

Newark IDP Update

Transport Chapter

Newark & Sherwood District Council
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1 INTRODUCTION

1.1 INTRODUCTION

- 1.1.1 In May 2017 Tetra Tech (then known as WYG) were commissioned by Newark and Sherwood District Council to produce an Infrastructure Delivery Plan (IDP) to support the District Council's Local Plan Review. The transport chapter of the 2017 IDP was based on the findings from a transport study outlining transport conditions in the district, prepared in support of the 2010 Local Plan.
- 1.1.2 This document has been produced to update the transport chapter of the 2017 IDP to ensure that it remains appropriate and up to date to support the amended Core Strategy and Allocations and Development Management DPD following the 2022 Local Plan review. Changes to the Local Plan are minimal, and as a result a full update of the 2010 transport study is not necessary. This report therefore represents a 'light touch' update to the transport chapter of the IDP.
- 1.1.3 This document identifies changes (or planned changes) to transport infrastructure that have occurred since the 2017 IDP and presents an analysis of the transport impacts of Local Plan development on the performance of transport networks.
- 1.1.4 The assessment has been carried out using the Newark VISUM model, and a spreadsheet model covering the rural areas of the district. This methodology is consistent with the transport assessment work undertaken for the 2017 IDP.
- 1.1.5 The models have been used to identify locations on the highway network where congestion and delays are forecast at the end of the local plan period (2033). Recommendations have been made on measures to help mitigate any negative impacts of Local Plan development on transport infrastructure within the district.
- 1.1.6 As part of the 2022 Local Plan review the Council is seeking to increase the number of gypsy and traveller pitches currently provided off Tolney Lane in Newark. Tolney Lane is at risk of flooding, so to facilitate the increase and protect existing residences, the Council is planning a flood alleviation scheme for the Tolney Lane area which will provide access resilience during flooding events and protect properties. The need for this improvement has been identified through a separate study but it has been summarised later in this report for inclusion in the updated Infrastructure Funding Statement.

2 EXISTING & COMMITTED TRANSPORT CONDITIONS

2.1 INTRODUCTION

2.1.1 The previous IDP report was produced in 2017 and was supported by findings from a detailed Transport Study undertaken in 2010 to identify the likely implications of Local Plan growth on transport infrastructure within the district. Since the 2010 Transport Study was produced there has been little change to existing transport conditions within the district and the overall quantum and distribution of Local Plan growth now being proposed remains broadly the same as that considered in 2010 and 2017. However, the status of the allocation sites has progressed in the meantime with many now having received planning permission and/or having been built. A full update to the Transport Study has therefore not been produced however, the traffic impact calculations have been updated to advise this IDP.

2.2 HIGHWAYS

2.2.1 This section identifies any key changes that have occurred to the highway network within the district since 2017, or any known changes that are planned.

2.2.2 The district has good access to regional and national transport links and is crossed by the A1 and A46 trunk roads, as well as several 'A' Roads including the A614, A617 and A6097.

A46 Trunk Road

2.2.3 The A46 Trunk Road links Leicester at its southern end, to Lincoln at its northern end and passes through the eastern side of the district on an approximate southwest to northeast alignment.

2.2.4 An improvement scheme to widen the A46 Trunk Road between Newark and Widmerpool to dual carriageway standard was opened to traffic in June 2012. The traffic effects of the A46 Newark to Widmerpool improvement were considered in the 2010 Transport Study, the 2017 IDP, and have also been considered in this review.

2.2.5 The A46 is now dual carriageway over its whole length between Leicester and Lincoln except for the 3.3 mile (5.3km) section comprising the Newark bypass to the west of the town, which remains single carriageway. The bypass and the junctions along it experience frequent traffic congestion and in the Autumn statement of 2014 the Department for Transport (DfT) announced its intention to improve this section of the A46 as part of its Roads Investment Strategy (RIS).

2.2.6 Following a detailed study and consultation process National Highways announced its preferred improvement option for the A46 Newark Bypass in February 2022. A copy of the preferred route plan can be found in **Appendix A**. The preferred route consists of the following elements:

- Widening the A46 to dual carriageway to provide two lanes in each direction between the Farndon and Winthorpe junctions.
- A new bridge over the A1 to the north of the existing bridge.
- A flyover junction at the Cattle Market roundabout with the A46 elevated to pass over the roundabout. This will separate through traffic from local traffic improving safety for all road users including pedestrians and cyclists
- Adding traffic lights to the Farndon junction to improve flows during peak hours.
- The Winthorpe junction will be enlarged to a five-arm roundabout with traffic lights to connect the new A46 link.

2.2.7 At the time of writing National Highways are currently evaluating feedback received following the preferred route announcement and will be undertaking statutory consultation in October 2022. In August 2022, a contractor was appointed to begin the process of preliminary design.

2.2.8 Following statutory consultation the next key milestone for the A46 improvement scheme is Development Consent Order (DCO) which is the process of gaining permission for nationally significant infrastructure projects (NSIP). It is anticipated that a DCO application will be submitted in July 2023 and until DCO approval has been secured the A46 Improvement is technically not a 'committed scheme'. So, for the purposes of this IDP review, scenarios 'with' and 'without' the completed A46 Improvement have been considered.

2.2.9 Assuming that DCO approval is granted, construction of the A46 improvement is expected to commence in 2025 with completion scheduled for 2028.

A1 Overbridge at Fernwood

2.2.10 The existing A1 overbridge at Farndon carries the B6326 which provides the main highway link between Fernwood and Newark. Widening of the bridge is identified as part of the highway mitigation strategy for the Fernwood development to accommodate additional traffic demands due to the development. The widening will provide two westbound traffic lanes, one eastbound traffic lane, and a combined footway/cycleway on the north side of the road.

2.2.11 Improvement of the A1 Overbridge is identified as the highest priority scheme in the Council's strategic infrastructure priority list for Community Infrastructure Fund (CIL) funding, given its need as part of the Fernwood development highways mitigation strategy and because the Settlement Hierarchy and Spatial Distribution of Growth policies (Spatial Policy 1 and 2) identify Newark, Balderton and Fernwood as the main location for new housing and employment growth in the district.

2.2.12 The Council has the necessary CIL funding in place to deliver this improvement and is currently liaising with National Highways to commission a detailed design. So, for the purposes of this IDP review, the improved bridge is assumed to be in place by the end of the Local plan period (2033).

Newark Southern Link Road

2.2.13 The Southern Link Road (SLR) comprises a new four mile long road linking the A46 near Farndon with the A1 at Balderton, with roundabout junctions at both ends and intermediate junctions to tie into existing and proposed roads. The approximate alignment of the SLR is shown in red in the image below.

Image 1 – Approximate alignment of the SLR



2.2.14 The SLR will primarily serve as an access road for the Middlebeck development (Land South of Newark) but will also provide traffic relief to the highway network within Newark. The estimated cost of the SLR is circa £90m which is being jointly funded by developer contributions, £20m of Government funding from the Levelling Up Fund (LUF) and contributions from the D2N2 LEP and Homes England.

2.2.15 Construction of the first phase between Bowbridge Road and Staple Lane is complete and open to traffic and the remaining sections are programmed for construction during 2023 with completion programmed for March 2024. So for the purposes of this review, the SLR is assumed to be complete and open by the end of the Local plan period (2033).

A614 / A6097 Junctions

2.2.16 Nottinghamshire County Council (NCC) is promoting a package of junction improvements on the A614 and A6097 corridors as part of the A614 / A6096 Major Road Network (MRN) Scheme.

Funding has been allocated from the Department for Transport (DfT) and detailed design is underway. Planning applications were submitted for the package of improvements at the end of February 2022 and planning consent was granted in September 2022. Construction is anticipated to commence in the winter of 2023 subject to completion of statutory processes.

2.2.17 The NCC scheme will deliver improvements to the following junctions by the end of the plan period.

- A614 / A616 / A6075 Ollerton Roundabout – enlarged roundabout
- A614 / Mickledale Lane, Bilsthorpe – new roundabout and link road
- A614 / Mansfield Road White Post Roundabout – maintenance scheme
- A614 / A6097 Warren Hill junction – improvements to existing layout and road markings
- A6097 / A612 roundabout, Lowdham - enlarged roundabout
- A6097 / Kirk Hill junction, East Bridgford (Rushcliffe District) – enlargement to traffic signals junction.

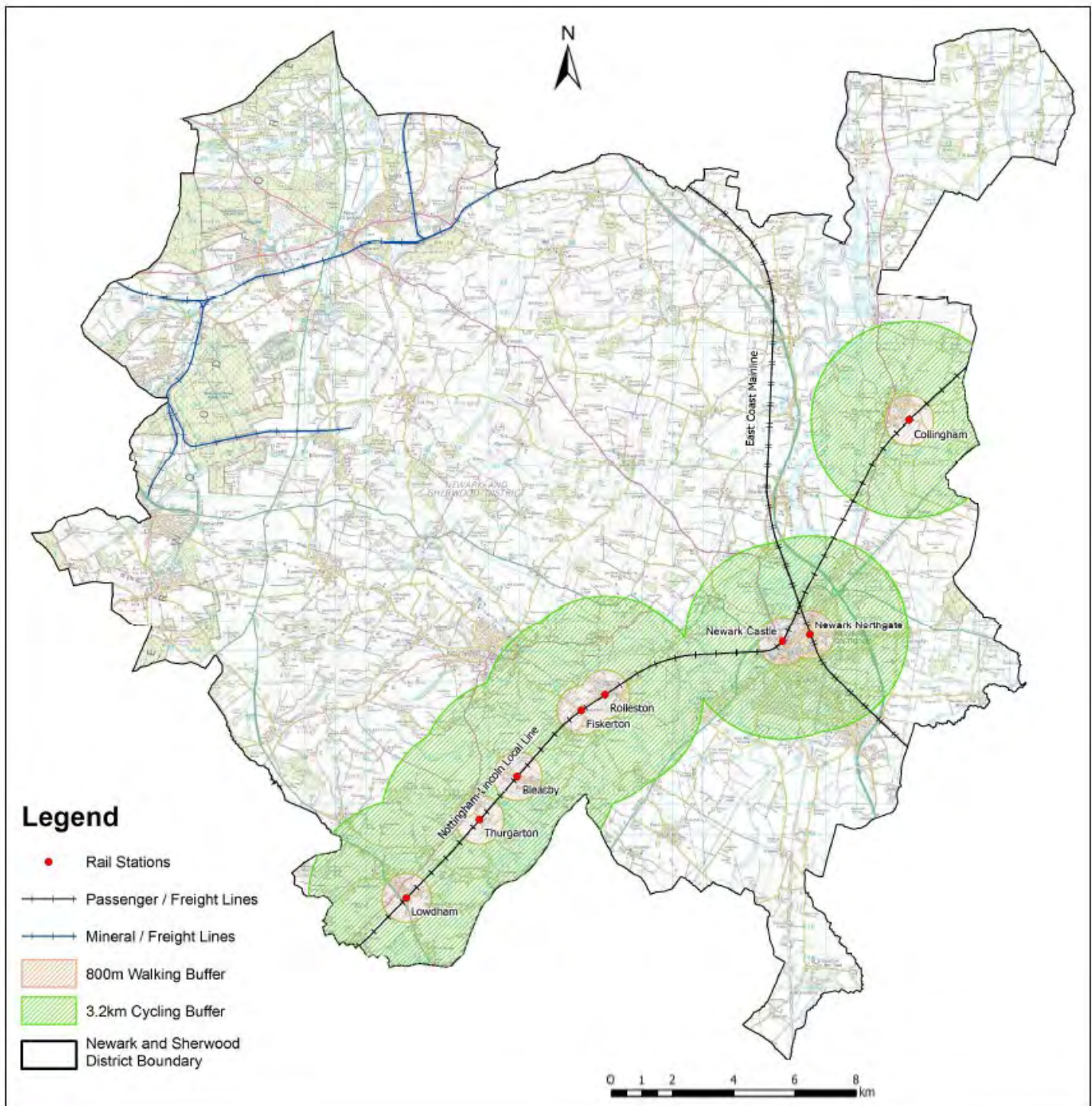
2.2.18 There are no other committed highway schemes that will have a significant effect on existing traffic conditions within the district.

