Sheffield Local Plan

Transport Assessment: Interim Report on Local Road Network Impacts and Potential Mitigation

SYSTRA

September 2023

TRANSPORT ASSESSMENT: INTERIM REPORT ON LOCAL ROAD NETWORK IMPACTS AND POTENTIAL MITIGATION

IDENTIFICATION TABLE	
Client/Project owner	Sheffield City Council
Project	Sheffield Local Plan
Study	Strategic Local Plan
Type of document	Report
Date	26/09/2023
File name	Transport Assessment: Interim Report on Local Road Network Impacts and Potential Mitigation_v03.docx
Number of pages	58

APPROVAL					
Version	**Name**		**Position**	**Date**	**Modifications**
1	Authors	Adam Hogg	Principal Consultant	10/06/2023	
	Checked by	Stephen Heritage	Associate Director	29/06/2022	
	Approved by	Stephen Heritage	Associate Director	30/06/2023	
2	Author	Adam Hogg	Principal Consultant	21/08/23	Comments on v1 from SCC addressed.
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	Approved by	Nick Benbow	Director	21/08/23	
3	Author	Adam Hogg	Principal Consultant	21/09/23	Comments on v2 from SCC addressed.
	Checked by	Alison Daniels	Associate	26/09/23	
	Approved by	Nick Benbow	Director	26/09/23	

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A LRN Link Capacity Analysis

B Potential Local Plan Mitigation Scheme Drawings

1. EXECUTIVE SUMMARY

1.1 Purpose of this Report

1.1.1 Sheffield City Council (SCC) have developed a series of Local Plan options corresponding to differing levels of development intensity. This report summarises the initial findings of the ongoing study into the predicted impact of the Local Plan on the operation of the LRN, and suggests and summarises some preliminary mitigation measures.

1.1.2 Impacts of the Local Plan have been assessed for two forecast years (2029 and 2039) focussing on a comparison with a Reference Case scenario. The Reference Case scenario includes committed land-use developments and transport schemes, which are independent of the scheme being tested, with overall demand for travel controlled to national forecasts (provided by the Department for Transport, through the National Trip End Model (NTEM) dataset).

1.2 Local Plan Assumptions

1.2.1 The Local Plan includes developments at 400 sites, ranging from very small sites containing only a few dwellings to large sites with more than 1,000 dwellings or more than 100,000 square metres of employment space. The sites are primarily located on the fringes of the city centre, in the Lower Don Valley, along the A61/A6102 corridor and in the suburban areas in the south-east of the city. Figure 1 shows the location of the Local Plan allocation sites.

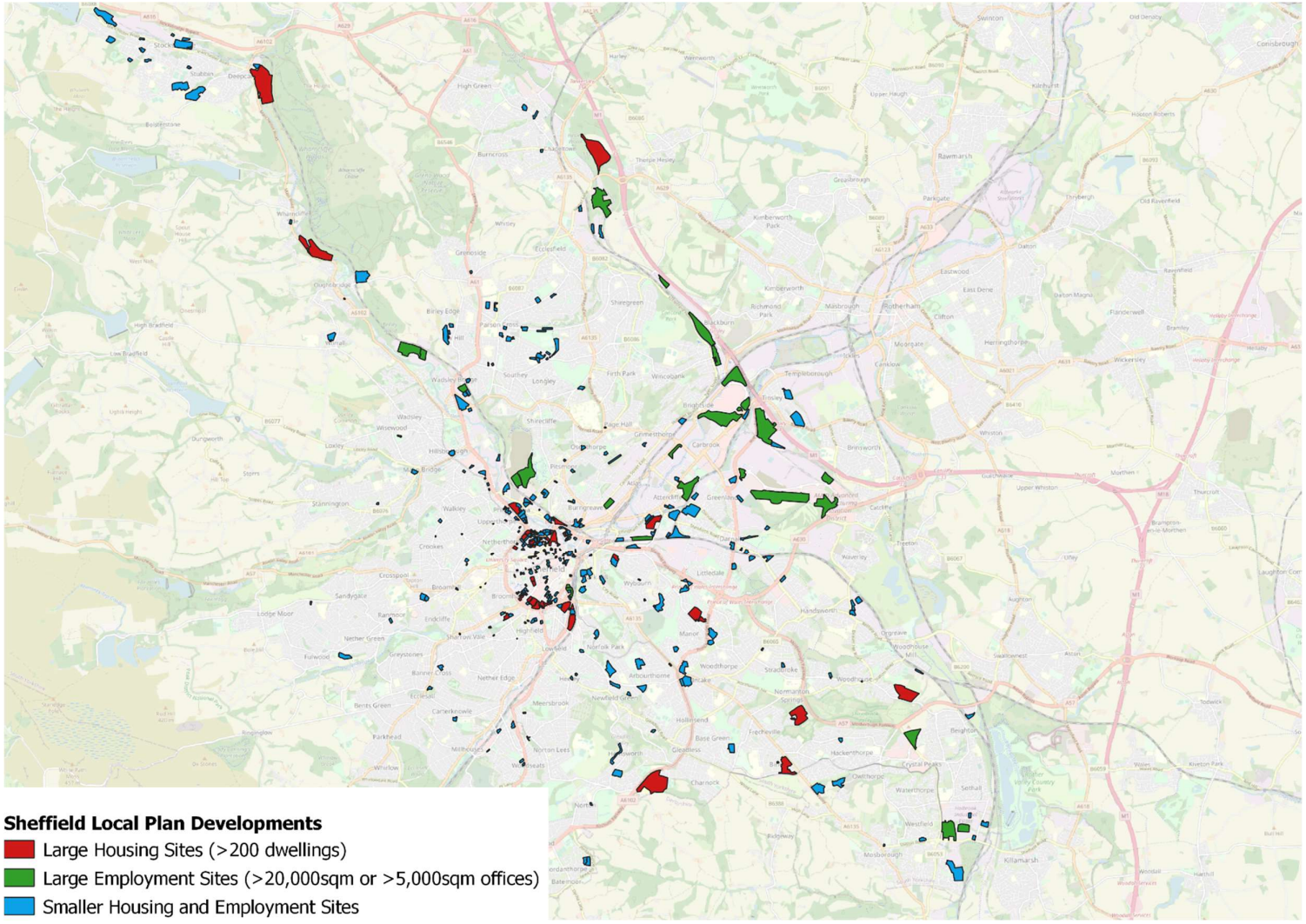


Figure 1. Local Plan Sites

1.3 Key Findings Relating the Local Road Network (LRN)

1.3.1 Analysis of the defined LRN study area indicates five junctions requiring mitigation schemes to be developed:

- A6135 City Road / Wulfric Road
- Birley Moor Road/Occupation Lane
- Mosborough Parkway/Coisley Hill
- Langsett Road North/Church Street
- Orchard Street/Station Lane

1.3.2 A map showing the location of these junctions has been included as Figure 3 on page 32.

1.3.3 Some link capacity impacts are forecast on the A630 Sheffield Parkway; however, none of these comprise severe impacts.

1.3.4 The analysis set out in this report does not cover the entire LRN within Sheffield. The city centre and Lower Don Valley areas are being assessed via AIMSUN microsimulation modelling. Impacts in these areas will be reported separately.

1.4 Next Steps

1.4.1 This study is ongoing and there are tasks still to be completed, these include:

- Review LRN mitigations in line with the comments from SCC internal technical teams
- Confirm / refine proposed mitigation schemes as defined in this report;
- Test and confirm effectiveness of LRN schemes in mitigating identified issues;
- Review Aimsun modelling of City Centre and Lower Don Valley;
- Identify junctions which require mitigation within Aimsun Model area in conjunction with SCC, Fore and Arup
- Design and test mitigation schemes within Aimsun model area in conjunction with SCC, Fore and Arup
- Confirm cumulative effectiveness of proposed mitigation measures via a With Mitigation SCRTM1 model run

2. INTRODUCTION

2.1 Background

2.1.1 SYSTRA are supporting Sheffield City Council (SCC) with the development of their Local Plan up to 2039. This is a complex undertaking which comprises a number of work stages. In late 2022 / early 2023, SYSTRA provided strategic transport modelling support to model the anticipated transport implications of the Local Plan developments. More recently, the project has moved into a more detailed analytical phase along with the consideration of potential mitigation measures.

2.1.2 SCC have developed a series of Local Plan options corresponding to differing levels of development intensity. The Council's agreed spatial option maximises sites in the urban area, whilst allowing consideration of brownfield sites in the Green Belt that adjoin the existing urban area, striking a balance between provision of new homes and protection of the environment. This work focusses on the preferred spatial option site allocations comprising of 28,067 homes and 1.04 million square metres of employment floorspace.

2.1.3 The work has utilised the Sheffield City Region Transport Model 1 (SCRTM1), which is a strategic transport model designed to estimate the effect of changes in transport infrastructure and travel cost upon patterns of demand.

2.1.4 The current phase of the work has focused upon identifying transport impacts and developing preliminary mitigation concepts under the following workstreams:

- public transport and active travel networks, outside Sheffield City centre and in the vicinity of significant development sites;
- Local road network (LRN), outside Sheffield City centre and in the vicinity of significant development sites; and
- Strategic Road Network (SRN) within the agreed area of influence.

2.2 Other Reports

2.2.1 This report should be read in conjunction with the reports documenting other workstreams, specifically:

- ***Summary Report on Strategic Modelling Results (September 2023)*** – documenting the strategic modelling work undertaken and the expected city-wide demand changes as a result of the Local Plan.
- ***Report on Public Transport and Active Travel Impacts and Potential Mitigation (September 2023)*** – documenting the public transport and active travel demand analysis undertaken using SCRTM1 and preliminary recommendations for mitigation measures.
- ***Report on Strategic Road Network Impacts and Potential Mitigation (September 2023)*** – documenting the SRN road capacity analysis undertaken using a range of modelling tools and techniques along with preliminary recommendations for mitigation measures.

2.3 Consultation

2.3.1 In addition to the technical components of the work, SYSTRA have also consulted with National Highways (NH, and their Spatial Planning consultants), South Yorkshire Mayoral Combined Authority (SYMCA), Rotherham Metropolitan Borough Council (RMBC) and other neighbouring authorities. The methodology and key assumptions have been agreed with these stakeholders as the work progressed.

