

NCC/TB/1

THE HIGHWAYS ACT 1980

AND

THE ACQUISITION OF LAND ACT 1981

THE NOTTINGHAMSHIRE COUNTY COUNCIL (A614/A6097 JUNCTIONS IMPROVEMENT SCHEME)
(SIDE ROADS) ORDER 2022

THE NOTTINGHAMSHIRE COUNTY COUNCIL (A614/A6097 JUNCTIONS IMPROVEMENT SCHEME)
COMPULSORY PURCHASE ORDER 2022

PROOF OF EVIDENCE

OF

THOMAS BOYLAN, BA (Hons)

OF NOTTINGHAMSHIRE COUNTY COUNCIL

ON BEHALF OF THE ACQUIRING AUTHORITY

SEPTEMBER 2023

1. QUALIFICATIONS AND EXPERIENCE

- 1.1. My name is Thomas Boylan. I hold an Upper Second-Class Honours in Economics (BA Hons) and a Professional Certificate in Highway and Traffic Engineering from Nottingham Trent University.

- 1.2. I am a Principal Officer in Transport Planning for the Transport Programme Delivery, Investment and Growth Team at Nottinghamshire Council ("**NCC**"). I first started working for NCC in 2004 predominantly in transport planning and major project (highways) matters. I have nearly 20 years' experience in the area of transport planning and been involved in highway projects such as the Hucknall Town Centre Improvement Scheme, Mansfield Ashfield Regeneration Route, Mansfield Public Transport Interchange, A612 Gedling Transport Improvement Scheme and Worksop Bus Station.

2. INVOLVEMENT WITH THE SCHEME

- 2.1. My first involvement to the proposals to upgrade Ollerton roundabout was in 2007 when I was involved in the public consultation events for the Ollerton roundabout improvement project. My next involvement in the A614/A6097 Major Road Network ("**MRN**") scheme was in 2018 during the options development phase whilst working for Via East Midlands ("**ViaEM**"). Via EM provides highway services including design, maintenance, environmental management and construction in partnership with NCC and was established in 2016. The company is now wholly owned by NCC. I have worked continuously on this scheme since 2018.

- 2.2. I together with my council colleagues and members of the ViaEM project team have been responsible for the delivery of the Scheme through the Business Case and statutory planning processes.

3. SCOPE OF EVIDENCE

- 3.1. This Proof of Evidence focuses on matters relating to the need for a scheme, economic appraisal and suitability of the Scheme under consideration, for which NCC is seeking to acquire the Order Land compulsorily. My Evidence includes detail on the need for the Scheme, anticipated benefits to be generated by the Scheme and background on the option selection process.

4. NEED FOR THE SCHEME

4.1. Existing network description and conditions

- 4.1.1. Traffic congestion at key intersections along the A614/A6097 is a longstanding issue. Traffic volumes had increased by as much as 10% on certain sections of the A614 between 2014-2019 compounding delays further **[CD14.1]**. The permanent traffic volume monitoring sites on the corridor did show that traffic volumes fell dramatically in 2020 because of Covid 19 but by 2022 traffic flow volumes had nearly returned to 2019 levels and the A6097 traffic counter near Gunthorpe Bridge had actually exceeded pre-Covid numbers.
- 4.1.2. The existing problems and traffic delays experienced by motorists on the corridor are set to worsen considerably with planned and forecast traffic growth **[CD14.2]**.

Figure 1: Vehicle delay per mile (seconds) for AM Peak Hour

Vehicle delay per mile (seconds) for the A614/A6097 corridor during the morning peak (0800-0900) in 2018. Termtime only. Source: Trafficmaster GPS Data