2.2.19 The operation of the highway network within the district has been assessed following the same approach that was applied for the 2017 IDP. A detailed VISUM traffic model of Newark has been used to examine the operation of the urban highway network within the town and a spreadsheet model has been used to assess the main rural roads within the district. This is discussed in **Section 3** of this report.

2.3 RAIL

2.3.1 The district is crossed by the East Coast Mainline railway with a station at Newark (Newark Northgate) and the Nottingham to Lincoln railway line with stations at Newark (Newark Castle) and local stations at Lowdham, Thurgarton, Bleasby, Fiskerton, Rolleston and Collingham. Existing rail infrastructure within the district is shown in the image below:

Image 2 – Rail Infrastructure



- 2.3.2 Newark has two rail stations; Newark North Gate is located on the electrified East Coast Main Line with services provided by the London North Eastern Railway, and Newark Castle station located on the Nottingham to Lincoln line with services provided by East Midlands Railway. Six other stations within the district are located on the Nottingham to Lincoln line at Lowdham, Thurgarton, Bleasby, Fiskerton, Rolleston and Collingham.
- 2.3.3 Newark North Gate station is managed by London North Eastern Railway (LNER) and has one car park with parking for 289 cars and storage for 70 cycles. Additional car parking is available in a nearby NCP car park with 371 spaces. Information provided by Network Rail suggests that the car parks already operate at capacity and any additional demand may require additional parking to be provided.
- 2.3.4 Newark Castle station is managed by East Midlands Railway and has one car park with parking for 69 cars and storage for 40 cycles. Whilst Network Rail suggests that this car park operates at capacity additional car parking is available on the campus of the District Council offices (Castle House) opposite the station and immediately south of Great North Road at the Riverside Arena car park.
- 2.3.5 Improvements were undertaken to the level crossing on the B6362 Great North Road on the eastern side of Newark (adjacent to Newark Castle station) in November 2016. As part of an improvement scheme to replace signal boxes and update level crossing controls on the Nottingham to Lincoln rail line the Newark Castle level crossing was renewed to current standards and is now controlled from Network Rail's East Midlands Control Room in Derby with the aid of CCTV cameras and monitoring equipment. The improvements are not expected to have any detrimental impacts on road traffic using the level crossing.
- 2.3.6 From May 2015 rail services using the Nottingham to Lincoln rail line were revised which resulted in an increase from one to four trains passing through and requiring a closure of the level crossing in both the AM and PM peak hours.
- 2.3.7 There are no other known changes, or planned changes to rail infrastructure within the district since the 2010 Transport Study was undertaken.

2.4 BUS

- 2.4.1 The district is served by a combination of commercial and financially supported bus services. The commercial network mainly comprises daytime bus services running Mondays to Saturdays between 07:00 and 19:00 hours. Nottinghamshire County Council therefore supports evening and Sunday operations where they are deemed necessary.
- 2.4.2 Stagecoach East Midlands is the dominant commercial bus operator within the district and bus services are provided from four depots at Mansfield, Worksop, Gainsborough, and Newark. The other major operator within the district is Marshall's Coaches based in Sutton-on-Trent.

Nottingham City Transport provides one commercial service between Southwell and Nottingham. A small number of other services are operated by Centrebus (North), CT4N (formerly Nottingham Community Transport) and Gem Mini Travel.

- 2.4.3 The Kesteven and Newark CallConnect service operates six-days-a-week: 7am-7pm, Monday-Friday, and 7:30am-6:30pm on Saturdays. This provides links into Newark from its operating area covering from Coleby to Allington and includes Downtown Shopping Centre, Caythorpe, Long Bennington, Bassingham, Temple Bruer and Stubton. Trips within Newark are not permitted on the service.
- 2.4.4 Most bus services operating within Newark and Sherwood originate or terminate in either Newark or Southwell. However, there are other services serving settlements in the north and west of the district. Subsidised bus services within the district are regularly reviewed by the County Council.
- 2.4.5 During weekday daytimes, Newark has a relatively good bus network. There are inter-urban services to Nottingham and Mansfield and a local town network provides frequent services to the main housing areas of the town.
- 2.4.6 Southwell has a relatively sparse bus network. The only core inter-urban services are to Nottingham, Mansfield, and Newark.
- 2.4.7 There is one bus station within the district which is situated in the Potterdyke area off Lombard Street, Newark. This was upgraded as part of a retail-led regeneration project and opened in November 2011.
- 2.4.8 Newark and Sherwood District is covered by the Bus Service Improvement Plan (BSIP) for Nottinghamshire that was published in October 2021. This led to an initial award from Government of £18.7 million to implement schemes outlined in the BSIP. The BSIP identifies some bus priority measures, within the district there are two bus gate proposals, one for Newark and a second in Fernwood. There is also a proposal to introduce a Demand Responsive Transport¹ (DRT) scheme covering Bassetlaw and Newark & Sherwood districts using a five vehicle fleet. Alongside the BSIP, Nottinghamshire County Council developed an Enhanced Partnership with bus operators, this formalises the way that the authority and bus operators will work together to improve the public transport network and was a requirement to enable access to bus service and infrastructure funding. The Nottinghamshire Enhanced Partnership was 'made' on 6 June 2022.

2.5 PARK & RIDE

- 2.5.1 There are no existing park and ride sites within the district.

¹ Public transport that can alter routes and travel times to respond to travel demands (e.g. dial a ride).

2.6 WALKING AND CYCLING

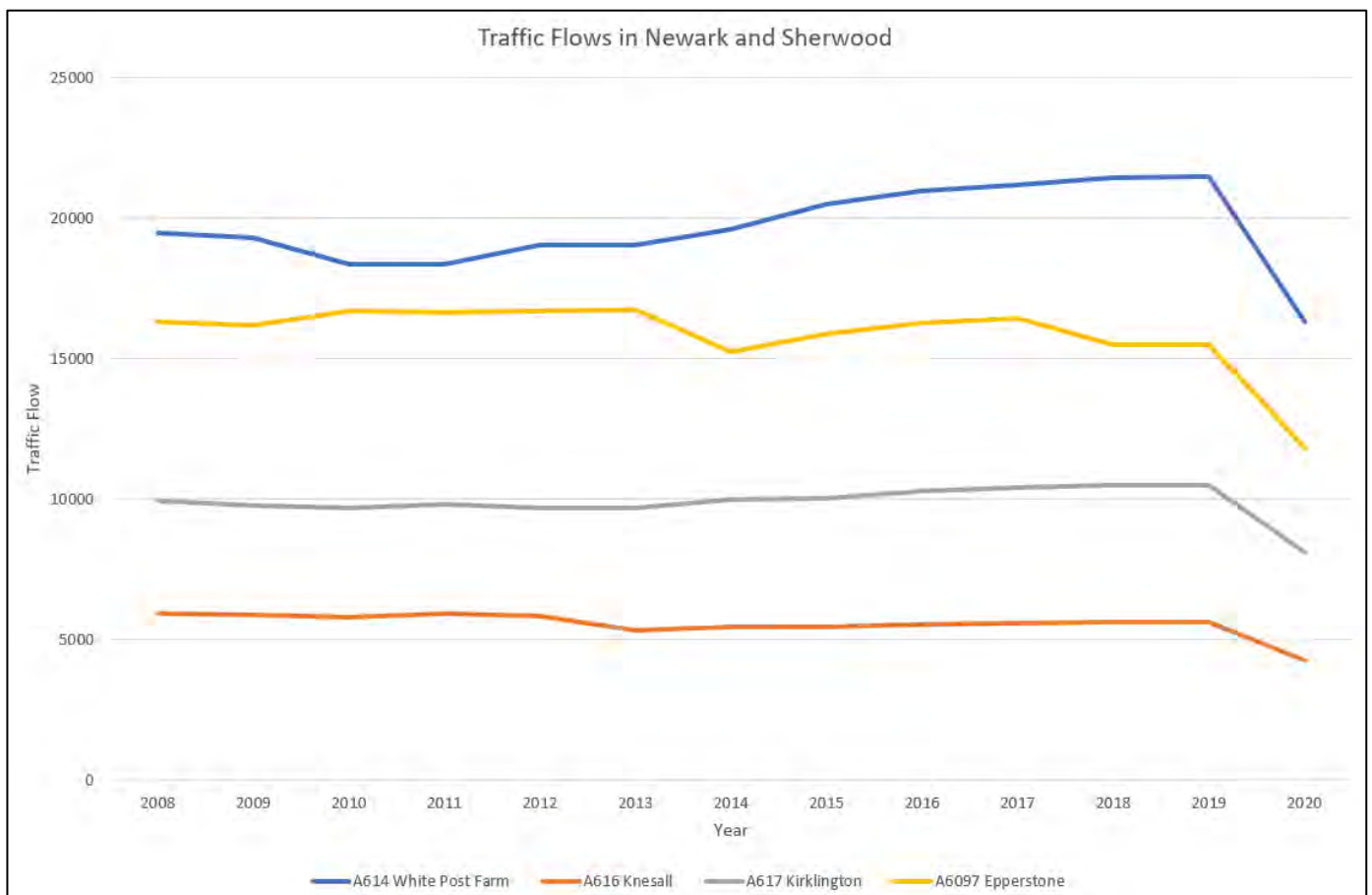
- 2.6.1 Footways are provided in all the main settlements and within most residential areas. As the district is largely rural, footways are not normally provided alongside carriageways in these locations due to the cost verses low levels of footfall, a lack of available width within the highway corridor and the aesthetic reason of not wishing to 'urbanise' the countryside. As part of the Local Transport Plan (LTP) the County Council provides enhanced dropped kerb crossings, new controlled crossings, and footway upgrades as part of highway improvement, road safety and highway maintenance schemes, in accordance with the latest design guidance contained within LTN1/20.
- 2.6.2 The focus of cycling provision is around Newark. The town centre and its environs have a comprehensive network of dedicated cycling infrastructure, pedestrianised streets, and quiet roads suitable for cycling. In recent years as Newark has expanded, the cycle network has moved outwards to cover these newer residential areas. Examples include the Beacon Hill route from the east of the town centre towards Coddington and additional facilities on London Road towards the south east of the town/Balderton area.
- 2.6.3 Much of the rest of the district's cycling infrastructure is made up of leisure based facilities and longer distance leisure routes are available in the form of National Cycle Network (NCN) route 64 which passes through most of the east of the district, joining NCN route 15 at Thoroton, before travelling to Lincoln via Newark.
- 2.6.4 The National Byway travels from Cotham to Newark sharing the same route as NCN route 64, before travelling northwest through Newark and onto South Muskham. The main route continues north through North Muskham, Norwell and Laxton, with an additional loop spurring westwards to Caunton, Hockerton, Southwell, Eakring before meeting the main route at Laxton.
- 2.6.5 In the area around Clipstone and Edwinstowe there are numerous off-road trails through Vicar Water, Sherwood Pines and Sherwood Forest which are ideal for leisure cycling and walking. There is also an attractive riverside cycle route between Newark Castle station and Lincoln Road Bridge in the town.

3 FUTURE TRANSPORT CONDITIONS

3.1 INTRODUCTION

- 3.1.1 This section of the report describes anticipated transport conditions within the district once the planned Local Plan development has been delivered.
- 3.1.2 An analysis of historic background traffic flow growth has been undertaken to inform this update to the IDP. Traffic flow changes between 2008 and 2020 have been examined at four sites across the district to establish local traffic growth patterns.
- 3.1.3 The analysis demonstrates that traffic flows have remained broadly the same across the district since 2010. The figure below presents an analysis of DfT traffic flow data on four key 'A' Roads within the district. The chart shows that no substantial growth in traffic flows has occurred since 2010. A sharp decrease in traffic flows is observed in 2020 which is due to the Covid-19 pandemic and the travel restrictions put in place to control the spread of the disease.

Image 3 – Historic Traffic Flows in Newark and Sherwood



- 3.1.4 It is acknowledged that the above is a small sample size and NCC has advised that when considering statistics across a wider selection of roads within the district there has been, on average, an increase of circa 5.6% between 2010-2019.

