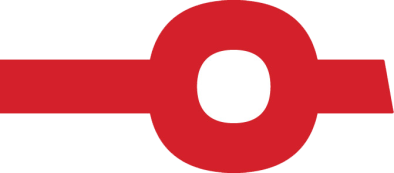
|  |  |
| --- | --- |
| Ashfield Local Plan | 28/09/2023 |

Reference number 110345

|  |  |
| --- | --- |
|  |  |
|  |  |

Ashfield Local Plan Strategic Transport Modelling Assessment Full Report V2



|  |  |
| --- | --- |
|  |  |



Ashfield Local Plan

**Ashfield Local Plan Strategic Transport Modelling Assessment Full Report V2**

|  |  |
| --- | --- |
| Identification table | |
| Client/Project owner | Ashfield District Council |
| Project | Ashfield Local Plan |
| Study | Ashfield Local Plan Strategic Transport Modelling Assessment Full Report V2 |
| Type of document | Report |
| Date | 28/09/2023 |
| Reference number | 110345 |
| Number of pages | 36 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Approval | | | | | |
| Version | Name | | Position | Date | Modifications | |
| 1 | Author | Lachlan McIntosh | Consultant | 23/02/2023 |  | |
| Checker | Helen O’mara | Associate Director | 24/02/2023 |
| Approver | Duncan Irons | Director | 03/03/2023 |
| 2 | Author | Lachlan McIntosh | Senior Consultant | 27/09/23 | Updates as provided by ADC | |
| Checker | Helen O’Mara | Associate Director | 27/09/23 |
| Approver | Duncan Irons | Director | 28/09/23 |

Table of contents

[1. Introduction 5](#_Toc146788618)

[1.1 Overview 5](#_Toc146788619)

[1.2 East Midlands Gateway Model 5](#_Toc146788620)

[1.3 Area of Influence 5](#_Toc146788621)

[2. Reference case development 6](#_Toc146788622)

[2.2 Reference Case Land Use Assumptions 6](#_Toc146788623)

[2.3 Highway Trip Growth 6](#_Toc146788624)

[2.4 Junction Congestion 6](#_Toc146788625)

[3. With Development 8](#_Toc146788626)

[3.1 Overview 8](#_Toc146788627)

[3.2 Development Traffic Generations 11](#_Toc146788628)

[3.3 Key Highway Impacts – 2040 With Development 13](#_Toc146788629)

[3.4 With Development Conclusions 18](#_Toc146788630)

[4. Local Plan Mitigation Proposals 20](#_Toc146788631)

[4.2 Bus Mitigation 20](#_Toc146788632)

[4.3 Rail Mitigation 20](#_Toc146788633)

[4.4 Pedestrian and Cycling Mitigation 21](#_Toc146788634)

[4.5 Highway Mitigation 22](#_Toc146788635)

[5. PUBLIC transport / active mode mitigation analysis 28](#_Toc146788636)

[5.1 Introduction 28](#_Toc146788637)

[5.2 Flow Change 28](#_Toc146788638)

[5.3 Total Congestion Percentage Change 28](#_Toc146788639)

[5.4 Network Statistics 28](#_Toc146788640)

[5.5 Public Transport Patronage 30](#_Toc146788641)

[5.6 Summary 30](#_Toc146788642)

[6. Full Mitigation Analysis 31](#_Toc146788643)

[6.1 Introduction 31](#_Toc146788644)

[6.2 Highway Flow Change 31](#_Toc146788645)

[6.3 Total Congestion Change 31](#_Toc146788646)

[6.4 Network Statistics 31](#_Toc146788647)

[6.5 Public Transport Patronage 33](#_Toc146788648)

[7. Overall Conclusions 34](#_Toc146788649)

[7.1 Study Overview 34](#_Toc146788650)

[7.2 2040 No Local Plan Scenario 34](#_Toc146788651)

[7.3 With Local Plan Scenario – No mitigation 34](#_Toc146788652)

[7.4 Public Transport and Active Mode Mitigation 34](#_Toc146788653)

[7.5 Full Mitigation 35](#_Toc146788654)

List of Tables

[Table 1. Growth in Highway Trips (pcus/hr) 6](#_Toc146788039)

[Table 2. Ashfield Local Plan Summary 9](#_Toc146788040)

[Table 3. Ashfield Local Plan Site Highway Generations (PCU) 11](#_Toc146788041)

[Table 4. With Development Scenario Network Statistics (AM Peak) 17](#_Toc146788042)

[Table 5. With Development Scenario Network Statistics (PM Peak) 17](#_Toc146788043)

[Table 6. Infrastructure Mitigation Proposals – Newly Congested Junctions 23](#_Toc146788044)

[Table 7. Infrastructure Mitigation Proposals – Junctions with Existing Congestion 24](#_Toc146788045)

[Table 8. Infrastructure Mitigation Proposals – Aecom measures 26](#_Toc146788046)

[Table 9. With Development Scenario and PT Mitigation Network Statistics (AM Peak) 29](#_Toc146788047)

[Table 10. With Development Scenario and PT Mitigation Network Statistics (PM Peak) 29](#_Toc146788048)

[Table 11. Boarders by Service – PT Mitigation 30](#_Toc146788049)

[Table 12. AM Network Statistics – Full Mitigation 32](#_Toc146788050)

[Table 13. PM Network Statistics – Full Mitigation 32](#_Toc146788051)

[Table 14. Boarders by Service 33](#_Toc146788052)

# Introduction

## Overview

### SYSTRA has been commissioned by Ashfield District Council to undertake a strategic transport assessment to support the Ashfield Local Plan using the East Midlands Gateway Model (EMGM).

### The Local Plan developments have been tested in one assessment year (2040).

### This document reports the methodology and outputs for the transport assessment of the local plan developments and their associated mitigation measures which have been developed in conjunction with Nottinghamshire County Council and National Highways. The document should be read in conjunction with the accompanying Figures Document which contains the graphical outputs of the assessments.

## East Midlands Gateway Model

### The East Midlands Gateway Model (EMGM) is a multimodal transport model built following the guidance in DfT’s TAG Unit M2. EMGM has all the expected demand responses (time of day, main mode, destination, route/sub-mode) arranged in the standard hierarchy order. The East Midlands Gateway modelling suite is comprised of the following elements:

* SATURN Highway Model;
* CUBE Voyager Public Transport Model;
* Cube Variable Demand Model including destination, mode choice, trip frequency and time of day responses;
* Park and Ride model; and,
* TRICs based Trip End Model.

### The model includes the authorities of Nottingham City, Ashfield, Broxtowe, Erewash, Gedling, Rushcliffe, Derby City, Amber Valley, South Derbyshire, Charnwood and North-West Leicestershire. All strategic roads, major A, B and important minor roads are modelled in these areas. The model boundary is shown in Figure 1 of the supplementary figures document.

## Area of Influence

### The Area of Influence (AOI) has been defined by comparing scenarios with and without the local plan developments. The highway links that experience a change in vehicle flow exceeding plus or minus 5% are deemed to be impacted by the development by a level greater than natural traffic fluctuations and therefore reside within the AOI of the developments. The AOI is shown in Figure 2 of the supplementary figures document.

# Reference case development

### A 2040 Reference Case has been developed for the assessment of the Ashfield Local Plan developments. The Reference Case represents information about the ‘most likely’ future year scenario taking into account planning permissions and allocations to date but excluding the developments associated with the Ashfield Local Plan. The impact of the Ashfield Local Plan developments proposals will be compared against this Reference Case.

