TECHNICAL NOTE

MANSFIELD LOCAL PLAN

STRATEGIC TRANSPORT IMPACT ASSESSMENT

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TABLE OF CONTENTS

NON-TECHNICAL SUMMARY		**3**
1.	**INTRODUCTION**	**6**
2.	**THE EAST MIDLANDS GATEWAY MODEL**	**7**
2.1	**MODEL OVERVIEW**	**7**
3.	**LOCAL PLAN SCENARIO: INPUT ASSUMPTIONS**	**10**
3.1	**INTRODUCTION**	**10**
3.2	**DEVELOPMENT LOCATIONS**	**10**
3.3	**DEVELOPMENT QUANTUMS**	**11**
3.4	**INFRASTRUCTURE ASSUMPTIONS**	**16**
3.5	**GROWTH OUTSIDE OF MANSFIELD DISTRICT**	**16**
4.	**LOCAL PLAN SCENARIO: OUTPUT ANALYSIS**	**17**
4.1	**INTRODUCTION**	**17**
4.2	**GENERATED PERSON TRIPS AND MODE SHARES**	**17**
4.3	**KEY HIGHWAY IMPACTS**	**19**
4.4	**NETWORK STATISTICS**	**27**
4.5	**LOCAL PLAN SCENARIO CONCLUSION**	**28**

5.	**WITH MITIGATION SCENARIO: INPUT ASSUMPTIONS**	**33**
5.1	**INTRODUCTION**	**33**
5.2	**PROPOSED DEMAND MANAGEMENT AND ACTIVE MODE MEASURES**	**33**
5.3	**PROPOSED PUBLIC TRANSPORT MEASURES**	**35**
5.4	**PROPOSED HIGHWAY MEASURES**	**38**
6.	**WITH MITIGATION SCENARIO: OUTPUT ANALYSIS**	**44**
6.1	**INTRODUCTION**	**44**
6.2	**PHASE 1 (DEMAND, ACTIVE MODE AND PUBLIC TRANSPORT MITIGATION)**	**44**
6.3	**PHASE 2 (FULL MITIGATION PACKAGE)**	**50**
7.	**STUDY CONCLUSIONS**	**63**

APPENDIX 1 – MODEL VALIDATION REPORT

APPENDIX 2 – FORECASTING REPORT

NON-TECHNICAL SUMMARY

Introduction

Strategic transport modelling has been undertaken to support the preparation of Mansfield District Council's Local Plan Review. The purpose of this work is twofold: firstly, to assess the strategic transport impacts arising from the development proposed within the Local Plan; and secondly, to evaluate the extent to which the identified mitigation measures may reduce those strategic transport impacts.

The transport modelling has been undertaken using the East Midlands Gateway Model (EMGM), which is the established multi-modal strategic transport model covering the East Midlands area. Following a prior review and refinement of the model, the assessment of the Local Plan was carried out through a structured four-stage process, comprising the development of a 2043 No Local Plan Scenario, a 2043 Local Plan Scenario, the formulation of a mitigation strategy and the subsequent testing of that mitigation within the 2043 Local Plan Scenario to assess to what extent mitigation can help offset the strategic transport impacts of the developments associated with the Local Plan.

Modelling Methodology

Stage 1 of the assessment comprised the preparation of a 2043 No Local Plan Scenario. This scenario represents the forecast position in terms of development build-out at the end of the Local Plan period (2043). This scenario includes committed development and infrastructure proposals outside Mansfield District, together with relevant background growth to 2043 levels. Within Mansfield District, the No Local Plan Scenario includes only developments, or parts of developments, that have been constructed by 2023, as well as developments not forming part of the Local Plan. This enables the strategic transport impacts of the Local Plan to be isolated and assessed.

Stage 2 comprised the preparation of a 2043 Local Plan Scenario. This scenario includes residential and employment developments proposed as part of the Local Plan. This development was represented in the model through the inclusion of new model zones and associated connections to the highway and public transport networks, based on reasonable assumptions and likely access arrangements for the proposed sites at a strategic level.

*Stage 3 involved the development of a transport mitigation strategy. This was informed by the Stage 2 modelling outputs and structured around the principles of "**Avoid, Shift, Manage and Mitigate**". The **Avoid** principle seeks to reduce the need to travel, particularly by private car, through the promotion of compact and connected development that enables the day-to-day needs of the resident population to be met locally. The **Shift** principle seeks to encourage a move towards more sustainable modes of transport, including walking, cycling and public transport, through measures that improve accessibility to these modes of travel. The **Manage and Mitigate** principle focuses on targeted interventions to the highway and public transport networks to address many of the residual impacts once travel demand reduction and modal shift opportunities were maximised.*

Stage 4, the final stage, comprised the incorporation into the Local Plan Scenario of transport mitigation schemes, in which the identified package of active travel, public transport and highway mitigation measures was incorporated to test the likely extent to which the strategic transport impacts of the Local Plan may be able to be offset.

Assessment Findings

The Stage 1 2043 Local Plan Scenario modelling demonstrates that by 2043, in the absence of any growth associated with this Local Plan, there will be modest levels of junction congestion across the surrounding local and strategic transport networks from increases in traffic volumes between 2023 and 2043. This reflects the constraint of the EMGM to TEMPro levels of growth over the same period. Several junctions are forecast to be operating close to or above capacity in the absence of any growth associated with the Local Plan, for example along the A38, A60 and A6191 corridors. This indicates that the baseline transport position features network stress, driven by background traffic growth to 2043 levels and existing development commitments, with consequential delays and congestion on the local and strategic transport networks.

The inclusion of Local Plan development in Mansfield District worsens conditions on the highway network. Given that some junctions were already forecast to be operating at or near capacity without the addition of any Local Plan development, relatively modest increases in traffic associated with the Local Plan give rise to a general deterioration in the operating performance of the transport network in congestion and other related impacts. These impacts are not confined to the areas immediately adjacent to the proposed Local Plan development sites, but are also distributed more widely across the network, reflecting the cumulative and strategic nature of traffic movements within the District and the wider area.

Mitigation Strategy

The extent of the mitigation strategy developed in Stage 3 reflects the impacts identified in Stage 2. The mitigation measures were identified by MDC alongside consultation with stakeholders. In some locations, opportunities for significant junction capacity enhancements are limited by physical constraints, surrounding development and the nature of the urban environment in Mansfield District.

Accordingly, the mitigation approach places greater emphasis on enhancing non-car travel options first, improving public transport provision, supporting active travel, and introducing demand management measures, rather than relying primarily on major highway widening, signalisation or junction enlargement schemes. This approach is consistent with the DfT's and Mansfield District Council's sustainable transport objectives and reflects the practical and financial limitations of providing large-scale highway capacity improvement schemes.

With Mitigation Modelling Outcomes

The Stage 4 modelling indicates that the proposed mitigation package would provide a high level of Local Plan impact relief, in strategic transport terms, when compared to the scenario without mitigation included. In terms of congestion relief delivered by the mitigation package in the AM peak, 88% of Local Plan-related congestion impacts are mitigated, and in the PM peak, 72% of Local Plan-related congestion impacts can be mitigated.

Conclusions

The strategic transport modelling demonstrates that the Local Plan's development proposals will inevitably result in additional transport impacts, including some increased congestion on the highway network. However, these effects arise within the context of a transport network that is already forecast to experience increases in congestion between 2023 and 2043 in the absence of any Local Plan development. The modelling therefore indicates that the Local Plan adds to an already congested baseline position, rather than creating congestion in isolation solely due to its development proposals.

The proposed mitigation measures would likely in many areas improve the forecast position relative to a scenario in which no mitigation is provided, but they would not eliminate the impacts of Local Plan-related development completely. This reflects both the extent of existing and forecast background congestion and the constrained nature of many corridors and junctions within the District and the wider area.

The study has shown that with the full package of mitigation measures, including highway mitigation, the congestion impacts of the Local Plan can be mitigated by 88% in the AM peak and by 72% in the PM peak. Key corridors within Mansfield District which have been shown to experience decreases in congestion as a result of the implementation of the full package of mitigation measures are along the A60 and A6191 corridors.

Having regard to paragraph 11B of the NPPF 2024, the assessment indicates that the Local Plan has positively sought to address the cumulative transport effects of development through a coordinated package of mitigation measures. While some residual impacts remain, the strategic modelling shows that a substantial proportion of Local Plan-related congestion impacts can be mitigated, and the evidence supports the view that the residual cumulative impacts would not reasonably be characterised as severe in strategic transport terms. The strategic assessment also does not identify a basis for concluding that the Local Plan would, in principle, result in an unacceptable impact on highway safety, although any detailed site-specific safety considerations would remain for subsequent assessment where necessary.

The assessment recognises that, given the extent of existing congestion, the dispersed nature of network impacts and the scale of background growth, it is difficult to apportion individual mitigation measures directly to individual development sites. The mitigation strategy must therefore be understood as a package of coordinated interventions responding to cumulative and strategic effects across the whole transport network.

It is important to recognise that, while strategic transport models such as the EMGM provide a robust indication of likely network-wide transport impacts, there are locations where a more detailed understanding of operational performance would be beneficial. In these instances, microsimulation modelling can provide a more refined assessment of local transport impacts. This allows for a clearer understanding of site-specific effects, particularly in areas where congestion or queuing may require more detailed analysis.

1. INTRODUCTION

1.1.1 Mansfield District Council is preparing a Local Plan Review for implementation across the District up to 2043. It will identify a preferred strategy in terms of housing and employment growth within the District and set out policies to deliver sustainable growth.

1.1.2 SYSTRA has been commissioned to undertake an assessment of the strategic transport impacts of the Local Plan Review. This will provide an indication of whether the development proposals are feasible in strategic transport terms and if so, what strategic mitigation could be implemented to accommodate the proposals given their strategic transport impacts.

1.1.3 This assessment is undertaken using the East Midlands Gateway Model (EMGM). The EMGM is a multimodal transport model built following the guidance in the Department for Transport's (DfT) Transport Analysis Guidance (TAG). The model was fully calibrated and validated in line with TAG guidance in 2018 and has a base year of 2016. It has since been used for a variety of studies, including Local Plan assessments, development assessments, DfT-compliant business cases and regional growth strategy studies.

1.1.4 To ensure that the EMGM is fit for purpose for the Mansfield Local Plan assessment, the model was expanded and revalidated within the Mansfield District area. Details of this process are provided in the accompanying Model Validation Report[1], provided in Appendix 1.

1.1.5 The assessment year of this study is 2043, which allows for the Local Plan's proposed developments to be fully occupied and operational. A 2043 No Local Plan Scenario has been developed to assess the strategic transport impacts of the Mansfield Local Plan. A 2023 Baseline Scenario has also been developed for comparison purposes. The approach to developing these models and key outputs from them is provided in the accompanying Mansfield Local Plan - Forecasting Report[2], provided in Appendix 2.

1.1.6 The purpose of this Technical Note is to detail:

- The assumptions and outputs from the 2043 Local Plan Scenario compared against the 2043 No Local Plan Scenario;
- From that comparison, the active mode, public transport and highway mitigation measures modelled to try and alleviate the impacts of Local Plan development;
- The outputs from the 2043 With Mitigation Local Plan Scenario compared against the 2043 Local Plan Scenario, and
- The studies overall conclusions on the Local Plan's impact on the strategic public transport and highway networks in Mansfield District and surrounds.

[1] Mansfield Local Plan - Model Validation Report v2.0.pdf, September 2024
[2] Mansfield Local Plan - Forecasting Report v2.1.pdf, May 2025

2. THE EAST MIDLANDS GATEWAY MODEL

2.1 Model Overview

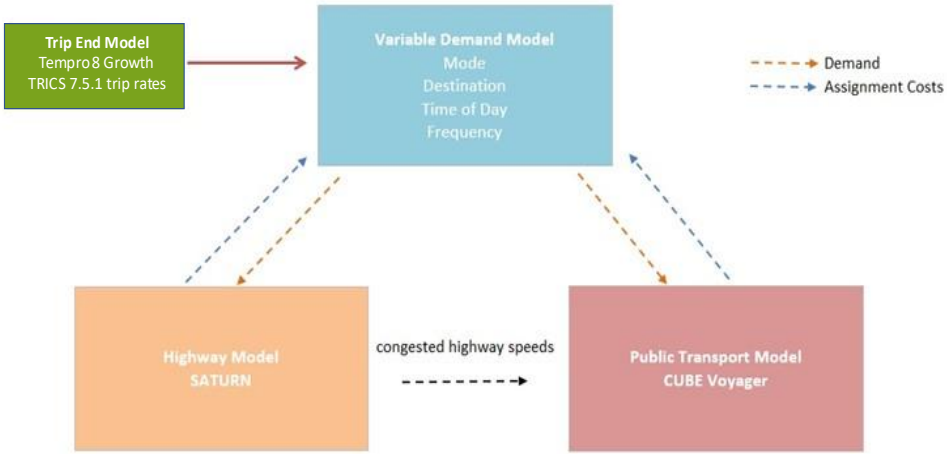
2.1.1 This assessment is undertaken using the East Midlands Gateway Model (EMGM). The EMGM was developed as a multimodal transport model following guidance in the DfT's Transport Analysis Guidance (TAG). It is fully simulated in an area covering Nottinghamshire, Derbyshire and North Leicestershire.

2.1.2 It was previously recalibrated and validated in line with TAG. To ensure that the EMGM is fit for purpose for this assessment, a review of the model was undertaken as part of this study in and around Mansfield District, and no issues were identified.

2.1.3 An overview of the structure of the EMGM is shown in Figure 1. In summary, the modelling suite is comprised of the following elements:

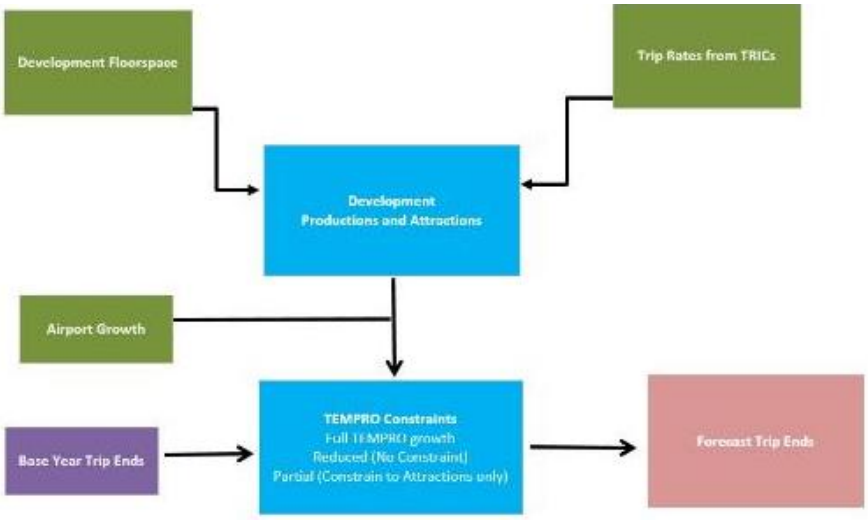
- SATURN Highway Model.
- Cube Voyager Public Transport Model.
- Cube Variable Demand Model including destination, mode choice, trip frequency and time of day responses.
- Park and Ride model.
- TRICS-based Trip End Model.

Figure 1. EMGM Technical Structure



2.1.4 Forecast demand is calculated in the Trip End Model, as in Figure 2.

Figure 2. Trip End Model Structure



2.1.5 The number of development trips is calculated from trip rates contained within TRICS. These are applied to floorspace, or the number of dwellings, proposed at each development. The development trips are added to the base year model's matrices, and then background growth is applied to the matrices in a way that ensures that the outturn growth matches the DfT's Trip End Model Presentation Program's (TEMPro 8.1) growth forecasts. Note, the EMGM is constrained to TEMPro growth.

2.1.6 Outturn generations for developments which have been entered specifically, closely align with the expected level of trip generation. Residual TEMPro growth is applied to surrounding wards within each MSOA and constrained at a District level.

2.1.7 Trip rates have been extracted from TRICS 7.5.1 for distinct types of land use and segmented by mode and time-period. The final person trip rates applied in the trip end model are shown in Table 1. These are provided in the accompanying Forecasting Report and, as per the development of all EMGM models, were agreed with the Local Authorities and National Highways for use in this assessment.

Table 1. EMGM Person Trip Rates

LAND USE	AM PEAK (08:00 – 09:00)			PM PEAK (17:00 – 18:00)		
	ARRIVAL	DEPARTURE	TOTAL	ARRIVAL	DEPARTURE	TOTAL
Residential house (per dwelling)	0.183	0.729	0.912	0.570	0.257	0.827
Residential flat (per flat)	0.074	0.295	0.369	0.231	0.104	0.335
B1 Employment (per 100sqm)	1.631	0.115	1.746	0.102	1.479	1.581
B2 Employment (per 100sqm)	0.388	0.145	0.533	0.081	0.375	0.456
B8 Employment (per 100sqm)	0.087	0.023	0.110	0.011	0.042	0.090
Primary Education (per 100sqm)	7.193	1.613	8.806	0.311	0.658	0.969
Secondary Education (per 100sqm)	2.341	0.256	2.597	0.066	0.634	0.700
College (Nottingham Skills Hub, per pupil)	0.359	0.017	0.376	0.031	0.069	0.100
Food Retail (per 100sqm)	3.518	2.624	6.142	6.558	6.887	13.445
Non-Food Retail (per 100sqm)	0.287	0.069	0.356	0.253	0.206	0.459
Café/Restaurant/Bar (per 100sqm)	0.000	0.000	0.000	6.256	2.874	9.130
Health Centre (Clinic) (per 100sqm)	1.952	0.355	2.307	0.124	0.805	0.929

3. LOCAL PLAN SCENARIO: INPUT ASSUMPTIONS

3.1 Introduction

3.1.1 The 2043 Local Plan Scenario includes all committed sites to 2043 levels of build-out and proposed site allocations associated with the new Mansfield Local Plan Review.

3.1.2 The 2043 Local Plan Scenario also includes a windfall allowance of 720 dwellings, with 90% (648 dwellings) spread evenly across the Mansfield urban area and 10% (72 dwellings) spread evenly across Warsop Parish.

3.1.3 In total, the 2043 Local Plan Scenario, relative to the No Local Plan Scenario, includes an additional:

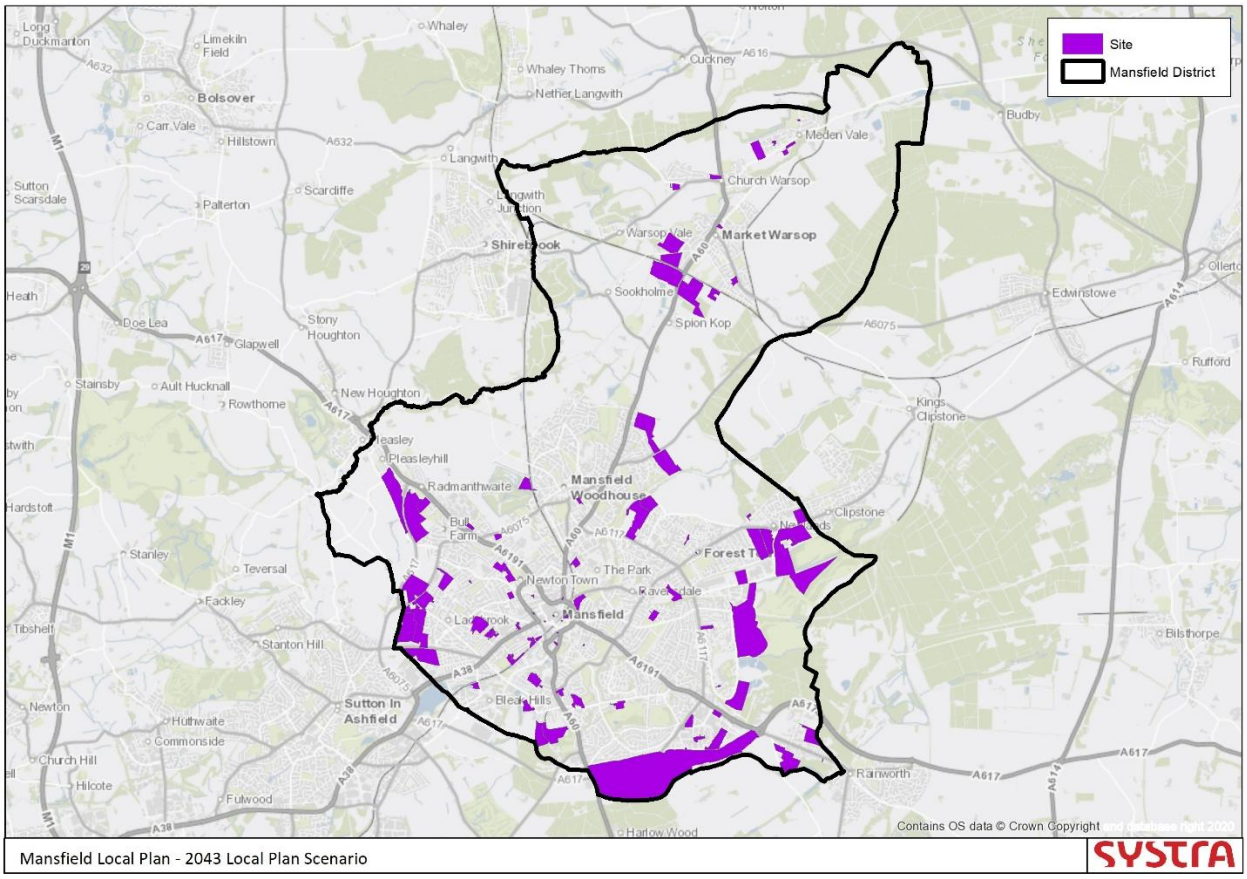
- **10,459** dwellings
- **53,400m²** B1 employment space
- **128,700m²** B2 employment space
- **134,100m²** B8 employment space

3.2 Development Locations

3.2.1 Figure 3 shows the approximate locations of all sites included in the 2043 Local Plan Scenario and which were not included in the 2043 No Local Plan Scenario.

3.2.2 Note, the Land at Berry Hill, Lindhurst (housing) site was included within the No Local Plan Scenario to its 2023 level of build-out, as detailed in the accompanying Forecasting Report. As with all other assessed sites, it is included to represent its full level of build-out in 2043 in the 2043 Local Plan Scenario.

Figure 3. Sites Assessed in the 2043 Local Plan Scenario vs No Local Plan Scenario



3.3 Development Quantums

3.3.1 For the sites marked in Figure 3, Table 2 details the quantum of housing and employment development that has been included in the 2043 Local Plan Scenario.

Table 2. Site Quantums Assessed in the 2043 Local Plan Scenario

DEVELOPMENT NAME	CLUSTER	HOMES	B1 (SQM)	B2 (SQM)	B8 (SQM)
Land at Berry Hill (Lindhurst)	n/a	1,700	36,000	72,000	72,000
Pleasley Hill Farm	n/a	850	3,600	7,200	7,200
Land off Jubilee Way	n/a	800	3,200	6,400	6,400
Stonebridge Lane / Sookholme Lane	n/a	400	0	0	0
Penniment Farm	n/a	372	2,900	17,800	17,800
Ratcher Hill Quarry	n/a	0	6,900	13,800	13,800
Oakfield Lane	n/a	0	0	11,000	11,000
Linney Group Limited, Tw 4 Bellamy Road	n/a	0	0	0	5,900
Trinity Methodists Church Clipstone Road West Forest Town	n/a	0	800	0	0
Mansfield Brick Crown Farm Way Forest Town	n/a	0	0	500	0
Land at Ashland Farm	n/a	350	0	0	0
Land off Peafield Lane	n/a	330	0	0	0
Clipstone Road East (Land south of Clipstone Road East (Land next to the pub))	n/a	313	0	0	0
Land off Mansfield Road (A60)	n/a	300	0	0	0
Land South East of Mansfield Road, Market Warsop	n/a	295	0	0	0
Land at Peafield Lane	n/a	254	0	0	0
Clipstone Road East (Clipstone Road East / Crown Farm Way (Next to Newlands roundabout)	n/a	197	0	0	0
Three Thorn Hollow Farm	n/a	190	0	0	0
Fields Farm, Abbott Road	n/a	183	0	0	0
Land off Helmsley Road, Rainworth	n/a	170	0	0	0
Marshalls	n/a	150	0	0	0
Clipstone Football Ground	n/a	130	0	0	0
Land north of Broomhill Lane	n/a	84	0	0	0
Centenary Road	n/a	77	0	0	0
Old Metal Box Site	n/a	74	0	0	0
Former Mansfield Sand Co	n/a	73	0	0	0

DEVELOPMENT NAME	CLUSTER	HOMES	B1 (SQM)	B2 (SQM)	B8 (SQM)
Gregory Quarry	n/a	64	0	0	0
Abbey Primary School	n/a	62	0	0	0
Land & Buildings at White Hart	n/a	60	0	0	0
Land to the rear of 28 High Oakham Hill	n/a	58	0	0	0
Former Sherwood Hall School	n/a	52	0	0	0
Football Ground Church Warsop Miners Phase 2	n/a	43	0	0	0
The Ridge	n/a	43	0	0	0
High Oakham Farm (east)	n/a	40	0	0	0
Land at Sherwood Street / Oakfield Lane	n/a	36	0	0	0
Land off Balmoral Drive	n/a	35	0	0	0
Land off Forest Road	n/a	35	0	0	0
Ladybrook Lane / Tuckers Lane	n/a	33	0	0	0
South of Debdale Lane	n/a	32	0	0	0
Hermitage Mill	n/a	31	0	0	0
Land at High Oakham House	n/a	28	0	0	0
Moorfield Farm	n/a	25	0	0	0
Clerkson House, Clerkson Street	n/a	20	0	0	0
Land Rear of Berry Hill Hall	n/a	20	0	0	0
Forest Edge, 19 Oak Tree Lane	n/a	19	0	0	0
Former Strand cinema	n/a	19	0	0	0
Land off Holly Road	n/a	16	0	0	0
Land at the corner of Newgate Lane & Gladstone Street	n/a	13	0	0	0
19-21 Market Place	n/a	12	0	0	0
Land North of Church Hill Avenue	n/a	12	0	0	0
Toothill Lane Car Park (south)	n/a	11	0	0	0
Grove Street Car Park	n/a	10	0	0	0
North Nottinghamshire Business Centre, 32 Rosemary Street	n/a	10	0	0	0
37 Stockwell Gate	n/a	9	0	0	0

DEVELOPMENT NAME	CLUSTER	HOMES	B1 (SQM)	B2 (SQM)	B8 (SQM)
Land at Spencer Street	n/a	9	0	0	0
53 Cromwell Street	n/a	7	0	0	0
Adj 188, Southwell Road East	n/a	7	0	0	0
Land adj 27, Redgate Street	n/a	7	0	0	0
Land adjacent Ravensdale Hotel	n/a	7	0	0	0
Shirland Drive Boiler House	n/a	7	0	0	0
2 West Hill Drive	n/a	6	0	0	0
Land at Lindley Street	n/a	6	0	0	0
Land to the North East of Woodview Gardens	n/a	6	0	0	0
Land North of Jenford Street	**A**	120	0	0	0
Kirkland Avenue Allotments	**A**	42	0	0	0
Former Mansfield Hosiery Mill Car Park & Electricity Board workshops & social club	**A**	29	0	0	0
Former Portland Mill Site, Victoria Street	**B**	73	0	0	0
Former Victoria Court Flats	**B**	62	0	0	0
Land astride Victoria Street	**B**	41	0	0	0
Land adjacent 125 Princes Street	**B**	12	0	0	0
Land at Redruth Drive	**C**	156	0	0	0
Land off Sherwood Oaks Close	**C**	44	0	0	0
Bellamy Road	**C**	40	0	0	0
Egmanton Road	**C**	22	0	0	0
Land off Skegby Lane	**D**	218	0	0	0
Land North of Skegby Lane	**D**	150	0	0	0
Land off Netherfield Lane	**E**	107	0	0	0
The Three Lions	**E**	30	0	0	0
Welbeck Farm	**E**	18	0	0	0
Melville Court	**E**	13	0	0	0
Former Meden Vale Village Hall	**E**	5	0	0	0
Land at Rosebrook Primary School	**F**	134	0	0	0

DEVELOPMENT NAME	CLUSTER	HOMES	B1 (SQM)	B2 (SQM)	B8 (SQM)
Abbott Road	**F**	102	0	0	0
The Local Inn, Armstrong Road	**F**	5	0	0	0
Land North of Old Mill Lane	**G**	250	0	0	0
Land at New Mill Lane	**G**	120	0	0	0
Land South of Clipstone Road East / East of Crown Farm Way	**H**	315	0	0	0
Bridleways Guest House and Holiday Homes	**H**	5	0	0	0
TOTAL	**n/a**	**10,315**	**53,400**	**128,700**	**134,100**

3.3.2 There are three methods through which these developments have been included in the 2043 Local Plan Scenario.

- **Explicitly Modelled:** Developments of at least 180 dwellings (or those that are of an equivalent size in terms of trip generation from their employment land uses) are explicitly modelled as sites in the model.
- **Modelled by Clustering:** Sites which do not meet this threshold, but which are adjacent to one or more other sites in strategic modelling terms, can be clustered together in the model (see Cluster IDs A-H in Table 2) such that they meet (or very nearly meet as with Cluster E) this threshold when modelled together. See Table 3 for a summary of the included quantums by cluster.
- **TEMPro 8 Growth Constraint:** All other sites which cannot be clustered together due to being in different locations in strategic terms, are included through application of the TEMPro 8 growth constraint, as detailed in the accompanying Forecasting Report.