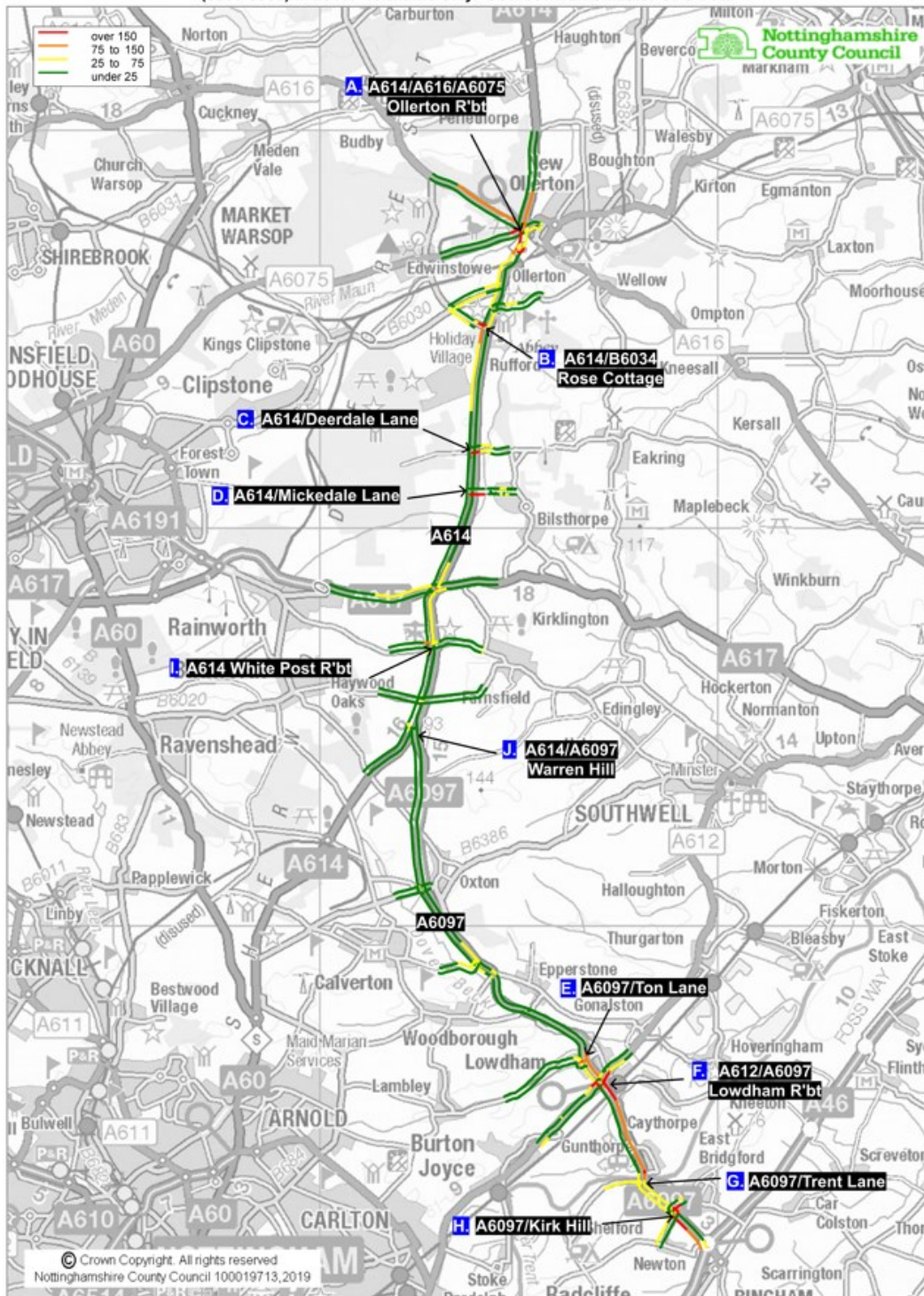
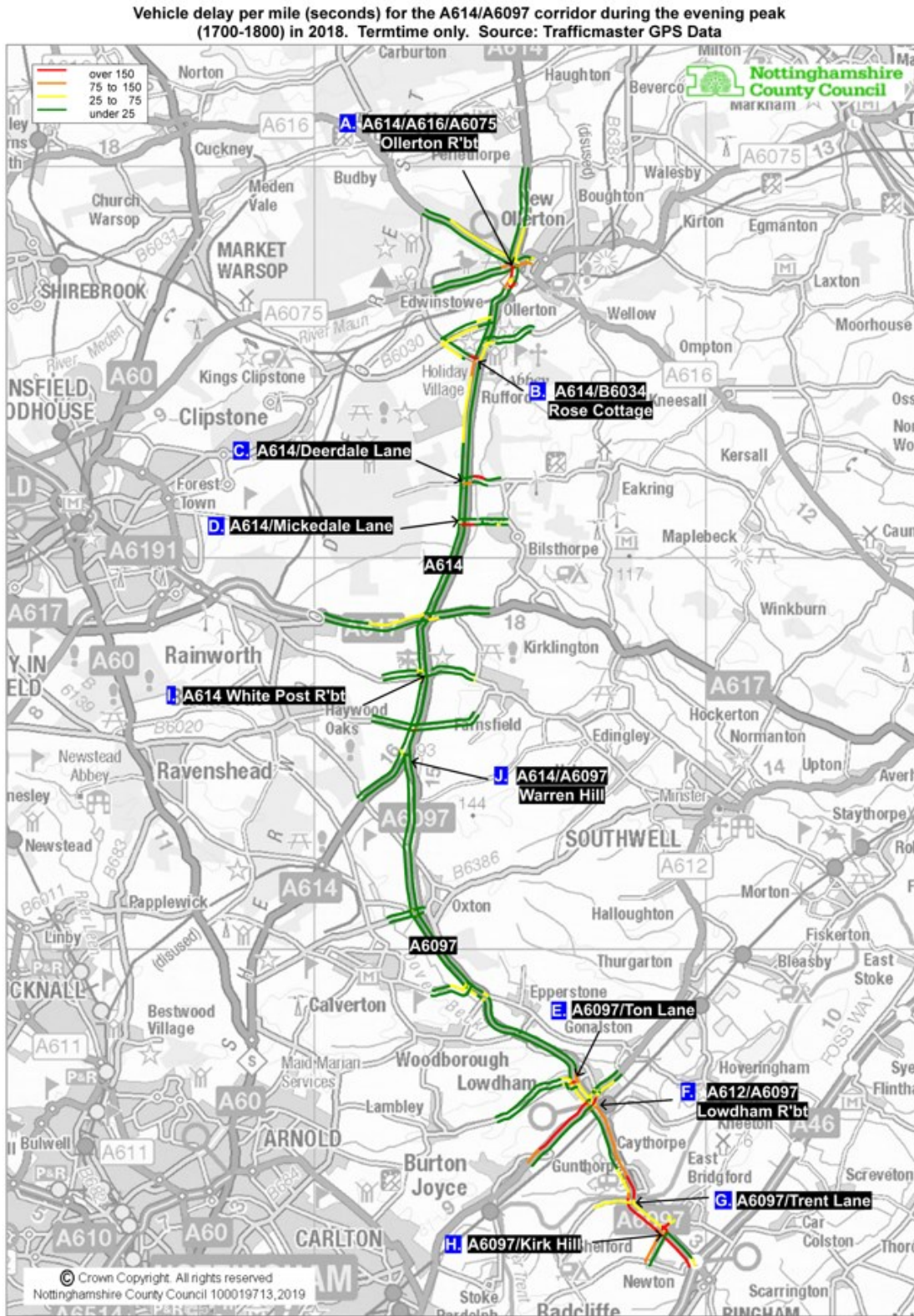


Figure 2: Vehicle delay per mile (seconds) for PM Peak Hour



4.1.3. Journey time delays worsen in the AM and PM peak hours, particularly at the Ollerton Roundabout, Lowdham Roundabout and Kirk Hill junctions as shown in Figures 1 and 2. The junctions do not have sufficient traffic capacity to cater for existing traffic demands and as a result queue lengths and delays are exacerbated at those intersections. The junctions are in rural locations and there is a high dependency of the car in the surrounding villages. The 2011 Census confirmed that 73% of Newark and Sherwood residents are dependent on the motor car and there is a limited public transport offer for those communities living in close proximity to the corridor.

4.1.4. Queue length surveys show significant levels of congestion at the three major junctions as presented in Table 1. The average recorded journey times for vehicles passing through each junction in 2018 are shown in Table 2. The information was obtained from Trafficmaster GPS data and shows the average journey time duration for the AM Peak (07:30 to 09:30), Inter Peak (“IP”) (10am to 12) and the PM peak (16:00 to 18:00). The journey times extracted from Trafficmaster show journey times between two specific reference points which are typically junctions.

Table 1: Queue length observations (2018)

Location	Average queue length (m) - AM Peak	Maximum queue length (m) - AM Peak	Average queue length (m) - PM Peak	Maximum queue length (m) - PM Peak
Ollerton Roundabout – A614 arm (northbound)	119m (approx. 22 vehicles)	250m (45 vehicles)	430m (78 vehicles)	550m (100 vehicles)
Lowdham Roundabout – A612 arm	58m (11 vehicles)	450m (82 vehicles)	994m (181 cars)	1250m (227 vehicles)
Kirk Hill/A6097 – Kirk Hill arm	83m (15 vehicles)	220m (40 vehicles)	111m (20 vehicles)	305m (55 vehicles)

- 4.1.5. The average recorded journey times for vehicles approaching and passing through Ollerton Roundabout for the A614 Old Rufford arm in 2018 show that the PM peak value of two minutes 42 seconds is 94 seconds greater than the IP journey time. The comparison with the IP time period is a useful reference point because the IP time period will often present free-flow traffic conditions. The ongoing congestion issues at Ollerton Roundabout during the peak hour time periods, particularly during the PM peak when vehicles are travelling northbound has had wider consequences with motorists' rat-running on inappropriate local roads such as Station Road through Old Ollerton village to avoid congestion at Ollerton Roundabout.
- 4.1.6. The PM journey times for the A612 arm at Lowdham Roundabout show a significant level of delay for vehicles travelling outbound from Nottingham compared to the IP. The average journey time of five minutes four seconds is two minutes thirty-seven seconds greater than the IP journey time, and this is reflected in the level of queueing at Lowdham Roundabout.
- 4.1.7. The largest delays at the Kirk Hill junction also take place in the PM peak. The average journey time of four minutes 51 seconds is three minutes twenty-two seconds greater than the IP average. The AM difference is one minute seven seconds.