## Reference Case Land Use Assumptions

### A number of proposed developments are expected to be completed or under development between 2016 and the 2040 Reference Case year (information to date – August 2021). The developments and associated land use quantities that have been specifically included in the Reference Case modelling are provided in Appendix A. The Reference Case also includes the following assumptions:

* Growth constrained to TEMPRO 7.2 growth assumptions between 2016 and 2040, applied to those areas outside of Ashfield. This is applied at a ward/district level within the simulated modelled area and at a regional level outside this area;
* East Midlands Airport growth to 2040; and
* HS2 Toton is included (as these assessment predate the latest rail plan).

### The Reference Case only includes development expected between 2017 and 2040. If part of the development has been built before this the generations will be included within the 2016 Base Year. Any identified infrastructure improvements associated with these developments will also be included in the modelling.

## Highway Trip Growth

### Table 1 below outlines the growth in highway trips between the 2016 base and the 2040 Reference Case for the AM and PM peaks. There is a 22% growth in highway trips between 2016 and 2040 in the AM peak and 21% in the PM peak compared to the 2016 base year.

1. Growth in Highway Trips (pcus/hr)

|  |  |  |  |
| --- | --- | --- | --- |
| PEAK | **2016 Base year** | **2040 Reference** | **% Change from BY** |
| AM Peak | 321,220 | 392,250 | 22% |
| PM Peak | 323,893 | 392,751 | 21% |

## Junction Congestion

### Junction congestion is measured by determining the ratio of the volume of traffic to the capacity of traffic that can be accommodated by a junction. A Volume to Capacity (V/C) percentage of 85% is considered to be the threshold at which the junction is approaching its effective operational capacity, therefore increasing the likelihood of operational problems including congestion and associated delays and queues. A V/C percentage of 100% indicates that the junction is operating above its theoretical maximum capacity.

### Figures 4 and 5 show the junctions which are forecast to have a maximum V/C ratio (%) of 75% or higher in the Reference Case. The yellow dots indicate junctions which are approaching the 85% threshold. The orange dots represent junctions with a V/C over 85% but under 100% and are therefore considered congested and red dots show junctions severely congested with a V/C of 100% or more.

### In the 2040 within the AOI of Ashfield, there is significant congestion throughout the area. The area that is the most heavily congested is Hucknall, which sits on the edge of the AOI and M1 Junction 28. The 2040 forecast models shows that there are also congestion issues on the A38 between M1 Junction 28 and Mansfield.

# With Development

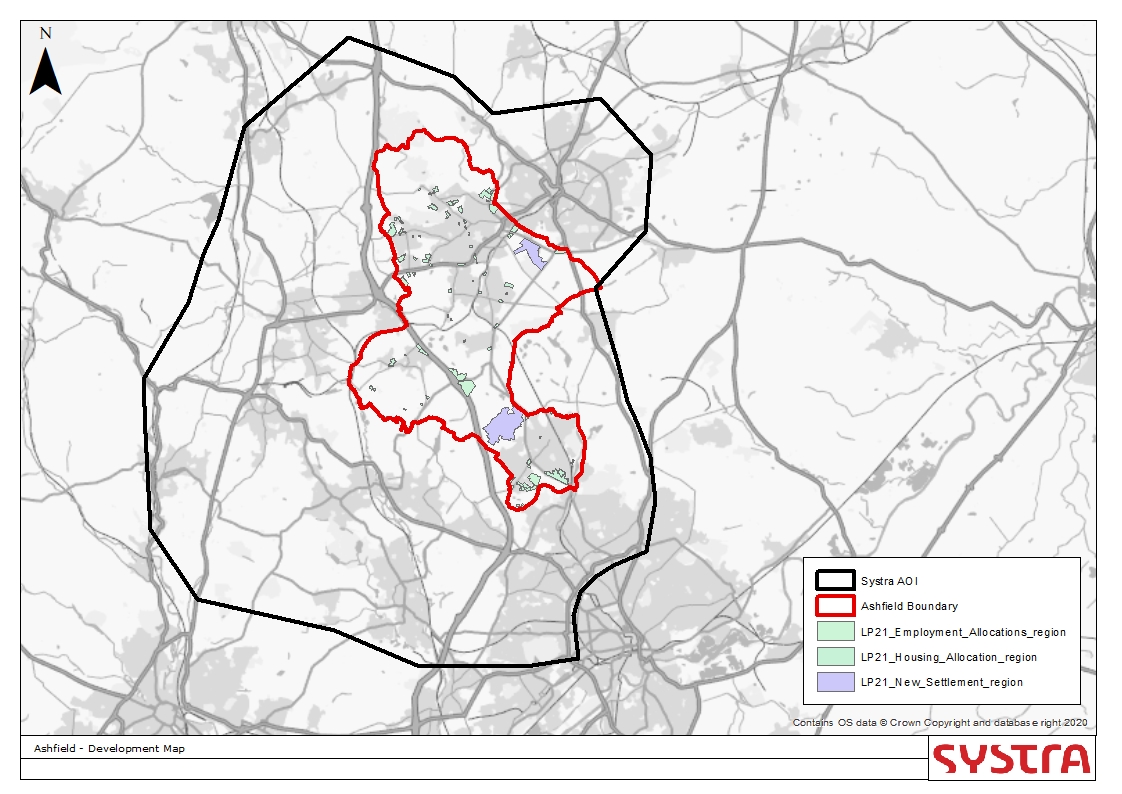
## Overview

### The Ashfield Local Plan includes a large number of residential and employment developments scattered over a very broad area.

### This report is based on the Regulation 19 Draft Local Plan and represents a worst case scenario should all elements of the proposed Local Plan be commissioned. The report details the maximum expected growth in the area and the associated additional congestion likely to be created as a result to give a robust indication of how the Local Plan proposals will impact the local area.

### The East Midlands Gateway Model is a strategic model, typically only developments greater than 250 houses or equivalent are explicitly coded into the model. For this study we have reduced this threshold to 180 houses as many of the developments were smaller than this. In order to maximise the quality of the assessment of the Local Plan developments, where there are a number of smaller developments in close proximity we have modelled them as a series of development clusters by combining them into a single zone. The development locations can be seen in Figure 1 below and Figure 3 of the Figure document that accompanies this report.

1. Ashfield Local Plan Developments



### All developments over 180 houses or equivalent have been included as individual developments, smaller developments have been grouped where appropriate. The developments that have been grouped are as follows:

* Hucknall:
* H1Hc - Land north of A611/South of Broomhill Farm, Hucknall, and H1Hn - (Phase 2) Land at Broomhill Farm.
* H1He, H1Hf and H1Hg - All developments associated with Rolls Royce (including those under 180) and Hucknall Town FC.
* Kirkby:
* All within one zone with access on the A611 just north of Diamond Avenue – includes H1ka - Beacon Farm Derby Rd, H1Kd - Walesby Drive, H1Ke - Land off Diamond Avenue, H1Kf - Warwick Close and H1Ki - Annesley Miners Welfare Institute.
* Sutton:
* H1Su - Rear 113 to 139 Beck Lane and H1Saa - Land at Beck Lane Skegby;
* H1Sa - Rear 211 Alfreton Road and H1Sx - Rear 249, 251 Alfreton Road, Sutton-In-Ashfield.
* Selston Parish:
* H1Vc - Bull and Butcher and H1Ve - Land off Park Lane.

