

Devonshire Property (MM) Ltd
Mastin Moor
Transport Assessment

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This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 276927-00

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1 Introduction

The purpose of this Transport Assessment is to explain and support an outline planning application for residential development of land at Mastin Moor (Chesterfield) as submitted to Chesterfield Borough Council (CBC) as the local planning authority (LPA) concerned. It outlines the context within which the application is made and provides a detailed assessment of the main transport considerations, together with a reasoned justification in support of the development.

1.1 Structure of the Report

This Report addresses the following:

- Chapter 2 provides context and background to the development;
- Chapter 3 considers the scope of transport assessment;
- Chapter 4 describes the existing site and surrounding transport networks;
- Chapter 5 summarises the local transport planning policy context under which this proposal has been developed;
- Chapter 6 provides details of the development proposals;
- Chapter 7 describes the highway assessment methodology and assumptions;
- Chapter 8 outlines the trip generation, mode share and distribution for the site;
- Chapter 9 provides the sustainable modes assessment;
- Chapter 10 provides an overview of the highway impact and proposed mitigation measures;
- Chapter 11 provides a Summary and Conclusion.

The Transport Assessment concludes that the proposed scheme can be satisfactorily accommodated on the local transport network and there are no reasons why residential development should not be supported on the site.

1.2 Other Reports

The proposal has been informed by a range of technical evidence. As such, the planning application comprises a suite of information which includes:

- Supporting Planning Statement
- Design and Access Statement
- Landscape and Visual Appraisal
- Transport Assessment
- Flood Risk Assessment
- Ecology Surveys

- Archaeological Assessment
- Geo-Environmental Assessment
- Noise and Vibration Assessment
- Air Quality Assessment
- Topographical Survey

1.3 Author

This report has been prepared by Ove Arup and Partners Ltd (Arup). Arup are an independent firm of designers, planners, engineers, consultants and technical specialists offering a broad range of professional services, with significant transport planning experience. Our contact details are as follows:

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2 Context

2.1 Applicant

The land subject of this application is owned and managed by Devonshire Property (MM) Limited (DPMML). DPMML is part of the Devonshire Group.

The Devonshire Group, known technically as the Chatsworth Settlement Trustees (CST), owns the land and estates of the Dukedom of Devonshire. Its main estates are in the vicinity of Chatsworth in Derbyshire and Bolton Abbey in North Yorkshire. It also runs visitor and other businesses on these estates, including hotels; retail and catering outlets; forestry; livestock and arable farming. It employs over 600 full time employees. It is committed to quality in all its activities and takes a responsible approach to development; as such, it measures performance in social and environmental as well as financial terms.

Together with the Chatsworth House Trust (registered charity no.1511149), CST's Derbyshire Estate provides over 450 full time equivalent jobs and contributes c.£50m of enabled Gross Value Added to the local economy each year (Source: New Economics Foundation 2014). Its income funds socio-economic facilities (e.g. village shop/post office) and environmental management activities (e.g. architectural conservation) without grant support. CST thereby provides benefits far beyond "just the estate".

CST has a range of interests in the Borough of Chesterfield including: agricultural land supporting modern farming; commercial properties supporting local employment; farmsteads supporting smaller scale rural enterprises; and the majority of the former Staveley Works site (including both the Clocktower Business Centre (leased to CBC and providing flexible term offices and workspaces) and the Devonshire Building (home to a gym and other enterprises)).

Whilst maintaining a long-term perspective, CST manages a diverse range of landholdings to achieve corporate and wider social and environmental objectives. It has thereby identified that the best long-term use for the land subject to this application would be for residential development. This will help deliver its own objective to deliver 1,000 new homes over the next ten years, and also meet the needs and aspirations of the local community and wider Borough, subject to securing a planning permission that is both attractive to the development market and commercially viable.

2.2 The Site

This section provides a summary of key features of the site. The site is more fully described within the Design and Access Statement submitted as part of the application.

The site is located at Mastin Moor, to the south of Worksop Road (A619) to both the east and west of Bolsover Road, with part of the site extending southwards to Woodthorpe Road. It encompasses some 46.2 ha of mainly agricultural land. The overall site forms a shallow valley sloping from the ridge lines along Worksop

Road and Woodthorpe Road towards a watercourse that runs in a westerly direction through the site. The highest part of the site is around 119m AOD in the north-east with the lowest part in the south-west at around 56m AOD.

The site is primarily comprised of undulating arable fields with limited features. The main features of note include:

- An unnamed watercourse which flows in a westerly direction through the site
- Bolsover Road which runs through the site on a north-south axis
- Pumphouse Farm (dwelling and curtilage) which is surrounded by the development proposal but does not form part of it
- Field boundaries which are a mixture of hedgerows, stone walls and woodland
- Isolated trees

The main part of the settlement of Mastin Moor is located to the north of the site, on the northern side of Worksop Road. The settlement of Woodthorpe is located generally to the west of the site. The site abuts a limited number of residential properties, as well as the Mastin Moor Community Garden.

Photograph 1: View over site from South-Eastern corner (adjacent Woodthorpe Road) looking towards Woodthorpe



Photograph 2: View over site from Bolsover Road (close to Community Garden) looking towards Woodthorpe



Photograph 3: Photo 3: View over site from Bolsover Road looking North West towards Worksop Road



Photograph 4: Photo 4: View over site from near North Eastern boundary adjacent to Worksop Road looking towards Bolsover Road and Woodthorpe



2.3 Design Process

CST first considered residential development options for its land at Mastin Moor in 2011 when it was identified in the Strategic Housing Land Availability Assessment by Chesterfield Borough Council. This formed part of the evidence base for what was at the time the emerging Local Plan: Core Strategy. CST appointed planning and masterplan specialists to explore these options. Outputs from that process formed part of CST's response to consultation on the Local Plan: Core Strategy.

Following adoption of the Local Plan: Core Strategy in 2013 which confirmed Mastin Moor as a focus for regeneration and growth, CST appointed an expanded team of specialists. Resulting technical surveys and reports contributed to a detailed appreciation of the development opportunity and potential constraints. These informed a masterplan-led approach that fully explored design options. The process had regard to the wider setting of the site and existing development in the locality.

Draft proposals were subject to extensive consultation with Chesterfield Borough Council, Derbyshire County Council and Staveley Town Council. Meetings were held with groups representing local residents and interest groups including Friends of Mastin Moor, the Woodthorpe Village Community Group and Mastin Moor Gardens and Allotments (formerly Mastin Moor Allotments Association). The

resulting proposals were presented at two community consultation events in July 2016, held at the Eventide Rest Room (Mastin Moor) and the Albert Inn (Woodthorpe), and were available to view at the same time on a website.

An outline planning application for 650 dwellings and other development was subsequently submitted to Chesterfield Borough Council (ref. CHE/17/00469/OUT) in June 2017. Contrary to the unequivocal recommendation of the Officer's report, and despite no objections being received from any statutory consultees, the application was refused by the Council's Planning Committee in October 2019. At the time of writing, an appeal against that refusal remains extant.

Feedback received during the course of the determination of the above application has informed the current proposals. The design process that has led to the proposals for which planning permission is now sought is more fully described within the Design and Access Statement.

2.4 Development Proposal

The proposed development seeks outline planning permission for residential development of up to 650 dwellings, a residential care facility with extra care, a Local Centre (including local retail, health facilities, leisure facilities, other local facilities and services, offices), open space, community garden extension, community building, parking and associated infrastructure and earthworks with all matters reserved except access. Details of scale, layout and landscaping are reserved for future consideration.

For illustrative purposes, an indicative layout has been prepared to show how the site could be developed. Further explanation of the design principles that have been incorporated into the proposals, and how the design has been informed and influenced by the comprehensive suite of technical information and analysis, is set out in the Design and Access Statement.

Key aspects of the proposal include:

- Up to 650 dwellings located on land to the south of Worksop Road (east and west of Bolsover Road) extending to Woodthorpe Road;
- A residential care facility with extra care;
- A Local Centre (including local retail, health facilities, leisure facilities, other local facilities and services, offices) located adjacent to Worksop Road;
- A new signal-controlled junction on Worksop Road providing access to the new Local Centre and residential areas, incorporating pedestrian and cyclist crossing facilities;
- New priority-controlled junctions on Bolsover Road and Woodthorpe Road;
- An extension to the Community Garden (approximately doubling its existing size), including provision for a new community building and associated car park;
- Significant new areas of parkland, play areas and other open space;

- Retention of existing hedgerows and trees wherever possible;
- Additional landscape planting and ecological enhancements;
- New walking and cycling connections;
- New drainage infrastructure including surface water storage ponds;
- Financial contributions to allow the expansion of existing local services including Norbriggs Primary School.

The proposal therefore comprises a high quality development scheme designed to: address multiple deprivation issues at Mastin Moor; help regenerate the area in line with key related Local Plan policy; respect but integrate with the distinct communities of Woodthorpe and Mastin Moor; acknowledge and address the specific physical challenges and constraints of the site (e.g. topography, drainage).

2.5 Planning Policy

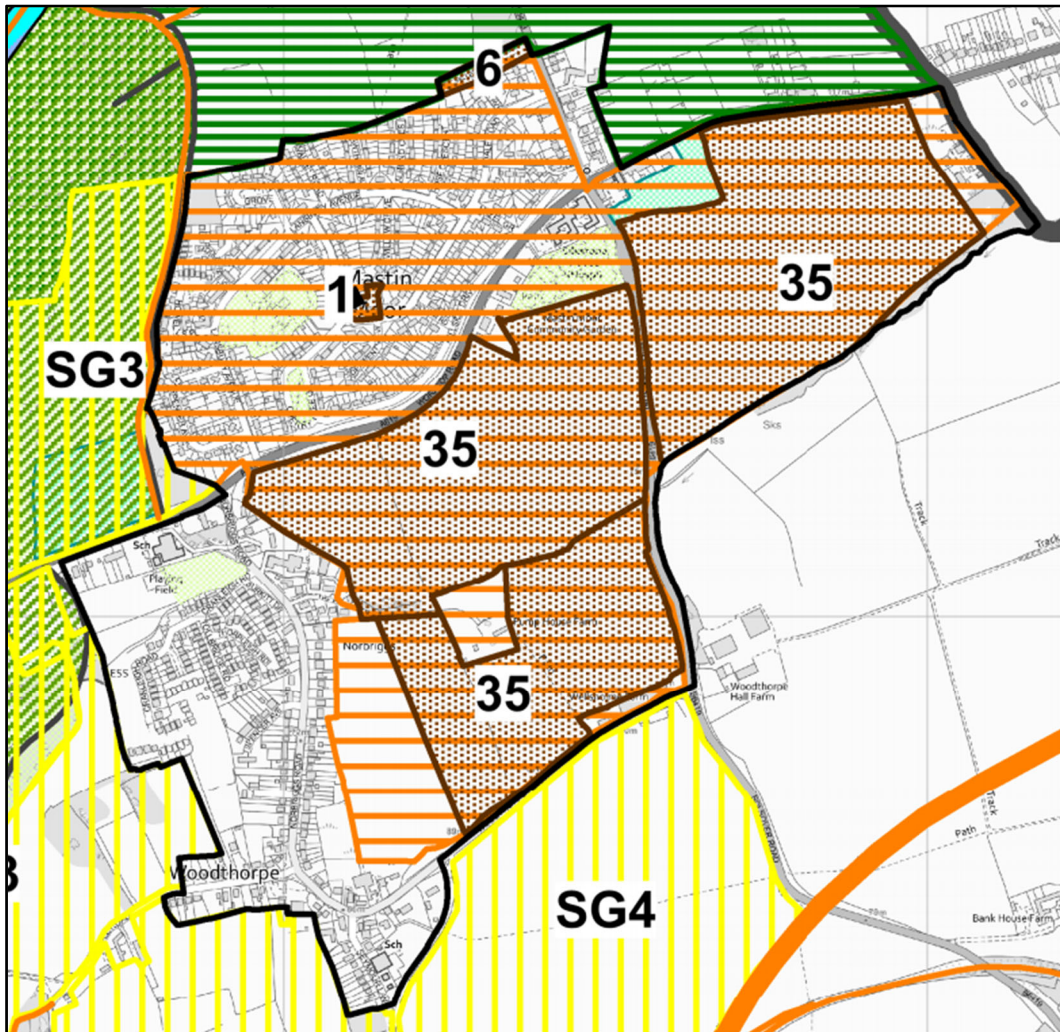
Section 38 (6) of the Planning and Compulsory Purchase Act 2004 requires that the determination of planning applications is undertaken in accordance with the development plan, unless material considerations indicate otherwise. The relevant document for this application is the Chesterfield Local Plan (2020) (the Local Plan).

The Local Plan allocates the site for development by way of Policy CLP3 Flexibility in Delivery of Housing. Table 4 within the Local Plan references the site as H35 (Land South of Worksop Road, and East and West of Bolsover Road, Mastin Moor), having a capacity of 650 dwellings, the extent of which is shown on the Local Plan Policies Map. Policy RP1 Regeneration Priority Areas sets out further specific requirements for any development within site H35.

Other relevant policies of the Local Plan include: CLP1 Spatial Strategy, CLP2 Principles for Location of Development, CLP4 Range of Housing, CLP6 Economic Growth, CLP8 Vitality and Viability of Centres, CLP9 Retail, CLP10 Social Infrastructure, CLP11 Infrastructure Delivery, CLP13 Managing the Water Cycle, CLP14 A Healthy Environment, CLP15 Green Infrastructure, CLP16 Biodiversity, Geodiversity and the Ecological Network, CLP17 Open Space, Play Provision, Sports Facilities and Allotments, CLP20 Design, CLP21 Historic Environment, CLP22 Influencing the Demand for Travel.

An extract from the Local Plan Policies Map showing the extent of the allocation and the wider Mastin Moor Regeneration Priority Area is shown below.

Picture 1: Local Plan Policies Map (extract)



The National Planning Policy Framework (NPPF) ‘sets out the Government’s planning policies for England and how these are expected to be applied’. Paragraph 10 of the NPPF sets out that ‘at the heart of the [NPPF] is a presumption in favour of sustainable development’. Paragraph 11 states that ‘For decision-taking this means:

- c) approving development proposals that accord with an up-to-date development plan without delay; or
- d) where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:
 - i. the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or
 - ii. any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.’

2.6 Planning Assessment

The proposal performs well against relevant Local Plan policies. In particular, it will deliver development in accordance with Policies CLP1 Spatial Strategy, CLP2 Principles for Location of Development, Policies CLP3 Flexibility in Delivery of Housing and Policy RP1 Regeneration Priority Areas.

It is also considered that there are no material considerations that indicate anything other than the fact that the LPA should determine the application in line with the extant plan as outlined above.

In addition, key benefits of the proposal would include:

- Provision of new, high quality housing;
- New development in an area with acknowledged regeneration needs;
- Greater variety of housing type and tenure (including Affordable Housing) to meet the diverse needs of the local community (including housing to buy and rent);
- Extension of the Community Garden (approximately doubling its existing size) including provision for a new community building and parking area;
- Improved local services and facilities (including provision for retail, health and other local and community services within a new Local Centre);
- Significant new areas of parkland, play areas and other open greenspace available to existing and new residents;
- New housing in a location where future residents will have a realistic choice of walking, cycling or using public transport, in preference to using private motor vehicles;
- Additional capacity at local schools;
- Opportunities for skills and learning through training programmes during construction and operational phases of the development;
- New employment opportunities during construction and operational phases of the development;
- Additional landscape planting and ecological enhancements;
- New traffic signal-controlled junction on Worksop Road to include pedestrian and cyclist crossing facilities;
- On-site water storage to help reduce existing off-site flood risk.

The proposal will therefore provide opportunities and benefits for all sections of the local community, including existing and future residents. Benefits will accrue in the short and longer term. It will help to overcome issues that can lead to deprivation and will contribute to regeneration in line with Local Plan objectives.

3 Transport Scope

3.1 Development Proposals

The proposals at Mastin Moor comprise:

Residential development of up to 650 dwellings, a residential care facility with extra care, a Local Centre (including local retail, health facilities, leisure facilities, other local facilities and services, offices), open space, community garden extension, community building, parking and associated infrastructure and earthworks.

The scheme includes the provision of new highway access junctions from the A619 Worksop Road, B6419 Bolsover Road and Woodthorpe Road as well as a network of pedestrian and cycle routes to tie into existing local provision.

3.2 Background

An outline planning application for development at Mastin Moor was submitted in June 2017 (ref 17/00469/OUT). The application was refused by notice dated 16 October 2019. No objections on access, highways or other transportation issues were raised to the application by either Derbyshire County Council (DCC), as highways authority, or Highways England. The reasons for refusal did not include any access, highways or other transportation issues. Following adoption of the Chesterfield Borough Local Plan (July 2020), the site is allocated as site reference H35 'Land South of Worksop Road' for 650 dwellings and related uses. This Revised Scheme application is prepared in accordance with this allocation.

A detailed TA was prepared in support of the previous application and submitted to Chesterfield Borough Council (CBC) and DCC. As part of the planning process, the TA methodology was agreed with DCC Highways and Highways England who were, as noted above, supportive of the scheme and associated transport impacts.

As agreed through the TA Scoping discussions, this TA for the Revised Scheme at Mastin Moor is based on the 2017 TA methodology with slight changes to the scheme and updates to the transport assessment methodology, as agreed with DCC and Highways England. The scheme changes focus on uses within or related to the proposed Local Centre. The proposed number of dwellings is not changed.

It is noted that the revised proposals are being prepared during the Coronavirus Covid-19 pandemic, which has affected travel behaviours. As a result, baseline traffic data is not considered representative of longer term travel patterns and implications associated with this are considered for the proposed assessment methodology.

3.3 Scope of the Assessment

The assessment has been produced in line with best practice guidance and in consultation with DCC, as highways authority, and Highways England, responsible for management of the motorway network.

This Transport Assessment has been produced in line with the Department for Transport (DfT) Guidance on Transport Assessments. Although this guidance has been archived it has not been replaced and remains valid.

The scope of transport assessment has been discussed with DCC and Highways England as follows:

- DCC – DCC email information (5 June 2020), Arup Scoping Note (dated 4 August 2020) with DCC email response (11 August 2020 and 1 September 2020);
- Highways England – Arup Scoping Note (dated 4 August 2020), Highways England email response (21 August 2020), Arup email response (3 September 2020) and Highways England email response (21 September 2020).

This TA for the Mastin Moor development is produced based on the ongoing discussions with DCC and Highways England.

4 Existing Situation

4.1 Site Information

Mastin Moor is located approximately 8km to the north east of Chesterfield, approximately 2km east of Staveley. The A619 runs through Mastin Moor, connecting with Staveley to the west and the M1 Junction 30 to the east. The site location is shown at Figure 1.

4.2 Site Location and Access

The site at Mastin Moor extends along the southern boundary of the A619 Worksop Road and is dissected by the B6419 Bolsover Road in a north-south direction as shown in Figure 2. The parcel of land to the west is largely bounded by A619 Worksop Road to the north, B6419 Bolsover Road to the east, Woodthorpe Road to the south and Woodthorpe to the west. The parcel of land to the east of the B6419 is bound by the A619 Worksop Road to the north, Castle View to the east, agricultural land to the south and the B6419 Bolsover Road to the west.

The western parcel of the site is agricultural in nature. An existing access through The Paddocks runs from Norbriggs Road in Woodthorpe to Pumphouse Farm, a privately owned property located within the confines of the site.

The eastern parcel of the site is also agricultural in nature. Due to the existing nature of the land, access is restricted to a gated arrangement with B6419 Bolsover Road to the south west corner of the parcel, with no formal means of access.

4.3 Surrounding Land Use

The residential area of Mastin Moor is located immediately north of the site and Woodthorpe is located to the west. The majority of houses in these areas are either detached or semi-detached properties. To the south and east lies agricultural land.

The built up areas of Staveley and Chesterfield are located to the west of the site and employment site Markham Vale located at M1 Junction 29A to the south west of the site.

4.4 Strategic Road Network

The strategic transport links are presented in Figure 1. The M1 is a major national route providing north south connections through the country. The site is located close to the M1 providing access north towards Sheffield, Doncaster (via M1/M18) and Leeds, and south towards Nottingham, the East Midlands and London. Junction 30 is located approximately 3km to the east of the site and junction 29A is located approximately 5km to the south west of the site.

The A619 provides an approximate east west route between Chesterfield and Worksop. From the site, the A619 provides a connection to the M1 Junction 30 to the north east and to Staveley and Chesterfield to the west.

4.5 Local Highway Network

The site location and local highway network are presented in Figure 2 and summarised below.

4.5.1 Key Links

A619 Worksop Road

The A619 Worksop Road provides the northern boundary of the site, running in an approximate east west direction. It provides connections between Chesterfield and Staveley to the south west and the M1 and Worksop to the north east.

Throughout its length the A619 is generally a wide single carriageway with a single lane operating in each direction. Local widening and turning lanes are provided at some junctions along the route.

In the vicinity of the site the speed limit of the A619 Worksop Road is 40mph with street lighting provided along its length. Speed cameras are provided on Worksop Road to the east of the junction with Bolsover Road and west of the junction with Norbriggs Road. Footways are provided along Worksop Road. To the east of the junction with Bolsover Road narrow footways are provided on both sides of the carriageway. To the west of Bolsover Road footways are provided on both sides approaching the junction with a footway provided on the northern side only beyond the bus stops. Footways are also provided on both sides of the carriageway approaching the Worksop Road junction with Norbriggs Road. A pedestrian refuge is located close to the bus stops opposite Rowan Road.

The A619 is a busy route and experiences congestion, particularly in the morning and evening peak periods.

B6419 Bolsover Road

B6419 Bolsover Road runs in a north south direction through the site, connecting the A619 Worksop Road and Bolsover town. It is a wide single carriageway with a single lane in both directions. The speed limit of the B6419 in the vicinity of the site is 50mph, reducing to 40mph as Bolsover Road approaches A619 Worksop Road.

The B6419 Bolsover Road is rural in nature with no street lighting or footways provided, except at the approach to the junction with Worksop Road.

A speed survey was carried out on Bolsover Road in June 2016. The northbound and southbound free flow speeds were recorded at two locations;

- Site 1 - northbound layby (approx. 150m south of A619 – 40mph limit);

- Site 2 - southbound layby (approx. 430m south of A619 – 50 mph limit).

A summary of the speed survey results are presented in Tables 1 and 2 below. The surveys indicate that the average speeds recorded are below the respective speed limits at the two sites. At Site 1, close to the junction with A619 Worksop Road (40mph limit), the average speeds in both north and southbound directions, are just over 30mph with 85%ile speeds up to 35mph. At site 2, further from the junction and built up areas (50mph limit) the average speeds increase to approximately 48mph and 85%ile speeds up to 56mph. Appendix A provides a copy of the speed survey data.

Table 1: Bolsover Road Speed Survey – Site 1

Site	Time	Direction	Sample	Speed limit	Lowest Speed	Highest Speed	Average Speed	85th % Dry Speed	85th % Wet Speed
1	11:25 to 14:45	NORTHBOUND	200	40	17	48	30.4	34.6	32.1
1	11:25 to 14:45	SOUTHBOUND	200	40	17	43	31.1	35.4	32.9

Table 2: Bolsover Road Speed Survey – Site 2

Site	Time	Direction	Sample	Speed limit	Lowest Speed	Highest Speed	Average Speed	85th % Dry Speed	85th % Wet Speed
2	09:15 to 11:35	NORTHBOUND	200	50	31	61	47.3	56.1	53.6
2	11:25 to 14:45	SOUTHBOUND	200	50	33	62	48.1	55.4	52.9

Norbriggs Road

Norbriggs Road runs in a north south direction providing a link between the A619 Worksop Road and Woodthorpe Road through Woodthorpe. It is a single carriageway road with a single lane in each direction. The road is largely bound by detached and semi-detached houses characterised by local access road junctions, driveways fronting the highway and on street parking.

The speed limit on Norbriggs Road is 30mph with 20mph ‘School Safety Zone’ signed adjacent Norbriggs Primary School and Woodthorpe Primary School. There are footways and street lighting provided along the length of Norbriggs Road. A 7.5t restriction ‘Except for Access’ is signed through Woodthorpe.

Woodthorpe Road

Woodthorpe Road runs in an east west direction and connects the B6419 Bolsover Road and Norbriggs Road. It is a single carriageway road with a single lane in each direction.

The majority of the highway is currently through farmland and is rural in nature with no street lighting and a footway on the north side of the carriageway only.

The speed limit of Woodthorpe Road is 50mph beyond the built up area of Woodthorpe.

B6419 Renishaw Road

B6419 Renishaw Road runs in a north south direction, connecting the A619 Worksop Road and Mastin Moor with Renishaw and areas to the south of Sheffield. It is a single carriageway road with a single lane in both directions. The speed limit of the B6419 Renishaw Road in Mastin Moor is 40mph, increasing to the national speed limit beyond the built up area of Mastin Moor.