Table 2: Average journey times by time period (2018)

Location	AM Peak	Inter Peak	PM Peak
Ollerton -A614 arm (northbound)	01:52	01:08	02:42
Lowdham – A612 arm *	02:41	02:27	05:04
A6097/Kirk Hill – A6097 (NW bound)	02:36	01:29	04:51

*The Lowdham data is from 2016

- 4.1.8. The Midlands Connect Strategy: Powering the Midlands Engine published March 2017 [CD13.12] aims to make the East and West Midlands an engine for growth for the UK economy. The document outlined plans to invest a further £392 million through the Local Growth Fund, on top of the £1.5 billion Local Growth Fund investments which had previously been announced.
- 4.1.9. Improving connectivity in order to increase productivity is one of the Midland Engine's key objectives. Investment in local transport connections and are designed to address the fragmentation of the Midlands' economy which is fairly dependent on the region's 11 cities (Nottingham being the closest City to the A614/A6097 corridor). The funding is to target poorly connected areas which are not able to fully synergise with the region's productive areas, allowing businesses and people to make the most of their strategic position in the centre of the country. The Midlands Connect Strategy [CD13.12] identifies that in order to achieve ambitions of high-quality end to end journeys, further intervention is required on the local and sub-regional networks too, rather than just the Strategic Road Network ("SRN").
- 4.1.10. The Strategy also identifies that a 'Resiliently Connected' network will encourage productivity and provide a reliable road network; reducing costs to businesses. The Derby, Derbyshire, Nottingham and Nottinghamshire LEP ("D2N2") has lower than average economic productivity when compared to the regional average. The Scheme will reduce travel costs, improve connectivity for local businesses and reduce congestion at key locations on the corridor. Improving transport connectivity could also allow for a greater spill over of skills from highly productive areas to less productive areas as well as allowing for increased trade and specialisation throughout the region.

- 4.1.11. A lack of network resilience is also a problem if the local highway is unable to cope with disruptive events, such as a surge in demand because of incidents elsewhere on the highway network, particularly where traffic diverts from the SRN due to a major incident. The more common the event, the more important it is for the network to be able to recover quickly in order to restore an acceptable level of service.
- 4.1.12. The A614/A6097 MRN corridor is a very important part of the highway network within Nottinghamshire. It sits between the A1 to the east and M1 to the west, providing an alternative north-south route through the County. Part of the route also acts as the designated emergency route for any incident or closure of the nearby A1.
- 4.1.13. Whilst full closures of the A46 and A1 are typically infrequent events, they can be in place for up to 12 hours, significantly worsening congestion along the A614/A6097 MRN corridor. Permanent NCC monitoring traffic count sites were analysed to see how certain sections of the A614/A6097 MRN corridor are affected when there is a major incident on the SRN. For example, the incident that closed the A1 between Tuxford slip road and Markham Moor on 18th July 2018 for nearly five hours resulted in a 42% increase in the 24-hour flow at a permanent counter just north of the Ollerton roundabout (A614 Clumber Park). During the closure 4,640 extra vehicles were diverted towards Ollerton roundabout and the A614 which resulted in the flow increasing from 10,925 (average weekday flow for preceding two weeks at this site) to 15,565. The permanent A614 Center Parcs counter also recorded an increase in traffic by 7%. The flow increased by 1,398 vehicles on the day from 20,797 (average weekday flow preceding two weeks) to 22,195.

4.1.14. This temporary increase in traffic volumes places an enormous strain on a corridor which is already over-capacity at a number of junction locations during 'normal' traffic conditions. The additional volume of trips diverted onto the network results in greater travel delays and increases levels of driver frustration. The inability of the MRN to cope with the diverted traffic is also likely to result in motorists using unsuitable alternative routes such as Station Road, Old Ollerton. Congestion issues at Ollerton roundabout does result in motorists using Station Road, Old Ollerton as an alternative route to the A614 and A616 approaches to the roundabout, despite the road being narrow and traffic calmed. The core route through the village, now called Station Road, Market Square and Main Street, is also part of the Ollerton Conservation Area, retaining its original road layout and dimensions. As such, it is narrow, and many properties are built right up to the footway. A significant number of the houses have no driveway or garage, meaning residents park on-street which in turn narrows the road further.

4.2. **Growth expectations for local and wider area**

4.2.1. According to the Office for National Statistics ("**ONS**"), Newark and Sherwood has approximately 122,000 residents making up around 15% of Nottinghamshire's population [**CD14.3**]. The district's population has grown by 16% since the year 2000, making it the fastest growing district in Nottinghamshire, which has by comparison grown 11.1% over the same time period. Growth across the district is expected to continue to increase and the ONS population statistics forecast an average 7.6% increase in the resident population across the local authorities along the A614/A6097 MRN corridor over the next 10 years, much faster than the 4.4% expected nationally.

4.2.2. The largest population centre along the A614/A6097 MRN corridor is Ollerton with around 10,000 residents. The villages of Lowdham, Bilsthorpe and Farnsfield are also adjacent to the route and

have been identified by Newark and Sherwood District Council as 'Principal Villages' in that they have an important role in the provision of day-to-day services to surrounding areas.

4.2.3. There are a large number of development sites which have planning permission that are close to the A614/A6097 MRN corridor as presented in Table 3. Development has commenced on eight of these sites and there are recent planning permissions in place for the remaining two sites. The Thoresby Colliery and Teal Close developments have planning constraints which are dependent on specific highway improvements to Ollerton Roundabout and Lowdham Roundabout. The Thoresby Colliery site is only 1 mile from Ollerton Roundabout and is accessed directly from the A6075 Ollerton Road. This development is constrained to 608 dwellings and 7.5% of its employment potential until the Ollerton roundabout scheme is implemented. The Council has secured third-party contributions through Section 106 monies and the Harworth Group has paid a financial contribution of £1.198m towards the Ollerton Roundabout Scheme. Likewise, the Teal Close development in Stoke Bardolph (situated just off the A612 Colwick Loop Road and 6km to the south-west of Lowdham Roundabout) is constrained to 325 dwellings until the Lowdham roundabout junction is upgraded. The former air base RAF Newton site has been granted planning permission by Rushcliffe Borough Council and is located just 8 miles from the City of Nottingham. The Decision Notice for the application required improvements to the A6097/Kirk Hill signal-controlled junction. Evidence collected from consultation as part of the Wider Economic Impact Report [CD14.3] also indicated that viability of other projects along the corridor are weakened by congestion which impacts on demand and therefore the sale value of residential properties and employment space.

