WYG Transport Planning

Newark & Sherwood District Council

District-Wide Transport Study

Final Report

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Executive Summary

This study has been produced following discussions with Newark and Sherwood District Council, Nottinghamshire County Council and the Highways Agency. It is a strategic study intended to identify the cumulative transport implications of residential and employment growth options within the District in order to advise strategic transport infrastructure requirements.

The study considers all modes of transport and has examined 4 different growth scenarios at an assessment year of 2026 in order to advise the emerging Local Development Framework (LDF).

On the whole, the existing bus, rail, walking/cycling and highway networks within the District currently operate within capacity; the key exception being the A46(T) to the south of Newark which is already over capacity.

Committed improvements are already proposed to rail services through the District which will increase capacity and reduce journey times. However, this is likely to be at the expense of rail services to local village stations.

A new bus station is already proposed at Newark on Trent as part of a regeneration project. There are no other significant committed improvements proposed to existing bus infrastructure.

There is a committed programme of Local Transport Plan funded improvements to existing cycle/pedestrian infrastructure within the District.

There is one committed highway infrastructure scheme within the District; the A46 Newark to Widmerpool Improvement (currently under construction).

Locating future growth predominantly within Newark on Trent is considered to be preferable in terms of minimising impacts on the rural highway network and maximising accessibility to existing facilities and sustainable transport infrastructure.

The provision of a Southern Link Road is required to help mitigate the traffic impacts as a result of Growth Scenario traffic within Newark on Trent and its provision should therefore be developer funded.

Provision of a Southern Link Road will not mitigate traffic impacts entirely and further improvements will be required at multiple locations on the urban highway network. These locations are summarised in **Table 38** on page 102.

Additional demands for rail travel and cycling/walking as a result of the growth scenarios are expected to be largely accommodated by existing infrastructure. However, local improvements will be required to integrate development sites. Improvements to existing bus networks and infrastructure will be required to meet additional demands, and encouraging bus use will have an important role to play in reducing car travel within the District. Strategic highway infrastructure improvements will be required at various locations on the rural highway network within the District and these are summarised in **Table 43** on page 136.

It is expected that individual developers will fund any measures or infrastructure improvements required to mitigate the direct transport impacts of developments. In addition to addressing the direct transport implications of developments, it is recommended that developers also provide financial contributions through S106 Agreements towards the delivery of the strategic transportation improvements identified for developer funding in this report.

The list of improvements would first need to be worked-up in more detail with accurate construction costs and a delivery programme identified. The list would then become a 'live document' which would be reviewed on a regular basis to take into account future changes. The total value of the identified improvements would be split based on the size of the development proposal (i.e. on a pro-rata basis in accordance with employment floor area and residential units) and this contribution framework would be used for any future developments in the District. This approach to calculating contributions is considered to be consistent with the Community Infrastructure Levy proposed in the recent Planning Reform Bill.

This study has quantified the likely transport implications of 4 future Growth Scenarios for Newark and Sherwood District. The findings are presented in this report for consideration by the Council to help inform the selection of a preferred Growth Scenario for promotion through the emerging Local Development Framework (LDF).

1 Objectives and Scope of the Study

1.1 CONTEXT TO THE STUDY AND OBJECTIVES

1.1.1 Newark & Sherwood District Council has commissioned 'WYG Environment Planning and Transport Ltd' to undertake a District–wide study (with a focus on the Sub-Regional Centre of Newark-on-Trent and Balderton and other locations for development during the plan period) to examine the transport implications of alternative locations for development. The outputs from the study will form part of the evidence base to support and inform the emerging Local Development Framework (LDF) for the District. Its primary objectives are to ensure that transport infrastructure does not constrain plans for growth within the District and that appropriate new transport infrastructure is identified and programmed to facilitate growth where necessary.

1.1.2 The context for the study is framed by central Government's commitment to a target of building three million homes by 2020. In order to facilitate this, 29 areas were named as New Growth Points in December 2005 with the aim of contributing towards a new target to deliver 240,000 additional homes a year by 2016 – an increase of 32% on previous plans for housing supply in these areas. Newark and Sherwood District Council was successful in its bid to become a New Growth Point which is a non-statutory designation. The Council aims to ensure that the entire District will benefit from Growth Point status.

1.1.3 This growth is reflected in the provisions of the East Midlands Regional Plan (EMRP) which was published in March 2009. The EMRP endorses Newark as a New Growth Point. Policy 7 (Regeneration of Northern Area), states that the economic, social and environmental regeneration of the Northern Sub-Area will be a priority and this will be achieved by a number of methods. One of these is by ensuring that the agreed Growth Point Programme of Delivery in Newark is achieved both in overall numbers of dwellings and in the agreed phasing of development.

1.1.4 In addition, the average annual housing provision figures for the District, set out in Policy 13 reflect Newark's status as a Growth Point. The Regional Plan identifies Newark as a 'sub-regional centre' and sets an overall housing target for the District of 14,800 new homes between 2006 and 2026. In terms of employment the District needs to plan for a net increase in employment land of between 30 and 50 hectares and to consider further growth in Newark-on-Trent.

1.1.5 As Newark-on-Trent has been recognised as a New Growth Point and as a sub-regional centre it is likely to be the focus for a large part of the Districts' growth. However, without prejudging the findings of this study, the service centres of Ollerton & Boughton, Rainworth, Clipstone and Southwell are also likely to experience growth.

1.1.6 The scale of planned housing and employment development in Newark and Sherwood, presents great opportunities as well as challenges. Well planned and targeted growth and the investment in supporting transport infrastructure has the potential to improve services, facilities and the quality of life for both new and existing communities. It presents an opportunity for a step-change in the long-term sustainability of settlements, built development and lifestyles. Without a robust Transport Study it is likely that the projected growth will not take place or that it will happen piecemeal and be sub-optimal in terms of its sustainability.

1.1.7 The Transport Study will therefore be vital in shaping the options for growth, its location and the design and sustainability aspects of that new development. It will inform and underpin many of the strategic and detailed decisions which will be taken in formulating the LDF and provide an on-going reference, in realising sensitive, beneficial and sustainable growth. The Transport Study will be a key component of the evidence base supporting the LDF 'Core Strategy' and indeed other strategic plans and Supplementary Planning Documents (SPDs). In particular it will form an integral part of the Infrastructure Delivery Plan (IDP) which is being prepared at the same time.

1.1.8 National Planning Policy Statements PPS12 (Local Spatial Planning) and PPS3 (Housing) and the draft PPS4 (Planning for Sustainable Economic Development) advocate the importance of a robust 'evidence-based policy approach' in the preparation of LDFs. In particular these statements provide guidance for the preparation of infrastructure studies. PPS 12 states in section 4:

"4.8 The core strategy should be supported by evidence of what physical, social and green infrastructure is needed to enable the amount of development proposed for the area, taking account of its type and distribution. This evidence should cover who will provide the infrastructure and when it will be provided. The core strategy should draw on and in parallel influence any strategies and investment plans of the local authority and other organisations. Good infrastructure planning considers the infrastructure required to support development, costs, sources of funding, timescales for delivery and gaps in funding. This allows for the

identified infrastructure to be prioritised in discussions with key local partners. ……The infrastructure planning process should identify, as far as possible:

- *infrastructure needs and costs;*
- *phasing of development;*
- *funding sources; and*
- *responsibilities for delivery."*

[**Source**: Planning Policy Statement 12: creating strong safe and prosperous communities through Local Spatial Planning; CLG, 2008]

1.1.9 This Transport Study for Newark and Sherwood is prepared within the context of these strategic terms of reference, with the aim of providing a robust assessment of current deficiencies and future requirements, costs, potential funding sources, phasing and delivery issues.

1.2 STRUCTURE OF THE REPORT

1.2.1 The structure and content of the remainder of this report is summarised as follows.

Baseline Assessment

1.2.2 This section comprises an overview of the study area, identification of existing transport conditions as of Spring 2009, travel patterns and existing transport services and infrastructure for the following transport categories:

- Highways & Car Parking
- Bus
- Passenger Rail
- Cycling and walking
- Freight

1.2.3 These categories are applied consistently throughout the subsequent sections of the report.

Committed Schemes/Developments

1.2.4 This section comprises the identification of committed transport schemes and developments that will result in material changes to existing transport conditions within the District and identification of their likely transport effects.

Growth Scenarios

1.2.5 This section identifies the proposed growth site locations, presents an audit of their relative sustainability in transportation terms, and identifies modal splits and estimates trip generation and distribution onto existing transport networks.

Impacts of Growth

1.2.6 This section comprises the identification of likely impacts on existing transportation networks as a result of the proposed growth site scenarios.

Transport Infrastructure Requirements

1.2.7 This section identifies potential infrastructure improvements required to facilitate the proposed development scenarios and/or mitigate transportation impacts on existing networks. Potential strategic infrastructure improvements are identified in a preliminary format and these will be subject to detailed assessment and design as and when development proposals are brought forward. Preliminary construction costs have been estimated and comments provided on scheme deliverability and order of priority.

Summary and Conclusions

1.2.8 The final section summarises the findings of the study and presents recommendations.

Figures and Appendices

1.2.9 The Figures referred to in the text are presented after the glossary towards the end of the report. Appendices are attached after the Figures at the end of the report.

2 Baseline Assessment

2.1 INTRODUCTION

2.1.1 This baseline assessment has been prepared using information obtained from a variety of existing published documents which are summarised in the data sources summary box below. For ease of reference, data sources are highlighted throughout this report at the beginning of each section.

Data Sources

- North Nottinghamshire Local Transport Plan 2006/7 to 2010/11
- Newark District Council's 2009 State of the District Report
- Newark & Sherwood Local Plan (Adopted 1999)
- Nottingham City Council's NOMAD Website
- Newark & Sherwood District Council's Website
- 2001 National Census Data
- Discussions with Nottinghamshire County Council
- Condition of Nottinghamshire 2009 Study

Background to the District

2.1.2 Newark and Sherwood is a local government District of Eastern Nottinghamshire. The District was formed on 1st April 1974, by a merger of the municipal Borough of Newark with Newark Rural District and Southwell Rural District. It was originally known just as Newark: the name was changed by the Council with effect from 1 April 1995.

2.1.3 The District covers an area of 65,132 Hectares and is predominantly rural. The estimated population of the District in 2001 was 106,273 persons (1.63 persons per Ha) and in 2007 was 112,600 persons (1.73 persons per Ha). This compares to 3.59 persons per Ha for the whole of Nottinghamshire in 2001 and 1.69 persons per Ha for Bassetlaw District which is similar in rural nature to Newark and Sherwood.

2.1.4 The main town within the District is Newark-on-Trent and the four other notable towns are Southwell, Clipstone, Rainworth and Ollerton. Other settlements in the District are rural hamlets and villages presenting their own challenges in terms of transport provision.

Existing Modes of Travel

2.1.5 Data obtained from the Newark District Council's 2009 State of the District Report confirms that the percentages of the total District population travelling to work by different modes of transport are as summarised in **Table 1** below (derived from 2001 Census data). Percentages for Nottinghamshire and England & Wales as a whole are also provided as a comparison.

Table 1 – Percentage of the Population Travelling to Work by Mode

Transport Mode	Newark & Sherwood	Nottinghamshire	England & Wales
Car or Van	68.20	64.28	61.78
Public Transport	5.27	12.33	14.55
Walking & Cycling	14.53	13.73	12.82

2.1.6 Newark and Sherwood District exhibits a slightly higher proportion of the population using private motor vehicles to travel to work than the rest of the county and England and Wales as a whole. However, the percentage is similar to that found in other areas of the region (Source: Newark District Council's 2009 State of the District Report). The areas with the most private vehicle usage are found in the rural parts, to the west of the District where there are good road links to Nottingham and Mansfield (Edwinstowe, Blidworth and Rainworth wards) (Source: Newark District Council's 2009 State of the District Report).

2.1.7 A significantly lower percentage of the District population uses public transport to travel to work with all wards having a lower percentage than the remainder of the county, region and England and Wales as a whole. The wards with the highest public transport usage are to the west of the District and include Blidworth, Rainworth and Clipstone. The wards with the lowest levels of usage are the less populated rural areas of the District and include Farnsfield, Sutton-on-Trent and Caunton.

2.1.8 A slightly higher proportion of the District population travels to work on foot or by cycle than the remainder of the county, region and England and Wales as a whole. As could be expected the lowest percentages for these modes of travel are found in the rural parts of the District including Trent, Muskham and Farnsfield wards. Those wards with the highest proportion are Magnus (31.3%), Devon (27.62%), Bridge (27.21%), Castle (25.05%) and Beacon (23.86%),

all of which are within the town of Newark-on-Trent and exhibit higher proportions of travel by these modes than the rest of the County and England and Wales as a whole (Source: Newark District Council's 2009 State of the District Report).

Journeys to Work

2.1.9 Information on distance of travel to work is provided in Newark and Sherwood District Council's 2009 State of the District Report. As could be expected the wards with the least distance to travel to work are found in the town of Newark-on-Trent with Castle Ward having the highest number of people (1023) located within 1km of their place of work.

2.1.10 The areas with the furthest distance to travel to work are found to the west of the District where there are more rural wards. The wards with the most people travelling over 10km to work are Farnsfield (1371) and Lowdham (1160).

2.1.11 Information on employment destinations is provided in the 2001 Census Travel to Work data. A summary of data for Newark and Sherwood District is presented in **Table 2** below and this identifies the key employment destinations for travel to work trips originating from within Newark and Sherwood District.

Table 2 – Destinations of Employment Trips Originating in Newark & Sherwood

Trip Destinations	Trips	Percentages of Total Travel to Work Trips by Mode						
		Train	Bus	Car	M/C	Cycle	Walk	Other
Newark & Sherwood District	23,244	0	4	67	1	10	17	0
Lincolnshire	2,432	1	6	90	1	1	1	0
Nottinghamshire	32,422	0	4	73	1	7	13	0
Leicestershire	412	1	1	97	1	0	0	0
Derbyshire	823	0	1	96	1	1	1	0
London	321	35	6	45	1	0	9*	5
Other**	5,990	4	6	86	1	1	1	0

Note: Data excludes people working from home.
Car trips include taxi.
* Assumed to represent walking to the railway station.
** Only includes destinations in England & Wales.

2.1.12 Information on the origins of employees working in Newark and Sherwood District has also been summarised and this is presented in **Table 3** below.

Table 3 – Origins of Employment Trips with Destinations in Newark & Sherwood

Trip Destinations	Trips	Percentages of Total Travel to Work Trips by Mode						
		Train	Bus	Car	M/C	Cycle	Walk	Other
Newark & Sherwood District	23,244	0	4	67	1	10	17	0
Lincolnshire	2,396	1	1	96	1	1	0	0
Nottinghamshire	29,437	0	4	72	1	8	14	0
Leicestershire	271	0	0	94	1	2	3	0
Derbyshire	679	0	3	92	3	1	0	0
London	21	14	0	57	0	14	0	14
Other*	1,295	2	5	87	1	1	3	1

Note: Data excludes people working from home.
Car trips include taxi.
* Only includes origins in England & Wales.

Car Ownership

2.1.13 Data on car and van ownership has been obtained from the Office of National Statistics (ONS) Key Statistics for local authorities in England and Wales 2001 Census summary tables. **Table 4** below details car and van ownership levels for the County and provides a breakdown by District/Borough.

Table 4 – Car and Van Ownership

Area	All Households	Percentage of Households with Numbers of Cars or Vans					Ave' No. Per House	All Cars or Vans in the Area
		None	One	Two	Three	> Four		
Newark & Sherwood	44,465	21.92	44.76	26.75	4.98	1.58	1.20	53,495
Ashfield	46,600	27.96	46.07	21.34	3.61	1.01	1.04	48,515
Bassetlaw	44,690	23.62	45.11	25.06	4.84	1.37	1.16	51,773
Broxtowe	45,445	23.41	46.12	25.29	4.00	1.17	1.14	51,779
Gedling	47,556	22.87	46.92	24.77	4.29	1.15	1.15	54,454
Mansfield	41,601	29.30	45.10	21.28	3.43	0.90	1.02	42,417
Rushcliffe	43,670	16.75	43.40	32.73	5.48	1.63	1.33	57,867
Nottinghamshire County	314,027	23.68	45.38	25.31	4.38	1.26	1.15	360,300

2.1.14 As can be seen from **Table 4** on page 10 Newark and Sherwood has the third highest level of car/van ownership in Nottinghamshire (after Rushcliffe and Gedling). However, the percentages of numbers of vehicles per household are approximately consistent with the county averages.

Road Safety

2.1.15 Personal Injury Accident (PIA) statistics have been provided by Nottinghamshire County Council for the 'A' and 'B' road network within the District (including Trunk Roads) for the period covering 01/01/2005 to 18/12/2008.

2.1.16 For the purposes of this study data covering the 3 year period from 01/01/2006 to 18/12/2008 has been analysed. The data includes all fatal accidents up to the end of 2008, however for serious and slight injuries full data is only provided up until 05/11/2008. A summary of the data is presented in **Table 5** as follows.

Table 5 – Personal Injury Accident Summary

	Fatal	Serious	Slight	Total
2006	14	50	250	314
2007	10	61	254	325
2008 (part)	9	49	164	222
Total	33	160	668	861

2.1.17 **Figure 1** depicts the locations of all personal injury accidents within the District between 01/01/2006 and 18/12/2008. Accident severities have been colour coded with red representing Fatal accidents, blue serious and green slight accidents.

2.1.18 Analysis of **Figure 1** and the supporting accident data reveals that there are a number of routes which appear to have high concentrations of accidents, these include the B6326 and the B6166 through the centre of Newark (higher concentrations of accidents in urban areas are expected due to the higher number of vehicles and conflict points), a section of the A614 just north of Rufford Country Park and the A6075 to the east of New Ollerton.

2.1.19 It appears that a high number of KSI (Killed and Seriously Injured) accidents have occurred to the north of Blidworth on the A617 and B6020, the A616 between Wellow and South Muskham and the A617 between east of the A614 and the junction of the A612.

2.1.20 Nottinghamshire County Council defines accident problem sites as locations where there have been 4 or more accidents in one year, or 12 over three years. Analysis has been carried out using the most up to date data from 2008 (the number of problem sites may increase when the full year accident information is available). Six problem sites have been identified for 2008 (3 Trunk and 3 non-Trunk Road locations) which are summarised in **Table 6** as follows.

Table 6 – Accident Problem Sites

Location	Fatal	Serious	Slight	3 year Total	2008 Total
A1/A17 Winthorpe Roundabout	1	2	8	11	4
A1/A46 Brownhills Roundabout	0	1	12	13	5
A46/A616 Cattle Market Roundabout	0	2	26	28	5
A6097/Trentside- Gunthorpe	0	0	8	8	4
A614/A6034 Old Rufford Rd/Rufford Rd	0	0	9	9	4
B6326 London Rd/Baines Ave - Newark	0	2	4	6	4

2.2 STUDY AREA

2.2.1 The study area comprises the administrative boundary of Newark and Sherwood District as indicated on **Figure 2**. The District is the largest in Nottinghamshire, covering nearly one third of the County. Nottingham and Mansfield conurbations are situated to the south west and west of the District respectively. Lincolnshire adjoins the eastern boundary, with Lincoln to the north east and Grantham to the south east.

2.2.2 The District is predominantly rural in nature with most areas open countryside in agricultural use. There is a dispersed pattern of settlement. Newark-on-Trent is the largest town but most of the settlements are small; 58 parishes (70%) having a population of less than 500 (total of 83 parishes).

2.2.3 The settlement pattern of the eastern part of the District is dominated by the market town of Newark-on-Trent (pop 37,260). The town acts as the main shopping and service centre for the surrounding rural area. Most of the jobs in this part of the District are located within Newark, with a significant proportion of these in the manufacturing sector. The largest settlement in the eastern side of the District outside the Newark urban area is Collingham (pop 4495 – combined with Meering) which acts as a rural service centre. (Population Data Source: 2007 Ward Population Estimates for England and Wales, mid-2007).

2.2.4 In the north-western part of the District the main settlements are those which grew as a result of the exploitation of the area's coal reserves from the 1920s onwards. The principal colliery settlements are Ollerton (pop 6,553)/Boughton (pop 5,029), Rainworth (pop 7,081, of which ,6580 are within the Newark & Sherwood District area of the village), Edwinstowe (pop 5,145), Blidworth (pop 4,511), Clipstone (pop 4,366, of which 3,915 are within Clipstone Parish within Newark and Sherwood District) and Bilsthorpe (pop 8,134 – combined with Farnsfield). The decline of the coal industry in the 1980's saw the loss of many jobs and the collieries at Ollerton, Rainworth, Blidworth and Bilsthorpe have all since closed. (Population Data Sources: 2007 Ward Population Estimates for England and Wales, mid-2007 and Information and Statistics on Newark & Sherwood, Newark & Sherwood District Council & BURA, January 2009).

2.2.5 The Mansfield Travel to Work Area (see **note** below) covers most of the western part of the District. In the south-western part of the District the small market town of Southwell (pop 7,379) is the main shopping and service centre. Farnsfield (pop 8,134 – combined with Bilsthorpe) and Lowdham (pop 5,354) also have a limited range of facilities. The southern part of the District has a number of villages, which are popular as a place of residence for people working in Nottingham but there are few local employment opportunities. (Population Data Source: 2007 Ward Population Estimates for England and Wales, mid-2007).

***Note**: Travel to Work Areas are defined by the Office for National Statistics using census data for commuting between wards, based on the different locations of individuals' home and work addresses. A Travel to Work Area is a collection of wards for which "of the resident economically active population, at least 75% actually work in the area, and also, that of everyone working in the area, at least 75% actually live in the area".*

2.2.6 The strategic road network includes the Trunk Roads A1 and A46, and county primary roads A617 A17, A614, A6097, A612 and A1133, A616 and A6075. The remainder of the road network connects with locally important centres.

2.2.7 The eastern side of the District has excellent road and rail connections with the rest of the country. The A1, A46 and A17 roads all pass close to Newark, which also has stations on both the East Coast main railway line and the Nottingham to Lincoln line. By comparison the western part of the District is not so well served by existing transport infrastructure although the A614 passes through the area and the completion of the Mansfield Ashfield Regeneration Route (MARR) has improved connectivity to the west via the A617.

2.3 HIGHWAYS

Data Sources

- North Nottinghamshire Local Transport Plan 2006/7 to 2010/11
- Newark District Council's 2009 State of the District Report
- Nottingham City Council's NOMAD Website
- Highways Agency's TRADS Website
- Newark & Sherwood District Council's Website
- TA 46/97 'Traffic Flow Ranges for use in the Assessment of New Rural Roads'
- 2001 National Census Data
- Faber Maunsell Newark & Sherwood District Car Parking Review (2006)
- Discussions with Nottinghamshire County Council
- AMScott study of the A46(T)/A617/A616/B6326 roundabout, April 2006
- AMScott study of the A46(T) Newark Bypass, April 2006
- VISUM transport model for Newark on Trent (as supplied by WSP)

Existing Conditions

2.3.1 Roads within the District fall into two categories; Trunk Roads (A1, A46) which are the responsibility of the Highways Agency (HA) and County Roads (all other roads in the District) which are the responsibility of Nottinghamshire County Council (NCC). The road network examined for the purposes of this study is identified in **Figure 2**. The network includes all 'A' and 'B' Classification roads within the District as well as some unclassified roads close to the proposed growth areas. The highway networks considered in the study are illustrated in **Figure 3** and **Figure 4**.

2.3.2 Existing conditions on the study area network have been determined through the examination of relevant data sources (as identified at the beginning of this section) and through discussions with the highway authorities responsible for the road network within the District.

2.3.3 Traffic flow data has been obtained from NCC and the HA for all 'A' and 'B' Classification roads and this has been analysed and 'factored' to a common 2008 base year. Details of the data

and analysis methodology can be found in **Appendix A** and the resultant flows are illustrated on **Figure 5**, **Figure 6**, **Figure 7**, and **Figure 8**. Existing conditions are summarised in **Table 7** below.

Table 7 – Summary of Conditions for Existing 'A' Road Network

Road	Standard	Average Annual Daily Traffic (AADT) (2-Way) Flow Range				
		<20,000	20,000 to 40,000	40,000 to 60,000	>60,000	HGV
A1(T)	Dual Carriageway		31,000 to 38,000			8,000 to 10,000
A46(T)	Single Carriageway (South of Newark-on-Trent)		22,000 to 23,000			2,000 to 3,000
A46(T)	Dual Carriageway (north of Newark-on-Trent)		29,000 to 33,000			3,000 to 4,000
A17	Single Carriageway	10,000 to 14,000				2,000 to 3,000
A612	Single Carriageway	4,000 to 15,000				300 to 1,000
A614	Single Carriageway		13,000 to 21,000			600 to 3,000
A616	Single Carriageway	4,000 to 9,000				300 to 600
A617	Single Carriageway (short section of dual)	8,000 to 18,000				900 to 2,000
A6075	Single Carriageway	4,000 to 19,000				300 to 2,000
A6097	Single Carriageway (2 short sections of dual)	6,000 to 19,000				500 to 2,000
A1133	Single Carriageway	4,000 to 8,000				400 to 900

Note: HGV flows are AADT HGV 2-way movements including Passenger Service Vehicles (PSV).

2.3.4 As can be seen from **Table 7** above the roads with the highest volumes of traffic are the two Trunk Roads (A1 and A46) which is as would be expected because these both form part of the strategic road network and therefore tend to carry longer-distance through traffic in addition to local movements.

Traffic Patterns

2.3.5 2001 Census 'Journey to Work' data (**Table 2** on page 9) indicates that 45% of all employment trips have a destination outside the District and 55% are internal to the District. Of those with a destination outside the District the majority are travelling by car to a destination within Nottinghamshire.

2.3.6 **Table 3** on page 10 shows that 32% of employment trips to the District originate from outside the District and 68% are internal to the District. The majority of trips internal to the District are made by car. Of the trips originating from outside the District the majority are travelling by car from Nottinghamshire.

2.3.7 The vast majority of commuter trips to/from the District are therefore between origins and destinations within Nottinghamshire and the majority of these are made by car.

2.3.8 Traffic flows on some of the main roads vary considerably along their length. For instance, the A46(T) south of Newark-on-Trent (around 23,000 AADT) is materially lower than north of the town (around 33,000 AADT). Likewise flows on the A612 of around 15,000 AADT reduce considerably north of the A6097 to less than 9,000, and the A614 flows of around 21,000 AADT south of Ollerton reduce to less than 10,000 north of the town.

Network Performance

2.3.9 Network performance for the rural road network within the study area (i.e. the network outside of the urban area of Newark-on-Trent) has been assessed based on link capacity. The prime indicator for road capacity and congestion on rural links is determined by the Congestion Reference Flow (CRF), which is defined in Annex D of TA 46/97 'Traffic Flow Ranges for use in the Assessment of New Rural Roads' as follows:

"The Congestion Reference Flow (CRF) of a link is an estimate of the Annual Average Daily Traffic (AADT) flow at which the carriageway is likely to be congested at peak periods on an average day. For the purposes of calculating the CRF, 'congestion' is defined as a situation when the hourly traffic demand exceeds the maximum sustainable hourly throughput of the link. At this point the effect on traffic is likely to be one or more of the following: flow breaks down with speeds varying considerably, average speeds drop significantly, the sustainable throughput is reduced and queues are likely to form. This critical flow level can vary from day to day and from site to site and must be considered as an average. The CRF is a measure of the performance of a road link between junctions."

"The congestion threshold is a measure of the maximum achievable hourly throughput of a link."

"Any increase in demand above this threshold can lead to flow breakdown, queueing and reduced throughput."

"The threshold may be expressed in terms of annual average daily traffic (AADT) by identifying the likely ratio of peak to daily flow and applying this to the threshold hourly value. The resulting AADT is known as the Congestion Reference Flow (CRF)". (Source: Design Manual for Roads and Bridges, Volume 5, Section 1, Part 3 TA 46/97).

2.3.10 Congestion Reference Flow (CRF) values have been used as a measure of the performance of rural links within the study area. Based on these calculated reference capacities link "stress" levels have been identified where "stress" is defined as the ratio of the annual average daily traffic (AADT) flow to the Congestion Reference Flow expressed as a percentage.

2.3.11 A stress level of 100% (i.e. when the demand flow equals the CRF value) is the critical point at which link flows breakdown resulting in queuing and reduced throughput. Therefore for the purposes of this study the following stress thresholds have been applied to identify when links are approaching, or exceeding their theoretical maximum capacity:

- Less than 90% stress - the link operates within capacity, although journey times may become less reliable over 75% stress (see below).
- Between 90% and 100% stress - The link is approaching capacity and is increasingly susceptible to flow breakdown.
- Greater than 100% stress - The link operates over capacity and is likely to experience flow breakdown on a regular basis.

2.3.12 The above thresholds have been applied to easily identify when link capacity is approaching critical conditions (i.e. 100% stress). However, as stated in the DfT's WebTAG Guidance on the 'New Approach to Appraisal' it should be noted that 75% stress is generally accepted as the threshold level for adverse effects on journey time reliability. Therefore, links with between 75% and 99% stress will still be operating within capacity but journey times are likely to be less reliable than on links with less than 75% stress.

2.3.13 Details of the CRF calculation methodology, data analysis and results can be found in **Appendix A**. and the resultant CRF link values are illustrated on **Figure 9**. The comparison between observed link flows and CRF values is illustrated on the stress plan presented as **Figure 10**.

2.3.14 For ease of reference on **Figure 10**, congestion of less than 90% on links is shown in green, congestion of 90%-100% is shown in amber, and congestion of greater than 100% on links is shown in red.

2.3.15 The stress plan clearly indicates that all rural links within the District currently operate at less than 90% stress except for the A46(T) south of Newark on Trent (102%). The following links have stress levels between 75% and 90% and whilst still within capacity could be expected to experience less reliable journey times:

- A617 between Newark-on-Trent and Kelham (81%)
- A6097 between East Bridgford and Oxton (89%)

2.3.16 There are known traffic capacity problems at the A614/A616/A6075 Ollerton Roundabout which struggles to cope with the large volumes of traffic passing through it, particularly in the peak hours. As a consequence long queues of vehicles can develop on a number of approaches to the junction and drivers can be significantly delayed. To avoid this congestion some traffic now uses unsuitable routes through the residential streets within Ollerton village and elsewhere.

2.3.17 There are also known issues at the A46(T)/A617/A616/B6326 'Cattle Market' roundabout at Newark-on-Trent and its approaches. A study undertaken by AMScott on behalf of the HA in April 2006 identified that the roundabout is approaching capacity and that traffic queuing back from the adjacent level crossing on the B6326 sometimes also contributes to this congestion. The study concluded that the roundabout will be over capacity by 2010 and recommended that an improvement scheme should be developed and implemented before then.

2.3.18 A study undertaken by AMScott on behalf of the HA in April 2006 also identified that the single carriageway section of the A46(T) Newark Bypass between Farndon Road roundabout to the south of Newark-on-Trent and the A1(T) roundabout to the north of Newark-on-Trent is likely to be close to, or over capacity by 2010. The programmed dualling of the A46(T) between Widmerpool and Newark (detailed later in this report) will mean that the A46(T) Newark Bypass will then be the only section of single carriageway road on the A46(T) between Lincoln and Leicester.

2.3.19 Discussions with Nottinghamshire County Council have also highlighted the following locations within the District as experiencing existing congestion problems during the peak periods:

- A1(T)/B6326 London Road Roundabout at Balderton.
- A612 through Southwell.
- A612/A6097 junction at Lowdham.

2.3.20 For urban networks link stress is a less reliable indicator of network performance because there are typically a greater number of junctions in urban areas and junction capacity is therefore usually the limiting factor. For the urban area of Newark-on-Trent data has therefore been obtained from the VISUM model which has been built to examine the likely traffic effects of major new developments proposed to the south and east of the town (this model was built by WSP on behalf of Catesby Property Group to examine the traffic effects of the 'Land South of Newark', 'Fernwood' and 'Land East of Newark' major development proposals). The 'do nothing' model has been calibrated and validated to the satisfaction of NCC and the Highways Agency and is deemed to be acceptable for the assessment of future year development scenarios.

2.3.21 'Reference Case' model flows for a 2026 design year have therefore been obtained and these represent the 'do nothing' scenario (i.e. background plus committed development traffic flows). These form the basis for the assessment of the urban highway network within Newark on Trent. The reference case flows are presented in **Figure 11** and **Figure 12**.

2.3.22 Journey time surveys undertaken in 2008 by NCC suggest that the existing urban road network within Newark-on-Trent operates largely satisfactorily with no major congestion problems. Journey time surveys were undertaken on the main radial routes into Newark-on-Trent and confirmed average vehicle speeds of 21.36 mph in the AM peak hour, 20.5 mph in the inter-peak and 18.6mph in the PM peak with journey times to/from the town centre of 5 minutes or less on all routes.

