Strategic Transport Assessment

Local Plan Evidence Base –
Newcastle-under-Lyme Borough Council

Change list

Ver	Date	Description of the change	Reviewed	Approved by
0	12/07/2024	Draft Release	XM	MS
1	15/07/2024	Initial Release	XM	MS
2	17/07/2024	Update	XM	MS
3	18/07/2024	Update	XM	MS

Sweco UK Limited Reg. No. 2888385
Project Name NULBC LP STA
Project Number 65212118
Client Newcastle-under-Lyme Council
Author Edward Whittaker
Reviewed by Xenia Masoura
Approved by Martin Sellman
Date 2024-07-18
Ver 3
Document reference NULBC LP STA

Table of contents

1 Executive Summary

This Strategic Transport Assessment (STA) has been commissioned by Newcastle-under-Lyme Borough Council (NULBC) to support the emerging Regulation 19 Local Plan (LP). The STA is a critical component in understanding the transport implications of proposed site allocations within the LP. The assessment is informed by extensive transport modelling and has involved extensive stakeholder engagement with local authorities and National Highways.

The STA utilises the North Staffordshire Multi-Modal (NSMM) transport model to analyse the transport impacts of the developments. These developments include core LP sites as well as three potential strategic developments at Junction 16 of the M6 (AB2), Talke (TK30), and Keele (KL15). The initial data analysis to set the background for the study includes an overview of census information, an accident data analysis, an accessibility analysis, and a review of existing traffic conditions. The STA also considers environmental aspects, such as air quality and CO2 emissions, with a focus on sustainable transport solutions.

Throughout the assessment process, there has been close collaboration with stakeholders, including National Highways, to ensure that the transport impacts are accurately captured and that appropriate mitigation strategies are identified. The STA report includes scenario development for the strategic sites and a final scenario combining the preferred sites, followed by an analysis of the modelling results.

The initial modelling work identified a need for mitigation measures around site AB2, on Newcastle Road in Talke and on Keele Road in Keele. The chosen mitigation measures included enhanced public transport connectivity for site AB2, junction enhancements for Newcastle Road and a new link road between Keele Road and Whitmore Road. These mitigations were tested and found to be beneficial with the suggestion of further junction modelling to investigate the proposed Newcastle Road mitigations.

In conclusion, the STA provides a robust analysis of the transport impacts associated with the Local Plan site allocations. It offers insights into the necessary infrastructure improvements and mitigation measures required to support sustainable development in Newcastle-under-Lyme. The STA is a vital step in ensuring that the transport network can accommodate future growth whilst promoting environmental sustainability and a high quality of life for residents.

2 Background and Context

2.1 Overview

Sweco have been commissioned by Newcastle-under-Lyme Borough Council (NULBC) to undertake a Strategic Transport Assessment (STA) in support of the emerging Regulation 19 Local Plan (LP). This STA will be utilised to undertake an assessment of the transport impacts of sites allocated for the LP as well as three potential strategic developments located at:

- Junction 16 of the M6 (AB2)
- Talke (TK30)
- Keele (KL15)

The transport impacts of these developments will be established through modelling analysis using the North Staffordshire Multi-Modal (NSMM) transport model. This document includes the following:

- The STA modelling background and context
- Initial data analysis for the STA including census, accident, accessibility, and existing traffic trends and conditions
- Scenario development for the three strategic sites as well as a final scenario with the combination of preferred sites
- Analysis of the results from the scenario modelling

Figure 2-1 below shows the approximate locations of the NULBC LP core and strategic developments sites relative to the strategic and local road networks. Table 2-1 provides further information on the three strategic sites. As can be seen, as well as the larger strategic sites, other significant LP allocations include:

- Chatterley Valley – BW1 (816 jobs east of Talke)
- Rowhust Close – CT20 (612 jobs south of Talke)
- Keele University – KL13 (1,100 jobs for Keele Science Park – Phase 3).

Of the three strategic sites, the Keele development (KL15) has the greatest capacity to impact the local network due to its size and location. Both Talke (TK30) and M6 junction 16 (AB2) have capacity to impact the National Highways (NH) strategic road network (A500 and M6). As a result, there has been close liaison with NH throughout the modelling process.

Smaller, non-strategic development sites exist towards the northern half of the borough with a cluster located around the centre of Newcastle-under-Lyme and around Talke/Kidsgrove. In addition, a smaller number of residential sites are located west of the M6.

Figure 2-1: NULBC Local Plan Allocations

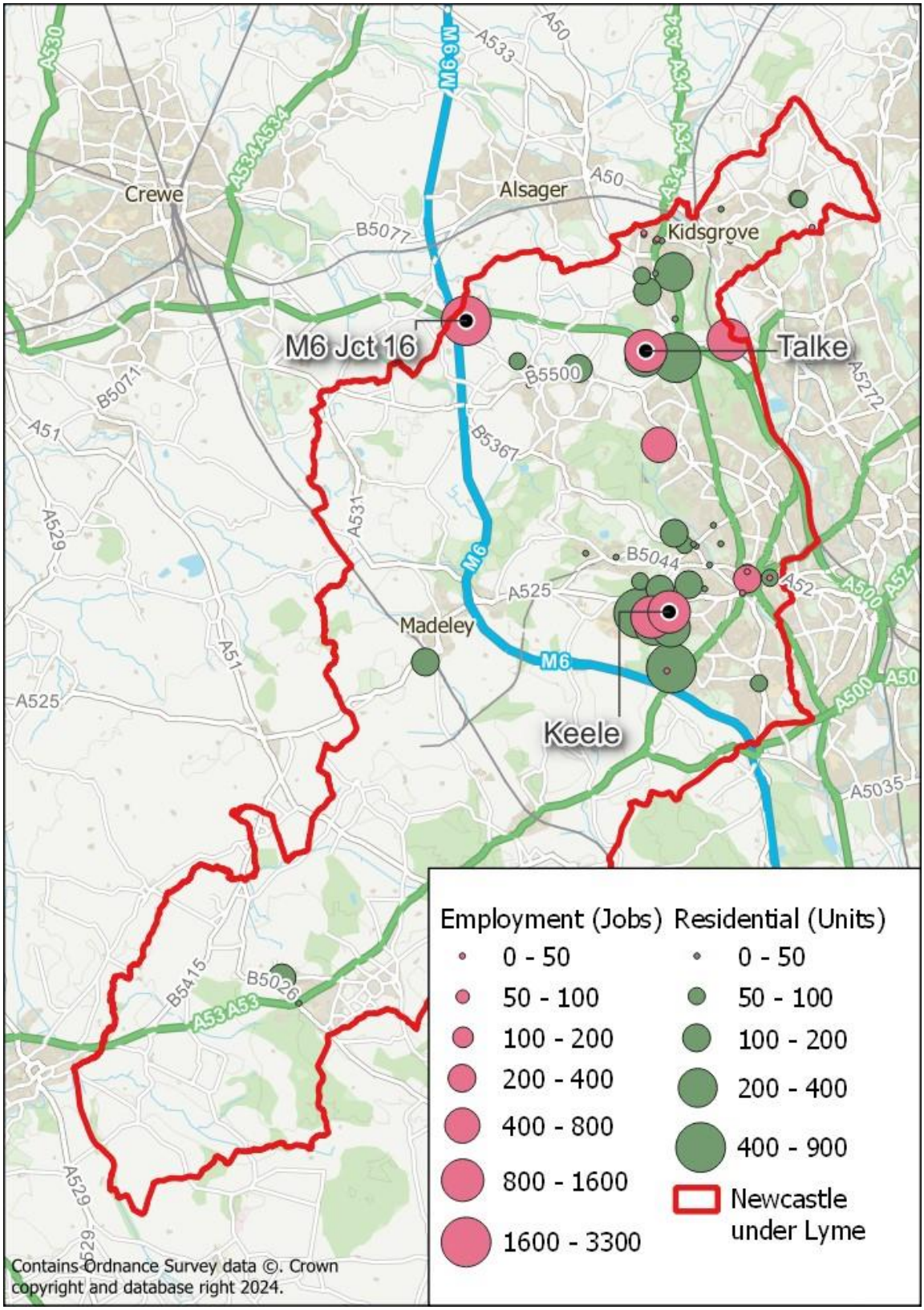


Table 2-1: Strategic development sites

Site Reference	Site Name / Address	Settlement Hierarchy (Ward)	Site Size (Ha)	Indicative Dwellings	Indicative Employment (jobs)
AB2	Land adjoining corner of A500 and M6 southbound	Rural Centre (Audley)	79	N/A	3,300
KL15	Land south of A525 between Keele University and Newcastle-under-Lyme	Rural Centre (Keele)	18	260	1,278 (estimated)
TK30	Land off Talke Road and A500, Talke	Urban Centre (Talke & Butt Lane)	66	390	1,052

2.1.1 The NSMM Transport Model

The NSMM transport model has been developed to allow forecasting and assessment of the impact of proposed planning and infrastructure developments. It is a multi-modal transport model of North Staffordshire, with 288 zones covering the urban areas of Newcastle-under-Lyme and Stoke-on-Trent.

The model includes three main modules,

- **Variable Demand Model (VDM)** – Formed of trip generation, destination choice, mode choice (car vs. public transport).
- **Highway Assignment Model (HAM)** – Includes all the key roads and junctions, assigning cars, LGVs and HGVs (see network on Figure 2-2).
- **Public Transport Assignment Model (PTAM)** – Including bus and rail services.

The following peak hours from the NSMM transport model will be utilised for this study,

- **AM** – 0800 to 0900
- **PM** – 1700 to 1800

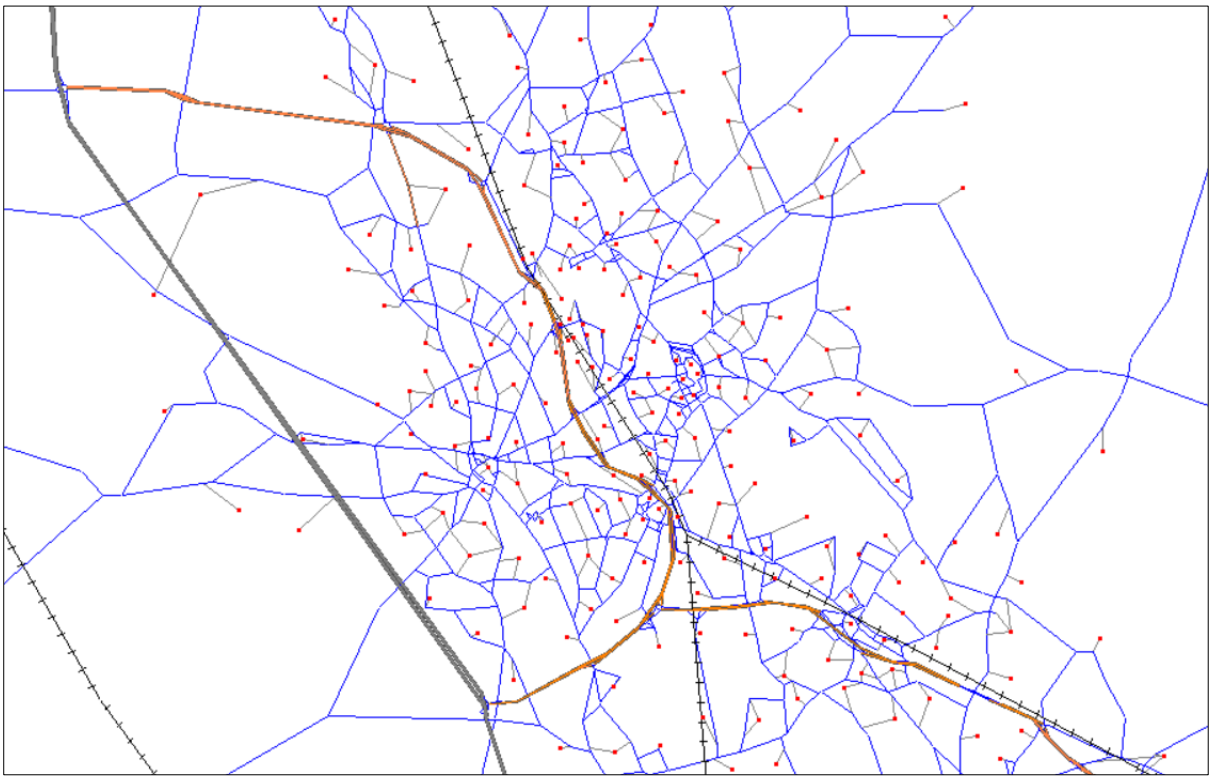
The NSMM transport model was developed for Stoke-on-Trent City Council and has been successfully utilised by other nearby authorities including NULBC and Staffordshire County Council for recent and current modelling tasks.

The Etruria Valley Link Road was modelled within the NSMM transport model. The modelling for this scheme was signed off by the DfT and the link road has recently opened.

Modelling work underpinning the North Staffordshire Local Air Quality Plan following a government ministerial direction for NULBC in conjunction with Staffordshire County Council and Stoke-on-Trent City Council has made significant use of the NSMM transport model. This has included checks of the base model undertaken against observed 2015 and 2018 data and subsequent checks looking at traffic growth between 2015 and 2022. The use of the NSMM transport model was signed off by JAQU (DfT/DEFRA).

A recent successful bid for the Transforming Cities Fund used the NSMM transport model to model College Road and Station Road schemes. The NSMM transport model was used to produce evidence of the scheme impact for National Highways on the A500 slip roads. This use of the model was approved by both DfT and National Highways and provided the evidence to unblock the commencement of construction.

Figure 2-2: NSMM transport model - highways network



2.2 Aims & Objectives

This report is the final deliverable for the STA development process. The STA development process included the following stages:

- **Stage 1 Inception:** Establish the baseline and methodology for the STA study.
- **Stage 2 Review:** Review the results of the model runs 1-4 to inform the identification of traffic impacts resulting from the LP.
- **Stage 3 Workshops:** Undertake an accumulative assessment, define the mitigation measures based on the outcomes of the workshop meetings.
- **Stage 4 Final Report:** Provide the final report including the output of the Steering Groups Review.

This final report aims to provide an overview of the STA findings based on five modelling runs utilising the NSMM transport model. It considers the location and impact of potential mitigation measures and has been written with close engagement with relevant stakeholder. The modelling runs are outlined in Table 2-2.

Table 2-2: Assessment – Model Runs

Model Run	Model Year	Demand Assumption	Assumption
1	2040	First draft Local Plan (Regulation 18 stage)	Reference Case + Local Plan infrastructure
2	2040	Model Run 1 + J16 potential strategic location	Model Run 1
3	2040	Model Run 1 + Talke potential strategic location	Model Run 1
4	2040	Model Run 1 + Keele potential strategic location	Model Run 1
5	2040	Model Run 1 + final suite of sites proposed for Regulation 19	Model Run 1

2.3 Policy & Guidance

This STA report utilises the National Planning Policy Framework and various other national, regional, and local policies to identify and tackle transport issues, explore opportunities, and propose measures to mitigate them. By doing so, the STA report aligns with the broader policy framework and considers the transport-related matters outlined in these policies.

The National Planning Policy Framework (2023) is a significant policy document emphasised in the report. It underscores the importance of integrating transport considerations early in the planning process, ensuring a comprehensive and sustainable approach by accounting for transport factors from the initial stages of planning.

The Policy Context section of this report offers a succinct overview of the policy documents that comprise the foundational evidence for the STA with more detail outlined in Appendix A – Policy Context.

2.4 Engagement

As part of the STA inception stage, the STA team engaged with NH, NULBC, Staffordshire County Council (SCC), Stoke-on-Trent City Council (SoTCC), and neighbouring local planning authorities including Cheshire East Council (CEC). Further detail of these meetings can be found in the following meeting minutes (See appendix):

- 2024-02-21 – NULBC, SoTCC, SCC, NH, Sweco
- 2024-03-04 – NULBC, CEC, SCC, Sweco
- 2024-03-18 – NULBC, SoTCC, SCC, NH, CEC, Sweco - Stakeholder Inception meeting
- 2024-05-15 – NULBC, SoTCC, SCC, NH, CEC, Sweco - Stakeholder meeting
- 2024-06-19 – NULBC, SoTCC, SCC, NH, CEC, Sweco - Stakeholder meeting

From these discussions, to ensure early engagement with key stakeholders it was agreed that a technical note would be produced that would include details of the preliminary data analysis and the review of the existing traffic conditions. This technical note was made available to all stakeholders prior to the production of this final report and has been expanded as part of this report.

2.5 Structure

This report will follow the structure outlined below:

- Chapter 3: Policy Context
- Chapter 4: Data Analysis
- Chapter 5: Existing Traffic Conditions
- Chapter 6: Uncertainty Log Development
- Chapter 7: The 2040 Reference Case

- Chapter 8: Model Scenarios and Results
- Chapter 9: Summary
- Appendix A: Policy Context
- Appendix B: Steering Group Minutes
- Appendix C: 2023 Model Validation Results

3 Policy Context

The Policy Context section of this report offers a succinct overview of the policy documents that comprise the foundational evidence for the STA with more detail outlined in Appendix A – Policy Context. The STA report draws upon an array of policy frameworks that span national, regional, and local levels, ensuring a comprehensive approach to transport planning.

The policies focus on transport, land use, infrastructure, and environmental considerations at national, regional, and local levels. The STA considers these policies to identify, address transport issues, opportunities, and propose mitigation measures. Thus, key policy themes and transport-related matters from each document were derived in Table 3-1 to inform the preparation of the STA.

Notable policies include the Conservation of Habitats and Species Regulations (2017), National Planning Policy Framework (2023), various Staffordshire strategic and improvement plans, cross-boundary studies, as well as local and neighbourhood development plans. Air quality reports and the Sustainable Environment Strategy were considered to provide insights on the current air quality status and guidance for the potential mitigations.

The Newcastle-under-Lyme Strategic Employment Site Assessment Report (2023) specifically outlines the key problems and opportunities raised for the three strategic sites, most relevant to this report. It provided understanding around the transport needs associated with the three strategic sites, and mitigation strategies that might be needed for sustainable development.

Table 3-1 summarises the prevailing themes in each of the national, regional, and local policy documents identified.

Table 3-1: Policy Overview key themes

Policy	Overview
National	
National Planning Policy (2023)	Importance of integrating transport considerations early in the planning process
Conservation of Habitats and Species Regulations (2017)	Mandate for Habitats Regulations Assessment to safeguard designated natural sites; any planning for transport infrastructure must consider the potential impacts on designated habitat sites
Regional	
Staffordshire Bus Service Improvement Plan (2022)	The BSIP and LCWIP are integral to Staffordshire's broader transport strategy. These plans work in tandem to create a more integrated, efficient, and sustainable transport network for the county.
Staffordshire Local Walking and Cycling Infrastructure Plan (2021)	
Staffordshire and Stoke-on-Trent Strategic Infrastructure Plan (2019)	Strategic approach to support regional growth through improved infrastructure and connectivity
Stoke-on-Trent and Staffordshire Strategic Economic Plan (2018)	Economic growth and connectivity framework focusing on Stoke-on-Trent's transformation and Staffordshire's strategic positioning
Cheshire East - Staffordshire Cross Boundary Study Report (2016)	Analysis of cross-boundary transport impacts with recommendations for improving active travel and public transport options
Newcastle-under-Lyme Borough - Integrated Transport Strategy (2015)	Outlines the borough's transport objectives, including transport planning in support of land use development, with a vision for creating a well-connected Staffordshire. Document to be updated for the Local Plan
Staffordshire Local Transport Plan (2011)	County-wide transport plan with an emphasis on accessibility, congestion reduction, safety, and sustainable travel

Policy	Overview
Newcastle-under-Lyme and Stoke-on-Trent Core Spatial Strategy (2009) and the saved policies of the Newcastle-under-Lyme Local Plan (2011)	Sets out the previous joint long-term vision for the spatial development of the area, including aspects of urban renewal, community development, and infrastructure improvements to guide growth and connectivity
Local	
Draft Newcastle-under-Lyme Infrastructure Delivery Plan (2023)	Outlines the infrastructure needs for potential development sites, providing insight into future transport infrastructure requirements to support the Local plan.
Newcastle-under-Lyme Strategic Employment Site Assessment Report (2023)	Provides understanding around the transport needs associated with the three strategic sites, and mitigation strategies that might be needed for sustainable development
Air Quality Report - Annual Status Report (2023)	Provides data and analysis on the air quality of the area, informing transport strategies. It highlights the impact of road traffic, especially through the AQMAs and the much-needed shift towards sustainable transport improvements
Made' Neighbourhood Plans (2019-2022)	Community driven plans reflecting local transport needs, promoting connectivity and sustainable modes of transport within neighborhoods
Strategic Housing and Employment Land Availability Assessment (2022)	Identifies land for housing and business, informing the borough's capacity for growth with transport considerations.
Newcastle-under-Lyme Borough Issues and Strategic Options Paper (2021)	Discusses the three strategic development sites and their associated transport opportunities and challenges.
Newcastle-under-Lyme Sustainable Environment Strategy & Action Plan (2022)	Commits to environmental sustainability and green transport initiatives to reduce emissions and improve quality of life
First Draft Local Plan (2023)	Contains a draft spatial strategy ensuring growth is well-distributed and supported by necessary amenities, addressing the impacts of new developments on the transport network

These policies collectively guide sustainable development, infrastructure needs, and environmental protection in line with growth objectives. By analysing these policies and drawing out key transport-related matters, the STA is able to address key transport issues for the plan allocations, identify opportunities, and propose appropriate mitigation measures that align with the current policy context.

4 Data Analysis

4.1 Overview

This section summarises the analysis of the following data sources:

- Census data
  - Journey To Work (JTW) data analysis showing the spatial distribution of trips across Newcastle-under-Lyme Borough
  - JTW analysis to establish the modal share of trips for Newcastle-under-Lyme Borough
- DfT raw traffic data
  - Analysis of DfT traffic count data showing the regional trends across Newcastle-under-Lyme Borough and Staffordshire
- NH WebTRIS data
  - Used to derive 24-hour traffic flow distributions for sites on the M6, A500 and on the strategic road network
- Accident analysis
  - Analysis of the last full five years accident data
  - Data compiled from STATS19 and local sources
  - Identifying local patterns around NULBC LP allocation sites
- Accessibility analysis
  - Comparing baseline accessibility to key services at NULBC LP allocation sites
  - Identifying baseline public transport accessibility isochrones

This analysis provides an overview of the current situation across Newcastle-under-Lyme Borough in alignment with the National Planning Policy Framework (NPPF). The NPPF emphasises the importance of addressing transport issues early in the planning process and leveraging existing infrastructure to support sustainable development. Based on the NPPF principles, the STA ensures that the planning and development of strategic sites contribute positively to the UK's sustainable development goals.

4.2 Census Data

Analysis of census commute datasets provides an understanding of the transportation trends across Newcastle-under-Lyme. The last census was held during the COVID-19 pandemic in 2021 and questions regarding commute patterns were not as detailed as the previous census. We have therefore adopted data from the previous 2011 census. Note that levels of working from home have expected to have increased.

Figure 4-1 shows the split of the commute mode share across Newcastle-under-Lyme Borough. Car or van driver or passenger makes up 72% of commute trips followed by on-foot (9%) and bus, minibus, or coach (7%). It is clear from these results that residents find car use to be especially attractive for commuting purposes.

Figure 4-1: Commute mode types

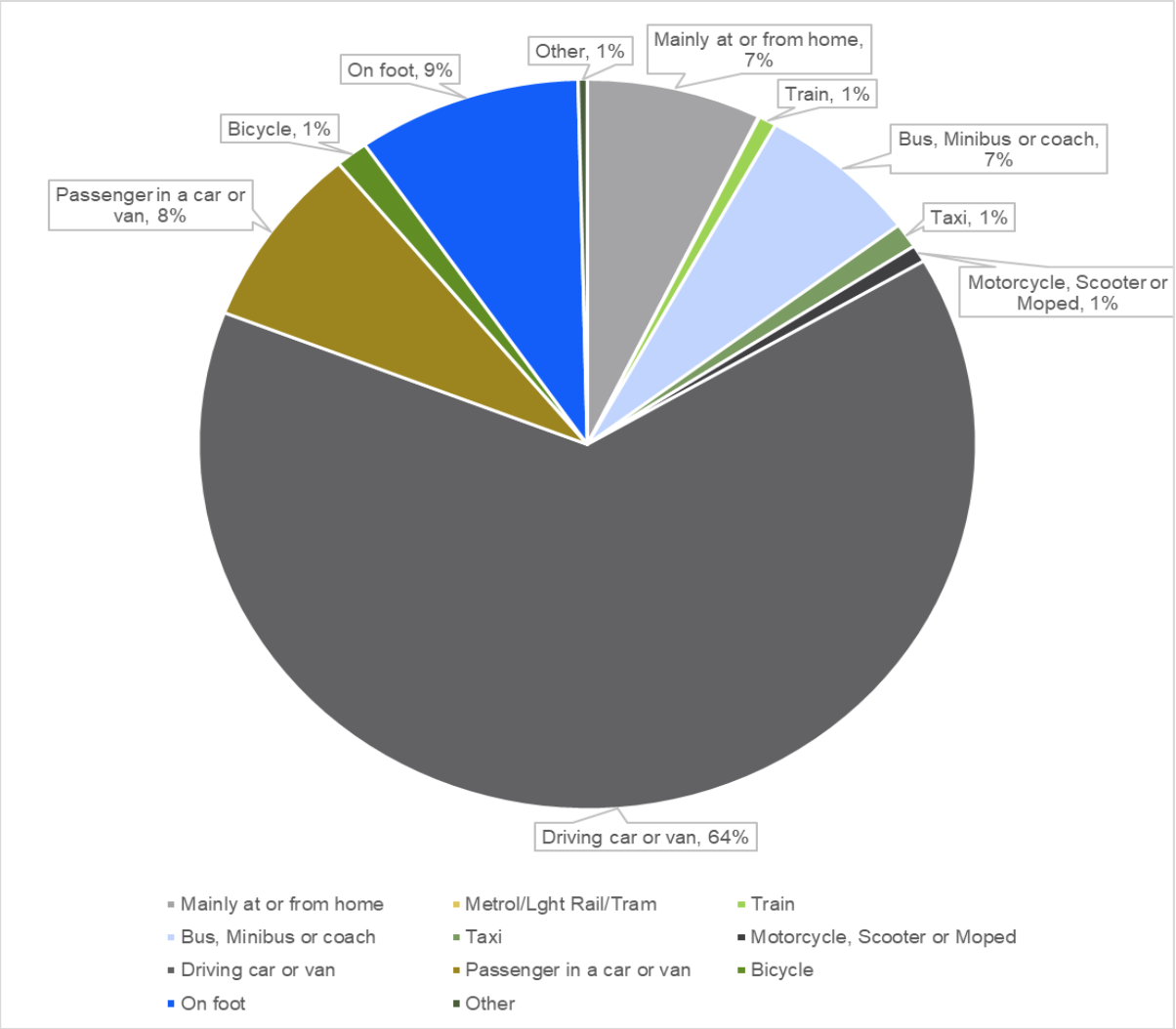
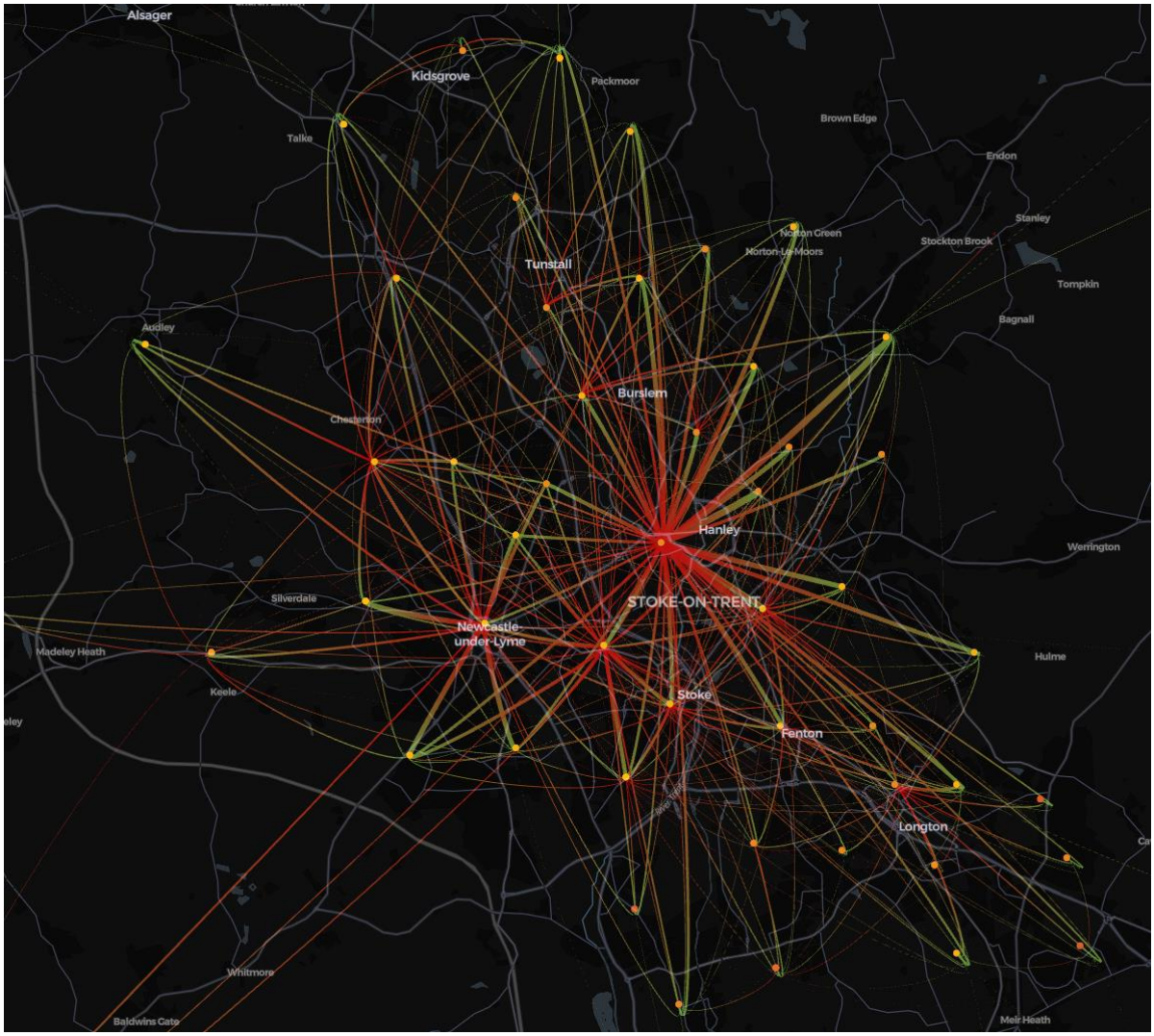


Figure 4-2 shows origin-destination movements between census output areas for home and place of work. Lines are graduated from green (origin) to red (destination) and the thickness is scaled by flow volume. The polycentric nature of the region is evident, with clear attractors obvious at Stoke-on-Trent, Hanley, and Newcastle-under-Lyme. Analysis shows that Hanley is the main attractor for commute trips. Newcastle-under-Lyme shows key commute trends coming from locations within 5 Km of the main Newcastle-under-Lyme centre. There is little commute traffic from beyond the Newcastle-under-Lyme/Stoke-on-Trent region with insignificant flows coming from west of the M6.

Figure 4-2: Commute origin-destination flows



4.3 DfT Traffic Growth Trends

Figure 4-3 below shows the available profiles of annual vehicle miles derived from DfT online data[1] for Staffordshire and Stoke-on-Trent. As annual vehicle mile profiles are not available for Newcastle-under-Lyme Borough, additional data for total regional Annual Average Daily Flow (AADF) profiles were derived from comparable DfT counts across 2015-2022.Figure 4-4 and Figure 4-5 below shows the trend in aggregate AADF indexed to 2015 for Newcastle-under-Lyme Borough and Staffordshire as a whole.

[1] https://roadtraffic.dft.gov.uk

Figure 4-3: Annual traffic by vehicle type (Staffordshire & Stoke on Trent)

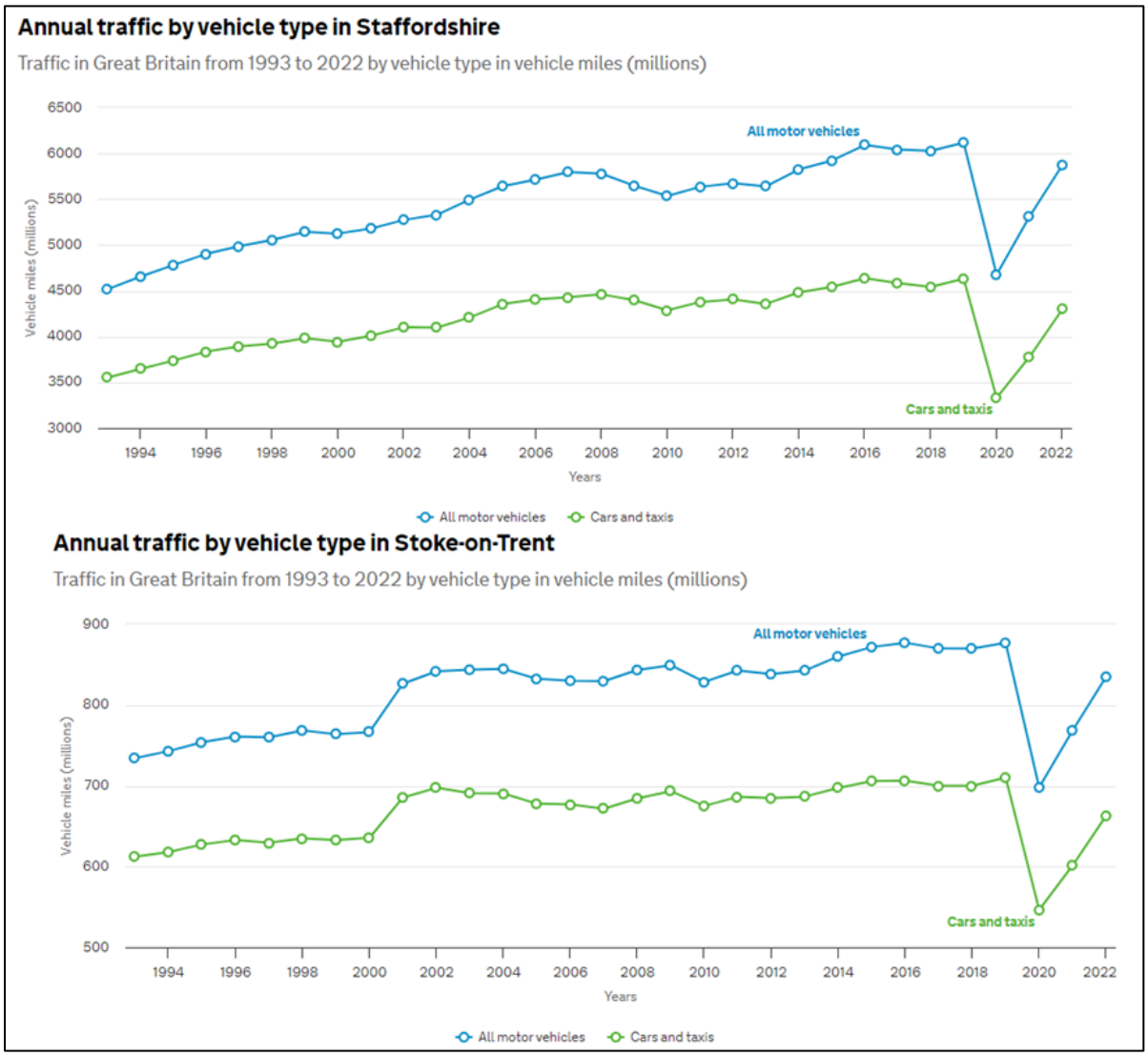


Figure 4-4: Indexed AADF for Newcastle-under-Lyme Borough

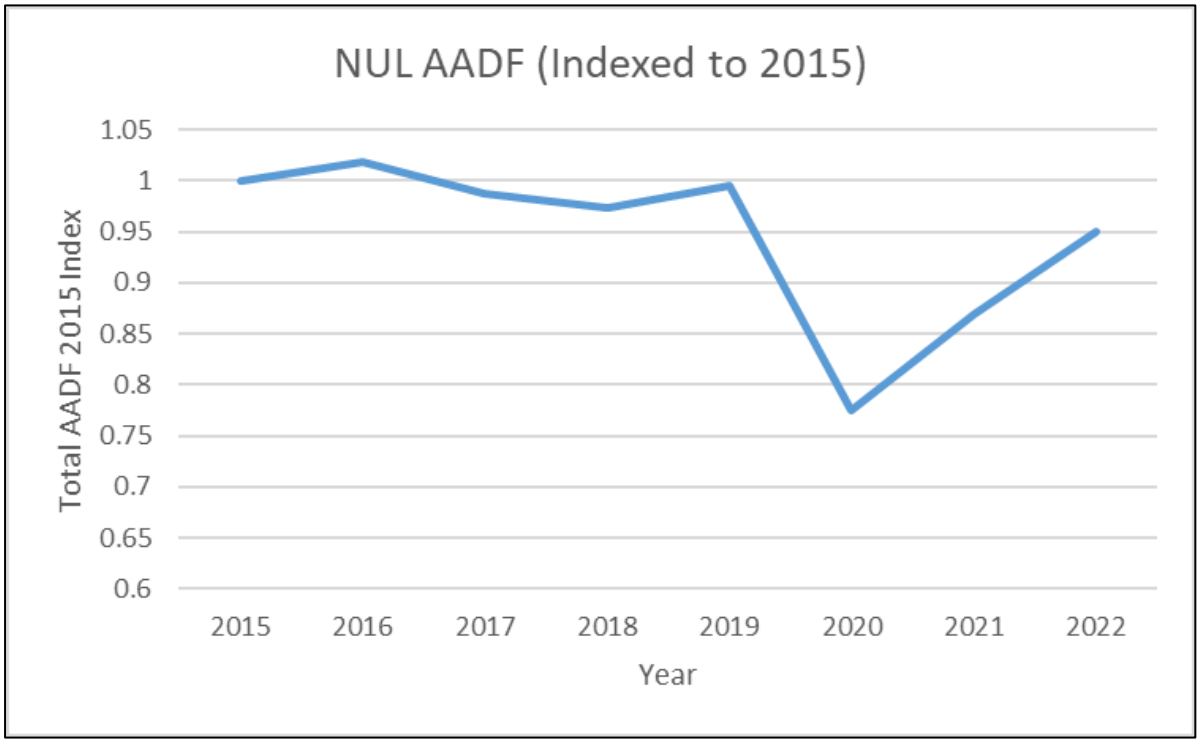
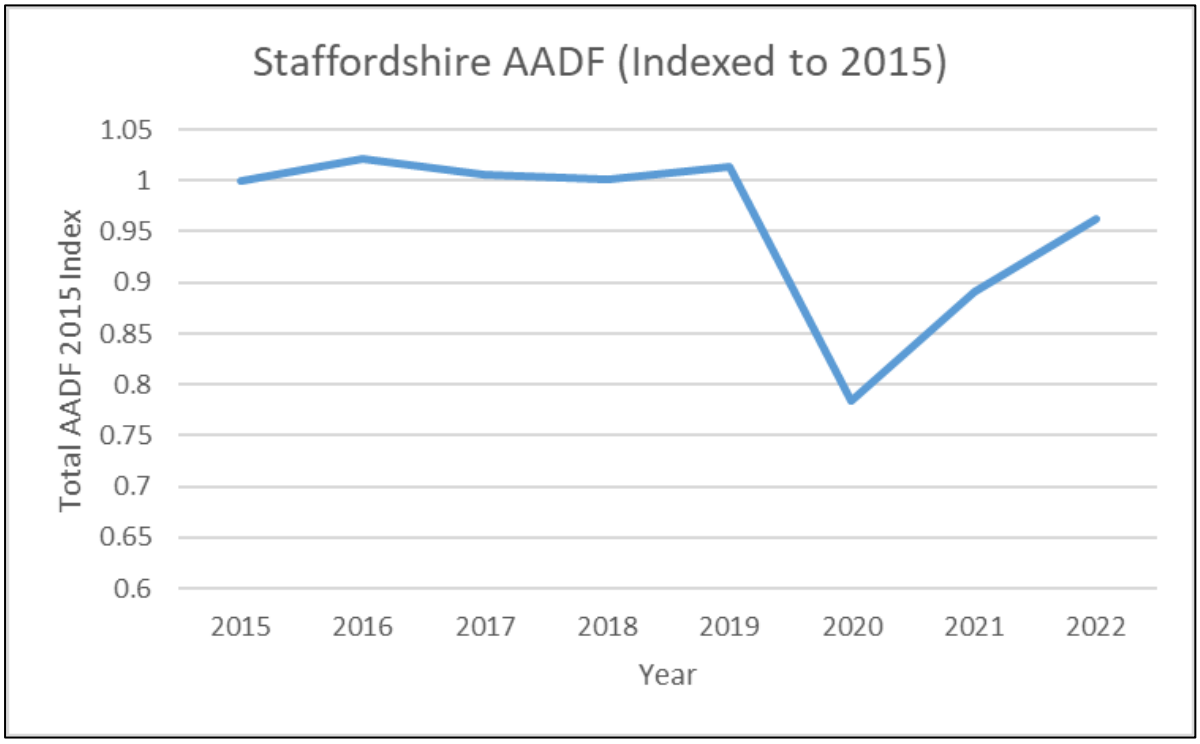


Figure 4-5: Indexed AADF for Staffordshire



Analysis of the DfT total AADF data indicates that a 2015-2022 factor of around 0.95 is derived for both Staffordshire and Newcastle-under-Lyme Borough. Furthermore, it can be seen that the pre-COVID-19 2015-2019 trend is fairly static with index factors around 1.00-1.02. In addition to this the post-COVID-19 recovery 2000-2022 data indicates an overall increasing trend in total AADF traffic flows, showing traffic trends projected towards the pre-COVID-19 2015 levels.