Table 3: Development sites in near vicinity of A614/A6097 corridor

Development	Planning application reference	No. of dwellings	Employment land	Planning constraints
Petersmith Drive, Ollerton	17/00595	305	N/A	
Thoresby Colliery	16.02173	800	32,375m ²	Yes – linked to Ollerton roundabout
Eakring Road	20/00873	103	N/A	
Kirklington Road	18/00931	136	N/A	
Oldbridge Way	16/01618	113	N/A	
Bingham	10/01962	1,000	55,740m ²	
RAF Newton	10/02105	500	15,800m ²	Kirk Hill junction upgrade required
Calverton	2018/0607	650	N/A	
Teal Close	2013/0546	830	18,000m ²	Yes – linked to Lowdham roundabout
Gedling Colliery	2015/1376	1,050	N/A	

4.2.4. The Newark and Sherwood Core Strategy [CD13.10.2]. presents the more rural western part of the district as suffering from poor transport connectivity despite the A614/A6097 bisecting the area. The strategy states that improvements to the Ollerton Roundabout are required to accommodate any additional growth in the north-west of the district, highlighting how the route is potentially stifling economic development in the area. The Core Strategy (Appendix D) [CD13.10.3] also states that highway infrastructure improvements to junctions such as White Post Roundabout and the Lowdham Roundabout are required in order to facilitate planned growth within the district to the end of the 2033 plan period. Without scheme intervention all five junctions will be over capacity by 2037 (design year assessment for Outline Business Case submission) once factoring in housing development aspirations for the corridor (as shown in Table 4). Junctions with Ratio to Flow Capacity (“RFC”) values above 0.85 are likely to produce

queues which increase slowly. An RFC value greater than 1.0 is more likely to be at capacity which results in delay and large increases in queue lengths. The Practical Reserve Capacity (“**PRC**”) is related to the degree of saturation of a particular traffic signal junction and is calculated by LinSig (the industry standard traffic signal modelling software). A positive PRC indicates that the junction has spare capacity, a negative PRC indicates that the junction is already over capacity and is suffering from traffic congestion.

Table 4: Future Junction capacity forecasts (2037 - AM and PM peak) - without intervention

Junction	AM Peak RFC/PRC	PM Peak RFC/PRC	Summary
A614/A616/A6075 Ollerton Roundabout	1.17	1.20	Over capacity in both peak hour periods.
A614/Mansfield Road White Post Roundabout	0.93	0.99	Over capacity in both peak hour periods.
A614/A6097 Warren Hill Junction	0.85	1.03	Over capacity in PM peak
A6097/A612 Nottingham Road/Southwell Road Lowdham Roundabout	1.0	1.37	Over capacity in both peak hour periods.
A6097/East Bridgford Road Kirk Hill Junction	Signals – Practical Reserve Capacity (PRC) is -37.4	Signals - Practical Reserve Capacity (PRC) is -65.8	Over capacity in both peak hour periods.

4.2.5. The dependent development sites unlocked by the proposed scheme are also of strategic importance for the area and will support a large number of employment opportunities. It is estimated that once fully operational, Thoresby Colliery will support 1,048 gross direct jobs, making a significant economic contribution to the local economy in Newark and Sherwood as well as Nottinghamshire more widely. The scheme will also benefit the development site at Teal Close in the Borough of Gedling which is estimated to support a further 684 gross direct jobs locally.

The matter of job creation is important when levels of deprivation are taken into account. The levels of deprivation experienced across the corridor do vary considerably throughout the different Lower Super Output Areas (“LSOAs”). However, the highest levels of deprivation along the route can be seen in Ollerton where one of the LSOAs is considered within the top 10% most deprived areas in the County. This LSOA is one of only three ranked within the top 10% in Newark and Sherwood.

4.2.6. A number of development sites along the A614/A6097 MRN corridor have planning conditions which restricts the level of development permitted until the Ollerton and Lowdham roundabouts are improved. This is constraining economic growth in the local area. As such, the A614 serves a dual economic function: firstly, it facilitates regular commuter trips and local movements and secondly, it is also an important corridor for the tourist economy which will continue to grow in the future. An example is that White Post Farm and Wheelgate Family Theme Park are both accessed from the White Post Farm junction. The proposed improvements that consist of the Scheme therefore seek to continue the strategic development of the corridor to both accommodate and facilitate economic growth.

4.2.7. The Growth Plan 2022 [CD12.26] makes growth the government’s central economic mission, setting a target of reaching 2.5% trend rate. Sustainable growth will lead to higher wages, greater opportunities and provide sustainable funding for public services. The A614/A6097 corridor scheme was named in Annex B: Infrastructure Projects of the Growth Plan [CD12.26] which listed all infrastructure projects “which will be accelerated as fast as possible, aiming to get the vast majority starting construction by the end of 2023. These projects may benefit from acceleration

through planning reform, regulatory reform, improved processes or other options to speed up their development and construction, including through development consent processes”.

4.3. **Scheme development**

4.3.1. In line with best practice contained within the Department for Transport’s Transport Analysis Guidance (“TAG”), [CD12.16], the Council, as Acquiring Authority, has considered a broad range of options to help reduce congestion and support economic development in the area. During workshops held in 2017 and 2018, a number of interventions were considered that, if delivered, would achieve the aims of the Scheme.

4.3.2. In assessing the need for intervention, an analysis of the current and future anticipated problems along the corridor has been considered alongside an assessment of the underlying causes. The assessment was informed by TAG and focused on an objective-led option sifting process to develop an options long list, a sift to produce a short list, and then finally to be in a position to select a preferred option. A substantial amount of work has previously been carried out in identifying the key issues along the corridor, which mainly focused on reducing congestion at junctions. Newark and Sherwood District Council commissioned a district wide transport study in 2010 which was part of the evidence base to support their Local Plan. This study was undertaken by transport consultants, White Young Green in collaboration with NCC and established the base line conditions district wide, but also included detailed consideration of the current and future predicted performance of both the A614 and A6097. Traffic congestion plots and stress maps were produced and these informed recommendations for capacity improvements at a series of junction along the A614/A6097 MRN corridor.

4.3.3. Targeting junctions that were already over capacity, and potentially restricting economic growth or demonstrating a poor record of road safety, a total of 12 potential interventions were identified as set out below in Table 5:

Table 5: Identified intervention options

Intervention 1	Continuation of Dual Carriageway from A6097 Epperstone By-Pass to Ollerton roundabout
Intervention 2	Ollerton roundabout Capacity Improvement
Intervention 3	Ollerton By-Pass
Intervention 4	Rose Cottage Capacity Improvement
Intervention 5	Deerdale Lane, Bilsthorpe Junction Upgrade
Intervention 6	Mickledale Lane, Bilsthorpe Junction Upgrade
Intervention 7	White Post roundabout Capacity Improvement
Intervention 8	Warren Hill Junction Upgrade
Intervention 9	Ton Lane, Epperstone By-Pass Capacity Improvement
Intervention 10	Lowdham roundabout Capacity Improvement
Intervention 11	Gunthorpe Bridge Dual Carriageway
Intervention 12	Kirk Hill, East Bridgford Capacity Improvement

4.3.4. Schemes were grouped together resulting in a total of four different packages as shown in Table 6. Boxes shaded grey show those interventions that formed part of a specific package as summarised:

- Package 1 Dual carriageway from Epperstone By-Pass to Ollerton and junction upgrades (intervention1, 2 and 4 to 12).
- Package 2 Ollerton By-Pass (Intervention 3 only)
- Package 3 Upgrade between Ollerton and Lowdham roundabouts only (Intervention 2 and Interventions 4 to 10 only).
- Package 4 Package 3 minus Rose Cottage and Ton Lane junctions.