2.3.23 The following extract from the North Nottinghamshire Local Transport Plan 2006/7 to 2010/11 is therefore still relevant:

"As a thriving market town, Newark does from time to time experience localised congestion, particularly close to the town centre where several radial routes converge, and near the large supermarkets. However, the journey time surveys show that congestion is not a problem overall. The town centre can be accessed along all the radial routes in less than 5 minutes. The exception is the B6326 through Balderton – which acts as the main route into town from the A1 south – along which journeys take 10 minutes in the peak."

Car Parking

Parking in Newark-on-Trent

2.3.24 There are 12 Council run car parks within the District. 8 of these are in Newark-on-Trent, with a total of 1,152 spaces available. All of the car parks in Newark-on-Trent are pay and display. It is understood that the District has recently reviewed car parking charges in its own facilities so that they now apply for 24 hours on all days of the week.

2.3.25 In addition to the Council promoted car parks, there are a further 1,300 off-street parking places provided in the town at locations such as the three major supermarkets, The NCP at St Mark's Place and the two railway stations. 'The majority of off-street parking places (1,400) have a pricing structure to discourage long stay commuter parking' (Source: Faber Maunsell Newark & Sherwood District car parking review, 2006).

2.3.26 In addition to the car parks, there is a 160 vehicle capacity lorry and coach park situated at Great North Road. Parking is free in the day for these vehicles, however an £8 charge applies for evening/overnight stays.

Other Car Parks in the District

2.3.27 There are two Council car parks in Southwell, at Church Street and King Street, which provide 135 pay and display spaces. In addition there are 149 spaces available at 3 private car parks. In Ollerton 92 free spaces are available in the Council run Forest Road car park, with 38 spaces at the private Rufford Avenue facility. Edwinstowe has 174 off-street spaces at 4 sites, with 74 of these being Council provided.

On-Street Parking

2.3.28 The 2006 car parking review identified the following numbers of on-street car parking spaces which are within easy access of the respective centres; 120 in Newark-on-Trent, more than 75 in Southwell, 69 in Ollerton and 24 in Edwinstowe. The County Council has confirmed that these levels are still accurate and that no alterations to make the time-restricted, free and unlimited waiting spaces 'pay and display' are currently planned.

Civil Parking Enforcement

2.3.29 Civil Parking Enforcement was implemented in Nottinghamshire on 12 May 2008. Newark & Sherwood District Council makes up part of the Nottinghamshire Parking Partnership, along with Nottinghamshire County Council and all of the other District and Borough Councils within

the County. This means that the partnership has taken over parking enforcement responsibility for all County roads and Council owned car parks from the Police.

2.4 BUS TRANSPORT

Data Sources

- North Nottinghamshire Local Transport Plan 2006/7 to 2010/11
- Newark District Council's 2009 State of the District Report
- Bus Strategy for North Nottinghamshire 2006/7 - 2010/11 (March 2006)
- Newark & Sherwood District Council website
- Route and timetable information available from Nottinghamshire County Council
- Route and timetable information available from various websites
- Discussions with Stagecoach East Midlands
- Discussions with Nottinghamshire County Council
- Condition of Nottinghamshire 2009 Study

Existing Conditions

Rural Bus Services

2.4.1 Bus services within the District fall into two distinct groups, commercial and financially supported. Commercial services tend to provide the links between the major settlements in the south of the District. Whilst in the northern rural area much of the bus network is financially supported by Nottinghamshire County Council. It is estimated that the County Council supports approximately 65% of bus services within the District at an annual cost of some £1m. Lincolnshire County Council also supports some services which operate into Nottinghamshire. A plan showing the extent of the County supported network is at **Figure 13**.

2.4.2 The commercial network mainly comprises daytime bus services running Mondays to Saturdays between 07:00 and 19:00 hours. The County Council therefore supports evening and Sunday operations where they are deemed necessary.

2.4.3 Within Nottinghamshire approximately 77% of households in rural areas (Parishes with a population of less than 3,000) are within 800 metres walking distance of a bus stop with a bus

service with an hourly frequency (or better) on Mondays to Saturdays between 06:00 and 18:00 hours. This is illustrated in **Table 8** as follows.

Table 8 – Accessibility to Existing Bus Services

Area	% of Households within 800m of a Bus Stop With an Hourly (or Better) Weekday (06:00-18:00 hrs) Bus Service	
	Commercial Services	All Services
Nottinghamshire Urban (>3,000 population)	89%	94%
Nottinghamshire Rural (<3,000 population)	53%	77%
All Nottinghamshire County	83%	91%

2.4.4 Stagecoach East Midlands is the dominant commercial bus operator within the District. Bus services are provided from 4 depots at Mansfield, Worksop, Gainsborough and Newark-on-Trent, although only the latter is within the Newark and Sherwood District. From all 4 locations, over 165 vehicles and 450 staff are employed and between them they operate approximately 50 routes covering more than 7 million miles and carrying over 10 million passengers a year.

2.4.5 Stagecoach currently has eleven buses based at the Newark Bus Station, maintained from their main depot at Lincoln. These buses provide the local town services in Newark through Bus Quality Partnership with Nottinghamshire County Council under the brand “Newark Bus About Town”. In addition, Stagecoach East also operates service 29 into Newark from Mansfield, using buses based in Mansfield, and a service between Newark and Lincoln.

2.4.6 Around 45,000 passenger journeys are taken each month on the town service network. 44% are adult fare paying customers, 10% are children, with the remaining 46% being concessionary pass holder journeys. Patronage is generally trending upwards with the three core town routes showing year on year passenger growth of around 6%.

2.4.7 Two other major operators within Newark and Sherwood are Marshall’s Coaches based in Sutton-on-Trent, and Veolia (formerly Dunn-Line) who have bases in Nottingham and Tuxford. Marshall’s operate a growing mix of commercial and tendered services whilst Veolia provide mainly tendered services operated on behalf of Nottinghamshire County Council.

2.4.8 Nottingham City Transport provides one commercial service between Southwell and Nottingham, whilst Premiere Travel a relative newcomer and also based in Nottingham, provides some of the tendered network in the south of the District.

Bus Services - Newark-on-Trent

2.4.9 During weekday daytimes, Newark-on-Trent has a relatively good bus network. There are inter-urban services to Nottingham and Mansfield and a local town network provides frequent services to the main housing areas of the town. However, the rural daytime network; evening town network, and Sunday services currently require about £1m annual financial subsidy from the County Council.

2.4.10 **Figure 13** illustrates the Newark-on-Trent bus service network. **Table 9** on page 24 identifies all bus services operating in the Newark-on-Trent area and gives information relating to the frequency of these services.

Table 9 - Newark-on-Trent Bus Services & Frequencies

Service No.	Operator	Route	Service Frequency (Buses per Hour)			
			07:00-09:00	09:00-17:00	17:00-19:00	Evenings
1	SEM/Veo	Balderton – Newark – Coddington	2	2	1	1
2	SEM/Veo	Balderton – Newark – Lincoln Road Estates	2	2	1	1
3/3A	SEM/Veo	Newark – Hospital – Gill House - Newark	4	4	2	1
29/29A	SEM	Newark – Southwell – Mansfield	1	2	1	Infrequent
29B	Veo	Newark – Southwell – Bilsthorpe	1	1	1	-
32/32A	Veo	Newark – New Ollerton	2	Infrequent	1	-
33	Marshalls	Newark – Balderton – Fernwood	1	1	1	-
33	Veo	Newark – Laxton – Tuxford	-	Infrequent	-	-
37	Veo	Newark – Tuxford – Retford	1	1	1	-
37/39/39A/39B	Marshalls	Newark – Sutton-on-Trent – Normanton – Tuxford	2	1	1	-
46	SEM	Newark – Swinderby – Lincoln	1	Infrequent	1	-
54/56/56B	Premiere	Newark – Bingham/Bottesford	1	Infrequent	1	-
61	Veo	Nottingham – Calverton – Southwell – Newark	-	Infrequent	-	-
66/67	Veo/TW	Newark – Collingham - Harby	1	1	1	1
77	Marshalls	Newark – Hawtonville	-	1	-	-
87	KJB	Newark – Lincoln	1	Infrequent	1	-
90/90A	Marshalls	Newark – Farndon – Nottingham	1	1	1	½
103	Premiere	Newark – Southwell – Lowdham	1	Infrequent	1	-
227	TW	Newark – Southwell – Bilsthorpe – Edwinstowe	-	Infrequent	-	-
602	CB	Newark – Grantham	-	Infrequent	-	-
S7L	TW	Newark – Collingham – Newark	-	1	-	-
CM1	SCB	Maplebeck – Newark	-	Infrequent	-	-

Operator codes:
SEM – Stagecoach East Midlands
Veo – Veolia
TW – Travel Wright
KJB – KJB Buses
CB – Centrebus
SCB – Sherwood Countryman Buses

Bus Services – Southwell

2.4.11 Southwell has a relatively sparse bus network. The only core inter-urban services are to Nottingham and Mansfield.

2.4.12 Whilst collating information for this report, we learnt of some changes to be made by Nottingham City Transport (NCT) to their 100 route. Whilst these are not major changes, they are worthy of reporting here as they are symptomatic of the problems facing bus operators running on today's crowded roads. These changes were introduced from Sunday 29th March 2009.

2.4.13 In a prepared statement outlining the changes, NCT said

> *"Sadly, despite our £1m investment in new high quality buses and the new timetable introduced last March (which has solved the reliability problems) Pathfinder 100 hasn't been covering its running costs for several months and has lost nearly £110,000 this financial year."*
>
> *"To improve the viability of the service and secure Pathfinder 100 for the long-term, we will be making changes to the route, timetable as well as the fares. To reduce costs on Pathfinder 100, we need to speed up the overall journey between Nottingham and Southwell. For this reason, Lowdham Village will no longer be served by Pathfinder 100 and all buses will now stop on the A612 Main Road, near the War Memorial. By running straight along the Main Road we are able to save around 7-8 minutes in each direction, speed up the overall journey and achieve significant cost savings. With changes to the route, a new timetable will be introduced on all days; however buses will still be running up to every 20 minutes during the Monday to Saturday daytime and hourly in the evenings and on Sundays."*

2.4.14 The convenience of the service to the village of Lowdham will be compromised by the requirement for passengers to walk to bus stops situated on the main road.

2.4.15 **Table 10** on page 26 identifies all bus services operating in the Southwell area and gives information relating to the frequency of these services.

Table 10 - Bus Services in the Southwell Area

Service No.	Operator	Route	Service Frequency (Buses per Hour)			
			07:00-09:00	09:00-17:00	17:00-19:00	Evenings
29/29A	SEM	Newark – Southwell – Mansfield	1	2	1	Infrequent
29B	Veo	Newark – Southwell – Bilsthorpe	1	1	1	-
61	Veo	Nottingham – Lowdham – Calverton – Southwell – Newark	-	Infrequent	-	-
100	NCT	Nottingham – Burton Joyce – Lowdham – Southwell	3	3	3	1
103	Premiere	Lowdham – Southwell – Newark	1	Infrequent	1	-
227	TW	Newark – Southwell – Bilsthorpe – Edwinstowe	-	Infrequent	-	-
S9	Premiere	Southwell – Lowdham – Burton Joyce – Victoria Park	-	Infrequent	-	-
CM2	SCB	Maplebeck – Eakring – Kirklington – Southwell	-	Infrequent	-	-

Other Bus Services Within the District

2.4.16 The majority of bus services operating within Newark and Sherwood originate or terminate in either Newark-on-Trent or Southwell. However, there are other services serving settlements in the north and west of the District and these are shown in **Table 11** on page 27.

Table 11 - Bus Services in the north and west of Newark and Sherwood District

Service No.	Operator	Route	Service Frequency (Buses per Hour)			
			07:00-09:00	09:00-17:00	17:00-19:00	Evenings
Sherwood Arrow	SEM	Nottingham – Bilsthorpe – Edwinstowe – New Ollerton New Ollerton – Budby - Worksop	1	½	1	Infrequent
14/15/15A	SEM	Mansfield – Clipstone – Edwinstowe – New Olleton – Walesby/Kirton	2	2	2	1
27/27A	SEM	Mansfield – Rainworth – Bilsthorpe	1	2	1	Infrequent
28/28A	SEM	Mansfield – Rainworth – Blidworth	2	2	2	Infrequent
29/29A	SEM	Newark – Southwell – Mansfield	1	2	1	Infrequent
29B	Veo	Newark – Southwell – Bilsthorpe	1	1	1	-
31	Veo	Bilsthorpe – Eakring – Wellow - Ollerton	1	Infrequent	-	-
32/32A	Veo	Newark – New Ollerton	2	Infrequent	1	-
33	Veo	Newark – Laxton – Tuxford	-	Infrequent	-	-
33A	Veo	Nottingham – Sherwood Forest (Summer Sundays only)	-	-	-	-
35	Veo	New Ollerton – Walesby – Retford	1	½	1	-
36	Veo	Old Ollerton – Tuxford – Retford	1	½	1	-
103	Premiere	Lowdham – Southwell – Newark	1	Infrequent	1	-
141	tb	Nottingham – Hucknall – Blidworth – Rainworth – Mansfield – Sutton	1	1	1	Infrequent
145	MG	Blidworth – Ravenshead – Kirkby – Mansfield	1	Infrequent	1	-
227	TW	Newark – Southwell – Bilsthorpe – Edwinstowe	-	Infrequent	-	-

Operator codes:
SEM – Stagecoach East Midlands
Veo – Veolia
TW – Travel Wright
tb – trentbarton
MG – Midland General

Note - ½ refers to a 2 hourly frequency

Coach Services

2.4.17 Newark-on-Trent is served by two coach services, both operated by National Express. Service 447 runs once daily and links Newark-on-Trent to London via Grantham; Stamford; and Peterborough, whilst Service 339 also running once daily provides links to Grimsby; Cleethorpes; Louth and Lincoln (northbound) and to Leicester; Birmingham; Cheltenham; Bristol; Weston-super-Mare; Taunton; Barnstaple and Westward Ho! (southbound).

Demand

2.4.18 As with bus services throughout most of the country, services within the District generally are in decline. However, within the urban area of Newark, Stagecoach is reporting a small increase in the number of customers (paragraph 2.4.22). This increase may result from the introduction of the national Concessionary Fares scheme in 2008.

2.4.19 Traditionally bus services in Newark are busier on market days Mondays, Wednesdays Fridays and Saturdays.

Bus Stations

2.4.20 There is one bus station within the District which is situated in the Potterdyke area off Lombard Street, Newark-on-Trent. This is operated by Stagecoach, has a total of 6 bus bays and is currently in a poor state of repair. Stagecoach uses the premises to overnight park vehicles based in Newark on Trent.

2.4.21 Planning permission was granted in November 2008 for a retail-led regeneration project for the Potterdyke area of Newark-on-Trent. The proposals include for the provision of a new bus station to replace the existing station which will be redeveloped as part of the project. The current timescale for development of the Potterdyke area will see the new bus station operational from approximately 2014.

Network Performance

2.4.22 Stagecoach has indicated that their town network within Newark is showing a small year-on-year growth in the number of passengers travelling. However, given that 46% of customers are travelling using Free Concessionary passes, the burden of funding this travel will fall to the concessionary reimbursement arrangements which are the subject of ongoing dialogue between the bus operators; District and County Councils.

2.4.23 Nottinghamshire County Council is responsible for funding much of the rural network, at an estimated cost of £1m per annum. The current network was introduced after a major tendering exercise undertaken in 2006. Contracts are in place until 2011, and the County expects to review the network again in 2010. Nottinghamshire expect to make some economies from the current network, mainly through the expeditious use of buses providing school services.

Accessibility to Services and Key Destinations

2.4.24 Information contained within Newark and Sherwood District Council's 2009 State of the District Report confirms that there are clear bus service corridors which follow major transport routes and that existing bus services provide good coverage within the District, with all primary populated areas (see note) having a majority of households within 500m of a bus stop.

***Note**: The term "Primary Populated Areas" is derived from the Local Development Framework. One of the principal tasks of the Local Development Framework (LDF) is to select the appropriate locations for new development within the District. As part of this process, a hierarchy of settlement sizes and types has been defined. This hierarchy categorises the communities of the District into five distinct levels, namely Newark and Balderton as a Sub-Regional Centre, 12 communities as Rural Centres, 42 communities as Villages, 28 communities as Settlements and seven communities as Green Belt Settlements. All have populations in excess of 100 persons (Source: 'Core Strategy: Preferred Options Report', published by Newark and Sherwood District Council, October 2006).*

2.4.25 **Figure 14** shows the location of every bus stop within the District (Source: Nottinghamshire County Council). Each bus stop location is shown with a 400m and 800m buffer zone surrounding the stop to provide an indication of accessibility to bus services within the District. These buffers represent typical 5 and 10 minute walking distances respectively.

2.4.26 As could be expected there are clear bus service corridors that follow major transport routes throughout the District. The areas where bus service coverage is at its highest include Edwinstowe, Ollerton and Boughton to the northwest, a corridor between Southwell and Rainworth and Newark-on-Trent. It is also clear from **Figure 14** there are areas, mainly less populated rural areas, where walking distances to bus services are much greater.

Park & Ride

2.4.27 Park & Ride facilities are car parks with connections to public transport that allow commuters and others wishing to travel into city centres to leave their personal vehicles in a car park and transfer to a bus or rail system (rapid transit, light rail or commuter rail) for the rest of their journey. Park & Ride facilities are generally located on the outer edges of large cities and their usual aim is to remove car trips from urban areas; reduce traffic congestion and reduce the need for city centre car parks where there are competing demands for land use.

2.4.28 The majority of Park & Ride sites in the UK rely on bus-based onward transport to and from the city or town centre, but there are now a few using light-rail (Nottingham and Sheffield). Some key pointers to successful Park & Ride schemes are:

- Park & Ride sites located conveniently in relation to main arterial routes.

- Shortage of low-cost easy-access city or town centre parking.
- Frequent dedicated public transport link to town or city centre.
- Shorter journey time by public transport than by car.
- Competitive journey pricing.

2.4.29 There are some Park & Ride facilities provided by rail. These are suffixed "Parkway" and are from stations outside of main urban areas such as Bristol; Tiverton; Didcot; Luton Airport; East Midlands; Liverpool South; Warwick and Southampton. Some (as in the case of Luton; East Midlands and Southampton) also serve airports. There are two other rail-based Park & Ride services worthy of mention. Both are in Cornwall where there's Liskeard (for Looe) and Lelant Saltings (for St Ives). These are not commuter based schemes – rather they cater for tourists and the leisure market.

Park & Ride in Nottingham

2.4.30 There are no existing Park & Ride or Parkway facilities within Newark and Sherwood District. However, Nottingham has an excellent Park & Ride network with 7 sites located around the city, each of which is well-connected to the city centre. There are 4 sites which are considered to be reasonably close to the District which could be used by commuters travelling into Nottingham. These are described as follows.

Moor Bridge

2.4.31 Moor Bridge Park & Ride site is located off Hucknall Lane (A617) near Bulwell Morrisons. This site is served by Nottingham's trams. The site is open from 0600-0100 daily and has 116 car parking spaces. The car park is monitored by CCTV, whilst the trams are fully accessible for wheelchairs and buggies.

Nottingham Racecourse

2.4.32 Nottingham Racecourse Park & Ride site is located off the A612 Colwick Loop Road and is served by the distinctive bright yellow single deck buses. On Mondays to Fridays buses run every 12 minutes, and on Saturdays every 10 minutes. The site is open from 0700-1930, has 470 parking spaces, a patrol for site security and has received a "Gold" award for site security. This is the most convenient for Southwell residents.

The Forest

2.4.33 The Forest Park & Ride site is located off Gregory Boulevard in Hyson Green, near to the A60. The site is open from 0600-0100 daily and has parking spaces for 982 cars. The site is served by Nottingham trams which are fully wheelchair and buggy accessible. Additionally the car park is monitored by CCTV. Trams run every 5-6 minutes during Monday to Saturday daytimes and every 10 minutes in the evenings and on Sundays.

Wilkinson Street

2.4.34 Wilkinson Street Park & Ride site is located off Nottingham's Ring Road (A6514) close to the junction with the A610. From the Southwell area, it is the least accessible site. As with the other Park & Ride sites served by the tram, it is open from 0600-0100, and the car park is monitored by CCTV. There are 912 car parking spaces. Tram frequencies from the site are similar to those for The Forest above.

2.5 PASSENGER RAIL

Data Sources

- North Nottinghamshire Local Transport Plan 2006/7 to 2010/11
- Route and timetable information available on various websites
- Network Rail ECML (Route 8) Route Utilisation Strategy (RUS) (February 2008) and CP4 Route Delivery Plans (March 2009).
- Network Rail's East Midlands and Yorkshire and Humberside Route Utilisation Strategies (RUS) (Spring 2008).
- Network Rail's South Cross Pennine and Midland Main Line (Routes 11 and 19) CP4 Delivery Plans (March 2009).
- Consultation with Nottinghamshire County Council's rail manager.
- National Rail Trends – Office of Rail Regulation (ORR).
- National Rail Travel Survey – Final Report – 2008.
- The Office of Rail Regulation (ORR) decision on a series of applications for track access rights for passenger services on the East Coast Main Line
- East Midlands Trains website (www.eastmidlandstrains.co.uk)

Existing Conditions

2.5.1 **Figure 15** shows the passenger rail network within Newark and Sherwood District. The District is served by two existing passenger routes, the East Coast Mainline which runs north-south down the eastern side of the District served through Newark Northgate station and the East Midlands local network Nottingham to Lincoln line which runs in a southwest to northeast direction passing through Newark-on-Trent, and serving Newark Castle station.

2.5.2 The East Coast Main Line (ECML) is the high-speed link between London, Yorkshire, the North East and Edinburgh. It also handles cross-country, commuter and local passenger services, and carries heavy tonnages of freight traffic, particularly over the northern sections. The route forms a key artery on the eastern side of the country and parallels the A1 Trunk Road. It links London, the South East and East Anglia, with the Yorkshire and Humber and North East Regions, and Eastern Scotland. It also carries key commuter flows for the north side of London.

2.5.3 National Express East Coast is the name under which the train operating company NXEC Trains Ltd operates the *InterCity East Coast* rail franchise, which includes services in England and Scotland along the East Coast Main Line. NXEC Trains Ltd is a subsidiary of the National Express Group. National Express took over the franchise from the Great North East Railway (GNER) on 9th December 2007.

2.5.4 On 1 July 2009, after unsuccessfully attempting to re-negotiate the franchise terms, the National Express Group announced it would not provide further financial support to ensure it can continue operations for the full term of the franchise. In response, the government stated it would temporarily re-nationalise the franchise when this occurs by handing over the assets of NXEC to a publicly owned company, which would retain the NXEC service levels, before re-tendering the franchise in 2010.

2.5.5 The current normal weekday level of operation of long distance trains in and out of King's Cross comprises approximately 2 trains per hour (TPH) to/from the North East and Edinburgh, up to 2 TPH to/from Leeds and a train roughly every two hours between Hull and King's Cross. This level of service increases to 5 or 6 TPH at peak times. Some of the Leeds and Edinburgh trains extend to/from Bradford, Harrogate, Skipton, Glasgow Central, Inverness and Aberdeen.

2.5.6 However, not all trains serve Newark-on-Trent and the timetables are not clock-face (i.e. train times do not coincide with easy to remember intervals such as 10 past the hour etc); but the general frequency gives 2/3 trains each hour southbound to London during Monday to Saturday daytimes. The fastest journey is just 1 hour 17 minutes which is a very competitive journey time given the distance involved. Northbound services are approximately half-hourly.

2.5.7 There is a significant long distance commuter market using ECML stations, particularly Grantham and Newark-on-Trent.

2.5.8 After detailed consideration, the Office of Rail Regulation (ORR) recently announced a favourable decision in respect of firm rights for NXEC's track access application for their franchise commitment from December 2010 through until 2015. This commitment includes a fifth hourly off-peak service to/from Kings Cross to either Lincoln or York. However this approval has been granted from December 2009, but only subject to East Midlands Trains approval. NCC believes that EMT cannot accommodate additional trains over Lincoln-Newark without substantial additional resource costs, which they are unlikely to commit to without any guaranteed return. If implemented this proposal will improve services for Newark.

2.5.9 These rights will be designed to ensure that they cannot impede the future development of the ECML timetable, and are the result of a long process of consideration. This decision will enable improved services to some locations which are currently poorly served, and more frequent services to others. It is also expected to lead to the introduction of a standard pattern timetable on the ECML. This will increase the capacity available for both passenger and freight trains and will therefore benefit both passengers and freight users.

2.5.10 Newark Castle station is on the East Midlands local network Nottingham to Lincoln line and is managed by East Midland Trains (EMT). Legally known as East Midlands Trains Limited, the parent company of East Midlands Trains is Stagecoach Group which also owns South West Trains and 49% of the Virgin Trains franchise.

2.5.11 East Midlands Trains is based in Derby. It provides train services in the East Midlands and surrounding areas, chiefly in the counties of South Yorkshire, Nottinghamshire, Leicestershire, Derbyshire, Northamptonshire, and Lincolnshire.

2.5.12 The franchise began on 11th November 2007 and is expected to run until 31st March 2015. It was formed through the amalgamation of the former Midland Mainline, which operated inter-city services from London to Yorkshire, and the eastern side of Central Trains operating companies.

2.5.13 East Midlands Trains initially divided its services between two sub-brands: *Mainline* InterCity services, and *Connect* urban and suburban services, which mainly came from the Central Trains franchise. However, from April 2008, East Midlands Trains dropped the "Mainline" and "Connect" branding in favour of "London" and "Local" services.

2.5.14 East Midlands Trains provide local train services between Lincoln, Nottingham and Leicester and also serve smaller stations at Carlton; Burton Joyce; Lowdham; Thurgarton; Bleasby; Fiskerton; Rolleston; Collingham; Swinderby and Hykeham. EMT also provides a service from Newark Northgate to Lincoln with some journeys continuing to Cleethorpes and also calling at Grimsby Town.

2.5.15 From December 2008 East Midlands Trains introduced a new service from Lincoln to London St Pancras. There is one through peak-hour journey in each direction, but there are good off-peak connections at other times in Nottingham. Although offering a slower journey this route offers the potential direct links to other region centres such as Loughborough; Leicester; and Kettering together with connections at St Pancras International.

The Robin Hood Line

2.5.16 The Robin Hood Line is the railway line which runs from Nottingham to Worksop. It does not serve Newark and Sherwood District directly but rather offers connections into the rail network at the nearby stations of Mansfield Woodhouse; Mansfield; Kirkby-in-Ashfield and Newstead. At Nottingham there are frequent onward connections to London, Birmingham, Derby, Leicester, Manchester Norwich and other centres, whilst at Worksop there are connections for Retford, Lincolnshire and Sheffield. At Retford there are connections into the East Coast Main Line for either London or Scotland and the North East of England.

2.5.17 Passenger services are operated by East Midlands Trains. Currently, the Robin Hood Line operates frequent services, on Mondays to Saturdays between 0540 and 2305. During the day, trains run at half hourly intervals between Nottingham and Mansfield Woodhouse, with one service an hour continuing to Worksop. On Sundays, a more limited service is provided between 0730 and 2030 hours. A copy of the current timetable can be found in **Appendix J**.

2.5.18 In addition to being an important commuter service, used by over 3,500 people a day, the line also offers access to a number of attractions in Nottinghamshire and Derbyshire.

Other Rail Links

2.5.19 A section of the former Lancashire, Derbyshire and East Coast Railway (originally built in 1897), and running from Chesterfield to Lincoln, served Newark and Sherwood District, with Stations at Edwinstowe, Ollerton and Boughton. The line closed to passenger traffic in 1955, but remained in use for mineral traffic (mainly coal) until the late 1990's. Latterly coal was transported to High Marnham power station using this route. (High Marnham closed in 2003 after nearly 45 years in operation, and is currently undergoing demolition).

2.5.20 Currently Network Rail proposes to use the eastern section of this line between Ollerton and High Marnham for rail maintenance training purposes. This project is referred to as "High Marnham RVCC".

2.5.21 Retention of the eastern section ensures that the western section between Ollerton and Shirebrook remains open and maintained and this presents an opportunity to reintroduce rail services to Edwinstowe and Ollerton.

Demand

2.5.22 The East Coast Main Line Route Utilisation Strategy (RUS) sets out the relevant background information on the East Coast Main Line and North East routes, identifying the issues that are currently faced on these routes and those that are predicted to arise over the next decade. Included within the ECML RUS, which was published by Network Rail in February 2008, are selected and broad demand patterns.

2.5.23 The aim of the RUS programme is to identify a strategy for the railway to meet expected future requirements in a way that is deliverable, affordable and consistent with performance and safety improvements.

2.5.24 The East Coast Main Line Route Utilisation Strategy encompasses all long distance high speed and London commuter services into King's Cross and Moorgate (via Finsbury Park), all local services in North East England and various other regional and longer distance services covering parts of the route. It includes all freight services within or traversing the RUS area.

2.5.25 The East Coast Main Line Route Utilisation Strategy includes the main line from London King's Cross to Leeds and Edinburgh, the line from Hitchin towards Cambridge (beyond which some services are extended to King's Lynn), the Hertford Loop and the Moorgate branch. It also includes all secondary, rural and freight only routes in North East England, and the North Berwick branch in Scotland. For our purposes only the information in respect of Newark is of relevance.

2.5.26 The East Coast Main Line Route Utilisation Strategy has interfaces with the East Midlands Route Utilisation Strategy and the Yorkshire and Humberside Route Utilisation Strategy, on generally east – west routes utilising sections of, or crossing, the East Coast Main Line around Peterborough, Grantham and Newark

2.5.27 The key drivers for the development of the East Coast Main Line are:

- growth on long distance high speed services to/from London
- reduced journey times between London, the Yorkshire and Humber and North East Regions, and Scotland
- growth in commuter journeys to London from the outer London area, Hertfordshire, Cambridgeshire, Peterborough, west Norfolk and parts of the East Midlands
- growth in commuter journeys into Leeds and Newcastle

- increased freight path requirements on certain key sections, particularly Peterborough - Doncaster
- improved reliability of services.

2.5.28 The overarching strategy for the route proposed in the East Coast Main Line Route Utilisation Strategy is:

- progressive lengthening of London and Regional commuter services wherever possible to make best use of existing capacity
- provision of additional long distance high speed services to/from London in the short to medium term to allow better segregation of flows and improve journey times on the longer journeys
- increased train length and seating capacity on long distance high speed London services in the longer term, mainly as a result of the Intercity Express Programme (IEP)
- operation of a standard hour timetable to make best use of capacity for all passenger and freight operations and improve connectivity for passengers
- infrastructure improvements to reduce the number of bottlenecks thereby improving capacity and performance.

2.5.29 Within the extensive geographical coverage of the East Coast Main Line Route Utilisation Strategy there are diverse passenger and freight markets. The passenger flows include long distance travel (both for business and leisure journeys), commuting (almost entirely into major conurbations) and local journeys (including connections onto longer distance services).

2.5.30 The Route Utilisation Strategy classifies passengers from Newark into LDHS (Long Distance High Speed) category. It estimates that 1,500 journeys per weekday are made to and from Newark. The counts are total passengers in both directions and are summarised between stations. The daily total flow from north of Newark is 26,200 and from south of Newark is 27,500. Similar methodology is used to identify capacity, with the number of seats available south of Doncaster identified as 63,950 per weekday.

2.5.31 The Route Utilisation Strategy comments that demand is highest between London and Peterborough and this key flow has shown very strong growth in recent years. The highest rate of growth, on individual flows, has generally been between London and stations within an approximate 90-minute journey time of King's Cross, reflecting an increase in commuting from

areas further away from London. However, the historic rate of growth, particularly at Grantham, Newark and Retford, appears to have stabilised over the last few years.

2.5.32 **Table 12** below highlights the growth in the number of passenger journeys from the top 4 stations on the East Coast Main Line.

Table 12 – Growth in Rail Journeys to/from London

Passenger Journeys to/from London Between 1998/99 – 2004/05			
Station	1998/99	2004/05	% Change
Grantham	235,000	420,000	80
Hull	120,000	210,000	75
Newark	250,000	430,000	70
Retford	55,000	85,000	60

2.5.33 The demand and supply measurements used in the Route Utilisation Strategy are generalised in that no attempt is made to selectively identify capacity problems at stations or times of the day/week. The Route Utilisation Strategy comments "Services on Fridays are used by higher numbers of passengers – by business, commuter and weekday leisure travellers (as for the rest of the week) plus weekend travellers."

2.5.34 East Coast Main Line services suffer from significant overcrowding at certain times. On the busiest trains it is not uncommon for passengers to have to stand, especially between London and Peterborough with average current peak loadings between 70 to 80 percent in this area. Standing can extend to Leeds and York or further on some busy weekend trains.