Through Mastin Moor the B6419 Renishaw Road is characterised by local access roads, driveways and on street parking. Street lighting and footways on both sides of the carriageway are provide. Beyond Mastin Moor Renishaw Road is rural in nature with no street lighting provided and a narrow footway in poor condition provide on the western side of the carriageway only.

The Paddocks

An existing access through The Paddocks runs to Pumphouse Farm, a privately owned property located within the confines of the site. The Paddocks is a narrow two way road with street lighting and narrow footways on both sides of the carriageway provided. The Paddocks forms a priority junction with Norbriggs Road to the west of the site.

4.5.2 Key Junctions

A619 Worksop Road / B6419 Bolsover Road / Renishaw Road

The junction of the A619 Worksop Road with B6419 Bolsover Road and Renishaw Road is a 4 arm traffic signal controlled junction with all turning movements provided for. There is a single lanes approach on 3 arms with 2 lanes provided on the A619 Worksop eastbound approach. Space is provided within the junction for right turning traffic from Worksop Road in both directions. Pedestrian crossings are provided across all arms of the junction.

A619 Worksop Road / Norbriggs Road

The junction of the A619 Worksop Road with Norbriggs Road is a 3 arm traffic signal controlled junction with all turning movements provided for. There is a single lanes approach on all arms with space provided for right turning traffic from Worksop Road to queue without blocking the mainline flows. Pedestrian crossings are provided across all arms of the junction.

B6419 Bolsover Road / Woodthorpe Road

The junction of B6419 Bolsover Road with Woodthorpe Road is a 3 arm priority controlled junction with Woodthorpe Road the minor arm giving way to traffic on

B6419 Bolsover Road. A short flare is provided on approach to the junction. No pedestrian crossing facilities are provided at the junction.

A619 Lowgates / Fan Road

The junction of A619 Worksop Road / Lowgates with Fan Road is located approximately 1.2km to the west of the site. The junction is a 3 arm priority controlled junction with Fan Road the minor arm giving way to traffic on A619 Lowgates. The junction is in the built up areas of Staveley with no highway space to provide flares on approach to the junction. Dropped kerb crossing facilities are provided across Fan Road with a traffic signal control crossing provide across A619 Lowgates approximately 40m west of the junction.

A619 Chesterfield Road / A616 / Oxcroft Way – Treble Bob

The junction of A619 Chesterfield Road with A616, Oxcroft Way and Staveley View Road, known as the Treble Bob roundabout, is located approximately 2km to the east of the site. The junction is a 5 arm priority controlled roundabout. Two lanes are provided on all approaches to the junction except Staveley View Road which has a single lane approach. Dropped kerb crossing facilities are provided across all arms of the junction.

4.6 DCC's North Derbyshire Traffic Model

Operation of the existing highway network has been modelled using DCC's North Derbyshire Traffic Model. The model has been built using the SATURN programme and is currently operated by Aecom on behalf of DCC. Aecom previously updated the SATURN model in 2014 and are currently in the process of updating the Base and Future year models.

Details of the SATURN modelling and data outputs are provided at Chapter 7.

4.7 Accident Data Analysis

Traffic accident data has been obtained from the Crashmap website (<https://www.crashmap.co.uk/>) for the five year period from January 2015 to December 2019, over the study area within the vicinity of the site, as shown in Image 1 below.

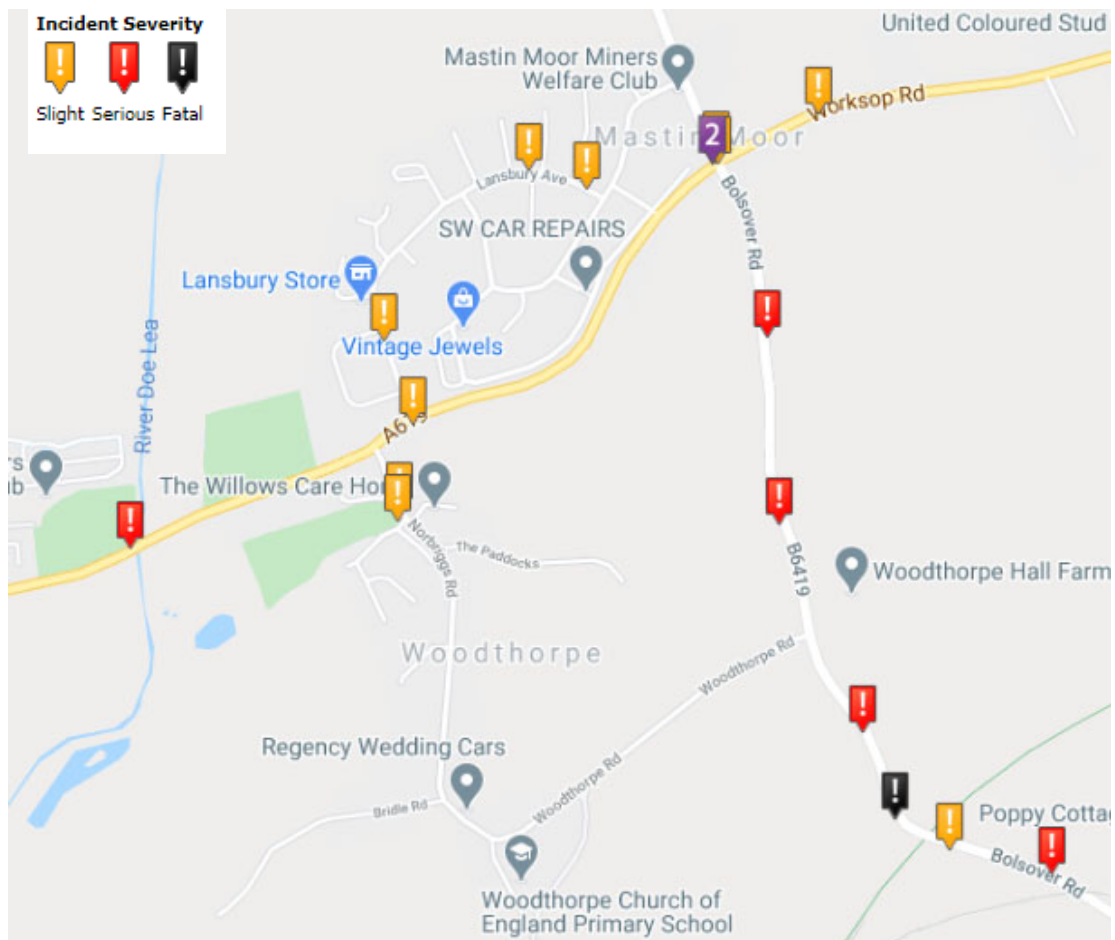


Image 1: Location of the accidents in the study areas (Source:crashmap.co.uk)

Table 3 provides an annual summary of the accidents by injury severity. In the five year period, a total of 19 accidents comprising one ‘fatal’ accident, five ‘serious’ and thirteen ‘slight’ injury accidents have been recorded in the system.

Table 3: Number of accidents in the past five years in the study area

Year	Severity		
	Slight	Serious	Fatal
2019	1	0	0
2018	2	1	0
2017	2	2	0
2016	2	1	0
2015	6	1	1

The majority of accidents have resulted in slight injuries. In the immediate vicinity of the site:

- Eight accidents were recorded on A619 Worksop Road in the vicinity of the site, including five recorded at the A619 Worksop Road / Bolsover Road signalised junction. These were all classified as slight apart from one to the west of Mastin Moor;

- Two accidents were recorded on Norbriggs Road and three within the existing Mastin Moor residential area with all classified as slight;
- A number of accidents have been recorded on B6419 Bolsover Road, including one resulting in a fatality and four resulting in serious injuries. It is noted that the fatal and one of the serious injury accidents involved motorcycles as the only vehicle involved;
- Three of the recorded accidents resulted in injury to pedestrians including the serious injury accident on the A619 to the west of Mastin Moor. None of the recorded accidents within the study area resulted in injury to cyclists.

Of the accidents recorded, there aren't any significant clusters of accidents and the majority of accidents resulted in slight injury only.

It is considered that the volume of accidents in the vicinity of the site over the five year period is low. Whilst the causation of each of the accidents is not provided, the majority appear to be isolated random events with no common site-related causal factors. As a result, there are no significant safety concerns.

The exception to this is the number of accidents on Bolsover Road. Three of the accidents involved single vehicles and occurred close to the bend over the railway bridge which is likely to be loss of control as a result of driver / rider error and excessive speeds.

4.8 Public Transport Provision

The public transport networks servicing the site are presented in Figure 3.

4.8.4 Bus Services

In the vicinity of the site, bus stops are located on the A619 Worksop Road, Norbriggs Road and Woodthorpe Road. Shelters are provided at the bus stops on A619 Worksop Road but generally poles only on Norbriggs Road and Woodthorpe Road. Bus stops are also provided at a number of locations within Mastin Moor. The bus stops in the vicinity of the site are described below.

- Worksop Road west of Norbriggs Road (WR1/WR2) – eastbound and westbound bus stops are located in laybys, have shelters, limited seating and timetable information.
- Worksop Road outside the former community centre (WR3/WR4) – eastbound at WR3 is in a layby, has a shelter and timetable information. Westbound at WR4 is on the carriageway with a shelter only.
- Worksop Road at the crossroads with Bolsover Road (WR5/WR6) – eastbound at WR5 is on the carriageway and has a pole with timetable information attached. WR6 is westbound and is on the carriageway with a shelter, seating and a timetable.
- Worksop Road opposite Providence Place (WR7/WR8) – eastbound at WR7 is a pole with a timetable attached. Westbound at WR8 is on the carriageway with a shelter and a timetable.

- Woodthorpe Road (WD) adjacent to Wellsholme Farm – eastbound is on the carriageway, with a pole on the pavement. Westbound is on the carriageway, with a pole on the grass verge.
- Norbriggs Road (NR1/NR2) at the junction with Bridle Road – South-eastbound is on the carriageway, with a pole on the pavement. Northbound is on the carriageway with a shelter, seating and a timetable.
- Norbriggs Road (NR3/NR4) adjacent to Spencer Avenue – Southbound is on the carriageway, with a pole on the pavement. Northbound is on the carriageway, with a pole on the pavement.
- Norbriggs Road (NR5/NR6) near The Willows – Southbound is on the carriageway, with a pole on the pavement. Northbound is on the carriageway outside the school but not marked.
- Renishaw Road (RR) near junction with A619 – Both southbound and northbound are on the carriageway, with a pole on the pavement with timetable information attached.
- Edale Road (ER1/ER2) near the junction with Renishaw Road – eastbound on the carriageway with a pole on the pavement. Westbound is on the carriageway with a shelter.
- Edale Road (ER3) near the junction with Rowan Road – northbound on the carriageway with a pole.
- Blunt Avenue (BA) near the junction with Lansbury Avenue – southbound on the carriageway with a pole.
- Lansbury Avenue (LA1) near the junction with Edale Road – westbound on the carriageway with a shelter.
- Lansbury Avenue (LA2/LA3) near the junction with Blunt Avenue – both on the carriageway. Eastbound with a pole only and westbound with a shelter.
- Lansbury Avenue (LA4/LA5) near the junctions with Carpenter Avenue – both on the carriageway. Northbound and southbound with a pole only.

There are a number of bus services currently servicing Mastin Moor and Woodthorpe in the vicinity of the site. The table below shows a summary of the local bus services showing destinations and approx. frequencies. Figure 3 shows the bus routes and bus stops around the area of the site. It is noted that due to Covid-19 there may be temporary alterations to timetables, however the table below sets out the longer term bus operations where information is available.

Table 4: Local Bus Services

Service No.	Operator	Route	Closest Stop(s) Location	Frequency (mins)	
				Daytime M-Sat	Evening / Sun
74A	Stagecoach	Mastin Moor - Staveley – Inkersall – Brimington – Chesterfield – Brimington – Inkersall – Staveley – Mastin Moor	ER2, LA1, LA5, WR1/2, WR3, RR1	60	-

77	Stagecoach	Worksop – Creswell – Clowne - Barlborough – Mastin Moor – Staveley -Brimington - Chesterfield	WR3/4, WR1/2, WR5/6/7/8	30	-
77A	Stagecoach	Workshop – Creswell – Clowne - Barlborough – Mastin Moor – Staveley -Brimington - Chesterfield	RR, ER1/2, LA1/2/3/4/5, WR1/2	-	60
80	Stagecoach	Chesterfield – Staveley – Mastin Moor – Killamarsh – Sheffield Centre	ER1/2, LA1/2/3/4/5, WR1/2	60	-
80A	Stagecoach	Chesterfield – Staveley – Mastin Moor – Killamarsh – Sheffield Centre	WR7/8, WR1/2, NR1/2/3/4/5/6 WD	-	60
81	TM Travel	Bolsover – Mastin Moor – Staveley – Markham Vale	WR1/2, NR1/2/3/4/5/6 WD	60	-
508	TM Travel	Mastin Moor – Woodthorpe – Staveley – Barrow Hill – Middlecroft - Barrow Hill Staveley – Woodthorpe – Mastin Moor	LA4, LA2, ER1, RR2, NR6, NR4, NR2, WR1/2	School Service	-

4.8.5 Rail Services

Chesterfield station lies approximately 8km from the site. Chesterfield rail station is served by a variety of national and regional services. Services to Sheffield operate approximately every 30 minutes during peak periods, London St Pancras approximately every 30 minutes and hourly services to Plymouth, Liverpool Lime Street and Nottingham. There are also alternate hourly services to Edinburgh and Glasgow.

Other local rail stations include Creswell, located approximately 8km east of the site. Whitwell and Langwith-Whaley Thorns train stations are located within 12km of the site to the north east. These stations are located on the same line, operated by an hourly local stopping service from Worksop to Nottingham.

4.9 Cycling Facilities

There are no dedicated cycling facilities in the immediate vicinity of the site. The nearest cycle route is National Route 67 which runs through Staveley towards Chesterfield to the south-west and towards Renishaw, Killamarsh and Rother Valley Country Park to the north. This is part of the stretch between Chesterfield and Leeds which forms part of the Trans Pennine Trail. The Trans Pennine Trail is traffic free between Chesterfield and Rother Valley Country Park.

DCC are working on improving the cycling infrastructure with a range of measures identified to connect routes through Mastin Moor, Woodthorpe, Staveley and to Markham Vale, as shown on Figure 4.

4.10 Pedestrian Facilities

Existing pedestrian facilities adjacent to the site are mixed in quality and provision. Figure 4 shows the pedestrian provision in the vicinity of the site.

The A619 Worksop Road adjacent to the western parcel of the site has footway provision on the northern side of the carriageway. On the southern side of the carriageway are wide grass verges. Street lighting is provided and a refuge crossing is located for access to local bus stops. To the north of the eastern parcel of land narrow footways are provided on both sides of A619 Worksop Road. Approaching the junction with Bolsover Road from both the east and the west the A619 Worksop Road has footways on both sides of the road, connecting local bus stops with residential areas. Pedestrian crossings are provided on all approaches to the junction of A619 Worksop Road / Bolsover Road. Approaching the junction with Norbriggs Road from both the east and west, A619 Worksop Road has footways on both sides of the road. Pedestrian crossing facilities are provided on all approaches to the junction of A619 Worksop Road / Norbriggs Road. Street lighting is provided.

B6419 Bolsover Road does not have pedestrian facilities adjacent to the site however, includes grass verges on both sides. There is no street lighting.

Woodthorpe Road has a grass verge and footway on the northern side of the carriageway and a grass verge only on the southern side. There is no street lighting.

Renishaw Road has footways on both sides between A619 and Edale Road, however, further to the north there is limited footpath provision with a narrow footway of poor quality on the western side of the carriageway and grass verges on the eastern site beyond the built up area.

The residential areas of Mastin Moor and Woodthorpe have good pedestrian facilities with footways on both sides of roads and street lighting. Pedestrian footways have regular dropped kerbs across local access roads. Some vehicle parking on pedestrian footways is evident which can cause obstruction for footway users. Pedestrian links are provided to connect A619 Worksop Road with the residential areas of Mastin Moor.

In addition, off road pedestrian routes are provided through the local rural area as part of CBC's strategic walking routes. These include routes through the site, connecting A619 Worksop Road and Mastin Moor with The Paddocks and Norbriggs Road and a link between The Paddocks and Woodthorpe Road. Further walking routes are provided to the south of Woodthorpe and west of Mastin Moor, connecting with Staveley and open spaces including Netherthorpe Nature Reserve and Pools Brook Country Park, as shown on Figure 4.

5 Transport Planning Policy Context

National and local transport planning policy has been reviewed and a summary of key policy and how the Mastin Moor scheme responds to it has been provide below.

5.1 National Planning Policy Framework

The revised NPPF was published in February 2019. It sets out the overarching planning policies and principles for England and provides high level guidance upon the application of transport policy in the context of development schemes.

The document has three main objectives:

- *An economic objective, by building a strong, responsive and competitive economy;*
- *A social objective, supporting strong, vibrant and healthy communities;*
- *An environmental objective, protecting and enhancing the natural, built and historic environment.*

The NPPF suggests that Local Authorities should follow the approach of the presumption in favour of sustainable development. With regards to plan making, this effectively means that plans should seek opportunities to meet the development needs of the area and be sufficiently flexible to adapt to rapid change. With regards to decision taking, development proposals that accord with up-to-date development plan should be approved without delay. Where the development plan is out-of-date or absent, proposals should be approved unless any adverse impacts would significantly and demonstrably outweigh the benefits when assessed against the NPPF as a whole.

The document identifies that transport issues should be considered from the earliest stages of plan-making and development proposals, so that:

- a) the potential impacts of development on transport networks can be addressed;
- b) opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;
- c) opportunities to promote walking, cycling and public transport use are identified and pursued;
- d) the environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains; and;
- e) patterns of movement, streets, parking and other transport considerations are integral to the design of schemes and contribute to making high quality places.

The NPPF states that developments should be located and designed to:

- *give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;*
- *address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*
- *create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*
- *allow for the efficient delivery of goods, and access by service and emergency vehicles; and*
- *be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations*

The Mastin Moor proposals will help to manage the movement of vehicles in and around the site and promote sustainable transport modes of travel. The site is located close to urban areas and is served by a number of bus services. The scheme has been designed to promote pedestrian and cycle movements between local facilities and the site.

In assessing sites that may be allocated for development in plans, or where there are specific applications for development, it should be ensured that:

- *“appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;*
- *safe and suitable access to the site can be achieved for all users; and*
- *any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree”.*

Under *Considering Development Proposal* in Chapter 9 of NPPF discusses how development should promote sustainable transport. It states that *“All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed”*

The proposed development at Mastin Moor will include new highway infrastructure and has the potential to generate a significant number of trips. A Transport Assessment and Travel Plan have been produced to help quantify and mitigate these effects.

5.2 Derbyshire County Council Local Transport Plan

The Derbyshire County Council Local Transport Plan Three (‘DCC LTP3’) sets out a transport vision, goals, challenges to be tackled and a strategy covering the period to 2026. It has set out five key goals:

- *Supporting a resilient local economy*
- *Tackling climate change*
- *Contributing to better safety, security and health*
- *Promoting equality of opportunity*
- *Improving quality of life and promoting a healthy natural environment*

It hopes that the vision will achieve a transport system that is both fair and efficient, promotes healthier lifestyles, safer communities and better access to jobs and services.

The Mastin Moor scheme has been designed to respond to these goals, providing a high quality, attractive and safe environment for all. Proposals to encourage walking and cycling aim to improve activity and health of residents.

5.3 Chesterfield Borough Council Local Plan

A new Chesterfield Borough Local Plan was adopted on 15 July 2020. It sets out the strategy for development across the Borough until 2035.

In the new Local Plan, the Council's vision for the Borough comprises:

- *A thriving Borough, where everyone has access to the jobs, training and support they need;*
- *A clean, green and attractive Borough, where our open spaces and built heritage are valued;*
- *A healthy and safe Borough, where the community is free from the fear of crime;*
- *A place where everyone has fair access to a decent and affordable home;*
- *An inclusive Borough, where everyone feels valued and has equal and fair access to local services.*

5.3.4 Strategic Objective S9

In relation to Transport, Strategic Objective S9 aims to “*tackle traffic congestion, improve air quality, secure strategic improvements to the transport system in the borough and enable healthier and more sustainable transport choices*”.

The travel and transport chapter identifies the ultimate aims to reduce congestion and carbon emissions, tackle air pollution and increase accessibility for all the Borough's residents.

5.3.5 CLP1 Spatial Strategy

Policy CLP1 Spatial Strategy sets out the overall approach to growth across the Borough. Mastin Moor is identified as a Regeneration Priority Area.

5.3.6 RP1 Regeneration Priority Areas

Policy RP1 states that within RPA boundaries, as shown on the Policies Map, the Council will expect a masterplanned approach to deliver sustainable high quality residential development. It states that within the Mastin Moor Regeneration Priority Area development is expected to

- i. deliver up to 670 new homes on sites H1, H6 and H35; and*
- ii. provide safe and convenient walking and cycling access to job opportunities at Markham Vale, the community garden and Norbriggs and Woodthorpe Primary Schools; and*
- iii. provide a new Local Centre with additional community facilities and the opportunity for provision of health facilities; and*
- iv. provide safe and convenient walking and cycling connections to the surrounding rights of way network, including connections to The Cuckoo Way and Chesterfield Canal; and*
- v. promote design that positively contributes to the surrounding area, and conserves or enhances the significance of heritage assets including the former pumping engine and tramway; and*
- vi. deliver a new and/or improved pedestrian and cycle crossing over the A619; and*
- vii. protect and enhance the setting of and access to the community garden; and*
- viii. minimise visual impact on the ridgelines along Worksope Road and Woodthorpe Road; and*
- ix. provide a defined edge of development and a clear break to prevent continued coalescence and extension of ribbon development along Worksope Road; and*
- x. maintain the distinct identities and settings of Mastin Moor and Woodthorpe through the use of landscaping and open space.'*

5.3.7 Housing Allocation H35 Land South of Worksope Road and East and West of Bolsover Road, Mastin Moor

Allocation H35 identifies the site as having a capacity of 650 dwellings.

5.3.8 CLP22 Influencing the Demand for Travel

Policy CLP22 states that:

'To reduce congestion, improve environmental quality and encourage more active and healthy lifestyles, the Council will seek to maximise walking, cycling and the use of public transport through the location and design of development and

parking provision. Priority will be given to measures to encourage more sustainable travel choices.

To secure this aim, the council will expect development proposals to demonstrate the following in order of priority:

- a) site specific and area wide travel demand management (measures to reduce travel by private car and incentives to use walking, cycling and public transport for appropriate journeys, including intensive travel planning;*
- b) improvements to walking and cycling facilities and public transport services that are provided early in the build out period of new developments and that are sufficient to encourage sustainable modes of transport;*
- c) optimisation of the existing highway network to prioritise walking, cycling and public transport such as measures to prioritise the needs of pedestrians above the car and improved or new cycle and bus lanes provided early in the build out period of new developments; and*
- d) mitigation including highway capacity enhancements where the initiatives required under points (a) to (c) above are insufficient to avoid significant impacts from the development on the transport network in terms of capacity and congestion; and.*
- e) provision of opportunities for charging electric vehicles where appropriate*

Development proposals will not be permitted where they would have an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.

The level of vehicle and cycle parking provision appropriate to any individual proposal will take into account the circumstances of the particular scheme, including in particular:

- i. The size of any dwellings proposed.*
- ii. The type, mix and use of the development.*
- iii. The proximity of facilities such as schools, shops or employment*
- iv. The availability of and capacity for safe on-street and public car parking in the area.*
- v. Proximity to and availability of public transport and other sustainable transport options.*
- vi. The likelihood that any existing on-street parking problems in terms of highway safety, congestion, pedestrian and cyclist accessibility and amenity will be made worse.*
- vii. Local car ownership levels.*

Cycle parking, where provided as part of new development, should be located to ensure safe, secure and convenient access, with weather protection where possible. The council will prepare an SPD to provide further practical guidance on planning for walking and cycling within new development.

Any necessary mitigation measures should be set out in development proposals, including within Transport Statements, Transport Assessments and Travel Plans where these are required, and secured through conditions and/or legal agreements.

Priority areas for combinations of sustainable transport measures and highways improvements will be:

- *the A61 Corridor;*
- *the A619 Chatsworth Road;*
- *the A619 corridor through Brimington and Staveley;*
- *Chesterfield Town Centre;*
- *access to Chesterfield Railway Station.*

For masterplanned or phased developments, provision for the monitoring of traffic impact and mitigation of identified problems will be made through the use of legal agreements.

In accordance with Policy CLP22 a Transport Assessment and Travel Plan have been produced in support of the development. These set out the development transport impacts and mitigation measures. The scheme will be designed to prioritise access for pedestrians and cyclists and incorporate links to local bus services. The Travel Plan will set out a range of measures to encourage access by sustainable modes of travel.