- 3.1.5 The assessment methodology considers committed developments within the district and in adjacent districts, plus Local Plan development sites within the district. Trips generated by Local Plan development sites that have been completed and occupied since the 2010 transport study was produced are included in the assessment, these trips were just moved into the Reference Case. The Reference Case flows therefore include all current known committed developments and all major developments completed since 2010 and therefore provide a reasonable approximation of existing traffic conditions.
- 3.1.6 As a cross check the total increase in network trips between the 2014 Base and the 2033 end of Plan have been compared. This shows network trips increase by circa 7,600 in both the AM and PM peaks (total vehicles) over this period. When compared against the Base network trips this represents a 27% increase. TEMPro growth for the same period for Newark & Sherwood is 25.8% so the flows used in the appraisal are slightly higher than TEMPro forecasts and therefore robust.
- 3.1.7 If we were to apply background traffic growth as well, we would be double counting a lot of trips due to the methodology explained above. No general background traffic growth has therefore been applied to estimate future year traffic conditions within the district.

3.2 ASSUMPTIONS

- 3.2.1 The following assumptions have been applied for the traffic assessments undertaken to advise this review.
- **2014 Base Year** – this represents the operation of the highway network as it is now. The VISUM model is built and validated to a 2014 Base Year and as mentioned above there has been minimal change in traffic volumes within the district since 2010, so the 2014 Base is still considered to be representative of current conditions.
 - **2033 Reference Case** – this includes all major developments known to have been completed and occupied since 2010, plus developments already benefitting from planning permission, or that have a high likelihood of proceeding before the end of the Plan period. In terms of transport infrastructure the 2033 Reference Case assumes completion of the SLR and the A1 Overbridge widening.
 - **2033 With Growth** – this represents the Reference Case plus traffic generated by Local Plan allocations.
- 3.2.2 Assessments have been undertaken for the AM / PM peaks for each of the above scenarios. All future year assessments have been undertaken both 'with' and 'without' the planned A46 Improvement scheme in place at the end of the Local Plan period (2033).

4 FORECAST IMPACTS AND MITIGATION

4.1 URBAN HIGHWAY NETWORK

- 4.1.1 As mentioned earlier, the operation of the highway network within the district has been assessed following the same approach that was applied for the 2017 IDP. A detailed VISUM traffic model of Newark has been used to examine the operation of the urban highway network within the town and a spreadsheet model has been used to assess the main rural roads within the district.
- 4.1.2 VISUM software summarises junction performance in terms of Level of Service (LoS). Junction performance is graded from A (very good) to F (very poor). The definitions of the VISUM grading system are summarised in **Table 1** below.

Table 1 – Level of Service (LoS) Grading System

LoS	Interpretation
A-C	Free flow conditions
D	Flow is impaired by traffic density
E	Unstable operation at or very near to capacity
F	Forced or breakdown flow

- 4.1.3 The results of the VISUM assessment are summarised in **Table 2** and **Table 3** on the following pages. Results are only presented for junctions that exhibit LoS results of 'D' or worse in any scenario tested (i.e. only junctions expected to experience congestion) and the LoS results represent the worst performing arm at each junction.

Table 2 – Urban Junctions at or close to Capacity - No A46 Improvement

Junction	Level of Service (LoS)					
	Base Year AM	Base Year PM	2033 Ref Case AM	2033 Ref Case PM	2033 With Growth AM	2033 With Growth PM
A46 / A1133 (A46 Winthorpe Roundabout)	F	F	F	F	F	F
A17 / A46 / A1 (Friendly Farmer Roundabout)	D	C	D	C	C	C
A46 / A1 / Lincoln Rd (Brownhills)	F	F	F	F	F	F
A46 / A617 / Great N Rd (Cattle Market)	F	F	F	F	F	F
A46 / B6166 Farndon Rd (Farndon)	F	E	F	F	F	F
Lincoln Rd / Brunel Dr	C	D	D	E	D	F
A616 Great N Road / Ollerton Rd/ Main St/Kelham Lane	B	A	D	E	E	F
B6166 Lincoln Rd / Northern Rd	C	C	E	F	E	F
B6166 N Gate / Queens Rd	D	D	D	D	D	E
Northern Rd / Brunel Dr	A	B	A	C	F	E
Beacon Hill Rd / Northern Rd	C	E	D	F	F	F
Queens Rd / Sleaford Rd / Friary Rd	C	D	C	E	E	E
Sherwood Ave / Barnby Gate	D	D	D	E	E	E
B6326 Lombard St / Castle Gate / Mill Gate	C	D	D	D	F	D
B6326 Lombard Street / ASDA access	B	D	B	D	B	D
Lombard St / B6166 Portland St / B6326 London Rd	E	E	E	F	E	F
B6326 London Rd / Lime Grove	A	B	B	A	C	B
London Rd / Sherwood Ave / Bowbridge Rd	E	F	E	E	F	E
London Rd / Main Street	D	D	D	D	E	E

4.1.4 In the 'without A46 Improvement' scenario several junctions are close to capacity in the Base Year and the addition of committed development and Local Plan development traffic makes this situation slightly worse in the Reference Case and With Growth scenarios.

Table 3 – Urban Junctions at, or close to Capacity - with A46 Improvement

Junction	Level of Service (LoS)					
	Base Year AM	Base Year PM	2033 Ref Case AM	2033 Ref Case PM	2033 With Growth AM	2033 With Growth PM
A46 / A1133 (A46 Winthorpe Roundabout)	F	F	D	D	E	D
A17 / A46 / A1 (Friendly Farmer Roundabout)	D	C	B	A	C	A
A46 / A1 / Lincoln Rd (Brownhills)	F	F	C	B	D	A
A46 / A617 / Great N Rd (Cattle Market)	F	F	F*	F*	F*	F*
A46 / B6166 Farndon Rd (Farndon)	F	E	F*	F*	F*	F*
Lincoln Rd / Brunel Dr	C	D	D	D	D	F
A616 Great N Road / Ollerton Rd/ Main St/Kelham Lane	B	A	D	D	D	F
B6166 Lincoln Rd / Northern Rd	C	C	D	E	E	F
B6166 N Gate / Queens Rd	D	D	D	C	E	D
Northern Rd / Brunel Dr	A	B	A	B	D	E
Beacon Hill Rd / Northern Rd	C	E	C	E	F	F
Queens Rd / Sleaford Rd / Friary Rd	C	D	C	D	D	E
Sherwood Ave / Barnby Gate	D	D	D	D	D	D
B6326 Lombard St / Castle Gate / Mill Gate	C	D	D	C	D	D
B6326 Lombard St / ASDA access	B	D	B	D	B	D
Lombard St / B6166 Portland St / B6326 London Rd	E	E	E	E	E	F
B6326 London Rd / Lime Grove	A	B	C	A	C	E
London Rd / Sherwood Ave / Bowbridge Rd	E	F	E	D	E	E
London Rd / Main Street	D	D	D	D	E	D

*See paragraph 4.1.6 below for explanation.

- 4.1.5 A very similar pattern is observed in the ‘with A46 Improvement’ results although the performance of the A46 Winthorpe and A46 Brownhills roundabout junctions is improved by the A46 Improvement scheme in the Reference Case and With Growth scenarios.
- 4.1.6 The results presented above for the A46 Cattle Market and A46 Farndon roundabouts suggest no betterment will be delivered by the A46 Improvement scheme. However, this is an anomaly of the VISUM junction coding and the way that LoS is reported by the model for more complex junctions. In practice, the performance of both junctions will be returned to LoS A-C by the A46 Improvement.

4.2 RURAL HIGHWAY NETWORK

- 4.2.1 For the rural highway network outside of Newark the VISUM model is less detailed, so the same spreadsheet methodology applied in the 2017 appraisal has been used for this review. Network 'stress plans' depicting the results from the spreadsheet assessment can be found in **Appendix B**.
- 4.2.2 Outside of the urban area of Newark the VISUM model contains no base traffic flows however the wider rural highway network of the district is represented within the model and is sufficiently detailed to enable simple trip assignment to be undertaken.
- 4.2.3 Local Plan development trips on the rural highway network have therefore been assigned by VISUM using an 'all-or-nothing' assignment. This means that between any origin-destination pair, all trips for that pair are assigned to the lowest cost route, with costs calculated from an empty network. This corresponds to free-flow speeds when only travel time is considered, as is the case here. Within the model free-flow speeds have been set as the existing mandatory speed limits on the rural network for simplicity and to encourage routing on to major highway links.
- 4.2.4 This methodology is essentially the same as undertaking a manual appraisal, but VISUM has been used as a tool to assign development trips onto the network automatically, instead of having to manually assign each trip individually using route planning software.
- 4.2.5 The performance of rural roads has been assessed based on link capacity. The prime indicator for road capacity and congestion on rural links is determined by the Congestion Reference Flow (CRF), which was defined in Annex D of TA 46/97 '*Traffic Flow Ranges for use in the Assessment of New Rural Roads*'. This document was withdrawn from the Design Manual for Roads and Bridges (DMRB) in March 2020, but CRF is still referenced in the latest version of TAG Unit A1.3 which was last updated in July 2021. To maintain consistency with the 2017 IDP methodology and in the absence of any replacement DMRB guidance the withdrawn standard has been applied for the purposes of this report update as it still provides useful guidance on link capacity.
- 4.2.6 Congestion Reference Flow (CRF) values have been used as a simple indication of the performance of rural links within the district. The CRF of a link is a standard measure and is an estimate of the Annual Average Daily Traffic (AADT) flow at which the carriageway is likely to be 'congested' in the peak periods on an average day. Congestion is defined as the situation when the hourly traffic demand exceeds the maximum sustainable hourly throughput of the link. When this condition occurs, the effects on traffic flow are likely to be one or more of the following:
- Flows break down with speeds varying
 - Average speeds drop

- Journey times become longer and unreliable
 - Sustainable throughput is reduced; and/or
 - Queues are likely to form
- 4.2.7 Because CRF is calculated using average traffic flows it is implicit that when a link reaches 100% stress (i.e. forecast flows equal CRF) it can be expected to experience the type of conditions described above in half of the weekday peaks during the year.
- 4.2.8 DfT guidance identifies that journey time reliability is not an issue for stress levels below 75% and reliability does not deteriorate any further once 125% stress is reached. Links therefore operate satisfactorily between 75% and 100% stress, albeit with reduced performance in terms of journey times and journey time reliability in comparison to a link with less than 75% stress. For links with stress of 100% and greater 'congestion' can be expected to affect half of the weekday peak periods over the course of a year.
- 4.2.9 When a link reaches 100% stress or greater the most likely outcome is slow moving traffic during half of the weekday peaks during the year (i.e. a link at 100% stress is not automatically 'gridlocked'). In these conditions some drivers may choose to travel outside of the peak periods to avoid potential 'congestion' and some drivers may divert to alternative routes, where less congested alternatives are available. Neither of these effects have been considered in this assessment due to the significant additional complexity involved in assessing these factors. The results of the Transport Study are therefore 'worst case'.
- 4.2.10 The assessment methodology uses surveyed link flows and forecast flows to determine Congestion Reference Flows (CRF) and based on these calculated reference capacities link 'stress' levels have been identified where stress is defined as the ratio of the annual average daily traffic (AADT) flow to the Congestion Reference Flow expressed as a percentage.
- 4.2.11 For the purposes of the study the following stress thresholds have been applied to identify when links are approaching, or exceeding their theoretical maximum capacity:
- Less than 90% stress (**Green**) - the link operates within capacity, although journey times may become less reliable over 75% stress.
 - Between 90% and 100% stress (**Orange**) - The link is approaching capacity and is increasingly susceptible to flow breakdown.
 - Greater than 100% stress (**Red**) - The link operates over capacity and is likely to experience flow breakdown on a regular basis.
- 4.2.12 CRF is a link-based assessment and does not consider junction capacity. However, in practice, junction operation usually determines the overall performance of a highway corridor and junctions will exceed their capacity and exhibit congestion and queuing problems long before a link does. Therefore, for the purposes of this study the key junctions on any links identified as

being close to, or at capacity, have been identified for potential junction improvements as these junctions are likely to require improvement in advance of consideration of link widening/dualling.

4.2.13 A summary of the critical links on the rural highway network that are forecast to meet or exceed 90% stress in any scenario is presented in **Table 4** below. The spreadsheet methodology used to assess rural links within the district does not reflect any trip reassignment to avoid network congestion or delays, so the results presented below are the same for both the ‘without’ and ‘with’ A46 Improvement scheme.