2.4 LRN Area of Impact

2.4.1 Further detailed analysis of the LRN in the city centre and Lower Don Valley is being undertaken using the Aimsun microsimulation models held by SCC. This work is progressing separately to this report, and results will form the base of a separate report. Table 1 describes the analytical tools used for specific LRN areas.

Table 1. Analytical Tools Utilised for Specific Locations

ANALYTICAL TOOLS	ROAD JUNCTION / SECTION / AREA
Aimsun Models	Lower Don Valley City Centre
Local Junction Models	Local Road Network outside city centre and Lower Don Valley (covering most of Sheffield and also small areas of Rotherham)

2.5 Scenarios

2.5.1 Transport demand, capacity impacts and mitigation requirements have been assessed for the following scenarios:

- Reference Case scenario 2029 and 2039 – (with no local plan development)
- With Sheffield Local Plan 2029 and 2039

2.6 Purpose of this Report

2.6.1 The purpose of this report is to summarise the initial findings of the ongoing study into the predicted impact of the Local Plan on the operation of the LRN. This report will also suggest and summarise indicative mitigation schemes as necessary.

2.6.2 The report is structured as follows:

- Chapter 3 - sets out the technical approach;
- Chapter 4 - provides a summary of junction capacity impacts;
- Chapter 5 - provides a summary of link capacity impacts;
- Chapter 6 - sets out identified preliminary mitigation measures; and
- Chapter 7 - summarises the findings of the report.

3. TECHNICAL APPROACH

3.1 Forecasting Approach

3.1.1 In order to support the development of the Sheffield Local Plan, a multi-modal transport model, called Sheffield City Region Transport Model 1 (SCRTM1), has been used. This model was developed by the South Yorkshire Mayoral Combined Authority (SYMCA). The SCRTM1 variable demand model (VDM) is a strategic transport model designed to estimate the effect of changes in transport infrastructure and travel cost upon patterns of traffic demand. All of the traffic flows used in this analysis are derived from the SCRTM1 model.

3.1.2 SCRTM1 comprises a transport variable demand model (VDM) and highway and public transport supply models, with a base year representation of travel of 2016. An explanation of the VDM process is provided in a separate report: Summary Report on Strategic Model Results (August 2023).

3.1.3 This assessment is considered to represent a worst case scenario in terms of traffic demand. The future year Reference Scenario forecasts do not include the representation of any transport interventions over and above already committed and funded interventions, nor the introduction of the policy proposals and mode shift proposals set out in the Sheffield Transport Strategy (https://www.sheffield.gov.uk/travel-transport/transport-strategy-plans). Hence the model tests described in this report are referred to as "Policy Off" tests. As a consequence of this, the strategic modelling does not capture the likely impacts of the land use policies and transport interventions intended to result in reduced trip lengths, as trips increasingly redistribute to local neighbourhood destinations. Nor do they take account of the expected increase in the use of public transport or active modes resulting from improved provision of facilities. This approach represents the most robust level of assessment possible.

3.2 Selection of Junctions for Detailed Analysis

3.2.1 The process of selecting junctions for further detailed analysis via local junction modelling was undertaken using the SCRTM1 strategic model. Two primary variables were considered:

- Increases in traffic demand flows resulting from the Local Plan; and
- The increase in Volume/Capacity (V/C) of junctions across the model network.

3.2.2 These variables were compared between the future year Reference Case scenarios for the 2029 and 2039 model years, and the With the Local Plan scenarios for the 2029 and 2039 model years.

3.2.3 Through GIS mapping of the strategic SCRTM1 network and incorporating the comparisons set out above, junctions affected by the introduction of trips associated with the Local Plan allocations were identified for detailed assessment. Each junction should be taken on its own specific merits. Therefore, it was important to use professional judgment when deciding if detailed assessment was required. However to guide the decision making process the criteria presented in Table 2 was considered as a starting point for each junction. Most junctions will experience some change in traffic flow over the local plan period, and this assessment aimed to identify those which were likely to be severely impacted by Local plan traffic. A V/C change of 10% or more was judged to be a large enough level of change for a junction to require further consideration.

Table 2. Starting Assumptions when Considering Junctions for Assessment

	V/C DECREASE	V/C REMAINS UNCHANGED	V/C INCREASES BY MORE THAN 10%
TRAFFIC DEMAND DECREASES	Do Not Include	Do Not Include	Possibly Include
TRAFFIC DEMAND REMAINS THE SAME	Do Not Include	Do Not Include	Include
TRAFFIC DEMAND INCREASES BY MORE THAN 10%	Possibly Include	Include	Include

3.2.4 As stated, Table 2 represents a starting point for consideration. Factors such as how close the junction is to it theoretical capacity in the reference case and which arms of the junction were experiencing the highest traffic demand increases were also considered.

3.2.5 In addition to the above, junctions considered to be of strategic importance with regard to local traffic corridors and their proximity to Local Plan allocation sites were included by default. This was regardless of whether they were within capacity, nearing capacity or over capacity. This was done to attempt to include junctions which would likely be the subject of scrutiny thought the EIP process.

3.2.6 From this exercise, 42 LRN junctions were identified as having junction congestion that increased from within or nearing capacity to over-capacity, or were likely to experience significant increases in congestion.

3.3 Local Junction Modelling

3.3.1 Once identified, local junction capacity assessments were created utilising the Junctions 10 and LinSig v3 software packages in order to conduct a more detailed review of the potential impacts associated with the Local Plan. All junction modelling has been undertaken in accordance with the relevant TAG guidance (*TAG UNIT M3.1 Highway Assignment Modelling*).

3.3.2 Junctions 10 is an industry standard software package used to assess priority junctions and unsignalised roundabouts. With each of these analysis tools, the measurement of impacts across these junctions has been based on the units used within each respective program – in the case of unsignalised junctions this is Ratio of Flow to Capacity (RFC). RFC provides a measure of the utilised capacity of a junction approach arm. Arms exceeding a ratio of 0.85 (i.e. 85% capacity utilised) are considered to be approaching capacity.

3.3.3 For Junctions 10 models It should be noted that once a Ratio-to Flow-Capacity (RFC) value reaches 1.00 (100%), further impacts are generally over-estimated and should be treated with increased caution.

3.3.4 For signalised junctions the industry standard software LinSig v3 is used , for these junctions Practical Reserve Capacity (PRC) is reported. The threshold indicator is recognised as the Degree of Saturation (DoS%). Once the DoS value reaches 1.0 (100%) a junction is considered to be operating at its theoretical capacity.

3.3.5 For the purpose of the Local Plan evidence base, a ratio of flow to capacity (uncontrolled junctions) / Degree of Saturation (signal controlled junctions) figure of between 85% and 99% was taken to illustrate that the junction is approaching its operational capacity, and a figure of 100% or over illustrates that operational capacity of the junction is exceeded and increased vehicle queuing and delay are likely to occur:

3.4 Approach to Mitigation

3.4.1 The With Local Plan Scenario was compared to the Reference Scenario for the same assessment year, with analysis of the results being classified as per the criteria set out in Table 3 below. Where necessary, professional judgement was applied to confirm the need for mitigation. As a general rule these principles were applied when determining the severity of the predicted impact:

Table 3. Classification of Junction Capacity Results

REFERENCE SCENARIO RESULT	WITH LOCAL PLAN SCENARIO RESULT	CLASSIFICATION	MITIGATION
Result 85% or less	With Local Plan Scenario result 85% or less	No significant impact	No mitigation required
	With Local Plan Scenario result 100% or greater	Significant impact	Mitigation required
Result between 85% and 99%	With Local Plan Scenario between 85% and 99%	No significant impact	No mitigation required
	With Local Plan result is 10% + greater than Reference result	Significant impact	Mitigation required
100% or greater	With Local Plan result is <10% greater than Reference result	No significant impact	No Mitigation required
	With Local Plan result is 10% + greater than Reference result	Significant impact	Mitigation required

3.4.2 Further to any mitigation schemes developed as a result of impacts compared to the criteria set out in Table 3, pre-existing committed infrastructure upgrades as outlined within Sheffield City Council's Infrastructure Delivery Plan (IDP) have also been

reviewed. This was done to attempt to ensure that no mitigation strategies already exist for junctions identified through this study as needing intervention. Schemes identified as having significant PT/Active and Highway capacity benefits have been listed in Table 4.

Table 4. SCC Infrastructure Development Plan Schemes - Road

SCHEME NAME	SCHEME TYPE	INFRASTRUCTURE TYPE	SCHEME DETAILS
TR07 (Shalesmoor)	Integrated transport improvements	Transport - Local Road Network	Provision of additional transport capacity to support housing and employment growth around Kelham and Neepsend in the Shalesmoor Gateway (A61 Penistone Road between Rutland Road and Shalesmoor). Encouragement of more travel by active modes (walking and cycling) and public transport (tram and bus). Improve journey times and reliability for all modes on the Inner Ring Road. Support emergency access to the Northern General Hospital.
TR08 (Broadfield Road)	Integrated transport improvements	Transport - Local Road Network	Provision of increased highway capacity on a localised section of the A61 Chesterfield Road corridor – complemented by the Sheaf Valley cycle route which takes active travel users away from the busy intersection at Broadfield Road
TR38 (Nether Edge to City Centre)	Integrated transport improvements	Transport - Sustainable / Public Transport	Enhanced transport connectivity between Sharrow, Nether Edge and Broomhall linking into the city centre while at the same time improving journeys in the local area.
TR44 (A61 Chesterfield Road South)	Integrated transport improvements	Transport - Sustainable / Public Transport	Proposed A61 South Chesterfield Road corridor improvements including the delivery of a range of public transport, pedestrian access, highways and signal interventions.
TR45 (A61 North - Penistone Road)	Integrated transport improvements	Transport - Sustainable / Public Transport	Proposed A61 North Penistone Road corridor improvements including the delivery of a range of public transport, pedestrian access, highways and signal interventions.

TR46 (Sheffield to high Green)	Integrated transport improvements	Transport - Sustainable / Public Transport	Proposed Sheffield to High Green corridor improvements including the delivery of a range of public transport, pedestrian access, highways and signal interventions.