This analysis is supported by a comparison of selected individual DfT site data points, plotted graphically in Figure 4-6 and summarised for Newcastle-under-Lyme Borough in Table 4-1. Overall, it can be seen that between 2015 and 2022 traffic growth has stayed relatively static with an overall change of around 1% in Newcastle-under-Lyme Borough and 0.01% across Staffordshire.

Figure 4-6: DfT traffic count sites

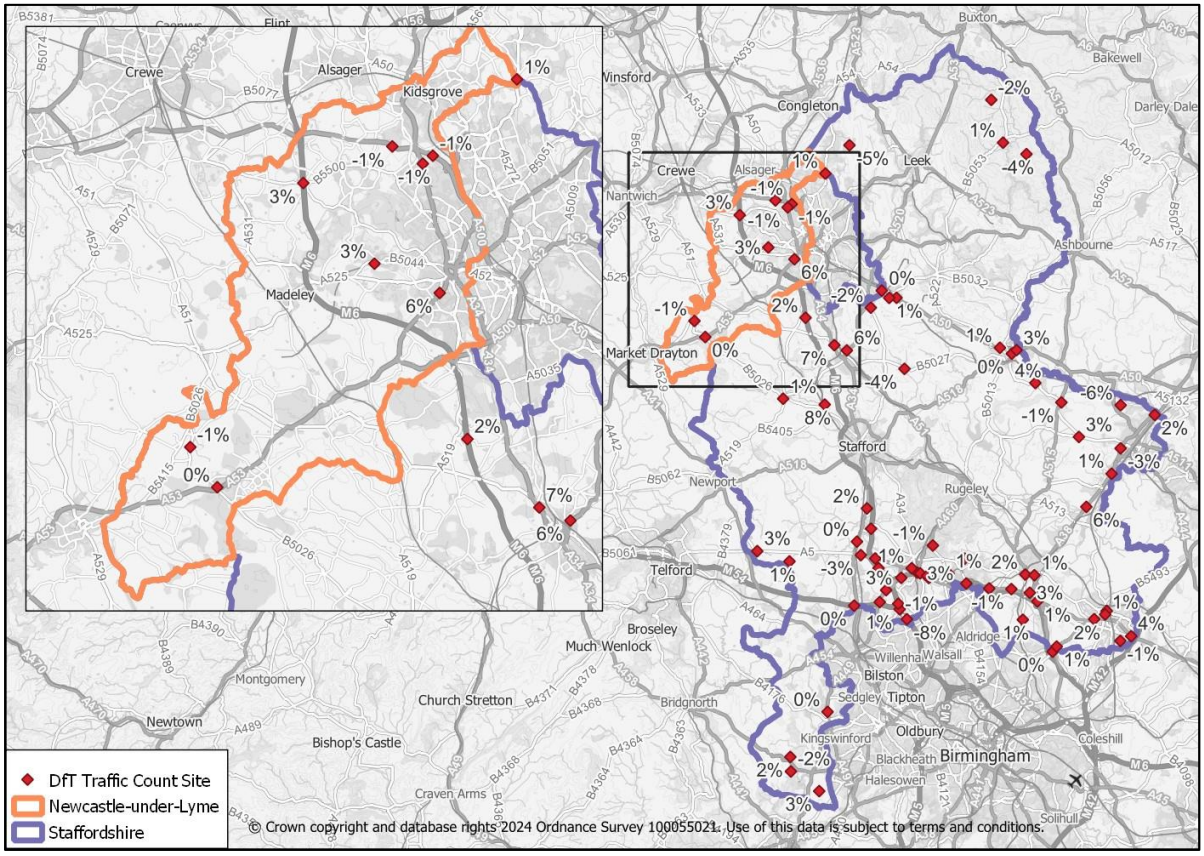


Table 4-1: DfT count percentage change (Newcastle-under-Lyme Borough)

Location	Perc. Change (2015 - 2022)
A53 Priory Rd	+6%
Underwood Rd	+3%
M6	+3%
B5026 Mucklestone Rd	+0%
A34 (Crackley)	-1%
A500 (West of M6 J16)	-1%
B3026	-1%
A500 (East of M6 J16)	-1%
Average	+1%

4.4 WebTRIS Data Analysis

Daily traffic profiles for an average weekday, derived from a month of available data points, were obtained for a number of WebTRIS counters along the A500 and M6 for both 2015 and 2022/23. Figure 4-7 below shows the location of the following WebTRIS comparison sites:

- M6 NB between J15 and J6:
  - M6/6536A – March 2015
  - M6/6491A– March 2023
- M6 SB between J16 and J5:
  - M6/6536B – March 2015
  - M6/6491B – March 2023
- A500 WB between Alsager Jn and M6 J16:
  - 7540/1 – March 2015 and 2022
- A500 EB between Alsager Jn and Talke Interchange
  - 7539/1 – June 2015 and June 2023
- A500 WB between A500/A5271 and A500/A527:
  - 7541/1 – March 2015 and 2023
- A500 EB between A500/A527 and A500/A5271:
  - 7542/1 – March 2015 and 2023

Figure 4-7: WebTRIS site locations

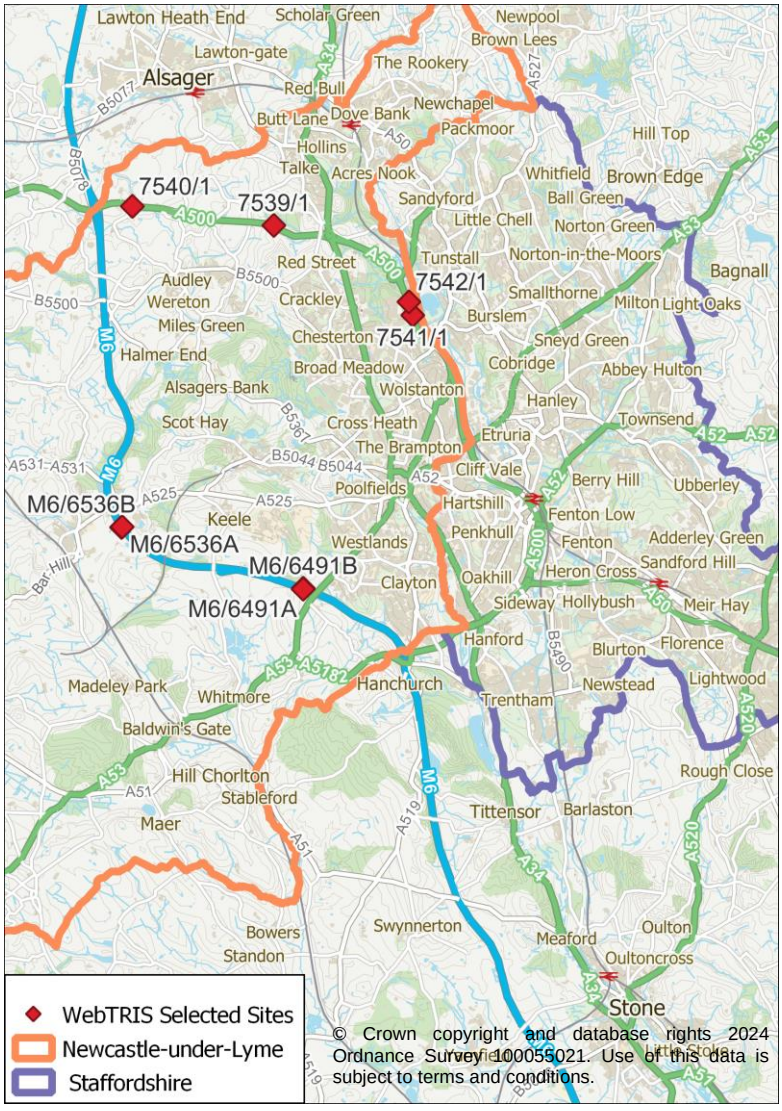


Table 4-2 below summarises the traffic flow analysis of the comparable M6 J15-J16 WebTRIS counters by time period (AM: 08:00-0900, IP average 10:00-16:00, PM 17:00-18:00). The M6 24-hour traffic profiles are also displayed in Figure 4-8. In summary it can be seen that a relatively similar daily traffic profile is observed between the 2015 and 2023 data sets with an overall decrease in traffic flows from 2015 to 2023. In particular a decrease in AM peak traffic of around 10% is observed in both directions.

Table 4-2: M6 average weekday traffic profile analysis – between J15 and J16

	2015-NB	2023-NB	Diff %	2015-SB	2023-SB	Diff %
AM	3,177	2,861	-10%	3,368	3,046	-10%
IP	3,351	3,333	-1%	3,317	3,295	-1%
PM	3,674	3,430	-7%	3,460	3,425	-1%
24-Hr	55,023	50,752	-8%	54,573	50,771	-7%

Figure 4-8: M6 average weekday traffic profile (Northbound, Southbound) – between J15 and J16

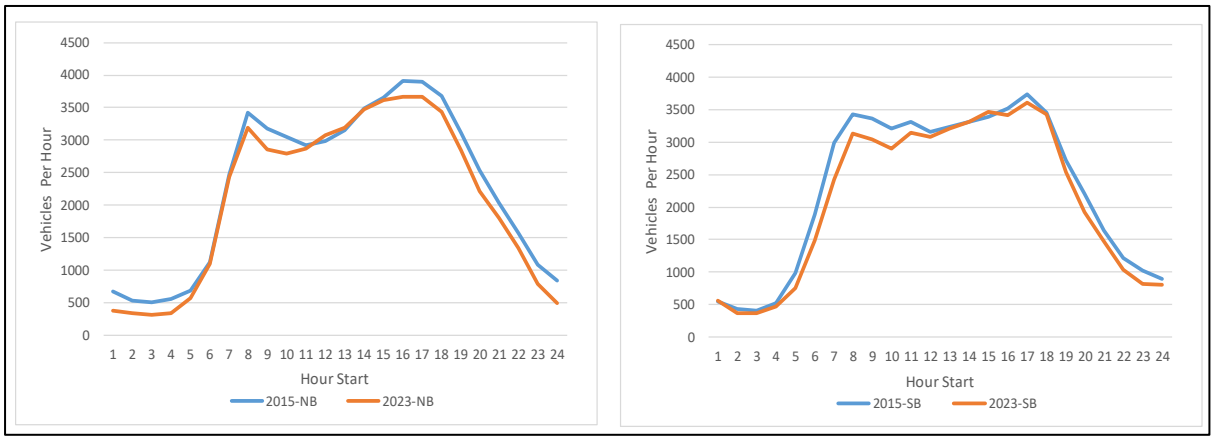


Table 4-3 and Table 4-4 below summarises the traffic flow analysis of WebTRIS at two sites along the A500 by time period. The 24-hour traffic profiles for these sites are also displayed in Figure 4-9 and Figure 4-10. Analysis of the traffic data profiles at both sites indicates an overall increase in traffic across the A500. In particular in the AM peak in the eastbound direction where traffic flow increases of around 25-35% are observed.

Table 4-3: A500 average weekday traffic profile - between A34 and M6

	2015-WB	2022-WB	Diff %	2015-EB	2023-EB	Diff %
AM	1,359	1,435	6%	1,685	2,141	27%
IP	1,312	1,371	4%	1,457	1,578	8%
PM	1,576	1,626	3%	1,872	1,938	4%
24-Hr	21,029	23,735	13%	23,946	28,331	18%

Figure 4-9: A500 average weekday traffic profile (Westbound, Eastbound) - between A34 and M6

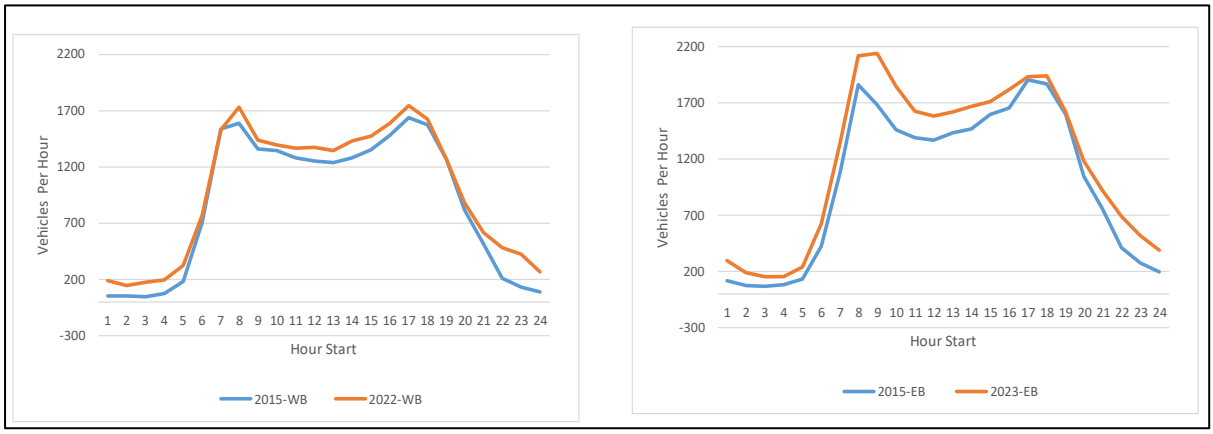
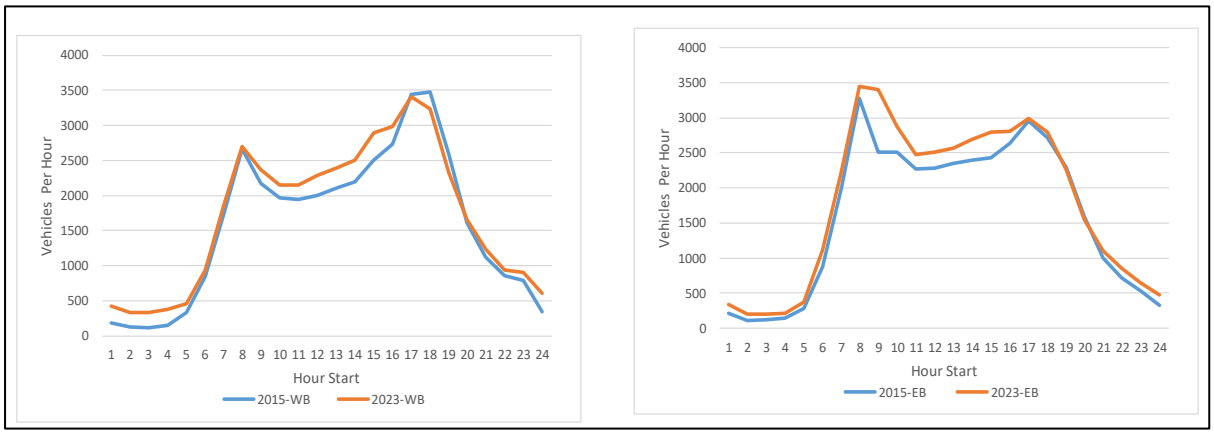


Table 4-4: A500 average weekday traffic profile analysis - between A5271 and A527

	2015-WB	2023-WB	Diff %	2015-EB	2023-EB	Diff %
AM	2,173	2,370	9%	2,511	3,400	35%
IP	2,249	2,391	6%	2,464	2,517	2%
PM	3,474	3,232	-7%	2,711	2,800	3%
24-Hr	37,983	41,453	9%	38,551	42,927	11%

Figure 4-10: A500 average weekday traffic profile (Westbound, Eastbound) - between A5271 and A527



4.5 Accident Data Analysis

The accident data analysis has used locally validated information within Newcastle-under-Lyme Borough and STATS19 information, collected by the police and made available by the DfT[2], for external areas. The latest year of validated STATS19 data is 2022 therefore for a five-year analysis period, data relating to 2018 to 2022 was selected. Analysis used the full national coverage of the STATS19 dataset so that relevant accident patterns beyond the Newcastle-under-Lyme Borough border may be identified.

[2] https://www.data.gov.uk/dataset/cb7ae6f0-4be6-4935-9277-47e5ce24a11f/road-safety-data

A localised 1.5km radius study area is identified for each strategic site and is centred on the site boundary with the strategic road network. In addition, patterns around other significant core LP sites and beyond the study area are identified.

Figure 4-11 shows accident heatmaps for the three strategic sites. For AB2 (M6 J16), there are a cluster of accidents on the entry and exit slip roads north of the junction as well as on the westbound approach on the A500. Whilst there are no prominent clusters on the A500 to the west of the roundabout, there are three serious and two fatal accidents on the 2km approach. Whilst the TK30 (Talke) site shows a number of accidents including serious and fatal accidents occurring along its A500 boundary and a cluster of minor accidents at the Talke roundabout, qualitatively, these are typical of the A500 as a whole. Site KL15 (Keele) shows two small clusters of accidents on the A525 Keele Rd, close to the university.

A breakdown of accidents occurring within 1.5km of each strategic site is shown in Table 4-5 and Table 4-6. These show a greater total of collisions for AB2 and also a higher proportion of serious collisions. In part, this is likely due to the inclusion of the M6 and its vehicle volume and running speed which results in more significant accidents.

Figure 4-12 and Figure 4-13 show collision heatmaps for locations within Newcastle-under-Lyme Borough where local plan developments are expected. Whilst there are no obvious accident hotspots for the developments outside of the main Newcastle-under-Lyme conurbation, there are a number of accident hotspots that are in close proximity to predominantly residential developments. Such hotspots include on Basford Rd, on the A52 and the A34/A527 roundabout.

Table 4-5: Categorised accidents within 1.5Km of strategic sites

Element	Measure	Fatal	Serious	Slight	Total
AB2	Personal injury collisions (PICs) (5-year total)	1	8	41	50
TK30	Personal injury collisions (PICs) (5-year total)	1	5	29	35
KL15	Personal injury collisions (PICs) (5-year total)	1	2	22	25

Table 4-6: Categorised accidents by proportions within 1.5Km of strategic sites

Element	Measure	Fatal	Serious	Slight
AB2	Personal injury collisions (PICs) (5-year total)	2%	16%	82%
TK30	Personal injury collisions (PICs) (5-year total)	3%	14%	83%
KL15	Personal injury collisions (PICs) (5-year total)	4%	8%	88%

Figure 4-11: Strategic sites accident heatmap

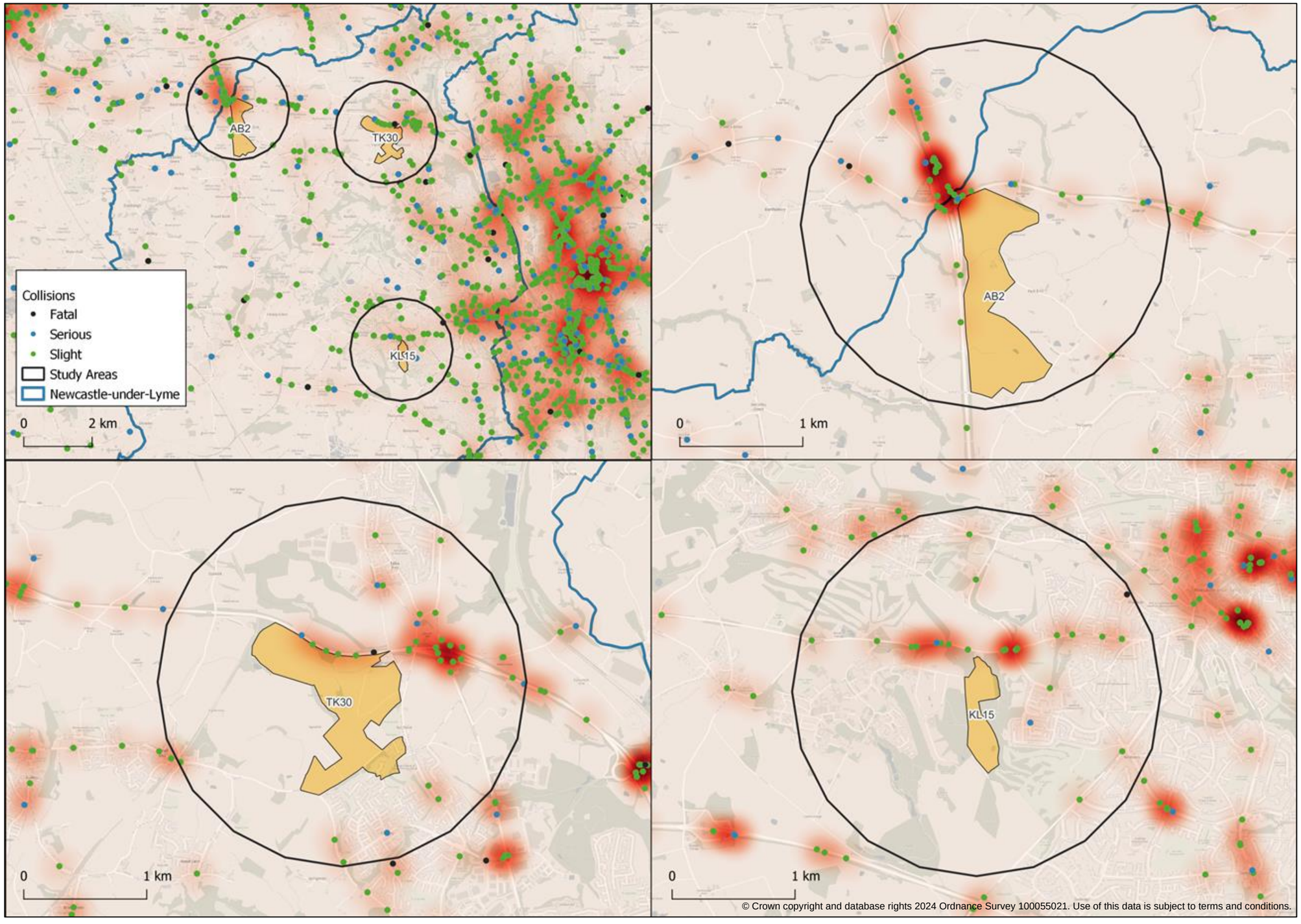


Figure 4-12: NULBC local plan sites accident heatmap

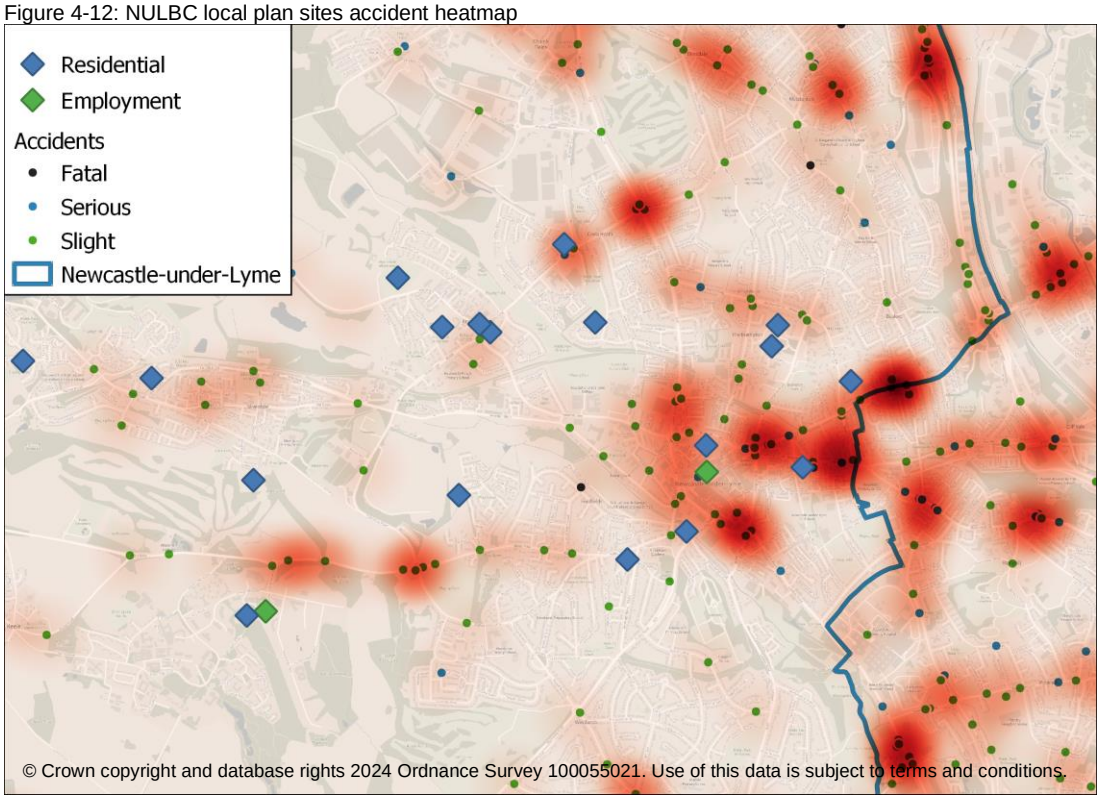
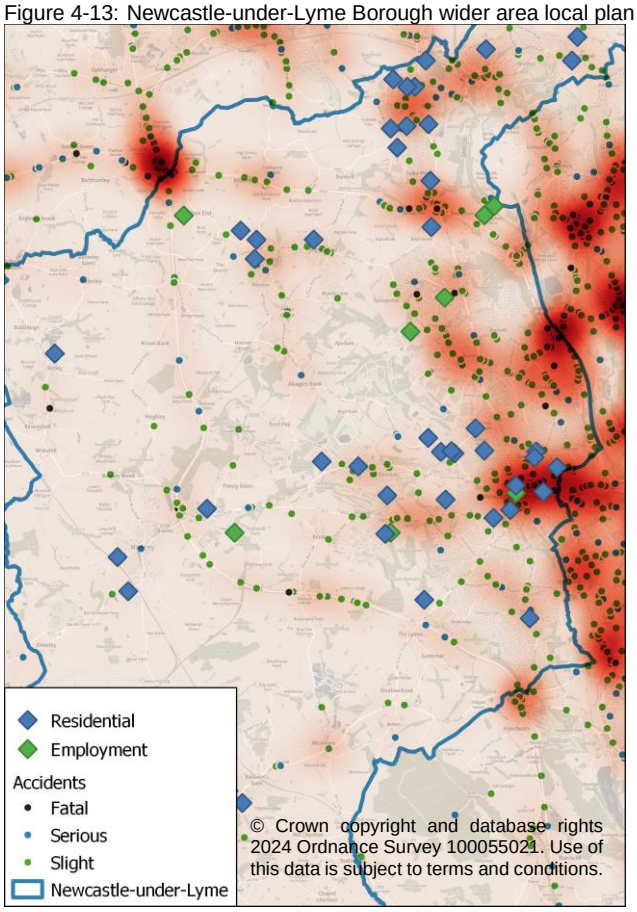


Figure 4-13: Newcastle-under-Lyme Borough wider area local plan accident heatmap



4.6 Accessibility Analysis

4.6.1 Isochrone Analysis

The following analysis is intended to investigate the accessibility of major local town centres from residential developments proposed in the Local Plan. The centres of Newcastle-under-Lyme and Stoke-on-Trent have been chosen as being suitably local and as a proxy for available services and employment opportunities. This test investigates active modes (walk and cycle) as well as public transport (bus and rail).

Isochrones were created for walk, cycle, and public transport at 15, 30, 45 minutes and in addition, 60 minutes for public transport. 45 minutes was taken as the upper limit for active mode trips whilst 60 minutes was taken as the upper limit for public transport trips. the public transport isochrone was drawn for a 9AM weekday and the cycle isochrone was created to favour safer routes.

Figure 4-14 shows accessibility to the urban centres by walking. Being the slowest mode and having the shortest range in the allowable time, only the centre of Newcastle-under-Lyme is accessible from any of the Local Plan housing developments. A number of smaller residential schemes within the existing extent of the urban conurbation will be within walking distance of the town centre though the majority of the larger schemes will be too distant.

Figure 4-15 shows accessibility to the urban centres by cycling. This analysis will favour safer routes over faster routes though further cycle network enhancements may still be beneficial. The results show a significantly greater proportion of sites being within at least a 45-minute cycle ride of the urban centres, including some of the larger planned residential sites towards Talke and Keele areas. A number of sites towards Audley and Kidsgrove are beyond cyclable distance of Newcastle-under-Lyme or Stoke-on-Trent centres though are near their own distinct urban centres.

Figure 4-16 shows accessibility to the urban centres by public transport. Whilst the increased speed of public transport allows for significantly further trips in the allowed time period, the choice of available routes limits movements to specific corridors. Whilst residential sites towards Keele and Stoke-on-Trent that were accessible by cycle are still accessible by public transport, large sites towards Talke are now beyond the allowable time period. Whilst Kidsgrove is reachable within 45 minutes, few of the nearby residential sites are close enough to benefit, nor are sites within the more rural parts of Newcastle-under-Lyme Borough.

Table 4-7 shows the total number of planned residences within range of the main urban centres by mode. It can be seen that there is potential for nearly half of all planned strategic sites to be within a 45-minute cycle ride and suggests there is potential for improved cycle infrastructure to bring benefits. It also suggests that selected new public transport services could open new corridors helping improve accessibility, especially for those developments in the Talke area.

Table 4-7: Residential Accessibility

	Walk (45 mins)	Cycle (45 mins)	Public Transport (60 mins)
Residences	811	2241	2051
Percentage	17%	47%	43%

Figure 4-14: Isochrone Accessibility - Walk

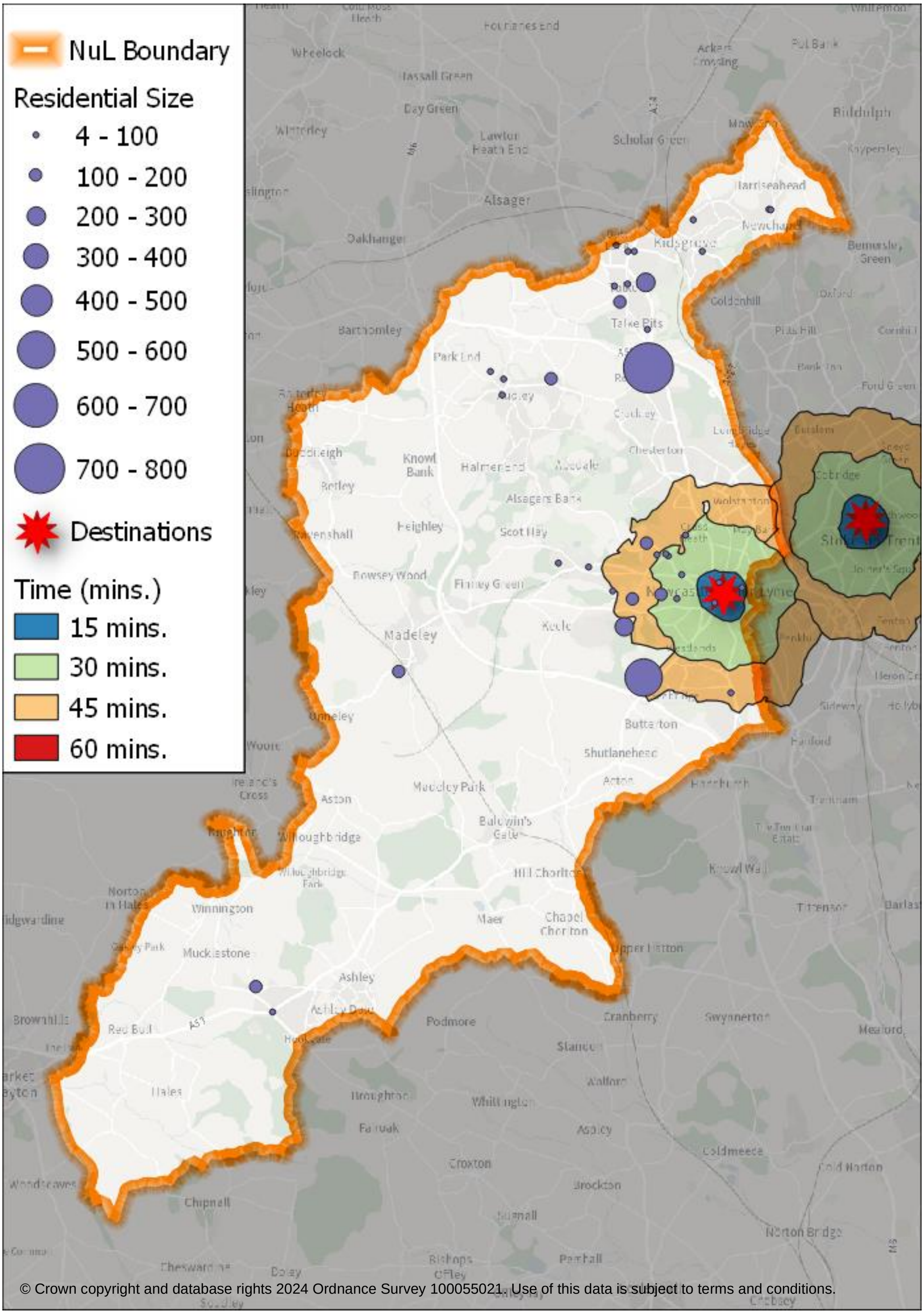


Figure 4-15: Isochrone Accessibility - Cycle

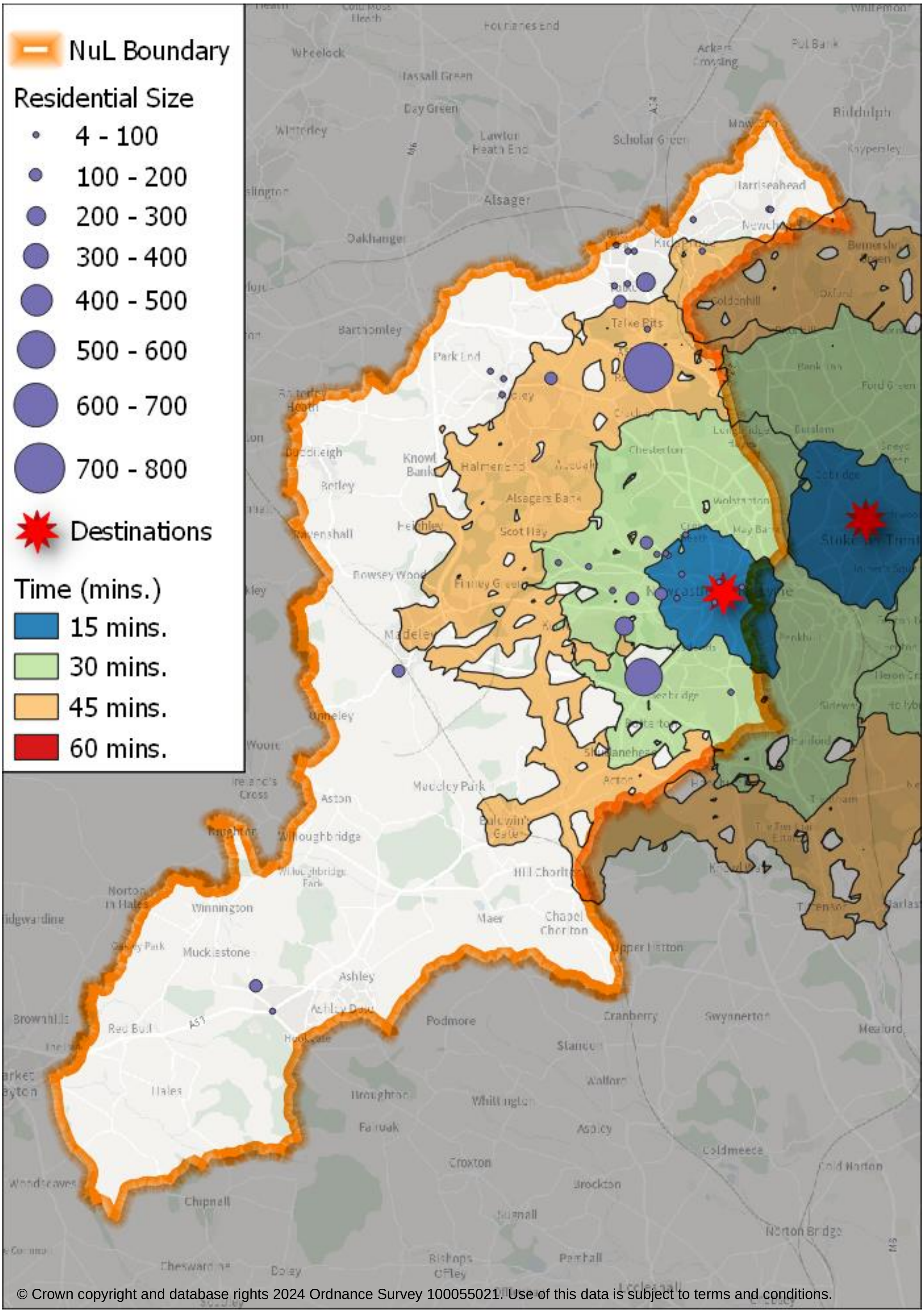
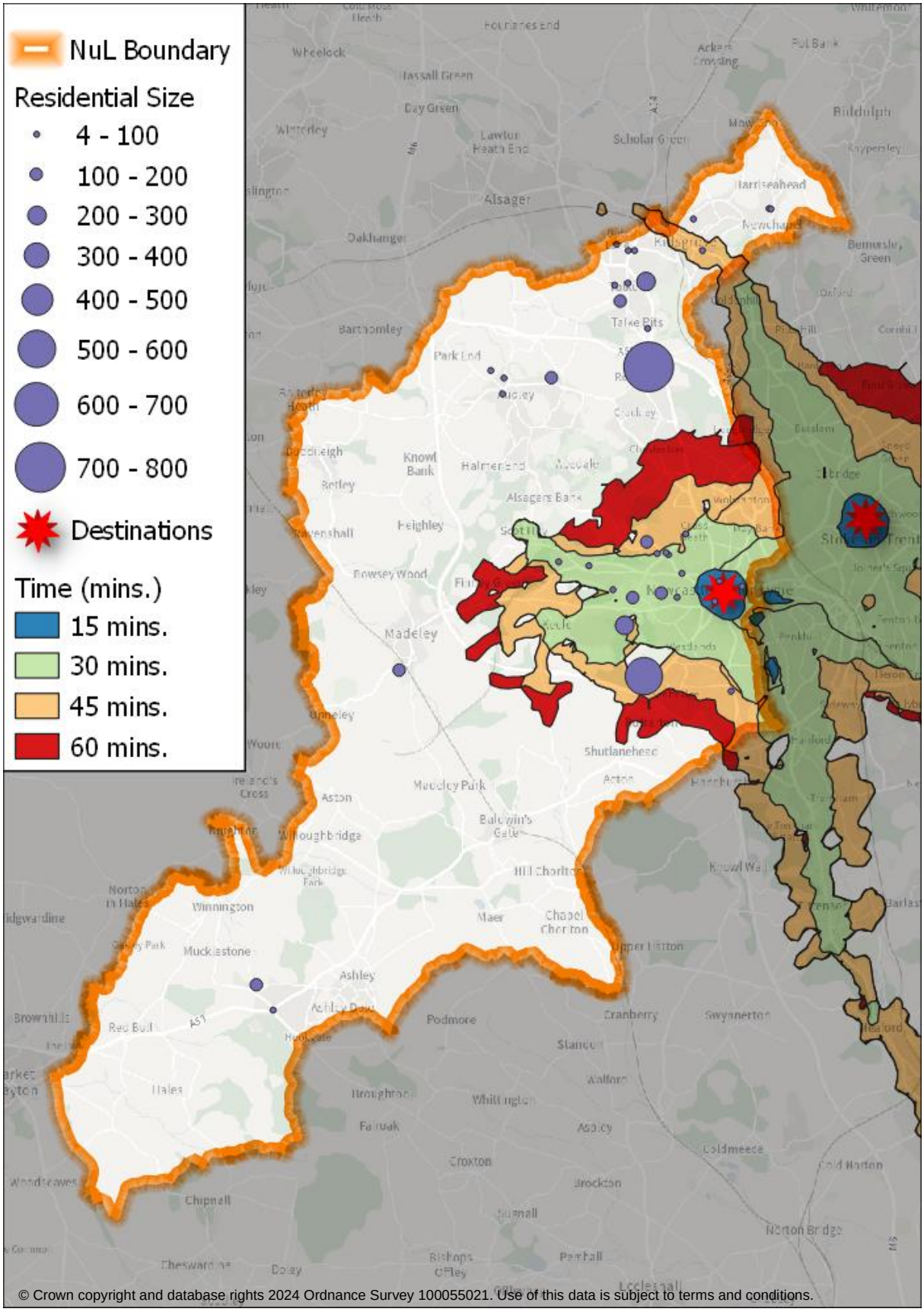


Figure 4-16: Isochrone Accessibility - Public Transport



An isochrone analysis was conducted for public transport modes (bus and rail) for all three strategic sites. The analysis identifies catchment areas at 15-, 30-, 45- and 60-minute intervals for a weekday 9 AM arrival for each site. The analysis used current (2024) publicly available timetable data for bus (DfT Bus Open Data Service) and rail (ATOC/Rail Delivery Group).