Table 4 – Critical Rural Links

Link Description	Approx' Link Lengths (km)	Percentage Link 'Stress'		
		2014 Base	2033 Base + Committed	2033 Base + Committed + Growth
A617 through Kelham and Averham Villages	1.75	65%	88%	112%
A617 between Newark & Kelham	2.75	65%	145%	183%
A617 east of A614	4.80	54%	82%	109%
A6097 between A46(T) & A612	5.00	97%	97%	97%
A614 between A617 & C13	3.60	63%	119%	140%
A616 Ollerton Road between A614 and A6075	0.60	63%	90%	100%

Note: Highest values used where there is more than one value on a route

4.2.14 The results indicate that all rural links within the district currently operate at less than 90% stress except for the A6097 at Gunthorpe (97%). Whilst this link is still within its theoretical capacity it could be expected to experience less reliable journey times.

4.2.15 The addition of committed development traffic flows for the Reference Case results in no change to the Base Year 97% stress identified on the A6097 but three other links are operating at 90% stress or higher. These are the A617 between Newark and Kelham, the A614 between the A617 and the C13 Mansfield Road, and the A616 Ollerton Road between the A614 (Ollerton Roundabout) and the A6075 in Ollerton.

4.2.16 With the addition of Local Plan development traffic two further links exceed 90% stress; the A617 through Kelham and Averham Villages, and the A617 east of A614, and the level of stress increases on the links already identified as being under pressure.

4.2.17 Based on the results of the link capacity appraisal the following key junctions could be expected to experience capacity issues by the end of the plan period:

- A6097 / A612 roundabout, Lowdham
- A617 through Kelham / Averham villages
- A614/A617 'Lockwell Hill' Roundabout

- A614 / Mickledale Lane, Bilsthorpe
- A614 / Deerdale Lane, Eakring
- A614 / A616 / A6075 Ollerton Roundabout
- A616 Back Lane / A6075 Roundabout in Ollerton

A614 / A6097 Junctions

4.2.18 As mentioned earlier Nottinghamshire County Council (NCC) is promoting a package of junction improvements on the A614 and A6097 corridors as part of the A614 / A6096 Major Road Network (MRN) Scheme. Funding has been allocated from the Department for Transport (DfT) and detailed design is underway. The Planning applications for the schemes were granted consent in September 2022 and construction is anticipated to commence in the winter of 2023 subject to completion of statutory processes.

4.2.19 The NCC improvement scheme will address the following three junctions identified by this appraisal as being likely to require capacity improvement by the end of the plan period.

- A6097 / A612 roundabout, Lowdham
- A614 / Mickledale Lane, Bilsthorpe
- A614 / A616 / A6075 Ollerton Roundabout

4.2.20 Copies of the current improvement layouts for the above junction improvements can be found in **Appendix A**. For the A614 / Deerdale Lane junction NCC had initially proposed a comprehensive improvement however, this has since been dropped from the scheme due to the complexity of removing a hidden dip in the A614 close to the junction. NCC are now investigating a lower-cost alternative solution for this junction and a plan is not yet available.

Kelham Bypass

4.2.21 The A617 through Kelham and Averham villages was identified in the 2017 IDP for improvement, probably in the form of a revised wide-single or dual carriageway aligned to the south of Kelham, north of Averham with a new bridge crossing the River Trent. The key constraint on this section of the A617 is the existing bridge over the river Trent which is narrow with poor carriageway alignment. Delivering increased traffic capacity is therefore dependent upon provision of the Kelham Bypass scheme.

4.2.22 Nottinghamshire County Council (NCC) has been safeguarding the route for a bypass of Kelham village for several years and the district council's Infrastructure Funding Statement, December 2021 (see **Table 5**) already identifies Kelham Bypass as being required to address future transport conditions with a revised estimated delivery cost of £50m.

4.2.23 For the 2017 IDP review the County Council also confirmed that since National Highways committed to upgrading the A46(T) Newark Relief Road, the A617 at Kelham becomes one of the key deficiencies on the local highway network, placing greater priority on this improvement.

It is therefore recommended that no change is made to the current Infrastructure Funding Statement with regards to Kelham Bypass.

A614/A617 Lockwell Hill

- 4.2.24 A improvement was delivered at the A614/A617 Lockwell Hill roundabout junction by NCC in 2013. The improvement provided increased capacity to help make journey times more reliable. This junction is therefore not seen as a priority for further improvement at this time, and it is recommended that the operation of this junction be monitored.

A616 / A6075 Roundabout in Ollerton

- 4.2.25 The CRF link based appraisal has identified a short section of the A616 immediately east of the A614 Ollerton roundabout as reaching 100% stress by 2033 with Local Plan development traffic in place. This section of the A616 Ollerton Road is approximately 600m long and joins the A614 Ollerton roundabout at its western end to a roundabout junction with the A6075 at its eastern end in Ollerton.
- 4.2.26 This section of the A616 is forecast to just reach 100% stress by the end of the plan period with Local Plan development traffic in place. As mentioned earlier an improvement is already planned to the A614 Ollerton Roundabout at the western end of the link (see paragraph 4.2.19). No further improvements are therefore suggested at this time, and it is recommended that the operation of the A616 / A6075 roundabout at the eastern end of this link be monitored.

4.3 INFRASTRUCTURE FUNDING STATEMENT

4.3.1 The district council's current Infrastructure Funding Statement (December 2021) includes 12 highway improvement schemes which are identified as priorities for CIL spending. These are summarised in the table below which is taken directly from the December 2021 Funding Statement.

Table 5 – Existing Highway Infrastructure List

No.	Location	Estimated Cost	CIL/Other Public Contribution	Required Works	Status / Funding Source
Newark					
1	A1 Overbridge widening, Fernwood	£5.2m	£5.2m	Widening of A1 Overbridge	To be implemented
2	London Road, Portland Street Junction	£60,000	£60,000	Signal Control	To be implemented
3	Northern Road / Brunel Drive	£500,000	£500,000	Signal Control	To be implemented
4	Castle Gate / Lombard Street Junction	£300,000	£300,000	Junction improvements	To be implemented
5	Sleaford Road / Friary Road Junction	£300,000	£300,000	Junction improvements	To be implemented
6	Queens Road / North Gate	£240,000	£0	Junction improvements	To be implemented
Rural Areas					
7	A614 / C13 Eakring Road Junction ²	£9,400,000	£9,400,000		To be implemented
8	Kelham Bypass	£20,000,000 ³	£20,000,000	New bridge over River Trent and a bypass to the village	To be implemented. Suggested funding split 33% CIL, 76% D2N2 LEP
9	A614 / C1 White Post Roundabout	£270,000	Unknown until NCC's business case finalised	Junction improvements	DfT granted MRN Programme Entry in June 2021
10	A6097 / A612 Lowdham Junction	£6,000,000	Unknown until NCC's business case finalised	Junction improvements	MRN funding bid to DfT, part funded by CIL contributions
11	A614 / Mickledale Lane Junction	£5,400,000	Unknown until NCC's business case finalised	Junction improvements and signal control	MRN funding bid to DfT, part funded by CIL contributions
12	A614 / A6096 Oxton Bypass (Warren Hill)	£250,000	Unknown until NCC's business case finalised	Junction improvements	MRN funding bid to DfT, part funded by CIL contributions

4.3.2 For the Newark urban area there are six highway infrastructure improvement schemes identified in the Infrastructure Funding Statement which are all junction improvements except for the A1 overbridge widening scheme.

4.3.3 Within the rural areas of the district the Infrastructure Funding Statement identifies a further six highway infrastructure improvement schemes which are all junction improvement schemes

² Incorrectly listed as Eakring Road, it should read Deerdale Lane.

³ The estimated cost for Kelham Bypass has subsequently been revised to £50m.

except for the Kelham Bypass (No. 8) which comprises the delivery of a new bridge over the river Trent and a bypass around Kelham village.

4.4 REVIEW OF INFRASTRUCTURE REQUIREMENTS

- 4.4.1 The latest VISUM modelling has identified the urban junctions requiring potential improvement to accommodate forecast traffic flows at the 2033 end of plan period. The pattern of junctions identified is similar for the 'without' and 'with' A46 Improvement scenarios tested except for the key junctions onto the A46.
- 4.4.2 National Highways has previously confirmed that the A46 junctions will be addressed as part of the A46 Improvement scheme and there is no need to include these junctions on the highway infrastructure list in the Infrastructure Funding Statement. The A46 junctions have therefore not been considered any further in this chapter.
- 4.4.3 The VISUM modelling results for the urban junctions in Newark presented in **Table 3** on page 16 have been reviewed to identify where improvements are likely to be required to accommodate forecast traffic flows to the end of the plan period. Only the results for the 'with' A46 Improvement have been considered for the purposes of this review.
- 4.4.4 Junction performance thresholds have been applied to determine where improvements should be prioritised. For junctions with a LoS of F in either peak, or a LoS of E in both peaks, improvements have been recommended. Where junctions experience LoS E in one peak only (and better performance in the other peak) it is recommended that improvements have a lower priority, and the operation of these junctions should be monitored.
- 4.4.5 Applying these thresholds to the five urban junctions already listed on the Council's 2021 Infrastructure Funding Statement list (numbers 2 to 6 inclusive in **Table 5**) only one junction, Lombard St / B6166 Portland St / B6326 London Rd (number 2) is identified as requiring improvement in the 'with' A46 Improvement scenario. It is therefore recommended that the other four junctions (3, 4, 5 & 6) be removed from the Infrastructure Funding Statement list.
- 4.4.6 The A1 Overbridge widening at Fernwood (No.1) has been identified separately through transport assessment work associated with development in the Fernwood area. As this is required to address an urban link capacity issue it has not been identified by the modelling. However, this scheme should be retained in the Infrastructure Funding Statement.
- 4.4.7 The need for improvements at the A614 / C1 White Post Roundabout (No. 9), and the A614 / A6097 Oxtun Bypass junction (No. 12) have not been identified by the latest appraisal. All links adjoining these junctions have forecast stress levels well below 90% by 2033 with Local Plan traffic. The link based appraisal has therefore not identified these locations as being of concern and it is recommended that these two junctions be removed from the Infrastructure Funding Statement and their operation be monitored. As part of the DfT funded A614 / A6096 MRN

Scheme mentioned earlier the County Council is also already proposing improvements to both junctions.

4.4.8 The table below presents a comparison between the improvement schemes currently included in the 2021 Infrastructure Funding Statement and the findings from the latest appraisal.

Table 6 – Comparison against 2021 Infrastructure Funding Statement

Improvements in the 2021 Infrastructure Funding Statement		Identified by Latest Modelling?
No.	Location	
Urban Locations		
1	A1 Overbridge widening, Fernwood	See 4.4.6
2	London Road, Portland Street Junction	Yes
3	Northern Road / Brunel Drive	No
4	Castle Gate / Lombard Street Junction	No
5	Sleaford Road / Friary Road Junction	No
6	Queens Road / North Gate	No
Rural Locations		
7	A614 / Deerdale Lane Junction	Yes
8	Kelham Bypass	Yes
9	A614 / C1 White Post Roundabout	No
10	A6097 / A612 Lowdham Junction	Yes
11	A614 / Mickledale Lane Junction	Yes
12	A614 / A6097 Oxtan Bypass (Warren Hill)	No

4.4.9 The latest modelling also identifies nine urban junctions that are not already included in the 2021 Infrastructure Funding Statement. These are discussed in the table below.

Table 7 – Review of Urban Junctions Identified by Latest Modelling

Location	2033 LoS Results with Local Plan Development		Recommendation
	AM Peak	PM Peak	
Lincoln Road / Brunel Drive	D	F	Add to Infrastructure Funding Statement
A616 Great N Rd / Ollerton Rd/ Main St / Kelham Ln	D	F	Add to Infrastructure Funding Statement
B6166 Lincoln Road / Northern Road	E	F	Add to Infrastructure Funding Statement
Beacon Hill Road / Northern Road	F	F	Add to Infrastructure Funding Statement
Sherwood Avenue / Barnby Gate	D	D	Monitor junction performance
B6326 Lombard Street / ASDA access	B	D	Monitor junction performance
B6326 London Road / Lime Grove	C	E	Monitor junction performance
London Road / Sherwood Avenue / Bowbridge Road	E	E	Add to Infrastructure Funding Statement
London Road / Main Street	E	D	Monitor junction performance

4.5 UPDATED HIGHWAY INFRASTRUCTURE LIST

4.5.1 Based on the findings from this review a revised list of highway infrastructure schemes is recommended for inclusion in the Council's Infrastructure Funding Statement. This is summarised in the table below and discussed further in Section 5.