### Table 2 shows the developments which have been specifically included in the With Development model.

1. Ashfield Local Plan Summary

|  |  |  |  |
| --- | --- | --- | --- |
| Site Ref. | Development | Housing (dwellings) | Employment (Ha) |
| H1Hc | Land north of A611 / South of Broomhill Farm, Hucknall/(Phase 2) Land at, Broomhill Farm (Clustered) | 850 |  |
| H1He/H1Hf/H1Hg | Rolls Royce (including those under 180) Plus Hucknall Town FC (Clustered ) | 313 |  |
| H1Hd | Land adjoining Stubbing Wood Farm, Watnall Road | 198 |  |
| H1Ka/H1Kd/H1Ke/H1Kf/H1Ki | Walesby Drive/A611 just North of Diamond Avenue/ Beacon Farm, Derby Road/ Land off Diamond Avenue/Warwick Close/ Annesley Miners Welfare Institute" (Clustered) | 359 |  |
| S6 | Whyburn Farm | 1600 | 11ha |
| H1Sb | Cauldwell Road, Sutton-In-Ashfield | 208 |  |
| H1Sd | Adj Oakham Business Park, Sutton-In-Ashfield | 225 |  |
| H1Si | Rear Kingsmill Hospital, Sutton-In-Ashfield | 264 |  |
| H1Sk | Sunnyside Farm, Blackwell Road, Huthwaite | 283 |  |
| H1Ss | Land to the east of A6075, Beck Lane, Skegby | 212 |  |
| H1Su | Land at Beck Lane, Skegby | 100 |  |
| H1Sz | Alfreton Road | 223 |  |
| H1Vc | Bull and Butcher and land off Park Lane  (Clustered – see above) | 318 |  |
| H1Su | Cauldwell New Settlement | 315 |  |
| S8 | Land to the North East of Junction 27, M1 |  | 18.42ha |
| S8 | Land to the South East of Junction 27, M1 |  | 22.5ha |
| EM2 S3 | Hamilton Road, Sutton-In-Ashfield |  | 3.34ha |
| EM2 S2 | West of Fulwood, Export Drive, Sutton-In-Ashfield |  | 4.54ha |
| EM2 K1 | Kings Mill Road, Kirkby-In-Ashfield |  | 1.99ha |
| EM2 K3 | Portland Industrial Park, Kirkby-In-Ashfield |  | 1.76ha |
| EM1 H1 | Aerial Way, Hucknall |  | 0.83ha |
| EM2 S1 | Castlewood Business Park, Sutton-In-Ashfield |  | 7.7ha |
| EM2 S2 | Fulwood Road North, Sutton-In-Ashfield |  | 1.23ha |
| EM2 S4 | South West Oakham, Sutton-In-Ashfield |  | 1.52ha |
| EM2 K2 | Park Lane, Kirkby-In-Ashfield |  | 1.84ha |
| EM1 H2 | Blenheim Park, Hucknall |  | 3.16ha |
| EM3 H3 | Butlers Hill, Hucknall |  | 1.78ha |
| EM1 H4 | Harrier Park, Hucknall |  | 15.5ha |

### The With Development model includes 5,468 of the 7,068 planned houses (net requirement 2022 - 2038, based on the Standard Method (467dpa) using the latest data) and 97.11ha of employment. Minimal changes to the highway network in order to accommodate access to the site have also been included but no enhancements to the public transport networks.

### The remaining housing developments which are too small to specifically model within the EMGM are captured through the application of a TEMPRO growth constraint to the Ashfield area under this with Local Plan development scenario.

## Development Traffic Generations

### Table 3 below provides a summary of the two-way highway generations in Passenger Car Units (PCUs) of each of the sites that have been specifically modelled as individual development zones.

1. Ashfield Local Plan Site Highway Generations (PCU)

|  |  |  |
| --- | --- | --- |
|  | 2-way Highway Generations (PCU’s) | |
| Development | AM PEAK | PM PEAK |
| Land north of A611 / South of Broomhill Farm, Hucknall/(Phase 2) Land at, Broomhill Farm (Clustered) | 628 | 568 |
| Rolls Royce (including those under 180) Plus Hucknall Town FC (Clustered ) | 255 | 231 |
| Land adjoining Stubbing Wood Farm, Watnall Road | 168 | 153 |
| Walesby Drive/A611 just North of Diamond Avenue/ Beacon Farm, Derby Road/ Land off Diamond Avenue/Warwick Close/ Annesley Miners Welfare Institute" (Clustered) | 303 | 275 |
| Whyburn Farm New Settlement | 1334 | 1210 |
| Whyburn Farm (Employment) | 285 | 289 |
| Cauldwell Road, Sutton-In-Ashfield | 176 | 160 |
| Adj Oakham Business Park, Sutton-In-Ashfield | 195 | 177 |
| Rear Kingsmill Hospital, Sutton-In-Ashfield | 219 | 200 |
| Sunnyside Farm, Blackwell Road, Huthwaite | 236 | 214 |
| Land to the east of A6075, Beck Lane, Skegby | 179 | 163 |
| Land at Beck Lane, Skegby (Clustered) | 340 | 310 |
| Alfreton Road | 173 | 157 |
| Bull and Butcher and land off Park Lane  (Clustered – see above) | 275 | 249 |
| Land to the North East of Junction 27, M1 | 174 | 90 |
| Land to the South East of Junction 27, M1 | 208 | 108 |
| Hamilton Road, Sutton-In-Ashfield | 85 | 85 |
| West of Fulwood, Export Drive, Sutton-In-Ashfield | 42 | 21 |
| Kings Mill Road, Kirkby-In-Ashfield | 82 | 90 |
| Portland Industrial Park, Kirkby-In-Ashfield | 71 | 78 |
| Aerial Way, Hucknall | 35 | 40 |
| Castlewood Business Park, Sutton-In-Ashfield | 183 | 166 |
| Fulwood Road North, Sutton-In-Ashfield | 8 | 8 |
| South West Oakham, Sutton-In-Ashfield | 320 | 178 |
| Park Lane, Kirkby-In-Ashfield | 22 | 24 |
| Blenheim Park, Hucknall | 11 | 5 |
| Butlers Hill, Hucknall | 19 | 22 |
| Harrier Park, Hucknall | 986 | 914 |
| Cauldwell New Settlement Village | 267 | 242 |

## Key Highway Impacts – 2040 With Development

Trip Distribution

### Figures 6 and 7 show the distribution of development trips across the network in the AM and PM peaks respectively. All flows are in Passenger Car Units (PCUs).

### The Ashfield Local Plan traffic is using the M1 in both directions especially south of M1 Junction 28. The A38 heading west also experiences a significant increase in traffic flow from the developments, these trips are heading towards Ripley and Derby. Another well used route for the development traffic is the Derby Road (A611) from Mansfield to Nottingham via Hucknall. Nottingham Road (A60) is also used but to a lesser extent. A number of trips also route around the south and west of Mansfield along Sherwood Way and Beck Lane, where there are a number of developments. Further south traffic is also using M1 junction 26 via Low Wood Road (A6002) and to access the Hucknall area (close to Bestwood Business Park) and the north of Nottingham. These patterns can be seen in both the AM and PM periods.

Reassignment

### The addition of development traffic to the highway network may indirectly affect the routing of background none Local Plan traffic as changes to delays and speeds along existing routes can lead to reassignment of background traffic onto alternative routes. Figure 8 shows the reassignment impact of the Ashfield Local Plan developments in the AM peak with Figure 9 showing the PM peak. Blue lines represent roads which background traffic is moving away from whilst orange lines represent roads which experience an increase in traffic due to the reassignment impact.

### Background trips move away from followings roads:

* M1 Northbound (from J26) (AM);
* M1 Southbound (from J28) (AM);
* Derby Road, both directions (A611);
* A38 Westbound;
* A610 Westbound (off J26 of the M1);
* A38 Eastbound (PM);
* M1 Southbound (between J29 and J28 and J27 to J26 of the M1) (PM);
* M1 Northbound (from J27) (PM); and
* A608.