3.3.3 Table 3 shows the total quantum of housing included in each development cluster, where developments have been modelled by clustering them together for strategic modelling.

Table 3. Homes Included in Clusters A-H

CLUSTER ID	HOMES
A	191
B	188
C	262
D	368
E	173
F	241
G	370
H	320

3.4 Infrastructure Assumptions

3.4.1 The infrastructure assumptions remain consistent with the 2043 No Local Plan Scenario and therefore the model includes transport infrastructure (public transport, active and highway) forecast to be operational in 2043.

3.5 Growth Outside of Mansfield District

3.5.1 The 2043 Local Plan Scenario has been constrained to include full 2043 TEMPro across the whole EMGM. Therefore, outside of Mansfield District, all committed and allocated housing and employment growth is consistent with the No Local Plan Scenario.

4. LOCAL PLAN SCENARIO: OUTPUT ANALYSIS

4.1 Introduction

4.1.1 This chapter examines the strategic transport impacts of the proposed Mansfield Local Plan, looking at the number of generated person trips, the distribution of highway trips, highway flows, junction congestion and overall network statistics. Comparisons are made against the 2043 No Local Plan Scenario.

4.2 Generated Person Trips and Mode Shares

4.2.1 Table 4 details the number of person trips being made to and from each development or cluster of developments and the mode share between highway, public transport and active modes (walking and cycling) in the 2043 Local Plan Scenario.

4.2.2 Active modes are not explicitly modelled by the EMGM but have been estimated post Variable Demand Model (VDM) run by analysing the same TRICS surveys upon which the EMGM's person trip rates are based to derive the percentage of trips likely to be made additionally by active modes.

4.2.3 Due to the strategic nature of the EMGM and this assessment, only those developments which have either been explicitly modelled or been modelled by clustering adjacent developments together can be assessed at this level of detail. Developments included through the application of the TEMPro 8 growth constraint are not assessed in this respect.

Table 4. Person Trips and Mode Shares by Development or Cluster

DEVELOPMENT NAME	AM PEAK TRIPS	PM PEAK TRIPS	HIGHWAY	PUBLIC TRANSPORT	ACTIVE
Land at Berry Hill (Lindhurst)	2,912	2,719	85%	3%	13%
Pleasley Hill Farm	971	895	83%	6%	11%
Land off Jubilee Way	896	829	82%	7%	11%
Stonebridge Lane / Sookholme Lane	400	366	84%	6%	10%
Penniment Farm	548	515	83%	6%	11%
Ratcher Hill Quarry	219	213	86%	3%	10%
Land at Ashland Farm	348	319	84%	6%	10%
Land off Peafield Lane	329	302	86%	3%	10%
Clipstone Road East (Land south of Clipstone Road East (Land next to the pub))	311	285	86%	3%	10%
Land off Mansfield Road (A60) AND Land South East of Mansfield Road, Market Warsop	595	545	84%	6%	10%
Land at Peafield Lane	253	232	86%	3%	10%
Clipstone Road East (Clipstone Road East / Crown Farm Way (Next to Newlands roundabout)	195	179	86%	3%	10%
Three Thorn Hollow Farm	187	172	83%	7%	10%
Fields Farm, Abbott Road	182	167	84%	6%	10%
Cluster A	190	174	84%	6%	10%
Cluster B	187	171	80%	10%	10%
Cluster C	258	237	83%	7%	10%
Cluster D	366	336	85%	5%	10%
Cluster E	173	159	85%	5%	10%
Cluster F	240	220	84%	6%	10%
Cluster G	367	337	86%	4%	10%
Cluster H	317	291	87%	3%	10%

4.2.4 The average mode split of person trips across the assessed developments and clusters is 84% by highway, 5% by public transport and 11% by active modes (walking and cycling, including e-scooters).

4.3 Key Highway Impacts

Distribution of Development Traffic

4.3.1 Figure 4 and Figure 5 show the distribution of all development traffic in the Local Plan Scenario. The development traffic uses a variety of roads across the District including:

- A38 Kings Mill Road East
- A60
- A617 Beck Lane
- A617 Sherwood Way South
- A617 Mansfield Road/Chesterfield Road
- A6117 Oak Tree Lane

4.3.2 There is also interaction with areas outside Mansfield District, with development traffic extending into Ashfield, Gedling and North Derbyshire.

Figure 4. Development Distribution Local Plan Scenario – AM

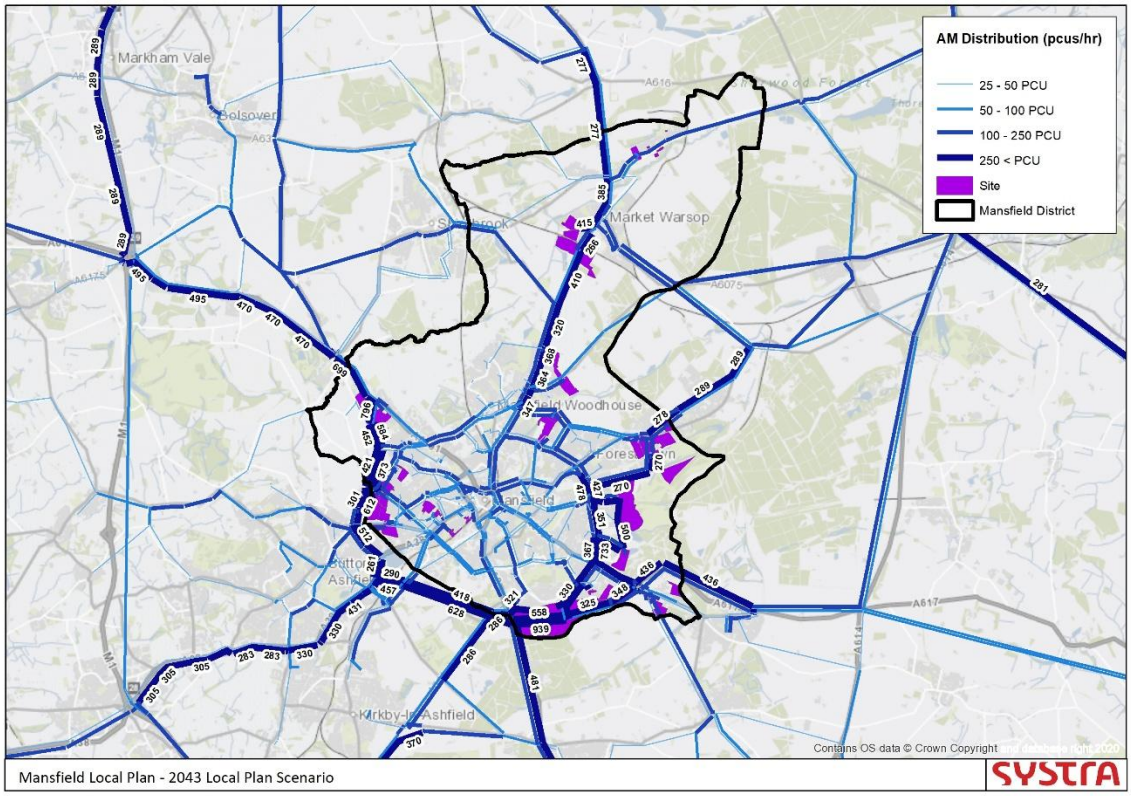
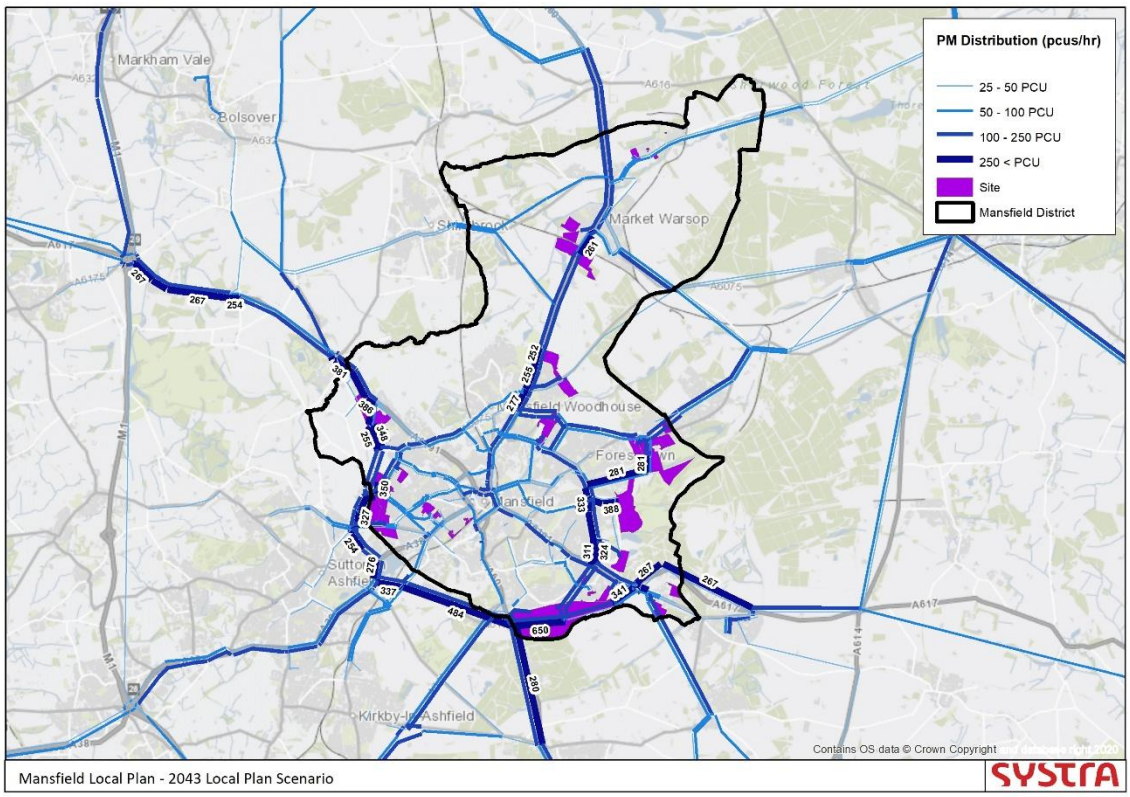


Figure 5. Development Distribution Local Plan Scenario – PM



Flow Change

4.3.3 Figure 6 and Figure 7 present the change in traffic between the 2043 No Local Plan Scenario and the Local Plan Scenario. Red lines indicate an increase in traffic and green lines represent roads with a reduction in flow.

4.3.4 In both peak hours there is an increase in traffic on roads surrounding Local Plan sites. In the east of the District, the A60, A6117 and B6030, which are close to many of the proposed Local Plan sites, experience increases in traffic in both peaks.

4.3.5 In the AM peak, there is a flow decrease along the A6117 (eastbound) corridor between Crown Farm Way and the A60 caused by congestion at the A60 / A6117 Old Mill Lane / Butt Lane junction, resulting partly from additional development traffic associated with the Local Plan proposals using this corridor. This impact is identified in the congestion analysis.

4.3.6 On the western side of Mansfield, flows are expected to increase along the A617 and along the A6191 Chesterfield Road South. There is also forecast to be an increase in traffic flows on local roads in the south-east of the District, reflecting the cluster of Local Plan sites adjacent to the A617, A6117 and A6191.

4.3.7 Outside of Mansfield District, there are small increases in flows on rural routes north of the District (generally less than 50 PCU) as non-Local Plan traffic is displaced onto alternative routes. There are also impacts on the A617, for example, through Glapwell and Bramley Vale, east of M1 Junction 29.

4.3.8 There are also increases in flows along the Strategic Road Network (SRN), particularly north of M1 Junction 29 where mainline flows increase in both directions. Overall, there is a greater use of M1 Junction 29 to access the wider SRN, with flows through M1 Junction 28 remaining relatively unchanged.

4.3.9 Flows along the A38 leading into M1 Junction 28 also do not change significantly in either peak, partially due to the already congested nature of the route before the Local Plan growth is added.

Figure 6. Highway Flow Change 2043 No Local Plan vs Local Plan Scenario – AM

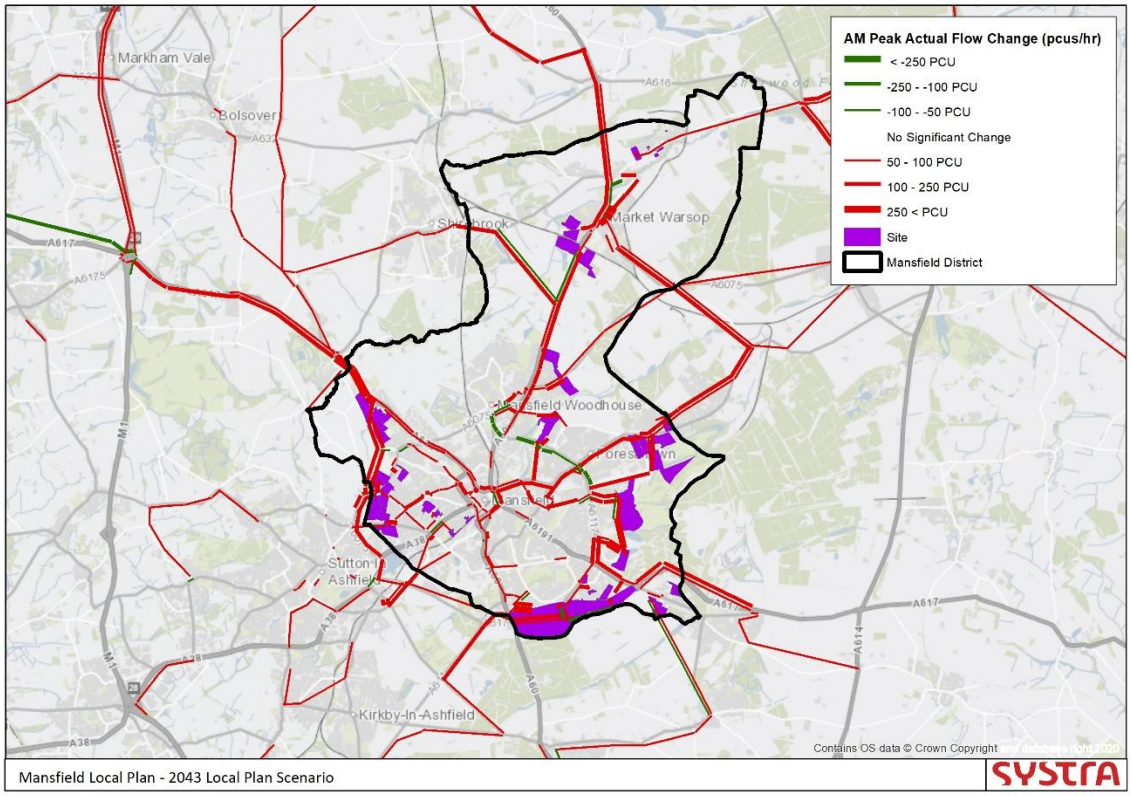
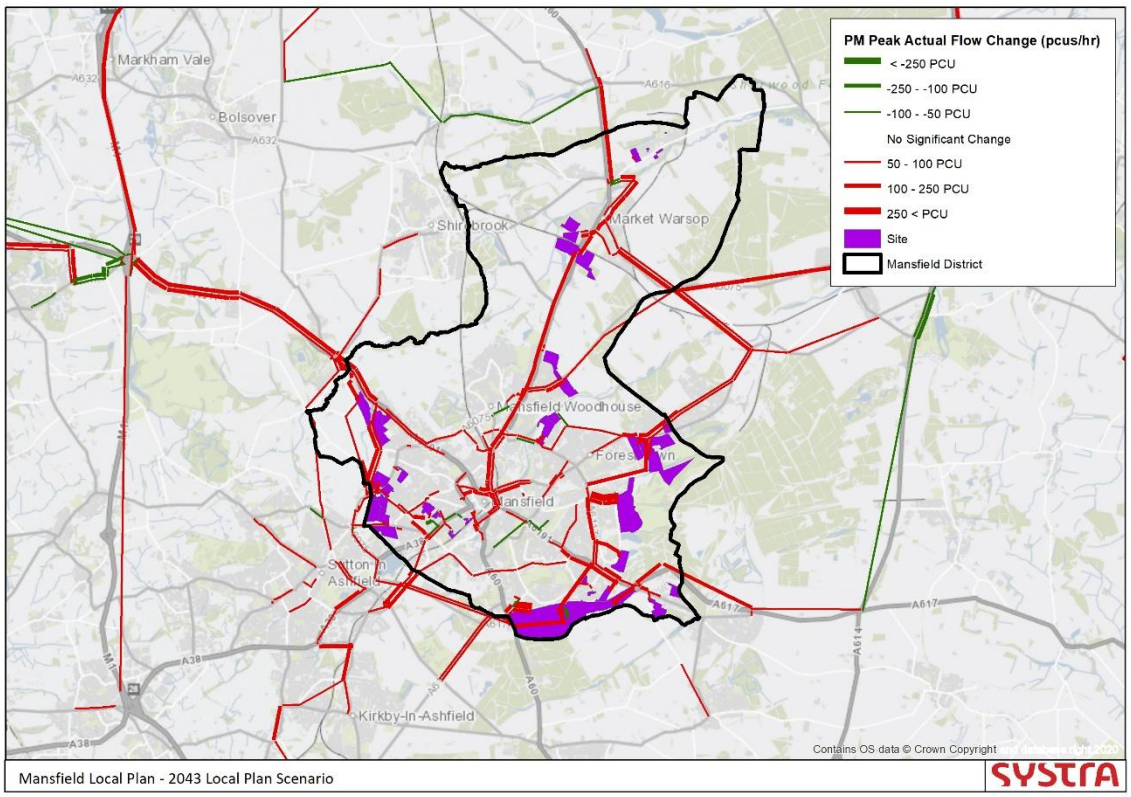


Figure 7. Highway Flow Change 2043 No Local Plan vs Local Plan Scenario – PM



4.3.10 Figure 8 and Figure 9 show the change in congestion between the 2043 No Local Plan and the Local Plan Scenario. The figures show the locations of all:

- Junctions which are already congested and forecast to experience a worsening (or improvement) in congestion in the Local Plan Scenario.
- Junctions where the Volume/Capacity (V/C) ratio is pushed over 85% as a result of the Local Plan Scenario.

4.3.11 Within Mansfield District, the following junctions experience congestion increases in the Local Plan Scenario:

- A60 / A6075 Warsop Road
- A60 / A6117 Old Mill Lane / Butt Lane
- A60 / A6191 Chesterfield Road South / Leeming Street
- A60 / Berry Hill Lane / Atkin Lane
- A60 / Bishops Walk
- A60 / Cauldwell Road / Old Newark Road
- A60 / Haddon Road
- A60 / Hetts Lane
- A60 / Robin Down Lane
- A60 / Sookholme Road
- A611 Derby Road / Cauldwell Road
- A617 / A6191 Chesterfield Road North
- A617 / A6191 Southwell Road West / B6020 Southwell Road East
- A617 / Water Lane
- A6075 / Brick Kiln Lane
- A6075 Abbott Road / Water Lane
- A6117 Oak Tree Lane / Jubilee Way South
- A6117 Pump Hollow Road / Coronation Drive
- A6117 Violet Hill / Eakring Road
- A6191 Ratcliffe Gate / Frederick Street
- A6191 Ratcliffe Gate / Newgate Lane
- A6191 Rock Hill / B6030 Windsor Road / Carter Lane

4.3.12 There are also increases in V/C at M1 Junction 29 in the AM peak due to additional traffic passing through the junction. These adverse impacts are not seen in the PM peak.

4.3.13 The A38 west of Mansfield shows an increase in congestion at the following junctions:

- A38 / Station Road
- A38 / Coxmoor Road
- A38 / A617 Sherwood Way South

4.3.14 This is partly due to the A38 being already at, or in some locations, over-capacity by 2043 and therefore being unable to accommodate any additional Local Plan traffic.

Figure 8. Change in Junction Congestion 2043 No Local Plan vs Local Plan Scenario – AM

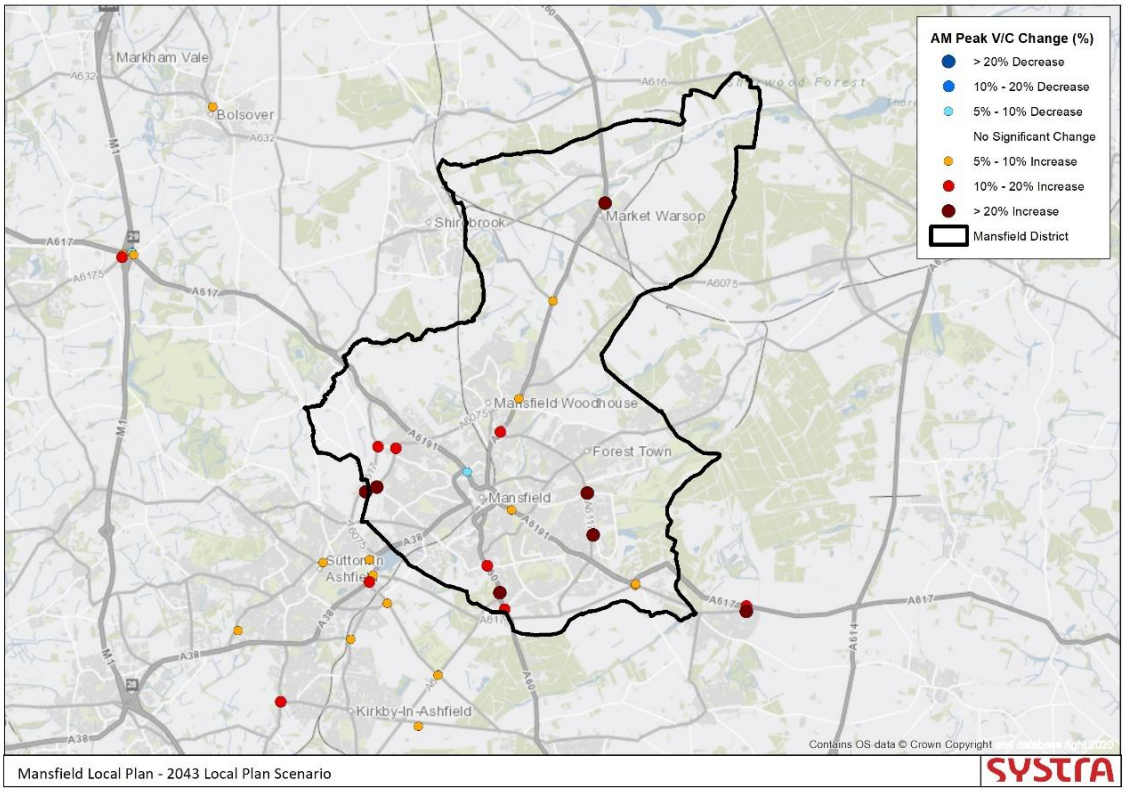
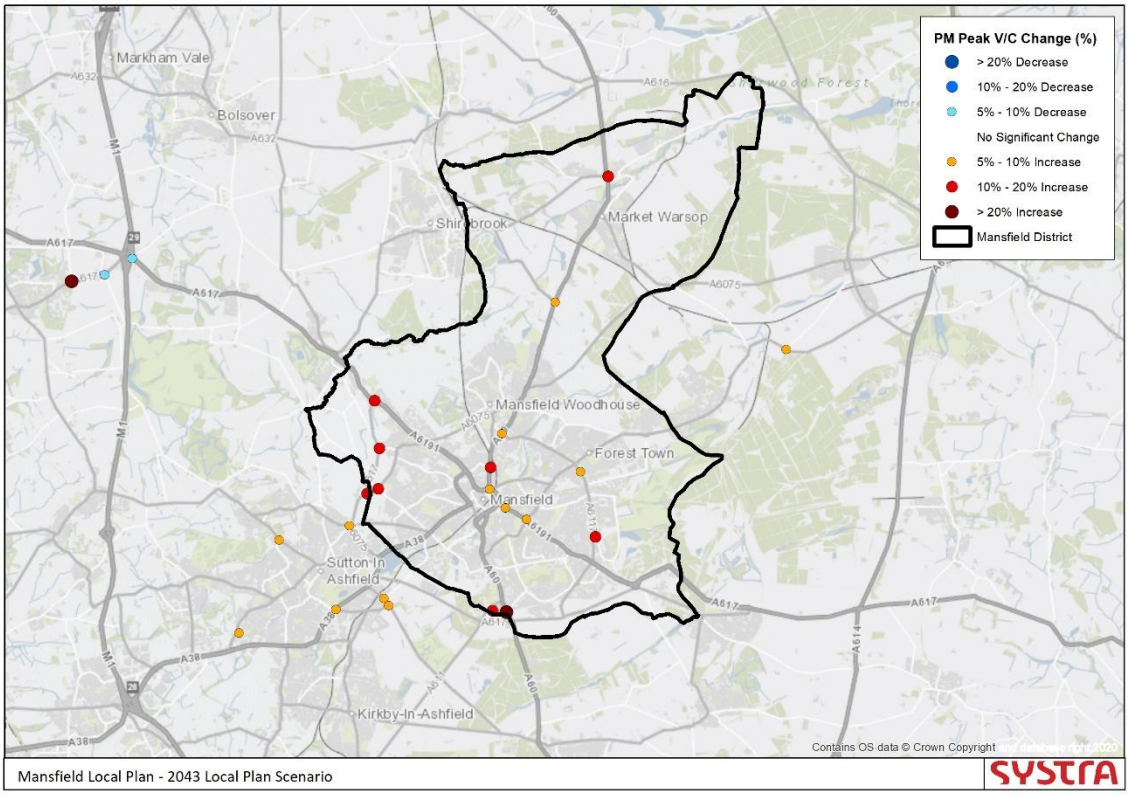


Figure 9. Change in Junction Congestion 2043 No Local Plan vs Local Plan Scenario – PM



4.3.15 Figure 10 and Figure 11 show the junctions which are forecast to have a maximum V/C ratio (%) of 75% or greater in the 2043 Local Plan Scenario. Yellow dots indicate junctions which are approaching the 85% V/C ratio threshold. Red dots represent junctions with a V/C over 85% but under 100% and are therefore considered congested. Brown dots indicate junctions severely congested with a V/C of at least 100%.