5.3.9 CLP23 Major Transport Infrastructure

Policy CLP23 states:

'The council will safeguard land for major new transport infrastructure as shown on the Policies Map, including:

- *Chesterfield-Staveley Regeneration Route (CSRR) between Rother Way on the A619 and Bilby Lane, and within the area of the Staveley and Rother Valley Corridor (as set out in Policy SS5)*
- *Staveley Northern Loop Road Phase 2*
- *Hollis Lane Link Road between Hollis Lane and Crow Lane*

Proposals for the CSRR and Staveley Northern Loop Road will be required to conserve and enhance the route of Chesterfield Canal and the Trans Pennine Trail and make provision for safe and convenient walking and cycling access to these routes.'

The Mastin Moor scheme development and traffic impact testing has considered these safeguarded schemes, in discussion with CBC and DCC.

6 Development Proposals

Mastin Moor is located to the north east of Chesterfield, approximately 2km east of Staveley and 8km from Chesterfield. The A619 runs through Mastin Moor, connecting with Staveley to the west and the M1 Junction 30 to the east. The site location is shown at Figure 1.

The proposals at Mastin Moor comprise the provision of up to 650 dwellings with additional community facilities, including:

- Residential Care facility;
- Local Centre (including local retail, health facilities, leisure facilities, other local facilities and services, offices),
- open space, community garden extension, community building;
- parking and associated infrastructure and earthworks.

The scheme includes the provision of new access junctions from the A619 Worksop Road, B6419 Bolsover Road and Woodthorpe Road. An Indicative Masterplan is attached at Appendix B, although it is noted that the internal scheme layout is not fixed and will be confirmed through Reserved Matters applications. Further detail of the development and indicative proposals is provided below.

6.1 Development Proposals

The proposed site covers an approximate area of 46.21ha. This is broadly split in to three parcels of development:

- Central / Western parcel – located immediately south of A619 Worksop Road and west of B6419 Bolsover Road. Development in this parcel comprises provision of up to 150 dwellings including houses and apartments, as well as the community facilities including the Care Home, local retail and health facilities and gardens / open space;
- Eastern parcel – located immediately south of A619 Worksop Road and east of B6419 Bolsover Road. Development in this parcel comprises provision of up to 325 dwellings, predominantly houses, and open space;
- Southern parcel – located immediately north of Woodthorpe Road and west of B6419 Bolsover Road. Development in this parcel comprises provision of up to 175 dwellings, predominantly houses, and open space.

6.2 Highway and Access Proposals

The internal highway network has been developed with the footpath and cycle routes to provide a clear hierarchy which will aid navigation and encourages permeability. A road hierarchy has been developed as set out within the Design and Access Statement and summarised at Section 6.2.6 below.

A new road is proposed through the central / western parcel of development, linking A619 Worksop Road and B6419 Bolsover Road. A new access road will

provide access to the eastern parcel. The access road will be a cul-de-sac providing internal loops and turning heads to access the proposed residential dwellings. Similarly, a new cul-de-sac access, loop roads and turning heads provide access to residential dwellings in the southern parcel of development.

The proposed development includes provision of four new access junctions. These comprise:

- Access 1 - traffic signal control junction with A619 Worksop Road (West) providing access to the western parcel and connecting as a through route to B6419 Bolsover Road (at Access 2);
- Access 2 - priority junction with B6419 Bolsover Road (Central), providing access to the western parcel and connecting as a through route to A619 Worksop Road (at Access 1);
- Access 3 - priority junction with Woodthorpe Road (South), providing access to the southern parcel only.
- Access 4 - priority junction with B6419 Bolsover Road (East), providing access to the eastern parcel only.

Drawing Ref 276927-SK-200 shows the location of the proposed access junctions.

6.2.1 Site Access 1

Site Access 1 provides the northern / western access to the site via the A619 Worksop Road. The proposed junction takes the form of a signalised arrangement, with pedestrian and cycle crossing facilities. Drawing Ref 276927-SK-100 provides a general arrangement layout. The proposed junction incorporates the following:

- Dedicated left-turn lane along the A619 Worksop Road (East);
- Dedicated right-turn lane along the A619 Worksop Road (West);
- Single lane plus flare at the site exit;
- Pedestrian crossings, including cycle crossing facilities, at each approach to connect with existing pedestrian provision on A619 and in Mastin Moor as well as new multi user paths within the development;
- Relocation / replacement of the existing bus stop on the A619 Worksop Road (East) approach.

6.2.2 Site Access 2

Site Access 2 provides access from B6419 Bolsover Road to the western / central parcel of development to the west of Bolsover Road. The proposed access takes the form of a priority controlled T-junction. The minor arm (site access) comprises a single lane access with minor flaring at the entry to the junction to accommodate development traffic. Widening is proposed along the B6419 to provide a right turn lane for traffic movements into the site and to provide pedestrian / cycle crossing locations to the south of the junction.

The existing hedge located to the west of the B6419 Bolsover Road will be removed to provide suitable junction visibility. A new 4.5m wide verge and 2.5m wide footway will be provided on the western side of B6419 Bolsover Road for pedestrian / cycle connections into the site. Drawing Ref 276927-SK-101 provides a layout for the proposed access junction.

6.2.3 Site Access 3

Site Access 3 provides access to the southern parcel of development via Woodthorpe Road. The proposed junction, located along the southern boundary of the site, takes the form of a priority controlled T-junction. The minor arm (site access) will require a single lane access with minor flaring at the entry to the junction to accommodate development traffic. No widening is proposed along Woodthorpe Road to accommodate turning movements into the site. Drawing Ref 276927-SK-102 provides a layout for the proposed access junction.

6.2.4 Site Access 4

Site Access 4 provides access to the eastern parcel of development from the B6419 Bolsover Road. The proposed access takes the form of a priority controlled T-junction, located to the north of site Access 2 to stagger the two junctions proposed on Bolsover Road. The minor arm (site access) comprises a single lane access with minor flaring at the entry to the junction to accommodate development traffic. No widening is proposed along the B6419 Bolsover Road in the immediate vicinity of the junction to accommodate traffic movements into the site, although widening is proposed south of the access to provide pedestrian/cycle crossing facilities. A short section of hedge on the eastern side of the B6419 Bolsover Road will be removed immediately south of the junction to provide suitable junction visibility.

Pedestrian footways are provided at the junction and dropped kerb provision made across the site access and B6419 southern approach. Drawing Ref 276927-SK-101 provides a layout for the proposed access junction.

6.2.5 Bolsover Road

The Mastin Moor development includes residential development fronting Bolsover Road as well as new verges and footways on the western side of the carriageway and street lighting. In addition, two new access junctions and a number of pedestrian crossing points are located at various locations along Bolsover Road. As a result of the development proposals, the character of the road will change from an open rural road to a developed urban road. It is anticipated that the change in character will reduce vehicle speeds in the vicinity of the site. DCC will consider reducing the speed limit where actual vehicle speed reductions are observed.

6.2.6 Road Hierarchy

The indicative scheme layout has been developed based on a road hierarchy and in accordance with the Delivering Streets and Places design guide. Further details of

the road hierarchy and specifications are provided within the Design and Access Statement. The indicative scheme layout is set out on the Masterplan at Appendix B:

- Main Street / Avenue = 6m width plus 2m footways;
- Secondary Road = 6m on a potential bus route and 5m on other routes plus 2m footways;
- Peripheral Road / Park-edge Road = 5m plus footway or 7.5m overall width;
- Private Drive = shared surface 7.5m corridor width.

All routes will be designed to achieve a 20mph design speed across the site. Details of the internal site layout and street specifications will be confirmed during Reserved Matters applications.

6.3 Parking

The CBC Local Plan does not provide parking standards for new developments. The Delivering Streets and Place design guidance refers to provision based on the Department for Communities and Local Government methodology to determine appropriate levels of car parking.

The detail of type of dwelling and internal site layout are not confirmed at this stage and will be developed as part of Reserved Matters. The detailed layout of residential dwellings and numbers of parking spaces is therefore not confirmed. The parking proposals will be developed in line with the required parking standards and in discussion with CBC and DCC.

The broad car parking principles comprise:

- Car parking provided within curtilages for residential houses - garages and driveways;
- Some on street parking for visitors;
- Car parking plots will be provided close to the local centre for residents of and visitors to the residential apartments;
- Communal parking area for users of the local centre retail and health / community facilities.

Electric vehicle charging points will be located within the local centre parking area and dwellings designed to include or be adaptable to allow vehicle charging.

6.3.4 Cycle Parking

The Manual for Streets outlines the provision of high quality, well lit, safe and secure cycle parking is an important factor in promoting cycling as a mode of transport.

The CBC Local Plan states *“The level of vehicle and cycle parking provision appropriate to any individual proposal will take into account the circumstances of*

the particular scheme". No minimum cycle parking standards are referred to, although a walking and cycling SPD is to be prepared.

Delivering Streets and Places references cycle parking requirements "*For residential developments with common facilities such as flats, one space per five dwellings (to be secure and undercover and with step-free access) shall be used only in the absence of specific guidance from the relevant LHA. For other residential developments, one space per dwelling, with garages counting towards cycle parking provision if they meet the 'Preferred' standard in the Garages and Gated Accesses to Parking Spaces DES*".

The cycle parking proposals will be developed in line with the required parking standards and in discussion with CBC and DCC. Cycle parking provision for residential houses will be within each plot. A secure cycle parking area will be provided for residential apartments. Short stay Sheffield stand cycle parking will be provided in close proximity of the local centre. All cycle parking will be located in public, well lit areas close to the amenities.

6.4 Public Transport Access

The Mastin Moor scheme is well located for access to existing bus services. The indicative scheme proposals therefore comprise the use of existing bus infrastructure provision. The scheme has been designed to facilitate pedestrian access to existing bus stops on Worksop Road and in Mastin Moor and Woodthorpe. A network of high quality, safe and attractive routes are proposed through the site linking to the local highway network and directly linking to bus stops within a good walking distance, on A619 Worksop Road and Woodthorpe Road.

The existing westbound bus stop on A619 Worksop Road opposite Rowan Road will be relocated approx. 30m to the northeast to enable provision of the site access junction. Raised kerbs and new shelter with seating and timetable information will be provided at this relocated/new bus stop.

Improvements to other existing local bus stops will be undertaken where this will encourage greater patronage, comfort and / or safety of passengers, details of which will be agreed with DCC.

At this stage it is not proposed to divert bus services into the Mastin Moor site. However, it is acknowledged that permeability of bus services through the site will encourage greater bus patronage. Further to discussions with DCC and local bus operators it may be appropriate to divert some services into the site (such as route 81 and/or alternate route 74A / 77). The indicative layout has been developed to accommodate potential bus movements in the future if required. In line with the Delivering Streets and Places Design Guide, the access road through the central / western parcel will be 6m minimum width and space would be available for the provision of bus stops. In the eastern and southern parcels routes are identified as potential bus loops with 6m access roads suitable to accommodate bus movements.

6.5 Pedestrians and Cyclists

Cycling and walking provision form a key part of the Masterplan and the Mastin Moor proposals include the provision of a network of pedestrian and multi user paths through the site. These will provide high quality, safe and well lit routes through the site. A range of routes will connect with the local highway network, the existing Mastin Moor and Woodthorpe areas and towards the Seymour Link Road for connections towards Markham Vale. Routes follow key desire lines to amenities including bus stops, local schools, existing retail provision and employment opportunities.

A network of footpaths provide access for pedestrians through the site. These will be 2m wide, surfaced and well lit. The multi user paths will provide access for pedestrians and cyclists through the site. These follow core routes east west through the site and connect to the local highway network. The design specifications will be agreed as part of detailed design / reserved matters. Based on recent design guidance the multi user paths should segregate pedestrians (2m width) and cyclists (2.5m width) and be surfaced and well lit.

Roads through the site will have 2m footways on both sides of the carriageway with dropped kerb crossing provision. Cycle provision is proposed on the carriageways through the site, in accordance with Delivering Streets and Places guidance for lightly trafficked routes. Routes follow existing contours where feasible to limit gradients and provide easier access for pedestrians and cyclists.

Off site pedestrian and cycle proposals comprise:

- Toucan crossings at the new access road junction with the A619 Worksop Road;
- Two new pedestrian refuges for crossing over B6419 Bolsover Road;
- New footway on the western side of Bolsover Road;
- Multi user link along Woodthorpe Road to Seymour Link Road for connections to Markham Vale – detailed proposals to be agreed with CBC / DCC.

Following public consultation feedback and as a result of the potential increased footfall towards Norbriggs Primary School, options for a new pedestrian crossing on Norbriggs Road were previously considered. DCC Highways advised that a zebra crossing is not appropriate as the pedestrian movements would be limited to school start and finish times. Outside these times, demand would be limited so drivers would not be expecting to stop which could provide a safety risk. An alternative option would be to provide a school crossing patrol at the school start and finish times.

As part of the internal pedestrian and cycle network, circular walks and trip trails will be incorporated to promote healthy lifestyles.

7 Highway Assessment Methodology

An outline application for residential development at Mastin Moor was submitted in 2017. The application included a detailed Transport Assessment (TA) to determine the transport impacts of the proposed scheme. The methodology for the 2017 TA was agreed with DCC Highways and Highways England prior to submission and the submitted 2017 TA accepted. Highways England raised no objection to the scheme and DCC Highways were supportive of the proposals.

Through the Revised Mastin Moor TA Scoping process, DCC and Highways England agreed that the 2017 Transport Assessment methodology, as set out below, is generally acceptable with some updates for the 2020 submission, as described within this chapter.

7.1 SATURN Model

Previous TA scoping discussion with Derbyshire County Council's (DCC) Development Control officer confirmed that assessment of the highway impact should be undertaken using DCC's North Derbyshire Traffic Model, a strategic traffic model (SATURN). Aecom currently maintain and operate the North Derbyshire SATURN traffic model on behalf of DCC.

Local updates to the SATURN model were in 2014 in relation to testing the 2017 Mastin Moor and the nearby Staveley Works Area schemes with the parameters for the modelling work agreed with DCC and Highways England. We note the 2014 and future year SATURN models are currently in the process of being updated, however it has been agreed that the previous modelling outputs are suitable to identify the impacts of this Revised Mastin Moor scheme.

7.1.1 Assessment Years

Aecom previously provided the SATURN Modelling Note (see Appendix C – Ref Mastin Moor_TN01_Modelling Methodology_V3.pdf) which summarises the methodology used to produce the SATURN modelling work used to assess the Mastin Moor development. This includes:

- 2014 Base: model updates based on 2014 data – see below details in relation to 2019 Base year and recent traffic data trends;
- 2026 Do Minimum: core strategy forecast year. The Do Minimum year includes committed development trips, network changes and traffic growth; and
- 2026 Do Something: Do Minimum and proposed Mastin Moor development of 650 residential dwellings.

Additional ancillary development comprising community retail and health has not been included as part of the strategic modelling, however, is included in local junction models as set out at Section 7.2.

2019 Base Year

A review of historical traffic flows has been undertaken, based on data provided by DCC. DCC's permanent and manual traffic count data is hosted on Drakewell's C2 web database. Annual Daily Traffic (ADT) was reviewed for four sites close to Mastin Moor, to compare changes in traffic flows from 2014 to 2019. It is noted that 2020 data was excluded due to Covid-19 disruption to travel patterns.

Image 2 below shows the traffic data site locations and Image 3 provides a summary of the ADT flows from 2014 to 2019. Sites 1, 2 and 4 are permanent loop counters and Site 3 is taken from Bluetooth data.

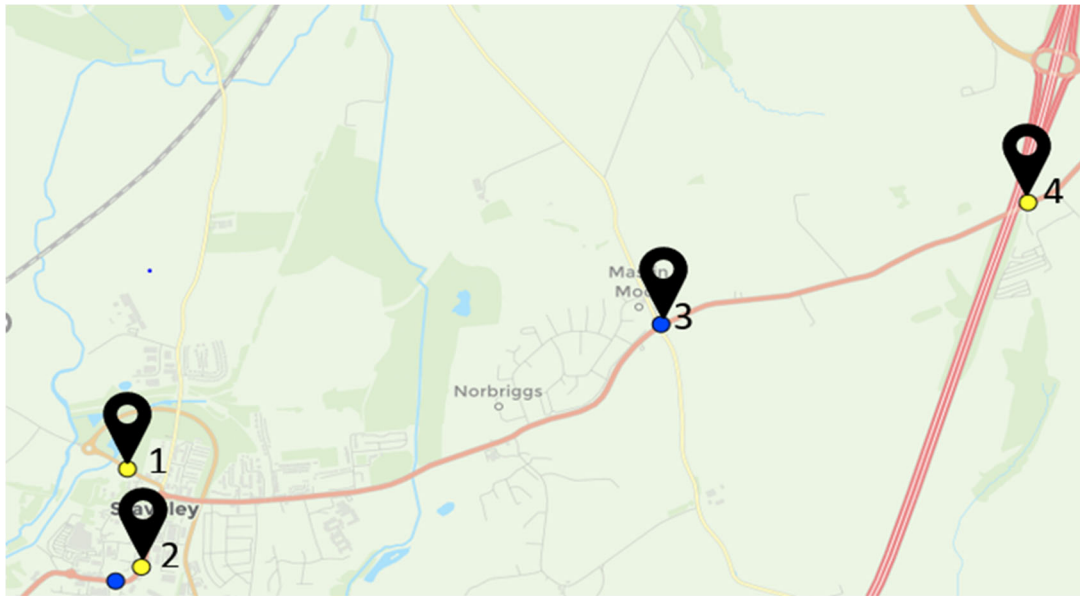


Image 2: ADT Count Locations

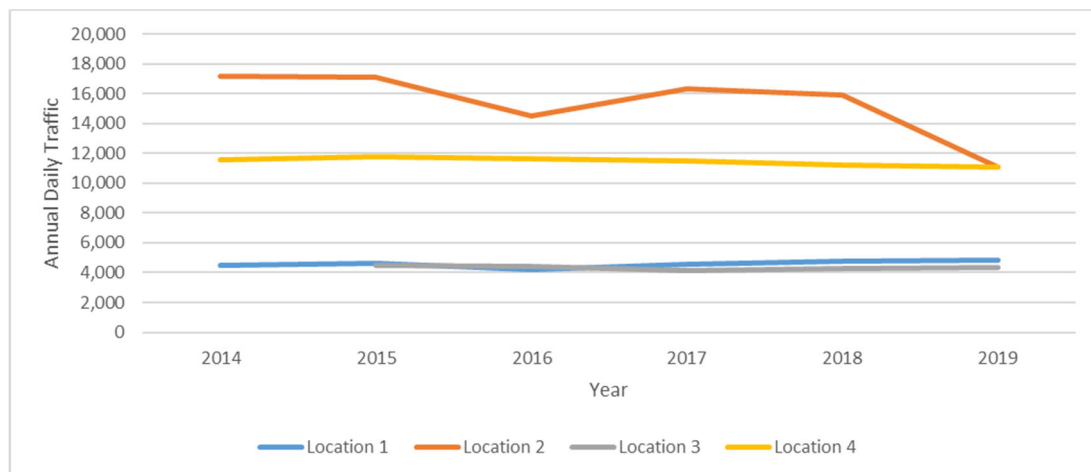


Image 3: ADT Count Data

The data shows that over the last five years, there has been limited changes in the ADT flows recorded, with some reduction in flows at Site 2. It is therefore considered that the 2014 Base year data used for the 2017 TA assessment is appropriate to be used for a 2019 Base year.

7.1.2 Assessment Periods

Assessments have been undertaken for the following peak hours:

- AM peak hour = 08:00-09:00hrs;
- PM peak hour = 17:00-18:00hrs.

7.1.3 Committed Development

Planned developments by the three district planning authorities; CBC, NE Derbyshire District Council and Bolsover District Council, have been included in the Do Minimum model developed as part of the 2014 Model for the 2017 assessment. The Aecom Modelling Note identifies the developments included from all three districts. In order to develop the Do Minimum model for Mastin Moor, the Mastin Moor development was removed from the Staveley Works Area Do Minimum model and the Staveley Works Area Scenario 2 development was included.

2019 Committed Development

For the Revised Mastin Moor scheme TA, a review of recently submitted or adopted Local Plans for each of the Councils has been undertaken to determine any significant changes to sites / allocations and determine whether this may impact the local highway network surrounding Mastin Moor.

The review concluded that the majority of Strategic Sites planned within the three local authority areas were identified in previous Local Plans, therefore were included as part of the highway modelling for the 2017 TA. Some new sites have been included in the latest Local Plans but are located some distance from Mastin Moor and are therefore not considered to generate trips on the local network at Mastin Moor.

The exception to this is the Clowne Garden Village scheme, which is a major mixed use scheme located less than 5km to the north east of Mastin Moor and forecast to have an impact on the A619 towards Mastin Moor and at the M1 Junction 30 and the A616/A619 Treble Bob roundabout located approx. 2.5km north east of Mastin Moor. The Clowne Garden Village application benefits from a resolution to grant outline planning permission but agreement on detailed highway mitigation measures including at the Treble Bob roundabout has not yet been reached.

Predicted trips associated with the Clowne Garden Village scheme have been taken from the Transport Assessment (Aecom, November 2017) within the Environmental Statement submitted as part of the scheme planning application. Forecast vehicle trips were taken from Table 5.2 and assignment from Figure 5.4 of the Transport Assessment. All trips forecast along the A619 to/from Chesterfield are assumed to pass through Mastin Moor on the A619 Worksop Road. These trips have been added to the Do Minimum and Do Something SATURN model outputs.

7.1.4 Committed Infrastructure

Committed infrastructure included within the Do Minimum model comprises:

- Staveley Northern Loop Phase II. The junctions through Staveley experience high levels of congestion in the Do Minimum cases without the Staveley Northern Loop Phase II included (to the extent that the DM forecasts do not converge). The Staveley Northern Loop was included following discussions with DCC. Phase II forms a new link between the A619 at the Lime Avenue junction, connecting to the fourth arm of the Northern Loop roundabout along Hall Lane. The link has also been included in the DS scenarios;
- M1 J28-J31 All Lane Running. 4 lane capacity;
- A61 - Whittington Moor Roundabout. Capacity upgrades at the roundabout.

7.1.5 Model Outputs

SATURN model data outputs comprise traffic flows, volume to capacity ratios (VCR) and queues. These outputs have identified the study area for detailed assessment and fed into the isolated junction assessments undertaken. Further detail is provided below.

7.2 Study Area and Assessment

As agreed with DCC for the 2017 TA, the methodology for determining junctions for further detailed assessment comprised identifying junctions that are operating at a volume to capacity ratio (V/C) beyond 80% and have been impacted by 5% or more by the Mastin Moor development. Details of the model outputs and junctions for further assessment are provided below.

7.2.1 SATURN Model Outputs

Aecom undertook the SATURN modelling for the 2017 Mastin Moor development, based on the methodology described above.

Output data was provided, including:

- Difference Plots v2.zip - SATURN Difference plots showing the change in flows between scenarios DM and DS scenarios;
- Junctions 5%_v2.zip – An assessment showing the percentage change in volume/capacity ratio at junctions in comparison to the DM. The methodology used identifies modelled junctions in the DM with a V/C > 80%. These junctions are reviewed to see if the V/C change by more than 5% in the DS case;
- Model_Outputs_MMv4-Issue.xlsx – Link and junction turning (demand) flows for the links and junctions adjacent to the development (the output includes all the junctions identified in the SWA AAP modelling). The spreadsheets also include Volume/Capacity ratios, Queues, Delays

and %HGVs by turn and link by time periods. Data was provided for Base Year, Do Minimum and Do Something scenarios;

- Dev SLs v2.zip - Select links from the proposed development showing development traffic only.

The Aecom SATURN data Model Outputs are provided at Appendix D. In terms of determining the study area for more detailed assessment this is based on a review of the Junctions 5% output. V/C data was extracted from the Do Minimum and Do Something model for individual nodes and filtered to show the nodes with a V/C greater than 80%. Comparisons were then made between the filtered nodes in the Do Something and Do Minimum models and nodes with a difference greater than 5% highlighted for further assessment. The results of this are presented in the table below.