Figure 4-17 shows public transport isochrones for site KL15 (Keele). This location benefits from existing public transport accessibility serving Keele University. Accessibility is directed towards the built-up areas of Newcastle-under-Lyme and Stoke-on-Trent. The site can be accessed from Newcastle-under-Lyme within 30 minutes and from Stoke-on-Trent railway station within 45 minutes. Areas within the 60-minute isochrone include significant residential areas extending to Crackley, Feg Hayes, Sneyd Green, Longton and Trentham. There is poor accessibility to the east and south (Access from Crewe is in excess of one hour so beyond the 60-minute isochrone).

Figure 4-18 shows public transport isochrones for site KL30 (Talke). This site has very similar patterns of accessibility as KL15 to Newcastle-under-Lyme and Stoke-on-Trent though also benefits from increased accessibility towards the north of the borough with Kidsgrove and Mowcop within a 30-minute isochrone. Again, accessibility from the east is poor.

Site AB2 is located on a dual carriageway with currently no footpath or nearby bus stop, therefore, no public transport was accessible within the catchment times. It should be noted that the developer has indicated that, following conversations with local bus operators and Staffordshire County Council, the development of this site would include a funded bus route to improve the public transport provision to the area and the site. The plans include the extension of the Audley to Longton bus route (via Silverdale, Newcastle-under-Lyme, and Stoke-on-Trent) and the Audley to Hanley bus route (via Chesterton and Newcastle-under-Lyme).

It should be noted that the updated Staffordshire Bus Service Improvement Plan (BSIP, 2024) places great emphasis on enhancing public transport availability, integrating various modes of transport, ensuring safety, and improving the accessibility of bus services across the county. A notable example is the proposed phase one scheme and bus rapid transit (BRT) offer near Keele University, which has the potential to bring substantial benefits to the KL15 strategic site and is being delivered by Newcastle Towns Fund.

Figure 4-17: KL15 (Keele) Public Transport isochrone

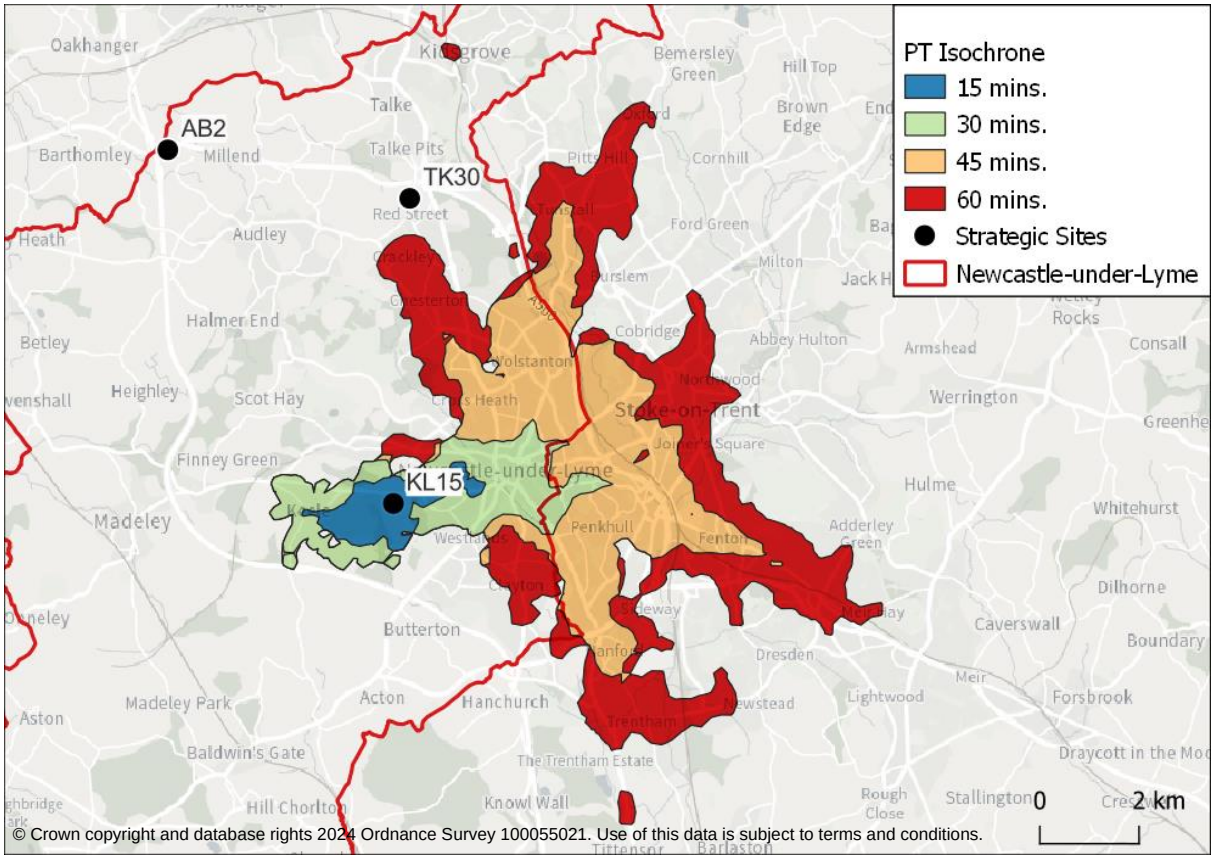
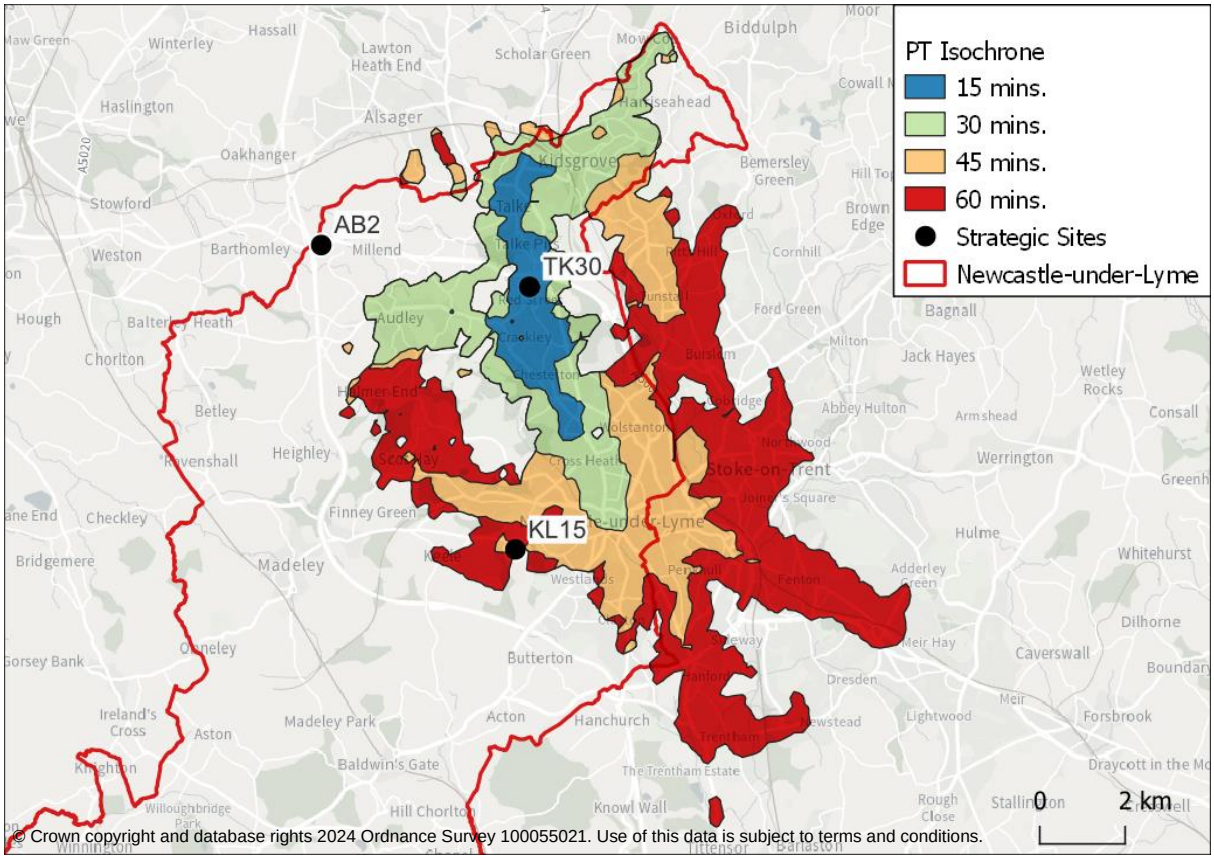


Figure 4-18: TK30 (Talke) Public Transport isochrone



4.6.2 Local Neighbourhood Accessibility

A local neighbourhood accessibility analysis was conducted for Newcastle-under-Lyme Borough. This calculates an accessibility index value for each neighbourhood based on 15-minute accessibility by active means (bicycle and walk) to local key facilities including,

- Education
  - Early childcare
  - Primary schools
  - Secondary schools
- Entertainment and leisure
- Banks and Post Offices
- Food shops
  - Supermarkets
  - Convenience stores
- Healthcare
  - Doctors
  - Dentists
  - Pharmacists
- Public open space

The accessibility score is influenced by both the quality and quantity of available infrastructure and the availability of local facilities. Cycle routing is influenced by an estimated safety score based on road class and availability and type of cycle infrastructure.

As this analysis is focussed on testing accessibility to key neighbourhood facilities, it is most relevant for sites with significant residential LP allocations in both the core allocations and strategic sites TK30 (Talke) and KL15 (Keele). This analysis is concerned about current baseline accessibility, a future accessibility score could be improved by either the addition of a range of additional destination features (e.g., new schools), additional network connectivity (e.g., new link roads) or improvements to the existing network (e.g., improved cycling facilities on existing roads). Large Local Plan developments would be expected to include such improvements to accessibility though as these have yet to be defined, have not been modelled.

Site AB2 (M6 Junction 16) has poor accessibility scores for both walking and cycling. This is an expected outcome of the analysis as there is limited nearby residential populations and therefore limited nearby services. As the proposal for TK30 is purely for employment purposes, the type of destination features being tested here for accessibility are not relevant. Accessibility by public transport for employees is described in the previous section where note is made of developer-funded bus improvements.

Figure 4-19 shows neighbourhood accessibility for walking. TK30 has a relatively low score due to its accessibility to a limited range of destinations surrounding Talke. Whilst KL15 has a lower score, it is immediately adjacent to Silverdale that has a better accessibility index.

Figure 4-20 shows a histogram showing the accessibility index for all neighbourhoods identified in Newcastle-under-Lyme Borough. Each neighbourhood is plotted as a vertical bar with the ones with best accessibility to local destinations towards the left. This shows that TK30 and KL15 both have poor baseline accessibility when compared to other Newcastle-under-Lyme Borough neighbourhoods.

Figure 4-19: Accessibility Analysis – Walk

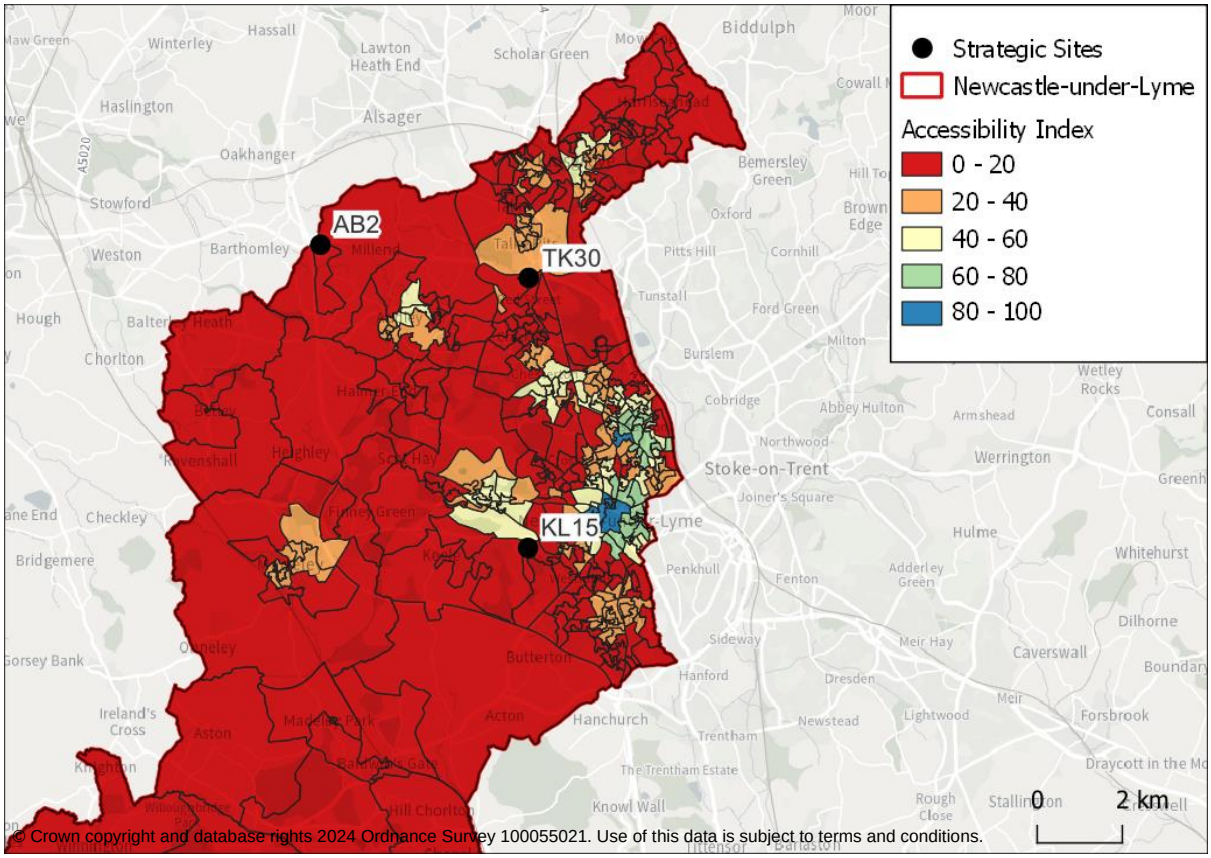


Figure 4-20: Accessibility histogram - Walk

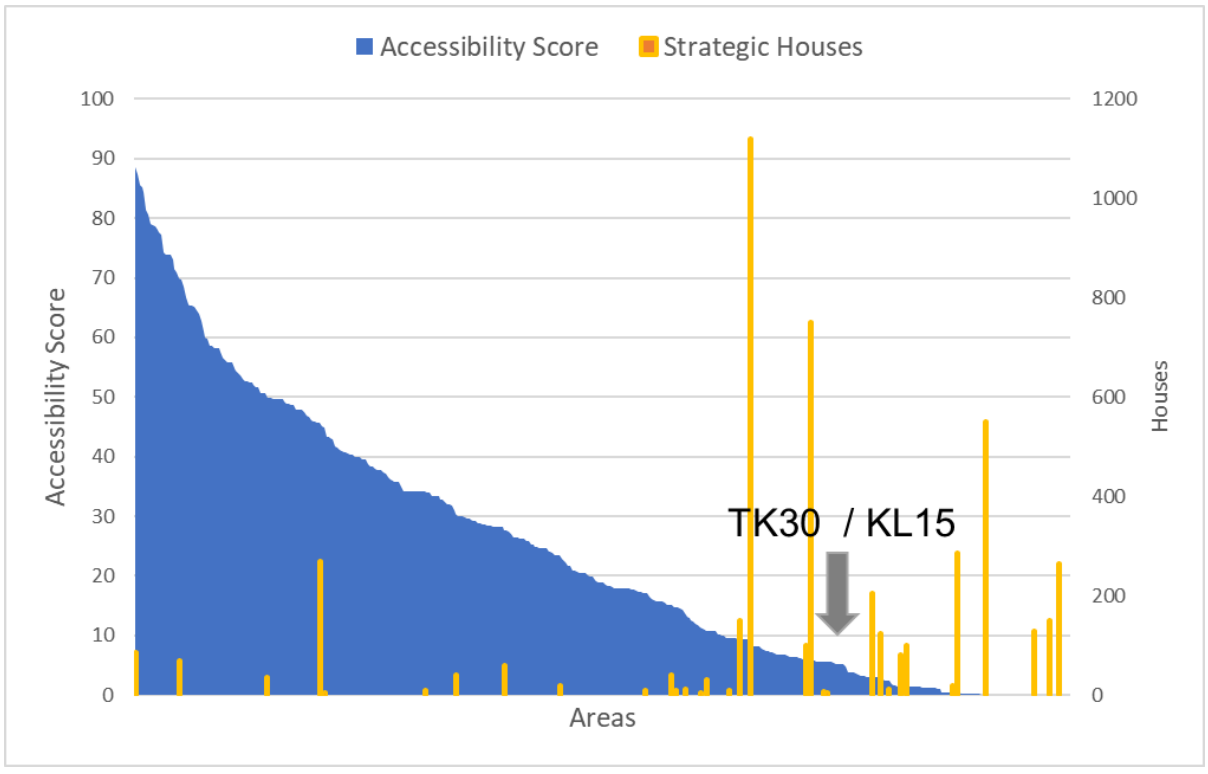


Figure 4-21 shows neighbourhood accessibility for cycling. Accessibility has increased for both KL15 and TK30. This is also evident on the histogram in Figure 4-22 where TK30 now has a relatively average accessibility index compared to local Newcastle-under-Lyme Borough neighbourhoods whilst KL15 is now in the top half of Newcastle-under-Lyme Borough neighbourhoods for accessibility. This is likely related to their location, which is within cycle of facilities within the more populous areas of the borough. This is especially true for KL15 which benefits from being close to National Cycle Network route 551 from Silverdale to Newcastle-under-Lyme.

Figure 4-21: Accessibility Analysis – Cycle

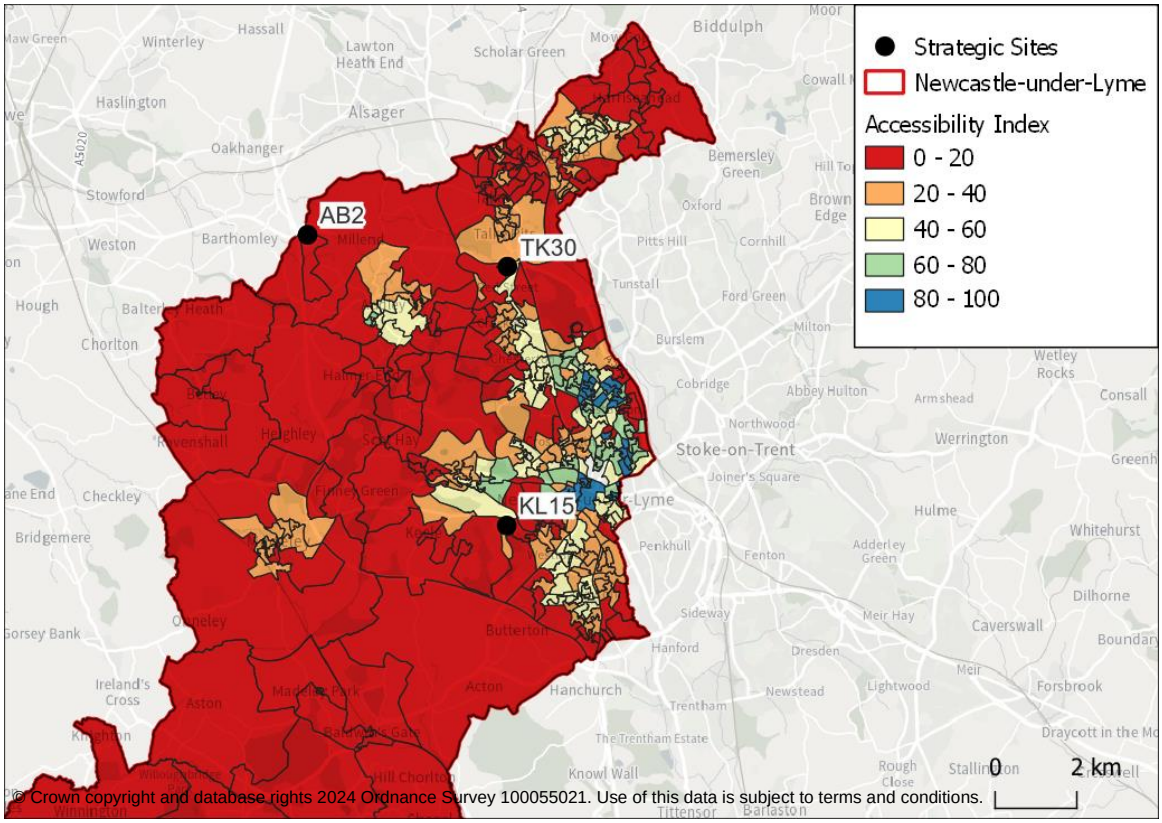
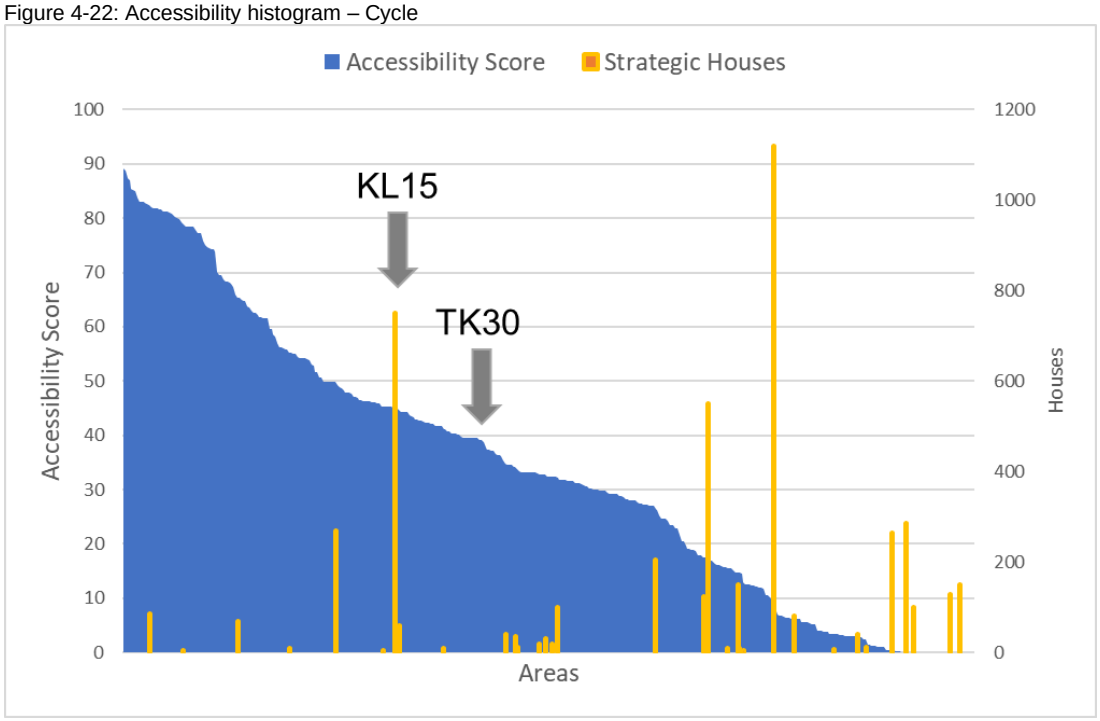


Figure 4-22: Accessibility histogram – Cycle

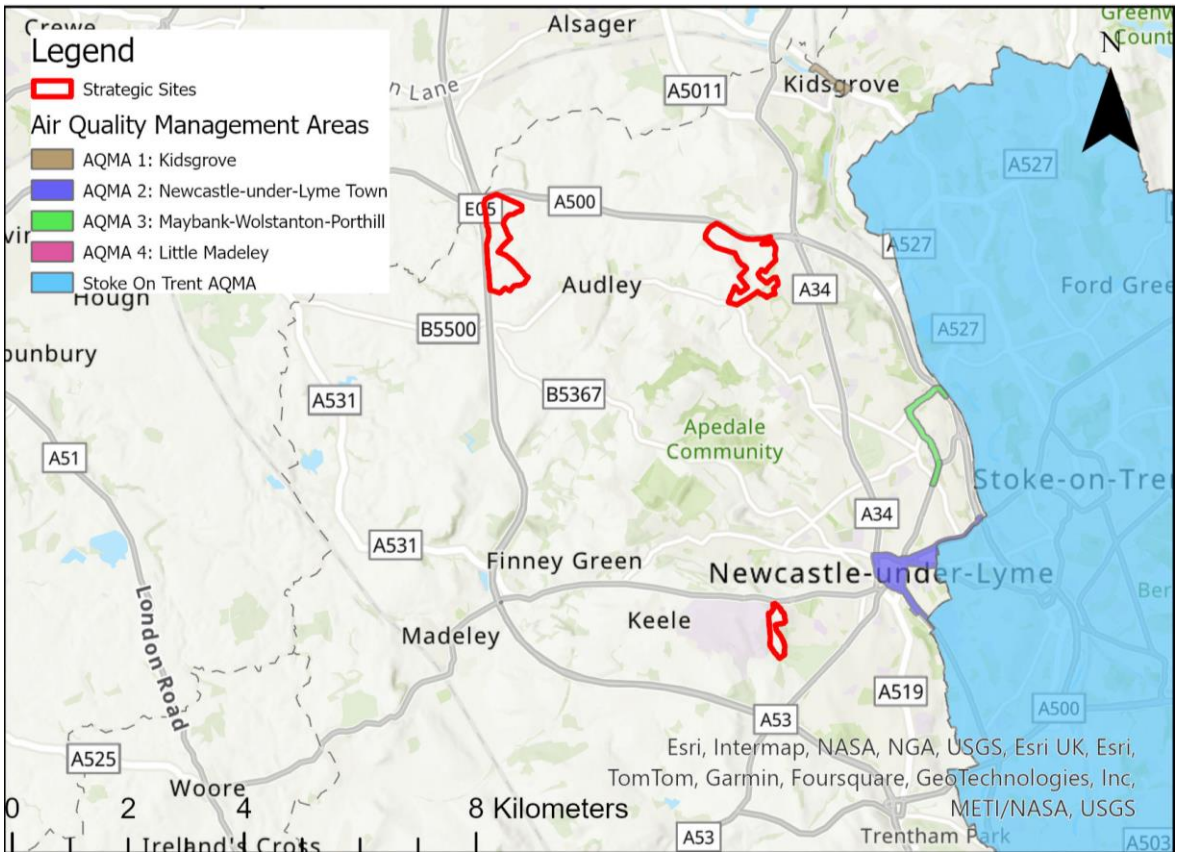


4.7 Air Quality

Local authorities are responsible for reviewing air quality within their boundary on an annual basis. Where national air quality standards are reported to be exceeded at sensitive receptor locations, an Air Quality Management Area (AQMA) is declared. The Local Authority then needs to implement an Air Quality Action Plan with aim of reducing pollutant levels to below standard. The Air Quality Report - Annual Status Report (2023) provides an analysis of the air quality level across Newcastle-under-Lyme, highlighting that road traffic is the most significant source of pollution in the Borough with high proportion of traffic travelling into/through the AQMAs.

Presence of AQMAs is a key planning consideration for new development that will either introduce new sensitive receptors (e.g., housing) or will lead to new pollutant sources (e.g., more traffic on roads). There are 4 x AQMAs in Newcastle-under-Lyme and 1 x AQMA in Stoke, which are relevant to the local plan sites as shown in Figure 4-23.

Figure 4-23: Nearby AQMAs



These AQMAs were declared for exceedances of the annual mean standard for NO_2 (40ug/m3). The Newcastle-under-Lyme Town AQMA was also declared for exceedances of the one-hour objective (200ug/m3). Whilst none of the strategic sites are within AQMA areas, some of the core Local Plan sites are within the NULBC town AQMA and all have the potential to influence traffic volumes through the Stoke-on-Trent AQMA.

Poor air quality has been linked directly to respiratory illness and associated hospital admissions. The number of admissions in local area exceeds national average (see Table 4-8).

Table 4-8: Hospital admissions for respiratory diseases (per 100,000 people)

Indicator Name	England	NHS North Staffordshire CCG
Emergency hospital admissions for COPD, all ages	248	261
Emergency hospital admissions for asthma in adults aged 19 years and over	90	87
Hospital admissions for asthma (under 19 years)	185	254
Emergency hospital admissions for pneumonia	463	598
Emergency hospital admissions for respiratory disease	1523	1983

Defra estimates that NO_2 contributes to curtailing life expectancy by an average of five months, which ranges from healthy individuals experiencing negligible effects to susceptible individuals whose poor health is seriously worsened by NO_2 pollution. The overall population burden is estimated to result in over 23,000 premature deaths in the UK per year.

Figure to Figure show air quality constraints for the three strategic sites. Whilst current nearby monitoring suggests existing levels of NO_2 are below the national standard (40µg/m^3), further work is required to consider ambient levels of particulate matter (PM_{10}, $PM_{2.5}$). It should also be noted that there are some potentially sensitive designated sites nearby that might be sensitive to changes in nitrogen (e.g., SSSIs and Ancient Woodland).

Figure 4-24: TK30 - Air quality constraints

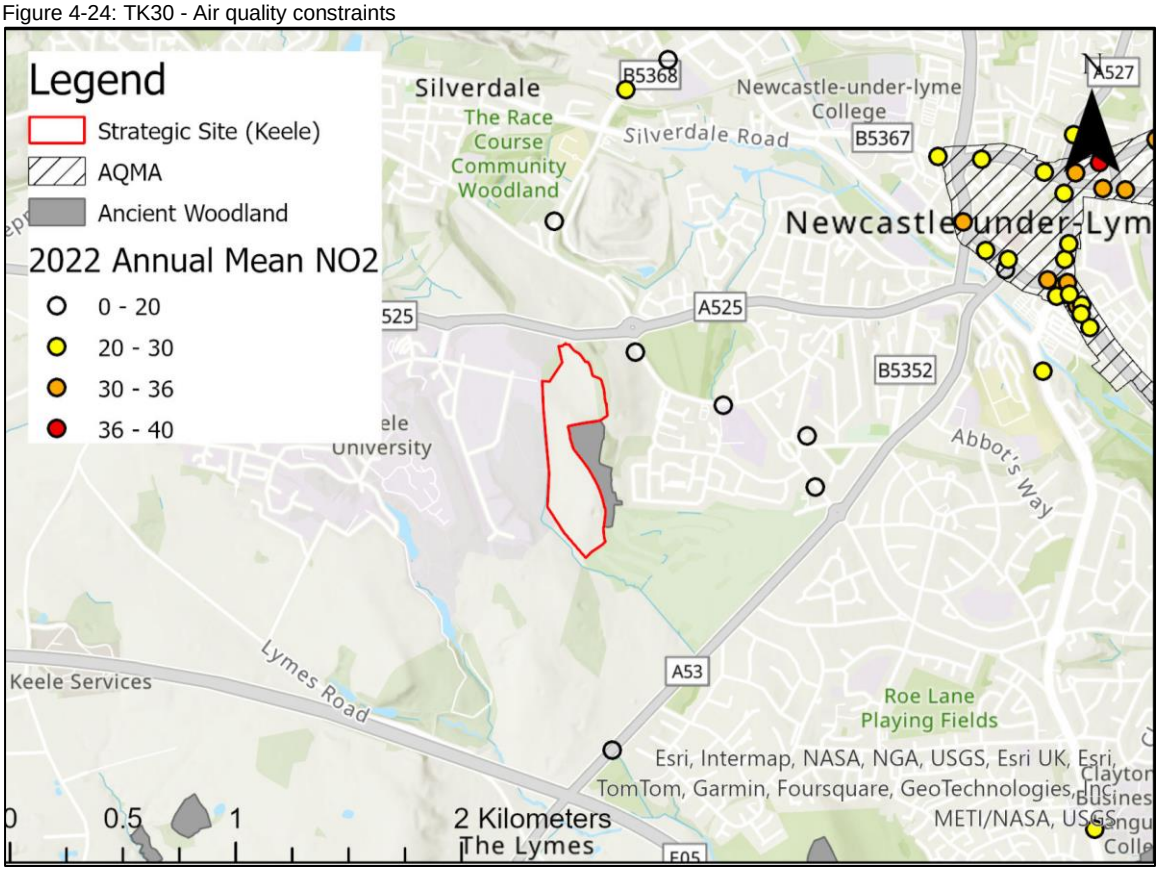


Figure 4-25: AB2 - Air quality constraints

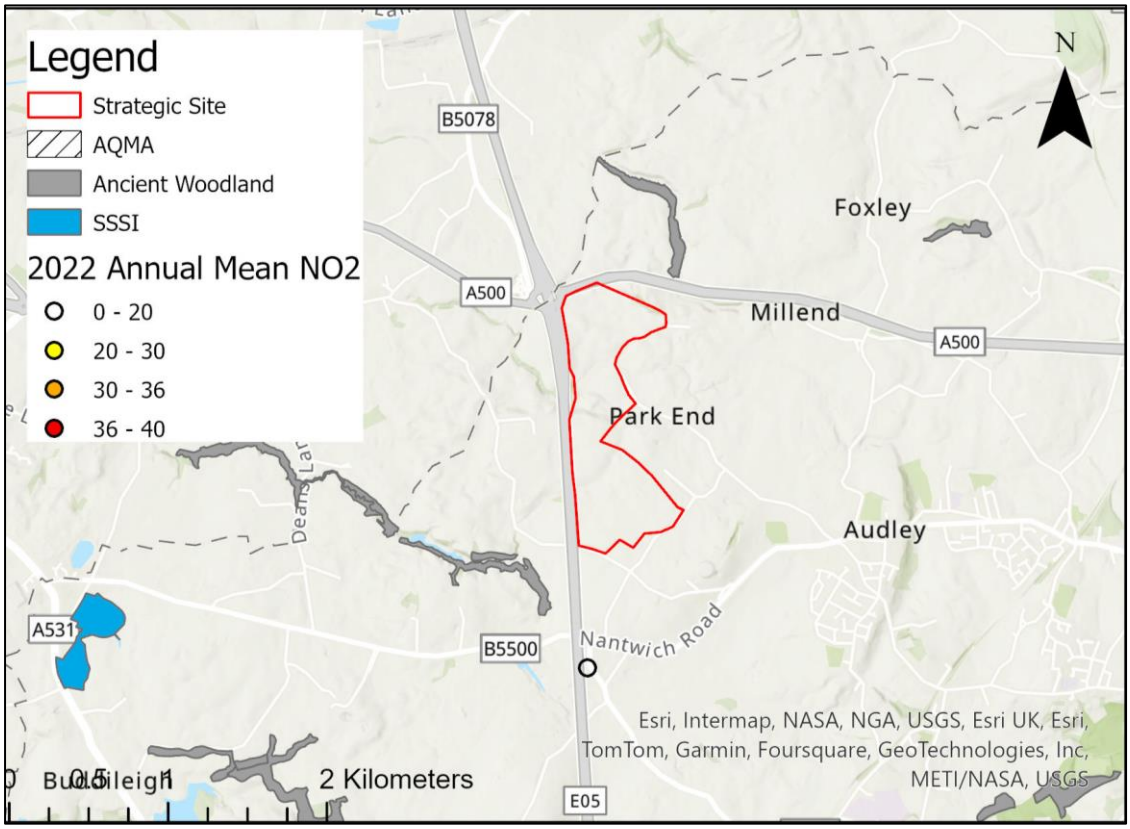
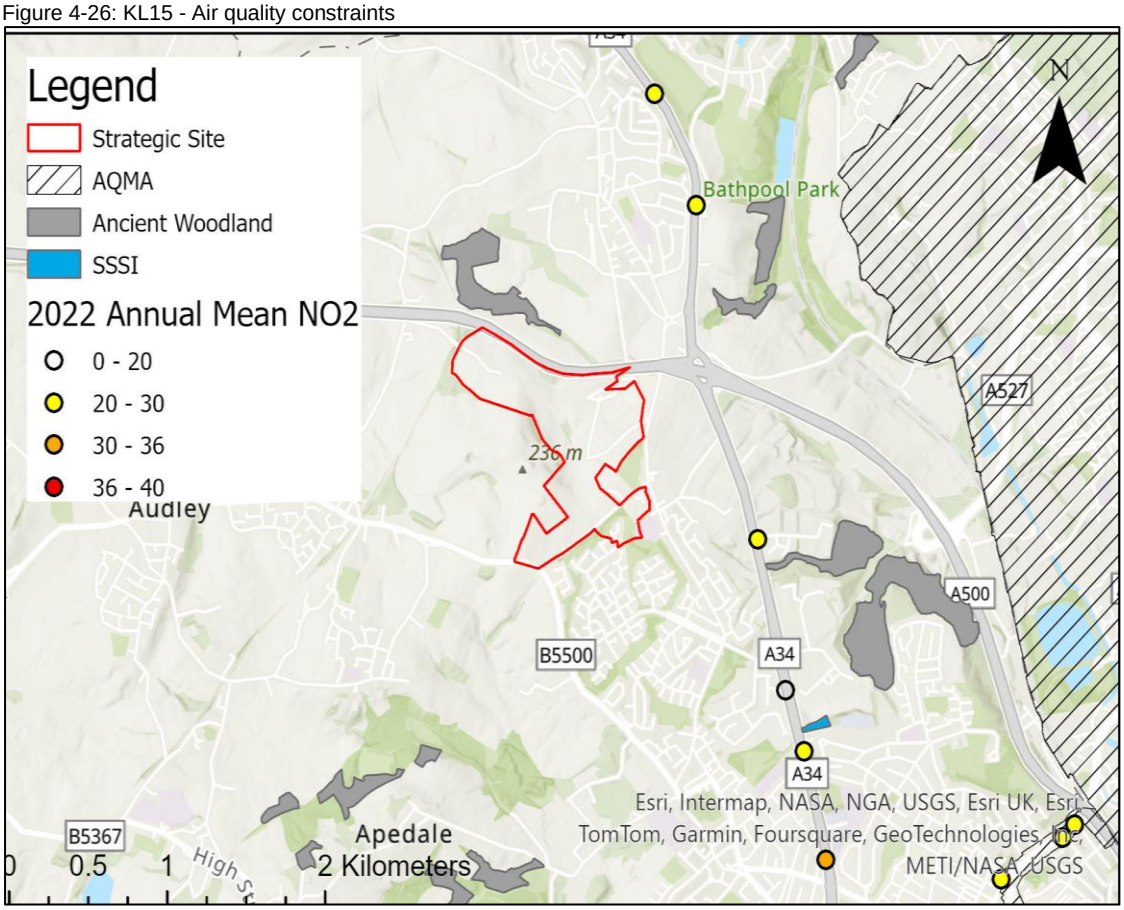


Figure 4-26: KL15 - Air quality constraints



5 Existing Traffic Conditions

5.1 Overview

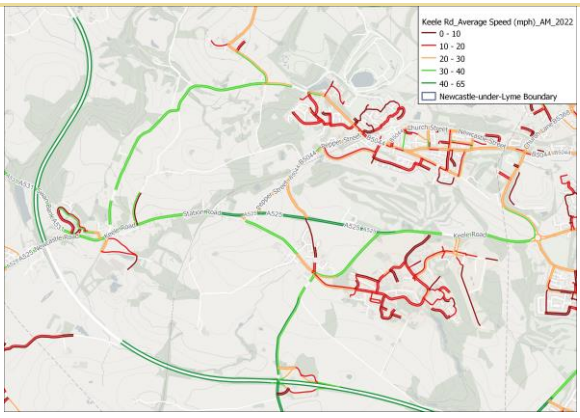
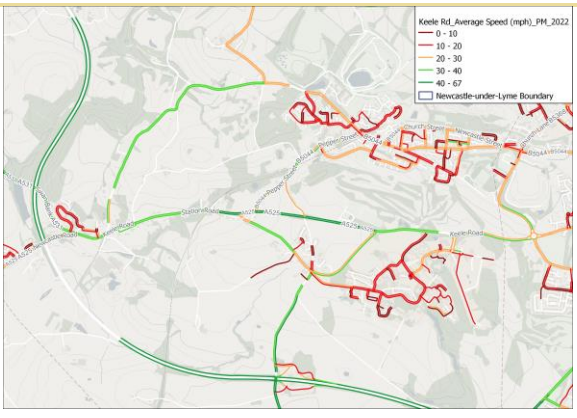
To identify areas of existing traffic speed congestion related to Local Plan sites, INRIX observed speed data has been analysed. This section discusses the observations drawn from the observed speed data in relation key Local Plan sites, as well as any Strategic Road Network (SRN) junctions which may be impacted.