4.3.16 The A60, A38, A617 and A6117 all show significant levels of congestion in both peak hours. Further afield, there is congestion along the A38, at M1 Junction 28 and M1 Junction 29, along the A614 and along the A60 south of Mansfield.

Figure 10. Junction Congestion 2043 Local Plan Scenario – AM

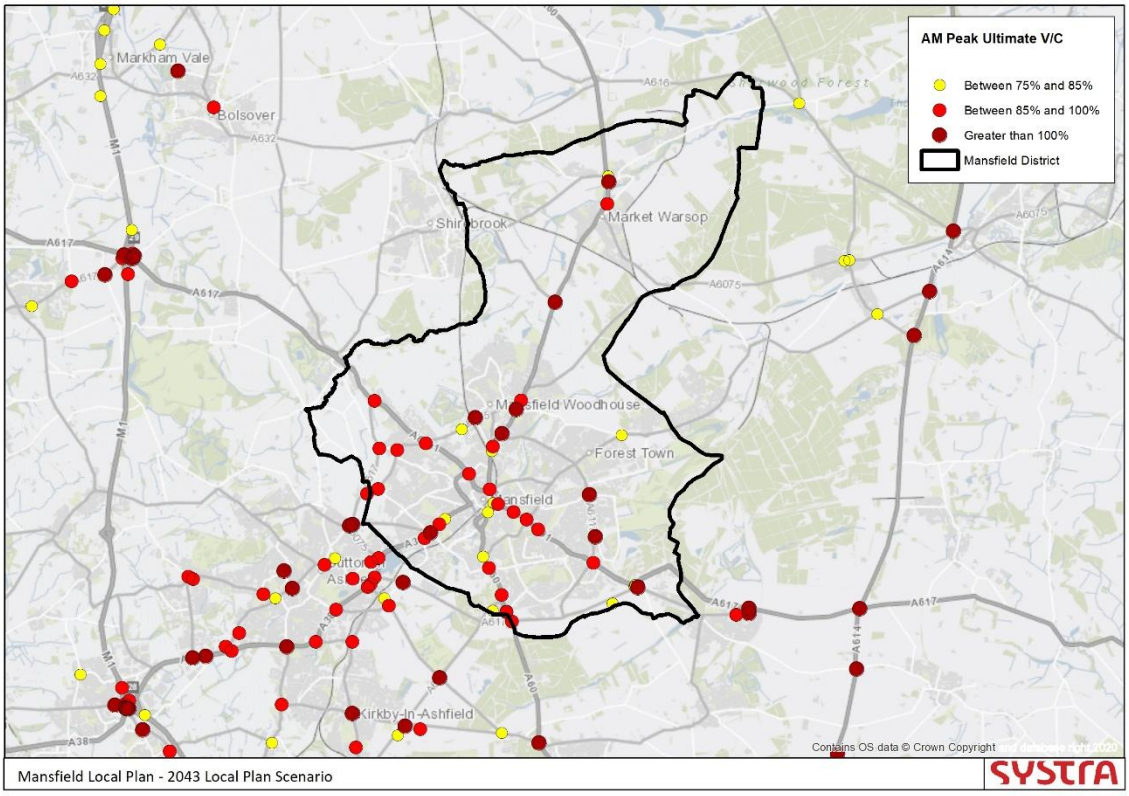
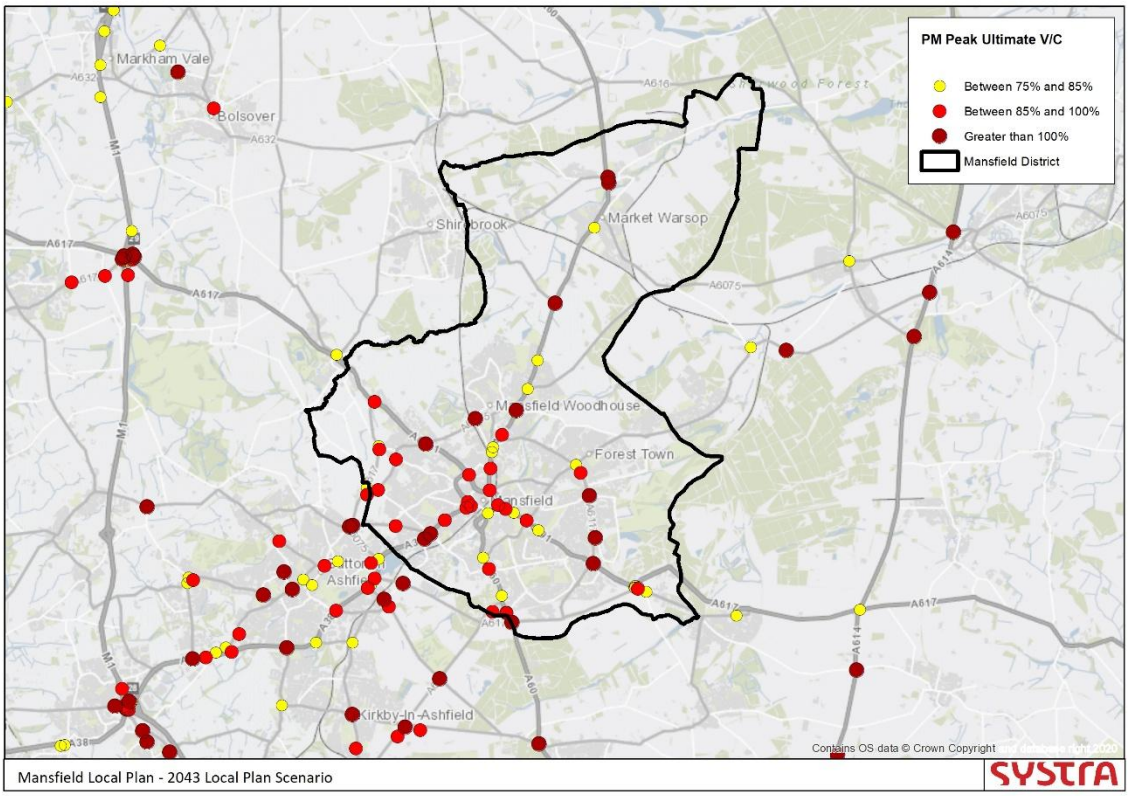


Figure 11. Junction Congestion 2043 Local Plan Scenario – PM



4.4 Network Statistics

4.4.1 Network statistics provide a way of gauging the overall impact from the addition of trips associated with the development sites. An explanation of the key indicators is as follows:

- Congestion / Over Capacity Queues – reflect the change in overall congestion and is the time spent queuing at junctions that are over capacity. As traffic levels increase, a growing number of junctions reach capacity and the time spent queuing at junctions can increase.
- Total Travel Time – across the highway network in passenger car unit (PCU) hours.
- Total Travel Distance – across the highway network in PCU kilometres.
- Average Speed – kilometres per hour, averaged for all traffic. Increased traffic levels lead to greater delays, potentially resulting in a lower average travel speed.

4.4.2 Network statistics for Mansfield District are provided in Table 5 and Table 6 for the AM and PM peaks, respectively.

Table 5. Network Statistics – AM Peak

INDICATOR	NO LOCAL PLAN SCENARIO	LOCAL PLAN SCENARIO	CHANGE (%)
Overcapacity Queues / Congestion (PCU hrs)	68	270	**294%**
Total Travel Time (PCU hrs)	4,655	5,487	**18%**
Total Travel Distance (PCU kms)	140,866	156,199	**11%**
Average Speed (km/h)	30	29	**-6%**

Table 6. Network Statistics – PM Peak

INDICATOR	NO LOCAL PLAN SCENARIO	LOCAL PLAN SCENARIO	CHANGE (%)
Overcapacity Queues / Congestion (PCU hrs)	87	262	**201%**
Total Travel Time (PCU hrs)	4,952	5,723	**16%**
Total Travel Distance (PCU kms)	146,293	159,905	**9%**
Average Speed (km/h)	30	28	**-5%**

4.4.3 In both peaks, there is an increase in congestion within Mansfield District (denoted by the overcapacity queues statistic), with increases in total travel time and total travel distance.

4.4.4 Congestion increases by **294%** in the AM peak and by **201%** in the PM peak. This is a function of both new traffic in the Local Plan Scenario experiencing the same congestion as existing traffic, plus additional congestion from more traffic being present on the network in the Local Plan Scenario. This translates into 16% to 18% increases in travel time and 5% to 6% reductions in travel speed.

4.5 Local Plan Scenario Conclusion

4.5.1 Local Plan traffic is forecast to use a range of roads across Mansfield District. The most affected routes include the A60, A617, A6191 and A6117 where flows are expected to mostly increase. There are also forecast to be increases in traffic flow along the SRN, particularly north of M1 Junction 29 in both directions. Overall, there is a greater use of, and associated congestion at, M1 Junction 29 which is used to access the wider SRN.

4.5.2 M1 Junction 28 remains relatively unchanged in transport impact terms, as do flows and congestion along the A38. This is because this section of road is already heavily congested before Local Plan growth is added and the road cannot easily accommodate further increases in traffic.

4.5.3 Overall, in the AM peak, across Mansfield District, network statistics indicate that there is an increase in congestion. This is a function of both new traffic in the Local Plan Scenario experiencing the same congestion as existing traffic, plus additional congestion from more traffic being present on the network in the Local Plan Scenario.

5. WITH MITIGATION SCENARIO: INPUT ASSUMPTIONS

5.1 Introduction

5.1.1 This chapter sets out the proposed transport mitigation strategy, supporting the delivery of the Local Plan to 2043. The mitigation measures were identified by MDC alongside consultation with stakeholders.

5.1.2 Where transport solutions are recommended, the strategy focuses on measures which facilitate high walking, cycling and public transport mode shares, with highway capacity interventions proposed in locations where other alternatives are either not viable or are considered unable to accommodate good levels of modal shift away from car travel.

5.1.3 To enable this approach, mitigation is assessed in two incremental phases, as detailed in Chapter 6:

- **Phase 1:** Demand management, active mode and public transport mitigation.
- **Phase 2:** Phase 1 plus local and strategic highway enhancements.

5.1.4 Estimated costs associated with each mitigation scheme are provided for indicative purposes only. These are based on SYSTRA's experience of scheme design and other Local Plan studies.

5.2 Proposed Demand Management and Active Mode Measures

Compact and Connected Neighbourhoods

5.2.1 In this study, and in other Local Plan studies recently assessed by SYSTRA for other Local Authorities in Nottinghamshire, Compact and Connected Neighbourhoods are defined as developments located within 500-800m of an existing or proposed town or local centre, or developments delivering more than 1,000 dwellings (or fewer for mixed-use sites where employment uses increase trip generation to equivalent levels). Such sites can support local services and facilities. In consultation with MDC, the following sites have been identified as being Compact and Connected for this assessment:

- Land at Berry Hill (Lindhurst)
- Pleasley Hill Farm
- Land off Jubilee Way

5.2.2 Such sites will be designed with attractive, safe, and walkable routes connecting residents to key destinations and services, which should support higher walking mode shares than smaller sites. To reflect this in the With Mitigation Scenario, EMGM commuting-to-work trip rates at these sites have been reduced by 10%.

5.2.3 As this is a policy-based mitigation implemented through each site's planning process, it is anticipated that the associated costs will be met by third-party developers.

Walking and Cycling Connectivity Enhancements

5.2.4 As part of the With Mitigation Scenario, modelling assumptions have been applied to represent town-centre walking and cycling initiatives and their potential to reduce car-based trips. This is modelled as increased active-mode connectivity between key residential,

employment and interchange areas in Mansfield District, resulting in reduced demand between specific zone pairs and lower highway trip volumes.

5.2.5 This intervention has been guided by the D2N2 local cycling and walking infrastructure plan which identifies long-term plans for improvements to walking and cycling measures within Mansfield District.

5.2.6 Specifically, two measures have been included within the With Mitigation Scenario to reflect this:

- An improvement in the attractiveness and accessibility of Mansfield and Mansfield Woodhouse railway stations, leading to an improvement in public transport utilisation.
- An overall reduction in highway demand because of an uptake in cycling and walking between key residential and employment areas.

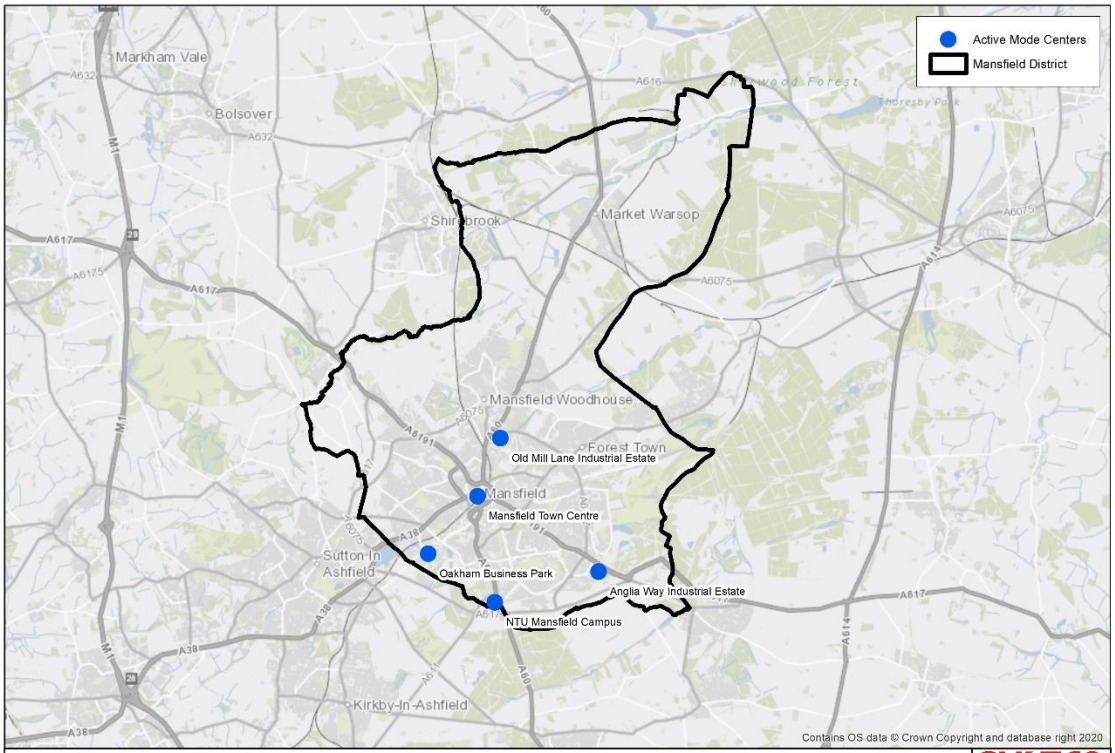
5.2.7 Firstly, improvements in accessibility and the attractiveness of Mansfield and Mansfield Woodhouse rail stations have been represented by reducing walk times to and from these rail stations. This increases the attractiveness of rail as a mode for trips already being made by public transport in and around Mansfield District.

5.2.8 Secondly, the likely increased propensity for trips to be made by active modes (walking and cycling) between key residential and employment areas in Mansfield District has been included through a targeted approach. Figure 12 shows identified locations where the presence of active mode mitigation will impact on sustainable mode choice. These locations are:

- Mansfield Town Centre
- Nottingham Trent University, Mansfield Campus
- Old Mill Lane Industrial Estate
- Oakham Business Park
- Anglia Way Industrial Estate

5.2.9 Car trips between these locations have been reduced by 5%. This modest reduction is consistent with earlier analysis in the study and represents a realistic, achievable change.

Figure 12. Key Residential and Employment Areas for Targeted Connectivity Enhancements



5.2.10 In addition, all sites associated with the Local Plan in Mansfield District will be encouraged to be well connected to walking and cycling routes, ensuring integration with wider strategic active travel routes, as per Nottinghamshire's Cycling Strategy Delivery Plan and Active England's third Cycling and Walking Investment Strategy (CWIS3).

5.3 Proposed Public Transport Measures

5.3.1 Building on existing schemes and priorities in the County's Transforming Cities Fund Tranche 2 programme and safeguarded public transport routes, the following section sets out the proposed public transport mitigation measures and associated costs.

Increased Bus Service Frequencies

5.3.2 SYSTRA has reviewed bus service provision across Mansfield District in relation to the Local Plan site allocations. The review concluded that most of the proposed development site locations are currently well served, but increasing the frequency of bus Service 7 (Mansfield Bus Station to Oak Tree circular) to every 20 minutes in its hours of operation (from a current frequency of every 30 minutes) is a desirable and realistic intervention for inclusion in the With Mitigation Scenario.

5.3.3 It is understood that some high-level initial discussions have already taken place with EMCCA and Stagecoach to determine the suitability of this in principle. The nature of this improvement and any others of a similar nature would need to be discussed further and agreed with Stagecoach and the local highway authority at subsequent planning stages.

5.3.4 This improvement is not currently programmed or funded, but will likely be funded via S106 contributions, alongside a wider Bus Service Improvement Plan funded by East Midlands

Combined County Authority (EMCCA) (a network review is ongoing), as part of the Land off Jubilee Way development, for example.

5.3.5 Such an improvement will have a cost range from £180k to £420k per additionally required vehicle, in addition to operating and fixed costs based on fuel type and operating efficiency from £800k to £1.5M per annum, to be funded through S106 contributions and EMCCA. These costs are in line with those reported in the Greater Nottingham Strategic Plan study[4] in terms of costs per additional vehicle and operating costs for consistency across Local Plan studies.

A60 Nottingham Road Bus Priority

5.3.6 Pre-construction is currently underway for bus priority and junction capacity improvements at the A60 Nottingham Road / Baums Lane / Park Lane junction in Mansfield. Works include a short northbound bus lane, widening into the adjacent retail park and layout changes to reduce congestion and improve bus reliability.

5.3.7 Detailed design is complete, and additional funding is secured. This intervention has been included in the With Mitigation Scenario. Mansfield District Council's Infrastructure Funding Statement (2023/2024)[3] provides a cost estimate of £2.01M for Mansfield District Council's contribution towards the scheme. NCC have advised that the total and latest cost estimate to deliver the junction upgrade is within the £7.6M to £8.9M range.

5.3.8 Note that in strategic modelling terms, the short length of the associated bus lane means it is more appropriately tested as a highway intervention than a public transport measure and therefore the scheme has been included in the Phase 2 With Mitigation Scenario only and not the Phase 1 With Mitigation Scenario.

A6191 Ratcliffe Gate Bus Priority

5.3.9 NCC has provided a preliminary design for an A6191 Ratcliffe Gate Bus Priority scheme featuring the creation of an inbound bus lane along the A6191 Ratcliffe Gate approach into Mansfield Town Centre. The scheme aims to improve public transport reliability and journey times.

5.3.10 A major and significant scheme review across the County in 2010 recommended that the scheme continues to be safeguarded and a potential cost of £800,000 was identified. Third-party land is required for this scheme, and it currently has no funding status. Funding would likely come from EMCCA and developer S106 contributions if the scheme is taken forward for further consideration.

Improvements to National Rail

5.3.11 The following measures are included within the With Mitigation Scenario to reflect the potential to offer new journey opportunities by rail:

- Upgrade of the Maid Marian Line to facilitate passenger services between Mansfield, Derby and Leicester (£12M to £19M)[4].
- Extension of the Robin Hood Line to Ollerton (£40M to £45M)[4].

[3] https://www.mansfield.gov.uk/downloads/file/6774/mansfield-district-council-infrastructure-funding-statement-2023-2024

[4] https://www.gnplan.org.uk/media/2cdledjg/infrastructure-delivery-plan-september-2024.pdf

5.3.12 Funding and delivery will likely be through EMCCA.

5.3.13 The Robin Hood Line runs from Nottingham to Worksop via Mansfield. An extension has been proposed that would follow the existing line from Nottingham to Shirebrook, before diverting to the east, stopping at both Warsop and Edwinstowe, before terminating at Ollerton. The extension has been represented with the following assumptions:

- Extension of the existing rail service between Nottingham and Mansfield Woodhouse to call at Shirebrook, Warsop, Edwinstowe and Ollerton.
- 60-minute frequency in all three time periods.

5.3.14 The Maid Marian line is intended to increase the east/west connectivity of the public transport options in the East Midlands by providing hourly rail services between Mansfield and Derby/Leicester. It repurposes an existing freight line from Kirkby-in-Ashfield, stopping at Sutton Parkway and Pinxton before connecting to the existing Midland Mainline to access Ilkeston before heading onto Derby or Leicester.

5.3.15 The new service has been represented with the following assumptions:

- New rail service between Mansfield and Leicester, at a 60-minute frequency.
- New rail service between Mansfield and Derby, at a 60-minute frequency.
- New rail station at Pinxton served by both new services.

Summary of Demand Management, Active Mode and Public Transport Mitigation

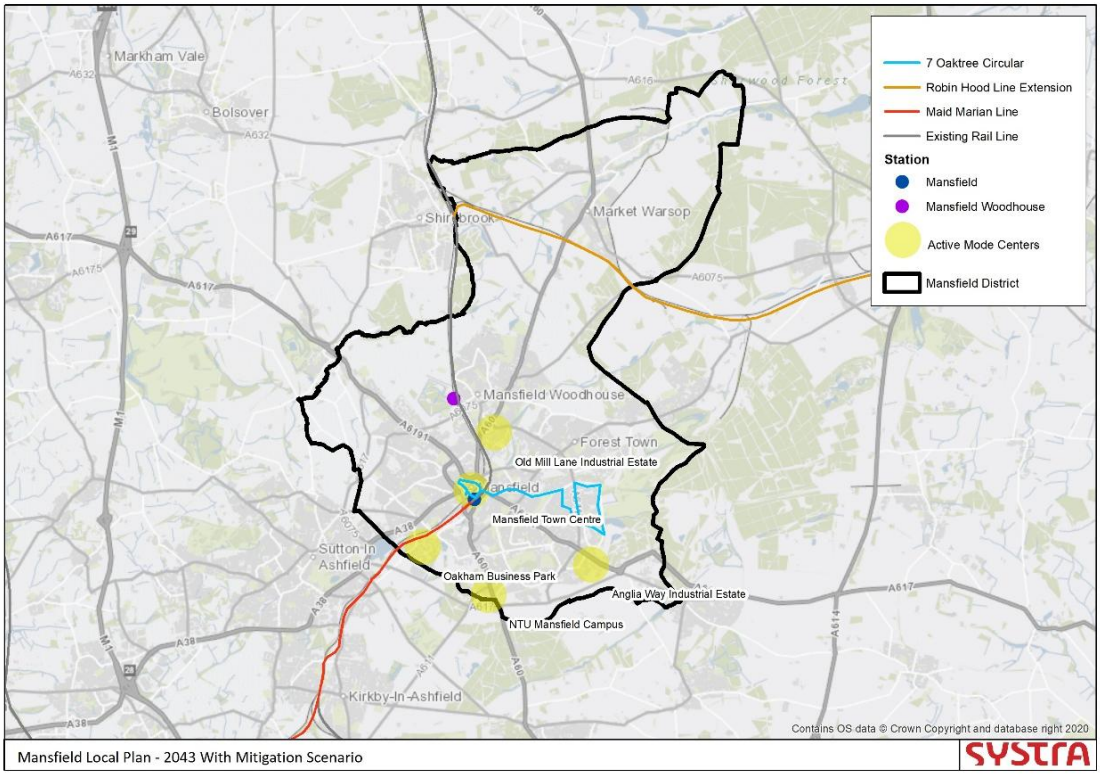
5.3.16 Table 7 provides a summary of the demand management, active mode and public transport mitigation included in the Phase 1 With Mitigation Scenario.

Table 7. Phase 1 With Mitigation Scenario Measures

SCHEME	FUNDING MECHANISM	ESTIMATED COST
Compact and Connected Neighbourhoods	n/a	n/a
Walking and Cycling Connectivity Enhancements	DfT Active Travel Fund / EMCCA / S106	Shared use: £1.58M per km Segregated: £2.5M per km (Excluding unknown maintenance costs)
Increased Bus Service Frequencies	S106 / EMCCA	£180k to £420k per additionally required vehicle + £800k to £1.5M in costs per annum
A60 Nottingham Road Bus Priority	S106 / EMCCA / NCC / MDC	£7.6M to £8.9M (safeguarded scheme)
A6191 Ratcliffe Gate Bus Priority	S106 / EMCCA	£800,000
Improvements to National Rail	EMCCA	£12M to £19M for Maid Marian Line and £40M to £45M for extension of Robin Hood Line

5.3.17 Figure 13 shows the locations of the mitigation schemes modelled in Phase 1, except for the Compact and Connected Neighbourhoods concept (a demand management measure).

Figure 13. Locations of Demand Management, Public Transport and Active Mode Mitigation Schemes



5.4 Proposed Highway Measures

5.4.1 The following highways schemes are proposed as part of the mitigation strategy and included in the With Mitigation Phase 2 scenario.

Signal Timing Optimisation

5.4.2 Optimisation of the signal timings at the following junctions has been implemented to adjust the signal timings to an optimum solution given the modelled highway flow. All these junctions are already operating under MOVA / Scoot control currently, and so there are no costs associated with this intervention:

- A38 / Station Road
- A38 / A617 Sherwood Way South
- A60 / A6191 Chesterfield Road South / Leeming St
- A60 / Berry Hill Lane / Atkin Lane
- A611 Derby Road / Cauldwell Road
- A6191 Rock Hill / B6030 Windsor Rd / Carter Lane
- A60 / A6117 Old Mill Lane / Butt Lane
- A6117 Violet Hill / Eakring Road
- A617 / A6191 Chesterfield Road North
- A38 / Coxmoor Road

5.4.3 These junctions were identified for signal timing optimisation following analysis of the congestion in the Local Plan Scenario.

New Road Between Old Mill Lane and New Mill Lane

5.4.4 MDC advised SYSTRA that in the context of development on the Land North of Old Mill Lane and Land at New Mill Lane sites, access can be safeguarded for all land parcels and connectivity within the sites could be achieved to a satisfactory level in line with current and national and local guidance through the provision of a new road between Old Mill Lane and New Mill Lane.

5.4.5 In strategic modelling terms and through analysis of potential masterplans for these two sites, a road through both developments between Old Mill Lane and New Mill Lane has been included in the Phase 2 With Mitigation Scenario. It would be funded through S278 contributions as part of the planning process associated with development in this location.

Peafield Lane Connectivity Enhancements

5.4.6 Based on information from MDC for the Land off Peafield Lane and Land at Peafield Lane sites, a shared roundabout between the two sites, retaining the second access to the Land off Peafield Way site, is a viable mitigation measure to offset some strategic transport impacts associated with their development.

5.4.7 Noting some work is still required to establish any third-party land involvement associated with the Land off Peafield Lane development site, there is viability to create another access off Sandringham Road which is not modelled but could be considered in future studies.

