Retford Transport Assessment

Bassetlaw District Council
July 2022

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REPORT CONTROL

Project:	Retford Transport Assessment
Client:	Bassetlaw District Council
Job Number:	B023665
File Origin:	N:\Projects\B023665 - Ordsall, Retford\09 - Reports\Transport Assessment\01 - Text\B023665 Ordsall Retford Transport Assessment 11th July 2022.docx

Document Checking:

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Issue	Date	Status	Checked for Issue
1	31/05/2022	Final	ASG
2	11/07/2022	Revised Final to address NCC Comments	ASG
3			
4			
5			

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1 INTRODUCTION

1.1 BACKGROUND

1.1.1 Tetra Tech has been appointed by Bassetlaw District Council (BDC) to prepare a Transport Assessment document (TA) to assess the impact of housing growth identified in the latest version of the Draft Local Plan for Bassetlaw which was published for consultation in November 2020. The following sites are considered in this report as shown in **Figure 1**:

- HS7 Trinity Farm, Retford – 244 dwellings
- HS8 Milnercroft, Retford – 5 dwellings
- HS9 Former Elizabethan School, Retford – 46 dwellings
- HS10 St. Michael's View, Hallcroft Road, Retford – 20 dwellings
- HS11 Fairy Grove, Grove Road, Retford – 61 dwellings
- HS12 Station Road, Retford – 5 dwellings
- HS13 Ordsall, Retford – 930 dwellings (note that an additional 320 dwellings are assessed as part of a sensitivity test)

1.1.2 As indicated above, Site HS13 is the largest of the seven sites and therefore forms the focus of this report. It should be noted that the draft allocation is for approximately 890 dwellings. Nevertheless, as advised by BDC this report assesses a development of 930 dwellings plus a sensitivity test with an additional 320 dwellings (a total of 1,250 dwellings) to understand the potential for the site to accommodate more growth than the minimum.

1.1.3 The location of Site HS13 is shown in **Figure 2** and the site boundary is included in Appendix A~~Appendix A~~. Trip generation from all the above sites has been considered in this report. In addition, trip generation from the Apleyhead and Peaks Hill Farm major allocations have also been included.

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1.1.4 The findings of this report will be used to help inform BDC on transport and highway matters relating to Local Plan growth.

1.1.5 The highway network near the site is maintained by Nottinghamshire County Council (NCC) in their capacity as the local highway authority. The A1(T) is maintained by National Highways. BDC is the local planning authority.

1.2 SCOPE OF TRANSPORT ASSESSMENT

1.2.1 This TA has been prepared in accordance with the Ministry of Housing, Communities and Local Government (MHCLG) Planning Practice Guidance 'Travel Plans, Transport Assessments and Statements' (2014), which presents the Government's most up-to-date guidance on the preparation of highways and transportation documents to support development proposals. It has also been prepared in accordance with the National Planning Policy Framework (NPPF).

1.2.2 Preliminary discussions were held with NCC highways in relation to the scope of this report and correspondence is included in Appendix B~~Appendix B~~. NCC specifically advised in relation to committed developments and the TA study area and have provided detailed comments on earlier drafts of this report which have been addressed in this version following further discussion. NCC also indicated that Main Road between Ollerton Road and the A638 through the village of Eaton is not well suited to a material increase in traffic due to its existing characteristics.

1.3 TA STUDY AREA

1.3.1 The TA study area has been informed by discussions with NCC and comprises of the following off-site junctions as shown in **Figures 3** and **4**:

- A1/A620 Retford Road/B6079 Retford Road
- A1/B6420 Mansfield Road/A614 Blyth Road/A57
- A1/Elkesley Bridge Road/Jockey Lane/Eskil Way
- A1/B6387 Dover Bottom
- A1 Markham Moor Junction
- A620 Babworth Road/B6420 Mansfield Road/A620 Straight Mile/Sutton Lane
- A620 Babworth Road/Ordsall Road
- A620 Amcott Way/Bridlegate/A620 Hospital Road/A638 North Road/Hallcroft Road
- A620 Amcott Way/A620 Moorgate/A638 Arlington Way
- A638 Arlington Way/Spital Hill/Chapelgate
- A638 Arlington Way/Grove Street
- A638 Arlington Way/A638 London Road/Carolgate
- Ollerton Road/West Hill Road
- A638 London Road/Whitehouses Road
- A638 London Road / Whinney Moor Lane / Bracken Lane
- All Hollows Street / High Street / Goosemoor Lane
- Ollerton Road / Main Road
- A638 / Main Road (Eaton)
- A638 / B6387 Rectory Lane

1.4 REPORT LAYOUT

1.4.1 This TA investigates the highways and transportation issues associated with development of the site. The structure of the report is as follows:

- Chapter 2 summarises relevant planning policy documents.
- Chapter 3 describes existing conditions.
- Chapter 4 outlines development assumptions.
- Chapter 5 explores the opportunities for encouraging sustainable travel.

- Chapter 6 outlines the future assessment year, background traffic growth and committed development traffic.
- Chapter 7 calculates development trip generation.
- Chapter 8 distributes development trips.
- Chapter 9 presents highway impacts.
- Chapter 10 presents the results of capacity assessments.
- Chapter 11 considers the need for mitigation.
- Chapter 12 summarises the report.

2 PLANNING POLICY AND GUIDANCE

2.1 INTRODUCTION

2.1.1 The following planning policy and guidance documents have been considered in the preparation of this TA:

- National Planning Policy Framework (Ministry of Housing Communities and Local Government (MHCLG), July 2021)
- Draft Bassetlaw Local Plan (BDC, November 2020)
- Draft Bassetlaw Local Plan Publication Version Addendum (BDC, January 2022)
- Draft Bassetlaw Local Plan Publication Version Second Addendum (BDC, May 2022)
- Bassetlaw District Local Development Framework – Core Strategy and Development Management Policies DPD (BDC, 2011)
- Nottinghamshire Local Transport Plan (LTP) 2011 - 2026 (NCC, 2011)
- Nottinghamshire Highway Design Guide (NCC, 2021)
- Travel Plans, Transport Assessments and Statements (MHCLG, 2014)

2.2 NATIONAL PLANNING POLICY FRAMEWORK

The NPPF sets out the Government's planning policies for England and how these should be applied. An updated version of the NPPF was published in July 2021. At the heart of the NPPF is a presumption in favour of sustainable development. In terms of transport, Paragraph 110 states that:

"In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

a) appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location.

b) safe and suitable access to the site can be achieved for all users;

c) the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code; and

d) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree."

2.2.1 Paragraph 111 goes on to state that "Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe."

2.2.2 To address this, applications for development should give priority to pedestrian, cycle and public transport movements; address the needs of people with disabilities and reduced mobility; create places that are safe, secure and attractive; allow for the efficient delivery of goods, service and emergency vehicles; and be designed to enable charging of plug-in vehicles.

2.2.3 Considering the above, this TA considers whether the development proposals will provide suitable access for all travel modes, as well as whether any associated increase in traffic will result in a severe cumulative impact.

2.3 DRAFT BASSETLAW LOCAL PLAN

2.3.1 The latest version of the Draft Local Plan for Bassetlaw was published for consultation in November 2020. In addition, a Publication Version Addendum was prepared in January 2022 and a Publication Version Second Addendum was prepared in May 2022. Policy ST27, Site HS13 covers the land at Ordsall South, which is the subject of this study. For completeness, trip generation from the six other Local Plan sites in Retford is also considered in this report, namely:

- HS7 Trinity Farm, Retford – 244 dwellings
- HS8 Milnercroft, Retford – 5 dwellings
- HS9 Former Elizabethan School, Retford – 46 dwellings
- HS10 St. Michael's View, Hallcroft Road, Retford – 20 dwellings
- HS11 Fairy Grove, Grove Road, Retford – 61 dwellings
- HS12 Station Road, Retford – 5 dwellings

2.3.2 In addition, this assessment also considers the Apleyhead and Peaks Hill Farm major allocations insofar as the traffic generated by these sites impacts on the highway within Retford.

~~2.3.2~~2.3.3 Land at Ordsall South is identified for development for residential, community and open space uses to deliver a safe, sustainable, quality living environment. The Bassetlaw Local Plan 2022-2038 Publication Version Second Addendum identifies that development should deliver approximately 890 dwellings during the Plan period to 2038 and should incorporate a mix of housing types, sizes, and tenures to meet local needs. With regards to transport and connectivity, Policy ST27 states the following for site HS13:

"all necessary transport infrastructure improvements through direct mitigation or contributions to new and improved infrastructure, referring to the development's Transport Assessment and Travel Plan, informed by Local Highway Authority advice, detailing:

I. A two-point distributor standard access to the east and west parts of the site from Ollerton Road for vehicles, cyclists and pedestrians;

II. A well-connected street hierarchy that provides high quality, safe and direct walking, cycling and public transport routes within the site and to neighbouring areas by non vehicular modes of transport;

III. Appropriate improvements to off-site highway infrastructure as identified by the Infrastructure Delivery Plan in the locality of the site including towards:

- *The junction at the A620 Babworth Road / B6420 Mansfield Road / A620 Straight Mile / Sutton Lane;*
- *The junction at Ordsall Road / A620 Babworth Road*
- *The junction at London Road / Whitehouses Road*

- *Junctions at the: A614 Blythe Road / A57 / A1; the A60 Mansfield Road / A619; the A57 / Sandy Lane; the A57 / Claylands Avenue / Shireoaks Common; the A57 / B6034 / Netherton Road and the A57 / B6040; and the A57 / A614 / A1 Five Lanes End roundabout*
- *The provision of off-site traffic calming / management schemes along Main Road, Eaton and Ordsall Old Village.*

IV. *Appropriate highway demand management measures to be in operation throughout the lifetime of the construction of the site;*

V. *New and improved pedestrian and cycle links from the site to neighbouring areas including to Old Ordsall Village;*

VI. *A new footway~~path~~ and marked cycle path along the Ollerton Road frontage (east and west) to connect to the existing network at Ordsall;*

VII. *Improvements to the existing Public Rights of Way that cross the site and run along its boundaries;*

VIII. *A financial contribution towards a high frequency bus service from the site to Retford town centre and the wider area supported by appropriate public transport infrastructure within the site.*

Infrastructure shall be secured by planning condition, agreement and/or other mechanism considered appropriate by the relevant infrastructure partners, the Council and the developer."

2.4 BASSETLAW DISTRICT LOCAL DEVELOPMENT FRAMEWORK – CORE STRATEGY & DEVELOPMENT MANAGEMENT POLICIES DPD 2011-2028

2.4.1 Adopted by Bassetlaw District Council on 22 December 2011, the Core Strategy identifies the overarching framework for new development over an 18-year period and sets out a vision for change in Bassetlaw up to 2028.

2.4.2 Within the Vision for Bassetlaw, the Core Strategy states that future development proposals in Retford for the period up to 2028:

> "*will continue to provide an attractive range of homes and a good concentration of services and facilities, allowing it to maintain its role in supporting surrounding rural communities without compromising its market town character. Development in Retford will, therefore, protect the town's retail and service role, delivering growth of a scale that respects the town's heritage assets and, where appropriate, supporting the increased value of the Chesterfield Canal*".

2.4.3 A set of 10 Strategic Objectives are, as such set out as part of the Core Strategy. Of these 10 Objectives, the following are most applicable to future development within the Retford area:

- **SO1** – To provide a range of high-quality market and affordable houses in Worksop, Retford, Harworth Bircotes, Carlton-in-Lindrick/Langold, Tuxford, Misterton and sustainable rural settlements (as identified in the Settlement Hierarchy) to meet the diverse needs of Bassetlaw's growing population.
- **SO4** – To enhance and protect the vitality and viability of the centres of Worksop, Retford, Harworth Bircotes and Tuxford, through environmental improvements and provision of increased town centre retail, employment and leisure development.

- **SO6** – To ensure that all new development addresses the causes and effects of climate change by, as appropriate, reducing or mitigating flood risk; realising opportunities to utilise renewable and low carbon energy sources and/or infrastructure, alongside sustainable design and construction; taking opportunities to achieve sustainable transport solutions; and making use of Sustainable Drainage Systems.
- **SO7** – To ensure that all new development enhances the attractiveness and local distinctiveness of the area and, where appropriate, achieves its full potential against national and local design standards.
- **SO10** – To ensure the provision of the essential physical, social and green infrastructure required to support the District's growth.

2.4.4 This TA explores whether development of the site will positively contribute towards the vision and applicable Strategic Objectives set by BDC.

2.5 NOTTINGHAMSHIRE LOCAL TRANSPORT PLAN (LTP3) 2011-2026

2.5.1 The Nottinghamshire Local Transport Plan (LTP3) 2011-2026 was published in 2011. Replacing the second Local Transport Plan for Greater Nottingham, the LTP3 details the transport strategy for the whole of the county of Nottinghamshire for the period between April 2011 and March 2026.

2.5.2 Underpinned by 12 local transport objectives which identify how transport in Nottinghamshire will help support economic growth; protect the environment; improve health and safety; improve accessibility, and maintain and improve existing infrastructure, three transport goals are set out within the LTP3. These Transport Goals are to:

- Provide a reliable, resilient transport system which supports a thriving economy and growth whilst encouraging sustainable and healthy travel.
- Improve access to key services, particularly enabling employment and training opportunities.
- Minimise the impacts of transport on people's lives, maximise opportunities to improve the environment and help tackle carbon emissions.

2.5.3 This TA considers how development of the site accords with the aims and policies of the Nottinghamshire Local Transport Plan as it is in an area easily accessible by sustainable modes of transport.

2.6 NOTTINGHAMSHIRE HIGHWAY DESIGN GUIDE

2.6.1 The Nottinghamshire Highway Design Guide provides clear and common guidance to developers across Nottinghamshire with reasonably practicable and agreeable guidance to

assist in the delivery of housing growth, encourage sustainable development and minimise the impact of development on the highway.

2.6.2 This TA has considered the Nottinghamshire Highway Design Guide in the production of this report.

2.7 TRAVEL PLANS, TRANSPORT ASSESSMENTS AND STATEMENTS

2.7.1 The Planning Practice Guidance provides information relating to the preparation of a TA, including when they are required, the scope of the report and what information to include. This TA has been prepared in accordance with the Planning Practice Guidance and NCC Travel Plan Guidance https://www.nottinghamshire.gov.uk/media/124515/travelplanguidance.pdf

2.8 SUMMARY

2.8.1 Future development of the site should be in accordance with the policy objectives set out in the national and local planning policy summarised in this chapter.

3 EXISTING CONDITIONS

3.1 EXISTING SITE

3.1.1 The location of the Ordsall South site is illustrated on **Figures 1** and **2**. The site currently comprises agricultural land and is bound to the north by residential development and Retford Golf Club, and to the east, west and south by agricultural land.

3.1.2 For this TA, the site is assumed to be accessed via Ollerton Road, which bisects the site and divides the site into an eastern and western parcel. The western parcel of the site is larger than the eastern parcel.

3.2 NEARBY LOCAL FACILITIES AND AMENITIES

3.2.1 Retford town centre is approximately 4.0km from the site and provides a range of employment, retail, leisure, and other needs. Table 1~~Table 1~~ below shows the approximate distance between the site and other key local facilities/amenities nearer to the site. The distances should be treated as approximate distances as they will vary depending on where within the site the measurement is taken from.

Table 1 - Summary of Distances to Nearby Local Amenities

Nearby Local Amenities	Approximate Distance (km)
Convenience Store	1.0
Post Office	1.0
Pre-School	1.0
Pharmacy	1.1
Primary School	1.6
Retford Train Station	1.8
Secondary School	2.6
Retford Hospital	3.5
Doctor's Surgery	3.7
Dentist	3.8

3.3 WIDER CONTEXT

3.3.1 In the wider area, Table 2~~Table 2~~ below summarises approximate distances to the nearest large towns and cities.

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Table 2 - Distance to Nearby Towns and Cities

Nearby Local Amenities	Approximate Distance (km)
Doncaster	31.4
Lincoln	35.2
Nottingham	50.0
Sheffield	48.3

3.4 PEDESTRIAN ACCESSIBILITY

Pedestrian Infrastructure

3.4.1 There are no footways on Ollerton Road adjacent to the site frontage. To the north of the site, footways are provided on both sides of Ollerton Road and form part of a network of pedestrian routes within Retford. To the south of the site there are no footways adjacent to Ollerton Road.

3.4.2 A public footpath is aligned in an east-west direction through the western parcel of the site. The footpath connects Brecks Road in the east with a bridleway beyond the western boundary of the site. Several public footpaths are aligned through the eastern parcel of the site, along Water Lane and connecting to High Street. These footpaths form part of a network of Public Rights of Way in the local area, increasing connectivity with Ordsall and the wider countryside.

Pedestrian Catchment Area

3.4.3 In terms of what constitutes a reasonable walking distance it is necessary to consider what is realistic for a walking trip. The Chartered Institution of Highways and Transportation (CIHT) document 'Guidelines for Providing for Journeys on Foot' (2000) states that "walking accounts for over a quarter of all journeys and four fifths of journeys less than one mile". The document also provides guidance on acceptable walking distances and suggests that a preferred maximum walking distance of 2km is applicable for commuting or school trips.

3.4.4 It can therefore be concluded that distances up to 2km can be considered reasonable to be undertaken on foot, and that walking is a realistic mode to consider for trips within this distance. Whilst this does not preclude pedestrians from undertaking longer journeys, it is considered that 2km is reasonable. Based on an average walking speed of 1.4 m/s it can be concluded that a 2km walk would take approximately 24 minutes.

3.4.5 A 2km catchment from the site is presented at **Figure 5.** The catchment demonstrates that all Ordsall and some areas of Retford are within 2km of the site. As a result, amenities such as the nearest convenience store, pharmacy, post office, pre-school and primary school are located within a reasonable walking distance to the site. Table 1~~Table 1~~ summarises these distances.

3.4.6 Improvements will be required to existing pedestrian infrastructure to maximise accessibility of the site for pedestrians. Any new infrastructure should tie in with existing nearby infrastructure. Subject to infrastructure improvements, the location of the site near to local facilities/amenities may help to encourage a proportion of shorter trips from the area to be made on foot. It is considered that travel on foot should be the key mode of travel for trips originating from the site and the surrounding area. Walking should be encouraged as the most appropriate mode of travel for local trips.

3.5 CYCLIST ACCESSIBILITY

Cycle Infrastructure

3.5.1 Retford has the key attributes to be an attractive town to cycle around. The urban area is less than 4km from north to south and less than 3km from east to west, which coupled with the generally flat topography ensures that all major trip generators are within easy reach.

3.5.2 The corridors formed by the river and canal provide good opportunities to travel across the town without coming into conflict with general traffic, giving Retford significant potential to make cycling the mode of choice for all trips to access employment, education, healthcare and leisure facilities provided locally.