Network Performance

2.5.35 In order to formulate and monitor policy a variety of statistics are collected and published. The Office of Rail Regulation has overall responsibility for rail statistics and produces the key industry statistics publication.

2.5.36 The Office of Rail Regulation collects and publishes Rail Statistical information on a quarterly basis. Two main measures are used – Public Performance Measure (PPM) and complaints and handling.

2.5.37 The Public Performance Measure was introduced in 2000 to give a better indication of the actual performance of Britain's passenger railways. It combines figures for punctuality and

reliability into a single performance measure. It covers all scheduled services, seven days a week. PPM measures the performance of individual trains against their planned timetable. This may differ from the published timetable. PPM is therefore the percentage of trains 'on time' compared to the total number of trains planned.

2.5.38 A train is defined as on time if it arrives within five minutes (i.e. four minutes 59 seconds or less) of the planned destination arrival time for London, South East and regional operators; or ten minutes (i.e. nine minutes 59 seconds or less) for long distance operators. Where a train fails to run its entire planned route, calling at all timetabled stations, it will either be shown as cancelled (if it runs less than half its planned mileage) or will be added to the trains in the '20 minutes or more' lateness band.

2.5.39 Trains which complete their journey as planned are measured for punctuality at their final destination. A train's performance is generally recorded by the automated monitoring systems which log performance using the signalling equipment.

2.5.40 The latest results available from the Office of Rail Regulation were published in January 2009 and relate to second quarter 2008 (July to September). In addition to the quarterly PPM figure; the Office of Rail Regulation also publishes moving annual averages (MAA) which allows for comparisons between train operating companies. Unfortunately due to changes to franchise arrangements introduced in December 2007 – MAA comparisons are not representative.

2.5.41 **Table 13** below shows information relating to the PPM for the two rail networks. This information has been extracted from National Rail Trends data published by the Office of Rail Regulation and compares the former train operating companies (GNER and Central Trains) with the current operators (National Express East Coast and East Midlands Trains).

Table 13 – Summary of Public Performance Measure

Train Operating Company	2008/9 Q2 (July - Sept')	2008/9 Q1 (April -June)	2007/8 Q4 (Oct' – Dec')	2007/8 Q3 (Jan' - March)
National Express East Coast / GNER	87.0	86.1	83.2	85.7
East Midlands Trains / Central Trains	90.0	89.1	88.8	84.8

2.5.42 The number of complaints received is a useful addition to the range of performance indicators. Unlike other system-based measures, the number of complaints reflects direct feedback from

passengers. Used in conjunction with other performance measures, such as the PPM, a more comprehensive description of rail industry service and passenger satisfaction is reported.

2.5.43 A complaint is defined as 'any expression of dissatisfaction by a customer or potential customer about service delivery or about company or industry policy'. Train operating company's record and report complaints made by letter, fax, e-mail, pre-printed form or telephone. As some train operating companies carry more passengers than others, this data is expressed as a rate per 100,000 passenger journeys.

Table 14 – Summary of Train Operator Complaints

Train Operating Company	2008/9 Q2 (July - Sept')	2008/9 Q1 (April -June)	2007/8 Q4 (Oct' –Dec')	2007/8 Q3 (Jan' - March)
National Express East Coast	329	243	491	193
GNER	-	-	-	235
East Midlands Trains	138	139	73	48
Central Trains	-	-	-	84

2.5.44 **Table 14** above shows the number of complaints received per 100,000 customers for the two train operating companies serving Newark. As with the PPM comparisons between the current and former franchisees are unrepresentative given the constitution of the franchises.

Rail Stations

2.5.45 Newark-on-Trent is unusual for a town of its size in having two rail stations. Newark North Gate is located on the electrified East Coast Main Line and has services provided by National Express, whilst Newark Castle station has services provided by East Midlands Trains between Lincoln and Nottingham. Other stations within the District are all located on the Lincoln to Nottingham line and these are situated at Lowdham, Thurgarton, Bleasby, Fiskerton, Rolleston and Collingham.

2.5.46 North Gate station is managed by National Express East Coast (NXEC) and has two car parks. The north car park is managed by NXEC and has 289 parking spaces. The daily car parking charge is £9 (Monday to Friday) and £5 at weekends. The south car park is managed by NCP and has 357 spaces. Charges here are £1 per hour or £9 daily.

2.5.47 Newark Castle station is managed by East Midlands Trains (EMT) and has one car park which is managed by Newark and Sherwood DC and has 80 spaces. Car parking charges are from £2 per day. A summary of facilities available at all stations within the District is presented in **Table 15** below.

Table 15 – Summary of Station Facilities

Facility	Newark North Gate	Newark Castle	Collingham	Rolleston	Fiskerton	Bleasby	Thurgarton	Lowdham
Station Operator	NXEC	EMT	EMT	EMT	EMT	EMT	EMT	EMT
Accessibility customer help points	Yes	No	Yes	Yes	No	No	Yes	Yes
Hearing loop	Yes	No	No	No	No	No	No	No
Accessible ticket machines	Yes	No	No	No	No	No	No	No
Accessible booking office counter	Yes	No	No	No	No	No	No	No
Ramp for train access	Yes	No	No	No	No	No	No	No
Accessible taxis	Yes	No	No	No	No	No	Yes	Yes
Accessible public telephones	Yes	No	No	No	No	No	No	No
National key toilet	Yes	No	No	No	No	No	No	No
Step-free access to whole station	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Impaired mobility set-down	Yes	No	No	No	No	No	No	No
Accessible car park equipment	No	Yes	No	No	No	No	Yes	Yes
Wheelchairs available	Yes	No	No	No	No	No	No	No
Staff help available	Yes	No	No	No	No	No	No	No
Facilities CCTV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
First class lounge	No	No	No	No	No	No	No	No
Seated area	Yes	No	No	No	No	No	No	No
Waiting room	Yes	No	No	No	No	No	No	No
Toilets	Yes	No	No	No	No	No	No	No
Baby changing facility	Yes	No	No	No	No	No	No	No
Additional travel car park	Yes	Yes	No	No	Yes	No	No	No
Taxi Rank	Yes	Yes	No	No	No	No	No	No
Cycle storage spaces	32	10	-	-	-	-	-	-
Cycle storage CCTV	Yes	No	-	-	-	-	-	-
Cycle Hire	No	Yes	No	No	No	No	No	No

Note: NXEC: National Express East Coast, EMT: East Midlands Trains

Accessibility to Services & Key Destinations

2.5.48 **Figure 15** indicates 800m and 3.2km (straight line) catchment distances to all existing rail stations within the District. These represent the typical distances covered in 10 minutes walking or cycling respectively (see **Appendix B** for details).

2.5.49 As can be seen from the figure a large proportion of the south eastern area of the District has reasonable access to passenger rail, including the majority of the urban area of Newark-on-Trent and outlying areas, the majority of Southwell and all locations identified in earlier paragraphs with stations on the Lincoln to Nottingham line.

2.5.50 As described earlier in this section the Lincoln to Nottingham Line serves stations between Cleethorpes and Nottingham and therefore caters predominantly for local movements. The East Coast Mainline serves longer distance destinations between London and Edinburgh as well as linking into a wider network of cross-country, commuter and local passenger services.

2.5.51 The presence of stations on both of these rail lines in Newark-on-Trent therefore provides the opportunity for linked trips which greatly improves general accessibility to a wide range of key rail destinations nationwide.

2.6 CYCLING AND WALKING

Data Sources

- North Nottinghamshire Local Transport Plan 2006/7 to 2010/11
- Newark District Council's 2009 State of the District Report
- Nottinghamshire Rights of Way Improvement Plan 2007
- Cycling in Newark & Sherwood Map
- Nottinghamshire County Council Cycle Monitoring Results
- Nottinghamshire Highway Network Management Plan
- Discussions with Nottinghamshire County Council

Existing Conditions

Highway Cycle Network

2.6.1 The focus of cycling provision is around Newark-on-Trent. The town centre and its environs has a comprehensive network of dedicated cycling infrastructure, pedestrianised streets and quiet roads suitable for cycling on. The pedestrianised centre of the town does not have an exemption within the Traffic Regulation Order to formally permit cycling within it. Instead, cyclists are encouraged to walk their cycles or park at locations around the periphery of the Market Square. However, in reality cycling does take place. For through cycling northwards,

users are required to use the lightly trafficked Carter Gate, Appleton Gate and Lincoln Street where the National Cycle Network is met.

2.6.2 In recent years as Newark has expanded, the cycle network has moved outwards to cover these newer residential areas. Examples include the Beacon Hill route from the east of the town centre towards Coddington and additional facilities on London Road towards the south east of the town/ Balderton area.

2.6.3 Much of the rest of the District's cycling infrastructure is made up of leisure based facilities rather than within the highway boundary for commuter journeys. The exceptions are around Rainworth and Gunthorpe/Lowdham. A shared-use footway/cycleway is provided along the southern side of the A617 in Rainworth. This joins with similar facilities further west in order to access the series of employment sites along this road and eventually Mansfield town centre. At Gunthorpe there is a shared-use footway/cycleway adjacent to the A6097. There is also a recently built footway/cycleway from Lowdham to Gonalston and there are plans in the current LTP to continue this link westwards to Burton Joyce.

2.6.4 Longer distance leisure routes are described in more detail below, however in addition to the National Cycle Network and National Byways there are a number of other notable off-road cycle links. In the area around Clipstone and Edwinstowe there are numerous off-road trails through Vicar Water, Sherwood Pines and Sherwood Forest which are ideal for leisure cycling and walking. In 2008 the County Council installed a new Pegasus crossing on the A614 in the north west of Newark and Sherwood District which improved access to these leisure routes. There is also an attractive riverside cycle route between Newark Castle station and Lincoln Road Bridge in the town. It crosses the river Trent via a striking new foot/cycle bridge installed in the late 1990s.

National Cycle Network

2.6.5 National Cycle Network (NCN) route 64 passes through the majority of the east of the District, joining NCN route 15 at Thoroton, before travelling to Lincoln via Newark-on-Trent. The section between Cotham and Newark-on-Trent is completely traffic free, along a high quality surfaced former railway line. Near Newark Northgate railway station the route rises to street level and cyclists travel north eastwards to Winthorpe, Holme, Collingham and South Scarle on a series of quiet roads.

2.6.6 NCN route 15 skirts the south of the District between Bingham (in Rushcliffe Borough) to Bottesford (in Leicestershire). NCN route 6 is located within the north west of the District. It is found on signed quiet roads through Blidworth before joining off-road paths towards Rainworth and eventually through Sherwood Pines Forest Park. NCN route 6 continues northwards off-road to Old Clipstone and Edwinstowe, then through tracks within Sherwood Forest Country Park just north of the District.

National Byway

2.6.7 The National Byway stretches 4,500 miles through the UK's natural environment, providing signed directions along quiet rural lanes. In addition to the main route, there are 50 circular loop rides. In Newark and Sherwood the National Byway travels from Cotham to Newark-on-Trent sharing the same route as NCN route 64, before travelling north west through Newark-on-Trent town centre and onto South Muskham. The main route continues north through North Muskham, Norwell and Laxton, with an additional loop spurring westwards to Caunton, Hockerton, Southwell, Eakring before meeting the main route at Laxton.

Public Rights of Way

2.6.8 **Figure 16** illustrates the public rights of way (PROW) noted on the definitive map for the Newark and Sherwood area. This shows that there is a fairly even split of facilities across the District. The most densely served areas for PROW within Newark and Sherwood are the southern part of Collingham and Meering ward and the area around Southwell. In the Rights of Way Improvement Plan (ROWIP) it is detailed that 77% of the Nottinghamshire PROW network is made up of footpaths, 19% bridleways, 3% bridleways open to all traffic and 1% restricted byways. These figures are reflected in similar splits within the District of Newark and Sherwood.

2.6.9 As part of the ROWIP, four different areas of Nottinghamshire were assessed in detail to carry out a detailed assessment of current conditions and future requirements within a 5km grid square area. In Newark and Sherwood, the area around Elston to the south west of Newark on Trent was used. Public consultation showed that in this rural area the PROW network is not well used, although footpaths closer to the village centres of Elston and Farndon were found to have good levels of usage for accessing shops. Other findings from the work showed that:

- Large areas have no PROWs or access provision

- The network is very fragmented to the west and severed by the A46 and the River Trent which have no crossing points
- There is evidence of large scale equestrian use on some footpaths in order to connect with the permissive and definitive bridleway network
- There is a good bridleway network around Hawton
- There is good access to the National Cycle Network to the east
- There is a high number of larger scale obstructions compared to other areas
- There is 100% signage in this area but waymarking is poor
- Small circular routes close to Elston and Syerston provide good circular dog walking routes. There are some issues with dog fouling and control.

Footways

2.6.10 Footways are provided in all of the main settlements and within many of the residential areas. As the District is largely rural, footways are not normally provided alongside carriageways in these locations. The reasons for this are likely due to the cost verses likely low levels of footfall, a lack of available width within the highway corridor to provide footways to current specifications and the aesthetic reason of not wishing to 'urbanise' the countryside. As part of the LTP there is an annual programme to upgrade dropped crossing points in every District of the County which assists pedestrians with visual and mobility impairments, as well as pushchair users. The County Council also provides new controlled crossings and footway upgrades as part of highway improvement, road safety and highway maintenance schemes.

Patterns of Movement

2.6.11 Newark & Sherwood has the second highest level of cycling and walking trips to work in Nottinghamshire based upon the 2001 Census results. 14.5% of trips are made by these modes, ranking it 117 out of 376 Districts in England and Wales. Cycling and walking is particularly prevalent around Newark-on-Trent town centre, with its wards having between 31% and 23% of trips to work being made in this way. In other parts of the District, however, there are significant fluctuations. Trent ward, towards the south of the District, has the lowest level of cycling and walking trips to work at 4.8%. Muskham and Farnsfield also have low levels of travel by these methods at 5.2% and 6.8% respectively.

2.6.12 Nottinghamshire County Council's traffic counts show Newark-on-Trent to have the highest levels of cycling within the County. The 2008 cycle counts show B6326 London Road to have an average of 326 cyclists present within a 9 hour period over the course of six separate monthly counts. B6166 Lincoln Road has an average of 351 over the same period. As a comparison similarly trafficked roads entering Worksop, Retford and Mansfield town centres had averages of 255, 171 and 97 cyclists per 9 hours respectively.

2.6.13 NCN route 64 had an average of 189 cyclists counted in 9 hours in 2008, although this could have been even higher if counts were undertaken at weekends when leisure usage is likely to be higher.

2.6.14 The Council also undertake annual cordon counts, although the latest calibrated data available was for 2006. This shows that the total number of cyclists entering and leaving Newark-on-Trent town centre is significantly greater than all comparable market towns within Nottinghamshire with 2,103 cyclists recorded at the 8 cordon sites in Newark-on-Trent, compared to Worksop 922, Mansfield 731 and Retford 681.

2.6.15 By looking at these various sets of data, it is concluded that the District has higher than average levels of trips by foot and by pedal cycle and levels of travel by these modes have generally remained constant within the past decade.

Network Gaps/Deficiencies

2.6.16 Generally the District is well catered for in terms of cycling infrastructure, with a well connected network around Newark-on-Trent and the east of the District in particular. As well as provision of physical infrastructure implemented by the County and District Councils and its partners such as Sustrans, cycling and walking is promoted well in Newark & Sherwood through a detailed, modern cycling map, cycle training and school/ workplace travel plans. From an initial inspection and discussions there are, however the following missing sections.

2.6.17 A key missing link is between the southern side of Newark-on-Trent and Fernwood/Balderton. London Road is a busy cycle route to and from the town, yet the existing facilities cease prior to reaching the approach to the A1. In order to mitigate some of this barrier, the County Council proposes to introduce a new cycle route between Main Street, Balderton and the Fernwood Business Park through its 2009/10 LTP Integrated Transport Measures budget.

2.6.18 It would also be desirable to provide a link between London Road and NCN route 64 using Hawton Lane. A feasibility study has been undertaken by Nottinghamshire County Council on this route and it is hoped that a scheme will be introduced post LTP2.

2.6.19 There is a lack of river crossing opportunities suitable for non-motorised users available between Newark-on-Trent and Gunthorpe. Kelham Bridge is narrow and particularly unsuitable for pedestrians and cyclists, although the Kelham bypass mentioned as a future scheme in LTP2 may allow this section of the A617 to be downgraded and retained only as a quiet road.

2.6.20 The possibility of linking Lowdham with Burton Joyce by a new shared use footway/cycleway adjacent to the A612 would create a virtually continuous cycling route to Nottingham city centre from the south west of Newark and Sherwood. At present the A612 is well used by confident touring and commuter cyclists, although the section of the road where the new scheme is proposed is governed by a National Speed Limit and therefore may prevent more vulnerable cyclists from using the road and therefore the shared footway may allow greater usage of the corridor. This scheme is included in the 2009/10 LTP programme.

2.6.21 Interestingly, Muskham ward, which is situated immediately north west of Newark-on-Trent town centre has one of the lowest levels of cycling and walking to work at just over 5% of trips. This is likely to be because it is a reasonably large and generally rural ward. However the fact that it is geographically close to the biggest settlement in the District may make it possible to encourage more trips by sustainable modes. However, the existing road network and river are barriers between Newark-on-Trent and the north west at present.

2.6.22 Nottinghamshire County Council submitted a bid to the Big Lottery Fund in 2007 for Sherwood: The Living Legend, which was ultimately unsuccessful. One of the elements of the bid was to provide a comprehensive new leisure cycling and walking network to connect with the existing major routes such as the NCN. As part of this substantial preliminary route investigation was undertaken and it is understood that the authority will revisit these proposals to develop future cycling and walking infrastructure subject to a funding package being agreed and approved. A new Sherwood Forest visitor centre is likely to open in 2010. Therefore as part of the Newark and Sherwood Transport Study these proposals should be integrated with development sites as they are brought forward.

2.7 FREIGHT

Data Sources

- North Nottinghamshire Local Transport Plan 2006/7 to 2010/11
- Network Rail, Freight Route Utilisation Strategy, March 2007
- Transport Statistics Bulletin - Water Borne Freight in the UK (2005) – DfT & ONS
- Freight on Water a New Perspective (2002) - Freight Study Group (DETR)
- River Trent Water Freight Feasibility Study – Peter Brett Associates/MDS Transmodal – (2009)

Road Freight

2.7.1 For the purposes of land use and transport planning the County Council applies the following hierarchy of roads:

- Category 1 – Main Roads (Strategic Road Network) – carry traffic between main towns.
- Category 2 – Major Secondary Roads – carry traffic between and within main towns and connect to the Strategic Road Network.
- Category 3 – Other Secondary Roads – district distributor roads, similar to Category 2 but traffic is not specifically directed to use them.
- Category 4 – Local Roads – local distributor roads and access roads.

2.7.2 The purpose of this hierarchy is to influence traffic to take the most suitable routes and to minimise intrusion in the areas through which it passes.

2.7.3 Heavy goods vehicles are directed to use Category 1 and 2 roads wherever possible and through traffic is not encouraged to use Category 3 and 4 roads. Roads forming the strategic network include all Trunk Roads, County primary roads and County non-primary routes of more than local importance, which in Newark and Sherwood District are; the A1(T), A17(T), A46(T), A614, A617, A6097, A612 and A1133. The A616 and A6075 which are major secondary roads also serve the District.

2.7.4 In certain areas heavy goods vehicles are prohibited through the use of location specific or area-wide mandatory vehicle weight limits. All existing weight limits within the District are indicated on **Figure 17**.

2.7.5 **Figure 6** depicts the road network within the District with 2008 HGV flows (2-way AADT) indicated. Observation of the HGV flows suggests that the main freight routes through the District are the A1(T), the A46(T), and the A17. This is as could be expected as these routes form part of the wider strategic highway network, providing links between Nottingham, Lincoln, Leicester, Grantham, and the M1 to the north.

Rail Freight

2.7.6 The principal routes for rail freight through the District are the East Coast Mainline and the Nottingham to Lincoln local line both of which share track space with passenger services. In 2004/05 these had Annual Average Daily freight train frequencies of 10 to 19.9 trains per day and 5 to 9.9 trains per day respectively.

2.7.7 There is also a network of mineral rail lines linking the former collieries in the north western area of the District. These pass through Ollerton, Edwinstowe, Clipstone, Rainworth and Bilsthorpe. In 2004/05 this network had Annual Average Daily freight train frequencies of 0 to 4.9 trains per day. Thoresby is the only remaining active colliery, with coal taken by rail to nearby power stations including West Burton, near Gainsborough. Otherwise, it is understood that a lot of the sidings infrastructure no longer exists.

Water-borne Freight

2.7.8 Information for this section has been taken from "Freight on Water a New Perspective (2002)", a report prepared by the Freight Study Group set up by the Department of the Environment, Transport and the Regions (DETR) in November 2000 to examine the scope for increasing freight traffic on the inland waterways of England and Wales; and from the "River Trent Water Freight Feasibility Study" commissioned by British Waterways with support from the East Midlands Development Agency (EMDA), undertaken by Peter Brett Associates in partnership with MDS Transmodal and published in January 2009.

2.7.9 Newark and Sherwood District is connected to the Humber Estuary by the River Trent. The river runs approximately north-south through the east of the District passing through Newark-on-Trent town.

2.7.10 The commercial section of the River Trent watercourse runs between the Humber estuary and Nottingham. From the Humber at Trent Falls to Cromwell Lock, a distance of 81 Km, the waters are tidal. Beyond Cromwell Lock (i.e. travelling south) the navigation extends a further

33 Km through a further 6 locks to the city of Nottingham. The tidal section of the River Trent accommodates seagoing vessels and larger barges where channel widths and depths permit.

2.7.11 The tidal influence is strong as far as Torksey, and because of the uneven timings for flood and ebb tides, navigation against the flood tide is difficult. Most vessels can not make the northward trip on a single tide and are required to ground for a period around low tide.

2.7.12 The non-tidal Trent (Nottingham to Cromwell Lock) is a Regulated River under the control of British Waterways (BW) where the depth and flow variations are minimised by locks. Here vessel size and carrying capacity is determined mainly by lock dimensions but also by sedimentation and dredging between locks. Key constraints on the non-tidal Trent are the locks at Newark, Stoke and Cromwell which impose both width and depth restrictions, Town Bridge in Newark-on-Trent which imposes height and width restrictions and navigation hazards imposed by the tight double bends in the river through Newark-on-Trent.

2.7.13 Bulk cargoes such as coal, fuel oil, aggregates, steel, timber, grain and waste are the commodities most suited to carriage on inland waters and historically sand and gravel extracted from Girton quarry (in the north east of the District) was transported to the Humber area by barge. However, this no longer occurs and aggregates from the quarry now supply more local markets and are therefore transported by road.

2.7.14 The availability of terminal facilities is a critical factor to the movement of freight by water. On the non-tidal Trent there are no wharfs other than private berths and this is acknowledged as a significant limiting factor for commercial craft.

2.7.15 Not withstanding this, recent movements of abnormal loads to Staythorpe Power Station in Nottinghamshire have been undertaken using a converted tanker barge. This was conveyed through the central arch of the historic Town Bridge at Newark-on-Trent, previously thought to have been impassable for a load of such size suggesting that it is practicable to transport abnormal loads into the centre of Nottingham.

2.7.16 Peter Brett Associates, in partnership with MDS Transmodal, were appointed by BW in February 2008 to carry out a study to assess the feasibility of increasing freight traffic on a stretch of the River Trent running between the Humber estuary and Nottingham. The main research phase of the study was carried out between March and August 2008.

2.7.17 This report concludes that the River Trent is an under-utilised transport artery within the East Midlands region. There is currently little freight traffic on the British Waterways section of the river, with the main freight flows being the movement of aggregates from wharves between Newark and Gainsborough to Humberside and West Yorkshire, which amounted to over 200,000 tonnes in 2006-2007. The potential for more extensive use of the river is recognised in the East Midlands Development Agency's Regional Economic Strategy and through the East Midlands Regional Assembly Regional Freight Strategy, particularly for traffics linking the Humber ports with a possible development of an inland port near Nottingham.

2.7.18 Increased use of the River for freight would also contribute to the aspirations of the Department of Transport White Paper "The Future of Transport" (2004), which outlines Government policy to "encourage transfer of freight from road to sea and inland waterways".

2.7.19 One important conclusion of the River Trent Water Feasibility Study is that "*local and regional authorities should consider strengthening support for the development of industries and particularly distribution centres alongside the River Trent*". In support of this policy the following statement is recommended: *'Newark and Sherwood District Council will support the location of development involving heavy or frequent freight movement on areas that facilitate transport of goods by water or rail.'* In particular, the potential for the development of a water accessible distribution centre in the Newark area should be noted.

2.7.20 Therefore the opportunity for water-borne freight exists within the District. However, it is likely to be limited to the movement of bulk goods loaded at private wharfs (i.e. sand/gravel) or the infrequent movement of abnormal loads. As such, the relevance of water-borne freight to this study is minimal, given the nature of the growth options being considered.

3 Committed Infrastructure Schemes and Land-Use Developments

3.1 INTRODUCTION

3.1.1 For the purposes of this study committed infrastructure schemes have been assumed to be any proposed changes to existing transport infrastructure or transport services within the District where funding and/or delivery timescales have been confirmed. As this is a strategic study, smaller scale improvements that are unlikely to significantly alter existing transport conditions have been ignored.

3.1.2 Committed land-use developments within the District have been assumed to be proposed developments with planning permissions yet to be implemented, or developments already under construction but yet to be completed or occupied.

3.1.3 Only land-use development proposals that will result in a material changes to existing transport conditions within the District have been taken into account. The criteria used to identify whether transport effects are material are described later in this section.

3.2 HIGHWAYS

Data Sources

- North Nottinghamshire Local Transport Plan 2006/7 to 2010/11
- Highways Agency website (www.highways.gov.uk)
- Nottinghamshire County Council website (www.nottinghamshire.gov.uk)
- Discussions with Nottinghamshire County Council

Scheme Summary

3.2.1 There is one key committed highway improvement scheme within the District; the A46(T) Newark to Widmerpool Improvement. A previously committed scheme to improve the A614/A616/B6075 Ollerton Roundabout has recently been dropped from the LTP programme following a change of political administration at Nottinghamshire County Council. The proposed improvement had been taken to 'Preferred Option' stage but since funding has been withdrawn a delivery date can no longer be confirmed. Details of the proposal have therefore been

included in this report for information purposes but it has not been considered as a committed improvement.

A46(T) Newark to Widmerpool Improvement

3.2.2 Details of the proposed alignment of the A46(T) improvement can be found in **Appendix C** and the following extract from the Highways Agency's website describes the scheme:

"The A46 is an important regional Trunk Road connecting the East and West Midlands. The section between Widmerpool and Newark carries between 16200 and 25300 vehicles per day, of which up to 15% are heavy goods vehicles. This level of traffic gives rise to frequent congestion and delay.

The existing A46 is generally straight and undulating as it follows the line of the old Roman Road – Fosse Way. This can make safe overtaking difficult and it is made worse by many junctions and accesses to fields, farms and houses. The road has a poor safety record – in the five years between 2001 and 2005 there have been 13 fatal, 56 serious and 222 slight accidents.

Bridleways and footpaths join and cross this section of the A46 but walkers, cyclists and horse-riders find it difficult to cross because of the traffic.

The Highways Agency proposes a new 28km long two-lane dual carriageway from the A606 two level junction at Widmerpool to an improved roundabout at Farndon, just south of Newark.

The improvement would reduce congestion, improve safety and provide a bypass for East Stoke and Farndon.

Each carriageway would consist of two traffic lanes with a vertical concrete safety barrier along the whole length of the central reserve.

Some sections of the existing A46 would be retained for use by local traffic and some sections would be downgraded for use by cyclists, walkers and horse riders and for private means of access."

A614/A616/B6075 Ollerton Roundabout Improvement

3.2.3 Details of the previously proposed improvement scheme can be found in **Appendix D**. The scheme comprised an enlarged conventional roundabout (increasing the diameter of the roundabout from 37m to 60m) with the Newark Road bus link relocated so that it connects to the A616 Ollerton Road, instead of directly to the roundabout. The proposal also provided crossings for pedestrians and cyclists across the A614 south of the roundabout and the A6075 Mansfield Road.

3.2.4 The following extract from Nottinghamshire County Council's website describes the background to the scheme:

"The A614/A616/A6075 Ollerton Roundabout is an important intersection on the County Council's strategic road network. Currently around 30,000 vehicles per day pass through the junction.

Unfortunately the existing roundabout struggles to cope with the large volumes of traffic which pass through it, particularly at peak times. As a consequence long queues of vehicles can develop on a number of approaches to the junction and drivers can be significantly delayed. To avoid this congestion some traffic now uses unsuitable routes through the residential streets within Ollerton village and elsewhere. Planned and committed development in and around Ollerton is only likely to exacerbate the problem in the future if no solution can be achieved.

Delivery Timescale & Funding

A46(T) Newark to Widmerpool Improvement

3.2.5 On the 25 November 2008 the Secretary of State for Transport announced that central government would fund 50% of the total scheme cost (£174 million) as part of a national £1billion fiscal stimulus package. The Region is providing the other £174 million to complete the project. Construction commenced in early 2009 with an anticipated opening to traffic during 2012.

A614/A616/B6075 Ollerton Roundabout Improvement

3.2.6 Work was due to begin on site in 2010 after the preferred improvement option (**Appendix D**) was approved. However, following a recent change in political administration at the County Council funding for the scheme was withdrawn and it will no longer be constructed within the

original timescale. A revised delivery date has yet to be confirmed. The scheme will cost around £3.1 million and it is expected to be funded through the Local Transport Plan (LTP).

Network & Traffic Changes

3.2.7 The traffic effects of the A46(T) Newark to Widmerpool Improvement have been taken into account in the assessment of the rural highway network. Forecast traffic flow data was obtained from the A46 Newark to Widmerpool Improvement Environmental Statement Addendum dated March 2007 (see extracts in **Appendix C**). These have been applied to the A46 south of Newark on Trent at the assumed 2026 assessment year. Congestion Reference Flow (CRF) values for this link have also been modified to reflect its dual carriageway status at 2026.

3.2.8 The traffic effects of the A46 improvement are also taken into account in the 2026 'reference case' VISUM model for Newark on Trent. These flows form the basis for the assessment of the urban highway network presented in this report and therefore by implication, include for the traffic effects of the A46(T) improvement scheme.

3.2.9 When implemented the Ollerton Roundabout Improvement scheme will improve local traffic conditions at and in the immediate vicinity of the junction but is unlikely to significantly affect Annual Average Daily Traffic (AADT) flows on the routes that pass through the junction. Similarly the improvement is unlikely to significantly affect CRF values on the routes that pass through the junction. For the purpose of this strategic study no specific account has therefore been taken of this possible improvement in the traffic assessment of the rural highway network within the District.

Car Parking

3.2.10 No committed improvement schemes have been identified that will materially alter existing public parking provision within the District. Any proposed new parking provision associated with committed private developments is assumed to cater for the requirements of the development only and will therefore not materially affect existing parking conditions.

3.3 BUS TRANSPORT

Data Sources

- North Nottinghamshire Local Transport Plan 2006/7 to 2010/11.
- Discussions with Stagecoach East Midlands
- Discussions with Nottinghamshire County Council

Scheme Summary

3.3.1 The North Nottinghamshire Local Transport Plan (LTP) – 2006/07 – 2010/11 (Bus Strategy for North Nottinghamshire March 2006) provides for the majority of improvements planned to bus services within the District and includes improvements to provide:

- Area wide bus priority – Bus priority including information, marketing, infrastructure and small scale traffic management measures.
- Public Transport Accessibility – Raised kerbs, physical access, bus boarders, bus stop lighting (including solar), information, CCTV and other supporting measures to improve accessibility, safety and security for public transport users.
- Bus location and electronic information – electronic displays and real time information.
- Ticketing – Integrated ticketing, prepaid and smartcard systems.
- Upgrading of interchange facilities – Relocation of bus stops, coordinated information, lighting and footway improvements at key nodes in District/local centres.

3.3.2 As mentioned previously the redevelopment of the Potterdyke area of Newark on Trent will also provide a new bus interchange to replace the existing facility off Lombard Street.

Delivery Timescale & Funding

3.3.3 Funding for all schemes (with the exception of the Potterdyke redevelopment) is from Nottinghamshire County Council's LTP budget.

3.3.4 Area wide bus priority – Bus priority including information, marketing, infrastructure and small scale traffic management measures are ready for implementation in Newark. Within the District, bus priority as a solution to relieving traffic congestion for public transport is limited to Newark and currently there are no bus priority proposals outstanding.