4. LOCAL ROAD NETWORK – JUNCTION CAPACITY IMPACTS

4.1 Introduction

4.1.1 As described in Section 3.3, 40 LRN junctions were identified as requiring detailed investigation via local junction modelling. These junctions were categorised by their geographic region within the Sheffield City Council area, and a unique identifier was assigned this is outlined in Table 5. Following this, Figure 2 illustrates the approximate location of these junctions and indicates the junction type.

Table 5. Junctions Requiring Detailed Analysis

GEOGRAPHIC REGION	UNIQUE JUNCTION ID	JUNCTION
SOUTHWEST	L-SW-7	Glossop Road/Clarkehouse Road
SOUTHEAST	L-SE-6	London Road/Boston Street
	L-SE-13	Chesterfield Road South/Greenhill Main Road
	L-SE-19	B6388 Gleadless Road / Daresbury Road (tbc)
	L-SE-20	A6135 Granville Road / City Road
	L-SE-21	A6135 City Road / Manor Lane
	L-SE-22	A6135 City Road / Wulfric Road
	L-SE-26	A6102 Ridgeway Road / Newlands Road
	L-SE-27	A6102 Ridgeway Road / B6388 Gleadless Road
	L-SE-28	A6102 Bochum Parkway / Norton Avenue
	L-SE-32	B6053 Eckington Way / Westfield Northway / Holbrook Avenue
	L-SE-33	B6053 Eckington Way / Station Road

	L-SE-35	Station Road/Rother Valley Way
	L-SE-39	B6053 Eckington Way/Owlthorpe Greenway
	L-SE-41	A57 Mosborough Parkway/ B6053 Eckington Way
	L-SE-42	A57 Mosborough Parkway/Woodhouse Lane
	L-SE-43	Birley Moor Road/Occupation Lane
	L-SE-46	A57 Mosborough Parkway/Coisley Hill
NORTHWEST	L-NW-6	A61 Penistone Road / Bradfield Road / Owlerton Green
	L-NW-7	A61 Penistone Road / Owlerton Green
	L-NW-12	A6102 Forge Hill / Langsett Road South
	L-NW-13	A61 Halifax Road / A6102 Herries Road
	L-NW-14	A61 Halifax Road / Herries Road South
	L-NW-15	Langsett Road North/Cockshutts Lane
	L-NW-16	Langsett Road North/Orchard Street
	L-NW-17	Langsett Road North/Church Street
	L-NW-18	Orchard Street/Station Lane
	L-NW-19	Penistone Road North/Claywheels Lane
NORTHEAST	L-NE-2	A630 Sheffield Parkway / B6066 Poplar Way
	L-NE-3	Europa Link/Europa Avenue
	L-NE-18	Burncross Road/Lound Side
	L-NE-19	A6135 Ecclesfield Road / A629 Cowley Lane

	L-NE-20	Cowley Lane/Nether Lane
	L-NE-25	Rutland Road/Neepsend Bridge
	L-NE-26	Pitsmoor Road/Rock Street
	L-NE-29	Rutland Road/Pitsmoor Road
	L-NE-30	Pitsmoor Road/Barnsley Road
	L-NE-31	A6135 / Norwood Road
	L-NE-32	A6135 / A6102
	L-NE-34	Wordsworth Avenue / Southey Green Road

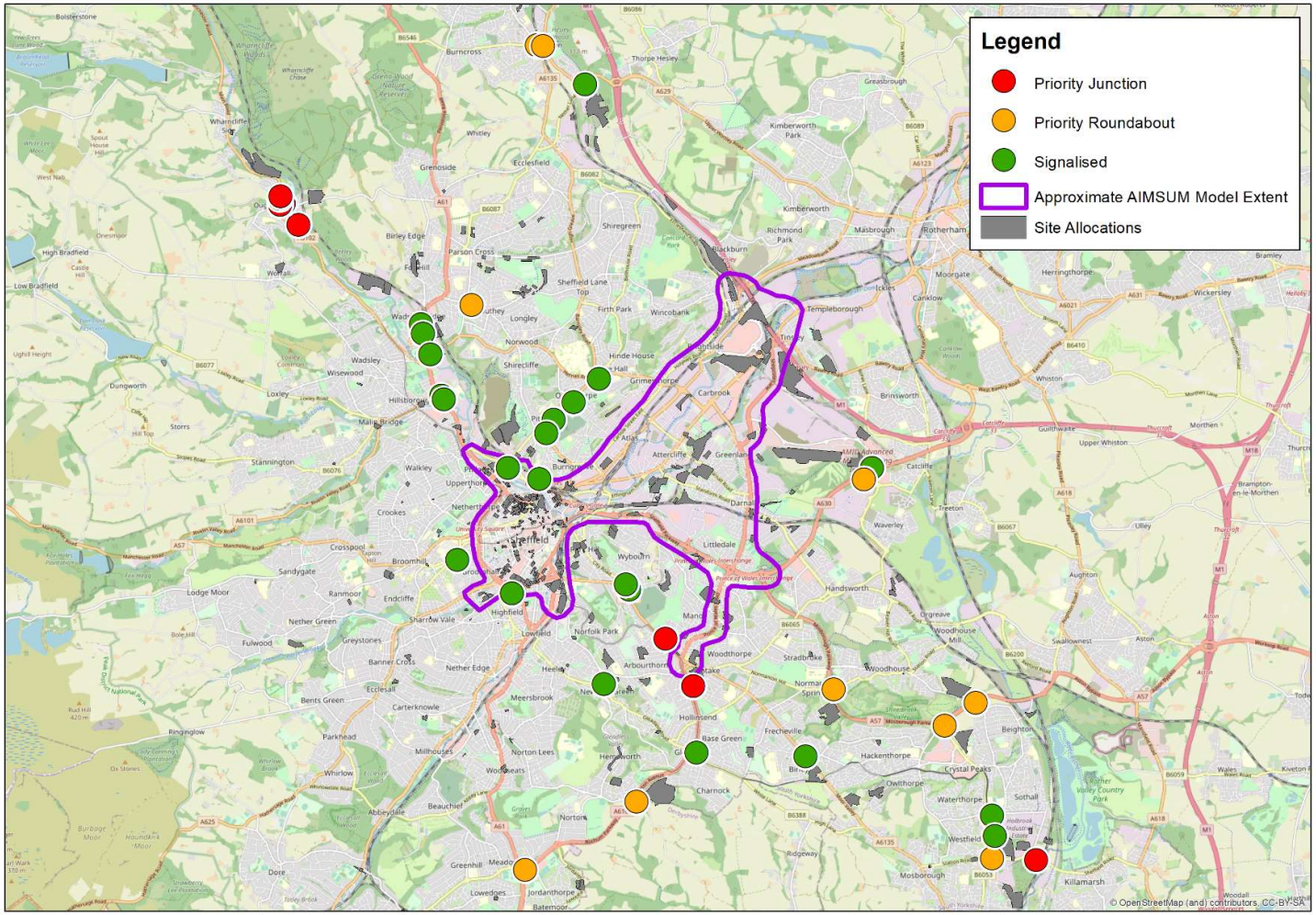


Figure 2. Local Road Network – Junctions Assessed

4.2 Assessment Results

4.2.1 The results of the junction capacity assessments have been summarised in Tables 6 to 8. The junctions have been grouped by geographic region:

- South
- North West
- North East

4.2.2 Junctions which require testing have been assessed using the relevant modelling software, either Junctions 10 or LINSIG v3, and consider the AM and PM peak hours for each scenario tested.

4.2.3 The summary of the analysis for those junctions outlined in Table 5 is based on the highest RFC/DoS recorded at any arm of the junction, and is measured in RFC/DoS (the measurements of which are outlined in section 3.4) depending on the type of junction and the software used to assess the traffic impacts.

4.2.4 For the purpose of the Local Plan evidence base, a ratio of flow to capacity (uncontrolled junctions) / Degree of Saturation (signal controlled junctions) figure of between 85% and 99% was taken to illustrate that the junction is nearing its operational capacity, and a figure of 100% or over illustrates that flows exceed the operational capacity at the junction and increased vehicle queuing and delay are likely to occur.

4.2.5 Table 6 to Table 8 provide a colour coded summary of the results :

- Within Capacity: <84% (Green)
- Nearing Capacity: 85 – 99% (Amber)
- Over Capacity: >100% (Red)

4.3 Junction Capacity Assessment Results – South

4.3.1 Capacity analysis results for the South region are shown in Table 6.

Table 6. Junction Capacity Assessment Results – South

JUNCTION UNIQUE ID	JUNCTION NAME	CAPACITY RESULTS							
		2029 Reference Case		2029 With Local Plan		2039 Reference Case		2039 With Local Plan	
		MORNING PEAK	EVENING PEAK	MORNING PEAK	EVENING PEAK	MORNING PEAK	EVENING PEAK	MORNING PEAK	EVENING PEAK
L-SW-7	Glossop Road/Clarkehouse Road	74%	52%	75%	57%	80%	56%	75%	70%
L-SE-6	London Road/Boston Street	88%	73%	96%	77%	98%	76%	105%	84%
L-SE-13	Chesterfield Road South/Greenhill Main Road	101%	101%	101%	97%	100%	97%	99%	93%
L-SE-19	B6388 Gleadless Road / Daresbury Road	59%	78%	59%	79%	60%	81%	62%	84%
L-SE-20	A6135 Granville Road / City Road	103%	74%	106%	76%	103%	75%	108%	79%
L-SE-21	A6135 City Road / Manor Lane	88%	133%	96%	133%	83%	131%	115%	136%
L-SE-22	A6135 City Road / Wulfric Road	195%	181%	205%	196%	200%	193%	210%	219%
L-SE-26	A6102 Ridgeway Road / Newlands Road	96%	102%	111%	104%	115%	105%	123%	108%
L-SE-27	A6102 Ridgeway Road / B6388 Gleadless Road	90%	111%	95%	117%	92%	122%	96%	132%
L-SE-28	A6102 Bochum Parkway / Norton Avenue	97%	109%	96%	114%	97%	116%	99%	122%

L-SE-32	B6053 Eckington Way / Westfield Northway / Holbrook Avenue	72%	90%	81%	97%	77%	99%	84%	101%
L-SE-33	B6053 Eckington Way / Station Road	88%	93%	86%	95%	87%	97%	87%	98%
L-SE-35	Station Road/Rother Valley Way	103%	90%	110%	97%	107%	97%	140%	152%
L-SE-39	B6053 Eckington Way/Owlthorpe Greenway	114%	138%	122%	141%	118%	142%	125%	146%
L-SE-41	Mosborough Parkway/Eckington Way	101%	109%	101%	114%	102%	114%	101%	117%
L-SE-42	Mosborough Parkway/Woodhouse Lane	67%	71%	68%	67%	67%	69%	72%	65%
L-SE-43	Birley Moor Road/Occupation Lane	71%	117%	85%	128%	79%	120%	92%	128%
L-SE-46	Mosborough Parkway/Coisley Hill	108%	100%	129%	105%	117%	104%	133%	114%

4.3.2 The junction modelling assessments indicate that, while there are several junctions currently operating over capacity in the Reference Case scenarios, the only junctions within this areas shown to be severely impacted by the introduction of generated trips associated with the Local Plan are as follows:

- A6135 City Road/Wulfric Road
- Birley Moor Road/Occupation Lane
- Mosborough Parkway/Coisley Hill

4.3.3 The initial assessment indicated that signalisation of New Street / Station Road may be necessary. However, additional information about the potential access arrangements for site SES04 has become available and further work will be undertaken to assess the implications of this.