5.2 Local Roads

5.2.1 The A525 (Keele Road)

Figure 5-1 below shows INRIX observed speed data along the A525 between Madeley and Keele University for the AM and PM peaks respectively. In general, the observed speed data is in line with the A525 speed limits which, with the exception of the 50mph section between Station Road and Keele Road, is 40mph. The A525 between Keele University and Madeley Heath is primarily a single lane rural road.

Figure 5-1: A525 (Keele Rd)

The A525 (Keele Road) - AM	The A525 (Keele Road) - PM
	

5.2.2 Other Local Plan Sites in Newcastle-under-Lyme Borough

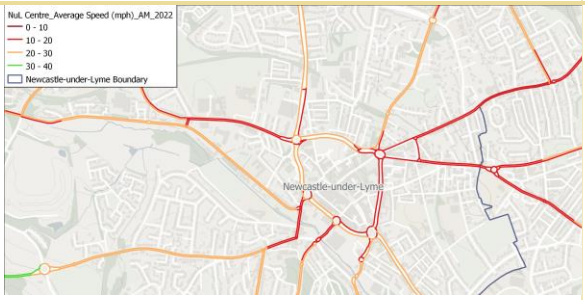
Figure 5-2 shows AM and PM peaks from the INRIX average speed data across a number of locations relevant to the NULBC local plan sites. In summary the following observations are derived from the average speed data:

- Newcastle-under-Lyme Centre:
  - The A34 Lower Street/A52 Ryecroft/A527 Barracks Road form a ring road around the Centre of Newcastle Under Lyme. The A34/A527/A52 ring road primarily comprises of

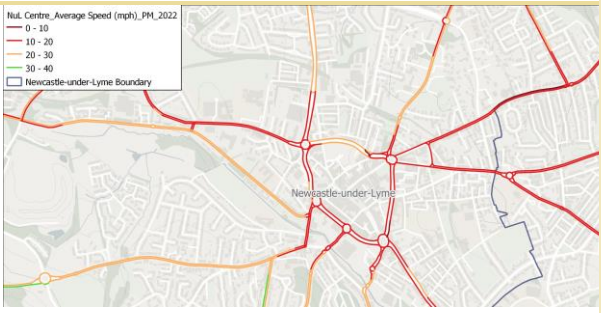
dual carriageway roads with 30mph speed restrictions connected by roundabout junctions.
    - The average speed data indicate that traffic speeds are general between 10-20mph indicating slow moving traffic around the ring road in both the AM and PM peaks. In the PM peak, traffic speeds of 0-10mph are observed on the A527 southbound approach to the Grosvenor Roundabout.
    - In both AM and PM peaks slow moving traffic (10-20mph) are also observed across the A52, A53 and B5367 north of the ring road. South of the ring road traffic speeds of around 1-10mph are observed along the A34 in the PM peak.
- Newcastle-under-Lyme Borough - South:
    - In general traffic speeds of 20-30mph are observed along the A519 Clayton Road. This indicates some reduction in speed relative to the 40-mph speed limit.
    - Across the A34 traffic speeds of 10-20mph are observed across several links across the corridor in both peaks.
    - Observed speed data for the A53 shows traffic traveling broadly in line with the speed limits, which is national speed limit around the M6 crossing decreasing to 40mph south of Sutherland Drive.
- Madeley:
    - In line with the 30mph speed restrictions, observed speeds along the A525 drop to 20-30mph between Madeley and Madeley Heath.
    - Slower moving traffic (10-20mph) is observed on the Moss Lane, Vicarage Road, and The Holborn side road links.
- Audley:
    - In line with the 30mph speed restrictions, observed speeds along the B5500 drop to 20-30mph between Audley and Bignall End.
    - In the PM peak reduced speeds of 10-20mph are observed along the side roads of Church Street and Chester Road.
- Talke:
    - National speed limits are in place on the A34 Newcastle Road from the A500 to north of Clough Hall Drive. Therefore, the observed speeds of 20-30mph along parts of this section does indicate some relatively slow-moving traffic. However, the data indicates that this is slow moving traffic, but in general the data does not indicate any large reductions in speed due to queuing.
    - Traffic speed of 10-20mph is observed along the A34 Congelton road in both peak periods north of the A34/A5011 traffic signal. In the PM peak 10-20mph speeds are observed on the A5011 and A34 Newcastle Road approach arms indicating traffic congestion at the signalised junction.

Figure 5-2: Other local roads

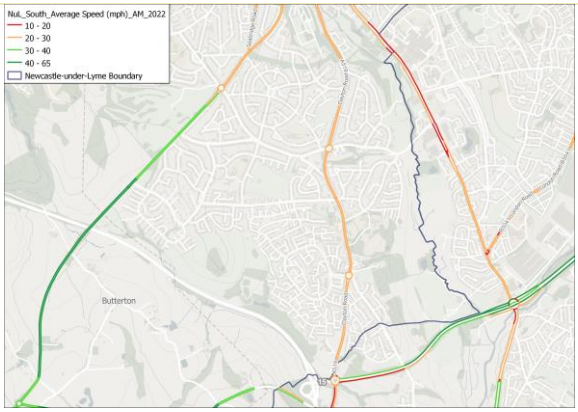
Newcastle-under-Lyme Centre - AM



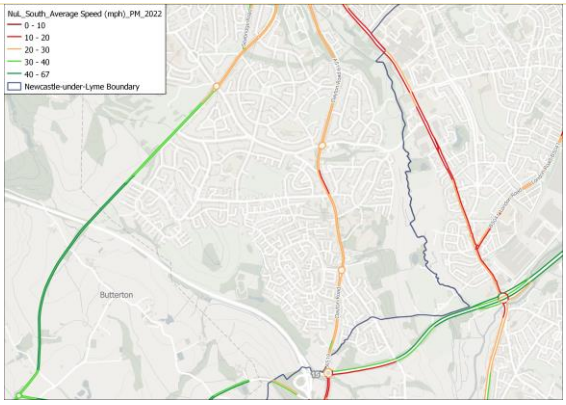
Newcastle-under-Lyme Centre - PM



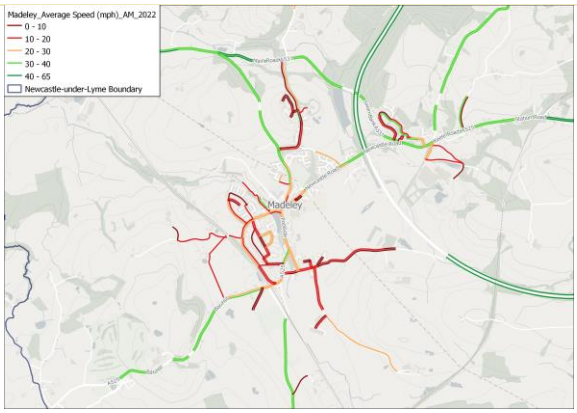
Newcastle-under-Lyme Borough - South - AM



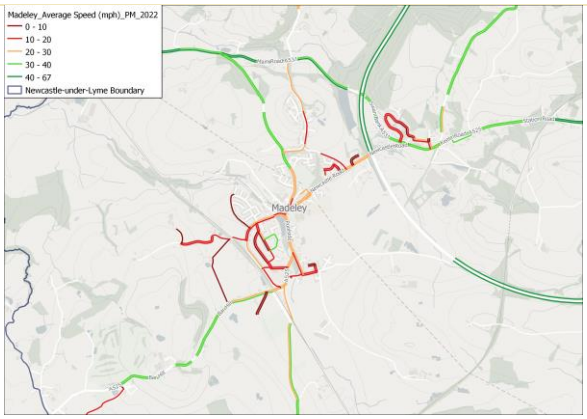
Newcastle-under-Lyme Borough - South - PM



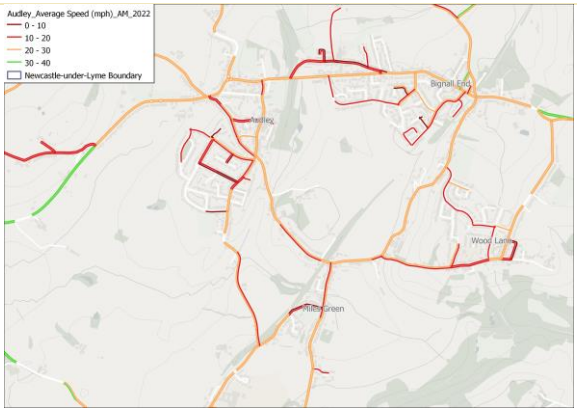
Madeley - AM



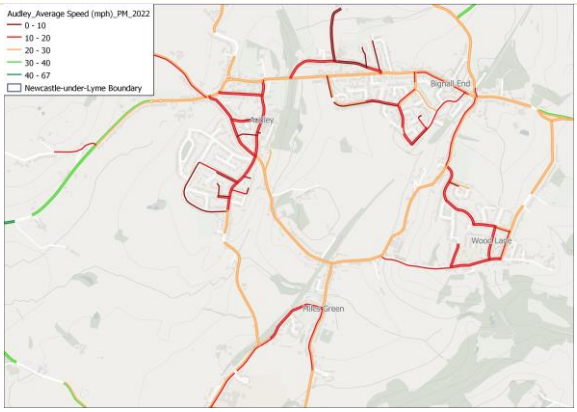
Madeley - PM

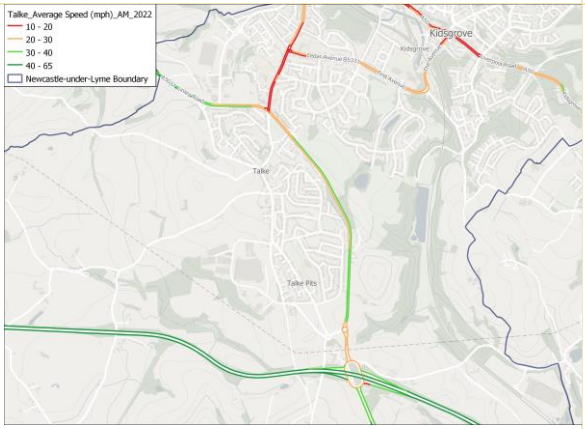


Audley - AM



Audley - PM



Talke - AM	Talke - PM
	

5.3 The Strategic Road Network

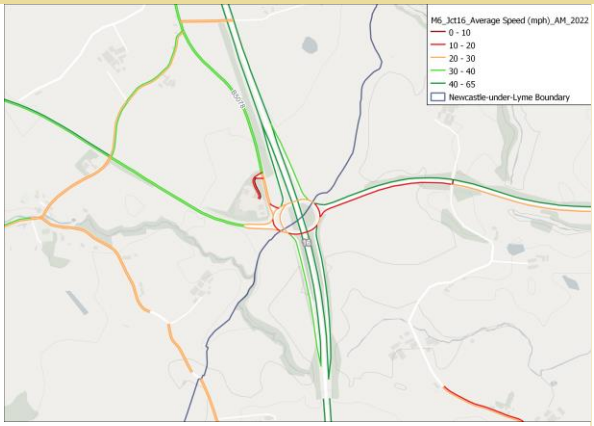
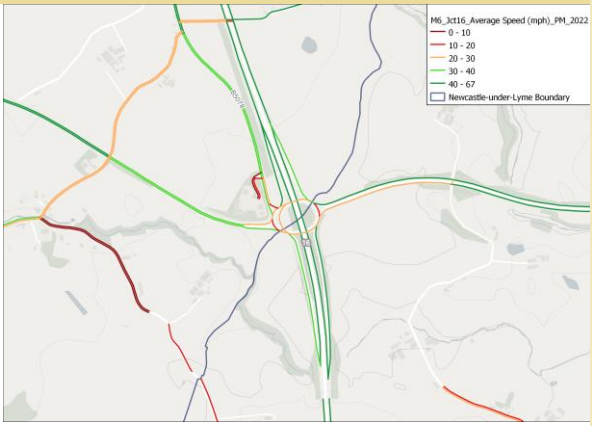
5.3.1 The M6

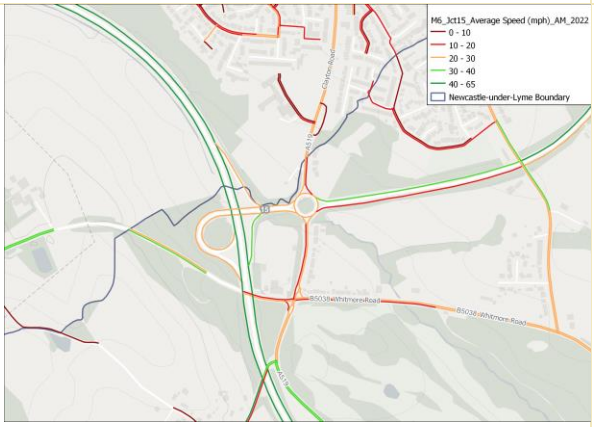
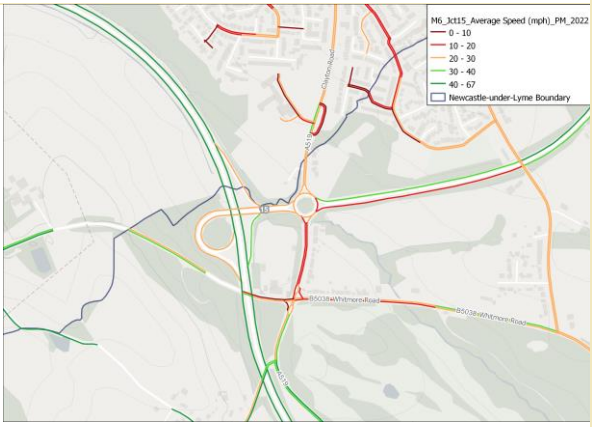
Figure 5-3 below show INRIX average speed analysis of the M6 J15 and J16. In summary both figures show that the mainline carriageway is operating with speeds greater than 40mph. On the slip roads, decreased speeds can be seen on the M6 J15 off slips (20-30 mph, AM, and PM peaks). Both the M6 J15 and J16 SB off slip approach signalised controlled junctions at the M6/A500 gyratories.

On the A500 westbound and eastbound directions approaching the M6 J16 congestion can be seen in the AM peak with speeds in the range of 0-20 mph. It should be noted that the M6 J16 operates with a signalised gyratory, therefore the INRIX speed data indicates that slow moving traffic is extending back from the A500 stop line approaches.

At the M6 J15, queued traffic (speed 0-10mph) is observed along the A500 approach to the A500 Queensway\Newcastle Road roundabout in the PM peak. The A519\A500\Whitmore Road signalised junction is located approximately 200 metres south of the A500 Queensway\Newcastle Road roundabout. The 200m link between these two junctions operates in congested conditions, with speeds between 1-10mph, in both AM and PM peak periods in both directions. Furthermore, analysis of the average speed data indicates traffic delays on all approach arms to the A519\A500\Whitmore Road signalised junction in both time periods.

Figure 5-3: M6

M6 Junction 16 - AM	M6 Junction 16 - PM
	

M6 Junction 15 - AM	M6 Junction 15 - PM
	

5.3.2 The A500

Figure 5-4 below shows the AM and PM average speed conditions, based on INRIX data, for the identified sites along the A500. Analysis of the average speed data indicates the following:

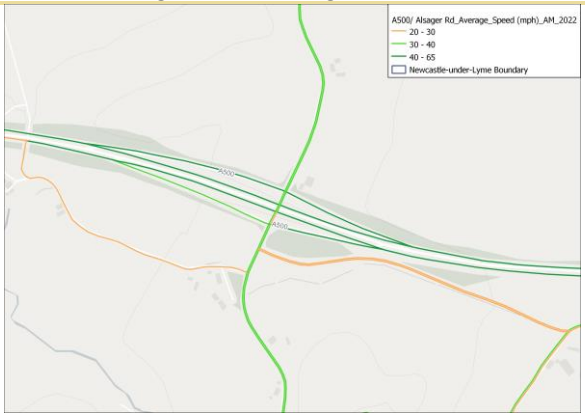
- A500\Alsager Road:
  - Average speeds in the range of 30-40 mph are observed along Alsager Road and greater than 40mph on the A500. In general, it can be inferred from this data that the junction is operating without any capacity related congestion in the peak hours.
- Talke Interchange:
  - National speed limits are in place on the Newcastle Road approach and exit from Talke Interchange. Therefore, observed speeds of 20-30mph indicates some relatively slow-moving traffic along the section between the Newcastle Road\Talke Road roundabout. However, the data indicates that this is slow moving traffic, but in general the data does not show any large reductions in speed due to queuing.
  - Slip roads to\from the A500 are operating with speeds greater than 30mph, which similarly indicates that queues do not form on a regular basis during the peak hour.
  - In the PM peak slow moving traffic (10-20 mph), is observed on the western side of the gyratory. Otherwise, traffic is flowing with an average speed between 20-30mph around the gyratory.
- A500/A527
  - Analysis of the average speed traffic data at this junction in general indicates that traffic is operating without the presence of queues long term queues during the peak hour. Lower traffic speeds of less than 30mph are observed on the A527/Chemical Lane gyratory and along the Chemical Lane side road.
- A500/A5271
  - On the A5271 and B5370 speed limits of 30mph are in place, which explains the average speed 20-30mph. On the A257 southbound approach to the A500/A5271 traffic speeds drop less than 20mph in both the AM and PM peaks. In the PM traffic speeds of less than 20mph are also observed in the north eastbound direction.
  - The A500 off slip road traffic speeds are greater than 30mph in the AM peak. In the PM peak some decrease in speed on the off slips is observed with speeds decreasing into the 20-30mph category. However, as the observed speeds are above 20mph, the INRIX analysis indicates that queues are not present on average across the peak hour.
  - Similarly, in both the AM and PM peak hours the A500 south-bound on-slip shows average speeds of around 20-30mph. Whereas the north-bound on slip shows an increased speed of greater than 30mph in both peak hours.
- A500/A34
  - In the AM peak, observed speeds of around 20-30mph are in line with the speed limits in place on the A34. This is with the exception of the A34 northbound approach to the gyratory which shows lower observed speeds of around 10-20mph. In the PM

peak, lower speeds of 10-20mph are also observed on the southbound approach to the gyratory.

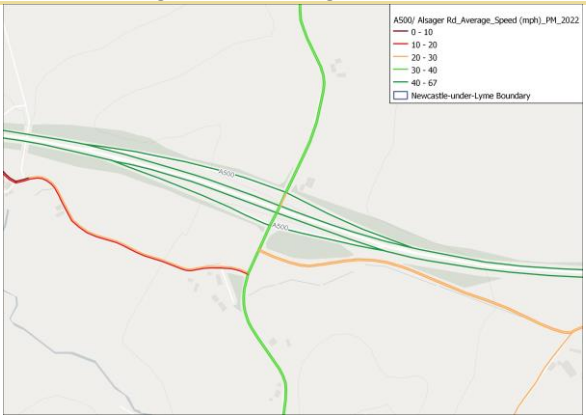
- In both the AM and PM peaks, speeds of 20-30mph are observed on the A500 westbound off-slip. In the PM peaks, speeds 20-30mph are also observed on the westbound on-slip.
- Speeds of 10-20mph are observed on the eastern side of the A500/A34 gyratory in both AM and PM peaks.

Figure 5-4: A500

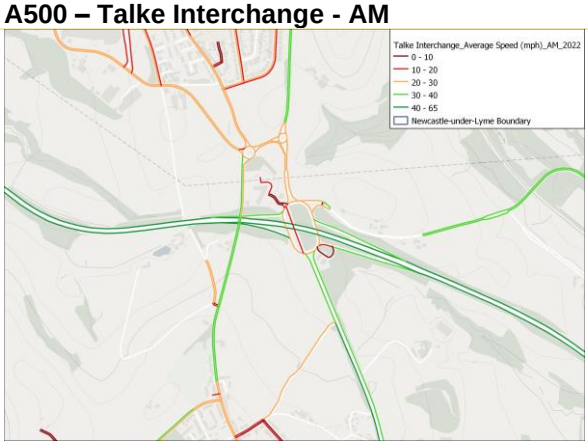
A500 – Alsager Interchange - AM



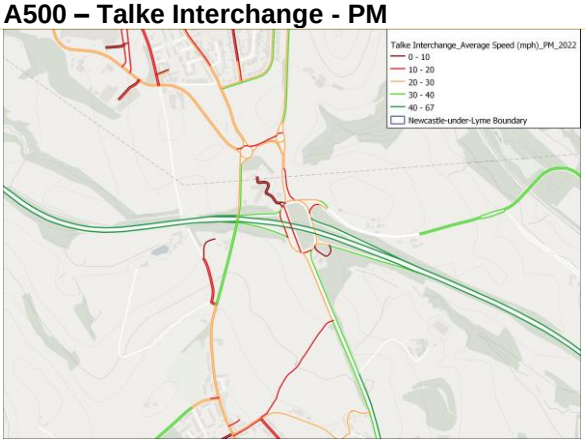
A500 – Alsager Interchange - PM



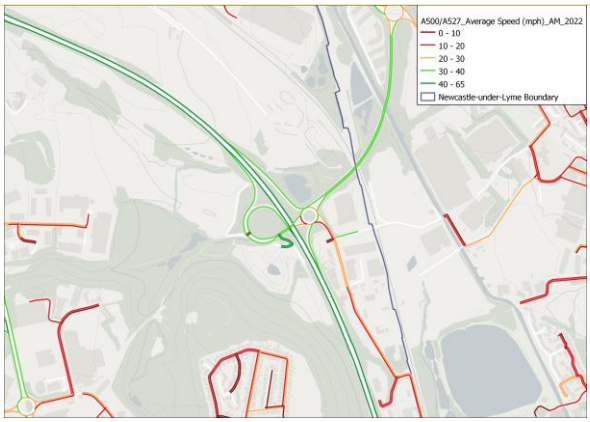
A500 – Talke Interchange - AM



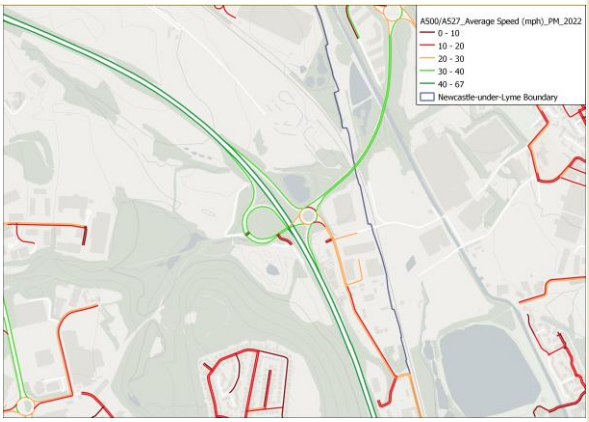
A500 – Talke Interchange - PM



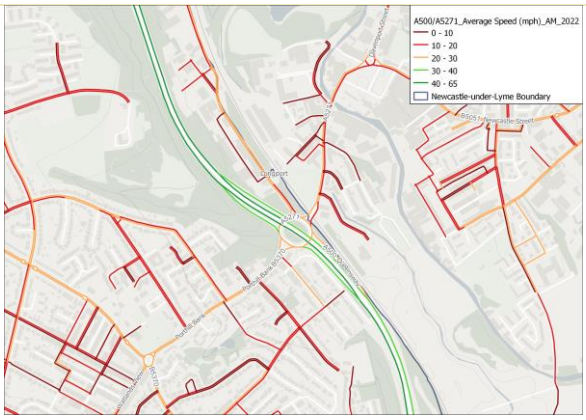
A500 – A527 - AM



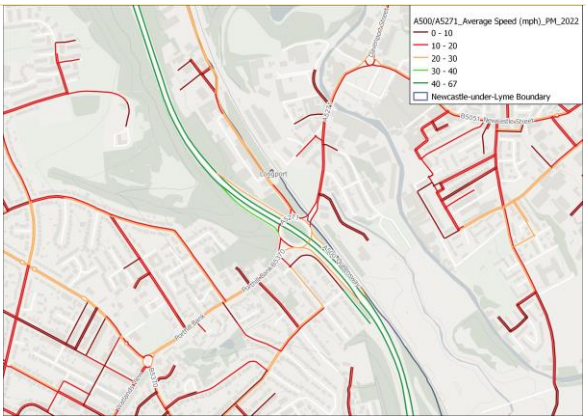
A500 – A527 - PM



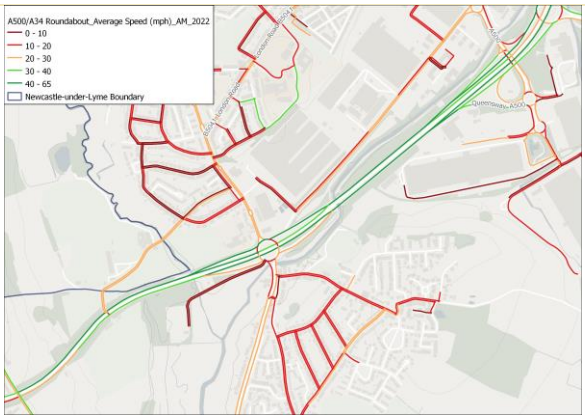
A500 – A5271 - AM



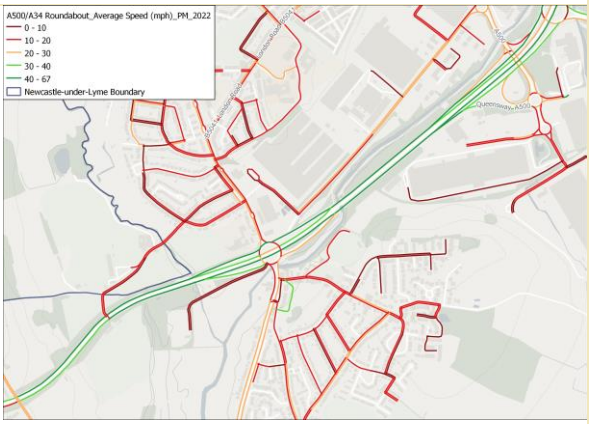
A500 – A5271 - PM



A500 – A34 - AM



A500 – A34 - PM



5.4 2023 Model Validation

Utilising available one-day MCC DfT raw traffic data as well as WebTRIS data averaged across a neutral month, a 2022/3 validation exercise against the 2015 NSMM transport model base year was undertaken (locations and results shown in Appendix C). Result tables show the comparison of the model against the DfT and WebTRIS data. In general, although a reasonable level of validation was achieved against the DfT data, the following comments were identified:

- Overall, the model is overestimating flow in the base year compared to the 2022/3 data. This is more pronounced in the WebTRIS data where the model shows an overestimation of traffic flows of around 26-28%
- In total terms the model does not validate well against the 2023 WebTRIS data with only around 15-35% of counts passing. Whilst the 2015 model does not validate well against 2022/3 data, it should be noted that the focus of this modelling commission for this STA is in the 2040 forecast year which takes account of committed land use, the Local Plan, committed transport schemes and mitigation measures (in the case of run 5).

6 Uncertainty Log Development

6.1 Uncertainty Log Generation

An uncertainty log has been produced for a 2040 future year in conjunction with Newcastle under Lyme Council (NULBC), Stoke on Trent City Council (SoTCC), Cheshire East Council (CEC), Staffordshire County Council (SCC) and National Highways (NH) The uncertainty log consists of,

- NULBC – Land use reference case schemes
- NULBC – Local Plan core allocated schemes
- NULBC – Local Plan strategic sites
- SoTCC – Land use reference case schemes
- SoTCC - Local Plan allocated schemes (preliminary)
- SCC - Land use reference case schemes
- CEC - Local Plan allocated schemes

NH have indicated that future development of the M6 Jct 15 is not currently confirmed so has been included in the uncertainty log as “Reasonably foreseeable” and so according to DfT TAG is excluded from modelling. NH have indicated that there are no other schemes proposed for the local SRN that should be included within the uncertainty log.

As some of the neighbouring authority’s area extends into the external area of the NSMM transport model, only log entries that fall within the NSMM transport model internal and peripheral areas are included for modelling. For model zones beyond the model periphery, growth will be defined by TEMPro which is justifiable as the area of influence of these developments will be outside the Newcastle-under-Lyme Borough area.

Table 6-1 shows the NULBC allocated residential Local Plan core schemes within the uncertainty log (including strategic sites in bold). The contents of this table are taken from the First Draft Local Plan.

Table 6-1: NULBC Local Plan residential allocations

SHELAA Ref	Site Name	Size of Development (Including Demolitions) (Residential Units)
AB12	Land East of Diglake Street, Bignall End	150
AB15	Land North of Vernon Avenue, Audley	40
AB32	Land Nursery Gardens, Audley	20
AB33	Land off Nantwich Road / Park Lane (1) Audley	60
BL18	Clough Hall Playing Fields, Talke	285
BL24	Land adjacent 31 Banbury Street, Talke	10
BL32	Land at Congleton Road, Butt Lane	20

SHELAA Ref	Site Name	Size of Development (Including Demolitions) (Residential Units)
BL8	Land adjacent to roundabout at West Avenue, Kidsgrove	40
CH13	Castletown Grange, Douglas Road, Cross Heath	0
CH14	Maryhill Day Centre, Wilmott Drive, Cross Heath	30
CT1	Land at Red Street and High Carr Farm, Chesterton	750
KG6	William Road, Kidsgrove (site of the Galley PH)	6
KS11	Knutton Community Centre, High Street Knutton	9
KS17	Knutton Recreation Centre, Knutton Lane	55
KS18	Land North of Lower Milehouse Lane, Knutton	10
KS3	Land at Blackbank Road, Knutton (adjacent Knutton Children's Centre)	150
MD29	Land South of Bar Hill, Madeley	150
NC13	Land West of Bullockhouse Road, Harriseahead	100
SB12	Land adjacent to Clayton Lodge Hotel	60
SP11	Former Keele Municipal Golf Course	900
SP12	Site off Glenwood Close, Silverdale	70
SP2	Site at Cheddar Drive, Silverdale	8
SP22	Former playground off Ash Grove, Silverdale	36
TB19	Land south of Newcastle Golf Club, Whitmore Road	550
TB23	Land West of Galingale View, Thistleberry	124
TC22	Marsh Parade, Newcastle (former Zanzibar night club)	70
TC40	Car Park, Blackfriars Road, Newcastle	10
TC7	Land bound by Ryecroft, Ryebank , Merrial Street, Corporation Street and Liverpool Road, Newcastle	75
TK10	Land at Crown Bank, Talke	175
TK17	Land off St Martins Road, Talke	40
TK27	Land off Coppice Road, Talke (2)	90
TK6	Site at Coalpit Hill, Talke	10
RC8	Land at Liverpool Road	6
KL13	Keele Science Park, Phase 3	220
LW53	Land Corner of Muchlestone Wood Lane	130
NC77	Bent Farm, Newchapel	80

SHELAA Ref	Site Name	Size of Development (Including Demolitions) (Residential Units)
SP23	Land at Cemetery Road	200
LW87	Former Petrol Station, Eccleshall Road	12
TB6	Former Pool Dam Pub Sites	13
KS19	Knutton Lane	5
KL15	**Land south of A525 between Keele University and Newcastle-under-Lyme (strategic site)**	**260**
TK30	**Land off Talke Road and A500, Talke (strategic site)**	**390**

Table 6-2 lists the NULBC Local Plan key employment allocations and strategic sites (in bold). The values of the number of jobs have been derived from the gross floor area and use class using standard density guides. For modelling purposes, job creation for the strategic sites has been supplied by NULBC and site AB2 (M6 Jct 16) uses developer supplied vehicle movement forecasts.

Table 6-2: NULBC Local Plan key employment allocations

SHELAA Ref	Site Name	Derived number of Jobs
CT20	Rowhurst Close (circa 8 hectares south of Talke)	612
BW1	Chatterley Valley (circa 6 hectares east of Talke)	816
TC45	York Place, Newcastle Town Centre	292
KL13	Keele University (circa 11 hectares for Keele Science Park (Phase 3))	1100
AB2	**M6 Jct 16 development (Strategic site)**	**3300**
KL15	**Keele Science Park (Phase 4 - strategic site)**	**1278**
TK30	**Talke (Strategic site)**	**1052**

The modelling will test a number of combinations of core and strategic sites as described in Chapter 8 – Scenario Development.

7 The 2040 Reference Case

7.1 Reference Case Development

The 2040 reference case scenario represents future year increase in demand related to non-local plan land use allocation and developments proposed by adjacent authorities. It does not include any NULBC strategic or core LP developments. This scenario acts as a base that subsequent scenarios that in addition include NULBC strategic and/or core LP developments can be compared against.

7.2 2040 Reference Case Network Performance

Figure 7-1 and Figure 7-2 below show the link Volume over Capacity (V/C) and junction delay results of the 2040 reference case. These figures show the absolute level of V/C and junction delay in the 2040 reference case AM and PM peak hours and are categorised into three levels: Slight, Moderate, and Serious. Qualitative analysis of these results indicates the following:

- Link V/Cs range between 90% to > 100% over the A500 between the A50 and Talke Interchange (a V/C of 100% indicates that traffic volume has reached the road capacity).
- Slight traffic delays are forecasted on the A500 EB approach to the M6/A500.
- At Talke Interchange Slight to Moderate traffic delays are forecasted at the A34 southbound approach to the A500/A34 junction. In the PM link V/Cs range from Moderate to Severe along the A34 north of the junction.
- Severe Traffic delays are forecasted at the A500 Queensway\Newcastle Road roundabout in both peaks. Severe traffic delays are also present at the A500/A5182 signalised junction south of the roundabout.
- In general, the A525 is operating without any notable traffic related capacity issues except for between Keele University and Gallowstree roundabout where moderate congestion is forecast.