### With the following roads showing an increase in background traffic movements as traffic reassigns:

* M1 Southbound (between Junction 28 and Junction 27)(PM);
* Salmon Lane / Annesley Lane / Alfreton Road / B600;
* Willey Lane southbound (PM);
* Moor Road, Hucknall (AM);
* Church Lane (A608); and
* Mansfield Road / Wild Hill / High St (B6014) (PM).

Overall Flow Change

### The overall flow change on the network is a combination of traffic directly generated by the site and traffic which is reassigned as a consequence of the additional development traffic.

### Figure 10 shows the AM flow change compared to the Reference Case. Figure 11 shows the same information for the PM peak. Red lines represent roads which experience a net increase in traffic whilst green lines represent roads which experience a net reduction in traffic.

### During the AM peak there is increased traffic on the M1 between junction 28 and junction 27 in the southbound direction, however there is a decrease in flows between junction 27 and 28 of the M1 travelling north due to background traffic moving away from the M1 in the northbound direction. There is an increase in vehicles using the B600 and Mansfield Rd (A608) from junction 27 of the M1, as well as increases heading into Mansfield from many different directions.

### In the PM the flow change shows different patterns with an increase in flows northbound along the M1 to Junction 27. There is also an increase in traffic using the Derby Road (A611) towards Mansfield. Background traffic appears to be using Kirkby Lane, Alfreton Road and the Mansfield Road (B6014) to avoid the A38 and M1, this could be due to the PM Peak congestion issues at M1 Junction 28.

Junction Congestion

### Junction congestion is measured by determining the ratio of the volume of traffic to the capacity of traffic that can be accommodated by a junction. A Volume to Capacity (V/C) percentage of 85% is considered to be the threshold at which the junction is approaching its effective operational capacity, therefore increasing the likelihood of operational problems including congestion and associated delays and queues. A V/C percentage of 100% indicates that the junction is operating above its theoretical maximum capacity.

### Figures 12 and 13 (Already congested) show the junctions which are forecast to have a maximum V/C ratio (%) of 85% or higher in the Reference Case and experience an increase in congestion once the Local Plan developments are in place. Figures 14 and 15 (Pushed over) show the junctions which do not have a V/C ratio of 85% or higher in the Reference Case but do once the Ashfield Local Plan developments are in place, for the AM and PM peak hours respectively.

### Total congestion for the area is shown in Figures 16 and 17.

### The figures show a number of junctions are exceeding effective operational capacity during the AM peak and five junctions which are forecast to be pushed past operational capacity:

* A6002 Hucknall Lane / A611 Moor Bridge roundabout;
* Vernon Road / Waterford Street / B6004 junction;
* Nottingham Road / Annesley Lane;
* A6002 Sandhurst Road / Squires Avenue junction; and
* Annesley Lane / Portland Road.

### In the PM the figures show a number of junctions are pushed beyond effective operational capacity but several are forecast to be pushed beyond operational capacity as follows:

* Nottingham Road / Annesley Lane;
* M1 junction 27;
* Pinxton Rd / Laburnum Avenue junction;
* Nottingham Rd / Longdale lane;
* Longdale Lane / Kighill Lane / Chapel Lane;
* Moorgreen / Engine Lane;
* New Junction on A38; and
* Beechdale Road / Redbourne Drive.

### There are also many junctions which were already congested in the reference model but now are congested even more so. Already congested junctions with a difference >10% are listed below:

**AM**

* Old Mill Lane / Clipstone Road;
* Abbott / Brick Kiln Lane;
* Highbury Road / Cantrell Road;
* Larkfield Road / Kimberley Road;
* Kimberley Road / Maple Drive;
* Watnall Road / Kimberley Road;
* Eastwood Road / Maws Lane;
* Main Street / James Street / Newdigate Street; and
* Eastwood Road / Main Street / Nine Corners.

**PM**

* Mansfield Rd / Kings Mill Road East / Sutton Rd;
* A38 / Alfreton Road / Pinxton Lane;
* Nottingham Road / A38 WB Off- Slip;
* Derby Road / Shoulder of Mutton Hill;
* Nuncargate Road / Nottingham Road / Shoulder of Mutton Hill;
* Mansfield Road / Kighill Lane;
* Alfreton Road / Sandhill Road;
* Willey Lane / Alfreton Road / Main Road;
* Moorgreen / Church Road;
* Nottingham Road / Baker Road;
* Bulwell High Road / Ravensworth Road;
* Crabtree Road / Seller's Wood Drive;
* Woodhouse Way / Mellors Way;
* Middelton Boulevard / Derby Rd Roundabout; and
* M1, Junction 27.

Network Statistics

### Highway indicators provide a way of gauging the overall impact of the trips associated with the development site across the Area of Influence of the development. A brief explanation of key indicators is provided below:

* **Over Capacity Queues** – reflects the change in overall congestion and is the time spent queuing at junctions that are over capacity. As traffic levels increase we expect to see a growing number of junctions reaching capacity and the time spent queuing at these overcapacity junctions increasing;
* **Total Travel Time** – Total travel time across the highway network simulation area expressed in PCU hours;
* **Total Travel Distance** – Total distance travelled across the highway network simulation area expressed in PCU kilometres; and
* **Average Speed** - Expressed as kilometres per hour for all traffic within the highway model simulation area for each peak period. Increased traffic levels lead to more delays resulting in lower average speeds.

### The network statistics for the With Development Scenario are provided in Tables 4 and 5.

### During both peaks there is a significant change in congestion over the Local Plan AOI (denoted by the overcapacity queues statistic). These statistics also indicates that due to the congested network, traffic is taking longer to get around the network leading to a reduced average speed.

1. With Development Scenario Network Statistics (AM Peak)

|  |  |  |  |
| --- | --- | --- | --- |
| indicator | 2040 reference | 2040 With Development | change (%) |
| Over Capacity Queues (congestion) | 1394 | 2136 | 53% |
| Total Travel Time (PCU hrs) | 31425 | 32496 | 3% |
| Average Speed km/hr | 41 | 39 | -4% |

1. With Development Scenario Network Statistics (PM Peak)

|  |  |  |  |
| --- | --- | --- | --- |
| **INDICATOR** | **2040 REFERENCE** | **2040 WITH DEVELOPMENT** | **CHANGE (%)** |
| Over Capacity Queues (congestion) | 1931 | 2276 | 18% |
| Total Travel Time (PCU hrs) | 32712 | 33356 | 2% |
| Average Speed km/hr | 41 | 40 | -2% |

## With Development Conclusions

### The With Development Scenario includes all the developments associated with the Ashfield Local Plan modelled with no highway or public transport mitigation. The Local Plan developments are predicted to result in congestion issues both locally and along the Strategic Road Network (SRN) on the M1 and A38.

### The junctions that are most affected are the following, consideration of potential mitigation at these locations could be explored further.

* A6002 Hucknall Lane / A611 Moor Bridge roundabout;
* Vernon Road / Waterford Street / B6004 junction;
* Nottingham Road / Annesley Lane;
* A6002 Sandhurst Road / Squires Avenue junction; and
* Annesley Lane / Portland Road.
* M1 junction 27;
* Pinxton Rd / Laburnum Avenue junction;
* Nottingham Rd / Longdale lane;
* Longdale Lane / Kighill Lane / Chapel Lane;
* Moorgreen / Engine Lane;
* New Junction on A38; and
* Beechdale Road / Redbourne Drive.