4.4 Junction Capacity Assessment Results – Northwest

4.4.1 Capacity analysis results for the Northwest region are shown in Table 7.

Table 7. Junction Capacity Assessment Results – Northwest

JUNCTION UNIQUE ID	JUNCTION NAME	CHANGE IN DEGREE OF SATURATION							
		2029 Reference Case		2029 With Local Plan		2039 Reference Case		2039 With Local Plan	
		MORNING PEAK	EVENING PEAK	MORNING PEAK	EVENING PEAK	MORNING PEAK	EVENING PEAK	MORNING PEAK	EVENING PEAK
L-NW-6	A61 Penistone Road / Bradfield Road / Owlerton Green	73%	72%	72%	73%	74%	73%	81%	74%
L-NW-7	A61 Penistone Road / Owlerton Green								
L-NW-12	A6102 Forge Hill / Langsett Road South	66%	72%	69%	81%	69%	75%	72%	85%
L-NW-13	A61 Halifax Road / A6102 Herries Road	99%	87%	92%	90%	100%	90%	93%	91%
L-NW-14	A61 Halifax Road / Herries Road South	49%	48%	50%	52%	51%	52%	52%	53%
L-NW-15	Langsett Road North/Cockshutts Lane	49%	45%	45%	41%	47%	45%	44%	42%
L-NW-16	Langsett Road North/Orchard Street	0%	0%	0%	0%	0%	0%	0%	0%
L-NW-17	Langsett Road North/Church Street	98%	139%	132%	172%	115%	162%	164%	198%
L-NW-18	Orchard Street/Station Lane	105%	114%	137%	123%	112%	121%	163%	133%
L-NW-19	Penistone Road North/Claywheels Lane	53%	54%	47%	50%	54%	55%	48%	51%

4.4.2 The junction modelling assessments indicate that, while there are several junctions currently operating over capacity in the Reference Case scenarios, the only junctions in this area forecast to be severely impacted by the introduction of Local Plan generated trips are listed as follows:

- Langsett Road North/Church Street
- Orchard Street/Station Lane

4.5 Junction Capacity Assessment Results – Northeast

4.5.1 Capacity analysis results for the Northeast region are shown in Table 8.

Table 8. Junction Capacity Assessment Results – Northeast

JUNCTION UNIQUE ID	JUNCTION NAME	CHANGE IN DEGREE OF SATURATION							
		2029 Reference Case		2029 With Local Plan		2039 Reference Case		2039 With Local Plan	
		MORNING PEAK	EVENING PEAK	MORNING PEAK	EVENING PEAK	MORNING PEAK	EVENING PEAK	MORNING PEAK	EVENING PEAK
L-NE-2	A630 Sheffield Parkway / B6066 Poplar Way	82%	82%	73%	85%	75%	84%	83%	88%
L-NE-3	Europa Link/Europa Avenue	64%	36%	77%	54%	64%	37%	78%	53%
L-NE-18	Burncross Road/Lound Side	78%	103%	80%	106%	83%	105%	83%	107%
L-NE-19	A6135 Ecclesfield Road / A629 Cowley Lane	100%	100%	100%	101%	101%	100%	104%	100%
L-NE-20	Cowley Lane/Nether Lane	57%	66%	66%	66%	68%	68%	80%	68%
L-NE-25	Rutland Road/Neepsend Bridge	57%	53%	65%	68%	54%	55%	65%	70%
L-NE-26	Pitsmoor Road/Rock Street	50%	76%	50%	84%	50%	78%	48%	84%
L-NE-29	Rutland Road/Pitsmoor Road	100%	88%	102%	96%	104%	92%	104%	99%
L-NE-30	Pitsmoor Road/Barnsley Road	74%	68%	76%	70%	77%	69%	77%	71%

L-NE-31	A6135 / Norwood Road	74%	67%	74%	68%	75%	68%	74%	70%
L-NE-32	A6135 / A6102	84%	72%	84%	75%	85%	73%	84%	78%
L-NE-34	Wordsworth Avenue / Southey Green Road	60%	88%	65%	94%	61%	90%	64%	96%

4.5.2 The junction modelling assessments indicate that, while there are several junctions currently operating over capacity in the Reference Case scenarios, there are no junctions illustrated to be severely impacted by the introduction of Local Plan generated trips.

4.6 Assessment Summary

4.6.1 The detailed assessment has identified five junctions across the study area which require mitigation options to be considered, those are:

- A6135 City Road / Wulfric Road
- Birley Moor Road/Occupation Lane
- Mosborough Parkway/Coisley Hill
- Langsett Road North/Church Street
- Orchard Street/Station Lane

4.6.2 Mitigation schemes for these junctions will be discussed in Chapter 6. A map showing the location of these junctions is shown in Figure 3.

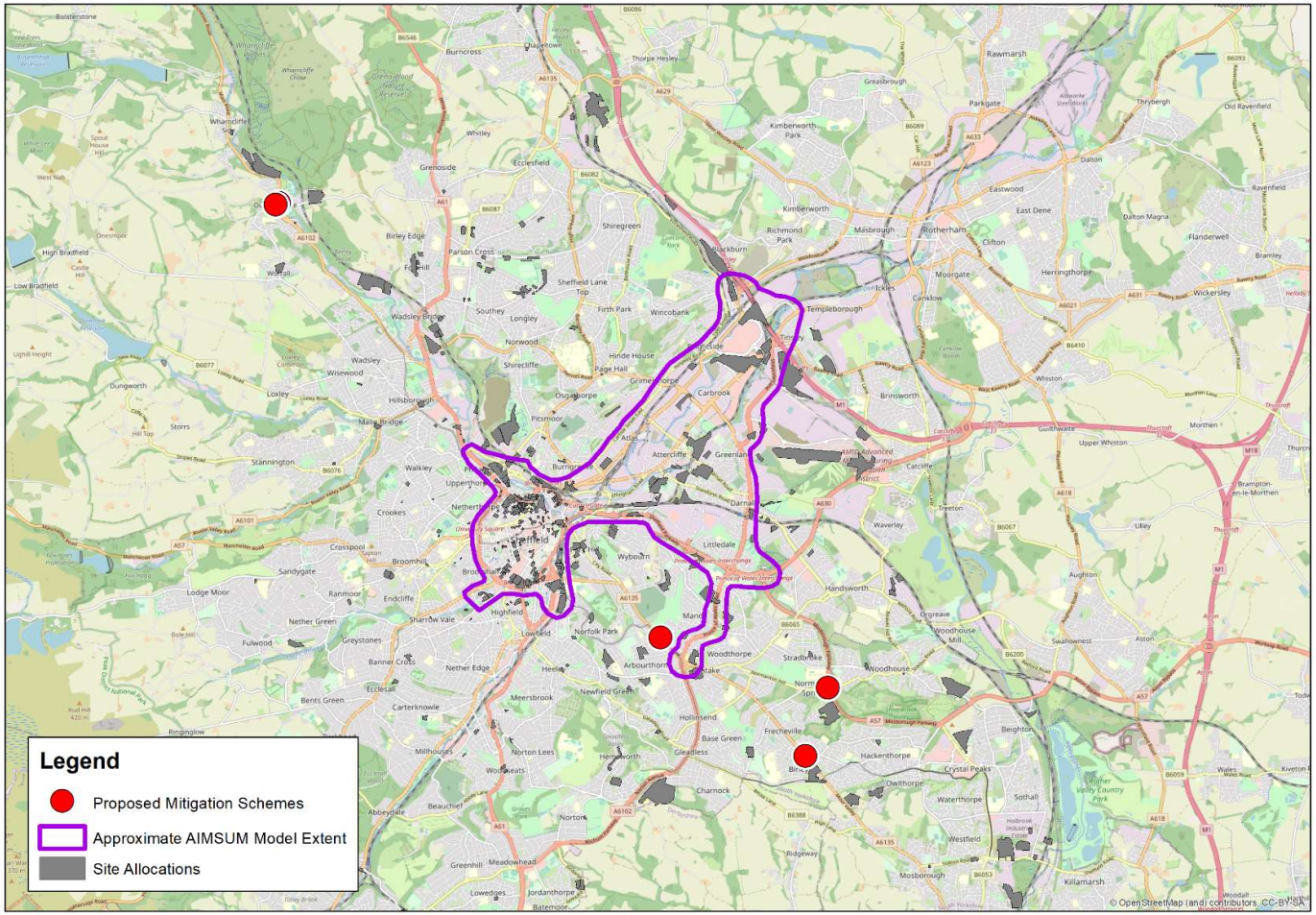


Figure 3. Junctions Requiring Mitigation

5. LOCAL ROAD NETWORK – LINK CAPACITY IMPACTS

5.1.1 Analysis of traffic flows and capacities was undertaken for all dual carriageway / grade-separated roads beyond the Strategic Road Network (SRN). Appendix A presents the following analysis for these roads:

- Assumed Link Capacity.
- Observed Base Year Flows.
- Base Year, 2029 and 2039 Reference Case Flows, and 2029 and 2039 Local Plan Scenario Flows in vehicles / hour.
- Flow Differences between the Reference Case and the Local Plan Models.
- Calculated Volume Over Capacity Ratios – this is a ratio which gives a good overall guide to a road's capacity *(V/C ratio is calculated for each turning movement at each junction. It is calculated by dividing the flow arriving at the junction by the capacity, separately for each turning movement. When the V/C is 100% the junction is at capacity*).

