Hill Road (R23).

The impact description of changes in traffic flow associated with the Southern Link Road with respect to annual mean PM_{10} exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table 6-11**.

Table 6-11. Impact Description of Effects at Key Receptors (PM_{10})

Impact Description of PM_{10} Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	-0.01	-0.03	0%	≤75% of AQO	Negligible Increase

R2	<0.01	0.00	0%	≤75% of AQO	Negligible Decrease
R3	<0.01	0.00	0%	≤75% of AQO	Negligible Decrease
R4	<0.01	0.00	0%	≤75% of AQO	Negligible Decrease
R5	0.02	0.06	0%	≤75% of AQO	Negligible Increase
R6	-0.06	-0.16	0%	≤75% of AQO	Negligible Decrease
R7	-0.06	-0.16	0%	≤75% of AQO	Negligible Increase
R8	-0.11	-0.28	0%	≤75% of AQO	Negligible Decrease
R9	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R10	-0.07	-0.19	0%	≤75% of AQO	Negligible Decrease
R11	-0.06	-0.17	0%	≤75% of AQO	Negligible Increase
R12	-0.03	-0.07	0%	≤75% of AQO	Negligible Increase
R13	-0.02	-0.06	0%	≤75% of AQO	Negligible Increase
R14	-0.03	-0.06	0%	≤75% of AQO	Negligible Increase
R15	-0.02	-0.06	0%	≤75% of AQO	Negligible Increase
R16	-0.03	-0.06	0%	≤75% of AQO	Negligible Increase
R17	-0.12	-0.30	0%	≤75% of AQO	Negligible Increase
R18	-0.15	-0.38	0%	≤75% of AQO	Negligible Increase
R19	0.00	0.00	0%	≤75% of AQO	Negligible Increase
R20	-0.02	-0.04	0%	≤75% of AQO	Negligible Increase
R21	0.03	0.09	0%	≤75% of AQO	Negligible Increase
R22	0.16	0.40	0%	≤75% of AQO	Negligible Increase
R23	0.28	0.68	1%	≤75% of AQO	Negligible Increase
R24	0.03	0.07	0%	≤75% of AQO	Negligible Increase
R25	0.03	0.08	0%	≤75% of AQO	Negligible Increase
R26	-0.05	-0.13	0%	≤75% of AQO	Negligible Increase
R27	-0.03	-0.09	0%	≤75% of AQO	Negligible Increase
R28	-0.04	-0.12	0%	≤75% of AQO	Negligible Increase
R29	-0.05	-0.11	0%	≤75% of AQO	Negligible Increase
R30	-0.04	-0.08	0%	≤75% of AQO	Negligible Increase

R31	-0.04	-0.08	0%	≤75% of AQO	Negligible Increase
R32	-0.11	-0.28	0%	≤75% of AQO	Negligible Increase
R33	-0.17	-0.43	0%	≤75% of AQO	Negligible Increase
R34	-0.11	-0.28	0%	≤75% of AQO	Negligible Increase
R35	-0.01	-0.02	0%	≤75% of AQO	Negligible Increase
R36	-0.02	-0.03	0%	≤75% of AQO	Negligible Increase
R37	-0.01	-0.01	0%	≤75% of AQO	Negligible Increase
R38	-0.01	-0.02	0%	≤75% of AQO	Negligible Increase
R39	-0.02	-0.05	0%	≤75% of AQO	Negligible Increase
R40	-0.02	-0.04	0%	≤75% of AQO	Negligible Increase
R41	-0.02	-0.04	0%	≤75% of AQO	Negligible Increase
R42	0.02	0.05	0%	≤75% of AQO	Negligible Increase
R43	-0.03	-0.08	0%	≤75% of AQO	Negligible Increase
R44	-0.03	-0.06	0%	≤75% of AQO	Negligible Increase
R45	-0.02	-0.06	0%	≤75% of AQO	Negligible Increase
R46	-0.03	-0.08	0%	≤75% of AQO	Negligible Increase
R47	-0.13	-0.31	0%	≤75% of AQO	Negligible Increase
R48	-0.14	-0.37	0%	≤75% of AQO	Negligible Increase
R49	-0.21	-0.52	1%	≤75% of AQO	Negligible Increase
R50	-0.08	-0.20	0%	≤75% of AQO	Negligible Increase
R51	-0.07	-0.18	0%	≤75% of AQO	Negligible Increase
R52	-0.04	-0.11	0%	≤75% of AQO	Negligible Increase
R53	0.10	0.24	0%	≤75% of AQO	Negligible Increase
R54	0.03	0.06	0%	≤75% of AQO	Negligible Increase
R55	0.08	0.20	0%	≤75% of AQO	Negligible Increase
R56	-0.01	-0.01	0%	≤75% of AQO	Negligible Increase
R57	-0.02	-0.05	0%	≤75% of AQO	Negligible Increase
R58	-0.02	-0.07	0%	≤75% of AQO	Negligible Increase
R59	-0.04	-0.09	0%	≤75% of AQO	Negligible Increase

R60	-0.08	-0.20	0%	≤75% of AQO	Negligible Increase
R61	-0.06	-0.17	0%	≤75% of AQO	Negligible Increase
R62	-0.05	-0.14	0%	≤75% of AQO	Negligible Increase
R63	-0.06	-0.13	0%	≤75% of AQO	Negligible Increase
R64	0.02	0.04	0%	≤75% of AQO	Negligible Increase
R65	-0.25	-0.62	1%	≤75% of AQO	Negligible Increase
R66	-0.21	-0.53	1%	≤75% of AQO	Negligible Increase
R67	-0.21	-0.54	1%	≤75% of AQO	Negligible Increase
R68	0.03	0.06	0%	≤75% of AQO	Negligible Increase
R69	-0.70	-1.74	2-5%	≤75% of AQO	Negligible Increase
R70	0.05	0.12	0%	≤75% of AQO	Negligible Increase
R71	-0.03	-0.08	0%	≤75% of AQO	Negligible Increase
R72	-0.04	-0.12	0%	≤75% of AQO	Negligible Increase
R73	-0.06	-0.16	0%	≤75% of AQO	Negligible Increase

+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.

The impact description of the effects of changes in traffic as a result of the Southern Link Road, with respect to annual mean PM_{10} exposure for existing receptors is determined to be:

- 'Negligible Increase' at 66 Receptors; and,
- 'Negligible Decrease' at 7 Receptors.

This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

Particulate Matter ($PM_{2.5}$)

Table 6-12 presents a summary of the predicted change in annual mean $PM_{2.5}$ concentrations at relevant receptor locations, due to changes in traffic flow associated with the Southern Link Road, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table 6-12. Predicted Annual Average Concentrations of $PM_{2.5}$ at Receptor Locations

Receptor		$PM_{2.5}$ (µg/m^3)			
		2019 Baseline	2033 Do Minimum	2033 Do Something	Development Contribution
R1	20 Wheatsheaf Avenue	11.24	11.06	11.06	<0.01
R2	24 Robert Dukeson Avenue	10.81	10.68	10.68	<0.01
R3	65 Alexander Avenue	10.10	9.99	9.99	<0.01

R4	7 Waters Edge, Kings Sconce Avenue	9.80	9.74	9.74	<0.01
R5	34 Sandhills Close	9.73	9.59	9.61	0.02
R6	Andreas, Great North Road	10.14	10.01	9.97	-0.04
R7	2 Manners Road	10.07	9.95	9.92	-0.03
R8	Castle View Court, Mather Road	10.58	10.41	10.35	-0.06
R9	1 Bar Gate	10.54	10.24	10.21	-0.03
R10	19 Bar Gate	10.82	10.46	10.42	-0.04
R11	29 North Gate	10.88	10.43	10.39	-0.04
R12	162 North Gate	9.90	9.68	9.66	-0.02
R13	19 Apple Tree	9.85	9.65	9.63	-0.02
R14	1 Lincoln Road	9.96	9.80	9.79	-0.01
R15	31 Linseed Avenue	10.91	10.82	10.81	-0.01
R16	Premier Inn Newark	11.04	10.91	10.90	-0.01
R17	11 Bryans Close	10.99	11.00	10.94	-0.06
R18	70 Newark Road	12.81	12.85	12.78	-0.07
R19	Greenfield Close Care Home	11.25	11.48	11.48	<0.01
R20	37 Cannon Close	10.81	10.94	10.93	-0.01
R21	157 Beacon Hill Road	10.62	10.82	10.84	0.02
R22	77 Beacon Hill	9.72	9.59	9.68	0.09
R23	76 Beacon Hill Road	10.42	10.20	10.35	0.15
R24	66 Esther Varney Place	10.03	9.99	10.01	0.02
R25	2 Sleaford Road	11.49	11.25	11.27	0.02
R26	1 Friary Road	10.18	10.02	9.99	-0.03
R27	24 Queens Court	9.98	9.85	9.84	-0.01
R28	13 Queens Court	10.33	10.13	10.10	-0.03
R29	62 Barnby Gate	10.40	10.30	10.28	-0.02
R30	Newark College	9.86	9.79	9.77	-0.02
R31	181 Barnby Gate	9.84	9.81	9.80	-0.01
R32	Barnby Road Academy	9.53	9.64	9.58	-0.06
R33	Edinburgh Lodge, Barnby Road	9.30	9.49	9.40	-0.09
R34	Green Bank Lodge, Barnby Road	10.67	10.75	10.69	-0.06
R35	27 Bayford Drive	10.76	10.72	10.71	-0.01
R36	Greenways Newark Road	11.51	11.47	11.46	-0.01
R37	35 Edgehill Drive	10.73	10.70	10.70	<0.01
R38	Field House Farm, Coddington Road	10.67	10.63	10.63	<0.01
R39	Bridgeholme Cottage, Coddington Road	12.12	12.00	11.99	-0.01
R40	144 Main Street	11.74	11.64	11.63	-0.01
R41	22 Southfield	11.85	11.75	11.74	-0.01
R42	7 Bilton Close	9.73	9.92	9.93	0.01
R43	233 London Road	9.76	9.73	9.71	-0.02
R44	196 London Road	9.34	9.35	9.34	-0.01
R45	2 Glebe Park	9.64	9.68	9.66	-0.02
R46	89 London Road	9.97	10.01	9.99	-0.02
R47	2 Cottage Homes, London Road	11.43	11.09	11.02	-0.07
R48	2 Bowbridge Road	10.61	10.12	10.04	-0.08
R49	115 Bowbridge Road	10.79	10.18	10.07	-0.11
R50	120 Bowbridge Road	9.31	9.26	9.22	-0.04
R51	Hawtonville Children's Centre	9.25	9.22	9.18	-0.04

R52	254 Bowbridge Road	9.38	9.35	9.33	-0.02
R53	7 Tannington Grove	9.13	9.22	9.28	0.06
R54	Millstone Cottage Bowbridge Lane	9.01	9.13	9.14	0.01
R55	The Willows, Newark Road	8.89	8.90	8.94	0.04
R56	205 Hawton Road	9.42	9.44	9.44	<0.01
R57	1 Hawton Road	9.19	9.19	9.18	-0.01
R58	12 Newark Court, Boundary Road	9.43	9.42	9.41	-0.01
R59	14 Alert Street	9.55	9.46	9.44	-0.02
R60	3 London Road	10.76	10.49	10.45	-0.04
R61	Travelodge Newark	10.30	10.14	10.10	-0.04
R62	4 Portland Street	9.88	9.70	9.67	-0.03
R63	6 Victoria Street	9.77	9.58	9.55	-0.03
R64	1 Mill Gate	9.39	9.28	9.29	0.01
R65	1 The Waterfront	9.91	9.75	9.62	-0.13
R66	67 Farndon Road	9.97	9.84	9.73	-0.11
R67	149 Farndon Road	10.02	9.81	9.70	-0.11
R68	31 The Ivies	9.88	9.68	9.69	0.01
R69	Farndon Fields Farm, Fosse Way	9.77	9.59	9.21	-0.38
R70	4 Mill Gate	9.40	9.30	9.33	0.03
R71	37 Lombard Street	9.62	9.54	9.53	-0.01
R72	30 Castle Gate	10.39	10.12	10.09	-0.03
R73	1 Castle Gate	10.95	10.59	10.55	-0.04
Annual Mean AQO		**25 µg/m³**			

All modelled existing receptors are predicted to be below the AQO for $PM_{2.5}$ in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table 6-12**, the maximum predicted increase in annual average exposure to $PM_{2.5}$ at any existing receptor, due to changes in traffic movements associated with the Southern Link Road is 0.15 µg/m³ at 76 Beacon Hill Road (R23).

The impact description of changes in traffic flow associated with the Southern Link Road with respect to annual mean $PM_{2.5}$ exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table 6-13**.

Table 6-13. Impact Description of Effects at Key Receptors ($PM_{2.5}$)

Impact Description of $PM_{2.5}$ Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	<0.01	-0.02	0%	≤75% of AQO	Negligible Increase
R2	<0.01	0.00	0%	≤75% of AQO	Negligible Decrease
R3	<0.01	0.00	0%	≤75% of AQO	Negligible Decrease
R4	<0.01	0.00	0%	≤75% of AQO	Negligible Decrease
R5	0.02	0.05	0%	≤75% of AQO	Negligible Increase

R6	-0.04	-0.14	0%	≤75% of AQO	Negligible Decrease
R7	-0.03	-0.14	0%	≤75% of AQO	Negligible Increase
R8	-0.06	-0.24	0%	≤75% of AQO	Negligible Decrease
R9	-0.03	-0.13	0%	≤75% of AQO	Negligible Decrease
R10	-0.04	-0.16	0%	≤75% of AQO	Negligible Decrease
R11	-0.04	-0.14	0%	≤75% of AQO	Negligible Increase
R12	-0.02	-0.06	0%	≤75% of AQO	Negligible Increase
R13	-0.02	-0.05	0%	≤75% of AQO	Negligible Increase
R14	-0.01	-0.06	0%	≤75% of AQO	Negligible Increase
R15	-0.01	-0.05	0%	≤75% of AQO	Negligible Increase
R16	-0.01	-0.05	0%	≤75% of AQO	Negligible Increase
R17	-0.06	-0.25	0%	≤75% of AQO	Negligible Increase
R18	-0.07	-0.32	0%	≤75% of AQO	Negligible Increase
R19	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R20	-0.01	-0.03	0%	≤75% of AQO	Negligible Increase
R21	0.02	0.07	0%	≤75% of AQO	Negligible Increase
R22	0.09	0.36	0%	≤75% of AQO	Negligible Increase
R23	0.15	0.61	1%	≤75% of AQO	Negligible Increase
R24	0.02	0.06	0%	≤75% of AQO	Negligible Increase
R25	0.02	0.07	0%	≤75% of AQO	Negligible Increase
R26	-0.03	-0.11	0%	≤75% of AQO	Negligible Increase
R27	-0.01	-0.07	0%	≤75% of AQO	Negligible Increase
R28	-0.03	-0.10	0%	≤75% of AQO	Negligible Increase
R29	-0.02	-0.09	0%	≤75% of AQO	Negligible Increase
R30	-0.02	-0.07	0%	≤75% of AQO	Negligible Increase
R31	-0.01	-0.06	0%	≤75% of AQO	Negligible Increase
R32	-0.06	-0.24	0%	≤75% of AQO	Negligible Increase
R33	-0.09	-0.37	0%	≤75% of AQO	Negligible Increase
R34	-0.06	-0.24	0%	≤75% of AQO	Negligible Increase

R35	-0.01	-0.02	0%	≤75% of AQO	Negligible Increase
R36	-0.01	-0.02	0%	≤75% of AQO	Negligible Increase
R37	<0.01	-0.01	0%	≤75% of AQO	Negligible Increase
R38	<0.01	-0.02	0%	≤75% of AQO	Negligible Increase
R39	-0.01	-0.05	0%	≤75% of AQO	Negligible Increase
R40	-0.01	-0.04	0%	≤75% of AQO	Negligible Increase
R41	-0.01	-0.04	0%	≤75% of AQO	Negligible Increase
R42	0.01	0.04	0%	≤75% of AQO	Negligible Increase
R43	-0.02	-0.07	0%	≤75% of AQO	Negligible Increase
R44	-0.01	-0.05	0%	≤75% of AQO	Negligible Increase
R45	-0.02	-0.06	0%	≤75% of AQO	Negligible Increase
R46	-0.02	-0.07	0%	≤75% of AQO	Negligible Increase
R47	-0.07	-0.27	0%	≤75% of AQO	Negligible Increase
R48	-0.08	-0.32	0%	≤75% of AQO	Negligible Increase
R49	-0.11	-0.45	0%	≤75% of AQO	Negligible Increase
R50	-0.04	-0.17	0%	≤75% of AQO	Negligible Increase
R51	-0.04	-0.16	0%	≤75% of AQO	Negligible Increase
R52	-0.02	-0.10	0%	≤75% of AQO	Negligible Increase
R53	0.06	0.21	0%	≤75% of AQO	Negligible Increase
R54	0.01	0.05	0%	≤75% of AQO	Negligible Increase
R55	0.04	0.17	0%	≤75% of AQO	Negligible Increase
R56	<0.01	-0.01	0%	≤75% of AQO	Negligible Increase
R57	-0.01	-0.04	0%	≤75% of AQO	Negligible Increase
R58	-0.01	-0.06	0%	≤75% of AQO	Negligible Increase
R59	-0.02	-0.07	0%	≤75% of AQO	Negligible Increase
R60	-0.04	-0.17	0%	≤75% of AQO	Negligible Increase
R61	-0.04	-0.15	0%	≤75% of AQO	Negligible Increase
R62	-0.03	-0.11	0%	≤75% of AQO	Negligible Increase
R63	-0.03	-0.11	0%	≤75% of AQO	Negligible Increase

R64	0.01	0.04	0%	≤75% of AQO	Negligible Increase
R65	-0.13	-0.54	1%	≤75% of AQO	Negligible Increase
R66	-0.11	-0.46	0%	≤75% of AQO	Negligible Increase
R67	-0.11	-0.47	0%	≤75% of AQO	Negligible Increase
R68	0.01	0.05	0%	≤75% of AQO	Negligible Increase
R69	-0.38	-1.50	2-5%	≤75% of AQO	Negligible Increase
R70	0.03	0.10	0%	≤75% of AQO	Negligible Increase
R71	-0.01	-0.07	0%	≤75% of AQO	Negligible Increase
R72	-0.03	-0.11	0%	≤75% of AQO	Negligible Increase
R73	-0.04	-0.15	0%	≤75% of AQO	Negligible Increase

+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.

The impact description of the effects of changes in traffic as a result of the Southern Link Road, with respect to annual mean PM_{10} exposure for existing receptors is determined to be:

- 'Negligible Increase' at 66 Receptors; and,
- 'Negligible Decrease' at 7 Receptors.

This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

6.5.4 Ecological Sensitive Receptor Locations

Background concentrations at each of the ecologically sensitive sites were determined through a review of the NO_X pollutants published on the APIS website.

The below assessment has been undertaken in accordance with A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites (IAQM, 2020).

Nitrogen Oxide

Table 6-14 presents a summary of the predicted change in NO_X concentrations at relevant receptor locations, due to changes in traffic flow associated with the development, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table 6-14. Predicted Annual Average Concentrations of NO_X at Ecological Receptor Locations

Ecological Receptor		Predicted Maximum Annual Mean Concentration (µg/m^3)				
		Do Minimum 2033 NO_X	Do Something 2033 NO_X	Process Contribution (PC)	PC as %age of AQO	Background
E1	Devon Park Pastures (LNR)	18.56	18.31	-0.26	-0.85	16.68
E2	Devon Park Pastures (LNR)	17.71	17.60	-0.11	-0.37	16.68

E3	Devon Park Pastures (LNR)	17.75	17.65	-0.10	-0.35	16.68
Annual Mean AQO/Critical Level (CL)		**30 µg/m^3**				

As indicated in **Table 6-14**, there is not predicted to be an increase in the annual average exposure to NO_X at any ecological receptor, due to changes in traffic movements associated with the development. The maximum predicted decrease in the annual average exposure to NO_X at any ecological receptor, due to changes in traffic movements associated with the development is -0.85 µg/m^3 at Devon Park Pastures (LNR) (E1).

Section 5.5.4.1 of *A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites*', IAQM 2020 states:

> *Where the assessment indicates that changes in annual mean NO_x concentrations within a designated site cannot be dismissed as imperceptible (i.e. an increase of over 0.4 µg/m^3) and the NO_x critical level is exceeded, then changes in nutrient nitrogen deposition should be calculated as supporting information to further assist in the evaluation of significance.*

There is not predicted to be an increase in the annual average exposure to NO_x at the identified ecological receptor, due to changes in traffic movements associated with the development. As a result, the predicted change is below the 0.40 µg/m^3 development contribution stated within the guidance of '*A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites*', IAQM 2020.

As a result, no further assessment is required and the impact at Devon Park Pastures (LNR) (E1) as this is considered to be negligible.