Figure 7-1: Reference case 2040 - AM

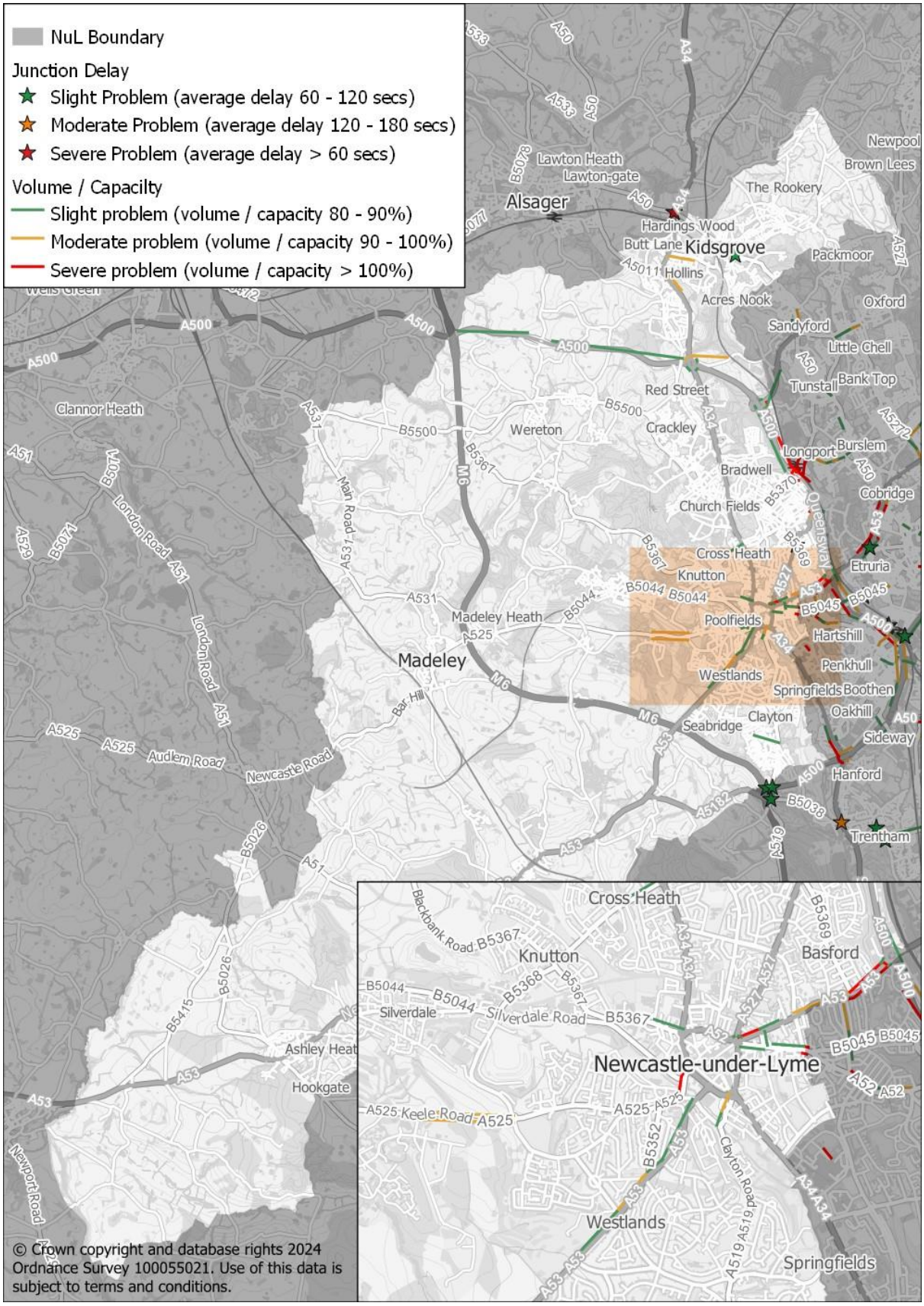
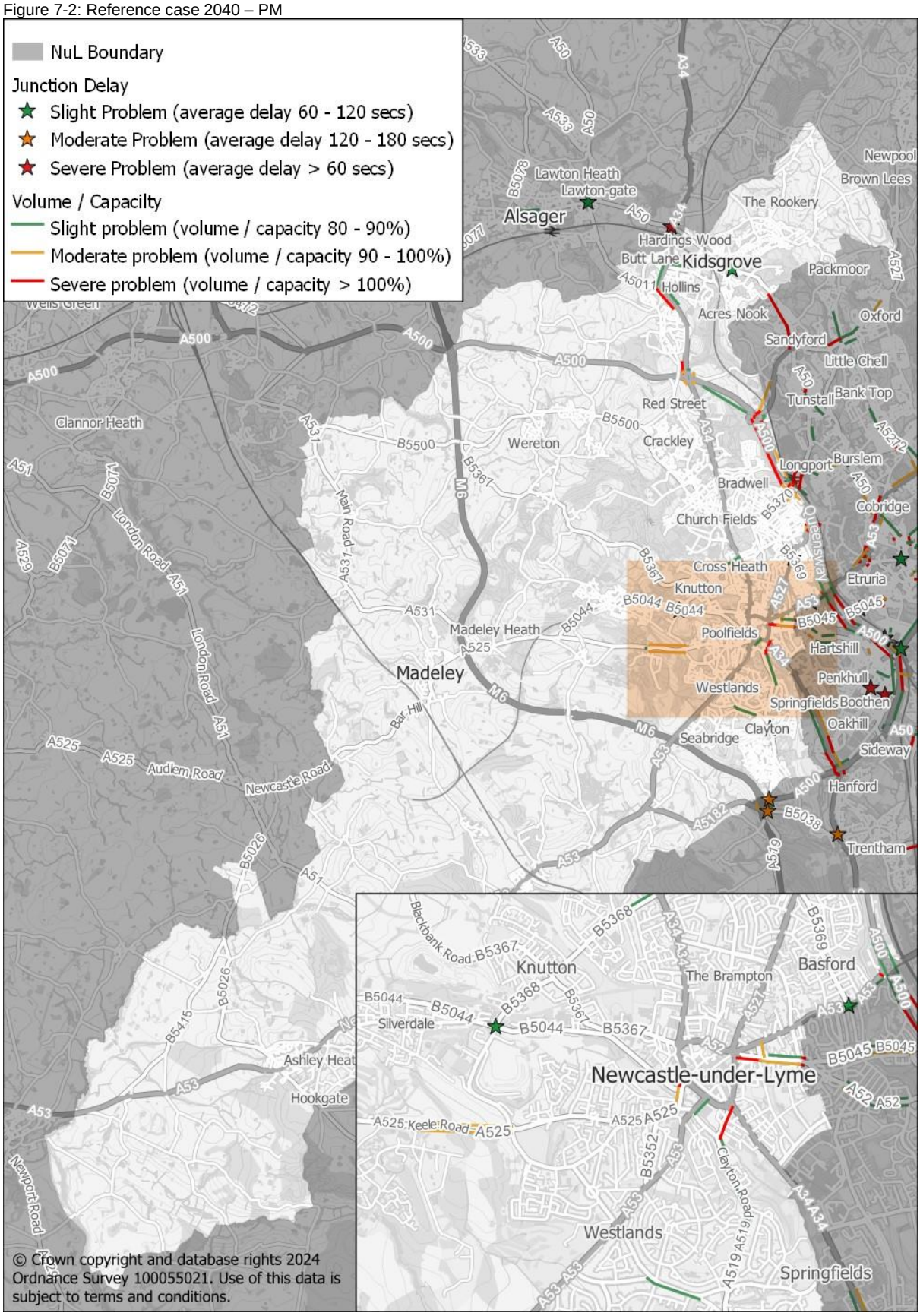


Figure 7-2: Reference case 2040 – PM



8 Model Scenarios and Results

8.1 Scenario Development

Sweco have been commissioned to model five scenarios as shown in Table 8-1. Scenario 1 contains demand assumptions as described in the draft Local Plan (core sites though no strategic sites). Scenarios 2 to 4 in addition include one of the three strategic development sites. Scenario five contains the final suite of chosen development sites (included selected core and strategic sites)

Table 8-1: Model scenarios

Model Run	Model Year	Demand Assumption	Assumption
1	2040	First draft Local Plan (Regulation 19 stage)	Reference Case + Local Plan infrastructure
2	2040	Model Run 1 + J16 potential strategic location	Model Run 1
3	2040	Model Run 1 + Talke potential strategic location	Model Run 1
4	2040	Model Run 1 + Keele potential strategic location	Model Run 1
5	2040	Model Run 1 + final suite of sites proposed for Regulation 19	Model Run 1

8.2 Model Run 1 – Core Local Plan Sites

8.2.1 Model Development

This model run takes the reference case model as a base and includes additional demand and related infrastructure from the Local Plan (core sites). It does not include any of the three potential strategic sites. Additional network has been added between Keele Road and Silverdale to model the spine road planned as part of the SP11 residential development. No changes have been made to public transport infrastructure.

8.2.2 Model Results

Figure 8-1 and Figure 8-2 show the junction delay and link volume/capacity for the AM and PM periods respectively. The following observations can be made,

- Slight problems are now indicated on the westbound A500 approach to junction 16 of the M6 in the AM. It should be noted that live traffic data suggests that this section is currently operating under capacity constraints
- Moderate problems becoming more severe on cedar avenue in Kidsgrove
- Slight junction delay issues on the south-bound approach of Newcastle Road to the A500 Talke roundabout
- No significant change around the A500 Queensway between Newcastle-under-Lyme and Stoke-on-Trent
- Worsening of the conditions on Keele Road between the University and Gallowstree Lane roundabout

Figure 8-3 and Figure 8-4 show the difference in junction delay and link V/C between the reference case and model run 1. In addition to the issues described above, it can be seen that there is increased demand on links around Keele/Silverdale related to significant core developments. It can be seen that none of the link increases is more than moderate and none of the junction delay increases are more than slight although they may have the ability to move an already constrained link into severe congestion.

Figure 8-1: Scenario 1 - 2040 - AM

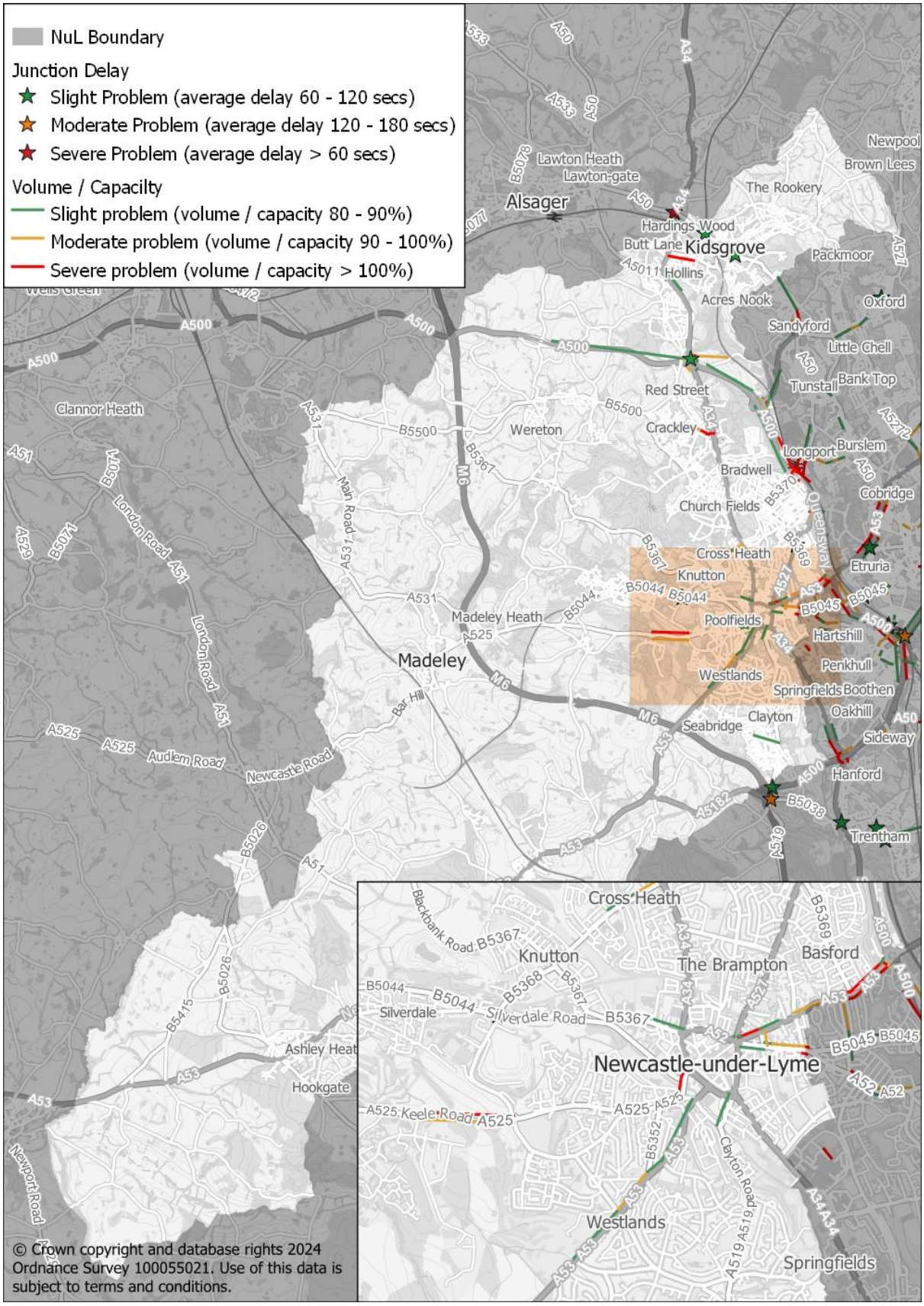


Figure 8-2: Scenario 1 - 2040 - PM

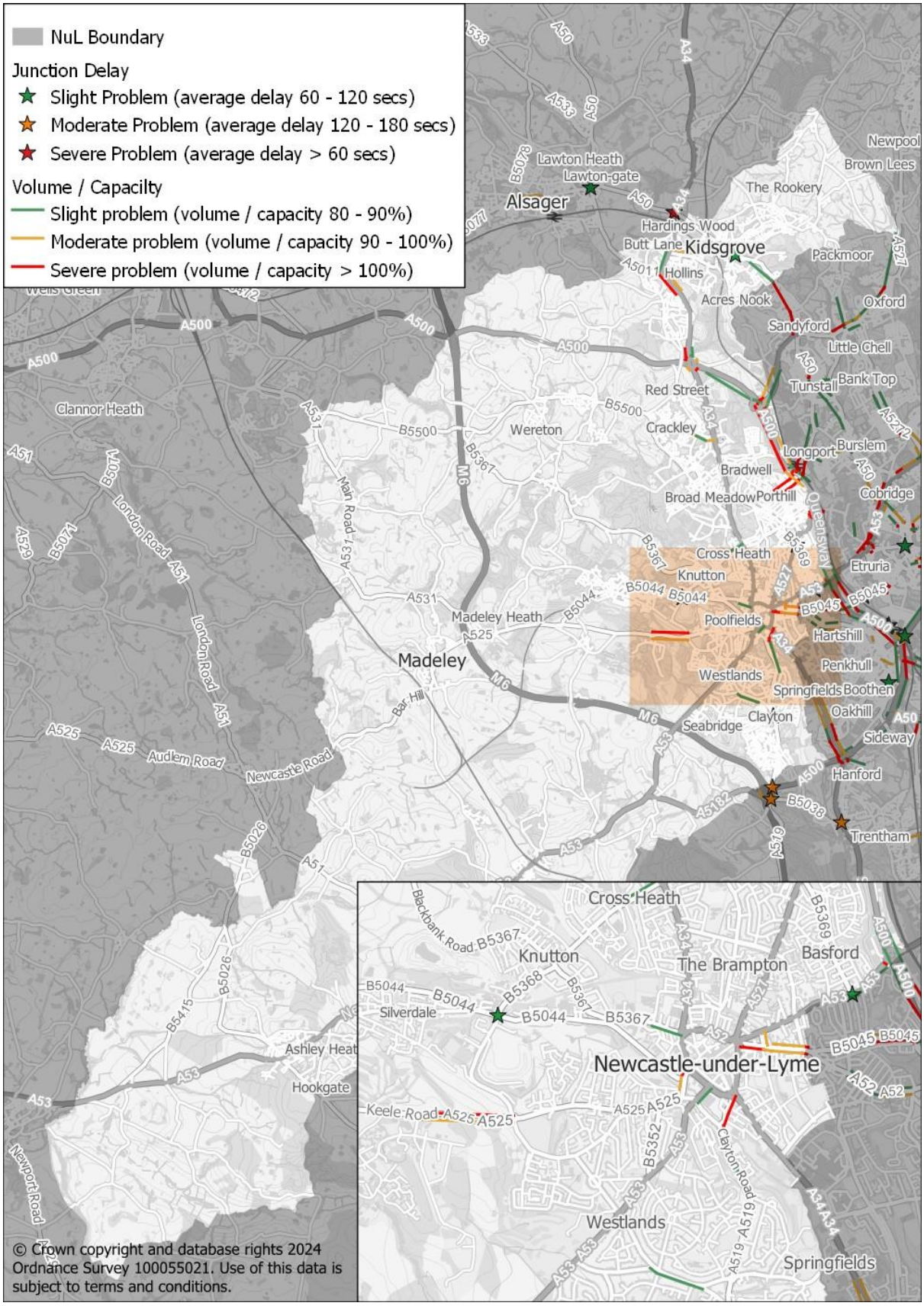


Figure 8-3: Scenario 1 - Difference - AM

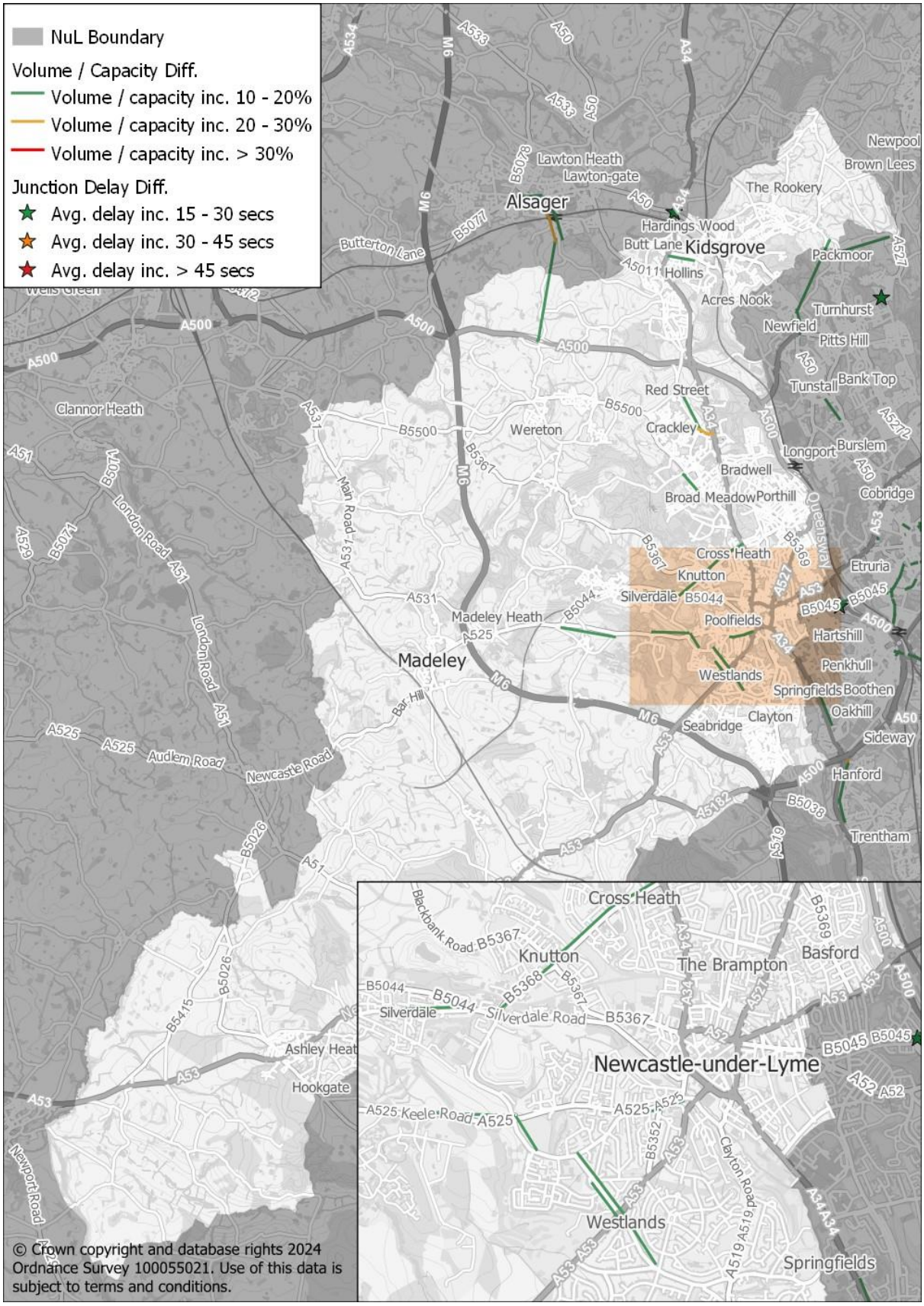
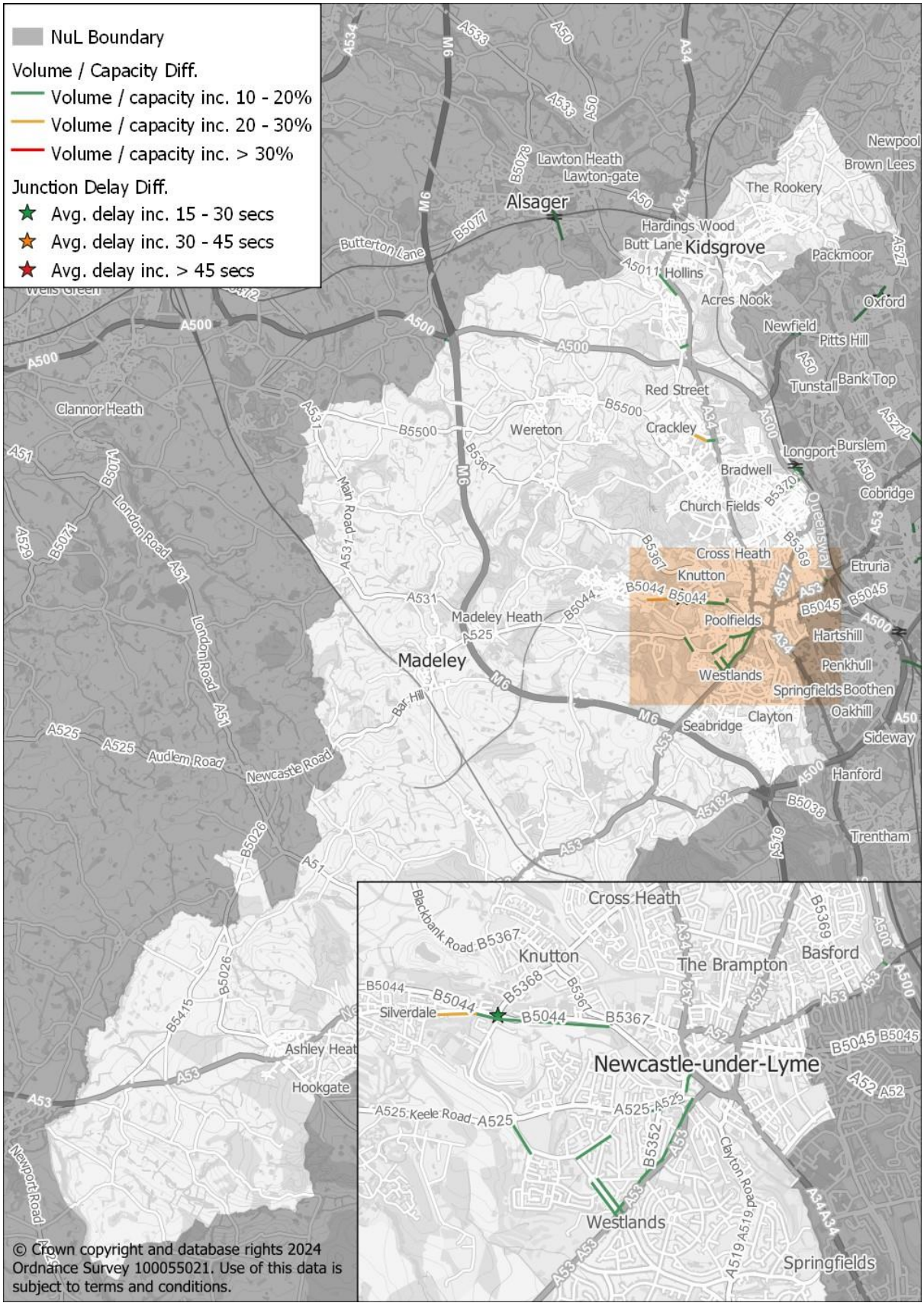


Figure 8-4: Scenario 1 - Difference - PM



8.3 Model Run 2 – Core and AB2

8.3.1 Model Development

This model run takes model run 1 as a base (reference case + LP core sites) and includes additional demand and related infrastructure for strategic site AB2. No changes have been made to public transport infrastructure. Site AB2 has a combination of employment and lorry parking facilities with an expectation that a significant proportion of related traffic will access from the motorway network via the adjacent M6 junction 16. As a result, the trip generation and trip assignment assumptions published in the PJA "Land at M6 Junction 16" Modelling Report has been utilised to build this model run. This report describes the creation of a Vissim model to represent the AB2 scheme and has been reviewed by National Highways. See section 8.6.3 for an analysis of forecast turn flows for Junction 16 using the final model run.

8.3.2 Model Results

Figure 8-5 and Figure 8-6 show the junction delay and link volume/capacity for the AM and PM periods respectively whilst Figure 8-7 and Figure 8-8 show the difference between model run 1 (core) and model run 2 for AM and PM respectively.

There is very little difference between the absolute plots for both time periods which is also highlighted in the difference plots, the changes are small and localised and include,

- A slight (AM) or moderate (PM) delay related to the new signalised junction on the A500 immediately east of M6 junction 16. This though has reduced the capacity issues on the west bound link immediately before the signalised junction.

Figure 8-5: Scenario 2 - 2040 - AM

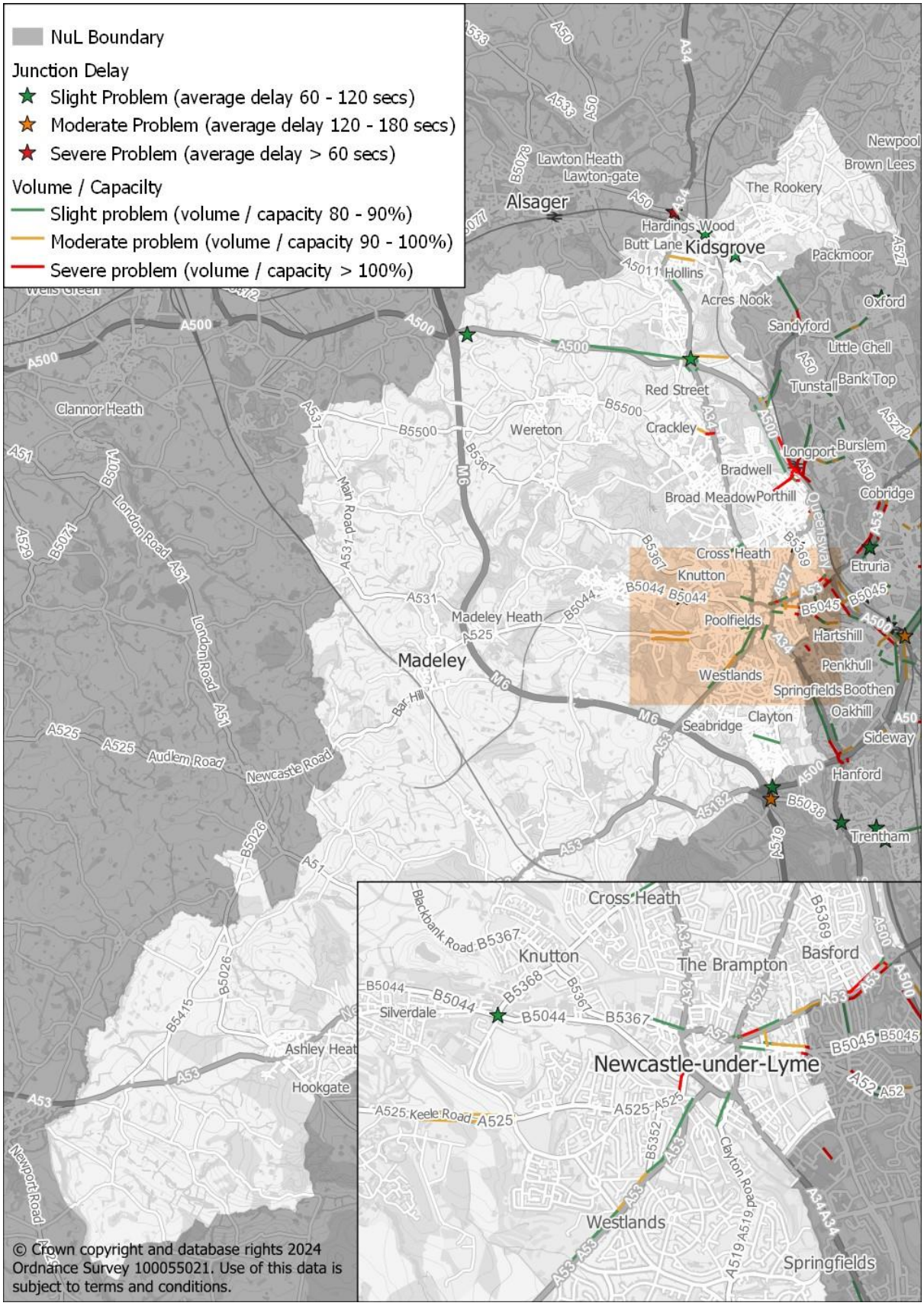


Figure 8-6: Scenario 2 - 2040 - PM

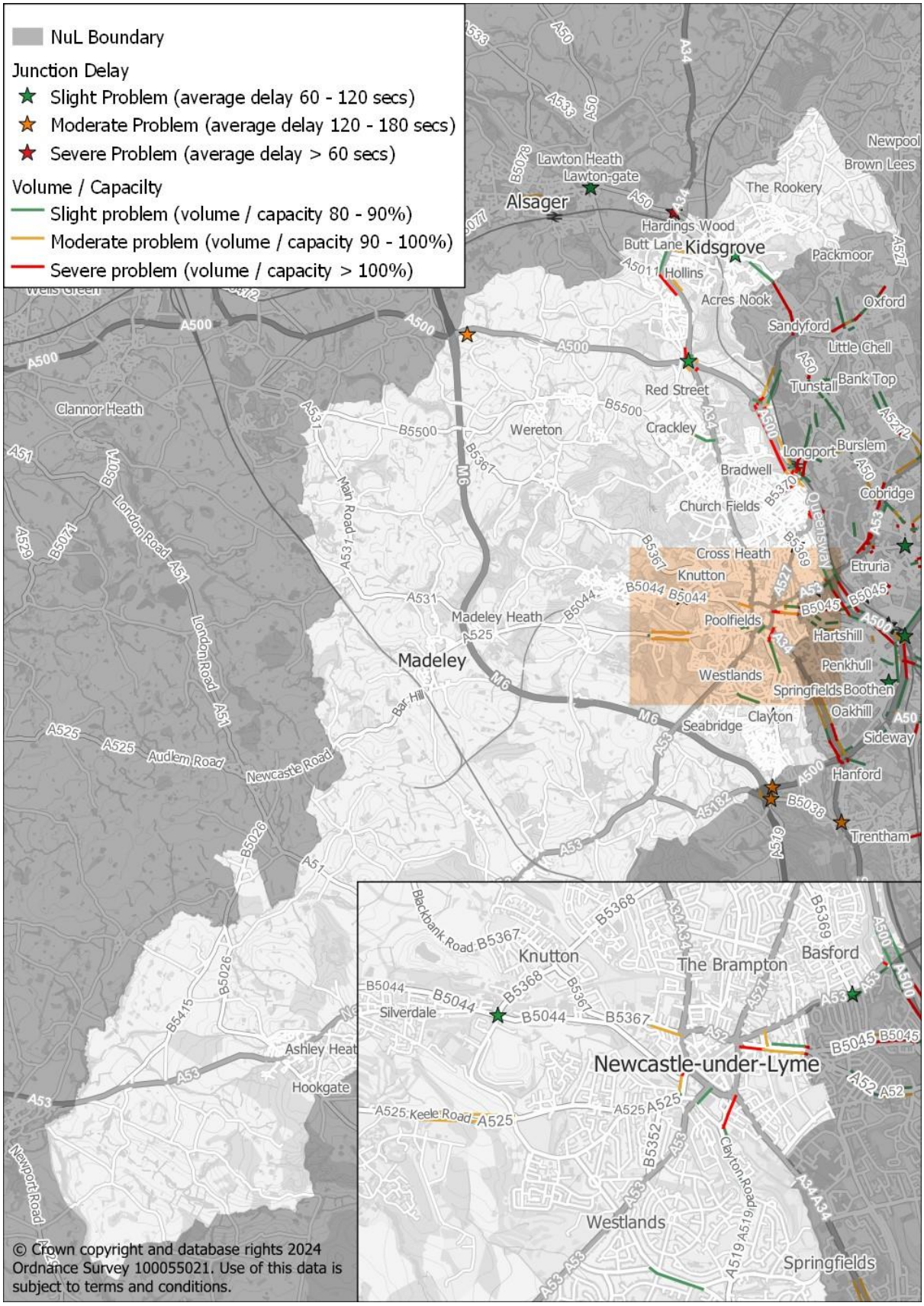


Figure 8-7: Scenario 2 - Difference - AM

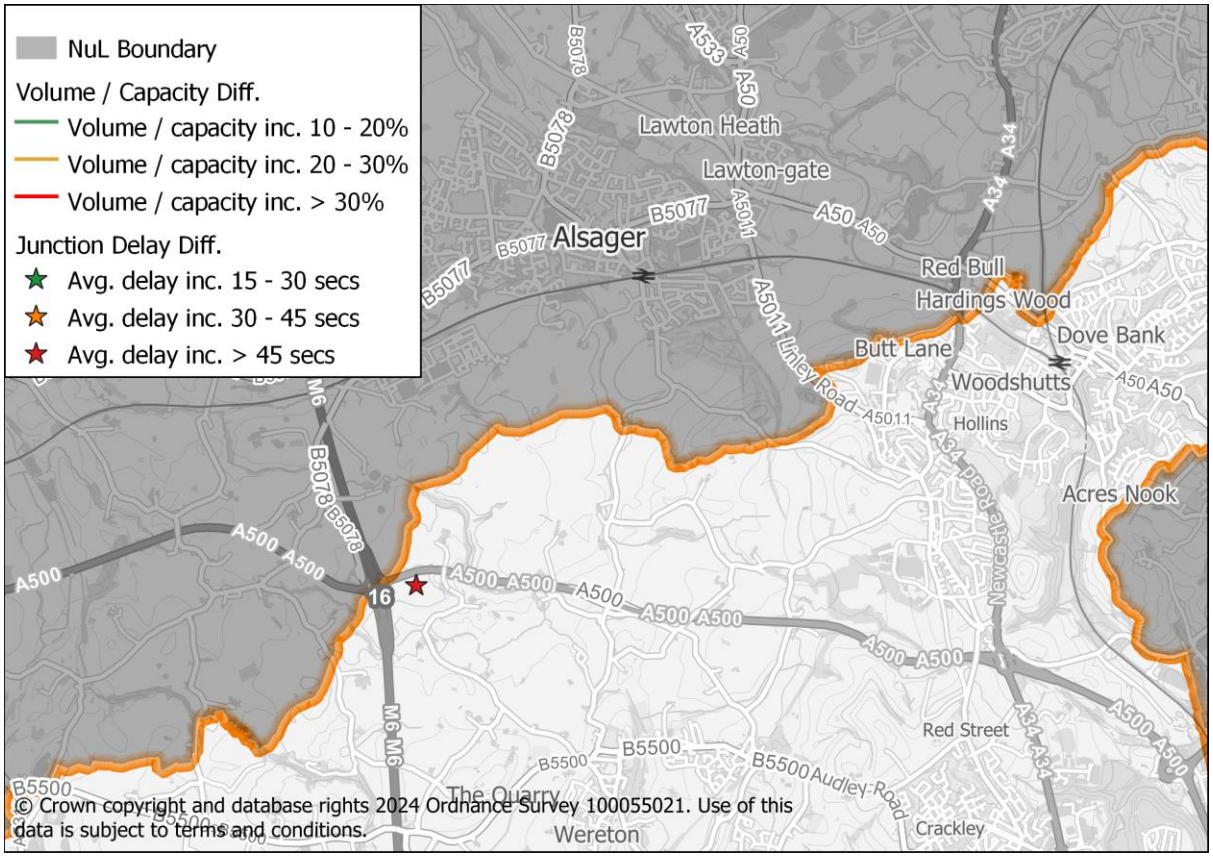
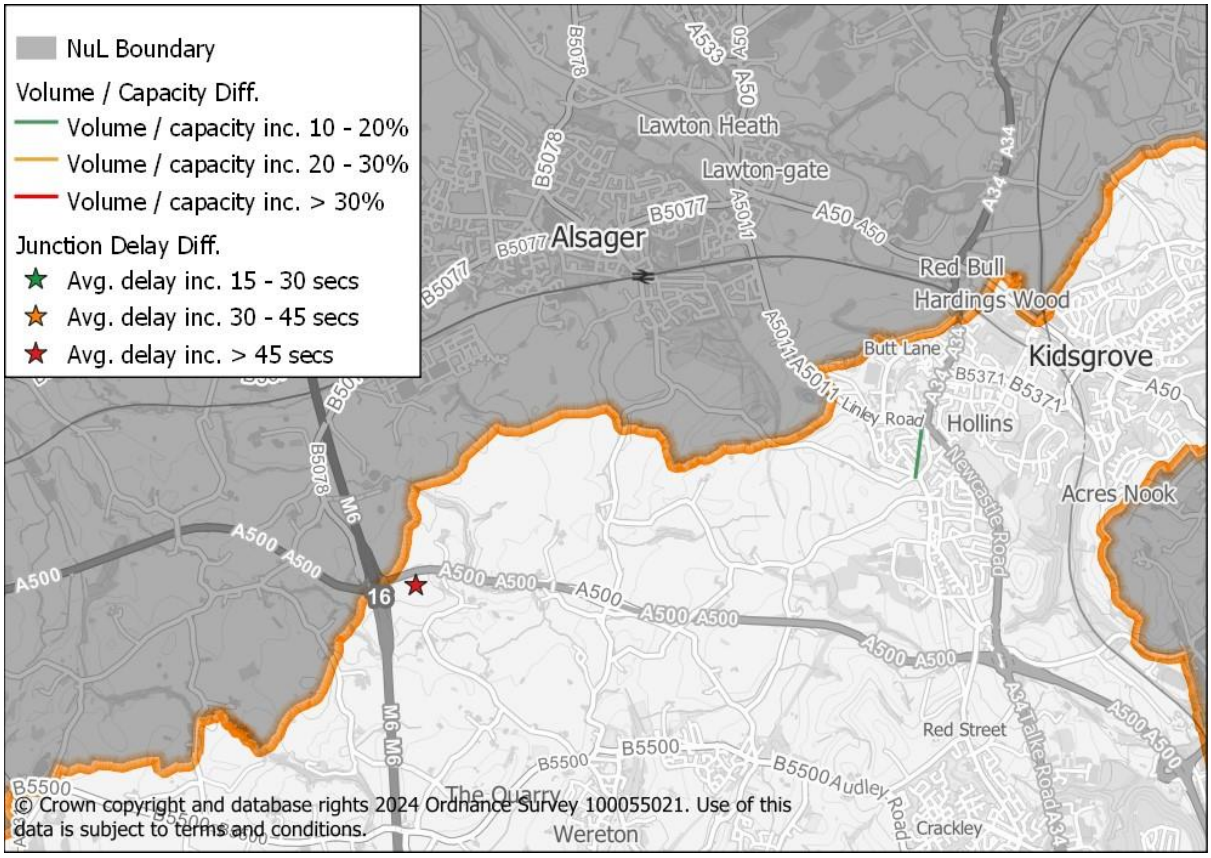


Figure 8-8: Scenario 2 - Difference - PM



8.4 Model Run 3 – Core and TK30

8.4.1 Model Development

This model run takes model run 1 as a base (reference case + LP core sites) and includes additional demand and related infrastructure for strategic site TK30. No changes have been made to public transport infrastructure.

8.4.2 Model Results

Figure 8-9 and Figure 8-10 show the junction delay and link volume/capacity for the AM and PM periods respectively whilst Figure 8-11 and Figure 8-12 show the difference between model run 1 (core) and model run 3 for AM and PM respectively. These show impacts to be largely small and limited to slight increases in congestion along Newcastle Road (north of Talke roundabout) and around Crackley where the development traffic would join the A34 Talke Road. There is also an increased junction delay on the westbound A500 approach to the M6 junction 16 roundabout (noting that this scenario does not include the AB2 scheme and it's network improvements).