5.4.8 These interventions would be funded through S278 contributions.

Schemes Associated with Planning Application Reference 2017/0816/OUT (Market Warsop)

5.4.9 In association with planning application reference 2017/0816/OUT in Market Warsop, the following schemes are included in the Phase 2 With Mitigation Scenario:

- A60 / Warsop Road Junction Signalisation
- A60 / Eastlands Lane Junction Widening
- A60 / Sookholme Road Junction Signalisation
- A60 / Vale Avenue / Askew Lane Junction Signalisation

5.4.10 Funding for these schemes would be via S106 contributions.

A60 / Baums Lane / Park Lane Junction Upgrade

5.4.11 An upgrade of the A60 / Baums Lane / Park Lane junction is an NCC safeguarded scheme. It will be partly delivered under NCC's Bus Service Improvement Plan (BSIP) as it features bus priority measures aiming to improve bus reliability and journey times, as well as through funding from the Levelling Up Partnership Fund, which awarded £2.01M to NCC to directly progress this upgrade. As well as bus service punctuality improvements, the scheme targets general traffic capacity improvements and better highway access to the adjacent retail park, including a segregated lane for the Sainsbury's supermarket.

A617 Rainworth Bypass / A6191 Southwell Road Roundabout Signalisation

5.4.12 In association with the Land at Berry Hill (Lindhurst) development, full signalisation of the A617 Rainworth Bypass / A6191 Southwell Road roundabout has been included in the Phase 2 With Mitigation Scenario. The delivery mechanism for this scheme will be through S106 developer contributions.

A60 / Cauldwell Road Junction Signalisation

5.4.13 Nottinghamshire County Council have provided plans associated with the Land at Berry Hill (Lindhurst) development, involving the full signalisation of the A60 / Cauldwell Road junction, which has been included in the Phase 2 With Mitigation Scenario. The delivery mechanism for this scheme will be through S278 developer contributions.

A60 / Derby Road Junction Signalisation

5.4.14 Nottinghamshire County Council have provided plans associated with the Land at Berry Hill (Lindhurst) development, involving the full signalisation of the A60 / Derby Road junction, which has been included in the Phase 2 With Mitigation Scenario. The delivery mechanism for this scheme will be through S106 developer contributions.

A60 / Bishop's Walk Junction Signalisation

5.4.15 A scheme at the A60 / Bishop's Walk junction is proposed by Via EM; however, there are viability concerns particularly regarding conservation and visibility. In the absence of full details, this junction has been modelled as receiving a signalisation upgrade in the Phase 2 Mitigation Scenario. The delivery mechanism for this scheme will be through S106 developer contributions.

Oak Tree Lane / Violet Hill / Eakring Road Junction Improvements

5.4.16 Changes are planned for the Oak Tree Lane / Violet Hill / Eakring Road junction aimed at improving the pedestrian crossing with an upgrade to puffin-style facilities. The benefits of this change in a strategic capacity are marginal, and as such, the junction is modelled as receiving the optimisations to its signal timings.

Summary of Highway Mitigation

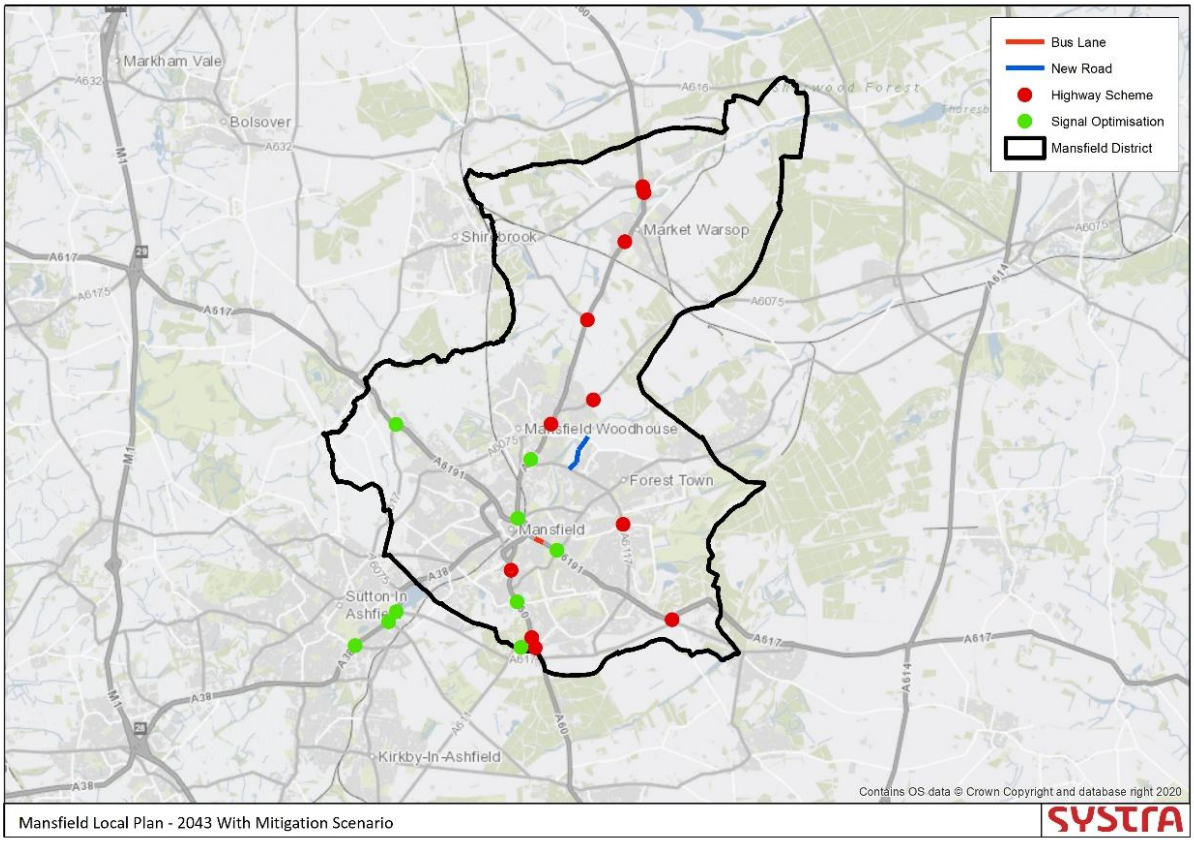
5.4.17 Table 8 summarises the highway mitigation included in the Phase 2 With Mitigation Scenario and the associated estimated costs. Indicative costing assumes a 2026 construction base year and excludes inflation. Limited information on site levels, drainage, utilities, and third-party land costs means the figures are for guidance only; more detailed costs will be required as part of the design development process.

Table 8. Phase 2 With Mitigation Scenario Measures

SCHEME	FUNDING MECHANISM	ESTIMATED COST
Signal Timing Optimisation	n/a	n/a
New Road Between Old Mill Lane and New Mill Lane	S278	£4M to £5M
Peafield Lane Connectivity Enhancements	S278	£1M to £1.5M
Schemes Associated with Planning Application Reference 2017/0816/OUT (Market Warsop)	S106	A60 / Eastlands Lane: £50k to £100k A60 / Vale Avenue / Askew Lane: £350k to £550k A60 / Warsop Road: £350k to £550k A60 / Sookholme Road: £750k to £1M
A60 / Baums Lane / Park Lane Junction Upgrade	S106 / EMCCA / NCC / MDC	£7.6M to £8.9M (safeguarded scheme)
A617 Rainworth Bypass / A6191 Southwell Road Roundabout Signalisation	S106	£2M to £2.5M
A60 / Cauldwell Road Junction Signalisation	S278	£4M to £5M
A60 / Derby Road Junction Signalisation	S106	£0.75M to £1.25M
A60 / Bishop's Walk Junction Signalisation	S106	£500k to £750k
Oak Tree Lane / Violet Hill / Eakring Road Junction Improvements	S106	£250k to £500k

5.4.18 Figure 14 shows the locations of the highway mitigation schemes modelled in Phase 2.

Figure 14. Locations of Highway Mitigation Schemes



6. WITH MITIGATION SCENARIO: OUTPUT ANALYSIS

6.1 Introduction

6.1.1 This chapter examines the strategic transport impacts of the With Mitigation Scenarios, looking at mode shares, highway flows, junction congestion and overall network statistics. Comparisons are made against the 2043 Local Plan Scenario and the No Local Plan Scenario.

6.1.2 Two strategic mitigation scenarios were developed based on discussions with Mansfield District Council. Mitigation was assessed in two incremental phases:

- **Phase 1:** Demand management, active mode and public transport mitigation.
- **Phase 2:** Phase 1 plus local and strategic highway enhancements.

6.2 Phase 1 (Demand, Active Mode and Public Transport Mitigation)

6.2.1 SYSTRA has undertaken a high-level assessment of the active travel and public transport schemes included in the Phase 1 With Mitigation Scenario, as defined in Chapter 5. The schemes or policy concepts included are:

- Compact and Connected Neighbourhoods policy concept;
- Walking and cycling connectivity enhancements;
- Increased bus frequencies (Service 7);
- Maid Marian Line (National Rail scheme), and
- Robin Hood Line (National Rail scheme)

Change in Mode Shares

6.2.2 Table 9 details the change in the mode share between the Phase 1 With Mitigation Scenario and the Local Plan Scenario.

6.2.3 Active modes are not explicitly modelled by the EMGM but have been estimated post Variable Demand Model (VDM) run by analysing the same TRICS surveys upon which the EMGM's person trip rates are based to derive the percentage of trips likely to be made additionally by active modes.

6.2.4 Due to the strategic nature of the EMGM and this assessment, only those developments which have either been explicitly modelled or been modelled by clustering adjacent developments together can be assessed at this level of detail. Developments included through the application of the TEMPro 8 growth constraint are not assessed in this respect.

6.2.5 Across all the sites and clusters assessed, Phase 1 results in a **3%** increase in the number of highway trips and a **2%** reduction in the total number of public transport trips because of the impact of the active mode and public transport mitigation measures on mode choice.

6.2.6 The mitigation measures also impact on the mode choice of non-Local Plan traffic too, which will exhibit differing levels of mode shift compared to that associated with the Local Plan.

Table 9. Change in Mode Shares by Development or Cluster (Phase 1)

DEVELOPMENT NAME	WITHOUT MITIGATION (%)			WITH MITIGATION (%)			MODE SHARE DIFFERENCE (% POINTS)		
	HIGHWAY	PUBLIC TRANSPORT	ACTIVE	HIGHWAY	PUBLIC TRANSPORT	ACTIVE	HIGHWAY	PUBLIC TRANSPORT	ACTIVE
Land at Berry Hill (Lindhurst)	85%	3%	13%	85%	3%	13%	**0%**	**0%**	**0%**
Pleasley Hill Farm	83%	6%	11%	83%	6%	11%	**0%**	**0%**	**0%**
Land off Jubilee Way	82%	7%	11%	82%	7%	11%	**0%**	**0%**	**0%**
Stonebridge Lane / Sookholme Lane	84%	6%	10%	83%	6%	10%	**-1%**	**1%**	**0%**
Penniment Farm	83%	6%	11%	83%	6%	11%	**0%**	**0%**	**0%**
Ratcher Hill Quarry	86%	3%	10%	86%	3%	10%	**0%**	**0%**	**0%**
Land at Ashland Farm	84%	6%	10%	84%	6%	10%	**0%**	**0%**	**0%**
Land off Peafield Lane	86%	3%	10%	86%	4%	10%	**-1%**	**1%**	**0%**
Clipstone Road East (Land south of Clipstone Road East (Land next to the pub))	86%	3%	10%	86%	3%	10%	**0%**	**0%**	**0%**
Land off Mansfield Road (A60) AND Land South East of Mansfield Road	84%	6%	10%	83%	6%	10%	**0%**	**0%**	**0%**
Land at Peafield Lane	86%	3%	10%	86%	4%	10%	**-1%**	**1%**	**0%**
Clipstone Road East (Clipstone Road East / Crown Farm Way (Next to Newlands rbt.)	86%	3%	10%	86%	3%	10%	**0%**	**0%**	**0%**
Three Thorn Hollow Farm	83%	7%	10%	83%	7%	10%	**0%**	**0%**	**0%**
Fields Farm, Abbott Road	84%	6%	10%	84%	6%	10%	**0%**	**0%**	**0%**

DEVELOPMENT NAME	WITHOUT MITIGATION (%)			WITH MITIGATION (%)			MODE SHARE DIFFERENCE (% POINTS)		
	HIGHWAY	PUBLIC TRANSPORT	ACTIVE	HIGHWAY	PUBLIC TRANSPORT	ACTIVE	HIGHWAY	PUBLIC TRANSPORT	ACTIVE
Cluster A	84%	6%	10%	84%	6%	10%	**0%**	**0%**	**0%**
Cluster B	80%	10%	10%	79%	11%	10%	**-1%**	**1%**	**0%**
Cluster C	83%	7%	10%	83%	7%	10%	**0%**	**0%**	**0%**
Cluster D	85%	5%	10%	85%	5%	10%	**0%**	**0%**	**0%**
Cluster E	85%	5%	10%	84%	5%	10%	**0%**	**0%**	**0%**
Cluster F	84%	6%	10%	83%	7%	10%	**-1%**	**1%**	**0%**
Cluster G	86%	4%	10%	85%	4%	10%	**-1%**	**1%**	**0%**
Cluster H	87%	3%	10%	87%	3%	10%	**0%**	**0%**	**0%**

Robin Hood Line Utilisation

6.2.7 The Robin Hood Line improves the accessibility of Warsop, Edwinstowe, and Ollerton to/from the wider East Midlands region, with passengers using the service in all peaks to access the villages and surrounding area. The improved accessibility is likely to be beneficial for a range of journey purposes, including tourism and leisure.

6.2.8 Table 10 shows the total number of boardings and alightings at the new stations along the extension of the Robin Hood Line in each peak.

Table 10. Total Boardings and Alightings at Stations on the Robin Hood Line Extension

	AM PEAK	PM PEAK
Boarding	209	66
Alighting	66	153

6.2.9 In addition to the new stations being well used, the extension also boosts passenger numbers along the existing Robin Hood Line. Some existing users are also likely to transfer to the new stations rather than using a bus or a car to access existing stations further down the line. The service improves connectivity and accessibility of towns such as Hucknall and Mansfield to the wider Nottinghamshire region.

6.2.10 Table 11 shows the total number of passengers using the Robin Hood Line across the whole route. The change in passengers compared to the equivalent and existing Robin Hood Line service in the Local Plan Scenario is shown in brackets.

Table 11. Total Boardings on the Robin Hood Line

	AM PEAK	PM PEAK
Nottingham to Ollerton	256 (+102)	542 (+158)
Ollerton to Nottingham	520 (+226)	210 (+92)

Maid Marian Line Utilisation

6.2.11 The Maid Marian Line provides new, direct routes between Mansfield and Derby and Mansfield and Leicester. Boardings and Alightings increase at all stations served by the new services, in particular at Mansfield, Kirkby in Ashfield and Langley Mill as the service improves connectivity between, and to/from, these towns.

6.2.12 Table 12 shows the total number of passengers using the Maid Marian Line across the route.

Table 12. Total Boardings on the Maid Marian Line

	AM PEAK	PM PEAK
Mansfield – Leicester	251	149
Leicester – Mansfield	132	446
Mansfield – Derby	219	142
Derby – Mansfield	155	143

Bus Service 7 Utilisation

6.2.13 Table 13 shows the total number of boardings and alightings on bus service 7 in Mansfield in each peak. As part of the mitigation package, its frequency was increased to every 20 minutes from every 30 minutes in the Local Plan and No Local Plan Scenarios.

Table 13. Total Boardings and Alightings at Service 7 Bus Stops

	AM PEAK	PM PEAK
Boarding	414	344
Alighting	426	322

Overall Impact on Public Transport Demand

6.2.14 Table 14 summarises the changes to boardings by public transport mode between the 2043 Local Plan Scenario and the Phase 1 With Mitigation Scenario within Mansfield District.

Table 14. Changes to Boardings by Public Transport Mode

MODE	AM PEAK	PM PEAK
Bus	-29% (-363)	-25% (-291)
Rail	56% (+303)	124% (+239)

6.2.15 Within Mansfield District, the impact of the Phase 1 mitigation measures is forecast to result in a decrease in total bus boardings of **-29%** and **-25%** in the AM and PM peaks, respectively. There is forecast to be an increase in the number of rail boardings of **56%** and **124%,** indicating that the Robin Hood and Maid Marian rail schemes are attractive measures, partly because they provide fewer interchanges and/or lower journey times than bus.

Network Statistics

6.2.16 Network statistics provide a way of gauging the overall impact from the addition of trips associated with the development sites. An explanation of the key indicators is as follows:

- Congestion / Over Capacity Queues – reflect the change in overall congestion and is the time spent queuing at junctions that are over capacity. As traffic levels increase, a growing number of junctions reach capacity and the time spent queuing at junctions can increase.
- Total Travel Time – across the highway network in passenger car unit (PCU) hours.
- Total Travel Distance – across the highway network in PCU kilometres.
- Average Speed – kilometres per hour, averaged for all traffic. Increased traffic levels lead to greater delays, potentially resulting in a lower average travel speed.

6.2.17 Network statistics for Mansfield District are provided in Table 15 and Table 16 for the AM and PM peaks, respectively. The percentage changes in the impact mitigated column indicate how far the mitigation proposals have taken network performance back to the situation in the No Local Plan Scenario without the addition of any Local Plan development.

Table 15. Network Statistics – AM Peak

INDICATOR	NO LOCAL PLAN SCENARIO	LOCAL PLAN SCENARIO	WITH MITIGATION	IMPACT MITIGATED
Overcapacity Queues / Congestion (PCU hrs)	68	270	247	**11%**
Total Travel Time (PCU hrs)	4,655	5,487	5,445	**5%**
Total Travel Distance (PCU kms)	140,866	156,199	155,777	**3%**
Average Speed (km/h)	30	29	29	**6%**

Table 16. Network Statistics – PM Peak

INDICATOR	NO LOCAL PLAN SCENARIO	LOCAL PLAN SCENARIO	WITH MITIGATION	IMPACT MITIGATED
Overcapacity Queues / Congestion (PCU hrs)	87	262	252	**5%**
Total Travel Time (PCU hrs)	4,952	5,723	5,691	**4%**
Total Travel Distance (PCU kms)	146,293	159,905	159,390	**4%**
Average Speed (km/h)	30	28	28	**6%**

6.2.18 In both peaks, the Phase 1 mitigation package is forecast to result in a reduction in congestion within Mansfield District (denoted by the overcapacity queues statistic) compared to the Local Plan Scenario.

- In the AM peak, **11%** of the Local Plan's impact on congestion has been mitigated.
- In the PM peak, **5%** of the Local Plan's impact on congestion has been mitigated.

6.2.19 These reductions are a result of the public transport and active mode measures, but also due to the presence of the Compact and Connected Neighbourhoods concept as mitigation.

6.2.20 The next section assesses what impact including the full package of mitigation measures has on the strategic transport impacts of the Local Plan, with highway mitigation measures included too.

6.3 Phase 2 (Full Mitigation Package)

Change in Mode Shares

6.3.1 In terms of mode shares, analysis of the Phase 2 With Mitigation Scenario compared to the Phase 1 With Mitigation Scenario has confirmed that across all assessed development sites, there is no material change compared to Phase 1. Similarly to Phase 1, there has been a **3%** increase in the total number of highway trips and a **1%** reduction in the total number of public transport trips due to the impact of the full mitigation package on mode choice.

Flow Change: With Mitigation Scenario vs Local Plan Scenario

6.3.2 Figure 15 and Figure 16 present the change in traffic flow between the Phase 2 With Mitigation Scenario and the Local Plan Scenario. Red lines represent roads with flow decreases and green reductions. The impact of the Phase 2 mitigation package is apparent.

6.3.3 In the north, in both peaks there are localised routing impacts through Warsop and along Sookholme Road due to the range of highway schemes along the A60 here. In the PM peak, there are also flow decreases on the A60 itself, and flow increases south of Sookholme Road.

6.3.4 In the east, in the AM peak there are flow increases along the A6117 between Jubilee Way South and the A60 Leeming Lane South, and in the PM peak between A6191 Southwell Road West and Sandlands Way. In both peaks, there are flow increases on New Mill Lane mainly because of the addition of the New Road between Old Mill Lane and New Mill Lane, signal timing optimisation at the junction of the A60 / A6117 Old Mill Lane / Butt Lane, and Oak Tree Lane / Violet Hill / Eakring Road Junction improvements. In the Local Plan scenario (without mitigation), traffic encountered difficulties accessing this key route due to the high volume of Local Plan traffic in the area, leading to congestion and thus modelled decreases in traffic flow. These mitigation schemes serve to improve the ability of traffic to access this route, easing congestion and allowing traffic to move more freely onto the wider highway network.

6.3.5 In the south, in both peaks there is a flow increase along the A617 Sherwood Way East and A60 Nottingham Road, adjacent to and south of Land at Berry Hill (Lindhurst), mainly due to signalisation of the A617 Rainworth Bypass / A6191 Southwell Road roundabout, the A60 / Cauldwell Road junction and the A60 / Derby Road junction.

6.3.6 In the west, in both peaks there are flow increases on the A617 MARR corridor at its northernmost end, and at its southernmost end in the AM peak only, mainly because of signal timing optimisation at junctions in Ashfield District along the A38 corridor, and/or signal timing optimisation at the junction of A617 / A6191 Chesterfield Road North. In the PM, there are also flow decreases along the A6191 Chesterfield Road North corridor mainly because of signal timing optimisation at the A617 / A6191 Chesterfield Road North junction too.

6.3.7 In the centre of Mansfield, there are roads with flow increases and flow decreases because of signal timing optimisation at the A60 / A6191 Chesterfield Road South / Leeming Street junction, A6191 Rock Hill / B6030 Windsor Rd / Carter Lane junction, and the highway scheme at the A60 / Baums Lane / Park Lane junction. There is a flow decrease along the A60 in the PM peak north of Mansfield Town Centre due to signal timing optimisation at the latter.

6.3.8 In both peaks, there are no significant changes in flow along the Strategic Road Network, and there are limited impacts on local roads outside of Mansfield District.

Figure 15. Highway Flow Change 2043 With Mitigation Scenario vs Local Plan Scenario – AM

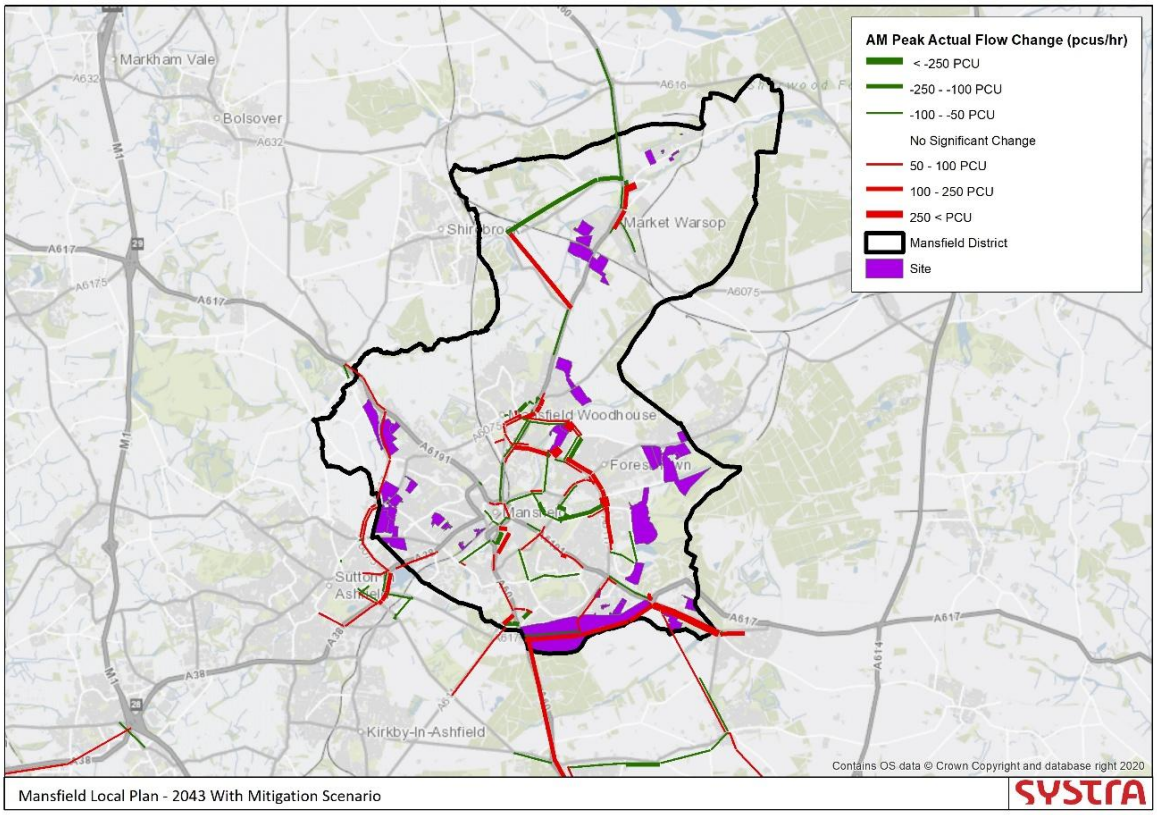
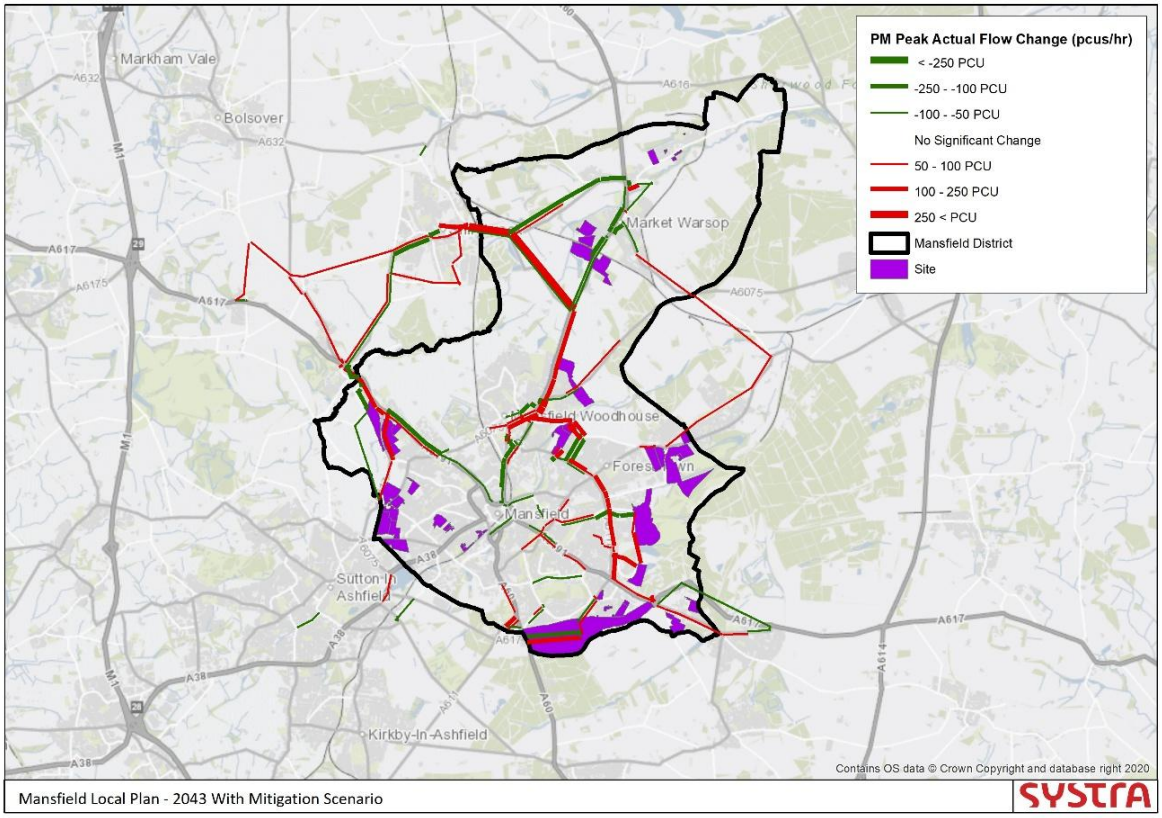


Figure 16. Highway Flow Change 2043 With Mitigation Scenario vs Local Plan Scenario – PM



Flow Change: With Mitigation Scenario vs No Local Plan Scenario

6.3.9 Figure 17 and Figure 18 present the change in traffic flow between the Phase 2 With Mitigation Scenario and the No Local Plan Scenario. Red lines indicate an increase in traffic and green lines represent roads with a reduction in flow. Therefore, the combined impact of Local Plan development and the mitigation package is apparent.