6.5.4.1 Scenario 2 – Improvements Completed on A46

Nitrogen Dioxide

Table 6-15 presents a summary of the predicted change in NO_2 concentrations at relevant receptor locations, due to changes in traffic flow associated with the Southern Link Road, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table 6-15. Predicted Annual Average Concentrations of NO_2 at Receptor Locations

Receptor		NO_2 (µg/m^3)			
		2019 Baseline	2033 Do Minimum	2033 Do Something	Development Contribution
R1	20 Wheatsheaf Avenue	26.11	18.88	19.06	0.18
R2	24 Robert Dukeson Avenue	19.93	15.27	15.42	0.15
R3	65 Alexander Avenue	19.01	15.26	15.37	0.11
R4	7 Waters Edge, Kings Sconce Avenue	16.90	14.59	14.64	0.05
R5	34 Sandhills Close	19.07	14.93	15.01	0.08
R6	Andreas, Great North Road	21.62	15.69	15.66	-0.03
R7	2 Manners Road	21.07	15.52	15.48	-0.04
R8	Castle View Court, Mather Road	25.30	16.80	16.71	-0.09
R9	1 Bar Gate	28.86	17.38	17.27	-0.11
R10	19 Bar Gate	29.06	17.66	17.56	-0.10
R11	29 North Gate	33.44	18.19	18.10	-0.09
R12	162 North Gate	21.09	15.12	15.10	-0.02

R13	19 Apple Tree	22.51	15.17	15.16	-0.01
R14	1 Lincoln Road	23.24	15.39	15.41	0.02
R15	31 Linseed Avenue	22.99	17.69	17.73	0.04
R16	Premier Inn Newark	25.29	18.27	18.34	0.07
R17	11 Bryans Close	21.15	14.83	14.83	<0.01
R18	70 Newark Road	33.87	18.51	18.50	-0.01
R19	Greenfield Close Care Home	23.49	16.21	16.18	-0.03
R20	37 Cannon Close	20.11	14.96	14.95	-0.01
R21	157 Beacon Hill Road	19.37	15.17	15.19	0.02
R22	77 Beacon Hill	16.92	12.61	12.61	<0.01
R23	76 Beacon Hill Road	22.01	15.34	15.35	0.01
R24	66 Esther Varney Place	19.19	14.35	14.40	0.05
R25	2 Sleaford Road	40.75	22.38	22.64	0.26
R26	1 Friary Road	25.25	16.87	16.94	0.07
R27	24 Queens Court	22.32	15.93	15.92	-0.01
R28	13 Queens Court	28.25	17.84	17.84	<0.01
R29	62 Barnby Gate	24.80	15.99	15.78	-0.21
R30	Newark College	17.72	13.77	13.78	0.01
R31	181 Barnby Gate	17.36	13.67	13.56	-0.11
R32	Barnby Road Academy	14.69	13.11	13.04	-0.07
R33	Edinburgh Lodge, Barnby Road	13.54	11.83	11.74	-0.09
R34	Green Bank Lodge, Barnby Road	16.94	12.98	12.91	-0.07
R35	27 Bayford Drive	17.17	12.93	12.92	-0.01
R36	Greenways Newark Road	24.92	15.86	15.83	-0.03
R37	35 Edgehill Drive	16.98	12.92	12.91	-0.01
R38	Field House Farm, Coddington Road	16.79	12.66	12.65	-0.01
R39	Bridgeholme Cottage, Coddington Road	27.70	15.81	15.77	-0.04
R40	144 Main Street	25.08	15.12	15.09	-0.03
R41	22 Southfield	27.43	15.99	15.99	<0.01
R42	7 Bilton Close	19.15	13.33	13.70	0.37
R43	233 London Road	22.56	13.85	13.74	-0.11
R44	196 London Road	15.49	11.75	11.68	-0.07
R45	2 Glebe Park	15.85	12.35	12.28	-0.07
R46	89 London Road	18.48	14.42	14.34	-0.08
R47	2 Cottage Homes, London Road	37.42	19.22	18.81	-0.41
R48	2 Bowbridge Road	29.04	14.96	14.84	-0.12
R49	115 Bowbridge Road	26.44	14.47	14.44	-0.03
R50	120 Bowbridge Road	15.26	11.51	11.55	0.04
R51	Hawtonville Children's Centre	14.41	11.35	11.38	0.03
R52	254 Bowbridge Road	14.88	10.89	11.03	0.14
R53	7 Tannington Grove	11.44	10.28	10.45	0.17
R54	Millstone Cottage Bowbridge Lane	10.41	9.89	9.97	0.08
R55	The Willows, Newark Road	9.51	9.22	9.39	0.17
R56	205 Hawton Road	14.22	12.41	12.52	0.11
R57	1 Hawton Road	16.57	13.92	14.00	0.08
R58	12 Newark Court, Boundary Road	19.33	14.94	15.01	0.07
R59	14 Alert Street	20.07	14.70	14.57	-0.13
R60	3 London Road	35.05	19.58	19.04	-0.54
R61	Travelodge Newark	29.84	17.82	17.59	-0.23

R62	4 Portland Street	23.19	15.46	15.28	-0.18
R63	6 Victoria Street	21.46	14.93	14.76	-0.17
R64	1 Mill Gate	17.99	14.07	14.02	-0.05
R65	1 The Waterfront	21.68	15.39	14.78	-0.61
R66	67 Farndon Road	18.78	13.64	13.13	-0.51
R67	149 Farndon Road	20.70	14.12	13.66	-0.46
R68	31 The Ivies	17.91	13.16	13.21	0.05
R69	Farndon Fields Farm, Fosse Way	17.68	12.83	11.79	-1.04
R70	4 Mill Gate	18.95	14.36	14.41	0.05
R71	37 Lombard Street	21.02	14.99	14.92	-0.07
R72	30 Castle Gate	28.67	16.88	16.78	-0.10
R73	1 Castle Gate	34.13	18.99	18.84	-0.15
Annual Mean AQO		**40 µg/m^3**			

All modelled existing receptors are predicted to be below the AQO for NO_2 in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table 6-8**, the maximum predicted increase in annual average exposure to NO_2 at any existing receptor, due to changes in traffic movements associated with the Southern Link Road is likely to be 0.37 µg/m^3 at 7 Bilton Close (R42).

The predicted long-term NO_2 concentrations at all existing receptors are well below 60 µg/m^3 in all scenarios. Therefore, it is unlikely there will be any exceedances for the short-term NO_2 AQO at all modelled receptors as outlined in LAQM TG16 technical guidance.

Figure 6-1 and **Figure 6-2** below illustrate the Total Long Term Annual Average Nitrogen Dioxide (NO_2) Concentration and contribution at the Southern Link Road (µg/m^3).

Figure 6-3. Annual Average Long-Term Nitrogen Dioxide (NO_2) Contribution as a Result of the Newark Southern Link Road ($\mu g/m^3$)

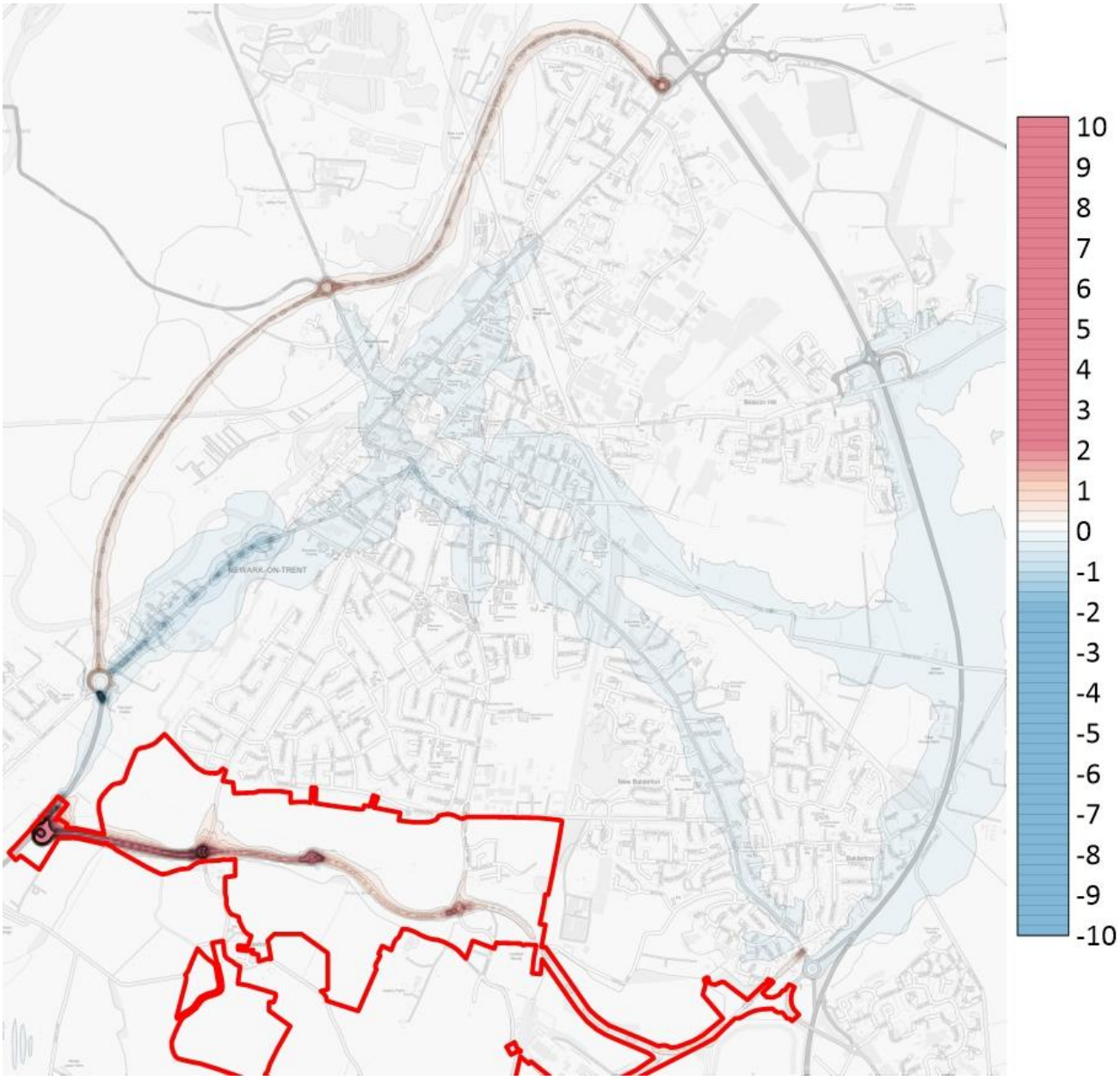
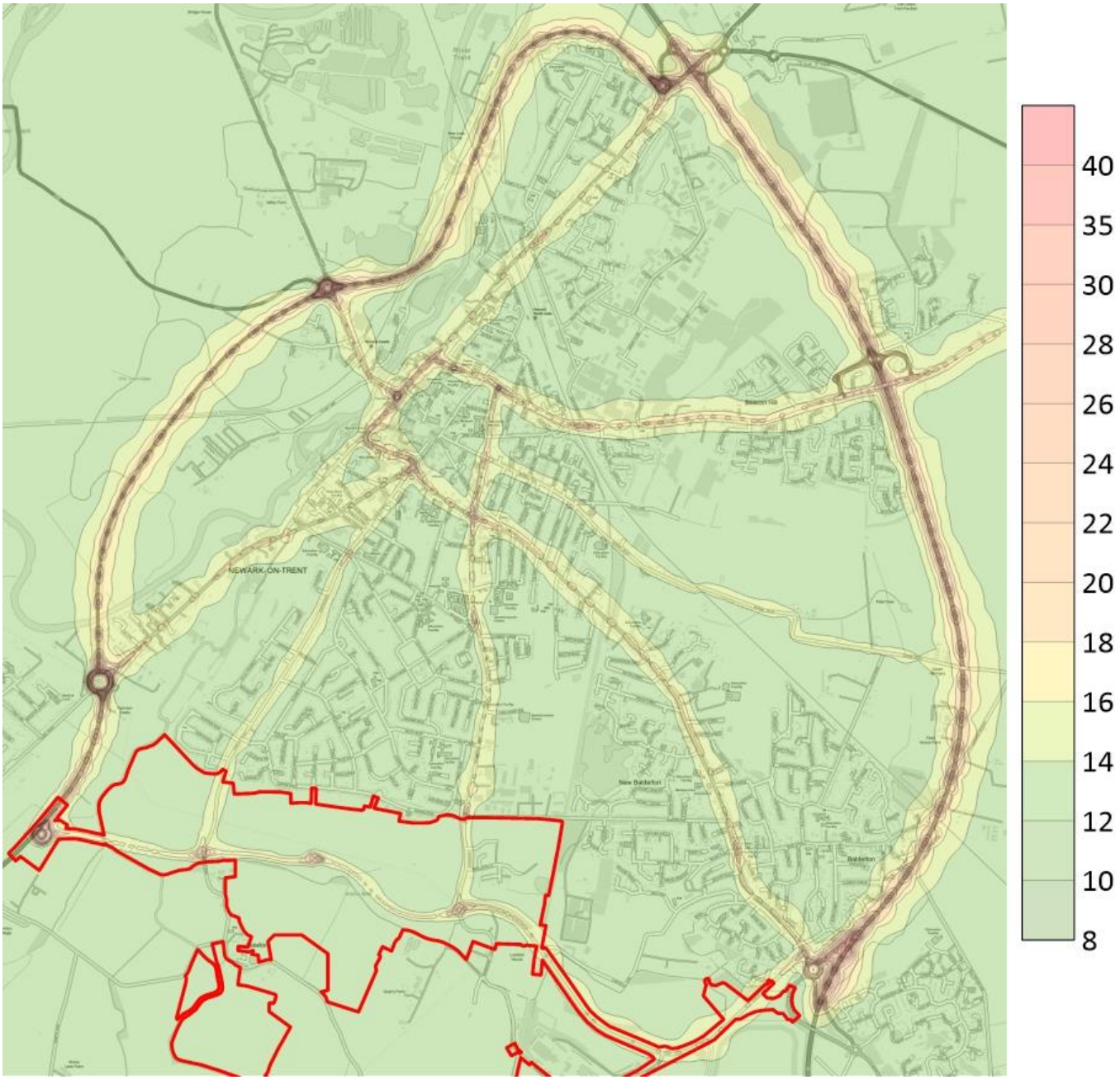


Figure 6-4. Total Long Term Annual Average Nitrogen Dioxide (NO_2) Concentration Across the Study Area ($\mu g/m^3$)



The impact description of changes in traffic flow associated with the Southern Link Road with respect to annual mean NO_2 exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table 6-16**.

Table 6-16. Impact Description of Effects at Key Receptors (NO_2)

Impact Description of NO_2 Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	0.18	0.45	0%	≤75% of AQO	Negligible Increase
R2	0.15	0.37	0%	≤75% of AQO	Negligible Increase
R3	0.11	0.27	0%	≤75% of AQO	Negligible Increase
R4	0.05	0.12	0%	≤75% of AQO	Negligible Increase
R5	0.08	0.20	0%	≤75% of AQO	Negligible Increase
R6	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R7	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R8	-0.09	-0.22	0%	≤75% of AQO	Negligible Decrease
R9	-0.11	-0.27	0%	≤75% of AQO	Negligible Decrease
R10	-0.10	-0.25	0%	≤75% of AQO	Negligible Decrease
R11	-0.09	-0.22	0%	≤75% of AQO	Negligible Decrease
R12	-0.02	-0.05	0%	≤75% of AQO	Negligible Decrease
R13	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R14	0.02	0.05	0%	≤75% of AQO	Negligible Increase
R15	0.04	0.10	0%	≤75% of AQO	Negligible Increase
R16	0.07	0.17	0%	≤75% of AQO	Negligible Increase
R17	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R18	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R19	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R20	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R21	0.02	0.05	0%	≤75% of AQO	Negligible Increase
R22	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R23	0.01	0.02	0%	≤75% of AQO	Negligible Increase
R24	0.05	0.12	0%	≤75% of AQO	Negligible Increase

R25	0.26	0.65	1%	≤75% of AQO	Negligible Increase
R26	0.07	0.17	0%	≤75% of AQO	Negligible Increase
R27	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R28	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R29	-0.21	-0.52	1%	≤75% of AQO	Negligible Decrease
R30	0.01	0.02	0%	≤75% of AQO	Negligible Increase
R31	-0.11	-0.27	0%	≤75% of AQO	Negligible Decrease
R32	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
R33	-0.09	-0.22	0%	≤75% of AQO	Negligible Decrease
R34	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
R35	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R36	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R37	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R38	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R39	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R40	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R41	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R42	0.37	0.92	1%	≤75% of AQO	Negligible Increase
R43	-0.11	-0.27	0%	≤75% of AQO	Negligible Decrease
R44	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
R45	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
R46	-0.08	-0.20	0%	≤75% of AQO	Negligible Decrease
R47	-0.41	-1.02	1%	≤75% of AQO	Negligible Decrease
R48	-0.12	-0.30	0%	≤75% of AQO	Negligible Decrease
R49	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R50	0.04	0.10	0%	≤75% of AQO	Negligible Increase
R51	0.03	0.07	0%	≤75% of AQO	Negligible Increase
R52	0.14	0.35	0%	≤75% of AQO	Negligible Increase
R53	0.17	0.42	0%	≤75% of AQO	Negligible Increase

R54	0.08	0.20	0%	≤75% of AQO	Negligible Increase
R55	0.17	0.42	0%	≤75% of AQO	Negligible Increase
R56	0.11	0.27	0%	≤75% of AQO	Negligible Increase
R57	0.08	0.20	0%	≤75% of AQO	Negligible Increase
R58	0.07	0.17	0%	≤75% of AQO	Negligible Increase
R59	-0.13	-0.32	0%	≤75% of AQO	Negligible Decrease
R60	-0.54	-1.35	1%	≤75% of AQO	Negligible Decrease
R61	-0.23	-0.57	1%	≤75% of AQO	Negligible Decrease
R62	-0.18	-0.45	0%	≤75% of AQO	Negligible Decrease
R63	-0.17	-0.42	0%	≤75% of AQO	Negligible Decrease
R64	-0.05	-0.12	0%	≤75% of AQO	Negligible Decrease
R65	-0.61	-1.52	2-5%	≤75% of AQO	Negligible Decrease
R66	-0.51	-1.27	0%	≤75% of AQO	Negligible Decrease
R67	-0.46	-1.15	0%	≤75% of AQO	Negligible Decrease
R68	0.05	0.12	0%	≤75% of AQO	Negligible Increase
R69	-1.04	-2.60	2-5%	≤75% of AQO	Negligible Decrease
R70	0.05	0.12	0%	≤75% of AQO	Negligible Increase
R71	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
R72	-0.10	-0.25	0%	≤75% of AQO	Negligible Decrease
R73	-0.15	-0.37	0%	≤75% of AQO	Negligible Decrease

+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.

The impact description of the effects of changes in traffic flow as a result of the Southern Link Road, with respect to NO_2 exposure for existing receptors, is determined to be:

- 'Negligible Increase' at 30 Receptors; and,
- 'Negligible Decrease' at 43 Receptors.

This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

Particulate Matter (PM_{10})

Table 6-17 presents a summary of the predicted change in annual mean PM_{10} concentrations at relevant receptor locations, due to changes in traffic flow associated with the Southern Link Road, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table 6-17. Predicted Annual Average Concentrations of PM_{10} at Receptor Locations

Receptor		PM_{10} (µg/m^3)			
		2019 Baseline	2033 Do Minimum	2033 Do Something	Development Contribution
R1	20 Wheatsheaf Avenue	19.64	19.61	19.73	0.12
R2	24 Robert Dukeson Avenue	18.99	19.12	19.24	0.12
R3	65 Alexander Avenue	16.69	16.79	16.89	0.10
R4	7 Waters Edge, Kings Sconce Avenue	16.16	16.19	16.23	0.04
R5	34 Sandhills Close	16.16	16.19	16.23	0.04
R6	Andreas, Great North Road	16.88	16.82	16.80	-0.02
R7	2 Manners Road	16.76	16.70	16.67	-0.03
R8	Castle View Court, Mather Road	17.65	17.53	17.47	-0.06
R9	1 Bar Gate	17.51	17.08	17.03	-0.05
R10	19 Bar Gate	18.01	17.45	17.40	-0.05
R11	29 North Gate	18.05	17.35	17.31	-0.04
R12	162 North Gate	15.98	15.56	15.55	-0.01
R13	19 Apple Tree	15.86	15.47	15.47	<0.01
R14	1 Lincoln Road	16.04	15.62	15.64	0.02
R15	31 Linseed Avenue	19.08	18.81	18.84	0.03
R16	Premier Inn Newark	19.29	19.03	19.08	0.05
R17	11 Bryans Close	19.21	19.17	19.30	0.13
R18	70 Newark Road	22.36	22.40	22.56	0.16
R19	Greenfield Close Care Home	19.67	20.05	20.06	0.01
R20	37 Cannon Close	18.90	19.04	19.06	0.02
R21	157 Beacon Hill Road	18.56	18.81	18.83	0.02
R22	77 Beacon Hill	16.63	16.67	16.68	0.01
R23	76 Beacon Hill Road	16.89	16.97	16.98	0.01
R24	66 Esther Varney Place	16.23	16.23	16.26	0.03
R25	2 Sleaford Road	18.56	18.45	18.54	0.09
R26	1 Friary Road	16.41	16.23	16.27	0.04
R27	24 Queens Court	16.09	16.00	16.00	<0.01
R28	13 Queens Court	16.65	16.49	16.49	<0.01
R29	62 Barnby Gate	16.81	16.65	16.58	-0.07
R30	Newark College	15.92	15.84	15.85	0.01
R31	181 Barnby Gate	15.89	15.84	15.77	-0.07
R32	Barnby Road Academy	15.36	15.52	15.46	-0.06
R33	Edinburgh Lodge, Barnby Road	15.90	16.16	16.07	-0.09
R34	Green Bank Lodge, Barnby Road	19.43	19.57	19.52	-0.05
R35	27 Bayford Drive	19.54	19.53	19.53	<0.01
R36	Greenways Newark Road	20.10	20.13	20.14	0.01
R37	35 Edgehill Drive	19.49	19.49	19.49	<0.01
R38	Field House Farm, Coddington Road	19.44	19.42	19.42	<0.01
R39	Bridgeholme Cottage, Coddington Road	21.55	21.49	21.50	0.01
R40	144 Main Street	20.89	20.83	20.84	0.01
R41	22 Southfield	21.05	21.01	21.03	0.02
R42	7 Bilton Close	16.38	16.70	16.85	0.15
R43	233 London Road	16.39	16.39	16.36	-0.03
R44	196 London Road	15.72	15.77	15.73	-0.04

R45	2 Glebe Park	16.27	16.39	16.34	-0.05
R46	89 London Road	16.12	16.24	16.19	-0.05
R47	2 Cottage Homes, London Road	18.49	18.00	17.86	-0.14
R48	2 Bowbridge Road	17.15	16.27	16.23	-0.04
R49	115 Bowbridge Road	17.52	16.31	16.27	-0.04
R50	120 Bowbridge Road	15.24	15.10	15.13	0.03
R51	Hawtonville Children's Centre	15.14	15.04	15.07	0.03
R52	254 Bowbridge Road	16.65	16.57	16.62	0.05
R53	7 Tannington Grove	16.25	16.41	16.51	0.10
R54	Millstone Cottage Bowbridge Lane	16.04	16.22	16.32	0.10
R55	The Willows, Newark Road	16.13	16.17	16.25	0.08
R56	205 Hawton Road	16.11	16.24	16.30	0.06
R57	1 Hawton Road	14.79	14.89	14.92	0.03
R58	12 Newark Court, Boundary Road	15.19	15.32	15.36	0.04
R59	14 Alert Street	15.41	15.37	15.30	-0.07
R60	3 London Road	17.39	17.20	17.01	-0.19
R61	Travelodge Newark	16.62	16.51	16.42	-0.09
R62	4 Portland Street	15.97	15.83	15.73	-0.10
R63	6 Victoria Street	15.79	15.67	15.56	-0.11
R64	1 Mill Gate	15.13	15.11	15.07	-0.04
R65	1 The Waterfront	16.04	16.06	15.70	-0.36
R66	67 Farndon Road	17.07	17.08	16.78	-0.30
R67	149 Farndon Road	17.13	17.13	16.86	-0.27
R68	31 The Ivies	16.92	17.00	17.03	0.03
R69	Farndon Fields Farm, Fosse Way	16.70	16.59	15.83	-0.76
R70	4 Mill Gate	15.15	15.10	15.12	0.02
R71	37 Lombard Street	15.52	15.47	15.43	-0.04
R72	30 Castle Gate	16.82	16.44	16.39	-0.05
R73	1 Castle Gate	18.17	17.67	17.61	-0.06
Annual Mean AQO		**40 µg/m³**			

All modelled existing receptors are predicted to be below the AQO for PM_{10} in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table 6-17**, the maximum predicted increase in annual average exposure to PM_{10} at any existing receptor, due to changes in traffic movements associated with the Southern Link Road is 0.16 µg/m³ at 70 Newark Road (R18).