5.1.2 Of these dual carriageway / grade separated links only the A630 Sheffield Parkway is significantly affected by the local plan traffic in 2029 as shown in Table 9. In the morning peak hour, the V/C ratios increase for most sections of the Parkway, in both directions, but there are no sections where the V/C ratio increases significantly. In the evening peak hour, the V0C ratios increase significantly at the following locations, but still remain under 100%:

- Eastbound between city centre and A6102 junction (V/C increases from 85% to 91%)
- Eastbound between A57 Interchange and Handsworth Interchange (V/C increases from 83% to 89%)
- Eastbound between Europa Link and M1 Junction 33 (V/C increases from 84% to 96%)

5.1.3 In 2039, the V/C ratios increase on every section of the Parkway, in both directions and in both time periods. The section most affected is the eastbound section between Europa Link and M1 Junction 33, where in the evening peak hour the V/C increases from 87% to 101%, pushing it over capacity.

Table 9. 2029 Link Capacity Analysis for the LRN (A630 Parkway)

			REF CASE V/C		LOCAL PLAN V/C	
ROUTE	**DIRECTION**	**DESCRIPTION**	**AM**	**PM**	**AM**	**PM**
A630 Parkway	Eastbound	to A6102 junction	57%	85%	67%	91%
A630 Parkway	Westbound	from A6102 junction	94%	80%	92%	86%
A630 Parkway	Eastbound	A57 Int to Handsworth Int	77%	83%	84%	89%
A630 Parkway	Westbound	Handsworth Int to A57 Int	89%	90%	90%	93%
A630 Parkway	Eastbound	Europa Link to M1 j33	86%	84%	90%	96%
A630 Parkway	Westbound	M1 j34 to Europa Link	97%	92%	100%	94%

6. LOCAL ROAD NETWORK - PRELIMINARY JUNCTION MITIGATION MEASURES

6.1 Junctions Requiring Mitigation

6.1.1 As identified in Chapter 4, due to the levels of congestion introduced at specific junctions across the Study area, four mitigation schemes (covering the five junctions) have been developed, these are outlined in Table 10 below.

Table 10. Mitigation schemes

AREA	JUNCTION	MITIGATION PROPOSED
South	A6135 City Road / Wulfric Road	Signalisation of all arms – signal phasing and staging for regular traffic includes Sheffield Supertram due to shared approach arm.
South	Birley Moor Road/Occupation Lane	Addition of left-turn lane for Occupation Lane (with filter) and indicative right-turn arrow for Birley Moor Road (S)
South	A57 Mosborough Parkway/Coisley Hill	Conversion of this junction to a signalised crossroads with a three-lane stop line approach for A57 north and south arms
North West	Langsett Road North/Church Street	Signalisation of all arms at both junctions. Two junctions will effectively operate as one. Therefore, only one set of results has been reported
North West	Orchard Street/Station Lane	

6.1.2 Following the identification of mitigation schemes illustrated in Table 10, junction capacity assessments have been conducted and are summarised in Table 11 and Table 12, again breaking results down by geographic area. These tables also provide the initial results extracted from Table 6 for comparison.

6.1.3 As with the initial junction assessment, The analysis for those junctions outlined in Table 11 and Table 12 is based on the arm with the highest result, and is measured in RFC/DoS (the measurements of which are outlined above) depending on the type of junction and the software used to assess the traffic impacts.

6.1.4 Further details as to the development of the mitigation schemes and a description of what the improvement works entail are illustrated in the following sections.

6.2 South

6.2.1 With mitigation capacity analysis results for the South region are shown in Table 11.

Table 11. Mitigation Results South Area

JUNCTION ID	JUNCTION NAME	JUNCTION TYPE	2029 REF		2029 LOCAL PLAN		2039 REF		2039 LOCAL PLAN	
			AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
L-SE-22	A6135 City Road / Wulfric Road	Existing	195%	181%	205%	196%	200%	193%	210%	219%
		Mitigation	N/A	N/A	80%	89%	N/A	N/A	83%	95%
L-SE-43	Birley Moor Road/Occupation Lane	Existing	71%	117%	85%	128%	79%	120%	92%	128%
		Mitigation	N/A	N/A	78%	107%	N/A	N/A	83%	113%
L-SE-46	A57 Mosborough Parkway/Coisley Hill	Existing	108%	100%	129%	105%	117%	104%	133%	114%
		Mitigation	N/A	N/A	94%	78%	N/A	N/A	103%	89%

A6135 City Road / Wulfric Road

6.2.2 Congestion issues demonstrated at this location were found to be caused by the inability of traffic to successfully exit from Wulfric Road onto the A6135 City Road due to the volume of conflicting traffic passing along the A6135 City Road – this was compounded further by the presence of the Sheffield Supertram.

6.2.3 Mitigation was developed at this location that included the introduction of signalisation of all arms – as the Supertram operates along the same carriageway as regular traffic, tram movements could be governed through the same signal staging as road traffic without the need for separate stages or phases which would add additional delay. The proposed layout is shown in Appendix B Figure B1.

6.2.4 With the introduction of signals at this location, significant improvements have been noted as traffic from Wulfric Road is now able to exit within a suitable timeframe without resulting in severe queue lengths, while not affecting the current performance of the A6135 City Road or the Sheffield Supertram. The maximum DoS is now reported as 95% in the 2039 PM Peak.

6.2.5 SCC currently use a net management strategy in this area, using signals to hold traffic on side roads to prioritise the tram. The area has very good PT services and SCC would like to encourage a change in mode of travel, rather than increasing highway capacity. Although this mitigation scheme is viable at this junction, it is recommended that Sheffield City Council continue to use their network management strategy, and that this is reviewed 5 years into the Local Plan.

Birley Moor Road/Occupation Lane

6.2.6 Congestion issues demonstrated at this location were found to be caused by a lack of suitable turning space available on all arms, specifically in the PM Peak scenarios.

6.2.7 As this junction is already signalised, mitigation focussed on the increase of lane capacity at this location through the widening of the Occupation Lane approach arm.

As the junction is surrounded by areas of open greenspace, the ability to widen the approach lanes for Occupation Lane through a slight realignment of this arm to the north was available, allowing an additional short-lane for left-turning traffic from Occupation Lane to be added.

6.2.8 This was coupled to a revision of the signal phasing and staging at the junction which included the addition of a left-turn filter signal for the Occupation Lane approach, and the addition of an indicative right-turn arrow for the Birley Moor Road southern approach. The filter and indicative arrow would run in parallel alongside the ahead movement for the Birley Moor Road southern arm, thus allowing more time for these movements to be undertaken.

6.2.9 With the introduction of the widening and revised signal staging for this junction, the mitigation recommended has shown success in alleviating the impact but not eliminating it. However, as the overarching objective of the mitigation is to accommodate trips associated with the Local Plan allocations, and is not focussed on solving pre-existing congestion issues across the network, the inclusion of the infrastructure changes to this junction are considered to have successfully accommodated Local Plan development trips. This scheme is indicatively shown in Appendix B Figure B3 .

6.2.10 Maximum queue lengths now exhibited at this junction are 86 PCUs on the Occupation Lane arm during the 2039 With Local Plan PM Peak scenario, while maximum DoS is 113% during the same scenario on the same arm.

6.2.11 Although this mitigation scheme is viable at this junction, it is recommended that Sheffield City Council continue to use their network management strategy in this area, and that this junction is reviewed 5 years into the Local Plan.

A57 Mosborough Parkway/Coisley Hill

6.2.12 Congestion issues at this location were found to be caused by a lack of turning storage on the A57 Mosborough Parkway southern arm and Coisley Hill western arm in all scenarios.

6.2.13 Initially, proposals were made to introduce a free-flow slip that would connect the A57 Mosborough Parkway southern arm with the Coisley Hill western arm so as to remove this movement from the circulatory, the intention being to increase circulatory space on the roundabout itself and thus alleviate congestion on the Coisley Hill western arm by allowing more green time for this arm. However, due to the presence of a heavily wooded area bounding the roundabout to the west, together with general space constraints, a free-flow slip could not be implemented at this location without requiring a departure from standard and potentially significant ecological impact.

6.2.14 Therefore, proposals were instead made to convert the roundabout to a signalised crossroads, using the space made available from the removal of the roundabout to allow for a three-lane approach for both the A57 Mosborough Parkway northern and southern arms. Phasing and staging of signals would then be used to ensure that the maximum cycle time was exploited to allow traffic to enter and exit the junction without significant queuing – right-turn movements would give-way to opposing flows during their respective green-times.

6.2.15 With the introduction of the widening and revised signal staging for this junction, the mitigation recommended has shown success in alleviating the impact but not eliminating it. However, as the overarching objective of the mitigation is to accommodate trips associated with the Local Plan allocations, and is not focussed on solving pre-existing congestion issues across the network, the inclusion of the infrastructure changes to this junction do successfully accommodate Local Plan development trips. This scheme is indicatively shown in Appendix B Figure B4 .

6.2.16 Maximum queue lengths now exhibited at this junction are 30 PCUs on the A57 Mosborough Parkway northern approach during the 2039 With Local Plan PM Peak scenario, while maximum DoS is 102% during the 2039 With Local Plan AM Peak scenario on the same arm.

6.2.17 A second potential scheme was also investigated converting the existing roundabout into an oval shape that occupied some of the surrounding green space, thus allowing for additional space on the circulatory for traffic movements, while all arms would be signalised so as to manage traffic entering the junction. While tests were undertaken based on this scheme using an Inscribed Circle Diameter (ICD) of 74m west to east, and 54m north to south, this failed to alleviate the issues of queuing on the A57 Mosborough Parkway south arm and Coisley Hill western arm.

6.2.18 It is understood that there is a part-time traffic signals scheme which has been recently completed at this junction. This will be tested in next revision of this assessment. It is possible that this scheme could reduce the scale of or need for mitigation at this junction.