4.5.2 An improvement to Tolney Lane is also included in the table below. This improvement, which has been identified separately, is to provide flood alleviation for the Tolney Lane area and is therefore not related to traffic capacity. It has been included in the table below for the sake completeness. The costs in **Table 8** are best estimates at the time of writing. NCC advise that the costs for the junction improvements along the A614 are under review and may change.

Table 8 – Updated Highway Infrastructure List

No.	Location	Indicative Total Scheme Costs	Likely Required Works
Newark			
1	A1 Overbridge widening, Fernwood	£5.2m	Widening of A1 Overbridge
2	London Rd / Portland St Junction	£60,000	Signal Control
3	Lincoln Rd / Brunel Drive	TBC	Improved Signal Control
4	A616 Great North Rd / Ollerton Rd / Main St / Kelham Ln, South Muskham	TBC	TBC
5	B6166 Lincoln Rd / Northern Rd	£150,000	Improved Signal Control
6	Beacon Hill Rd / Northern Rd	£150,000	Improved Signal Control
7	London Rd / Sherwood Ave / Bowbridge Rd	£150,000	Improved Signal Control
8	Tolney Lane, Newark	£5.9m	Highway Flood Alleviation
Rural Areas			
9	A614 / Deerdale Lane Junction	TBC	Lower-cost Scheme to be identified by NCC
10	A614 / A616 / A6075 Ollerton Roundabout	£10.5m	Enlarged Roundabout
11	Kelham Bypass	£50m	New bridge over River Trent and a bypass to the village
12	A6097 / A612 Lowdham Junction	£6.5m	Enlarged Roundabout
13	A614 / Mickledale Lane Junction	£7m	New Roundabout and Link Road Connection

4.6 RAIL, BUS CYCLING & WALKING

4.6.1 The increase in person trips due to the latest Local Plan growth has been estimated using the same methodology applied in the 2017 appraisal. This applied person trip generation rates to the proposed residential and employment growth, the trip rates used in the 2017 appraisal were retained to allow direct comparison. Modal splits taken from the 2011 Census were then applied

to estimate trips by each relevant mode of travel (i.e. car, bus, rail, walking & cycling). This calculation has been repeated for the latest development proposals.

- 4.6.2 Using this methodology the forecast increase in trips by rail, bus, cycling and walking due to planned residential and employment growth is as summarised in the table below.

Table 9 – Estimated Increase in AM Peak Two-Way Person Trips by Mode

AM Peak	Train	Bus/Coach	Bicycle	Walking
2022 Estimate	103	228	544	1,133
2017 Estimate	435	675	1,851	3,752
2010 Estimate	215	740	1,727	2,306

Note: An element of ‘double counting’ will be present between residential and employment trips, however the above estimates are considered to provide a robust guide to the approximate order of increase in travel by these modes.

- 4.6.3 The reasons for the variations seen in **Table 9** are due to the reduction in the number of allocation sites. Whilst there have been a small number of sites deallocated, the significant difference from the 2017 assessment is the number that are either now within the planning application process or have been consented and are currently being built out or even completed (i.e. a net reduction of 11,437 dwellings and a net reduction of circa 350,000 sqm of employment land across the district in comparison to the 2017 assessment). Trips associated with those developments are therefore not included within the **Table 9** calculations. Whilst the table shows a notable reduction from 2017, as outlined most of those trips identified in 2017 are still likely to be generated.

- 4.6.4 The findings of the 2017 assessment for these modes have therefore been reviewed and are considered to remain appropriate. These are summarised as follows:

Bus

- 4.6.5 Across the district it is anticipated that forecast demands would be largely accommodated by existing services. However, developers may be required to fund improvements to existing bus services (via S106 Agreements) to help mitigate the direct transport impacts of developments. Details will need to be determined as part of the planning application process.

Rail

- 4.6.6 The anticipated increased demand for rail travel should be accommodated on existing services and would be insufficient to itself justify any improvements to rail infrastructure or services. However, there may be additional demand for car parking at Newark North Gate and Newark Castle stations which may require additional car parking capacity to be provided.

Cycling

- 4.6.7 The forecast increase in cycling is focused within Newark and represents a large increase in cycle activity in the AM peak hour. Developers will therefore be required to deliver

new/improved cycle infrastructure to provide cycle access to development sites and to provide safe connections to the existing cycle network, including the provision of new crossing facilities, capacity enhancements and other appropriate cycle infrastructure, where necessary. Significant developments should be provided with adequate facilities for cyclists, such as secure and covered cycle parking, changing facilities and internal access roads which give priority to cycles and pedestrians wherever possible. New infrastructure connections from developments onto the existing cycle network will be required, including new controlled crossings at locations where major roads create barriers for cyclists and pedestrians. It is expected that developers will fund the provision of new/improved cycle infrastructure (via S106 Agreements) to help mitigate the direct transport impacts of developments. Details will need to be determined as part of the planning application process. In general the extensive existing cycling network in Newark should be able to accommodate the forecast increase in users. Some carriageway reallocation or shared surfacing may be required to give pedestrians and cyclists more priority on major routes around the town centre. However, most of the corridors into Newark and its environs already have excellent facilities for these users. Forecast cycling trips in rural settlements are not significant and would be accommodated on existing cycling infrastructure (where available) with suitable developer funded enhancements, as appropriate.

Walking

- 4.6.8 Walking trips are also focused within Newark in the AM peak hour. As for the cycling trips these would be spread across the urban area and would be accommodated on existing infrastructure with developer-funded enhancements provided on a site-by-site basis, as appropriate. Facilities should be included to connect developments to existing footways and where appropriate provide additional crossing facilities. Consideration of gradients for wheelchair users and pushchair users should be made. Personal security and street lighting is also of importance for pedestrian trips, as well as ensuring that footways are wide enough to accommodate the increased levels of usage, particularly at bus stops. At sites where there may be high levels of visitors, direction signing to bus and train interchanges may be appropriate to encourage walking to these locations ahead of the use of private car. Forecast walking trips in rural settlements are low and would be accommodated on existing infrastructure with suitable developer funded enhancements, as appropriate.

5 TRANSPORT INFRASTRUCTURE DELIVERY PLAN

5.1 INTRODUCTION

5.1.1 This section of the report summarises the transport infrastructure expected to be required to support Local Plan development to 2033. A summary is provided in **Table 10** below. Transport infrastructure requirements are also summarised in a schedule in **Appendix C**.

5.2 ASSUMPTIONS

5.2.1 No detailed junction capacity assessment work has been undertaken at this stage and further investigations and discussions with Nottinghamshire County Council will be required to determine appropriate solutions for each location. The comments and indicative costs provided in **Table 10** are therefore preliminary only.

Table 10 – Highway Improvements to 2033

No.	Location	Existing Junction Type	Potential Improvement	Indicative Total Scheme Costs	Comments
Newark					
1	A1 Overbridge widening, Fernwood	N/A	Widening of A1 Overbridge	£5.2m	Identified as the highest priority highway improvement for CIL funding. The Council is currently liaising with National Highways to commission a detailed design.
2	London Rd, Portland St Junction	Signals	Improved Signal Control	£150,000	The operation of this junction changes to an 'F' LoS in the PM peak hour at the 2033 Forecast Year. An improvement is therefore likely to be required at this location. The junction is constrained on all sides by built development and space to deliver any carriageway widening is very limited. The most likely form of improvement will be providing improved signal control at the existing junction, however consideration is being given as part of the Newark Heritage Action Zone to potential improvements to the junction and townscape around it.
3	Lincoln Rd / Brunel Drive	Signals	Improved Signal Junction Layout – Monitor Operation Post A46 Improvement Opening	£TBC	The operation of this junction changes to an 'F' LoS in the PM peak hour at the 2033 Forecast Year. An improvement is therefore likely to be required at this location. There are wide verges present on Lincoln Road which may enable localised widening on these approaches. However, it is recommended that the junction operation be reviewed following completion of the A46 Improvement scheme as this is expected to improve the operation of the A46 Brownhills roundabout to the north, removing queues that currently interact with the Lincoln Road / Brunel Drive junction.
4	A616 Great North Rd / Ollerton Rd / Main St / Kelham Ln, South Muskham	Mini Roundabout	Monitor Performance Post A46 Improvement Opening	£TBC	The operation of this junction changes to a 'F' LoS in the PM peak at the 2033 Forecast Year. Providing a meaningful capacity improvement to this 5-arm junction will require third-party land to enable a larger roundabout to be provided and/or the closure or diversion of Kelham Lane to reduce the number of arms, which may then allow a signal controlled crossroads to be provided. Improvement of this junction will therefore be complicated and expensive. However, it is recommended that the junction operation be reviewed following completion of the A46 Improvement scheme as demand for the Great North Road corridor may reduce once the key congestion bottle necks on the A46 are removed. It is therefore recommended that the operation of this junction be monitored post completion of the A46 Improvement to see if forecast conditions materialise.