6.3.10 The combined impact of Local Plan development and the mitigation package particularly impacts route choice, and therefore highway flows on links, in and around Mansfield Town Centre in the AM peak. There are also impacts in the PM peak in Mansfield Town Centre, but the impacts are less widespread than in the AM peak.

6.3.11 There are also impacts on the A617, to the south and west of Mansfield Town Centre, and on radial routes in and out of Mansfield, such as the A6191 (around the Berry Hill, Lindhurst (housing) site and Pleasley), A38 (northernmost end only) and A60 (north of Mansfield) in both peaks.

6.3.12 On the SRN, the mitigation package has the effect of particularly increasing highway flows north of M1 Junction 29 in both peaks. In the PM peak, there is also an increase in highway flow south of M1 Junction 29 towards M1 Junction 28 and beyond to the south.

Figure 17. Highway Flow Change 2043 With Mitigation Scenario vs No Local Plan Scenario – AM

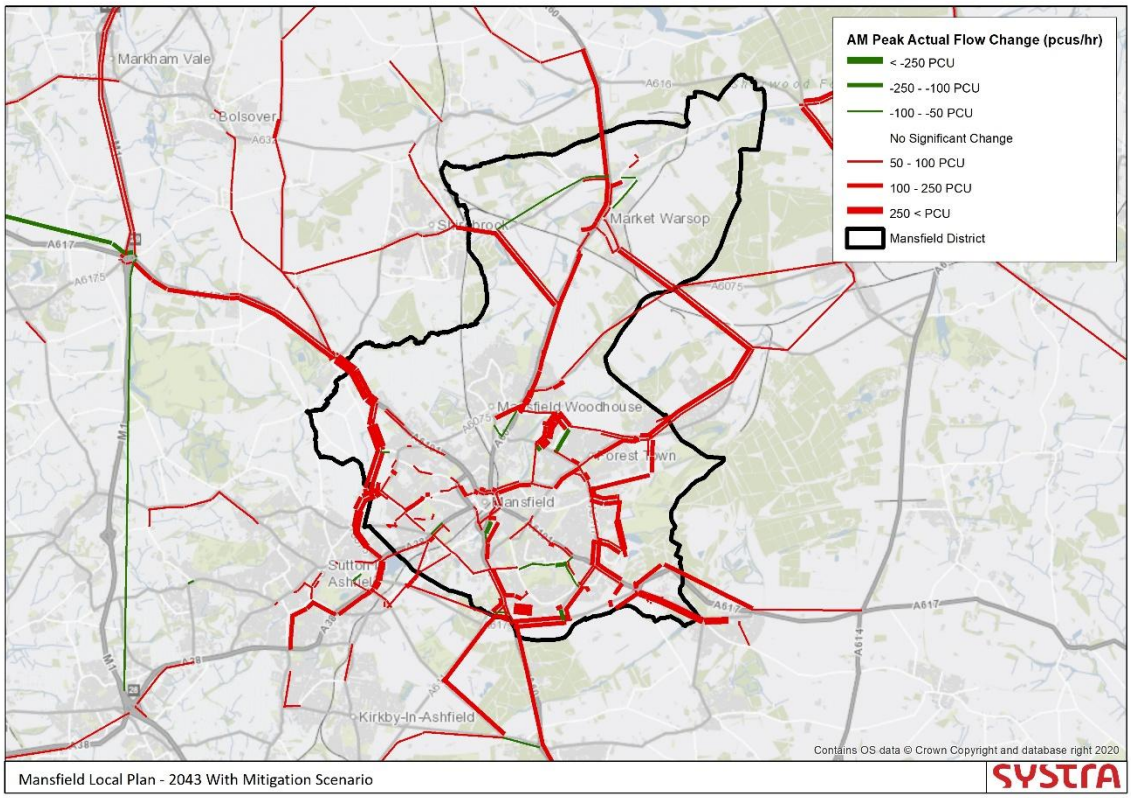
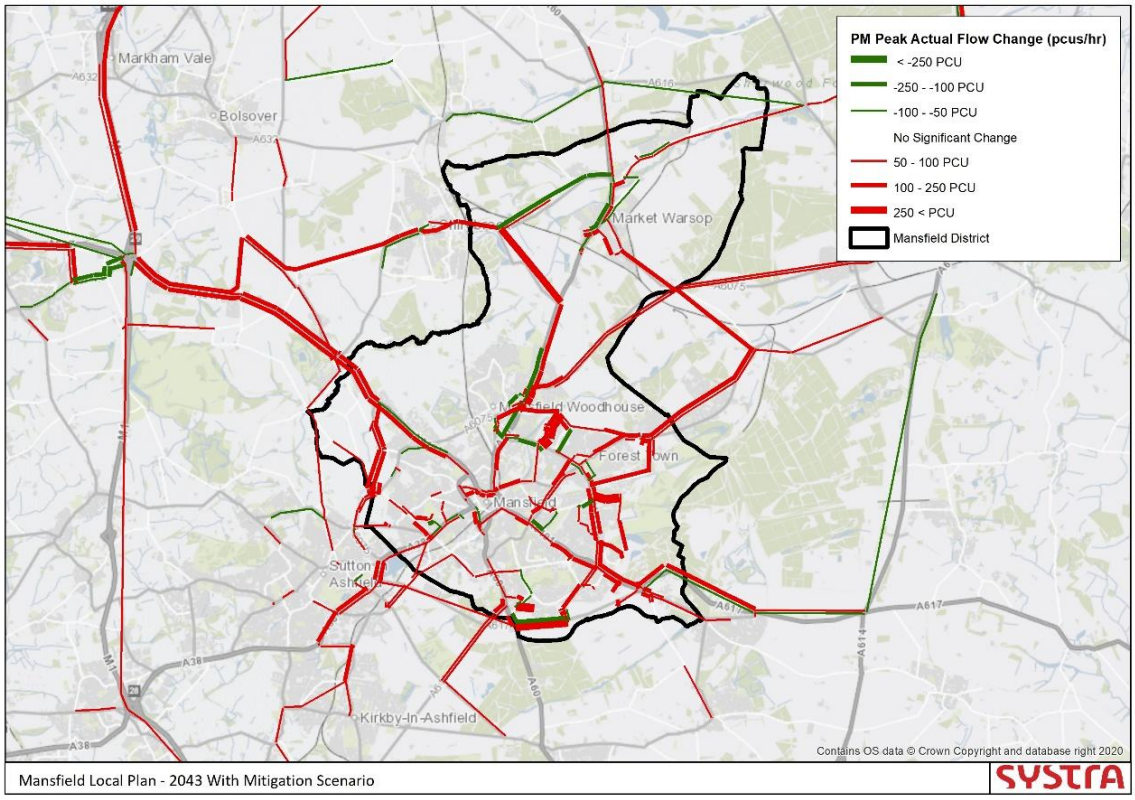


Figure 18. Highway Flow Change 2043 With Mitigation Scenario vs No Local Plan Scenario – PM



6.3.13 Figure 19 and Figure 20 show the change in congestion between the 2043 With Mitigation Scenario and the Local Plan Scenario. The impact of the Phase 2 mitigation package is apparent. The figures show the locations of all:

- Junctions which were congested in the Local Plan Scenario and are forecast to experience a change in congestion in the With Mitigation Scenario.
- Junctions where Volume/Capacity (V/C) ratios become over 85% with mitigation.

6.3.14 Within Mansfield District, the following junctions experience a congestion decrease in the With Mitigation Scenario as a result of the Phase 2 mitigation:

- A60 St Peter's Way / A60 Woodhouse Road
- A60 / Sookholme Road
- A617 / A6191 Chesterfield Road North

6.3.15 Whilst mitigation has a positive impact on these junctions, it changes route and mode choice between the Local Plan Scenario and the With Mitigation Scenario across the District and results in small increases in congestion at some locations. These increases cannot be attributed to any one scheme. The most notable locations for this are:

- Southwell Road East / Bildworth Lane – the increased flow on Southwell Road East causes delays for traffic joining from Blidworth Lane.
- B6407 Carter Lane / Longster Lane – signalisation of the A60 Sookholme Road junction draws traffic onto Sookholme Road through the Carter Lane / Longster Lane junction.

6.3.16 There are no significant changes to congestion on the SRN.

Figure 19. Change in Junction Congestion 2043 With Mitigation Scenario vs Local Plan Scenario – AM

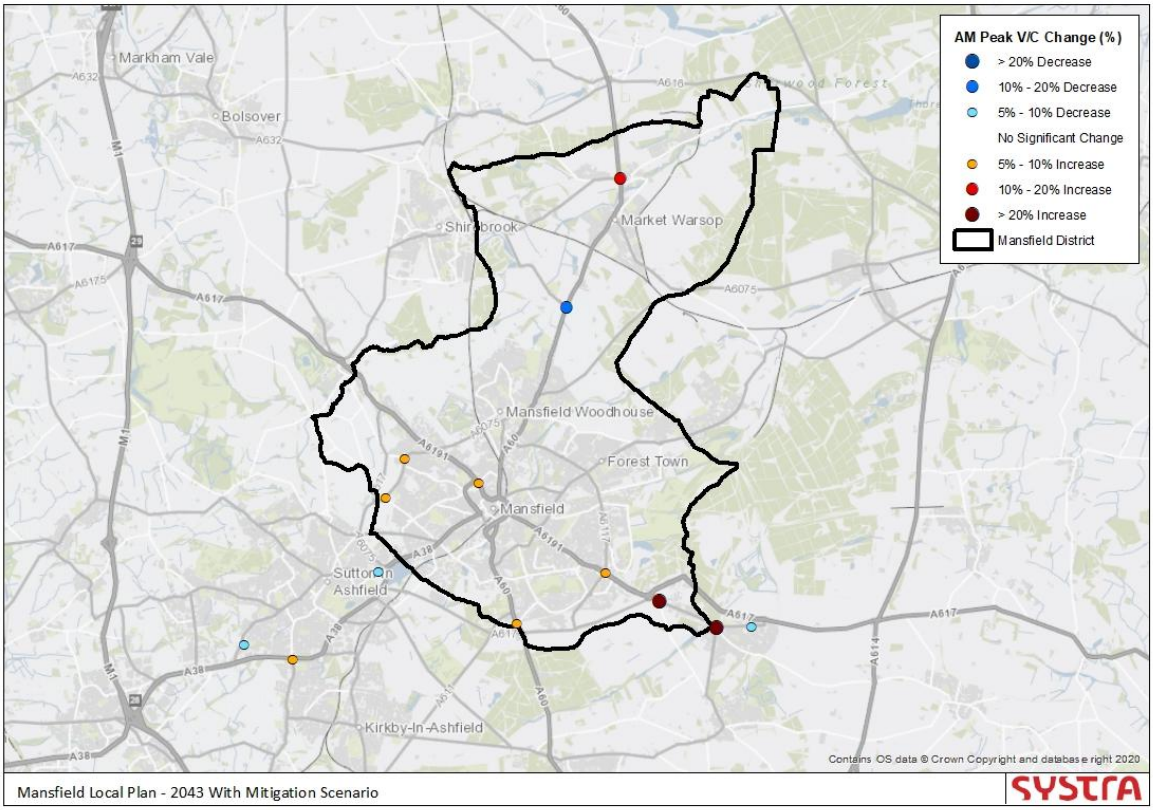
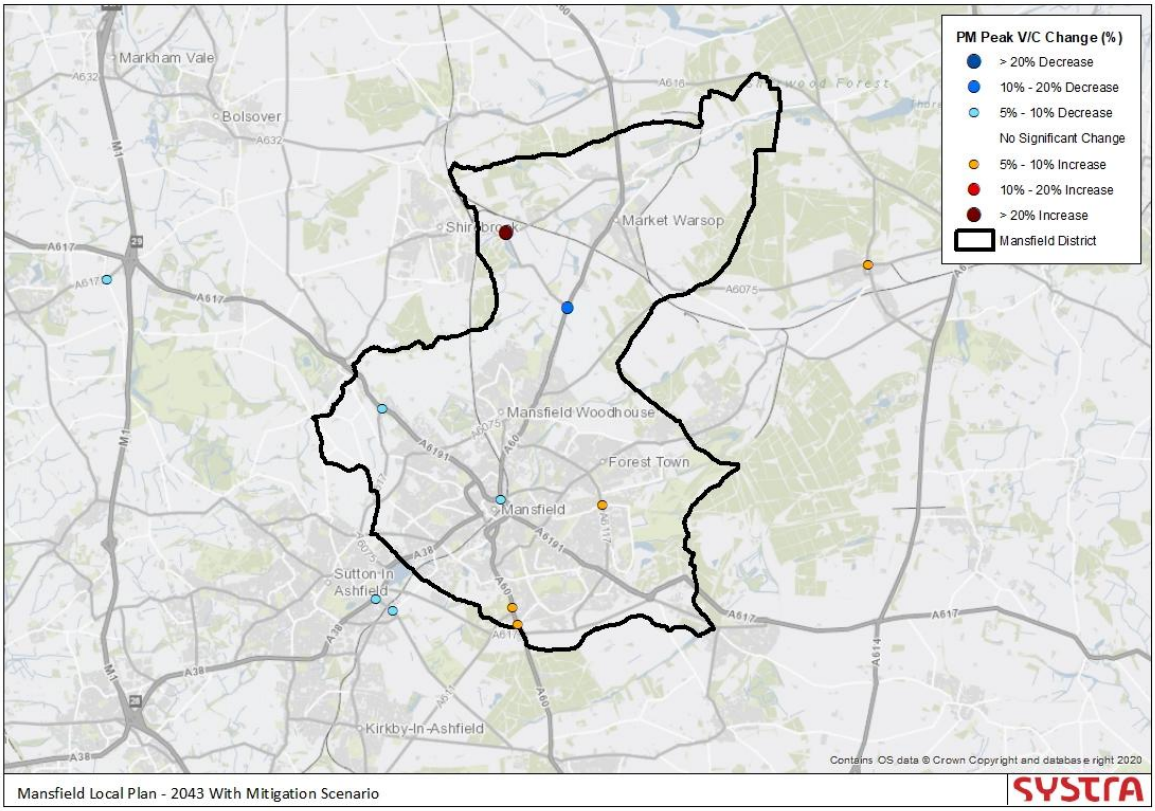


Figure 20. Change in Junction Congestion 2043 With Mitigation Scenario vs Local Plan Scenario – PM



6.3.17 Figure 21 and Figure 22 show the change in congestion between the 2043 With Mitigation Scenario and the No Local Plan Scenario. Therefore, the combined impact of Local Plan development and the mitigation package is apparent. They show the locations of all:

- Junctions which were congested in the No Local Plan Scenario and are forecast to experience a change in congestion in the With Mitigation Scenario.
- Junctions where Volume/Capacity (V/C) ratios become over 85% with mitigation.

6.3.18 Within Mansfield District, the combined impact of Local Plan development and the mitigation package increases congestion, particularly on radial routes in and out of Mansfield Town Centre. For example, at some junctions on the A6191 (around the Berry Hill, Lindhurst (housing) site), on the A617 MARR to the south of Mansfield and around Pleasley to the west, and in the PM peak only on the A60 through Market Warsop. There are also congestion increases on the A6117 adjacent to the Land off Jubilee Way development site.

6.3.19 On the SRN, there are increases in congestion at various points around M1 Junction 29 in the AM peak only. In the PM peak, there is less of an impact on the SRN with a decrease in congestion at one location on M1 Junction 29.

Figure 21. Change in Junction Congestion 2043 With Mitigation Scenario v No Local Plan Scenario – AM

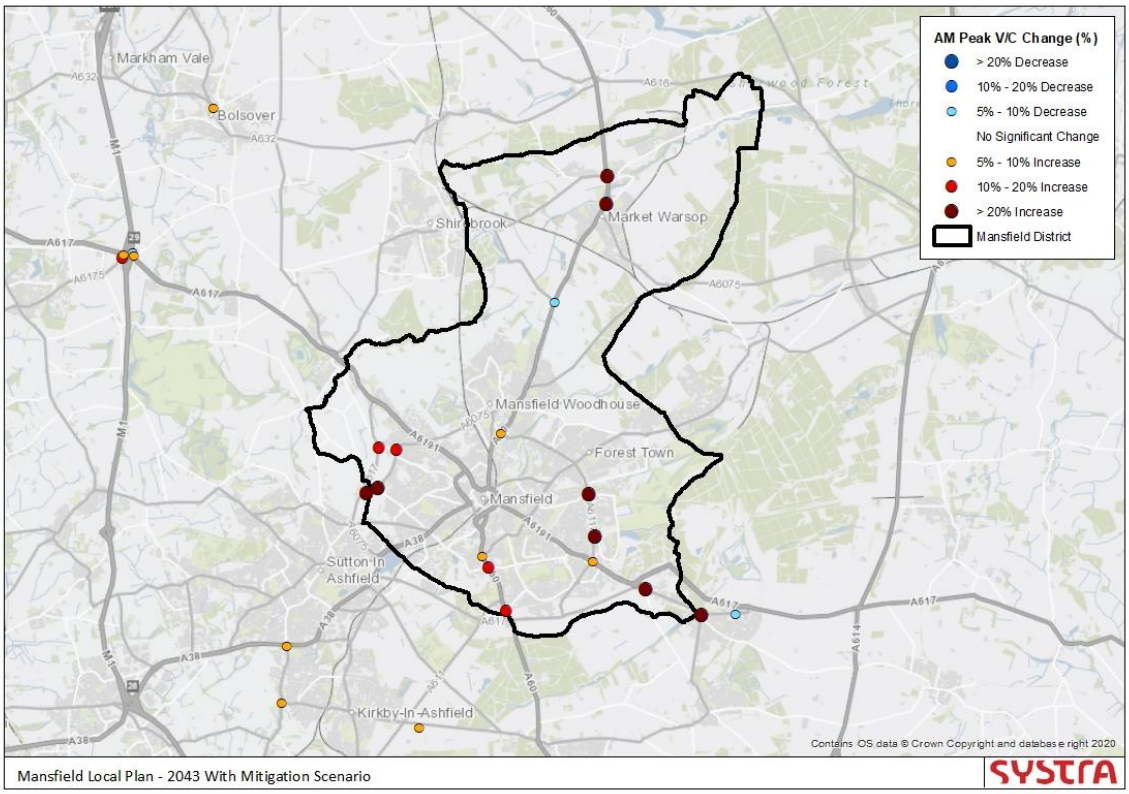
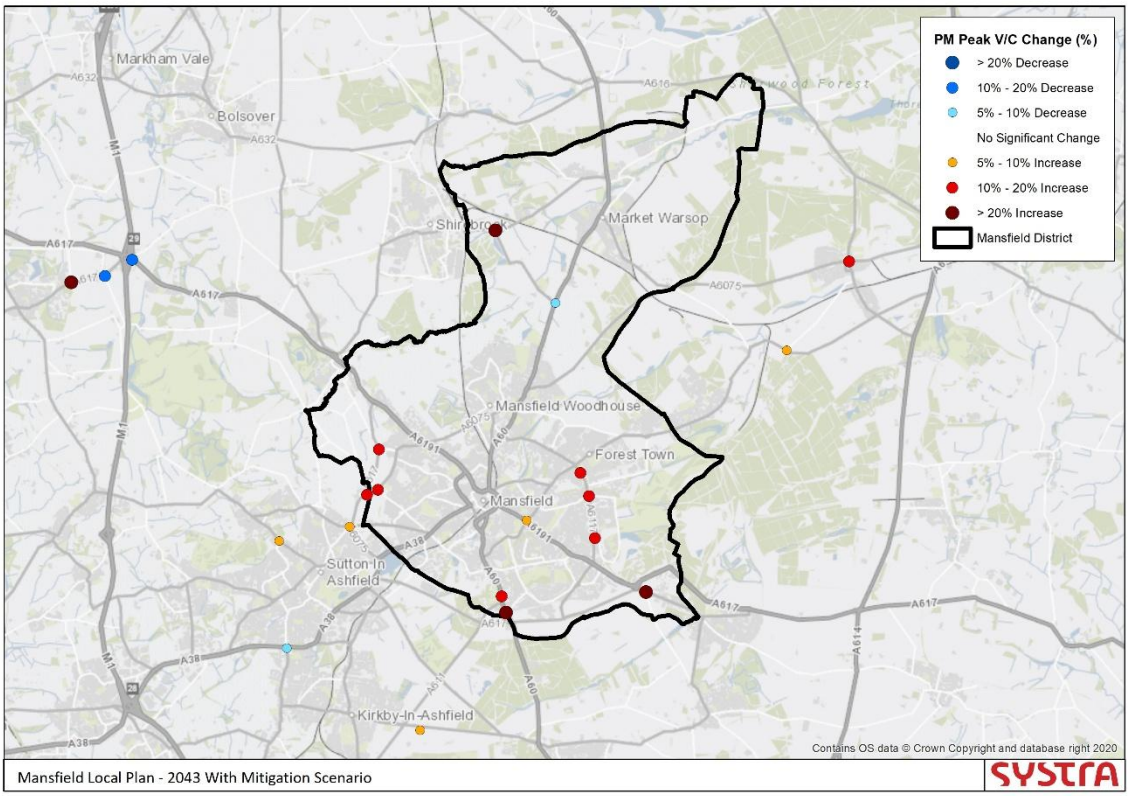


Figure 22. Change in Junction Congestion 2043 With Mitigation Scenario v No Local Plan Scenario – PM



Ultimate Highway Congestion

6.3.20 Figure 23 and Figure 24 show the junctions which are forecast to have a maximum V/C ratio (%) of 75% or greater in the 2043 Phase 2 With Mitigation Scenario. Yellow dots indicate junctions which are approaching the 85% V/C ratio threshold. Red dots represent junctions with a V/C over 85% but under 100% and are therefore considered congested. Brown dots indicate junctions severely congested with a V/C of at least 100%.

6.3.21 The A60, A38, A617 and A6117 all show significant levels of congestion in both peak hours. Further afield, there is congestion along the A38, at M1 Junction 28 and M1 Junction 29, along the A614 and along the A60 south of Mansfield.

Figure 23. Junction Congestion 2043 With Mitigation Scenario – AM

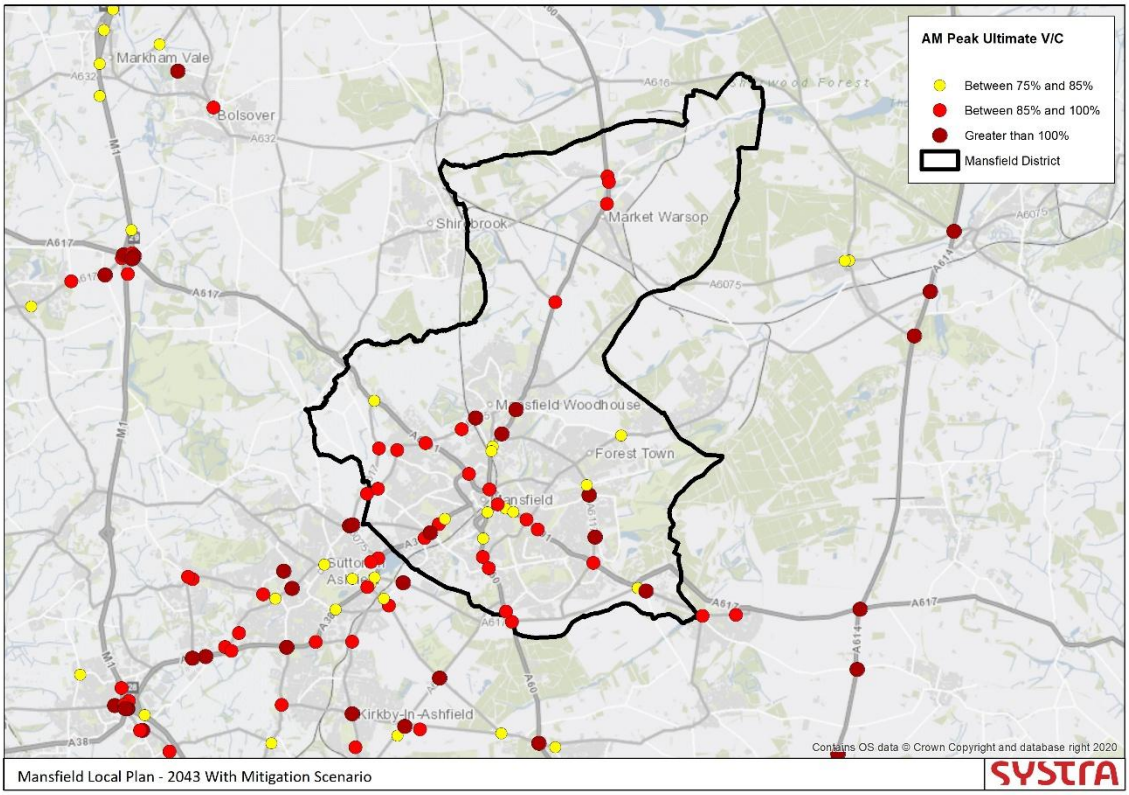
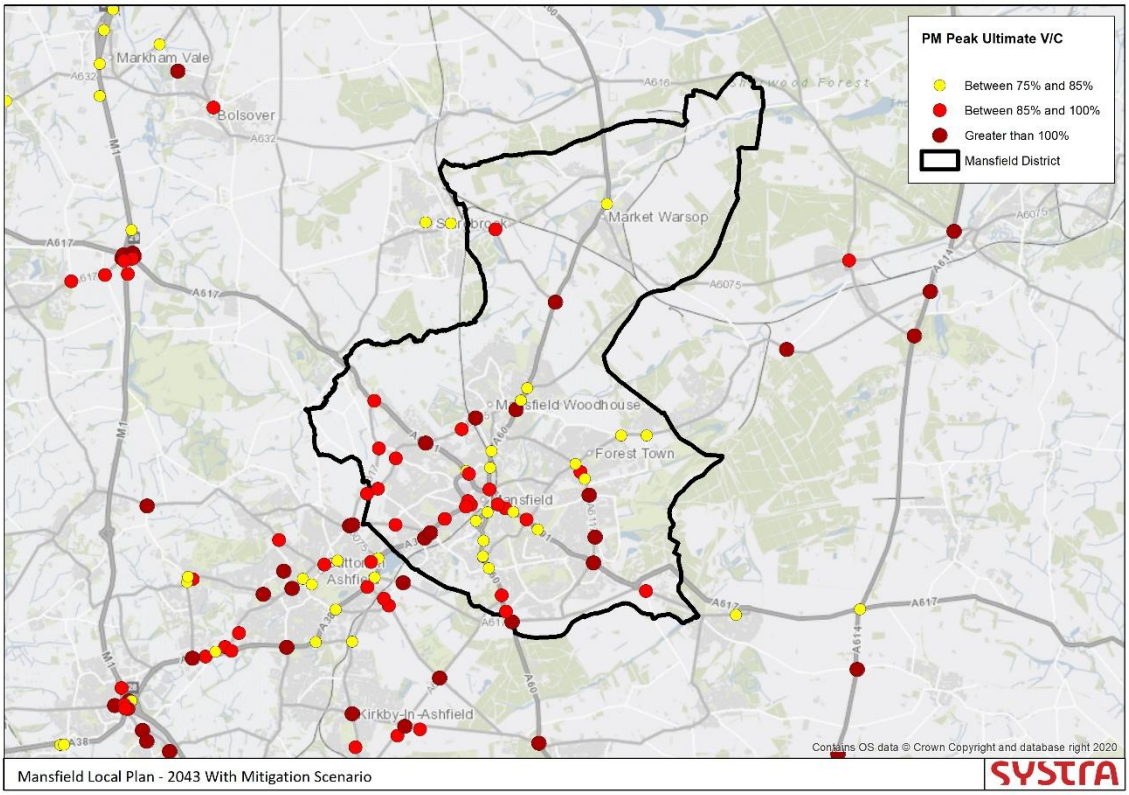


Figure 24. Junction Congestion 2043 With Mitigation Scenario – PM



Network Statistics

6.3.22 Network statistics provide a way of gauging the overall impact of the mitigation measures package. An explanation of the key indicators is as follows:

- Congestion / Over Capacity Queues – reflect the change in overall congestion and is the time spent queuing at junctions that are over capacity. As traffic levels increase, a growing number of junctions reach capacity and the time spent queuing at junctions can increase.
- Total Travel Time – across the highway network in passenger car unit (PCU) hours.
- Total Travel Distance – across the highway network in PCU kilometres.
- Average Speed – kilometres per hour, averaged for all traffic. Increased traffic levels lead to greater delays, potentially resulting in a lower average travel speed.