The impact description of changes in traffic flow associated with the Southern Link Road with respect to annual mean PM_{10} exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table 6-18**.

Table 6-18. Impact Description of Effects at Key Receptors (PM_{10})

Impact Description of PM_{10} Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	0.12	0.31	0%	≤75% of AQO	Negligible Increase

R2	0.12	0.31	0%	≤75% of AQO	Negligible Increase
R3	0.10	0.24	0%	≤75% of AQO	Negligible Increase
R4	0.04	0.11	0%	≤75% of AQO	Negligible Increase
R5	0.04	0.11	0%	≤75% of AQO	Negligible Increase
R6	-0.02	-0.06	0%	≤75% of AQO	Negligible Decrease
R7	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R8	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R9	-0.05	-0.11	0%	≤75% of AQO	Negligible Decrease
R10	-0.05	-0.13	0%	≤75% of AQO	Negligible Decrease
R11	-0.04	-0.09	0%	≤75% of AQO	Negligible Decrease
R12	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R13	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R14	0.02	0.04	0%	≤75% of AQO	Negligible Increase
R15	0.03	0.08	0%	≤75% of AQO	Negligible Increase
R16	0.05	0.14	0%	≤75% of AQO	Negligible Increase
R17	0.13	0.32	0%	≤75% of AQO	Negligible Increase
R18	0.16	0.41	0%	≤75% of AQO	Negligible Increase
R19	0.01	0.04	0%	≤75% of AQO	Negligible Increase
R20	0.02	0.06	0%	≤75% of AQO	Negligible Increase
R21	0.02	0.04	0%	≤75% of AQO	Negligible Increase
R22	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R23	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R24	0.03	0.08	0%	≤75% of AQO	Negligible Increase
R25	0.09	0.22	0%	≤75% of AQO	Negligible Increase
R26	0.04	0.08	0%	≤75% of AQO	Negligible Increase
R27	<0.01	-0.01	0%	≤75% of AQO	Negligible Decrease
R28	<0.01	-0.01	0%	≤75% of AQO	Negligible Decrease
R29	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
R30	0.01	0.03	0%	≤75% of AQO	Negligible Increase

R31	-0.07	-0.20	0%	≤75% of AQO	Negligible Decrease
R32	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R33	-0.09	-0.23	0%	≤75% of AQO	Negligible Decrease
R34	-0.05	-0.13	0%	≤75% of AQO	Negligible Decrease
R35	<0.01	0.01	0%	≤75% of AQO	Negligible Increase
R36	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R37	<0.01	0.01	0%	≤75% of AQO	Negligible Increase
R38	<0.01	0.01	0%	≤75% of AQO	Negligible Increase
R39	0.01	0.02	0%	≤75% of AQO	Negligible Increase
R40	0.01	0.02	0%	≤75% of AQO	Negligible Increase
R41	0.02	0.05	0%	≤75% of AQO	Negligible Increase
R42	0.15	0.37	0%	≤75% of AQO	Negligible Increase
R43	-0.03	-0.08	0%	≤75% of AQO	Negligible Decrease
R44	-0.04	-0.09	0%	≤75% of AQO	Negligible Decrease
R45	-0.05	-0.11	0%	≤75% of AQO	Negligible Decrease
R46	-0.05	-0.13	0%	≤75% of AQO	Negligible Decrease
R47	-0.14	-0.35	0%	≤75% of AQO	Negligible Decrease
R48	-0.04	-0.11	0%	≤75% of AQO	Negligible Decrease
R49	-0.04	-0.09	0%	≤75% of AQO	Negligible Decrease
R50	0.03	0.08	0%	≤75% of AQO	Negligible Increase
R51	0.03	0.09	0%	≤75% of AQO	Negligible Increase
R52	0.05	0.13	0%	≤75% of AQO	Negligible Increase
R53	0.10	0.25	0%	≤75% of AQO	Negligible Increase
R54	0.10	0.23	0%	≤75% of AQO	Negligible Increase
R55	0.08	0.22	0%	≤75% of AQO	Negligible Increase
R56	0.06	0.14	0%	≤75% of AQO	Negligible Increase
R57	0.03	0.08	0%	≤75% of AQO	Negligible Increase
R58	0.04	0.08	0%	≤75% of AQO	Negligible Increase
R59	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease

R60	-0.19	-0.48	0%	≤75% of AQO	Negligible Decrease
R61	-0.09	-0.22	0%	≤75% of AQO	Negligible Decrease
R62	-0.10	-0.25	0%	≤75% of AQO	Negligible Decrease
R63	-0.11	-0.28	0%	≤75% of AQO	Negligible Decrease
R64	-0.04	-0.09	0%	≤75% of AQO	Negligible Decrease
R65	-0.36	-0.90	1%	≤75% of AQO	Negligible Decrease
R66	-0.30	-0.75	1%	≤75% of AQO	Negligible Decrease
R67	-0.27	-0.68	1%	≤75% of AQO	Negligible Decrease
R68	0.03	0.07	0%	≤75% of AQO	Negligible Increase
R69	-0.76	-1.90	2-5%	≤75% of AQO	Negligible Decrease
R70	0.02	0.04	0%	≤75% of AQO	Negligible Increase
R71	-0.04	-0.08	0%	≤75% of AQO	Negligible Decrease
R72	-0.05	-0.13	0%	≤75% of AQO	Negligible Decrease
R73	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease

+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.

The impact description of the effects of changes in traffic as a result of the Southern Link Road, with respect to annual mean PM_{10} exposure for existing receptors is determined to be:

- 'Negligible Increase' at 39 Receptors; and,
- 'Negligible Decrease' at 34 Receptors.

This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

Particulate Matter ($PM_{2.5}$)

Table 6-19 presents a summary of the predicted change in annual mean $PM_{2.5}$ concentrations at relevant receptor locations, due to changes in traffic flow associated with the Southern Link Road, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table 6-19. Predicted Annual Average Concentrations of $PM_{2.5}$ at Receptor Locations

Receptor		$PM_{2.5}$ (µg/m^3)			
		2019 Baseline	2033 Do Minimum	2033 Do Something	Development Contribution
R1	20 Wheatsheaf Avenue	11.24	11.15	11.22	0.07
R2	24 Robert Dukeson Avenue	10.81	10.83	10.89	0.06
R3	65 Alexander Avenue	10.10	10.11	10.17	0.06

R4	7 Waters Edge, Kings Sconce Avenue	9.80	9.79	9.81	0.02
R5	34 Sandhills Close	9.73	9.70	9.73	0.03
R6	Andreas, Great North Road	10.14	10.05	10.04	-0.01
R7	2 Manners Road	10.07	9.98	9.97	-0.01
R8	Castle View Court, Mather Road	10.58	10.44	10.41	-0.03
R9	1 Bar Gate	10.54	10.21	10.18	-0.03
R10	19 Bar Gate	10.82	10.41	10.38	-0.03
R11	29 North Gate	10.88	10.36	10.34	-0.02
R12	162 North Gate	9.90	9.63	9.62	-0.01
R13	19 Apple Tree	9.85	9.58	9.58	<0.01
R14	1 Lincoln Road	9.96	9.66	9.67	0.01
R15	31 Linseed Avenue	10.91	10.72	10.73	0.01
R16	Premier Inn Newark	11.04	10.84	10.87	0.03
R17	11 Bryans Close	10.99	10.89	10.96	0.07
R18	70 Newark Road	12.81	12.63	12.71	0.08
R19	Greenfield Close Care Home	11.25	11.37	11.38	0.01
R20	37 Cannon Close	10.81	10.82	10.84	0.02
R21	157 Beacon Hill Road	10.62	10.71	10.72	0.01
R22	77 Beacon Hill	9.72	9.70	9.71	0.01
R23	76 Beacon Hill Road	10.42	10.39	10.40	0.01
R24	66 Esther Varney Place	10.03	9.99	10.01	0.02
R25	2 Sleaford Road	11.49	11.24	11.29	0.05
R26	1 Friary Road	10.18	10.01	10.03	0.02
R27	24 Queens Court	9.98	9.87	9.87	<0.01
R28	13 Queens Court	10.33	10.15	10.15	<0.01
R29	62 Barnby Gate	10.40	10.23	10.20	-0.03
R30	Newark College	9.86	9.78	9.78	<0.01
R31	181 Barnby Gate	9.84	9.78	9.74	-0.04
R32	Barnby Road Academy	9.53	9.60	9.57	-0.03
R33	Edinburgh Lodge, Barnby Road	9.30	9.42	9.38	-0.04
R34	Green Bank Lodge, Barnby Road	10.67	10.69	10.67	-0.02
R35	27 Bayford Drive	10.76	10.70	10.70	<0.01
R36	Greenways Newark Road	11.51	11.41	11.41	<0.01
R37	35 Edgehill Drive	10.73	10.68	10.68	<0.01
R38	Field House Farm, Coddington Road	10.67	10.61	10.61	<0.01
R39	Bridgeholme Cottage, Coddington Road	12.12	11.94	11.94	<0.01
R40	144 Main Street	11.74	11.58	11.59	0.01
R41	22 Southfield	11.85	11.69	11.70	0.01
R42	7 Bilton Close	9.73	9.84	9.92	0.08
R43	233 London Road	9.76	9.68	9.66	-0.02
R44	196 London Road	9.34	9.33	9.31	-0.02
R45	2 Glebe Park	9.64	9.67	9.65	-0.02
R46	89 London Road	9.97	10.00	9.97	-0.03
R47	2 Cottage Homes, London Road	11.43	10.99	10.92	-0.07
R48	2 Bowbridge Road	10.61	10.02	10.00	-0.02
R49	115 Bowbridge Road	10.79	10.04	10.02	-0.02
R50	120 Bowbridge Road	9.31	9.21	9.22	0.01
R51	Hawtonville Children's Centre	9.25	9.17	9.19	0.02

R52	254 Bowbridge Road	9.38	9.30	9.33	0.03
R53	7 Tannington Grove	9.13	9.21	9.27	0.06
R54	Millstone Cottage Bowbridge Lane	9.01	9.11	9.16	0.05
R55	The Willows, Newark Road	8.89	8.90	8.95	0.05
R56	205 Hawton Road	9.42	9.47	9.50	0.03
R57	1 Hawton Road	9.19	9.22	9.24	0.02
R58	12 Newark Court, Boundary Road	9.43	9.46	9.48	0.02
R59	14 Alert Street	9.55	9.48	9.44	-0.04
R60	3 London Road	10.76	10.51	10.40	-0.11
R61	Travelodge Newark	10.30	10.12	10.07	-0.05
R62	4 Portland Street	9.88	9.73	9.68	-0.05
R63	6 Victoria Street	9.77	9.64	9.58	-0.06
R64	1 Mill Gate	9.39	9.33	9.31	-0.02
R65	1 The Waterfront	9.91	9.85	9.65	-0.20
R66	67 Farndon Road	9.97	9.92	9.76	-0.16
R67	149 Farndon Road	10.02	9.96	9.81	-0.15
R68	31 The Ivies	9.88	9.87	9.89	0.02
R69	Farndon Fields Farm, Fosse Way	9.77	9.66	9.25	-0.41
R70	4 Mill Gate	9.40	9.33	9.34	0.01
R71	37 Lombard Street	9.62	9.54	9.52	-0.02
R72	30 Castle Gate	10.39	10.08	10.05	-0.03
R73	1 Castle Gate	10.95	10.54	10.51	-0.03
Annual Mean AQO		**25 µg/m^3**			

All modelled existing receptors are predicted to be below the AQO for $PM_{2.5}$ in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table 6-19**, the maximum predicted increase in annual average exposure to $PM_{2.5}$ at any existing receptor, due to changes in traffic movements associated with the Southern Link Road is 0.08 µg/m^3 at 70 Newark Road (R18), and 7 Bilton Close (R42).

The impact description of changes in traffic flow associated with the Southern Link Road with respect to annual mean $PM_{2.5}$ exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table 6-20**.

Table 6-20. Impact Description of Effects at Key Receptors ($PM_{2.5}$)

Impact Description of $PM_{2.5}$ Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m^3)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	0.07	0.27	0%	≤75% of AQO	Negligible Increase
R2	0.06	0.26	0%	≤75% of AQO	Negligible Increase
R3	0.06	0.21	0%	≤75% of AQO	Negligible Increase
R4	0.02	0.09	0%	≤75% of AQO	Negligible Increase
R5	0.03	0.10	0%	≤75% of AQO	Negligible Increase

R6	-0.01	-0.05	0%	≤75% of AQO	Negligible Decrease
R7	-0.01	-0.06	0%	≤75% of AQO	Negligible Decrease
R8	-0.03	-0.13	0%	≤75% of AQO	Negligible Decrease
R9	-0.03	-0.10	0%	≤75% of AQO	Negligible Decrease
R10	-0.03	-0.12	0%	≤75% of AQO	Negligible Decrease
R11	-0.02	-0.08	0%	≤75% of AQO	Negligible Decrease
R12	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R13	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R14	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R15	0.01	0.07	0%	≤75% of AQO	Negligible Increase
R16	0.03	0.12	0%	≤75% of AQO	Negligible Increase
R17	0.07	0.27	0%	≤75% of AQO	Negligible Increase
R18	0.08	0.34	0%	≤75% of AQO	Negligible Increase
R19	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R20	0.02	0.05	0%	≤75% of AQO	Negligible Increase
R21	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R22	0.01	0.02	0%	≤75% of AQO	Negligible Increase
R23	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R24	0.02	0.07	0%	≤75% of AQO	Negligible Increase
R25	0.05	0.20	0%	≤75% of AQO	Negligible Increase
R26	0.02	0.07	0%	≤75% of AQO	Negligible Increase
R27	<0.01	-0.01	0%	≤75% of AQO	Negligible Decrease
R28	<0.01	-0.01	0%	≤75% of AQO	Negligible Decrease
R29	-0.03	-0.14	0%	≤75% of AQO	Negligible Decrease
R30	<0.01	0.02	0%	≤75% of AQO	Negligible Increase
R31	-0.04	-0.17	0%	≤75% of AQO	Negligible Decrease
R32	-0.03	-0.12	0%	≤75% of AQO	Negligible Decrease
R33	-0.04	-0.19	0%	≤75% of AQO	Negligible Decrease
R34	-0.02	-0.11	0%	≤75% of AQO	Negligible Decrease

R35	<0.01	0.01	0%	≤75% of AQO	Negligible Increase
R36	<0.01	0.02	0%	≤75% of AQO	Negligible Increase
R37	<0.01	0.01	0%	≤75% of AQO	Negligible Increase
R38	<0.01	0.01	0%	≤75% of AQO	Negligible Increase
R39	<0.01	0.02	0%	≤75% of AQO	Negligible Increase
R40	0.01	0.02	0%	≤75% of AQO	Negligible Increase
R41	0.01	0.04	0%	≤75% of AQO	Negligible Increase
R42	0.08	0.32	0%	≤75% of AQO	Negligible Increase
R43	-0.02	-0.07	0%	≤75% of AQO	Negligible Decrease
R44	-0.02	-0.08	0%	≤75% of AQO	Negligible Decrease
R45	-0.02	-0.10	0%	≤75% of AQO	Negligible Decrease
R46	-0.03	-0.11	0%	≤75% of AQO	Negligible Decrease
R47	-0.07	-0.30	0%	≤75% of AQO	Negligible Decrease
R48	-0.02	-0.10	0%	≤75% of AQO	Negligible Decrease
R49	-0.02	-0.07	0%	≤75% of AQO	Negligible Decrease
R50	0.01	0.07	0%	≤75% of AQO	Negligible Increase
R51	0.02	0.07	0%	≤75% of AQO	Negligible Increase
R52	0.03	0.11	0%	≤75% of AQO	Negligible Increase
R53	0.06	0.22	0%	≤75% of AQO	Negligible Increase
R54	0.05	0.19	0%	≤75% of AQO	Negligible Increase
R55	0.05	0.19	0%	≤75% of AQO	Negligible Increase
R56	0.03	0.13	0%	≤75% of AQO	Negligible Increase
R57	0.02	0.08	0%	≤75% of AQO	Negligible Increase
R58	0.02	0.07	0%	≤75% of AQO	Negligible Increase
R59	-0.04	-0.15	0%	≤75% of AQO	Negligible Decrease
R60	-0.11	-0.42	0%	≤75% of AQO	Negligible Decrease
R61	-0.05	-0.20	0%	≤75% of AQO	Negligible Decrease
R62	-0.05	-0.21	0%	≤75% of AQO	Negligible Decrease
R63	-0.06	-0.24	0%	≤75% of AQO	Negligible Decrease

R64	-0.02	-0.08	0%	≤75% of AQO	Negligible Decrease
R65	-0.20	-0.79	1%	≤75% of AQO	Negligible Decrease
R66	-0.16	-0.66	1%	≤75% of AQO	Negligible Decrease
R67	-0.15	-0.59	1%	≤75% of AQO	Negligible Decrease
R68	0.02	0.06	0%	≤75% of AQO	Negligible Increase
R69	-0.41	-1.64	2-5%	≤75% of AQO	Negligible Decrease
R70	0.01	0.04	0%	≤75% of AQO	Negligible Increase
R71	-0.02	-0.07	0%	≤75% of AQO	Negligible Decrease
R72	-0.03	-0.12	0%	≤75% of AQO	Negligible Decrease
R73	-0.03	-0.13	0%	≤75% of AQO	Negligible Decrease
+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					

The impact description of the effects of changes in traffic as a result of the Southern Link Road, with respect to annual mean PM_{10} exposure for existing receptors is determined to be:

- 'Negligible Increase' at 39 Receptors; and,
- 'Negligible Decrease' at 34 Receptors.

This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

6.5.5 Ecological Sensitive Receptor Locations

Background concentrations at each of the ecologically sensitive sites were determined through a review of the NO_X pollutants published on the APIS website.

The below assessment has been undertaken in accordance with A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites (IAQM, 2020).

Nitrogen Oxide

Table 6-21 presents a summary of the predicted change in NO_X concentrations at relevant receptor locations, due to changes in traffic flow associated with the development, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table 6-21. Predicted Annual Average Concentrations of NO_X at Ecological Receptor Locations

Ecological Receptor		Predicted Maximum Annual Mean Concentration (µg/m^3)				
		Do Minimum 2033 NO_X	Do Something 2033 NO_X	Process Contribution (PC)	PC as %age of AQO	Background
E1	Devon Park Pastures (LNR)	18.77	18.41	-0.36	-1.21	16.68
E2	Devon Park Pastures (LNR)	17.83	17.68	-0.15	-0.50	16.68

E3	Devon Park Pastures (LNR)	17.87	17.72	-0.15	-0.49	16.68
Annual Mean AQO/Critical Level (CL)		**30 µg/m^3**				

As indicated in **Table 6-21**, there is not predicted to be an increase in the annual average exposure to NO_X at any ecological receptor, due to changes in traffic movements associated with the development. The maximum predicted decrease in the annual average exposure to NO_X at any ecological receptor, due to changes in traffic movements associated with the development is -1.21 µg/m^3 at Devon Park Pastures (LNR) (E1).

Section 5.5.4.1 of *A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites*', IAQM 2020 states:

> *Where the assessment indicates that changes in annual mean NO_x concentrations within a designated site cannot be dismissed as imperceptible (i.e. an increase of over 0.4 µg/m^3) and the NO_x critical level is exceeded, then changes in nutrient nitrogen deposition should be calculated as supporting information to further assist in the evaluation of significance.*

There is not predicted to be an increase in the annual average exposure to NO_x at the identified ecological receptor, due to changes in traffic movements associated with the development. As a result, the predicted change is below the 0.40 µg/m^3 development contribution stated within the guidance of '*A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites*', IAQM 2020.

As a result, no further assessment is required and the impact at Devon Park Pastures (LNR) (E1) as this is considered to be negligible.

7.0 ANALYSIS OF AIR QUALITY EFFECTS

The Newark Southern Link Road is predicted to have an overall positive impact across the study area. The Southern Link Road is expected have a positive impact in the reduction of exposure to pollutants across the road network in Newark-on-Trent. Whilst there will be some areas which are predicted to have an minor adverse effect on air quality, such as the areas surrounding the Southern Link Road, and the A46 (where there is less residential exposure) this is balanced by the benefits along the town center and arterial routes where there is more residential exposure.

Scenario 1 – No Improvements made to A46

Following completion of the Southern Link Road, there are few areas where road vehicle emissions are expected to increase, as shown in **Figure 6-1**, such the location of the Southern Link Road, and the A46 between Farndon Road and Great North Road. Further to this, there is predicted to be an increase in Nitrogen Dioxide (NO_2) on Beacon Hill Road. **Figure 6-1** shows the modelled change in Nitrogen Dioxide across the study area as a result of the construction of the Southern Link Road, where areas in red are adversely affected, and areas in blue are beneficially affected. The majority of the modelled road network is expected to experience a decrease in pollutant concentrations, these roads are predominantly those in residentially dense areas, with a high concentration of residential properties as opposed to the location of the Southern Link Road and the A46.

Of the 73 modelled existing sensitive residential receptor locations, 17 are expected to experience an adverse effect with respect to NO_2 concentrations associated with the change is road traffic as a result of the completion of the Southern Link Road, however 52 modelled existing sensitive residential receptor locations are predicted to experience a beneficial effect. 16 modelled existing sensitive residential receptor locations are predicted to experience an adverse effect with respect to concentrations of particulate matter (PM_{10} and $PM_{2.5}$), whilst 57 modelled existing sensitive residential receptor locations are predicted to experience a beneficial effect.