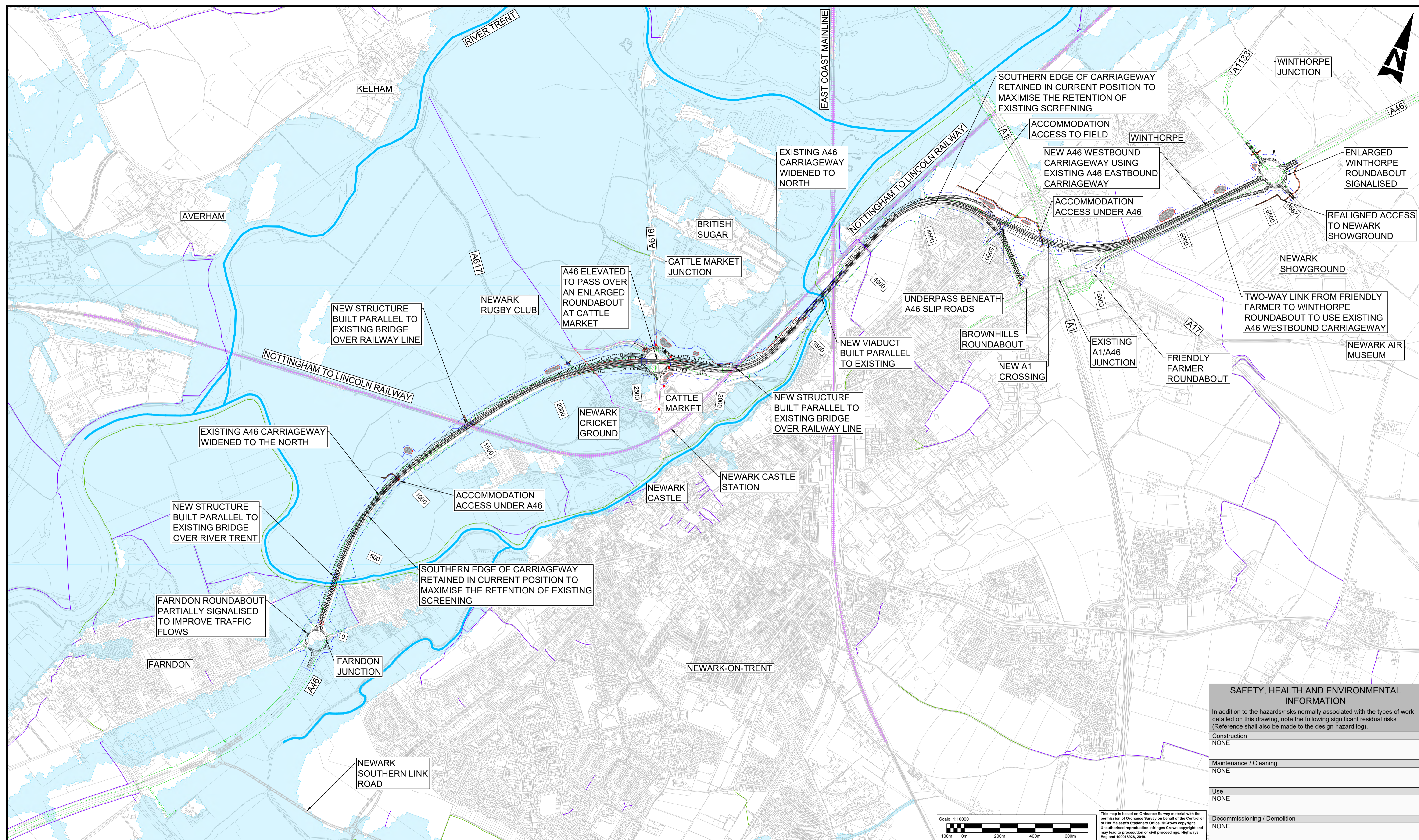
5	B6166 Lincoln Rd / Northern Rd	Signals	Improved Signal Control	£150,000	The operation of this junction changes to an 'F' LoS in the PM peak hour at the 2033 Forecast Year. An improvement is therefore likely to be required at this location. The junction is constrained on all sides by built development and available space to deliver any carriageway widening is limited. The most likely form of improvement will be providing improved signal control at the existing junction.
6	Beacon Hill Rd / Northern Rd	Signals	Improved Signal Control	£150,000	The operation of this junction changes to an 'F' LoS in the AM and PM peaks at the 2033 Forecast Year. An improvement is therefore likely to be required at this location. The junction is constrained by an adjacent railway bridge and available space to deliver any carriageway widening is limited. The most likely form of improvement will be providing improved signal control at the existing junction.
7	London Rd / Sherwood Ave / Bowbridge Rd	Signals	Improved Signal Control	£150,000	The operation of this junction changes to an 'E' LoS in the AM and PM peak hours at the 2033 Forecast Year. An improvement is therefore likely to be required at this location. The junction was improved by NCC in 2014 to change lane allocations, upgrade the signal control and provide improved pedestrian facilities. The junction is constrained on all sides by built development and there is minimal space available within the highway to deliver any meaningful carriageway widening. The most likely form of improvement will be providing optimised signal control at the existing junction (if possible).
8	Tolney Lane, Newark	Highway Flood Alleviation	Flood alleviation and access resilience works	£5.9m	Improvements to Tolney Lane have been identified separately and comprise works to provide access resilience and property protection during flooding events. The proposed works comprise: <ul style="list-style-type: none"> • Raising Tolney Lane and access into the traveller site. • Provision of a surface water pumping station. • Installation of a bypass channel. • Flood wall between the road and railway embankment. • Creation of a flood storage area.
Rural Areas					
9	A614 / Deerdale Lane Road Junction	Ghost Island Priority Junction	TBC	TBC	NCC are currently investigating a lower-cost alternative solution for this junction and details are not yet available.
10	A614 / A616 / A6075 Ollerton Roundabout	Priority Roundabout	Enlarged Priority Roundabout	£10.5m	Forms part of the DfT funded MRN improvement scheme being promoted by NCC.
11	Kelham Bypass	N/A	New bridge over the River Trent and a bypass to the village	£50m	Bypass with a new bridge over the River Trent with an indicative cost of £20m.
12	A6097 / A612 Lowdham Junction	Priority Roundabout	Enlarged Priority Roundabout	£6.5m	Forms part of the DfT funded MRN improvement scheme being promoted by NCC.
13	A614 / Mickledale Lane Junction	Ghost Island Priority Junction	New roundabout and link road connection to Mickledale Lane	£7m	Forms part of the DfT funded MRN improvement scheme being promoted by NCC.

APPENDICES

APPENDIX A – IMPROVEMENT PLANS

A46 Improvement (Preferred Route)

DO NOT SCALE
 Millimetres
 0 10 100



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).	
Construction	NONE
Maintenance / Cleaning	NONE
Use	NONE
Decommissioning / Demolition	NONE

- NOTES:**
- ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
 - ANY RETAINING WALLS AND BRIDGE DECKS SHOWN IN PLAN ARE INDICATIVE ONLY.
 - LOCATIONS OF PROPOSED DRAINAGE ATTENUATION PONDS ARE INDICATIVE ONLY TO SHOW THE DESIGN INTENT AND WILL BE REVISED AS THE DESIGN IS DEVELOPED FURTHER.
 - LAND PROPOSED TO BE ACQUIRED OR USED FOR THE SCHEME PERMANENTLY OR TEMPORARILY SHOWN WHICH THERE IS APPROPRIATE CONFIDENCE IT IS REQUIRED AT THIS STAGE

KEY :	
	EXISTING HIGHWAY BOUNDARY
	ASSUMED PROJECT BOUNDARY
	RIVER NETWORK
	RAILWAY TRACK
	PROPOSED RETAINING WALL
	PROPOSED BRIDGE
	EXISTING BRIDGE TO BE RETAINED
	MAINLINE CHAINAGE
	EARTHWORK
	STOPPED EXISTING FOOTPATH
	EXISTING BRIDLEWAY
	EXISTING FOOTPATH
	FLOOD ZONE 3
	INDICATIVE ACCOMMODATION WORKS
	EXISTING FOOTWAY / CYCLEWAY
	PROPOSED FOOTWAY / CYCLEWAY
	PEDESTRIAN / CYCLEWAY CROSSING
	PROPOSED ATTENUATION POND INDICATIVE LOCATION

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
FOR INFORMATION	A1	CO1	PG	SG	EN	ADK	17/02/21
FOR CHECK	A1	CO2	PG	SG	EN	KM	23/04/21
FOR INFORMATION	A1	CO3	PG	SG	KM	KM	28/05/21
For Notification of Development	A1	CO4	KO	EN	ADK	ADK	17/06/21

Drawing Suitability: **APPROVED - PUBLISHED** Status: **A1**

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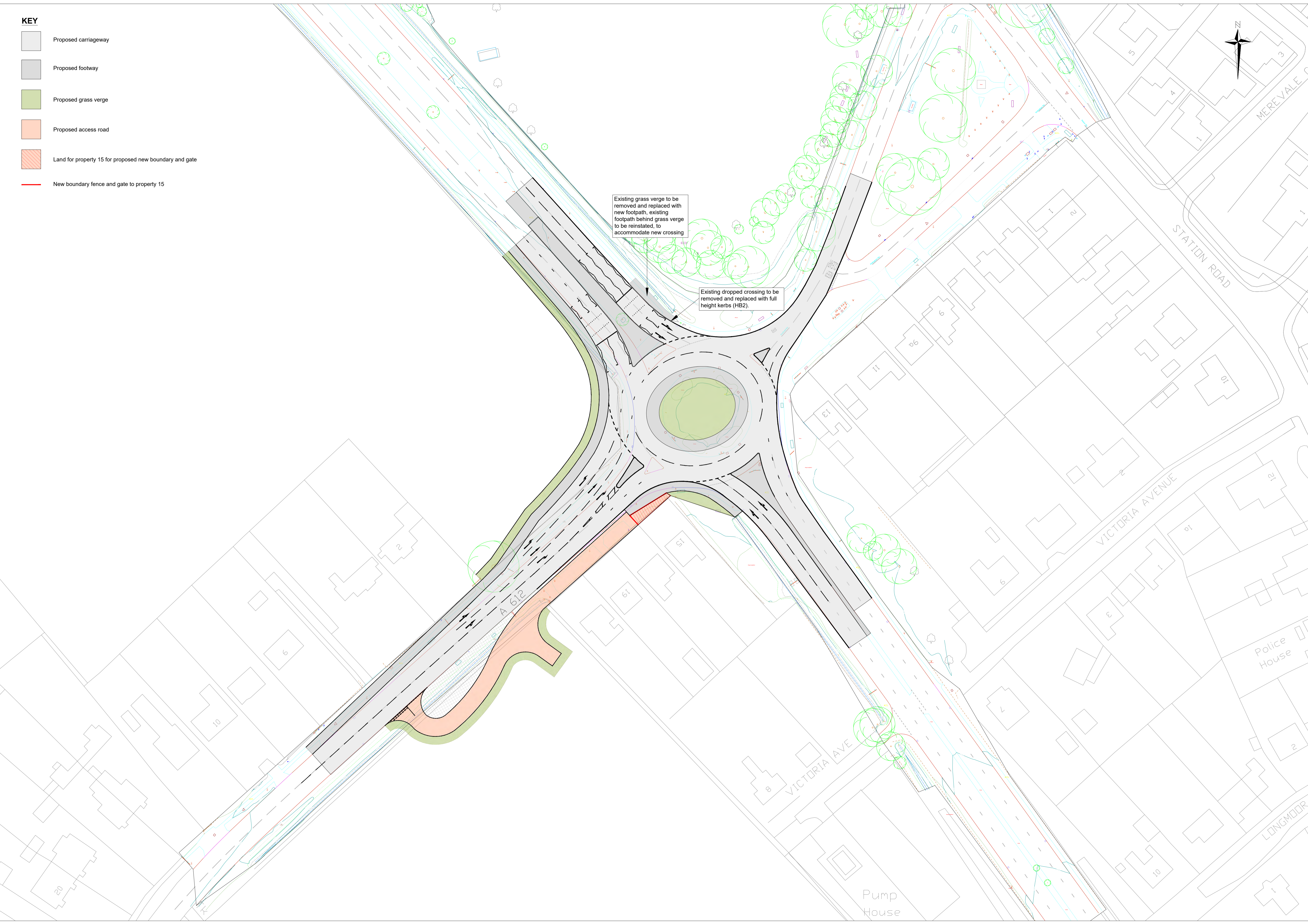
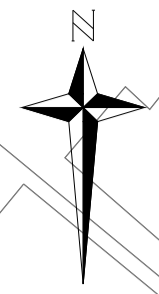
national highways

Project Title: A46 Newark Northern Bypass	
Drawing Title: GENERAL ARRANGEMENT OPTION 2 MODIFIED FOR NOTIFICATION OF DEVELOPMENT	
Drawing Number: HE551478	Originator: ATK
Project: OP2_A46_Z	Volume: - DR - CH - 000009
Location: OP2_A46_Z	Type: DR
Original Size: A1	Scale: 1:10000
Project Ref. No.: 5162675	Sheet: 1 of 1
Rev: C04	

A614 / A6097 SRN Improvement Scheme
A6097 / A612 Roundabout, Lowdham

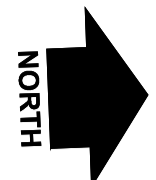
KEY

- Proposed carriageway
- Proposed footway
- Proposed grass verge
- Proposed access road
- Land for property 15 for proposed new boundary and gate
- New boundary fence and gate to property 15



A614 / A6097 SRN Improvement Scheme

A614 / Mickledale Lane, Bilsthorpe



OLD RUFFORD ROAD

The Limes

A614

Existing Mickledale Lane Junction Closed Off

MICKLEDALE LANE

Tank

Featherstone House Farm

WB

Fairfield Bungalow

Magnolia Cottage

Fairfield Farm House

Featherstone Cott

Waters Edge

NOTES

1. This drawing is to be read in conjunction with all other relevant drawings, details and specifications.
2. Do not scale from this drawing.
3. All measurements are given in metres unless otherwise stated.