3.3.5 Bus stops and on-street infrastructure has been reviewed and updated. Bus stop upgrades are ongoing and those for Newark, Rainworth and Southwell have already been implemented. Rural towns and villages are expected to be completed within 2009/10.

3.3.6 Supporting measures to improve accessibility, safety and security have now been implemented in Newark Town centre and are ready for implementation in Clipstone, Rainworth and Southwell.

3.3.7 Real Time Passenger Information (RTPI), bus location and electronic displays and integrated ticketing are still under consideration. As this infrastructure will be network based, the County Council is seeking expert advice before proceeding further. There are no immediate plans to include telematics within the Newark and Sherwood District. In respect of RTPI – NCC's framework consultants are preparing a report on the way forward for Nottinghamshire.

3.3.8 With regard to the Potterdyke redevelopment, the existing bus station site is an integral part of the redevelopment site. The former owners (Stagecoach) have disposed of the site as it was surplus to their requirements and the County Council is currently its funding continued use as a bus station but only until the redevelopment commences. The County Council will ensure that a replacement interchange is provided as part of the redevelopment of the site. Currently plans for the redevelopment are on hold pending developer funding.

Network/Service Changes

3.3.9 The bus network within the Newark and Sherwood District is relatively stable with few changes currently proposed to the commercial network. The County Council supported tendered network is to be reviewed in 2010 ahead of a major retendering exercise scheduled to take place in 2011.

3.4 PASSENGER RAIL

Data Sources

- North Nottinghamshire Local Transport Plan 2006/7 to 2010/11.
- Network Rail, Freight Route Utilisation Strategy, March 2007.
- Office of the Rail Regulator, decision on a series of track access rights Feb' 2009.
- Network Rail, ECML Route 8 Route Plan March 2009.
- Network Rail, Midland Mainline Route 19 Route Plan March 2009.
- Network Rail, ECML Route Utilisation Strategy February 2008.
- Consultation with Nottinghamshire County Council's rail manager.

3.4.1 Given the importance of the rail network to the governments transport strategy, and the timescale and costs associated with improvements to the network, rail developments take a more coordinated approach, but need longer timescales to implement.

Scheme Summary, Delivery Timescales and Funding

3.4.2 There are 6 major improvement schemes proposed which affect the District and these are described as follows.

Capacity Relief East Coast Main Line

3.4.3 A wide ranging programme of proposals all designed to lead to improved capacity for passenger services on the East Coast Main Line (ECML). The proposals include a level crossing closure programme; gauge enhancements; overhead line equipment enhancement and capacity relief plans to strengthen or upgrade the ECML and alternative routes.

3.4.4 Overall the proposals lead to increased capacity and improved safety and performance across the route. The Level Crossing closure programme includes Bathley Lane crossing, which is situated just west of the A1/B6325 junction on an unclassified road linking Bathley to North Muskham.

3.4.5 Network Rail will bear the cost but will make considerable cost savings. The Office of Rail Regulation (ORR) approved £235m funding for the improvement programme on 30th October 2008 (includes cost of upgrade work to other adjacent routes).

3.4.6 Gauge enhancements between Peterborough and Doncaster will accommodate the carriage of deep sea container traffic on the East Coast Main Line north of Peterborough. Capacity relief between Peterborough and Doncaster and enhancement of the GN/GE Joint Line via Spalding and Lincoln will provide increased flexibility by the creation of suitable diversionary and alternative routes.

3.4.7 W10 gauge enhancement from Newark to Doncaster via Swinderby and Gainsborough will also provide the capability to carry deep sea containers on standard deck height wagons and will provide additional capacity when the East Coast Main Line can not carry W10 traffic. These combined schemes are being funded by Network Rail and other contributions and are expected to be implemented over the period from 2009-2014. Estimated cost is £248m.

Nottingham Hub

3.4.8 Proposals include Nottingham to Newark re-signalling, increased line speed and capacity between Nottingham and Newark and improved Nottingham to Lincoln journey times.

3.4.9 Additionally at Nottingham station, redevelopment works including a potential additional platform, improved waiting/retail facilities and enhanced station and interchange facilities are proposed. The Office of the Rail Regulator (ORR) has approved a £14m funding package for improvements to Nottingham Midland station with the aim of allowing for bi-directional running in order to increase the overall station capacity.

3.4.10 Additionally a Nottinghamshire County Council (NCC) sponsored programme of upgrades has been approved with an allocation of £50m of funding through the Regional Funding Allocation (RFA) process (one of only 2 schemes funded by the RFA). The programme ties together several aspirations of NCC to improve rail services through the County and includes the station redevelopment. On strength of the RFA funding award NCC has commissioned Network Rail to commence the design work on three options for the Nottingham-Lincoln line; with the aim of achieving line-speeds of 75, 90 or 100mph. The latter would give overall journey times of circa 35 minutes with one intermediate stop at Newark, so Newark-Nottingham in circa 18 minutes and Newark-Lincoln in circa 17 minutes.

3.4.11 With regard to timescales a 4 year delay to the start date (to 2013) has been required to accommodate the funding requirements of the A46 Newark to Widmerpool Improvement being brought forward and the A453 Improvement scheme. Completion is now likely to be 2015/16.

Station Car Parking Capacity Enhancements at Newark Northgate

3.4.12 Up to 2,000 more car parking spaces are to be provided by the end of the seven-year franchise for East Coast Main Line. The County Council does not support the additional car parking plan, but have an aspiration to improve cycle access to Newark Northgate, especially given the high levels of cycling within the town.

Improved Lincoln to London Services (Direct London Services via ECML)

3.4.13 From December 2010 a new two-hourly direct Lincoln-London service will be introduced via Newark, Grantham and Peterborough. The proposal has been approved by the Office of Rail Regulation (ORR) from December 2009, but only subject to East Midlands Trains (EMT) approval. The County Council believes that EMT cannot accommodate additional trains between Lincoln-Newark without substantial additional resource costs, which they are unlikely to commit to without any return. As this is a franchise commitment, funding would be provided by the train operators.

Station Improvement Schemes

3.4.14 Newark North Gate is one of 150 stations that may benefit from a proposed station enhancement scheme. There are also maintenance and renewals plans for Bleasby, Fiskerton, Lowdham, Newark Castle, Newark North Gate, Rolleston, and Thurgarton stations. Funding is earmarked by National Rail for maintenance and renewal with other improvements at larger stations to include platform lifts.

Staffing Levels at Newark Castle

3.4.15 It's an aspiration for Newark Castle station is to become fully staffed (i.e. to have platform staff available throughout the period of timetabled train service). However, East Midlands Trains who manage this station and are not prepared to increase staffing costs. Footfall through the station is busiest over the morning peak period and increased staffing could only be justified by ticket sales.

3.5 CYCLING AND WALKING

Data Sources

- North Nottinghamshire Local Transport Plan 2006/7 to 2010/11
- Cycling in Newark & Sherwood map
- Discussions with Nottinghamshire County Council
- Nottinghamshire Highway Network Management Plan
- Nottinghamshire Cycling Design Guide 2006

Scheme Summary

3.5.1 Committed cycling and walking schemes are shown in **Figure 18**.

Highway-Related Schemes

3.5.2 Two of the cycling network gaps identified in the baseline assessment will be rectified in the near future. A new cycle route will be provided from Balderton and the Fernwood Business Park. This will consist of a combination of cycle lanes and shared footway/ cycleways. It will provide a continuous route from Newark on Trent town centre to Fernwood and Balderton which is currently difficult because of the barrier provided at the south through the A1 and its approaches.

3.5.3 The other major cycle scheme is to upgrade the footway adjacent to the A612 between Lowdham and Burton Joyce. By carrying out strip widening, surfacing improvements, introducing dropped crossings and lighting upgrades the scheme will create a shared footway/ cycleway. It will link other cycle routes built in the LTP2 period from Gonalston to Lowdham and from Gedling to Burton Joyce. The result of upgrading this missing link will be a continuous dedicated cycle network between Gonalston and Lowdham in the south west of Newark & Sherwood District and Nottingham City Centre. It will also create a link to employment sites in Gedling Borough such as the Netherfield retail park.

3.5.4 The County Council also has an annual budget for introducing new cycle parking and directional signing for cycle routes. The directional signing may be useful for notifying cyclists of short cuts on quiet roads to new cycle routes and new developments, although for the latter there is likely to be a requirement for the developer(s) to provide this infrastructure if it is directly required from their works. For pedestrians there is also an area wide programme to

implement new dropped crossings and make dropped crossing upgrades at existing junctions. Particular key sites for additional cycle route signing, cycle parking and dropped crossings within the existing highway recommended as part of the Transport Study should be noted as the County Council allocates these schemes based upon the assessment of requests from partner authorities and the public.

Public Rights of Way (PROW) schemes

3.5.5 As part of the LTP budget there is an annual programme for carrying out Rights of Way upgrades and signing/ waymarking improvements throughout the North of Nottinghamshire. Upgrades to PROW typically consist of measures such as surface enhancement and widening, renewing stiles and gates and removal of obstruction or overgrown vegetation.

Sherwood Forest

3.5.6 In 2007 Nottinghamshire County Council submitted an ultimately unsuccessful bid to the Big Lottery Fund to redevelop the Sherwood Forest visitors centre into a major regional attraction. This would have also included a significant multi-user network to connect the visitor centre with settlements throughout the county and outside of its boundary, such as Doncaster, Sheffield, Derby, Lincoln and Gainsborough.

3.5.7 The County Council is still proposing to redevelop the Sherwood Forest visitors centre, however and it is anticipated that this will open in 2010. In conjunction with this, there are still plans to enhance cycling, walking and equestrian routes by providing additional links to the National Cycle Network, National Byway, Public Rights of Way network and local cycle network. Key projects for the Newark and Sherwood are:

- Circular routes for the visitors centre around Ollerton and Edwinstowe.
- Farnsfield, Bilsthorpe and Rufford Country Park route.
- Bilsthorpe disused railway line link to the existing National Cycle Network route 64.
- Link to National Cycle Network route 64 at Harby westwards to the visitor centre. Will involve route through High Marnham.
- Newark on Trent to Southwell. The route will require use of a new river crossing west of Newark on Trent.
- Southwell to Rainworth, where route would meet the existing National Cycle Network route 6 at Rainworth

- Develop links in the south of the District from National Cycle Network routes 15 and 64 into Rushcliffe Borough and Bottesford area in North Leicestershire.

3.5.8 At the present time precise route alignments are not confirmed as the County Council requires further negotiations with land owners on some of these schemes. Work had begun on this process for the Living Legend Big Lottery bid, however until new funding is confirmed this process is currently on hold. For the Newark and Sherwood Transport Study it is important that future development sites consider these proposals and try to link in with these to encourage sustainable transport to new homes, leisure and workplaces.

Delivery Timescale & Funding

3.5.9 The primary source for carrying out cycling and walking schemes will be the Local Transport Plan. The 2009/10 North Nottinghamshire Local Transport Plan programme has been approved and the following schemes are included in the District:

- Main Street, Balderton to Fernwood Business Park cycle route
- Lowdham to Burton Joyce – shared footway/ cycleway
- Cycle parking (North Nottinghamshire wide)
- Cycle direction signing (North Nottinghamshire wide)
- New dropped crossings programme and dropped crossing upgrades at existing junctions
- Rights of Way upgrades and signing improvements programme (North Nottinghamshire wide)

3.5.10 In addition to these specific cycling and walking projects, the major Ollerton roundabout improvement scheme programmed for construction in 2010/11 will provide new footways and toucan crossings which will improve the connectivity between settlements, which are currently cut off for non motorised users by the major barrier the A614 provides.

3.5.11 The Sherwood Forest access network is likely to be developed through a combination of sources in 2010/11 onwards. From discussions with Nottinghamshire County Council, budgets have not yet been confirmed for the routes, however it seems likely that the routes will now be phased in over a number of years, with the emphasis initially being placed on the west of the District around the new visitor centre.

3.5.12 In addition, from discussions with the County Council, it has been indicated that the following are likely to be future schemes included in the LTP3 period from 2011/12 onwards:

- Hawton Lane cycle route
- Lincoln Road cycle route

3.5.13 Additional funding opportunities for providing infrastructure for further schemes identified for non-motorised users in the District as part of the Transport Study include:

- Inclusion within Local Transport Plan projects which are non-specific cycling/ walking schemes but will benefit these users – e.g. highway improvements, safer routes to school, accident remedial schemes, smarter choices/ accessibility planning, speed limit reviews and local access transport studies. There is a need to ensure that design is suitable for cyclists and pedestrians through documents such as Manual for Streets and NCC's Cycling Design Guide.
- Nottinghamshire County Council Building Better Communities fund – for environmental and regeneration improvement schemes but often with an accessibility element involved.
- Section 106 and 278 agreement contributions secured through the planning application process.
- Sustrans Connect2 - Big Lottery Funding to create dedicated, high quality local walking and cycling networks.
- Sustrans Links to Schools fund – to connect schools and their communities to the National Cycle Network to provide the safe routes that young people need to cycle and walk to school.
- Landfill Communities Fund – used to provide environmental benefits and to improve the lives of communities living near landfill sites.
- Aggregates Levy Sustainability Fund - used to reduce the environmental impacts of the extraction of aggregates and to deliver benefits to areas subject to these impacts.
- Schools Travel Plan Capital Grants – used to deliver travel plan measures/initiatives and associated improvement works.
- Coalfields Regeneration Trust - would need to be via EMDA as it is a regional rather than local funding opportunity and would be geographically limited to former coalfield areas.

- Partnerships with Public Transport Operators and Local Employers, for example to introduce cycle parking near bus stops and employment areas.

3.6 FREIGHT

Scheme Summary

3.6.1 No specific committed schemes or developments have been identified that will materially affect existing road, rail or waterborne freight infrastructure or activity within or through the District. The committed highway schemes discussed earlier will improve traffic conditions on the A46 to the south of Newark on Trent and on the A614 at the Ollerton roundabout which will have knock-on benefits for road freight movements on these routes.

3.6.2 Committed employment developments within the District and adjacent areas may also give rise to increased heavy goods vehicle movements. However, from the information that is available on committed and proposed employment developments it is not possible to identify final use-classes definitively. Therefore, for the purposes of this study all employment (committed and proposed) has been assessed as B1 Business Park use-class which contains a mixture of office and light industrial uses and is typically not a significant generator of heavy goods vehicle activity. As a result, any increase in heavy goods vehicle movements within or through the District has been assumed to be small and in proportion to total traffic volumes. Heavy goods vehicle percentages have therefore been assumed to remain constant between 2008 and the 2026 assessment year.

3.6.3 The River Trent Freight Feasibility Study considered the opportunity for the location of a new inland port activity on the middle section of the River Trent between Gainsborough and Nottingham. However, no existing wharf provides anything like the type of facility that might be required for a water connected distribution park. The proposed inland port at Colwick (Nottingham) could not perform this function as it does not have the required hinterland. There are though, a small number of locations along the River Trent which have good road access, and one which has good road and rail access.

3.6.4 Locating a distribution park at Newark has some advantages:

- Newark has excellent road accessibility from several directions, including being located on the A1
- Locating a water served distribution centre below Newark Nether Lock means that barge payloads are less constrained than sites above Newark.

3.6.5 Two locations are worthy of consideration:

- Land around the British Sugar plant – this would require considerable investment to provide good wharf and road access. Rail access might be possible, however.
- Land downstream of Cromwell Lock. This site has good road access and plenty of space for possible development. However, it does not offer rail access and is likely to be in flood plain.

3.6.6 The Study concluded that "Local and regional authorities should consider these and other opportunities for possible promotion through the planning process as regionally significant distribution opportunities".

3.7 DEVELOPMENTS

Data Sources

- West Lindsey Annual Monitoring Report (April 07 – March 08).
- North Kesteven Annual Monitoring Report 07/08.
- Lincoln State of the City Report (Dec' 08) (Incorporates annual monitoring report).
- South Kesteven Annual Monitoring Report (Dec' 08).
- South Kesteven Employment Land Review (Oct' 05).
- Committed development details from A453 Improvement transport model research.
- Correspondence and discussions with neighbouring District/Borough Councils.

3.7.1 For the purposes of this study land-use developments have been split into two categories; committed land-use developments located within the Newark and Sherwood District and land-use developments located in adjacent Districts/Boroughs that are likely to result in trips through Newark and Sherwood District.

3.7.2 To avoid double counting, trips between the District and land-use developments outside of the District have been ignored since these are included in the trips generated by growth within the District (although it is acknowledged that land-use developments in adjacent Districts/Boroughs may change the distribution of trips to/from the District).

Committed Land-Use Developments within the District

3.7.3 Information has been obtained from the planning department at Newark and Sherwood District Council regarding all committed land-use developments within the District (proposed developments with planning permissions yet to be implemented, or developments already under construction but yet to be completed or occupied). The supplied data was accurate to 1st April 2008, which was the most recent information available at the time.

3.7.4 Only committed land-use developments that have the potential to generate material changes in existing transport conditions have been taken into account and 'material' has been defined as housing developments comprising 50 or more dwellings, or employment/retail developments of 1,500sqm or greater floor area. These thresholds are defined in the DfT / DCLG – Guidance on Transport Assessment (March 2007) as the trigger points requiring a

Transport Statement to be submitted in support of a planning application. So it is considered reasonable to assume that developments smaller than these thresholds will have no material transport impacts.

3.7.5 Full details of the committed land-use developments taken into account and the estimation of the traffic implications of these developments can be found in **Appendix E**.

Land-Use Developments Outside of the District

3.7.6 As requested by Nottinghamshire County Council an assessment has also been undertaken of the likely future traffic effects of committed and likely developments in adjacent Districts/Boroughs. In order to do this information has been obtained on development proposals within all Districts/Boroughs that border Newark and Sherwood (**Figure 19**). In addition, information has also been obtained for Nottingham City and Lincoln City because, whilst these do not directly adjoin Newark and Sherwood District, they have the potential to be significant trip generators.

3.7.7 Data has been obtained from a variety of sources including consultation with the relevant local authority planning departments, relevant planning strategy documents and data collected in support of the Highways Agency's proposed improvement of the A453 as the modelled area for this scheme covers many of the Districts adjacent to Newark and Sherwood. Data has been obtained for the following Districts/Boroughs:

- Bassetlaw
- Mansfield
- Ashfield
- Gedling
- Nottingham
- Rushcliffe
- Melton
- South Kesteven
- North Kesteven
- Lincoln
- West Lindsey

3.7.8 Only land-use developments that have the potential to generate material changes in existing transport conditions have been taken into account (i.e. greater than 50 dwellings, or greater than 1,500sqm of employment/retail as per paragraph 3.7.3). In accordance with Department for Transport WebTAG guidance the data has been summarised and categorised by likelihood of the development proceeding using the following definitions of probability:

- *Near Certain*: The outcome will happen or there is a high probability that it will happen.
- *More Than Likely*: The outcome is likely to happen but there is some uncertainty.
- *Reasonably Foreseeable*: The outcome may happen, but there is significant uncertainty.

- *Hypothetical*: There is considerable uncertainty whether the outcome will ever happen.

3.7.9 The assessment has considered only those sites classified as 'Near Certain' and 'More Than Likely' (which is consistent with the A453 'core scenario' as agreed with the Highways Agency and local authorities). Full details the analysis can be found in **Appendix E**. A summary of the developments that have been taken into account for the purposes of this study is presented in **Table 16** below.

Table 16 – Summary of Committed Development Outside of the District

District/ Borough	Size of Development by Development Use-Class					
	C3 (Dwellings)	100 sqm Floor Area				C1 (Hotel Beds)
		B1	B2	B8	A1	
Melton	1,267	213	213	213	0	0
Ashfield	3,251	3,346	1,657	1,657	0	250
Bassetlaw	100	1,731	1,731	1,731	0	0
Gedling	698	0	0	0	0	0
Mansfield	1,696	3,250	1,250	0	80	0
Rushcliffe	1,552	2,340	1,842	1,508	0	0
Lincoln City	1,044	1,416	932	968	0	0
Total	9,608	12,296	7,625	6,077	80	250

Comparison with TEMPRO Forecasts

3.7.10 A comparison has been made between the land-use development taken into account within the District in terms of the numbers of dwellings and numbers of employees (derived from total employment floor areas) and the growth assumptions contained within the DfT's TEMPRO (V6.1) Trip End Model Presentation Program for the Newark and Sherwood District.

3.7.11 The analysis demonstrates that the committed and proposed land-use development being assessed within the District exceeds the growth assumptions contained within TEMPRO. Therefore, to avoid any double-counting effects no additional traffic growth factors have been applied to the 2008 base flows in order to estimate the 2026 assessment year flows. Details of the analysis can be found in **Appendix F**.

Trip Generation & Distribution

3.7.12 The likely vehicle trip generation for relevant committed land-use developments within and outside the District has been estimated and these trips have been distributed and assigned onto the existing highway network (**Figure 19**) within the District in accordance with Census

2001 travel to/from work data. Full details of the trip generation and distribution methodology and calculations can be found in **Appendix E**.

3.7.13 **Figure 20** depicts the estimated annual average daily traffic (AADT) flows on the rural highway network within the District as a result of committed land-use developments located within the District (a similar figure is not presented for the urban highway network within Newark on Trent because committed development flows are included in the '2026 reference case' flows obtained from the VISUM model). Flows are spread evenly across the network and are relatively low (maximum of 2,000 two-way vehicles per day on the A616 to the east of Ollerton Roundabout which is approximately equivalent to a 2-way flow of 200 vehicles in the peak hour).

3.7.14 **Figure 21** depicts the estimated annual average daily traffic (AADT) flows on the rural highway network within the District as a result of relevant land-use developments located outside of the District (i.e. land-use development trips that pass through the District). Flows are concentrated on the key routes through the District with the highest being observed on the A6097 between east Bridgford and Lowdham with a maximum of 8,000 two-way vehicles per day (approximately equivalent to a 2-way flow of 800 vehicles in the peak hour).

3.7.15 **Figure 22** depicts the estimated annual average daily traffic (AADT) flows on the rural highway network within the District as a result of all committed land-use developments (i.e. the total of the flows indicated on **Figure 20** and **Figure 21**).

3.7.16 **Figure 23** depicts the estimated annual average daily traffic (AADT) flows on the rural highway network within the District as a result of base 2026 flows plus all committed land-use developments. As could be expected the highest flows are on the A46 and A1 trunk roads (maximum flows of 44,100 and 39,000 two-way vehicles per day respectively), as well as the A6097 and the A614 (maximum flows of 26,300 and 24,900 two-way vehicles per day respectively).

3.7.17 **Figure 24** depicts a stress plan which compares the total 2026 base plus committed land-use development flows on the rural network against congestion reference flow (CRF) values.

3.7.18 For ease of reference on **Figure 24**, congestion of less than 90% on links is shown in green, congestion of 90%-100% is shown in amber, and congestion of greater than 100% on links is shown in red.

3.7.19 The stress plan clearly indicates that at 2026 with the addition of committed land-use development flows all rural links within the District are expected to operate at less than 90% stress except for the following:

- A617 between A46(T) at Newark on Trent and the C17 at Kelham
- A6097 between the A46 at East Bridgford and the A612 at Lowdham
- A6097 between the A612 at Lowdham and the B6386 at Oxton

3.7.20 In addition the A614 between the A6097 and Ollerton Roundabout has stress levels of between 75% and 90% and whilst this is still within capacity it could be expected to experience less reliable journey times. The highest stress level on this section of the A614 is 90% between its junctions with the A617 and the C13 at Eakring/Bilsthorpe.

3.7.21 The implications of these results are that, even without any future growth within the District, improvements will be required to provide additional traffic capacity at the locations identified above. The nature and scale of the improvements required and potential costs are discussed in Section 6.

4 Growth Scenarios

4.1 HOUSING GROWTH

4.1.1 Four residential growth scenarios have been supplied by Newark and Sherwood District Council and these represent the following different approaches to accommodating residential growth within the District to 2026:

- *Dispersal (Scenario 1)* – Growth spread across the District including Newark & Balderton, major villages referenced in Policy H13, minor villages referenced in H14 and areas identified in greenbelt FS11.
- *Regeneration Based Growth (Scenario 2)* - 6 areas identified.
- *Focused Growth (Scenario 3)* – Newark and Balderton, 4 service centres and 6 principal villages.
- *Urban Concentration Based Growth (Scenario 4)* – As Focused Growth but without principal villages

4.1.2 **Table 17** below summarises the proposed residential dwellings for each scenario. **Figure 25** shows the site locations.

Table 17 – Residential Growth Scenarios (Numbers of Dwellings)

Settlement	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Sub-Regional Centre				
Newark, Balderton & Fernwood	5,312	5,612	6,542	7,678
Service Centers				
Ollerton & Broughton	583	1,499	838	1,073
Clipstone	367	1,875	494	612
Rainworth	588	696	715	833
Southwell	472	0	599	717
Principal Villages				
Bilsthorpe	340	596	328	0
Blidworth	380	636	368	0
Collingham	172	0	166	0
Edwinstowe	285	0	273	0
Farnsfield	195	0	189	0
Lowdham	215	0	209	0
Sutton on Trent	201	0	195	0
Secondary Villages				
Bleasby	108	0	0	0
Coddington	117	0	0	0
Elston	91	0	0	0
Farndon	357	0	0	0
Fiskerton Cum Morton	101	0	0	0
Gunthorpe	98	0	0	0
Halam	44	0	0	0
Harby	28	0	0	0
Norwell	47	0	0	0
North Muskham	109	0	0	0
Walesby	158	0	0	0
Winthorpe	92	0	0	0
Other Villages & Settlements	454	0	0	0
Totals	10,914	10,914	10,916	10,913

Note: The total for Scenario 3 is slightly higher due to rounding.

4.1.3 As can be seen from **Table 17** (on page 72) the total number of residential dwellings is the same for each growth scenario, the only difference between each scenario being how the development has been located across the District.

Residential Development within Newark on Trent

4.1.4 The level of development within Newark on Trent varies between the different Growth Scenarios as summarised in the Newark and Sherwood Core Strategy Options Report:

- Growth Scenario 1 – 'Dispersal' – Newark Urban Area would accommodate around 50% of new housing development.
- Growth Scenario 2 – 'Regeneration Based Growth' – Newark Urban Area would accommodate around 55% of new housing development.
- Growth Scenario 3 – 'Focused Growth' – Newark Urban Area would accommodate around 60% of new housing development.
- Growth Scenario 4 – 'Urban Concentration Based Growth' – Newark Urban Area would accommodate around 70% of new housing development.

4.1.5 The differing Scenarios are all based on the Newark Urban Area accommodating at least 5,000 dwellings over the plan period.

4.1.6 To test transport impacts within the urban area of Newark on Trent the Growth Scenario 4 '*Urban Concentration Based Growth'* development assumptions have been applied. This is because Growth Scenario 4 results in the highest concentration of development within the town and therefore generates the largest traffic impacts within the urban area.

4.1.7 This approach was adopted due to the time and cost implications associated with modelling the traffic impacts of multiple Growth Scenarios on the urban highway network. However, given that all Growth Scenarios result in significant new growth within Newark on Trent there will be a corresponding significant increase in vehicular activity on the urban highway network that will require mitigation works to be provided at locations where there is insufficient traffic capacity to accommodate those increases.

4.1.8 It is anticipated that the requirement for highway improvements will be focussed on the key corridors into and through the town that will be impacted upon by all Growth Scenarios. Therefore, the results obtained from the modelling of Scenario 4 will highlight those key

corridors that will need to be subject to more detailed assessment as development proposals progress.

4.1.9 On this basis, the results obtained from modelling Scenario 4 will highlight the critical corridors that will require further, more detailed analysis for all Growth Scenarios and will provide an indication of the location and number of junctions that will be approaching or exceeding operational capacity. The results obtained from modelling Growth Scenario 4 therefore provide a good indication of the location and extent of impacts expected as a result of all Growth Scenarios.

4.1.10 Three different spatial distributions of residential development within Newark on Trent have been tested for the purposes of the study which are summarised as:

- **Test 1** – development focused on sites to the south of Newark on Trent (predominantly the 'Land South of Newark' and Fernwood sites).
- **Test 2** – development of 'infill' sites within central Newark on Trent followed by the 'Land South of Newark' and 'Land East of Newark' sites.
- **Test 3** - development of 'infill' sites within central Newark on Trent followed by the Fernwood and 'Land East of Newark' sites.

4.1.11 The numbers of dwellings assumed on each site for each test are detailed in **Table 18** on page 75 (the total number of dwellings in Newark on Trent was rounded up from 7,678 to 7,700.

Table 18 – Summary of Residential Tests

Site ID	Site Name	Residential Tests (Dwellings)		
		Test 1 - 'Southern Sites'	Test 2 - 'Central Sites - Balance on Land to South'	Test 3 - 'Central Sites - Balance on Fernwood & Land to South'
1	Land South of Newark	4,000	3,300	500
2	Land East of Newark	150	2,000	2,000
3	Land around Fernwood	2,800	0	2,800
4	Land at Bowbridge Road	750	750	750
5	NSK Works	0	400	400
6	North of Beacon Hill Road	0	600	600
8	Newark Cattle Market and Notts CC Depot	0	250	250
9	Quibells Lane	0	400	400
Total Dwellings		7,700	7,700	7,700

4.2 EMPLOYMENT GROWTH

4.2.1 Anticipated employment growth demand within the District to 2026 has been taken from the 'East Midlands Northern Sub-Region Employment Land Study' dated March 2008. This document identifies a range of anticipated employment growth demand within the District and the upper end of the recommended range of 52.6ha has been assessed for the purposes of this study.

4.2.2 The East Midlands Northern Sub-Region Employment Land Study estimated 52.6ha employment growth by taking into account RSS growth, including Newark Growth Point, plus additional employment provision to reduce out-commuting from the District by one third. It is therefore considered to be a robust estimate.

4.2.3 For the purposes of this study the 52.6ha employment growth has been dispersed between settlements within the District on a pro-rata basis according to the residential growth within each settlement (i.e. close to residential growth to reduce commuting) and then split between individual sites in each settlement.

4.2.4 This methodology may throw up some anomalies where sites already have planning permission for a different area than has been assumed for the purposes of this study. This is because the 52.6ha area represents forecast employment growth for the whole District to 2026 but does not take into account employment land that will be 'lost' during this period due to planning permissions not being implemented, employment land being de-allocated, or existing employment sites being redeveloped for alternative (non-employment) uses.

4.2.5 Therefore, before 2026 the spatial distribution of employment growth within the district could change but the overall forecast demand of 52.6ha is assumed to remain constant. This study has therefore applied a logical estimation of where employment growth could/should occur within the district (i.e. close to residential growth to reduce commuting) but acknowledges that this distribution could change over time.

4.2.6 It should also be noted that for the purposes of this strategic assessment all employment growth has been assessed as B1 'Business Park' development use-class because the employment use-classes that will be developed are unknown at this stage in many cases. The use of B1 'Business Park' development use-class represents a robust assessment in terms of total vehicular trip generation. However, the total volume and composition of employment trips would change if B2 'Industrial' or B8 'Warehouse/Distribution' development use-classes were considered. In particular the total vehicle generation could be expected to reduce, but the number of HGV movements could increase significantly if B2 or B8 development use-classes were applied.

4.2.7 As an indication, data obtained from the TRICS online database (see note below) suggests that in comparison to B1 'Business Park' a B8 development use-class would generate approximately 40% fewer total vehicle trips but would generate almost 15 times more HGV movements. Therefore the employment trip generation assumptions applied in this strategic study are considered robust in terms of total trip generation but may significantly underestimate HGV activity if B2 and B8 development use-classes were to be considered, and further sensitivity testing would be required if this were the case.

(***Note**: Trip Rate Information Computer System (TRICS) is an on-line database of vehicular trip generation rates for different development use-classes. It is an 'industry standard' tool for estimating traffic generation*)

4.2.8 Net developable floor areas were estimated as 40% of gross site areas which is generally considered a typical development density for B1 Use-Class employment (all employment sites are assumed to be B1 Business Park for the purposes of this study). The resultant employment growth scenarios for the District are presented in **Table 19** on page 77 and the locations of these sites can be seen in **Figure 25**.