3.5.3 However, at present, the coverage and quality of infrastructure to support and encourage cyclists falls below modern standards, both in terms of on-road and off-road routes in place, including those along the canal and river. Where attractive links are provided, they are often undermined by a lack of continuity and the absence of safety features at major junctions.

3.5.4 In the immediate vicinity of the site, there are no formal cycle facilities along Ollerton Road meaning that cyclists must travel within the carriageway.

Cycle Catchment Area

3.5.5 In much the same way as pedestrian trip lengths are defined, the length of cycling trips will be governed by routes that are available and trip length, although several other factors often mitigate for or against making these trips.

3.5.6 Local Transport Note 1/20 'Cycle Infrastructure Design' (DfT, 2020) states that *"two out of every three personal trips are less than five miles in length – an achievable distance to cycle for most people*". Accounting for the fact that some people will not want to cycle five miles, three miles has been assumed in this report to inform a catchment area for cycle trips. Three miles is equivalent to approximately 5km.

3.5.7 **Figure 5** shows a 5km catchment centred on the site. A 5km distance includes all of Retford, Ordsall, Newtown and Balk Field. Cycling should also therefore be encouraged as an appropriate mode of travel for local trips.

3.6 BUS ACCESSIBILITY

3.6.1 The CIHT document 'Buses in Urban Developments' (2018) recommends a maximum walking distance to bus stops of 400m. Therefore, 400m is generally regarded as being the maximum walking distance to a public transport access point.

3.6.2 In the first instance, it should be noted that the size of the site is such that, the distance to a bus stop will vary depending on where the measurement is taken from. The far extremities of the site are more than 1km from Ollerton Road. Future development of the site should therefore facilitate bus access into the development itself. Nevertheless, for the purpose of this Chapter, existing bus provision is considered.

3.6.3 The nearest bus stops to the site are shown in **Figure 1**. A southbound bus stop is located on the eastern side of Ollerton Road, approximately 100m north of the site boundary, opposite Glen Eagles Way. The bus stop comprises of a flag and pole and timetable information.

3.6.4 Approximately 350m north of the site boundary, bus stops are located on both sides of West Hill Road (Brecks Road stops). Both stops consist of a flag, timetable information and a shelter.

3.6.5 Additional bus stops are located approximately 650m from the northern site boundary on Welbeck Road and High Street. A summary of regular bus services stopping at the nearest bus stops to the site is provided in Table 3~~Table 3~~.

Table 3 - Summary of Bus Services Stopping near the Site

Service / Route	Bus Stop	Mon - Fri Frequency			Saturday Frequency	Sunday Frequency
		7am – 9am	9am – 5pm	4pm - 6pm	9am – 6pm	9am – 6pm
335: Retford - Ollerton	Glen Eagles Way	N/A	N/A	1 Bus	1 Bus	No Service
335: Newark – Retford	Brecks Road	1 Bus	N/A	N/A	1 Bus	No Service
Doncaster Shopper: Trafford Way at Doncaster Interchange – Tuxford	Glen Eagles Way	N/A	1 Bus	N/A	N/A	No Service
Doncaster Shopper: Tuxford – Trafford Way at Doncaster Interchange	Brecks Road	N/A	1 Bus	N/A	N/A	No Service
Sherwood Arrow: Retford - Nottingham	Glen Eagles Way	2 Buses	4 Buses	1 Bus	4 Buses	2 Buses
Sherwood Arrow: Nottingham – Retford	Brecks Road	N/A	4 Buses	1 Bus	4 Buses	2 Buses
47 Retford – Ordsall	Brecks Road	N/A	1 Bus Every Hour Between 09:15 and 14:15	1 Bus	1 Bus Every Hour Between 09:15 and 15:15, Then A Further 2 Buses	No Service
47 Ordsall – Retford	Brecks Road	N/A	1 Bus Every Hour Between 09:25 and 14:25	1 Bus	1 Bus Every Hour Between 09:25 and 15:25, Then A Further 2 Buses	No Service
Lincoln Shopper: Lincoln – Retford	Welbeck Road	N/A	1 Bus	N/A	N/A	No Service
Lincoln Shopper: Retford – Lincoln	Welbeck Road	N/A	1 Bus	N/A	N/A	No Service

3.6.6 As shown in Table 3~~Table 4~~ there are four bus services that operate to the nearest bus stops to the site (Glen Eagles Way and Brecks Road). These offer infrequent or semi-frequent services with Service 47 providing an hourly connection to Retford between 0915-1425 hrs Monday to Saturday and the ~~But only one of these (the~~ Sherwood Arrow~~)~~ providing ~~offer~~four services between 0900-1700 hrs.

~~3.6.6 s frequent services, providing a connection between Ordsall and Retford.~~

Table 4 - Summary of Bus Services Departing from Retford Bus Station

Service / Route	Monday – Friday Frequency		Saturday Frequency	
	No. of Buses Per Day	Approximate Frequency	No. of Buses Per Day	Approximate Frequency
136 Retford - Walesby	4	Approx. every two hours between 10:30 and 16:40	3	Approx. every two hours between 10:30 and 14:30
190 Retford – Tuxford	3	Approx. every 70 mins between 16:05 and 18:25	3	Approx. every 70 mins between 16:05 and 18:25
195 Retford - Gainsborough	2	06:50 and 17:10	2	06:50 and 17:10
197 Retford - Beckingham	1	12:30	1	12:30
335; Retford – Ollerton	1	17:30	1	17:30
27 Retford - Everton	6	Approx. every 2 hours between 08:45 and 15:25/15:35, then 18:15	6	Approx. every 2 hours between 08:45 and 15:35, Then 18:15
29 Retford - Doncaster	5	Approx. every 2 – 3 hours between 08:54 and 17:35	5	Approx. every 2 – 3 hours between 08:54 and 17:35
37 Retford - Newark	11	Approx. every hour between 08:00 and 18:20	11	Approx. every hour between 08:00 and 18:20
43 Retford – Worksop / Wensleydale	14	Approx. every hour between 05:45 and 19:05	14	Approx. every hour between 05:45 and 19:05
95 Retford - Gainsborough	6	Approx. every 2 hours between 08:40 and 14:30, then 16:00 and 17:50	6	Approx. every 2 hours between 08:40 and 14:30, then 16:00 and 17:50
97 Retford - Gainsborough	4	Approx. every hour between 09:30 and 15:55	4	Approx. every 2 hours between 09:30 and 15:55
99 Retford - Doncaster	10	Approx. every hour between 07:40 and 17:45	10	Approx. every hour between 07:40 and 17:45
123 Retford Town Circular Route	3	11:00, 12:00 and 13:30	3	11:00, 12:00 and 13:30

3.6.8 The information above highlights that there are regular bus services during peak travel times to some key nearby towns which offer employment, retail, leisure, and other opportunities to future residents.

3.7 RAIL SERVICES

3.7.1 The nearest train station is Retford Station, which is located approximately 1.1 miles north-east of the site boundary when walking or cycling. This equates to a walk of approximately 20 minutes or a cycle ride of approximately 7 minutes. When travelling by road, the train station is located approximately 2.4 miles from the site boundary. This is a drive of approximately 7 minutes. In the context of the site, the train station is therefore more suited to pedestrian and cycle trips than car trips. However, it is worth noting that the condition of the underpass beneath the railway line between Station Road and Tunnel Road may discourage people from using this route, particularly cyclists who may struggle to negotiate the steps.

3.7.2 Many trains operate throughout the day to destinations such as London, Doncaster, York, Sheffield and Lincoln catering for peak commuter travel and as well as other journey types. Table 5~~Table 5~~ summarises the times of the first and last weekday trains at Retford Station.

Table 5 - Time of the first and last Weekday trains at Retford Train Station

Train	Arrivals from London Kings Cross	Departures to London Kings Cross	Arrivals from Doncaster	Departures to Doncaster	Arrivals from York	Departures to York
First Train	07:33	05:51	05:50	07:34	08:32	07:56
Last Train	23:16	23:02	23:01	23:17	23:01	16:48

Train	Arrivals from Sheffield	Departures to Sheffield	Arrivals from Lincoln	Departures to Lincoln
First Train	06:23	06:13	07:19	06:24
Last Train	22:28	22:51	23:17	21:33

3.7.3 Retford Train Station is located on the East Coast Main Line between Edinburgh and London Kings Cross, calling at Newcastle, York, Doncaster, and Peterborough on the way. The Station is also located on the Sheffield to Lincoln line.

3.7.4 Trains to London Kings Cross operate every day of the week, with approximately one train every one to two hours. Trains to London have an approximate journey time of between 90 and 105 minutes. During peak journey times, there are four trains between 6am and 9am and six trains between 4pm and 7pm.

3.7.5 One train departs from Retford to Edinburgh during the week at 0756 hrs, taking approximately 3 hours and 25 minutes, calling at Doncaster, York, Northallerton, Darlington, Durham and Newcastle before 1000 hrs.

3.7.6 Two trains per hour depart from Retford to Lincoln between Monday and Friday and have an approximate duration of around 35 minutes. Trains departing from Retford to Lincoln on Saturday and Sunday typically operate at a frequency of around one train per hour.

3.7.7 Trains are frequently available to Doncaster, with three trains departing from Retford at peak times between 0700 and 0900 hrs, Monday to Friday. Outside of peak times, one train is available every one to two hours. On average, trains to Doncaster typically take around 15 minutes.

3.7.8 In addition to these regular train services, two direct trains are available to Hull during the week, and three direct trains are available to Hull during the weekends, taking approximately 1 hour and 10 minutes. One direct train is available to Beverley, taking approximately 1 hour and 40 minutes, Monday to Saturday and one direct train to Bradford, taking approximately 1 hour and 25 minutes.

3.7.9 Travel by train provides a genuine alternative to the private car and should therefore assist in encouraging modal shift away from the private car. The journey time to the station is similar when cycling or driving or driving by car due to the longer distance when travelling by car. Walking time to the train station is approximately 20 minutes, which should encourage walking and cycling between the site and the station. Furthermore, there are 38 sheltered bicycle parking spaces at Retford Train Station, providing the opportunity for staff and visitors to cycle to and from the station.

3.7.10 Additionally, bus stops located directly adjacent to the station on Victoria Road are served by the Sherwood Arrow service, which also stops at the nearest bus stops to the site boundary.

3.7.11 Using sustainable means of transport in this way is therefore an attractive and viable option between the site and the Train Station.

3.8 HIGHWAY NETWORK

To/from Retford Town Centre

3.8.1 The two most likely routes for vehicles to travel between the site and Retford town centre are via Ordsall Road/Babworth Road or Goosemoor Lane/Whitehouses Lane/London Road.

3.8.2 Ordsall Road, which is a continuation of Ollerton Road is a single carriageway subject to a 30mph speed limit. It is a typical distributor road with footways adjacent to both sides of the carriageway and is street lit. Babworth Road is aligned in an east to west direction and provides a route to the A1 in the west and the town centre in the east. It joins Ordsall Road at a mini-roundabout. Babworth Road is a single carriageway subject to a 40mph speed limit in the vicinity of Ordsall Road. To the east, the speed limit changes to 30mph and to the west, the speed limit changes

to 50mph. Babworth Road has a footway adjacent to one side of the carriageway and is street lit. Bus routes operate along Ordsall Road and Babworth Road.

3.8.3 Goosemoor Lane/Whitehouses Road is aligned in an east to west direction and provides a link between Ollerton Road and London Road. It is a single carriageway subject to a 30mph speed limit. Street lighting is provided. Footways are typically provided adjacent to both sides of the carriageway, although a section of Goosemoor Lane has a footway adjacent to one side only. London Road is aligned in a north to south direction and provides a route between the A1 in the south (Markham Moor) and Retford town centre in the north. Near Whitehouses Road, London Road is subject to a 40mph speed limit. To the south, the speed limit changes to 50mph and to the north, the speed limit changes to 30mph.

3.8.4 The highway network around the town centre includes several signal-controlled junctions which are known to experience congestion during peak periods.

To/from the Markham Moor Junction

3.8.5 The Markham Moor junction on the A1 is likely to be used by vehicles travelling to/from the A1 (south) and for trips to/from Lincoln via the A57. It will also facilitate local trips to villages south of Markham Moor. The Markham Moor junction is a recently improved dumbbell layout.

3.8.6 Trips from the site are likely to use London Road or Jockey Lane/A1 to access the Markham Moor junction. To access London Road, some vehicles may use Goosemoor Lane/Whitehouses Road, although it is also likely that vehicles will use Main Road through the centre of Eaton village. Main Road is a single carriageway with limited footway provision and limited street lighting. Main Road is also narrow in places with reduced visibility. Furthermore, the existing bridge over the River Idle is only wide enough for one-way vehicular traffic.

To/from the A1 (north)

3.8.7 Vehicles are likely to access the A1 at its junction with the A620 Retford Road via Ordsall Road and Babworth Road. The junction with the A1 includes slip roads which facilitate all movements.

To/from Worksop

3.8.8 There are three likely routes for vehicles travelling to/from Worksop as identified below:

- Brick Yard Lane, Jockey Lane, the A1(T), A57
- A620, B6079, A57
- B6420, A57

3.9 BACKGROUND TRAFFIC FLOWS

3.9.1 Full classified turning counts were undertaken on Wednesday 7th July 2021 between 07:30-09:30 and 16:30-18:30 at the following junctions:

- A1/A620 Retford Road/B6079 Retford Road
- A1/B6420 Mansfield Road/A614 Blyth Road/A57
- A1/Elkesley Bridge Road/Jockey Lane/Eskil Way
- A1/B6387 Dover Bottom
- A1 Markham Moor Junction
- A620 Babworth Road/B6420 Mansfield Road/A620 Straight Mile/Sutton Lane
- A620 Amcott Way/Bridlegate/A620 Hospital Road/A638 North Road/Hallcroft Road
- Ollerton Road/West Hill Road
- Ollerton Road / Main Road
- A638 / Main Road (Eaton)
- A638 / B6387 Rectory Lane

3.9.2 NCC has been monitoring traffic flows throughout the county to compare flows recorded since the Covid-19 pandemic began with flows before the Covid-19 pandemic. Traffic flows in Retford for the week commencing 5th July 2021 are below flows recorded in March 2020 before the national lockdown. As such, NCC has provided Covid-19 adjustment factors to apply to the AM and PM peak hour traffic flows recorded in the above surveys. The relevant factors are 92% (AM) and 91% (PM).

3.9.3 As agreed with NCC, existing peak period classified turning counts have been obtained for study area junctions where new counts have not been obtained. The following existing counts have been obtained and used in this TA:

- A620 Babworth Road/Ordsall Road – Tuesday 7th May 2016
- A620 Amcott Way/A620 Moorgate/A638 Arlington Way – Mon 12th March 2018
- A638 Arlington Way/Spital Hill/Chapelgate – Mon 12th March 2018
- A638 Arlington Way/Grove Street – Mon 12th March 2018
- A638 Arlington Way/A638 London Road/Carolgate – Mon 12th March 2018
- A638 London Road/Whitehouses Road – Thursday 12th May 2016
- A638 London Road / Whinney Moor Lane / Bracken Lane – Tuesday 10th October 2017

- High Street / Goosemoor Lane – Tue 4th December 2018

3.9.4 Traffic data is presented in **Appendix C**~~**Appendix C**~~.

3.10 COLLISION ANALYSIS

3.10.1 Personal Injury Collision (PIC) data has been obtained from NCC for the most recently available five-year period between 1st January 2015 and 30th September 2020. The Study Area comprises of Ollerton Road/Ordsall Road between its junctions with the A620 Babworth Road to the north of the site and Main Road (west of Eaton) to the south of the site. The study area also includes High Street and Goosemoor Lane.

3.10.2 Collision data is presented in **Appendix C** – Traffic Data

~~3.10.2 Appendix **DAppendix C** – Traffic Data~~

severity is included as **Figure 6**.

Table 6 – Personal Injury Collision Data January 2015 to September 2020

Year	Severity			Total
	Slight	Serious	Fatal	
2015	3	1	0	4
2016	1	0	0	1
2017	3	2	0	5
2018	4	1	0	5
2019	0	2	0	2
2020	1	0	1	2
Totals	12	6	1	19

3.10.4 In total, there were nineteen collisions that occurred within the study area and of these collisions, 12 were classified as slight in severity, six were classified as serious in severity and one was classified as fatal in severity. No recorded collisions involved cyclists. However, a total of four collisions involved pedestrians.

3.10.5 A total of four collisions occurred at the Babworth Road/Ordsall Road mini-roundabout junction, with three of these classified as slight in severity and one classified as serious in severity. All of these collisions involved vehicles only and involved vehicles performing conflicting movements at the mini roundabout junction.

3.10.6 A total of four collisions involving pedestrians occurred within the study area, three of which occurred along Ordsall Road and West Hill Road. Only one of these incidents involving pedestrians was classified as serious in severity and involved a car colliding with a child outside Ordsall Primary School. The remaining two collisions were classified as slight in severity, one of

which involved a car colliding with a young pedestrian after daylight hours, whilst the other involved a goods vehicle colliding with a pedestrian.

3.10.7 Five further collisions involving vehicles only occurred along Ordsall Road and West Hill Road. Four of these incidents were classified as slight in severity, three of which involved cars performing conflicting movements at junctions, whilst the remaining collision involved a standing passenger on a bus falling. The remaining one incident at was classified as serious in severity and involved two cars travelling in opposite directions colliding during hours of darkness.

3.10.8 Two incidents occurred at the Ollerton Road/West Hill Road junction. These incidents involved vehicles only, one of which was classified as slight in severity and involved a car turning right onto Ollerton Road (south) and colliding with a motorcycle travelling south on Ollerton Road in wet conditions. The remaining collision was classified as serious in severity and involved one vehicle turning left onto Ollerton Road (south) and colliding with a car travelling north on Ollerton Road.

3.10.9 One incident occurred along the National Speed Limit section of Ollerton Road at the Ollerton Road/Main Road junction and involved vehicles only. The incident was classified as slight in severity.

3.10.10 A total of four collisions occurred along Goosemoor Lane and Whitehouses Road, two of which occurred at the London Road/Whitehouses Road mini roundabout junction. Both incidents at the mini roundabout were classified as slight in severity and involved cars performing conflicting movements at the junction. The one fatality in the study area occurred on Goosemoor Lane/Whitehouses Road and involved a car turning right into Goosemoor Produce Farm Shop and colliding with a motorcycle. The final incident that occurred on Goosemoor Lane involved a car colliding with a pedestrian during the early hours of the morning and was classified as slight in severity.

3.10.11 The collisions that occurred throughout the study area do not suggest any spatial clustering or clear causational trends. No collisions occurred at or near to the Ollerton Road site frontage. It is therefore concluded that there are no existing road safety issues which are likely to be exacerbated by future development at the site.