Table 5: SATURN Data – V/C Changes from DM to DS at Junctions with V/C over 80%

Node Location	AM Peak Hour			PM Peak Hour		
	DM	DS	% Change	DM	DS	% Change
Highfield Lane/B6051 Newbold Rd	87.6	86.47	-1.31%	86	86	0.00%
Brimington Rd/A61 Roundabout	109.81	109.43	-0.35%	82.31	82.39	0.10%
Lockoford Rd/Sheffield Rd Roundabout	81.08	81.39	0.38%			
Lordsmill Roundabout				92.03	92.74	0.77%
Brimington Rd/Brewery St Roundabout	83.06	83.25	0.23%	92.55	92.72	0.18%
A61 Offslip onto Hollis Ln	104.84	104.95	0.10%	93.54	93.62	0.09%
A61/A617 Roundabout-A617 WB Off the Roundabout	84.23	83.03	-1.45%			
Spital Ln/Hady Hill Signalised Junction	81.37	82.73	1.64%			
A61/Nethermoor Rd Roundabout	97.38	97.05	-0.34%	101.9	101.93	0.03%
A619 Chesterfield Rd/Hall Rd Brimington Gyratory				89.6	89.95	0.39%
A619 Ringwood Road/High Street				81.62	82.12	0.61%
B6425 Hassocky Ln/A617 Off/Onslip	79.79	80.6	1.00%	91.32	91.35	0.03%
A632 Chesterfield Rd/Staveley Rd	96.58	96.58	0.00%	99.47	99.54	0.07%
A38 WB nr Alfreton				88.23	88.45	0.25%
M1 J28	81.69	81.85	0.20%	84.77	84.81	0.05%
M1 NB Approaching J28				100.23	100.33	0.10%
A38 WB Approaching J28	103.4	103.43	0.03%	101.19	101.15	-0.04%
A38/Cartwright Ln/Berristow Ln Roundabout	89.06	89.11	0.06%	91.37	91.37	0.00%
A38/Common Rd (in buffer)	98.78	98.82	0.04%	100.71	100.65	-0.06%
A617 Chesterfield Rd/Green Ln	90.94	91.09	0.16%	91.93	91.95	0.02%
Hall Ln	96.81	101.05	4.20%	101.55	100.54	-1.00%

A619 Markham Rd/A619 Chatsworth Rd Roundabout-A619 WB Approaching Roundabout	81.41	81.91	0.61%	87.29	57.56	0.31%
A619 Markham Rd/A619 Chatsworth Rd Roundabout-A619 EB Approaching Roundabout	81.93	82.46	0.64%			
A61/A619 Rother way Roundabout-A619 EB Approaching Roundabout	92.89	92.34	-0.60%			
A61/A619 Rother way Roundabout-A61 NB Approaching Roundabout	86.23	85.55	-0.79%			
A61/A617 Roundabout-circulatory	52.35	98.31	46.75%			
M1 J29 NB Offslip onto Roundabout				106.35	106.42	0.07%
M1 J30-M1 SB Onslip	83	84.85	2.18%			

On the basis of the SATURN data, the Mastin Moor development is not predicted to have a significant impact (ie less than 5%) at the vast majority of the identified junctions. The one exception was the significant increase in V/C predicted in the AM peak at the A61/A617 junction on one circulatory link. An increase of a small number of vehicles on the circulatory carriageway (<10) in the Do Something causes queues to extend beyond the B&Q priority approach arm. On review of the total turning flows at the junction, there is predicted to be a slight overall reduction (approx. 50). As a result, the impact of Mastin Moor development at this junction, approx. 9km from the site, was not considered significant and no further assessment has been undertaken.

7.2.2 Strategic Road Network Impact

Following discussions with Highways England traffic flow data outputs for the M1 motorway junctions 30 were provided from the SATURN model. A summary of predicted impact at the junctions was provided, as shown at Appendix E. While the impact of the proposed Mastin Moor development at the M1 junction 30 is minor, Highways England requested that further assessment of the impact of the development at the Treble Bob roundabout is undertaken as queuing from the roundabout can affect the M1 junction 30. This is presented at Section 10.11.

7.2.3 Junction Assessment

It is however noted that operation of junctions in the immediate vicinity of the proposed development should be considered through more detail assessment. In addition, assessment of the proposed site accesses is required. Additional ancillary development including predicted community retail and health trips will be included in the site access junction models but has not been included as part of the strategic modelling assessment and outputs.

On this basis, the following junctions within the local highway network, where impact is predicted and isolated junction assessments are required, have been identified as follows:

- Junction 1 – A619 / B6419 Bolsover Road traffic signal controlled junction (signals);
- Junction 2 – A619 / Norbriggs Road traffic signal controlled junction (signals);
- Junction 3 – B6419 Bolsover Road / Woodthorpe Road priority controlled junction (T-junction);
- Access 1 - traffic signal control junction with A619 Worksop Road (West);
- Access 2 - priority junction with B6419 Bolsover Road (Central);
- Access 3 - priority junction with Woodthorpe Road (South).
- Access 4 - priority junction with B6419 Bolsover Road (East).

2026 Do Minimum

Detailed assessment of existing Junctions 1 – 3 has been undertaken in the Do Minimum scenario based on the junction turning flow data provided from the SATURN model and including the forecast Clowne Garden Village flows through Junctions 1 and 2.

2026 Do Something

Detailed assessment of existing Junctions 1 – 3 and the Site Access junctions 1 – 4 has been assessed in the Do Something scenario using turning flow data from SATURN as well as local assignment of local retail and health trips. Details of the proposed development trip generation and distribution are provided at Chapter 8.

Local junction assessments have been undertaken using appropriate modelling programmes (LinSig, Junctions9) to assess operation of the network. Results of the highway assessments are presented at Chapter 10.

7.2.4 Treble Bob Roundabout Sensitivity Test

Following scoping discussions with DCC and Highways England assessment of the A616 / A619 Treble Bob roundabout adjacent to the M1 Junction 30 to the north east of Mastin Moor has been undertaken. As identified at Section 7.1.3, the Clowne Garden Village scheme in Bolsover is a strategic site for BDC which was not included in the 2017 Assessment of the Mastin Moor scheme. Assessment of local junctions in Mastin Moor include the Clowne Garden Village scheme as committed development. As part of this TA, two scenarios have been considered in relation to operation of the nearby Treble Bob roundabout:

With Clowne Garden Village included as a committed development

The Clowne Garden Village scheme Transport Assessment (Aecom, Nov 2017) includes the predicted Mastin Moor traffic flows as committed development. It is assumed that if the Clowne Garden Village receives planning consent appropriate highway mitigation at M1 Junction 30 and Treble Bob roundabout will be agreed and will accommodate development at Mastin Moor, therefore further assessment of these junctions is not required.

Without Clowne Garden Village

Without Clowne Garden Village highway assessment of the impact of Mastin Moor development at the Treble Bob roundabout has been undertaken, as follows:

- It is noted that the SATURN model outputs do not include data for the Treble Bob roundabout. Traffic survey data (June 2016) presented within the Clowne Garden Village TA (Appendix O, Figures 1 and 2) has therefore been used. The survey data excludes traffic flows to/from Slayley View Road therefore a low level of traffic flow has been added to/from this link for completeness. TEMPRO growth factors have been applied for 2019 Base and 2026 Future Years (see table below). It is noted that, as this scenario does not include the Clowne Garden Village scheme, no other committed development traffic has been added for the 2026 Do Minimum scenario.

Table 6: TEMPRO Growth Factors (Bolsover 001 + Chesterfield 002)

	AM	PM
2016-2019	1.0340	1.0314
2016-2026	1.0959	1.0900

- Predicted Mastin Moor traffic at the Treble Bob roundabout has been taken from the SATURN model outputs. The forecast Do Minimum traffic flows have been subtracted from the forecast Do Something traffic flows on the A619 Worksop Road link in both the eastbound and westbound direction. These have been assumed to arrive at and depart from the Treble Bob roundabout respectively. This is considered a robust assessment as no development traffic is considered to turn on/off the A619 in either direction between Mastin Moor and the Treble Bob roundabout. The predicted Mastin Moor traffic flows have been distributed at the Treble Bob roundabout according to turning proportions at the existing junction (based on the 2016 survey data).
- Assessment of the junction has been undertaken using the Junctions9 modelling software. Highway geometries have been taken from the Aecom TA and reviewed against Google Maps. Detail of the survey data is not provided within the Clowne Garden Village data, therefore indicative proportions of HGVs have been assumed (A619/A616 = 10%, minor roads 5%).

Results of the assessment are presented at Section 10.11

8 Trip Generation and Distribution

A methodology for predicted trip generation and distribution has been agreed with DCC and Highways England, as set out below.

8.1 Trip Generation

8.1.1 Development Scenario

The Revised Scheme proposals comprise:

- Up to 650 dwellings, in accordance with the CBC Local Plan allocation;
- Healthcare provision – 1000sqm GFA health centre plus new Care Home facility (80 bedroom);
- Local Retail – 1000sqm GFA local shops;
- New small-scale Office – 300sqm;
- Community gardens / allotments, play areas and other open space.

The predicted vehicle trips for the Revised Mastin Moor scheme are based on the agreed trip rates, taken from the 2017 TA, for the residential development and Health Centre provision. These trip rates have been applied to the Revised Scheme development quantum.

Trips Rates for the proposed Retail provision has been reviewed to reflect the provision of a number of smaller units, including convenience store. In addition, trips associated with the new Care Home and Office elements of the scheme have been forecast, as set out below.

8.1.2 Residential Trip Generation

Residential trip generation is taken from the agreed 2017 TA. Trip generation rates associated with the residential land uses followed the same methodology as agreed for the nearby SWA site based on the former Coalite Works site in Bolsover (Bolsover District Council planning application reference: 14/00089/OUTEA), as set out below. The person trip generation rates and predicted people trips for the Mastin Moor development are presented in Table 7.

Table 7: Forecast Person Trip Rates – Residential

		08:00-09:00			17:00-18:00		
		Arrivals	Departures	Total	Arrivals	Departures	Total
Trip Rate	Per dwelling	0.237	0.713	0.950	0.541	0.350	0.891
Trip Generation	650 dwellings	154	464	618	352	228	579

However, due to local geographic variances, the person trip generation rates have been factored using 2011 Census data to obtain vehicle trip rates. An interrogation of the 2011 Census data has been undertaken for travel to work statistics at

National, Regional and local levels associated with car driver modes of transport. The results of the exercise are presented in Table 8.

Table 8: National Statistics 2011, Travel to Work Assessment

	England	East Midlands	Derbyshire	Chesterfield
Vehicle Trip Factor	60.7%	69.5%	73.6%	62.9%

Given the location of the site, the census data associated with the Chesterfield Rural area was considered appropriate. The travel to work data has been used to calculate all mode shares for the residential land use with the mode shares presented in Table 9 below.

Table 9: Residential Land Use Mode Share

	Vehicle Driver	Vehicle Passenger	PT – Bus	Cyclist	Pedestrian	M/Cycle / Scooter	Total
Residential	62.9%	10.6%	15.3%	1.0%	8.9%	1.3%	100%

By multiplying the person trip rates by the Chesterfield vehicle mode factor, the site residential vehicle trip rates required for SATURN modelling have been calculated and are set out in Table 10. The total predicted vehicle trips associated with the Mastin Moor development are also set out in the table below.

Table 10: Residential Vehicle Trip Generation Rates and Trips

		08:00-09:00			17:00-18:00		
		Arrivals	Departures	Total	Arrivals	Departures	Total
Trip Rate	Per dwelling	0.148	0.445	0.593	0.338	0.218	0.556
Trip Generation	650 dwellings	96	289	385	220	142	361

It is noted that the calculated residential trip generation rate applies for both residential dwellings and flats/apartments for the purpose of the SATURN modelling exercise. This will slightly over estimate the volume of traffic the site will generate, although provide a robust representation of the likely traffic reassignment and impact on the adjacent highway network.

8.1.3 Local Centre / Community – Health Centre Trip Generation

The Health Centre trip generation rates have been taken from the agreed 2017 TA, obtained from the TRICS 7.3.3 database.

Forecasts of trips generated by the Health Centre element have been made by interrogating the TRICS database ‘GP Surgeries’ category, excluding sites in London, Ireland, Wales and Scotland. The site selection has been filtered for Edge of Town Centre, Edge of Town and Suburban Area locations. The detailed TRICS outputs are provided at Appendix F and the person trip rates and resultant trip generation presented below.

Table 11: Forecast Person Trip Rates – Health Care (GP Surgeries)

		08:00-09:00			17:00-18:00		
		Arrivals	Departures	Total	Arrivals	Departures	Total
Trip Rate	Per 100m ²	6.537	3.162	9.699	2.950	4.660	7.610
Trip Generation	1,000m ²	65	32	97	30	47	76

The mode share for the health centre land uses were also taken from TRICS with the detailed outputs provided at Appendix F and results presented below in Table 12.

Table 12: Health Centre Land Use Mode Share

	Vehicle Driver	Vehicle Passenger	PT – Bus	Cyclist	Pedestrian	M/Cycle / Scooter	Total
Health Centre	58.2%	13.5%	1.9%	1.2%	25.2%	n/a	100%

By multiplying the person trip rates by the vehicle mode factor, the health centre vehicle trip rates have been calculated as set out below in Table 13.

Table 13: Health Centre Vehicle Trip Rate and Trips

Land use	AM			PM		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Health Centre – GP Surgery (GFA/100m ²)	3.805	1.840	5.645	1.717	2.712	4.429
Health Centre trips	38	18	56	17	27	44

8.1.4 Local Centre / Community - Care Home Trip Generation

Forecasts of trips generated by the proposed Care Home development have used the ‘Care Home (Elderly Residential)’ category within the TRICS 7.7.1 database, excluding sites in London, Ireland, Wales and Scotland. The site selection has been filtered for Suburban Area and Edge of Town locations. The TRICS outputs are provided at Appendix F and person trip rates and resultant peak hour trip generation presented below.

Table 14: Forecast Person Trip Rates – Care Home

		08:00-09:00			17:00-18:00		
		Arrivals	Departures	Total	Arrivals	Departures	Total
Trip Rate	Per resident	0.145	0.099	0.244	0.099	0.132	0.231
Trip Generation	80	16	8	24	9	9	18

The mode share for the Care Home uses were also taken from TRICS and are presented below in Table 15. The mode share multi vehicle occupants is assumed to comprise a car occupancy of two therefore split equally between vehicle driver and passenger modes.

Table 15: Care Home Mode Share

	Vehicle Driver	Vehicle Passenger	PT – Bus / Rail	Cyclist	Pedestrian	Other	Total
Care Home	57.9%	12.2%	9.3%	1.6%	19%	0%	100%

By multiplying the person trip rates by the vehicle mode factor, the Care Home vehicle trip rates have been calculated as set out in Table 16.

Table 16: Care Home Vehicle Trip Rates and Trips

Land use	AM			PM		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Care Home (resident)	0.084	0.057	0.141	0.057	0.076	0.134
Care Home trips	7	5	11	5	6	11

8.1.5 Local Centre / Community - Local Shops Trip Generation

Forecasts of trips generated by the proposed Retail element of the development have used the 'Local Shops' category within the TRICS 7.7.1 database, excluding sites in London, Ireland, Wales and Scotland. The site selection has been filtered for Edge or Town and Neighbourhood Centre locations. A review of the surveyed sites has been undertaken and sites are generally in mainly residential areas several kilometres from towns. The local shops comprise a mixture of units including small convenience stores (Tesco Express / Co-op), newsagent, pharmacy, hair & beauty and food takeaways and are considered appropriate for the type of development proposed. The TRICS outputs are provided at Appendix F and person trip rates and resultant peak hour trip generation presented below.

Table 17: Forecast Person Trip Rates – Local Shops

	08:00-09:00			17:00-18:00		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Local Shops (per 100m ² GFA)	16.508	16.766	33.274	14.563	16.706	31.269
Trip Generation – 1000sqm	165	168	333	146	167	313

The mode share for the Retail uses were taken from TRICS and are presented below in Table 18. The mode share multi vehicle occupants is assumed to

comprise a car occupancy of two therefore split equally between vehicle driver and passenger modes.

Table 18: Local Shops Mode Share

	Vehicle Driver	Vehicle Passenger	PT – Bus	Cyclist	Pedestrian	Other	Total
Local Shops	44.0%	12.7%	1.8%	1.3%	40.3%	0.0%	100%

By multiplying the person trip rates by the vehicle mode factor, the site retail vehicle trip rates have been calculated as set out in Table 19.

Table 19: Local Shops Vehicle Trip Rates and Trips

Land use	AM			PM		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Local Shops (per 100m ² GFA)	7.247	7.360	14.607	6.393	7.334	13.727
Trip Generation	73	74	146	64	73	137

8.1.6 Local Centre / Community - Office Trip Generation

Forecasts of trips generated by the proposed Office development have used the SWA1 agreed trip rates and mode shares and are presented in the tables below.

Table 20: Forecast Person Trip Rates – Office

	08:00-09:00			17:00-18:00		
	Arrivals	Departures	Total	Arrivals	Departures	Total
B1 Office Employment (per 100m ² GFA)	2.288	0.219	2.508	0.173	1.910	2.083
Trip Generation – 300sqm	7	1	8	1	6	6

Table 21: Office Mode Share

	Vehicle Driver	Vehicle Passenger	PT – Bus	Cyclist	Pedestrian	M/cycle / Scooter	Total
Office	62.9%	10.6%	15.3%	1.0%	8.9%	1.3%	100%

By multiplying the person trip rates by the vehicle mode factor, the site retail vehicle trip rates have been calculated as set out in Table 22.

Table 22: Office Vehicle Trip Rates and Trips

Land use	AM			PM		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Office (per 100m ² GFA)	1.441	0.138	1.579	0.109	1.202	1.311
Office trips	4	0	5	0	4	4

8.2 Total Vehicle Trip Generation

Table 23 below provides a summary of the trip rates and total trips for all land uses within the Revised Mastin Moor scheme.

Table 23: Revised Scheme – Vehicle Trip Generation Rates and Trips

	08:00-09:00			17:00-18:00		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Residential Trip Rate (per dwelling)	0.148	0.445	0.593	0.338	0.218	0.556
Residential Trips - 650 dwellings	96	289	385	220	142	361
Health Centre / GP Surgery Trip Rate (per 100m ² GFA)	3.805	1.840	5.645	1.717	2.712	4.429
Health Centre Trips – 1000sqm	38	18	56	17	27	44
Care Home Trip Rate (per resident)	0.084	0.057	0.141	0.057	0.076	0.134
Care Home Trips – 80 bedroom	7	5	11	5	6	11
Local Shops Trip Rate (per 100m ² GFA)	7.247	7.360	14.607	6.393	7.334	13.727
Local Shops Trips - 1000sqm	73	74	146	64	73	137
Office Trip Rate (per 100m ² GFA)	1.441	0.138	1.579	0.109	1.202	1.311
Office Trips – 300sqm	4	0	5	0	4	4
Total trips	218	386	603	306	252	557

8.3 Trip Distribution

8.3.1 Trip Distribution

The proposed Mastin Moor development includes provision of four new access junctions. These comprise:

- Access 1 - traffic signal control junction with A619 Worksop Road (West);
- Access 2 - priority junction with B6419 Bolsover Road (Central);
- Access 3 - priority junction with Woodthorpe Road (South).
- Access 4 - priority junction with B6419 Bolsover Road (East).

8.3.2 External Trip Distribution - Residential Trips

The distribution of residential trips adopted within the assessment have been based on those used in the 2017 TA Strategic SATURN model outputs, as the proposed residential development is unchanged from the 2017 application. Within SATURN, the distribution of development trips on the network was calculated from the SWA distribution for local residential zones. Minor adjustments were made as a result of the Mastin Moor development located to the east of Staveley, increasing the proportions to Sheffield, North and East zones and reducing the proportions to South and West zones. Details of the distribution are provided at the Aecom modelling note at Appendix C.

8.3.3 Site Accesses – Residential Trips

The predicted residential development trips have been taken from the 2017 TA SATURN model, as the proposed residential development is unchanged from the 2017 application. The SATURN model provides the turning movements for Site Access 1 (A619 West) and Site Access 2 (Central) with the connecting link road. There is no output for Site Accesses 3 and 4, therefore these have been calculated using the predicted trips for the southern and eastern parcels of development and using the wider network distribution from the SATURN model to determine the local route choice / turning movements at the accesses.

8.3.4 Internal Trip Distribution – Local Centre Trips

As agreed with DCC, local trips in relation to the Local Centre (local shops, health centre, care home and office) have not been included in the strategic SATURN model, as will generally serve the surrounding local communities (existing Mastin Moor, Woodthorpe and the proposed new development) with trips generally assumed to already be on the wider highway network.

The predicted local centre trips have therefore been distributed on the local highway network only. The local centre will be located to the north of the development site close the A619 Worksop Road with visibility from the main road.

The majority of the predicted trips will arrive and depart via the new signal control junction with the A619 Worksop Road; 50% of trips will arrive from / depart to the west for local trips to existing Mastin Moor, Woodthorpe and towards Staveley; 20% will arrive from / depart to the east for local trips to western areas of Mastin Moor. 30% of trips are predicted to arrive / depart through the new development access road for local trips to / from the proposed new development as well as areas to south of the site.

8.4 Assessment Traffic Flows

The SATURN output data is provided at Appendix D. The predicted traffic flows on the local highway network in the vicinity of the development are shown on Figures 5 to 23.

The 2026 Do Minimum trips for the AM and PM peak hours are taken from the SATURN outputs and shown on Figures 5 and 6. The predicted Clowne Garden Village traffic flows, taken from the Aecom TA, are shown on Figures 7 and 8 with the Updated Do Minimum traffic flows for the AM and PM peak hours shown on Figures 9 and 10.

The 2026 Do Something trips for the AM and PM peak hours, taken from the SATURN outputs are shown on Figures 11 and 12. These show the future year traffic flows including the Mastin Moor residential development flows at the junctions within the SATURN network (ie including site accesses 1 and 2 only).

The distribution of Local Centre trips (retail, health, care home and office) across the local highway network is shown in Figure 13 with the predicted retail, health, care home and office forecast trips for the AM and PM peak hours shown on Figures 14 to 21.

The total 2026 Do Something traffic flows for the AM and PM peak hours are shown on Figures 22 and 23. These comprise:

- The DM SATURN outputs and additional Clowne Garden Village committed development trips;
- the DS SATURN outputs for residential trips on the existing highway network and the modelled site accesses (1 and 2);
- the calculated residential trips for Site Accesses 3 and 4;
- the predicted retail, health, care home and office trips on the local network.

It is noted that there are discrepancies in turning movements between the junctions on the local network. These are as a result of the differences from the SATURN model outputs which occur from the strategic model zoning and link connectors.

Local junction assessments using appropriate modelling programmes (LinSig, Junctions9) have been undertaken to assess operation of the network and are presented at Chapter 10.

8.4.4 Treble Bob Traffic Flows

The methodology for the Sensitivity Test assessment of the impact of the Mastin Moor scheme on operation of the Treble Bob roundabout without the Clowne Garden Village scheme has been set out at Section 7.2.4.

The 2016 surveyed junction turning movement flows for the AM and PM peak hours are shown at Figures 24 and 25 respectively, with the growthed 2019 (Base) and 2026 (Do Min) AM and PM peak hour flows shown at Figure 26-27 and 28-29. The 2026 Do Something flows with the Mastin Moor traffic added are shown at Figures 30 and 31 for the AM and PM peak hours respectively.

9 Sustainable Modes Assessment

The promotion of walking, cycling and public transport will be important to reduce reliance on car trips on the local highway network. For the Mastin Moor development it will connect communities and provide vibrant places to live. The development will provide a mix of land uses to encourage walking and cycling within the site and connect to the wider area. Walking trips will be feasible for trips to Mastin Moor, Woodthorpe and parts of Staveley. Cycling trips are more likely to be undertaken for longer trips connecting the site with the wider town of Staveley and parts of Chesterfield to the west. There are also opportunities for public transport connections to the wider area, particularly along the A619 corridor.

9.1 Bus Services

9.1.1 Accessibility

‘Planning for Public Transport in Developments’¹ (paragraph 6.20) states that: *“the maximum walking distance to a bus stop should not exceed 400m and preferably be no more than 300m”*. The Delivering Streets and Places design guide (DES: Bus Routes) states that it is highly desirable that *“Trip attractors and generators (e.g. residential, commercial, employment and recreational land uses) are located within 250m walking distance of a public transport facility (i.e. a bus stop, train station or tram stop) and usually never more than 400m”*.

It is also noted that best practice for bus services to new developments should be access to services with a frequency of at least one service every half hour.

Within the site, walking distances to existing bus provision are dependent on the location within the proposed development itself. Figure 32 shows bus stop locations and 400m walking distance from key bus stops surrounding the site, based on the network of footpaths and multi user routes set out on the indicative site masterplan.

The vast majority of the site is located within 400m walking distance of existing bus stops. In addition, the majority of the site has access to at least two buses per hour serving a range of destinations:

- The assessment demonstrates good coverage from the site to bus services on A619 Worksop Road. The majority of dwellings within the central / western parcel and eastern parcel are within 400m walking distances of various bus stops on A619 Worksop Road. During the day there are approximately two service per hour in each direction along the A619 Worksop Road between Chesterfield and Worksop (Service 77). An hourly daytime service also operates between Chesterfield and Mastin Moor eastbound along A619 Worksop Road (service 74A).

¹ Chartered Institution of Highways and Transportation, 1999.

- Some dwellings located to the north of the central / western and eastern parcels are within 400m walking distances of bus stops in Mastin Moor. One service per hour runs through Mastin Moor in each direction between Chesterfield and Killamarsh / Sheffield (Services 80). In addition, the hourly service (74A) between Chesterfield and Mastin Moor runs westbound through Mastin Moor. Hourly evening / Sunday services also run through Mastin Moor between Chesterfield and Worksop (Service 77A).
- The majority of the southern parcel of the site has access to Norbriggs Road and Woodthorpe Road services where one service per hour runs between Bolsover and Markham Vale (Service 81). Hourly evening / Sunday services also run through Woodthorpe between Chesterfield and Killamarsh (Service 80A). Access to bus services in the southern parcel of the site is therefore limited, although the same as much of Woodthorpe.