Table 19 – Employment Growth Scenarios

Ref No	Name	Net Employment Floor Areas (sqm)			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
1	Land South of Newark	32,000	36,000	40,000	48000
3	Land around Fernwood	32,000	36,000	40,000	48000
5	NSK Works	4,000	4,000	4,000	4000
7	Newark & Nottinghamshire Showground	4,000	0	4,000	4000
8	Newark Cattle Market and Notts CC Depot	0	0	0	0
10	Northern Road Industrial Estate	32,000	32,000	40,000	44000
19	Sherwood Energy Village	8,000	14,000	8,000	10000
20	Boughton Industrial Estate	6,000	8,000	8,000	8000
24	South of Rainworth Bypass	6,000	4,000	4,000	8000
25	Rufford Colliery	4,000	0	6,000	6000
28	Land at Crew Lane	4,000	0	6,000	6000
31	Land North of Mill Park	4,000	16,000	4,000	8000
32	Clipstone Colliery Mansfield Road	4,000	20,000	4,000	4000
33	North and West of Cavendish Park	2,000	0	2,000	0
38	Land at Collingham Station	2,000	0	2,000	0
42	North of Woodhill Road	4,000	4,000	4,000	0
44	South of Dale Lane	4,000	8,000	4,000	0
47	Burma Road Industrial Estate	4,000	6,000	4,000	0
54	Brailwood Road Industrial Estate	4,000	6,000	4,000	0
55	Bilsthorpe Colliery	4,000	14,000	8,000	10000
-	Edwinstowe	6,000	0	4,000	0
-	Farnsfield	4,000	0	2,000	0
-	Lowdham & Gunthorpe	6,000	0	4,000	0
-	Sutton on Trent	4,000	0	2,000	0
-	Bleasby	2,000	0	0	0
-	Farndon & Elston	10,000	0	0	0
-	North Muskham	2,000	0	0	0
-	Walesby	4,000	0	0	0
-	Winthorpe	6,000	0	0	0
Total		208,000	208,000	208,000	208,000

Notes: Specific sites have not been identified for locations without a reference number.

4.2.9 As can be seen from **Table 19** above the total employment floor area is the same for each growth scenario, the only difference between each scenario being how the development has been located across the District.

Trip Generation

4.2.10 Residential person trip generation has been estimated using trip rates derived from 2001 Census Method of Travel to Work data (Resident Population) for wards within the District. Employment person trip generation has been estimated using trip rates derived from 2001 Census Method of Travel to Work data (Daytime Population) for wards within the District.

4.2.11 Separate trip rates have been derived for rural and urban wards and for the purposes of the study wards located within Newark on Trent have been categorised as urban wards (i.e. Bridge, Castle, Beacon, Devon, Magnus, Balderton North and Balderton West) all other wards have been categorised as rural.

4.2.12 Full details of the trip generation methodology and calculations are presented in **Appendix G**. Summaries of the total vehicle trip estimates for each of the 4 growth scenarios are presented in **Table 20**, **Table 21** and **Table 22** below.

Table 20 – Residential Vehicle Trip Generation (VPH)

Scenario	AM			PM		
	Inbound	Outbound	2-Way	Inbound	Outbound	2-Way
1	1,772	6,705	8,477	4,629	2,843	7,472
2	1,761	6,661	8,422	4,599	2,824	7,423
3	1,725	6,528	8,253	4,507	2,767	7,274
4	1,681	6,361	8,042	4,392	2,697	7,088

Table 21 – Employment Vehicle Trip Generation (VPH)

Scenario	AM			PM		
	Inbound	Outbound	2-Way	Inbound	Outbound	2-Way
1	3,144	437	3,581	344	2,720	3,064
2	3,136	436	3,572	343	2,713	3,057
3	3,098	431	3,529	339	2,681	3,020
4	3,061	426	3,486	335	2,648	2,983

Table 22 – Total Vehicle Trip Generation (VPH)

Scenario	AM			PM		
	Inbound	Outbound	2-Way	Inbound	Outbound	2-Way
1	4,916	7,142	12,058	4,973	5,563	10,536
2	4,897	7,097	11,994	4,942	5,537	10,480
3	4,823	6,959	11,782	4,846	5,448	10,294
4	4,742	6,787	11,528	4,727	5,345	10,071

Note: Inbound = trips to developments, Outbound = trips from developments.

4.2.13 As can be seen from the summaries the total trip generation for each scenario is very similar, which is as could be expected because the total dwellings and employment floor area is identical in each scenario. The slight differences are due to where the growth is located within

the District because the urban modal splits that have been used to estimate trip generation are less car-oriented than the rural modal splits. Therefore, Scenarios 3 and 4 which focus more growth within Newark on Trent generate slightly fewer vehicle car trips compared to Scenarios 1 and 2 which include more rural growth.

4.2.14 The vehicle trip rates that have been derived for the purposes of this study have been compared to the vehicle trip rates that were approved by Nottinghamshire County Council and the Highways Agency for assessment of the Land to the South of Newark. In all cases the vehicle trip rates applied in this study are higher than the approved trip rates because the approved rates included reductions to reflect travel plan measures and linked-trip effects (i.e. trips between proposed residential and employment sites). The trip rates applied in this study do not allow for any such reductions and are therefore considered to be very robust.

Modal Splits

4.2.15 Total person trips have been estimated using data obtained from the TRICS database. Modal splits obtained from 2001 Census Travel to/from Work data have then been used to estimate person trips by each mode of transport. Full details of the person trip generation calculations are presented in **Appendix G**. A summary of the estimated person trips is presented in **Table 23, Table 24 and Table 25.**

Table 23 – Residential Person Trip Generation by Mode of Travel

Scenario	AM Peak	Total	Underground, light rail/tram	Train	Bus	Taxi	Car/Van Driver	Car/Van Passenger	Motorcycle	Bicycle	On Foot	Other
1	Inbound	2,674	1	36	119	10	1,772	204	33	189	298	11
	Outbound	10,117	4	135	451	38	6,705	774	126	714	1,127	43
2	Inbound	2,674	1	36	119	10	1,761	205	34	196	302	11
	Outbound	10,117	4	137	448	39	6,661	776	127	741	1,141	42
3	Inbound	2,674	1	38	117	11	1,725	207	34	218	313	11
	Outbound	10,119	4	144	441	41	6,528	782	128	825	1,185	42
4	Inbound	2,674	1	40	114	12	1,681	209	34	245	327	11
	Outbound	10,116	3	151	432	44	6,361	790	129	927	1,238	41

Table 24 – Employment Person Trip Generation by Mode of Travel

Scenario	AM Peak	Total	Underground, light rail/tram	Train	Bus	Taxi	Car/Van Driver	Car/Van Passenger	Motorcycle	Bicycle	On Foot	Other
1	Inbound	4,754	2	19	168	17	3,144	387	63	340	596	18
	Outbound	661	0	3	23	2	437	54	9	47	83	2
2	Inbound	4,754	2	19	168	18	3,136	386	63	348	597	17
	Outbound	661	0	3	23	2	436	54	9	48	83	2
3	Inbound	4,754	1	20	168	19	3,098	383	62	387	598	16
	Outbound	661	0	3	23	3	431	53	9	54	83	2
4	Inbound	4,754	1	22	168	20	3,061	379	61	427	600	14
	Outbound	661	0	3	23	3	426	53	9	59	83	2

Table 25 – Total Person Trip Generation by Mode of Travel

Scenario	AM Peak	Total	Underground, light rail/tram	Train	Bus	Taxi	Car/Van Driver	Car/Van Passenger	Motorcycle	Bicycle	On Foot	Other
1	Inbound	7,428	3	54	287	27	4,916	592	97	528	894	29
	Outbound	10,779	5	138	474	40	7,142	828	135	761	1,210	45
2	Inbound	7,428	3	55	287	28	4,897	591	97	544	898	29
	Outbound	10,779	4	140	472	41	7,098	830	136	789	1,224	45
3	Inbound	7,428	2	58	285	30	4,824	590	96	605	912	27
	Outbound	10,781	4	147	465	44	6,959	835	137	879	1,268	44
4	Inbound	7,428	2	62	282	32	4,742	588	95	672	927	25
	Outbound	10,778	4	154	455	47	6,787	842	138	986	1,322	43

Notes: AM peak data presented as the 'worst case'.

Inbound = trips to developments, Outbound = trips from developments.

4.2.16 As can be seen from the summaries the majority of trips are expected to be made by car in all scenarios. However, there is a significant proportion walking and cycling.

Trip Distribution & Assignment

4.2.17 Estimated vehicle trips have been distributed in accordance with 2001 Census travel to work data. Ward level census data was applied with central points identified in each ward as origins/destinations. The distribution takes into account trips within the District and trips between the District and external origins/destinations. Trips were assigned to the existing

highway network within the District in accordance with shortest journey distances. Full details of the distribution methodology can be found in **Appendix G**.

4.2.18 The resultant trip assignments on the rural highway network are presented in **Figure 26** to **Figure 29** which depict the employment trips, **Figure 30** to **Figure 33** which present the residential trips and **Figure 34** to **Figure 37** which depict the combined (residential plus employment) trips.

4.2.19 Looking at the combined (residential plus employment) trips on **Figure 34** to **Figure 37** the highest flows are summarised as follows:

- Scenario 1 - 11,800 2-way vehicles per day on the A617 between the A46 and Kelham
- Scenario 2 - 20,600 2-way vehicles per day on the B6030 at Clipstone
- Scenario 3 – 8,900 2-way vehicles per day on the A617 between the A46 and Kelham
- Scenario 4 – 8,000 2-way vehicles per day on the A46 to the south of Newark on Trent

4.2.20 The urban highway network within Newark on Trent has been assessed using a VISUM model and the modelling methodology and results are described in Section 5. As a result of using a model network flow diagrams depicting 'base + committed + development' have not been prepared as the 'build up' of flows was undertaken in the model.

Residential Site Accessibility

4.2.21 Site accessibility by sustainable transport modes has been determined by assessing the proximity of each residential site to existing local facilities and existing public transport facilities. The assessment is based on the methodology applied in the 'Newark and Sherwood State of the District Report', with slight variations to reflect the availability of destination data and to enable a relative comparison to be made between the sites. Each site was awarded a weighted score to reflect the likely frequency of trips to the destinations assessed. Scores were then ranked to provide an indication of each site's relative accessibility. The Local facility destinations assessed were:

- Community Centres
- Further Education
- Hospitals
- Libraries
- Leisure Centres
- Post Offices
- Dental Surgeries
- Places of Worship
- Local Shopping Centres
- Junior Schools
- Senior Schools
- GP Surgeries
- Employment Sites
- Supermarkets/Food Stores

The public transport facilities/services assessed were:

- Rail Stations
- Bus stops with better than an hourly service
- Bus stops with an hourly service
- Bus stops with a less than hourly service

4.2.22 Proximity was determined based on the following straight-line distance isochrones:

- 800m walking distance to local facilities
- 3200m cycling distance to local facilities
- 400m walking distance to bus stops
- 800m walking distance to bus stops
- 800m walking distance to rail stations
- 3200m cycling distance to rail stations

4.2.23 These distances represent the following typical journey times:

- 400m walking is approximately equivalent to a 5 minute journey time
- 800m walking is approximately equivalent to a 10 minute journey time
- 3200m cycling is approximately equivalent to a 10 minute journey time

4.2.24 An estimation of the potential for each residential site to deliver improvements to existing sustainable transport infrastructure, thereby improving its relative accessibility, has also been made based on a developer contribution of £750 per dwelling.

4.2.25 This value has been derived from the 'Newark & Sherwood Local Development Framework, Developer Contributions Supplementary Planning Document' (SPD), dated October 2008 which identifies an upper contribution level of £22,500 per net developable hectare for residential developments (page 29 of the SPD). Assuming a development density of 30 dwellings per hectare gives the assumed contribution level of £750 per dwelling.

4.2.26 However, it should be noted that as this is a relative assessment, the actual value of the financial contribution assumed per dwelling has no bearing on the results of the assessment and this information is presented in **Appendix H** for information purposes only, to provide an indication of the total value of developer contributions that may be expected per settlement if the SPD contribution levels are applied.

4.2.27 The Supplementary Planning Document states that this contribution should be:

> *"used as a starting point for negotiations with developers and for larger developments they will form an integral part of the Transport Assessment Procedure. Developers will be expected to provide an acceptable internal layout and good access to the site for all modes of transport together with a financial contribution that the District Council can pool towards*

integrated transport improvements in the vicinity of the development. The contributions will be allocated against identified schemes within the general area within which the development lies.

Examples of such schemes include:

- *Bus Quality Partnership elements, bus priority measures and bus stop facilities;*
- *Public Transport Revenue support;*
- *Extension and improvement of the cycle network and pedestrian facilities;*
- *New heavy rail infrastructure;*
- *Park & Ride;*
- *Traffic Management;*
- *Pedestrian schemes; and*
- *Other transport measures and highway improvements to support public"*

4.2.28 The potential contribution per site has been estimated from the growth scenario totals for each settlement which have been distributed pro-rata between the sites in each settlement in accordance with the number of dwellings per site. The calculation applies residential dwelling numbers provided by developers where known, and where this information was not available a residential density of 30 dwellings per hectare of gross site area has been assumed.

4.2.29 A relative weighting per site was then derived by dividing the financial contribution from each site by the total contribution value for each growth scenario. Full details of the methodology applied and calculations can be found in **Appendix H** and **Figures AP1** to **AP18** depict the travel distance isochrones. A summary of the assessment results is presented in **Table 26** on the following page.

Table 26 – Residential Sites - Accessibility Ranking

Site Ref	Name of Site	Existing Accessibility	Potential Accessibility			
			Scenario 1	Scenario 2	Scenario 3	Scenario 4
Newark on Trent						
1	Land South of Newark					
2	Land East of Newark					
3	Land around Fernwood					
4	Land at Bowbridge Road					
5	NSK Works					
6	North of Beacon Hill Road					
8	Newark Cattle Market and Notts CC Depot					
9	Quibells Lane					
Ollerton & Boughton						
11	North of Petersmiths Drive					
12	Land around Hallam Rd					
13	South of Griceson Close					
14	South of Wellow Road					
15	North of Wellow Road					
16	South of Tor Lane					
17	South of Tuxford Road					
18	South of Church Road					
Rainworth						
21	South of Preston Road					
22	South of Southwell Road East					
23	North of Kirklington Rd					
Southwell						
26	Land West of Nottingham Road					
27	Land South of Halam Road					
28	Land at Crew Lane					
29	Land at Kirklington Road / Lower Kirklington Road					
30	South of Potwell Dyke					
Clipstone						
32	Clipstone Colliery Mansfield Road					
33	North and West of Cavendish Park					
34	Baulker Farm					
35	Mansfield Road/Cavendish Way					
Collingham						
36	South of Collingham Hall					
37	Land North of Dykes End					
38	Land at Collingham Station					
39	Land at Station Road					
40	North of Village Centre, High Street					
41	East of High Street					
42	North of Woodhill Rd					
Blidworth						
43	South of New Lane					
44	South of Dale Lane					

45	West of Mansfield Road					
46	South of Main Street					
	Bilsthorpe					
48	East of Kirklington Road					
49	South of Farnsfield & Bilsthorpe Roads					
50	West of Kirkington Road					
51	South of Bilsthorpe					
52	North of Bilsthorpe					
53	Land at Mickledale Lane					
	Edwinstowe					
56	Land at Mansfield Road					
57	North of Ollerton Road					
58	South of Lansbury Road					
59	South of the River Maun					
	Farnsfield					
60	Land at Brickyard Lane					
61	South of Mansfield Road					
62	West of Cockett Lane					
63	East of Cockett Lane					
	Lowdham					
64	North of Epperstone Road					
65	East of Barker Hill/Ridge Hill					
66	Land at Southwell Road					
67	South of Caythorpe Road					
	Sutton on Trent					
68	South Bulham Lane					
69	South of High Street					
70	Land at Barrel Hill Road					
71	East of Great North Road					

Note: Missing reference numbers 7, 10, 19, 20, 24, 25, 31, 47, 54 & 55 are all employment only sites.

4.2.30 For ease of reference the results in **Table 26** have been colour coded as follows:

- Red (least accessible) – sites with below average accessibility.
- Amber – all sites between red and green.
- Green (most accessible) – the 15% most accessible sites.

4.2.31 As can be seen from **Table 26** the sites that are rated as having the highest existing relative accessibility (green) are located in the settlements of Newark on Trent (5, 8 & 9), Collingham (36, 37, 38, 40, 41) and Lowdham (66). Observation of the accessibility scoring matrix (**Appendix H**) reveals that the sites in Newark on Trent score highly both in terms of proximity to local facilities and also in terms of public transport accessibility (bus and rail).

4.2.32 The sites in Collingham and Lowdham score only slightly above the average in terms of proximity to local facilities but score highly in terms of public transport accessibility due to their close proximity to bus stops with regular bus services and their proximity to rail stations (the key differential being their close proximity to rail stations).

4.2.33 The relative accessibility ranking changes once the potential for sustainable transport infrastructure investment is taken into account and the sites that are rated as having the highest potential accessibility (green) are located in the settlements of Newark on Trent (1, 2, 3, 4, 5, 6, & 9), Ollerton & Boughton (11 & 12), Rainworth (21), Southwell (26) and Clipstone (32 & 33).

4.2.34 Two of these sites (5 and 9) were also rated highly in the assessment of existing accessibility. The others have increased their rating through their potential to fund improvements to sustainable transport infrastructure. Most notably the larger sites which, due to their higher number of residential dwellings, would result in proportionately higher financial contributions.

4.2.35 It is recommended that priority is given to those sites with good existing accessibility (in particular sites 5,8 and 9 in Newark on Trent), since these should generate fewer vehicle trips and should be served by existing sustainable transport infrastructure (although infrastructure improvements may still be required in order to accommodate additional demands). Followed by sites that have good potential accessibility through their ability to contribute most towards new/improved sustainable transport infrastructure (in particular those sites within and to the south of Newark on Trent which would benefit from the wider range of facilities on offer within the town).

5 Impacts of Growth

5.1.1 In this section the impacts of the estimated trips generated as a result of the growth scenarios are examined. For each scenario the total 2-way trips generated (total of residential and employment trips) are presented followed by a discussion on the likely impacts of these trips on each mode of transport. Measures to accommodate and mitigate the identified impacts are discussed in Section 6 of this report.

5.1.2 It is worth noting that there is very little difference between the total trips generated across the District in each scenario because the total growth is approximately the same for each. The key difference is where the growth is located in each scenario. Trips have therefore been presented on a settlement-by-settlement basis so the differences between each scenario can be clearly seen and compared.

5.1.3 For the purposes of this strategic assessment employment growth for all scenarios has been assumed to comprise B1 Business Park which typically generates very few heavy goods vehicle movements. No specific freight-related impacts are therefore anticipated in any scenario and any future proposals for employment uses that will generate significant heavy goods vehicle activity (e.g. B8 Warehouse/Distribution), or impacts on existing rail or water-borne freight infrastructure, will need to be assessed on its own merits at the planning application stage.

5.1.4 As discussed in paragraphs 4.2.6 and 4.2.7 the employment trip generation assumptions applied in this strategic study are therefore considered robust in terms of total trip generation but may significantly underestimate HGV activity if B2 and B8 development use-classes were to be considered, and further sensitivity testing would be required if this were the case.

5.1.5 Impacts on the rural highway network have been identified by comparing the combined Base, Committed and Development traffic flows summarised in **Figure 38** to **Figure 41** against their respective link CRF values in order to determine the stress levels that are presented in **Figure 42** to **Figure 45**. For each scenario the critical links (i.e. all links forecast to be operating close to, or over, capacity) have been tabulated and compared to the 'no Growth Scenario'. For ease of reference the tables are colour coded as follows:

- Red = in excess of 100% stress
- Yellow = 90% to 100% stress
- Green = less than 90% stress

Table 27 – Critical Links – No Growth Scenario

Link Description	Percentage 'Stress'
A617 between Newark & C17	93%
A6097 between A46(T) & A612	129%
A6097 between A612 & B6386	107%

5.1.6 As can be seen from **Table 27** on page 88 there are 3 links that are forecast to be close to, or over capacity at 2026 without the addition of any growth. These are the A617 between its junctions with the A46 at Newark and the C17 at Kelham, the A6097 between its junctions with the A46 at Bingham and the A612 at Lowdham and the A6097 between its junctions with the A612 at Lowdham and the B6386 at Oxton. The results suggest that capacity improvements will be required on all of these links before 2026, regardless of any growth proposals within the District.

5.1.7 It should be noted that CRF is a link-based assessment and does not take into account junction capacity. In practice, junction operation usually determines the overall performance of a highway corridor and junctions will exceed their capacity and exhibit congestion and queuing problems long before a link does. As a result, the key junctions on those links identified as being close to, or at capacity, will require improvement in advance of consideration of link widening/dualling. Details of impacts at specific junctions will therefore need to be determined as part of the Transport Assessments submitted in support of development proposals and appropriate improvements secured through the planning process.

5.1.8 As explained earlier in this report (4.1.4 to 4.1.9) this study has examined the effects of Growth Scenario 4 on the urban highway network within Newark on Trent. This is because Scenario 4 results in the highest concentration of development within the town and therefore generates the largest traffic impacts within the urban area.

5.1.9 The results obtained from modelling Scenario 4 will highlight the critical corridors that will require further, more detailed analysis for all Growth Scenarios and will provide an indication of the location and number of junctions that will be approaching or exceeding operational capacity. The results obtained from modelling Growth Scenario 4 therefore provide a good indication of the location and extent of impacts expected as a result of all Growth Scenarios.

5.2 SCENARIO 1 (DISPERSAL)

Estimated Trips

Table 28 – Total 2-Way Trips by Mode – Scenario 1

Settlement	Train	Bus	Car	Bicycle	Walking
Newark on Trent	123	346	5,465	1,061	1,200
Ollerton & Boughton	8	44	739	25	98
Rainworth	8	39	631	20	79
Southwell	6	34	566	19	74
Clipstone	5	28	474	16	63
Collingham	2	14	227	8	30
Blidworth	5	29	485	16	64
Bilsthorpe	5	32	562	19	80
Edwinstowe	4	22	364	12	48
Farnsfield	3	15	247	8	33
Lowdham	3	18	302	10	41
Sutton on Trent	3	15	252	8	33
Secondary Villages	18	99	1,641	54	214
Other Villages	6	26	401	12	46
Total	200	761	12,358	1,290	2,104

Notes:
1. Train includes; train, underground, metro, light rail or tram.
2. Bus includes, bus, minibus or coach.
3. Car includes; car, taxi or minicab, motorcycle, scooter or moped.

5.2.1 In this scenario approximately half of the total growth is located in Newark on Trent and the balance is dispersed evenly across the District. Trips are therefore correspondingly spread between Newark on Trent and the rural settlements of the District. It should be noted that the trips for 'Secondary Villages' are split between the following 12 locations; Bleasby, Coddington, Elston, Farndon, Fiskerton-Cum-Morton, Gunthorpe, Halam, Harby, Norwell, North Muskham, Walesby and Winthorpe. The trips for 'Other Villages' are also split between multiple locations.

Impacts on the Rural Highway Network

Table 29 – Critical Links – Scenario 1

Link Description	Percentage 'Stress'	
	Base + Committed	Scenario 1
A617 between Newark & C17	93%	149%
A617 between C17 & A614	-	98%
A6097 between A46(T) & A612	129%	139%
A6097 between A612 & B6386	107%	124%
A614 between A6097 & C1	-	105%
A614 between A617 & C13	-	121%
A614 between C13 & B6034	-	93%
A614 between B6030 & A06075/A616	-	98%
A612 south of Southwell	-	92%

5.2.2 As can be seen from **Table 29** on page 89 the Scenario 1 growth results in an additional 6 links approaching or exceeding capacity by 2026. This includes; the A617 between the C17 west of Averham and its junction with the A614 to the west, 4 links on the A614 between its junctions with the A6097 to the south of Farnsfield and the A616/A6075 Ollerton roundabout to the north and the A612 Westgate south of Southwell.

Impacts on Bus Transport

5.2.3 Some 761 new bus trips are forecast with almost half (346) originating in Newark on Trent. Assuming a notional bus occupancy of 50 persons per bus would equate to approximately 16 additional buses in the AM peak hour to accommodate the total anticipated demand with 7 buses required to meet the additional demands in Newark on Trent during the AM peak hour.

5.2.4 Developers will be required to fund new/improved bus services in order to meet the additional travel demands generated by new developments. Given the scale of the forecast increase in demand for bus travel this should be easily accommodated through a combination of using any spare capacity on existing services, providing additional buses to increase capacity on existing service routes, or through the provision of new bespoke services.

5.2.5 Increases across the rural areas of the District are relatively small with less than a single bus load estimated from any one location during the AM peak hour (note that trips for 'Secondary Villages' are split between 12 locations). As a result these should be easily accommodated on the existing bus network, with suitable developer-funded capacity enhancements where necessary.

Impacts on Passenger Rail

5.2.6 The maximum additional demand for rail is 200 trips in the AM peak with 123 trips originating within Newark on Trent. Considering that this demand will be split between several stations over a 1 hour period (at least 2 trains per hour) the additional demand per train is likely to be small. Assume these trips are split between 2 stations and over 2 trains gives an additional 50 persons per train, which if split between 5 carriages would be 10 persons per carriage. This level of anticipated increased demand for rail travel should be accommodated on existing services and would be insufficient to itself justify any improvements to rail infrastructure or services.

Impacts on Cycling & Walking

5.2.7 The majority of the 1,290 cycling trips generated are focused within Newark on Trent (1,061), which has the best exiting cycle infrastructure. These trips would be distributed across the urban area on the existing cycle network. However, this still represents a large increase in cycle activity in the AM peak hour and should be considered in further detail at the planning application stage as part of the Transport Assessments prepared for individual developments.

5.2.8 In particular, the origins and destinations of cycle trips to/from development sites should be examined to determine where enhancements to the existing cycle network may be required to safely accommodate additional trips. Developers will be required to deliver new/improved cycle infrastructure to provide cycle access to individual development sites and to provide safe connections to the existing cycle network, including the provision of new crossing facilities, capacity enhancements and other appropriate cycle infrastructure, where necessary.

5.2.9 The forecast cycling trips in the rural settlements are not significant and would be accommodated on existing cycling infrastructure (where available) with suitable developer funded enhancements, as appropriate.

5.2.10 Combined with the planned improvements to existing cycle facilities described in Section 3.5 the forecast increase in cycle activity should therefore be satisfactorily accommodated in this manner.

5.2.11 Walking trips are also focused within Newark on Trent with 1,200 trips forecast in the AM peak hour. As for the cycling trips these would be spread across the urban area and would be accommodated on existing infrastructure with developer-funded enhancements provided on a site-by-site basis, as appropriate. Forecast walking trips in the rural settlements (up to 100 trips per location) are not significant (note that the trips for 'Secondary Villages' are split between 12 locations) and would be accommodated on existing infrastructure with suitable developer funded enhancements, as appropriate.

5.3 SCENARIO 2 (REGENERATION BASED GROWTH)

Estimated Trips

Table 30 – Total 2-Way Trips by Mode – Scenario 2

Settlement	Train	Bus	Car	Bicycle	Walking
Newark on Trent	130	364	5,743	1,115	1,262
Ollerton & Boughton	20	111	1,848	61	242
Rainworth	9	47	764	25	96
Southwell	0	0	0	0	0
Clipstone	26	140	2,329	78	306
Collingham	0	0	0	0	0
Blidworth	9	47	786	26	103
Bilsthorpe	8	49	826	28	112
Edwinstowe	0	0	0	0	0
Farnsfield	0	0	0	0	0
Lowdham	0	0	0	0	0
Sutton on Trent	0	0	0	0	0
Secondary Villages	0	0	0	0	0
Other Villages	0	0	0	0	0
Total	202	758	12,296	1,333	2,123

Notes:
1. Train includes; train, underground, metro, light rail or tram.
2. Bus includes, bus, minibus or coach.
3. Car includes; car, taxi or minicab, motorcycle, scooter or moped.

5.3.1 In this scenario approximately half of the total growth is focused in Newark on Trent and the balance is split between; Ollerton, Rainworth, Clipstone, Blidworth and Bilsthorpe. No growth is located within secondary or 'other' villages.

Impacts on the Rural Highway Network

Table 31 – Critical Links – Scenario 2

Link Description	Percentage 'Stress'	
	Base + Committed	Scenario 2
A617 between Newark & C17	93%	121%
A6097 between A46(T) & A612	129%	133%
A6097 between A612 & B6386	107%	118%
A614 between A6097 & C1	-	102%
A614 between A617 & C13	-	129%
A614 between C13 & B6034	-	97%
A614 between B6034 & C57	-	97%
A614 between B6030 & A06075/A616	-	110%
B6030 to west of B6034 at Ollerton	-	135%
A6075 east of Ollerton Roundabout	-	93%

5.3.2 As can be seen from **Table 31** the Scenario 2 growth results in an additional 7 links approaching or exceeding capacity by 2026. This includes 5 links on the A614 between its junctions with the A6097 to the south of Farnsfield and the A616/A6075 Ollerton roundabout to the north, the B6030 to the west of Ollerton (and possibly further to the west into Mansfield District) and the A6075 to the east of Ollerton roundabout.

Impacts on Bus Transport

5.3.3 Regeneration growth concentrates the additional demands in fewer locations and from the 758 trips, 346 are generated within Newark on Trent. Assuming a notional bus occupancy of 50 persons per bus would equate to approximately 15 additional buses in the AM peak hour to accommodate the total anticipated demand with 7 buses required to meet the additional demands in Newark on Trent during the AM peak hour. As for Scenarios 1 developers will be required to fund new/improved bus services in order to meet the additional travel demands generated by new developments.

5.3.4 Trip increases across the rural areas of the District are relatively small with 111 in Clipstone; and 140 in Ollerton and Broughton. Bus services to these settlements radiate from Mansfield and the corridor enjoys relatively frequent services which should absorb additional trips without the provision of extra resources. The remainder of 143 are generated from the three villages of Rainworth, Blidworth and Bilsthorpe and would be accommodated by existing services.

Impacts on Passenger Rail

5.3.5 The maximum additional demand for rail is 202 trips in the AM peak with 130 trips originating within Newark on Trent. Assuming this demand is split between 2 stations and over 2 trains gives approximately an additional 50 persons per train which if split between 5 carriages would be approximately 10 persons per carriage. This level of anticipated increased demand for rail travel should be accommodated on existing services and would be insufficient to itself justify any improvements to rail infrastructure or services

Impacts on Cycling & Walking

5.3.6 As for the previous scenarios the vast majority of the 1,333 cycling trips (1,115) generated are focused within Newark on Trent, which has the most comprehensive existing cycle infrastructure. These trips would be distributed across the urban area on the existing network and would be accommodated through a combination of developer funded and planned

improvements. In this scenario there are also modest trip increases generated at Ollerton & Boughton (61) and Clipstone (78) whilst the remaining rural settlements would not see significant increases. Cycle trips in the rural areas of the District would be accommodated by existing infrastructure with developer-funded enhancements where necessary.

5.3.7 As for Scenario 1 walking trips are again focused within Newark on Trent with 1,262 trips forecast in the AM peak hour. Forecast walking trips in the rural settlements are highest at Ollerton & Boughton (242) and Clipstone (306) with other settlements seeing increases of around 100 trips per location. These would be accommodated on existing infrastructure with suitable developer funded enhancements, as appropriate.

5.4 SCENARIO 3 (FOCUSED GROWTH)

Estimated Trips

Table 32 – Total 2-Way Trips by Mode – Scenario 3

Settlement	Train	Bus	Car	Bicycle	Walking
Newark on Trent	152	426	6,729	1,306	1,478
Ollerton & Boughton	11	63	1,039	35	137
Rainworth	9	48	781	25	98
Southwell	8	45	753	25	99
Clipstone	7	36	586	19	76
Collingham	2	13	221	7	30
Blidworth	5	28	475	16	63
Bilsthorpe	5	30	514	18	72
Edwinstowe	4	19	316	10	41
Farnsfield	2	13	204	7	26
Lowdham	3	16	259	9	34
Sutton on Trent	3	13	210	7	26
Secondary Villages	0	0	0	0	0
Other Villages	0	0	0	0	0
Total	211	749	12,089	1,484	2,180

Notes:
1. Train includes; train, underground, metro, light rail or tram.
2. Bus includes, bus, minibus or coach.
3. Car includes; car, taxi or minicab, motorcycle, scooter or moped.

5.4.1 In this scenario slightly more that half of the total growth is focused in Newark on Trent and the balance is split between all the main rural settlements within the District. No growth is located within secondary or 'other' villages.

Impacts on the Rural Highway Network

Table 33 – Critical Links – Scenario 3

Link Description	Percentage 'Stress'	
	Base + Committed	Scenario 3
A617 between Newark & C17	93%	135%
A6097 between A46(T) & A612	129%	138%
A6097 between A612 & B6386	107%	122%
A614 between A6097 & C1	-	103%
A614 between A617 & C13	-	121%
A614 between C13 & B6034	-	93%
A614 between B6030 & A06075/A616	-	100%
A612 south of Southwell	-	95%

5.4.2 As can be seen from **Table 33** the Scenario 3 growth results in an additional 5 links approaching or exceeding capacity by 2026. This includes 4 links on the A614 between its junctions with the A6097 to the south of Farnsfield and the A616/A6075 Ollerton roundabout to the north, and the A612 Westgate south of Southwell.