4.3.5. The combinations were entered into the Early Assessment and Sifting Tool (“**EAST**”). EAST is a decision support tool that has been developed by the Department for Transport (“**DfT**”) to quickly summarise and present evidence on options in a clear and consistent format. It provides decision

makers with relevant, high-level information to help them form an early view of how options perform and compare.

Table 6: Composition of Junction Packages 1 to 4

	1	2	3	4	5	6	7	8	9	10	11	12
Package 1	■	■		■	■	■	■	■	■	■	■	■
Package 2			■									
Package 3		■		■	■	■	■	■	■	■		
Package 4		■			■	■	■	■		■		

4.3.6. The Kirk Hill junction (Intervention 12) was originally omitted from consideration because there were already proposed Section 278 works scheduled to improve the junction as part of the RAF Newton development. The subsequent junction modelling analysis indicated that the proposal put forward by the developer was not sufficient and would not provide the level of capacity improvements required to meet the forecast traffic demand from the development site. The existing problems at this junction and need for intervention at this junction were reinforced by comments made at the Lowdham public consultation events held in August 2019. In response, an improvement to the Kirk Hill traffic signal-controlled junction was subsequently added as a new package and became Package 5 (Table 7).

- Package 5 Package 4 plus upgrade to Kirk Hill junction

Table 7 : Composition of Junction Packages 1 to 5

	1	2	3	4	5	6	7	8	9	10	11	12
Package 1	■	■		■	■	■	■	■	■	■	■	■
Package 2			■									
Package 3		■		■	■	■	■	■	■	■		
Package 4		■			■	■	■	■		■		
Package 5		■			■	■	■	■		■		■

4.3.7. As the project progressed and preliminary design work was underway it became evident that a design solution for the Deerdale Lane junction as part of the Scheme was unaffordable because of the likely utility diversion costs as a result of the construction works. The costs were

disproportionally expensive to construct and had a detrimental impact on the Benefit Cost Ratio (“BCR”) for the overall works package. As a result, the proposed Deerdale Lane scheme was dropped as a potential option and this resulted in the creation of Package 6. Senior Management at NCC informed the DfT about the decision and need to remove the Deerdale Lane junction from the OBC bidding document in October 2020 prior to the December 2020 submission.

- Package 6 Package 5 minus the Deerdale Lane Junction improvement scheme

Table 8: Composition of Junction Packages 1 to 6

	1	2	3	4	5	6	7	8	9	10	11	12
Package 1	■	■	■	■	■	■	■	■	■	■	■	■
Package 2	■	■	■	■	■	■	■	■	■	■	■	■
Package 3	■	■	■	■	■	■	■	■	■	■	■	■
Package 4	■	■	■	■	■	■	■	■	■	■	■	■
Package 5	■	■	■	■	■	■	■	■	■	■	■	■
Package 6	■	■	■	■	■	■	■	■	■	■	■	■

4.3.8. Consideration was also given to low-cost demand management and traffic management solutions such as speed limit changes to increase and decrease the speed limit from the existing 50mph speed limit.

- Low cost Option A – **Renamed Package 7** – Increase speed limit on A614/A6097 to 60mph.
- Low cost Option B – **Renamed Package 8** – Reduce speed limit on A614/A6097 to 40 mph.

4.3.9. Early discussions also took place with the County Council’s public transport team to seek feedback on whether there was an obvious public transport solution.

4.3.10. The A614 corridor is served by the Sherwood Arrow service which has an hourly frequency from Ollerton to Nottingham. The route passes through Redhill, Farnsfield, Bilsthorpe, Rufford Country Park, Sherwood Forest and Ollerton. The route takes approximately 65 minutes to travel from Ollerton to Nottingham in the AM peak and 77 minutes in the PM peak. The journey times in the other direction (Nottingham to Ollerton) are 71 minutes in the AM peak and 67 minutes in the PM peak. Increasing the frequency of the service by subsidising the route during the peak time periods was unlikely to result in any noticeable shift in modal share because the journey length would still not compare favourably with car travel. A more direct express service (say from Ollerton to Nottingham only) was also dismissed because the existing service is mainly used by passengers to get to the other villages along the corridor. Unfortunately, there were no viable or feasible public transport solutions that could significantly improve travel conditions along the A614 corridor whilst also being financially sustainable in the long term. The overall conclusion at this stage was that the provision of standalone non-car options would be unlikely to deliver any meaningful benefit to the A614/A6097 corridor. However, by delivering a package of junction improvements along the corridor this would improve journey time and reliability for public transport users.

4.3.11. Following the initial EAST assessment, the package options were assigned a simplistic RAG score (Red, Amber and Green) against the following key categories:

- Whether the Scheme/Package meets overall objectives;
- Whether the Scheme/Package fits with local, regional and national strategies;
- Likely impact on the environment;
- Whether the Package is financially affordable;
- Likely acceptability to stakeholders; and

- Whether the Package is likely to deliver economic benefits.

Table 9: RAG scoring summary for Packages 1 to 8

	Meets scheme objectives	Strategies	Environmental impacts	Financially affordable	Stakeholder acceptability	Economic Benefits
Package 1	Green	Green	Red	Red	Yellow	Green
Package 2	Yellow	Yellow	Red	Yellow	Yellow	Green
Package 3	Green	Green	Red	Red	Yellow	Yellow
Package 4	Green	Green	Yellow	Green	Green	Yellow
Package 5	Green	Green	Yellow	Red	Yellow	Yellow
Package 6	Green	Green	Yellow	Green	Yellow	Green
Package 7	Green	Green	Green	Green	Yellow	Red
Package 8	Red	Red	Green	Green	Red	Green

4.3.12. Another crucial part of the design selection process involved the drawing up of a potential list of options (longlist) at each junction and this was discussed at another project team workshop involving staff from ViaEM, AECOM and NCC. DfT guidance provides a template on how a broad range of potential options should be considered in order to ensure that the most appropriate solution to a problem is pursued.