4 DEVELOPMENT ASSUMPTIONS

4.1 INTRODUCTION

4.1.1 For this TA, a development consisting of 930 dwellings at the Ordsall South site has been assumed. A sensitivity test including an additional 320 dwellings at the Ordsall South site has also been undertaken.

4.2 SITE ACCESS STRATEGY

4.2.1 Ollerton Road bisects the site and is the only existing adopted highway from which vehicular access can be provided. It has been assumed that the site will be accessed from two new roundabouts onto Ollerton Road with land to the east and west of Ollerton Road accessed from separate arms onto the roundabouts. Land to the west will be accessed from both roundabouts and land to the east will be accessed from one roundabout. A concept layout depicting a possible site access strategy has been prepared by the consultant working on behalf of the site promoter and is provided in **Appendix E~~Appendix E~~**.

4.2.2 The concept layout shows footways and segregated cycleways on all the site access arms. Footways are also shown on both sides of Ollerton Road between the two site access roundabouts and to the north. Segregated cycleways are shown on the western side of Ollerton Road between the two site access roundabouts and on both sides of Ollerton Road to the north.

4.2.3 The concept layout does not impact on any existing public rights of way (PROW).

4.3 INTERNAL SITE LAYOUT

4.3.1 The internal layout of the site will need to be designed to provide a road network in which pedestrian and cyclist movements are prioritised. The road network should allow for future bus access into the site as set out in **Chapter 5**. The internal layout of the site should have a 20mph design speed throughout.

4.3.2 The opportunity should be taken to maximise connectivity for pedestrians and cyclists with adjoining areas. Wherever possible, it is recommended that the alignment of any existing PROW remains as per existing.

4.4 SERVICE AND EMERGENCY VEHICLES

4.4.1 Service and emergency vehicles will gain access to the development via the same route as other vehicular traffic.

4.5 PEOPLE WITH DISABILITIES AND OTHER MOBILITY IMPAIRMENTS

4.5.1 The detailed design of the development and its internal transport infrastructure will be undertaken in accordance with the requirements of the 2010 Equality Act and in accordance with current good practice as embodied within the DfT's 'Inclusive Mobility' document.

4.5.2 This approach will ensure that the completed development is fully inclusive and meets the needs of all users, including those with disabilities or temporary mobility impairments.

4.5.3 The requirement to design for disabled people will permeate all aspects of the design process and will include access to and movement within the site, but also the interface between the development and the surrounding highway network and in particular, the pedestrian routes and public transport facilities.

5 OPPORTUNITIES TO IMPROVE SUSTAINABLE TRANSPORT INFRASTRUCTURE

5.1 WALKING AND CYCLING

5.1.1 As outlined in **Chapter 3**, southern parts of Retford are within reasonable walking distance of the site and all of Retford is within reasonable cycling distance.

5.1.2 The 'Grey to Green Retford Walking and Cycling Audit' prepared by Tetra Tech in 2021 identified a series of recommendations and priorities for improving walking and cycling in Retford. There would be the opportunity for development of the Ordsall site to contribute towards delivery of some of these recommendations and priorities.

5.1.3 As a minimum, development at the site should provide connections with existing infrastructure adjoining and near to the site.

5.1.4 Pedestrian infrastructure is already of a reasonable standard but there may be locations for example, where improved crossing facilities could be provided, or a footway could be widened. As any development proposals are worked up, consideration should be given to likely pedestrian desire lines, and this should inform improvements to pedestrian infrastructure. This should focus on routes to key trip attractors such as schools, shops, and the train station.

5.1.5 Improvements to cycle infrastructure should focus on routes to Retford town centre and Retford Train Station. There could be an opportunity for some of the priority links identified in the 'Grey to Green Retford Walking and Cycling Audit' to be improved as part of development at the site, particularly the Babworth Road and London Road corridors. Any improvements should be Local Transport Note (LTN) 1/20 compliant. Where cycle infrastructure cannot meet the requirements of LTN 1/20, this should be discussed with NCC. NCC will be required to advise if the developer should provide cycle infrastructure that meets the requirements LTN as best it can but acknowledging that it will not be fully LTN 1/20 compliant, or alternatively, if cycle infrastructure should not be provided.

5.1.6 The opportunity to contribute to or safeguard a new strategic walking or cycling route should also be taken, for example any proposals for a walking/cycling corridor between Retford and Worksop; and/or improved links to Retford Train Station.

5.2 BUS SERVICES

5.2.1 Whilst existing bus stops are located within the recommended 400m of the site boundary, large parts of the site are further than 400m from an existing bus stop. In addition, existing bus services stopping at the nearest bus stops to the site are not high frequency services.

5.2.2 The site layout should be designed in a manner that allows bus access into the site. As a minimum, bus services should access the western parcel of the site. Subject to discussions with NCC and local bus operators, if bus stops are provided on Ollerton Road near the site access, the need for buses to access the eastern parcel of the site could be removed.

5.2.3 To future proof the site, the western and eastern parcels should both be designed to allow future bus access. The western parcel of the site should include a loop road arrangement to allow bus penetration into the site. A development of 930 dwellings should be ~~of a suitable scale~~large enough to enable developer funding of a new or extended bus service. To encourage modal shift from single occupancy car to bus, it is likely that a 30-minute frequency service will~~ould~~ be required. The highway authority will require annual financial contributions towards a new / extended bus service until bus patronage sustains the service financially.

~~5.2.3 It is typically the case that developers would fund a bus service for five years. After five years the idea is that the service would be sustainable without the need for financial support. This would need to be explored in further detail. The risk is that if the service is not sustainable and additional support is not available, the bus service would cease to operate or would operate a reduced timetable.~~

5.3 TRAIN SERVICES

5.3.1 The site benefits from its proximity to Retford Train Station and as set out in this chapter, efforts should be made to maximise connectivity with the train station. Travel by train provides a genuine opportunity for future residents to undertake longer journeys by train rather than single occupancy car. As noted earlier in this report, the condition of the underpass beneath the railway line between Station Road and Tunnel Road may discourage people from using this route. Development of the site may provide an opportunity to improve the condition of the underpass.

6 FUTURE TRAFFIC FLOWS

6.1 FORECAST GROWTH

6.1.1 Traffic growth factors for a 2021 base year and a future design year of 2038 have been derived using TEMPro software, for the 'Bassetlaw 010' Middle Super Output Area (MSOA). The TEMPro outputs are presented in **Appendix E** and the resulting growth factors are shown below.

- 2016 to 2021 AM = 1.080
- 2016 to 2021 PM = 1.076
- 2017 to 2021 AM = 1.064
- 2017 to 2021 PM = 1.060
- 2018 to 2021 AM = 1.048
- 2018 to 2021 PM = 1.045
- 2021 to 2032 AM = 1.120
- 2021 to 2032 PM = 1.119
- 2032 to 2038 AM = 1.044
- 2032 to 2038 PM = 1.043

6.1.2 The 2038 assessment year has been selected because it is the end year of the Local Plan.

6.1.3 It should be noted that there is considerable uncertainty regarding future traffic flows in the years ahead and whether traffic will return to pre-Covid levels. It is widely accepted that there will be an increase in home working and therefore less commuter travel in typical rush hour periods. There is also likely to be a decrease in public transport use for a period with people perhaps favouring the car. The Department for Transport has not issued revised growth forecasts, but the increases indicated in TEMPro for the period to 2038 are perhaps higher than may ultimately prove to be the case. Nevertheless, this TA uses TEMPro growth forecasts and therefore presents a robust assessment of future background traffic levels.

6.2 COMMITTED DEVELOPMENTS

6.2.1 Committed schemes are defined as developments or transport schemes which have current planning consent, but which are unimplemented or incomplete, and could in the future have a significant impact on transport conditions or the layout of the local highway network. NCC has confirmed that the following committed development should be included in this TA:

- Application 14/00503/OUT - Outline Application for the Erection of up to 175 Dwellings Including Public Open Space, Attenuation Drainage Basin and Associated Works. The site is located off Tiln Lane.

- Application 15/00493/OUT - Outline Planning Application for a Mixed Use Development of up to 196 dwellings and 11.11ha of Employment Land with All Matters Reserved Except Access. The site is located off North Road.

- Application 16/00015/FUL - Hybrid Planning Application, comprising: A) Full Application for New Manufacturing Building (Class B2) and Two Storey Offices (B1), with Associated Parking and Refurbishment and Change of Use to Class A1/A3/B1 or D1 Use for Former Northern Rubber Tower Building. B) Outline Application for the Erection of A Convenience Supermarket (A1), Freestanding Hot Food Restaurant or Take Away (A3/A5) and A Single Storey Building for Non Food Retail and Leisure Use (A1/D2) With Associated Access, Car Park, and Service Infrastructure. The site is located off London Road/South Street/Thrumpton Lane.

- Application 16/01777/FUL – Demolition of Nursery Buildings and Erection of 113 Dwellings together with Access to London Road and Creation of Public Open Space. The site is located at Kenilworth Nurseries, London Road.

- Application 18/00695/FUL – Erect 109 Dwellings and Construct New Access Including Provision of Public Open Space and Surface Water Balancing Pond. The site is located at Kenilworth Nurseries, London Road.

6.2.2 The TAs for the above developments have been reviewed and the development traffic flows have been obtained. Committed development trips have been added to the background traffic flows in this TA. Committed development flows are presented in **Appendix G~~Appendix G~~**.

6.3 OTHER POSSIBLE LOCAL PLAN DEVELOPMENT SITES

6.3.1 As requested by BDC, development trips from the other six housing allocation sites in the Draft Local Plan (i.e. in addition to Ordsall South) have also been taken into consideration in this TA. The following housing allocations have been considered:

- HS7 Trinity Farm, Retford – 244 dwellings
- HS8 Milnercroft, Retford – 5 dwellings
- HS9 Former Elizabethan School, Retford – 46 dwellings
- HS10 St. Michael's View, Hallcroft Road, Retford – 20 dwellings
- HS11 Fairy Grove, Grove Road, Retford – 61 dwellings

- HS12 Station Road, Retford – 5 dwellings

6.3.2 Development trip generation has been calculated and trips have been distributed onto the existing highway network. The approach taken for trip generation and distribution is the same as the approach taken for the Ordsall site. This is explained in **Chapters 7** and **8**. Traffic flows from these sites are presented in Appendix H~~Appendix H~~.

6.3.3 This TA includes assessments 'with' and 'without' trips associated with the other possible development sites taken into consideration. No additional sites other than those identified in this Chapter have been taken into consideration.

6.4 APLEYHEAD AND PEAKS HILL FARM

6.4.1 As requested by NCC, development trips associated with the proposed major allocations at Apleyhead and Peaks Hill Farm have been considered. For this TA, a development of 216ha of employment has been assessed at Apleyhead and a development of 1,000 dwellings and 5ha of employment has been assessed at Peaks Hill Farm. There are no other allocations proposed within the District that will have a material effect on traffic conditions in Retford.

6.4.2 Apleyhead and Peaks Hill Farm trips have been distributed using a VISUM model[1]. The model uses Census 2011 Journey to Work data and assigns trips to the network using an 'all or nothing' assignment onto routes with the shortest / quickest journey times.

6.4.3 Vehicle trips associated with the Apleyhead and Peaks Hill Farm allocation sites have then been manually combined with the development trips generated by the proposed allocation sites in Retford that are the subject of this report. Traffic flows from the Apleyhead and Peaks Hill Farm site are presented in Appendix H~~Appendix H~~.

6.4.4 Vehicle trips from the Apleyhead and Peaks Hill Farm allocation sites have been manually added to background traffic flows at the following junctions:

- Junction 2A - Apleyhead Interchange (A57 /Blyth Road / A1)
- Junction 6 - A620 Babworth Rd/B6420 Mansfield Rd/A620 Straight Mile/Sutton Lane
- Junction 7 - A620 Babworth Road/Ordsall Road

6.4.5 Apleyhead and Peaks Hill Farm development trips are lower at all other study area junctions and therefore assumed to be accounted for as part of general background traffic growth.

[1] The same VSUM model as used for the Bassetlaw Transport Study.

7 TRIP GENERATION

7.1 TRIP GENERATION

7.1.1 Development trip generation has been calculated using trip rates obtained from the TRICS database. The category 'Residential – Houses Privately Owned' was interrogated for sites in England, Scotland, and Wales, excluding Greater London. The data was obtained for the highway peak periods of 0800-0900 hrs and 1700-1800hrs. As requested by NCC, sites listed as 'mixed housing' or 'flats' were removed from the selection.

7.1.2 The full TRICS outputs are presented in Appendix I~~Appendix I~~ and the resultant trip rates are summarised in Table 7~~Table 7~~ and Table 8~~Table 8~~ as follows. The trip rates in Table 7~~Table 7~~ have been used to calculate trip generation for the Ordsall South and Trinity Farm Local Plan allocation sites identified in **Section 6.3**. The trip rates in Table 8~~Table 8~~ have been used to calculate trip generation at all other Local Plan allocation sites considered in this TA[2]. Trip rates have been agreed with NCC.

Table 7 - Residential Trip Rates by Mode (Houses Privately Owned)

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Vehicles	0.160	0.441	0.601	0.407	0.179	0.586
Taxis	0.006	0.007	0.013	0.000	0.001	0.001
OGVs	0.000	0.000	0.000	0.000	0.000	0.000
PSVs	0.002	0.001	0.003	0.000	0.000	0.000
Cyclists	0.004	0.022	0.026	0.016	0.007	0.023
Vehicle Occupants	0.175	0.705	0.880	0.559	0.249	0.808
Pedestrians	0.041	0.152	0.193	0.038	0.052	0.090
Public Transport Users	0.000	0.008	0.008	0.006	0.001	0.007
Total People	0.221	0.888	1.109	0.618	0.309	0.927

Table 8 - Residential Trip Rates by Mode (Houses Privately Owned)

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Vehicles	0.163	0.340	0.503	0.393	0.206	0.599
Taxis	0.000	0.000	0.000	0.000	0.000	0.000
OGVs	0.000	0.000	0.000	0.000	0.000	0.000
PSVs	0.006	0.006	0.012	0.000	0.000	0.000
Cyclists	0.000	0.012	0.012	0.009	0.006	0.015
Vehicle Occupants	0.175	0.500	0.675	0.552	0.310	0.862
Pedestrians	0.052	0.172	0.224	0.049	0.049	0.098
Public Transport Users	0.003	0.009	0.012	0.006	0.003	0.009
Total People	0.230	0.693	0.923	0.617	0.368	0.985

[2] It should be noted that the traffic generation rates of individual development sites could be greater than those applied for the purposes of this strategic study depending on the specific nature of each development. Detailed Transport Assessments will therefore be required in support of developments at the planning application stage.

7.1.3 Using the trip rates presented in Table 7~~Table 7~~ and Table 8~~Table 8~~ the resultant development trip generation of all allocation sites is shown in the following tables.

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Table 9 - Residential Trip Generation by Mode (allocation HS13 – 930 Dwellings)

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Vehicles	149	410	559	379	166	545
Taxis	6	7	12	0	1	1
OGVs	0	0	0	0	0	0
PSVs	2	1	3	0	0	0
Cyclists	4	20	24	15	7	21
Vehicle Occupants	163	656	818	520	232	751
Pedestrians	38	141	179	35	48	84
Public Transport Users	0	7	1	6	1	7
Total People	206	826	1,031	575	287	862
PCUs	149	410	559	379	166	545

Table 10 - Residential Trip Generation by Mode (Allocation HS7 - 244 Dwellings)

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Vehicles	39	108	147	99	44	143
Taxis	1	2	3	0	0	0
OGVs	0	0	0	0	0	0
PSVs	0	0	1	0	0	0
Cyclists	1	5	6	4	2	6
Vehicle Occupants	43	172	215	136	61	197
Pedestrians	10	37	47	9	13	22
Public Transport Users	0	2	2	1	0	2
Total People	54	217	271	151	75	226
PCUs	39	108	147	99	44	143

Table 11 - Residential Trip Generation by Mode (Allocation HS8 - 5 Dwellings)

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Vehicles	1	2	3	2	1	3
Taxis	0	0	0	0	0	0
OGVs	0	0	0	0	0	0
PSVs	0	0	0	0	0	0
Cyclists	0	0	0	0	0	0
Vehicle Occupants	1	3	3	3	2	4
Pedestrians	0	1	1	0	0	0
Public Transport Users	0	0	0	0	0	0
Total People	1	3	5	3	2	4
PCUs	1	2	3	2	1	3

Table 12 - Residential Trip Generation by Mode (Allocation HS9 - 46 Dwellings)

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Vehicles	7	16	23	18	9	28
Taxis	0	0	0	0	0	0
OGVs	0	0	0	0	0	0
PSVs	0	0	1	0	0	0
Cyclists	0	1	1	0	0	1
Vehicle Occupants	8	23	31	25	14	40
Pedestrians	2	8	10	2	2	5
Public Transport Users	0	0	1	0	0	0
Total People	11	32	42	28	17	45
PCUs	7	16	23	18	9	28

Table 13 - Residential Trip Generation by Mode (Allocation HS10 - 20 Dwellings)

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Vehicles	3	7	10	8	4	12
Taxis	0	0	0	0	0	0
OGVs	0	0	0	0	0	0
PSVs	0	0	0	0	0	0
Cyclists	0	0	0	0	0	0
Vehicle Occupants	4	10	14	11	6	17
Pedestrians	1	3	4	1	1	2
Public Transport Users	0	0	0	0	0	0
Total People	5	14	18	12	7	20
PCUs	3	7	10	8	4	12

Table 14 - Residential Trip Generation by Mode (Allocation HS11 - 61 Dwellings)

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Vehicles	10	21	31	24	13	37
Taxis	0	0	0	0	0	0
OGVs	0	0	0	0	0	0
PSVs	0	0	1	0	0	0
Cyclists	0	1	1	1	0	1
Vehicle Occupants	11	31	41	34	19	53
Pedestrians	3	10	14	3	3	65
Public Transport Users	0	1	1	0	0	1
Total People	14	42	56	38	22	60
PCUs	10	21	31	24	13	37

Table 15 - Residential Trip Generation by Mode (Allocation HS12 - 5 Dwellings)

Mode	AM (08:00-09:00)			PM (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Vehicles	1	2	3	2	1	3
Taxis	0	0	0	0	0	0
OGVs	0	0	0	0	0	0
PSVs	0	0	0	0	0	0
Cyclists	0	0	0	0	0	0
Vehicle Occupants	1	3	3	3	2	4
Pedestrians	0	1	1	0	0	0
Public Transport Users	0	0	0	0	0	0
Total People	1	3	5	3	2	5
PCUs	1	2	3	2	1	3

8 TRIP DISTRIBUTION

8.1 TRIP DISTRIBUTION

8.1.1 The external vehicle trip generation summarised in **Chapter 7** has been distributed onto the local highway network based upon 2011 Journey to Work (JTW) data for Bassetlaw 010 middle super output area (MSOA). Using GIS and HERE road data, the trips identified within the JTW data were routed to their corresponding origin/destination MSOAs using the Ollerton Road site frontage as the origin point for Bassetlaw 010 MSOA.