Table 7-1. Adversely Affected Road Links and Receptors (Scenario 1)

Link	Approximate Number of Receptor within 200m of the Effected Road	Worst Case Receptor Locations	Change Due to Development (DS-DM) (µg/m³) NO_2	Change Due to Development (DS-DM) (µg/m³) PM_{10}	Change Due to Development (DS-DM) (µg/m³) $PM_{2.5}$
A46 (Farndon Road – Great North Road)	80	R5 R68	0.05 0.08	0.02 0.02	0.01 0.01
Southern Link Road (West of Bowbridge Lane)	1	R55	0.15	0.08	0.04
Beacon Hill Road	900	R22 R23	0.28 0.46	0.16 0.27	0.09 0.15
Overall Exposure Factor [Average pollutant level per dwelling increase based on worst case receptors]	(Total 981)	-	**0.34**	**0.20**	**0.11**

Scenario 2 – Improvements Completed on A46

Following completion of the Southern Link Road, there are predicted to be two roads where road vehicle emissions are expected to increase, as shown in **Figure 6-3**. These road links are the location of the Southern Link Road, and the A46 between Farndon Road and Lincoln Road. **Figure 6-3** shows the modelled change in Nitrogen Dioxide across the study area as a result of the construction of the Southern Link Road, where areas in red are adversely affected, and areas in blue are beneficially affected. The majority of the modelled road network is expected to experience a decrease in pollutant concentrations, these roads are predominantly those in residentially dense areas, with a high concentration of residential properties as opposed to the location of the Southern Link Road and the A46.

Of the 73 modelled existing sensitive residential receptor locations, 26 are expected to experience an adverse effect with respect to NO_2 concentrations associated with the change is road traffic as a result of the completion of the Southern Link Road, however 43 modelled existing sensitive residential receptor locations are predicted to experience a beneficial effect. 39 modelled existing sensitive residential receptor locations are predicted to experience an adverse effect with respect to concentrations of particulate matter (PM_{10} and $PM_{2.5}$), whilst 34 modelled existing sensitive residential receptor locations are predicted to experience a beneficial effect.

Table 7-2. Adversely Affected Road Links and Receptors (Scenario 2)

Link	Approximate Number of Receptor within 200m of the Effected Road	Worst Case Receptor Locations	Change Due to Development (DS-DM) (µg/m³) NO_2	Change Due to Development (DS-DM) (µg/m³) PM_{10}	Change Due to Development (DS-DM) (µg/m³) $PM_{2.5}$
A46 (Farndon Road – Great North Road)	80	R5 R68	0.08 0.05	0.04 0.04	0.02 0.02
A46 (Farndon Road – Lincoln Road)	340	R1 R2 R3	0.18 0.15 0.11	0.12 0.12 0.10	0.07 0.07 0.05
Southern Link Road (West of Bowbridge Lane)	1	R55	0.17	0.09	0.05
Overall Exposure Factor [Average pollutant level per dwelling increase based on worst case receptors]	(Total 421)	-	**0.13**	**0.10**	**0.06**

Table 7-3. Difference Between Pollutant Exposure (Scenario 1 Compared to Scenario 2)

Link	Change Due to Development (DS-DM) (µg/m³) NO_2	Change Due to Development (DS-DM) (µg/m³) PM_{10}	Change Due to Development (DS-DM) (µg/m³) $PM_{2.5}$
Scenario 1 Overall Exposure Factor [Average pollutant level increase per dwelling increase based on worst case receptors]	**0.34**	**0.20**	**0.11**
Scenario 2 Overall Exposure Factor [Average pollutant level increase per dwelling increase based on worst case receptors]	**0.13**	**0.10**	**0.06**
Comparison of Worst Increases between scenario 1 and scenario 2	**0.21**	**0.10**	**0.05**

8.0 MITIGATION

8.1 CONSTRUCTION PHASE

The dust risk categories have been determined in Section 5 for each of the four construction activities. The assessment has determined that the potential impact description of dust emissions associated with the construction phase of the Southern Link Road is 'high risk' at the worst affected receptors.

Using the methodology described in Appendix A, appropriate site-specific mitigation measures associated with the determined level of risk can be found in Section 8.2 of the 'IAQM Guidance on the Assessment of Dust from Demolition and Construction'.

The mitigation measures have been divided into general measures applicable to all sites and measures applicable specifically to demolition, earthworks, construction and trackout. They are categorised into 'highly recommended' and 'desirable' measures.

The mitigation measures for the Southern Link Road are detailed in **Table 8-1** and **Table 8-2**.

Table 8-1. IAQM Guidance on the Assessment of Dust from Demolition and Construction 'Highly Recommended' Mitigation Measures

Communications
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
Display the head or regional office contact information.
Dust Management
Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The DMP may include monitoring of dust deposition, dust flux, real time PM_{10} continuous monitoring and/or visual inspections.
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
Make the complaints log available to the local authority when asked.
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.
Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.
Avoid site runoff of water or mud.
Keep site fencing, barriers and scaffolding clean using wet methods.
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.

Cover, seed or fence stockpiles to prevent wind whipping.
Ensure all vehicles switch off engines when stationary - no idling vehicles.
Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
Use enclosed chutes and conveyors and covered skips.
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Avoid bonfires and burning of waste materials.
Earthworks
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
Only remove the cover in small areas during work and not all at once.
Construction
Avoid scabbling (roughening of concrete surfaces) if possible.
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
Trackout
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
Avoid dry sweeping of large areas.
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
Record all inspections of haul routes and any subsequent action in a site log book.
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
Access gates to be located at least 10m from receptors where possible.

Table 8-2. IAQM Guidance on the Assessment of Dust from Demolition and Construction 'Desirable' Mitigation Measures

Communications
No Action Required.
Dust Management
No Action Required.
Earthworks
No Action Required.
Construction
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Trackout
No Action Required.

Following the implementation of the mitigation measures detailed in the tables above, the impact description of the construction phase is not considered to be significant.

8.2 OPERATIONAL PHASE

All modelled existing receptor locations are predicted to be below the annual average AQOs for NO_2, PM_{10} and $PM_{2.5}$, and the impact description of the effects of changes in traffic flow as a result of the Southern Link Road, with respect to NO_2, PM_{10} and $PM_{2.5}$ exposure, is determined to be 'negligible' at all existing receptors. Therefore, no further mitigation is required.

9.0 CONCLUSIONS

Tetra Tech have undertaken an Air Quality Assessment to support of a bid to the Levelling Up Fund for the delivery of the western section of the Newark Southern Link Road (SLR) to provide a new roundabout junction onto the A46(T) and the western section of the SLR thereby forming a continuous road link between the A46(T) and the A1(T) to the south of Newark.

Construction Phase

Prior to the implementation of appropriate mitigation measures, the potential impact description of dust emissions associated with the construction phase of the Southern Link Road is 'high risk' at the worst affected receptors without mitigation. However, appropriate site-specific mitigation measures have been proposed based on Section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition, Earthworks, Construction and Trackout. It is anticipated that with these appropriate mitigation measures in place, the risk of adverse effects due to dust emissions from the construction phase will not be significant.

Overall Exposure Comparison

The Newark Southern Link Road is predicted to have an overall positive impact across the study area. The Southern Link Road is expected have a positive impact in the reduction of exposure to pollutants across the road network in Newark-on-Trent. Whilst there will be some areas which are predicted to have an minor adverse effect on air quality, such as the areas surrounding the Southern Link Road, and the A46 (where there is less residential exposure) this is balanced by the benefits along the town center and arterial routes where there is more residential exposure. This reduction in exposure to pollutants will have both health and related financial benefits.

When comparing the worst effects of each scenario, scenario 2 has the least adverse effect on overall exposure to pollutants together with the greater positive effects.

Operational Assessment

<u>Scenario 1 – No Improvements made to A46</u>

The 2033 assessment of the effect of emissions from traffic associated with the scheme, has determined that the maximum predicted increase in the annual average exposure to NO_2 at any existing receptor is likely to be 0.46 µg/m^3 at 76 Beacon Hill Road (R23).

The predicted long-term NO_2 concentrations at all existing receptors are well below 60 µg/m^3 in all scenarios. Therefore, it is unlikely there will be any exceedances for the short-term NO_2 AQO at all existing receptors as outlined in LAQM TG16 technical guidance.

For PM_{10}, the maximum predicted increase in the annual average exposure is likely to be 0.27 µg/m^3 at 76 Beacon Hill Road (R23). For $PM_{2.5}$, the maximum predicted increase in the annual average exposure is likely to be 0.15 µg/m^3 at 76 Beacon Hill Road (R23).

The impact description of the effects of changes in traffic flow as a result of the Southern Link Road, with respect to NO_2, PM_{10} and $PM_{2.5}$ exposure, is determined to range from a 'negligible increase' to a 'negligible decrease' at all existing receptors.

Scenario 2 – Improvements Completed on A46

The 2033 assessment of the effect of emissions from traffic associated with the scheme, has determined that the maximum predicted increase in the annual average exposure to NO_2 at any existing receptor is likely to be 0.37 µg/m^3 at 7 Bilton Close (R42).

The predicted long-term NO_2 concentrations at all existing receptors are well below 60 µg/m^3 in all scenarios. Therefore, it is unlikely there will be any exceedances for the short-term NO_2 AQO at all existing receptors as outlined in LAQM TG16 technical guidance.

For PM_{10}, the maximum predicted increase in the annual average exposure is likely to be 0.16 µg/m^3 at 70 Newark Road (R18). For $PM_{2.5}$, the maximum predicted increase in the annual average exposure is likely to be 0.08 µg/m^3 at 70 Newark Road (R18), and 7 Bilton Close (R42).

The impact description of the effects of changes in traffic flow as a result of the Southern Link Road, with respect to NO_2, PM_{10} and $PM_{2.5}$ exposure, is determined to range from a 'negligible increase' to a 'negligible decrease' at all existing receptors.

Operational Assessment – Ecology

There is not predicted to be an increase in the annual average exposure to NO_x at the identified ecological receptor, due to changes in traffic movements associated with the development in either Scenario 1 and Scenario 2. As a result, the predicted change is below the 0.40 µg/m^3 development contribution stated within the guidance of '*A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites*', IAQM 2020.

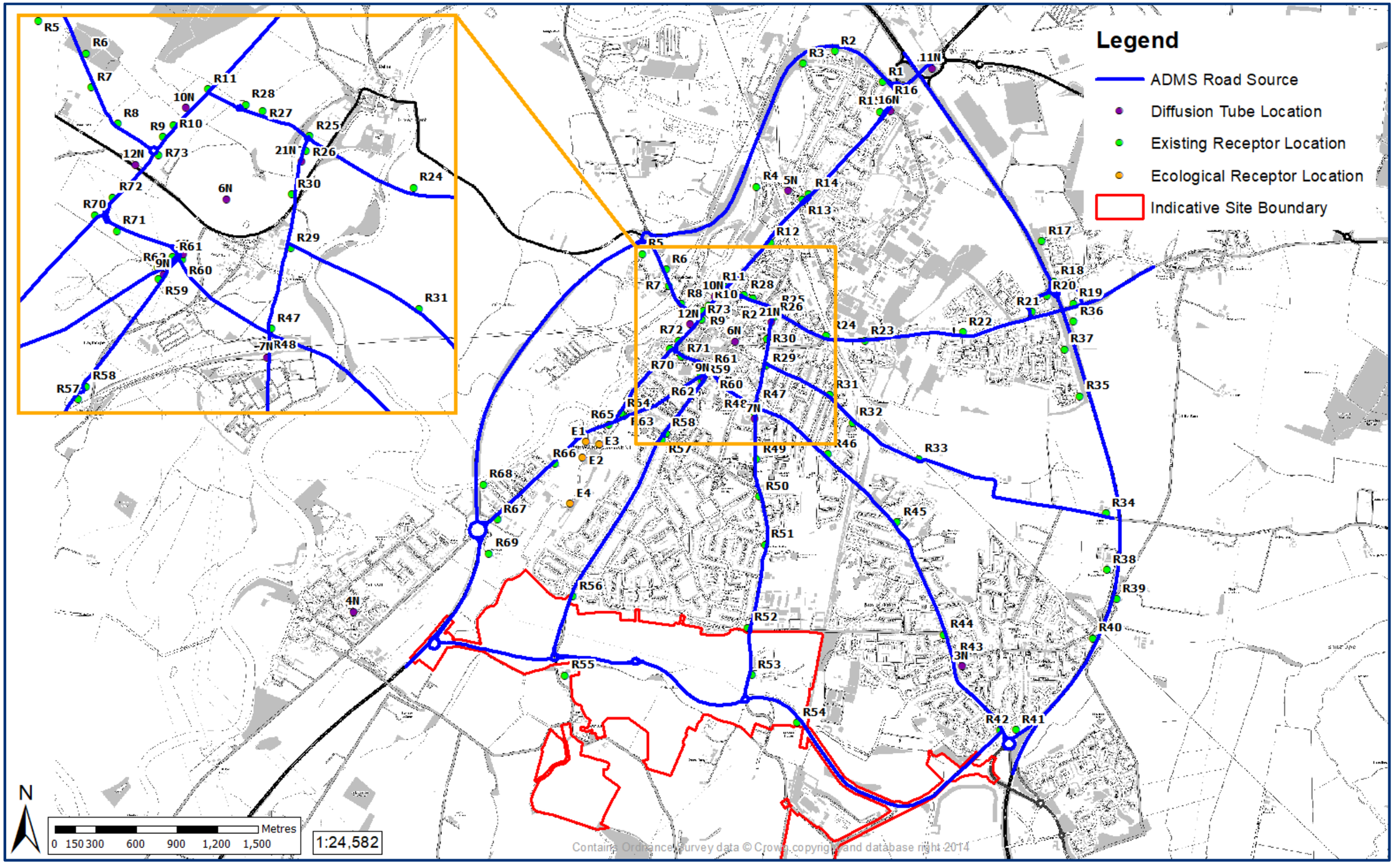
As a result, no further assessment is required and the impact at Devon Park Pastures (LNR) as this is considered to be negligible.

Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

In conclusion, the development is not considered to be contrary to any of the national and local planning policies regarding air quality.

APPENDIX A - FIGURES

Figure A-1 Air Quality Assessment Area



APPENDIX B - CONSTRUCTION PHASE ASSESSMENT METHODOLOGY

The following information sets out the adopted approach to the construction phase impact assessment in accordance with the aforementioned IAQM guidance[1].

Step 1 – Screen the Requirement for a more Detailed Assessment

An assessment is required if there are sensitive receptors within 350m of the site boundary, within 50m of the route(s) used by construction vehicles on the surrounding road network, or within 500m from the site entrance. A detailed assessment is also required if there is an ecological receptor within 50m of the site boundary.

Step 2A – Define the Potential Dust Emission Magnitude

Demolition

The dust emission magnitude for the demolition phase has been determined based on the below criteria:

- *Large*: Total building volume >50 000m^3, potentially dusty construction (e.g. concrete), on-site crushing and screening, demolition activities >20m above ground level;
- *Medium*: Total building volume 20 000m^3 – 50 000m^3, potentially dusty construction material, demolition activities 10-20m above ground level; and,
- *Small*: Total building volume <20 000m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.

Earthworks

The dust emission magnitude for the planned earthworks has been determined based on the below criteria:

- *Large:* Total site area >10 000m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), > 10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100 000 tonnes;
- *Medium*: Total site area 2 500m^2 – 10 000m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4m-8m in height, total material moved 20 000 tonnes – 100 000 tonnes; and
- *Small:* Total site area <2 500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <10 000 tonnes, earthworks during wetter months.

Construction

The dust emission magnitude for the construction phase has been determined based on the below criteria:

- *Large:* Total building volume >100 000m^3, on site concrete batching; sandblasting
- *Medium:* Total building volume 25 000m^3 – 100 000m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and,
- *Small:* Total building volume <25 000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

The dust emission magnitude for trackout has been determined based on the below criteria:

- *Large:* >50 HGV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- *Medium:* 10-50 HGV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m; and,
- *Small:* <10 HGV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

Step 2B - Defining the Sensitivity of the Area

Sensitivities of People to Dust Soiling Effects

- *High:*
  - Users can reasonably expect an enjoyment of a high level of amenity;
  - The appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably expect to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land; and,
  - Indicative examples include dwellings, museums and other culturally important collections, medium- and long-term car parks

[1] Institute of Air Quality Management 2014. *Guidance on the Assessment of dust from demolition and construction.*

and car showrooms.

- *Medium:*
  - Users can reasonably expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home;
  - The appearance, aesthetics or value of their property could be diminished by soiling;
  - The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land; and,
  - Indicative examples include parks and places of work.
- *Low:*
  - The enjoyment of amenity would not reasonably be expected;
  - Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling;
  - There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land; and,
  - Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table B-1. Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Sensitivities of People to the Health Effects of PM_{10}

- *High:*
  - Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day);
  - Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.
- *Medium:*
  - Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day); and,
  - Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.
- *Low:*
  - Locations where human exposure is transient; and,
  - Indicative examples include public footpaths, playing fields, parks and shopping streets.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table B-2. Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28 - 32 µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24 – 28 µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
	-	1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Sensitivities of Receptors to Ecological Effects

- *High:*
  - Locations with an international or national designation and the designated features may be affected by dust soiling;
  - Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain; and,
  - Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
- *Medium:*
  - Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown;
  - Locations with a national designation where the features may be affected by dust deposition; and,
  - Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
- *Low:*
  - Locations with a local designation where the features may be affected by dust deposition; and,
  - Indicative example is a local Nature Reserve with dust sensitive features.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table B-3. Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Note - The likely routes the construction traffic will use should also be included to enable the presence of trackout receptors to be included in the assessment. As a general guidance, without site-specific mitigation, trackout may occur along the public highway up to 500 m from large sites (as defined in step 2A), 200 m from medium sites and 50 m from small sites, as measured from the site exit.

Step 2C - Defining the Risk of Impacts

The risk of impacts with no mitigation is determined by combining the dust emission magnitude determined in Step 2A and the sensitivity of the area determined in Step 2B.

The following tables provide a method of assigning the level of risk for each activity.

Demolition

Table B-4. Risk of Dust Impacts, Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Earthworks

Table B-5. Risk of Dust Impacts, Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Construction

Table B-6. Risk of Dust Impacts, Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Trackout

Table B-7. Risk of Dust Impacts, Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Step 3 – Site Specific Mitigation

The dust risk categories for each of the four activities determined in Step 2C should be used to define the appropriate, site-specific mitigation measures to be adopted.

These mitigation measures are contained within section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition and Construction.

APPENDIX C - THEORETICAL SCENARIO (NO REDUCTION IN UK FLEET EMISSIONS OVER TIME) RESULTS

Scenario Context

This additional theoretical scenario uses emission factors for 2019 for the 'Do Minimum' and 'Do Something' based on a recent appeal decision (planning reference no.APP/D3830/A/14/22269877) that favoured the uncertainty of emissions forecasts. It should be noted that this is a theoretical scenario which assumes that the government (Defra) predictions for reductions in emissions over the forthcoming years will not occur. This should not be considered as a 'more correct' scenario in accordance with the 2010 note [http://laqm.defra.gov.uk/laqm-faqs/faq5.html] which confirms that: '*There is no evidence to suggest that background concentrations associated with the other (non-traffic) source contributions should not behave as forecast. This disparity in the historical data highlights the uncertainty of future year projections of both NO_X and NO_2, but at this stage there is no robust evidence upon which to base any revised road traffic emissions projections'.*

The assessment scenarios are defined below:

- 2019 Baseline = Existing Baseline Conditions (2019);

Scenario 1 – No Improvements made to A46

- 2033 "Do Minimum" = Baseline Conditions + Committed Development Flows (using 2019 traffic emission factors); and,
- 2033 "Do Something" = Baseline Conditions + Committed Development Flows + Southern Link Road (using 2019 traffic emission factors).

Scenario 2 – Improvements Completed on A46

- 2033 "Do Minimum" = Baseline Conditions + Committed Development Flows (using 2019 traffic emission factors); and,
- 2033 "Do Something" = Baseline Conditions + Committed Development Flows + Southern Link Road (using 2019 traffic emission factors).

Scenario 1 – No Improvements made to A46

Nitrogen Dioxide

Table C-1 presents a summary of the predicted long term NO_2 concentrations at relevant existing receptor locations based on the modelled 2033 'Do Minimum' and 'Do Something' scenarios.

Table C-1. Predicted Annual Average Concentrations of NO_2 at Receptor Locations

Receptor		NO_2 (µg/m^3)			
		2019 Baseline	2033 Do Minimum	2033 Do Something	Development Contribution
R1	20 Wheatsheaf Avenue	26.11	25.67	25.64	-0.03
R2	24 Robert Dukeson Avenue	19.93	19.78	19.81	0.03
R3	65 Alexander Avenue	19.01	18.89	18.92	0.03

R4	7 Waters Edge Kings Sconce Ave	16.90	16.81	16.81	<0.01
R5	34 Sandhills Close	19.07	18.42	18.56	0.14
R6	Andreas Great North Road	21.62	21.48	21.18	-0.30
R7	2 Manners Road	21.07	20.99	20.67	-0.32
R8	Castle View Court Mather Road	25.30	25.22	24.69	-0.53
R9	1 Bar Gate	28.86	27.62	27.09	-0.53
R10	19 Bar Gate	29.06	28.72	28.12	-0.60
R11	29 North Gate	33.44	30.80	30.11	-0.69
R12	162 North Gate	21.09	20.60	20.38	-0.22
R13	19 Apple Tree	22.51	21.25	21.01	-0.24
R14	1 Lincoln Road	23.24	22.75	22.52	-0.23
R15	31 Linseed Avenue	22.99	22.91	22.78	-0.13
R16	Premier Inn Newark	25.29	24.95	24.80	-0.15
R17	11 Bryans Close	21.15	22.61	22.24	-0.37
R18	70 Newark Road	33.87	37.81	37.33	-0.48
R19	Greenfield Close Care Home	23.49	27.67	27.60	-0.07
R20	37 Cannon Close	20.11	23.18	23.29	0.11
R21	157 Beacon Hill Road	19.37	23.91	24.13	0.22
R22	77 Beacon Hill	16.92	16.64	17.45	0.81
R23	76 Beacon Hill Road	22.01	21.40	22.69	1.29
R24	66 Esther Varney Place	19.19	19.74	19.91	0.17
R25	2 Sleaford Road	40.75	41.07	41.25	0.18
R26	1 Friary Road	25.25	25.14	24.60	-0.54
R27	24 Queens Court	22.32	22.35	22.09	-0.26
R28	13 Queens Court	28.25	28.15	27.71	-0.44
R29	62 Barnby Gate	24.80	26.03	25.16	-0.87
R30	Newark College	17.72	17.69	17.45	-0.24
R31	181 Barnby Gate	17.36	18.00	17.67	-0.33
R32	Barnby Road Academy	14.69	16.32	15.61	-0.71
R33	Edinburgh Lodge Barnby Road	13.54	16.09	14.99	-1.10
R34	Green Bank Lodge Barnby Road	16.94	18.90	18.19	-0.71
R35	27 Bayford Drive	17.17	17.85	17.76	-0.09
R36	Greenways Newark Road	24.92	26.78	26.65	-0.13
R37	35 Edgehill Drive	16.98	17.72	17.67	-0.05
R38	Field House Farm Coddington Rd	16.79	17.43	17.35	-0.08
R39	Bridgeholme Cottage Coddington	27.70	29.37	29.16	-0.21
R40	144 Main Street	25.08	26.50	26.33	-0.17
R41	22 Southfield	27.43	29.27	29.10	-0.17
R42	7 Bilton Close	19.15	22.74	23.16	0.42
R43	233 London Road	22.56	24.09	23.64	-0.45
R44	196 London Road	15.49	16.54	16.34	-0.20
R45	2 Glebe Park	15.85	17.07	16.91	-0.16
R46	89 London Road	18.48	19.75	19.55	-0.20
R47	2 Cottage Homes London Road	37.42	36.23	34.90	-1.33
R48	2 Bowbridge Road	29.04	22.97	21.77	-1.20
R49	115 Bowbridge Road	26.44	21.46	20.28	-1.18
R50	120 Bowbridge Road	15.26	15.29	14.83	-0.46
R51	Hawtonville Children's Centre	14.41	14.66	14.27	-0.39
R52	254 Bowbridge Road	14.88	15.27	14.94	-0.33

R53	7 Tannington Grove	11.44	12.57	13.11	0.54
R54	Millstone Cottage Bowbridge La	10.41	11.56	11.67	0.11
R55	The Willows Newark Road	9.51	9.72	10.25	0.53
R56	205 Hawton Road	14.22	14.78	14.79	0.01
R57	1 Hawton Road	16.57	17.07	16.96	-0.11
R58	12 Newark Court Boundary Road	19.33	20.02	19.81	-0.21
R59	14 Alert Street	20.07	20.10	19.82	-0.28
R60	3 London Road	35.05	35.63	34.84	-0.79
R61	Travelodge Newark	29.84	30.61	30.07	-0.54
R62	4 Portland Street	23.19	23.03	22.61	-0.42
R63	6 Victoria Street	21.46	21.23	20.91	-0.32
R64	1 Mill Gate	17.99	17.92	18.15	0.23
R65	1 The Waterfront	21.68	22.60	21.21	-1.39
R66	67 Farndon Road	18.78	19.50	18.28	-1.22
R67	149 Farndon Road	20.70	20.36	18.98	-1.38
R68	31 The Ivies	17.91	16.96	17.11	0.15
R69	Farndon Fields Farm Fosse Way	17.68	16.91	13.01	-3.90
R70	4 Mill Gate	18.95	18.87	19.42	0.55
R71	37 Lombard Street	21.02	21.53	21.25	-0.28
R72	30 Castle Gate	28.67	27.96	27.77	-0.19
R73	1 Castle Gate	34.13	32.81	32.50	-0.31
Annual Mean AQO		**40 µg/m^3**			

As indicated in **Table C-1**, the maximum predicted increase in annual average exposure to NO_2 at any existing receptor, due to changes in traffic movements associated with the Southern Link Road is 1.29 µg/m^3 at 76 Beacon Hill Road (R28).