Table 10: Maxtrix of Scheme Options

	Existing Control			Link Options
	Priority	Signals	Roundabout	
Options Considered	Widen minor arm	Review signal timings	Increase entry widths	Provide additional lanes
	Provide right-turn harbourage	Review stage arrangement	Increase circulating carriageway	Accept congestion & prioritise users (i.e. public transport priority)
	Ban Movements	Stagger pedestrian provision / Consider on-crossing detection	Provide segregated traffic lanes	Improve pedestrian / cyclist provision
	Change priority	Ban Movements	Signalise roundabout	Provide Bypass
	Convert to signals	Extend flares ¹	Replace with signalled junction	Review speed limit
	Convert to roundabout / mini-roundabout	Provide additional lanes	Accept congestion & prioritise users (i.e. public transport priority)	Road Closures (with diversions)
	Improve pedestrian / cyclist provision	Accept congestion & prioritise users (i.e. public transport priority)		Grade Separation
	Accept congestion & prioritise users (i.e. public transport priority)	Convert to roundabout / mini-roundabout		
		Provide segregated traffic lanes		
	A "flare" is a short additional lane on the approach to a junction.			

4.3.13. Table 11 presents the various options that were dismissed outright or proceeded to a second EAST review. A wide range of options were considered at each location including traffic signals, roundabouts, road closures and even by-passes where applicable. Preliminary designs were produced where feasible and junction modelling software such as PICADY, ARCADY and LINSIG were used to assess the overall junction performance and this optioneering is covered in further detail in section 6.

Table 11: Longlist of potential Scheme options for the A614/A6097 works package.

No	Name	Description	Comments	Verdict
1a	Ollerton - grade separated junction	Grade separation to segregate conflicting movements	Expensive and large adverse impact on environment	DISMISS
1b	Ollerton Bypass	New route corridor to bypass Ollerton and remove trips from Ollerton village	Large adverse impact on environment and too much third party land.	DISMISS
1c	Enlarged conventional Roundabout	Enlargement - previously assessed in 2007	Feasible to engineer within site constraints, within available budget, expected increase in capacity.	PROCEED TO EAST 2
1d	Ollerton - Signals	Signalise junction - considered in 2007	Feasible to engineer within site constraints, within available budget, expected increase in capacity.	PROCEED TO EAST 2
2a	Deerdale Lane - Signals	2+1 option, smaller scheme footprint	Feasible to engineer within site constraints, within available budget, expected increase in capacity.	PROCEED TO EAST 2
2b	Deerdale Lane - Signals	2+2 option	Feasible to engineer within site constraints, within available budget, expected increase in capacity.	PROCEED TO EAST 2
2c	Deerdale Lane - Roundabout	4 arm roundabout	Feasible to engineer with some land take, expected increase in capacity.	PROCEED TO EAST 2
2d	Reduce speed limit on A614	Reduction in Speed Limit	speed limit along route reduced to 50mph in 2012	DISMISS
2e	Close Deerdale Lane	Close Deerdale Lane junction with A614. Traffic to reassign to alternative routes.	Large detours. Unlikely to be accepted by Stakeholders - closure of Deerdale Lane will see increase of HGVs through Bilsthorpe residential areas.	DISMISS
2f	Single lane dualling	Increase capacity of A614 mainline	Unfeasible without significant land take	DISMISS
2g	Electronic Warning System	Advance warning of turning traffic	No capacity improvement	DISMISS
3a	Mickledale Lane - Signals	2+1 option, smaller scheme footprint	Feasible to engineer within site constraints, within available budget, expected increase in capacity.	PROCEED TO EAST 2
3b	Mickledale Lane - Signals	2+2 option	Feasible to engineer within site constraints, within available budget, expected increase in capacity.	PROCEED TO EAST 2
3c	Mickledale Lane - Roundabout	4 arm roundabout	Feasible to engineer within site constraints, with some land take including residential property & expected increase in capacity.	PROCEED TO EAST 2
3d	Physical Islands	Right turn harbourage bays on A614	Old style engineering- dismissed on road safety grounds	DISMISS
3e	Staggered junctions	Realign Mickledale Lane and Inkersall Lane to staggered configuration	Large expense with minimal benefits to side road	DISMISS
3f	Reduce speed limit on A614	Reduction in Speed Limit	speed limit along route reduced to 50mph in 2012	DISMISS
3g	Close Mickledale Lane	Close Mickledale Lane junction with A614. Traffic to reassign to alternative routes.	Large detours. Unlikely to be accepted by Stakeholders.	DISMISS
3h	Single lane dualling	Increase capacity of A614 mainline	Unfeasible without significant land take	DISMISS
3i	Electronic Warning System	Advance warning of turning traffic	No capacity improvement	DISMISS
4a	White Post - capacity improvements	Widen entry lanes	Feasible to engineer with some land take, expected increase in capacity.	PROCEED TO EAST 2
4b	White Post - Signals	Signalise all arms	Feasible to engineer with some land take.	PROCEED TO EAST 2
4c	White Post - assess only, 3 arm	Close entry to junction from Mansfield	Large detours. Unlikely to be accepted by Stakeholders. Need to maintain access to businesses.	PROCEED TO EAST 2
4d	White Post - road safety	Anti-skid resurfacing and maintenance	Current road anti-skid surface in poor condition.	PROCEED TO EAST 2
5a	Warren Hill - Signals	A614 priority 3 arm traffic signal controlled junction	Feasible to engineer with minimal land take, removes unusual gyratory of existing layout.	PROCEED TO EAST 2
5b	Warren Hill - Roundabout	Conventional 3 arm roundabout	Feasible to engineer with minimal land take, removes unusual gyratory of existing layout.	PROCEED TO EAST 2
5c	Warren Hill - Signalise existing layout	Add traffic signals to existing layout	Low cost option, existing geometry unsuitable for traffic signals.	DISMISS
5d	Warren Hill - T junction	Major realignment to convert to a traditional priority junction.	Major works for limited capacity increase. Large journey time disbenefits expected.	PROCEED TO EAST 2
6a	Lowdham - enlarged Roundabout	Enlarged conventional roundabout with widened approaches.	Feasible to engineer with some land take, expected increase in capacity.	PROCEED TO EAST 2
6b	Lowdham - Signals	Signalisation of all 4 arms. Increased pedestrian provision	Feasible to engineer with some land take, expected increase in capacity.	DISMISS
6c	Lowdham grade separated junction	Grade separation to segregate conflicting movements	Expensive and large adverse impact on environment. Requires third party land.	DISMISS
7a	Kirk Hill - Widening	Localised widening of existing signal controlled junction.	Feasible to engineer and will increase capacity significantly/	PROCEED TO EAST 2
7b	Kirk Hill - Widening + realignment of Kirk Hill	Localised widening of existing signal controlled junction plus realignment of Kirk Hill link to conform to current design standards.	This option is unlikely to be accepted by Stakeholders, significant amount of third party land to be acquired. Further investigation required.	PROCEED TO EAST 2

* Kirk Hill assessment was completed at a different time to schemes 1 to 6. Inserted here for completeness.

4.3.14. The Addendum to the Statement of Case and Evidence provided by Joelle Davis [NCC/JD/1] outlines the reasons for the final change to the junction package which resulted in the removal of the Mickledale Lane scheme on cost and viability grounds.