25/01/21

Rev.	Description	Drawn	Ch'kd	Auth	Date
Project					
A614/A6097 CORRIDORS IMPROVEMENTS MICKLEDALE LANE JUNCTION					
Status		Project No.			
FOR INFO		20949			
Drawing Title					
PROPOSED ROUNDABOUT CENTRALLY ON A614					
Scale		Drawn	JD	Date	
1:1000 @A1		Ch'kd	JJP	Date	
		Auth	JJP	Traced	JD
Drawing No.					Rev.
20949/GEN/M003/RI/00001					P01

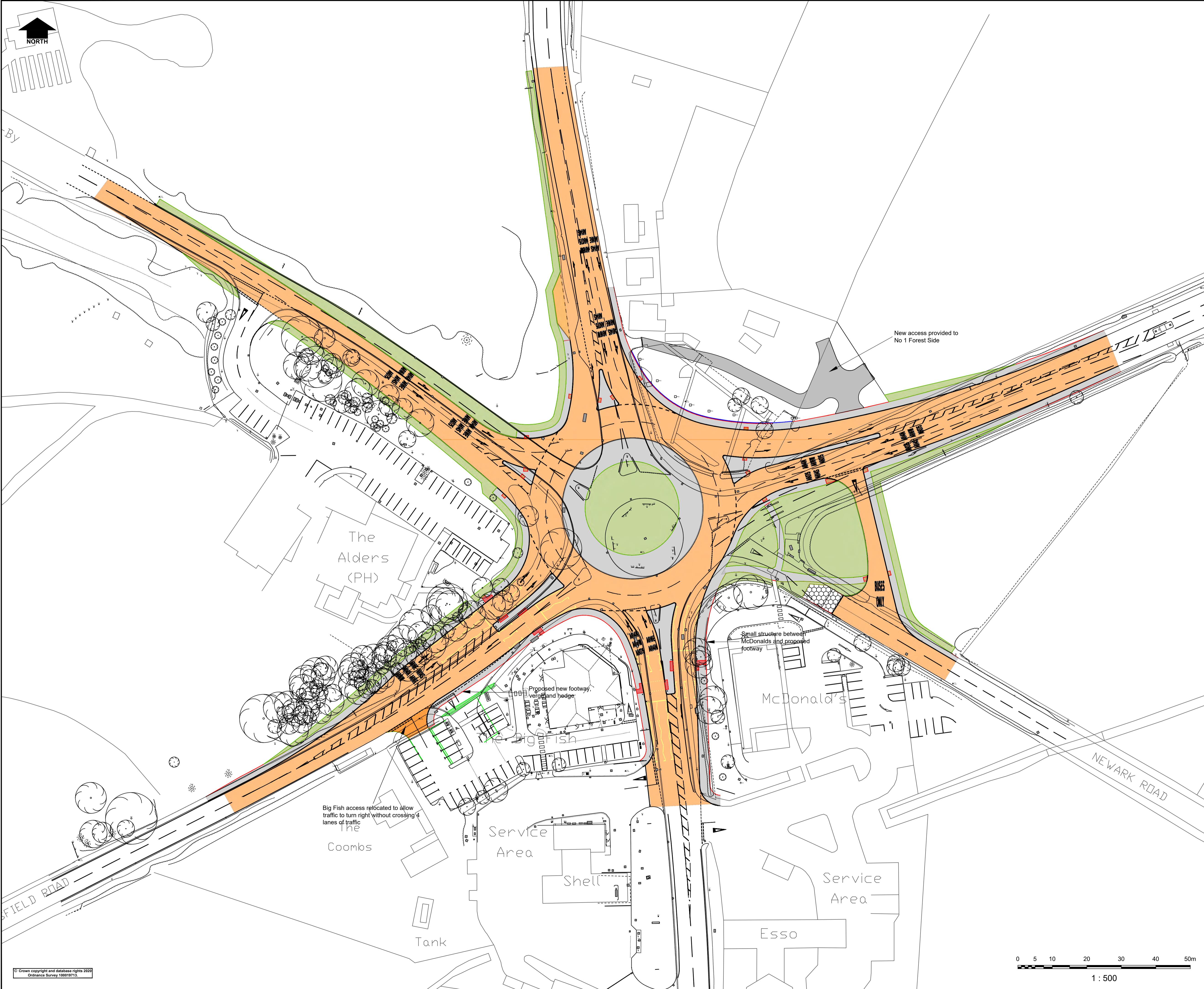
in partnership with




www.viam.co.uk Tel 0115 804 2100
Bilthorpe Depot, Bilthorpe Business Park, Bilthorpe, Nottinghamshire, NG22 8ST

A614 / A6097 SRN Improvement Scheme

A614 / A616 Ollerton Roundabout



NOTES

1. This drawing shows the updated revised layout of the enlarged 60m ICD roundabout improvements.
2. The lane arrangements are configured to suit the current and future traffic forecast (2033) requirements.
3. The proposed lane destination markings are provided to suit the current and future peak flow and are suggested to compliment the road signage to reduce the potential conflict associated with vehicles crossing over lanes.
4. The layouts are subject to further road safety audits which will be commissioned following the detailed design stage.
5. The revised layout has been produced using updated topographical survey information obtained June 2018.
6. The precise extents of private land are subject to change which may be required as a result of the the detailed design process. The extents of embankments/ earth slopes are shown for indicative purposes and are based on the assumption that adjoining land does not significantly fluctuate in level. Where private land interfaces are restricted in respect of widths available retaining features may be required at these locations. Further verification for the embankment interface will be determined once updated private land topographical survey information and detailed design information is available.
7. A preliminary analysis has been undertaken to verify vertical design requirements, this has determined that the proposals could meet this design criteria if the speed limits on the approaches were altered to 30mph. Further verification in to the affect of the vertical design on to adjoining land is to be determined during the detailed design process.
8. Refer to feasibility report produced August 2018 by Via EM Ltd. for further information on the proposals and the departures from standards required.

KEY

- Proposed Carriageway Areas
- Proposed Footways/Hardstanding Areas
- Proposed Verges

P02	New access provided to No 1 Forest Side and scale bar added	JD	JJP	JJP	18/11/21
P01	First Issue	JD	JJP	JJP	30/09/21
Rev.	Description	Drawn	Ch'kd	Auth	Date

**A614/A6097
CORRIDOR IMPROVEMENTS
OLLERTON ROUNDABOUT**

FOR INFO Project No. HW20949

GENERAL ARRANGEMENT

Scale 1:500@A1	Drawn	AP	Date	20.02.2019
	Ch'kd	AP	Date	20.02.2019
	Auth	JJP	Traced	AP

Drawing No. **20949/GEN/O001/00003** Rev. **P02**

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APPENDIX B – SUPPORTING INFORMATION

Key

- District Boundary
- Base + Committed Stress**
- Under 90%
- 90% - 99%
- 100% and Greater



PRELIMINARY ISSUE

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Rev	Description	Date	Dwn	Chk	App
-	-	-	-	-	-

IDP Review
Newark & Sherwood District Council

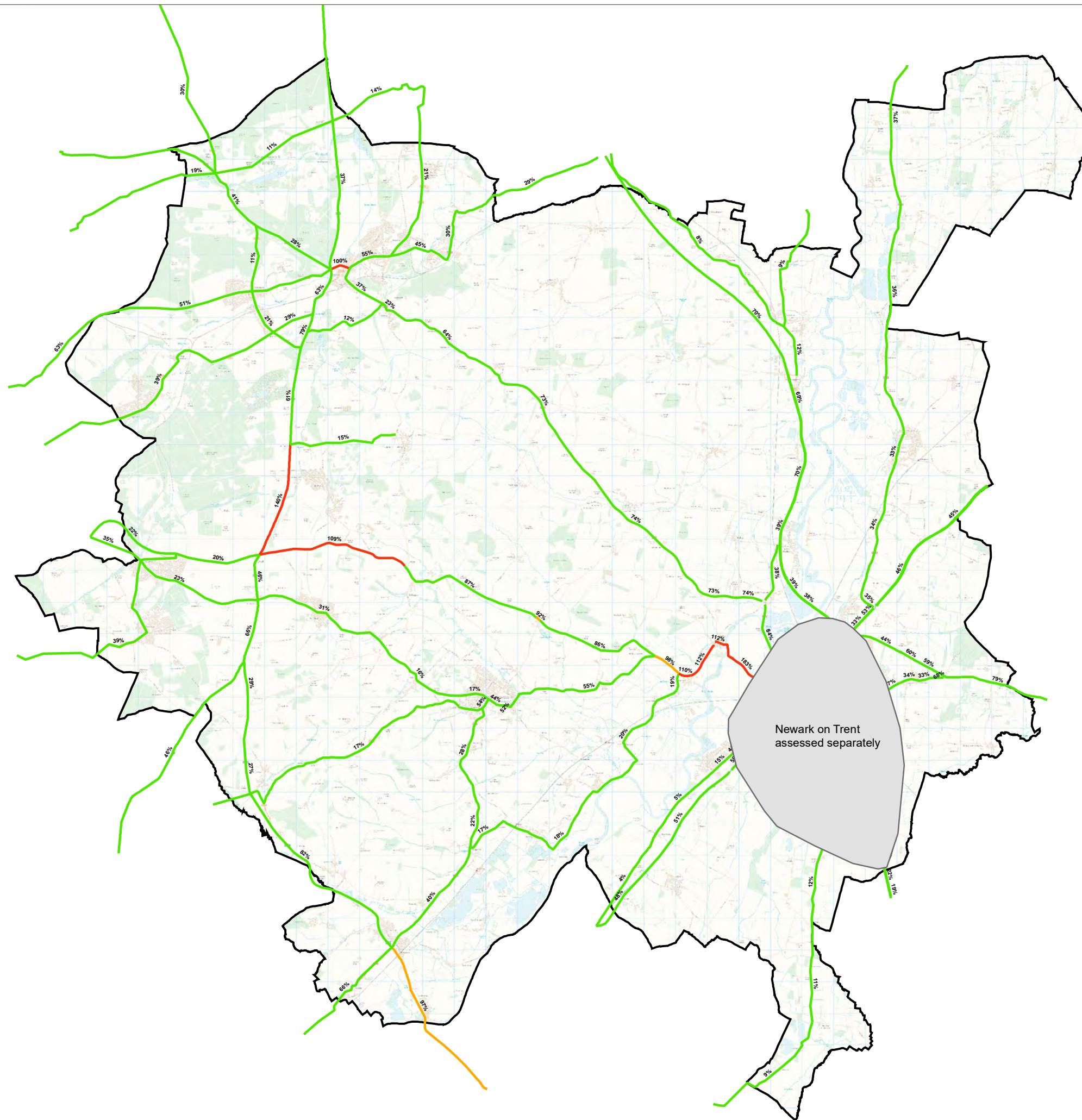
Base + Committed Rural Link Stress 2033 (No A46 Improvement)

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Client Proj No	Origin	Vol/System	Level/Location	Type/Code	Role	Drawing No	Revision	
-	TTE	00	XX	MP	O	001	-	

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Anstey, Leicester, LE7 7GR
Tel: 0116 234 8000

Key

- District Boundary
- Base + Committed + Dev Stress**
- Under 90%
- 90% - 99%
- 100% and Greater



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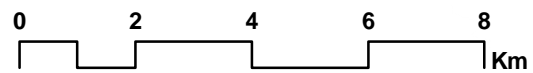
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IDP Review
Newark & Sherwood District Council

Base + Committed + Allocations Rural Link Stress 2033 (No A46 Improvement)

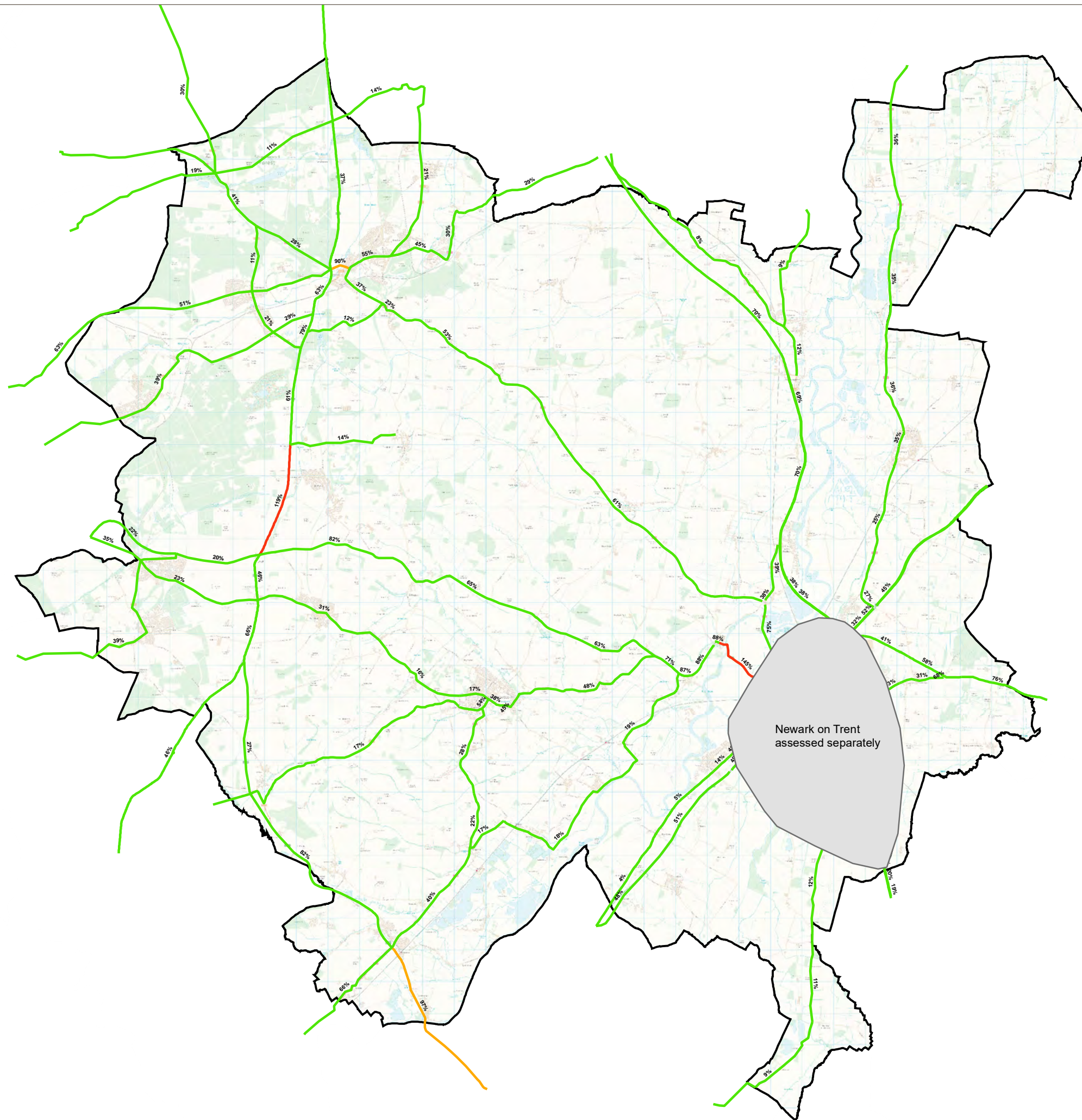
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Anstey, Leicester, LE7 7GR
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Key