Figure 8-9: Scenario 3 - 2040 - AM

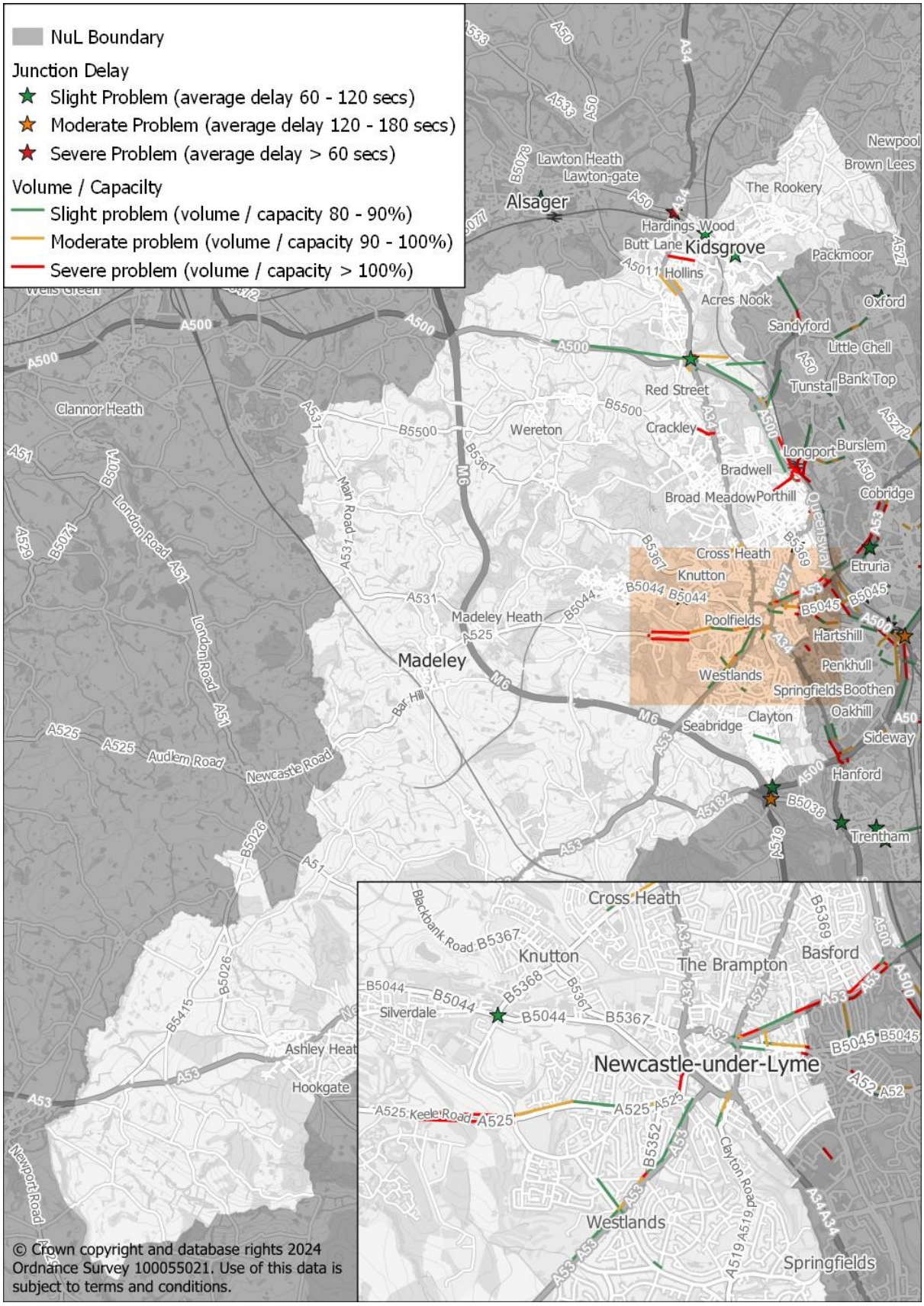


Figure 8-10: Scenario 3 - 2040 - PM

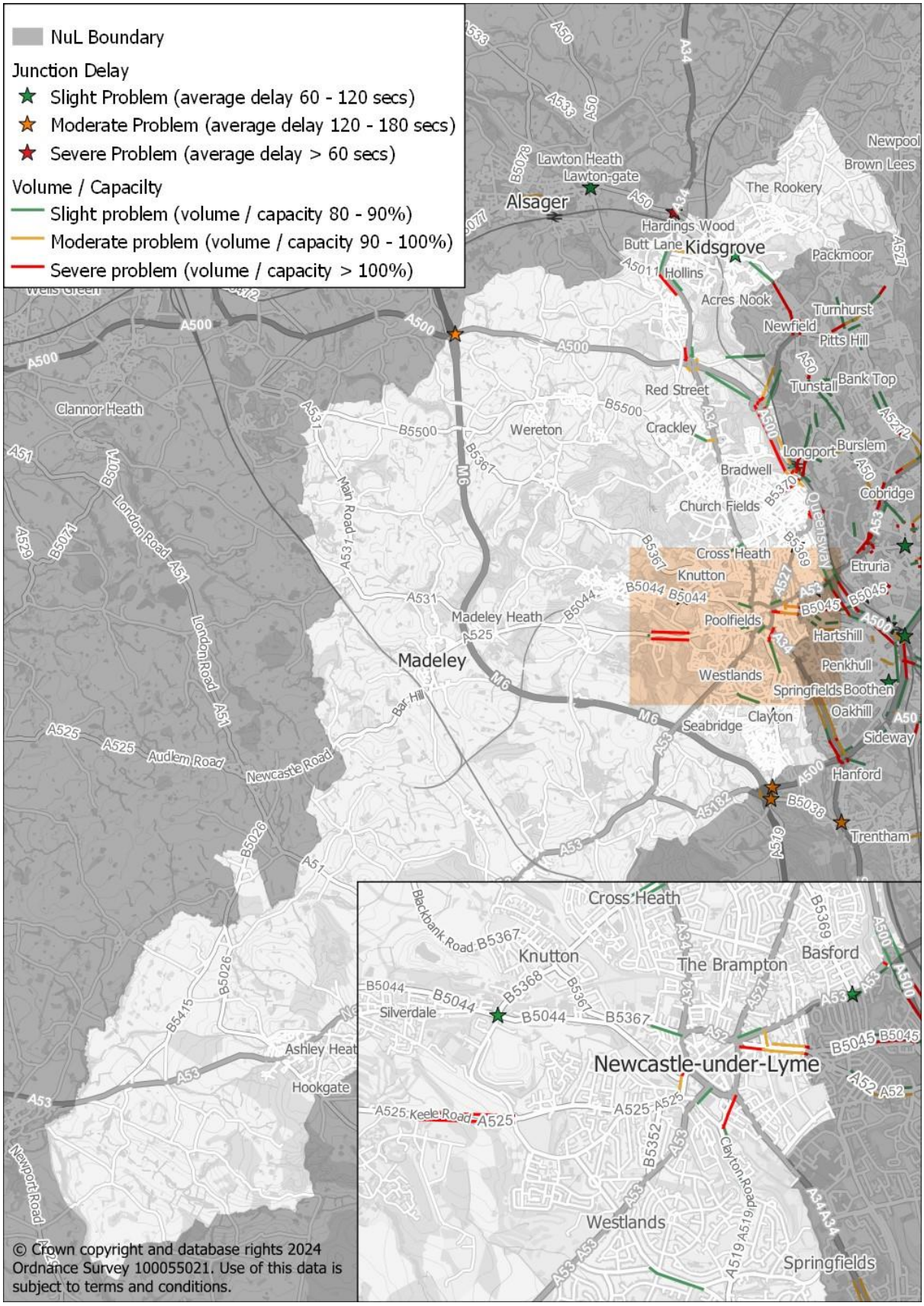


Figure 8-11: Scenario 3 - Difference - AM

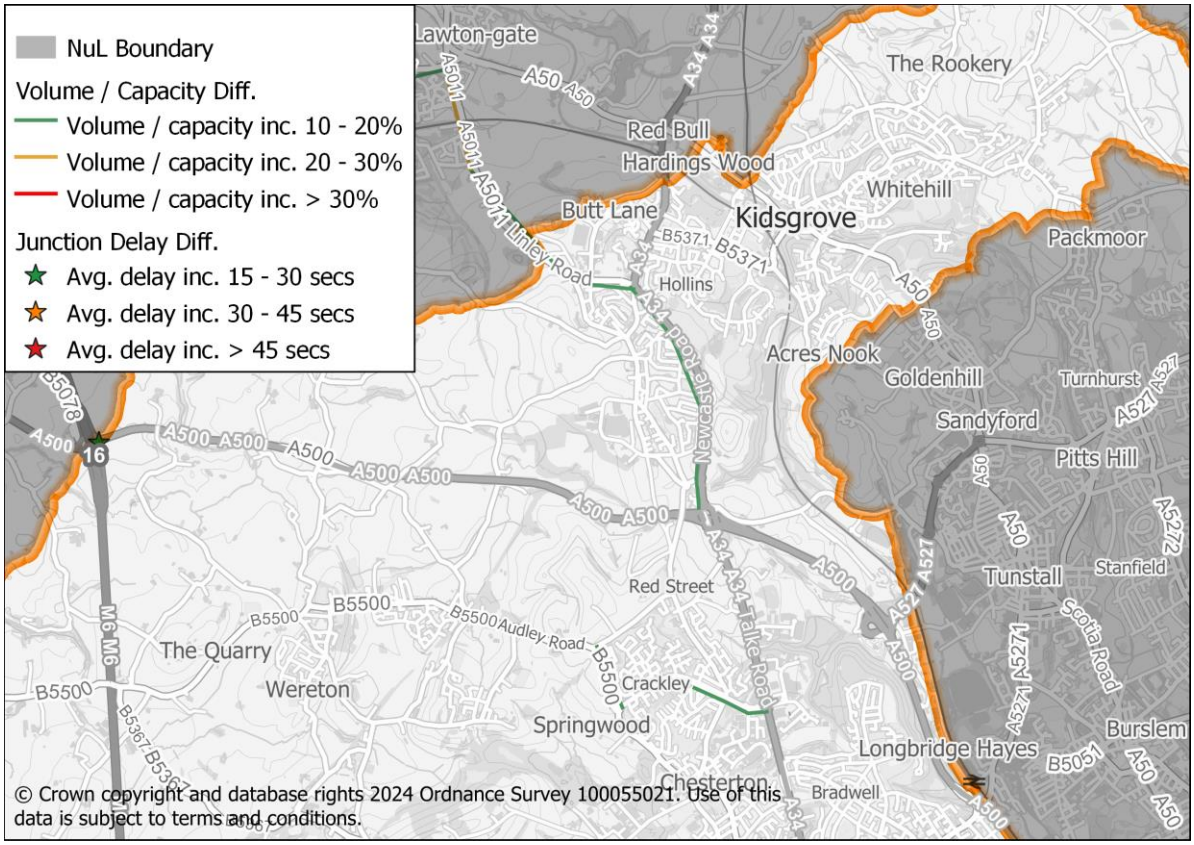
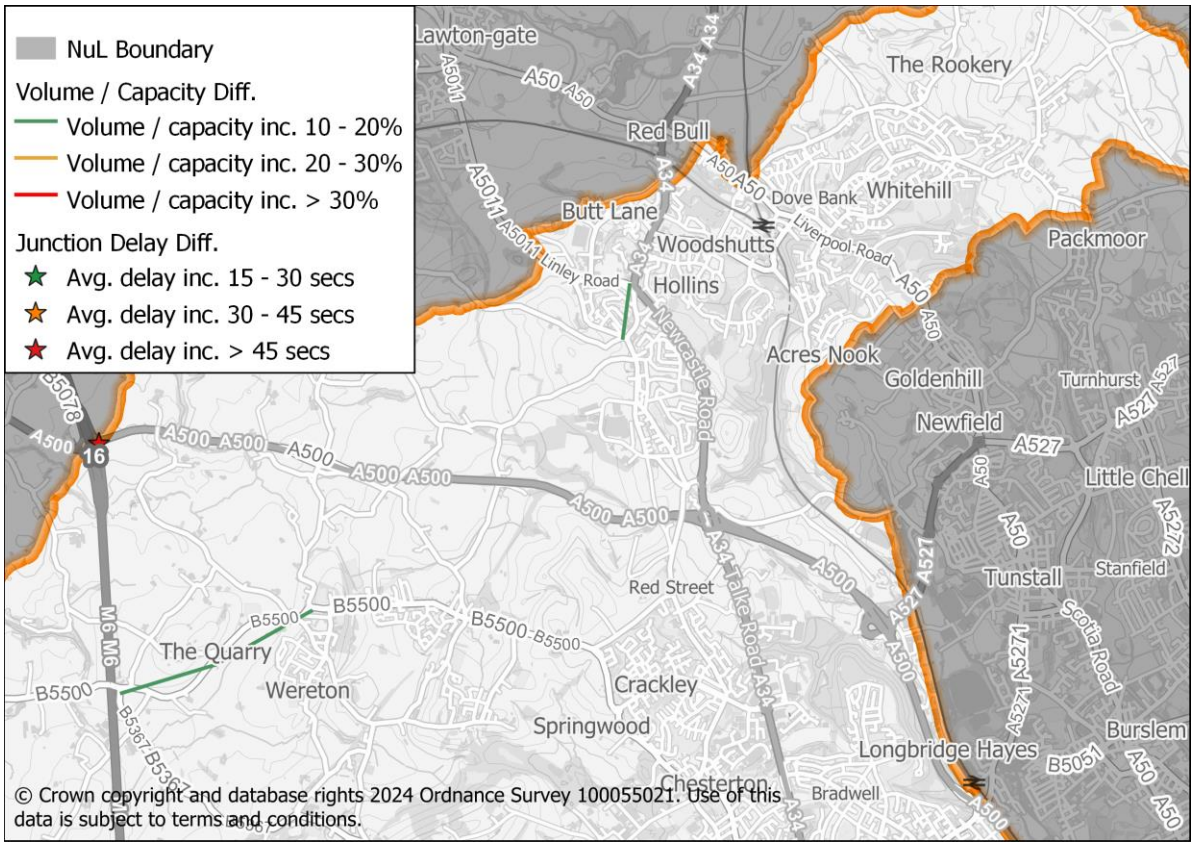


Figure 8-12: Scenario 3 - Difference - PM



8.5 Model Run 4 – Core and KL15

8.5.1 Model Development

This model run takes model run 1 as a base (reference case + LP core sites) and includes additional demand and related infrastructure for strategic site KL15. No changes have been made to public transport infrastructure.

8.5.2 Model Results

Figure 8-13 and Figure 8-14 show the junction delay and link volume/capacity for the AM and PM periods respectively. It can be seen that there is a further worsening from the core-only scenario with now severe congestion forecast in both directions of Keele Road between the University and Gallowstree Lane roundabout. Evidence of re-routing is seen with increases in V/C forecast for Mill Street in Silverdale. Moderate junction delay issues begin to become apparent at the signalised junction of Cemetery Road/Church Lane/B5044. These patterns are also visible in the difference plots (Figure 8-15 and Figure 8-16) where volume has increased around the B5044 (Silverdale), A525 (Keele Road) and A53. It should be noted that the NSMM model is developed within the CUBE modelling software application. A limitation of the CUBE software is that it does not model blocking back (traffic queuing back to previous road links with potential to impact other links and junctions). Therefore, there is the possibility of additional related impacts to queuing traffic on Keele Road, for example to the Keele University roundabout.

Figure 8-13: Scenario 4 - 2040 - AM

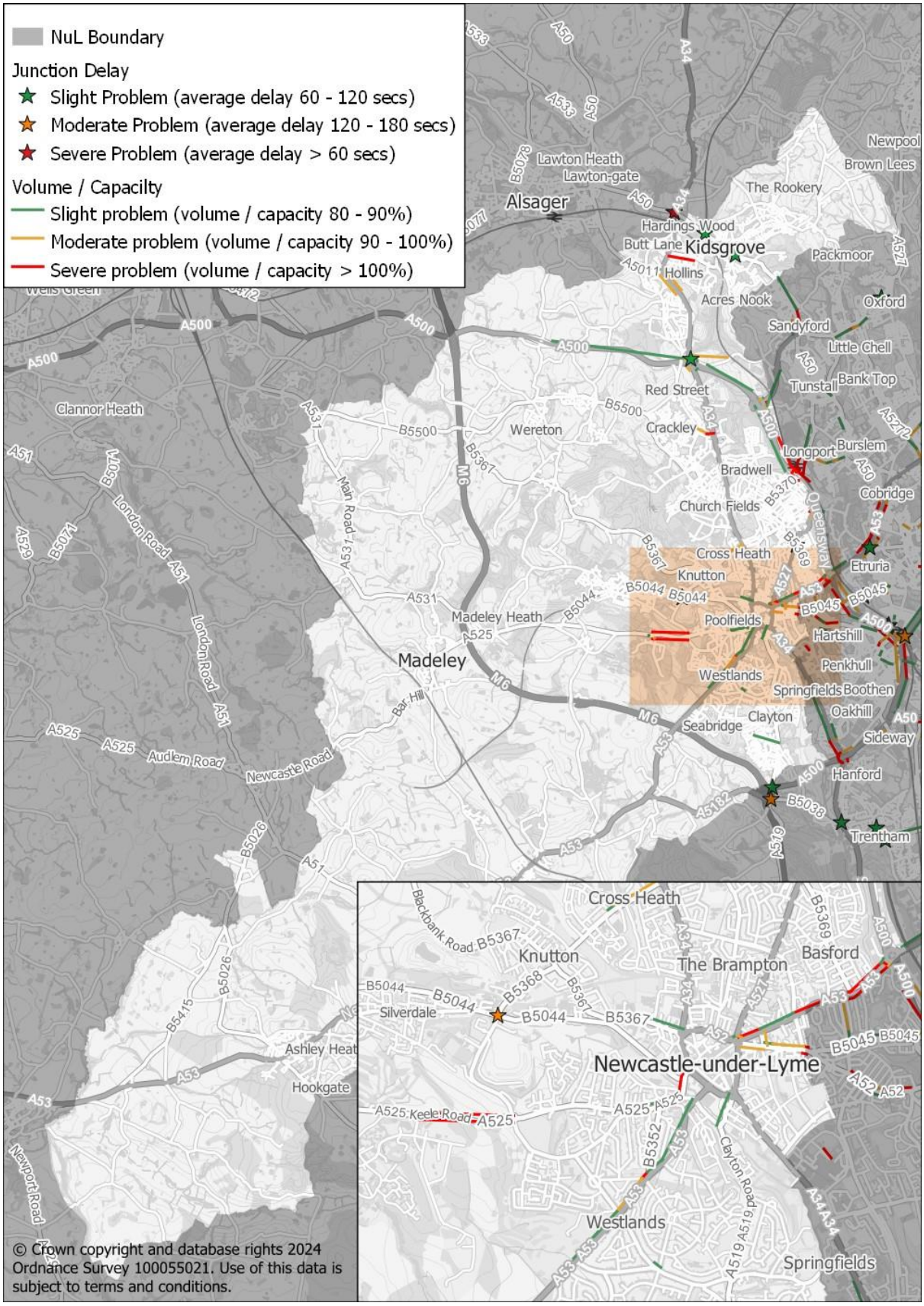


Figure 8-14: Scenario 4 - 2040 - PM

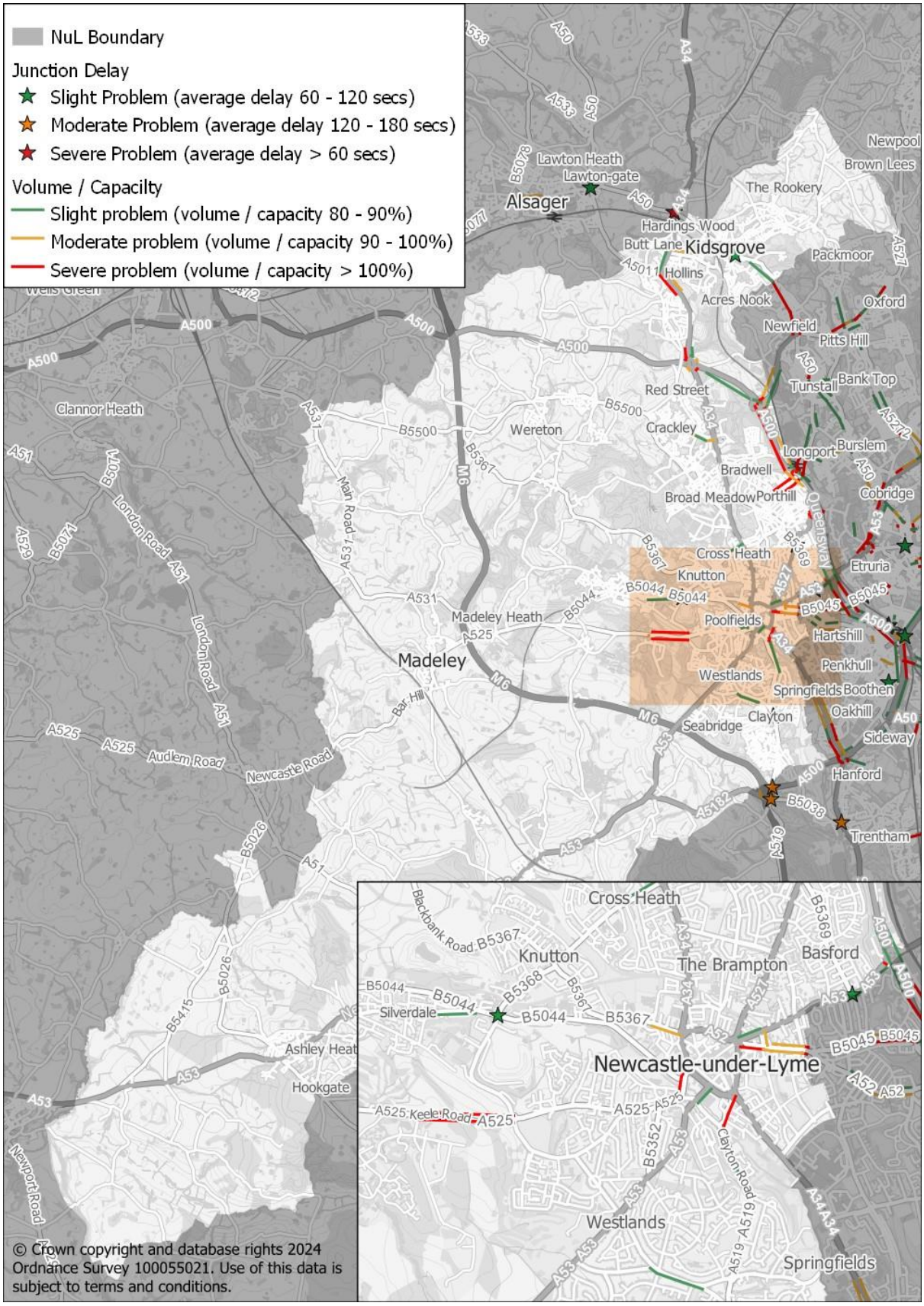


Figure 8-15: Scenario 4 - Difference - AM

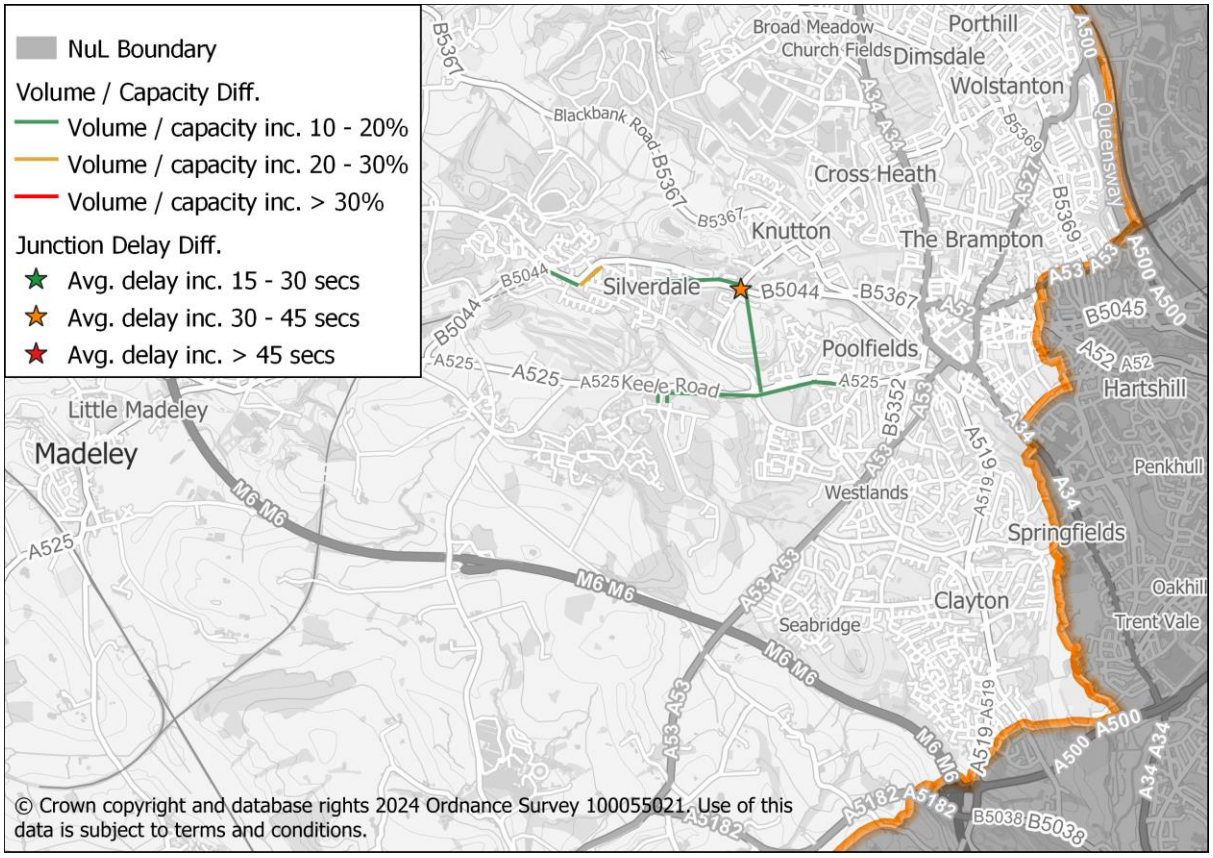
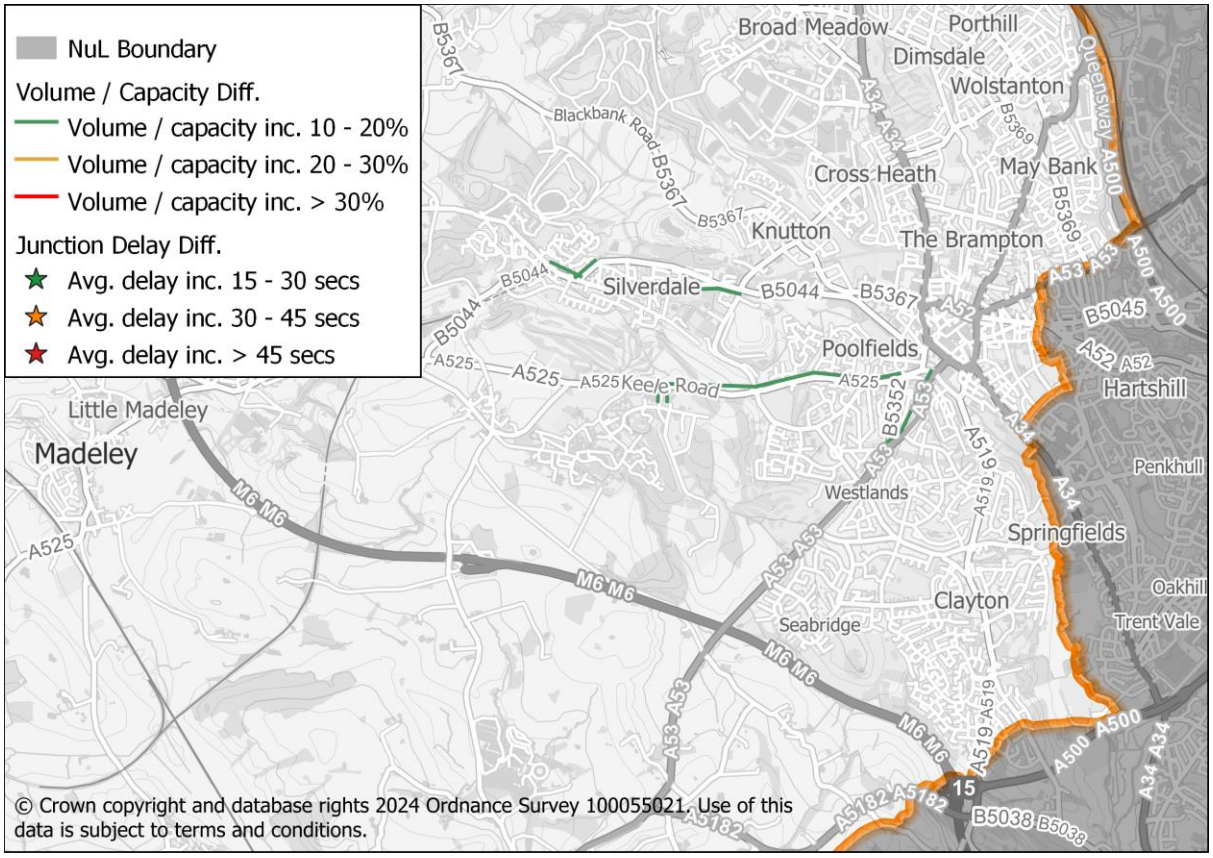


Figure 8-16: Scenario 4 - Difference - PM



8.6 Model Run 5 – Core and Final Suite of strategic sites

8.6.1 Model Development

The final model run 5 is used to test the finalised list of developments which will be taken forward in the NULBC Local Plan. This consists of the final selection of core and strategic sites. In addition, it also includes selected mitigation measures to reduce traffic impacts observed in the previous model runs. The identification of the final suite of modelled sites has been informed by the initial outcomes of the STA. The Council has also separately undertaken a site selection process which has identified appropriate site options for model run 5. The outcomes of the site selection process are included in the Plan and there is a separate part of the Local Plan evidence base which addresses the site selection methodology and outcomes. The selected core housing and employment sites are largely similar to those used for previous scenario testing with minor allocation and boundary changes as the list is finalised for the Regulation 19 Local Plan. Site boundary changes have no impact on previous model runs. Of the strategic sites being tested, AB2 and KL15 have both been chosen to go forwards to this final scenario. See Table 8-2 and Table 8-3 for the final allocations.

Table 8-2: Final NULBC Local Plan residential allocations

SHELAA Ref	Site Name	Size of Development (Including Demolitions) (Residential Units)
AB12	Land East of Diglake Street, Bignall End	125
AB15	Land North of Vernon Avenue, Audley	33
AB33	Land off Nantwich Road / Park Lane (1) Audley	60
BL18	Clough Hall Playing Fields, Talke	150
BL32	Land at Congleton Road, Butt Lane	20
BL8	Land adjacent to roundabout at West Avenue, Kidsgrove	40
CH13	Castletown Grange, Douglas Road, Cross Heath	-7
CH14	Maryhill Day Centre, Wilmott Drive, Cross Heath	30
CT1	Land at Red Street and High Carr Farm, Chesterton	750
KG6	William Road, Kidsgrove (site of the Galley PH)	6
KS11	Knutton Community Centre, High Street Knutton	9
KS17	Knutton Recreation Centre, Knutton Lane	55
KS18	Land North of Lower Milehouse Lane, Knutton	10
KS3	Land at Blackbank Road, Knutton (adjacent Knutton Children's Centre)	150
MD29	Land South of Bar Hill, Madeley	150
NC13	Land West of Bullockhouse Road, Harriseahead	100
SB12	Land adjacent to Clayton Lodge Hotel	48
SP11	Former Keele Municipal Golf Course	900
SP2	Site at Cheddar Drive, Silverdale	8

SHELAA Ref	Site Name	Size of Development (Including Demolitions) (Residential Units)
SP22	Former playground off Ash Grove, Silverdale	36
TB19	Land south of Newcastle Golf Club, Whitmore Road	550
TB23	Land West of Galingale View, Thistleberry	124
TC22	Marsh Parade, Newcastle (former Zanzibar night club)	70
TC40	Car Park, Blackfriars Road, Newcastle	10
TC7	Land bound by Ryecroft, Ryebank , Merrial Street, Corporation Street and Liverpool Road, Newcastle	75
TK10	Land at Crown Bank, Talke	170
TK17	Land off St Martins Road, Talke	40
TK27	Land off Coppice Road, Talke (2)	90
TK6	Site at Coalpit Hill, Talke	10
RC8	Land at Liverpool Road	7
KL13	Keele Science Park, Phase 3	220
LW53	Land Corner of Muchlestone Wood Lane	130
SP23	Land at Cemetery Road	200
LW87	Former Petrol Station, Eccleshall Road	12
TB6	Former Pool Dam Pub Sites	13
KS19	Knutton Lane	5
CH3	Cross Heath	106
LW74	Baldwins Gate	200
TC52	Goose Street	25
TC19	Hassell Street Car Park	5
TC20	King Street Car Park	10
TC71	Car Park	100
TC50	Cherry Orchard Car Park	5
WS9	Land off Lamphouse Way, Wolstanton	43
KL15	**Land south of A525 between Keele University and Newcastle-under-Lyme (strategic site)**	**260**

Table 8-3: Final NULBC Local Plan key employment allocations

SHELAA Ref	Site Name	Derived number of Jobs
CT20	Rowhurst Close (circa 8 hectares south of Talke)	612
BW1	Chatterley Valley (circa 6 hectares east of Talke)	816
TC45	York Place, Newcastle Town Centre	292
KL13	Keele University (circa 11 hectares for Keele Science Park (Phase 3))	1100
AB2	**M6 Jct 16 development (Strategic site)**	**3300**
KL15	**Keele Science Park (Phase 4 - strategic site)**	**1278**

8.6.1.1 Model Identified Mitigations

A number of mitigation measures have been identified to address the instances of delays and congestion identified within the modelling exercise and associated with core and strategic LP sites. In addition, this report takes into consideration the assessment and analysis of the three strategic sites (key issues and mitigations) conducted previously as part of the Newcastle-under-Lyme Strategic Employment Site Assessment Report (2023), which is summarised in Appendix A - Policy Context.

The proposed mitigation measures take the form of either,

- Improved network link capacity – e.g., widening a link,
- Improved junction capacity – e.g., junction signalisation,
- Enhanced network – e.g., new network links added,
- Enhanced public transport – e.g., new bus services added.

The final selection of mitigation measures is as follows,

- AB2
  - Bus provision connecting employees within Stoke-on-Trent, Newcastle-under-Lyme and Crewe with AB2 employment. It is assumed the service is timed to meet the needs of any shift patterns and enable some connection with other existing public transport services. This is expected to be a replacement for 10% of car trips originating in nearby zones that could use this and other existing public transport services to access AB2 within 1 hour.
- Keele
  - A new link road running between University Avenue/Barkers Wood Road to Whitmore Road. The link road will be a 30mph 7.3m wide road connecting the A525 with the A53 to provide an additional route to distribute trips and relieve pressure on the A525.
  - A new circular bus service serving Newcastle-under-Lyme bus station, Keele University, KL15, KL13, TB19, and SP11 sites via Keele Road, the new link road and Whitmore Road.
- Talke / Kidsgrove
  - Extension of the NW-bound Newcastle Road two-lane approach to the signalised junction at Newcastle Road/Coalpit Hill. This will give additional space for right-turning traffic that is leading to junction delay issues in scenario 2 – core local plan sites.
  - Cedar Avenue – Community improvements to Cedar Avenue to increase attractiveness of walking, wheeling, and cycling (not able to model in the strategic NSMM transport model).

Note that in addition to mitigations identified for modelling within the final model run, additional measures are being identified that cannot be modelled within a strategic transport model such as the NSMM.

8.6.2 Model Results

Figure 8-17 and Figure 8-18 show the results for model run 5 (with mitigations) for AM and PM respectively.

The mitigation measure on the Newcastle Road in Talke is not shown within the NSMM model to give a significant improvement. It should be noted that as a strategic model, the NSMM model has limitations when small scale local interventions are tested. For this location, it is recommended that additional testing is undertaken using a local junction model.

For Keele, the mitigation measure of a new link road added between the University and Whitmore Road is seen to have a positive impact on the reduction of traffic on Keele Road between the University Roundabout and Gallowstree Lane. Table 8-4 shows the change in vehicles and resultant V/C on Keele Road between the University and Gallowstree Lane roundabouts as a result of the link road.

Table 8-4: Change in traffic in Keele Road

	AM		PM	
	Eastbound	Westbound	Eastbound	Westbound
KL15 Tot. Veh (PCU).	1835	1824	1790	1590
Final Tot. Veh (PCU).	1768	1552	1583	1443
Veh. Diff (PCU).	67	272	207	147
KL15 V/C	115.00%	114.00%	138.00%	101.00%
Final V/C	111.00%	96.60%	100.80%	91.60%
Diff. V/C	4.00%	17.40%	37.20%	9.40%

It can be seen that during the AM period, westbound traffic is most improved whilst in the PM period, eastbound traffic is most improved. This is likely to be of significant improvement for University traffic and related bus services. It can also be seen that the mitigation brings volume back or nearly back to capacity for each direction and period. There is potential for additional improvements to be made with high impact travel plans and other local bus service improvements.

The modelled vehicle flows for the link road are shown in Table 8-4 and shows a moderate usage for the new road.

Table 8-5: Vehicles (PCU) using link road

	AM	PM
Northbound	243	235
Southbound	81	194

The mitigation measures for site AB2 include the modelling of a potential bus service that would help reduce car traffic to the site. This intervention sees the flow-weighted delay at the proposed signalised site entrance junction on the A500 fall from 81 to 72 seconds for the AM period whilst staying constant for the PM period. Other related network improvements can be seen to the Talke Roundabout in both periods where potential minor junction delays are now eliminated.