4.4. **Equality, Diversity and Inclusion statement**

4.4.1. An Equalities Impact Assessment (“EqIA”) has been carried out for the A614 / A6097 MRN scheme as highlighted in [CD4.10]. This considered the impact of the proposed works on those with protected characteristics in accordance with the Public Sector Equality Duty, set out in the Equality Act 2010. Furthermore, the EqIA assessment considered that the scheme should provide a range of positive benefits for those with protected characteristics related to age, disability and gender. Improved journey times will make it easier to reach job, education and training opportunities, and healthcare facilities. Improvements to road surfacing, lighting, signage, crossing facilities, and reductions in speed limits in some areas will improve road safety for all users and increase mobility and accessibility for those who are less mobile. No negative impacts on users with protected characteristics were identified.

5. **BENEFITS OF THE SCHEME**

5.1. The anticipated benefits deriving from the A614/A6097 Scheme are set out in the accompanying Addendum for this proof [NCC/TB/3].

6. **ALTERNATIVES TO THE SCHEME**

6.1. A variety of different junction layouts were considered at each of the five locations during the option appraisal phase.

Ollerton Roundabout

6.1.1. Two options were considered in detail for Ollerton Roundabout – use of Traffic Signals (Figure 3) and an enlarged conventional roundabout solution. The junction modelling software predicted that significant journey time benefits would be generated compared to the existing situation, but Traffic Signals had a much bigger overall footprint which in turn would require more third-party land. This larger footprint also had a negative impact on environmental considerations such as ecology, air quality, noise and the landscape. The signals layout had a significant impact on the Site of Special Scientific Interest (“SSSI”) that is located in the north-west corner of the junction and it was highly likely that an objection would be raised by Natural England at the planning application stage if this option was pursued. As a result, the enlarged conventional roundabout option was the preferred option.

Figure 3: Traffic Signals option for Ollerton Roundabout



White Post Roundabout

- 6.1.2. Four options were initially considered at the EAST stage for the junction. The first arrangement to be considered was the widening of entry lanes on the A614 approaches but space was extremely limited and it would require third party land that would impact on the operations of the businesses located immediately adjacent to the public highway. This would be prohibitively expensive and objections to the scheme were considered likely so was dismissed as a feasible option at a very early stage.
- 6.1.3. The second option to be investigated was Traffic Signals (Figure 4) but the traffic modelling predicted significant delays on the A614 Old Rufford Road arms and signals were deemed not necessary.

Figure 4: Traffic Signals option for White Post Roundabout



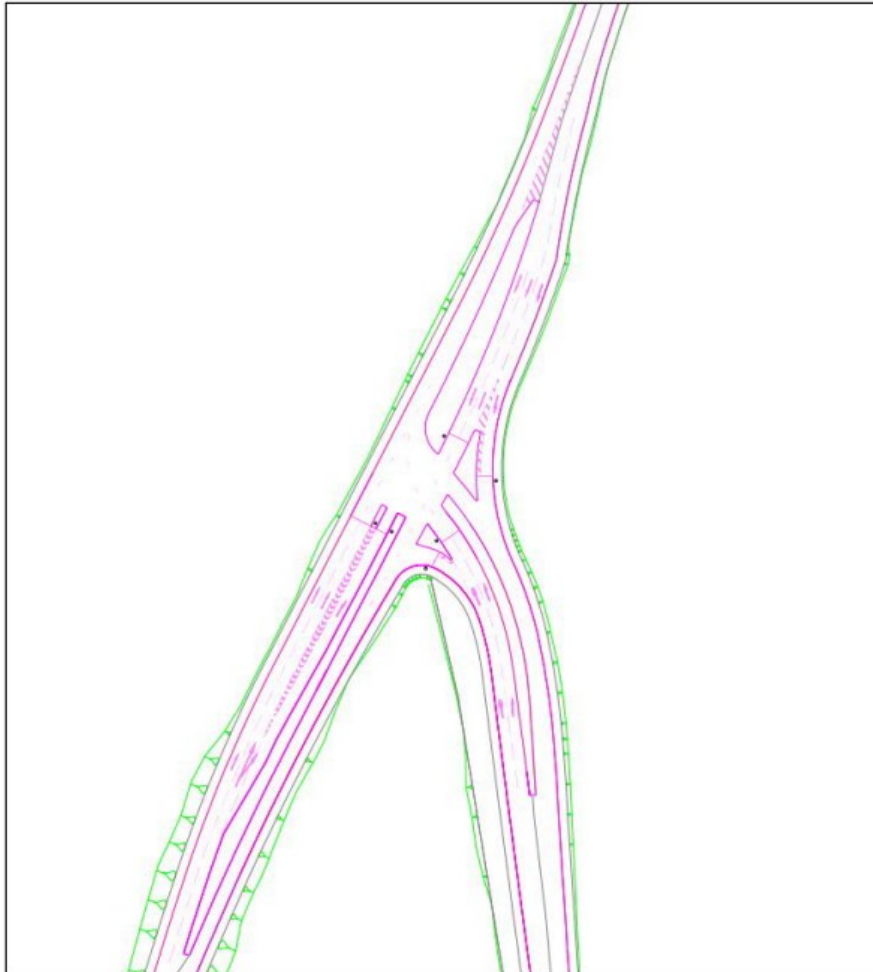
6.1.4. The third option to be considered restricted access on the Mansfield Road arm (west of the junction) so the junction mainly functioned as a 3-arm roundabout, but this was dismissed on public acceptability grounds. The detours involved for those residents living in Rainworth and beyond would generate a significant number of objections if a Traffic Regulation Order (“TRO”) was progressed to prohibit vehicular movements on this arm.

6.1.5. The fourth option to be considered focused on anti-skid road surfacing and maintenance improvements to the four junction approaches. Following careful consideration of the options to improve this junction it became clear that the availability of land to permit a meaningful improvement scheme was severely limited due to the level of development on all four corners of the junction. It was decided that in order to ensure network resilience and ensure that the junction performs as effectively and safely as possible that the junction would be improved in situ and within the existing constraints (i.e., all within the public highway). The modest alterations will ensure the junction remains fit for purpose and provides consistency of junction standards along the A614/A6097 MRN corridor.

Warren Hill

6.1.6. Four options were also considered at the A614/A6097 Warren Hill junction. Traffic signals (Figure 5) were tested at this location, but the junction modelling work showed that the junction was predicted to perform poorly in the AM peak hour period and result in large volumes of queueing and journey time delays. This in turn would have a negative impact on the BCR for the overall Scheme package if pursued so was dismissed on those grounds.