6.3 North West

6.3.1 With mitigation capacity analysis results for the Northwest region are shown in Table 12.

Table 12. Mitigation Results North West Area

JUNCTION ID	JUNCTION NAME	JUNCTION TYPE	2029 REF		2029 LOCAL PLAN		2039 REF		2039 LOCAL PLAN	
			AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK	AM PEAK	PM PEAK
L-NW-17	Langsett Road North/Church Street	Existing	98%	139%	132%	172%	115%	162%	164%	198%
		Mitigation	N/A	N/A	106%	81%	N/A	N/A	103%	86%
L-NW-18	Orchard Street/Station Lane	Existing	105%	114%	137%	123%	112%	121%	163%	133%
		Mitigation	N/A	N/A	106%	81%	N/A	N/A	103%	86%

Langsett Road North/Church Street and Orchard Street/Station Lane

6.3.2 Congestion issues demonstrated at these junctions were found to be caused by the inability of traffic to successfully exit either of the minor arms, Church Street for the Langsett Road North/Church Street junction and Station Lane for the Orchard Street/Station. This was due to the volume of conflicting traffic passing along Langsett Road North and Orchard Street, respectively.

6.3.3 Mitigation was developed at this location that included the introduction of signalisation on all arms of both junctions, effectively combining them into a single signalised junction.

6.3.4 With the introduction of signals for these junctions, the mitigation recommended has shown success in alleviating the impact but not eliminating it. However, as the overarching objective of the mitigation is to accommodate trips associated with the Local Plan allocations, and is not focussed on solving pre-existing congestion issues across the network, the inclusion of the infrastructure changes to this junction are considered to have successfully accommodated Local Plan development trips. This scheme is indicatively shown in Appendix B Figure B5.

6.3.5 Maximum queue lengths with the mitigation in place are 33 PCUs on Bridge Hill during the 2039 With Local Plan AM Peak scenario, while maximum DoS is 106% during the 2029 With Local Plan AM Peak on the Orchard Street arm.

6.3.6 Alternatively, proposals were investigated as to closing Bridge Hill, which connects the two junctions, to through traffic, and thus creating an expanded gyratory around the centre of Oughtibridge via Langsett Road North in the northbound direction, and Orchard Street in the southbound direction – access would still be maintained via Bridge Hill to the car park of The Cock Inn pub located adjacent to Langsett Road North. This arrangement would also be non-signalised at either of the junctions.

6.3.7 As a result of this proposal, however, severe congestion concerns, particularly in the 2039 model years, still existed at both junctions, and thus this mitigation scheme was not explored further.

6.3.8 Due to the complexity of this junction, alternative options may need to be considered in addition to the above proposals.

7. SUMMARY

7.1 Summary

7.1.1 SYSTRA are working on behalf of Sheffield City Council (SCC) who have developed a series of Local Plan options corresponding to differing levels of development intensity. The Council's agreed spatial option maximises sites in the urban area, whilst allowing consideration of brownfield sites in the Green Belt that adjoin the existing urban area, striking a balance between provision of new homes and protection of the environment. This report summarises the findings of the strategic transport model analysis of the transport impacts of the preferred spatial option site allocations comprising of 28,067 homes and 1.04 million square metres of employment floorspace.

7.1.2 Impacts of the Local Plan have been assessed for two forecast years (2029 and 2039) focussing on a comparison with a Reference Case scenario.

7.1.3 Of the 40 junctions tested only five required highway mitigation schemes to be developed, those are :

- A6135 City Road / Wulfric Road
- Birley Moor Road/Occupation Lane
- Mosborough Parkway/Coisley Hill
- Langsett Road North/Church Street
- Orchard Street/Station Lane

7.1.4 Possible mitigation schemes have been proposed at these five locations.

7.1.5 Some link capacity impacts are forecast on the A630 Sheffield Parkway; however, none of these comprise severe impacts.

7.1.6 Based on the work to date, SYSTRA foresees no highway capacity issues on the local road network caused by the trips generated by the Local Plan which cannot be successfully mitigated.

7.2 Next Steps

7.2.1 Beyond the work which has been undertaken to date it is intended to complete the following tasks:

- Review LRN mitigations in line with the comments from SCC internal technical teams
- Confirm / refine proposed mitigation schemes as defined in this report;
- Test and confirm effectiveness of LRN schemes in mitigating identified issues;
- Review Aimsun modelling of City Centre and Lower Don Valley;
- Identify junctions which require mitigation within Aimsun Model area in conjunction with SCC, Fore and Arup
- Design and test mitigation schemes within Aimsun model area in conjunction with SCC, Fore and Arup
- Confirm cumulative effectiveness of proposed mitigation measures via a With Mitigation SCRTM1 model run

7.2.2 By completing these tasks it is believed that a comprehensive picture can be established demonstrating the full impact of the preferred option of Sheffield's Local Plan on the local highway network.

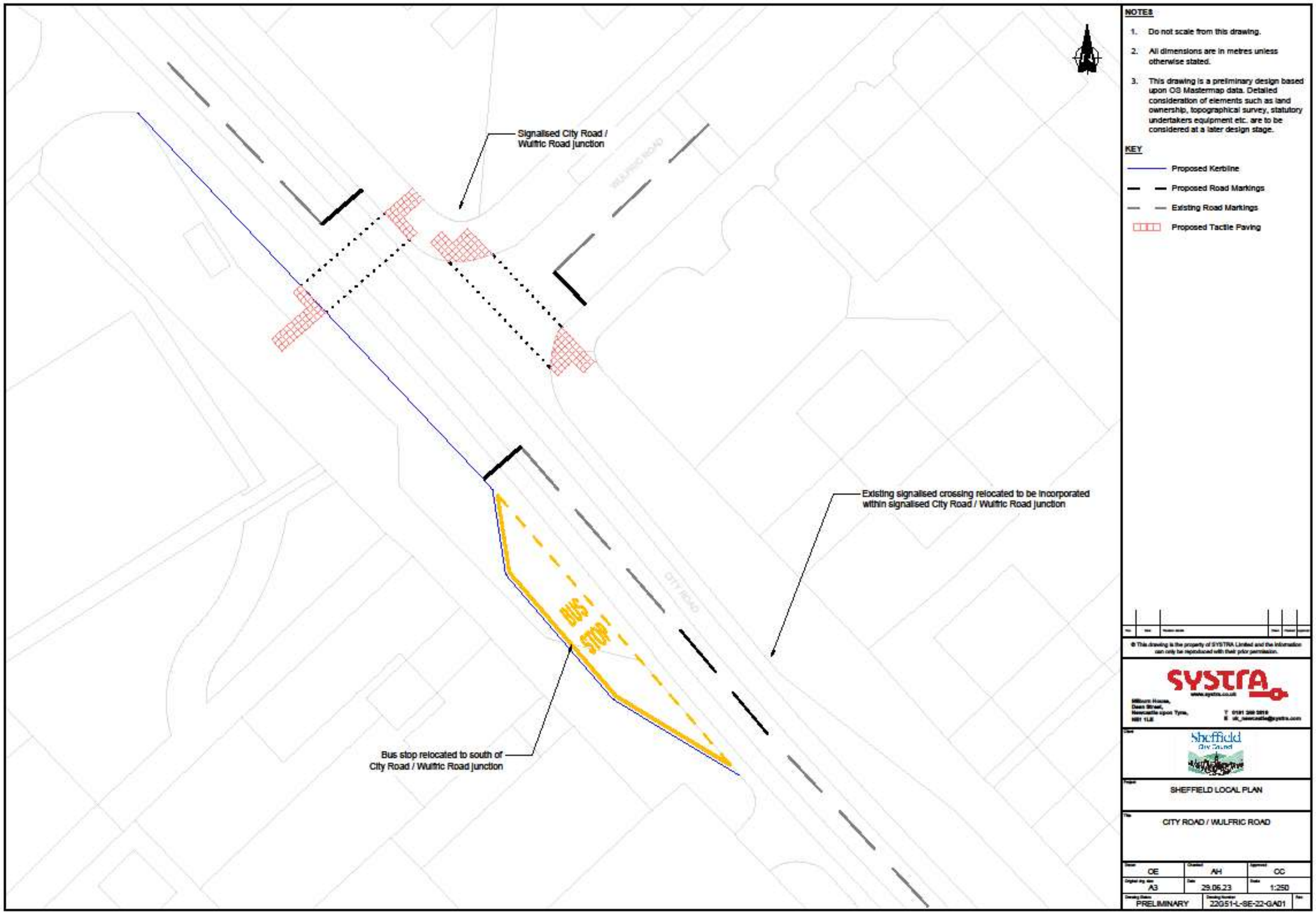
APPENDIX A: LRN Link Capacity Analysis

			Number of Lanes	Assumed Lane Capacity	2029 Ref		2029 Local Plan		Flow Difference 2029 Ref-> 2029 Local Plan		2029 Ref		2029 Local Plan	
Units				Vehs	Vehs		Vehs		Vehs					
Source					Demand Flows		Demand Flows		Demand Flows		VoC		VoC	
Motorway Route	Direction	Link name			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
A630 Parkway	Eastbound	to A6102 jn	2	3,400	1,936	2,887	2,279	3,107	343	220	57%	85%	67%	91%
A630 Parkway	Westbound	from A6102 jn	2	3,400	3,204	2,725	3,143	2,908	- 62	183	94%	80%	92%	86%
A630 Parkway	Eastbound	A57 Int to Handsworth Int	2	3,400	2,602	2,827	2,868	3,023	267	195	77%	83%	84%	89%
A630 Parkway	Westbound	Handsworth Int to A57 Int	2	3,400	3,027	3,052	3,048	3,155	21	103	89%	90%	90%	93%
A630 Parkway	Eastbound	Europa Link to M1 j33	2	3,400	2,939	2,842	3,062	3,279	123	436	86%	84%	90%	96%
A630 Parkway	Westbound	M1 j33 to Europa Link	2	3,400	3,297	3,126	3,389	3,206	92	80	97%	92%	100%	94%
A61	Northbound	Penistone Rd near Albert Terrace Rd	2	3,400	1,009	1,404	1,005	1,421	- 4	17	30%	41%	30%	42%
A61	Southbound	Penistone Rd near Albert Terrace Rd	2	3,400	1,346	876	1,366	913	21	38	40%	26%	40%	27%
A61	Northbound	Penistone Rd, Hillsborough	2	3,400	1,572	2,013	1,619	2,018	46	4	46%	59%	48%	59%
A61	Southbound	Penistone Rd, Hillsborough	2	3,400	2,134	1,647	2,150	1,762	16	115	63%	48%	63%	52%
A61	Northbound	Halifax Rd nr Wilcox Rd	2	3,400	990	1,245	839	1,238	- 151	- 7	29%	37%	25%	36%
A61	Southbound	Halifax Rd nr Wilcox Rd	2	3,400	1,207	1,077	1,138	1,116	- 70	39	36%	32%	33%	33%
A631 Shepcote Lane	Northbound	Europa Link to M1 j34	2	3,400	662	862	780	814	119	- 48	19%	25%	23%	24%
A631 Shepcote Lane	Southbound	M1 j34 to Europa Link	2	3,400	844	528	992	618	148	91	25%	16%	29%	18%
A631 Shepcote Lane	Northbound	Europa Link to A6102	2	3,400	642	709	791	727	150	18	19%	21%	23%	21%
A631 Shepcote Lane	Southbound	A6102 to Europa Link	2	3,400	645	766	709	888	64	122	19%	23%	21%	26%