### We also identify a number of junctions which were already highly congested in the reference case. With the addition of the development these junctions become noticeably more congested, with a tolerance exceeding a +10% increase. These junctions are as follows:

* Old Mill Lane / Clipstone Road;
* Abbott / Brick Kiln Lane;
* Highbury Road / Cantrell Road;
* Larkfield Road / Kimberley Road;
* Kimberley Road / Maple Drive;
* Watnall Road / Kimberley Road;
* Eastwood Road / Maws Lane;
* Main Street / James Street / Newdigate Street;
* Eastwood Road / Main Street / Nine Corners;
* Mansfield Rd / Kings Mill Road East / Sutton Rd;
* A38 / Alfreton Road / Pinxton Lane;
* Nottingham Road / A38 WB Off- Slip;
* Derby Road / Shoulder of Mutton Hill;
* Nuncargate Road / Nottingham Road / Shoulder of Mutton Hill;
* Mansfield Road / Kighill Lane;
* Alfreton Road / Sandhill Road;
* Willey Lane / Alfreton Road / Main Road;
* Moorgreen / Church Road;
* Nottingham Road / Baker Road;
* Bulwell High Road / Ravensworth Road;
* Crabtree Road / Seller's Wood Drive;
* Woodhouse Way / Mellors Way;
* Middelton Boulevard / Derby Rd Roundabout; and
* M1, Junction 27.

### A few junctions, which have not been proposed for mitigation by SYSTRA, were also previously assessed by Aecom in their A611 Feasibility Study, complete with preliminary design concepts. In a separate Aecom report (2018) there were also proposed modifications to junctions along the A38 west of Mansfield. As such, both the A611 Feasibility Study and the A38 modifications have been marked as proposed mitigation sites. The junctions include:

* Kings Mill Road East/ Sutton Road;
* Kings Mill Road East / Station Road;
* Sutton Road / Sheepbridge Lane;
* A611 / Annesley Rd;
* A611 / Annesley Cutting;
* A611 / Forest Road - School Hill;
* A611 / Midfield Rd;
* A611 / B6020 (Diamond Ave);
* A611 / B6139 (Coxmoor Rd); and
* A611 / Cauldwell Rd.

# Local Plan Mitigation Proposals

### A two phase mitigation strategy has been developed to reduce the impact of the proposed developments within the Ashfield local plan upon the local road network. The initial phase focusses on public transport and active modes with highway mitigation measures included in a second modelling phase in line with the standard DfT hierarchical approach which requires sustainable modes to be considered before highway measures.

## Bus Mitigation

### New bus routes/extensions to existing routes have been identified to service the development demand to and from public transport hubs and towns within Ashfield with the aim of connecting people to the rail and NET services which provide access to the wider East Midlands and beyond.

### Three new services have been introduced, with the proposed routes displayed in Figure 18. These will have to be discussed and agreed with the bus operators which may result in changes to routing and the services frequencies.

### The Blue service starts at Huthwaite Lane serving the new developments in this area. The service connects to Huthwaite, Sutton-in-Ashfield via Lammas Road, Kings Mill Hospital, new developments at Beck Lane and enters Mansfield via Chesterfield Road South. It has been assumed that this service will run 4 buses per hour with an average journey time of 37 minutes which will require 6 buses. This will cost in the region of £1.08m to operate on an annual basis.

### The Red service starts at Selston serving the new developments in this area to Mansfield via the B6018 to Kirkby in Ashfield. The service connects to rail stations at Kirkby in Ashfield and Sutton Parkway, to developments at Sherwood Way South and onto the Nottingham Road. It has been assumed that this service will run 4 buses per hour with an average journey time of 41 minutes which will require 6 buses. This will cost in the region of £1.08m to operate on an annual basis.

### The Green service runs from Kimberley, through Watnall onto the B6009 where there are several new developments. The service then goes through Hucknall to Station Road before continuing along Annesley Road to the junction with Wighay Road. It has been assumed that this service will run 3 buses per hour with an average journey time of 35 minutes which will require 4.5 buses to operate. This will cost in the region of £810K to operate on an annual basis.

### This gives an annual operating cost £2.97m per year giving an expected cost over the first 5 years of the plan period will be £14.85m. This cost is expected to be offset by revenue from the bus services which will, once the service is established and a viable commercial route, replace the need for any subsidy which will reduce year on year. Therefore the subsidy cost, taking into account the ticket revenue gained is approximately 50% of this overall figure at £7.43m.

## Rail Mitigation

### Alterations to the rail network have also been introduced, with two new services running across all model peak periods.

### The first route operates between Mansfield and Leicester, the second route between Mansfield and Derby. Both services use the proposed Maid Marian line which is assumed to be opened to passenger services between Mansfield and Derby. These routes are depicted in Figure 19. Each service is hourly.

### The Leicester to Mansfield service stops at all stations including:

* Leicester;
* East Midlands Parkway;
* Langley Mill;
* Kirkby in Ashfield;
* Sutton Parkway; and
* Mansfield.

### The Derby to Mansfield service stops at all stations including:

* Derby;
* Ilkeston;
* Langley Mill;
* Kirkby in Ashfield;
* Sutton Parkway; and
* Mansfield.

### A formal capital and revenue case will have to be prepared to enable these new services to become operational. This will be required to show to show the cost represents good value for money and that the revenue generated by the new services through ticket sales covers the operating costs of the services. These services are already being considered by a number of organisations including Nottinghamshire County Council and will therefore be funded from other sources and not just the Ashfield Local Plan developments.

## Pedestrian and Cycling Mitigation

### To encourage a switch to pedestrian and cycling it has been proposed that additional infrastructure be developed on key routes to link the developments to public transport hubs and facilities within local towns.

### Links between developments that are located within this 5 KM of these services the nearest town centre/public transport hub have been included to create the cycle network shown in Figure 20.

### On each cycle route the likely origins and destinations of potential cycle trips have been identified and it is assumed that 5% of within these trips will cycle due to the improved safety and convenience of this mode resulting from the implementation of the improved infrastructure.

### This will provide in the region of 40 Km of cycle infrastructure within Ashfield at a cost of around £4.4m, assuming they are largely provided off highway.

### Four additional existing cycle routes have been identified by Ashfield District Council as part of the Towns Fund Investment Plan after the modelling work was undertaken for which upgrades to enhance the cycle network are to be included in the Local Plan. The estimated cost of this work is £1.98m, however the impacts of these have not been included in the evaluation of the Local Plan mitigation package in this report.

## Highway Mitigation

### A review of the highway impacts identified in the With Development assessments of the Local Plan proposals, together with an understanding of the operation of the highway network has led to the identification of the highway mitigation proposals identified in Table 6 with the locations shown in Figure 21. Some additional sites have also been listed including junction improvements as proposed in Aecom’s Transport Studies for the A611 and A38 corridors

### The estimated capital costs of these schemes provides an indication of the potential construction costs based on average costs for similar scheme elsewhere. These exclude land acquisition and any significant adjustments to underground services and further design of these measures will be required to provide a more robust assessment of these costs.

### The initial costs were calculated using Spon's Civil Engineering and Highway Works Price Book 2019 based on indicative generalised descriptions of the works required and measurements from maps.. All costs are indicative and more detailed design and costing of the measures will be required during the planning application processes for the development schemes.

### Local plans in neighbouring local authority areas will have an impact on a number of the junctions where mitigation has been identified. Therefore, whilst the table below shows the total costs of the mitigation some of this cost will be allocated to developments outside of the Ashfield area and costs for these mitigation schemes will be shared between the developers, Ashfield District Council, neighbouring Local Authorities and National Highways where appropriate.