8.1.2 Trips that remain within the Bassetlaw 010 MSOA within the 2011 census data are assumed to travel to/from a point on Ollerton Road north of the Ollerton Road/West Hill Road but south of Babworth Road.

8.1.3 The road network used in this assessment covers the Bassetlaw district. Within the network area there are zones that match the MSOA boundaries, the connection of these zones to the network (model connectors), where trips enter and leave the network for the purposes of assignment, is taken to be a point in the largest urban centre within the MSOA. Trips that do not originate or terminate at an MSOA within the network area are allocated an 'exit' zone of the network on the link that they would exit the network along. The distribution percentage for all MSOAs that would use each exit zone is aggregated together to provide a distribution percentage for that zone.

8.1.4 Development trips have been distributed as follows:

- A1 (north) – 11%
- Retford Road (to/from Worksop) – 7%
- A57 (to/from Worksop) – 5%
- A614 Blyth Road – 8%
- Dover Bottom – 2%
- A57 (to/from Lincoln) – 2%
- A1 (south) and Great North Road – 21%
- Carolgate (to/from Retford town centre) – 11%
- Chapel Gate (to/from Retford town centre) – 4%
- Moorgate (east of Retford) – 5%
- Hallcroft Road – 9%
- Sutton Lane - 11%
- Whiney Moor Lane - 4%

8.2 TRIP ASSIGNMENT

8.2.1 VISUM software was used to assign the generated development trips onto the network. The development trips were compiled into a matrix based upon the distribution percentages to each

zone from the JTW MSOA analysis. The trips were assigned to the network using an 'all or nothing' assignment, with trips taking the shortest route based upon journey time. There is no trip reassignment or delays / congestion included within the model.

8.2.2 The link speeds within VISUM were based upon the mandatory speed limits which were adjusted where required to reflect observed driver behaviour. The routing generated within the model was compared to suggested routings from Google's mapping engine that considers historic average traveling speeds on links based on congestion and the quality of the link. This indicated that in some cases rural national speed limit (60mph) links were being selected by VISUM, when in practice the actual speed of travel would be lower, and an alternative route may provide a quicker journey as it would be possible to travel faster albeit with a lower mandatory speed limit. Therefore, link speeds were adjusted on some links to force routing to match the routes observed in Google Maps.

8.2.3 In addition, specific consideration has been given to the route between the site and the Markham Moor junction. The VISUM model initially distributed all trips between the site and the Markham Moor junction (except A1 (north) trips) via Main Road through Eaton village. Whilst Main Road is subject to the National Speed Limit, some sections are narrow, and visibility is reduced in places. As such, the journey time along Main Road can be slower than for other routes which could make it less attractive than some alternative route options. Table 16~~Table 16~~ indicates the distance and journey time between the site and the Markham Moor junction using different route options.

Table 16 - Distance and Journey Time to Markham Moor Junction

Route	Distance	Journey Time
Via Main Road (Eaton)	6.9km	7 minutes
Via High Street and Goosemoor Lane	8.2km	8 minutes
Via Brick Yard Lane	8.9km	8 minutes

8.2.4 Furthermore, specific consideration was also given to the route between the site and Worksop. As discussed with NCC, there are three likely routes to Worksop as indicated in Table 17~~Table 17~~.

Table 17 - Distance and Journey Time to Worksop (A57/B6040 Roundabout)

Route	Distance	Journey Time
Via B6420 and A57	11.3km	12 minutes
Via Jockey Lane and A1	13.5km	12 minutes
Via A620, B6079 and A57	11.7km	12 minutes

8.2.5 Driver choice will vary between individual but on balance, for the purpose of this TA, trips to/from the Markham Moor junction have been split equally between the three route options in Table 16~~Table 16~~ and trips to/from Worksop have been split equally between the three route options in Table 17~~Table 17~~.

8.2.6 For this TA, it is assumed that 75% of development trips will be to/from the western parcel of the site and 25% will be to/from the eastern parcel of the site.

8.2.7 The resultant AM/PM peak period development trip distribution on the highway network near the site is shown in Appendix J~~Appendix J~~.

9 HIGHWAY IMPACTS

9.1 IMPACTS

9.1.1 Estimated two-way development traffic impacts on key local links are shown in Table 18~~Table 18~~ below.

Table 18 - Two-Way Ordsall South Development Traffic Impacts on Links (PCUs)

Road Link	Development Flows (930 Dwellings)		Development Flows (1,250 Dwellings)	
	AM	PM	AM	PM
Babworth Road (west of Ordsall Rd)	212	207	285	278
Babworth Road (east of Ordsall Rd)	78	76	105	103
A1 (north)	61	60	83	81
A1 (south)	65	49	88	65
A620 Amcott Way	28	27	38	37
A620 Moorgate	28	27	38	37
A638 Arlington Way	22	22	30	29
A638 London Road	67	75	145	144
A638 (south of Main Road)	101	96	136	129
Main Road	54	53	73	71
Goosemoor Lane	155	151	208	203
Brick Yard Lane	65	64	88	85
A57 (east)	11	11	15	14
A57 (west)	22	22	30	29
Great North Road	86	84	115	112

9.1.2 Table 19~~Table 19~~ on the next page shows the increase in vehicle trips at each study area junction. Full calculations are presented in Appendix J~~Appendix J~~.

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Table 19 - Two-Way Ordsall South Development Traffic Impacts at Junctions (PCUs)

Ref	Junction	Development Flows				Test
		930 Dwellings		1,250 Dwellings		
		AM	PM	AM	PM	
1A	A1 / B6079 Retford Road	67	40	91	54	*
1B	A1 / A620 Retford Road	84	82	113	110	*
2A	Apleyhead Interchange (A57 /Blyth Road / A1)	67	65	90	88	*
2B	A1 / B6420 Mansfield Road / A614 Blyth Road / A57	67	65	90	88	*
3	Elkesley Bridge Road / A1 Worksop Road	49	57	66	77	*
3B	Jockey Lane / Eskil Way	65	64	88	85	*
4A	A1 / B6387 Dover Bottom (North)	11	11	15	15	
4B	A1 / B6387 Dover Bottom (South)	11	11	15	15	
5A	Markham Moor Interchange (A638 / A57 Cliff gate / A57 / A1)	86	84	115	112	*
5B	A1 Markham Moor (A1 / Great N Road / Main Street / A57)	31	79	42	107	*
6	A620 / B6420 Mansfield Rd / A620 Straight Mile / Sutton Lane	212	207	285	278	*
7	A620 Babworth Road / Ordsall Road	291	283	391	381	*
8	A620 / Bridlegate / A620 Hospital Rd / A638 North Rd / Hallcroft Rd	78	76	105	103	*
9	A620 Amcott Way / A620 Moorgate / A638 Arlington Way	28	27	38	37	*
10	A638 Arlington Way / Spital Hill / Chapelgate	22	22	30	29	*
11	A638 Arlington Way / Grove Street	16	7	22	9	*
12	A638 Arlington Way / A638 London Road / Carolgate	84	82	113	110	*
13	Ollerton Road / W Hill Road	445	434	598	584	*
14	London Road / Whitehouses Road	184	151	248	203	*
15	London Road / Whinney Moor Lane / Bracken Lane	106	104	143	139	*
16	All Hallows Street / High Street / Goosemoor Lane	155	151	208	203	*
17	Site Access / Ollerton Road	559	511	751	687	*
18	Ollerton Road / Brick Yard Road	119	116	160	156	*
19	A638 / Main Road	97	94	130	127	*
20	A638 / B6387 Rectory Lane	101	96	136	129	*

Note: Junctions with red asterisks are discussed further in Chapter 11.

9.1.3 NCC has indicated that capacity assessments should be undertaken at locations where an increase of 30 or more trips is forecast in the AM or PM peak hour. Based on the highway impacts in Table 19~~Table 19~~, capacity assessments are required at all off-site junctions in the study area except Junction 4. Junctions where capacity assessments have been undertaken are indicated with red asterisks.

9.1.4 The number of junctions where an increase of 30 or more trips is forecast in the AM or PM peak hour is significant. For any junctions shown to operate above capacity following the addition of development traffic, NCC may require mitigation. Any mitigation will need to be directly related to the proposed development and must be proportionate to the scale of impact.

9.1.5 It should be noted that just because a junction is forecast to have an increase in trips greater than 30 PCUs in the AM or PM peak hour does not necessarily mean that physical mitigation in

the form of highway improvements will be required. There may be 'spare' traffic capacity available at some junctions that can accommodate development trips without improvement. Alternatively, providing enhanced walking, cycling and public transport connections will also help to reduce development traffic impacts at off-site junctions.

9.2 HIGH STREET / GOOSEMOOR LANE

9.2.1 At locations where highway capacity is exceeded, it is usually the case that junction capacity is the issue rather than link capacity. Nevertheless, the capacity of High Street / Goosemoor Lane is worth specific consideration in this instance as it was identified by NCC as a potential constraint during preliminary discussions. Trip distribution calculations show an increase of 155 and 151 PCUs during the AM and PM peak hours respectively for a development of 930 dwellings at Ordsall South. For the sensitivity test of 1,250 dwellings at Ordsall South, trip distribution calculations show an increase of 208 and 203 PCUs during the AM and PM peak hours respectively.

9.2.2 Goosemoor Lane has a typical width which varies between 6.0m and 7.5m, although it narrows to circa 5.3m at the bridge over the River Idle. High Street has a typical width between 5.8m and 6.5m. On-street parking occurs on the eastern side of High Street to the north of Farm View and to the south of Southgate. Occasional on-street parking occurs elsewhere on High Street. On-street parking effectively restricts the available carriageway width to one-way flow.

9.2.3 Guidance on link capacity was provided in Volume 5 of the Design Manual for Roads and Bridges (DMRB) in TA 79/99 'Traffic Capacity of Urban Roads' and TA 46/97 'Traffic Flow Ranges for use in the Assessment of New Rural Roads'. Both documents were withdrawn in March 2020. However, in the absence of any replacement guidance, the withdrawn guidance has been used to assess link capacity in this TA. TA 79/99 defines an urban road as 'an all-purpose road within a built up area, either a single carriageway with a speed limit of 40mph or less or a dual carriageway with a speed limit of 60mph or less.'. TA 46/97 defines rural roads as 'all-purpose roads and motorways that are generally not subject to a local speed limit'. On this basis, High Street is an urban road and Goosemoor Lane is a rural road. Therefore, for the purposes of this assessment, forecast link flows on High Street have been assessed using TA 79/99 and forecast link flows on Goosemoor Lane have been assessed using TA 46/97.

High Street

9.2.4 Comparing the characteristics of High Street to Table 1 of TA79/99 shows it is classed as an Urban All-Purpose (UAP3) road "Variable standard road carrying mixed traffic with frontage access, side roads, bus stops and at-grade pedestrian crossings, 30 to 40mph speed limit, with frontage access". Table 2 of TA79/99 shows that 6.1m and 7.3m wide UAP3 category roads have a one-way hourly capacity in each direction equivalent to 900 and 1,300 VPH respectively (busiest direction of flow assuming a 60/40 directional split).

9.2.5 Calculations in Appendix J~~Appendix J~~ indicate that by 2038 in the 'Base + Committed Developments + Ordsall South + Other Local Plan Sites' scenario, one-way flows are less than 900 when considering 930 or 1,250 dwellings at Ordsall South. In the scenario with 1,250 dwellings at Ordsall South, the highest one-way directional flow is 340 in the AM peak hour and 314 in the PM peak hour. Flows are therefore considerably lower than the maximum capacity of urban roads indicated in TA 79/99, although it is acknowledged that on-street parking will effectively reduce the available link capacity and High Street is therefore likely to require further consideration as part of any planning application.

Goosemoor Lane

9.2.6 TA 46/97 provides the equation below for calculating the link capacity of rural roads where:

Capacity = [A – B * Pk%H]

Where for single carriageways A = 1,380, B = 15 and Pk%H is the percentage of Heavy Vehicles in the peak hour.

9.2.7 The percentage of Heavy Vehicles in the peak hours has been obtained from the traffic counts undertaken at the London Road/Whitehouses Road and High Street/Goosemoor Lane junctions. The percentage of Heavy Vehicles was higher at the London Road/Whitehouses Road junction (2.3%) and has been used in the TA 46/97 capacity calculation. Applying the observed 2.3% percentage of Heavy Vehicles in the peak hour for Pk%H gives the maximum Rural Link capacity of 1,345 in each direction.

9.2.8 Calculations in Appendix J~~Appendix J~~ indicate that by 2038 in the 'Base + Committed Developments + Ordsall South + Other Local Plan Sites' scenario, one-way flows are less than 1,345 when considering 930 or 1,250 dwellings at Ordsall South. In the scenario with 1,250 dwellings at Ordsall South, the highest one-way directional flow is 666 in the AM peak hour and 717 in the PM peak hour. Flows are therefore considerably lower than the maximum capacity of rural roads indicated in TA 46/97, although it is acknowledged that on-street parking will effectively reduce the available link capacity and Goosemoor Lane is therefore likely to require further consideration as part of any planning application.

9.3 MAIN ROAD

9.3.1 As with High Street / Goosemoor Lane, the capacity of Main Road through Eaton village is worth specific consideration in this instance as it was identified by NCC as a potential constraint during preliminary discussions. Trip distribution calculations show an increase of 54 and 53 PCUs during the AM and PM peak hours respectively for a development of 930 dwellings at Ordsall South. For the sensitivity test of 1,250 dwellings at Ordsall South, trip distribution calculations show an increase of 73 and 71 PCUs during the AM and PM peak hours respectively. Main Road

is therefore likely to require further consideration as part of any planning application. This is discussed further in **Chapter 11**.

9.3.2 As requested by NCC, a sensitivity test has also been undertaken whereby trips to/from Markham Moor have been split across two routes rather than three as per the trip distribution set out in **Section 8.2**. For the sensitivity test, trips to/from Markham Moor have been split between Main Road (Eaton) and Brick Yard Lane. Trips assigned to Goosemoor Lane and High Street have instead been assigned to Main Road (Eaton). Trips assigned to Brick Yard Lane have not been amended for the sensitivity test. In the sensitivity test, Ordsall South trips assigned to Main Road increase from 10% to 17%. For a development of 930 dwellings at Ordsall South, this equates to 95 and 93 two-way PCUs in the AM and PM peak hours respectively. For a development of 1,250 dwellings at Ordsall South, this equates to 128 and 125 two-way PCUs during the AM and PM peak hours respectively.

9.3.3 Using the guidance in TA 79/99 and TA 46/97, the eastern part of Main Road is defined as a rural road and the western part of Main Road is defined as an urban road. Therefore, for the purpose of assessing link capacity, forecast link flows on Main Road (east) have been assessed using TA 79/99 and forecast link flows on High Street (west) have been assessed using TA 46/97.

Main Road (east)

9.3.4 Comparing the characteristics of High Street to Table 1 of TA79/99 shows it is classed as an Urban All-Purpose (UAP3) road "Variable standard road carrying mixed traffic with frontage access, side roads, bus stops and at-grade pedestrian crossings, 30 to 40mph speed limit, with frontage access". Main Road (east) has a typical width of less than 6.1m (the minimum in Table 2 of TA79/99). Table 2 of TA 79/99 shows that 6.1m wide UAP3 category roads have a one-way hourly capacity in each direction equivalent to 900 VPH (busiest direction of flow assuming a 60/40 directional split).

9.3.5 Calculations in Appendix J~~Appendix J~~ indicate that by 2038 in the 'Base + Committed Developments + Ordsall South + Other Local Plan Sites' scenario, one-way flows are less than 900 when considering 930 or 1,250 dwellings at Ordsall South. In the scenario with 1,250 dwellings at Ordsall South, the highest one-way directional flow is 190 in the AM peak hour and 207 in the PM peak hour. Flows are therefore considerably lower than the maximum capacity of urban roads indicated in TA 79/99.

Main Road (west)

9.3.6 For input into the TA 46/96 formula in paragraph 9.2.6, the percentage of Heavy Vehicles in the peak hours has been obtained from the traffic count undertaken at the London Road/Main Road junction. The percentage of Heavy Vehicles was 1.9% and has been used in the TA 46/97

capacity calculation. Applying the observed 1.9% percentage of Heavy Vehicles in the peak hour for Pk%H gives the maximum Rural Link capacity of 1,352 in each direction.

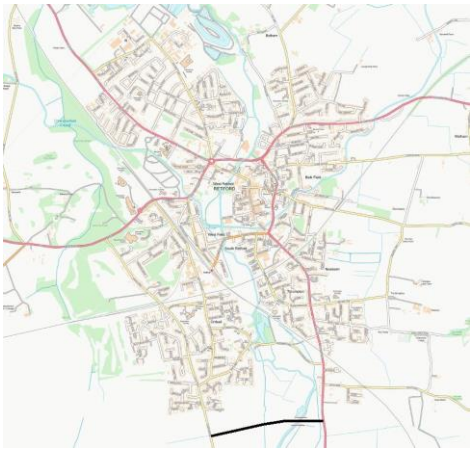
9.3.7 Calculations in Appendix J~~Appendix J~~ indicate that by 2038 in the 'Base + Committed Developments + Ordsall South + Other Local Plan Sites' scenario, one-way flows are less than 1,352 when considering 930 or 1,250 dwellings at Ordsall South. In the scenario with 1,250 dwellings at Ordsall South, the highest one-way directional flow is 120 in the AM peak hour and 127 in the PM peak hour. Flows are therefore considerably lower than the maximum capacity of rural roads indicated in TA 46/97.

9.3.8 The assessment of link capacity on High Street, Goosemoor Lane and Main Road has also demonstrated that there is sufficient link capacity on High Street / Goosemoor Lane to accommodate any re-assignment of traffic from Main Road if measures are introduced to deter traffic from using Main Road.

9.4 LINK ROAD FEASIBILITY

9.4.1 A previous suggestion from residents in the Ordsall area is for the provision of a new link road between Ollerton Road and the A638. The logic behind this suggestion is that a new link road would help to relieve existing pressure on Goosemoor Lane and its junctions onto High Street at its western end and London Road at its eastern end. A new link road would also allow development traffic to easily access the A638 London Road without having to use Main Road through Eaton Village, which is unsuitable for any significant increase in use due to its alignment, width, and character through the village. An indicative location and alignment for the suggested new link road is shown in the image below.