Impacts on Bus Transport

5.4.3 Of the forecast 749 new trips 426 would be generated from within Newark on Trent. This would equate to approximately 15 additional buses in the AM peak hour to accommodate the total anticipated demand with 9 buses required to meet the additional demands in Newark on Trent during the AM peak hour. As for the previous scenarios developers will be required to fund new/improved bus services in order to meet the additional travel demands generated by new developments.

5.4.4 Increases across the rural areas of the District are relatively small with 63 trips in Ollerton and Broughton being the highest outside of Newark on Trent, these would be accommodated by existing services.

Impacts on Passenger Rail

5.4.5 The maximum additional demand for rail is 211 trips in the AM peak with 152 trips originating within Newark on Trent. This equates to approximately an additional 53 persons per train which if split between 5 carriages would be approximately 11 persons per carriage. This level of anticipated increased demand for rail travel should be accommodated on existing services and would be insufficient to itself justify any improvements to rail infrastructure or services

Impacts on Cycling & Walking

5.4.6 The vast majority of the 1,484 cycling trips generated are focused within Newark on Trent (1,306), which has the most comprehensive existing cycle infrastructure. As for the previous scenarios these trips would be distributed across the urban area on the existing network and would be accommodated through a combination of developer funded and planned improvements. In this scenario there is very little increase in cycle activity forecast in the rural areas of the District and this would be accommodated by existing infrastructure.

5.4.7 As for the previous scenarios walking trips are focused within Newark on Trent with 1,478 trips forecast in the AM peak hour. Forecast walking trips in the rural settlements are highest at Ollerton & Boughton (137), Southwell (99) and Rainworth (98) with other settlements seeing increases of less than 77 trips per location. These would be accommodated on existing infrastructure with suitable developer funded enhancements, as appropriate.

5.5 SCENARIO 4 (URBAN CONCENTRATION BASED GROWTH)

Estimated Trips

Table 34 – Total 2-Way Trips by Mode – Scenario 4

Settlement	Train	Bus	Car	Bicycle	Walking
Newark and Balderton	178	498	7,861	1,526	1,727
Ollerton & Boughton	15	80	1,322	44	173
Rainworth	11	55	885	29	110
Southwell	10	52	858	28	111
Clipstone	8	46	765	25	101
Collingham	0	0	0	0	0
Blidworth	0	0	0	0	0
Bilsthorpe	1	7	150	6	26
Edwinstowe	0	0	0	0	0
Farnsfield	0	0	0	0	0
Lowdham	0	0	0	0	0
Sutton on Trent	0	0	0	0	0
Secondary Villages	0	0	0	0	0
Other Villages	0	0	0	0	0
Total	222	738	11,840	1,658	2,249

Notes:
1. Train includes; train, underground, metro, light rail or tram.
2. Bus includes, bus, minibus or coach.
3. Car includes; car, taxi or minicab, motorcycle, scooter or moped.

5.5.1 In this scenario growth is focused in 6 locations, predominantly Newark and Balderton, with a small amount in Ollerton, Rainworth, Southwell, Clipstone and Bilsthorpe. No growth is located within secondary or 'other' villages.

Impacts on the Urban Highway Network

5.5.2 The impacts of three different distributions of residential development within Newark on Trent tests have been assessed (as detailed in **Table 18** on page 75) using a VISUM traffic model. Details of the modelling methodology can be found in the WSP technical note titled 'Newark on Trent Option Modelling Assumptions' and the results of the modelling exercise are summarised in WSP report 'Newark on Trent LDF Options Model Assessment Summary', copies of both of which can be found in **Appendix I**.

5.5.3 The modelling examined the AM and PM peak hour operation of the urban highway network within Newark on Trent for a 2026 Reference Case (i.e. 2026 base + committed development flows) and 2026 'With Development' (i.e. assuming the addition of Growth Scenario traffic). The 'With Development' was tested for the 3 options as detailed in **Table 18** on page 75. Both the 'Reference Case' and 'With Development' were tested with and without a Southern Link Road (SLR) between the A46 and the A1 to the south of Newark on Trent.

5.5.4 The SLR was modelled as a dual carriageway with 4 at-grade roundabout junctions and a 40mph design speed. This design speed was applied due to a combination of factors including; the relatively short link lengths on the SLR, the number of priority junctions and the desire to achieve a carriageway alignment that, as far as possible, is contained within land under the control of the developer(s) that would deliver the SLR. Details can be found on page 3 of the 'Newark on Trent LDF Options Model Assessment Summary' report in **Appendix I**.

5.5.5 Comparison of the results with and without the SLR for the 2026 Reference Case (i.e. without any Growth Scenario traffic) demonstrate that the provision of the link road will help to relieve pressure on some congested routes in Newark on Trent such as London Road, Beacon Hill Road and Farndon Road.

5.5.6 Without any Growth Scenario traffic the demand for the provision of the SLR is very modest (max' 2-way flow of 1,060 vehicles per hour in the AM peak).

5.5.7 The modelling demonstrates that there is little 'through traffic' demand for the SLR for trips between the A46 and the A1. The majority of trips using the SLR are forecast to have origins and destinations close to the SLR (e.g. trips starting/ending in Farndon, Balderton, Land to the South of Newark and Land around Fernwood).

5.5.8 Comparing the forecast 2-way flows on the SLR during the AM peak hour with and without any Growth Scenario traffic demonstrates that the addition of development traffic growth results in maximum increases of 108%, 80% and 85% for Option tests 1, 2 and 3 respectively.

5.5.9 The modelling work therefore clearly demonstrates the need for the SLR to accommodate Growth Scenario traffic within Newark on Trent and suggests that a single carriageway will be sufficient to meet forecast traffic demands. However, it should be noted that the modelling work undertaken to date examines an assessment year of 2026 which is consistent with the end of the LDF plan period. Nottinghamshire County Council, in their capacity as highway authority, will require the SLR to be designed and constructed to meet the forecast traffic demands at a design year 15-years post completion of the SLR (i.e. completion of the entire length of the SLR between the A46 and the A1). Forecast flows on the SLR after 2026 may therefore be higher and could warrant provision of a dual carriageway.

5.5.10 HGV use of the SLR is not forecast to be significant. However, as mentioned in Section 4.2 the assessment has applied B1 'Business Park' trip rates which, whilst robust in terms of total trip generation, may significantly underestimate HGV activity if B2 and B8 development use-classes were to be considered (a B8 development use-class could generate approximately 40% fewer total vehicle trips but could generate almost 15 times more HGV movements than a B1 development use-class). Further sensitivity testing is therefore recommended if employment development comprising HGV intensive uses is proposed.

5.5.11 It should also be noted that the modelling undertaken to date is to advise the strategic District-wide Transport Study and applies employment development assumptions that are consistent with the findings of the 'East Midlands Northern Sub-Region Employment Land Study' dated March 2008.

5.5.12 As a result, the employment floor area that has been tested is less than the net employment floor area than is already allocated/committed within the town and further sensitivity testing may therefore be required, particularly with regard to HGV activity.

5.5.13 The 'Newark on Trent LDF Options Model Assessment Summary' report in **Appendix I** presents 4 key outputs to measure the relative performance of the urban highway network with and without Growth Scenario 4 traffic flows. These are; network statistics (total vehicle hours and distance travelled on the network), changes in local traffic flows, link saturation flows and junction performance. The last category is considered the most relevant for the purposes of this study since junction capacity is the main determinant of urban highway network operation. The relevant summary tables for this category have therefore been reproduced as **Table 36** and **Table 37**.

5.5.14 Performance of junctions is usually measured by reporting the Ratio of Flow to Capacity (RFC) values which are calculated by dividing the demand for each movement by the available capacity for that movement, to produce a degree of saturation in percentage terms. Typically for signalised junctions, any movement with an RFC value greater than 90% would be considered close to capacity and subsequent queuing may result. An RFC value greater than 100% suggests that the demand is greater than the capacity, or that the movement is over capacity.

5.5.15 VISUM, the transport modelling software used to develop the model, summarises the junction performance in terms of Level of Service (LoS). Junction performance is graded from A (very good) to F (very poor). This system allows the user to rapidly identify any problematic junctions. The definitions of the VISUM grading system are detailed in **Table 35** below.

Table 35 – Level of Service Grading System

LoS	Interpretation	RFC Value
A	Uncongested operations; all queues clear in a single cycle (if junction is signalised)	< 0.60
B	Very light congestion; an occasional approach phase is fully utilised	0.60 to 0.69
C	Light congestion; occasional backups on critical approaches	0.70 to 0.79
D	Significant congestion on critical approaches, but junction is functional. Cars required to wait through more than one cycle during short peaks. No long standing queues formed.	0.80 to 0.89
E	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements (yellow box). Traffic may block back to upstream junctions.	0.90 to 0.99
F	Total breakdown. Stop and go operation.	> 1.0

5.5.16 The LoS for key junctions in the 2026 AM and PM scenarios are summarised in **Table 36** on page 100 and **Table 37** on page 101. They include the worst-performing arms on each junction in each case. Sites 1 to 10 are the key junctions on the A46, the A1 and the Southern Link Road. Sites 11 to 25 are those with an LoS of D, E or F in at least one scenario.

Table 36 – 2026 AM Peak Urban Junction Performance Summary

Ref	Junction Name	Junction Type	RC	Opt 1	Opt 2	Opt 3	RC SLR	Opt 1 SLR	Opt 2 SLR	Opt 3 SLR
1	A46 / Farndon Road / SLR	Priority	F	F	F	F	F	F	F	F
2	A46 / A616 / A617	Priority	A	A	A	A	A	A	A	A
3	A46 / A1 -southern roundabout	Priority	A	A	A	A	A	A	A	A
4	A46 / A1 -northern roundabout	Priority	A	A	A	A	A	A	A	A
5	A1 / Beacon Hill Road	Priority	A	A	A	A	A	A	A	A
6	A1 / London Road	Priority	A	E	A	D	A	B	A	A
7	A1 / SLR	Priority	-	-	-	-	A	A	A	A
8	SLR / Hawton Road	Priority	-	-	-	-	A	A	A	A
9	SLR / Bowbridge Lane	Priority	-	-	-	-	A	A	A	A
10	SLR / Grange Lane	Priority	-	-	-	-	A	A	A	A
11	London Road / Main Street	Signalised	C	F	E	E	C	D	D	D
12	London Road / Bowbridge Road	Signalised	E	F	F	F	E	F	F	E
13	London Road / Portland Street	Signalised	E	F	F	F	E	F	F	F
14	Barnby Gate / Sherwood Avenue	Signalised	F	F	F	F	E	F	F	F
15	Great North Road level crossing	Signalised	C	D	D	D	C	D	D	D
16	Lincoln Road / Brunel Drive	Signalised	F	F	F	F	F	F	F	F
17	Barnby Road / Coddington Road	Priority	A	D	B	D	A	D	B	D
18	Castle Gate / Lombard Street	Priority	C	D	D	C	C	D	D	D
19	Bowbridge Road / Boundary Road	Priority	A	D	C	C	A	B	A	A
20	Bowbridge Road / Hawton Lane	Priority	B	D	C	C	B	C	B	B
21	A1 southbound offslip to B6326	Priority	C	C	E	D	C	C	D	C
	No. nodes with LOS D, E or F		**10**	**18**	**14**	**17**	**10**	**14**	**16**	**16**

Key to Table Headings:

RC = Reference Case – without SLR
Opt 1 = Development focused on sites to the south of Newark on Trent (predominantly the 'Land South of Newark' and Fernwood sites) – without SLR.
Opt 2 = development of 'infill' sites within central Newark on Trent followed by the 'Land South of Newark' and 'Land East of Newark' sites – without SLR
Opt 3 - development of 'infill' sites within central Newark on Trent followed by the Fernwood and 'Land East of Newark' sites – without SLR
RC SLR = Reference Case – with SLR
Opt 1 SLR = Development focused on sites to the south of Newark on Trent (predominantly the 'Land South of Newark' and Fernwood sites) – with SLR.
Opt 2 SLR = development of 'infill' sites within central Newark on Trent followed by the 'Land South of Newark' and 'Land East of Newark' sites – with SLR
Opt 3 SLR - development of 'infill' sites within central Newark on Trent followed by the Fernwood and 'Land East of Newark' sites – with SLR

Table 37 – 2026 PM Peak Urban Junction Performance Summary

Ref	Junction Name	Junction Type	RC	Opt 1	Opt 2	Opt 3	RC SLR	Opt 1 SLR	Opt 2 SLR	Opt 3 SLR
1	A46 / Farndon Road / SLR	Priority	F	F	F	F	F	F	F	F
2	A46 / A616 / A617	Priority	A	A	A	A	A	A	A	A
3	A46 / A1 -southern roundabout	Priority	A	A	A	A	A	A	A	A
4	A46 / A1 -northern roundabout	Priority	A	A	A	A	A	A	A	A
5	A1 / Beacon Hill Road	Priority	A	A	C	C	A	A	C	C
6	A1 / London Road	Priority	B	C	C	C	A	B	C	B
7	A1 / SLR	Priority	-	-	-	-	A	C	B	B
8	SLR / Hawton Road	Priority	-	-	-	-	A	B	B	B
9	SLR / Bowbridge Lane	Priority	-	-	-	-	A	A	A	A
10	SLR / Grange Lane	Priority	-	-	-	-	A	A	A	A
11	London Road / Main Street	Signalised	C	D	D	D	C	C	C	C
12	London Road / Bowbridge Road	Signalised	E	F	F	F	E	E	F	F
13	London Road / Portland Street	Signalised	F	F	F	F	F	F	F	F
14	Barnby Gate / Sherwood Avenue	Signalised	E	E	E	E	E	E	E	E
15	Great North Road level crossing	Signalised	D	D	D	D	D	D	D	D
16	Lincoln Road / Brunel Drive	Signalised	F	F	F	F	F	F	F	F
17	Barnby Road / Coddington Road	Priority	A	D	B	D	A	C	B	C
18	Castle Gate / Lombard Street	Priority	D	E	E	E	C	D	D	D
19	Bowbridge Road / Boundary Road	Priority	C	E	E	D	C	D	D	D
20	Bowbridge Road / Hawton Lane	Priority	B	F	D	D	C	D	C	C
21	A1 southbound offslip to B6326	Priority	A	F	C	E	A	E	B	D
22	Beacon Hill Road / Northan Road	Signalised	F	F	E	E	F	F	E	E
23	Lincoln Road / Northan Road	Signalised	E	F	D	D	E	F	D	D
24	Castle Gate / Stodman Street	Priority	F	F	F	F	F	F	F	F
25	Sleaford Road / Friary Road	Priority	C	E	E	D	C	E	D	E
26	Queen's Road / King's Road	Priority	B	D	E	D	B	D	E	E
	No. nodes with LOS D, E or F		**14**	**23**	**21**	**22**	**13**	**20**	**18**	**19**

Key to Table Headings:

RC = Reference Case – without SLR
Opt 1 = Development focused on sites to the south of Newark on Trent (predominantly the 'Land South of Newark' and Fernwood sites) – without SLR.
Opt 2 = development of 'infill' sites within central Newark on Trent followed by the 'Land South of Newark' and 'Land East of Newark' sites – without SLR
Opt 3 - development of 'infill' sites within central Newark on Trent followed by the Fernwood and 'Land East of Newark' sites – without SLR
RC SLR = Reference Case – with SLR
Opt 1 SLR = Development focused on sites to the south of Newark on Trent (predominantly the 'Land South of Newark' and Fernwood sites) – with SLR.
Opt 2 SLR = development of 'infill' sites within central Newark on Trent followed by the 'Land South of Newark' and 'Land East of Newark' sites – with SLR
Opt 3 SLR - development of 'infill' sites within central Newark on Trent followed by the Fernwood and 'Land East of Newark' sites – with SLR

5.5.17 As can be seen from **Table 36** and **Table 37** there are numerous junctions that fall into the worst congested categories of D, E and F in all tested development scenarios. In comparison to the Reference Case the addition of the development tests increases the number of congested junctions in all instances. The provision of the Southern Link Road helps to reduce

the number of congested junctions in all instances except for Option 2 AM. In the PM peak the provision of the SLR reduces the total number of congested junctions across the network by approximately 14% in all tests

5.5.18 The provision of the SLR therefore helps to relieve traffic flows and junction congestion within Newark on Trent caused by the addition of Growth Scenario traffic, regardless of where that development is located. However, it does not mitigate its impacts entirely and further junction (and possibly link) improvements will be required at multiple locations within the town.

5.5.19 Further detailed analysis will be required in order to identify the exact details of the junction improvements required. However, the modelling work undertaken so far has highlighted junctions on several key corridors through the town that, even with the provision of the SLR, will require some form of improvement in order to accommodate growth scenario traffic. These are summarised in **Table 38** as follows:

Table 38 – Summary of Urban Junctions likely to Require Improvement

Ref	Junction Name	Existing Junction Type
Farndon Road Corridor		
1	A46 / Farndon Road / SLR	Priority
London Road Corridor		
6	A1 / London Road	Priority
21	A1 Southbound off slip to B6326	Priority
11	London Road / Main Street	Signalised
12	London Road / Bowbridge Road	Signalised
13	London Road / Portland Street	Signalised
Barnby Road/Barnby Gate Corridor		
14	Barnby Gate / Sherwood Avenue	Signalised
17	Barnby Road / Coddington Road	Priority
Great North Road Corridor		
15	Great North Road level crossing	Signalised
Lincoln Road/North Gate/Castle Gate Corridor		
16	Lincoln Road / Brunel Drive	Signalised
23	Lincoln Road / Northern Road	Signalised
18	Castle Gate / Lombard Street	Priority
24	Castle Gate / Stodman Street	Priority
Bowbridge Road Corridor		
19	Bowbridge Road / Boundary Road	Priority
20	Bowbridge Road / Hawton Lane	Priority
Beacon Hill Road/Sleaford Road/Queen's Road Corridor		
22	Beacon Hill Road / Northern Road	Signalised
25	Sleaford Road / Friary Road	Priority
26	Queen's Road / King's Road	Priority

5.5.20 Whilst there may be some minor changes to the above list depending on which Growth Scenario is considered it is anticipated that the majority of the above junctions will require some form of improvement regardless of which Growth Scenario is progressed.

5.5.21 The modelling assessment also demonstrates that Option 2 'Central Sites - Balance on Land to South' results in the least overall impacts on the urban highway network (with or without the SLR), whilst Option 1 'Southern Sites' results in the greatest impacts (with or without the SLR). However, the differences between all of the option tests undertaken are very small.

5.5.22 The modelling work undertaken to date is strategic in nature and examines the impacts of Growth Scenario traffic on the urban highway network of Newark on Trent at a single assessment year of 2026. It does not examine impacts as a result of the development of specific sites in isolation (e.g. Land East of Newark, Fernwood, Land to the South of Newark etc), or any phased development that may occur on these sites.

5.5.23 It is therefore not possible to provide a direct comparison between these sites in terms of their individual traffic impacts, or the level of traffic demand that each site in isolation would generate on the SLR. Nor is it possible to identify a 'trigger threshold' of development floor area, or a future date when the SLR will be required.

5.5.24 However, the assessment undertaken so far demonstrates that there is only a very modest demand for the SLR if no future growth occurs but this demand increases significantly with the addition of Growth Scenario traffic.

5.5.25 The assessment also demonstrates that provision of the SLR would help to reduce traffic flows on already congested routes within Newark on Trent (e.g. London Road, Beacon Hill Road and Farndon Road) and would therefore benefit the town as a whole including sites such as 'Land East of Newark'.

5.5.26 The 'Land South of Newark' and 'Fernwood' sites are situated immediately adjacent to the line of the SLR and will therefore benefit from its provision, either by gaining direct site access from it, or by providing an alternative route for east-west traffic movements that would otherwise travel though the centre of Newark on Trent.

5.5.27 As a result it can be concluded that the provision of the SLR is required to help mitigate the impacts as a result of Growth Scenario traffic within Newark on Trent and its provision should therefore be developer funded.

Impacts on the Rural Highway Network

Table 39 – Critical Links – Scenario 4

Link Description	Percentage 'Stress'	
	Base + Committed	Scenario 4
A617 between Newark & C17	93%	130%
A6097 between A46(T) & A612	129%	135%
A6097 between A612 & B6386	107%	118%
A614 between A6097 & C1	-	93%
A614 between A617 & C13	-	108%
A614 between B6030 & A06075/A616	-	99%
A612 south of Southwell	-	96%

5.5.28 As can be seen from **Table 39** the Scenario 4 growth results in an additional 4 links approaching or exceeding capacity by 2026. This includes 3 links on the A614 between its junctions with the A6097 to the south of Farnsfield and the A616/A6075 Ollerton roundabout to the north, and the A612 Westgate south of Southwell.

Impacts on Bus Transport

5.5.29 Urban Concentrated Based Growth clusters the additional demands in fewer locations and from the 738 trips; 498 (68%) are generated within Newark and Balderton. This equates to approximately 15 additional buses in the AM peak hour to accommodate the total anticipated demand with 10 buses required to meet the additional demands in Newark on Trent during the AM peak hour. As for the previous scenarios developers will be required to fund new/improved bus services in order to meet the additional travel demands generated by new developments.

5.5.30 Increases across the rural areas of the District are relatively small with 80 trips in Ollerton and Broughton being the highest outside of Newark on Trent, these would be accommodated by existing services.

Impacts on Passenger Rail

5.5.31 The maximum additional demand for rail is 222 trips in the AM peak with 178 trips originating within Newark on Trent. This equates to approximately an additional 55 persons per train which if split between 5 carriages would be approximately 11 persons per carriage. This level of anticipated increased demand for rail travel should be accommodated on existing services and would be insufficient to itself justify any improvements to rail infrastructure or services.

Impacts on Cycling & Walking

5.5.32 The vast majority of the 1,658 cycling trips generated are focused within Newark on Trent (1,526), which has the most comprehensive existing cycle infrastructure. In this scenario there is very little increase in cycle activity forecast in the rural areas of the District and this would be accommodated by existing infrastructure.

5.5.33 As for the previous scenarios walking trips are focused within Newark on Trent with 1,727 trips forecast in the AM peak hour. Forecast walking trips in the rural settlements are highest at Ollerton & Boughton (173), Southwell (111), Rainworth (110) and Clipstone (101) the only other settlement seeing an increase is Bilsthorpe with 26 trips. These would be accommodated on existing infrastructure with suitable developer funded enhancements, as appropriate.

5.6 ALL SCENARIOS - COMPARISON

Impacts on the Rural Highway Network

Table 40 – Critical Links – All Scenarios

Link Description	Percentage 'Stress'				
	Base + Committed	Scenario 1	Scenario 2	Scenario 3	Scenario 4
A617 between Newark & C17	93%	149%	121%	135%	130%
A617 between C17 & A614	-	98%	-	-	-
A6097 between A46 & A612	129%	139%	133%	138%	135%
A6097 between A612 & B6386	107%	124%	118%	122%	118%
A614 between A6097 & C1	-	105%	102%	103%	93%
A614 between A617 & C13	-	121%	129%	121%	108%
A614 between C13 & B6034	-	93%	97%	93%	-
A614 between B6034 & C57	-	-	97%	-	-
A614 between B6030 & A06075/A616	-	98%	110%	100%	99%
B6030 to west of B6034 at Ollerton	-	-	135%	-	-
A6075 east of Ollerton Roundabout	-	-	93%	-	-
A612 south of Southwell	-	92%	-	95%	96%

5.6.1 **Table 40** reveals the critical links are very similar in all 4 growth scenarios. However, Scenario 2 results on the overall highest impact on the rural highway network with 10 of the listed links forecast to be close to, or over capacity at 2026 and Scenario 4 results in the lowest overall impact on the rural highway network, with 7 of the listed links forecast to be close to, or over capacity at 2026. This is as would be expected because Scenario 4 focuses the majority of growth within the urban area of Newark and Balderton and therefore results in the least impact on the rural highway network.

Impacts on Sustainable Transport Modes

5.6.2 **Table 41** below presents a summary of the impacts of each growth scenario on sustainable modes of transport (i.e. Rail, Bus, Cycling and Walking).

Table 41 – Comparison of Sustainable Transport Modes

Scenario	Maximum Increase in Passengers per Train Carriage[1]	Estimated Additional Buses Required to Meet Demand		Cycling – New Trips[3]		Walking – New Trips[3]	
		District[2]	Newark on Trent[2]	Newark on Trent	Rural Settlements	Newark on Trent	Rural Settlements
Scenario 1	10	16	7	1,061	25	1,200	98
Scenario 2	10	15	7	1,115	78	1,262	306
Scenario 3	11	15	9	1,306	35	1,478	137
Scenario 4	11	15	10	1,526	44	1,727	173

Notes:
1. Assumes trips split over 2 trains per hour at 2 stations, 5 carriages per train.
2. Assumes 50 persons per bus.
3. Maximum figures presented.

5.6.3 As can be seen from the Table there is essentially no difference between the 4 Growth Scenarios in terms of the estimated increase in rail use.

5.6.4 The total demand for buses is approximately the same for all Growth Scenarios, with Scenario 4 (Urban Concentration Based Growth) resulting in the highest demand in Newark on Trent by a small margin.

5.6.5 In practice, Growth Scenario 4, which concentrates most growth in Newark on Trent, offers the greatest 'critical mass' of bus patronage which would help to make any new bus services financially self supporting and therefore most viable in the long-term. On this basis Growth Scenario 4 could be considered more favourable by a small margin. Growth Scenarios 1 and 3 which result in the most dispersed growth present the greatest challenge to existing bus services to cater for the new demand.

5.6.6 There is little difference between all scenarios in terms of cycling and pedestrian trips, although as could be expected, Growth Scenario 4, which concentrates growth in Newark on Trent, results in the highest demand for both modes in the town, whereas Growth Scenario 1 (Dispersal) results in the lowest.

5.6.7 The implication of these figures is that significant developments must be provided with adequate facilities for cyclists, such as secure and covered cycle parking, changing facilities and internal access roads which give priority to cycles and pedestrians wherever possible. New infrastructure connections from developments onto the existing cycle network will be required,

including new controlled crossings at locations where major roads create barriers to cyclists and pedestrians.

5.6.8 It is suggested that in general the extensive existing cycling network and proposed LTP enhancements in Newark on Trent will be able to accommodate these fairly significant additional numbers of users. Some carriageway reallocation or shared surfacing may be required to give pedestrians and cyclists more priority on major routes around the town centre. However, the majority of the corridors into Newark on Trent and its environs already have excellent facilities for these users.

5.6.9 For pedestrians, facilities should be included to connect the developments to existing footways and where appropriate provide additional crossing facilities. Consideration of gradients for wheelchair users and pushchair users must be made. Personal security and street lighting is also of importance for pedestrian trips, as well as ensuring that footways are wide enough to accommodate the increased levels of usage, particularly at bus stops. Connections to public transport are essential concerns. At sites where there may be high levels of visitors, direction signing to bus and train interchanges may be appropriate in order to encourage walking to these locations ahead of the use of private car.

5.6.10 In general, cycling trips on the more rural links will be undertaken by more confident, commuter cyclists, whose commitment to carrying out these journeys is unlikely to be diminished by additional delays on these routes. On routes where there are off-carriageway cycling and walking facilities, increases in motorised traffic delay may actually have a limited impact upon encouraging more trips by foot and bicycle in a bid to make journey times more reliable.

6 Transport Infrastructure Requirements

Introduction

6.1.1 This study has been produced following discussions with Newark and Sherwood District Council, Nottinghamshire County Council and the Highways Agency. It is a strategic study intended to identify the cumulative transport implications of growth options within the District in order to advise strategic transport infrastructure requirements.

6.1.2 There is insufficient detail to comment on access issues or the individual transportation impacts of each site. Detailed Transport Assessments and Travel Plans will be required in support of planning applications for each development site (where appropriate) and these should identify specific site access arrangements, on-site transport infrastructure requirements and specific off-site transport measures/infrastructure in order to mitigate the forecast impacts of each development.

6.1.3 This study has identified likely infrastructure improvements that will be required in order to address the cumulative impacts of the 4 Growth Scenarios that have been assessed. Potential improvements have been described in outline only at this stage and more detailed assessments will be required in order to identify definitive improvement proposals.

6.1.4 Budget scheme costs have been identified in preliminary form and these are intended to give a **very approximate** 'order of cost'. All scheme proposals and costs presented in this report exclude any issues associated with land ownership/acquisition, environmental impacts, statutory procedures and detailed design, and are presented for information purposes only. As a result, no reliance in terms of preferred scheme selection should be placed on the cost estimates presented in this report.

6.1.5 Potential sources of funding have been identified as follows:

- Developer – funding provided in full by developers to address transport impacts as a result of development proposals.
- LTP – funding provided in full by the Local Transport Plan (LTP) budget to address existing transport issues on the County highway network.
- LTP/Developer – funding split between the Local Transport Plan (LTP) budget and developer(s) to address existing transport issues on the County highway network that will be exacerbated by development proposals.

- LTP/Central Gov' - funding split between the Local Transport Plan (LTP) budget and Central Government to investigate potential rail connection opportunities.
- HA/Developer - funding split between the Highways Agency (HA) and developer(s) to address existing transport issues on the Trunk Road network that will be exacerbated by development proposals.

6.1.6 Costs identified to be Nottinghamshire County Council (NCC), Highways Agency (HA) or Central Government funded, are subject to NCC, HA and Central Government approval. Future Regional Funding Allocations (RFA) and Local Transport Plan (LTP) funding levels are not guaranteed and any schemes put forward would need to be assessed and prioritised through the appropriate scheme programme process.

6.1.7 The current LTP plan period commits funding to 2010/11, beyond this date funding levels and priorities are unknown. Several possible improvement schemes are identified later in this section of the report for potential LDF funding. However, it should be noted that none of these are currently being safeguarded or committed through the LTP by the County Council. In the absence of LTP funding then the County Council has confirmed that developers will be expected to restore link and/or junction capacity to the state it would have been without a development proceeding (i.e. nil detriment).

6.1.8 Other possible funding sources (as discussed in Section 3 of this report) include:

- Nottinghamshire County Council Building Better Communities fund – for environmental and regeneration improvement schemes but often with an accessibility element involved.
- Sustrans Connect2 - Big Lottery Funding to create dedicated, high quality local walking and cycling networks.
- Sustrans Links to Schools fund – to connect schools and their communities to the National Cycle Network to provide the safe routes that young people need to cycle and walk to school.
- Landfill Communities Fund – used to provide environmental benefits and to improve the lives of communities living near landfill sites.
- Aggregates Levy Sustainability Fund - used to reduce the environmental impacts of the extraction of aggregates and to deliver benefits to areas subject to these impacts.
- Schools Travel Plan Capital Grants – used to deliver travel plan measures/initiatives and associated improvement works.

- Coalfields Regeneration Trust - would need to be via EMDA as it is a regional rather than local funding opportunity and would be geographically limited to former coalfield areas.
- Partnerships with Public Transport Operators and Local Employers, for example to introduce cycle parking near bus stops and employment areas.

6.1.9 Funding major transport infrastructure improvements is not the primary purpose of the sources listed above and any funding received is therefore likely to be limited to providing relatively small scale accessibility improvements as part of other projects (e.g. local enhancements to cycle and walking facilities as part of a school travel Plan etc). These funding sources have therefore not been considered a realistic method of delivering the strategic transport infrastructure improvements identified in this study.

Developer Contribution Methodology

6.1.10 It is expected that individual developers would fund any measures or infrastructure improvements required to mitigate the direct transport impacts of developments. This would include funding for items such as; Smarter Choices measures and initiatives, Travel Plans, on and off-site cycling and walking infrastructure, bus network/infrastructure enhancements and/or bespoke bus services, and any off-site highway infrastructure improvements required to mitigate traffic impacts.

6.1.11 In addition to addressing the direct transport implications of developments it is recommended that developers also provide financial contributions through S106 Agreements or planning tariffs towards the delivery of the strategic transportation improvements identified for developer funding in **Table 43** (page 136). S106 payments would be made to Newark and Sherwood District Council or Nottinghamshire County Council and this would be agreed at the relevant time. This money would then be used to implement the improvements identified in **Table 43** which would be updated as additional development proposals arise in the future.

6.1.12 In terms of the apportionment of funding between developments the total value of the identified improvements would be split based on the size of the development proposal (i.e. on a pro-rata basis in accordance with employment floor area and residential units).

6.1.13 The aim of this methodology is to provide an equitable, transparent and fair system to enable developers to provide funding for the identified strategic infrastructure improvements. The list of improvements would first need to be worked-up in more detail, accurate construction costs identified and a delivery programme identified. It is also proposed that this list would become

a 'live document' which would be reviewed on a regular basis to take into account future changes.