1. Infrastructure Mitigation Proposals – Newly Congested Junctions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Junction Number |  | Junction Name | Identified Issues | Proposed Mitigation | Indicative Costs |
| 1 |  | A6002 Hucknall Lane / A611 Moor Bridge roundabout | Increased demand on approach to the Hucknall Lane roundabout from the North leads to congestion at the northern arm of the roundabout. | Segregated left-hand lane turning from Hucknall Lane north to Moor Bridge | £350,000 |
| 2 |  | Vernon Road / Waterford Street / B6004 junction | Increased congestion observed adjacent to the tram crossing. The junction is heavily constrained which limits mitigation possibilities | No mitigation Solution Found |  |
| 3 |  | 23404, Nottingham Rd/ Annesley Lane | Congested on Annesley Lane, due to the additional demand | extend the flare within current carriageway | £100,000 |
| 4 |  | A6002 Sandhurst Rd / Squires Avenue junction | Delay on all arms of the junction. | Signal cycle time adjusted to provide more capacity. |  |
| 5 |  | 23402, Annesley Lane/ Portland Rd | Caused by blocking back from Nottingham Rd Junction. | No mitigation Solution Found |  |
| 6 |  | M1 junction 27 | Significant constraint on the network leading to ‘rat running’ on minor routes | Additional dedicated left turn lane on all approaches with the exception of the M1 southbound Slip on. | £450,000 |
| 7 |  | B6018 (Pinxton Road) / Laburnum Avenue junction | Congestion on Laburnum Avenue | Traffic management to prevent ‘rat running’ | £250,000 |
| 8 |  | Nottingham Rd / Longdale Ln | Increased congestion to/from Longdale Ln | No mitigation Solution Found |  |
| 9 |  | Longdale Ln/Kighill Ln/ Chapel Lane | Congestion along Longdale Ln, for vehicles turning right and on Chapel Lane (AM). | No mitigation Solution Found |  |
| 10 |  | Moorgreen / Engine Lane | Highly congested on Engine Lane. | No mitigation Solution Found |  |

### Further heavily congested junctions shown in Table 7 were identified. These are junctions which have existing issues but have become more congested by the local plan developments. The improvements suggested would improve overall congestion levels in the area.

1. Infrastructure Mitigation Proposals – Junctions with Existing Congestion

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Junction Number | Junction Name | Description | Mitigation | Estimated Costs |
| 13 | Old Mill Lane / Clipstone Rd | General increase in congestion | Optimise signal timings |  |
| 14 | Abbott / Brick Kiln Lane | Increased congestion for right turn traffic out of minor arm | Right turn flare lane | £50,000 |
| 15 | Highbury Rd / Cantrell Rd | Already heavily congested | Signalise junction | £150,000 |
| 16 | Larkfield Rd / Kimberley Rd | Lakefield View right turn onto Kimberley Road congested | Signalise junction | £150,000 |
| 17 | Kimberley Rd / Maple Dr | Kimberley Road ‘rat running’ | No mitigation Solution Found |  |
| 18 | Watnall Rd / Kimberley Rd | Increased congestion to and from Watnall Drive | Optimise signal timings |  |
| 19 | Eastwood Road / Maws Lane | Slight increase in congestion turning right onto Eastwood Road | No mitigation Solution Found Maws Lane already has speed restrictive measures |  |
| 20 | Main St / James St / Newdigate St | Increase in traffic from Newdigate Street increasing delay | No mitigation Solution Found |  |
| 21 | Eastwood Road / Main St / Nine Corners | Increase in delay on Nine Corners | Signalise junction | £150,000 |
| 22 | Mansfield Rd / Kings Mill Road East / Sutton Rd | Low levels of congestion change | Optimise signal timings |  |
| 23 | A38 / Alfreton Rd / Pinxton Lane | General congestion due to inefficient lane usage. | Change lanes markings to encourage greater lane usage | £50,000 |
| 24 | Nottingham Rd (B600) / A38 WB Off | Westbound Slip off the A38 is congested. | Add traffic signals | £120,000 |
| 25 | Derby Rd / Shoulder of Mutton Hill | Congestion on northern arm | Optimise signals |  |
| 26 | Nuncargate Rd / Nottingham Rd / Shoulder of Mutton Hill | Increased congestion on Nuncargate Rd | No mitigation Solution Found |  |
| 27 | Mansfield Rd / Kighill Lane | Increased congestion on Kighill Lane | No mitigation Solution Found |  |
| 28 | Alfreton Rd / Sandhill Road | Congestion on Sandhill Rd | No mitigation Solution Found |  |
| 29 | Willey Lane / Alfreton Road / Main Road | Slight increase in congestion | No mitigation Solution Found |  |
| 30 | Moorgreen / Church Rd | Increase in congestion on Moorgreen Lane | No mitigation Solution Found |  |
| 31 | Nottingham Rd / Baker Rd | Small increase in delay | No mitigation Solution Found |  |
| 32 | Bulwell High Rd / Ravensworth Road | Small increase in delay | No mitigation Solution Found |  |
| 33 | Crabtree Road / Seller's Wood Dr | Increase in congestion due to Hempshill Lane being used as a ‘rat run’ | Traffic management on Hempshill Lanes | £150,000 |
| 34 | Woodhouse Way / Mellors Way | Big delay, due most likely to the Spigot | No mitigation Solution Found |  |
| 35 | Middelton Boulevard / Derby Rd Rbt | Small increase in delay | No mitigation Solution Found |  |
| 36 | M1 Junction 28 | Already heavily congested | Implement the National Highways Interim scheme which is already programmed for construction | £750,000 |
| 47 | B6019 Mansfield Lane/ Storth Lane | Congestion on Storth Lane | Signalise junction | £150,000 |
| Thank48 | Nottingham Rd/ A610 slip | Right turners on Nottingham Road increasing congestion | Signalise junction | £150,000 |
| 49 | A609 Nottingham Rd/ Thurman St | Thurman St is heavily congested | Signalise junction | £150,000 |

1. Infrastructure Mitigation Proposals – Aecom measures

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Junction Number | Junction Name | Description | Mitigation | Estimated Costs |
| 37 | Kings Mill Rd East/ Sutton Rd | A38 Proposed | Add additional lanes to help turning movements | £5-7.5m |
| 38 | Kings Mill Rd East/ Station Rd | A38 Proposed | Add additional lane heading WB | £3-5m |
| 39 | Sutton Rd/ Sheepbridge Lane | A38 Proposed | Add left turn from Sutton Rd to Sheepbridge Ln | £0.5-1m |
| 40 | A611/ Annesley Rd Roundabout | A611 Feasibility Study | Add additional lanes | £1.9-2.8m |
| 41 | A611/ Annesley Cutting | A611 Feasibility Study | Add additional NB lane | £5.5-8m |
| 42 | Forest Rd/ School Hill | A611 Feasibility Study | Add additional NB lane | £1.1-1.7m |
| 43 | A611/ Midfield Rd | A611 Feasibility Study | Provide space for right turning vehicles | £1.6-2.4m |
| 44 | A611/ B6020 Diamond Ave | A611 Feasibility Study | Add in proposed signalised gyratory | £3.4-5m |
| 45 | A611/ B6139 Coxmoor Rd | A611 Feasibility Study | Add additional lanes to help turning movements | £2.5-3.7m |
| 46 | A611/ Cauldwell Rd | A611 Feasibility Study | Add additional NB lane to allow merging | £1.2-1.9m |

### As part of the Transport Assessments for the individual sites more local junction mitigation is likely to be required to mitigate the local impacts of the schemes which are not addressed as part of this strategic transport assessment. These local measures and associated costs will be the responsibility of the individual developers and are not included in this strategic modelling assessment.

### In addition the A38 corridor is a critical route to access northern Ashfield and Mansfield and is constraining economic regeneration in this area. Whilst some improvements are identified at some locations along this route this, corridor is very congested and there are few improvements that can be achieved without a comprehensive corridor level strategy which will required a separate study and is not covered under this strategic assessment focused on the Ashfield Local Plan schemes.