The predicted long-term NO_2 concentrations at all proposed and existing receptors are below 60 µg/m^3 in all scenarios. Therefore, it is unlikely there will be any exceedances for the short-term NO_2 AQO at all modelled receptors as outlined in LAQM TG16 technical guidance.

The impact description of changes in traffic flow associated with the Southern Link Road with respect to annual mean NO_2 exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table C-2**.

Table C-2. Impact Description of Effects at Key Receptors (NO2)

Impact Description of NO_2 Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m^3)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R2	0.03	0.07	0%	≤75% of AQO	Negligible Increase
R3	0.03	0.07	0%	≤75% of AQO	Negligible Increase
R4	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R5	0.14	0.35	0%	≤75% of AQO	Negligible Increase

R6	-0.30	-0.75	1%	≤75% of AQO	Negligible Decrease
R7	-0.32	-0.80	1%	≤75% of AQO	Negligible Decrease
R8	-0.53	-1.32	1%	≤75% of AQO	Negligible Decrease
R9	-0.53	-1.32	1%	≤75% of AQO	Negligible Decrease
R10	-0.60	-1.50	2-5%	≤75% of AQO	Negligible Decrease
R11	-0.69	-1.72	2-5%	≤75% of AQO	Negligible Decrease
R12	-0.22	-0.55	1%	≤75% of AQO	Negligible Decrease
R13	-0.24	-0.60	1%	≤75% of AQO	Negligible Decrease
R14	-0.23	-0.57	1%	≤75% of AQO	Negligible Decrease
R15	-0.13	-0.32	0%	≤75% of AQO	Negligible Decrease
R16	-0.15	-0.37	0%	≤75% of AQO	Negligible Decrease
R17	-0.37	-0.92	1%	≤75% of AQO	Negligible Decrease
R18	-0.48	-1.20	1%	76-94% of AQO	Negligible Decrease
R19	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
R20	0.11	0.27	0%	≤75% of AQO	Negligible Increase
R21	0.22	0.55	1%	≤75% of AQO	Negligible Increase
R22	0.81	2.02	2-5%	≤75% of AQO	Negligible Increase
R23	1.29	3.22	2-5%	≤75% of AQO	Negligible Increase
R24	0.17	0.42	0%	≤75% of AQO	Negligible Increase
R25	0.18	0.45	0%	103-109 of AQO	Negligible Increase
R26	-0.54	-1.35	1%	≤75% of AQO	Negligible Decrease
R27	-0.26	-0.65	1%	≤75% of AQO	Negligible Decrease
R28	-0.44	-1.10	1%	≤75% of AQO	Negligible Decrease
R29	-0.87	-2.17	2-5%	≤75% of AQO	Negligible Decrease
R30	-0.24	-0.60	1%	≤75% of AQO	Negligible Decrease
R31	-0.33	-0.82	1%	≤75% of AQO	Negligible Decrease
R32	-0.71	-1.77	2-5%	≤75% of AQO	Negligible Decrease
R33	-1.10	-2.75	2-5%	≤75% of AQO	Negligible Decrease
R34	-0.71	-1.77	2-5%	≤75% of AQO	Negligible Decrease

R35	-0.09	-0.22	0%	≤75% of AQO	Negligible Decrease
R36	-0.13	-0.32	0%	≤75% of AQO	Negligible Decrease
R37	-0.05	-0.12	0%	≤75% of AQO	Negligible Decrease
R38	-0.08	-0.20	0%	≤75% of AQO	Negligible Decrease
R39	-0.21	-0.52	1%	≤75% of AQO	Negligible Decrease
R40	-0.17	-0.42	0%	≤75% of AQO	Negligible Decrease
R41	-0.17	-0.42	0%	≤75% of AQO	Negligible Decrease
R42	0.42	1.05	1%	≤75% of AQO	Negligible Increase
R43	-0.45	-1.12	1%	≤75% of AQO	Negligible Decrease
R44	-0.20	-0.50	1%	≤75% of AQO	Negligible Decrease
R45	-0.16	-0.40	0%	≤75% of AQO	Negligible Decrease
R46	-0.20	-0.50	1%	≤75% of AQO	Negligible Decrease
R47	-1.33	-3.32	2-5%	76-94% of AQO	Slight Decrease
R48	-1.20	-3.00	2-5%	≤75% of AQO	Negligible Decrease
R49	-1.18	-2.95	2-5%	≤75% of AQO	Negligible Decrease
R50	-0.46	-1.15	1%	≤75% of AQO	Negligible Decrease
R51	-0.39	-0.97	1%	≤75% of AQO	Negligible Decrease
R52	-0.33	-0.82	1%	≤75% of AQO	Negligible Decrease
R53	0.54	1.35	1%	≤75% of AQO	Negligible Increase
R54	0.11	0.27	0%	≤75% of AQO	Negligible Increase
R55	0.53	1.32	1%	≤75% of AQO	Negligible Increase
R56	0.01	0.02	0%	≤75% of AQO	Negligible Increase
R57	-0.11	-0.27	0%	≤75% of AQO	Negligible Decrease
R58	-0.21	-0.52	1%	≤75% of AQO	Negligible Decrease
R59	-0.28	-0.70	1%	≤75% of AQO	Negligible Decrease
R60	-0.79	-1.97	2-5%	76-94% of AQO	Slight Decrease
R61	-0.54	-1.35	1%	≤75% of AQO	Negligible Decrease
R62	-0.42	-1.05	1%	≤75% of AQO	Negligible Decrease
R63	-0.32	-0.80	1%	≤75% of AQO	Negligible Decrease
R64	0.23	0.57	1%	≤75% of AQO	Negligible Increase

R65	-1.39	-3.47	2-5%	≤75% of AQO	Negligible Decrease
R66	-1.22	-3.05	2-5%	≤75% of AQO	Negligible Decrease
R67	-1.38	-3.45	2-5%	≤75% of AQO	Negligible Decrease
R68	0.15	0.37	0%	≤75% of AQO	Negligible Increase
R69	-3.90	-9.75	6-10%	≤75% of AQO	Slight Decrease
R70	0.55	1.37	1%	≤75% of AQO	Negligible Increase
R71	-0.28	-0.70	1%	≤75% of AQO	Negligible Decrease
R72	-0.19	-0.47	0%	≤75% of AQO	Negligible Decrease
R73	-0.31	-0.77	1%	76-94% of AQO	Negligible Decrease

+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.

The impact description of the effects of changes in traffic flow as a result of the Southern Link Road, with respect to NO_2 exposure for existing receptors, is determined to be:

- 'Negligible Increase' at 18 Receptors;
- 'Negligible Decrease' at 52 Receptors; and,
- 'Slight Decrease' at 3 Receptors.

This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

Particulate Matter (PM_{10})

Table C-3 presents a summary of the predicted change in annual mean PM_{10} concentrations at relevant receptor locations, due to changes in traffic flow associated with the Southern Link Road, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table C-3. Predicted Annual Average Concentrations of PM_{10} at Receptor Locations

Receptor		PM_{10} ($\mu g/m^3$)			
		2019 Baseline	2033 Do Minimum	2033 Do Something	Development Contribution
R1	20 Wheatsheaf Avenue	19.64	19.62	19.61	-0.01
R2	24 Robert Dukeson Avenue	18.99	18.96	18.96	<0.01
R3	65 Alexander Avenue	16.69	16.66	16.66	<0.01
R4	7 Waters Edge Kings Sconce Ave	16.16	16.14	16.14	<0.01
R5	34 Sandhills Close	16.16	16.06	16.09	0.03
R6	Andreas Great North Road	16.88	16.86	16.79	-0.07
R7	2 Manners Road	16.76	16.75	16.68	-0.07
R8	Castle View Court Mather Road	17.65	17.64	17.52	-0.12
R9	1 Bar Gate	17.51	17.33	17.26	-0.07
R10	19 Bar Gate	18.01	17.76	17.67	-0.09
R11	29 North Gate	18.05	17.71	17.63	-0.08
R12	162 North Gate	15.98	15.76	15.72	-0.04

R13	19 Apple Tree	15.86	15.70	15.67	-0.03
R14	1 Lincoln Road	16.04	16.01	15.98	-0.03
R15	31 Linseed Avenue	19.08	19.10	19.08	-0.02
R16	Premier Inn Newark	19.29	19.30	19.27	-0.03
R17	11 Bryans Close	19.21	19.59	19.45	-0.14
R18	70 Newark Road	22.36	23.34	23.17	-0.17
R19	Greenfield Close Care Home	19.67	20.53	20.52	-0.01
R20	37 Cannon Close	18.90	19.44	19.43	-0.01
R21	157 Beacon Hill Road	18.56	19.19	19.23	0.04
R22	77 Beacon Hill	16.63	16.56	16.73	0.17
R23	76 Beacon Hill Road	16.89	16.75	17.03	0.28
R24	66 Esther Varney Place	16.23	16.33	16.36	0.03
R25	2 Sleaford Road	18.56	18.81	18.85	0.04
R26	1 Friary Road	16.41	16.41	16.35	-0.06
R27	24 Queens Court	16.09	16.10	16.06	-0.04
R28	13 Queens Court	16.65	16.66	16.60	-0.06
R29	62 Barnby Gate	16.81	16.95	16.89	-0.06
R30	Newark College	15.92	15.92	15.88	-0.04
R31	181 Barnby Gate	15.89	15.99	15.95	-0.04
R32	Barnby Road Academy	15.36	15.66	15.54	-0.12
R33	Edinburgh Lodge Barnby Road	15.90	16.37	16.17	-0.20
R34	Green Bank Lodge Barnby Road	19.43	19.82	19.69	-0.13
R35	27 Bayford Drive	19.54	19.69	19.68	-0.01
R36	Greenways Newark Road	20.10	20.52	20.51	-0.01
R37	35 Edgehill Drive	19.49	19.65	19.64	-0.01
R38	Field House Farm Coddington Rd	19.44	19.58	19.57	-0.01
R39	Bridgeholme Cottage Coddington	21.55	21.96	21.94	-0.02
R40	144 Main Street	20.89	21.23	21.21	-0.02
R41	22 Southfield	21.05	21.48	21.46	-0.02
R42	7 Bilton Close	16.38	17.04	17.06	0.02
R43	233 London Road	16.39	16.66	16.62	-0.04
R44	196 London Road	15.72	15.90	15.87	-0.03
R45	2 Glebe Park	16.27	16.49	16.46	-0.03
R46	89 London Road	16.12	16.35	16.32	-0.03
R47	2 Cottage Homes London Road	18.49	18.51	18.36	-0.15
R48	2 Bowbridge Road	17.15	16.60	16.43	-0.17
R49	115 Bowbridge Road	17.52	16.70	16.47	-0.23
R50	120 Bowbridge Road	15.24	15.27	15.18	-0.09
R51	Hawtonville Children's Centre	15.14	15.19	15.11	-0.08
R52	254 Bowbridge Road	16.65	16.73	16.68	-0.05
R53	7 Tannington Grove	16.25	16.47	16.57	0.10
R54	Millstone Cottage Bowbridge La	16.04	16.30	16.33	0.03
R55	The Willows Newark Road	16.13	16.17	16.26	0.09
R56	205 Hawton Road	16.11	16.23	16.22	-0.01
R57	1 Hawton Road	14.79	14.90	14.88	-0.02
R58	12 Newark Court Boundary Road	15.19	15.34	15.31	-0.03
R59	14 Alert Street	15.41	15.43	15.39	-0.04
R60	3 London Road	17.39	17.50	17.41	-0.09
R61	Travelodge Newark	16.62	16.80	16.72	-0.08

R62	4 Portland Street	15.97	15.93	15.87	-0.06
R63	6 Victoria Street	15.79	15.70	15.64	-0.06
R64	1 Mill Gate	15.13	15.09	15.11	0.02
R65	1 The Waterfront	16.04	16.04	15.78	-0.26
R66	67 Farndon Road	17.07	17.06	16.83	-0.23
R67	149 Farndon Road	17.13	17.02	16.78	-0.24
R68	31 The Ivies	16.92	16.73	16.75	0.02
R69	Farndon Fields Farm Fosse Way	16.70	16.57	15.80	-0.77
R70	4 Mill Gate	15.15	15.13	15.19	0.06
R71	37 Lombard Street	15.52	15.61	15.57	-0.04
R72	30 Castle Gate	16.82	16.73	16.68	-0.05
R73	1 Castle Gate	18.17	18.03	17.97	-0.06
Annual Mean AQO		**40 µg/m^3**			

All modelled existing receptors are predicted to be below the AQO for PM_{10} in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table C-3**, the maximum predicted increase in annual average exposure to PM_{10} at any existing receptor, due to changes in traffic movements associated with the Southern Link Road is 0.28 µg/m^3 at 76 Beacon Hill Road (R28).

The impact description of changes in traffic flow associated with the Southern Link Road with respect to annual mean PM_{10} exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table C-4**.

Table C-4. Impact Description of Effects at Key Receptors (PM_{10})

Impact Description of PM_{10} Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m^3)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	-0.01	-0.03	0%	≤75% of AQO	Negligible Decrease
R2	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R3	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R4	<0.01	0.00	0%	≤75% of AQO	Negligible Decrease
R5	0.03	0.06	0%	≤75% of AQO	Negligible Increase
R6	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
R7	-0.07	-0.18	0%	≤75% of AQO	Negligible Decrease
R8	-0.12	-0.30	0%	≤75% of AQO	Negligible Decrease
R9	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
R10	-0.09	-0.22	0%	≤75% of AQO	Negligible Decrease
R11	-0.08	-0.20	0%	≤75% of AQO	Negligible Decrease

R12	-0.04	-0.08	0%	≤75% of AQO	Negligible Decrease
R13	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R14	-0.03	-0.08	0%	≤75% of AQO	Negligible Decrease
R15	-0.02	-0.07	0%	≤75% of AQO	Negligible Decrease
R16	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R17	-0.14	-0.33	0%	≤75% of AQO	Negligible Decrease
R18	-0.17	-0.42	0%	≤75% of AQO	Negligible Decrease
R19	-0.01	0.00	0%	≤75% of AQO	Negligible Decrease
R20	-0.01	-0.04	0%	≤75% of AQO	Negligible Decrease
R21	0.04	0.09	0%	≤75% of AQO	Negligible Increase
R22	0.17	0.43	0%	≤75% of AQO	Negligible Increase
R23	0.28	0.71	1%	≤75% of AQO	Negligible Increase
R24	0.03	0.07	0%	≤75% of AQO	Negligible Increase
R25	0.04	0.08	0%	≤75% of AQO	Negligible Increase
R26	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R27	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R28	-0.06	-0.13	0%	≤75% of AQO	Negligible Decrease
R29	-0.06	-0.16	0%	≤75% of AQO	Negligible Decrease
R30	-0.04	-0.09	0%	≤75% of AQO	Negligible Decrease
R31	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R32	-0.12	-0.31	0%	≤75% of AQO	Negligible Decrease
R33	-0.20	-0.48	0%	≤75% of AQO	Negligible Decrease
R34	-0.13	-0.31	0%	≤75% of AQO	Negligible Decrease
R35	-0.01	-0.03	0%	≤75% of AQO	Negligible Decrease
R36	-0.01	-0.04	0%	≤75% of AQO	Negligible Decrease
R37	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R38	-0.01	-0.03	0%	≤75% of AQO	Negligible Decrease
R39	-0.02	-0.06	0%	≤75% of AQO	Negligible Decrease
R40	-0.02	-0.05	0%	≤75% of AQO	Negligible Decrease

R41	-0.02	-0.05	0%	≤75% of AQO	Negligible Decrease
R42	0.02	0.07	0%	≤75% of AQO	Negligible Increase
R43	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R44	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R45	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R46	-0.03	-0.09	0%	≤75% of AQO	Negligible Decrease
R47	-0.15	-0.37	0%	≤75% of AQO	Negligible Decrease
R48	-0.17	-0.42	0%	≤75% of AQO	Negligible Decrease
R49	-0.23	-0.56	1%	≤75% of AQO	Negligible Decrease
R50	-0.09	-0.21	0%	≤75% of AQO	Negligible Decrease
R51	-0.08	-0.19	0%	≤75% of AQO	Negligible Decrease
R52	-0.05	-0.12	0%	≤75% of AQO	Negligible Decrease
R53	0.10	0.26	0%	≤75% of AQO	Negligible Increase
R54	0.03	0.07	0%	≤75% of AQO	Negligible Increase
R55	0.09	0.22	0%	≤75% of AQO	Negligible Increase
R56	-0.01	-0.01	0%	≤75% of AQO	Negligible Decrease
R57	-0.02	-0.05	0%	≤75% of AQO	Negligible Decrease
R58	-0.03	-0.08	0%	≤75% of AQO	Negligible Decrease
R59	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R60	-0.09	-0.23	0%	≤75% of AQO	Negligible Decrease
R61	-0.08	-0.19	0%	≤75% of AQO	Negligible Decrease
R62	-0.06	-0.16	0%	≤75% of AQO	Negligible Decrease
R63	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R64	0.02	0.05	0%	≤75% of AQO	Negligible Increase
R65	-0.26	-0.66	1%	≤75% of AQO	Negligible Decrease
R66	-0.23	-0.57	1%	≤75% of AQO	Negligible Decrease
R67	-0.24	-0.60	1%	≤75% of AQO	Negligible Decrease
R68	0.02	0.05	0%	≤75% of AQO	Negligible Increase
R69	-0.77	-1.91	2-5%	≤75% of AQO	Negligible Decrease

R70	0.06	0.14	0%	≤75% of AQO	Negligible Increase
R71	-0.04	-0.09	0%	≤75% of AQO	Negligible Decrease
R72	-0.05	-0.12	0%	≤75% of AQO	Negligible Decrease
R73	-0.06	-0.17	0%	≤75% of AQO	Negligible Decrease
+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					

The impact description of the effects of changes in traffic as a result of the Southern Link Road, with respect to annual mean PM_{10} exposure for existing receptors is determined to be:

- 'Negligible Increase' at 15 Receptors; and,
- 'Negligible Decrease' at 58 Receptors.