6.3.23 Network statistics for Mansfield District are provided in Table 17 and Table 18 for the AM and PM peaks, respectively. The percentage changes in the impact mitigated column indicate how far the mitigation proposals have taken network performance back to the situation in the No Local Plan Scenario without the addition of any Local Plan development or mitigation.

Table 17. Network Statistics – AM Peak

INDICATOR	NO LOCAL PLAN SCENARIO	LOCAL PLAN SCENARIO	WITH MITIGATION	IMPACT MITIGATED
Overcapacity Queues / Congestion (PCU hrs)	68	270	93	**88%**
Total Travel Time (PCU hrs)	4,655	5,487	5,353	**16%**
Total Travel Distance (PCU kms)	140,866	156,199	157,527	**-9%**
Average Speed (km/h)	30.3	28.5	29.4	**50%**

Table 18. Network Statistics – PM Peak

INDICATOR	NO LOCAL PLAN SCENARIO	LOCAL PLAN SCENARIO	WITH MITIGATION	IMPACT MITIGATED
Overcapacity Queues / Congestion (PCU hrs)	87	262	137	**72%**
Total Travel Time (PCU hrs)	4,952	5,723	5,583	**18%**
Total Travel Distance (PCU kms)	146,293	159,905	160,571	**-5%**
Average Speed (km/h)	29.5	27.9	28.8	**56%**

6.3.24 In both peaks, between the With Mitigation and Local Plan Scenario there is a decrease in congestion within Mansfield District (denoted by the overcapacity queues statistic), accompanied by a decrease in total travel time, an increase in total travel distance and an increase in average speed. This indicates that the network is operating more efficiently, since traffic is experiencing less congestion and can travel faster across the network generally.

6.3.25 In terms of congestion relief delivered by the mitigation package helping to provide a more efficient highway network, the following headlines are drawn:

- In the AM peak, **88%** of Local Plan-related congestion impacts are mitigated.
- In the PM peak, **72%** of Local Plan-related congestion impacts are mitigated.

6.3.26 It would be challenging to achieve higher levels of congestion impact mitigation due to the strategic nature of this assessment and the fact that the presence of Local Plan development will likely add additional traffic onto the highway network. Not all journeys can be made efficiently by active or public transport modes alone.

6.3.27 Further or refined mitigation could be modelled at the detailed application stages for individual sites on a case-by-case basis.

7. STUDY CONCLUSIONS

7.1.1 To support a "vision and validate" approach to transport planning, moving away from historic "predict and provide" approaches, the strategic transport impacts of the Local Plan have been tested through a structured set of scenarios comprising a 2043 No Local Plan Scenario, a 2043 Local Plan Scenario, the development of a mitigation strategy, and the testing of that mitigation within the Local Plan Scenario. In the Local Plan Scenario, congestion increases by **294%** in the AM peak and by **201%** in the PM peak compared to the No Local Plan Scenario.

7.1.2 The evidence indicates that the transport effects of the Local Plan should be considered in the context of a network that is already forecast to experience increased congestion by 2043, even in the absence of Local Plan growth. The modelling shows that the Local Plan adds to an already constrained baseline position rather than creating transport impacts in isolation. The strategic transport impacts also arise from cumulative and dispersed movements across the network, rather than from individual sites alone, and the mitigation strategy has therefore been developed as a package of coordinated interventions responding to those cumulative effects.

7.1.3 The mitigation strategy has been informed by the principles of Avoid, Shift, Manage and Mitigate, with emphasis on reducing the need to travel by private car, increasing the attractiveness of walking, cycling and public transport, and introducing targeted interventions on the highway network where required.

7.1.4 In line with this approach, the demand management, public transport and active mode mitigation measures have a positive impact on mode shares and bus/rail utilisation, but a relatively limited effect on congestion alleviation overall. In the AM peak, **11%** of the congestion impacts associated with the Local Plan are mitigated, and in the PM peak this figure is **5%.** The additional rail opportunities afforded by the Maid Marian Line and the Robin Hood Line Extension proposals also lead to an increase in rail patronage.

7.1.5 The study has shown that, with the full package of mitigation measures, including highway mitigation, the congestion impacts of the Local Plan can be mitigated by **88%** in the AM peak and by **72%** in the PM peak.

7.1.6 Key corridors within Mansfield District shown to experience decreases in congestion as a result of the implementation of the full mitigation package include the A60 and A6191 corridors. For example, congestion impacts are successfully alleviated with mitigation at the A60 St Peter's Way / A60 Woodhouse Road junction in the PM peak, at the A60 / Sookholme Road junction in both peaks, and along the A6191 corridor at its junction with the A617 MARR in the PM peak.

7.1.7 Having regard to paragraph 11B of the NPPF 2024, the assessment has considered whether the Local Plan positively addresses any residual cumulative and severe impacts of development on the transport network. While some residual impacts from the Local Plan's proposals remain after the implementation of mitigation, the modelling shows that the full mitigation package would offset a substantial proportion of the Local Plan-related congestion impacts and would improve conditions on key corridors within the District.

7.1.8 In relation to highway safety, the strategic modelling and mitigation assessment do not identify a basis for concluding that the Local Plan would, in principle, result in an unacceptable impact on highway safety. The approach taken embeds mitigation within the overall Local Plan strategy and prioritises sustainable travel measures and targeted network interventions

in recognition of the physical and operational constraints affecting the District. However, as this is a strategic transport assessment, the findings should be understood as providing a robust indication of likely network effects rather than a precise prediction of future conditions, and any detailed site-specific highway safety considerations would remain to be addressed through subsequent design and application-stage assessment where necessary.

7.1.9 Overall, the strategic transport modelling demonstrates that, although the Local Plan's development proposals will inevitably give rise to some additional transport impacts, those impacts have been robustly assessed, and a comprehensive mitigation strategy has been identified. The evidence shows that the Local Plan has addressed the main transport-related challenges by considering cumulative effects, testing mitigation and demonstrating substantial relief of Local Plan-related congestion impacts.

7.1.10 The evidence therefore indicates that the Local Plan has taken a reasonable and proportionate approach to assessing and mitigating transport impacts in accordance with the relevant policy tests.

APPENDIX 1

This Appendix is provided separately as part of the supporting document package and is available for reference alongside this report.

APPENDIX 2

TECHNICAL NOTE

MANSFIELD LOCAL PLAN

FORECASTING REPORT V2.1

IDENTIFICATION TABLE	
Client/Project owner	Mansfield District Council
Project	Mansfield Local Plan
Title of Document	Forecasting Report v2.1
Type of Document	Technical Note
Date	29/05/2025
Reference number	GB01T23I15
Number of pages	42

TABLE OF CONTENTS

1.	**INTRODUCTION**	**3**
2.	**THE EAST MIDLANDS GATEWAY MODEL**	**4**
2.1	**EMGM OVERVIEW**	**4**
3.	**NO LOCAL PLAN DEFINITION**	**7**
3.1	**INTRODUCTION**	**7**
3.2	**INFRASTRUCTURE SCHEMES**	**7**
3.3	**COMMITTED AND PROPOSED DEVELOPMENTS – MANSFIELD DISTRICT**	**9**
3.4	**COMMITTED AND PROPOSED DEVELOPMENTS – REST OF MODEL**	**12**
3.5	**COVID ADJUSTMENTS**	**12**
3.6	**CONSTRAINING TO TEMPRO**	**13**
4.	**MODEL CONVERGENCE**	**14**
4.1	**DEMAND MODEL CONVERGENCE**	**14**
4.2	**HIGHWAY MODEL CONVERGENCE**	**14**
5.	**NO LOCAL PLAN OUTPUTS**	**15**
5.1	**HIGHWAY TRIP GROWTH**	**15**
5.2	**KEY HIGHWAY IMPACTS - 2023**	**15**

5.3 KEY HIGHWAY IMPACTS - 2043 19

6. CONCLUSION 25

1. INTRODUCTION

1.1.1 Mansfield District Council are reviewing their Local Plan and SYSTRA has been commissioned to assess the implications of their Local Plan strategy. The East Midlands Gateway Model (highway and public transport) will be utilised to assess the impacts of the Local Plan developments, a series of sustainable travel and public transport schemes, and associated mitigation packages on the local transport networks.

1.1.2 The East Midlands Gateway Model (EMGM) is a multimodal transport model built following the guidance in the Department for Transport's (DfT) 'Transport Analysis Guidance' (TAG). The model was fully calibrated and validated in line with TAG guidance in 2018 and has a base year of 2016. It has since been used for a variety of studies, including local plans, development assessments, DfT compliant business cases and regional growth strategies.

1.1.3 To ensure that the EMGM is fit for purpose for the Mansfield Local Plan assessment, the model has been expanded and revalidated within the local Mansfield area. Details of this process is provided in the Model Validation Report[1].

1.1.4 This note summarises the approach to developing the 2023 Baseline and 2043 No Local Plan models required to assess the strategic transport impacts of the Mansfield Local Plan using the East Midlands Gateway Model (EMGM).

1.1.5 The end of the plan period is proposed to be 2043. The assessment year is therefore 2043, which allows for the plan proposals to be fully occupied and operational. A 2023 baseline has also been developed for comparison purposes.

[1] Mansfield Local Plan - Model Validation Report v2.0.pdf, September 2024

2. THE EAST MIDLANDS GATEWAY MODEL

2.1 EMGM Overview

2.1.1 The EMGM has been developed as a multimodal transport model built following guidance in the Department for Transport's (DfT) Transport Analysis Guidance (TAG). The EMGM is fully simulated in an area covering Nottinghamshire, Derbyshire and North Leicestershire.

2.1.2 An overview of the structure of the EMGM is shown in Figure 1. In summary, the 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.
- TRICS based Trip End Model.

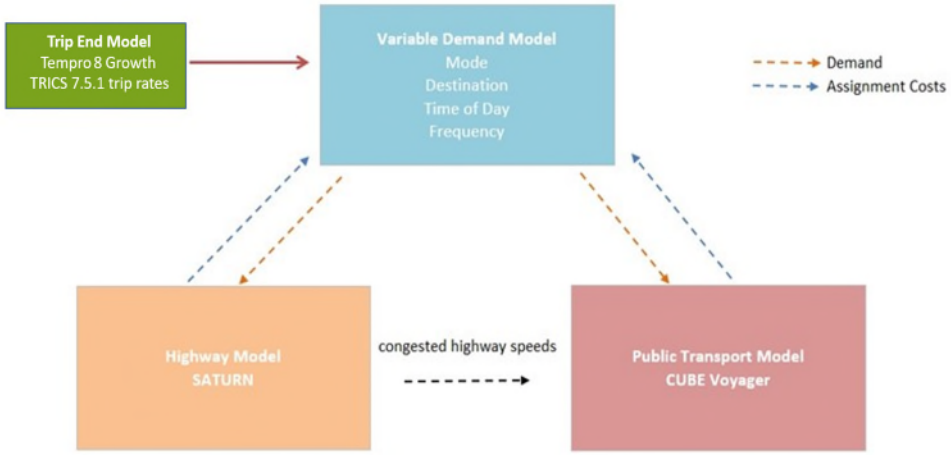


Figure 1. EMGM Technical Structure

2.1.3 Forecast demand is calculated in the Trip End Model, as in Figure 2.

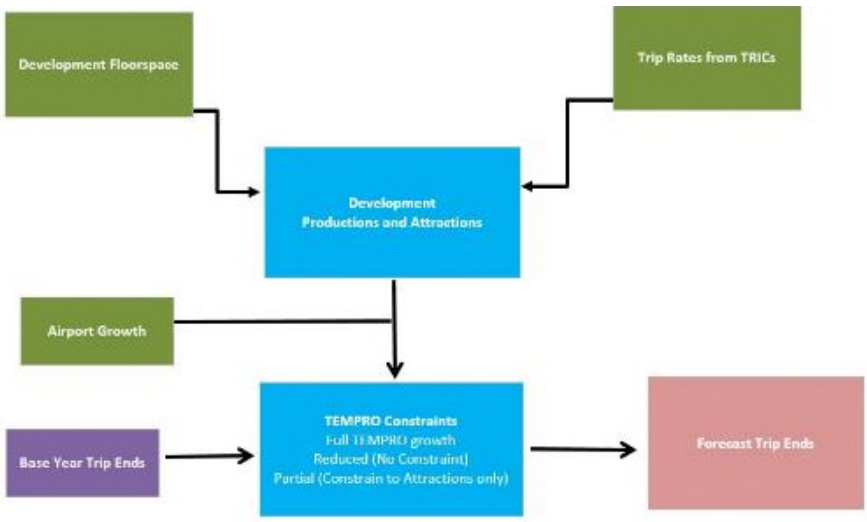


Figure 2. Trip End Model Structure

2.1.4 The development trips are calculated from trip rates contained within TRICS and are applied to floorspace, or the number of dwellings, proposed at each development. The development trips are added to the base matrices and then background growth is applied to the matrix in a way that ensures that the outturn growth matches Trip End Model Presentation Program (TEMPro 8.1) growth forecasts i.e. the EMGM is constrained to TEMPro growth.

2.1.5 Outturn generations for developments which have been entered specifically, closely align with the expected level of generations. Residual TEMPro growth is applied to surrounding wards within each MSOA and constrained at a district level.

2.1.6 Trip rates have been extracted from TRICS 7.5.1 for different types of land-use and segmented by mode and time period. The final person trip rates applied in the trip end model are shown in Table 1. These have been previously agreed with the Local Authorities and National Highways for the development of previous EMGM Reference Cases in 2023 as part of the assessment of the Greater Nottingham Strategic Plan.

Table 1. EMGM Person Trips Rates

	AM PEAK (08:00 – 09:00)			PM PEAK (17:00 – 18:00)		
	ARRIVAL	DEPARTURE	TOTAL	ARRIVAL	DEPARTURE	TOTAL
Residential houses (per dwelling)	0.183	0.729	0.912	0.570	0.257	0.827
Residential flat (per flat)	0.074	0.295	0.369	0.231	0.104	0.335
B1 Employment (per 100sqm)	1.631	0.115	1.746	0.102	1.479	1.581
B2 Employment (per 100sqm)	0.388	0.145	0.533	0.081	0.375	0.456
B8 Employment (per 100sqm)	0.087	0.023	0.110	0.011	0.042	0.090
Primary Education (per 100sqm)	7.193	1.613	8.806	0.311	0.658	0.969
Secondary Education (per 100sqm)	2.341	0.256	2.597	0.066	0.634	0.700
College (Nottingham Skills Hub, per pupil)	0.359	0.017	0.376	0.031	0.069	0.100
Food Retail (per 100sqm)	3.518	2.624	6.142	6.558	6.887	13.445
Non-Food Retail (per 100sqm)	0.287	0.069	0.356	0.253	0.206	0.459
Café/Restaurant/Bar (per 100sqm)	0.000	0.000	0.000	6.256	2.874	9.130
Health Centre (Clinic) (per 100sqm)	1.952	0.355	2.307	0.124	0.805	0.929

3. NO LOCAL PLAN DEFINITION

3.1 Introduction

3.1.1 This chapter details the developments and infrastructure schemes that have been included in the 2043 No Local Plan Scenario. Build out rates are based upon best available knowledge, as provided by each Planning Authority.

3.2 Infrastructure Schemes

Committed Infrastructure Schemes

3.2.1 Table 2 to Table 5 detail the committed infrastructure schemes included in the 2043 No Local Plan scenario. These schemes are either already constructed or are committed and expected to be operational by 2043. Information is presented by Authority. Details of the development and infrastructure proposals to be included in the model have been agreed with National Highways and Nottinghamshire County Council in advance of undertaking the modelling of the 2043 No Local Plan scenario.

Table 2. National Highways Committed Infrastructure Schemes

NATIONAL HIGHWAYS SCHEMES
A52 Nottingham junction improvements at the following junctions: Bingham Road, Stragglethorpe Road, Silverdale roundabout and Gamston roundabout
Grade Separation of A38 junctions with A61, A52 and A5111
EM SRFI mitigation at M1 J24/24a (built)
A52 Nottingham Junctions Improvement Scheme (Nottingham Knight and Wheatcroft)
Improvements to M1 J22 (associated with Bardon Grange development)
A453 Mill Hill roundabout and Crusader roundabout improvement schemes as conditioned to the consented Clifton South SUE development (planning reference 14/01417/OUT)
Smart Motorways schemes implemented along M1 J23a to J25 (built)
M1 J20 signalisation to support the Lutterworth East development
A46/A6 junction improvements to support North Birstall development
M1 J26/A610 slip road improvements

Table 3. Nottingham City and Nottinghamshire Committed Infrastructure Schemes

NOTTINGHAM CITY AND NOTTINGHAMSHIRE SCHEMES
Turning Point South
Gedling Access Road (built)

NOTTINGHAM CITY AND NOTTINGHAMSHIRE SCHEMES
Boots Link Road (built)
A614 / A6097 MRN junction scheme package (6 junctions)
A60 Larch Farm crossroads improvement, Ravenshead
A612 Colwick Loop Road bus priority linked to southern growth corridor
Northern, Southern, Central and Western bus priority growth corridors as part of Transforming Cities Fund

Table 4. Derby City and Derbyshire Committed Infrastructure Schemes

DERBY CITY OR DERBYSHIRE SCHEMES
Highway Proposals associated with the East Midlands Gateway development adjacent to M1 J24 (built)
Stenson Road/A5111 associated with Stenson Fields development
Radbourne Lane development mitigation
Schemes associated with South Derbyshire Core Strategy (south of A50)
A52 Wyvern Transport Improvement Scheme (built)
NO2 Scheme
Rolls Royce Victory Road Realignment (built)
New A50 junction and associated South Derby Growth Zone link road
Pentagon Island bus priority
Junction Improvements at Blue Peter Roundabout and London Road (built)
Junction Improvements associated with Boulton Moor development

Table 5. Leicestershire Committed Infrastructure Schemes

LEICESTERSHIRE SCHEMES
Bardon vehicular link and improvements to A42 junction 13 (associated with Bardon Grange)
Link Road between A512 and A6 north and improvements to M1 J23 (associated with Garendon)
Castle Donnington Western Relief Road linking Back Lane with Hill Top
Signalisation of the A50/A46 roundabout (associated with Ashton Green and Glenfield Park)
Signalisation of the A46/Ansty Lane roundabout (associated with Ashton Green)
Kegworth Bypass (built)

3.2.2 Table 6 to Table 8 detail all proposed infrastructure schemes included in the 2043 scenario that are associated with Local Plans within the wider modelled area.

Table 6. Nottingham City or Nottinghamshire Proposed Infrastructure Schemes

NOTTINGHAM CITY AND NOTTINGHAMSHIRE SCHEME
Ashfield transport enhancements associated with Local Plan
Toton Link Road

Table 7. Derby City or Derbyshire Proposed Infrastructure Schemes

DERBY CITY OR DERBYSHIRE SCHEME
Kirk Hallam Relief Road
Amber Valley transport enhancements associated with Local Plan
Erewash transport enhancements associated with Local Plan

Table 8. Leicestershire Proposed Infrastructure Schemes

LEICESTERSHIRE SCHEMES
Main road via East Thurmaston from Barkby Thorpe Lane to King Street and Hamilton Lane
Link to Sandhills Avenue
Link road from North East Leicester SUE
Capacity enhancements at A607 Barkby Thorpe Lane and Troon way / Barkby Road roundabouts

3.3 Committed and Proposed Developments – Mansfield District

3.3.1 Table 9 presents the developments in Mansfield District included in the 2023 Baseline and 2043 No Local Plan Scenarios. This information was provided by Mansfield District Council's Housing Monitoring Report 2023[2]. The No Local Plan Scenario only includes developments that have been implemented by 2023 with the overall growth constrained to 2023 TEMPro levels in both the 2023 and 2043 scenarios.

[2] Housing Monitoring Report 2023 (mansfield.gov.uk)

Table 9. Mansfield No Local Plan Developments

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	FULL BUILD OUT HOMES BY 2043	FULL BUILD OUT EMPLOYMENT (HA) BY 2043	BUILD OUT BY 2023
1	Pleasley Hill Farm	SUE1	Mansfield District Council	925	1.7ha	0
2	Land east of Jubilee Way South	SUE2	Mansfield District Council	800	1.6ha	0
3	Land at Berry Hill (Lindhurst)	SUE3	Mansfield District Council	1700	18.8ha	576
4	Land south of Clipstone Road East	H1ai	Mansfield District Council	313	0	4
5	Clipstone Road East/Crown Farm Way	H1aii	Mansfield District Council	197	0	40
6	Land off Skegby Lane	H1b	Mansfield District Council	215	0	0
7	Fields Farm, Abbott Road	H1c	Mansfield District Council	200	0	0
8	Three Thorn Hollows Farm	H1d	Mansfield District Council	199	0	0
9	Land at Redruth Drive	H1e	Mansfield District Council	169	0	0
10	Land at Rosebrook Primary School	H1f	Mansfield District Council	134	0	0
11	Land adjacent to Abbot Road	H1g	Mansfield District Council	102	0	0
12	Stonebridge Lane	H1u	Mansfield District Council	400	0	0
13	Land north of Skegby Lane	H2k	Mansfield District Council	150	0	0

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	FULL BUILD OUT HOMES BY 2043	FULL BUILD OUT EMPLOYMENT (HA) BY 2043	BUILD OUT BY 2023
14	Phase 1 Penniment Farm	H2la	Mansfield District Council	202	0	202
15	Land adjacent to Abbot Road	H2lb	Mansfield District Council	228	0	0
16	Pleasley Hill Regeneration Area	H2n	Mansfield District Council	151	0	151
17	Park Hall Farm	H2t	Mansfield District Council	140	0	140
18	Ratcher Hill Quarry	E2a	Mansfield District Council	0	3.45ha	0
19	Oakfield Lane, Market Warsop	E2b	Mansfield District Council	0	2.2ha	0
20	Penniment Farm Employment	E2c	Mansfield District Council	0	9ha	0

3.4 Committed and Proposed Developments – Rest of Model

3.4.1 Appendix A details the committed and allocated housing and employment developments, presented by Local Authority (excluding Mansfield, which is provided separately in section 3.3), which have been included in the 2023 and 2043 scenarios. It is assumed that all developments will be fully built out by 2043 and therefore the quantum provided represents the fully built out development. The total percentage of the development built in 2023 has also been provided.

3.4.2 Developments of at least 180 dwellings (or those that are of an equivalent size in terms of trip generation for non-residential developments) are explicitly modelled. Smaller developments are included through the application of TEMPRO 8 growth assumptions.

3.5 COVID Adjustments

3.5.1 Demand in the 2023 scenario has been adjusted to reflect the impact of the pandemic on traffic flows. The adjustment has been made to the input TEMPRO data which feeds into the VDM model process and therefore the change is subject to the full demand responses.

3.5.2 Nottinghamshire County Council have provided traffic growth analysis based on average two-way traffic volumes across 51 permanent traffic counters within Nottinghamshire for 2nd March 2020 (pre pandemic) and 18th September 2023 (post pandemic). The key output of this data for the peak hours is presented in Table 10 below.

Table 10. Traffic Flow Change

	WEEK	WEEKDAY TRAFFIC FLOWS			PERCENTAGE CHANGE		
		URBAN	RURAL	AVERAGE	URBAN	RURAL	AVERAGE
AM	02-Mar-20	1,165	871	975	100%	100%	100%
	18-Sep-23	1,124	846	944	96%	97%	97%
PM	02-Mar-20	1,215	910	1,017	100%	100%	100%
	18-Sep-23	1,183	864	976	97%	95%	96%

3.5.3 Table 10 suggests that across Nottinghamshire traffic levels in 2023 were, in general, around 3% lower than pre-pandemic levels in the AM Peak and 4% in the PM peak.

3.5.4 The following process was adopted for the 2023 scenario:

- extract 2019 and 2023 forecast trip end data from a TEMPro 'Core' scenario.
- adjust the 2019 forecast data to be in line with the observed conditions (Table 10) whilst retaining the overall distribution of trips from the 2023 forecast.

3.5.5 For the longer-term forecasting, 2043 in this case, this is a relatively insignificant drop in flows and is unlikely to have a significant impact on the types of mitigation proposed for the Mansfield Local Plan.

3.6 Constraining to TEMPRO

3.6.1 The information contained in TEMPRO is based on adopted local plans. As the purpose of this study is to model the updated Mansfield Local Plan, we have not constrained the 2043 scenario to 2043 TEMPRO data within the area of the Local Plan. Instead, the 2043 No Local Plan scenario is constrained to 2023 TEMPRO levels within Mansfield District and includes the specific modelled developments which are over 180 houses (Table 9).

3.6.2 All areas outside Mansfield have been constrained to 2043 TEMPRO levels.

4. MODEL CONVERGENCE

4.1 Demand Model Convergence

4.1.1 The convergence statistics for the VDM models is shown in Table 11 below. The %GAP convergence for both scenarios meet the 0.2% threshold specified by TAG.

Table 11. No Local Plan Convergence

MODEL YEAR	LOOP NUMBER	% GAP
2025	4	0.16%
2043	10	0.20%

4.2 Highway Model Convergence

4.2.1 The convergence statistics for the No Local Plan SATURN models are shown in Table 12 below. The %GAP convergence for all scenarios is well below the 0.1% threshold specified by TAG.