# PUBLIC transport / active mode mitigation analysis

## Introduction

### The proposed public transport and active mode mitigation schemes detailed in this chapter have been modelled along with the local plan developments. This has been compared with the With Development modelling.

### Analysis has been undertaken looking at the following impacts:

* Flow Change – Total change in actual flow;
* Total Congestion Change – Total change in Volume/Capacity percentage (V/C %);
* Network Statistics – Key performance indicators; and
* Public Transport Patronage – Usage of new PT services.

## Flow Change

### Figures 22 to 25 show the change in flow as a result of the public transport and active mode mitigation compared to the reference case and with development scenarios. There is very little change in flow following the addition of the public transport and active mode mitigation as the changes only affect local short distance movements and therefore results in small reductions in vehicle trips on a wide number of routes.

## Total Congestion Percentage Change

### Figures 30 and 31 show the change in total congestion between the Reference Case and the public transport and active mode mitigation scenario.

### Figures 32 and 33 show the change in total congestion between the With Development scenario and the public transport and active mode mitigation scenario.

### The public transport and active mode mitigation has a minimal but generally positive effect on congestion levels in both the AM and PM peak.

## Network Statistics

### Network statistics comparing the Reference case, With Development and With Developments with public transport and active mode mitigation scenarios are displayed in Table 9 and Table 10Table 10.

1. With Development Scenario and PT Mitigation Network Statistics (AM Peak)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Indicator** | **Reference** | **With Development** | **With Development With PT Mitigation** | **% Change** |
| Over Capacity Queues (congestion) | 1,394 | 2,136 | 2,111 | **-1.16%** |
| Total Travel Time (PCU hrs) | 31,425 | 32,496 | 32,434 | **-0.19%** |
| Average Speed km/hr | 41 | 39 | 39 | **0.00%** |

1. With Development Scenario and PT Mitigation Network Statistics (PM Peak)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Indicator** | **Reference** | **With Development** | **With Development With PT Mitigation** | **% Change** |
| Over Capacity Queues (congestion) | 1,931 | 2,276 | 2,228 | **-2.14%** |
| Total Travel Time (PCU hrs) | 32,712 | 33,356 | 33,251 | **-0.32%** |
| Average Speed km/hr | 41 | 40 | 40 | **0.25%** |

### There are minor reductions in total travel time and distance within both the AM and PM peak when compared to the With Development scenario.

### Congestion decreases by 1% in the AM and 2% in the PM. This decrease mitigates the impact of the Local Plan development highway impact by around 3% in the AM and 14% in the PM.

### Overall the public transport and active mode mitigation is having a small positive impact on the impact of the Ashfield Local Plan developments.

## Public Transport Patronage

### New bus and rail services introduced in the mitigation scenario are being well used across all three time periods. Table 11 shows the boarders on each service for each peak.

1. Boarders by Service – PT Mitigation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mode | Service | AM Boarders | Inter Peak Boarders | PM Boarders |
| Bus | Green Route | 71 | 39 | 97 |
| Bus | Blue Route | 248 | 151 | 224 |
| Bus | Red Route | 156 | 98 | 126 |
| **Total Bus Mitigation** |  | **474** | **288** | **447** |
| Rail | Mansfield to Leicester | 240 | 114 | 304 |
| Rail | Mansfield to Derby | 233 | 151 | 211 |
| **Total Rail Mitigation** |  | **473** | **265** | **515** |

### All three bus services are predicted to have good levels of patronage with the Blue and Red services gaining the greatest levels of patronage. This is to be expected as they service some of the larger new developments and connect to a larger number of town centers and public transport hubs.

### The Green service has slightly lower numbers as this service has a lower population concentration along the route.

### Both rail services have high levels of patronage across all peak periods.

## Summary

### Whilst the public transport and active mode mitigation measures are resulting in an increase in the travel by these sustainable modes, the effect on the highway network is minimal and has only a minor impact in mitigating the overall impact of the Local Plan developments on the highway network.

# Full Mitigation Analysis

## Introduction

### Building on the public transport and active mode mitigation a series of highway interventions were modelled to create the Full Mitigation scenario as detailed in 4.5.4, Table 7 and Table 8.

### Analysis plots have been undertaken, looking at the following impacts:

* Actual Flow – Total change in actual flow;
* Total Congestion Change – Total change in V/C%;
* Network Statistics – Key performance indicators; and
* Public Transport Patronage – Usage of new PT services.

## Highway Flow Change

### Figures 34 and 35 depict flow change between the With Development and the Full Mitigation scenario.

### The AM suggests that traffic is moving away from the small local roads onto the SRN (the M1) particularly for traffic heading northbound. There are reductions in traffic through Kirby-in-Ashfield and along the A611 (Derby Rad) heading to/from Mansfield. There is also a reduction in traffic travelling clockwise around Hucknall.

### In the PM peak there are some small reductions on the M1 between junctions 26 and 28 as traffic readjusts which junction it accesses the motorway from due to the increase in capacity at Junctions 27 and 28 allowing traffic to utilise a more direct route and use the most convenient junction. Traffic coming from junction 27 and along B6139 (Coxmoor Road) increases although there are also some notable decreases in vehicle movements around the Moorgreen area.

## Total Congestion Change

### Total congestion change for the Full Mitigation scheme are shown in figures 36 and 37.

### The AM congestion change plot shows a big reduction in congestion, most notably over 15%, in many locations. There are reductions at both junction 28 and junction 26 and many of the junction surrounding junction 26, which correlates with the increase in traffic using the M1. There are also decreases in congestion all around the Ashfield area. Increases can be seen in Ilkeston and north of Nottingham (Moorbridge).

### The PM follows a similar story as the AM with reductions around junction 26 and 28, however there are some wider improvements in Mansfield and Ravenshead. The mitigation to junction 27 on the M1 is resulting in a reduction in congestion at the actual junction but the junctions immediately to the east are showing an increase.

## Network Statistics

### Network statistics comparing the Reference case, With Development and Full Mitigation are displayed in Table 12 and Table 13. These tables show the % mitigated, which shows how far the mitigation proposal has taken the statistics back to the reference case. It is worked out by taking the difference between the reference case and the two scenarios and then dividing the totals by one another.

1. AM Network Statistics – Full Mitigation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| AM | ReferEnce Case | With Development | Full Mitigation | Effect of FUll Mitigation |
| Over Capacity Queues (congestion) | 1,394 | 2,136 | 1,979 | **21%** |
| Total Travel Time | 31,425 | 32,496 | 32,457 | **4%** |
| Average Speed | 41 | 39 | 39 | **7%** |

1. PM Network Statistics – Full Mitigation

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PM | Reference Case | With Development | Full Mitigation | Effect of FUll Mitigation |
| Over Capacity Queues (congestion) | 1,931 | 2,276 | 2,074 | **58%** |
| Total Travel Time | 32,712 | 33,356 | 33,310 | **7%** |
| Average Speed | 41 | 40 | 40 | **25%** |

### In the AM the mitigation has a positive impact on congestion with small reductions in over capacity queues and travel time. However the highway mitigation provides more benefit in the PM peak with 58% of the congestion on the network mitigated.

### It is difficult to achieve higher levels of mitigation due to the strategic nature of this assessment and also the fact that the remaining increases in congestion are spread over a significant area and constitute small increases at junctions in the immediate vicinity of the individual development sites. Further mitigation will be achieved during the detailed application stage when local junction improvements are likely to be required to accommodate the individual sites.

## Public Transport Patronage

### New bus and rail services introduced in the Full Mitigation scenario are being well used across all three time periods. Table 14 shows the boarders on each service for each peak.