Indicative Link Road between Ollerton Road and the A638



9.4.2 A very high-level appraisal has been undertaken which has identified that delivering a new link road at this location would not be straight forward because the road will be crossing flood plain and a new bridge will be required over the River Idle. To avoid potential flooding issues the road would probably need to be constructed as an elevated carriageway, which would have implications for cost, flood risk and environmental impacts. Further detailed appraisal will therefore be required to investigate its feasibility.

9.4.3 Based on a very high-level appraisal the anticipated cost to provide a new link road at this location could be in the order of £10m considering the length of the link road (circa 1.15km) and the constraints mentioned above. This order of cost would be difficult for a developer to fund entirely and would probably require a combination of a significantly larger scale of development (potentially a few thousand dwellings) together with external funding assistance. Providing a new link road is therefore likely to prove technically very challenging and prohibitively expensive.

9.4.4 To model the attractiveness of a new link road for Ordsall South development traffic, the VISUM model described in **Chapter 8** has been updated to include a link between Ollerton Road and the A638. The link has been modelled as a single carriageway road with a 40mph speed limit. Table 20~~Table 20~~ shows Ordsall South development flows that would be attracted to use a new link.

Table 20 – Ordsall South Development Flows using a New Link

Number of Dwellings	Peak Period	Eastbound	Westbound	2-Way
930	AM	234	86	320
	PM	95	214	309
1,250	AM	318	114	432
	PM	127	291	418

9.4.5 The VISUM model indicates that a new link would attract Ordsall South development trips from existing routes including, High Street / Goosemoor Lane, Main Road and Ordsall Road.

9.4.6 Based on the scale of development assessed in this TA and the likely number of development trips that would use a new link, the costs to deliver a new link would far outweigh the benefits and provision of a link road would therefore not satisfy the requirements of item 122(2) of The Community Infrastructure Levy Regulations 2010 which requires planning obligations to be necessary to make the development acceptable in planning terms; directly related to the development; and fairly and reasonably related in scale and kind to the development.

9.4.7 A link road would also only help to address traffic impacts associated with development traffic using roads local to the site and would provide no relief for development trips through Retford. At some locations in Retford town ~~centre~~centre, it will be very difficult to deliver any meaningful mitigation in the form of increased junction capacity due to the physical space constraints that exist within the urban environment.

10 JUNCTION CAPACITY ASSESSMENTS

10.1 INTRODUCTION

10.1.1 Capacity assessment have been undertaken at all junctions identified in Table 19~~Table 19~~ with a red asterisk. Capacity assessments have been undertaken at off-site junctions for the following scenarios:

- 2021 base
- 2021 base + committed developments
- 2038 base + committed developments
- 2038 base + committed developments + Ordsall development
- 2038 base + committed developments + Ordsall development + other Local Plan allocation sites

10.1.2 Capacity assessments have been undertaken at the Ordsall South site access roundabouts for the following scenarios:

- 2038 base + committed developments + Ordsall development
- 2038 base + committed developments + Ordsall development + other Local Plan allocation sites

10.1.3 The Ordsall South development has been assessed based on 930 dwellings and a sensitivity test of 1,250 dwellings.

10.1.4 Capacity assessments undertaken at the Ordsall South site access roundabouts have been assessed on the basis that all development trips access the site from both roundabouts (i.e. development trips have not been split across the roundabouts). This provides a very robust assessment of the site access roundabouts. In the absence of a .dwg file of the site access roundabouts designed by the site promoter, assumptions have been made regarding the roundabout geometry for input to the site access capacity assessments.

10.1.5 Assessments of priority junctions and roundabouts have been undertaken using the Junctions 9 computer programme, which is the 'industry standard' traffic modelling computer software package used for assessing the capacity of priority junctions and roundabouts. Assessments of signal-controlled junctions have been undertaken using the LinSIG computer programme, which is the 'industry standard' traffic modelling software package used for assessing the capacity of signal-controlled junctions.

10.1.6 A Ratio of Flow to Capacity (RFC) value below 0.85 indicates that a junction operates 'within' capacity. An RFC value between 0.85 and 1.00 indicates that there may be occasions during the period modelled when queues will develop, and delays occur. An RFC value greater than 1.00 indicates that a junction operates 'above' capacity.

10.1.7 At signal-controlled junctions a Reserve Capacity (RC) or degree of overload is used to indicate whether a junction operates 'within' its theoretical capacity. The RC is the percentage of all round traffic growth, which a junction can accommodate within its capacity. When there is no RC, a degree of overload is the percentage by which the traffic flows exceed the capacity of the junction. Experience with RC calculations at existing junctions indicates that queuing does not become particularly noticeable until the degree of overload reaches 10% (i.e. -11% RC). For the purposes of comparison with priority junctions and roundabouts, it can be assumed that a RC of 0% (and a Degree of Saturation of 90%) roughly equates to an RFC of 0.85.

10.1.8 Geometry plans and capacity assessment outputs are presented in Appendix K~~Appendix K~~. Geometry inputs have been updated to reflect previous feedback provided by NCC, where appropriate. In particular, it is worth noting that the western roundabout of the dumbbell arrangement at the A1/ A614 Blyth Road/ A57 Worksop Road has been modelled with a reduced entry width on the western approach (A57) to reflect uneven lane usage (the majority of traffic uses the offside lane).

10.2 CAPACITY ASSESSMENT RESULTS

10.2.1 A summary of the capacity assessment results is presented in Table 21~~Table 21~~ on the next page and full outputs are presented in Appendix K~~Appendix K~~.

Table 21 - Capacity Assessment Results (Ordsall South Assessed With 930 Dwellings)

Junction	Arm	2021 Base + Committed Developments				2038 Base + Committed Developments				2038 Base + Committed Developments + Ordsall Development				2038 Base + Committed Developments + Ordsall Development + Other Local Plan Sites			
		AM		PM		AM		PM		AM		PM		AM		PM	
		RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ
1A - A1 / B6079 Retford Road	B - A1 slip road	0.12	0.1	0.12	0.1	0.15	0.2	0.15	0.2	0.15	0.2	0.15	0.2	0.15	0.2	0.15	0.2
	C - B6079 Retford Road	0.20	0.4	0.22	0.5	0.25	0.6	0.28	0.7	0.37	0.9	0.33	0.8	0.37	1.0	0.34	0.8
1B - A1 / A620 Retford Road	B - A1 slip road	0.31	0.4	0.20	0.2	0.38	0.6	0.25	0.3	0.45	0.8	0.38	0.6	0.45	0.8	0.39	0.6
	C - B6079 Retford Road	0.00	0.0	0.02	0.0	0.00	0.0	0.02	0.0	0.00	0.0	0.03	0.0	0.00	0.0	0.03	0.0
2A - Apleyhead Interchange (A57 /Blyth Road / A1)	A - A57	0.61	1.6	0.59	1.4	0.74	2.8	0.71	2.3	0.75	3.0	0.73	2.6	0.81	4.0	0.88	6.7
	C - Road Access A1 (East)	0.46	0.8	0.42	0.7	0.54	1.1	0.49	1.0	0.57	1.3	0.50	1.0	0.73	2.6	0.53	1.1
	D - Slip Rd - Entry Only	0.39	0.6	0.45	0.8	0.48	0.9	0.55	1.2	0.49	1.0	0.55	1.2	0.61	1.5	0.57	1.3
	E – Blyth Road	0.33	0.5	0.30	0.4	0.40	0.7	0.36	0.6	0.41	0.7	0.38	0.6	0.53	1.1	0.42	0.7
2BA - A1 / B6420 Mansfield Road / A614 Blyth Road / A57	A- A57 S	0.84	4.6	0.77	3.0	1.02	20.1	0.94	9.6	1.03	21.2	0.95	10.8	1.22	68.4	1.04	22.0
	A1 Link	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
	A57 N	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
2BB - A1 / B6420 Mansfield Road / A614 Blyth Road / A57	Mansfield Road	0.48	0.9	0.43	0.7	0.60	1.5	0.52	1.1	0.70	2.3	0.56	1.3	1.04	22.4	0.64	1.7
	A57	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
3 - A1 / Elkesley Bridge Road	A - Poulter Rise	0.04	0.0	0.08	0.1	0.05	0.1	0.09	0.1	0.08	0.1	0.10	0.1	0.08	0.1	0.10	0.1
	B - Unamed Road	0.04	0.0	0.03	0.0	0.04	0.0	0.04	0.0	0.04	0.0	0.04	0.0	0.04	0.0	0.04	0.0
	C - Elkesley Bridge Rd	0.06	0.1	0.07	0.1	0.07	0.1	0.08	0.1	0.09	0.1	0.12	0.1	0.09	0.1	0.12	0.1
3B - Jockey Lane / Eskil Way	A- Poulter Rise SE	0.05	0.1	0.03	0.0	0.06	0.1	0.04	0.0	0.07	0.1	0.07	0.1	0.07	0.1	0.07	0.1
	B - Jockey Lane	0.05	0.0	0.06	0.1	0.05	0.1	0.07	0.1	0.09	0.1	0.08	0.1	0.09	0.1	0.08	0.1

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Junction	Arm	2021 Base + Committed Developments				2038 Base + Committed Developments				2038 Base + Committed Developments + Ordsall Development				2038 Base + Committed Developments + Ordsall Development + Other Local Plan Sites			
		AM		PM		AM		PM		AM		PM		AM		PM	
		RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ
5A - Markham Moor Interchange (A638 / A57 Cliff gate / A57 / A1)	A - A57	0.20	0.3	0.24	0.3	0.24	0.3	0.28	0.4	0.25	0.3	0.32	0.5	0.26	0.4	0.34	0.5
	B - Entry Only	0.39	0.6	0.44	0.8	0.47	0.9	0.53	1.1	0.47	0.9	0.54	1.2	0.47	0.9	0.55	1.2
	C - A638	0.28	0.4	0.25	0.3	0.34	0.5	0.30	0.4	0.39	0.6	0.32	0.5	0.43	0.7	0.33	0.5
	D - Cliffe Gate	0.39	0.7	0.37	0.6	0.48	0.9	0.45	0.8	0.49	1.0	0.46	0.8	0.50	1.0	0.46	0.9
5B - A1 Markham Moor (A1 / Great N Road / Main Street / A57)	B - Entry from A1	0.13	0.2	0.18	0.2	0.16	0.2	0.22	0.3	0.17	0.2	0.24	0.3	0.17	0.2	0.24	0.3
	C - Great North Rd	0.21	0.3	0.21	0.3	0.26	0.3	0.26	0.4	0.27	0.4	0.31	0.5	0.29	0.4	0.35	0.5
	D - A638	0.19	0.2	0.19	0.2	0.23	0.3	0.24	0.3	0.24	0.3	0.25	0.3	0.24	0.3	0.25	0.3
	A - Cliffe Gate	0.36	0.6	0.40	0.7	0.42	0.7	0.48	0.9	0.42	0.7	0.49	0.9	0.42	0.7	0.50	1.0
6 - A620 Babworth Road / B6420 Mansfield Road / A620 Straight Mile / Sutton Lane	B - Mansfield Road	1.04	26.7	1.55	290.7	Max	539.9	Max	954.0	Max	739.4	Max	1183.0	Max	967.6	Max	1230.6
	B - Mansfield Road	1.02	1.7	0.14	6.5	Max	9.4	Max	20.0	Max	11.7	Max	23.3	Max	12.4	Max	23.6
	A - Babworth Road	0.81	4.8	0.62	1.8	0.83	5.1	0.63	1.8	0.83	5.1	0.63	1.9	0.76	3.5	0.64	1.9
	D - Sutton Lane	1.42	112.5	1.66	188.3	Max	63.8	Max	675.3	Max	629.1	Max	840.7	Max	665.6	Max	691.3
	D - Sutton Lane	1.03	1.5	1.30	2.2	Max	3.3	Max	6.2	Max	5.1	Max	6.7	Max	27.5	Max	12.2
	C - Straight Mile	0.95	12.5	0.95	12.8	0.95	12.9	0.95	12.0	0.95	12.0	0.97	1.3	0.95	10.9	0.98	12.4
7 - A620 Babworth Road / Ordsall Road	A- A620 Babworth Rd (E)	0.98	14.6	0.82	4.2	1.14	63.00	0.97	14.6	1.20	85.6	1.13	57.2	1.42	220.0	1.18	76.5
	B - Ordsall Road	0.94	8.5	0.60	1.5	1.13	34.90	0.76	2.9	1.64	225.0	0.91	7.2	1.70	264.1	0.98	13.0
	C - A620 Babworth Rd (W)	1.03	28.8	0.79	3.5	1.21	102.60	0.93	9.7	1.27	146.1	1.13	64.2	1.30	166.1	1.25	121.8
8 - A620 Amcott Way / Bridlegate / A620 Hospital Road / A638 North Road / Hallcroft Road	B - A620 Amcott Way	0.61	1.6	0.69	2.2	0.74	2.8	0.83	4.6	0.75	2.9	0.85	5.4	0.77	3.3	0.88	6.8
	C - Bridgegate	0.58	1.3	0.67	1.9	0.86	5.1	0.94	9.3	0.89	6.1	1.00	14.4	0.97	10.7	1.08	25.0
	D - A620 Hospital Road	0.89	6.7	0.84	5.0	1.15	64.8	1.07	39.8	1.21	91.0	1.09	48.3	1.25	104.0	1.16	75.5
	E - North Road	0.76	3.1	0.91	8.3	0.88	6.8	1.00	56.8	0.89	7.4	1.09	59.4	0.95	13.3	1.11	70.0
	A - Hallcroft Road	0.66	1.9	0.66	1.9	0.86	5.1	0.84	4.4	0.88	6.0	0.90	6.8	0.96	10.7	0.91	7.1

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Junction	Arm	2021 Base + Committed Developments				2038 Base + Committed Developments				2038 Base + Committed Developments + Ordsall Development				2038 Base + Committed Developments + Ordsall Development + Other Local Plan Sites			
		AM		PM		AM		PM		AM		PM		AM		PM	
		RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ
9 - A620 Amcott Way / A620 Moorgate / A638 Arlington Way	Moorgate (ahead/left)	97.2	28.1	83.8	15.1	112.4	95.1	97.1	27.6	113.4	99.4	98.7	30.9	115.0	108.0	99.5	32.9
	Amcott Way (ahead/right)	97.2	26.1	83.7	12.0	113.6	115.0	97.2	21.5	113.6	117.5	97.2	21.5	114.5	126.0	99.8	27.0
	Arlington Way (right/left)	93.7	12.2	83.8	10.6	108.6	41.0	96.4	18.6	108.6	40.8	98.7	22.2	115.8	60.6	99.2	23.5
	Practical Reserve Capacity (%)	-8.0		7.4		26.2		-8.0		26.2		-9.7		28.6		-10.8	
10 - A638 Arlington Way / Spital Hill / Chapelgate	Arlington Way (left/ahead/right)	68.1	14.0	74.2	16.6	79.5	18.7	86.1%	22.4	79.5%	18.7	84.5%	21.7	81.5%	20.1	86.5%	23.0
	Spital Hill (right/left/ahead)	67.3	7.2	73.0	7.7	78.7	9.2	84.6%	10.1	78.7%	9.2	89.3%	11.1	82.8%	9.7	89.3%	11.1
	Arlington Way (ahead/right/left)	63.3	12.1	77.0	17.7	73.7	16.0	87.6%	25.5	75.8%	17.0	88.5%	25.2	78.5%	17.0	91.4%	28.0
	Chapelgate (left/ahead/right)	27.0	2.3	49.2	4.6	36.4	2.8	63.1%	5.8	42.2%	3.1	82.3%	7.6	45.8%	3.2	82.3%	7.6
	Practical Reserve Capacity (%)	32.1		16.9		13.2		0.9		13.2		0.7		8.7		-1.6	
11 - A638 Arlington Way / Grove Street	Arlington Way (left/ahead/right)	76.2	13.7	84.8	17.8	88.7	21.1	98.1	32.3	88.7	21.1	98.1	32.3	92.4	24.6	98.1	29.1
	Grove Street (right/left/ahead)	57.5	3.1	58.3	3.2	67.4	3.9	68.2	4.0	67.4	3.9	68.2	4.0	67.4	3.9	68.2	3.8
	Arlington Way (ahead/right/left)	100.1	36.9	111.3	77.9	116.7	105.4	129.0	157.4	118.8	115.4	129.9	161.7	121.0	125.5	133.0	176.3
	Grove Street (left/ahead/right)	85.3	6.2	106.8	24.6	99.7	12.5	125.0	58.9	99.7	12.5	125.0	58.9	103.7	16.7	134.2	71.8
	Practical Reserve Capacity (%)	11.2		-23.6		-29.7		-43.3		-32.0		-44.4		-34.4		-49.1	
12 - A638 Arlington Way / A638 London Road / Carolgate	Carolgate (left/ahead/right)	52.9	2.9	95.7	15.4	62.2	4.0	115.1	58.1	70.0	4.7	121.0	78.2	70.0	4.5	123.7	33.9
	Arlington Way (right/left/ahead)	40.8	6.1	62.6	11.9	47.2	7.5	70.8	15.9	47.7	7.6	73.7	16.6	51.0	8.5	75.1	17.9
	London Road (ahead/right/left)	86.6	17.6	97.6	23.9	102.2	44.8	113.8	80.3	106.6	63.7	119.7	102.7	109.0	77.5	124.3	122.4
	Albert Road (left/ahead/right)	86.1	8.6	93.3	10.3	103.0	19.7	113.%	32.1	103.7	20.4	115.7	34.5	107.7	27.7	119.0	38.9
	Practical Reserve Capacity (%)	3.9		-8.4		14.5		-27.9		-18.5		-34.4		-21.1		-38.1	
13 - Ollerton Road / W Hill Road	B - Ollerton Road	0.07	0.1	0.10	0.1	0.08	0.1	0.12	0.1	0.15	0.2	0.33	0.5	0.15	0.2	0.33	0.5
	B - Ollerton Road	0.13	0.1	0.19	0.2	0.15	0.2	0.23	0.3	0.20	0.2	0.31	0.4	0.20	0.2	0.31	0.4
	C - West Hill Road	0.09	0.1	0.09	0.1	0.10	0.1	0.11	0.2	0.40	1.0	0.24	0.4	0.40	1.0	0.24	0.4