9.1.2 Impact

Based on the person trip generation presented in Chapter 8 and at Appendix F, the bus trips generated by the development are presented in Table 24.

Table 24: Bus Trip Generation

Description	Size	AM (08:00 to 09:00)			PM (17:00 – 18:00)		
		Arr	Dep	Total	Arr	Dep	Total
Residential	650 units	24	71	94	54	35	89
Health Centre	1000m ² GFA	1	1	2	1	1	2
Care Home	80 Bedrooms	1	1	2	1	1	2
Local Shops	1000m ² GFA	3	3	6	3	3	6
Office	300 m ² GFA	1	0	1	0	1	1
Total		30	76	105	59	41	100

It is predicted that the proposed development at Mastin Moor will generate approximately 100 two way bus passenger trips in both the morning and evening peak hours. It is anticipated that these trips will spread across bus services to a number of destinations and that this level of trip generation can be accommodated on existing bus routes serving the local area.

9.1.3 Proposals

The forecast level of bus passenger trips generated by the proposed development is unlikely to be sufficient to require additional bus service provision or re-routing of existing services.

The Mastin Moor scheme is well located for access to existing bus services, with good accessibility to existing bus stops, as set out above. The indicative scheme

proposals therefore comprise the use of existing bus infrastructure provision. While it is not proposed to divert existing services through the site at this stage, the internal highway network is designed to accommodate buses if this becomes a requirement in the future, and in discussion with DCC and local bus operators.

The scheme has been designed to facilitate pedestrian access to existing bus stops on Worksop Road and in Mastin Moor and Woodthorpe. A network of high quality, safe and attractive routes are proposed through the site linking to the local highway network and directly linking to bus stops on A619 Worksop Road and Woodthorpe Road.

The existing westbound bus stop on A619 Worksop Road opposite Rowan Road will be relocated approx. 30m to the northeast to enable provision of the site access junction. Raised kerbs and new shelter with seating and timetable information will be provided at this relocated/new bus stop.

A review of existing bus stop provision, identifies a number of local bus stops where upgraded facilities could be provided, such as on Woodthorpe Road where only poles are currently provided and on A619 Worksop Road fronting the north east parcel of development where the quality of infrastructure is poor. Improvements to these or other existing local bus stops will be undertaken where this will encourage greater patronage, comfort and / or safety of passengers, details of which will be agreed with DCC.

9.2 Pedestrians and Cyclists

9.2.1 Accessibility

The catchment for walking is substantially lower than for motorised modes of transport, however, walking is the most important mode for short journeys.

Although PPG13 has been superseded by the NPPF, PPG13 Guidance *A Guide to Better Practice* remains valid guidance. This document indicates the distance considered to be appropriate for various trips on foot. At paragraph 7.5, the document states that “*motorised modes are rarely used for trips of around half a mile (0.8km) or less*”. The guidance also identifies that “*walking is the most important mode of travel at the local level and offers the greatest potential to replace short car trips, particularly under 2 kilometres*”.

Figure 33 identifies a 2km catchment from the approx. centre of the site as well as 0.8km walking catchments from the approximate centre of the central / western, eastern and southern parcels of development.

Within the 2km walking catchment the entirety of the proposed development is accessible as well as the existing residential areas of Mastin Moor and Woodthorpe. The eastern side of Staveley and Netherthorpe are also within the potential 2km walking catchment. A number of amenities, including local shops and businesses, two primary schools and Netherthorpe School Science College are within walking distance of the development.

Within the 0.8km walking catchment:

- residents of the central / western parcel are within walking distance of Mastin Moor and the northern parts of Woodthorpe, for access to local convenience stores and Norbriggs Primary School (blue);
- residents of the eastern parcel are within walking distance of the eastern side of Mastin Moor for access to local retail provision (green);
- residents of the southern parcel are within walking distance of the majority of Woodthorpe for access to local amenities including Norbriggs and Woodthorpe Primary Schools (red).

In addition to housing, there are plans for a GP surgery, local shops, small scale office provision, allotments/community garden and other greenspace, all of which are within walking distance for new residents and existing residents in Mastin Moor and Woodthorpe.

According to Cycling England Guidance:

‘Integrating Cycling into Development Proposals’² notes that “Most cycle journeys for non-work purposes and those to rail stations are between 0.5 miles [0.8km] and 2 miles [3.2km], but many cyclists are willing to cycle much further. For work, a distance of 5 miles [8 km] should be assumed”.

Figure 34 identifies both a 3.2km and 8km cycling catchment from the approximate centre of the development site. Staveley is within a good cycling distance of the proposed development at Mastin Moor. Within the 3.2km catchment Renishaw and parts of Balborough and Duckmanton are also potentially accessible by cycle.

A range of destinations are within the wider cycling catchment, including eastern parts of Chesterfield, Brimington, Bolsover, Clowne and Duckmanton / Markham Vale giving residents access to a range of employment opportunities and services.

9.2.2 Impact

Based on the person trip generation presented in Chapter 8 and at Appendix F, the pedestrian trips generated by the development are presented in Table 25.

Table 25: Pedestrian Trip Generation

Description	Size	AM (08:00 to 09:00)			PM (17:00 – 18:00)		
		Arr	Dep	Total	Arr	Dep	Total
Residential	650 units	14	41	55	31	20	52
Health Centre	1000m ² GFA	16	8	24	7	12	19
Care Home	80 Bedrooms	2	2	4	2	2	4
Local Shops	1000m ² GFA	67	68	134	59	67	126

² Cycling England, 2009. Cycling England was abolished by the Coalition Government in 2011; however, the guidance is considered to remain appropriate for the purposes of this assessment.

Office	300 m ² GFA	1	0	1	0	1	1
Total		100	119	218	99	102	202

It is predicted that the proposed development at Mastin Moor will generate approximately 200 two way pedestrian trips in both the morning and evening peak hours. The scheme has been designed to provide a range of pedestrian routes through the sites and connect with local facilities, therefore these trips can be accommodated on the local pedestrian network.

Based on the person trip generation presented in Chapter 8 and at Appendix F, the cycling trips generated by the development are presented in Table 26.

Table 26: Cycle Trip Generation

Description	Size	AM (08:00 to 09:00)			PM (17:00 – 18:00)		
		Arr	Dep	Total	Arr	Dep	Total
Residential	650 units	2	5	7	4	2	6
Health Centre	1000m ² GFA	1	0	1	0	1	1
Care Home	80 Bedrooms	0	0	0	0	0	0
Local Shops	1000m ² GFA	2	2	4	2	2	4
Office	300 m ² GFA	0	0	0	0	0	0
Total		5	7	12	6	5	11

It is predicted that the proposed development at Mastin Moor will generate approximately 10-12 two way cycle trips in both the morning and evening peak hours. The scheme has been designed to provide a range of cycle routes through the site.

9.2.3 Proposals

Cycling and walking provision form a key part of the Masterplan and the Mastin Moor proposals include the provision of a network of pedestrian and multi user paths through the site. These will provide high quality, safe and well lit routes through the site. A range of routes will connect with the local highway network as well as the existing Mastin Moor and Woodthorpe. Routes follow key desire lines to amenities including bus stops, local schools and existing retail provision.

A network of footpaths provide access for pedestrians through the site. These will be 2m wide, surfaced and well lit. Roads through the site will have 2m footways on both sides of the carriageway with dropped kerb crossing provision.

The multi user paths will provide access for pedestrians and cyclists through the site. These follow core routes east west through the site and connect to the local highway network. The design specifications will be agreed as part of detailed

design / reserved matters. Based on recent design guidance the multi user paths should segregate pedestrians (2m width) and cyclists (2.5m width) and be surfaced and well lit.

Cycle provision is proposed on the carriageways through the site, in accordance with DSP. Routes follow existing contours where feasible to limit gradients and provide easier access for pedestrians and cyclists.

Off site pedestrian and cycle proposals comprise:

- Toucan crossings at the new access road junction with the A619 Worksop Road;
- Two new pedestrian / cycle refuges for crossing over B6419 Bolsover Road;
- New footway on the western side of Bolsover Road;
- Multi user link along Woodthorpe Road to connect with Seymour Link Road.

9.3 Summary

The proposed Mastin Moor scheme design considers access by sustainable modes. A network of footpaths and multi user paths are proposed to provide access through the site and connect with the surrounding area. These provide access to existing bus stops for public transport connections to the wider area. In addition, the development connects to the existing networks for pedestrian and cycle access to a range of destinations providing education, retail and employment opportunities for residents. The new local centre is located for convenient and safe access by existing residents in Mastin Moor and Woodthorpe. New crossing provision improves links across the A619 Worksop Road as well as connecting the eastern and western parcels of development across B6419 Bolsover Road.

10 Highway Impact Assessment

10.1 Introduction

As set out in Chapter 7, the study area for more detailed junction assessment is based on a review SATURN model outputs. V/C data was extracted from the Do Minimum and Do Something model for individual nodes and filtered to show the nodes with a V/C greater than 80%. Comparisons were then made between the filtered nodes in the Do Something and Do Minimum models and nodes with a difference greater than 5% highlighted for further assessment.

As identified at Section 7.2, the SATURN data identified negligible impact on the wider highway network. The following local junctions are identified for assessment:

- A619 / B6419 Bolsover Road traffic signal controlled junction;
- A619 / Norbriggs Road traffic signal controlled junction;
- B6419 Bolsover Road / Woodthorpe Road priority controlled T-junction.

In addition, assessments have been undertaken for the proposed site access junctions. Indicative junction layouts have been developed for the following junctions:

- Access 1 - traffic signal control junction with A619 Worksop Road (West);
- Access 2 - priority junction with B6419 Bolsover Road (Central);
- Access 3 - priority junction with Woodthorpe Road (South).
- Access 4 - priority junction with B6419 Bolsover Road (East).

Where a junction is a priority controlled, it has been assessed in 'Junctions9' modelling software, which calculates the Ratio to Flow Capacity (RFC) and average queues experienced by all vehicles on each arm of a junction. The RFC is a key indicator of the likely performance of a turning movement at a junction under a given set of traffic flows. It is generally accepted that a junction approach with an RFC value of less than 0.85 is operating within capacity. A modelled RFC of greater than 0.85 is operating over practical capacity and over 1.0 indicates that an approach is operating in excess of theoretical capacity.

Where a junction is signalised, the 'LinSig' software has been used to assess operation. LinSig is used to indicate the performance of a signalised junction under a given set of traffic flows. The software calculates the 'degree of saturation', expressed as a percentage, for each approach to a junction. Approaches where the degree of saturation is forecast to exceed 90% are considered over practical capacity and over 100% are over theoretical capacity. Alongside this the 'mean maximum queue' (MMQ), is calculated, to represent the average position of the furthest vehicle from the stop line in each cycle. The 'practical reserve capacity' (PRC) for the junction as a whole is also calculated, which reflects the spare capacity across the junction for additional traffic. A positive PRC figure indicates that the junction has spare capacity whilst a negative

PRC suggests that the junction is over capacity and will experience congested conditions.

The turning flows at each junction have been taken from the SATURN outputs provided by Aecom for the Base, 2026 Do Minimum and 2026 Do Something scenarios with additional Clowne Garden Village flows added to the Do Minimum and Do Something Scenario and updated Local Centre flows also added to the Do Something flows .

All junction modelling outputs are provided at Appendix G.

10.2 A619 Worksop Road / B6419 Bolsover Road

The junction is located to the north-east of the site, takes the form of a signalised crossroads and has been modelled using LinSig. In order to facilitate a detailed assessment of the junction, traffic signal timing information previously obtained from DCC has been incorporated into the model. To provide a robust assessment the 'all red' stage has been incorporated into every cycle. The results for the existing conditions are summarised below in Table 26 with the results for the future year Do Minimum and Do Something scenarios presented in Tables 27 and 28.

Table 27: A619 Worksop Rd/B6419 Bolsover Rd/Renishaw Road – Base

Item	Lane Description	Movement	Existing Layout - BASE			
			AM Peak		PM Peak	
			Deg Sat (%)	MMQ (pcu)	Deg Sat (%)	MMQ (pcu)
1/1	Renishaw Road	Left Ahead Right	78.6%	8.4	68.6%	6.0
2/1	A619 Worksop Road (East)	Left Ahead Right	82.3%	16.5	86.8%	19.3
3/1	B6419 Bolsover Road	Right Left Ahead	46.0%	3.8	85.2%	8.4
4/1+4/2	A619 Worksop Road (West)	Ahead Right Left	71.6%: 0%	14.2	84.1%:0%	19.7
PRC			9.4		3.7	

The results indicate that the A619 Worksop Road / B6419 Bolsover Road signal controlled junction operates within capacity in both the AM and PM peak hours, although arms are approaching capacity. In both the AM and PM peak hours queues are beginning to form on all approaches, in particular the A619 Worksop Road East and West approaches.

Table 28: A619 Worksop Rd/B6419 Bolsover Rd/Renishaw Road – 2026 Do Minimum

Item	Lane Description	Movement	Existing Layout - DM 2026			
			AM Peak		PM Peak	
			Deg Sat (%)	MMQ (pcu)	Deg Sat (%)	MMQ (pcu)
1/1	Renishaw Road	Left Ahead Right	95.5%	14.6	101.7%	18.2
2/1	A619 Worksop Road (East)	Left Ahead Right	100.6%	35.0	102.5%	42.0

3/1	B6419 Bolsover Road	Right Left Ahead	65.2%	5.9	95.2%	12.4
4/1+4/2	A619 Worksop Road (West)	Ahead Right Left	96.3 : 0%	30.3	102.4 : 0%	48.6
PRC			-11.8		-13.8	

The results indicate that in the Do Minimum scenario, the A619 Worksop Road / B6419 Bolsover Road / Renishaw Road junction predicted to operate in excess of capacity during both the AM peak and PM peak hours. The inclusion of background traffic growth and committed development traffic flows has increased the traffic through the junction, particularly in the PM peak hour.

During the AM peak hour, the Renishaw Road and A619 Worksop Road West approaches are predicted to operate over practical capacity with the Worksop Road East approach forecast to operate over theoretical capacity. During the PM peak period, all approaches are predicted to operate over practical capacity with three approaches predicted to operate over theoretical capacity. Queues of 30-50 pcus are predicted on a number of approaches.

Notwithstanding this, the 'Do Something' assessments have been undertaken to identify the impact of the Mastin Moor development. The results for each period are summarised below.

Table 29: A619 Worksop Rd/B6419 Bolsover Rd/Renishaw Road – 2026 Do Something

Item	Lane Description	Movement	Existing Layout – 2026 Do Something			
			AM Peak		PM Peak	
			Deg Sat (%)	MMQ (pcu)	Deg Sat (%)	MMQ (pcu)
1/1	Renishaw Road	Left Ahead Right	97.9%	16.3	93.6%	12.6
2/1	A619 Worksop Road (East)	Left Ahead Right	104.5%	46.6	109.3%	65.7
3/1	B6419 Bolsover Road	Right Left Ahead	106.6%	21.6	112.2%	32.9
4/1+4/2	A619 Worksop Road (West)	Ahead Right Left	96.7% : 96.7%	31.1	101.3% : 101.3%	43.6
PRC			-18.4		-24.7	

Given that the junction is predicted to operate over capacity in the Do Minimum scenario, the results of the Do Something assessment result in increases in the DoS and queues in both the AM and PM peak hours. In both the AM and PM peak hour all approaches are forecast to operate over practical capacity.

In the AM peak hour the predicted queues on A619 Worksop Road East and Bolsover Road increase by 12-15 pcus from the Do Minimum scenario and increases on Renishaw Road and A619 Worksop Road West are negligible.

In the PM peak hour, the predicted queues Worksop Road East and Bolsover Road increase by approx. 20 pcus from the Do Minimum scenario with slight decreases of queues on Renishaw Road and Worksop Road West (approx 5 pcus).

Whilst it is considered that the increase in queuing as a result of the Mastin Moor development is relatively minor, an improvement scheme has been identified to mitigate the increase in traffic at the junction. The scheme includes modification

to the ‘staging sequence’ that currently exists at the junction. The signal data obtained from DCC indicates that a right-turn indicative green arrow facility is used on the A619 Worksop Road (West) approach. It is noted from the SATURN data that the traffic flows associated with this movement are negligible. It is considered that this facility is not required to be called and as a result the right-turn indicative green facility has been excluded resulting in increased green time along the A619 Worksop Road. In addition, the cycle time has been increased from 90 seconds to 108 seconds. The pedestrian ‘all red’ stage is modelled every cycle to provide a robust assessment. The results for each scenario are summarised below.

Table 30: A619 Worksop Rd/B6419 Bolsover Rd/Renishaw Road – 2026 Do Something Mitigation

Item	Lane Description	Movement	Mitigation Layout – 2026 Do Something			
			AM Peak		PM Peak	
			Deg Sat (%)	MMQ (pcu)	Deg Sat (%)	MMQ (pcu)
1/1	Renishaw Road	Left Ahead Right	73.9%	11.0	79.4%	10.5
2/1	A619 Worksop Road (East)	Left Ahead Right	86.8%	24.8	86.7%	25.8
3/1	B6419 Bolsover Road	Right Left Ahead	98.1%	15.7	94.4%	15.9
4/1+4/2	A619 Worksop Road (West)	Ahead Right Left	100.4 : 100.4%	43.5	99.9: 99.9%	43.8
PRC			-11.6		-10.9	

The results of the Do Something with amended signal timings indicate that the junction is predicted to continue to operate in excess of capacity in both the AM and PM peak hours. The proposed mitigation scheme improves operation of the junction in the Do Something scenario and also has minor improvement on predicted operation of the junction from the Do Minimum scenario, as shown by the overall junction PRCs.

In both the AM and PM peak hours the Renishaw Road and A619 Worksop Road East approaches are predicted to operate within capacity while the Bolsover Road approach is forecast over practical capacity and the A619 Worksop Road West approach is at theoretical capacity.

There is improvement in the overall level of queuing between the Do Something Existing and Do Something Mitigation schemes with slight increases in the AM and decreases in the PM between the Do Minimum Existing and Do Something Mitigation.

It is noted, that due to the existing junction location, there is limited scope for further junction improvements as existing premises are located in close proximity to the junction. The suggested improvements are considered suitable to improve operation of the junction in both the Do Minimum and Do Something scenarios.

10.3 A619 Worksop Road / Norbriggs Road

The junction is located to the north-west of the site, takes the form of a three-arm signalised junction and has been modelled using LinSig. In order to facilitate a detailed assessment of the junction, traffic signal timing information obtained from DCC has been incorporated into the model. To provide a robust assessment the 'all red' stage has been incorporated into every cycle. The results are summarised below in Table 30.

Table 31: A619 Worksop Rd/Norbriggs Road – Base

Item	Lane Description	Movement	Existing Layout - BASE			
			AM Peak		PM Peak	
			Deg Sat (%)	MMQ (pcu)	Deg Sat (%)	MMQ (pcu)
1/1	A619 Worksop Road (East)	Left Ahead	80.7%	14.8	82.9%	16.3
2/1	Norbriggs Road (South)	Left Right	83.3%	6.1	83.7%	5.3
3/1+3/2	A619 Worksop Road (West)	Right Ahead	83.2 : 83.2 %	15.6	91.6 : 91.6%	21.5
PRC			8.0		-1.8	

The results indicate that the A619 Worksop Road / Norbriggs Road signal controlled junction operates within capacity in the AM peak hour but slightly over capacity in the PM peak hour. Queues are beginning to form, particularly on the A619 Worksop Road East and West approaches.

Table 32: A619 Worksop Rd/Norbriggs Road – 2026 Do Minimum

Item	Lane Description	Movement	Existing Layout - DM 2026			
			AM Peak		PM Peak	
			Deg Sat (%)	MMQ (pcu)	Deg Sat (%)	MMQ (pcu)
1/1	A619 Worksop Road (East)	Left Ahead	91.5%	25.2	91.7%	26.9
2/1	Norbriggs Road (South)	Left Right	88.3%	8.9	83.5%	6.1
3/1+3/2	A619 Worksop Road (West)	Right Ahead	105.6 : 105.6%	62.1	104.5 : 104.5%	61.5
PRC			-17.3		-16.1	

The results indicate the junction is predicted to operate over capacity in both the AM and PM scenarios with significant queues forecast, particularly on the A619 Worksop Road West approach.

The 'Do Something' assessments have been undertaken to identify the impact of the Mastin Moor development. The results for each scenario are summarised in Table 32 below.

Table 33: A619 Worksop Rd/Norbriggs Road – 2026 Do Something

Item	Lane Description	Movement	Existing Layout – DS 2026			
			AM Peak		PM Peak	
			Deg Sat (%)	MMQ (pcu)	Deg Sat (%)	MMQ (pcu)
1/1	A619 Worksop Road (East)	Left Ahead	106.8%	68.9	104.4%	62.8
2/1	Norbriggs Road (South)	Left Right	103.6%	17.2	78.3%	4.6
3/1+3/2	A619 Worksop Road (West)	Right Ahead	104.7 : 104.7%	59.4	104.1 : 104.1%	61.5
PRC			-18.7		-15.9	

The results indicate that traffic flows generated by the Mastin Moor development are predicted to further impact operation of the junction in both the AM and PM peak hours. Significant increases in queues are predicted on the A619 Worksop Road East approach in the AM and PM peak hours with minor changes (increases and decreases) and on the Worksop Road West and Norbriggs Road approaches.

As with the A619 Worksop Road / Bolsover Road / Renishaw Road junction, an improvement scheme has been identified, comprising changes to the signal timings. The cycle time has been increased from 90 seconds to 108 seconds. The pedestrian ‘all red’ stage is modelled every cycle to provide a robust assessment. The results for each scenario are summarised below.

Table 34: A619 Worksop Rd/Norbriggs Road – 2026 Do Something Mitigation

Item	Lane Description	Movement	Mitigation Layout – DS 2026			
			AM Peak		PM Peak	
			Deg Sat (%)	MMQ (pcu)	Deg Sat (%)	MMQ (pcu)
1/1	A619 Worksop Road (East)	Left Ahead	94.2%	36.0	90.4%	33.2
2/1	Norbriggs Road (South)	Left Right	95.1%	13.0	83.5%	5.7
3/1+3/2	A619 Worksop Road (West)	Right Ahead	94.3 : 94.3%	35.5	92.0 : 92.0%	34.7
PRC			-5.7		-2.2	

The results of the Do Something with amended signal timings indicate that the junction is predicted to operate slightly in excess of practical capacity in both the AM and PM peak hours. The proposed mitigation scheme significantly improves operation of the junction in the Do Something scenario and also improves predicted operation of the junction from the Do Minimum scenario, as shown by the overall junction PRCs.

All approach arms are predicted to operate slightly over capacity, except the Norbriggs Road approach in the PM peak hour.

There is a significant improvement in the overall level of queuing between the Do Something Existing and Do Something Mitigation schemes (25-30 pcus on A619 Worksop Road approaches) and slight improvements between the Do Minimum Existing and Do Something Mitigation.

It is noted, that due to the existing junction location, there is limited scope for further junction improvements as existing premises are located in close proximity to the junction. The suggested improvements are considered suitable to improve operation of the junction in both the Do Minimum and Do Something scenarios.

10.4 B6419 Bolsover Road / Woodthorpe Road

The junction, located to the south-east of the site, takes the form of a priority controlled junction and has been modelled using Junctions9. There are single lane approaches along the B6419 Bolsover Road, with Woodthorpe Road flaring at the junction entry to provide capacity for turning movements in each direction.

No SATURN data is provided for the Base Year as the junction is in the buffer and no turning movements are available. Assessments have been undertaken for the 2026 Do Minimum and Do Something scenarios and the results presented in Tables 35 and 36 below.

Table 35: B6419 Bolsover Road/Woodthorpe Road – 2026 Do Minimum

Arm	Movement	Existing Layout - DM 2026			
		AM Peak		PM Peak	
		RFC	Queue (PCU)	RFC	Queue (PCU)
Woodthorpe Road	Left	0.09	0.1	0.11	0.1
Woodthorpe Road	Right	0.15	0.2	0.21	0.3
B6149 Bolsover Road (North)	Ahead Right	0.13	0.2	0.13	0.2

The results clearly indicate, even with the introduction of background traffic growth and committed development flows, that the B6419 Bolsover Road / Woodthorpe Road junction is predicted to operate well within capacity during each peak period.

Table 36: B6419 Bolsover Road/Woodthorpe Road – 2026 Do Something

Arm	Movement	Existing Layout - DS 2026			
		AM Peak		PM Peak	
		RFC	Queue (PCU)	RFC	Queue (PCU)
Woodthorpe Road	Left	0.16	0.2	0.15	0.2
Woodthorpe Road	Right	0.17	0.2	0.18	0.2
B6149 Bolsover Road (North)	Ahead Right	0.14	0.2	0.20	0.4

The results of the assessment indicate that the impact of Mastin Moor development traffic is negligible. The junction is predicted to operate well within capacity in the future year scenario including development traffic. It is therefore considered that the Mastin Moor development can be accommodated at this junction.