- District Boundary
- Base + Committed Stress**
- Under 90%
- 90% - 99%
- 100% and Greater



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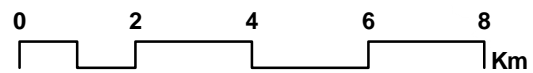
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IDP Review
Newark & Sherwood District Council

**Base + Committed Rural Link Stress 2033
(With A46 Improvement)**

TTE Proj No	Drwn by	Date	Ch'ked by	Date	Appr'd by	Date	Scale @ A3	Suitability
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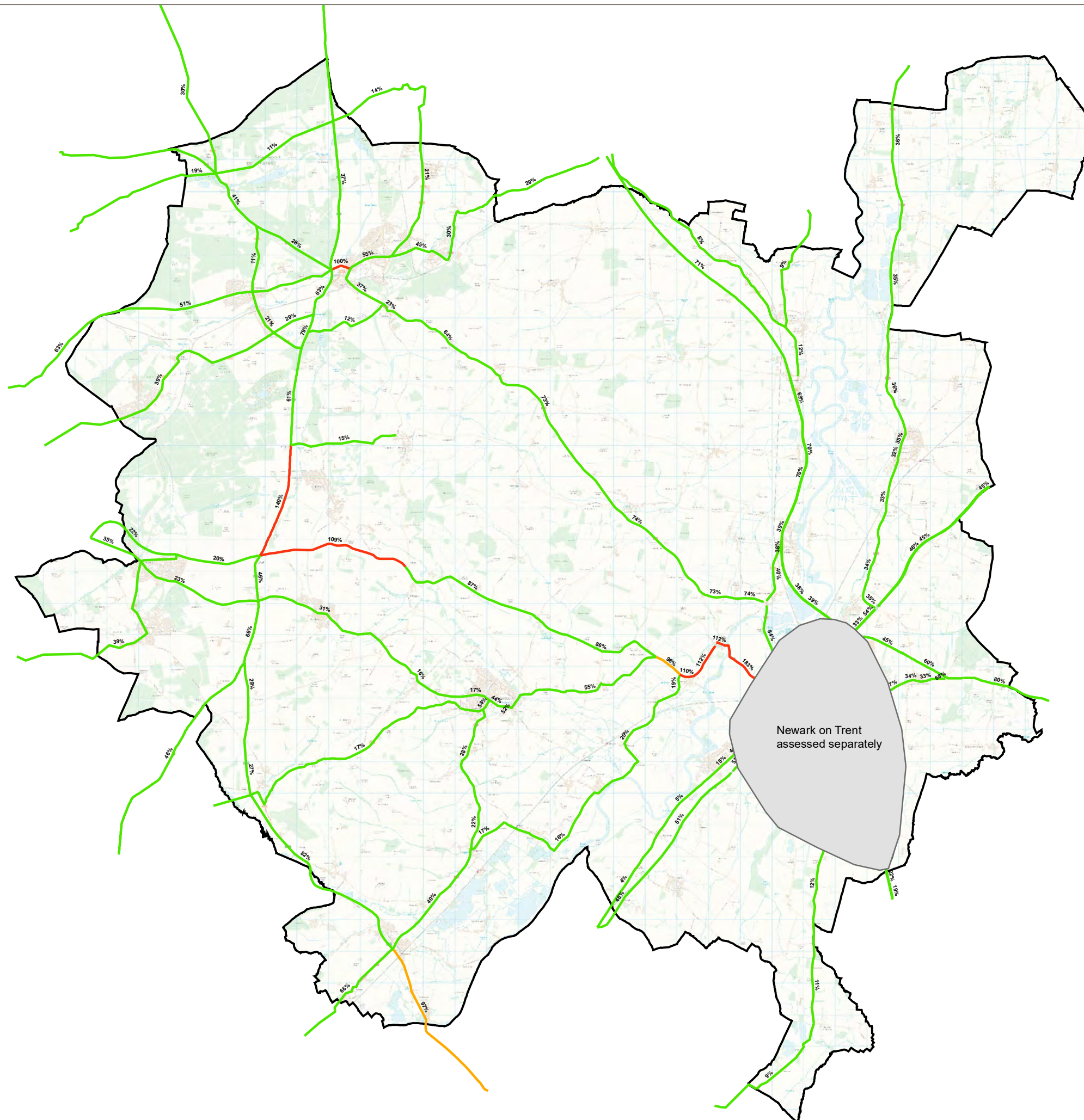
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Anstey, Leicester, LE7 7GR
Tel: 0116 234 8000



C:\Users\JONM\Documents\GIS\Temp\NEED2746-800925\003_BaseComStress_WRA46_2033.mxd

Key

- District Boundary
- Base + Committed + Dev Stress**
- Under 90%
- 90% - 99%
- 100% and Greater



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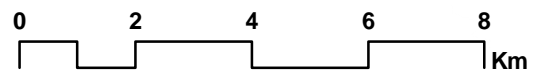
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IDP Review
Newark & Sherwood District Council

**Base + Committed + Allocations Rural Link
Stress 2033
(With A46 Improvement)**

TTE Proj No	Drwn by	Date	Ch'ked by	Date	Appr'd by	Date	Scale @ A3	Suitability
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Client Proj No	Origin	Vol/System	Level/Location	Type/Code	Role	Drawing No	Revision	
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APPENDIX C – HIGHWAY INFRASTRUCTURE SCHEDULE

Anticipated Transport Infrastructure Requirements to 2033

No.	Location	Existing Junction Type	Potential Improvement	Indicative Total Scheme Costs	Comments
Newark on Trent					
1	A1 Overbridge widening, Fernwood	N/A	Widening of A1 Overbridge	£5.2m	Identified as the highest priority highway improvement for CIL funding. The Council is currently liaising with National Highways to commission a detailed design.
2	London Rd, Portland St Junction	Signals	Improved Signal Control	£60,000	The operation of this junction changes to an 'F' LoS in the PM peak hour at the 2033 Forecast Year. An improvement is therefore likely to be required at this location. The junction is constrained on all sides by built development and space to deliver any carriageway widening is very limited. The most likely form of improvement will be providing improved signal control at the existing junction, however consideration is being given as part of the Newark Heritage Action Zone to potential improvements to the junction and townscape around it.
3	Lincoln Rd / Brunel Drive	Signals	Improved Signal Junction Layout - Monitor Operation Post A46 Improvement Opening	£TBC	The operation of this junction changes to an 'F' LoS in the PM peak hour at the 2033 Forecast Year. An improvement is therefore likely to be required at this location. There are wide verges present on Lincoln Road which may enable localised widening on these approaches. However, it is recommended that the junction operation be reviewed following completion of the A46 Improvement scheme as this is expected to improve the operation of the A46 Brownhills roundabout to the north, removing queues that interact with the Lincoln Road / Brunel Drive junction.
4	A616 Great North Rd / Ollerton Rd / Main St / Kelham Ln, South Muskham	Mini Roundabout	Monitor Performance Post A46 Improvement Opening	£TBC	The operation of this junction changes to a 'F' LoS in the PM peak at the 2033 Forecast Year. Providing a meaningful capacity improvement to this 5-arm junction will require third-party land to enable a larger roundabout to be provided and/or the closure or diversion of Kelham Lane to reduce the number of arms, which may then allow a signal controlled crossroads to be provided. Improvement of this junction will therefore be complicated and expensive. However, it is recommended that the junction operation be reviewed following completion of the A46 Improvement scheme as demand for the Great North Road corridor may reduce once the key congestion bottle necks on the A46 are removed. It is therefore recommended that the operation of this junction be monitored post completion of the A46 Improvement to see if forecast conditions materialise.
5	B6166 Lincoln Rd / Northern Rd	Signals	Improved Signal Control	£150,000	The operation of this junction changes to an 'F' LoS in the PM peak hour at the 2033 Forecast Year. An improvement is therefore likely to be required at this location. The junction is constrained on all sides by built development and available space to deliver any carriageway widening is limited. The most likely form of improvement will be providing improved signal control at the existing junction.
6	Beacon Hill Rd / Northern Rd	Signals	Improved Signal Control	£150,000	The operation of this junction changes to an 'F' LoS in the AM and PM peaks at the 2033 Forecast Year. An improvement is therefore likely to be required at this location. The junction is constrained by an adjacent railway bridge and available space to deliver any carriageway widening is limited. The most likely form of improvement will be providing improved signal control at the existing junction.
7	London Rd / Sherwood Ave / Bowbridge Rd	Signals	Improved Signal Control	£150,000	The operation of this junction changes to an 'E' LoS in the AM and PM peak hours at the 2033 Forecast Year. An improvement is therefore likely to be required at this location. The junction was improved by NCC in 2014 to change lane allocations, upgrade the signal control and provide improved pedestrian facilities. The junction is constrained on all sides by built development and there is minimal space available within the highway to deliver any meaningful carriageway widening. The most likely form of improvement will be providing optimised signal control at the existing junction (if possible).
8	Tolney Lane, Newark	Highway Flood Alleviation	Flood alleviation and access resilience works	£5.9m	Improvements to Tolney Lane have been identified separately and comprise works to provide access resilience and property protection during flooding events. The proposed works comprise: <ul style="list-style-type: none"> • Raising Tolney Lane and access into the traveller site. • Provision of a surface water pumping station. • Installation of a bypass channel. • Flood wall between the road and railway embankment. • Creation of a flood storage area.
Rural Areas					
9	A614 / Deerdale Lane Road Junction	Ghost Island Priority Junction	TBC	TBC	Forms part of the DfT funded MRN improvement scheme being promoted by NCC. NCC are currently investigating a lower-cost alternative solution for this junction and details are not yet available.
10	A614 / A616 / A6075 Ollerton Roundabout	Priority Roundabout	Enlarged Priority Roundabout	£7.4m	Forms part of the DfT funded MRN improvement scheme being promoted by NCC.
11	Kelham Bypass	N/A	New bridge over the River Trent and a bypass to the village	£20m	Bypass with a new bridge over the River Trent with a cost of £20m to be funded by CIL and the D2N2 LEP. Partial CIL funding assumed.
12	A6097 / A612 Lowdham Junction	Priority Roundabout	Enlarged Priority Roundabout	£4m	Forms part of the DfT funded MRN improvement scheme being promoted by NCC.
13	A614 / Mickledale Lane Junction	Ghost Island Priority Junction	New roundabout and link road connection to Mickledale Lane	£5.3m	Forms part of the DfT funded MRN improvement scheme being promoted by NCC.