6.1.14 It is proposed that this contribution framework would be used for any future developments in the District. This approach to calculating contributions is increasingly being used by a number of local authorities (for example Milton Keynes Council and Hinckley & Bosworth Borough Council) and is considered to be consistent with the Community Infrastructure Levy proposed in the recent Planning Reform Bill.

6.1.15 However, further detailed consideration will need to be given to detailed issues such as; prioritising scheme delivery, balancing the requirement for strategic improvements against development requirements, when financial contributions are required from developers, how any funding shortfalls would be met etc.

Improvement Programme

6.1.16 A very approximate estimate of scheme delivery priority has been made by determining 'spare' traffic capacity on highway corridors and equating this to an equivalent number of residential dwellings (assuming all vehicle trips to/from those dwellings would use that corridor). A likely delivery year has then been estimated by dividing the estimated number of dwellings by the annual residential build-out rate that would be required to achieve the Growth Scenario targets by 2026. This is a very crude methodology and is only intended as a rough guide.

6.1.17 Delivery priority has then been grouped into the following categories:

- 2009 – 2015 or 'Short Term' - improvements required in the near future to address existing capacity/safety issues, or to permit future growth to proceed.
- 2015 – 2020 or 'Medium Term' – improvements required to meet future traffic demands associated with residential/employment growth.
- 2020 – 2026 or 'Long Term' – improvements possibly required to meet future traffic demands associated with residential/employment growth.

6.1.18 Details of the estimated scheme delivery priorities can be seen in **Table 43** on page 136 at the end of this section.

Demand Management

6.1.19 From a traffic and highways perspective it is favourable to seek to reduce traffic impacts by managing travel demand thereby reducing/removing the requirement for highway improvement works.

6.1.20 Ideally residential and employment uses should therefore be complementary in order to provide local employment opportunities and reduce the need to travel, especially by private motor vehicle. The methodology that has been used to identify the proposed employment growth scenarios therefore seeks to complement the residential growth scenarios in terms of employment floor area and site locations (see Section 4.2).

6.1.21 Demand for travel by private car is also managed through the application of maximum car parking standards. By limiting car parking provision fewer trips are generated. However, there is a careful balance to be struck between limiting parking provision and meeting reasonable demand in order to prevent on-street parking in inappropriate locations.

6.1.22 Policy T25 of the Newark and Sherwood Local Plan states that "Planning permission will not be granted for development unless appropriate vehicle parking and servicing arrangements are provided". Standards for the provision of car parking and servicing for new developments are set out in the 'Parking Provision for New Developments' Supplementary Planning Guidance, May 2004 published by Nottinghamshire County Council in conjunction with the District Council and these standards should be applied to all new development proposals.

Modal Shift

6.1.23 Demand for car trips can also be reduced by encouraging use of sustainable transport modes (i.e. walking, cycling, bus etc) and in accordance with PPG13, Travel Plans will be required in support of planning applications for all major developments. It is expected that the Travel Plans developed and implemented for each site will complement the strategic infrastructure improvements detailed in this report in order to increase use of modes of transport other than the car. Travel Plans should be prepared in accordance with the guidance contained within the Department for Transport 'Good Practice Guidelines' documents; "The Essential Guide to Travel Planning", March 2008, "Making Residential Travel Plans Work", September 2005, and "Delivering Travel Plans Through the Planning Process", April 2009.

Smarter Choices

6.1.24 The publication of the "Smarter Choices – Changing the Way We Travel" report by the Department for Transport in July 2004 reinforced the stature of 'soft factors' within the overall context of transport planning. These 'soft factors' encompass workplace and residential plans, as well as other initiatives such as car sharing schemes, car clubs, personalised journey planning, tele-working, tele-conferencing, information and marketing, and home shopping.

6.1.25 Outlined in the following paragraphs is a menu of measures which could be expected to be included within the Travel Plans developed for each site. It is not meant to be an exhaustive list (since at this stage the end users on these sites are not known and hence exact measures and costs cannot be defined) but is intended to act as a guide as to the types of measures that could be expected to be included in Travel Plans.

Travel Plans for Employment Uses

6.1.26 Although primarily aimed at staff, it will be expected that the Travel Plans developed will also cover visitors and deliveries to each employment site. Possible measures to include within a employment-use development Travel Plan include:

- Appointment of a Travel Plan coordinator to oversee the implementation, monitoring and evaluation of the Travel Plan - initiatives that the Travel Plan coordinator would oversee include:
    - Setting up a car sharing database.
    - Implement car-sharing initiatives for staff including dedicated parking bays.
    - Provide Public Transport timetable information in public areas/restrooms/changing rooms.
    - Negotiations with public transport operators to adjust timetables to fit shift times and discounted fares.
    - Personalised journey planning.
    - Staff salary incentives for adoption of 'green' travel behaviour.
    - Provide loans for season tickets, cycle purchase etc.
    - Use of local suppliers and rationalisation of delivery movements.

- Set up cycle clubs, secure cycle parking, storage lockers, shower/changing facilities, negotiate discounts with local cycle shops.
- Design and maintenance of walking and cycling routes within the site to ensure good links to bus stops, cycle routes and adjacent footways.

Travel Plans for Residential Uses

6.1.27 Possible measures to include within a residential Travel Plan include:

- Appointment of a Travel Plan coordinator to oversee the implementation, monitoring and evaluation of the Travel Plan - initiatives that the Travel Plan coordinator would oversee include:
  - Preparation and distribution of travel information packs to residents including walking, cycling and public transport maps.
  - Cycle parking provided within residences.
  - Low cost cycle purchase initiatives.
  - Design and maintenance of walking and cycling routes within the site to ensure good links to bus stops, cycle routes and adjacent footways.
  - Encourage home working through provision of Wi-Fi coverage, Broadband etc.
  - Personalised journey planning.

Modal Share Targets

6.1.28 It is expected that Travel Plans will set out mode share targets against which the effectiveness of the Travel Plans will be measured and enable corrective actions to be identified when targets are not met. Targets for each site will be different depending on the particular end-user and the travel plan measures identified.

6.1.29 Existing modal splits for the District derived from 2001 Census data are summarised in **Table 1** (page 8) and as discussed in Section 2 the District already exhibits a higher proportion of trips on foot or cycle than the County, Region and England and Wales as a whole. However, it has a lower proportion of public transport use and a slightly higher proportion of car use (paragraphs 2.1.5 to 2.1.8 refer).

6.1.30 Achieving modal shift away from the car is most likely to require an increase in use of public transport as the level of walking and cycling in the District is already relatively high

(predominantly in Newark on Trent) and there is likely to be limited opportunity to further encourage walking and cycling in the rural areas of the District where longer journey distances are likely to discourage significant additional use of these modes.

6.1.31 It should be reasonable to assume that, as a minimum, car use could be reduced from the existing level (68.20%) to the same level as the County average (64.28%) and a 4% increase in use of public transport within the District would achieve this if walking and cycling remained constant at 14.53% (taking public transport use to approximately 9%, which is still below the County average of 12.33%).

6.1.32 Estimated total vehicle trips are summarised in **Table 22** (page 78) and 4% of the maximum 2-way trips in the AM peak hour (12,058 in Scenario 1) would equate to a reduction of 482 vehicle trips (12,058 to 11,576 vehicle trips). This, whilst helpful, would not materially reduce the impacts forecast on the rural and urban highway networks so this should therefore be treated as a minimum target, with more stringent targets applied to individual travel plans, where appropriate.

On-Going Travel Plan Monitoring

6.1.33 It is essential that the Travel Plans identify a long term plan for continually monitoring and reviewing the Travel Plan and taking corrective actions where necessary and agreeing these with both Nottinghamshire County Council and, where appropriate, the Highways Agency.

Travel Plan Costs

6.1.34 It is assumed that costs associated with developing, implementing, managing and monitoring Travel Plans will be met by developers.

New/Improved Infrastructure

6.1.35 This section of the report outlines potential infrastructure improvements that could be implemented to provide additional traffic capacity at locations that have been identified to be operating close to, or over capacity with the additional traffic as a result of the growth scenarios. Improvements are summarised in **Table 43** on page 136, at the end of this section.

6.2 HIGHWAYS

6.2.1 Where possible/required new highway infrastructure improvements should seek to incorporate bus priority measures and enhanced cycle/pedestrian routes and crossing facilities.

6.2.2 **Table 40** on page 105 summarises the rural links that are forecast to be operating close to, or above capacity in 2026 with the addition of Growth Scenario traffic and **Table 38** on page 102 summarises the urban junctions within Newark on Trent that are likely to require some form of improvement for all Growth Scenarios.

6.2.3 The following paragraphs describe possible highway infrastructure improvements that could be implemented to provide additional traffic capacity on these links and at the key junctions along these routes.

A617 – Newark to C17 (A617 Kelham Bypass)

6.2.4 The first location is the A617 between the A46 at Newark on Trent and its junction with the C17 to the west of Averham. In all Growth Scenarios peak stress levels exceeding 100% are forecast on this section of the A617 (peak stress level of 149% in Growth Scenario 1) and it is recommended that link capacity improvements would be required, probably in the form of a revised wide-single or dual carriageway aligned to the south of Kelham, north of Averham with a new bridge crossing the River Trent.

6.2.5 A scheme to provide a bypass of Kelham was mentioned in the North Nottinghamshire Local Transport Plan 2006/07 – 2010/11 for possible inclusion in LTP3 (2011 onwards). An indicative scheme cost of £15 million was identified. However, NCC has subsequently confirmed that following preliminary discussions with the Environment Agency it is considered that a new bridge across the flood plain of the River Trent south of Kelham would result in an unacceptable increase in flood risk and flood severity to adjacent properties. As a result NCC would not be able to support the original scheme.

6.2.6 Therefore further work would need to be undertaken to determine whether the bypass scheme design could be modified to reduce/mitigate its anticipated impact in terms of flooding. It is therefore possible that with suitable financial contributions from developers a revised scheme could be brought forward for implementation.

6.2.7 Such an improvement would also offer the potential to improve east-west pedestrian/cyclist/equestrian movements across the River Trent at this location by either

incorporating suitable provision for these modes into the design of the new bridge, or by removing sufficient vehicle activity from the existing Kelham Bridge as to make this a safer crossing opportunity.

A617 – Between C17 & A614

6.2.8 In Growth Scenario 1 a peak stress level of 98% is forecast on this section of the A617. In all other scenarios stress levels of less than 90% are forecast. As a result link improvements are unlikely to be required.

A6097 between A46 & A612

6.2.9 The A6097 Gunthorpe to A612 is single carriageway between Gunthorpe Bridge (over the River Trent) and a point approximately 500m south east of its junction with the A612 at Lowdham where it becomes dual carriageway on the approach to the A6097/A612 roundabout junction. In all scenarios stress levels exceeding 100% are forecast on this section of the A6097 as it passes through Gunthorpe, with peak stress levels of 139% in Growth Scenario 1.

6.2.10 The potential for significant on-line carriageway widening on this section of the A6097 is constrained by a combination of the single carriageway Gunthorpe Bridge and existing frontage development in Gunthorpe village.

6.2.11 Providing a significant improvement to the capacity of this link would therefore be likely to require an off-line solution with the provision of a new bridge over the River Trent and a bypass to the south west of Gunthorpe. Such an option is likely to be of the same order of cost as the indicative £15 million identified for the A617 Kelham Bypass.

6.2.12 There are no current proposals for a bypass at this location therefore such a scheme would probably need to be developer funded. Alternative, less expensive solutions could therefore first be examined which could include measures such as:

- Extending the existing dual carriageway section south towards Gunthorpe.
- Localised carriageway widening through Gunthorpe, where possible.
- Junction improvements to prioritise major road flows (i.e. possible introduction of signal control on side-road junctions etc).
- Provision of bus lay-bys to minimise disruption to major road flows.
- Banning turning movements, where feasible.

6.2.13 Capacity improvements are also likely to be required at the A6097/A612 roundabout junction in order to accommodate the anticipated additional traffic demands. This could include revising the junction layout to provide an at-grade signal-controlled roundabout or cross-roads junction. Approximate costs to provide such an improvement are likely to be in the region of £3 million, similar to the estimated cost of the Ollerton Roundabout junction improvement scheme recently proposed by Nottinghamshire County Council.

6.2.14 The junction of the A6097/Trentside at Gunthorpe has also been identified as an accident problem site with 4 recorded personal injury accidents during 2008. Any capacity improvements to this section of the A6097 should therefore also seek to address this existing highway safety issue.

A6097 between A612 & B6386

6.2.15 To the north of its junction with the A612 the A6097 is dual carriageway for approximately 1.2km before returning to single carriageway at the edge of the built-up area of Lowdham. The A6097 remains single carriageway from this point north to its roundabout junction with the B6386.

6.2.16 In all scenarios stress levels exceeding 100% are forecast on this section of the A6097 as it passes between Lowdham and the B6386, with peak stress levels of 124% in Scenario 1. This section of the A6097 passes through predominantly rural land so it may be feasible to provide on-line widening to dual carriageway standard. However, this section is approximately 5.7 km long and to widen this length of single carriageway road to dual carriageway standard could cost in the region of £6 million assuming a notional on-line carriageway widening cost of £1,000 per linear metre (assumes on-line widening to dual 2-lane carriageway, excludes; significant earthworks, highway structures and third-party land costs).

6.2.17 Alternative, less expensive solutions could therefore first be examined which could include similar measures to those listed for the Gunthorpe to A612 section of the A6096.

A614 between A6097 & C1 Mansfield Road

6.2.18 The A614 between its junction with the A6097 and the C1 Mansfield Road at the 'White Post' Roundabout is a single carriageway highway. In scenarios 1, 2, and 3 stress levels exceeding 100% are forecast on this section of the A614 with peak stress levels of 105% in Scenario 1.

6.2.19 This section of the A614 is therefore forecast to just exceed its theoretical link capacity in 3 Growth Scenarios and journey times are likely to become less reliable as it approaches 100% capacity. In addition, there are known capacity issues at the A614/Mansfield Road 'White Post' roundabout junction, so some form of junction improvement is likely to be required at this location in order to accommodate the anticipated additional traffic demands.

6.2.20 The existing 'White Post' roundabout is relatively small in diameter and is constrained on all quadrants by existing frontage development. In traffic capacity terms the optimum improvement would be a grade-separated junction, however this could require considerable third-party land acquisition and possibly property demolition and is therefore unlikely to be a feasible solution.

6.2.21 Alternative improvement solutions could include revising the junction layout to provide an at-grade signal-controlled roundabout or cross-roads junction. Approximate costs to provide such an improvement are likely to be in the region of £3 million, similar to the estimated cost of the Ollerton Roundabout junction improvement scheme recently proposed by Nottinghamshire County Council.

A614 between A617 & Ollerton Roundabout

6.2.22 The A614 between its junctions with the A617 and the A616/A6075 Ollerton Roundabout is a single carriageway highway with the forecast peak stress levels as follows.

Table 42 – A614 Between A617 & Ollerton Roundabout % Stress

Link Description	Percentage 'Stress'				
	Base + Committed	Scenario 1	Scenario 2	Scenario 3	Scenario 4
A614 between A617 & C13	-	121%	129%	121%	108%
A614 between C13 & B6034	-	93%	97%	93%	-
A614 between B6034 & C57	-	-	97%	-	-
A614 between B6030 & A06075/A616	-	98%	110%	100%	99%

6.2.23 The section of the A614 between the A617 and the C13/Deerdale Lane at Eakring passes through predominantly rural land so it may be feasible to provide on-line widening to dual carriageway standard. However, there is a constraint to widening in the form of a railway bridge over the A614 just to the north of its junction with Mickledale Lane at Bilsthorpe. This section of the A614 is also approximately 3.6 km long and to widen this length of single carriageway road to dual carriageway standard could cost in the region of £3.6 million assuming a notional on-line carriageway widening cost of £1,000 per linear metre (assumes

on-line widening to dual 2-lane carriageway, excludes; modifications to the railway bridge, significant earthworks, highway structures and third-party land costs).

6.2.24 Capacity improvements may also be required at the A614/A617 roundabout junction in order to accommodate the anticipated additional traffic demands. This could include revising the junction layout to provide an at-grade signal-controlled roundabout or cross-roads junction. Approximate costs to provide such an improvement are likely to be in the region of £3 million, similar to the estimated cost of the Ollerton Roundabout junction improvement scheme recently proposed by Nottinghamshire County Council.

6.2.25 The section of the A614 between the B6030 and Ollerton Roundabout is also predominantly rural in nature and whilst shorter at approximately 1.6 km in length also has constraints to widening in the form of a railway bridge over the A614 approximately half way between the B6030 junction and Ollerton Roundabout. There is also frontage development on both sides of the A614 on the immediate approach to the Ollerton roundabout that would further complicate a carriageway widening scheme.

6.2.26 To widen this length of single carriageway road to dual carriageway standard could cost in the region of £1.6 million (excluding any works required to the railway bridge, or third-party land issues) assuming a notional widening cost of £1,000 per linear metre (assumes on-line widening to dual 2-lane carriageway, excludes; modifications to the railway bridge, significant earthworks, highway structures and third-party land costs).

6.2.27 Alternative, less expensive solutions could therefore first be examined which could include similar measures to those listed for the Gunthorpe to A612 section of the A6096.

6.2.28 Capacity improvements may also be required at the A614/Mickledale Lane priority junction at Bilsthorpe and at the A614/C13 Deerdale Lane priority junction at Eakring in order to accommodate the anticipated additional traffic demands. This could include revising the junction layouts to provide signal-control. Approximate costs to provide such improvements are likely to be in the region of £0.5 million per junction.

B6030 to west of B6034 at Ollerton

6.2.29 The B6030 to the west of the B6034 at Ollerton is a single carriageway highway with forecast peak stress levels of 135% in Growth Scenario 2 between its junction with the B6034 and Clipstone to the west. The majority of this section of the B6030 is predominantly rural in nature so it may be feasible to provide on-line widening to dual carriageway standard,

although there are constraints in the form of a railway bridge immediately to the east of Old Clipstone and the built-up areas of Old Clipstone and New Clipstone that the road passes through. This section of the B6030 is approximately 7 km long (measured to its junction with Crown Farm Way in Clipstone) and to widen this length of single carriageway road to dual carriageway standard could cost in the region of £7 million assuming a notional on-line carriageway widening cost of £1,000 per linear metre (assumes on-line widening to dual 2-lane carriageway, excludes; modifications to the railway bridge, significant earthworks, highway structures and third-party land costs).

6.2.30 Capacity improvements may also be required at the existing signal controlled junction of the B6030/ Crown Farm Way in Clipstone in order to accommodate the anticipated additional traffic demands of Growth Scenario 2. This could include revising the junction layout to provide additional lane capacity. Approximate costs to provide such improvements are likely to be in the region of £0.5 million.

A616 East of Ollerton Roundabout

6.2.31 The A616 to the east of Ollerton Roundabout is a single carriageway highway with forecast peak stress levels of 93% in Growth Scenario 2 between the Ollerton Roundabout and its roundabout junction with the A6075 to the east. This section of the A616 is not therefore forecast to exceed its theoretical link capacity however journey times are likely to become less reliable as it approaches 100% capacity.

6.2.32 This section of the A616 is approximately 600m long and passes through the edge of the urban area of Ollerton with frontage development on both sides of the carriageway towards its eastern end. Widening to dual carriageway standard is therefore unlikely to be appropriate given the semi-urban nature and could be difficult to achieve given the constraints that adjacent residential development would impose.

6.2.33 There are known capacity issues at the Ollerton Roundabout and as discussed in Section 3 of this report Nottinghamshire County Council had previously planned junction improvement scheme at this location. However, the additional traffic that could be generated through this junction as a result of the Growth Scenarios may require further, more comprehensive junction improvement works which should be considered in detail as and when development proposals are progressed through the planning application process.

6.2.34 In addition, capacity improvements may also be required at the A616/A6075 roundabout junction in order to accommodate the anticipated additional traffic demands. Likely improvements could include minor revisions to the geometry of the existing roundabout to provide additional capacity, or providing signal control at the roundabout. Approximate costs to provide such improvements are likely to be in the region of £0.5 million.

A612 Westgate South of Southwell

6.2.35 This section of the A612 (between Church Gate and Nottingham Road) forms the key north-south route through Southwell and is approximately 365m long. It is located immediately to the south of the centre of Southwell Town and is an urban single carriageway with continuous frontage development along both sides (including Southwell Minster).

6.2.36 This section of Westgate has forecast peak stress levels of 96% with Growth Scenario 4 traffic flows and is not therefore forecast to exceed its theoretical link capacity. However journey times are likely to become less reliable as it approaches 100% capacity.

6.2.37 Widening to dual carriageway standard would not be appropriate given the sensitive urban nature of Westgate and alternative solutions would need to be found to address potential traffic capacity issues. These could include:

- Capacity improvements to the A612 Church Gate/Westgate/King Street junction.
- Review of on-street parking controls.
- Provision of bus lay-bys to minimise disruption to major road flows (where feasible).

6.2.38 Alternatively, Nottinghamshire County Council has confirmed that a bypass of Southwell is being considered and it may be that cumulative development impacts could warrant a contribution towards, or funding of, the provision of the bypass instead of improvements to Westgate.

6.2.39 Indicative costs for implementing the types of improvements mentioned above would be in the region of £0.5m. This section of the A612 is not forecast to operate close to capacity without the addition of traffic due to growth within the District (62%). However, Nottinghamshire County Council has identified this section of the A612 as a 'bottle neck' with existing delays particularly during peak periods.

Urban Network - Newark on Trent

6.2.40 The modelling work has identified numerous locations on the urban highway network that will experience capacity issues with the addition of Growth Scenario traffic. These locations are summarised in **Table 38** on page 102.

6.2.41 Without further detailed assessment it's not possible to identify specific improvements for these urban junctions, although these would most likely take the form of localised carriageway widening to provide additional lane capacity, introduction of signal control at existing priority junctions, modifications to existing signal controls to provide greater operational traffic capacity (e.g. introduction of SCOOT, MOVA etc) or by linking the operation of adjacent signal junctions to achieve network capacity benefits on key corridors. The details and costs of such improvements will need to be identified as part of a subsequent study or as part of the Transport Assessments submitted in support of individual developments as part of the planning application process.

6.2.42 The modelling work has also identified the requirement for highway improvements at several key locations on the edge of the urban area and these are discussed in the following paragraphs.

Southern Link Road

6.2.43 The VISUM modelling work has demonstrated that the provision of a Southern Link Road is required to; meet the demands for east-west traffic movements generated by Growth Scenario traffic, to help to mitigate the cumulative impacts of Growth Scenario traffic within Newark on Trent and to provide access for Land to the South of Newark. The provision of a Southern Link Road is therefore considered essential to allow future growth to occur within Newark on Trent and should therefore be developer funded.

A46/A617/A616/B6326 and A1/A46/A17 roundabouts

6.2.44 The provision of a Southern Link Road effectively completes a 'ring road' around Newark on Trent and although the VISUM modelling didn't identify capacity problems at the A46(T)/A617/A616/B6326 'Cattle Market' roundabout a study undertaken by AMScott on behalf of the HA in April 2006 identified that this junction was already approaching capacity and that traffic queuing back from the adjacent level crossing on the B6326 sometimes also contributes to this congestion (the VISUM modelling did identify capacity issues at the level crossing). The

study concluded that the roundabout will be over capacity by 2010 and recommended that an improvement scheme should be developed and implemented before then.

6.2.45 This junction has also been identified as an accident problem site with 28 reported injury accidents in the last 3 years (5 during 2008). Any improvement proposals at the junction should therefore also seek to address existing safety issues.

6.2.46 The optimum solution for the Cattle Market roundabout would be to provide grade-separation. However, this would probably be the most expensive solution and at-grade solutions may be more appropriate and less expensive (e.g. reconfiguring the roundabout for signal control). A major scheme to reconfigure the roundabout would be likely to cost in the region of £2million to £4million.

6.2.47 The A1/A46/A17 junction is already grade separated with the A1 passing beneath the A46. However, the A1/A17 'Winthorpe' roundabout junction has been identified as an accident problem site with 11 reported injury accidents in the last 3 years (4 during 2008). Improvements are therefore likely to be required at the junction to address existing safety issues before additional traffic as a result of Growth Scenarios can be accommodated.

6.2.48 The A1/A46 'Brownhills' roundabout junction has also been identified as an accident problem site with 13 reported injury accidents in the last 3 years (5 during 2008). Improvements are also therefore likely to be required at this junction to address existing safety issues before additional traffic as a result of Growth Scenarios can be accommodated.

6.2.49 Feasible improvements are likely to involve reconfiguring the roundabouts for signal control and this is likely to cost in the region of £2million to £4million per roundabout.

A1/B6326 London Road Roundabout

6.2.50 Nottinghamshire County Council has identified the A1/B6326 London Road Roundabout at Balderton as experiencing existing peak period traffic congestion problems (also identified in the VISUM modelling). As this is on one of the key routes to/from the centre of Newark on Trent from the A1(T) some form of traffic capacity improvement will be required at this location.

6.2.51 Feasible improvements are likely to involve reconfiguring the roundabout for signal control and this is likely to cost in the region of £2million to £3million.

A46 Newark Bypass

6.2.52 Following the completion of the A46 Newark to Widmerpool Improvement scheme the Newark Bypass will be the only section of single carriageway on the A46(T) between Lincoln and the M1 at Leicester. A study undertaken by AMScott on behalf of the HA in April 2006 identified that the single carriageway section of the A46(T) Newark Bypass between Farndon Road roundabout to the south of Newark-on-Trent and the A1(T) roundabout to the north of Newark-on-Trent is likely to be close to, or over capacity by 2010.

6.2.53 The bypass is a wide single carriageway construction and is elevated on high embankments over much of its length to avoid adjacent floodplains. The bypass also crosses numerous structures including two bridges over the River Trent, three railway bridges and two road bridges. Widening the bypass to dual carriageway standard is therefore likely to be prohibitively expensive due to the number of structures involved. Any improvements are therefore likely to be based on making the best possible use of the existing carriageway width.

6.2.54 The VISUM modelling has identified a requirement for capacity improvements at the A46 Farndon Roundabout in all modelled scenarios (with/without Growth Scenario traffic). However, this is as a result of the existing roundabout geometry being modelled with the additional traffic flows as a result of the A46 Newark to Widmerpool improvement scheme. The existing roundabout will be improved as part of the A46 scheme and will be modified again if the Southern Link Road is built to tie into this junction. As a result the capacity of this roundabout will be improved either as part of the A46 Newark to Widmerpool scheme, and/or as part of the delivery of the Southern Link Road.

6.3 BUS TRANSPORT

New/Improved Infrastructure

6.3.1 Improvements to bus services may take several forms. In most cases the extension of an existing route or increase in frequency of existing services will be sufficient to improve facilities. In other instances the addition of a new route to supplement the existing network may be required. It is recommended that improvements for each development site are formulated separately, but with an overview, so that where it might be possible to coordinate improvements to more than one site, economies of scale are not missed.

6.3.2 The larger developments will be able to justify and support the extension of existing bus facilities or the provision of new bespoke services. The exact requirements will vary from site

to site, but for each location a range of options can be prepared. Some examples of specific sites where some level of new/improved public transport provision could be provided are:

6.3.3 *Land South of Newark* – This site is just beyond the current boundary of bus services in Newark on Trent, but could be serviced with additional facilities at relatively low cost, by the extension of an existing service beyond its current terminus. Currently a low-frequency rural supported service runs through part of the site but this is likely to be inadequate given the long-term development proposals.

6.3.4 *Fernwood Site* – Currently an hourly dedicated supported service links this site to Newark on Trent town centre. Additional bus frequency would be easy to provide, by a simple commitment of additional resources, albeit at additional cost.

6.3.5 *Northern Road* – Site is at the edge of Newark on Trent town and not currently served by bus services. Because of its proximity to the town centre, using just the minimum resource (one vehicle and driver), a limited service could be provided to connect this site to the town centre and rail stations at reasonable cost.

6.3.6 *Newark & Nottinghamshire Showground* – An infrequent service passes close by the site, although the A1 and A46 provide major barriers to accessing this site from Newark on Trent at present. Providing bus services specifically for the development site looks likely to be expensive in terms of the resources required.

6.3.7 *Newark Cattle Market and NCC Depot* – this site is within walking distance of Newark on Trent town centre and is therefore well-connected into the public transport network.

6.3.8 *Rufford Colliery* – this site is only a short distance from good bus service provision in Rainworth village. By extending or re-routing existing services, links to and from the Mansfield area could be provided at reasonable cost.

6.3.9 *Bilsthorpe Colliery* – Given the relatively rural nature of Bilsthorpe's location it is reasonably well-served by bus services and part of the Colliery site is within 400 metres of existing bus stops. However, the main services provided to Bilsthorpe link the village to Rainworth and settlements outside of Newark and Sherwood District. Enhancing or supplementing these services is likely to be relatively expensive owing to the resource commitment necessary.

6.3.10 *Clipstone Colliery* – Like Bilsthorpe, Clipstone is well-connected by public transport. The majority of the Clipstone Colliery site is within 400 metres of existing bus services with the

remainder within 800 metres. The main bus services link the village to places outside and to the west of Newark and Sherwood District. However, given that Mansfield is a major residential and commercial area, this is a positive attribute. Any improvements made to these services would additionally benefit the other communities located along the line of route.

6.3.11 *Boughton Industrial Estate* – Bus services to Boughton form part of a key corridor of routes radiating from Mansfield in a north-easterly direction to Ollerton and the villages of Walesby and Kirton. As with Clipstone above, these bus services link to places outside of the District, but this should be viewed as a positive attribute.

6.3.12 In addition to new/improved bus services there will also be a requirement for new/improved supporting infrastructure in the form of additional bus stops, shelters, seating etc. Further enhancements such as real-time passenger information systems should also be explored as these offer good potential to further increase bus patronage.

6.3.13 Consideration should also be given to bus priority measures, where appropriate, in order to improve bus journey times and journey time reliability.

Delivery Timescale

6.3.14 Unlike rail, where improvements have long implementation timescales, improvements to bus services can usually be introduced with relatively short notice.

6.3.15 Consultation with existing bus service providers is always recommended to test the commercial viability of (and therefore reduce the subsidy required for) any potential new or improved services.

6.3.16 Complementary infrastructure improvements should also be considered as and when development sites are progressed and more accurate estimates of bus passenger demands, likely routes and infrastructure requirements can be determined.

6.3.17 With regard to timing it is essential to implement new and improved bus services and infrastructure very early in the life of a development, ideally before any units on the site are occupied, so that facilities are available and operational for new residents and employees 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.

6.3.18 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 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 in order to encourage good, sustainable travel behaviour.

6.3.19 Improvements to bus networks/infrastructure should therefore be timed to coincide with developments in order to meet forecast demands and have therefore been prioritised as 'medium term'.

Indicative Costs

6.3.20 The cost of providing additional resources will be site specific 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.

6.3.21 However, as a general 'rule of thumb' a new bus service with a single vehicle costs in the order of £300 per day to operate, or approximately £100,000 per vehicle per annum for a 7-day service.

6.3.22 Generally speaking improvements are funded to a specified level for specific time periods and are not therefore "open-ended" (usually secured via a Section 106 Agreement). A worthwhile option to pursue is the implementation of improvements funded by "seed corn" money where the commercial operator or local authority will take over the risk attached to providing improvements to bus services after a designated period of time.

6.4 PASSENGER RAIL

New/Improved Infrastructure

6.4.1 Rail Operators and Government are already engaged in a programme to increase capacity on rail services in the UK by the addition of 1,000 extra carriages to lengthen existing trains.

6.4.2 As detailed in **Table 25** (page 80) the demand forecasts for rail as a result of growth within the District are very low (based on existing modal splits). The highest forecast outbound person trips generated during the morning peak period by rail is 154 (Growth Scenario 4). Given the total number of outbound trips at 10,778; this is insignificant, and would not, on its own justify any additional investment in rail infrastructure.

6.4.3 Typically a High Speed Train (HST) set consisting of 8 carriages will have a seating capacity of 550. A class 158 train set as typically used by East Midlands Trains on the Lincoln-Newark-Nottingham-Leicester service has a seating capacity of 276.

6.4.4 On weekdays, during the morning peak period there are 7 trains departing from Newark for London; 4 from Newark to Nottingham and 3 from Newark to Lincoln. A reasonable assumption is that these trains provide a total capacity for over 5,700 passengers, although of course there are existing customer movements to consider. Given this wider perspective, the predicted level of increased rail usage is not significant and should be comfortably accommodated by existing services.

Potential New Rail links to Newark and Sherwood District

6.4.5 A local community group called the Ollerton and District Economic Forum is championing the reinstatement of rail services utilising the former mineral line between Ollerton and Shirebrook.

6.4.6 About 10 years ago, Nottinghamshire County Council commissioned a study to examine this possibility. At the time, it concluded that the costs associated with running trains from Mansfield Woodhouse (the terminal for ½ the frequency of the Robin Hood Line) would be prohibitive as two additional trains and crew would be required to provide a minimal service.