This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

Particulate Matter ($PM_{2.5}$)

Table C-5 presents a summary of the predicted change in annual mean $PM_{2.5}$ concentrations at relevant receptor locations, due to changes in traffic flow associated with the Southern Link Road, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table C-5. Predicted Annual Average Concentrations of $PM_{2.5}$ at Receptor Locations

Receptor		$PM_{2.5}$ (µg/m^3)			
		2019 Baseline	2033 Do Minimum	2033 Do Something	Development Contribution
R1	20 Wheatsheaf Avenue	11.24	11.23	11.22	-0.01
R2	24 Robert Dukeson Avenue	10.81	10.79	10.79	<0.01
R3	65 Alexander Avenue	10.10	10.08	10.09	0.01
R4	7 Waters Edge Kings Sconce Ave	9.80	9.79	9.79	<0.01
R5	34 Sandhills Close	9.73	9.67	9.69	0.02
R6	Andreas Great North Road	10.14	10.12	10.08	-0.04
R7	2 Manners Road	10.07	10.06	10.02	-0.04
R8	Castle View Court Mather Road	10.58	10.58	10.51	-0.07
R9	1 Bar Gate	10.54	10.44	10.40	-0.04
R10	19 Bar Gate	10.82	10.68	10.63	-0.05
R11	29 North Gate	10.88	10.68	10.63	-0.05
R12	162 North Gate	9.90	9.78	9.76	-0.02
R13	19 Apple Tree	9.85	9.76	9.74	-0.02
R14	1 Lincoln Road	9.96	9.94	9.92	-0.02
R15	31 Linseed Avenue	10.91	10.92	10.91	-0.01
R16	Premier Inn Newark	11.04	11.05	11.03	-0.02
R17	11 Bryans Close	10.99	11.20	11.13	-0.07
R18	70 Newark Road	12.81	13.38	13.28	-0.10
R19	Greenfield Close Care Home	11.25	11.75	11.75	<0.01
R20	37 Cannon Close	10.81	11.13	11.12	-0.01
R21	157 Beacon Hill Road	10.62	11.00	11.02	0.02

R22	77 Beacon Hill	9.72	9.68	9.78	0.10
R23	76 Beacon Hill Road	10.42	10.33	10.50	0.17
R24	66 Esther Varney Place	10.03	10.10	10.11	0.01
R25	2 Sleaford Road	11.49	11.63	11.65	0.02
R26	1 Friary Road	10.18	10.18	10.14	-0.04
R27	24 Queens Court	9.98	9.98	9.96	-0.02
R28	13 Queens Court	10.33	10.34	10.30	-0.04
R29	62 Barnby Gate	10.40	10.49	10.45	-0.04
R30	Newark College	9.86	9.86	9.84	-0.02
R31	181 Barnby Gate	9.84	9.90	9.87	-0.03
R32	Barnby Road Academy	9.53	9.71	9.64	-0.07
R33	Edinburgh Lodge Barnby Road	9.30	9.57	9.46	-0.11
R34	Green Bank Lodge Barnby Road	10.67	10.89	10.82	-0.07
R35	27 Bayford Drive	10.76	10.84	10.84	<0.01
R36	Greenways Newark Road	11.51	11.75	11.74	-0.01
R37	35 Edgehill Drive	10.73	10.82	10.81	-0.01
R38	Field House Farm Coddington Rd	10.67	10.75	10.75	<0.01
R39	Bridgeholme Cottage Coddington	12.12	12.36	12.35	-0.01
R40	144 Main Street	11.74	11.94	11.92	-0.02
R41	22 Southfield	11.85	12.10	12.08	-0.02
R42	7 Bilton Close	9.73	10.11	10.13	0.02
R43	233 London Road	9.76	9.92	9.90	-0.02
R44	196 London Road	9.34	9.44	9.43	-0.01
R45	2 Glebe Park	9.64	9.76	9.75	-0.01
R46	89 London Road	9.97	10.11	10.09	-0.02
R47	2 Cottage Homes London Road	11.43	11.43	11.33	-0.10
R48	2 Bowbridge Road	10.61	10.27	10.17	-0.10
R49	115 Bowbridge Road	10.79	10.31	10.18	-0.13
R50	120 Bowbridge Road	9.31	9.33	9.28	-0.05
R51	Hawtonville Children's Centre	9.25	9.28	9.23	-0.05
R52	254 Bowbridge Road	9.38	9.43	9.40	-0.03
R53	7 Tannington Grove	9.13	9.26	9.32	0.06
R54	Millstone Cottage Bowbridge La	9.01	9.16	9.18	0.02
R55	The Willows Newark Road	8.89	8.91	8.96	0.05
R56	205 Hawton Road	9.42	9.49	9.48	-0.01
R57	1 Hawton Road	9.19	9.25	9.24	-0.01
R58	12 Newark Court Boundary Road	9.43	9.52	9.50	-0.02
R59	14 Alert Street	9.55	9.57	9.54	-0.03
R60	3 London Road	10.76	10.82	10.77	-0.05
R61	Travelodge Newark	10.30	10.40	10.35	-0.05
R62	4 Portland Street	9.88	9.86	9.82	-0.04
R63	6 Victoria Street	9.77	9.72	9.68	-0.04
R64	1 Mill Gate	9.39	9.36	9.37	0.01
R65	1 The Waterfront	9.91	9.91	9.76	-0.15
R66	67 Farndon Road	9.97	9.97	9.84	-0.13
R67	149 Farndon Road	10.02	9.96	9.82	-0.14
R68	31 The Ivies	9.88	9.77	9.79	0.02
R69	Farndon Fields Farm Fosse Way	9.77	9.69	9.24	-0.45
R70	4 Mill Gate	9.40	9.39	9.43	0.04

R71	37 Lombard Street	9.62	9.67	9.65	-0.02
R72	30 Castle Gate	10.39	10.33	10.30	-0.03
R73	1 Castle Gate	10.95	10.87	10.83	-0.04
Annual Mean AQO		**25 µg/m³**			

All modelled existing receptors are predicted to be below the AQO for $PM_{2.5}$ in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table C-5**, the maximum predicted increase in annual average exposure to $PM_{2.5}$ at any existing receptor, due to changes in traffic movements associated with the Southern Link Road is 0.17 µg/m³ at 76 Beacon Hill Road (R28).

The impact description of changes in traffic flow associated with the Southern Link Road with respect to annual mean $PM_{2.5}$ exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table C-6**.

Table C-6. Impact Description of Effects at Key Receptors ($PM_{2.5}$)

Impact Description of $PM_{2.5}$ Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	-0.01	-0.03	0%	≤75% of AQO	Negligible Decrease
R2	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R3	0.01	0.00	0%	≤75% of AQO	Negligible Increase
R4	<0.01	0.00	0%	≤75% of AQO	Negligible Decrease
R5	0.02	0.06	0%	≤75% of AQO	Negligible Increase
R6	-0.04	-0.16	0%	≤75% of AQO	Negligible Decrease
R7	-0.04	-0.16	0%	≤75% of AQO	Negligible Decrease
R8	-0.07	-0.27	0%	≤75% of AQO	Negligible Decrease
R9	-0.04	-0.17	0%	≤75% of AQO	Negligible Decrease
R10	-0.05	-0.21	0%	≤75% of AQO	Negligible Decrease
R11	-0.05	-0.19	0%	≤75% of AQO	Negligible Decrease
R12	-0.02	-0.08	0%	≤75% of AQO	Negligible Decrease
R13	-0.02	-0.07	0%	≤75% of AQO	Negligible Decrease
R14	-0.02	-0.07	0%	≤75% of AQO	Negligible Decrease
R15	-0.01	-0.06	0%	≤75% of AQO	Negligible Decrease
R16	-0.02	-0.06	0%	≤75% of AQO	Negligible Decrease
R17	-0.07	-0.30	0%	≤75% of AQO	Negligible Decrease

R18	-0.10	-0.39	0%	≤75% of AQO	Negligible Decrease
R19	<0.01	-0.01	0%	≤75% of AQO	Negligible Decrease
R20	-0.01	-0.03	0%	≤75% of AQO	Negligible Decrease
R21	0.02	0.08	0%	≤75% of AQO	Negligible Increase
R22	0.10	0.39	0%	≤75% of AQO	Negligible Increase
R23	0.17	0.66	1%	≤75% of AQO	Negligible Increase
R24	0.01	0.07	0%	≤75% of AQO	Negligible Increase
R25	0.02	0.08	0%	≤75% of AQO	Negligible Increase
R26	-0.04	-0.14	0%	≤75% of AQO	Negligible Decrease
R27	-0.02	-0.09	0%	≤75% of AQO	Negligible Decrease
R28	-0.04	-0.13	0%	≤75% of AQO	Negligible Decrease
R29	-0.04	-0.16	0%	≤75% of AQO	Negligible Decrease
R30	-0.02	-0.09	0%	≤75% of AQO	Negligible Decrease
R31	-0.03	-0.10	0%	≤75% of AQO	Negligible Decrease
R32	-0.07	-0.29	0%	≤75% of AQO	Negligible Decrease
R33	-0.11	-0.45	0%	≤75% of AQO	Negligible Decrease
R34	-0.07	-0.29	0%	≤75% of AQO	Negligible Decrease
R35	<0.01	-0.03	0%	≤75% of AQO	Negligible Decrease
R36	-0.01	-0.04	0%	≤75% of AQO	Negligible Decrease
R37	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R38	<0.01	-0.03	0%	≤75% of AQO	Negligible Decrease
R39	-0.01	-0.06	0%	≤75% of AQO	Negligible Decrease
R40	-0.02	-0.05	0%	≤75% of AQO	Negligible Decrease
R41	-0.02	-0.05	0%	≤75% of AQO	Negligible Decrease
R42	0.02	0.07	0%	≤75% of AQO	Negligible Increase
R43	-0.02	-0.10	0%	≤75% of AQO	Negligible Decrease
R44	-0.01	-0.07	0%	≤75% of AQO	Negligible Decrease
R45	-0.01	-0.07	0%	≤75% of AQO	Negligible Decrease
R46	-0.02	-0.08	0%	≤75% of AQO	Negligible Decrease

R47	-0.10	-0.37	0%	≤75% of AQO	Negligible Decrease
R48	-0.10	-0.40	0%	≤75% of AQO	Negligible Decrease
R49	-0.13	-0.53	1%	≤75% of AQO	Negligible Decrease
R50	-0.05	-0.20	0%	≤75% of AQO	Negligible Decrease
R51	-0.05	-0.18	0%	≤75% of AQO	Negligible Decrease
R52	-0.03	-0.11	0%	≤75% of AQO	Negligible Decrease
R53	0.06	0.24	0%	≤75% of AQO	Negligible Increase
R54	0.02	0.07	0%	≤75% of AQO	Negligible Increase
R55	0.05	0.20	0%	≤75% of AQO	Negligible Increase
R56	-0.01	-0.01	0%	≤75% of AQO	Negligible Decrease
R57	-0.01	-0.05	0%	≤75% of AQO	Negligible Decrease
R58	-0.02	-0.07	0%	≤75% of AQO	Negligible Decrease
R59	-0.03	-0.09	0%	≤75% of AQO	Negligible Decrease
R60	-0.05	-0.23	0%	≤75% of AQO	Negligible Decrease
R61	-0.05	-0.18	0%	≤75% of AQO	Negligible Decrease
R62	-0.04	-0.15	0%	≤75% of AQO	Negligible Decrease
R63	-0.04	-0.14	0%	≤75% of AQO	Negligible Decrease
R64	0.01	0.05	0%	≤75% of AQO	Negligible Increase
R65	-0.15	-0.62	1%	≤75% of AQO	Negligible Decrease
R66	-0.13	-0.53	1%	≤75% of AQO	Negligible Decrease
R67	-0.14	-0.56	1%	≤75% of AQO	Negligible Decrease
R68	0.02	0.05	0%	≤75% of AQO	Negligible Increase
R69	-0.45	-1.78	0%	≤75% of AQO	Negligible Decrease
R70	0.04	0.14	0%	≤75% of AQO	Negligible Increase
R71	-0.02	-0.09	0%	≤75% of AQO	Negligible Decrease
R72	-0.03	-0.11	0%	≤75% of AQO	Negligible Decrease
R73	-0.04	-0.16	0%	≤75% of AQO	Negligible Decrease

+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.

The impact description of the effects of changes in traffic as a result of the Southern Link Road, with respect to annual mean PM_{10} exposure for existing receptors is determined to be:

- 'Negligible Increase' at 15 Receptors; and,
- 'Negligible Decrease' at 58 Receptors.

This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

Scenario 2 – Improvements Completed on A46

Nitrogen Dioxide

Table C-7 presents a summary of the predicted long term NO_2 concentrations at relevant existing receptor locations based on the modelled 2033 'Do Minimum' and 'Do Something' scenarios.

Table C-7. Predicted Annual Average Concentrations of NO_2 at Receptor Locations

Receptor		NO_2 (µg/m^3)			
		2019 Baseline	2033 Do Minimum	2033 Do Something	Development Contribution
R1	20 Wheatsheaf Avenue	26.11	26.69	27.38	0.69
R2	24 Robert Dukeson Avenue	19.93	21.20	21.77	0.57
R3	65 Alexander Avenue	19.01	20.07	20.53	0.46
R4	7 Waters Edge Kings Sconce Ave	16.90	17.34	17.55	0.21
R5	34 Sandhills Close	19.07	19.74	20.01	0.27
R6	Andreas Great North Road	21.62	21.96	21.85	-0.11
R7	2 Manners Road	21.07	21.31	21.17	-0.14
R8	Castle View Court Mather Road	25.30	25.49	25.20	-0.29
R9	1 Bar Gate	28.86	27.12	26.74	-0.38
R10	19 Bar Gate	29.06	28.06	27.67	-0.39
R11	29 North Gate	33.44	29.63	29.34	-0.29
R12	162 North Gate	21.09	19.77	19.71	-0.06
R13	19 Apple Tree	22.51	19.99	19.96	-0.03
R14	1 Lincoln Road	23.24	20.75	20.82	0.07
R15	31 Linseed Avenue	22.99	21.77	21.92	0.15
R16	Premier Inn Newark	25.29	23.93	24.23	0.30
R17	11 Bryans Close	21.15	21.96	22.34	0.38
R18	70 Newark Road	33.87	36.22	36.63	0.41
R19	Greenfield Close Care Home	23.49	26.48	26.48	<0.01
R20	37 Cannon Close	20.11	22.03	22.12	0.09
R21	157 Beacon Hill Road	19.37	22.06	22.24	0.18
R22	77 Beacon Hill	16.92	17.73	17.79	0.06
R23	76 Beacon Hill Road	22.01	23.19	23.26	0.07
R24	66 Esther Varney Place	19.19	19.78	19.97	0.19
R25	2 Sleaford Road	40.75	41.90	42.77	0.87
R26	1 Friary Road	25.25	25.08	25.32	0.24
R27	24 Queens Court	22.32	22.58	22.57	-0.01
R28	13 Queens Court	28.25	28.71	28.75	0.04
R29	62 Barnby Gate	24.80	24.85	24.02	-0.83
R30	Newark College	17.72	17.61	17.63	0.02
R31	181 Barnby Gate	17.36	17.58	17.05	-0.53

R32	Barnby Road Academy	14.69	15.86	15.43	-0.43
R33	Edinburgh Lodge Barnby Road	13.54	15.35	14.71	-0.64
R34	Green Bank Lodge Barnby Road	16.94	18.32	17.94	-0.38
R35	27 Bayford Drive	17.17	17.66	17.65	-0.01
R36	Greenways Newark Road	24.92	26.24	26.23	-0.01
R37	35 Edgehill Drive	16.98	17.53	17.52	-0.01
R38	Field House Farm Coddington Rd	16.79	17.25	17.23	-0.02
R39	Bridgeholme Cottage Coddington	27.70	28.87	28.84	-0.03
R40	144 Main Street	25.08	26.07	26.06	-0.01
R41	22 Southfield	27.43	28.65	28.72	0.07
R42	7 Bilton Close	19.15	21.94	23.35	1.41
R43	233 London Road	22.56	23.27	22.80	-0.47
R44	196 London Road	15.49	16.24	15.96	-0.28
R45	2 Glebe Park	15.85	16.99	16.67	-0.32
R46	89 London Road	18.48	19.66	19.29	-0.37
R47	2 Cottage Homes London Road	37.42	34.70	33.13	-1.57
R48	2 Bowbridge Road	29.04	21.60	21.01	-0.59
R49	115 Bowbridge Road	26.44	19.97	19.69	-0.28
R50	120 Bowbridge Road	15.26	14.66	14.90	0.24
R51	Hawtonville Children's Centre	14.41	14.12	14.34	0.22
R52	254 Bowbridge Road	14.88	14.42	15.02	0.60
R53	7 Tannington Grove	11.44	12.45	13.04	0.59
R54	Millstone Cottage Bowbridge La	10.41	11.35	11.78	0.43
R55	The Willows Newark Road	9.51	9.74	10.33	0.59
R56	205 Hawton Road	14.22	15.07	15.40	0.33
R57	1 Hawton Road	16.57	17.41	17.62	0.21
R58	12 Newark Court Boundary Road	19.33	20.48	20.65	0.17
R59	14 Alert Street	20.07	20.27	19.77	-0.50
R60	3 London Road	35.05	35.78	33.89	-1.89
R61	Travelodge Newark	29.84	30.32	29.51	-0.81
R62	4 Portland Street	23.19	23.25	22.58	-0.67
R63	6 Victoria Street	21.46	21.75	21.10	-0.65
R64	1 Mill Gate	17.99	18.59	18.43	-0.16
R65	1 The Waterfront	21.68	23.47	21.48	-1.99
R66	67 Farndon Road	18.78	20.28	18.58	-1.70
R67	149 Farndon Road	20.70	22.02	20.36	-1.66
R68	31 The Ivies	17.91	18.91	19.02	0.11
R69	Farndon Fields Farm Fosse Way	17.68	17.69	13.45	-4.24
R70	4 Mill Gate	18.95	19.33	19.49	0.16
R71	37 Lombard Street	21.02	21.32	21.07	-0.25
R72	30 Castle Gate	28.67	27.31	26.94	-0.37
R73	1 Castle Gate	34.13	32.20	31.68	-0.52
Annual Mean AQO		**40 µg/m^3**			

As indicated in **Table C-7**, the maximum predicted increase in annual average exposure to NO_2 at any existing receptor, due to changes in traffic movements associated with the Southern Link Road is 1.41 µg/m^3 at 7 Bilton Close (R42).

The predicted long-term NO_2 concentrations at all proposed and existing receptors are below 60 µg/m³ in all scenarios. Therefore, it is unlikely there will be any exceedances for the short-term NO_2 AQO at all modelled receptors as outlined in LAQM TG16 technical guidance.

The impact description of changes in traffic flow associated with the Southern Link Road with respect to annual mean NO_2 exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table C-8**.

Table C-8. Impact Description of Effects at Key Receptors (NO_2)

Impact Description of NO_2 Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	0.69	1.72	2-5%	≤75% of AQO	Negligible Increase
R2	0.57	1.42	1%	≤75% of AQO	Negligible Increase
R3	0.46	1.15	1%	≤75% of AQO	Negligible Increase
R4	0.21	0.52	1%	≤75% of AQO	Negligible Increase
R5	0.27	0.67	1%	≤75% of AQO	Negligible Increase
R6	-0.11	-0.27	0%	≤75% of AQO	Negligible Decrease
R7	-0.14	-0.35	0%	≤75% of AQO	Negligible Decrease
R8	-0.29	-0.72	1%	≤75% of AQO	Negligible Decrease
R9	-0.38	-0.95	1%	≤75% of AQO	Negligible Decrease
R10	-0.39	-0.97	1%	≤75% of AQO	Negligible Decrease
R11	-0.29	-0.72	1%	≤75% of AQO	Negligible Decrease
R12	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R13	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R14	0.07	0.17	0%	≤75% of AQO	Negligible Increase
R15	0.15	0.37	0%	≤75% of AQO	Negligible Increase
R16	0.30	0.75	1%	≤75% of AQO	Negligible Increase
R17	0.38	0.95	1%	≤75% of AQO	Negligible Increase
R18	0.41	1.02	1%	76-94% of AQO	Negligible Increase
R19	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R20	0.09	0.22	0%	≤75% of AQO	Negligible Increase
R21	0.18	0.45	0%	≤75% of AQO	Negligible Increase

R22	0.06	0.15	0%	≤75% of AQO	Negligible Increase
R23	0.07	0.17	0%	≤75% of AQO	Negligible Increase
R24	0.19	0.47	0%	≤75% of AQO	Negligible Increase
R25	0.87	2.17	2-5%	103-109 of AQO	Moderate Increase
R26	0.24	0.60	1%	≤75% of AQO	Negligible Increase
R27	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R28	0.04	0.10	0%	≤75% of AQO	Negligible Increase
R29	-0.83	-2.07	2-5%	≤75% of AQO	Negligible Decrease
R30	0.02	0.05	0%	≤75% of AQO	Negligible Increase
R31	-0.53	-1.32	1%	≤75% of AQO	Negligible Decrease
R32	-0.43	-1.07	1%	≤75% of AQO	Negligible Decrease
R33	-0.64	-1.60	2-5%	≤75% of AQO	Negligible Decrease
R34	-0.38	-0.95	1%	≤75% of AQO	Negligible Decrease
R35	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R36	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R37	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R38	-0.02	-0.05	0%	≤75% of AQO	Negligible Decrease
R39	-0.03	-0.07	0%	≤75% of AQO	Negligible Decrease
R40	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R41	0.07	0.17	0%	≤75% of AQO	Negligible Increase
R42	1.41	3.52	2-5%	≤75% of AQO	Negligible Increase
R43	-0.47	-1.17	1%	≤75% of AQO	Negligible Decrease
R44	-0.28	-0.70	1%	≤75% of AQO	Negligible Decrease
R45	-0.32	-0.80	1%	≤75% of AQO	Negligible Decrease
R46	-0.37	-0.92	1%	≤75% of AQO	Negligible Decrease
R47	-1.57	-3.92	2-5%	76-94% of AQO	Slight Decrease
R48	-0.59	-1.47	1%	≤75% of AQO	Negligible Decrease
R49	-0.28	-0.70	1%	≤75% of AQO	Negligible Decrease
R50	0.24	0.60	1%	≤75% of AQO	Negligible Increase
R51	0.22	0.55	1%	≤75% of AQO	Negligible Increase

R52	0.60	1.50	1%	≤75% of AQO	Negligible Increase
R53	0.59	1.47	1%	≤75% of AQO	Negligible Increase
R54	0.43	1.07	1%	≤75% of AQO	Negligible Increase
R55	0.59	1.47	1%	≤75% of AQO	Negligible Increase
R56	0.33	0.82	1%	≤75% of AQO	Negligible Increase
R57	0.21	0.52	1%	≤75% of AQO	Negligible Increase
R58	0.17	0.42	0%	≤75% of AQO	Negligible Increase
R59	-0.50	-1.27	1%	≤75% of AQO	Negligible Decrease
R60	-1.89	-4.72	2-5%	76-94% of AQO	Slight Decrease
R61	-0.81	-2.02	2-5%	≤75% of AQO	Negligible Decrease
R62	-0.67	-1.67	2-5%	≤75% of AQO	Negligible Decrease
R63	-0.65	-1.62	2-5%	≤75% of AQO	Negligible Decrease
R64	-0.16	-0.40	0%	≤75% of AQO	Negligible Decrease
R65	-1.99	-4.97	2-5%	≤75% of AQO	Negligible Decrease
R66	-1.70	-4.25	2-5%	≤75% of AQO	Negligible Decrease
R67	-1.66	-4.15	2-5%	≤75% of AQO	Negligible Decrease
R68	0.11	0.27	0%	≤75% of AQO	Negligible Increase
R69	-4.24	-10.60	≥10%	≤75% of AQO	Moderate Decrease
R70	0.16	0.40	0%	≤75% of AQO	Negligible Increase
R71	-0.25	-0.62	1%	≤75% of AQO	Negligible Decrease
R72	-0.37	-0.92	1%	≤75% of AQO	Negligible Decrease
R73	-0.52	-1.30	1%	76-94% of AQO	Negligible Decrease

+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.

The impact description of the effects of changes in traffic flow as a result of the Southern Link Road, with respect to NO_2 exposure for existing receptors, is determined to be:

- ‘Moderate Increase’ at 1 Receptor;
- ‘Negligible Increase’ at 32 Receptors;
- ‘Negligible Decrease’ at 37 Receptors;
- ‘Slight Decrease’ at 2 Receptors; and,
- ‘Moderate Decrease at 1 Receptor.