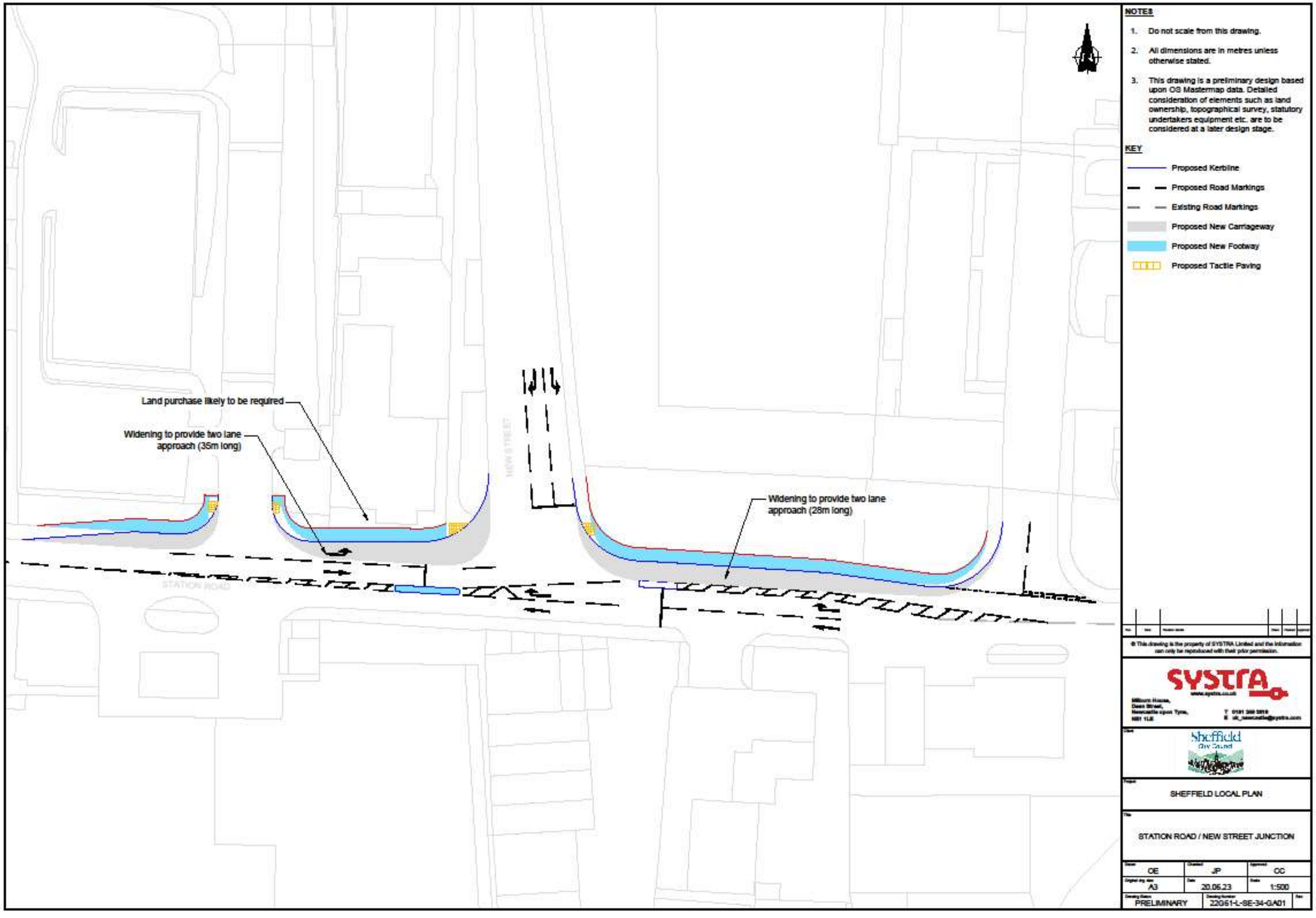
			Number of Lanes	Assumed Lane Capacity	2039 Ref		2039 Local Plan		Flow Difference 2039 Ref-> 2039 Local Plan		2039 Ref		2039 Local Plan	
Units				Vehs	Vehs		Vehs		Vehs					
Source					Demand Flows		Demand Flows		Demand Flows		VoC		VoC	
Motorway Route	Direction	Link name			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
A630 Parkway	Eastbound	to A6102 jn	2	3,400	1,997	3,029	2,455	3,324	459	295	59%	89%	72%	98%
A630 Parkway	Westbound	from A6102 jn	2	3,400	3,286	2,835	3,274	3,027	- 12	192	97%	83%	96%	89%
A630 Parkway	Eastbound	A57 Int to Handsworth Int	2	3,400	2,704	2,934	3,013	3,198	310	264	80%	86%	89%	94%
A630 Parkway	Westbound	Handsworth Int to A57 Int	2	3,400	3,092	3,139	3,121	3,253	29	114	91%	92%	92%	96%
A630 Parkway	Eastbound	Europa Link to M1 j33	2	3,400	3,143	2,951	3,298	3,437	155	486	92%	87%	97%	101%
A630 Parkway	Westbound	M1 j33 to Europa Link	2	3,400	3,370	3,228	3,476	3,369	106	141	99%	95%	102%	99%
A61	Northbound	Penistone Rd near Albert Terrace Rd	2	3,400	1,004	1,439	1,029	1,442	25	3	30%	42%	30%	42%
A61	Southbound	Penistone Rd near Albert Terrace Rd	2	3,400	1,412	941	1,457	1,033	45	92	42%	28%	43%	30%
A61	Northbound	Penistone Rd, Hillsborough	2	3,400	1,588	2,057	1,703	2,064	115	7	47%	61%	50%	61%
A61	Southbound	Penistone Rd, Hillsborough	2	3,400	2,181	1,724	2,199	1,871	18	147	64%	51%	65%	55%
A61	Northbound	Halifax Rd nr Wilcox Rd	2	3,400	1,012	1,253	862	1,254	- 150	1	30%	37%	25%	37%
A61	Southbound	Halifax Rd nr Wilcox Rd	2	3,400	1,227	1,125	1,163	1,148	- 63	24	36%	33%	34%	34%
A631 Shepcote Lane	Northbound	Europa Link to M1 j34	2	3,400	710	898	835	879	126	- 18	21%	26%	25%	26%
A631 Shepcote Lane	Southbound	M1 j34 to Europa Link	2	3,400	889	586	1,057	637	168	51	26%	17%	31%	19%
A631 Shepcote Lane	Northbound	Europa Link to A6102	2	3,400	684	757	855	799	171	42	20%	22%	25%	23%
A631 Shepcote Lane	Southbound	A6102 to Europa Link	2	3,400	672	838	782	915	110	77	20%	25%	23%	27%

APPENDIX B: Potential Mitigation Scheme Drawings

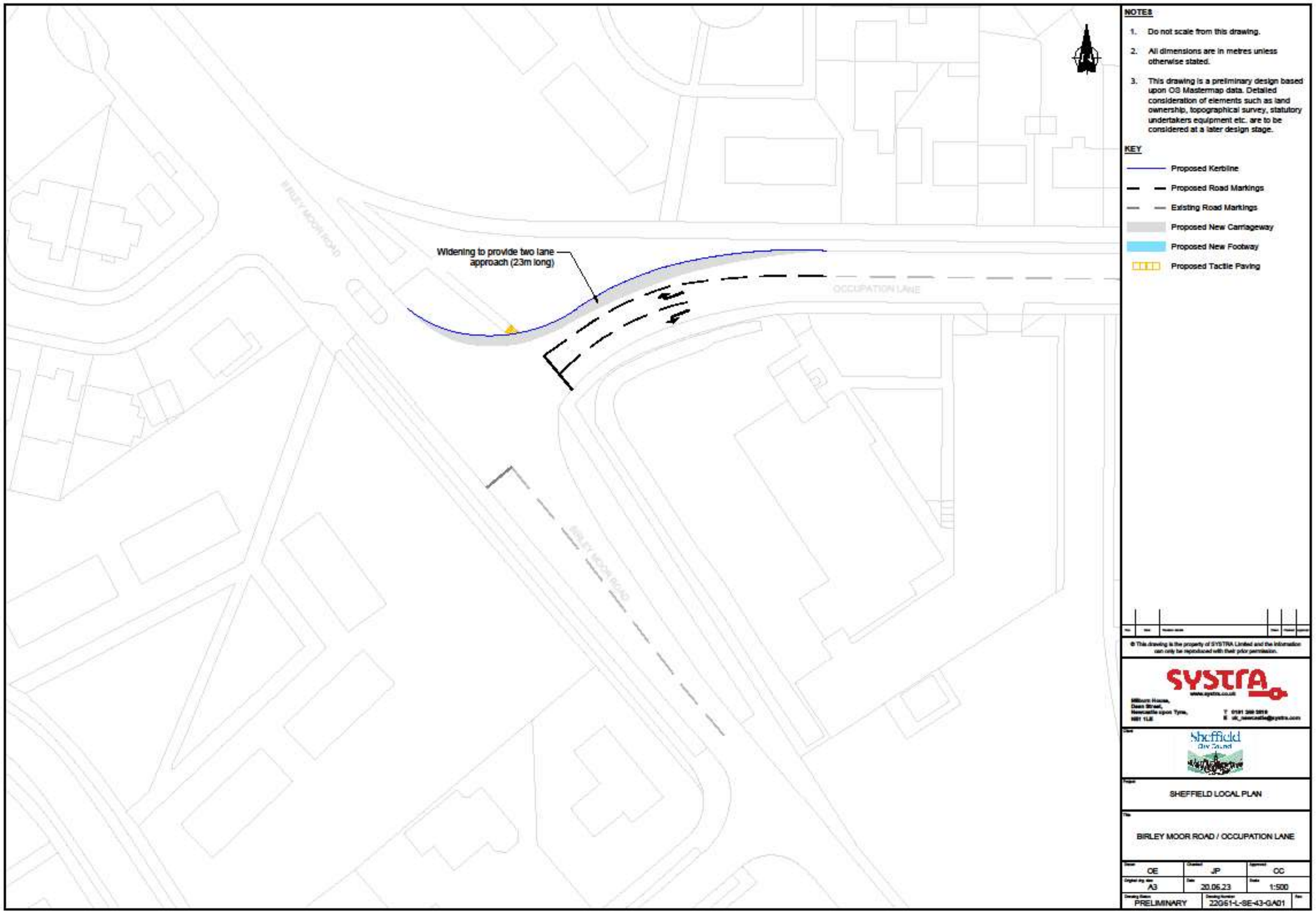
Appendix B Figure B1: A6135 City Road / Wulfric Road