10.5 Site Access 1 - A619 Worksop Road (West)

Site Access 1 provides the northern / western access to the site via the A619 Worksop Road. The proposed junction takes the form of a signalised arrangement, with pedestrian and cycle crossing facilities. Drawing Ref 276927-SK-100 provides an indicative general arrangement layout. The proposed junction incorporates the following:

- Dedicated left-turn lane along the A619 Worksop Road (East);
- Dedicated right-turn lane along the A619 Worksop Road (West);
- Single lane plus flare at the site exit;
- Pedestrian crossings, including cycle crossing facilities, at each approach;
- Relocation / replacement of the existing bus stop on the A619 Worksop Road (East) approach.

The junction performance has been assessed in LinSig software, and a summary of these assessments are provided below.

Table 37: Site Access 1 - A619 Worksop Road (West) Signals – 2026 Do Something

Item	Lane Description	Movement	Proposed Layout – 2026 Do Something			
			AM Peak		PM Peak	
			Deg Sat (%)	MMQ (pcu)	Deg Sat (%)	MMQ (pcu)
1/2+1/1	A619 Worksop Road (East)	Left Ahead	75.2 : 75.2%	18.6	82.2 : 82.2%	21.2
2/1+2/2	Site Access	Left Right	87.2 : 87.2%	9.1	84.9 : 84.9%	10.0
3/1+3/2	A619 Worksop Road (West)	Right Ahead	89.3 : 89.3%	25.8	86.7 : 86.7%	25.1
PRC			0.8		3.8	

The results indicate that the proposed signal access arrangement is predicted to operate within capacity during each peak period. Due to the nature of traffic signals, the introduction of delay to vehicles on the A619 results in queuing to accommodate vehicle and pedestrian movement associated with the Mastin Moor development. It should be noted that these results represent a robust assessment, with the ‘all-red’ facility incorporated every cycle.

It is important that the development proposals at Mastin Moor identify measures to encourage pedestrian and cycle connectivity to the area surrounding the site. The provision of signal control at the junction is considered to offer an environment that encourages multi-modal trips (vehicle, cycle and pedestrian), through the use of the ‘all red’ facility offering safe access across the A619 throughout the day. Furthermore, it should be noted that the ‘all red’ facility is likely to be demand dependant. During instances of a drop in utilisation of the pedestrian crossing, increased green time is likely to be assigned to the A619 by intuitive software reactive to on-ground conditions resulting in a reduction in queuing.

10.6 Site Access 2 - B6419 Bolsover Road (Central)

Site Access 2 provides access from B6419 Bolsover Road to the western / central parcel of development to the west of Bolsover Road. The proposed access takes the form of a priority controlled T-junction. The minor arm (site access) comprises a single lane access with minor flaring at the entry to the junction to accommodate development traffic. Widening is proposed along the B6419 to provide a right turn lane for traffic movements into the site and to provide pedestrian / cycle crossing locations to the south of the junction.

Drawing Ref 276927-SK-101 provides an indicative layout for the proposed access junction.

The junction performance has been assessed in Junctions 9 software, and a summary of these assessments are provided below.

Table 38: Site Access 2 - B6419 Bolsover Road (Central) – 2026 Do Something

Arm	Movement	Proposed Layout – 2026 Do Something			
		AM Peak		PM Peak	
		RFC	Queue (PCU)	RFC	Queue (PCU)
Site Access 2	Left	0.07	0.1	0.13	0.2
Site Access 2	Right	0.05	0.1	0.15	0.2
Bolsover Road (North)	Ahead Right	0.17	0.2	0.10	0.1

The results clearly indicate that the level of site access proposed for the B6419 Bolsover Road junction is adequate to accommodate development traffic with no queuing predicted during each peak period.

10.7 Site Access 3 - Woodthorpe Road (South)

Site Access 3 provides access to the southern parcel of development via Woodthorpe Road. The proposed junction, located along the southern boundary of the site, takes the form of a priority controlled T-junction. The minor arm (site access) will require a single lane access with minor flaring at the entry to the junction to accommodate development traffic. No widening is proposed along Woodthorpe Road to accommodate turning movements into the site. Drawing Ref 276927-SK-102 provides an indicative layout for the proposed access junction.

The junction performance has been assessed in Junctions9 software, and a summary of these assessments are provided below.

Table 39: Site Access 3 - Woodthorpe Road (South) – 2026 Do Something

Arm	Movement	Proposed Layout – 2026 Do Something			
		AM Peak		PM Peak	
		RFC	Queue (PCU)	RFC	Queue (PCU)
Site Access 3	Left	0.11	0.1	0.06	0.1
Site Access 3	Right	0.06	0.1	0.03	0.0

Woodthorpe Road	Ahead Right	0.06	0.1	0.10	0.1
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The results clearly indicate that the level of site access proposed for the Woodthorpe Road junction is adequate to accommodate development traffic with no queuing predicted during each peak period for each scenario.

10.8 Site Access 4 - B6419 Bolsover Road (East)

Site Access 4 provides access to the eastern parcel of development from the B6419 Bolsover Road. The proposed access takes the form of a priority controlled T-junction, located to the north of site Access 2 to stagger the two junctions proposed on Bolsover Road. The minor arm (site access) comprises a single lane access with minor flaring at the entry to the junction to accommodate development traffic. It should be noted that no widening is proposed along the B6419 Bolsover Road to accommodate traffic movements into the site, although widening is proposed south of the access to provide pedestrian/cycle crossing facilities.

Drawing Ref 276927-SK-101 provides an indicative layout for the proposed access junction.

The junction performance has been assessed in Junctions9 software, and a summary of these assessments are provided below.

Table 40: Site Access 4 - Bolsover Road (East) – 2026 Do Something

Arm	Movement	Proposed Layout – 2026 Do Something			
		AM Peak		PM Peak	
		RFC	Queue (PCU)	RFC	Queue (PCU)
Site Access 4	Left	0.11	0.1	0.06	0.1
Site Access 4	Right	0.25	0.3	0.12	0.1
Bolsover Road (South)	Ahead Right	0.07	0.1	0.13	0.3

The results clearly indicate that the level of site access proposed for the B6419 Bolsover Road east junction is adequate to accommodate development traffic with no queuing predicted during each peak period.

10.9 Summary

The results of the highway assessment indicate that the local highway network can satisfactorily accommodate the traffic predicted for the proposed Mastin Moor development.

In the Base scenario the A619 Worksop Road is a busy route and the inclusion of committed developments and background traffic growth increase the congestion and queuing at local junctions in the 2026 Do Minimum scenario. The addition of traffic generated by the Mastin Moor development has a relatively minor impact. It is noted that there are limited opportunities for physical mitigation measures, however, suggested amendments to signal timings would improve operation of the junctions in the Do Minimum and Do Something scenarios. Although there is

queuing predicted, this is considered acceptable at this location during the peak hours. It is also noted that the results represent a robust assessment, with the 'all-red' pedestrian facilities incorporated every cycle. These facilities would be demand dependant and during instances of a drop in utilisation of the pedestrian crossings, increased green time is likely to be assigned to the A619 Worksope Road by intuitive software reactive to on-ground conditions resulting in a reduction in queuing.

Assessments of existing and new priority controlled junctions on Bolsover Road and Woodthorpe Road demonstrate no capacity problems in both Do Minimum and Do Something scenarios.

Based on the assessments undertaken it is considered the Mastin Moor development can be satisfactorily accommodated on the local highway network.

10.10 Safety Assessment

A review of accident data on the local highway network generally raises no safety issues. Additional traffic as a result of the development is not considered to provide a safety concern. The new junctions proposed as part of the scheme will be provided in accordance with design guidance to provide suitable geometry and visibility.

The accident data does highlight an issue where a number of accidents have been recorded on B6419 Bolsover Road close to the site. It is anticipated that new development on Bolsover Road will change the road characteristics to slow down drivers and provide a safer environment. DCC are likely to reduce the speed by TRO in due course.

10.11 Treble Bob Sensitivity Test

A Sensitivity Test has been undertaken to consider operation of the existing Treble Bob roundabout as a result of the Mastin Moor development.

The Treble Bob roundabout is a large 5-arm priority controlled roundabout providing access to/from the M1 Junction 30 and A6135 Sheffield Road from/to A619 Chesterfield Road, Oxcroft Way and Slayley View Road via the A616 link.

The A616 link is a dual carriageway with two lane approach, the A619 Chesterfield Road arms are both wide single carriageways flaring to provide two lane access to the roundabout. Oxcroft Way and Slayley View Road are single carriageways with a short flare at the roundabout approaches.

The junction performance has been assessed in Junctions9 software, and a summary of the assessments are provided below. The junction was modelled as part of the Clowne Garden Village planning application, therefore the geometry data has been taken from the submitted Aecom TA (November 2017) and checked against Google maps. The 2016 surveyed traffic flows have also been taken from the Aecom TA and growthed to the 2019 Base year and 2026 Future year. As the 2016 survey data does not include turning movements to/from Slayley View Road

nominal flows have been included in the model. Estimates of HGV turning proportions are also made.

Operation of the junction in the 2019 Base Year is presented in Table 41 below.

Table 41: Treble Bob roundabout – 2019 Base

Arm	Existing Layout – 2019 Base			
	AM Peak		PM Peak	
	RFC	Queue (PCU)	RFC	Queue (PCU)
Slayley View Road	0.18	0.2	0.05	0.1
Oxcroft Way	0.45	0.9	0.70	2.4
A619 Chesterfield Road (West)	0.48	1.0	0.56	1.4
A616	0.74	3.1	0.66	2.1
A619 Chesterfield Road (East)	0.80	4.1	0.67	2.2

The results of the modelling show that the Treble Bob roundabout operates within capacity with minor queues. It is acknowledged, however, that the junction often experiences congestion in the peak hours with queues on the majority of the approach arms. Unfortunately, it is not currently feasible to obtain further traffic data given the recent disruption to traffic flows as a result of the Covid-19 pandemic. We note that Aecom included ‘intercept corrections’ as part of their modelling, however this resulted in significant overestimates of queues.

Given that the purpose of this assessment is to consider the impact of the Mastin Moor scheme a comparison of the Do Minimum compared with the Do Something results has been undertaken. The results are presented in Tables 42 and 43 below.

Table 42: Treble Bob roundabout – 2026 Do Minimum

Arm	Existing Layout – 2026 Do Minimum			
	AM Peak		PM Peak	
	RFC	Queue (PCU)	RFC	Queue (PCU)
Slayley View Road	0.21	0.3	0.05	0.1
Oxcroft Way	0.49	1.0	0.75	3.2
A619 Chesterfield Road (West)	0.52	1.1	0.61	1.7
A616	0.79	4.1	0.70	2.5
A619 Chesterfield Road (East)	0.87	6.5	0.73	2.8

Table 43: Treble Bob roundabout – 2026 Do Something

Arm	Existing Layout – 2026 Do Something			
	AM Peak		PM Peak	
	RFC	Queue (PCU)	RFC	Queue (PCU)
Slayley View Road	0.22	0.3	0.05	0.1
Oxcroft Way	0.49	1.0	0.76	3.3

A619 Chesterfield Road (West)	0.56	1.3	0.64	1.9
A616	0.81	4.5	0.71	2.7
A619 Chesterfield Road (East)	0.88	7.3	0.74	2.9

It is considered that while the Base model may not accurately reflect baseline traffic conditions, on the basis of the junction assessment undertaken, the predicted traffic as a result of the proposed Mastin Moor development will have negligible impact on operation of the existing Treble Bob roundabout. Forecast increases in the RFCs and Queues are very low between the Do Minimum and Do Something scenarios in both the AM and PM peak hours. The max RFC increase is 0.04 on A619 Chesterfield Road West approach with queues increasing by less than 1pcu on all approach arms.

It is noted that should the Clown Garden Village scheme come forward, a highway mitigation scheme will be agreed with DCC and Highways England for both the Treble Bob roundabout and M1 Junction 30. The TA for the Clowne Garden Village scheme included the proposed Mastin Moor development as Committed Development, therefore any highway mitigation scheme will accommodate the predicted Mastin Moor scheme traffic.

11 Summary and Conclusions

Arup has been commissioned to prepare a Transport Assessment in support of the outline application for development of land at Mastin Moor, approximately 2km east of Staveley near Chesterfield.

The proposals at Mastin Moor comprise the provision of up to 650 dwellings with additional community facilities including a residential care facility with extra care, a Local Centre (including local retail, health facilities, leisure facilities, other local facilities and services, offices), open space, community garden extension, community building, parking and associated infrastructure and earthworks.

The scheme includes the provision of new highway access junctions from the A619 Worksop Road, B6419 Bolsover Road and Woodthorpe Road as well as a network of pedestrian and cycle routes to tie into existing local provision.

The scheme has been designed in accordance with national and local transport planning policy. Consultation has been undertaken with CBC as local planning authority, DCC as the highway authority and Highways England in relation to the motorway network. The scheme has been developed as a result of these consultations and the highway transport assessment methodology agreed prior to submission.

The proposed Mastin Moor scheme design considers access by sustainable modes to provide realistic alternatives to the private car. A network of footpaths and multi user paths are proposed to provide access through the site and connect with the surrounding area. These provide access to existing bus stops for public transport connections to the wider area. In addition, the development connects to the existing network for pedestrian and cycle access to a range of destinations providing education, retail and employment opportunities for residents. This includes a new connection along Woodthorpe Road towards the Seymour Link Road for pedestrian and cycle connections to Markham Vale. The new local centre is located for convenient and safe access by existing residents in Mastin Moor and Woodthorpe. New crossing provision improves links across the A619 Worksop Road as well as connecting the eastern and western parcels of development across B6419 Bolsover Road. A Travel Plan has been prepared to accompany the planning application and will be developed as the scheme progresses. The aim of the Travel Plan is to encourage and promote access by these sustainable modes of travel.

The results of the highway assessment indicate that the local highway network can satisfactorily accommodate the traffic predicted for the proposed Mastin Moor development.

In the Base scenario the A619 Worksop Road is a busy route and the inclusion of committed developments and background traffic growth increase the congestion and queuing at local junctions in the 2026 Do Minimum scenario. The addition of traffic generated by the Mastin Moor development has a relatively minor impact on operation of local junctions. It is noted that there are limited opportunities for physical mitigation measures, however, suggested amendments to signal timings would improve operation of the junctions in the Do Minimum and Do Something

scenarios. Although there is queuing predicted, this is considered acceptable at this location during the peak hours. It is also noted that the results represent a robust assessment, with the 'all-red' pedestrian facilities incorporated every cycle. These facilities would be demand dependant and during instances of a drop in utilisation of the pedestrian crossings, increased green time is likely to be assigned to the A619 by intuitive software reactive to on-ground conditions resulting in a reduction in queuing.

Assessments of existing and new priority controlled junctions on Bolsover Road and Woodthorpe Road demonstrate no capacity problems in both Do Minimum and Do Something scenarios.

Assessment of the impact of the Mastin Moor scheme at the A619 / A616 Treble Bob roundabout shows negligible impact.

Based on the assessments undertaken it is considered the Mastin Moor development can be satisfactorily accommodated on the local transport network.

Figures

Figure 1 Site Location and Strategic Road Network

Figure 2 Site Location and Local Highway Network

Figure 3 Bus Infrastructure and Services

Figure 4 Pedestrian and Cycle Infrastructure

Figure 5 SATURN 2026 Do Minimum Traffic Flows – AM Peak Hour

Figure 6 SATURN 2026 Do Minimum Traffic Flows – PM Peak Hour

Figure 7 Clowne Garden Village Traffic Flows – AM Peak Hour

Figure 8 Clowne Garden Village Traffic Flows – PM Peak Hour

Figure 9 Updated Do Minimum Traffic Flows (SATURN+Clowne) – AM Peak Hour

Figure 10 Updated Do Minimum Traffic Flows (SATURN+Clowne) – PM Peak Hour

Figure 11 SATURN 2026 Do Something Traffic Flows – AM Peak Hour

Figure 12 SATURN 2026 Do Something Traffic Flows – PM Peak Hour

Figure 13 Local Centre Trip Distribution

Figure 14 GP Surgery Traffic Flows – AM Peak Hour

Figure 15 GP Surgery Traffic Flows – PM Peak Hour

Figure 16 Care Home Traffic Flows – AM Peak Hour

Figure 17 Care Home Traffic Flows – PM Peak Hour

Figure 18 Local Shops Traffic Flows – AM Peak Hour

Figure 19 Local Shops Traffic Flows – PM Peak Hour

Figure 20 Office Traffic Flows – AM Peak Hour

Figure 21 Office Traffic Flows – PM Peak Hour

Figure 22 2026 Total Do Something Traffic Flows – AM Peak Hour

Figure 23 2026 Total Do Something Traffic Flows – PM Peak Hour

Figure 24 Treble Bob Roundabout 2016 Surveyed Traffic Flows – AM Peak Hour

Figure 25 Treble Bob Roundabout 2016 Surveyed Traffic Flows – PM Peak Hour

Figure 26 Treble Bob Roundabout 2019 Base Traffic Flows – AM Peak Hour

Figure 27 Treble Bob Roundabout 2019 Base Traffic Flows – PM Peak Hour

Figure 28 Treble Bob Roundabout 2026 Do Minimum Traffic Flows – AM Peak Hour

Figure 29 Treble Bob Roundabout 2026 Do Minimum Traffic Flows – PM Peak Hour

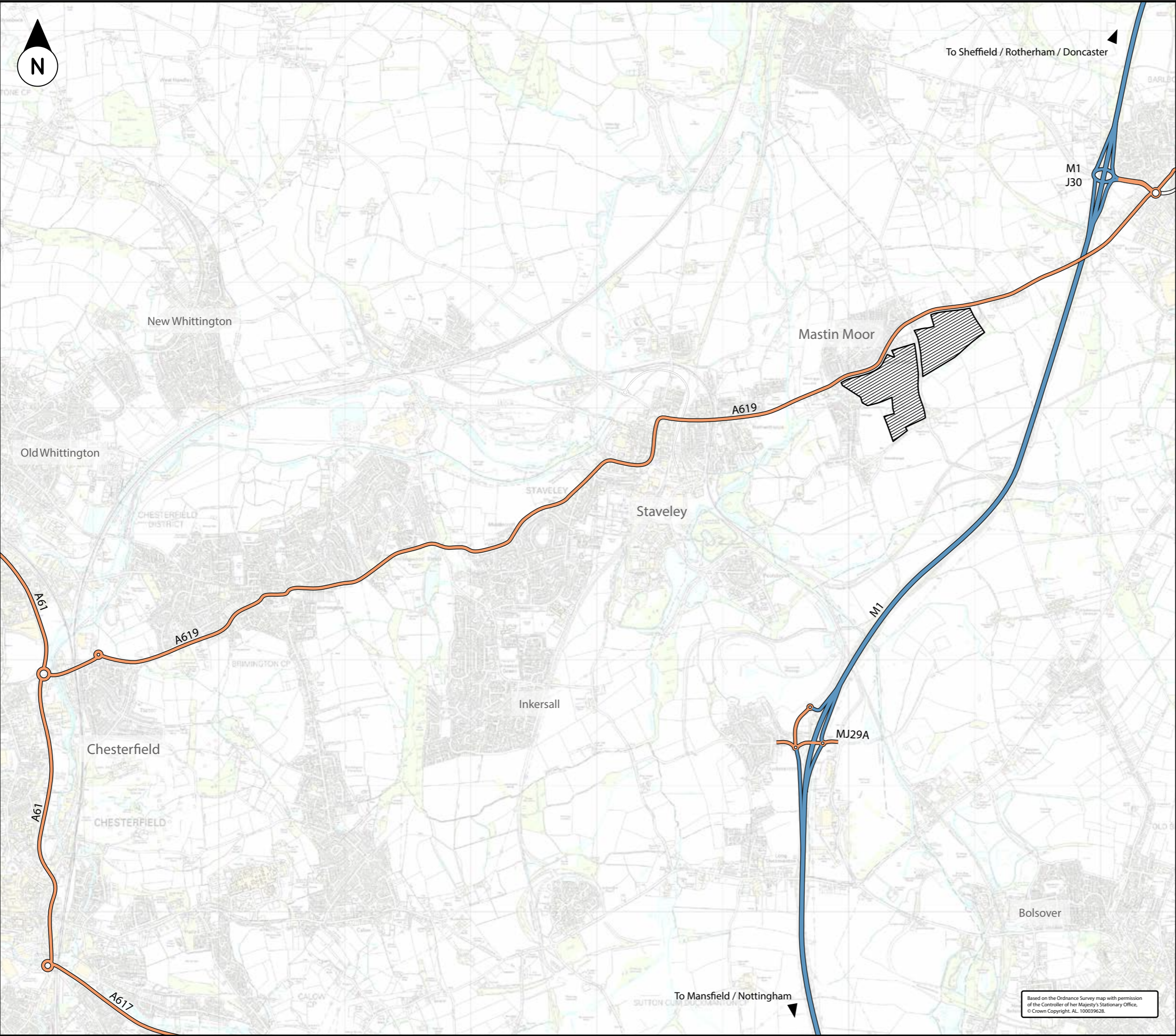
Figure 30 Treble Bob Roundabout 2026 Do Something Traffic Flows – AM Peak Hour

Figure 31 Treble Bob Roundabout 2026 Do Something Traffic Flows – PM Peak Hour

Figure 32 Bus Stop Accessibility

Figure 33 Walking Catchments – 0.8km/2km

Figure 34 Cycling Catchments – 3.2km/8km



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Key:
Site Boundary



Issue:	Date:	Originator:	Checked:	Approved:
D1	08.10..20	SM	SB	AG

Devonshire Property (MM) Ltd
MASTIN MOOR
Site location and Strategic Road Network

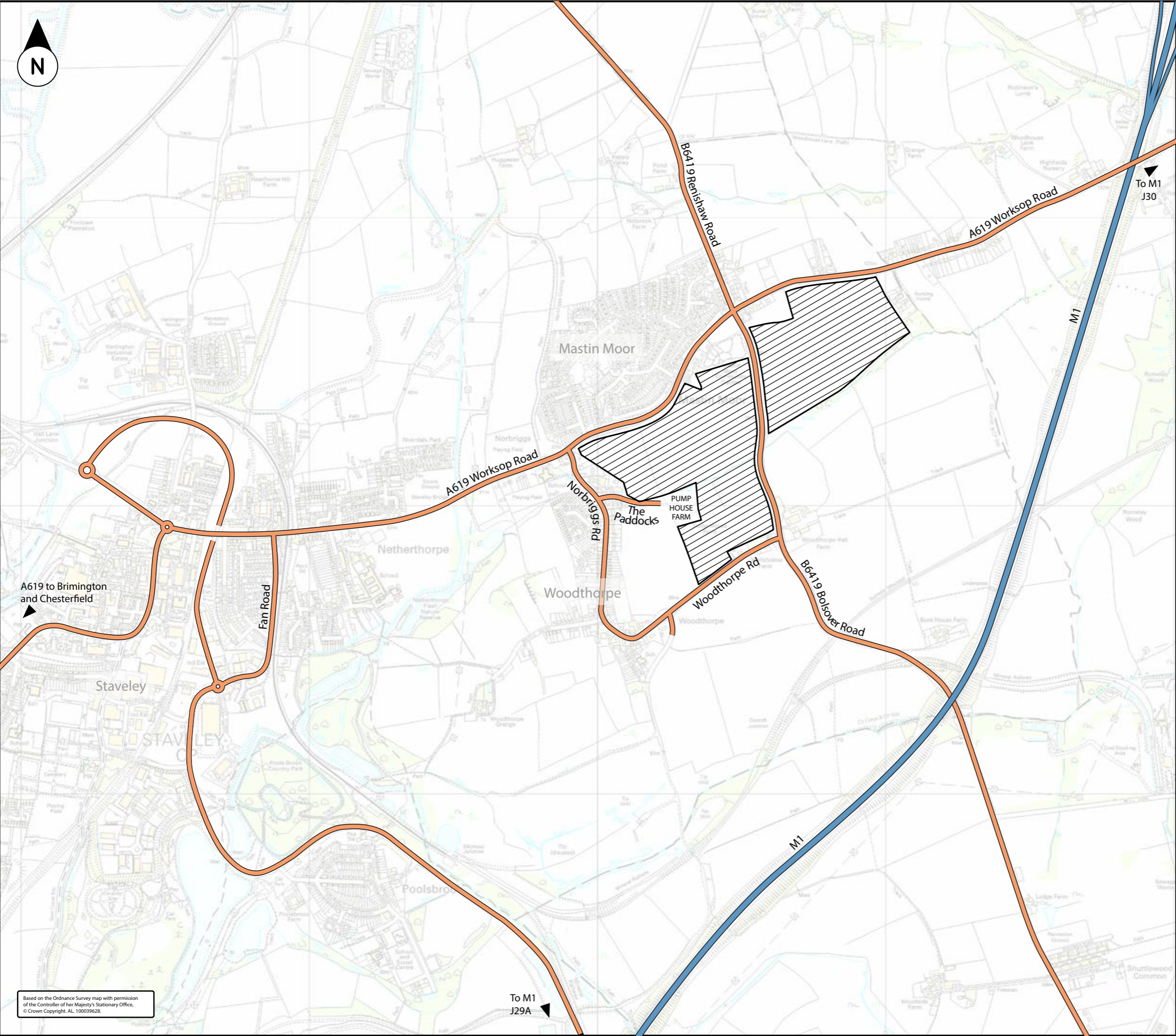
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Drawing Status:
For Planning