Figure 8-17: Scenario 5 - 2040 - AM

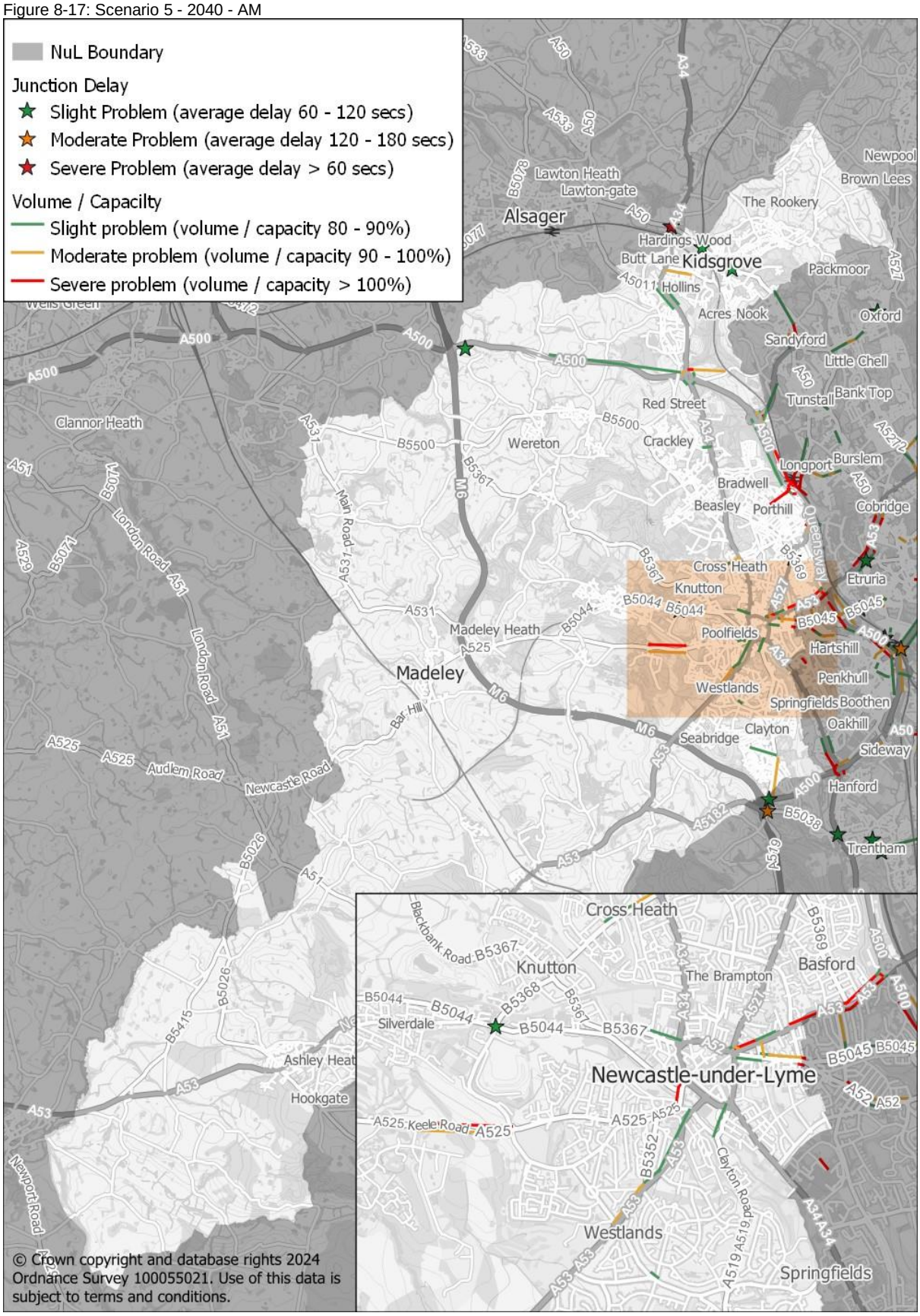
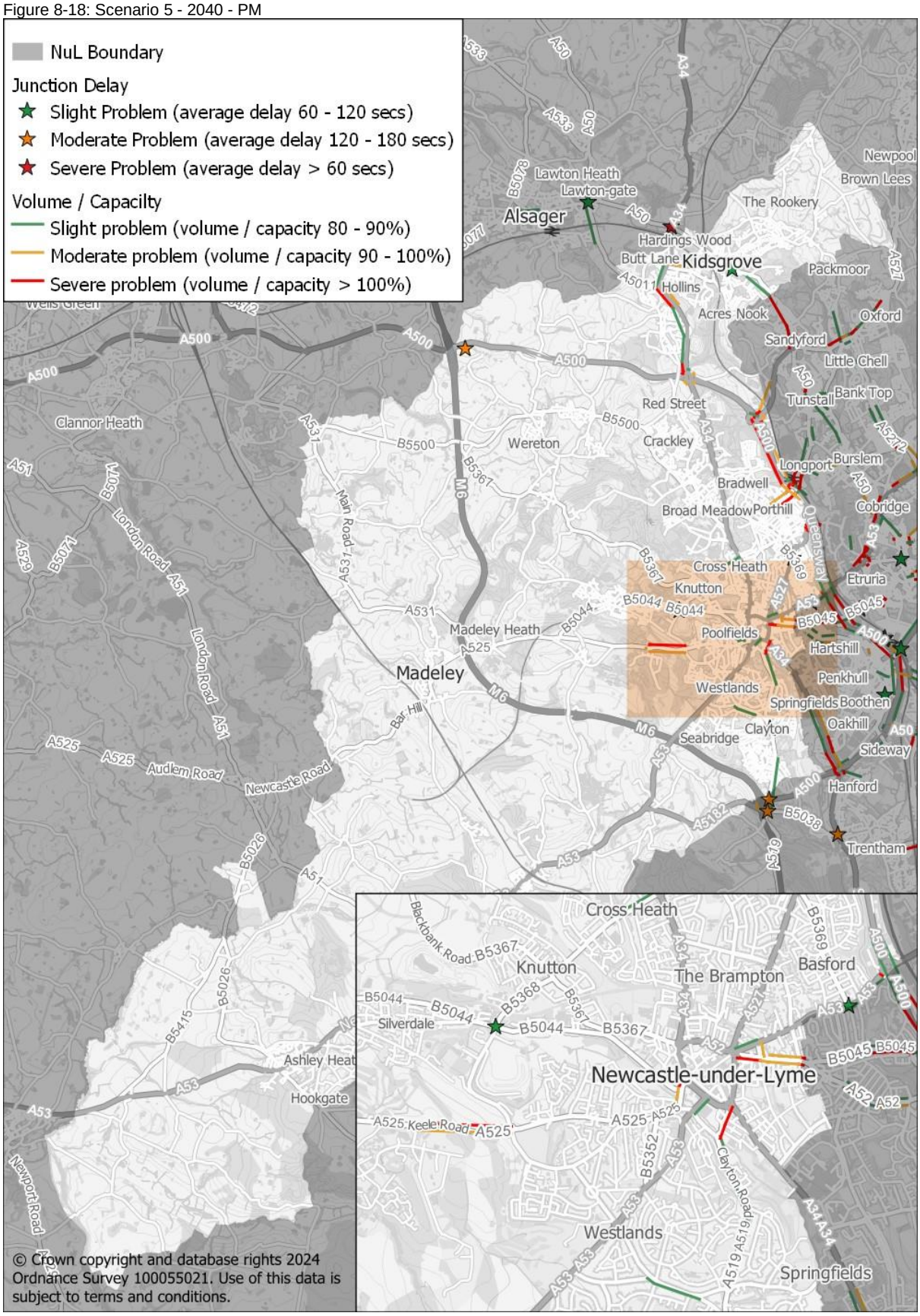


Figure 8-18: Scenario 5 - 2040 - PM



8.6.3 M6 Junction 16 (AB2) Forecast Turn Flows

As was noted in section 5.4, following the reduction in anticipated traffic growth after COVID-19, the NSMM transport model is over-predicting forecast traffic and in addition, the AB2 site lies towards the edge of the NSMM transport model internal area. Therefore, a different approach to presenting traffic growth around M6 Junction 16 will be utilised. This approach applies DfT growth factors to turn count data collected as part of the creation of the Junction 16 Vissim model and incrementally adds additional growth observed from the reference case NSMM transport model to the final model run 5 (with AB2 and mitigations). This approach will yield more consistent results for this location with results presented in Table 8-6.

Table 8-6: M6 Junction 16 Forecast 2040 Turn Flows

From	To	AM			PM		
		Light	HGV	Total	Light	HGV	Total
M6 North	**A500 (East)**	601	191	792	1115	156	1271
M6 North	**A500 (West)**	214	13	227	356	11	367
A500 (East)	**M6 North**	516	185	701	533	107	641
A500 (East)	**M6 South**	70	75	144	162	39	201
A500 (East)	**A500 (West)**	407	49	456	590	13	603
M6 South	**A500 (East)**	116	23	138	110	24	135
M6 South	**A500 (West)**	212	16	228	215	8	223
A500 (West)	**M6 North**	430	51	480	278	16	295
A500 (West)	**A500 (East)**	483	76	559	657	28	684
A500 (West)	**M6 South**	166	36	202	191	12	203

9 Summary

9.1 Summary

In summary, this report outlines the findings of the STA including the analysis of available traffic data sources, the review of the locations of existing traffic concerns as well as the outputs of the 2040 reference case models. The following key aspects of the assessment are outlined as follows:

Traffic Data Analysis:

- Long term DfT AADF traffic flow data analysis indicates a relatively flat traffic growth trend across Newcastle-under-Lyme Borough and Staffordshire as a whole from 2015 to 2022,
- Local traffic data analysis, across the strategic Stoke-on-Trent screenline, also shows a relatively consistent trend between 2015 and 2022,
- Average weekday traffic profiles derived from WebTRIS traffic data indicates some variances in the 2015-2023 observations including decreases in traffic across the M6 and increases in A500 traffic flow. The A500 traffic increase is particularly pronounced in the AM peak in the EB direction.

Accident Data Analysis:

- Accident hotspots on A500 westbound approach to M6/A500 junction. Small though significant number of fatal and serious accidents on A500 west of M6,
- Talke strategic site shows some small accident clusters though typical of A500 as a whole,
- Keele strategic site shows small clusters of minor accidents close to the University.

Accessibility Data Analysis:

- All strategic sites show an accessibility extent that is focussed towards The Potteries,
- M6 Jct 16 site has poor public transport connectivity,
- Keele and Talke strategic residential sites have below average baseline accessibility by foot though this improves when bicycle is considered.

Existing Traffic Condition in Newcastle-under-Lyme Borough:

- Slow moving traffic observed in and around Newcastle-under-Lyme centre,
- Some limited speed reductions in southern areas of Newcastle-under-Lyme Borough, Madeley and Audley,
- Slow moving traffic on the A34 Newcastle Road from the A500 to north of Clough Hall Drive though largely no queuing. Some traffic congestion on signalised roundabout.

Existing traffic conditions on the strategic road network:

- M16 J16 - Observed data shows traffic congestion along the A500 eastbound approach with decreased speeds (0-10mph AM, 10-0mph PM),

- M6 J15 - The speed data indicates that queued traffic (speed 1-10mph) is observed along the A500 approach to the A500 Queensway\ Newcastle Road roundabout in the PM peak,
- A500\Alsager Road – Can be inferred from data to be operating without any capacity related congestion,
- Talke Interchange - Some relatively slow-moving traffic, along the section between the Newcastle Road\Talke Road roundabout. However, the data indicates that this is slow moving traffic, but in general the data does not show any large reductions in speed due to queuing,
- A500/A527 - Data indicates that traffic is operating without the presence of queues long term queues during the peak hour,
- A500/A34 -In the AM peak observed speeds of around 20-30mph are in line with the speed limits in place on the A34. This is with the exception of the A34 northbound approach to the gyratory which shows lower observed speeds of around 10-20mph. In the PM peak lower speeds of 10-20mph are also observed on the southbound approach to the gyratory.

2022/23 post-COVID-19 NSMM transport model validation:

- Overall, the model is overestimating flow in the base year compared to the 2023 data. This is more pronounced in the WebTRIS data where traffic flows the model shows an overestimation of around 26-28%
- In total terms the model does not validate well against the 2023 WebTRIS data with only around 15-35% of counts passing

2040 NSMM Reference Case:

- Link V\Cs range between 90% to > 100% over the A500 between the A50 and Talke Interchange,
- Slight to Serious traffic delays are forecasted on the A500 EB approach to the M6/A500,
- At Talke Interchange, Slight to Moderate traffic delays are forecasted at the A34 southbound approach to the A500/A34 junction. In the PM link V/Cs range from Moderate to Severe along the A34 north of the junction.
- Severe Traffic delays are forecasted at the A500 Queensway\Newcastle Road roundabout in both peaks. Severe traffic delays are also present at the A500/A5182 signalised junction south of the roundabout,
- In general, the A525 is operating without any notable traffic related capacity issues.

NSMM Model Runs:

- Five model scenarios and a reference case were produced. The model runs test different combinations of core and strategic developments with the final run testing the chosen Regulation 19 Local Plan allocations with confirmed site boundaries.
- Mitigation measures were developed to reduce the impact of increased traffic volume on link and junctions as a result of Local Plan allocation traffic. Mitigations were applied to site AB2, at Kidsgrove on Newcastle Road and at Keele.
- Site AB2 showed improvements to junction delays as a result of testing proposed enhanced public transport connectivity. It was suggested that improvements at Kidsgrove were better tested with a local junction model rather than a large strategic model such as the NSMM model. The inclusion of a link road at Keele was shown to give positive improvements to Keele Road which will directly benefit access to the University and nearby proposed new housing developments.

Appendix A – Policy Context

Introduction

This section provides a summary of the policies that are relevant part of the evidence base for the Strategic Transport Assessment (STA) report. It is important to consider policies that directly relate to transport, land use, infrastructure, and environmental considerations within the local and broader national and regional context. The review's outcome will enable us to fully consider the transport issues, opportunities, and proposals as identified in the relevant policy documents.

This includes the following national, regional, and local policies:

- National Planning Policy Framework (2023)
- Conservation of Habitats and Species Regulations (2017)
- Staffordshire Bus Service Improvement Plan (2022)
- Staffordshire Local Walking and Cycling Infrastructure Plan (2021)
- Staffordshire and Stoke-on-Trent Strategic Infrastructure Plan (2019)
- Stoke-on-Trent and Staffordshire Strategic Economic Plan (2018)
- Cheshire East - Staffordshire Cross Boundary Study Report (2016)
- Newcastle-under-Lyme Borough Integrated Transport Strategy (2015)
- Staffordshire Local Transport Plan (2011)
- Newcastle-under-Lyme and Stoke-on-Trent Core Spatial Strategy (adopted 2009) and the saved policies of the Newcastle-under-Lyme Local Plan (2011)
- Draft Newcastle-under-Lyme Infrastructure Delivery Plan (2023)
- Newcastle-under-Lyme Strategic Employment Site Assessment Report (2023)
- Air Quality Report - Annual Status Report (2023)
- Made' Neighbourhood Plans including Loggerheads (2019), Chapel and Hill, Chorlton, Maer and Aston and Whitmore (2020), Betley, Balterley and Wrinehill (2022), Madeley Neighbourhood Plan (2022).
- Strategic Housing and Employment Land Availability Assessment (2022)
- Newcastle-under-Lyme Borough Issues and Strategic Options Paper (2021)
- Newcastle-under-Lyme Sustainable Environment Strategy (2020) & Action Plan (2022)
- First Draft Local Plan (2020-2040)

The following sections will summarise the prevailing themes in each of the policy documents identified, drawing out key transport-related matters that relevant in the preparation of the STA.

Conservation of Habitats and Species Regulations (2017)

According to the Conservation of Habitats and Species Regulations 2017, as revised by the 2019 amendments, conducting a Habitats Regulations Assessment (HRA) is a compulsory step to assess the potential impacts of a proposed plan or project on the integrity of designated habitat sites, including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). This assessment must be performed, and its findings considered thoroughly prior to issuing planning consent or authorising a project. The HRA report should also provide suggested recommendations or adjustments to be applied to the Local Plans' policies and proposals, ensuring that any significant detrimental effects on protected sites are avoided.

Alignment with the STA and the three strategic sites:

An HRA will be developed as part of the Local Plan and will highlight the challenges of the Local Plan strategies and how these may impact upon relevant Habitats sites; any planning for transport infrastructure must consider the potential impacts on designated habitat sites. If there is a potential for significant impact, the plan must include strategies to mitigate these effects or consider alternative solutions that have a lesser impact on the environment.

Therefore, the HRA ensures that transport planning does not negatively impact protected areas. If risks are identified, the plan must present mitigation measures or alternative approaches that minimise

ecological disruption. As part of the STA, mitigation measures will be explored, taking into account the potential environmental impact of each option.

National Planning Policy Framework (2023)

The National Planning Policy Framework (NPPF) sets out the land use planning policies of the UK Government. The primary objective is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental, and cultural well-being of the UK. The policy is affirming that *addressing and identifying transport issues* early in the planning process is crucial for managing the impact of development on transport networks and for leveraging existing and future infrastructure to support sustainable development. This further enables the identification and promotion of sustainable travel modes like walking, cycling, and public transport which is important when developing mitigation strategies for the final model scenario.

Alignment with the STA and the three strategic sites:

The STA's focus on identifying and mitigating transport-related challenges aligns with the NPPF's emphasis on sustainable travel. By evaluating the accessibility and connectivity of these sites, the STA contributes to the NPPF's objective of improving the social and economic well-being of the area through enhanced transport infrastructure. Moreover, the STA's attention to promoting sustainable modes of travel, such as the use of public transport, resonates with the NPPF's aim to foster environmental and cultural benefits.

Additionally, The National Planning Practice Guidance entitled 'Transport evidence bases in plan making and decision taking' provides relevant guidance for the STA. The STA's integration with the NPPF's principles ensures that the planning and development of the strategic sites contribute positively to the UK's sustainable development goals, reflecting a commitment to a balanced, forward-looking transport and land use planning strategy.

Staffordshire Bus Service Improvement Plan (2022)

The Staffordshire Bus Service Improvement Plan (BSIP) is a comprehensive document developed by Staffordshire County Council, designed to upgrade the region's bus services in line with the UK's National Bus Strategy. The BSIP identified one of the key local issues being the "poor access to employment areas by bus". The plan's objectives are to bolster the reliability and frequency of bus services, and to elevate the overall experience for passengers. Notable enhancements outlined in the document encompass:

- Increasing the frequency of services and ensuring their punctuality to foster a more reliable bus network.
- Facilitating seamless integration between bus services and other modes of transport.
- Revising fare structures and ticketing systems to make them more user-friendly and affordable.
- Improving the passenger experience through the introduction of higher-specification buses and better facilities.
- Enhancing information dissemination and establishing a standard brand identity for the bus network across the county.
- Promoting accessibility and inclusivity, while ensuring the safety of passengers across the bus service.
- Invest in decarbonisation; opportunities will be sought to deliver a migration to a zero-emission bus fleet with associated infrastructure over the coming years.

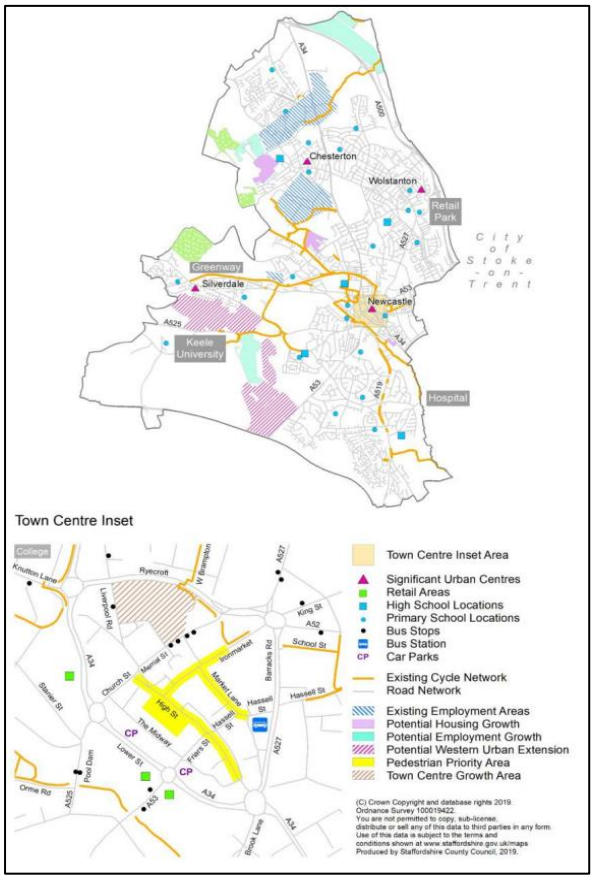
Alignment with the STA and the three strategic sites:

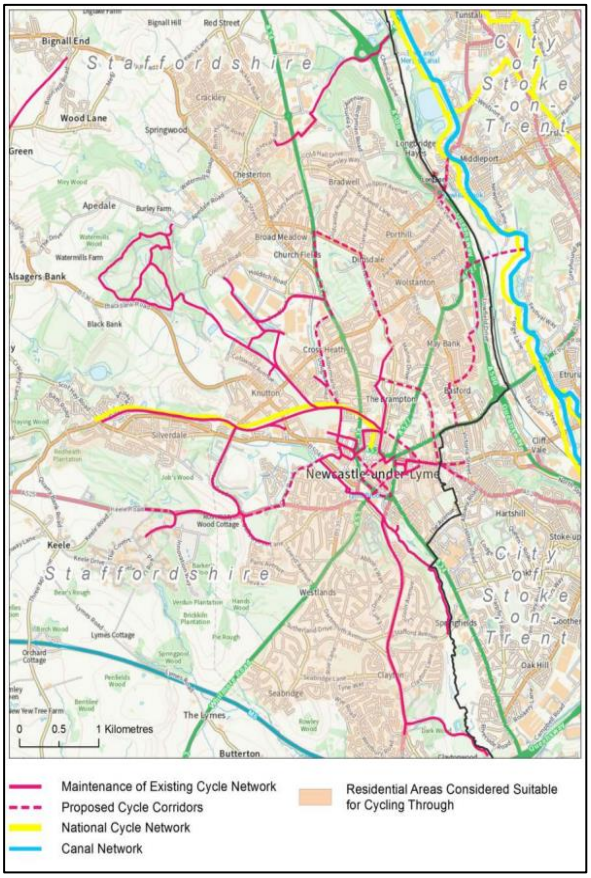
The objectives and improvements outlined in the Staffordshire BSIP demonstrate a strong alignment with the goals of the STA for the three strategic sites under consideration. Ensuring public transport availability, integration of transport modes, safety, and accessibility of bus services across the county reflects the STA's broader commitment to assess the accessibility and transport options around the strategic sites. Transport systems that cater to the needs of all users are essential for the inclusive growth of these areas. Specifically, the consideration of the phase one scheme and the bus rapid transit

(BRT) offer in proximity to Keele could be beneficial for the strategic site in proximity to Keele University (Ref KL15).

Staffordshire Local Cycling and Walking Infrastructure Plan (2021)

The Local Cycling and Walking Infrastructure Plan (2021) by Staffordshire County Council is a strategic document aimed at enhancing cycling and walking infrastructure within the county. It outlines a vision and a set of priorities for developing accessible, safe, and integrated networks that encourage active travel, contribute to public health, and reduce reliance on motorised transport, in alignment with broader sustainable transport and environmental goals. It is relevant for understanding local strategies for non-motorised transport, which can impact transport assessments.





Alignment with the STA and the three strategic sites:

The LCWIP's emphasis on developing accessible and safe cycling and walking networks complements the STA's goal of reducing dependency on motorised transport for the strategic sites. By providing safe and attractive alternatives, these networks support a shift towards more sustainable and healthy travel behaviours.

The LCWIP's vision of integrating cycling and walking infrastructure with other modes of transport aligns with the STA's holistic approach to connectivity. This integration is essential to ensure that active travel options are not isolated but form a key part of the overall transport strategy for the strategic sites, enabling seamless travel for residents.

The STA acknowledges the importance of active travel in supporting sustainable growth and development. Cycling and walking networks enable the strategic sites to reduce their transport-related carbon footprint and contribute to a greener and more sustainable future.

The LCWIP's goals for improving cycling and walking infrastructure are intrinsically linked to the STA's objectives for sustainable transport planning. The alignment between these documents ensures that

the strategic sites are developed with a comprehensive approach that includes active travel as a cornerstone of transport and land-use planning, reflecting a commitment to sustainability, health, and quality of life.

Staffordshire and Stoke-on-Trent Strategic Infrastructure Plan (2019)

The Staffordshire and Stoke-on-Trent Strategic Infrastructure Plan provides a strategic overview of the development and infrastructure requirements needed to support growth from 2018 to 2038. The plan addresses the challenges faced in funding the necessary infrastructure to facilitate growth and enhance the lives of existing and future residents across Staffordshire & Stoke-on-Trent.

It sets out the vision and priorities for infrastructure development across the region with focus on enhancing connectivity, supporting public health and education, accommodating growth, and improving the resilience and capacity of transport networks. All these are essential for supporting the region's economic aspirations and facilitating sustainable development. Within this framework, the plan highlights a range of development sites in Newcastle-under-Lyme, including residential and employment projects, with a notable focus on the Keele Science & Innovation Park as a key driver of regional advancement.

Stoke-on-Trent and Staffordshire Strategic Economic Plan (2018)

The Stoke-on-Trent and Staffordshire Strategic Economic Plan is designed to bring businesses and local authorities together to drive economic growth, create jobs and raise skills levels. It sets out a framework of priorities and addresses how industrial growth can benefit areas of the country such as Stoke-on-Trent & Staffordshire which have clear potential. A comprehensive plan aimed at stimulating economic growth in the region, with a strong focus on improving transport infrastructure to enhance connectivity and support business development. It envisions a transformation of Stoke-on-Trent into a Core City and the broader Staffordshire area into a connected county and hub of economic prosperity, utilising the M6 and other strategic routes linking the county to Birmingham and Manchester.

It highlights the region's strengths, such as its strategic location and business diversity, while addressing challenges like low productivity and skill gaps. The plan sets objectives around enhancing connectivity, urban centre competitiveness, sector support, and workforce skills, emphasizing collaboration with partners for delivery.

It further highlights the critical role of robust transport networks in driving competitiveness and economic expansion, addressing challenges such as congestion that impede labour and commerce mobility. The SEP advocates a multi-modal transport strategy, leveraging the area's strategic position and existing connections, provision of sustainable transport options and emphasizes collaboration with Midlands Connect for a unified national network.

Cheshire East - Staffordshire Cross Boundary Study Report (2016)

The Cheshire East - Staffordshire Cross Boundary Study Report was commissioned by Cheshire East Council (CEC) to assess the cross-boundary impacts and implications of the updated CEC Local Plan land allocations within the Staffordshire Moorlands, Stoke-on-Trent, and Newcastle-under-Lyme areas. The study aimed to provide Staffordshire County Council (SCC) with clarity on potential highway-related impacts and the sufficiency of public transport provision. Utilising tools like Accession for accessibility analysis and GraHAm for traffic distribution, the report highlighted limited public transport in Staffordshire Moorlands, potential impacts on key routes like the A50, A500 and A34 and suggested policy updates for mitigating cross-boundary transport issues. Recommendations included improving sustainable travel options and public transport services to manage the anticipated increase in traffic, particularly from Stoke-on-Trent.

Staffordshire Local Transport Plan (2011)

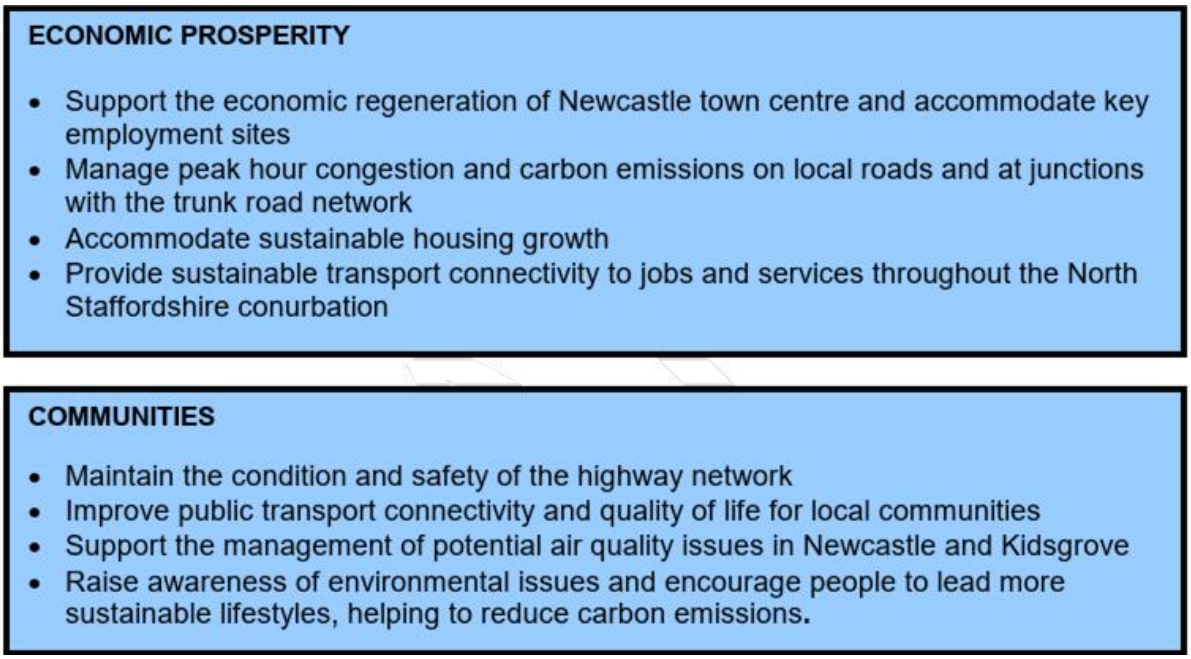
Staffordshire Local Transport Plan provides a detailed strategy for the development and management of transport across Staffordshire, addressing the needs of both urban and rural areas. It aims to improve accessibility, reduce congestion, enhance safety, and support the local economy while also promoting sustainable transport options such as walking, cycling and public transport and reducing the

environmental impact of travel. At this moment, the County Council is preparing their emerging LTP4 which has decarbonisation as a guiding principle.

Newcastle-under-Lyme Borough Integrated Transport Strategy (2015)

The Newcastle-under-Lyme Borough Integrated Transport Strategy (2015) outlines a strategic approach to improving transport within the borough to support economic development, enhance connectivity, and foster sustainability. It identifies key challenges and opportunities in the transport sector and sets out priorities for action (Priorities shown in Figure 9-1). These include upgrading public transport services promoting active travel through improved walking and cycling infrastructure, addressing congestion, and parking issues, and integrating transport planning with land use development.

Figure 9-1 Economic Prosperity and Community priorities for Newcastle-under-Lyme Borough[3]



Feedback from community and stakeholder consultations has highlighted specific areas for improvement, such as junction capacity, and road safety improvements. Additionally, key arterial routes like the A50 and A500 have been identified by Highways England as critical for future investment and development.

The strategy is dynamic and subject to review, particularly in light of potential transport impacts due to new housing developments within the Borough.

The strategy is designed to create a more efficient, reliable, and environmentally friendly transport network that meets the needs of residents, businesses, and visitors while contributing to the overall quality of life in the borough.

This document will be updated for the Local Plan.

Newcastle-under-Lyme and Stoke-on-Trent Core Spatial Strategy (adopted 2009) and the saved policies of the Newcastle-under-Lyme Local Plan (2011)

The Newcastle-under-Lyme and Stoke-on-Trent Core Spatial Strategy, in conjunction with the saved policies from the Newcastle-under-Lyme Local Plan, provides a cohesive framework for guiding spatial development including land use and transport integration. These documents establish guidelines for where and how development should take place, focusing on residential, commercial, and infrastructural

[3] Newcastle-under-Lyme Borough Integrated Transport Strategy 2015 - 2026

provisions. Furthermore, they encompass policies that shape the evolution of transport infrastructure to support growth, enhance connectivity, and encourage sustainable travel options.

The Core Spatial Strategy, specifically, delineates a vision for the long-term regeneration and development of Newcastle-under-Lyme Borough and Stoke-on-Trent City through to 2026. An essential objective of the Strategy is to advance a spatial plan that underpins an accessible and efficient transport network. Such a network is envisioned to enhance safe and enjoyable pedestrian and cycling conditions, connect communities effectively, and provide seamless access to employment hubs and high-quality services and amenities.

Collectively, these policy documents aim to balance the need for economic growth with environmental protection and the quality of life for residents.

Draft Newcastle-under-Lyme Infrastructure Delivery Plan (2023)

Expanding on the foundational work of the Newcastle-under-Lyme Borough Council's Infrastructure Baseline Report (2021), this interim report provides a comprehensive overview of the current infrastructure provision in Newcastle-under-Lyme. It highlights the principal infrastructure challenges and opportunities linked to potential development sites, drawing upon an updated review of the existing evidence base and engagement with infrastructure providers in early 2023.

The Plan identifies the future infrastructure requirements of development proposed in the Borough's draft Local Plan, ensuring that the necessary infrastructure is either already in place or will be established within the plan's timeframe. Thus, this document is an integral component of the evidence base supporting the draft Local Plan (Regulation 18) at the current stage of consultation.

Newcastle-under-Lyme Strategic Employment Site Assessment Report (2023)

This study is an assessment and analysis of the potential strategic employment site(s) to support allocation in the Local Plan Review and is an update to the previous Employment Sites Assessment (2020).

The assessment concerns the three potential sites that we are assessing in the STA:

- Land at J16 of the M6 (Ref: AB2)
- Land at Barkers Wood, Keele (Keele University) (Ref: KL15)
- Land off Talke roundabout/ A500 (Ref: TK30)

The overall objective of the study update is to identify the need for strategic employment land across the borough of Newcastle-under-Lyme for the period 2020 to 2040 and justify the inclusion of (a) strategic employment site(s) for allocation.

Based on the assessment report, the key transport issues for each strategic site as well as proposed mitigation plans:

1. **Keele University's extension site (ref:KL15)**:
    - **Congestion**: The site has multiple congestion hotspots on route to the strategic road network, which could impede traffic flow and access.
    - **Access to Strategic Road Network**: The site is close to the M6, but access to the nearest junction is slow, which could affect the movement of goods and people.
    - **Public Transport**: There is limited public transport access, with only one bus route from the centre of Newcastle-under-Lyme terminating at Keele Village. This could affect the ease of commuting for employees and visitors.
    - **Rail Access**: The nearest mainline railway station is Stoke-on-Trent, which may not be convenient for all users of the site.
    - **Mitigation Plans**: The University has a transport strategy with a bus interchange prepared, which could improve public transport access. There is also on-site energy generation, which may contribute to sustainability efforts.
2. **Land at J16 of the M6 (ref: AB2)**:

- **Public Transport**: There is a lack of public transport serving the site, which could limit access for employees without private vehicles.
- **Amenities and Workforce**: The site's location, while excellent for logistics due to proximity to the M6, may lack local amenities and have issues related to the availability of local workforce.
- **Mitigation Measures**: The developer, St Modwen Developments, is working on mitigation measures for the identified transport issues, including improving access to the business park.

3. **Site at Talke Roundabout (ref: TK30)**:
   - **Green Belt Release**: The site promoter has not yet demonstrated exceptional circumstances to justify the release from the Green Belt for the type of development promoted. This could affect the site's development potential.
   - **Market Demand**: There is strong market interest, and the developer is confident that the site will fill up rapidly, indicating a need for strategic site development in this location.
   - **Proximity to Conurbation and Public Transport**: The site is close to the conurbation and bus routes, which could be advantageous for access and commuting.

For all sites, the key transport issues revolve around congestion, access to the strategic road network, public transport availability, and the proximity to amenities and workforce. Each site has its own set of challenges and potential mitigation measures that need to be considered in the planning and development process to ensure they are suitable for their intended strategic employment purposes.

Air Quality Report - Annual Status Report (2023)

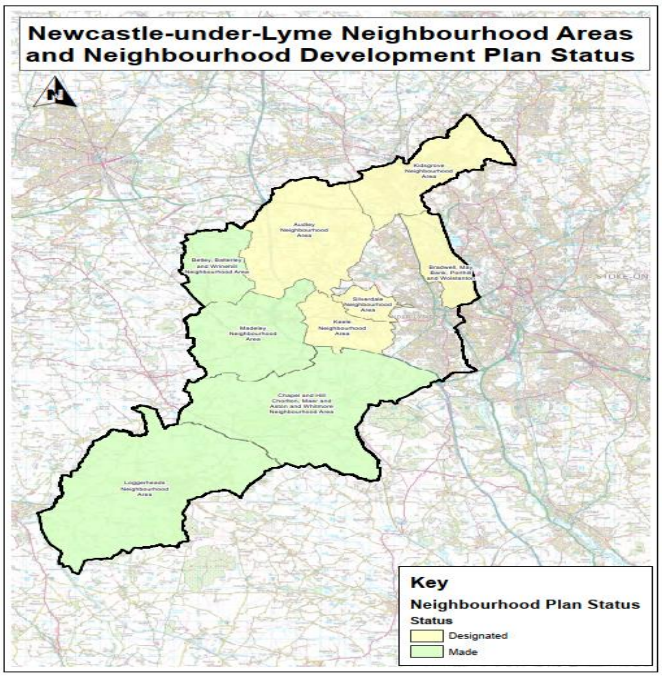
The report provides data and analysis on air quality level, informing transport strategies aimed at reducing air pollution and improving public health. It highlights that road traffic is the most significant source of pollution to the Borough with high proportion of traffic travelling into/through the four Air Quality Management Areas (AQMAs):

- AQMA 1: Liverpool Road, Kidsgrove
- AQMA 2: Newcastle-under-Lyme Town Centre
- AQMA 3: Maybank-Wolstanton-Porthill
- AQMA 4: Little Madeley

The report further provides next steps and actions towards public transport improvements and shifting towards sustainable transport options.

'Made'Neighbourhood Development Plans (2022)

Neighbourhood Development Plans (NDP) are developed by local communities, and they include specific policies on transport to reflect the unique needs of different areas, such as Loggerheads NDP, Chapel and Hill Chorlton, Maer and Aston and Whitmore NDP, Betley, Balterley and Wrinehill NDP, and Madeley NDP. They represent community-driven frameworks for local development, reflecting specific priorities and characteristics of each neighbourhood. These plans include tailored transport policies that aim to address local connectivity, traffic management, and support for sustainable modes of travel such as walking and cycling, ensuring that transport considerations are closely aligned with the area's growth and development objectives.



Newcastle-under-Lyme Strategic Housing and Employment Land Availability Assessment (2022)

The Strategic Housing and Employment Land Availability Assessment (SHELAA) serves as a tool for the NULBC to understand the landscape of available land for housing and business development, ensuring the borough can accommodate future growth. The assessment gives an overview of the potential land resources, identifying sites through various methods, including a public 'Call for Sites' exercise where stakeholders can suggest sites for consideration of potential development. As this is the council's first SHELAA report, it evaluates the land for residential and economic purposes and is set to be periodically updated to reflect changes and inform the ongoing development of the new local plan.

Newcastle-under-Lyme Borough Issues and Strategic Options Paper (2021)

The provision of infrastructure is integral to creating opportunities for growth, making best use of land and the delivery of sustainable development. It is also fully acknowledged that the location and scale of development potentially has a significant impact on the ability of existing infrastructure to absorb these additional demands.

The Newcastle-under-Lyme Local Plan Issues and Strategic Options paper discusses the two strategic sites, KL15 and AB2, among others and outlines the opportunities and issues associated with each. Both sites present a mix of opportunities for economic growth and development, as well as challenges related to environmental impact, infrastructure, and the need to balance development with the preservation of green belt land.

The transport issues identified in the paper are outlined below:

Site KL15 - Land to the south and east of new development site, Keele University:

Issues:

- The University Growth Corridor is located approximately 3 miles from the town centre, which may affect the ease of access for those not living nearby.

- The site is bounded by Keele University and Keele Science and Innovation Park to the west, the village of Silverdale to the north, and suburbs of Newcastle-under-Lyme to the east, which may present challenges in integrating new transport solutions with existing networks.
- An existing overhead high voltage line crosses the site, requiring a clearance of 20 meters to each side, which represents a constraint and could impact site development and transport infrastructure.
- The continual investment in Keele University suggests high deliverability for the site, but transport-related considerations, such as access and integration with existing networks, would still need to be addressed.

Site AB2 - Land southeast of Junction 16:

Issues:

- The workforce is not within immediate proximity, and the site is removed from current public transport routes and local service centres, which could necessitate the creation of Sustainable Travel Plans.
- The loss or potential moving of a layby to enable access to the site could be problematic indicating potential issues with site access and traffic flow.
- An increase in HGV and personal vehicle traffic is anticipated, which could lead to potential congestion and air pollution in the area.
- The site's strategic location on the M6 provides good accessibility to a large proportion of the UK's population and key markets, but this also means that the impact on the transport network needs careful consideration.

For both sites, NULBC intends to consider any impact on the transport network when undertaking the site selection process and to work with neighbouring councils to model the impact of proposed sites on the wider transport network to determine what mitigation may be required. Additionally, there is an intention to investigate the potential for all new developments to contain electric charging points to support new forms of transport such as electric cars.

While both sites have potential for development, there are transport-related issues that would need to be carefully planned for and mitigated to ensure sustainable and efficient access and to minimise negative impacts on the existing transport network and local communities. The STA will provide evidence on the transport-related impact on the network and provide recommendations.

Sustainable Environment Strategy (NULBC, 2020) and Action Plan (2022 – 2023)

The Sustainable Environment Strategy (NULBC, 2020) and its corresponding Action Plan (2022 – 2023) articulate Newcastle-under-Lyme's commitment to environmental sustainability, with an emphasis on reducing carbon emissions and enhancing biodiversity. Within the transport context, these documents highlight initiatives to promote green transport solutions, such as encouraging electric vehicle use, improving cycling, and walking infrastructure, and integrating public transport systems, aiming to create a cleaner, greener borough.

It states that 38% of the Borough's CO_2 emissions comes from transport. Good transport links and highways networks are vital for a successful economy and ensuring residents have a good quality of life. This policy also addresses the need for highway improvements to accommodate the additional road trips that come from increased development.

First Draft Local Plan (2020)

The first draft Newcastle-under Lyme Local Plan (2020-2040) contains a draft spatial strategy, site allocations and policies to guide future development. It has been informed by various evidence-based documents, ongoing Duty-to-Cooperate discussions, and feedback received on the Issues and Strategic Options paper.

Specifically, the local planning authority is working on a Local Plan as mandated by the government to guide the use of land and inform future development decisions. The Borough Council aims to foster a thriving and sustainable community that promotes health, safety, and accessible town centres. The new Local Plan will outline the required land for new homes, jobs, and infrastructure in Newcastle-under-Lyme until 2040, ensuring growth is well-distributed and supported by necessary amenities. The Plan will also establish criteria for evaluating planning applications.

The Plan is meant to reflect the Borough's unique needs and changes in the economy since the last development plan, support new housing and development to meet future demands, and extend the planning period to 2040. It also focuses on sustainable development and addressing climate change.

The draft Local Plan aligns with the National Planning Policy Framework and other government policies. Its evidence base is publicly accessible and continuously updated. The Plan's policies are given weight based on their progress, unresolved objections, and consistency with national policy.