Figure 5 – Traffic Signals option for Warren Hill junction



6.1.7. The construction of a conventional roundabout option (Figure 6) was also considered, and this layout required minimal third-party land as the majority of the design could fit within the existing highway boundary. However, this option was considerably more expensive than the other alternatives and it was felt that the business case funding for the overall package would be better off being spent on the A6097/Kirk Hill junction at East Bridgford instead. Option 3 proposed to create a T junction but was expected to cause large journey time disbenefits. The preferred option for the A614/A6097 Warren Hill junction is another low cost but cost-effective option that will simplify the operation of the junction by extending the merge lane resulting in a reduction in the number of conflicting movements at this junction.

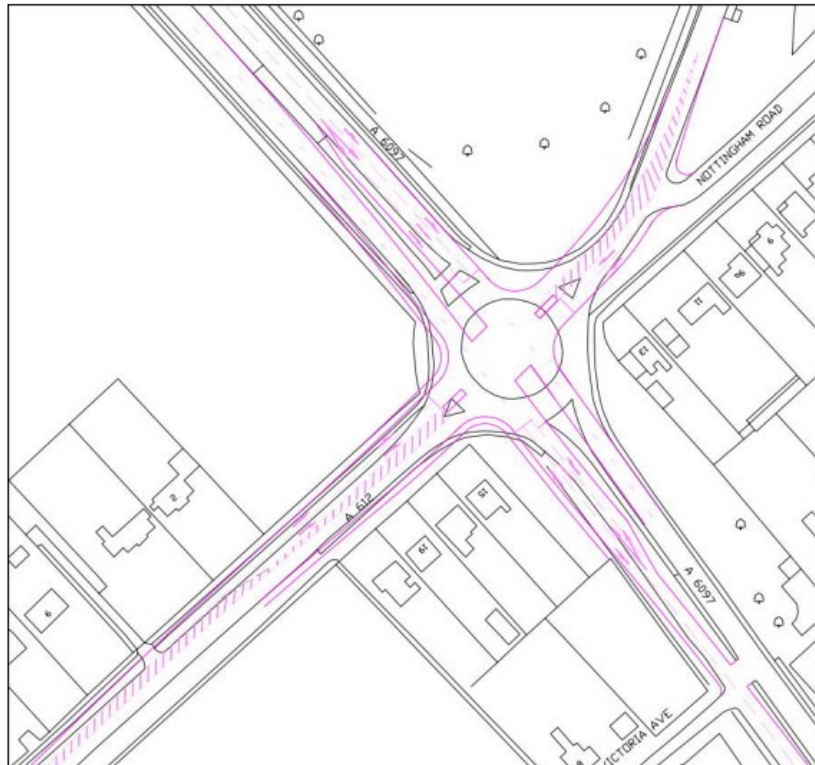
Figure 6: Conventional Roundabout option for Warren Hill junction



Lowdham Roundabout

6.1.8. The options considered at Lowdham Roundabout included an enlarged conventional roundabout and traffic signals. The modelling for the signalised option (Figure 7) predicted significant time delays and forecast to be over capacity in the design year for both peak hour time periods so was dismissed as a feasible option.

Figure 7: Initial Traffic Signals design option for Lowdham Roundabout



6.1.9. The first conventional roundabout (Figure 8) layout to be considered was exhibited at the public consultation events held in Lowdham back in August 2019. The scheme enlarged the roundabout to an ICD of 65m and the proposed circulatory was two lanes wide to cater for side-by-side movements of all vehicles around the circulatory of the roundabout. Unfortunately, the scheme required the removal of a large number of trees in the amenity area adjacent to the roundabout and also impacted the existing flood defences for the village so was not well received at the public consultation events. In response, NCC pledged to look at the conventional roundabout enlargement proposal again to see if a design could avoid the amenity area altogether.

6.1.10. The revised design option (Figure 8) proposed an elliptical roundabout which still delivered significant journey time benefits and had a far less environmental impact because it did not encroach on the amenity area nor impact on the existing flood defences.

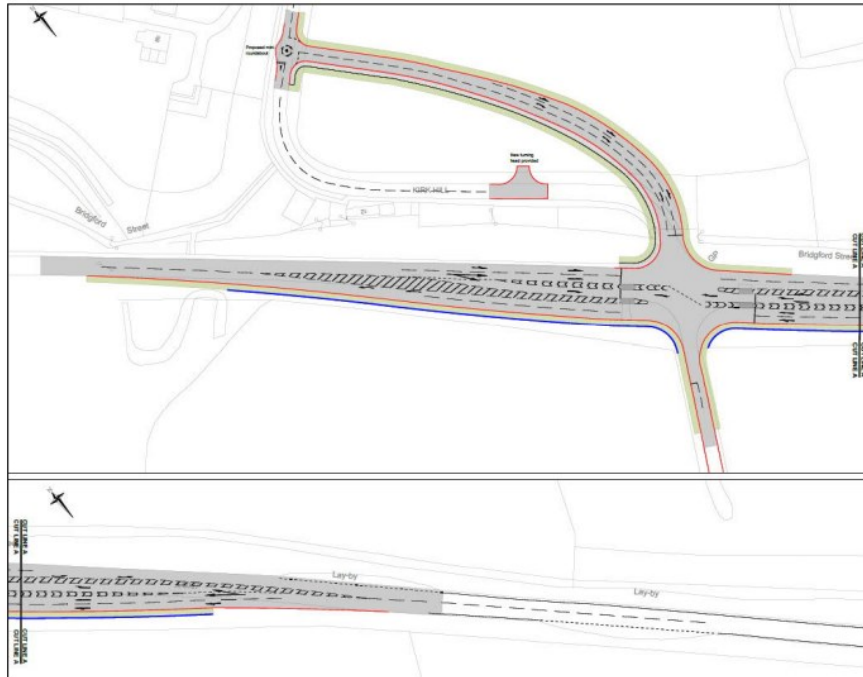
Figure 8: Enlarged conventional roundabout option at Lowdham Roundabout



Kirk Hill

6.1.11. The two options considered for the A6097/Kirk Hill junction retained the traffic signals at the existing junction but differed in their approach to the Kirk Hill arm itself. The first option (Figure 9) included localised widening on the A6097 junction to provide separate right turn lanes into Kirk Hill and East Bridgford Road. The second option also widened the junction itself to improve capacity but also altered the alignment of the Kirk Hill arm by way of a new road. This option cost significantly more and required significant amounts of third-party land to deliver so was dismissed on cost and deliverability grounds.

Figure 9: Traffic Signals at Kirk Hill junction with new link road alignment.



7. SUMMARY

7.1. I am satisfied that there is a strong need to deliver the Scheme, and this is reflected in the level of public support for the project in general. The Scheme has a strong economic business case as reflected in the BCR of 2.41 that has been calculated for the junction package. The project team have considered a wide range of options during the optioneering phase, and the chosen designs will help reduce congestion, support economic development in the local area, reduce journey times and improve network resilience.

8. STATEMENT OF TRUTH

8.1. I confirm that I am able to give evidence in light of my relevant experience as summarised above. I can confirm that the evidence I prepared is in accordance with the guidance of my professional institution and that the opinions given are my true professional opinions.

Date: 4 September 2023