Job Number:
276927-00

Drawing Number:
Figure 01

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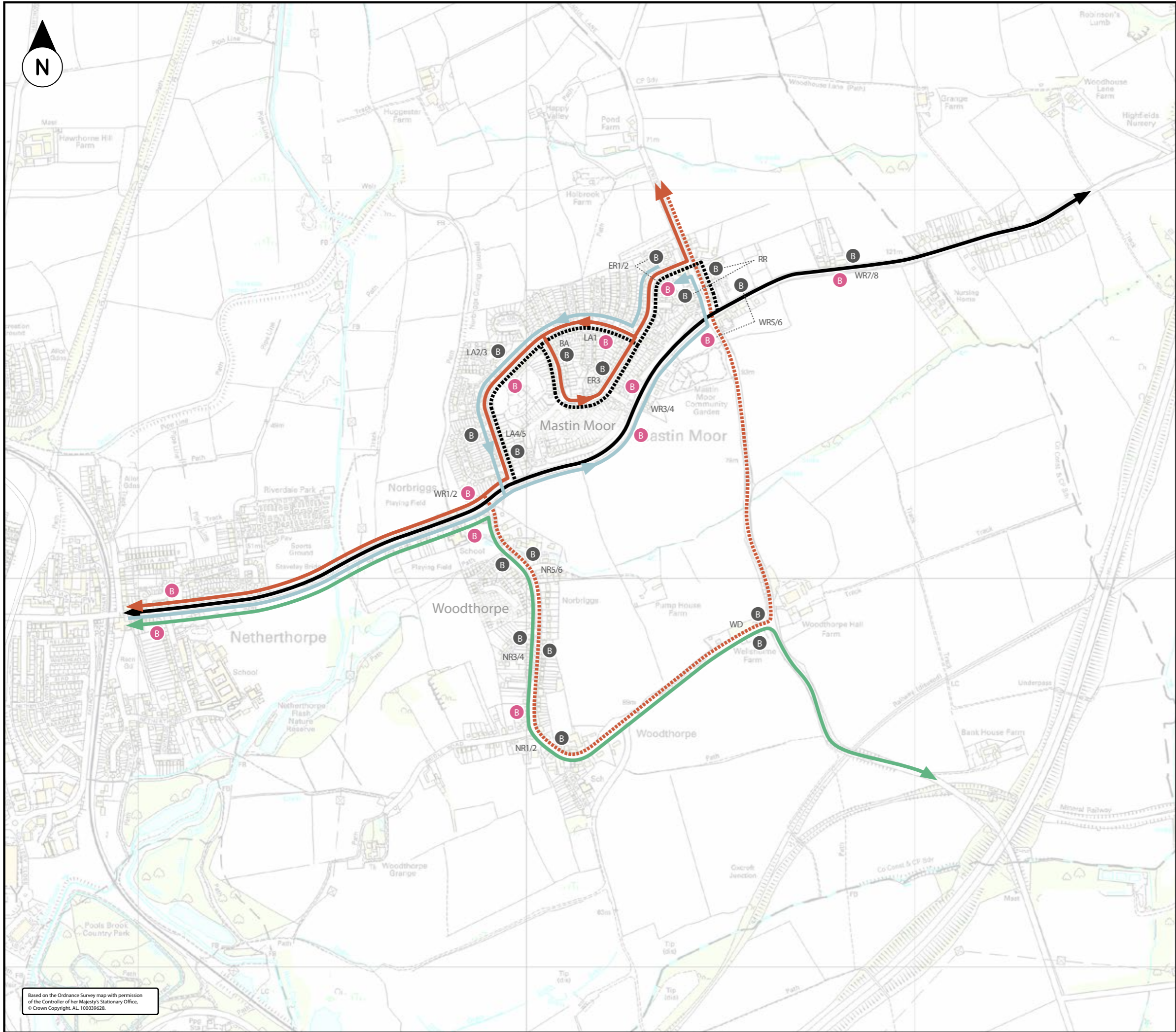


Issue:	Date:	Originator:	Checked:	Approved:
D1	08.10.20	SM	SB	AG
Devonshire Property (MM) Ltd MASTIN MOOR Site Location and Local Highway Network				
Scale @ A3: Not to Scale				
Drawing Status: For Planning				
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Key:

Bus Route 74A

Bus Route 77

Bus Route 77A (evening only)

Bus Route 80

Bus Route 80A (evening only)

Bus Route 81

Bus Stop (pole only)

Bus Stop (shelter)



Issue: Date: Originator: Checked: Approved:

D1 08.10.20 SM SB AG

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Bus Stops

Scale @ A3:
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Figure 03

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- Key:
- Footway
 - CBC Strategic Walking Network
 - Cycle Network
 - Proposed Cycle Network
 - Pedestrian Refuge
 - Traffic Signal Controlled Crossing

Issue:	Date:	Originator:	Checked:	Approved:
D1	08.10.20	SM	SB	AG

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Cycle and Pedestrian Facilities

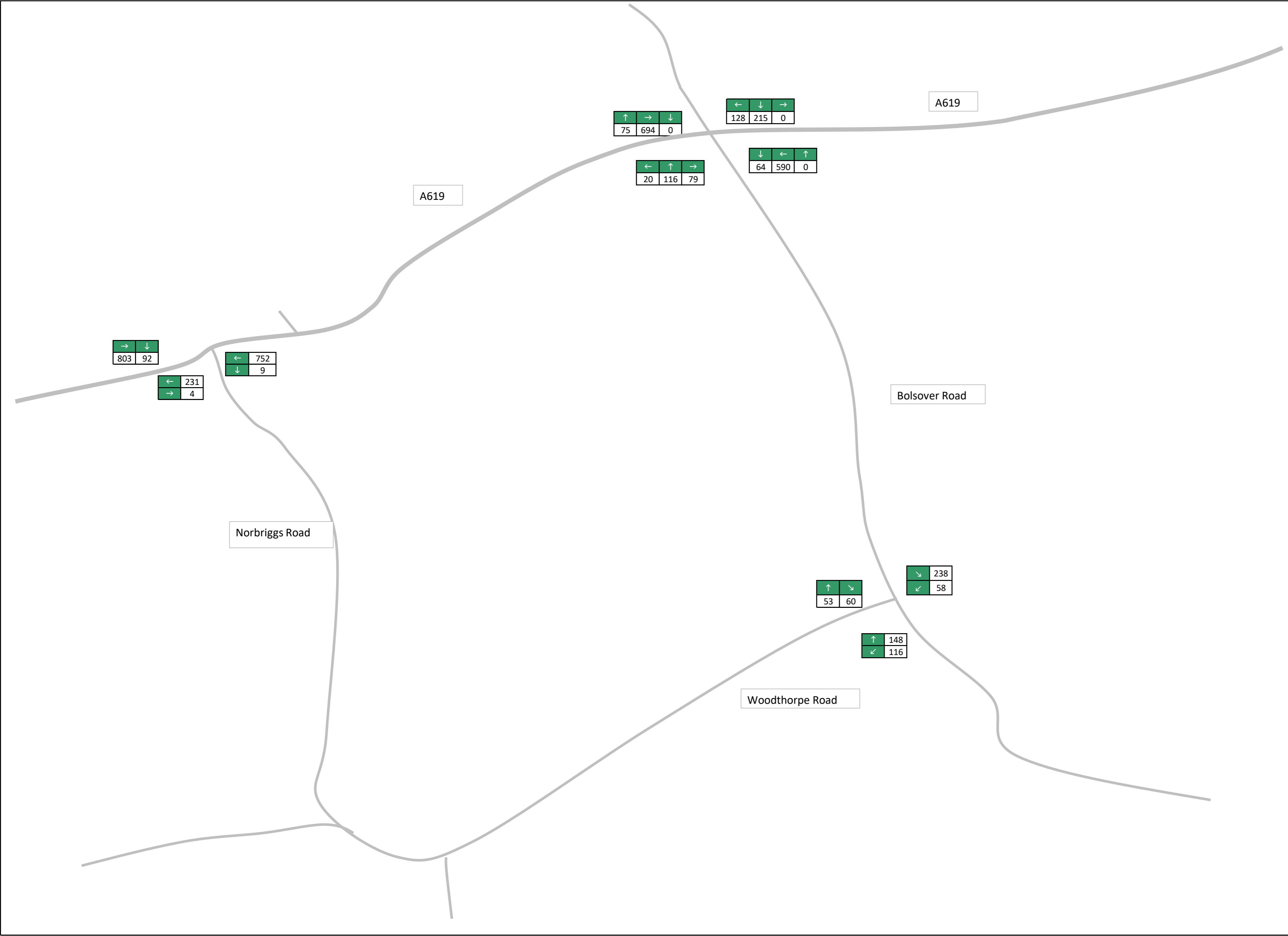
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Drawing Number:
Figure 04

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Date: 2020-09-29

Checked: SB

Approved: AG

Client:
Devonshire Property (MM) Ltd

Project Title:
Mastin Moor

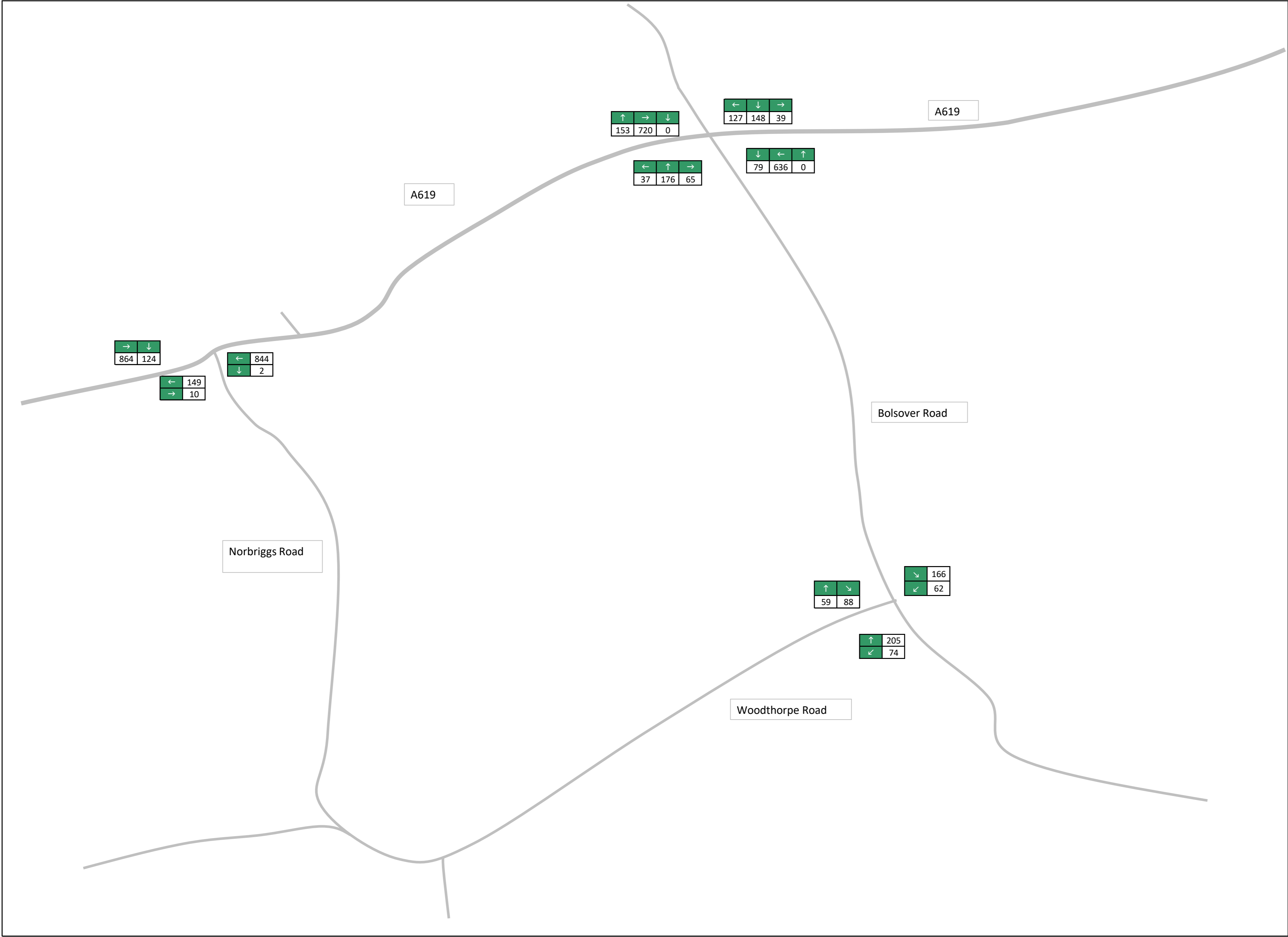
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2026 Do Minimum Traffic
Flows from SATURN AM

Scale @ A3
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Drawing Status
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Job Number:
276927-00

Drawing number:
Figure 5



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Issue:1

Date:2020-09-29

Checked:SB

Approved:AG

Client:
Devonshire Property (MM) Ltd

Project Title:
Mastin Moor

Drawing Title:
2026 Do Minimum Traffic
Flows from SATURN PM

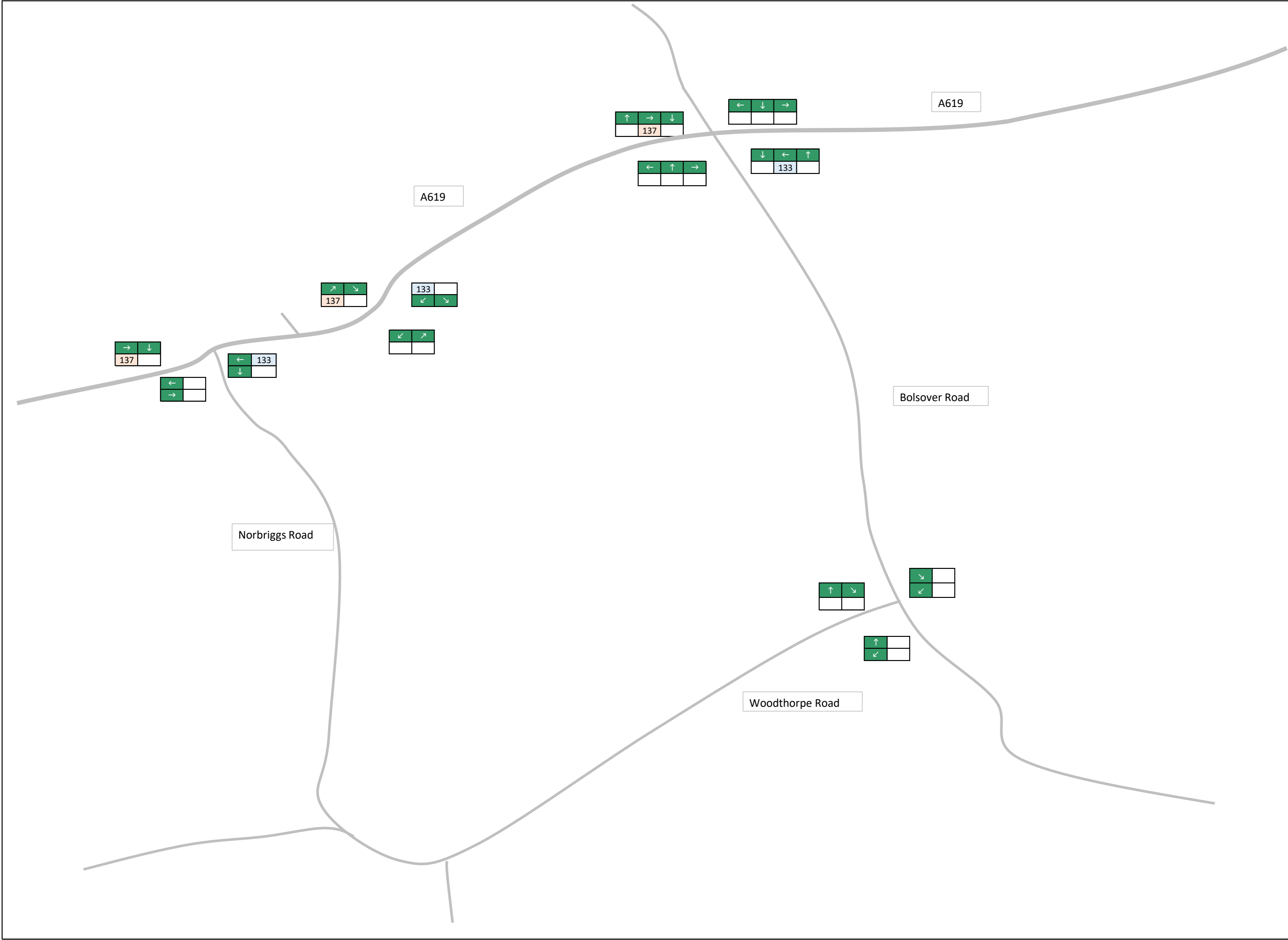
Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number:
276927-00

Drawing number:
Figure6

Note - Development for clowne garden was obtained from "Environment Statement Vol 2 Part 1 (Pg 73-76) 17% of the traffic go through A619



ARUP

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Tel: +44 (0)113 242 8498
Fax: +44 (0)1132428573
www.arup.com

Issue: 1
Date: 2020-09-29

Checked:
SB

Approved:
AG

Client:
Devonshire Property (MM) Ltd

Project Title:
Mastin Moor

Drawing Title:
Clowne Garden Village Flows
AM

Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number:
276927-00

Drawing number:
Figure 7

Note - Development for clowne garden was obtained from "Environment Statement Vol 2 Part 1 (Pg 73-76) 17% of the traffic go through A619

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Issue: 1
Date: 2020-09-29

Checked: SB

Approved: AG

Client:
Devonshire Property (MM) Ltd

Project Title:
Mastin Moor

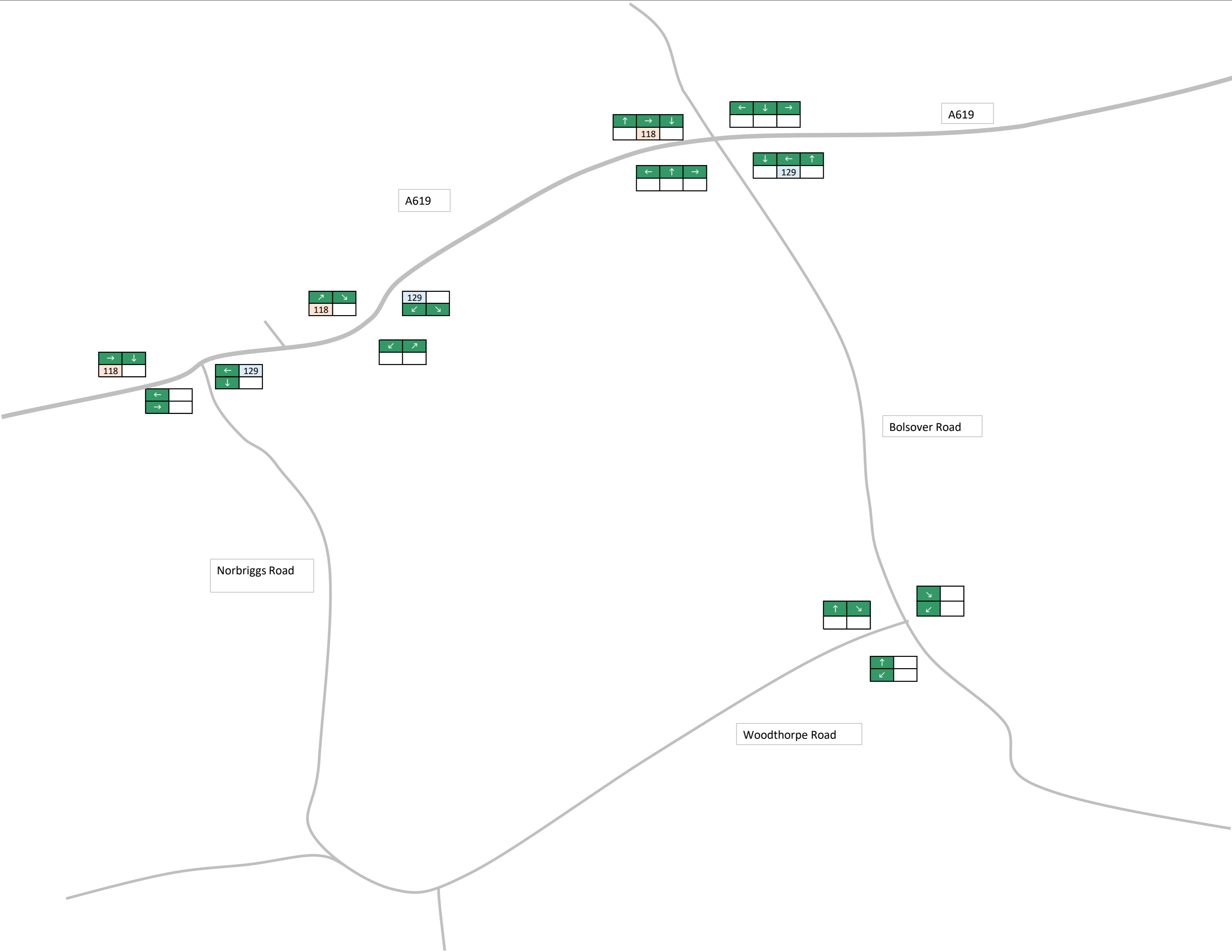
Drawing Title:
Clowne Garden Village Flows
PM

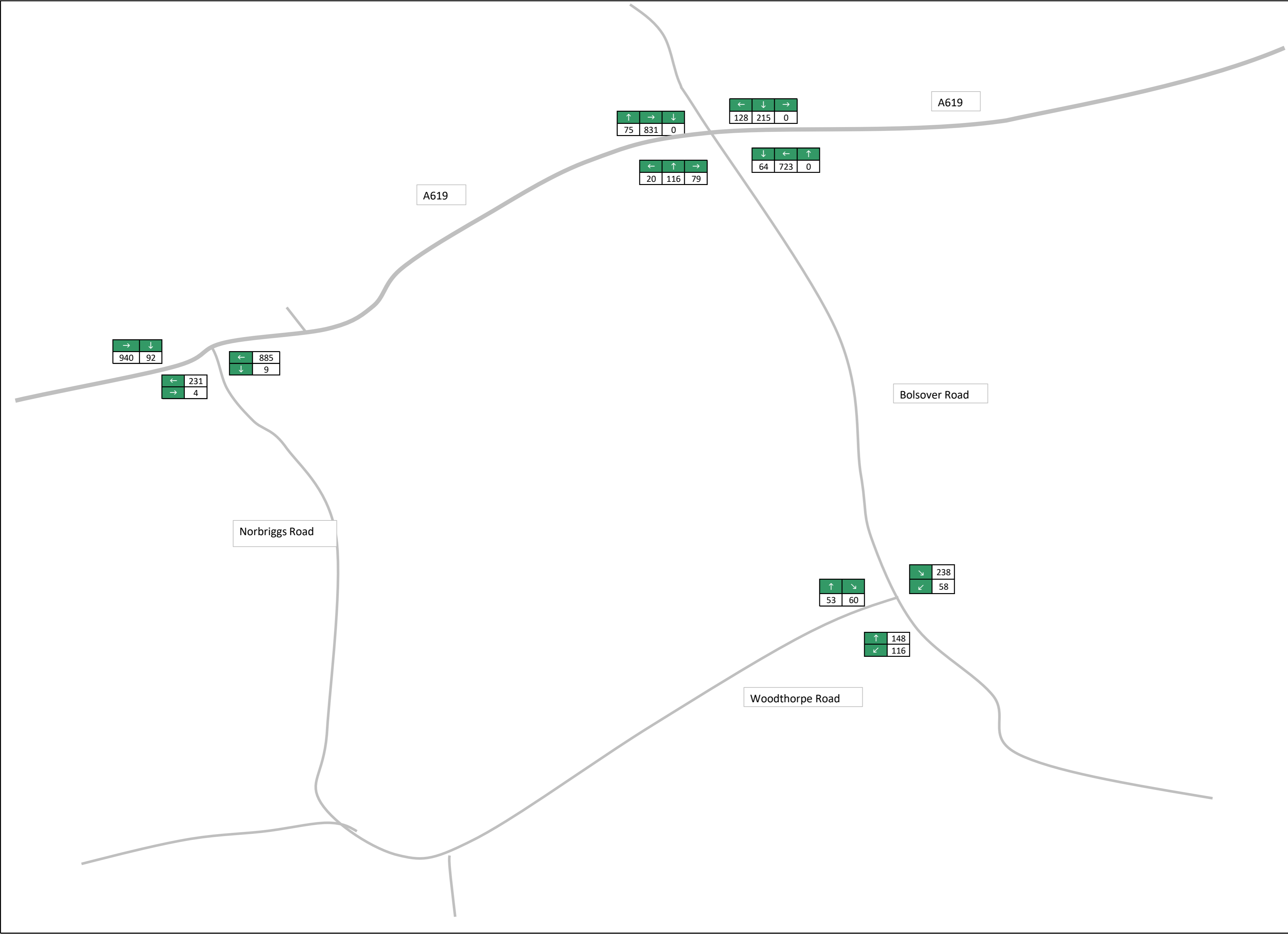
Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number:
276927-00