This draft is not the final version; public feedback will shape subsequent stages before submission to the Secretary of State for examination. An independent Inspector will review the Plan before the Council can adopt it.

Appendix B – Steering Group Minutes

Minutes of meeting

Place	Teams		
Date	18/03/2024	13:00	14:00
Present	Allan Clarke	NULBC	AC
	Eva Neale	Staffordshire CC	EN
	Joanne Keay	Staffordshire CC	JK
	Ed Whittaker	Sweco	EW
	Karl Jarvis	Sweco	KJ
	Martin Sellman	Sweco	MS
	Xenia Masoura	Sweco	XM
	Patrick Thomas	National Highways	PT
	Chris Morris	AECOM	CM
	Claire Simpson	SoTCC	CS
	Paul Griffiths	CEC	PG

Copy to	Brian Edwards	SoTCC	BE
	David Pyner	National Highways	DP
	Eri Wong	National Highways	EW

Subject of meeting: Newcastle-under-Lyme Local Plan - Strategic Transport Assessment

Meeting Agenda

1	**Introduction:** • **Introduction** from those attending the inception meeting (All) • **Purpose of the STA within the Local Plan:** to support the emerging Regulation 19 Local Plan, will assess the impacts of LP scheme based on analysis with the North Staffordshire Multimodal Model (NSMM). • **Review of the strategic development sites and other Local Plan sites**: presented map of local plan sites (residential and employment) and table of the three strategic sites: AB2 – employment site, TK30 and KL15 – mixed use sites. • **Steering group engagement strategy and timetable**: first of a series of meetings to review the reference case model, identify areas of concern and the study area. Future meetings will look at forecast traffic from the local plan sites and looking at potential mitigation packages before Sweco provides a final STA to the steering group.		
2	**NSMM (North Staffordshire Multi Modal) Model (Sweco)** • **Introduction to the NSMM:** To be used for forecasting and assessment of the impact of proposed planning. Multi-modal model of 288 zones covering NULBC and SoTCC in detail. It includes a demand model, highway assignment model, public transport model and it has been signed off by SoTCC, DfT, NH and JAQU. Model periods include AM, IP and PM peak hours (8-9am, 2-3pm and 5-6pm) • Presented network structure on map as well as junction coding • Several modelling reports available including LMVR, demand modelling report, data collection and forecasting report. As part of the local air quality plan, Sweco produced a T2 report (similar to LMVR). • **Applications of the NSMM and previous sign-offs**. Extensively used for various projects such as: o Etruria Valley Link Road - signed off by DfT o Local Plan Modelling - signed off by SoTCC Officers o Local Air Quality Plan - signed off by JAQU -DfT/DEFRA o TCF – College Road and Station Road changes - signed off by DfT	,	

3	**Policy Context (Sweco)** • **Key local national policies and how they relate to the STA:** We have started a policy review that would be key for the mitigation measures stage.		
4	**Data Analysis** • **Census commute data (2011):** 72% of commute trips are "driving car or van or passenger in a car or van. Plotting these commute patterns (map), the polycentric Stoke-on-Trent is evident with Hanley being the key commuting centre, and with NULBC centre following with slightly less trips. • **Local Traffic Trends:** annual traffic in Staffordshire and Stoke-on-Trent has been stable from 2016 (apart from the COVID period) and recovering in 2022. Traffic specifically for NULBC (DfT AADF from traffic counts) has been stable, apart from dropping during COVID. • **Accident data for the last 5 years:** showing map with accident hotspots based on the last five years data (locally validated data for NULBC and STATS19 data for external areas). With a 1.5km study area around the strategic sites which can be updated if needed later on. Observations: o **AB2**: cluster of accidents to the north of the site, both to the slip roads and junction. Not so many clear hotspots to the south. Some minor accidents on the west bound roundabout approach. A number of serious and fatal accidents on the A500 west of the roundabout. o **TK30:** On the A500 alongside proposed site, a fatal and a serious accident though with similar pattern to other sections of the A500. A hotspot on the roundabout (similar pattern to other A500 roundabouts). o **KL15:** few Hotspots on Keele Rd as approaching the University, generally minor accidents. • Presenting plots of accident data with residential and employment sites: Most other sites are not near obvious hotspots. We see more hotspots along Keele Rd towards NULBC centre where there are a proposed employment and residential sites. • **Accessibility Analysis:** presenting PT Isochrones on a typical day on 9am arrival. o **AB2** does not have PT access. o **KL15:** NULBC accessible in 30 min. SoT Railway within 45 min. Whilst the western side towards Crewe is served by an hourly service, the frequency and travel time severely affects accessibility. o **TK30:** accessibility towards north (Kidsgrove) is a bit more evident, good accessibility with the Stoke conurbation. o **Discounting the arrival wait time:** This analysis removes some of the impacts of an infrequent service. From KL15: increased accessibility to the west. From TK30: increased accessibility to the north and south. • **Local neighbourhood accessibility analysis:** Identified a series of amenity types that could be accessed within 15 minutes by active modes. o **Walk:** Maps illustrating how accessible the areas around the sites are. It is more useful for residential sites since we are looking for access to amenities (school, healthcare etc.) hence not so useful for site AB2 which is just commercial. The baseline analysis shows the need for accessibility, it is assumed that large strategic sites will be designed with improved network accessibility and new destination features. Mapped are all OAs ranged from most accessible OAs to least OAs. Keele and Talke are part of the least accessible neighbourhoods. o **Cycle:** The accessibility does improve. The analysis is heavily influenced by safe routes and cycling infrastructure.		
5	**Local AQ Management:** overview of nearby Air Quality Management Areas (AQMA)s of NULBC and SoTCC. Discussion on the North Staffordshire Local Air Quality Plan under ministerial direction. Discussion of the link between poor air quality and respiratory illnesses. Local hospital admissions for respiratory conditions exceeds national average. **Overview of AQ Constraints:** maps illustrating the 2022 Annual Mean NO_2 around the three strategic sites. M6 likely to present main constraint and will be significant source of air pollutant emissions near to each site. Monitoring in proximity to each site suggests existing levels of NO2 are below national standard (40µg/m3). There are some potentially sensitive designated sites nearby that might be sensitive to changes in nitrogen such as Ancient Woodland and SSSIs.		
6	**Existing Traffic Conditions (Sweco)** • **Examination of traffic speeds at key local sites:** o Identified junctions likely to be affected by Local Plan schemes. o Used 2022 Inrix observed speed data to understand current traffic conditions • **Plots illustrating traffic speeds at key locations AM and PM:**		

	○ **M6 Jct 16:** mainline operating ok. Slip Road shows delays in all time periods ○ **M6 Jct 15:** queueing traffic on the A500 approach, congestion between the roundabout and Newcastle Rd signalised junction with significant delays on all approaches. ○ **A500:** flowing pretty well. No capacity related issues. ○ **Talke Interchange:** slow moving traffic with the roundabout to the north showing delays. ○ **A527:** operating without queues. Slower moving traffic as you move to the side roads ○ **A5271:** signs of queuing traffic in SB and NB slip road in the PM. ○ **A34:** SB exit slip shows delays on AM/PM otherwise looks pretty free flow traffic ○ **A525:** Some slowing between Station Rd and Keele Rd		
7	**NSMM 2023 model validation:** • Previous validation for NSMM LMVR and LAQP show good validation across the model • Localised validation with the use of one day MCC Dft Dta and neutral month ATC WebTris data was presented • This shows NSMM overestimates by around 26-28% against observed: Related to level traffic growth since 2016 and impacts of Covid on travel behaviour • 15-35% of WebTRIS counts validate		
	2040 Reference Case (Sweco) • **Uncertainty log:** received potential allocation data. Any other development or network schemes to consider would be appreciated and would need submitting quickly noting tight timescales • **Reference case network performance (AM, PM):** without LP plan infrastructure added. We have plotted Links where capacity issues appear as well as junction delays: ○ At Talke Interchange Slight to Moderate traffic delays are forecasted at the A34 southbound approach to the A500/A34 junction. ○ Slight to Serious traffic delays are forecasted on the A500 EB approach to the M6/A500. ○ PM similar to the AM. Slight easing of AM issues around strategic sites ○ Non-strategic local plan sites are generally in areas less affected by poor network performance however some of the sites nearer to the centre of NULBC are close to junctions forecast to experience delays		
	Summary and Conclusions (Sweco) • **Overview and suggested modelling approach**: Pre-meeting Technical note shared on the 15th of March detailing our proposed approach. • Timescales are tight hence our proposal is reflecting the available time. • Using the NSMM at a strategic level. NSMM will focus on the incremental change between ref case and LP. • In addition to the ref case which focuses on the committed plans, Model Run 1 will include the Local plan in addition to the RC. Model Runs 2 to 4 are assessing the strategic sites separately.		

Model Run	Model Year	Demand Assumption	Assumption
1	2040	First draft Local Plan (Regulation 19 stage)	Reference Case + Local Plan infrastructure
2	2040	Model Run 1 + J16 potential strategic location	Model Run 1
3	2040	Model Run 1 + Talke potential strategic location	Model Run 1
4	2040	Model Run 1 + Keele potential strategic location	Model Run 1
5	2040	Model Run 1 + final suite of sites proposed for Regulation 19	Model Run 1

• From the validation analysis, NSMM over-forecasts in some areas. We can apply an incremental approach for key junctions. For example, we could utilise the Vissim model that exists for M6 J16 to provide more detail.
• Sensitivity testing will be undertaken.
• **Assessment methodology (including strategy for scoring junction delays):** presenting three approached for scoring junction delays. Previously used a RAG rating for SoTCC (20-

	40 secs, 40-60 secs >60 secs). However, another approach has been utilised by SoTCC (1-2 mins, >2 mins). • Alternative approach: Highway capacity manual - American manual though sometimes used in UK, requires categorisation of signalised/non-signalised junctions.		
	Next Steps: **Review of RC and LP schemes** • Where is traffic impact? • What is the traffic impact around relevant locations? • Consider air quality impacts		
	Open discussion on strategy (All) **Junction Delays:** • **MS:** Previously used the RAG rating. Discussion from Stoke led to the new approach. • **CM:** If the raw delay is supplied, can categorise as needed. **General Modelling Approach** *Vissim model available for J16:* • PT: NH colleagues from the North-west are supporting on this (WSP run a Vissim model of J16). **PT to facilitate a discussion with CM and provide feedback. NULBC to potentially contact NH northwest.** *In terms of J15:* • PT: Do not include in the modelling as it might not be delivered within the timeline of the local plan and it is not committed *Tech Note:* • **PT: To review and provide feedback** *In terms of what else was presented:* • PT: There are constraints regarding the M6 J16 location. Operational network and safety concerns around that junction that have been made to the developer. *Clarification:* • PG: Asking clarification on which HW team is owning the proposals/comments and the modelling? • PT: The border between the northwest and the midlands is on M6 J16. Hence, the site allocation proposals/comments is managed by the Midlands region but the Vissim model is with the northwest region. • PG: There is detailed Vissim model which would need to be utilised. How does that work? • PT: In conversation with the northwest office to get insights *AB2:* • PG: Concerned about baseline public transport access • PT: Agreed. Needs access by sustainable means. • PG: Where developers agree to fund an enhanced bus service, there is a risk of it being discontinued once the funding period concludes leaving a site with no public transport access • JK: Mitigation is needed for J16 sites. We need to understand how the buses will operate outside of working hours. Operators need to be willing to run those and understand what they are going to do with the vehicles for the rest of the day.		
	1. Actions • **Detailed technical note to be shared with more information (Sweco).** • **PT and consultants to review the already provided technical note on the methodology and provide feedback next week.** • **PT to provide feedback and contact for M6 J16 Vissim model.**		

Minutes by

Xenia Masoura

Approved by

Edward Whittaker

Minutes of meeting

Place	Teams			
Date	15/05/2024	10:00		10:45
Present	Allan Clarke	NULBC		AC
	Joanne Keay	Staffordshire CC		JK
	Ed Whittaker	Sweco		EW
	Martin Sellman	Sweco		MS
	Karl Jarvis	Sweco		KJ
	Xenia Masoura	Sweco		XM
	David Battershill	Sweco		DB
	Patrick Thomas	National Highways		PT
	David Pyner	National Highways		DP
	Esme Portsmith	AECOM		EP
	Chris Morris	AECOM		CM
	Brian Edwards	SoTCC		CS
Copy to	Eri Wong	National Highways	EW	
	Paul Griffiths	CEC	PG	

Subject of meeting: Newcastle-under-Lyme Local Plan - Strategic Transport Assessment

Meeting Agenda

1	**Introduction:** - **Introduction** from those attending the meeting **(All)** - **Agenda Overview (Sweco)** • Overview of existing traffic conditions • We will present the following scenarios: ○ Local Plan (non-strategic sites) ○ Local Plan (non-strategic sites) plus, ▪ AB2 – M6 Jct 16 ▪ TK30 – Talke ▪ KL15 - Keele • For each, we will show scenario details of the impact on the road network including plots of flow-difference, volume/capacity and junction delay • Discuss context including current accident statistics and air quality implications • Discuss reporting, including alternative methods of presenting junction delay • Seek advice from the steering group on modelling to date and future modelling • Open discussion on mitigation options, • Give some initial thoughts on potential mitigations • Seek advice from the steering group on mitigations		
2	**Existing Traffic Conditions (Sweco)** • **AM Peak Google Traffic:** presenting plots illustrating the typical AM peak congestion as well as plots of the traffic in proximity to the location of three key sites. Some congestion is visible on the A500 approaching Jct16. Congestion is particularly severe on the WB approach. Some congestion is notable around the Talke roundabout and further up Newcastle Rd. Congestion along parts of the A500 with some smaller severe areas. Congestion is evident in and around NULBC (city centre, A53) including the area around M6 Jct 15. • **SRN – Areas of Potential Interest:** plot presenting the key junctions of the SRN that are of interest as previously identified out by NH		
3	**Model Run Results (Sweco)** **Local Plan – Non Strategic Sites:** • **Local Plan (LP - non-strategic sites):** plot presenting the employment and residential sites excluding the three strategic sites for NULBC • **AM/PM Flow Diff Plots:** flow difference plots between the non-strategic LP and the reference case (RC) identifying the affected links.		

	• **Junction delays and link volume over capacity presented by** Slight Problem (average delay 20-40 secs), Moderate Problem (average delay 40-60 secs), Severe Problem (average delay > 60 secs):
	  ○ AM Junction Delays and Link Volume over Capacity RC (without any LP)
	  ○ AM Junction Delays and Link Volume over Capacity (RC + LP): Identified junctions and links likely to be affected by Local Plan schemes.
	  ○ PM Junction Delays and Link Volume over Capacity RC (without any LP): PM is quite similar to the AM.
	  ○ PM Junction Delays and Link Volume over Capacity (RC + LP): Identified junctions and links likely to be affected by Local Plan schemes. Similar to the AM
	• **Junction delays and link volume over capacity presented by the alternative approach;** Slight Problem (average delay 60-119 secs), Moderate Problem (average delay 120-179 secs), Severe Problem (average delay > 180 secs):
	  ○ AM Reference Case (without any LP)
	  ○ AM Junction Delays (RC + LP): Identified junctions and links likely to be affected by Local Plan schemes. The impact shown is less severe because of the ranges.
	  ○ PM Reference Case (without any LP): Similar to the AM with Jct 16 showing a moderate delay.
	  ○ PM Junction Delays (RC + LP): Identified junctions and links likely to be affected by Local Plan schemes.
	• **Junction delays differences (RC+ LP vs RC):** presenting the junction delay differences for the AM with an increase on the Talke Roundabout and small increases largely on to the local roads towards NULBC. This impact does not look like it travels further than the Jct 15. PM is fairly similar to the AM with Talke Roundabout showing increased delay.
	• **Mitigation: Key areas of increased junction delay**
	  ○ **Slight (Additional 10-20 secs delay)**
	  ▪ Talke Interchange (SRN)
	  ▪ A500/A52 (SRN)
	  ○ **Moderate (Additional 20-40 secs delay)**
	  ▪ A527/Oxford Rd (Chell)
	  ▪ B5500 (Chesterton)
	  ▪ B5044/B5368 (Sliverdale)
	• **Discussion (All):**
	  ○ *BE: To agree on how the results will be presented as the model outputs and plots include SoTCC allocation sites. Approach could include presenting plots including plans from SoTCC only, NULBC only, or combined.*
	  ○ *AP: Happy to meet with BE and JK separate and have a general discussion on how the outputs should be presented by Sweco.*		

4	**Model Run Results (Sweco)**
	Local Plan (non-strategic sites) plus AB2 – M6 Jct 16:
	
	AB2 is an employment site and truck stop site. Demand was derived from latest Jct 16 VISSIM model LMVR. The demand was then assigned to a new NSMM zone (utilising trip generation from Jct 16 LMVR). NSMM was used to assign additional demand to the network. Additional network changes and new signalised junction were implemented as per description in VISSIM LMVR.
	
	Current NSMM signal timings don't allow enough time for turn into development, resulting in delays on the network. Therefore, signal timing would need to be updated and re-run. As the NSMM model is a strategic model and site AB2 is near the periphery, we will assess based on flow change (absolute flow change) between scenarios utilising observed data.
	
	• **AM/PM Flow Difference Plots (AB2 vs Non-Strategic LP):** quite a lot of rerouting on Jct16, however subject to change based on the signal timings update.
	• **AMPM Junction Delays and Link Volume over Capacity (and alternative approach):** not much impact. The alternative approach is showing even slighter impact. Once the signals are resolved, it seems that the demand will also be resolved. Similar picture for the PM.
	• **AM/PM Junction Delay Differences (AB2 vs Non-Strategic LP):** slight increase near the Jct 16.
	• **Potential Mitigation:**
	  ○ Effort to improve the issues from new signalised junction signal timing in the model.
	  ○ PT access is currently poor. Enhanced PT could mitigate some of the car traffic for the employment site providing more travel options.		

	○ Potential HRA site north of Jct 16 on M6 ▪ Most likely to be impacted by additional HGV traffic ▪ Much of the truck stop HGV traffic will be existing M6 traffic. ○ Historic accident data are showing clusters of accidents on the M6 slips and westbound A500 approach. To increase safety, the layby could be removed, and the layout of the junction improved. • **Discussion (All):** ○ *BE: There is an early-stage discussion on how we are going to manage the traffic on the SRN and specifically the M6 and the M1. That would require new signage on Jct15 which would take some traffic off the Jct16. We will use the Jct15 to address that in the future. You can use that as part of commentary in the report.* ○ *PT: We are looking largely on the aspect of the strategic sites and in particular the removal of the layby. It is heavily used at the moment. How would that provision for the current use? NH have continuous conversation on the subject with the developer and has provided comments.* ○ *CM: If you are going to remove the layby, you should seek to replace or provide an alternative. Pay per use scenario does not feel like a valid alternative.* ○ *AP: What form of provision is NH looking to see, so NULBC can incorporate that as part of the policy requirements of the sites.* *PT: We can go away and think from NH perspective what we need. We want to facilitate the developer but also the transport of goods along the network.* ○ *CM: As a minimum - retain the current provision. Additional provision is welcome, however pay as you go scenario raises concerns from NH perspective as it will impact the HGV movements.*		
2	**Model Run Results (Sweco)** **Local Plan (non-strategic sites) plus TK30 – Talke:** TK30 is a strategic housing site which has been added to the existing zone that covers parts of Crackley. An additional zone connector was added to Talke Rd where strategic site access is expected. The NSMM was used to assign additional demand to the network. AM shows additional traffic favouring the A34 Crackley junction. PM shows additional traffic favouring the A500/A34 junction. • **AM/PM Flow Difference Plots (TK30 vs Non-Strategic LP):** slight increases. AM seems to be rerouting towards north and south, while PM is favouring the route from the roundabout down. • **AM/PM Junction Delays and Link Volume over Capacity (and alternative approach):** junction delays are very similar with the Non-Strategic LP in the AM, with the alternative approach looking even better. Similar in the PM and again no significant impact on the junctions. • **AM/PM Junction Delay Differences (TK30 vs Non-Strategic LP):** no modelled junctions that show any issues in the AM and PM. • **Potential Mitigation:** ○ Talke currently has fairly poor PT accessibility as shown in accessibility analysis (plot) ▪ NULBC within 30-45 mins, Hanley at 60 mins ○ Enhanced PT could benefit both local AQMAs of NULBC and Stoke-on-Trent ○ The historic accident count along A500 boundary and Talke Roundabout is typical of this section of A500 (plot) • **Discussion (All):** ○ *No comments*	,	
	Model Run Results (Sweco) **Local Plan (non-strategic sites) plus KL15 – Keele:** KL15 is a university housing and science park strategic site that has been added to existing zone which covers Keele. Additional network detail was added to the University roundabout on Keele Rd. The NSMM was used to assign additional demand to network. AM/PM shows additional traffic towards NULBC. • **AM/PM Flow Difference Plots (KL15 vs Non-Strategic LP):** slight rerouting impact from the EB to NULBC which could be explained by the new housing development (900 dwellings) near the golf course. Currently we are making adjustments on how that will affect the RC. PM is very similar.		

	• **AM/PM Junction Delays and Link Volume over Capacity (and alternative approach):** few junction delays and V/C on Keele Rd. In the alternative approach this is not so obvious. • **AM/PM Junction Delay Differences (KL15 vs Non-Strategic LP):** AM: few junction delays concentrated in NULBC, No other impact on the SRN. PM is similar with less severe junction impact other than near the university • **Potential Mitigation:** o Good options for enhanced PT ▪ Keele University Masterplan includes ambition or a sustainable transport hub due to new accommodation. o Potential options for a link road to A53 ▪ Potentially with bus gate o Some clusters of accidents on Keele Road close to University. • **Discussion (All):** o *No comments*		
3	**Next Steps** • To finesse runs 2-4 • AB2 – Improve signal timings • TK30 – Investigate demand split between zone connectors • To define final run 5 • Final suite of strategic sites • Proposed mitigation measures • Produce draft STA • Present draft STA • Finalise STA		
4	**Open discussion on mitigation options (All)** o *BE: Queried showing the difference at junction level and interested on the impact at the link level* o *BE:We would need to think the alternative approach for junction delays and may want to argue that there is a level of acceptance as it is very subjective. In terms of Junction capacity, we know that we have over 100% of theoretical capacity. However, it is a bit of a grey area.* o *CM: All cities have delays. There is a balance on how much you're willing to accept in terms of delays for growth. If you could report queues, then we can understand if there is an impact on safety (safety issues).* o *KJ: Assumptions on the local plan – agreed with BE on potential to do test with NULBC LP alone.* o *AP: Look to isolate the NULBC LP from the modelling. Cheshire East committed plan with be included.* o *BE: Conscious that the gov is releasing funds for HW improvements. Possibly look into the link road to A53 – this would be the right time. How will we intend to spend that indicative funding. This is the right time to put this into the programme if funding is required.*		
	Actions **Sweco:** • **Include plots on V/C change and queues in report** **NH:** • **Provide comments on the layby removal as a mitigation option for AB2.**		

Minutes by

Xenia Masoura

Approved by

Edward Whittaker

Minutes of meeting

Place	Teams		
Date	19/06/2024	16:00	16:30
Present	Allan Clarke	NULBC	AC
	Joanne Keay	Staffordshire CC	JK
	Eva Neale	Staffordshire CC	EN
	Ed Whittaker	Sweco	EW
	Martin Sellman	Sweco	MS
	Xenia Masoura	Sweco	XM
	Paul Griffiths	CEC	PG
	David Pyner	National Highways	DP
Copy to	Eri Wong	National Highways	EW
	Andrew Powell	SoTCC	AP
	Esme Portsmith	National Highways	EP
	Patrick Thomas	National Highways	PT
	Chris Morris	Aecom	CM
	Claire Simpson	SoTCC	CS

Subject of meeting: Newcastle-under-Lyme Local Plan - Strategic Transport Assessment

Meeting Agenda

1	**Introduction:** **Agenda Overview (Sweco)** • Current Results → updated results to date. • Final Scenario → Working on the final scenario at the moment. • Next Steps → discussion on timings and AOB

2	**Core & Strategic Sites Results (Sweco)**
	• Previously presented individual results for three scenarios as outlined below:
	  ○ Core Local Plan (LP)
	  ○ Core LP + AB2
	  ○ Core LP + KL15
	  ○ Core LP + TK30
	• Since then, Sweco have made improvements to the AB2 scenario. The routing choice has improved and is more reasonable now.
	• Now showing the difference between Reference Case (RC) and LP scenarios. The slides show where conditions have deteriorated, and mitigation may be required.

3	• **Core vs RC Difference**: overview plots showing the Core LP and RC difference for AM and PM, including locations of residential and employment developments. Additionally showing volume over capacity difference and junction delay difference. We do not see major differences when adding the strategic sites. We notice slight differences around:
	  ○ *Alsager*
	  ○ *Kidsgrove*
	  ○ *centred around Keele.*
	  ○ *No change on the A500 west of the M6.*
	  ○ *No change on the SRN*
	  ○ *Changes are mostly restricted in NULBC boundaries*.
	• **AB2 Impact:** Following the update to RC and core scenarios, we do not see any major difference between RC and Core LP. A minor delay issue in the north approach of the Talke Roundabout is shown on Core LP. When we add the AB2 development, we see the Talke Roundabout delay similar to the Core LP and a minor delay in the new Jct 16 signalised junction in the AM, affected only in the WB approach where existing queuing occurs.
	• **M6 Jct 16:**
	  ○ The NSMM is adjusted and now modelling additional AB2 traffic flow similar to the approved Jct 16 Visim model. The NSMM is a strategic model and doesn't have the same level of detail as the Jct 16 microscopic Visim model.

	○ The NSMM has some disadvantages with Jct 16 being on the edge of the fully modelled area, indicated by lower-than-expected turn proportions from M6 NB to A500 WB when compared to available MCC turn data. This movement has a small absolute number of car movements (approx. 50) in the MCC data. This movement is shown to not be impacted by LP trips in the NSMM model. ○ Our current approach for Jct 16 is to present the change in trips (Final Scenario - RC) on top of observed turn counts factored to future year. ○ Both Jct 16 Visim and NSMM models give confidence that they show similar flow patterns. ○ Further testing → our final scenario will be testing a combination of core and strategic sites providing confidence against the schemes going forward for the Local Plan. • **Alsager:** when looking at the difference between Core and RC we see a slight increase in V/C in the AM likely due to the employment/housing development sites in Cheshire East. This very minor increase in V/C (10% at most) does not flag any issues when looking at the absolute values. Mitigation is unlikely to be needed. • **Kidsgrove:** Minor V/C increase is observed, likely related to housing developments in the area (631 houses) with smaller impact in the AM. When looking at the core scenario at absolute values, the AM affected link goes moderate to severe, while in the PM the link is already severe in the RC. We will investigate mitigation options. • There is some junction delay in the Red Bull junction in the AM, however that already indicated severe problems in AM/PM RC model. • **Kidsgrove – Red Bull Signals:** *Sweco presented the NSMM modelled signal timings, requesting for feedback on the coding* ○ JK: the distribution of trips reflects how the local population is using the junction in reality. Suggest leaving as is. • **Crackley**: affecting the local network probably due to CT1 housing site (750), mild issues with less significance in the PM. ○ Core LP scenario - issues on Cedar/Parkhouse Rd only. ○ AM goes from no issues to mild/severe issues. ○ PM goes from no issues to slight/mild issues. • **Beasley:** only minor increase in the AM V/C that could be due to two nearby job sites (612 and 147 jobs). The increase is not enough to trigger V/C issues for Core LP scenario. When looking on the absolute values, the issue is minor, hence mitigation is unlikely to be needed. • **Keele/ Silverdale:** many core schemes have been added, so many links are highlighted due to increases in V/C, with slightly less pronounced impacts in the PM. The impacts are constrained to NULBC only. This is an area that we are discussing/developing mitigation.
4	**Final Scenario (Sweco)** **Uncertainty Log for Final Scenario:** • **Core Sites** ○ Some minor changes to housing allocation –a few being added, and a few removed. ○ No changes to employment allocation • **Strategic Sites – we are going forward with two strategic sites, and we will have a final scenario based on those** ○ AB2 ○ KL15 • **Mitigations** ○ TBC ○ Likely to include Keele
5	**Next Steps** • Develop and run the final scenario: finalise the uncertainty log and mitigation package. • Finalise and distribute the report. • Outline of dates by AC: NULBC has few key meetings over the summer: ○ July 4th – Local Plan published ○ July 16th – Council Review ○ July 24th - Members are approving the plan followed by a minimum of 6 weeks consultation with submission of the plan by end of year
	AOB - PG: Will all modelling and reporting be available during consultation? - AK: All will be published and available for people to comment on.

Minutes by	Approved by
Xenia Masoura	Edward Whittaker

Appendix C – 2023 Model Validation Results

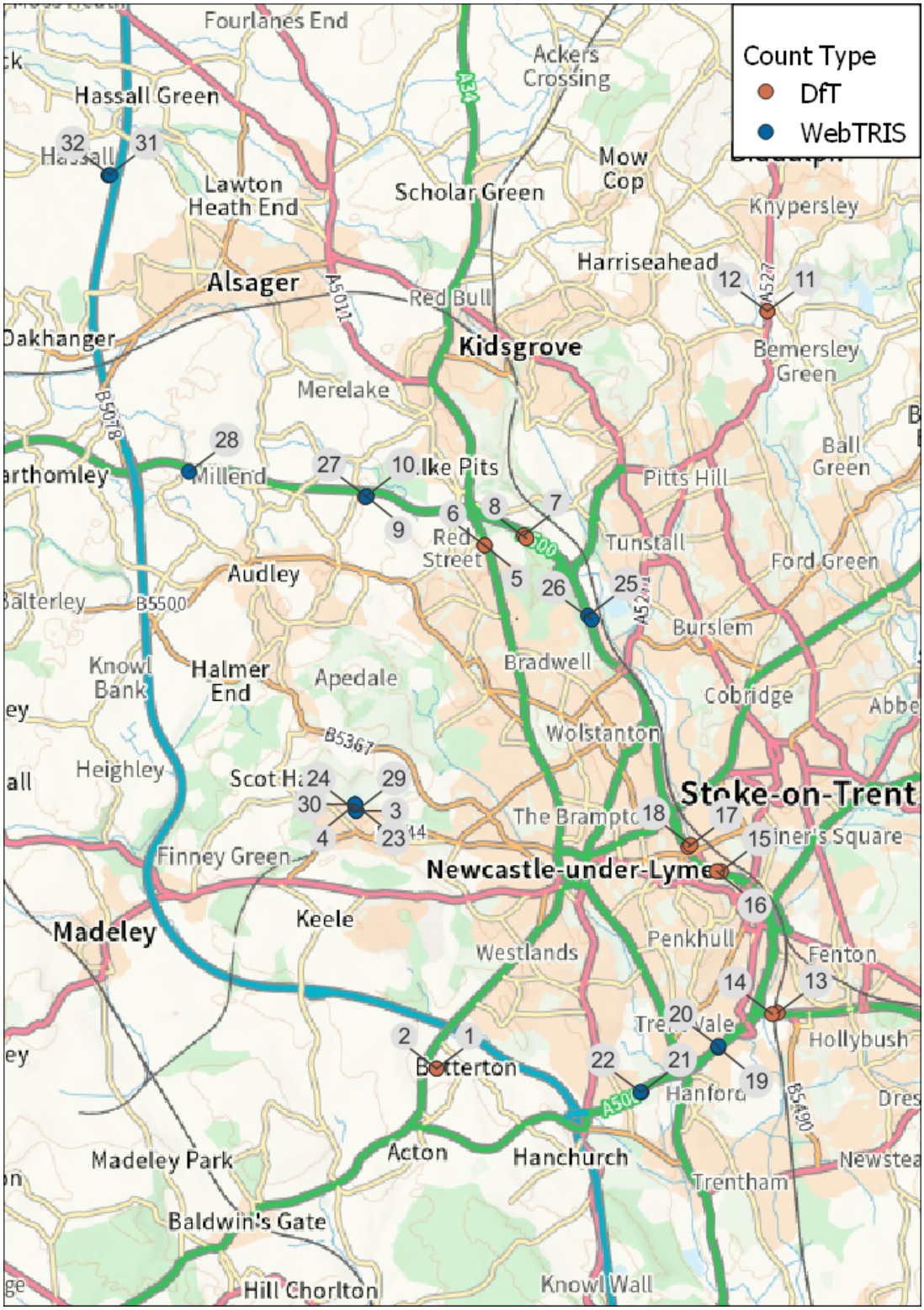


Table 9-1: AM validation - DFT

Id	Link	Direction	Observed	Modelled	Diff	% Diff	GEH	PASS DMRB	PASS GEH	TAG PASS	Year	Data Source
1	A53	S	256	278	22	9%	1.4	✓	✓	✓	2022	DfT
2	A53	N	572	768	196	34%	7.6	×	×	×	2022	DfT
3	M6	N	3081	3813	732	24%	12.5	×	×	×	2022	DfT
4	M6	S	3235	4737	1502	46%	23.8	×	×	×	2022	DfT
5	A34	S	1446	1469	23	2%	0.6	✓	✓	✓	2022	DfT
6	A34	N	803	899	96	12%	3.3	✓	✓	✓	2022	DfT
7	A500	E	2089	2353	264	13%	5.6	✓	×	✓	2022	DfT
8	A500	W	1890	1768	-122	-6%	2.8	✓	✓	✓	2022	DfT
9	A500	E	2179	2323	144	7%	3.0	✓	✓	✓	2022	DfT
10	A500	W	1508	1789	281	19%	6.9	×	×	×	2022	DfT
11	A527	N	590	596	6	1%	0.2	✓	✓	✓	2022	DfT
12	A527	S	676	863	187	28%	6.7	×	×	×	2022	DfT
13	A50	E	3277	3197	-80	-2%	1.4	✓	✓	✓	2022	DfT
14	A50	W	3403	3642	239	7%	4.0	✓	✓	✓	2022	DfT
15	A500	E	3598	3481	-117	-3%	2.0	✓	✓	✓	2022	DfT
16	A500	W	3537	3608	71	2%	1.2	✓	✓	✓	2022	DfT
17	A500	N	3112	3082	-30	-1%	0.5	✓	✓	✓	2022	DfT
18	A500	S	2991	3126	135	5%	2.4	✓	✓	✓	2022	DfT
	Total		**38243**	**41793**	**3550**	**9%**	**17.7**	×	×	×		
	Overall pass							**72%**	**67%**	**72%**		

Table 9-2: PM validation - DFT

Id	Link	Direction	Observed	Modelled	Diff	% Diff	GEH	PASS DMRB	PASS GEH	TAG PASS	Year	Data Source
1	A53	S	385	579	194	50%	8.8	✗	✗	✗	2022	DfT
2	A53	N	301	302	1	0%	0.0	✓	✓	✓	2022	DfT
3	M6	N	3566	5197	1631	46%	24.6	✗	✗	✗	2022	DfT
4	M6	S	3242	4253	1011	31%	16.5	✗	✗	✗	2022	DfT
5	A34	S	907	1077	170	19%	5.4	✗	✗	✗	2022	DfT
6	A34	N	1094	1357	263	24%	7.5	✗	✗	✗	2022	DfT
7	A500	E	1841	2348	507	28%	11.1	✗	✗	✗	2022	DfT
8	A500	W	2445	2613	168	7%	3.3	✓	✓	✓	2022	DfT
9	A500	E	1816	2290	474	26%	10.5	✗	✗	✗	2022	DfT
10	A500	W	1973	2445	472	24%	10.0	✗	✗	✗	2022	DfT
11	A527	N	808	933	125	16%	4.2	✗	✓	✓	2022	DfT
12	A527	S	576	688	112	19%	4.4	✗	✓	✓	2022	DfT
13	A50	E	3704	4089	385	10%	6.2	✓	✗	✓	2022	DfT
14	A50	W	3388	3164	-224	-7%	3.9	✓	✓	✓	2022	DfT
15	A500	E	3549	3772	223	6%	3.7	✓	✓	✓	2022	DfT
16	A500	W	4002	3849	-153	-4%	2.4	✓	✓	✓	2022	DfT
17	A500	N	3473	3469	-4	0%	0.1	✓	✓	✓	2022	DfT
18	A500	S	2565	3197	632	25%	11.8	✗	✗	✗	2022	DfT
	Total		**39635**	**45622**	**5987**	**15%**	**29.0**	✗	✗	✗		
	Overall pass							**39%**	**44%**	**50%**		

Table 9-3: AM validation - WebTRIS

Id	Link	Direction	Observed	Modelled	Diff	% Diff	GEH	PASS DMRB	PASS GEH	TAG PASS	Year	Data Source
19	A500	S	2397	2713	315	13%	6.2	✓	×	✓	2023	WebTRIS
20	A500	N	2885	3366	481	17%	8.6	×	×	×	2023	WebTRIS
21	A500	S	1459	1870	411	28%	10.1	×	×	×	2023	WebTRIS
22	A500	N	1828	2483	655	36%	14.1	×	×	×	2023	WebTRIS
23	M6	S	3046	4737	1690	55%	27.1	×	×	×	2023	WebTRIS
24	M6	N	2861	3813	952	33%	16.5	×	×	×	2023	WebTRIS
25	A500	N	2370	2559	189	8%	3.8	✓	✓	✓	2023	WebTRIS
26	A500	S	3400	3484	83	2%	1.4	✓	✓	✓	2023	WebTRIS
27	A500	S	2141	2323	182	8%	3.8	✓	✓	✓	2023	WebTRIS
28	A500	N	1435	1930	495	35%	12.1	×	×	×	2022	WebTRIS
29	M6	N	2990	3813	823	28%	14.1	×	×	×	2022	WebTRIS
30	M6	S	3040	4737	1697	56%	27.2	×	×	×	2022	WebTRIS
31	M6	N	3903	4302	399	10%	6.2	✓	×	✓	2023	WebTRIS
32	M6	S	3971	5307	1337	34%	19.6	×	×	×	2023	WebTRIS
	Total		**37727**	**47437**	**9710**	**26%**	**47.1**	×	×	×		
	Overall pass							**36%**	**21%**	**36%**		

Table 9-4: PM validation - WebTRIS

Id	Link	Direction	Observed	Modelled	Diff	% Diff	GEH	PASS DMRB	PASS GEH	TAG PASS	Year	Data Source
19	A500	S	2589	3245	656	25%	12.2	✗	✗	✗	2023	WebTRIS
20	A500	N	2330	2692	362	16%	7.2	✗	✗	✗	2023	WebTRIS
21	A500	S	1466	1931	465	32%	11.3	✗	✗	✗	2023	WebTRIS
22	A500	N	1529	1889	360	24%	8.7	✗	✗	✗	2023	WebTRIS
23	M6	S	3425	4253	829	24%	13.4	✗	✗	✗	2023	WebTRIS
24	M6	N	3430	5197	1767	52%	26.9	✗	✗	✗	2023	WebTRIS
25	A500	N	3232	3615	383	12%	6.5	✓	✗	✓	2023	WebTRIS
26	A500	S	2800	3228	429	15%	7.8	✗	✗	✗	2023	WebTRIS
27	A500	S	1938	2290	352	18%	7.7	✗	✗	✗	2023	WebTRIS
28	A500	N	1626	2193	568	35%	13.0	✗	✗	✗	2022	WebTRIS
29	M6	N	3409	5197	1789	52%	27.3	✗	✗	✗	2022	WebTRIS
30	M6	S	2971	4253	1282	43%	21.3	✗	✗	✗	2022	WebTRIS
31	M6	N	4170	5639	1469	35%	21.0	✗	✗	✗	2023	WebTRIS
32	M6	S	4274	4606	331	8%	5.0	✓	✓	✓	2023	WebTRIS
	Total		**39187**	**50230**	**11043**	**28%**	**52.2**	✗	✗	✗		
	Overall pass							**14%**	**7%**	**14%**		

Together with our clients and the collective knowledge of our 18,500 architects, engineers and other specialists, we co-create solutions that address urbanisation, capture the power of digitalisation, and make our societies more sustainable.

Sweco – Transforming society together

SWECO