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Junction	Arm	2021 Base + Committed Developments				2038 Base + Committed Developments				2038 Base + Committed Developments + Ordsall Development				2038 Base + Committed Developments + Ordsall Development + Other Local Plan Sites			
		AM		PM		AM		PM		AM		PM		AM		PM	
		RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ
14 - London Road / Whitehouses Road	A - A638 London Road (South)	0.69	2.2	1.09	51.0	0.81	4.2	1.30	156.1	0.85	5.1	1.42	224.4	0.87	6.2	1.47	265.6
	B - Whitehouses Road	0.96	11.0	0.89	5.9	1.23	59.5	1.01	15.5	1.50	146.2	1.05	23.9	1.55	158.7	1.08	29.4
	C A638 London Road	0.23	0.3	0.57	1.3	0.26	0.4	0.67	2.0	0.66	1.9	0.73	2.6	0.69	2.2	0.75	2.9
15 - London Road / Whinney Moor Lane / Bracken Lane	B - Bracken Lane	0.07	0.1	0.05	0.1	0.09	0.1	0.07	0.1	0.10	0.1	0.08	0.1	0.10	0.1	0.09	0.1
	B - Bracken Lane	0.14	0.2	0.11	0.1	0.20	0.2	0.17	0.2	0.22	0.3	0.21	0.3	0.24	0.3	0.24	0.3
	A - London Road (north)	0.11	0.1	0.15	0.2	0.13	0.2	0.19	0.2	0.14	0.2	0.19	0.2	0.14	0.2	0.20	0.2
	D - Whinney Moor Lane	0.20	0.3	0.16	0.2	0.34	0.5	0.40	0.6	0.47	0.9	1.03	5.2	0.57	1.2	1.15	7.1
	D - Whinney Moor Lane	0.38	0.6	0.49	0.9	0.57	1.3	0.77	2.7	0.70	2.1	1.02	8.0	0.76	2.6	1.13	11.8
	C - London Road (south)	0.05	0.0	0.05	0.1	0.06	0.1	0.07	0.1	0.06	0.1	0.07	0.1	0.06	0.1	0.07	0.1
16 - All Hallows Street / High Street / Goosemoor Lane	B - Goosemoor Lane	0.15	0.2	0.27	0.4	0.20	0.2	0.34	0.5	0.33	0.5	0.61	1.5	0.34	0.5	0.63	1.6
	B - Goosemoor Lane	0.47	0.9	0.46	0.8	0.57	1.3	0.56	1.3	0.64	1.7	0.62	1.6	0.67	1.9	0.64	1.7
	C - High Street	0.28	0.4	0.16	0.2	0.34	0.5	0.19	0.2	0.57	1.3	0.28	0.4	0.57	1.3	0.28	0.4
17 - Ollerton Road/Site Access (northern)	A - Ollerton Road (north)	-	-	-	-	-	-	-	-	0.24	0.3	0.44	0.8	0.24	0.3	0.44	0.8
	B - Site Access (east)	-	-	-	-	-	-	-	-	0.10	0.1	0.04	0.0	0.10	0.1	0.04	0.0
	C - Ollerton Road (south)	-	-	-	-	-	-	-	-	0.21	0.3	0.27	0.4	0.21	0.3	0.27	0.4
	D - Site Access (west)	-	-	-	-	-	-	-	-	0.32	0.5	0.13	0.1	0.32	0.5	0.13	0.1
17 - Ollerton Road/Site Access (southern)	A - Ollerton Road (north)	-	-	-	-	-	-	-	-	0.23	0.3	0.41	0.7	0.23	0.3	0.41	0.7
	C - Ollerton Road (south)	-	-	-	-	-	-	-	-	0.19	0.2	0.24	0.3	0.19	0.2	0.24	0.3
	D - Site Access (west)	-	-	-	-	-	-	-	-	0.29	0.4	0.12	0.1	0.29	0.4	0.12	0.1
18 - Ollerton Road / Brick Yard Road	B - Main Road	0.02	0.0	0.02	0.0	0.02	0.0	0.02	0.0	0.02	0.0	0.03	0.0	0.02	0.0	0.03	0.0
	B - Main Road	0.06	0.1	0.12	0.1	0.07	0.1	0.14	0.2	0.10	0.1	0.22	0.3	0.10	0.1	0.22	0.3
	C - Brick Yard Lane	0.03	0.0	0.01	0.0	0.03	0.0	0.01	0.0	0.03	0.0	0.01	0.0	0.03	0.0	0.01	0.0

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Junction	Arm	2021 Base + Committed Developments				2038 Base + Committed Developments				2038 Base + Committed Developments + Ordsall Development				2038 Base + Committed Developments + Ordsall Development + Other Local Plan Sites			
		AM		PM		AM		PM		AM		PM		AM		PM	
		RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ
19 - A638 / Main Road	B - Main Road	0.05	0.1	0.04	0.0	0.07	0.1	0.05	0.1	0.07	0.1	0.05	0.1	0.07	0.1	0.05	0.1
	B - Main Road	0.13	0.1	0.11	0.1	0.17	0.2	0.15	0.2	0.32	0.5	0.23	0.3	0.34	0.5	0.24	0.3
	C - A638 (north)	0.04	0.1	0.06	0.1	0.05	0.1	0.08	0.1	0.05	0.1	0.08	0.2	0.06	1.0	0.09	0.2
20 - A638 / B6387 Rectory Lane	B - B6387 Rectory Lane	0.24	0.3	0.34	0.5	0.44	0.8	0.41	0.7	0.30	0.4	0.44	0.8	0.30	0.4	0.46	0.8
	C - A638 (south)	0.24	0.3	0.22	0.3	0.29	0.4	0.27	0.4	0.32	0.5	0.28	0.4	0.32	0.5	0.29	0.4

Table 22 - Capacity Assessment Results (Ordsall South Assessed With 1,250 Dwellings)

Junction	Arm	2038 Base + Committed Developments + Ordsall Development				2038 Base + Committed Developments + Ordsall Development + Other Local Plan Sites			
		AM		PM		AM		PM	
		RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ
1A - A1 / B6079 Retford Road	B - A1 slip road	0.15	0.2	0.15	0.2	0.15	0.2	0.15	0.2
	C - B6079 Retford Road	0.41	1.1	0.35	0.9	0.41	1.1	0.35	0.9
1B - A1 / A620 Retford Road	B - A1 slip road	0.48	0.9	0.43	0.7	0.48	0.9	0.43	0.8
	C - B6079 Retford Road	0.00	0.0	0.03	0.0	0.00	0.0	0.03	0.0
2A - Apleyhead Interchange (A57 /Blyth Road / A1)	A - A57	0.76	3.0	0.74	2.7	0.81	4.1	0.88	6.8
	C - Road Access A1 (East)	0.58	1.4	0.51	1.0	0.74	2.8	0.54	1.1
	D - Slip Rd - Entry Only	0.50	1.0	0.55	1.2	0.61	1.5	0.57	1.3
	E - BlythRoad	0.42	0.7	0.39	0.6	0.54	1.2	0.42	0.7
2BA - A1 / B6420 Mansfield Road / A614 Blyth Road / A57	A- A57 S	1.03	21.6	0.99	14.4	1.22	69.0	1.04	23.0
	A1 Link	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
	A57 N	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
2BB - A1 / B6420 Mansfield Road / A614 Blyth Road / A57	Mansfield Road	0.74	2.7	0.58	1.3	1.08	29.6	0.66	1.8
	A57	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
3 - A1 / Elkesley Bridge Road	A - Poulter Rise	0.09	0.1	0.11	0.1	0.09	0.1	0.11	0.1
	B - Unamed Road	0.04	0.0	0.04	0.0	0.04	0.0	0.04	0.0
	C - Elkesley Bridge Rd	0.09	0.1	0.13	0.1	0.09	0.1	0.13	0.1
3B - Jockey Lane / Eskil Way	A- Poulter Rise SE	0.08	0.1	0.09	0.1	0.08	0.1	0.09	0.1
	B - Jockey Lane	0.11	0.1	0.09	0.1	0.11	0.1	0.09	0.1
5A - Markham Moor Interchange (A638 / A57 Cliff gate / A57 / A1)	A - A57	0.26	0.3	0.33	0.5	0.27	0.4	0.35	0.5
	B - Entry Only	0.47	0.9	0.55	1.2	0.47	0.9	0.56	1.2
	C - A638	0.41	0.7	0.33	0.5	0.44	0.8	0.34	0.5
	D - Cliffe Gate	0.49	1.0	0.46	0.9	0.50	1.0	0.47	0.9
5B - A1 Markham Moor (A1 / Great N Road / Main Street / A57)	B - Entry from A1	0.17	0.2	0.25	0.3	0.17	0.2	0.25	0.3
	C - Great North Rd	0.28	0.4	0.33	0.5	0.29	0.4	0.37	0.6
	D - A638	0.24	0.3	0.25	0.3	0.24	0.3	0.26	0.3
	A - Cliffe Gate	0.42	0.7	0.49	1.0	0.42	0.7	0.50	1.0

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Junction	Arm	2038 Base + Committed Developments + Ordsall Development				2038 Base + Committed Developments + Ordsall Development + Other Local Plan Sites			
		AM		PM		AM		PM	
		RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ
6 - A620 Babworth Road / B6420 Mansfield Road / A620 Straight Mile / Sutton Lane	B - Mansfield Road	Max	870.30	Max	1216.6	Max	1058.3	Max	1282.8
	B - Mansfield Road	Max	12.10	Max	23.5	Max	12.9	Max	24.1
	A - Babworth Road	0.83	5.2	0.64	1.9	0.76	3.6	0.64	2.0
	D - Sutton Lane	Max	661.20	Max	973.3	Max	767.4	Max	1014.4
	D - Sutton Lane	Max	5.20	Max	7.3	Max	31.2	Max	12.3
	C - Straight Mile	0.95	12.1	0.98	12.1	0.96	11.0	0.98	12.6
7 - A620 Babworth Road / Ordsall Road	A- A620 Babworth Rd (E)	1.22	94.1	1.18	75.4	1.44	233.1	1.23	97.3
	B - Ordsall Road	1.80	313.7	0.95	10.3	1.87	355.4	1.03	19.0
	C - A620 Babworth Rd (W)	1.29	162.0	1.20	95.2	1.32	182.5	1.32	170.9
8 - A620 Amcott Way / Bridlegate / A620 Hospital Road / A638 North Road / Hallcroft Road	B - A620 Amcott Way	0.75	3.0	0.86	5.8	0.78	3.7	0.89	7.3
	C - Bridgegate	0.90	6.6	1.02	16.7	0.99	11.6	1.10	28.4
	D - A620 Hospital Road	1.24	100.8	1.10	51.2	1.27	113.8	1.16	78.3
	E - North Road	0.90	7.7	1.09	60.3	0.95	13.8	1.11	70.8
	A - Hallcroft Road	0.89	6.3	0.92	8.1	0.96	11.5	0.93	8.5
9 - A620 Amcott Way / A620 Moorgate / A638 Arlington Way	Moorgate (ahead/left)	112.5	96.0	98.5	31.0	115.5	110.1	100.4	36.3
	Amcott Way (ahead/right)	113.6	117.2	99.2	25.2	114.5	126.5	99.8	27.0
	Arlington Way (right/left)	223.7	54.2	98.7	22.2	115.8	60.6	99.2	23.5
	Practical Reserve Capacity (%)	26.4		-10.2		-28.6		-11.6	
10 - A638 Arlington Way / Spital Hill / Chapelgate	Arlington Way (left/ahead/right)	79.5	18.7	84.5	21.7	81.5	20.1	86.5	23.0
	Spital Hill (right/left/ahead)	78.7	9.2	89.3	11.1	82.8	9.7	89.3	11.1
	Arlington Way (ahead/right/left)	78.5	17.2	88.8	25.4	78.5	17.2	91.7	28.5
	Chapelgate (left/ahead/right)	44.1	3.2	87.4	8.6	48.0	3.3	87.4	8.6
	Practical Reserve Capacity (%)	13.2		0.7		8.7		1.9	
11 - A638 Arlington Way / Grove Street	Arlington Way (left/ahead/right)	88.7	21.1	98.1	32.2	92.4	24.6	98.1	29.1
	Grove Street (right/left/ahead)	67.4	3.9	68.2	4.0	67.4	3.9	68.2	3.8
	Arlington Way (ahead/right/left)	119.4	118.3	130.2	162.9	121.6	128.5	133.3	177.5
	Grove Street (left/ahead/right)	99.7	12.5	125.0	58.9	103.7	16.7	134.2	71.8
	Practical Reserve Capacity (%)	32.7		-44.6		-35.1		-49.1	
12 - A638 Arlington Way / A638 London Road / Carolgate	Carolgate (left/ahead/right)	73.0	5.0	122.2	83.6	73.0	4.8	124.9	88.9
	Arlington Way (right/left/ahead)	47.9	7.6	75.0	16.9	51.2	8.5	76.4	18.6
	London Road (ahead/right/left)	108.2	71.5	122.3	112.2	110.6	85.9	124.9	126.3
	Albert Road (left/ahead/right)	103.9	20.7	116.5	35.3	107.9	28.0	126.0	45.4
	Practical Reserve Capacity (%)	20.2		-35.9		-22.9		-40.0	

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Junction	Arm	2038 Base + Committed Developments + Ordsall Development				2038 Base + Committed Developments + Ordsall Development + Other Local Plan Sites			
		AM		PM		AM		PM	
		RFC	MMQ	RFC	MMQ	RFC	MMQ	RFC	MMQ
13 - Ollerton Road / W Hill Road	B - Ollerton Road	0.18	0.2	0.42	0.7	0.18	0.2	0.42	0.7
	B - Ollerton Road	0.22	0.3	0.35	0.5	0.22	0.3	0.35	0.5
	C - West Hill Road	0.53	1.7	0.29	0.6	0.53	1.7	0.29	0.6
14 - London Road / Whitehouses Road	A - A638 London Road (South)	0.86	5.4	1.46	249.0	0.89	6.8	1.51	290.9
	B - Whitehouses Road	1.60	184.7	1.07	28.2	1.64	197.7	1.12	39.7
	C A638 London Road	0.67	2.0	0.75	2.9	0.70	2.3	0.76	3.2
15 - London Road / Whinney Moor Lane / Bracken Lane	B - Bracken Lane	0.10	0.1	0.08	0.1	0.11	0.1	0.09	0.1
	B - Bracken Lane	0.23	0.3	0.23	0.3	0.25	0.3	0.26	0.3
	A - London Road (north)	0.15	0.2	0.19	0.2	0.15	0.2	0.20	0.2
	D - Whinney Moor Lane	0.57	1.2	1.12	6.7	0.74	2.2	1.26	8.9
	D - Whinney Moor Lane	0.76	2.6	1.11	11.4	0.84	3.5	1.24	16.2
	C - London Road (south)	0.06	0.1	0.07	0.1	0.06	0.1	0.07	0.1
16 - All Hallows Street / High Street / Goosemoor Lane	B - Goosemoor Lane	0.38	0.6	0.74	2.6	0.40	0.7	0.75	2.8
	B - Goosemoor Lane	0.68	2.0	0.71	2.3	0.70	2.2	0.73	2.5
	C - High Street	0.64	1.8	0.31	0.5	0.65	1.8	0.32	0.5
17 - Ollerton Road/Site Access (northern)	A - Ollerton Road (north)	0.28	0.4	0.54	1.2	0.28	0.4	0.54	1.2
	B - Site Access (east)	0.14	0.2	0.06	0.1	0.14	0.2	0.06	0.1
	C - Ollerton Road (south)	0.23	0.3	0.31	0.4	0.23	0.3	0.31	0.4
	D - Site Access (west)	0.44	0.8	0.17	0.2	0.44	0.8	0.17	0.2
17 - Ollerton Road/Site Access (southern)	A - Ollerton Road (north)	0.27	0.4	0.49	1.0	0.27	0.4	0.49	1.0
	C - Ollerton Road (south)	0.20	0.3	0.27	0.4	0.20	0.3	0.27	0.4
	D - Site Access (west)	0.39	0.6	0.16	0.2	0.39	0.6	0.16	0.2
18 - Ollerton Road / Brick Yard Road	B - Main Road	0.02	0.0	0.03	0.0	0.02	0.0	0.03	0.0
	B - Main Road	0.11	0.1	0.25	0.3	0.11	0.1	0.25	0.3
	C - Brick Yard Lane	0.03	0.0	0.01	0.0	0.03	0.0	0.01	0.0
19 - A638 / Main Road	B - Main Road	0.08	0.1	0.05	0.1	0.08	0.1	0.06	0.1
	B - Main Road	0.38	0.6	0.25	0.3	0.40	0.6	0.27	0.4
	C - A638 (north)	0.05	0.1	0.08	0.2	0.06	0.1	0.09	0.2
20 - A638 / B6387 Rectory Lane	B - B6387 Rectory Lane	0.30	0.4	0.46	0.8	0.31	0.4	0.47	0.9
	C - A638 (south)	0.33	0.5	0.29	0.4	0.33	0.5	0.30	0.4

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10.2.2 As demonstrated by the capacity assessment results in Table 21~~Table 21~~ and Table 22~~Table 22~~ the following junctions are shown to experience capacity issues in one or more scenario:

- Junction 2A - Apleyhead Interchange (A57 /Blyth Road / A1)
- Junction 6 - A620 Babworth Rd/B6420 Mansfield Rd/A620 Straight Mile/Sutton Lane
- Junction 7 - A620 Babworth Road/Ordsall Road
- Junction 8 - A620 Amcott Way/Bridlegate/A620 Hospital Rd/A638 North Road/Hallcroft Rd
- Junction 9 - A620 Amcott Way/A620 Moorgate/A638 Arlington Way
- Junction 11 - A638 Arlington Way/Grove Street
- Junction 12 - A638 Arlington Way/A638 London Road/Carolgate
- Junction 14 - A638 London Road/Whitehouses Road
- Junction 15 - London Road / Whinney Moor Lane / Bracken Lane

10.2.3 The Apleyhead Interchange is shown to operate above capacity in scenarios where trips associated with the other Local Plan allocation sites are included in the assessment. The approach from the A57 (west) is over-capacity in the PM peak by 2038 and is the only arm of the junction that is over capacity. The RFC value does not exceed 0.88 in any scenario.

10.2.4 The A620 / B6420 junction (Junction 6) is shown to operate within capacity in the 2021 base scenario only. The addition of development trips from Ordsall South and other Local Plan allocation sites results in worsening of junction performance on all approaches except Babworth Road.

10.2.5 The A620 Babworth Road/Ordsall Road junction (Junction 7) is shown to exceed capacity on all arms of the junction in the 2021 'base' scenario. Junction performance significantly worsens in 2038. In the '2038 base plus committed development plus Ordsall South plus other Local Plan allocation sites', the longest queue for a development of 930 dwellings at Ordsall South is shown to be circa 1.6km on the Ordsall Road arm in the AM peak hour, with large queues shown on all approaches in both peak periods.

10.2.6 The A620 Amcott Way/Bridlegate/A620 Hospital Road/A638 North Road/Hallcroft Road junction (Junction 8) is shown to operate within capacity in the 2021 base scenario. The addition of Ordsall South development trips and trips from other allocation sites worsens junction performance with all arms of the junction shown to be over-capacity in at least one scenario in 2038.