This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

Particulate Matter (PM_{10})

Table C-9 presents a summary of the predicted change in annual mean PM_{10} concentrations at relevant receptor locations, due to changes in traffic flow associated with the Southern Link Road, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table C-9. Predicted Annual Average Concentrations of PM_{10} at Receptor Locations

Receptor		PM_{10} (µg/m^3)			
		2019 Baseline	2033 Do Minimum	2033 Do Something	Development Contribution
R1	20 Wheatsheaf Avenue	19.64	19.80	19.94	0.14
R2	24 Robert Dukeson Avenue	18.99	19.26	19.40	0.14
R3	65 Alexander Avenue	16.69	16.91	17.02	0.11
R4	7 Waters Edge Kings Sconce Ave	16.16	16.25	16.30	0.05
R5	34 Sandhills Close	16.16	16.30	16.34	0.04
R6	Andreas Great North Road	16.88	16.95	16.92	-0.03
R7	2 Manners Road	16.76	16.82	16.78	-0.04
R8	Castle View Court Mather Road	17.65	17.70	17.64	-0.06
R9	1 Bar Gate	17.51	17.26	17.21	-0.05
R10	19 Bar Gate	18.01	17.65	17.59	-0.06
R11	29 North Gate	18.05	17.58	17.53	-0.05
R12	162 North Gate	15.98	15.65	15.64	-0.01
R13	19 Apple Tree	15.86	15.56	15.56	<0.01
R14	1 Lincoln Road	16.04	15.73	15.74	0.01
R15	31 Linseed Avenue	19.08	18.90	18.93	0.03
R16	Premier Inn Newark	19.29	19.15	19.21	0.06
R17	11 Bryans Close	19.21	19.35	19.50	0.15
R18	70 Newark Road	22.36	22.87	23.05	0.18
R19	Greenfield Close Care Home	19.67	20.29	20.31	0.02
R20	37 Cannon Close	18.90	19.21	19.24	0.03
R21	157 Beacon Hill Road	18.56	18.96	18.98	0.02
R22	77 Beacon Hill	16.63	16.78	16.79	0.01
R23	76 Beacon Hill Road	16.89	17.11	17.13	0.02
R24	66 Esther Varney Place	16.23	16.34	16.37	0.03
R25	2 Sleaford Road	18.56	18.82	18.93	0.11
R26	1 Friary Road	16.41	16.39	16.43	0.04
R27	24 Queens Court	16.09	16.13	16.13	<0.01
R28	13 Queens Court	16.65	16.70	16.70	<0.01
R29	62 Barnby Gate	16.81	16.82	16.74	-0.08
R30	Newark College	15.92	15.91	15.92	0.01
R31	181 Barnby Gate	15.89	15.92	15.83	-0.09
R32	Barnby Road Academy	15.36	15.58	15.51	-0.07
R33	Edinburgh Lodge Barnby Road	15.90	16.23	16.13	-0.10
R34	Green Bank Lodge Barnby Road	19.43	19.70	19.64	-0.06
R35	27 Bayford Drive	19.54	19.65	19.65	<0.01

R36	Greenways Newark Road	20.10	20.40	20.41	0.01
R37	35 Edgehill Drive	19.49	19.61	19.61	<0.01
R38	Field House Farm Coddington Rd	19.44	19.54	19.54	<0.01
R39	Bridgeholme Cottage Coddington	21.55	21.83	21.84	0.01
R40	144 Main Street	20.89	21.12	21.13	0.01
R41	22 Southfield	21.05	21.35	21.37	0.02
R42	7 Bilton Close	16.38	16.89	17.06	0.17
R43	233 London Road	16.39	16.57	16.53	-0.04
R44	196 London Road	15.72	15.85	15.81	-0.04
R45	2 Glebe Park	16.27	16.47	16.42	-0.05
R46	89 London Road	16.12	16.34	16.28	-0.06
R47	2 Cottage Homes London Road	18.49	18.31	18.14	-0.17
R48	2 Bowbridge Road	17.15	16.40	16.35	-0.05
R49	115 Bowbridge Road	17.52	16.41	16.37	-0.04
R50	120 Bowbridge Road	15.24	15.16	15.20	0.04
R51	Hawtonville Children's Centre	15.14	15.09	15.13	0.04
R52	254 Bowbridge Road	16.65	16.63	16.69	0.06
R53	7 Tannington Grove	16.25	16.45	16.55	0.10
R54	Millstone Cottage Bowbridge La	16.04	16.25	16.35	0.10
R55	The Willows Newark Road	16.13	16.18	16.27	0.09
R56	205 Hawton Road	16.11	16.29	16.35	0.06
R57	1 Hawton Road	14.79	14.96	14.99	0.03
R58	12 Newark Court Boundary Road	15.19	15.42	15.46	0.04
R59	14 Alert Street	15.41	15.47	15.40	-0.07
R60	3 London Road	17.39	17.53	17.31	-0.22
R61	Travelodge Newark	16.62	16.76	16.66	-0.10
R62	4 Portland Street	15.97	15.99	15.88	-0.11
R63	6 Victoria Street	15.79	15.81	15.69	-0.12
R64	1 Mill Gate	15.13	15.20	15.16	-0.04
R65	1 The Waterfront	16.04	16.22	15.83	-0.39
R66	67 Farndon Road	17.07	17.22	16.90	-0.32
R67	149 Farndon Road	17.13	17.30	17.01	-0.29
R68	31 The Ivies	16.92	17.13	17.16	0.03
R69	Farndon Fields Farm Fosse Way	16.70	16.71	15.87	-0.84
R70	4 Mill Gate	15.15	15.20	15.21	0.01
R71	37 Lombard Street	15.52	15.59	15.56	-0.03
R72	30 Castle Gate	16.82	16.64	16.58	-0.06
R73	1 Castle Gate	18.17	17.94	17.87	-0.07
Annual Mean AQO		**40 µg/m^3**			

All modelled existing receptors are predicted to be below the AQO for PM_{10} in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table C-9**, the maximum predicted increase in annual average exposure to PM_{10} at any existing receptor, due to changes in traffic movements associated with the Southern Link Road is 0.17 µg/m^3 at 7 Bilton Close (R42).

The impact description of changes in traffic flow associated with the Southern Link Road with respect to annual mean PM_{10} exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table C-10**.

Table C-10. Impact Description of Effects at Key Receptors (PM_{10})

Impact Description of PM_{10} Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	0.14	0.35	0%	≤75% of AQO	Negligible Increase
R2	0.14	0.33	0%	≤75% of AQO	Negligible Increase
R3	0.11	0.27	0%	≤75% of AQO	Negligible Increase
R4	0.05	0.12	0%	≤75% of AQO	Negligible Increase
R5	0.04	0.12	0%	≤75% of AQO	Negligible Increase
R6	-0.03	-0.06	0%	≤75% of AQO	Negligible Decrease
R7	-0.04	-0.08	0%	≤75% of AQO	Negligible Decrease
R8	-0.06	-0.16	0%	≤75% of AQO	Negligible Decrease
R9	-0.05	-0.12	0%	≤75% of AQO	Negligible Decrease
R10	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R11	-0.05	-0.10	0%	≤75% of AQO	Negligible Decrease
R12	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R13	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R14	0.01	0.04	0%	≤75% of AQO	Negligible Increase
R15	0.03	0.09	0%	≤75% of AQO	Negligible Increase
R16	0.06	0.15	0%	≤75% of AQO	Negligible Increase
R17	0.15	0.36	0%	≤75% of AQO	Negligible Increase
R18	0.18	0.45	0%	≤75% of AQO	Negligible Increase
R19	0.02	0.04	0%	≤75% of AQO	Negligible Increase
R20	0.03	0.07	0%	≤75% of AQO	Negligible Increase
R21	0.02	0.05	0%	≤75% of AQO	Negligible Increase
R22	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R23	0.02	0.04	0%	≤75% of AQO	Negligible Increase
R24	0.03	0.09	0%	≤75% of AQO	Negligible Increase

R25	0.11	0.26	0%	≤75% of AQO	Negligible Increase
R26	0.04	0.09	0%	≤75% of AQO	Negligible Increase
R27	<0.01	-0.01	0%	≤75% of AQO	Negligible Decrease
R28	<0.01	-0.01	0%	≤75% of AQO	Negligible Decrease
R29	-0.08	-0.20	0%	≤75% of AQO	Negligible Decrease
R30	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R31	-0.09	-0.23	0%	≤75% of AQO	Negligible Decrease
R32	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
R33	-0.10	-0.26	0%	≤75% of AQO	Negligible Decrease
R34	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R35	<0.01	0.01	0%	≤75% of AQO	Negligible Increase
R36	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R37	<0.01	0.02	0%	≤75% of AQO	Negligible Increase
R38	<0.01	0.01	0%	≤75% of AQO	Negligible Increase
R39	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R40	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R41	0.02	0.06	0%	≤75% of AQO	Negligible Increase
R42	0.17	0.42	0%	≤75% of AQO	Negligible Increase
R43	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R44	-0.04	-0.11	0%	≤75% of AQO	Negligible Decrease
R45	-0.05	-0.13	0%	≤75% of AQO	Negligible Decrease
R46	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R47	-0.17	-0.42	0%	≤75% of AQO	Negligible Decrease
R48	-0.05	-0.14	0%	≤75% of AQO	Negligible Decrease
R49	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R50	0.04	0.10	0%	≤75% of AQO	Negligible Increase
R51	0.04	0.10	0%	≤75% of AQO	Negligible Increase
R52	0.06	0.16	0%	≤75% of AQO	Negligible Increase
R53	0.10	0.27	0%	≤75% of AQO	Negligible Increase

R54	0.10	0.25	0%	≤75% of AQO	Negligible Increase
R55	0.09	0.24	0%	≤75% of AQO	Negligible Increase
R56	0.06	0.15	0%	≤75% of AQO	Negligible Increase
R57	0.03	0.09	0%	≤75% of AQO	Negligible Increase
R58	0.04	0.08	0%	≤75% of AQO	Negligible Increase
R59	-0.07	-0.19	0%	≤75% of AQO	Negligible Decrease
R60	-0.22	-0.56	1%	≤75% of AQO	Negligible Decrease
R61	-0.10	-0.26	0%	≤75% of AQO	Negligible Decrease
R62	-0.11	-0.27	0%	≤75% of AQO	Negligible Decrease
R63	-0.12	-0.30	0%	≤75% of AQO	Negligible Decrease
R64	-0.04	-0.10	0%	≤75% of AQO	Negligible Decrease
R65	-0.39	-0.97	1%	≤75% of AQO	Negligible Decrease
R66	-0.32	-0.81	1%	≤75% of AQO	Negligible Decrease
R67	-0.29	-0.74	1%	≤75% of AQO	Negligible Decrease
R68	0.03	0.07	0%	≤75% of AQO	Negligible Increase
R69	-0.84	-2.09	2-5%	≤75% of AQO	Negligible Decrease
R70	0.01	0.04	0%	≤75% of AQO	Negligible Increase
R71	-0.03	-0.09	0%	≤75% of AQO	Negligible Decrease
R72	-0.06	-0.15	0%	≤75% of AQO	Negligible Decrease
R73	-0.07	-0.17	0%	≤75% of AQO	Negligible Decrease
+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					

The impact description of the effects of changes in traffic as a result of the Southern Link Road, with respect to annual mean PM_{10} exposure for existing receptors is determined to be:

- 'Negligible Increase' at 39 Receptors; and,
- 'Negligible Decrease' at 34 Receptors.

This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

Particulate Matter ($PM_{2.5}$)

Table C-11 presents a summary of the predicted change in annual mean $PM_{2.5}$ concentrations at relevant receptor locations, due to changes in traffic flow associated with the Southern Link Road, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table C-11. Predicted Annual Average Concentrations of $PM_{2.5}$ at Receptor Locations

Receptor		$PM_{2.5}$ (µg/m^3)			
		2019 Baseline	2033 Do Minimum	2033 Do Something	Development Contribution
R1	20 Wheatsheaf Avenue	11.24	11.34	11.42	0.08
R2	24 Robert Dukeson Avenue	10.81	10.97	11.05	0.08
R3	65 Alexander Avenue	10.10	10.23	10.29	0.06
R4	7 Waters Edge Kings Sconce Ave	9.80	9.85	9.88	0.03
R5	34 Sandhills Close	9.73	9.81	9.84	0.03
R6	Andreas Great North Road	10.14	10.18	10.17	-0.01
R7	2 Manners Road	10.07	10.10	10.08	-0.02
R8	Castle View Court Mather Road	10.58	10.61	10.58	-0.03
R9	1 Bar Gate	10.54	10.39	10.37	-0.02
R10	19 Bar Gate	10.82	10.61	10.58	-0.03
R11	29 North Gate	10.88	10.59	10.57	-0.02
R12	162 North Gate	9.90	9.72	9.71	-0.01
R13	19 Apple Tree	9.85	9.67	9.67	<0.01
R14	1 Lincoln Road	9.96	9.77	9.78	0.01
R15	31 Linseed Avenue	10.91	10.80	10.82	0.02
R16	Premier Inn Newark	11.04	10.96	10.99	0.03
R17	11 Bryans Close	10.99	11.07	11.15	0.08
R18	70 Newark Road	12.81	13.10	13.21	0.11
R19	Greenfield Close Care Home	11.25	11.61	11.62	0.01
R20	37 Cannon Close	10.81	10.99	11.01	0.02
R21	157 Beacon Hill Road	10.62	10.86	10.87	0.01
R22	77 Beacon Hill	9.72	9.81	9.81	<0.01
R23	76 Beacon Hill Road	10.42	10.55	10.55	<0.01
R24	66 Esther Varney Place	10.03	10.10	10.12	0.02
R25	2 Sleaford Road	11.49	11.64	11.71	0.07
R26	1 Friary Road	10.18	10.17	10.19	0.02
R27	24 Queens Court	9.98	10.00	10.00	<0.01
R28	13 Queens Court	10.33	10.37	10.36	-0.01
R29	62 Barnby Gate	10.40	10.41	10.36	-0.05
R30	Newark College	9.86	9.85	9.86	0.01
R31	181 Barnby Gate	9.84	9.86	9.80	-0.06
R32	Barnby Road Academy	9.53	9.66	9.62	-0.04
R33	Edinburgh Lodge Barnby Road	9.30	9.50	9.43	-0.07
R34	Green Bank Lodge Barnby Road	10.67	10.82	10.79	-0.03
R35	27 Bayford Drive	10.76	10.82	10.82	<0.01
R36	Greenways Newark Road	11.51	11.67	11.68	0.01
R37	35 Edgehill Drive	10.73	10.79	10.80	0.01
R38	Field House Farm Coddington Rd	10.67	10.73	10.73	<0.01
R39	Bridgeholme Cottage Coddington	12.12	12.29	12.29	<0.01
R40	144 Main Street	11.74	11.87	11.88	0.01
R41	22 Southfield	11.85	12.02	12.03	0.01
R42	7 Bilton Close	9.73	10.03	10.13	0.10
R43	233 London Road	9.76	9.87	9.84	-0.03
R44	196 London Road	9.34	9.42	9.39	-0.03
R45	2 Glebe Park	9.64	9.76	9.73	-0.03

R46	89 London Road	9.97	10.10	10.06	-0.04
R47	2 Cottage Homes London Road	11.43	11.31	11.20	-0.11
R48	2 Bowbridge Road	10.61	10.15	10.12	-0.03
R49	115 Bowbridge Road	10.79	10.14	10.11	-0.03
R50	120 Bowbridge Road	9.31	9.26	9.29	0.03
R51	Hawtonville Children's Centre	9.25	9.22	9.24	0.02
R52	254 Bowbridge Road	9.38	9.37	9.40	0.03
R53	7 Tannington Grove	9.13	9.25	9.31	0.06
R54	Millstone Cottage Bowbridge La	9.01	9.14	9.19	0.05
R55	The Willows Newark Road	8.89	8.91	8.97	0.06
R56	205 Hawton Road	9.42	9.52	9.55	0.03
R57	1 Hawton Road	9.19	9.29	9.31	0.02
R58	12 Newark Court Boundary Road	9.43	9.57	9.59	0.02
R59	14 Alert Street	9.55	9.59	9.54	-0.05
R60	3 London Road	10.76	10.84	10.70	-0.14
R61	Travelodge Newark	10.30	10.38	10.31	-0.07
R62	4 Portland Street	9.88	9.89	9.83	-0.06
R63	6 Victoria Street	9.77	9.78	9.71	-0.07
R64	1 Mill Gate	9.39	9.43	9.40	-0.03
R65	1 The Waterfront	9.91	10.02	9.79	-0.23
R66	67 Farndon Road	9.97	10.06	9.87	-0.19
R67	149 Farndon Road	10.02	10.12	9.95	-0.17
R68	31 The Ivies	9.88	10.01	10.03	0.02
R69	Farndon Fields Farm Fosse Way	9.77	9.77	9.28	-0.49
R70	4 Mill Gate	9.40	9.43	9.44	0.01
R71	37 Lombard Street	9.62	9.66	9.64	-0.02
R72	30 Castle Gate	10.39	10.28	10.25	-0.03
R73	1 Castle Gate	10.95	10.81	10.77	-0.04
Annual Mean AQO		**25 µg/m^3**			

All modelled existing receptors are predicted to be below the AQO for $PM_{2.5}$ in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table C-11**, the maximum predicted increase in annual average exposure to $PM_{2.5}$ at any existing receptor, due to changes in traffic movements associated with the Southern Link Road is 0.11 µg/m^3 at 70 Newark Road (R18).

The impact description of changes in traffic flow associated with the Southern Link Road with respect to annual mean $PM_{2.5}$ exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table C-12**.

Table C-12. Impact Description of Effects at Key Receptors ($PM_{2.5}$)

Impact Description of $PM_{2.5}$ Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m^3)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	0.08	0.32	0%	≤75% of AQO	Negligible Increase
R2	0.08	0.31	0%	≤75% of AQO	Negligible Increase

R3	0.06	0.25	0%	≤75% of AQO	Negligible Increase
R4	0.03	0.11	0%	≤75% of AQO	Negligible Increase
R5	0.03	0.11	0%	≤75% of AQO	Negligible Increase
R6	-0.01	-0.06	0%	≤75% of AQO	Negligible Decrease
R7	-0.02	-0.07	0%	≤75% of AQO	Negligible Decrease
R8	-0.03	-0.15	0%	≤75% of AQO	Negligible Decrease
R9	-0.02	-0.12	0%	≤75% of AQO	Negligible Decrease
R10	-0.03	-0.14	0%	≤75% of AQO	Negligible Decrease
R11	-0.02	-0.10	0%	≤75% of AQO	Negligible Decrease
R12	-0.01	-0.02	0%	≤75% of AQO	Negligible Decrease
R13	<0.01	0.00	0%	≤75% of AQO	Negligible Increase
R14	0.01	0.04	0%	≤75% of AQO	Negligible Increase
R15	0.02	0.08	0%	≤75% of AQO	Negligible Increase
R16	0.03	0.14	0%	≤75% of AQO	Negligible Increase
R17	0.08	0.33	0%	≤75% of AQO	Negligible Increase
R18	0.11	0.41	0%	≤75% of AQO	Negligible Increase
R19	0.01	0.04	0%	≤75% of AQO	Negligible Increase
R20	0.02	0.07	0%	≤75% of AQO	Negligible Increase
R21	0.01	0.05	0%	≤75% of AQO	Negligible Increase
R22	<0.01	0.03	0%	≤75% of AQO	Negligible Increase
R23	<0.01	0.04	0%	≤75% of AQO	Negligible Increase
R24	0.02	0.08	0%	≤75% of AQO	Negligible Increase
R25	0.07	0.25	0%	≤75% of AQO	Negligible Increase
R26	0.02	0.09	0%	≤75% of AQO	Negligible Increase
R27	<0.01	-0.01	0%	≤75% of AQO	Negligible Decrease
R28	-0.01	-0.01	0%	≤75% of AQO	Negligible Decrease
R29	-0.05	-0.20	0%	≤75% of AQO	Negligible Decrease
R30	0.01	0.02	0%	≤75% of AQO	Negligible Increase
R31	-0.06	-0.21	0%	≤75% of AQO	Negligible Decrease

R32	-0.04	-0.16	0%	≤75% of AQO	Negligible Decrease
R33	-0.07	-0.25	0%	≤75% of AQO	Negligible Decrease
R34	-0.03	-0.14	0%	≤75% of AQO	Negligible Decrease
R35	<0.01	0.01	0%	≤75% of AQO	Negligible Increase
R36	0.01	0.03	0%	≤75% of AQO	Negligible Increase
R37	0.01	0.01	0%	≤75% of AQO	Negligible Increase
R38	<0.01	0.01	0%	≤75% of AQO	Negligible Increase
R39	<0.01	0.02	0%	≤75% of AQO	Negligible Increase
R40	0.01	0.02	0%	≤75% of AQO	Negligible Increase
R41	0.01	0.05	0%	≤75% of AQO	Negligible Increase
R42	0.10	0.41	0%	≤75% of AQO	Negligible Increase
R43	-0.03	-0.10	0%	≤75% of AQO	Negligible Decrease
R44	-0.03	-0.10	0%	≤75% of AQO	Negligible Decrease
R45	-0.03	-0.12	0%	≤75% of AQO	Negligible Decrease
R46	-0.04	-0.14	0%	≤75% of AQO	Negligible Decrease
R47	-0.11	-0.42	0%	≤75% of AQO	Negligible Decrease
R48	-0.03	-0.14	0%	≤75% of AQO	Negligible Decrease
R49	-0.03	-0.10	0%	≤75% of AQO	Negligible Decrease
R50	0.03	0.09	0%	≤75% of AQO	Negligible Increase
R51	0.02	0.09	0%	≤75% of AQO	Negligible Increase
R52	0.03	0.15	0%	≤75% of AQO	Negligible Increase
R53	0.06	0.25	0%	≤75% of AQO	Negligible Increase
R54	0.05	0.23	0%	≤75% of AQO	Negligible Increase
R55	0.06	0.23	0%	≤75% of AQO	Negligible Increase
R56	0.03	0.14	0%	≤75% of AQO	Negligible Increase
R57	0.02	0.08	0%	≤75% of AQO	Negligible Increase
R58	0.02	0.08	0%	≤75% of AQO	Negligible Increase
R59	-0.05	-0.18	0%	≤75% of AQO	Negligible Decrease
R60	-0.14	-0.55	1%	≤75% of AQO	Negligible Decrease

R61	-0.07	-0.25	0%	≤75% of AQO	Negligible Decrease
R62	-0.06	-0.26	0%	≤75% of AQO	Negligible Decrease
R63	-0.07	-0.28	0%	≤75% of AQO	Negligible Decrease
R64	-0.03	-0.09	0%	≤75% of AQO	Negligible Decrease
R65	-0.23	-0.90	1%	≤75% of AQO	Negligible Decrease
R66	-0.19	-0.76	1%	≤75% of AQO	Negligible Decrease
R67	-0.17	-0.70	1%	≤75% of AQO	Negligible Decrease
R68	0.02	0.07	0%	≤75% of AQO	Negligible Increase
R69	-0.49	-1.95	2-5%	≤75% of AQO	Negligible Decrease
R70	0.01	0.04	0%	≤75% of AQO	Negligible Increase
R71	-0.02	-0.09	0%	≤75% of AQO	Negligible Decrease
R72	-0.03	-0.14	0%	≤75% of AQO	Negligible Decrease
R73	-0.04	-0.17	0%	≤75% of AQO	Negligible Decrease
+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					

The impact description of the effects of changes in traffic as a result of the Southern Link Road, with respect to annual mean PM_{10} exposure for existing receptors is determined to be:

- ‘Negligible Increase’ at 39 Receptors; and,
- ‘Negligible Decrease’ at 34 Receptors.