Appendix B Figure B2: Station Road/New Street

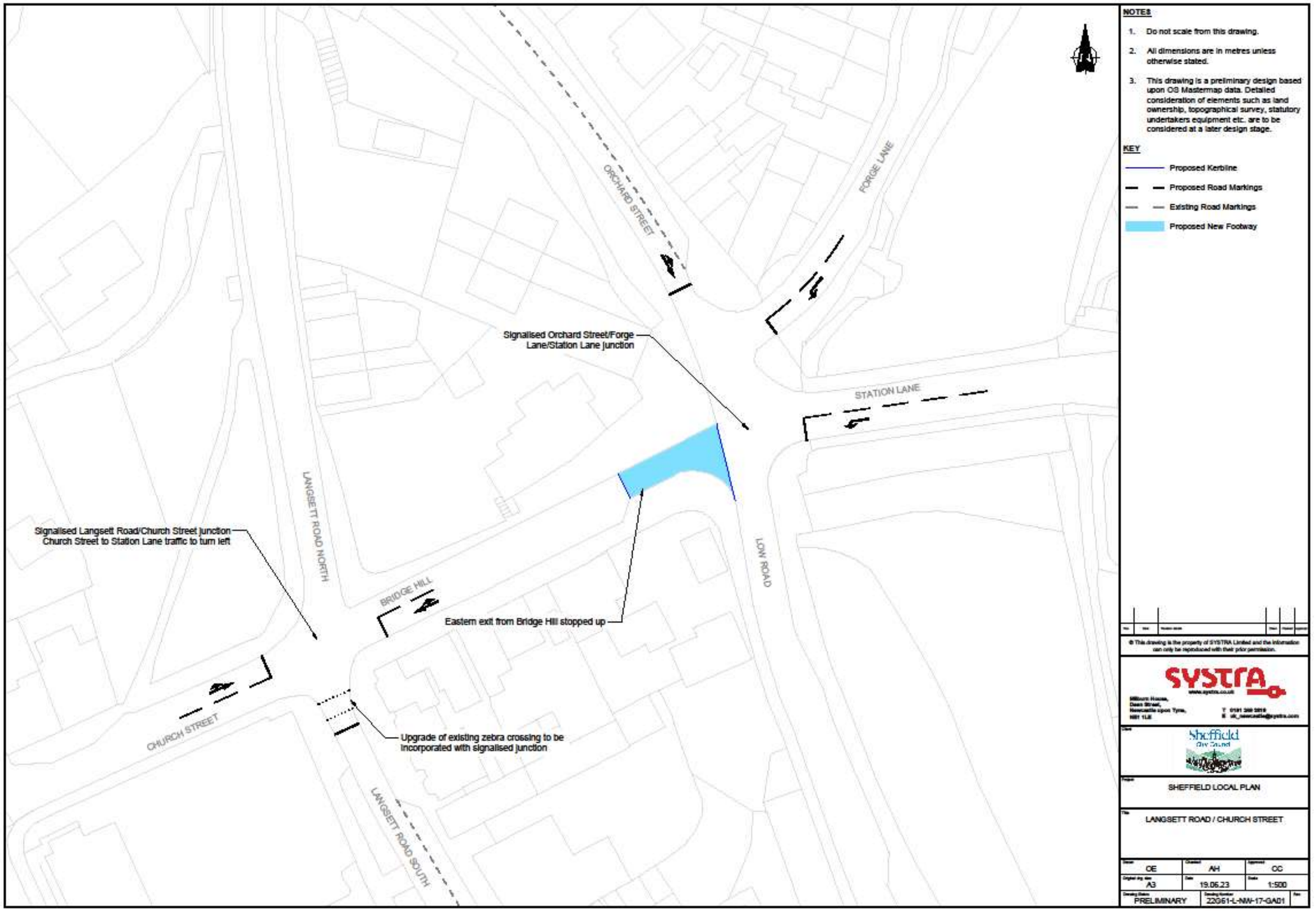


Appendix B Figure B3: Birley Moor Road/Occupation Lane

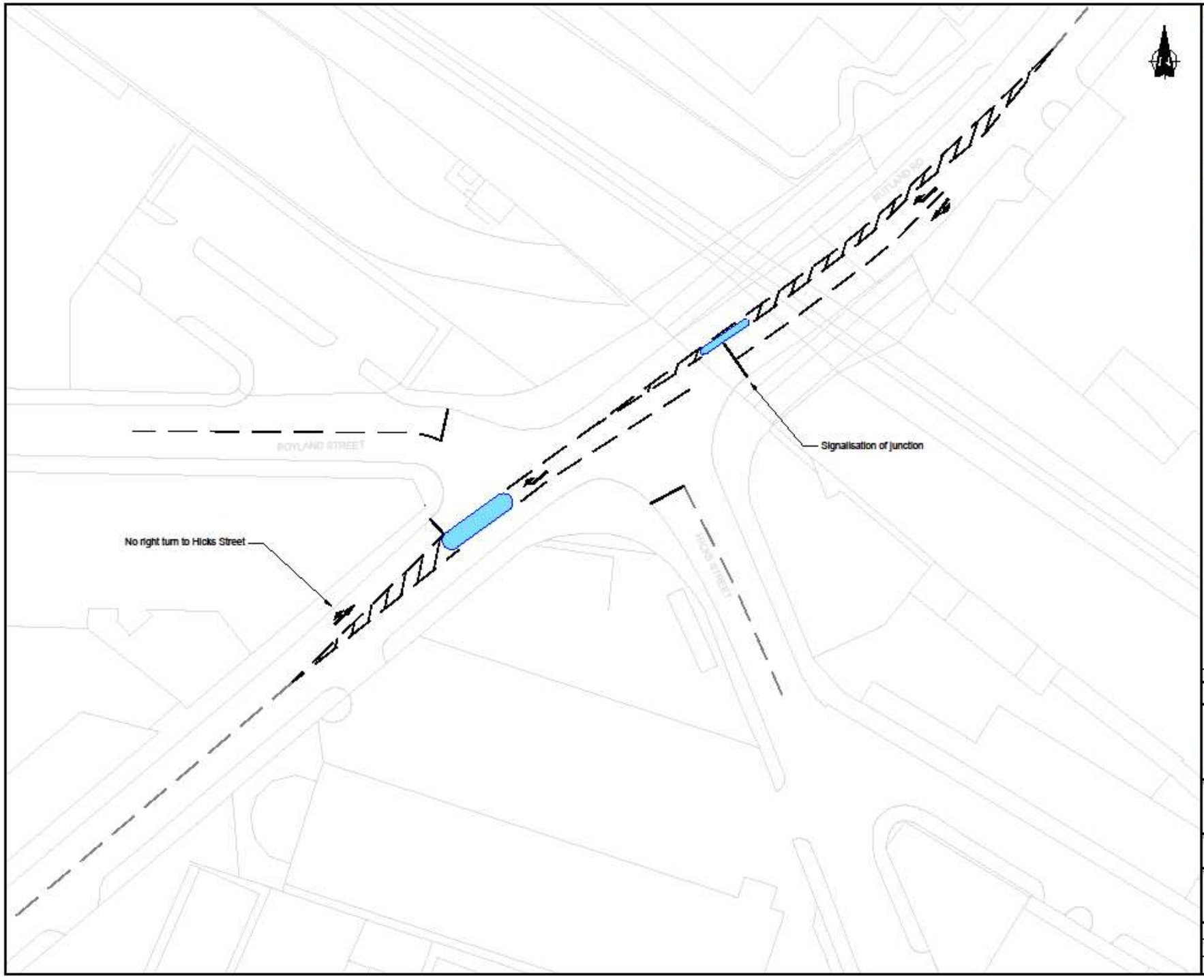


Appendix B Figure B4: A57 Mosborough Parkway/Coisley Hill Signalised Junction

Appendix B Figure B5: Langsett Road North/Church Street and Orchard Street/Station Lane



Appendix B Figure B6: B6070 Rutland Road / Boyland Street



NOTES

1. Do not scale from this drawing.
2. All dimensions are in metres unless otherwise stated.
3. This drawing is a preliminary design based upon OS Mastermap data. Detailed consideration of elements such as land ownership, topographical survey, statutory undertakers equipment etc. are to be considered at a later design stage.

KEY

- Proposed Kerbline
- Proposed Road Markings
- Existing Road Markings
- Proposed Traffic Island

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Client: Sheffield City Council

Project: SHEFFIELD LOCAL PLAN

Title: RUTLAND ROAD / BOYLAND STREET/ HICKS STREET

Drawn	Checked	Approved
FW	JP	CC
Original orig. size: A3	Date: 20.06.23	Scale: 1:500
Drawing Status: PRELIMINARY	Drawing Number: 21G61-L-NE-24-GA01	Rev:

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