10.2.7 The A620 Amcott Way/A620 Moorgate/A638 Arlington Way junction (Junction 9) is shown to operate within capacity at 2021. In the 2038 scenarios assessing Ordsall South with 930 dwellings, the junction is shown to be over capacity in the AM scenario and also the PM scenario when other Local Plan allocation sites are included in the assessment. In the sensitivity test

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assessing Ordsall South with 1,250 dwellings, the junction is shown to be over-capacity in the AM and PM scenarios at 2038.

10.2.8 The A638 Arlington Way/Grove Street junction (Junction 11) is shown to be over-capacity in both peaks in all scenarios. The only exception is the 2021 base scenario in which the junction is shown to be operating within capacity in the AM peak.

10.2.9 The A638 Arlington Way/A638 London Road/Carolgate junction (Junction 12) is shown to operate within capacity at 2021 in the 'base' and 'base plus committed developments' scenarios. At 2038 the junction is shown to be over-capacity in the AM and PM peak hours in all scenarios.

10.2.10 The A638 London Road/Whitehouses Road junction (Junction 14) is shown to operate above capacity on the A638 London Road (south) and Whitehouses Road arms of the junction in all scenarios except the 2021 AM base in which London Road (south) is shown to be within capacity in the 2021 AM base. The London Road (north) arm of the junction is shown to operate within capacity in all scenarios.

10.2.11 The London Road/Whinney Moor Lane/Bracken Lane junction (Junction 15) is shown to operate within capacity at 2021. With the addition of committed development trips and/or trips from other Local Plan sites, the capacity of the junction is exceeded at 2038. Capacity is exceeded on the Whinney Moor Lane arm of the junction in the 2038 scenarios. Capacity is not exceeded on other arms.

10.2.12 In addition to the junctions that have been identified above, it is noted that Junction 2B 'A1 / B6420 Mansfield Road / A614 Blyth Road / A57' is also shown to be over-capacity in some scenarios. Although the junction forms part of a dumbbell roundabout, it is not a conventional roundabout. As such, in this TA the junction has been modelled as two priority junctions. However, the junctions are not conventional priority junctions and modelling them as such may be impacting on the results presented. The modelling approach applied at this junction should be discussed and agreed with NCC when the TA is prepared as part of a planning application.

11 MITIGATION

11.1 INTRODUCTION

11.1.1 This Chapter outlines a preliminary strategy for mitigating the impact of a development of 930 dwellings (and a sensitivity test of 1,250 dwellings) at the Ordsall South site.

11.2 SUSTAINABLE TRAVEL INFRASTRUCTURE/MEASURES

11.2.1 Current best practice recommends that the transport implications of developments should be assessed having regard to:

- **Measures to encourage environmental sustainability** – i.e. reducing the need to travel, especially by car, providing sustainable transport information and choices and measures to assist in influencing travel behaviour.
- **Managing the existing network** – i.e. making best use of existing transport infrastructure, low cost improvements such as signal control systems and intelligent transport systems.
- **Mitigating residual impacts** – through demand management; improvements to public transport networks, walking and cycling infrastructure; and through minor physical improvements to existing roads.

11.2.2 In accordance with the NPPF all developments which generate significant amounts of movement will be required to provide a Travel Plan. As part of the travel planning process developers will be required to nominate a Travel Plan Coordinator and make financial contributions for the annual monitoring of travel plan performance against agreed targets for an agreed period following occupation of the development. In addition, bond payments will also be sought to cover the provision of supplementary sustainable travel infrastructure/measures if agreed targets are not met. Furthermore, if Travel Plan initiatives are relied on to address network capacity issues, fallback infrastructure improvements will need to be identified and secured as part of the planning application process if agreed targets are not met.

11.2.3 The detailed content of the Travel Plan will be site specific and will need to be agreed with the highway and planning authorities at the planning application stage but in general terms will set out the process for monitoring future travel behavior, and the site-specific strategy and measures that will be introduced to influence modal choice with a view to reducing dependency upon the private car. The broad aims of Travel Plan reports being to:

- Encourage the use of alternative modes of transport to the private car and to better manage private car usage to reduce environmental impacts for all journeys associated with the proposed development.

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- Include ‘smarter choices’ (for example car sharing, car clubs, teleworking, teleconferencing, home shopping, electric vehicle infrastructure etc.) to help change the way people travel.
- Deliver long-term commitments to changing travel habits by minimising the percentage of single occupancy car journeys associated with the proposal and maximising the proportion of trips made by public transport, by car share, on foot and by cycle.
- Identify and achieve the support of stakeholders for the Travel Plan and encourage a sustainable transport culture, which will develop and grow with time.
- To educate residents and employees regarding the health benefits of walking and cycling.
- To seek to reduce traffic generated by development to a lower level of car trips than would occur without the implementation of a Travel Plan.
- Promote healthy lifestyles and vibrant communities.

11.2.4 The site developer will be required to fund measures and/or infrastructure improvements required to mitigate the direct transport impacts of the development. This will include funding for items such as Smarter Choices measures and initiatives, Travel Plan, on and off-site cycling and walking infrastructure, bus network/infrastructure enhancements and new/enhanced bus services, where these can be demonstrated to be financially self-supporting in the long term.

11.3 BUS TRANSPORT

11.3.1 As discussed earlier in this report the existing bus services stopping close to the site are not high frequency services. Enhancements to these services, or the provision of new complimentary services should therefore be provided by the developer to ensure that residents on the completed development have sustainable travel choices available to them that meet the aspirations of the National Bus Strategy and supporting documents. The layout of the site should also be configured to allow bus penetration into the western parcel of land, as a minimum.

11.3.2 Consultation with existing bus service providers is recommended to test the commerciality of (and therefore reduce the subsidy required for) any potential service improvements. Furthermore, the ‘Bus Back Better: national bus strategy for England’ (March 2021) as well as NCC’s Bus Service Improvement Plan (BSIP) (Autumn 2021) and the Enhanced Partnership launched in June 2022 should be acknowledged. Future bus service provision should be in accordance with the aspirations set out in the national bus strategy and BSIP.

~~11.3.2 Consultation with existing bus service providers is recommended to test the commerciality of (and therefore reduce the subsidy required for) any potential service improvements. Furthermore, the ‘Bus Back Better: national bus strategy for England’ (March 2021) as well as NCC’s Bus Service Improvement Plan (BSIP) (Autumn 2021) and the intention to implement an Enhanced Partnership in 2022 should be acknowledged. Future bus service provision should be in accordance with the aspirations set out in the national bus strategy and BSIP.~~

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11.3.4 Detailed investigations should be undertaken at the planning application stage in order to identify the appropriate level of new/improved bus services and complementary infrastructure improvements required in order to support the trip rates used in this TA, cater for forecast demands and achieve modal split targets. Delivery of an appropriate package of improvements should be a conditional requirement of planning permission and should be implemented prior to development occupation and expanded into the site as development progresses to encourage good, sustainable travel behaviour.

11.3.5 It should be noted that in spring 2021 Nottinghamshire County Council was successful with a £1.5m bid to the Department of Transport Rural Mobility Fund. This funding will be used to pilot flexible Demand Responsive Transport (DRT) services across Nottinghamshire using new route planning and booking software and new vehicles. The areas to be served in Bassetlaw will be based on a revised network of services in the Ollerton Area with a new hub for interchange to mainline services. The services are expected to commence in 2022.

11.3.6 It is also worth noting the potential that community transport and related services such as taxi buses could have in providing a more sustainable alternative to conventional bus services. Several community transport providers are based in Bassetlaw including Bassetlaw Action Centre, based in Retford, which offers community car and minibus schemes including wheelchair accessible transport.

11.3.7 Improvements to bus networks/infrastructure should be timed to coincide with development to meet forecast demand.

11.3.8 The cost of providing additional bus resources will depend on the service specifics identified at the planning application stage and will be dependent upon the details of the bus contract specifications, numbers of vehicles required, routes, service frequencies and any new/improved infrastructure required.

11.3.9 However, as a general ‘rule of thumb’ a new bus service with a single vehicle costs in the order of £475 to £500 per day to operate, or approximately £175,000 per vehicle per annum for a 7-day service.

11.3.10 Improvements are funded to a specified level for specific time periods and are not therefore “open-ended” (usually secured via a Section 106 Agreement). It is typically the case that developers would fund a bus service for a minimum of five years, subject to build-out / occupation rate. After five years the idea is that the service would be sustainable without the need for financial support. This would need to be explored in further detail. The risk is that if the service is not sustainable and additional support is not available, the bus service would cease to operate or would operate a reduced timetable.

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11.3.11 Based on the assumption that a new service comprising two buses is required this would equate to a total cost of circa £1.75m for the service to be fully funded for a five year period, assuming no revenue generation from fares.

11.3.12 The bus service should be supported with high quality bus stop facilities within and adjacent the site meeting the standard set out in the Nottinghamshire County Council Highway Design guide and included as a conditional requirement of planning permissions for new development. This should include real time bus stop poles & displays with associated electrical connections, shelters, lighting, timetable cases and bus stop clearways. To future proof the development to allow the use of electric buses, the provision of vehicle charging infrastructure should be included.

11.4 CYCLING AND WALKING INFRASTRUCTURE

11.4.1 The site developer will be required to deliver new and improved walking and cycling infrastructure to connect the development to neighbouring areas and facilitate safe travel by these modes. A detailed access strategy will need to be identified at the planning application stage.

11.4.2 As advised by NCC, cycle infrastructure improvements should be carried out in accordance with Department for Transport (DfT) LTN 1/20 'Cycle Infrastructure Design'.

11.4.3 Where cycle infrastructure cannot meet the requirements of LTN 1/20, this should be discussed with NCC. NCC will be required to advise if the developer should provide cycle infrastructure that meets the requirements LTN as best it can but acknowledging that it will not be fully LTN 1/20 compliant, or alternatively, if cycle infrastructure should not be provided.

11.4.4 Subject to NCC approval in relation to LTN 1/20, as a minimum this should provide for LTN 1/20 compliant cycle infrastructure along Ollerton Road to connect the site to Ordsall as well as improvements to existing Public Rights of Way that cross the site and run along its boundaries.

11.4.5 Regarding timing, it is important to implement this new/improved walking and cycling infrastructure very early in the life of the development, ideally before any units on the site are occupied, so that the facilities are available and operational for new residents to use immediately. This is an important aspect of establishing good, sustainable travel behaviour and should be a conditional requirement of planning permissions for new development.

11.4.6 Indicative construction costs for developing new cycling and walking facilities are in the region of:

- New footway/ cycleway – £150,000 to £300,000 per km particularly dependent upon the number and complexity of side road junctions
- New on carriageway cycle lane – £25,000 to £50,000 per km depending upon number of junctions/ signalised junctions, existing highway layout, on street parking constraints etc.

- Rural/ off carriageway route – £50,000 to £100,000 per km primarily dependent upon surfacing material required
- Controlled crossing (toucan) in urban area – £60,000 per site (likely to be higher if on higher speed road or requires Pegasus arrangement to cater for equestrian use also)
- New pair of dropped (uncontrolled) crossings – £2,500 per site.

11.5 MITIGATION OF RESIDUAL HIGHWAY IMPACTS

11.5.1 The site developer will also be required to deliver off-site highway infrastructure improvements to mitigate residual traffic impacts. Details of which will need to be determined at the planning application stage through the submission of a Transport Assessment produced in accordance with the NPPF. The developer will be required to assess the transport implication of the site and the cumulative implications of any other committed land-use development and transport schemes in the local area. Appropriate transport mitigation will need to be identified and agreed with the highway authority to address residual traffic impacts. Delivery of mitigation will be secured through the planning approval process.

11.6 MITIGATION OVERVIEW

11.6.1 If junction modelling shows a junction to operate above capacity following the addition of development trips, NCC highways is likely to seek mitigation. If a junction is shown to operate above capacity prior to the introduction of development trips, the developer will be required to mitigate the impact of the development but will not be required to fix existing problems i.e. mitigation should be determined on a 'nil-detriment' basis.

11.6.2 At the nine junctions shown to be over-capacity, a preliminary approach to mitigation has been identified. Any scheme involving physical junction improvement works uses land within the adopted highway only.

11.7 APLEYHEAD INTERCHANGE (A57 /BLYTH ROAD / A1)

11.7.1 The layout of the existing junction is shown in the image below.

(Map data © Ordnance Survey)

11.7.2 The junction operates as a standard roundabout forming the western roundabout of a dumbbell layout. The junction includes slip roads to/from the northbound carriageway of the A1 as well providing access to the A57 and A614 Blyth Road.

11.7.3 To mitigate the impact of the development, the lane allocations for the A57 (west) approach have been amended to allow ahead moves from both lanes. The exit from the roundabout onto the bridge over the A1 has been widened to allow a two lane exit. A preliminary layout drawing is presented in Appendix L ~~Appendix L~~ together with Junctions 9 model outputs. Table 23 ~~Table 23~~ summarises the results of the '2038 Base + Committed Developments + Ordsall Development + Other Local Plan Developments' scenario for 930 dwellings at Ordsall South and demonstrates that the junction will operate within capacity. The table also summarises the results of the same scenario but for the Ordsall South 1,250 dwellings sensitivity test.

Table 23 – Capacity Assessment Results for Entry Widening Mitigation Scheme

Arm	2038 Base + Committed Developments + Ordsall South (930 dwellings) + Other Local Plan Developments			
	AM		PM	
	RFC	MMQ	RFC	MMQ
A57	0.57	1.3	0.69	2.2
Road Across A1	0.73	2.6	0.53	1.1
Slip road from Worksop Road	0.61	1.5	0.57	1.3
Blyth Road	0.53	1.1	0.42	0.7
Arm	2038 Base + Committed Developments + Ordsall South (1,250 dwellings) + Other Local Plan Developments			
	AM		PM	
	RFC	MMQ	RFC	MMQ
A57	0.57	1.3	0.70	2.3
Road Across A1	0.74	2.8	0.54	1.2
Slip road from Worksop Road	0.61	1.5	0.57	1.3
Blyth Road	0.54	1.2	0.42	0.7

11.7.4 As demonstrated by the capacity results in Table 23~~Table 23~~, the roundabout operates within capacity following introduction of the mitigation scheme.

11.8 A620 / B6420 MANSFIELD ROAD JUNCTION

11.8.1 The layout of the existing junction is shown in the image below.

(Map data © Ordnance Survey)

11.8.2 The junction currently operates as a staggered priority crossroad arrangement with right turn ghost islands provided on the A620. The junction also incorporates a private access to the north.

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11.8.3 To mitigate the impact of the development, a signal-controlled junction has been assessed. A preliminary layout drawing is presented in ~~'~~Appendix L~~Appendix L~~ together with LinSIG model outputs. Table 24~~Table 24~~ summarises the results of the '2038 Base + Committed Developments + Ordsall Development + Other Local Plan Developments' scenario for 930 dwellings at Ordsall South and demonstrates that the junction will operate within capacity. The table also summarises the results of the same scenario but for the Ordsall South 1,250 dwellings sensitivity test.

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Table 24 – Capacity Assessment Results for a Signal Controlled Mitigation Scheme

Arm	2038 Base + Committed Developments + Ordsall South (930 dwellings) + Other Local Plan Developments			
	AM		PM	
	DoS	MMQ	DoS	MMQ
A620 Babworth Road	87.9%	19.6	89.2%	18.0
B6420 Mansfield Road	87.1%	9.4	97.6%	17.7
A620 Straight Mile	76.8%	17.6	96.5%	30.7
Sutton Lane	17.9%	0.8	27.4%	1.3
Practical Reserve Capacity	2.4%		-8.4%	
Arm	2038 Base + Committed Developments + Ordsall South (1,250 dwellings) + Other Local Plan Developments			
	AM		PM	
	DoS	MMQ	DoS	MMQ
A620 Babworth Road	91.8%	24.6	92.0%	21.0
B6420 Mansfield Road	91.9%	11.1	99.5%	20.3
A620 Straight Mile	77.5%	18.2	101.7%	44.0
Sutton Lane	17.9%	0.8	27.4%	1.3
Practical Reserve Capacity	-2.1%		-13.0%	

11.8.4 A comparison of the results in Table 21~~Table 21~~, Table 22~~Table 22~~ and Table 24~~Table 24~~ demonstrates that the signal-controlled mitigation scheme fully mitigates the impact of Ordsall South and other Local Plan development.

11.9 A620 BABWORTH ROAD / ORDSALL ROAD

11.9.1 The layout of the existing junction is shown in the image below.

(Map data © 2021 TomTom)

11.9.2 This is one of the off-site junctions where the greatest increase in trips is forecast. The existing junction is a three-arm mini-roundabout.

11.9.3 To mitigate the impact of the development, a preliminary signal-controlled junction improvement has been assessed. A preliminary layout drawing is presented in Appendix L ~~Appendix L~~ along with LinSIG model outputs. Table 25 ~~Table 25~~ summarises the results of the '2038 Base + Committed Developments + Ordsall Development + Other Local Plan Developments' scenario for 930 dwellings at Ordsall South and demonstrates that the junction will operate within capacity. The table also summarises the results of the same scenario but for the Ordsall South 1,250 dwellings sensitivity test.

Table 25 – Capacity Assessment Results for a Signal Controlled Mitigation Scheme

Arm	2038 Base + Committed Developments + Ordsall South (930 dwellings) + Other Local Plan Developments			
	AM		PM	
	DoS	MMQ	DoS	MMQ
A620 Babworth Road (east)	96.4%	31.8	77.9%	16.4
Ordsall Road	95.8%	15.9	78.4%	6.7
Babworth Road (west)	96.0%	18.7	78.4%	10.5
Practical Reserve Capacity	-7.1%		14.9%	
Arm	2038 Base + Committed Developments + Ordsall South (1,250 dwellings) + Other Local Plan Developments			
	AM		PM	
	DoS	MMQ	DoS	MMQ
A620 Babworth Road (east)	99.9%	39.3	84.9%	18.9
Ordsall Road	100.2%	25.4	84.8%	7.9
Babworth Road (west)	98.7%	23.3	84.5%	11.8
Practical Reserve Capacity	-11.3%		6.1%	

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11.9.4 A comparison of the results in Table 21~~Table 21~~, Table 22~~Table 22~~ and Table 25~~Table 25~~ demonstrates that the signal-controlled mitigation scheme fully mitigates the impact of Ordsall South and other Local Plan development.

11.10 A620 AMCOTT WAY / BRIDLEGATE / A620 HOSPITAL ROAD / A638 NORTH ROAD / HALLCROFT ROAD

11.10.1 The layout of the existing junction is shown in the image below.

(Map data © Ordnance Survey)

11.10.2 The existing junction is a 5-arm priority roundabout with existing residential development on all sides which constrains options for improvement. Demand management measures to influence development modal splits (i.e. increasing use of sustainable transport in order to reduce car trips) should therefore be fully explored to help reduce development traffic impacts at this junction. This should include consideration of contributions towards new/improved public transport infrastructure and services. As outlined later in this Chapter, demand management measures are put forward as an approach to mitigation at two other off-site junctions. Demand management measures at all three off-site juntions are dicussed further in **Section 11.17**.