6.4.7 However, recently the case has been revisited. Separately, the County Council are funding considerable improvements to the Robin Hood Line including some line speed increases aimed at reducing journey times. As a consequence connecting Edwinstowe and Ollerton into the rail network becomes substantially more viable as only one additional train and crew would be required.

6.4.8 A draft report is currently being considered by the County Council, but it has still to achieve political and funding support before the proposal can progress. The County Council is seeking clarification of the projected operating costs prior to seeking political approval and considering funding options. Under current government funding options it is likely that the project would need to pass several value-for-money assessments and have some local funding guarantees in place before attracting central government funding.

6.4.9 The Ollerton and District Economic Forum have indicated that they would assist the project by inviting financial support to rebuild the station at Ollerton.

6.4.10 The suggested journey time from Ollerton to Nottingham would be around 55 minutes, and a projected 150,000 passenger movements are predicted annually. This figure includes as a by-product additional trade generated for the Robin Hood Line from Shirebrook (Derbyshire) which would see off-peak train services doubled from hourly to half-hourly.

6.4.11 There are no Park & Ride proposals associated with this project as train frequencies are considered too low.

6.4.12 As an added incentive in terms of increasing the sustainability credentials of this proposal, Nottinghamshire County Council have considered the benefits of improved links to tourist facilities in the north Nottinghamshire area. The potential has been identified, but the practicalities not fully explored. Nottinghamshire financially supports a number of seasonal bus services within the Sherwood Forest area and clearly any new rail link would present opportunities to integrate the public transport options.

6.4.13 Reinstatement of rail services utilising the former mineral line between Ollerton and Shirebrook offers potential for greater connectivity to the wider rail network, particularly the Robin Hood Line, and offers a potential alternative to commuter travel on the A614. This should therefore be explored further and has been prioritised as a 'long term' improvement proposal.

Potential for Improvements to Southwell Rail Services

6.4.14 Southwell, a town of some 7,000 residents does not have immediate access to a rail station. It once had a railway station on a branch line of the Midland Railway, running from Mansfield to Rolleston, a station on the Nottingham-Newark-Lincoln line. The Mansfield to Southwell section was closed in August 1929. Southwell to Rolleston Junction remained open until June 1959 before closing. Rolleston station remains open.

6.4.15 The closest stations to Southwell are therefore now Fiskerton and Rolleston both of which are on the Nottingham-Newark-Lincoln line which is served by East Midlands Trains. Fiskerton and Rolleston stations are both approximately 4km from the centre of Southwell although Fiskerton has slightly easier access by car.

6.4.16 Rolleston is served infrequently, and is usually a request stop. A timetable for the current train service can be found in **Appendix J**. Rolleston currently serves around 8,000 passengers per annum and Fiskerton around 10,000 passengers per annum (Source: Office of Rail Regulation statistics - Ticket sales information).

6.4.17 East Midland Trains operates trains over the Nottingham-Newark-Lincoln line on an approximate hourly frequency. During the daytimes on Mondays to Saturdays most trains start from Leicester and continue beyond Lincoln to terminate at Grimsby. Over the Nottingham-Newark section of route, not all trains serve all stations and hence Fiskerton and Rolleston are only served infrequently, although currently there are departures at peak times on Mondays to Fridays which are suitable for commuters.

6.4.18 As discussed in Section 3.4 there are committed proposals to improve services along the Nottingham-Newark-Lincoln corridor which will improve Nottingham to Lincoln journey times. As a result of these proposed improvements it is likely that services to Fiskerton and Rolleston will be reduced in favour of improved frequencies and reduced journey times for longer-distance passengers.

6.4.19 There would therefore appear to be limited potential to increase train stopping frequency at Fiskerton or Rolleston. However, consideration should be given to ensuring that those trains that do stop offer good connections to longer distance rail services from Nottingham and Lincoln thereby facilitating rail commuting to/from Southwell. Complementary improvements to provide additional car parking facilities at Fiskerton Station should also be considered to further encourage rail use by Southwell residents. These potential improvements should be explored further and have therefore been prioritised as 'long term'.

Potential for Park & Ride

6.4.20 Park & Ride facilities are typically used to manage car demands on congested urban networks by encouraging drivers to park on the outskirts of a city or town and travel into the centre using a more sustainable mass transit mode of transport such as bus or light rail.

6.4.21 To be commercially viable Park & Ride schemes typically require a significant resident population outside of the town centre who work and shop in the town centre.

6.4.22 Park & Ride sites also need to be located conveniently close to the existing major highway network, and on radial routes with public transport priority. They must also serve a centre with high parking charges and/or limited parking supply.

6.4.23 Within the District, Newark on Trent is the largest town and it currently does not experience traffic congestion or parking demand problems to the extent that a Park & Ride facility would be warranted. However, with the provision of additional residential and employment development within Newark on Trent this situation could change and the potential for a future

Park & Ride site (or sites) should be examined in more detail as development proposals are progressed through the planning process.

6.4.24 Possible sites for Park & Ride to service Newark on Trent are at the Newark Showground to the north (conveniently located for the A1, A17 and A46 north), Newark Cattle Market and NCC Depot Site to the west (convenient for the A612, A616, A617 and the A46), and on land to the south of Newark, close to the A46 at Farndon (convenient for the A46 south). These locations would serve all of the key commuter routes into Newark on Trent.

6.4.25 As mentioned earlier in this report Nottingham already has a good network of Park & Ride facilities, several of which would be suitable for commuters travelling from the District into Nottingham city centre. As a result, it is unlikely that there would be a requirement for additional Park & Ride facilities within the District to serve Nottingham-bound journeys.

6.4.26 The future investigation of the potential for Park & Ride facilities to serve Newark on Trent is therefore recommended as a 'long term' proposal.

6.5 CYCLING AND WALKING

New/Improved Infrastructure

6.5.1 General examples of the types of improvements which may need to be introduced as part of the housing and employment sites are mentioned in the previous chapter. Specific employment sites where considerable levels of cycle movements are predicted, along with recommendations on the nature of improvements required for these users are:

Land South of Newark – This site will require a series of new connections for cyclists, within the site and towards Hawton, Farndon, Cotham and Long Benington. Residential origins further south such Orston and Bottesford will also need consideration through connection to the existing National Cycle Network. Tying into the existing cycle network from the north of the site is likely to be more straight forward due to the quieter nature of the streets or prolificacy of existing routes.

Fernwood Site – Current LTP proposals for a new cycle route on London Road to connect Newark with Balderton and Fernwood will vastly improve connections to the site. There is also a future aspiration for a cycle route on Hawton Lane which will link well with the land south of Newark site. An additional connection may be required for access to Fernwood from the south from Long Bennington and Claypole in conjunction with Lincolnshire County Council.

Northern Road – there are existing cycle lanes and shared cycleway/ footways on Northern with good connections into Newark town centre, Coddington and Winthorpe and therefore no major infrastructure upgrades are envisaged.

Rufford Colliery – connections from the site to National Cycle Network (NCN) route 6 and Rainworth are suggested.

Newark & Nottinghamshire Showground – the A1 and A46 provide major barriers to accessing this site from Newark on Trent at present. In cost terms pedestrian and cycling improvements are therefore only likely to be feasible as part of other junction improvements or maintenance at this site.

Newark Cattle Market and Nottinghamshire County Council Depot – the site is well located to utilise existing facilities and quieter roads for cycle access, although small scale improvements to dropped kerbs and signing should be made.

Bilsthorpe Colliery – connections should be made to the existing National Byway route in Bilsthorpe for cycling. The County Council's Sherwood Forest multi-user route proposals will also have a positive impact on accessing the site for cycles.

Clipstone Colliery – Existing routes such as the NCN, the Timberland Trail and tracks around Sherwood Pines and Vicar Water provide excellent access towards the site. The County Council's proposals for Sherwood Forest will also enhance this baseline.

6.5.2 National, regional and local policy all encourages access to new residential and employment developments to be made by foot and cycling. The wards around Newark already have high levels of cycling and walking and the District as a whole has above National average levels of these users. The growth scenarios developed show an increase in the percentages of trips made by these user groups, particularly in the urban area. Therefore, it is essential the developments incorporate principals which will make trips by pedestrians and cyclists safe and comfortable. Improvements are also likely to be required where the sites interface with the existing highway and pedestrian and cycle networks.

6.5.3 In addition to new cycle route infrastructure all new developments should also made adequate provision for on-site cycle-related infrastructure including; cycle parking, secure and covered cycle storage, cyclist shower/changing/storage facilities etc to fully encourage cycle use as a sustainable means of travel. Details will need to be identified on a site specific basis and

designed and implemented in accordance with current standards and best practice guides such as the Nottinghamshire Cycling Design Guide, the Nottinghamshire, Leicestershire and Derbyshire County Council's 'Highways Transportation and Development' document and the Department for Transport's Local Transport Note 2/08 'Cycle Infrastructure Design'. Provision of such facilities should be a conditional requirement of planning permission.

Delivery Timescale

6.5.4 Many of the schemes required are feasible in the short to medium term, with some already programmed in the North Nottinghamshire LTP programme for 2009/10. Other desirable cycling schemes highlighted such as Hawton Lane are not programmed, however discussions with the County Council have indicated that they are likely future schemes during the LTP3 period.

6.5.5 In the case of the Land South of Newark will be developer-led, however it is possible that some of the connections to existing settlements will need to be met through LTP schemes. None of these are currently programmed to be introduced, although their timescale will depend upon the development's timeframes.

6.5.6 Providing a high quality continuous route to the Newark & Nottinghamshire Showground site is likely to be a longer term project, in conjunction with other partners such as Highways Agency and Sustrans as well as developer contributions. Proving the levels of potential cycling and walking access to the site will be essential for justifying the potentially expensive improvements to the infrastructure.

6.5.7 It is understood that there is still the desire to develop the Sherwood Forest cycling, walking and equestrian network by providing additional links to the National Cycle Network, National Byway, Public Rights of Way network and local cycle network. The new visitor centre is scheduled to open in 2010, however due to the unsuccessful Big Lottery bid funding for these multi-user routes is unconfirmed at present. From discussions with Nottinghamshire County Council, it is thought that the network will still be developed, which will prove beneficial for access to many of the development sites in Newark & Sherwood, however it is likely that the implementation of the routes will be phased over a number of years using various County Council and partner funding streams, starting with the most critical around the visitor centre.

6.5.8 Improvements to cycling/walking infrastructure should therefore be timed to coincide with developments in order to meet forecast demands and have therefore been prioritised as 'medium term'.

Indicative Costs

6.5.9 At 2009 prices, indicative construction costs for developing new cycling facilities are in the region of:

- New footway/ cycleway (3m wide) – £100,000 per km
- New on carriageway cycle lane – £20,000 per km
- Rural/ off carriageway route (3m wide) – £50,000 per km
- 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

6.5.10 All figures quoted are broad estimates and do not consider utilities diversion costs, drainage, particular site topography, temporary traffic management or design fees. Signing and lining costs may also vary greatly upon the surrounding site conditions and junctions. Costs for off-highway routes will also alter depending upon the material preferred and future maintenance arrangements and costs should be considered as part of this estimate if the route is not be maintained by the Highway Authority.

Table 43 – Summary of Improvements

Improvement Location	Indicative Costs (£m)	Base + Committed	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Timescale for Delivery	Likely Funding Sources	Comments
Sustainable Transport Infrastructure									
Smarter Choices (e.g. Travel Plans etc)	N/A	X	✓	✓	✓	✓	-	Developer/ LTP/ Sustrans	To be delivered with developments
On and off-site cycling/walking infrastructure	N/A	X	✓	✓	✓	✓	-	Developer/LTP	To be delivered with developments
Bus network/infrastructure improvements	N/A	X	✓	✓	✓	✓	-	Developer	To be delivered with developments
Newark on Trent Park and Ride	N/A	X	✓	✓	✓	✓	-	LTP/Developer	Potential future improvement
Rail link between Ollerton & Shirebrook	N/A	X	✓	✓	✓	✓	-	LTP/Central Gov'	Potential future improvement
Parking improvements at Fiskerton Station	N/A	X	✓	✓	✓	✓	-	LTP	Potential future improvement
Highway Infrastructure									
Newark Urban Area									
Various locations within Newark on Trent	TBC	X	✓	✓	✓	✓	-	Developer	See **Table 38** for further details
Newark on Trent Southern Link Road									
Newark on Trent Southern Link Road	20.0	X	✓	✓	✓	✓	2009 - 2015	Developer	Required to facilitate growth within Newark on Trent
A46 Newark on Trent Bypass									
A46 Link capacity	0.5	✓	✓	✓	✓	✓	2009 - 2015	HA/Developer	Lane marking revisions
A46/A617 Cattle Market Roundabout	3.0	✓	✓	✓	✓	✓	2009 - 2015	HA/Developer	Signalisation
A46/B6166 Farndon Roundabout	0	✓	✓	✓	✓	✓	2009 - 2015	HA/Developer	Improved as part of HA's A46 Scheme and/or SLR
A1									
A1/B6326 London Road Roundabout	3.0	✓	✓	✓	✓	✓	2009 - 2015	LTP/Developer	Signalisation
A1/A17 Winthorpe Roundabout	3.0	✓	✓	✓	✓	✓	2009 - 2015	HA/Developer	Signalisation - Accident remedial/capacity improvements
A1/A46 Brownhills Roundabout	3.0	✓	✓	✓	✓	✓	2009 - 2015	HA/Developer	Signalisation - Accident remedial/capacity improvements
A617 between Newark & C17									
A617 Link capacity	5.0	✓	✓	✓	✓	✓	2009 - 2015	LTP/Developer	Carriageway widening/alternative capacity improvements
Possible new bridge over River Trent	10.0	✓	✓	✓	✓	✓	2009 - 2015	LTP/Developer	May not be feasible due to impacts on flood plain
A617 between C17 & A614									
A617 Link capacity	15.0	X	✓	X	X	X	2015 – 2020	Developer	Carriageway widening/alternative capacity improvements
A6097 between A46(T) & A612									
A6097 Link capacity	2.0	✓	✓	✓	✓	✓	2009 - 2015	LTP/Developer	Carriageway widening/alternative capacity improvements
A6097/Trentside	0.5	✓	✓	✓	✓	✓	2009 - 2015	LTP/Developer	Accident remedial improvements
A6097/A612 junction	3.0	✓	✓	✓	✓	✓	2009 - 2015	LTP/Developer	Signalisation

A6097 between A612 & B6386									
A6097 Link capacity	6.0	✓	✓	✓	✓	✓	2009 - 2015	LTP/Developer	Carriageway widening/alternative capacity improvements
A6097/B6386 junction	3.0	✓	✓	✓	✓	✓	2009 - 2015	LTP/Developer	Signalisation
A614 between A6097 & C1									
A614 Link capacity	4.0	X	✓	✓	✓	✓	2009 - 2015	Developer	Carriageway widening/alternative capacity improvements
A614/C1 junction	3.0	X	✓	✓	✓	✓	2009 - 2015	Developer	Signalisation
A614 between A617 & C13									
A614/A617 junction	3.0	X	✓	✓	✓	✓	2009 - 2015	Developer	Signalisation
A614 Link capacity	3.6	X	✓	✓	✓	✓	2009 - 2015	Developer	Carriageway widening/alternative capacity improvements
A614/Mickledale Lane junction	0.5	X	✓	✓	✓	✓	2009 - 2015	Developer	Signalisation
A614/C13 junction	0.5	X	✓	✓	✓	✓	2009 - 2015	Developer	Signalisation
A614 between C13 & B6034									
A614 Link capacity	3.2	X	✓	✓	✓	X	2015 – 2020	Developer	Carriageway widening/alternative capacity improvements
A614/B6034 junction	0.5	X	✓	✓	✓	X	2015 – 2020	Developer	Signalisation
A614 between B6034 & C57									
A614 Link capacity	0.5	X	X	✓	X	X	2020 – 2026	Developer	Carriageway widening/alternative capacity improvements
A614/C57 junction	0.5	X	X	✓	X	X	2020 – 2026	Developer	Signalisation
A614 between B6030 & A06075/A616									
A614/B6030 junction	0.5	X	✓	✓	✓	✓	2009 - 2015	Developer	Signalisation
A614 Link capacity	1.7	X	✓	✓	✓	✓	2009 - 2015	Developer	Carriageway widening/alternative capacity improvements
A614/A6075/A616 junction	3.0	X	✓	✓	✓	✓	2009 - 2015	Developer	Signalisation
B6030 to west of B6034 at Ollerton									
B6030 Link capacity	7.0	X	X	✓	X	X	2020 – 2026	Developer	Carriageway widening/alternative capacity improvements
B6030/B6034 junction	0.5	X	X	✓	X	X	2020 – 2026	Developer	Signalisation
A6075 east of Ollerton Roundabout									
A6075/A616 junction	0.5	X	X	✓	X	X	2015 – 2020	Developer	Signalisation
A612 south of Southwell									
A612 Westgate link capacity	0.4	X	✓	X	✓	✓	2009 - 2015	Developer	Carriageway widening/Contribution to Southwell Bypass
Church Gate/Westgate/King Street junction	0.2	X	✓	X	✓	✓	2009 - 2015	Developer	Junction improvement/Contribution to Southwell Bypass
Total Costs per Scenario (£m)		42.0	101.1	94.5	86.1	82.4			

Notes:

1. Scheme costs are indicative only and are provided as a very approximate 'order of cost'.
2. Timescales for delivery are **indicative only** and assume that growth within the District occurs at a steady annual rate between 2009 and 2026 and traffic flows are evenly distributed across the District.
3. It is likely that the junctions on the links identified above will exceed their capacity before the links do and these junctions should therefore be improved in advance of consideration of link widening/dualling.
4. Details of impacts at specific locations should be determined as part of Transport Assessments submitted in support of development proposals and appropriate improvements secured through the planning process.

6.5.11 Most of the highway improvements detailed in **Table 43** are reliant upon other schemes to proceed or at least can be grouped in order to maximise the benefits of the proposals. These are:

- Ollerton roundabout improvement – there are connected infrastructure schemes on the A614 in the section between A617 and the roundabout, on the A614 between the B6030, on the A616 approaching the roundabout, the A616/A6075 roundabout, at the A614/ Mickledale Lane and C13 Deerdale Lane junctions. These schemes will maximise capacity improvements relating to the roundabout improvement although are not essential for it to take place.
- The 'White Post Farm' roundabout (A614/A6097/C1) is also within 6 miles of the Ollerton roundabout on the A614 corridor so has a connection to the schemes mentioned above.
- The A1/A17 Winthorpe and A1/A46 roundabouts are adjacent to each other and therefore are reliant upon co-development to ensure the required improvements are made.
- The A46/A617 Cattle Market roundabout, improvements to the existing A46 Newark on Trent bypass and the A617 to C17 at Kelham are all closely connected to each other and the A1/ A46 schemes mentioned in the previous paragraph.
- The A6097/ A612 roundabout scheme is enhanced by the associated proposals for the A6097 from Gunthorpe to the roundabout and the A6097/ Trentside junction. The A6097 corridor is also connected to improvements between the A612 and B6386 between Lowdham and Oxton.

6.5.12 The only scheme which is deemed not to be directly connected to nearby proposals is the A612 Westgate, Southwell improvements. Nearby proposals such as the A617 Newark to Kelham and A46 south west of Newark may impact upon future traffic flows in Southwell, however.

7 Summary

7.1.1 Newark and Sherwood District covers an area of 65,132 hectares, is predominantly rural with an estimated total population in 2007 of 112,600 persons. The main town within the District is Newark on Trent.

7.1.2 The District has a slightly higher proportion of the population travelling to work by car than the rest of the county and England and Wales, a lower proportion using public transport and a higher proportion walking and cycling to work.

7.1.3 The majority of employment trips that originate within the District are either travelling to places of work within the District (40.5%) or travelling to work in Nottinghamshire (51.3%) only a relatively small number travel to work in Lincolnshire (4.2%). Average car ownership within the District is 1.2 cars/vans per household.

7.1.4 Six accident problem sites have been identified within the District. These are the A1/A17 Winthorpe Roundabout, A1/A46 Brownhills Roundabout, A46/A616 Cattle Market Roundabout, A6097/Trentside in Gunthorpe, A614/A6034 Old Rufford Road/Rufford Road and the B6326 London Road/Baines Avenue in Newark on Trent.

7.1.5 The highway network within the District comprises 2 Trunk Roads (A1 and A46) which are the responsibility of the Highways Agency. All other roads are county highways and the responsibility of Nottinghamshire County Council. The 2 Trunk Roads carry the highest volumes of traffic in the District.

7.1.6 The highway network within the District generally operates within capacity except for the A46(T) to the south of Newark. However, there are also known capacity issues at the A46/A616 Cattle Market Roundabout, the A614/A616/A6075 Ollerton Roundabout, the A1(T)/B6326 London Road Roundabout at Balderton, the A612 through Southwell and at the A612/A6097 Roundabout at Lowdham.

7.1.7 There is a combination of commercial and County Council supported bus services within the District. Newark on Trent has very good commercial inter-urban and local bus services whilst the rural areas of the District are less well served. Routes that serve the rural areas of the District require financial subsidy from the County Council.

7.1.8 There is one bus station within the District which is located in Newark on Trent. This is due to be replaced by a new facility as part of a development proposal in the town centre which should be complete by 2014. There are no existing Park & Ride facilities within the District although existing sites located around Nottingham serve commuters from the District into Nottingham City Centre.

7.1.9 The District is served by 2 passenger rail lines, the East Coast Mail Line and the Nottingham to Lincoln line. Newark on Trent has 2 stations, Newark Castle and Newark Northgate. There are 6 other local stations within the District at; Lowdham, Thurgaton, Bleasby, Fiskerton, Rolleston and Collingham which are all on the Nottingham to Lincoln line and have relatively infrequent services.

7.1.10 The Robin Hood Line runs from Nottingham to Worksop and whilst this doesn't pass through the District it offers connections into the rail network at the nearby stations of Mansfield Woodhouse, Mansfield, Kirkby-in-Ashfield and Newstead.

7.1.11 There is also a former mineral railway line which runs across the north of the District which presents opportunities to reintroduce passenger rail services to Edwinstowe and Ollerton.

7.1.12 Newark on Trent and its environs has a comprehensive network of dedicated cycling infrastructure, pedestrianised streets and quiet roads suitable for cycling. Much of the rest of the District's cycling infrastructure is made up of leisure based cycle facilities.

7.1.13 Footways are provided in all of the main settlements and many residential areas. In rural areas of the District footways are not provided alongside all highways due to the cost verses low levels of footfall.

7.1.14 The District has the second highest level of cycling and walking to work trips in Nottinghamshire, based on the 2001 Census, with 14.5% of all trips made by these modes. Cycling and walking is particularly prevalent around Newark on Trent town centre with its Wards having between 23% and 31% of trips made by these modes.

7.1.15 Road based freight within the District uses the Strategic Road Network and major secondary roads for all through movements. Inappropriate heavy goods vehicle movements are prohibited through the use of location specific and area-wide mandatory vehicle weight limits. The main freight routes through the District are the A1, A46 and the A17.

7.1.16 The principal rail freight routes through the District are the East Coast Main Line and the Nottingham to Lincoln line.

7.1.17 The opportunity exists for water-borne freight movements through the District via the River Trent. However, it is likely to be limited to the movement of bulk goods loaded at private wharfs (i.e. sand/gravel) or the infrequent movement of abnormal loads.

7.1.18 There is one key committed highway infrastructure scheme within the District, the A46 Newark to Widmerpool Improvement which will see this section of the A46 widened to dual carriageway standard. Work commenced on this improvement in early 2009 and is due for completion in 2011/12.

7.1.19 A previously committed scheme to improve the A614/A616/B6075 Ollerton Roundabout has recently been dropped from the LTP programme following a change of political administration at Nottinghamshire County Council. The proposed improvement had been taken to 'Preferred Option' stage but since funding has been withdrawn a delivery date can no longer be confirmed. Details of the proposal have therefore been included in this report for information purposes but it has not been considered as a committed improvement.

7.1.20 Bus infrastructure improvements are included in the North Nottinghamshire Local Transport Plan 2006/07 – 2010/11 and these include measures to improve bus priority within Newark on Trent, update bus stops and on-street infrastructure within the District and generally improve accessibility safety and security for bus users. The Potterdyke redevelopment proposals will also see Newark on Trent bus station replaced with a new facility as part of a retail-led development scheme.

7.1.21 No major changes are proposed to the existing commercial bus network within the District and the County Council supported tendered network is to be reviewed in 2010 ahead of a major retendering exercise in 2011.

7.1.22 There are 6 major rail improvement schemes that will affect the District. These are; proposals to improve capacity on the East Coast Main Line through level crossing closures and rail infrastructure improvements; the 'Nottingham Hub' which will see improvements to journey speeds between Nottingham and Lincoln through signal improvements together with improvements at Nottingham station; station car parking capacity enhancements at Newark Northgate; an improved Lincoln to London service; a station improvement scheme which may benefit Newark North Gate and improvements to staffing levels at Newark Castle station.

7.1.23 Cycle route improvements include; a new route between Balderton and the Fernwood Business Park and provision of a shared cycle/footway on the A612 between Lowdham and Burton Joyce. The County Council also has proposals to redevelop the Sherwood Forest Visitors centre and provide comprehensive enhancements to cycle, walking and equestrian connections across the District as part of this project.

7.1.24 No specific committed infrastructure schemes or land-use developments have been identified that will materially affect road, rail or waterborne freight infrastructure or activity within or through the District.

7.1.25 Information has been obtained on all land-use developments, both within the District and in adjacent Districts/Boroughs, which have the potential to materially affect existing transport conditions within the District. Traffic flows as a result of these land-use developments have been estimated and distributed onto the highway network within the District.

7.1.26 With the addition of these traffic flows all roads within the District continue to operate within theoretical capacity at the 2026 assessment year. However, the A617 between the A46(T) and Kelham, the A6096 between the B6386 and the A612, and the A6097 between the A612 and the A46(T) are all forecast to be either approaching or exceeding their theoretical capacity.

7.1.27 Four residential growth scenarios have been supplied by Newark and Sherwood District Council which represent different approaches to accommodating residential growth across the District. These are; Scenario 1 - Dispersed Growth, Scenario 2 – Regeneration, Scenario 3 – Focused Growth and Scenario 4 – Urban Concentrated Based Growth.

7.1.28 Employment growth scenarios were identified that seek to reduce the requirement for longer distance commuting to/from the District by meeting the employment needs of the residential growth scenarios. A total of 4 employment growth scenarios were identified to complement the residential growth scenarios detailed above.

7.1.29 The likely person trip generation as a result of the residential and employment growth scenarios has been estimated and modal splits applied in order to estimate trips by all modes of travel (based on 2001 Census modal splits). Vehicle trips were distributed onto the highway network within the District in accordance with 2001 Census travel to/from work data.

7.1.30 An appraisal of the relative accessibility of each of the proposed residential employment sites by sustainable transport modes has been undertaken and sites have been ranked in

accordance with their accessibility to local facilities and public transport facilities/services. Account was also taken of the potential for each site to financially contribute towards improvements to sustainable transport infrastructure/services.

7.1.31 The results of this assessment reveal that sites predominantly located within Newark on Trent are generally most favourable. However, other sites around the District are also identified as being accessible, particularly larger sites which offer greater potential for financial contributions towards sustainable transport infrastructure improvements.

7.1.32 Impacts of growth on the rural highway network within the District have been assessed using a manual, spreadsheet based assessment. This has identified a schedule of highway improvements that would be required in order to accommodate the traffic impacts as a result of the 4 Growth Scenarios that have been examined. The key infrastructure improvements are summarised in **Table 43** on page 136.

7.1.33 For the urban highway network the impacts of three different distributions of residential development within Newark on Trent have been assessed using a VISUM traffic model. The modelling examined the operation of the urban highway network 'with' and 'without' a Southern Link Road between the A46 and the A1.

7.1.34 The modelling demonstrates that there is little 'through traffic' demand for the Southern Link Road for trips between the A46 and the A1. The majority of trips using the Southern Link Road are forecast to have origins and destinations close to the Southern Link Road (e.g. trips starting/ending in Farndon, Balderton, Land to the South of Newark and Land around Fernwood).

7.1.35 The modelling work clearly demonstrates the need for the Southern Link Road to accommodate Growth Scenario traffic within Newark on Trent and suggests that a single carriageway will be sufficient to meet forecast traffic demands. However, it should be noted that the modelling work undertaken to date examines an assessment year of 2026 which is consistent with the end of the LDF plan period. Nottinghamshire County Council, in their capacity as highway authority, will require the SLR to be designed and constructed to meet the forecast traffic demands at a design year 15-years post completion of the SLR (i.e. completion of the entire length of the SLR between the A46 and the A1). Forecast flows on the SLR after 2026 may therefore be higher and could warrant provision of a dual carriageway.

7.1.36 HGV use of the Southern Link Road is not forecast to be significant. However, for the reasons explained in Section 4.2 the employment assumptions applied in the assessment are robust in terms of total trip generation but may significantly underestimate HGV activity. Further sensitivity testing may therefore be required.

7.1.37 The provision of the Southern Link Road helps to relieve traffic flows and junction congestion within Newark on Trent caused by the addition of Growth Scenario traffic, regardless of where that development is located. However, it does not mitigate its impacts entirely and further improvements will be required at multiple locations within the town.

7.1.38 As a result it can be concluded that the provision of the Southern Link Road is required to help mitigate the impacts as a result of Growth Scenario traffic within Newark on Trent and its provision should therefore be developer funded.

7.1.39 It is likely that all new residential and employment sites will require enhancements to the existing bus network and infrastructure in order to meet the additional travel demands that will be generated. Details will need to be assessed on a site-by-site basis as developments are progressed through the planning process. However, the larger sites, particularly those already covered by, or on the edge of existing bus networks, are considered to offer the greatest potential to support new bespoke bus services, or extensions to existing services to meet demands.

7.1.40 Additional demand for passenger rail services is forecast to be relatively modest (using existing modal splits) and should be satisfactorily accommodated on existing/proposed services without the need for further improvements.

7.1.41 New cycle and pedestrian routes and infrastructure will need to be provided as part of all new developments in order to integrate with existing networks. In addition, on-site facilities such as secure and covered cycle parking, changing facilities and internal access routes will also need to be provided in accordance with current design standards and best practice guidance.

7.1.42 In general it is considered that the existing cycle and footway networks will have sufficient capacity to accommodate forecast additional demands. However, some improvements in the form of additional crossing facilities, access to public transport facilities etc are likely to be required and these should be assessed on a site-by-site basis.

7.1.43 No specific impacts in terms of road, rail or waterborne freight have been identified and it is anticipated that any general increases in road freight movements will be adequately accommodated on the existing/proposed highway network within the District.

7.1.44 It is expected that individual developers would fund any measures or infrastructure improvements required to mitigate the direct transport impacts of developments. This would include funding for items such as; Smarter Choices measures and initiatives, Travel Plans, on and off-site cycling and walking infrastructure, bus network/infrastructure enhancements and/or bespoke bus services, and any off-site highway infrastructure improvements required to mitigate direct impacts.

7.1.45 In addition to addressing the direct transport implications of developments it is recommended that developers also provide financial contributions through S106 Agreements or planning tariffs towards the delivery of the strategic transportation improvements identified for developer funding in the above summary table. S106 payments would be paid to Newark and Sherwood District Council or Nottinghamshire County Council and this would be agreed at the relevant time. This money would then be used to implement the list of identified improvements which would be updated as additional development proposals arise in the future.

7.1.46 In terms of the apportionment of funding between developments the total value of the identified improvements would be split based on the size of the development proposal (i.e. on a pro-rata basis in accordance with employment floor area and residential units).

7.1.47 The aim of this methodology is to provide an equitable, transparent and fair system to enable developers to provide funding for the identified strategic infrastructure improvements. The list of improvements would first need to be worked-up in more detail and accurate construction costs identified. It is also proposed that this list would become a 'live document' which would be reviewed on a regular basis to take into account future changes.

7.1.48 It is proposed that this contribution framework would be used for any future developments in the District. This approach to calculating contributions is increasingly being used by a number of local authorities (for example Milton Keynes Council and Hinckley & Bosworth Borough Council) and is considered to be consistent with the Community Infrastructure Levy proposed in the recent Planning Reform Bill.

GLOSSARY

FIGURES

Appendix A – Base Data

Appendix B – Walking & Cycling Assumptions

Appendix C – A46 Newark to Widmerpool Improvement

Appendix D – Ollerton Roundabout Improvement

Appendix E – Committed Development

Appendix F – Comparison with TEMPRO

Appendix G – Development Details

Appendix H – Accessibility Assessment

Appendix I – VISUM Modelling

Appendix J – Train Timetables