1. Boarders by Service

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mode | Service | AM Boarders | IP Boarders | PM Boarders |
| Bus | Green Route | 74 | 39 | 115 |
| Bus | Blue Route | 248 | 154 | 229 |
| Bus | Red Route | 154 | 94 | 123 |
| **Total Bus Mitigation** |  | **476** | **288** | **467** |
| Rail | Mansfield to Leicester | 238 | 115 | 300 |
| Rail | Mansfield to Derby | 232 | 152 | 210 |
| **Total Rail Mitigation** |  | **470** | **267** | **509** |

### PT patronage along those routes implemented within the PT Mitigation see a small reduction as improvements to the highway make public transport less attractive for some journeys.

# Overall Conclusions

## Study Overview

### SYSTRA has been commissioned by Ashfield District Council to undertake a strategic transport assessment to support the Ashfield Local Plan in a 2040 future year using the East Midlands Gateway Model (EMGM).This document reports the methodology and outputs for the transport assessment of the Ashfield Local Plan developments and their associated mitigation measures which have been developed in conjunction with Nottinghamshire County Council and National Highways.

## 2040 No Local Plan Scenario

### A 2040 Reference Case has been developed for the assessment of the Ashfield Local Plan developments. The Reference Case represents information about the ‘most likely’ future year scenario taking into account planning permissions and allocations to date (August 2021) but excluding the developments associated with the Ashfield Local Plan.

### In 2040 within Ashfield and surrounding areas there is significant congestion on the local and strategic highway network as a result of general growth and development outside the Ashfield area. This includes the M1 junctions 27 and 28 and the critical A38 corridor as well as routes around the core towns of Hucknall, Sutton in Ashfield and Kirkby in Ashfield.

## With Local Plan Scenario – No mitigation

### The Ashfield Local Plan includes a large number of residential and employment developments scattered over a very broad area. The current proposals includes 7,068 planned residential properties and 97.11ha of employment.

### The introduction of this level of development is predicted to have a significant impact in terms of congestion on the already congested strategic and main road networks which could lead to increased use of the minor road network by ‘rat running’ traffic trying to avoid this congestion on these routes.

### A detailed assessment of the impacts of the additional highway generations has identified areas of the network where mitigation measures (public transport, active mode and highway) will be required to reduce the overall impact of the local plan developments and encourage traffic to utilise the appropriate routes for their journeys.

## Public Transport and Active Mode Mitigation

### Three new bus routes/extensions to existing routes have been identified to service the development demand to and from public transport hubs and towns within Ashfield with the aim of connecting people to the rail and NET services which provide access to the wider East Midlands and beyond.

### Alterations to the rail network have also been introduced, with two new services running between Mansfield and Leicester and Mansfield and Derby using the proposed Maid Marian line which is being promoted by a number of local organisations including Nottinghamshire County Council.

### To encourage a switch to pedestrian and cycling it has been proposed that additional infrastructure be developed on key routes to link the developments to public transport hubs and facilities within local towns.

### Whilst the public transport and active mode mitigation measures are resulting in an increase in the travel by these sustainable modes, the effect on the highway network is minimal and has only a minor impact in mitigating the overall impact of the Local Plan developments on the highway network.

## Full Mitigation

### Building on the public transport and active mode mitigation a series of highway interventions have been included in the overall mitigation package to include junction capacity enhancements (additional lanes, signalisation schemes etc.) and traffic management schemes to deter minor routes being used as ‘rat runs’ and encourage traffic back to the major and strategic road networks.

### The full mitigation which was a combination of Public transport, active modes and highway mitigation reduced congestion levels and successfully removed some traffic from small local roads onto the strategic and major road routes.

### The mitigation has had an overall positive effect with the AM peak recording 21% over capacity queue mitigation and the PM peak 58% over capacity queue mitigation. However the mitigation did not completely mitigate the impact of the local plan developments as the network is heavily congested by 2040.

### Whilst the proposed mitigation package does not fully mitigate the overall impacts of the Local Plan developments, it is difficult to achieve higher levels of mitigation due to the strategic nature of this assessment and also the fact that the remaining increases in congestion are spread over a significant area and constitute small increases at junctions in the immediate vicinity of the individual development sites. Further mitigation will be achieved during the detailed application stage when local junction improvements are likely to be required to accommodate the individual developments.

### There are also schemes identified in this mitigation package that provide significant benefit to adjacent areas outside of Ashfield and will act as potential mitigation for Local Plans in these areas (including Mansfield, Amber Valley, Erewash, Gedling and Nottingham). Therefore the costs of implementing these schemes should be shared between these areas. These are mainly related to the improvements to the M1 junctions and also the A38 as well as the Maid Marion Line rail services, but could also apply to other major road improvements that have been proposed.

SYSTRA provides advice on transport, to central, regional and local government, agencies, developers, operators and financiers.

A diverse group of results-oriented people, we are part of a strong team of professionals worldwide. Through client business planning, customer research and strategy development we create solutions that work for real people in the real world.

For more information visit www.systra.co.uk

**Birmingham – Newhall Street**  
5th Floor, Lancaster House, Newhall St,

Birmingham, B3 1NQ  
T: +44 (0)121 393 4841

**Birmingham – Edmund Gardens**  
1 Edmund Gardens, 121 Edmund Street,

Birmingham B3 2HJ

T: +44 (0)121 393 4841

**Dublin**  
2nd Floor, Riverview House, 21-23 City Quay  
Dublin 2,Ireland  
T: +353 (0) 1 566 2028

**Edinburgh – Thistle Street**  
Prospect House, 5 Thistle Street, Edinburgh EH2 1DF   
United Kingdom   
T: +44 (0)131 460 1847

**Glasgow – St Vincent St**  
Seventh Floor, 124 St Vincent Street  
Glasgow G2 5HF United Kingdom   
T: +44 (0)141 468 4205

**Glasgow – West George St**  
250 West George Street, Glasgow, G2 4QY  
T: +44 (0)141 468 4205

**Leeds**

100 Wellington Street, Leeds, LS1 1BA

T: +44 (0)113 360 4842

**London**  
3rd Floor, 5 Old Bailey, London EC4M 7BA United Kingdom

T: +44 (0)20 3855 0079

**Manchester – 16th Floor, City Tower**16th Floor, City Tower, Piccadilly Plaza  
Manchester M1 4BT United Kingdom   
T: +44 (0)161 504 5026

**Newcastle**Floor B, South Corridor, Milburn House, Dean Street, Newcastle, NE1 1LE  
United Kingdom   
T: +44 (0)191 249 3816

**Perth**  
13 Rose Terrace, Perth PH1 5HA

T: +44 (0)131 460 1847

**Reading**  
Soane Point, 6-8 Market Place, Reading,

Berkshire, RG1 2EG  
T: +44 (0)118 206 0220

**Woking**Dukes Court, Duke Street  
Woking, Surrey GU21 5BH United Kingdom   
T: +44 (0)1483 357705

**Other locations:**

**France:**

Bordeaux, Lille, Lyon, Marseille, Paris

**Northern Europe:**

Astana, Copenhagen, Kiev, London, Moscow, Riga, Wroclaw

**Southern Europe & Mediterranean: Algiers, Baku, Bucharest,** Madrid, Rabat, Rome, Sofia, Tunis

**Middle East:**

Cairo, Dubai, Riyadh

**Asia Pacific:**

Bangkok, Beijing, Brisbane, Delhi, Hanoi, Hong Kong, Manila, Seoul, Shanghai, Singapore, Shenzhen, Taipei

**Africa:**

Abidjan, Douala, Johannesburg, Kinshasa, Libreville, Nairobi

**Latin America:**

Lima, Mexico, Rio de Janeiro, Santiago, São Paulo

**North America:**

Little Falls, Los Angeles, Montreal, New-York, Philadelphia, Washington