11.10.3 In the event that modal shift alone cannot address forecast impacts at this junction then the most likely form of improvement that could be delivered would be either the introduction of signal control on the roundabout or replacing the junction with a signal-controlled crossroads. However, both of these options would be very difficult to deliver in practice due to the constrained nature of the junction, so modal shift should be the initial priority. The site developers will be expected to deliver/fund any improvements required to achieve 'nil detriment'.

11.11 A620 AMCOTT WAY / A620 MOORGATE / A638 ARLINGTON WAY

11.11.1 The layout of the existing junction is shown in the image below.

(Map data © 2021 Ordnance Survey)

11.11.2 To mitigate the impact of the development, an improved signal-controlled junction has been assessed. A preliminary layout drawing is presented in Appendix L ~~Appendix L~~ together with LinSIG model outputs. Table 26 ~~Table 26~~ summarises the results of the '2038 Base + Committed Developments + Ordsall Development + Other Local Plan Developments' scenario for 930 dwellings at Ordsall South and demonstrates that the junction will operate within capacity. The table also summarises the results of the same scenario but for the Ordsall South 1,250 dwellings sensitivity test.

Table 26 – Capacity Assessment Results for a Signal Controlled Mitigation Scheme

Arm	2038 Base + Committed Developments + Ordsall South (930 dwellings) + Other Local Plan Developments			
	AM		PM	
	DoS	MMQ	DoS	MMQ
Moorgate (ahead/left)	104.3%	59.2	90.9%	19.8
Amcott Way (ahead/right)	106.0%	36.6	91.1%	17.0
Arlington Way (right/left)	105.4%	90.9	90.8%	19.9
Practical Reserve Capacity	-17.8%		-1.2%	
Arm	2038 Base + Committed Developments + Ordsall South (1,250 dwellings) + Other Local Plan Developments			
	AM		PM	
	DoS	MMQ	DoS	MMQ
Moorgate (ahead/left)	104.5%	60.3	91.4%	20.2
Amcott Way (ahead/right)	106.0%	36.6	91.1%	17.5
Arlington Way (right/left)	105.6%	92.5	90.8%	19.7
Practical Reserve Capacity	-17.8%		-1.6%	

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11.11.3 A comparison of the results in Table 21~~Table 21~~, Table 22~~Table 22~~ and Table 26~~Table 26~~ demonstrates that the signal-controlled mitigation scheme fully mitigates the impact of Ordsall South and other Local Plan development.

11.12 A638 ARLINGTON WAY / GROVE STREET

11.12.1 The layout of the existing junction is shown in the image below.

(Map data © Ordnance Survey)

11.12.2 The existing junction is a 4-arm signal controlled junction with existing commercial/residential development on all sides which constrains options for improvement.

11.12.3 Demand management measures to influence development modal splits (i.e. increasing use of sustainable transport in order to reduce car trips) should therefore be fully explored to help reduce development traffic impacts at this junction. This should include consideration of contributions towards new/improved public transport infrastructure and services. Demand management measures are dicussed further in **Section 11.17**.

11.12.4 The site developers will be expected to deliver/fund any improvements or demand management measures required to achieve 'nil detriment'.

11.13 A638 ARLINGTON WAY / A638 LONDON ROAD / CAROLGATE

11.13.1 The layout of the existing junction is shown in the image below.

(Map data © 2021 Google)

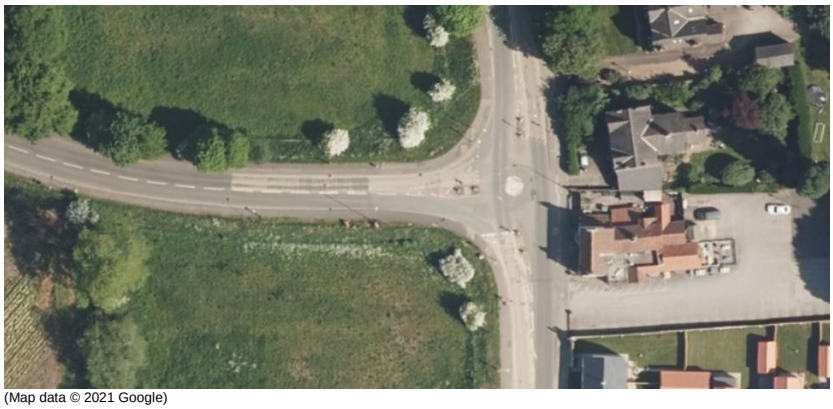
11.13.2 The existing junction is a 4-arm signal controlled junction with existing commercial/residential development on all sides which constrains options for improvement.

11.13.3 Demand management measures to influence development modal splits (i.e. increasing use of sustainable transport in order to reduce car trips) should therefore be fully explored to help reduce development traffic impacts at this junction. This should include consideration of contributions twards new/improved public transport infrastructure and services. Demand management measures are dicussed further in **Section 11.17**.

11.13.4 The site developers will be expected to deliver/fund any improvements or demand management measures required to achieve 'nil detriment'.

11.14 LONDON ROAD / WHITEHOUSES ROAD

11.14.1 The existing three-arm mini-roundabout layout is shown in the image below.



(Map data © 2021 Google)

11.14.2 To mitigate the impact of the development, a preliminary signal-controlled junction improvement has been assessed. A preliminary layout drawing is presented in Appendix L~~Appendix L~~ along with LinSIG model outputs. Table 27~~Table 27~~ summarises the results of the '2038 Base + Committed Developments + Ordsall Development + Other Local Plan Developments' scenario for 930 dwellings at Ordsall South and demonstrates that the junction will operate within capacity. The table also summarises the results of the same scenario but for the Ordsall South 1,250 dwellings sensitivity test.

Table 27 – Capacity Assessment Results for a Signal Controlled Mitigation Scheme

Arm	2038 Base + Committed Developments + Ordsall South (930 dwellings) + Other Local Plan Developments			
	AM		PM	
	DoS	MMQ	DoS	MMQ
A638 London Road (south)	87.7%	18.6	117.3%	127.4
Whitehouses Road	87.9%	13.7	113.1%	40.5
A638 London Road (north)	85.3%	14.3	114.6%	89.7
Practical Reserve Capacity	2.3%		-30.3%	
Arm	2038 Base + Committed Developments + Ordsall South (1,250 dwellings) + Other Local Plan Developments			
	AM		PM	
	DoS	MMQ	DoS	MMQ
A638 London Road (south)	90.0%	19.8	119.0%	137.4
Whitehouses Road	90.8%	15.9	118.0%	50.7
A638 London Road (north)	89.6%	15.6	119.1%	116.5
Practical Reserve Capacity	-0.9%		-32.3%	

11.14.3 A comparison of the results in Table 21~~Table 21~~, Table 22~~Table 22~~ and Table 27~~Table 27~~ demonstrates that the signal-controlled mitigation scheme substantially mitigates the impact of Ordsall South and other Local Plan development. At the planning application stage the applicant will need to investigate the operation of the proposed signal junction in greater detail to achieve

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the optimum performance, combined with travel demand measures to minimise off-site traffic impacts.

11.15 LONDON ROAD / WHINNEY MOOR LANE / BRACKEN LANE

11.15.1 The layout of the existing four-arm priority crossroad junction is shown in the image below.

(Map data © Ordnance Survey)

11.15.2 To mitigate the impact of development, consideration was given to widening on the Whinney Moor Lane approach. However, this did not mitigate the impact of Ordsall South and other Local Plan allocation sites. It is therefore likely that a signal-controlled scheme will be required at this location. A preliminary signal-controlled junction improvement has been assessed. A preliminary layout drawing is presented in Appendix L ~~Appendix L~~ along with LinSIG model outputs. Table 28 ~~Table 28~~ summarises the results of the '2038 Base + Committed Developments + Ordsall Development + Other Local Plan Developments' scenario for 930 dwellings at Ordsall South and demonstrates that the junction will operate within capacity. The table also summarises the results of the same scenario but for the Ordsall South 1,250 dwellings sensitivity test.

Table 28 – Capacity Assessment Results for a Signal Controlled Mitigation Scheme

Arm	2038 Base + Committed Developments + Ordsall South (930 dwellings) + Other Local Plan Developments			
	AM		PM	
	DoS	MMQ	DoS	MMQ
A - London Road (north)	60.9%	14.9	84.1%	27.4
B - Bracken Lane	45.4%	2.3	20.2%	1.2
C - London Road (south)	91.6%	34.4	88.2%	30.9
D - Whinney Moor Lane	90.5%	9.7	84.0%	8.0
Practical Reserve Capacity	-1.7%		2.1%	
Arm	2038 Base + Committed Developments + Ordsall South (1,250 dwellings) + Other Local Plan Developments			
	AM		PM	
	DoS	MMQ	DoS	MMQ
A - London Road (north)	65.1%	16.7	67.8%	30.5
B - Bracken Lane	45.0%	2.3	20.2%	1.2
C - London Road (south)	95.7%	40.8	92.5%	35.6
D - Whinney Moor Lane	91.4%	10.0	86.4%	8.5
Practical Reserve Capacity	-6.3%		-2.7%	

11.15.3 A comparison of the results in Table 21~~Table 21~~, Table 22~~Table 22~~ and Table 28~~Table 28~~ demonstrates that the signal-controlled mitigation scheme fully mitigates the impact of Ordsall South and other Local Plan development.

11.16 MAIN ROAD

11.16.1 As indicated previously in this report, NCC has expressed concern relating to any increase in traffic using Main Road. This is due to the character of Main Road which is a historic village layout with a winding road alignment, buildings directly abutting the carriageway, with poor forward and side-road visibility in places. Immediately to the west of the village, Main Road crosses the River Idle via a narrow bridge with no footways and a carriageway that is only wide enough for one-way traffic.

11.16.2 Whilst it may be possible to deliver improvements to the A638/Main Road junction and possibly introduce one-way traffic signal controlled working at the bridge it is unlikely to be appropriate to do so in practice because such improvements would only encourage more traffic to pass through the village.

11.16.3 The most likely form of mitigation is therefore the introduction of measures to discourage development-related traffic to drive between Ollerton Road and the A638 through the village. This could comprise a package of signing/lining measures and, if appropriate, traffic calming measures. Drawings showing an indicative traffic calming scheme for Main Road are presented in Appendix L~~Appendix L~~. If appropriate, the developer should work with NCC to design a suitable mitigation scheme as part of the Transport Assessment to be submitted with a planning application.

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11.17 DEMAND MANAGEMENT MEASURES

11.17.1 As indicated on the traffic flow diagrams in Appendix J~~Appendix J~~, development at Ordsall South plus development of other Local Plan allocation sites will result in the increase in vehicle trips shown in Table 29~~Table 29~~ at off-site junctions where demand management measures are identified as a mitigation measure.

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Table 29 – Trip increases where Demand Management Mitigation Measures are Identified

Junction	Ordsall South (930 dwellings) + Other Local Plan Sites		Ordsall South (1,250 dwellings) + Other Local Plan Sites	
	AM Peak	PM Peak	AM Peak	PM Peak
A620 Amcott Way / Bridlegate / Hospital Road / North Road	195	195	222	222
A638 Arlington Way / Grove Street	71	64	77	66
A638 Arlington Way / A638 London Road / Carolgate	139	139	168	167

11.17.2 For demand management measures to achieve nil-detriment, a reduction in peak hour trips by the number of trips in Table 29~~Table 29~~ will be required. A robust Travel Plan should be prepared to minimise the number of trips undertaken by single occupancy cars and maximise the number of trips undertaken by non-car modes. This should assist in reducing the increase in trips at off-site junctions. However, more extensive demand management measures will be required to achieve nil-detriment.

11.17.3 Improvements to bus services are considered the most likely demand management measure that could result in nil-detriment at the junctions in Table 29~~Table 29~~. Detailed calculations will be required as part of the Transport Assessment to be submitted by the developer as part of any planning application. For calculating the impact of demand management measures in this TA, an indicative 30-minute frequency bus service has been assumed. If the capacity of a bus is assumed to be 80 passengers (the capacity of the vehicles used will depend on the operator), a 30-minute frequency service would have capacity to carry 160 passengers per hour in each direction. A well-used bus service could therefore provide nil-detriment at the three junctions in Table 29~~Table 29~~ if passengers that would otherwise drive through the junctions in question choose to travel by bus instead. These passenger trips could be generated by Ordsall South, other Local Plan allocation sites and / or the existing population. The impact of bus services to provide demand management mitigation measures should be explored further as part of a TA to be submitted with a planning application.

11.18 MITIGATION SUMMARY

11.18.1 A summary of the possible walking/cycling and public transport mitigation discussed in this chapter is presented in Table 30~~Table 30~~ below. All costs are very preliminary 'ball park' estimates intended to provide an approximate indication of the likely scale of costs involved.

Table 30 – Summary of Sustainable Modes Mitigation

Description	Likely Improvement	Indicative Costs
Public Transport Improvements	New bus service funded for 5 years	£1.4m
Walking & Cycling	New and improved walking and cycling connections to the site	£0.75m

11.18.2 A summary of off-site highway infrastructure improvements to mitigate residual traffic impacts is presented in Appendix L~~Appendix L~~ and summarised in Table 31~~Table 31~~.

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Table 31 – Summary of Off-Site Highway Infrastructure Costs

Junction	Likely Improvement	Indicative Costs
Junction 2A - Apleyhead Interchange (A57 /Blyth Road / A1)	Re-allocation of lanes and minor kerb re-alignment	£540k
Junction 6 - A620 Babworth Rd/B6420 Mansfield Rd/A620 Straight Mile/Sutton Lane	Introduction of signal-control	£2.15m
Junction 7 - A620 Babworth Road/Ordsall Road	Introduction of signal-control	£1.08m
Junction 9 - A620 Amcott Way/A620 Moorgate/A638 Arlington Way	Improvements to existing signal-controlled layout	£1.08m
Junction 14 - A638 London Road/Whitehouses Road	Introduction of signal-control	£1.08m
Junction 15 - London Road / Whinney Moor Lane / Bracken Lane	Introduction of signal-control	£1.08m

11.18.3 As indicated in the table in Appendix L~~Appendix L~~, a suggested proportional split for infrastructure costs is identified. This is based on the number of development trips from each Local Plan allocation site passing through each junction in the highway peak hours as a proportion of the total Local Plan allocation trips from all sites. All costs are very preliminary 'ball park' estimates intended to provide an approximate indication of the likely scale of costs involved.

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11.18.4 The mitigation requirements for each Local Plan allocation site will need to be determined at the planning application stage through the submission of a Transport Assessment produced in accordance with the NPPF. The developer will be required to assess the transport implication of the development and the cumulative implications of any other committed land-use development

and transport schemes in the local area. Appropriate transport mitigation will need to be identified and agreed with the highway authority to address any residual traffic impacts.

12 SUMMARY

12.1 INTRODUCTION

12.1.1 This study assesses the impact of a potential development of 930 dwellings (1,250 as part of a sensitivity test) at the Ordsall South site on Ollerton Road, Retford. The site is allocated in the Draft Bassetlaw Local Plan under reference HS13 for approximately 890 dwellings.

12.1.2 The site currently comprises agricultural land and is bound to the north by residential development and Retford Golf Club, and to the east, west and south by agricultural land.

12.1.3 For the purposes of this study it has been assumed that the site will be accessed from two new roundabouts onto Ollerton Road with land to the east and west of Ollerton Road accessed from separate arms onto the roundabouts. Land to the west will be accessed from both roundabouts and land to the east will be accessed from one roundabout.

12.1.4 Existing bus services stopping close to the site are not high frequency services. Enhancements to these services, or the provision of new complimentary services should therefore be provided by the developer to ensure that residents on the completed development have sustainable travel choices available. The layout of the site should also be configured to allow bus penetration into the western parcel of land, as a minimum.

12.1.5 The site developer will be required to deliver new and improved walking and cycling infrastructure to connect the development to neighbouring areas and facilitate safe travel by these modes. A detailed access strategy will need to be identified at the planning application stage. Subject to NCC approval in relation to LTN 1/20, as a minimum this should include footways and marked cycle routes along Ollerton Road to connect the site to Ordsall plus the new and improved pedestrian and cycle links as detailed in Policy ST27 (for Site HS13) of the Bassetlaw Local Plan 2020-2037 Publication Version Addendum January 2022.

12.1.6 Ordsall residents have previously suggested that a new link road between Ollerton Road and the A638 would be beneficial and the merits of a possible link road to mitigate development traffic impacts have been examined. However, initial investigations suggest that providing a new link road is likely to prove technically very challenging and prohibitively expensive. It would also provide no relief for development trips passing through or around Retford town centre. As a result it is unlikely that a new link road could be justified as the costs would far outweigh the benefits.

12.1.7 At some town centre locations within Retford it will be very difficult to deliver any meaningful mitigation in the form of increased junction capacity due to the physical space constraints that exist within the urban environment and because at many locations opportunities to achieve additional traffic capacity appear to have already been taken.

12.1.8 The site developer will therefore need to focus on minimising travel demand (e.g. by facilitating home working through the provision of high speed broadband etc) and seeking to ensure that as many new trips are made by sustainable travel modes as possible.

12.1.9 The site developer will also be required to deliver off-site highway infrastructure improvements to mitigate residual traffic impacts. Details of which will need to be determined at the planning application stage through the submission of a Transport Assessment produced in accordance with the NPPF. The developer will be required to assess the transport implication of the site and the cumulative implications of any other committed land-use development and transport schemes in the local area. Appropriate transport mitigation will need to be identified and agreed with the highway authority to address residual traffic impacts.

12.1.10 This TA has identified that nine off-site junctions are likely to require physical mitigation. A preliminary approach to mitigation has been identified with walking/cycling improvements, bus service improvements and off-site junction improvements identified.

12.1.11 Delivery of mitigation will be secured through the planning approval process. Mitigation could take the form of a S106 contribution towards a scheme(s) or delivery of a scheme(s) in full. NCC may opt for a comprehensive scheme at a specific junction rather than several smaller piecemeal improvements at several junctions. In this scenario, a comprehensive scheme would also address existing capacity problems as well as the impact of the development.

Figures

Appendix A - Site Boundary

Appendix B – TA Scoping Correspondence

Appendix C – Traffic Data

Appendix D – Collision Data

Appendix E – Concept Access Layout

Appendix F – TEMPpro Outputs

Appendix G – Committed Development Flows

Appendix H – Development Flows for Other Allocations

Appendix I – Trip Generation & Distribution

Appendix J – Traffic Calculations

Appendix K – Capacity Assessments

(available on request)

Appendix L – Mitigation

(capacity assessments available on request)