Table 12. No Local Plan Convergence

TIME PERIOD	MODEL YEAR	LOOP NUMBER	% GAP	% FLOWS
AM	2023	100 101 102 103	0.013 0.011 0.012 0.0072	98.6 98.5 98.6 98.5
PM	2023	90 91 92 93	0.011 0.012 0.013 0.0094	98.0 98.5 98.4 98.4
AM	2043	86 87 88 89	0.025 0.020 0.026 0.021	98.8 98.8 98.8 98.7
PM	2043	67 68 69 70	0.030 0.021 0.028 0.022	98.8 98.8 98.7 98.8

5. NO LOCAL PLAN OUTPUTS

5.1 Highway Trip Growth

5.1.1 Table 12 below outlines the growth in highway trips between the 2016 Base Year and the 2023 Baseline and 2043 No Local Plan Scenario for the AM and PM peaks. The number of trips overall EMGM network is expected to increase by 8% in the AM peak and 7% in the PM peak between 2016 and 2023, and by 29% and 26% between 2016 and 2043.

Table 13. Growth in Highway Trips (PCUs/hr)

PEAK	2023	2043
AM Peak	8%	30%
PM Peak	7%	27%

5.2 Key Highway impacts - 2023

Flow Change

5.2.1 Figures 3 and 4 present the traffic flows in the 2023 Baseline Scenario. The M1, A38, A617, A60 and A614 experience significant traffic flows in both peaks. Within Mansfield District the flows are highest on the radial routes into and through the town centre (A60, A6191 and A617).

Figure 3. Highway Flows 2023 Baseline – AM

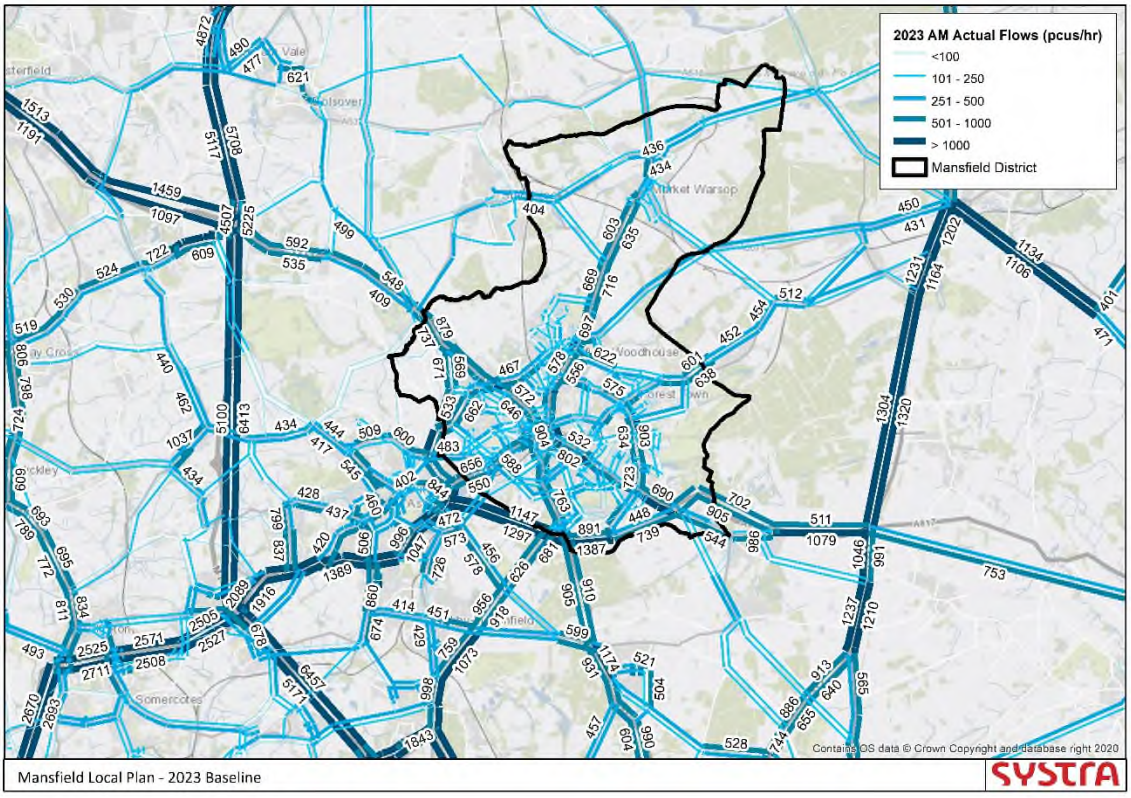
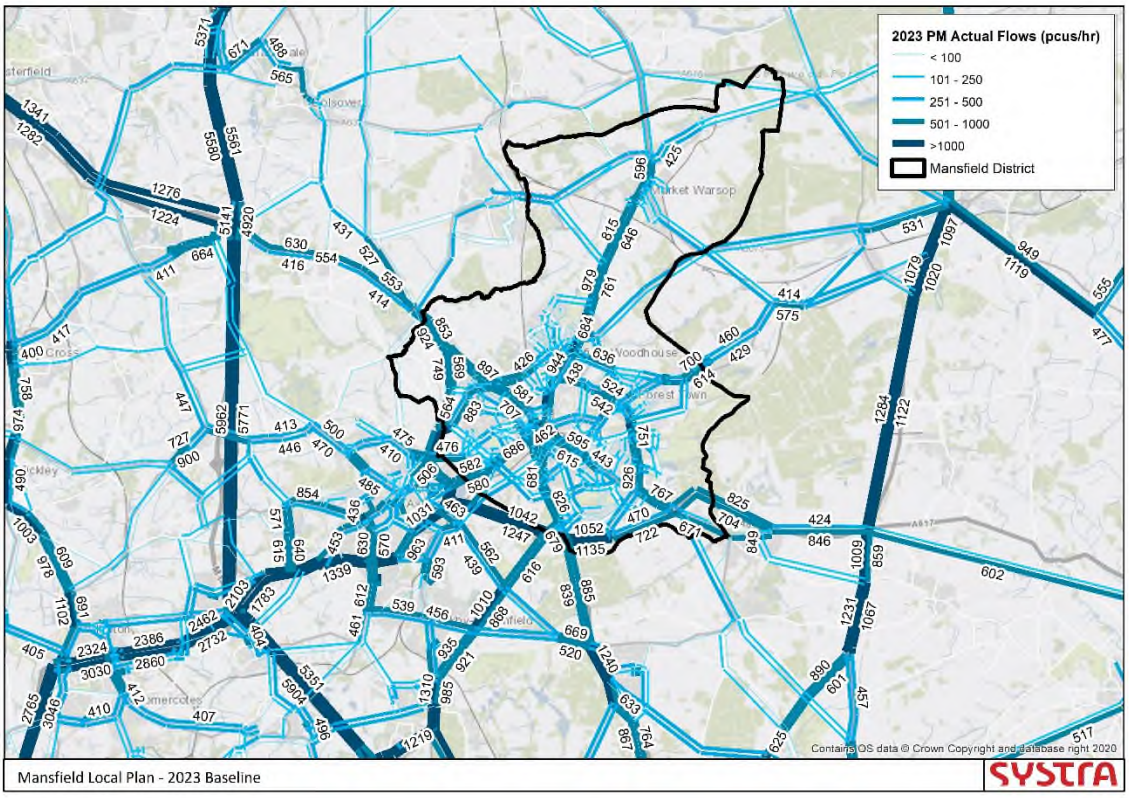


Figure 4. Highway Flows 2023 Baseline – PM



5.2.2 Figures 5 and 6 show the junctions which are forecast to have a maximum V/C ratio (%) of 75% or higher in the 2023 Base Scenario. The yellow dots indicate junctions which are approaching the 85% threshold. The red dots represent junctions with a V/C over 85% but under 100% and are therefore considered congested and brown dots show junctions severely congested with a V/C of 100% of more.

5.2.3 Several junctions along key radial routes into and out of Mansfield experience congestion in 2023. Junctions along the A60, the A6191 and the A38 are approaching or already congested.

5.2.4 The following junctions have a V/C over 100% in the Morning Peak:

- A60/Eastlands Lane.
- A60/New Mill Lane.

5.2.5 The following junctions have a V/C over 100% in the Evening Peak:

- A60/Sookholme Road.
- A60/New Mill Lane.
- A6075/Priory Road/Sherwood Street.
- A38/Hermitage Lane.
- A38/Sheepbridge Lane.

Figure 5. Junction Congestion 2023 Baseline – AM

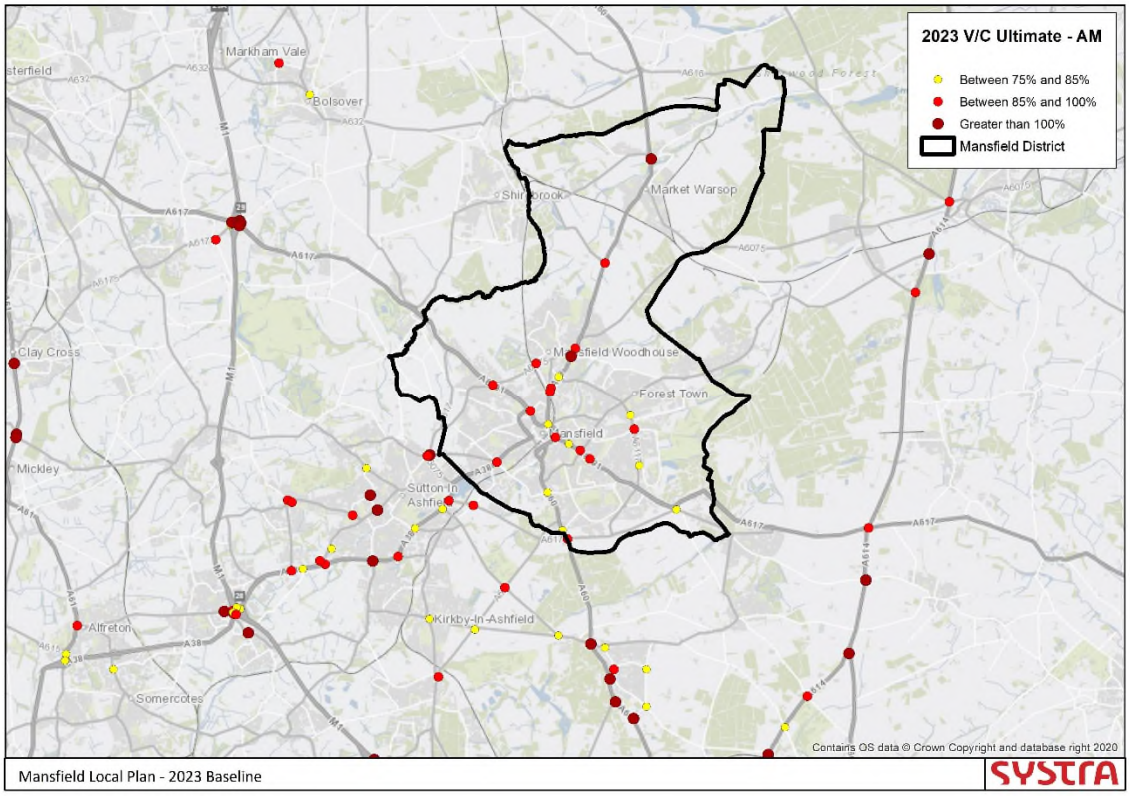
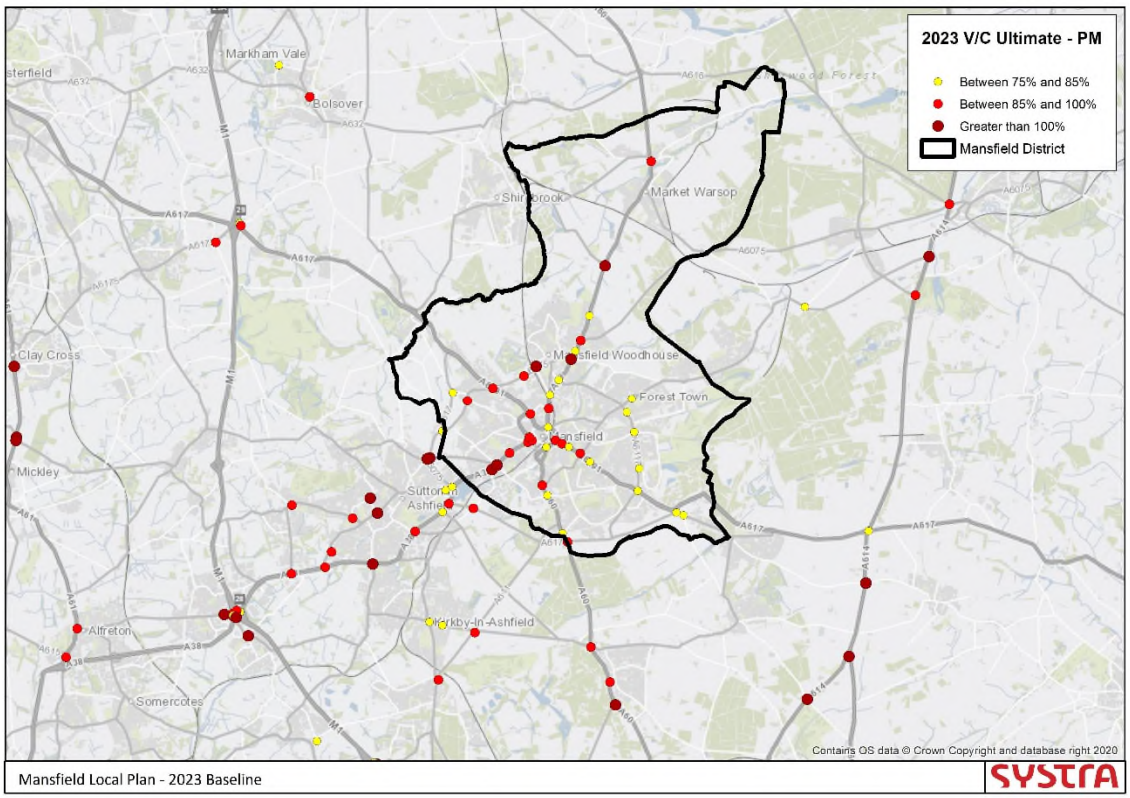


Figure 6. Junction Congestion 2023 Baseline - PM



5.3 Key Highway impacts - 2043

Flow Change

5.3.1 Figures 7 and 8 present the change in traffic flows between the 2023 Baseline and 2043 No Local Plan scenarios. Red lines indicate an increase in traffic compared to 2023 and green lines represent a reduction in flow.

5.3.2 Roads within Mansfield District experience small changes in traffic between 2023 and 2043. This reflects the approach adopted for Mansfield District to constrain to 2023 TEMPRO levels rather than 2043.

5.3.3 Outside of Mansfield District, there are significant increases in flows along Strategic Road Network, with flows on both the A38 and M1 increasing by around 600 pcus in each direction along the A38, and by around 1,600 pcus in each direction on the M1.

5.3.4 In both peak hours, several local roads through Ashfield experience an increase in traffic. The A617 south of Mansfield and the A614 to the west of Mansfield also experience increases in traffic. These increases are partially the result of the traffic induced by the Ashfield Local Plan developments.

5.3.5 There is a reduction in flow along the A611 Derby Road because of the proposed Ashfield Local Plan Mitigation Scheme at the A611/B6020 (Diamond Avenue) junction.

Figure 7. Highway Flow Change 2043 No Local Plan vs 2023 Baseline – AM

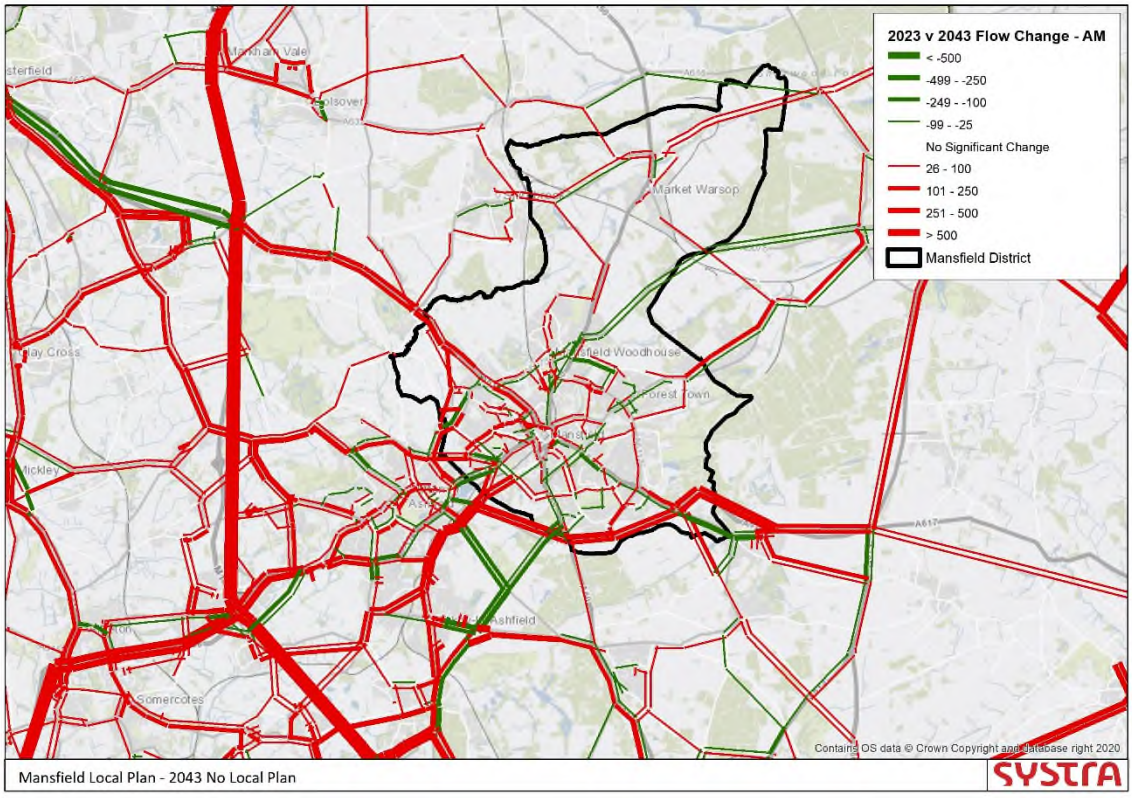
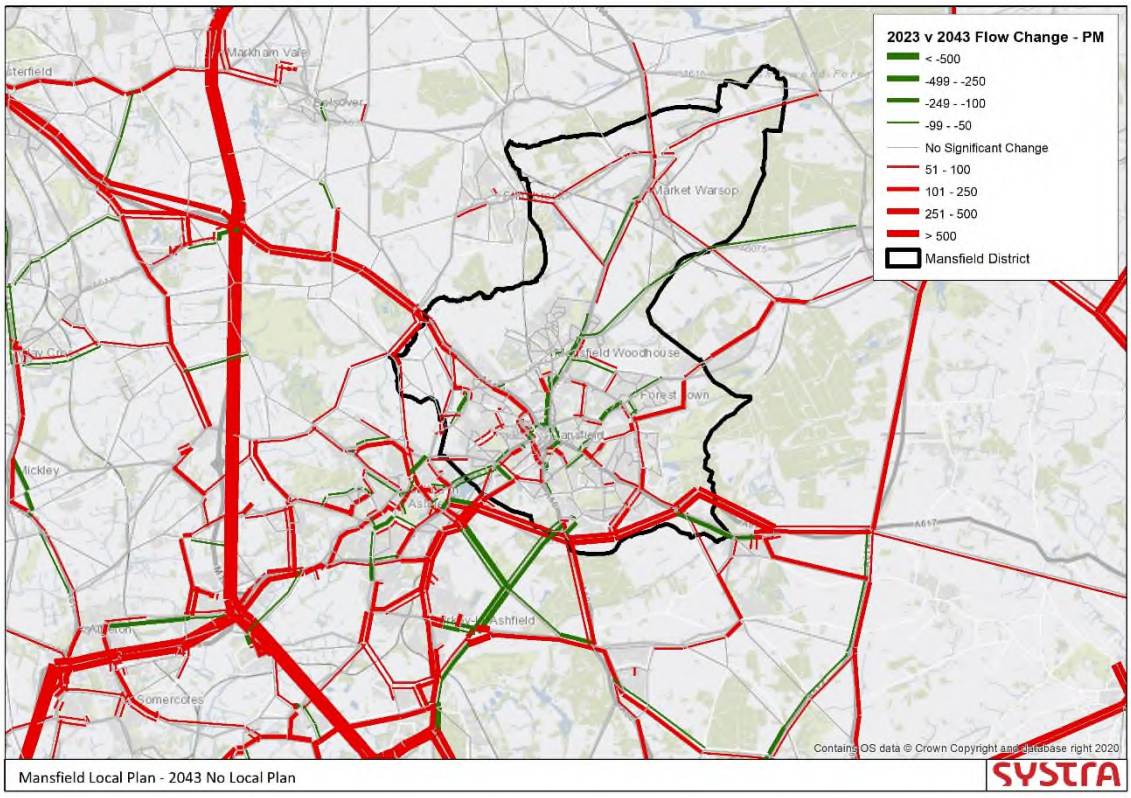


Figure 8. Highway Flow Change 2043 No Local Plan vs 2023 Baseline – PM



Highway Congestion Change

5.3.6 Figures 9 and 10 show the change in congestion between the 2023 Baseline and 2043 No Local Plan scenarios. The figures show locations of new congestion where the V/C is expected to be pushed over 85% in the No Local Plan Scenario.

5.3.7 Within Mansfield District the following junctions experience an increase in V/C larger than 10% by 2043:

- A617/A6191 Chesterfield Road (AM and PM).
- A617/A6075 Debdale Lane/Abbott Road (AM).
- A6075 Debdale Lane/Sherwood Rise (AM).
- A617/A6191 (AM).
- A6117/A60 (AM).
- A38 Sutton Road/Kirkland Avenue (AM).
- A38 Sutton Road/Hermitage Lane (AM).
- A38 Sutton Road/Sheepbridge Lane (AM).
- A6117/A6191 (AM and PM).
- A60/A617 (PM).
- A6117/Eakring Road (PM).
- A611/Cauldwell Road (PM).
- A60/Bishops Walk (PM).

Figure 9. Change in Junction Congestion 2023 Baseline v 2043 No Local Plan - AM

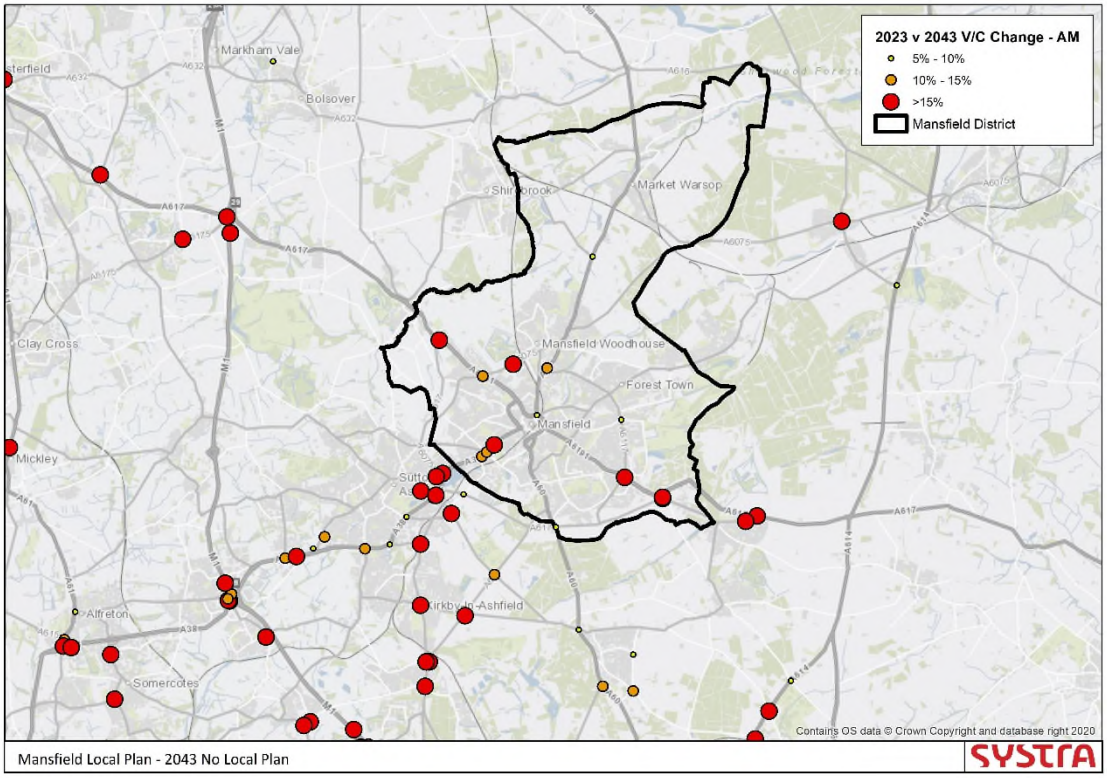
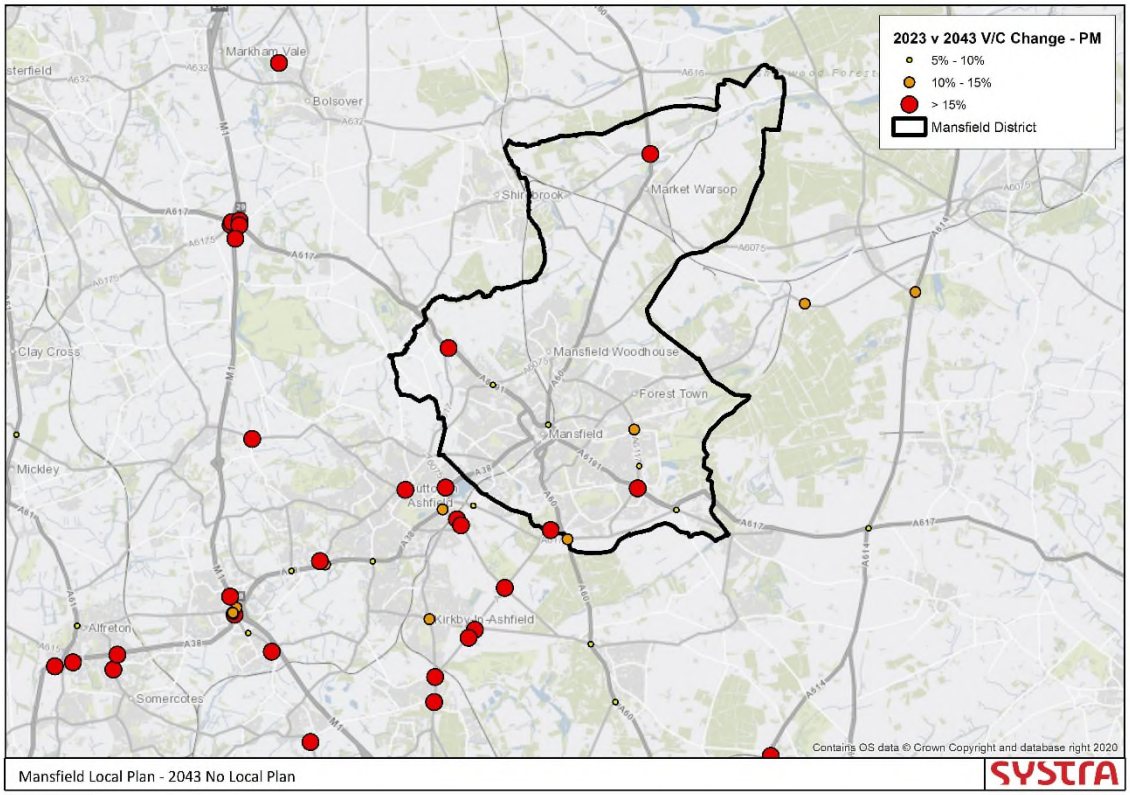


Figure 10. Change in Junction Congestion 2023 Baseline v 2043 No Local Plan - PM



Ultimate Highway Congestion

5.3.8 Figures 11 and 12 show the junctions which are forecast to have a maximum V/C ratio (%) of 75% or higher in the 2043 No Local Plan scenario. The yellow dots indicate junctions which are approaching the 85% threshold. The red dots represent junctions with a V/C over 85% but under 100% and are therefore considered congested and brown dots show junctions severely congested with a V/C of 100% of more.