This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be ‘high’.

APPENDIX D - REPORT TERMS & CONDITIONS

This Report has been prepared using reasonable skill and care for the sole benefit of Newark & Sherwood District Council ("the Client") for the proposed uses stated in the report by [Tetra Tech Limited] ("Tetra Tech"). Tetra Tech exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

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The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech accept no liability for issues with performance arising from such factors.

NEWARK TOWN COUNCIL

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E.Mail: post@newark.gov.uk • Web Site: www.newark.gov.uk

Mr J Robinson
Chief Executive
Newark & Sherwood District Council

19th May 2021

Dear John,

I am writing on behalf of Newark Town Council in support of Newark & Sherwood District Council's bid for grant funding from the first round of the Government's Levelling Up Fund, seeking to support the full delivery of the Newark Southern Link Road.

It is recognised that the cost of the road represents a major obstacle to its completion and although the first stage of the Southern Link Road has been delivered and new homes are under construction, further development cannot take place until the remaining sections are complete.

The Town Council has supported this urban extension of the town from the instigation of the plan. The buy in by the Town Council and the local community was significantly influenced by the accompanying Southern Link Road which, provides an opportunity to fundamentally improve traffic flows around the town. Without this road the town will be left with the worse of both worlds; an increased population and accompanying increased traffic volumes through the town centre on roads that are already often gridlocked.

In conjunction with the proposed upgrade of the A46 to the north and west of the town, delivering a Southern Link Road, connecting the A46 at Farndon to the A1 at Balderton is of paramount importance for alleviating the effects of road congestion in the town and delivering planned growth. Without the link road, the town's capacity to deliver much needed high quality new homes and up to 5000 new jobs is severely limited. Furthermore, as outlined in the Newark Town Investment Plan, the Southern Link Road is regarded as a critical piece of infrastructure that will unlock significant development opportunities and investment in the wider urban area.

Having worked in partnership with the District Council for many years, Newark Town Council remains committed to doing so in the future, offering strong support for this application. It remains committed to supporting the full competition of the Southern Link Road which is of paramount importance to support the future growth of the town and the and well being of its inhabitants.

Yours faithfully

Alan Mellor
Town Clerk

Balderton Parish Council

Balderton Village Centre, Coronation Street,
Balderton, Newark, Notts NG24 3BD Tel. 01636 703626

Our Ref: 1/4280c/229 **Your Ref:**

Chief Executive John Robinson
Newark & Sherwood District Council
Castle House
Great North Road
Newark
Notts NG24 1BY

June 2nd 2021

Dear Mr Robinson,

Newark Southern Link Road

I write on behalf of Balderton Parish Council in support of Newark & Sherwood District Council's bid for grant funding from the first round of the Government's Levelling Up Fund.

It is recognised that the cost of the Newark Southern Link Road represents a major obstacle to its delivery. Although the first stage of the Southern Link Road, at the A1 end has been completed and new homes are under construction, further development cannot take place until the remaining sections are complete.

In conjunction with the proposed upgrade of the A46 to the north and west of the town, delivering a Southern Link Road, connecting the A46 at Farndon to the A1 at Balderton is of paramount importance for alleviating the effects of road congestion in the town and delivering planned growth. Without the link road, the town's capacity to deliver much needed high-quality new homes and up to 5000 new jobs is severely limited. Furthermore, as outlined in the Newark Town Investment Plan, the Southern Link Road is regarded as a critical piece of infrastructure that will unlock significant development opportunities and investment in the wider urban area.

Completion of the Link Road will also ease Balderton's traffic congestion and thereby improve residents' quality of life. Having worked in partnership with the District Council for many years, Balderton Parish Council remains committed to doing so in the future, offering strong support for this application which we consider will be beneficial to the whole of the Newark area.

Yours sincerely,

Mrs Cheryl Davison-Lyth
Clerk to the Council

Fernwood Parish Council
Fernwood Village Hall
Rubys Avenue
Fernwood
Newark
NG24 3RS

26 May 2021

John Robinson
Newark and Sherwood District Council
Castle House
Great North Road
Newark
NG24 1BY

Dear John,

On behalf of Fernwood Parish Council, I am writing to let you know that we fully support Newark and Sherwood District Council's bid for grant funding from the first round of the Government's Levelling Up Fund to be used to fund the Southern Link Road which we are now in great need of.

Although the first stage of the Southern Link Road, on the western side of the A1 near to Fernwood has been completed and new homes are under construction, further development cannot take place until the remaining sections are complete.

We are worried as the Staple Lane/London Road junction is currently dangerous with the increased volume of traffic from new developments. Accidents here block the main route into Newark for those within Fernwood. With the construction of the 3000 new homes in our village we can only see the problems getting worse. The completion of the new road is vital to overcome this issue.

We are concerned to see that the cost of the Newark Southern Link Road represents a major obstacle to its delivery. In conjunction with the proposed upgrade of the A46 to the north and west of the town, delivering a Southern Link Road, connecting the A46 at Farndon to the A1 at Balderton is of paramount importance for alleviating the effects of road congestion in the town and delivering planned growth.

Without the link road, the town's capacity to deliver much needed high quality new homes and up to 5000 new jobs is severely limited. Furthermore, as outlined in the Newark Town Investment Plan, the Southern Link Road is regarded as a critical piece of infrastructure that will unlock significant development opportunities and investment in the wider urban area.

Having worked in partnership with the District Council for many years, Fernwood Parish Council remains committed to doing so in the future, offering strong support for this application.

Yours sincerely,

Marion Fox Goddard
Clerk to Fernwood Parish Council

FARNDON PARISH COUNCIL

Parish Room, Memorial Hall, Marsh Lane, Farndon, Newark, Notts, NG24 3TS
Tel: 01636 708538 Mob: 07946 601364
E-mail: clerk.farndon.pc@btconnect.com

Mr J Robinson
Chief Executive
Newark & Sherwood District Council
Castle House
Newark
Notts

13th June 2021

Dear John

I am writing on behalf of Farndon Parish Council in support of Newark & Sherwood District Council's bid for grant funding from the first round of the Government's Levelling Up Fund.

It is recognised that the cost of the Newark Southern Link Road represents a major obstacle to its delivery. Although the first stage of the Southern Link Road, at the A1 end has been completed and new homes are under construction, further development cannot take place until the remaining sections are complete.

In conjunction with the proposed upgrade of the A46 to the north and west of the town, delivering a Southern Link Road, connecting the A46 at Farndon to the A1 at Balderton is of paramount importance for alleviating the effects of road congestion in the town and delivering planned growth. Without the link road, the town's capacity to deliver much needed high quality new homes and up to 5000 new jobs is severely limited. Furthermore, as outlined in the Newark Town Investment Plan, the Southern Link Road is regarded as a critical piece of infrastructure that will unlock significant development opportunities and investment in the wider urban area.

There is significant impact on the village when there is severe congestion on the A46 as traffic uses the old route to try and bypass around it. This would be alleviated if the Southern Link Road was in place.

Having worked in partnership with the District Council for many years, Farndon Parish Council remains committed to doing so in the future, offering strong support for this application.

Yours sincerely

JAYNE SAUNDERS
Clerk to the Council

16th June 2021

Dear John
Ref levelling up fund-

I am writing on behalf of Newark Business Club, in my capacity as Chair, in support of Newark & Sherwood District Council's bid for grant funding from the first round of the Government's Levelling Up Fund, seeking to support delivery of the Newark Southern Link Road.

It is recognised that the cost of the road represents a major obstacle to its delivery and although the first stage of the Southern Link Road has been completed and new homes are under construction, further development cannot take place until the remaining sections are complete.

In conjunction with the proposed upgrade of the A46 to the north and west of the town, delivering a Southern Link Road, connecting the A46 at Farndon to the A1 at Balderton is of paramount importance for alleviating the effects of road congestion in the town and delivering planned growth. Without the link road, the town's capacity to deliver much needed high quality new homes and up to 5000 new jobs is severely limited. Furthermore, as outlined in the Newark Town Investment Plan, the Southern Link Road is regarded as a critical piece of infrastructure that will unlock significant development opportunities and investment in the wider urban area and of course for local business.

Having worked in partnership with the District Council for many years, Newark Business Club remains committed to doing so in the future, offering strong support for this application.

Kevin Guthrie
Chairman, Newark Business Club.

NEWARK & SHERWOOD DISTRICT COUNCIL

Minutes of the virtual meeting of the Newark Towns Fund Board Meeting held on Thursday, 22 April 2021 at 8.00 am.

PRESENT: Board
Councillor D.J. Lloyd – Leader of NSDC – Co-Chairman
Tom Cartledge – Co-Chairman
Steff Wright, Chief Executive, Gusto UK
Tom Marsden, Lincoln College Group
John Latham, Director of DVC Projects, University of Lincoln
Tony Aspbury, Chairman of Development Committee, Newark Showground
Alan Mellor – Town Clerk of Newark Town Council
Darren Burke – Director of Masdings
Simon Shaw – Newark Business Club
Richard Gelsthorpe – Pratt & Gelsthorpe
Michael Baker – Farndon Parish Council
Matt Colbourne – East Midlands Digital Media
Fiona Anderson – NTU
Gary Headland – Lincoln College Group
Johanne Thomas – Urban & Civic

Others
Matt Lamb – Director – Planning & Growth (NSDC)
Neil Cuttell – Business Manager – Economic Growth (NSDC)
Jane Hutchinson – Town Centre Development Manager (NSDC)
Cllr. Keith Girling – Deputy Leader of NSDC
Sanjiv Kohli – Deputy CX/Director – Resources/S151 Officer (NSDC)
Sandya Ward – Homes England
Tim Brown – DWP
Clive Fletcher – Historic England
Will Temple - Hatch Regenris

28.0 Apologies for Absence

The following apologies for absence were received from:

Simon Witts – Aviation 360
Richard Coppell – Urban & Civic
David Jones – Timico
Karl Tupling – Homes England
Linny Beaumont – Canal River Trust
Lorna Masey – DWP
Cllr. Ronnie White – Chairman of Balderton Parish Council

29.0 Minutes of the Meeting held on 11 February 2021

AGREED, that subject to the apology from Fiona Anderson – Head of Civic Engagement (NTU) being recorded, the minutes be accepted.

30.0 Declarations of Interest

None

Prior to the commencement of the business listed on the Agenda, TC advised the meeting that the Heads of Terms had been signed. He stated that a meeting had taken place with himself, John Robinson (CX of NSDC) and Matt Lamb with Kazco, a smart fleet business, who were looking to recruit up to 250 locals. He noted that they were not represented on the board but the generation of jobs was welcome news.

TC also advised of the recent passing of board member, John Coles, expressing his condolences. John has done much for the town, its residents, community groups, and businesses over many years. John was an advocate for the town, including backing for what we are seeking to achieve with the Towns Fund.

TC stated that it was now time to establish the correct teams to forge ahead with the projects. DJL added his thanks to all those involved with securing the funding and paid tribute to John Coles noting his contribution that will continue in legacy.

31.0 The Newark Town 'Deal' and Next Steps

ML advised that the Heads of Terms had now been signed by all parties so progress on the projects was now possible. He added that the Southern Link Road (SLR) had been included in the Heads of Terms but had not been listed in the priority projects for the Government, in accordance with the previous resolution of the Board. Rather, it was recommended that the SLR be subject to a separate funding submission to Government as part of the Levelling Up Fund (considered under the Funding Opportunities item). Paragraphs 2.4 and 2.5 of the report recaptured the Towns Fund priority projects together with the various project confirmation activities which had to be submitted to Government no later than 21 May 2021.

ML provided the Board with details of the two independent consultants appointed to assist with: the assessment of submitted Green Book Business Cases for the projects; and also to support or write Full Green Book Business Cases with and for each of the Project Sponsors. It was noted that the consultants appointed were Quod and Hatch. Details of the funding arrangements for their appointments were provided at paragraph 3.2 of the report.

TC stated that the intention was to spend the minimum amount possible on necessary beauracracy to ensure that as much of the funds awarded were spent on the projects to improve the town.

TC stated that should a new project come to the Board's attention it should be captured and recorded on an alternative list, as should any known projects that did not receive funding, noting the comments of Gary Headland and possible student accommodate for those attending the IASTI.

AGREED (unanimously) that:

(a) the contents of the report be noted;

(b) the priority projects for Towns Fund Grant (subject to Assurance and Full Business Case approval) and Project Sponsors be agreed;

(c) the submission by Newark & Sherwood District Council of a Levelling Up Fund bid for the delivery of the Newark Southern Link Road be supported;

(d) the identified accelerated projects for submission to Government be:

YMCA Community & Activity Village;
32 Stodman Street; and
IASTI

as detailed in paragraph 2.7 be agreed; and

(e) support be given to the principle of ring-fencing no more than 2% (£500,000) of Town Deal grant to cover management and monitoring of the program for the lifetime of the fund, subject to District Council and Government support.

32.0 Project Updates & Accelerated Fund Spend

NC presented an update on progress of various projects within the TIP, providing specific reference to the Accelerated Fund Projects that had required defrayment of spend by March 2021. The report provided details of the three projects identified to have met the criteria and the redistribution of allocated funding from the '20 Minute Town' project to the IASTI project. A table providing a project update was detailed in paragraph 2.4 of the report.

Construction College

GH stated that the development of the construction college was progressing well and would provide a modern facility for students. Recruitment on educations packages had commenced. TM added that work was ongoing with local business and it was likely that apprentices would be in place by June 2021. Further students would commence their courses in September to fit in with the education timetable e.g. plumbers; apprentice plumbers; bricklayers; and apprentice bricklayers. Work was also ongoing in relation to the provision of courses for adult students. He added that it was hoped that some 500 'learners' would have gone through the college in 5 years' time.

IASTI

It was noted that development of the project was progressing at pace. Core programmes were being developed but also a vision for the future was being established. An interim facility would be operational in September with students being visible within the town centre (with branded uniforms).

NC offered his thanks to GH and TM stating that Newark was one of a few areas that had proven their ability to deliver and had spent the monies on the priority projects within the set timescales.

AGREED (unanimously) that the report be noted.

33.0 Town Centre Project Updates

NC presented the report which provided an update on the various initiatives that were being undertaken in Newark Town Centre. These were listed as: Reopening High Streets Safely/Welcome Back Fund; Heritage Action Zone; Business Resilience Programme; High Street Diversification Fund Grant; Kickstart; and Footfall with a brief update of the latest position for each initiative being provided.

TC stated that more work needed to be done to understand what would create increased footfall in the town centre. In response NC agreed that more work was required, much of which would form part of the Cultural heart of Newark proposals. He noted that someone had raised the question of whether free parking would assist retail businesses. He stated that this tended not to be an incentive but it would be kept under review. DJL noted the previous comments adding that an experience needed to be created for visitors and that all day parking was already available in the edge of town car parks.

AGREED (unanimously) that:

(a) the ongoing initiatives being rolled out in the town centre be supported

34.0 New Funding Opportunities

ML presented to the Board a report on new revenue and capital funding opportunities that had been announced in the March 2021 budget. These were noted as the Community Renewal Fund (CRF) and the Levelling Up Fund (LUF). The CRF was largely revenue grant aimed as programs and interventions which could drive innovation and transformative change. Newark & Sherwood had been identified as Priority 1 place for investment based on an index of economic resilience. The LUF was a capital fund that invited proposals from local authorities for individual projects or a package bid (similar to the Towns Fund) which consisted of multiple projects. For this fund District Councils within two-tier areas were eligible to bid as were County Council with transport powers (eligible to submit one transport bid).

ML sought support for the funding of the Newark Southern Link Road (SLR) as the Round One LUF bid for the Newark Constituency area. He advised that that

any Sherwood LUF bid should not be made in Round 1 as it would not be able to meet the 'shovel ready' criteria. It is proposed that this be subject to a Round 2 bid, which should be developed via a "Sherwood Levelling Up Fund Board'.

NC advised that 107 bids had been submitted for adjudication to Nottinghamshire County Council for the CRF and that a submission would be made by NSDC also. GH stated that it could also potentially assist with existing projects, noting that the IASTI was 'revenue hungry'.

DJL noted that the new funding opportunities were being released in large numbers but with short timescales for the bidding process, thereby reinforcing the need to keep the list of potential projects updated.

AGREED (unanimously) that:

(a) the identified funding opportunities be noted and welcomed and that the necessary support in preparation of the bids be approved;

(b) full support be given for any Newark Levelling Up Fund bid which sought grant to deliver the Newark Southern Link Road.

35.0 Future Governance and Associated Draft Newark Towns Fund Assurance Framework

ML presented to the Board a report which set out the governance and assurance frameworks for the Newark Towns Board for the delivery of Newark Town Investment Plan.

The Board's current governance and structure was noted and that it was now time to review them as it entered the next phase in its programme. Details of the proposed new structure of the Board, together with an outline of principles were provided in paragraph 3 of the report. In presenting the report ML advised that assurance to the public and Government as to how the funds would be spent was required and that the proposed new structure would consist of: the Main Board; an Executive Board; and Sub Groups as appropriate.

TC suggested that progress of the projects be set by the following 3 levels:

Why To promote and to better the town;
What 9 Projects to be delivered
How Good Governance and Framework

AGREED (unanimously) that:

(a) the draft Local Assurance Framework, appended to the report, be supported; and

(b) the Local Assurance Framework be finalised, adopted and procedures put in place by the next proposed Towns Fund Board Meeting.

36.0 AOB

ML advised that he would recirculate the TIP prior to its publication to seek approval from all Board members. He noted that the Plan dated from 2020 but no changes could be made prior to its publication. A supporting document would also be published alongside it to reflect what developments and progress had been made since then. DJL sort to reinforce that the Plan had been set following consultation with the public and had not just been produced by the Council. He encouraged all Board members to reiterate this fact.

SW advised that the Newark Business Club were working towards setting a net zero carbon target and were looking to bring on board businesses who wished to achieve zero carbon output. TC advised that a number of businesses were now making such statements of interest and that he could offer an employee from his organisation who had relevant experience to assist a Business Club briefing.

The meeting closed at 9.35am.

Derby
Derbyshire
Nottingham
Nottinghamshire

www.d2n2lep.org

Tel: 0115 957 8757

Matt Lamb
Newark and Sherwood District Council
Castle House
Newark-on-Trent
NG24 1BY

11th June 2021

Dear Matt,

Letter of Support – Newark Southern Link Road, Letter of Support

I am writing on behalf of the D2N2 LEP to offer our support for Newark and Sherwood District Councils plans to deliver the Newark Southern Link Road project. The project closely aligns with the core themes for investment being proposed through Levelling Up Funding and will help to provide economic growth to Newark and the surrounding areas.

The D2N2 LEP has previously invested in the Newark Southern Link Road development parallel to this one through our previous capital programmes and see this proposal as a way to secure and build on the benefits of our funding. We see this development having the potential to contribute significantly to the economy of Newark and the D2N2 LEP area as a whole and offer areas of quality for local people to live in. The project fits within the strategic objectives of the LEP and will help to create a more prosperous and inclusive offer to local people as a place to live and work.

Please accept this letter as a confirmation of our ongoing support for this project and the economic benefits that the project will provide. With our support we would be pleased if you could keep us in touch with the outcome of this and we would like to work with you on an ongoing basis to maximise the potential of this investment.

Yours sincerely

Sajeeda Rose
Chief Executive
D2N2 LEP

This matter is being dealt with by:
Councillor Ben Bradley MP

T 0115 977 3854
E cllr.ben.bradley@nottscc.gov.uk
W nottinghamshire.gov.uk

Nottinghamshire County Council

John Robinson, Chief Executive
Newark & Sherwood District Council
Castle House, Great North Road
Newark
Nottinghamshire
NG24 1BY

Friday, 18 June 2021

Dear John,

Levelling Up Fund Bid

Please find below Nottinghamshire County Council's support as the Lead Highway Authority for Newark and Sherwood District Council's Levelling Up Fund bid for £20m; this being the totality of the gap funding required to build the Southern Link Road (SLR). This funding is necessary to enable delivery as, to date, the cost of the road has been a major obstacle to its delivery.

The County Council supports the need for this access road to be completed to enable the vital housing and employment growth in and around the town to continue. The funds bid will allow the completion of the section of road linking the A1 to the A46, enabling the delivery of a more than 2000 further households in this location and supporting economic growth at numerous other sites, as well as alleviating road congestion in and around the town. Without the SLR, capacity to deliver new homes and new jobs in this area will be limited.

The County Council has worked closely with your council to ensure the design meets the required standards. With the necessary planning and land already secured, this scheme is ready to go and only being held up on viability grounds. The scheme has the added benefit in that it is deliverable before the scheduled start of Highways England's A46 scheme and will provide significant network benefits during the inevitable lengthy build programme for the Department for Transport's vitally important Roads Investment Strategy 2020-25.

The County Council's support was discussed and received unanimous support at its Policy Committee meeting of 17th June 2021.

Kind regards,

Councillor Ben Bradley MP
Leader of Nottinghamshire County Council

cc. Cllr David Lloyd, Leader of Newark & Sherwood District Council
Anthony May, Chief Executive of Nottinghamshire County Council

RT HON ROBERT JENRICK MP

HOUSE OF COMMONS
LONDON SW1A 0AA

Ministry of Housing, Communities and Local Government
2 Marsham Street
London SW1P 4DF

18 June 2021

To whom it may concern:

Dear Sirs,

Newark & Sherwood District Council Levelling-Up Fund Application

Newark & Sherwood District Council have informed me of their application of the 18 June to the Levelling-Up Fund and requested that I write a letter of support as it is proposed the Members of Parliament provide for their application within their constituency in the guidance to the Fund.

I am happy to do so in my capacity as Member of Parliament for the Newark Constituency.

Kind regards,

Robert Jenrick