5.3.9 The following junctions have a V/C over 100% in the Morning Peak:

- A60/Eastlands Lane.
- A60/New Mill Lane.
- A617/A6191.

5.3.10 The following junctions have a V/C over 100% in the Evening Peak:

- A60/Eastlands Lane.
- A60/Sookholme Road.
- A60/New Mill Lane.
- A6075/Priory Road/Sherwood Street.
- A38/Hermitage Lane.
- A38/Sheepbridge Lane.

5.3.11 Further afield, there are increases in congestion along the A38, at M1 J28 and M1 J29, along the A614 and along the A60 south of Mansfield.

Figure 11. Junction Congestion 2043 No Local Plan – AM

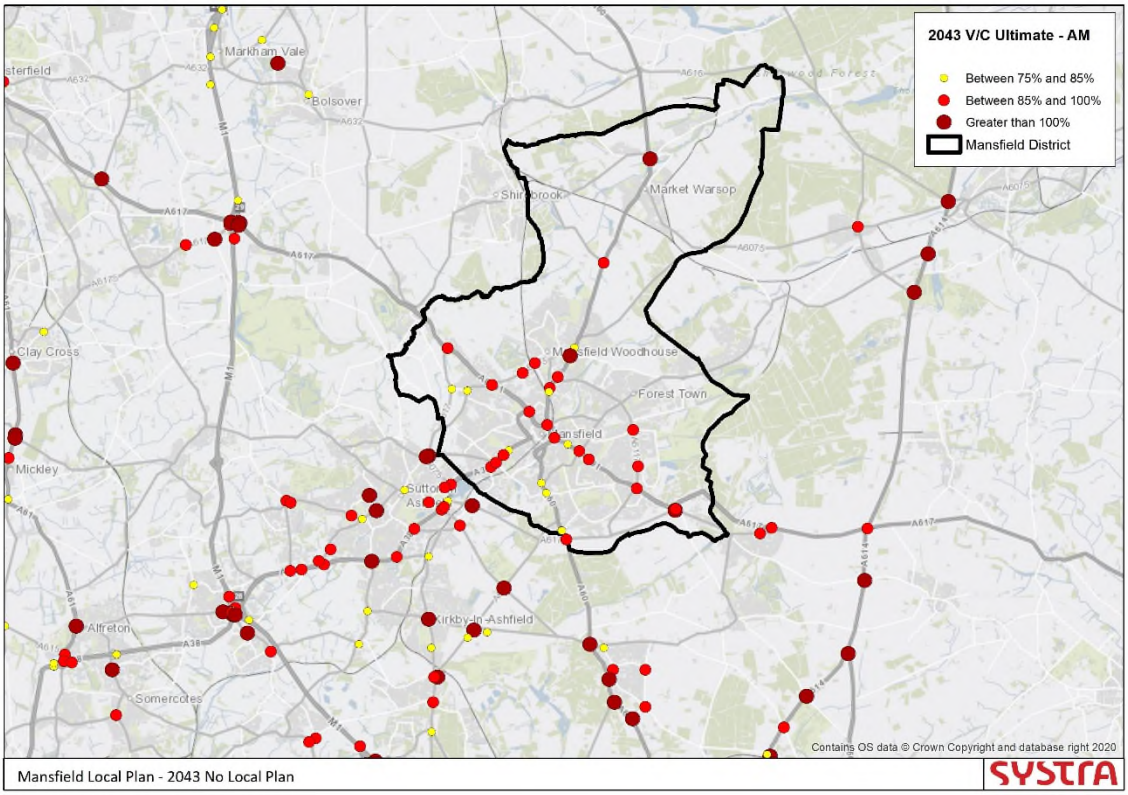
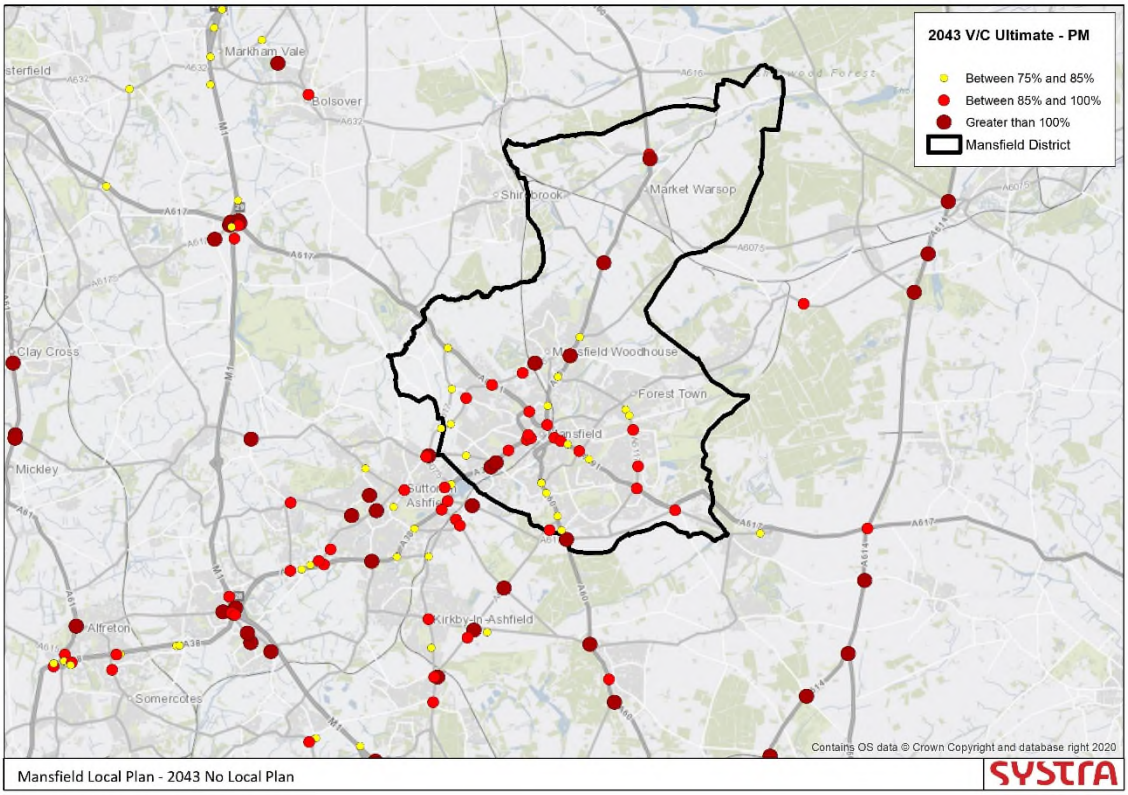


Figure 12. Junction Congestion 2043 No Local Plan - PM



6. CONCLUSION

6.1.1 This report has summarised the approach to developing the 2023 Baseline and 2043 No Local Plan modelling scenarios for the Mansfield Local Plan Assessment.

6.1.2 Traffic flows and congestion in Mansfield District show modest increases between 2023 and 2043. This reflects the constraint to TEMPRO levels for Mansfield District to 2023. Outside of Mansfield, there are forecast to be notable increases in traffic flows and congestion along the Strategic Road Network and on local roads through Ashfield. These increases are due to a combination of traffic induced by the Ashfield Local Plan and more generalised growth in the region between 2023 and 2043.

Appendix A

Table 14. No Local Plan Committed and Proposed Development Inputs

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
D1	Derbyshire	Rykneld Road (Heatherton Extn)	Derby	900					21%
D2	Derbyshire	Chaddesden Sidings (South)	Derby				22,875	132,075	35%
D3	Derbyshire	Derby Royal Infirmary	Derby	920					56%
D4	Derbyshire	Chaddesden Sidings (West)	Derby				13,000	13,000	56%
D5	Derbyshire	Raynesway/Derby Commercial Park	Derby					181,000	70%
D6	Derbyshire	Manor/Kingsway Hospitals	Derby	937					63%
D8	Derbyshire	Chellaston Business Park/Infinity Park	Derby			6,415	75,666	89,012	35%
D9	Derbyshire	Brook Farm Chaddesden	Derby	230					56%
D10	Derbyshire	Hackwood Farm	Derby	410					56%
D11	Derbyshire	Nightingale Works	Derby	400					56%
D12	Derbyshire	Infinity Park Extension	Derby			5,000	45,000		39%
D14	Derbyshire	Castleward	Derby	840					49%
D15	Derbyshire	Friar Gate Goods Yard	Derby	280	1,000	2,500			56%
D16	Derbyshire	Wragley Way (DCC)	Derby	180					70%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
D17	Derbyshire	Wragley Way (SDDC)	South Derbyshire	1,950					56%
D18	Derbyshire	Boulton Moor/Snelsmoor Grange	Derby	800					28%
D19	Derbyshire	Boulton Moor Phase 1	South Derbyshire	905					56%
D20	Derbyshire	Boulton Moor Phase 2	South Derbyshire	550					56%
D21	Derbyshire	Boulton Moor Phase 3	South Derbyshire	190					56%
D22	Derbyshire	Land at Hackwood Farm	South Derbyshire	290					28%
D23	Derbyshire	Land South of Sinfin Moor/Infinity Park	South Derbyshire			3,000	3,000	24,000	28%
D24	Derbyshire	Primula Way	South Derbyshire	500					28%
D25	Derbyshire	Chellaston Fields	South Derbyshire	500					28%
D26	Derbyshire	Land West of Mickleover Phase 1 (Newhouse Farm)	South Derbyshire	300					28%
D27	Derbyshire	Land West of Mickleover Phase 2	South Derbyshire	252					28%
D28	Derbyshire	Land West of Mickleover Phase 3	South Derbyshire	1,100					28%
D29	Derbyshire	Broomy Farm	South Derbyshire	600					28%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
D30	Derbyshire	Land NE of Hatton	South Derbyshire	400					28%
D31	Derbyshire	North of William Nadin Way	South Derbyshire	600					28%
D32	Derbyshire	Church Street, Church Gresley	South Derbyshire	350					28%
D33	Derbyshire	Land off the Mease, Hilton	South Derbyshire	485		7,000	14,000	14,000	28%
D34	Derbyshire	Woodville Regeneration Area	South Derbyshire	300		12,000	24,000	24,000	28%
D35	Derbyshire	Land North of Dove Valley Business Park	South Derbyshire			28,300	56,600	56,600	28%
D37	Derbyshire	Highfield Farm	South Derbyshire	1,056					28%
D38	Derbyshire	Drakelow Power Station	South Derbyshire	2,239		12,000	24,000	24,000	28%
D39a	Derbyshire	SmartParc (old Celanese Site)	Derby			10,450	99,275	99,275	40%
D41	Derbyshire	Phase 1 Radbourne Lane, Mackworth	Amber Valley	510					100%
D42	Derbyshire	Phase 2 Radbourne Lane, Mackworth	Amber Valley	600					10%
D43	Derbyshire	Land S of Mansfield Road/N of A38, Alfreton	Amber Valley	323					65%
D44	Derbyshire	Coppice Farm, Peasehill Road, Ripley	Amber Valley	400					7%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
D45	Derbyshire	Lily Street Farm, Derby Road, Swanwick	Amber Valley	600		6,500	7,500	10,000	21%
D46	Derbyshire	Kedleston Road, Quarndon	Amber Valley	400					13%
D47	Derbyshire	Shipley Lakeside, Shipley	Amber Valley	307					5%
D50	Derbyshire	West of Quarry Hill Road	Erewash	350					28%
D53	Derbyshire	Nether Farm, Birchwood Lane, Somercotes	Amber Valley	200					10%
D54	Derbyshire	Land off Somercotes Hill, Somercotes	Amber Valley	180					10%
D55	Derbyshire	Onslow Road	Derby	203					10%
D56	Derbyshire	Newlands/Loscoe Fields	Amber Valley	500					10%
D57	Derbyshire	Acorn Way	Erewash	600					0%
D58	Derbyshire	Spondon	Erewash	200					0%
D59	Derbyshire	Kirk Hallam	Erewash	1,000					0%
D60	Derbyshire	Cotmanhay	Erewash	250					0%
D64	Derbyshire	Nottingham Road	Amber Valley	181					10%
D65	Derbyshire	Land off Brun Lane, Mackworth	Amber Valley	2,000					10%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
D66	Derbyshire	Land off Aldreds Lane, Heanor	Amber Valley	250					10%
D49a	Derbyshire	North Stanton	Erewash				200,000	200,000	14%
D49b	Derbyshire	South Stanton	Erewash	1,000					0%
D67	Derbyshire	City Centre, Northern Gateway	Derby	200					63%
D68	Derbyshire	City Centre, Cultural Heart	Derby	186					63%
D69	Derbyshire	City Centre, Derbion Masterplan	Derby	400					63%
D78	Derbyshire	City Centre, Derbion Masterplan	Derby	400					63%
D70	Derbyshire	City Centre, Abbey Street Car Parks	Derby	100					63%
D71	Derbyshire	City Centre, Cathedral Road and Campion Glass	Derby	50					63%
D72	Derbyshire	City Centre, Railway Station Masterplan	Derby	1,000					63%
D73	Derbyshire	City Centre, Derby Riverside	Derby	800					63%
D74	Derbyshire	City Centre, Babington Lane Car Park	Derby	200					63%
D75	Derbyshire	City Centre, Becketwell	Derby	469	1,058	17,981			63%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
D76	Derbyshire	City Wide	Derby	1560					0%
D77	Derbyshire	Infinity Garden Village, Including Lowes Farm	South Derbyshire	1850	1,200		81,250	243,750	0%
N1	Nottinghamshire	Rolls Royce	Ashfield	902		47,000	35,250	35,250	44%
N11	Nottinghamshire	Boots Site	Broxtowe	627		4,500	30,000	30,000	14%
N12	Nottinghamshire	Field Farm	Broxtowe	450					29%
N15	Nottinghamshire	Toton Strategic Location for Growth	Broxtowe	1,200		10,000	4,000	4,000	10%
N16	Nottinghamshire	Land west of Awsworth	Broxtowe	250					15%
N17	Nottinghamshire	Eastwood	Broxtowe	960					61%
N18	Nottinghamshire	Kimberley	Broxtowe	363					41%
N19	Nottinghamshire	Chtwynd Barracks	Broxtowe	1,500					10%
N20	Nottinghamshire	Land Adjacent and north west of Bramcote Crematorium	Broxtowe	190					15%
N21	Nottinghamshire	East of Coventry Lane, Bramcote	Broxtowe	470					15%
N23	Nottinghamshire	Teal Close	Gedling	807					41%
N24	Nottinghamshire	Top Wighay Farm	Gedling	1,900		8,000	41,500		4%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
N25	Nottinghamshire	H16 Park Road, Calverton	Gedling	363					28%
N27	Nottinghamshire	Land West of A60 Redhill (X2 and X3)	Gedling	220					72%
N28	Nottinghamshire	Gedling Colliery	Gedling	941					49%
N29	Nottinghamshire	North of Papplewick Lane	Gedling	255					88%
N31	Nottinghamshire	Mapperley Plains and Killisick Lane	Gedling	435					20%
N34	Nottinghamshire	Bestwood Business Park	Gedling	220					10%
N38	Nottinghamshire	Chalfont Drive	Nottingham	475					32%
N39	Nottinghamshire	Former Padstow School Site Gainsford Crescent	Nottingham	291					32%
N40	Nottinghamshite	Canal Quarter – Island Site	Nottingham		3,750				10%
N42	Nottinghamshire	Phase 1 Unity Square, Sheriffs Way	Nottingham			58,360			10%
N43	Nottinghamshire	Stanton Tip	Nottingham	500					32%
N44	Nottinghamshire	Clifton West	Nottingham	285					32%
N45	Nottinghamshire	Waterside	Nottingham	1,289		21,000			32%
N46	Nottinghamshire	Boots Site	Nottingham	230		4,500	30,000	10,000	32%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
N48	Nottinghamshire	Alfreton Road - Forest Mill	Nottingham	484					32%
N51	Nottinghamshire	East of Melton Road, Edwalton	Rushcliffe	922					69%
N52	Nottinghamshire	West of Melton Road, Edwalton	Rushcliffe	922					69%
N54	Nottinghamshire	East and West of Chapel Lane, Bingham	Rushcliffe	1,022					40%
N55	Nottinghamshire	RAF Newton	Rushcliffe	528					22%
N56	Nottinghamshire	Clifton South	Rushcliffe	360	1,250	10,000	20,000	20,000	10%
N57	Nottinghamshire	Clifton South	Rushcliffe	1,440					10%
N58	Nottinghamshire	Clifton South	Rushcliffe	720					10%
N59	Nottinghamshire	Clifton South	Rushcliffe	480					10%
N60	Nottinghamshire	Clifton South	Rushcliffe		2,500	20,000	40,000	40,000	20%
N61	Nottinghamshire	East of Gamston North of Tollerton	Rushcliffe	3,000	2,500				10%
N62	Nottinghamshire	Kirk Ley, East Leake	Rushcliffe	287					100%
N63	Nottinghamshire	Between Platt Lane and Station Road, Keyworth	Rushcliffe	187					68%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
N64	Nottinghamshire	Land North of Nottingham Road/The Paddocks	Rushcliffe	175					36%
N66S	Nottinghamshire	Ratcliffe on Soar Power Station	Rushcliffe			48,370	246,645	83,617	20%
N67S	Nottinghamshire	Ratcliffe on Soar Power Station	Rushcliffe			48,370	246,645	83,617	20%
N68	Nottinghamshire	Land North of A611/South of Broomhill Farm/Land at Broomhill Farm, Hucknall	Ashfield	850					10%
N69	Nottinghamshire	Rolls Royce/Hucknall Town FC	Ashfield	727					10%
N70	Nottinghamshire	Land adj. Stubbing Wood Farm, Watnall Rd	Ashfield	198					10%
N71	Nottinghamshire	Walesby Drive/A611, Derby Road	Ashfield	359					10%
N74	Nottinghamshire	Cauldwell Village	Ashfield	315					10%
N75	Nottinghamshire	Adj. Oakham Business Park, Sutton-in-Ashfield	Ashfield	225					10%
N76	Nottinghamshire	Rear Kingsmill Hospital, Sutton-in-Ashfeild	Ashfield	264					10%
N77	Nottinghamshire	Sunnyside Farm, Blackwell Road, Huthwaite	Ashfield	283					10%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
N78	Nottinghamshire	Land to the East of A6075, Beck Lane, Skegby	Ashfield	212					10%
N79	Nottinghamshire	Land at Beck Lane, Skegby	Ashfield	422					10%
N80	Nottinghamshire	Alfreton Road	Ashfield	223					10%
N81	Nottinghamshire	Bull and Butcher and land off Park Lane	Ashfield	318					10%
N82	Nottinghamshire	Land to the North East of Junction 27, M1	Ashfield					184,200	10%
N83	Nottinghamshire	Land to the South East of Junction 27, M1	Ashfield					225,000	10%
N96	Nottinghamshire	Land at Former Cotgrave Colliery	Rushcliffe	372					100%
N99	Nottinghamshire	Land at Rempstone Road (north)	Rushcliffe	282					35%
N100	Nottinghamshire	Shelford Road/Grooms Cottage	Rushcliffe	455					47%
N101	Nottinghamshire	Sainsbury land south of Colwick Loop Road	Gedling		11,781				100%
N102	Nottinghamshire	Land on Wilford Lane West Bridgford	Rushcliffe		4,098				10%



REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
N103	Nottinghamshire	East Bridgford Garden Centre	Rushcliffe		13,136				10%
N104	Nottinghamshire	Lantern Lane, East Leake	Rushcliffe	365					63%
N105	Nottinghamshire	North of Bunny Lane	Rushcliffe	221					62%
N106	Nottinghamshire	East of L'brough Rd/Meadowcroft	Rushcliffe	231					47%
N107	Nottinghamshire	Ilkeston Road - Radford Mill	Nottingham	339					100%
N108	Nottinghamshire	Woodhouse Way - Woodhouse Park	Nottingham	214					100%
N109	Nottinghamshire	11 and Workshop Deakin Place	Nottingham	328					100%
N110	Nottinghamshire	Lidl on Linby Street, Bulwell	Nottingham		1,927				100%
N111	Nottinghamshire	Woodhouse Park	Nottingham		1,743				100%
N112	Nottinghamshire	The Triangle, Clifton	Nottingham		5,749				100%
N113	Nottinghamshire	Former Beechdale Baths	Nottingham		3,065				100%
N114	Nottinghamshire	Former N C V Garage Hucknall Road	Nottingham		1,600				100%
N115	Nottinghamshire	Beeston Business Park, Technology Drive, Beeston	Broxtowe	310					71%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
N116	Nottinghamshire	Bartons land between High Road & Queens Road West, High Road Chilwell	Broxtowe	221					14%
N117	Nottinghamshire	The Square, Beeston	Broxtowe		8,290				15%
N118	Nottinghamshire	Victoria Centre Huntingdon Street	Nottingham		37,000				10%
N119	Nottinghamshire	Farnborough Road - Former Fairham Comprehensive School	Nottingham	196					10%
N120	Nottinghamshire	406 And 408 Derby Road And Northern Dairies LTD, Radmarsh Road Nottingham	Nottingham	306					10%
N121	Nottinghamshire	Western Village, University of Nottingham Campus	Nottingham	200					10%
N122	Nottinghamshire	NG2 West	Nottingham			14,000			100%
N123	Nottinghamshire	Royal Quarter - Burton Street, Guildhall, Police Station and Fire Station	Nottingham			15,000			100%
N124	Nottinghamshire	North of Grantham Road	Rushcliffe	280					10%
N125	Nottinghamshire	Land R/O Mill Lane/the Old Park/South of Hollygate Lane	Rushcliffe	414					10%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
N135	Nottinghamshire	Teal Close, ALDI Foodstore and Local Centre, Mornando Way	Gedling		3,447				100%
N136	Nottinghamshire	Landmere Lane Edwalton	Rushcliffe		3,770				75%
N137	Nottinghamshire	Arnold (windfall)	Gedling	864					0%
N147	Nottinghamshire	Carlton (windfall)	Gedling	1,221					0%
N157	Nottinghamshire	Bestwood (windfall)	Gedling	541					0%
N158	Nottinghamshire	Calverton (windfall)	Gedling	586					0%
N159	Nottinghamshire	Ravenshead (windfall)	Gedling	586					0%
N160	Nottinghamshire	Nottingham City Centre Flats	Nottingham	18,811					0%
N161	Nottinghamshire	Nottingham City Centre Offices	Nottingham			115,741			0%
L1	Leicestershire	Bardon Grange, Coalville	NW Leicestershire	800					15%
L3	Leicestershire	South East Coalville	NW Leicestershire	3,496					15%
L4	Leicestershire	Standard Hill Coalville	NW Leicestershire	400					39%
L5	Leicestershire	Money Hill (phase 1) Ashby	NW Leicestershire	605					27%
L6	Leicestershire	Money Hill (phase 2) Ashby	NW Leicestershire	1,252					27%
L7	Leicestershire	Land at Money Hill Ashby	NW Leicestershire			31,980	21,329	21,320	28%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
L8	Leicestershire	Holywell Spring Farm Ashby	NW Leicestershire	400					56%
L9	Leicestershire	Burton Road/Moira Road Ashby	NW Leicestershire	800					56%
L10	Leicestershire	Castle Donington	NW Leicestershire	766					32%
L12S	Leicestershire	East Midlands Gateway	NW Leicestershire					435,108	56%
L14	Leicestershire	Loughborough, Science Park	Charnwood			250,000			28%
L15	Leicestershire	Garendon Park, Loughborough	Charnwood	3,200		15,000	30,000	30,000	28%
L16	Leicestershire	North East of Leicester	Charnwood	4,500		13,000	26,000	26,000	28%
L17	Leicestershire	North of Birstall (Broadnook)	Charnwood	1,650		15,000	30,000	30,000	28%
L18	Leicestershire	Watermead	Charnwood			12,500	23,750	23,750	28%
L19	Leicestershire	West Shepshed (various applications)	Charnwood	892					28%
L21	Leicestershire	Land at Gynsill Lane & Anstey Lane, Glenfield	Charnwood	260					6%
L23	Leicestershire	Laburnum Way, Loughborough	Charnwood	422					5%
L24	Leicestershire	Land South of Loughborough	Charnwood	723					2%

REF.	AREA	DEVELOPMENT NAME	LOCAL AUTHORITY	2043 HOMES	2043 RETAIL	2043 B1 (SQM)	2043 B2 (SQM)	2043 B8 (SQM)	2023 BUILD OUT
L25	Leicestershire	Land off Tickow Lane (north), Shepshed	Charnwood	394					4%
L26	Leicestershire	Land North of Hallamford Road and West of Shepshed	Charnwood	250					7%
L27	Leicestershire	Land off Tickow Lane (south)	Charnwood	300					5%
L28	Leicestershire	Land West of Anstey	Charnwood	600					4%
L29	Leicestershire	Land South East of Syston	Charnwood	960					2%
L30	Leicestershire	Barkby Road, Syston	Charnwood	270					6%
L32	Leicestershire	Measham Waterside	NW Leicestershire	426					0%
L33	Leicestershire	Islay Woodhouse	NW Leicestershire	4,250					6%
L34	Leicestershire	Land West of Castle Donnington	NW Leicestershire	1,026					6%
L35	Leicestershire	Land North and South of Park Lane Castle Donnington	NW Leicestershire			7,613	12,273	12,273	6%
L36	Leicestershire	Land North of Leicester Road, Ibstock	NW Leicestershire	450					0%
F1	FREEPORT	East Midlands Airport Area				Provided by East Midlands Freeports			0%
F2	FREEPORT	Ratcliffe-on-Soar Power Station				c.180,000sqm employment			O%

APPROVAL					
Version	**Name**		**Position**	**Date**	**Modifications**
1	Author	Jonathan Pagett & Owen Brown	Associate & Assistant Consultant	17/07/2026	Draft for Client Comments
	Checked	Rhian Collier & Jonathan Pagett	Associate Director & Associate	17/07/2026	
	Approved	Rhian Collier	Associate Director	17/07/2026	
2	Author	Jonathan Pagett & Owen Brown	Associate & Assistant Consultant	21/07/2026	Updated with estimated highway scheme costs
	Checked	Rhian Collier & Jonathan Pagett	Associate Director & Associate	21/07/2026	
	Approved	Rhian Collier	Associate Director	21/07/2026	
3	Author	Jonathan Pagett & Owen Brown	Associate & Assistant Consultant	07/08/2026	Updates following comments from EMCCA and NCC
	Checked	Rhian Collier & Jonathan Pagett	Associate Director & Associate	07/08/2026	
	Approved	Rhian Collier	Associate Director	07/08/2026	
4	Author	Jonathan Pagett & Owen Brown	Associate & Assistant Consultant	19/08/2026	Updates following comments from NCC
	Checked	Rhian Collier & Jonathan Pagett	Associate Director & Associate	19/08/2026	
	Approved	Rhian Collier	Associate Director	19/08/2026	