Drawing number:
Figure 8





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Issue: 1
Date: 2020-09-29

Checked: SB
Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: **Mastin Moor**

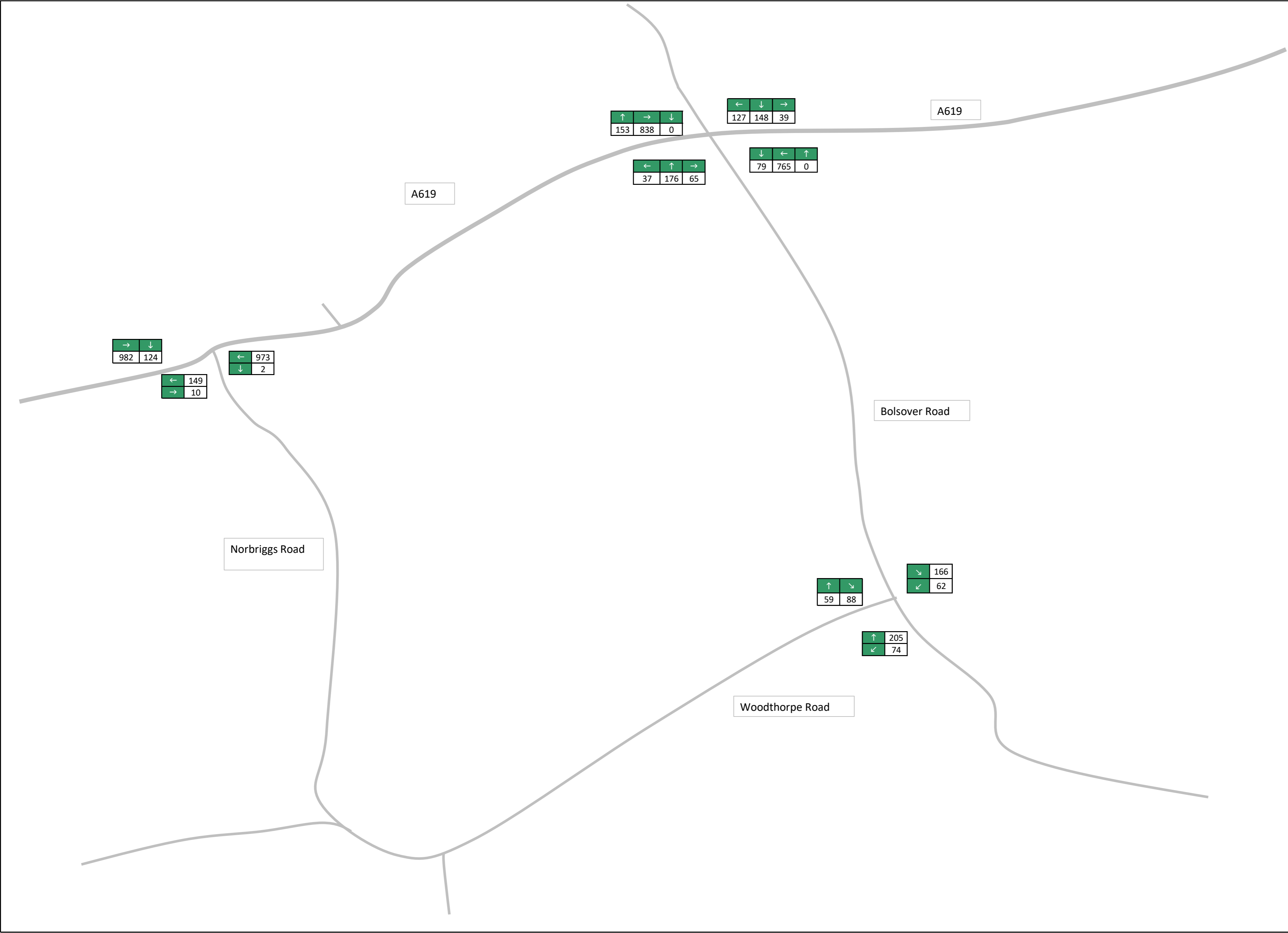
Drawing Title: 2026 Do Minimum Traffic Flow
AM (Clowne Garden + SATURN)

Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number: 276927-00

Drawing number: **Figure 9**



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Tel: +44 (0)113 242 8498
Fax: +44 (0)1132428573
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Issue: 1
Date: 2020-09-29

Checked: SB
Approved: AG

Client:
Devonshire Property (MM) Ltd

Project Title:
Mastin Moor

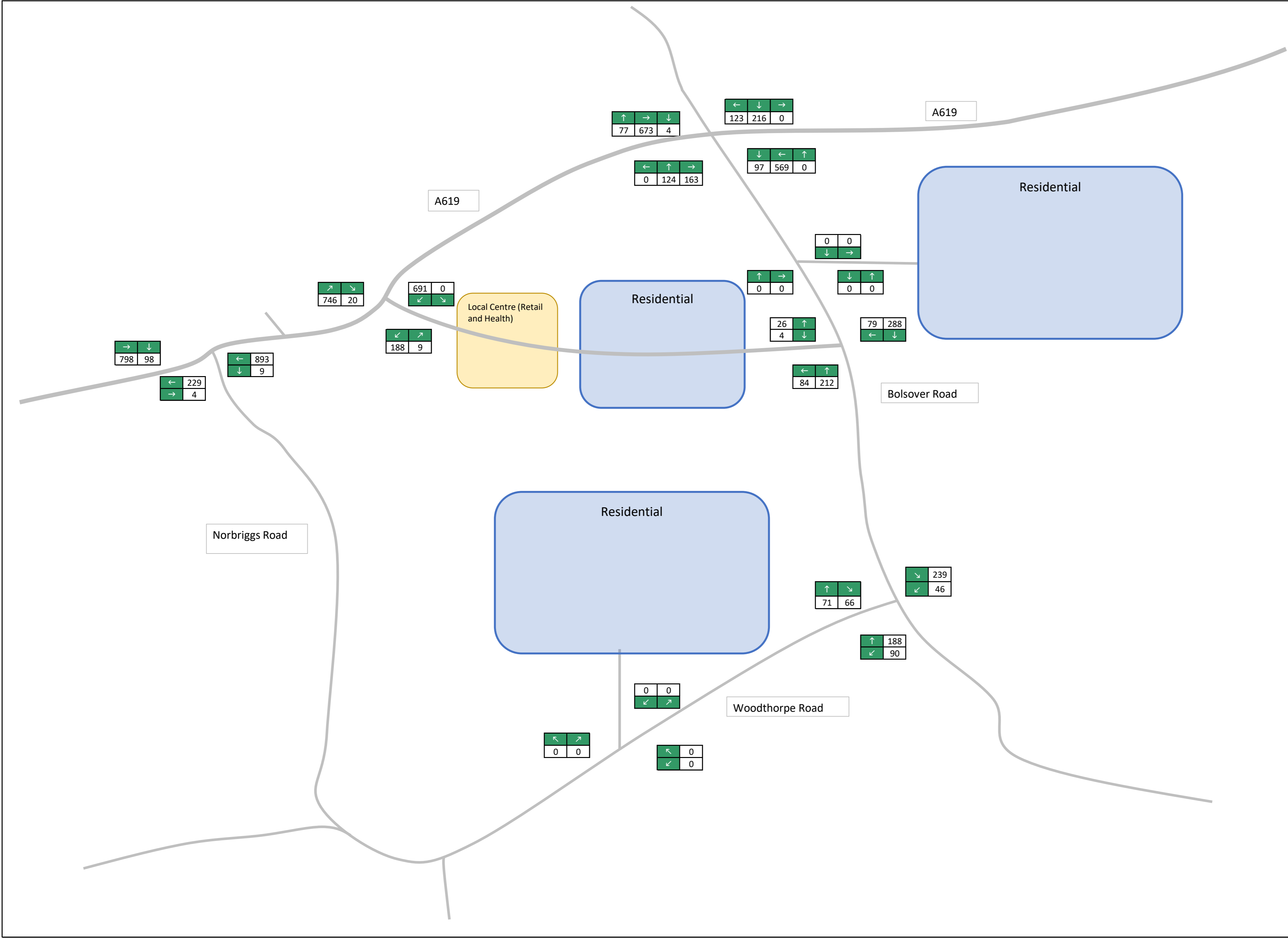
Drawing Title:
2026 Do Minimum Traffic Flow
PM (Clowne Garden + SATURN
)

Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number:
276927-00

Drawing number:
Figure 10



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Issue: 1
Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: **Mastin Moor**

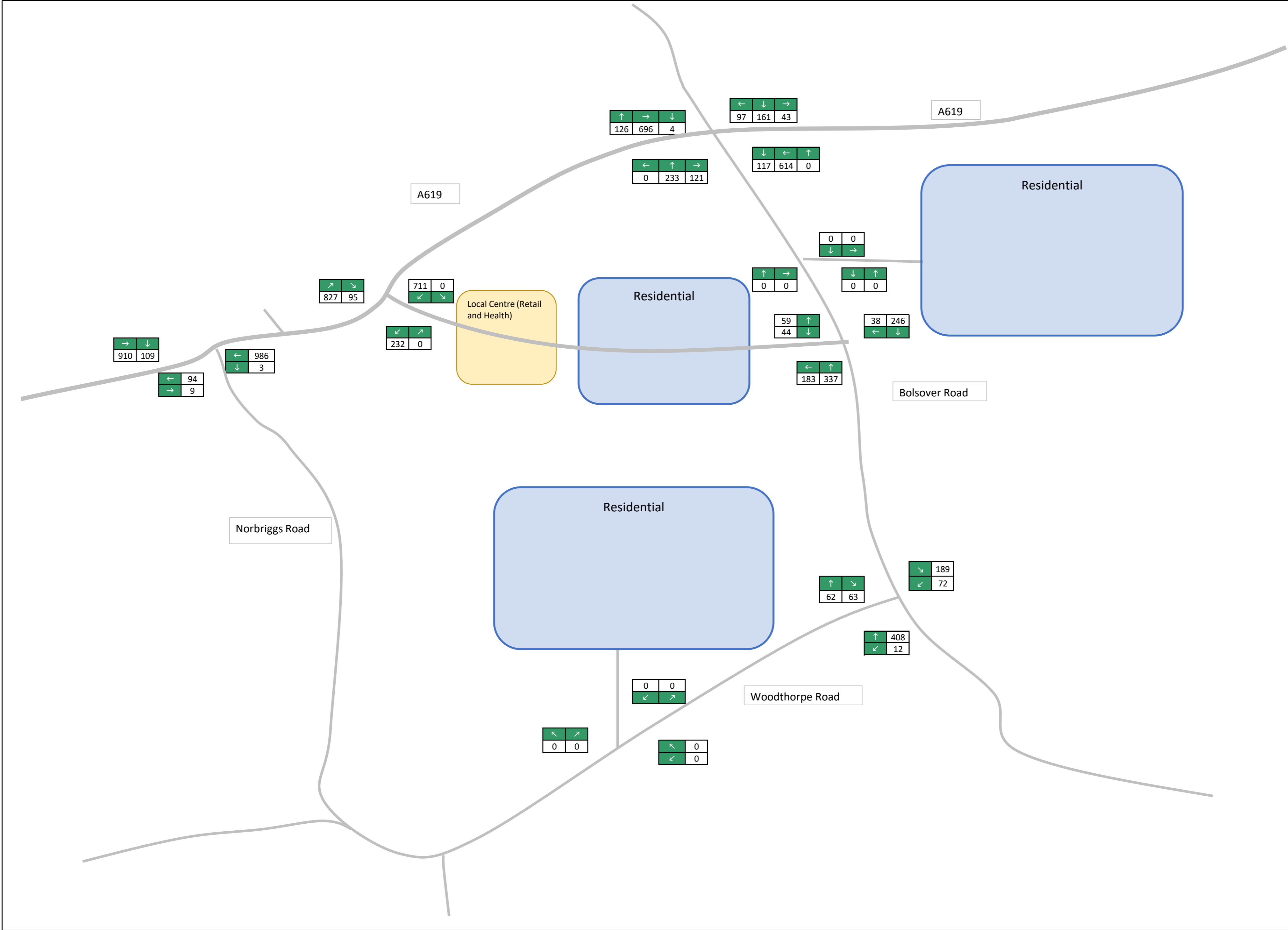
Drawing Title: 2026 Do Something Traffic Flows from SATURN AM

Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 11



Admiral House, Rose Wharf
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Issue: 1
Date: 2020-09-29

Checked: SB
Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: **Mastin Moor**

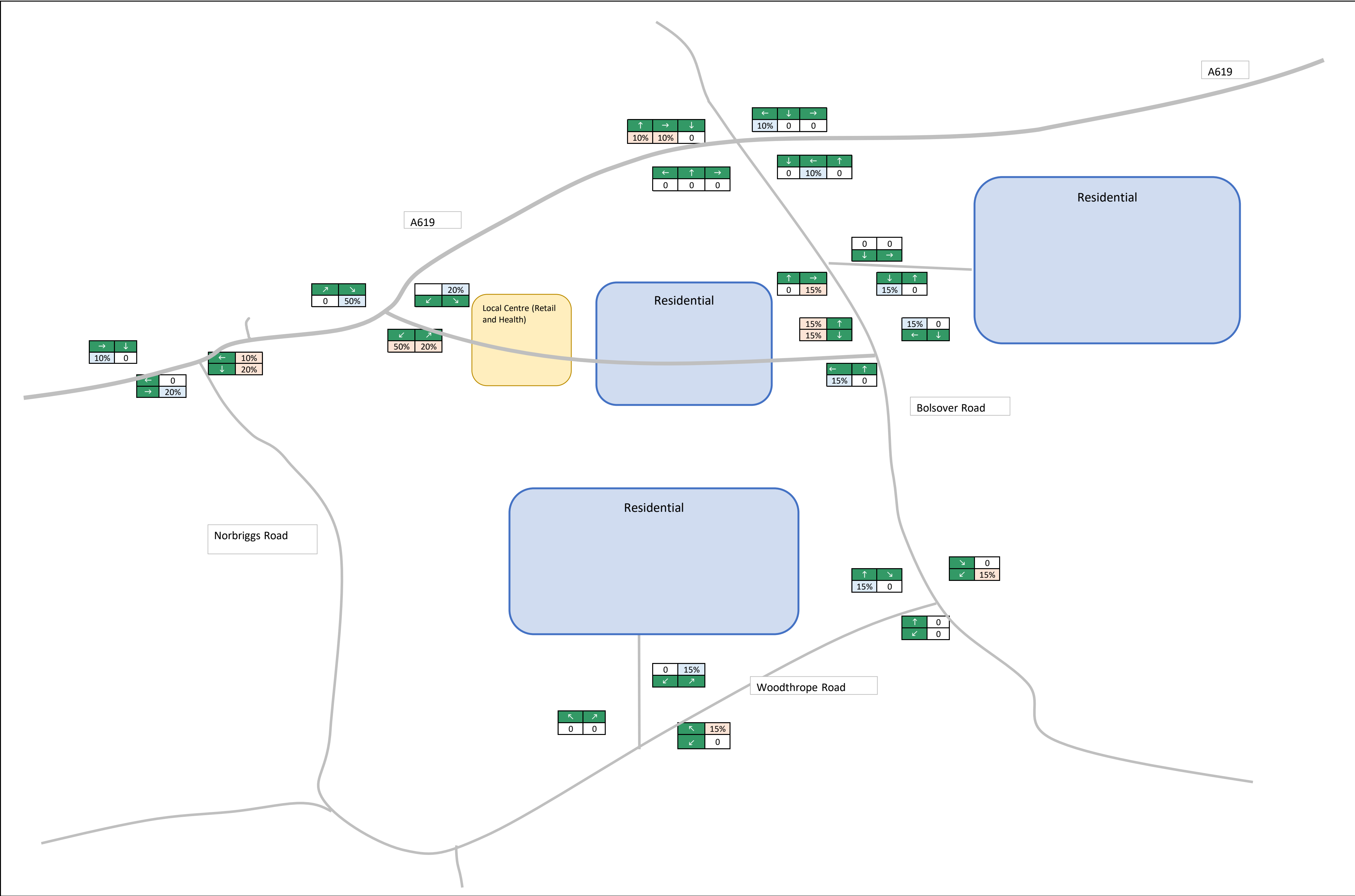
Drawing Title: 2026 Do Something Traffic Flows from SATURN PM

Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 12



Admiral House, Rose Wharf
78 East Street, Leeds, LS9 8EE
Tel: +44 (0)113 242 8498
Fax: +44 (0)1132428573
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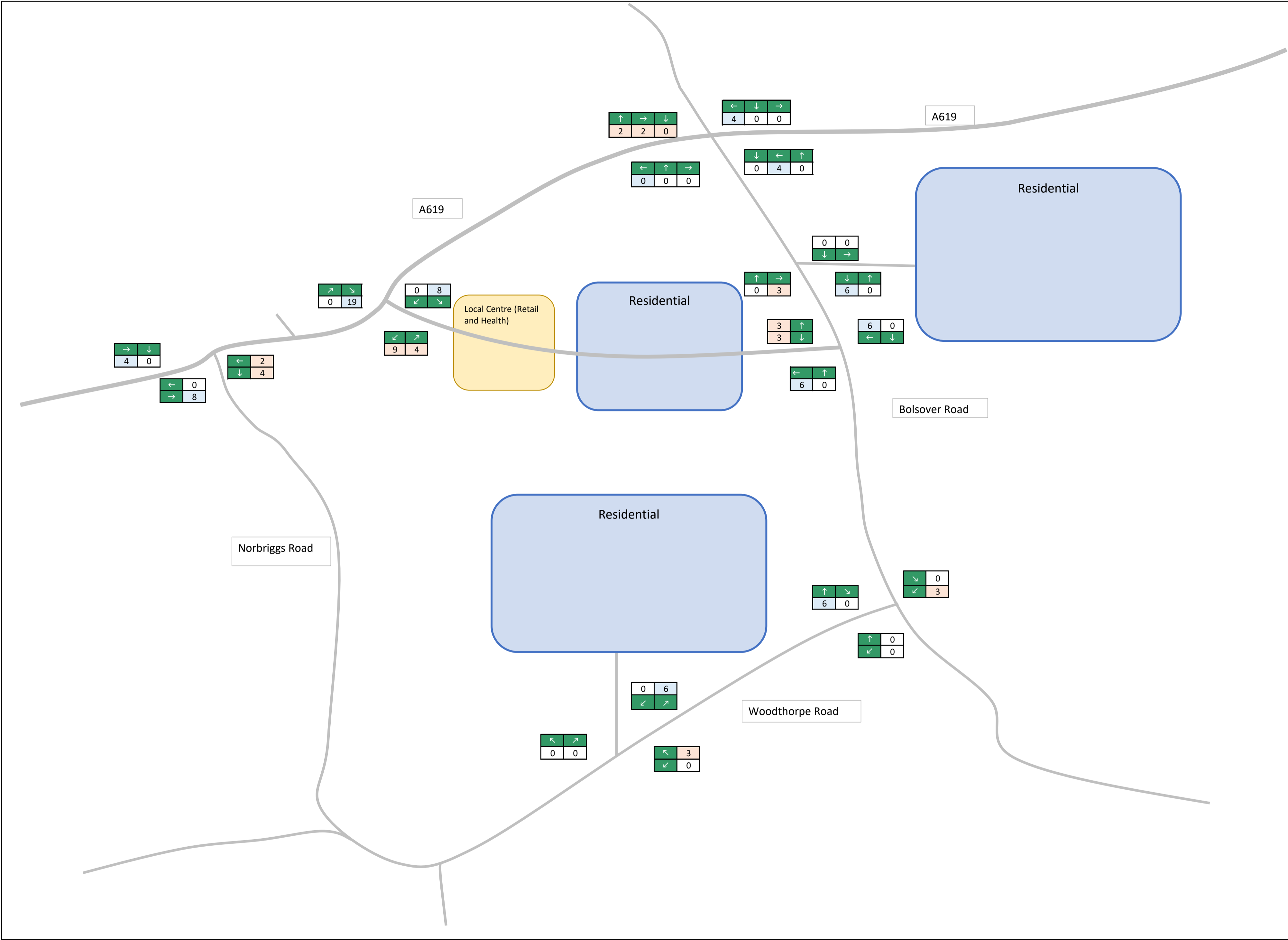
Issue: 1
Date: 2020-09-29
Checked: SB
Approved: AG

Client: Devonshire Property (MM) Ltd
Project Title: Mastin Moor
Drawing Title: Local Centre Distribution

Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number: 276927-00
Drawing number: Figure 13



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Issue: 1

Date: 29/09/2020

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: **Mastin Moor**

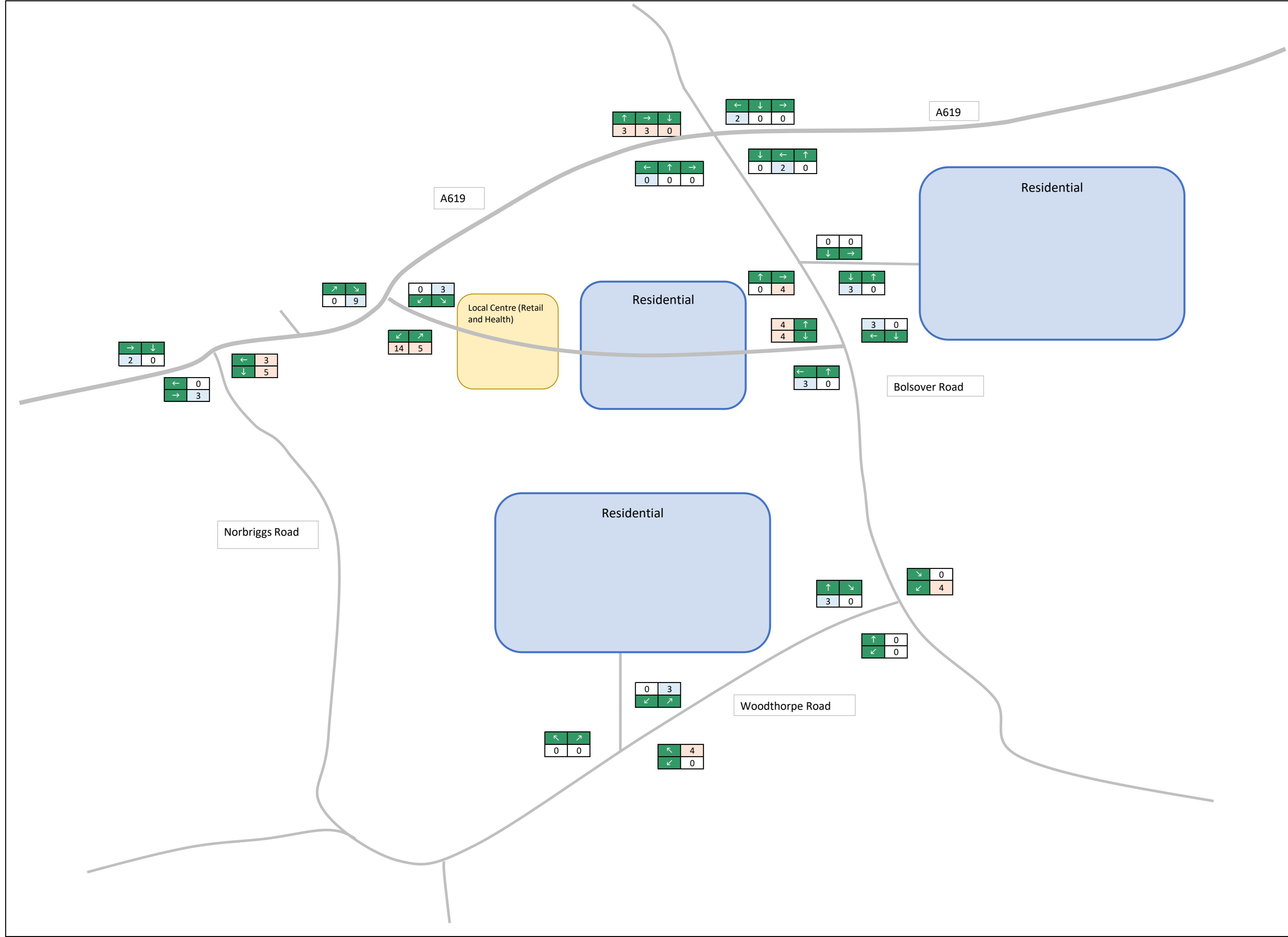
Drawing Title: Health Centre - GP Traffic Flows AM

Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 14



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Issue: 1
Date: 29/09/2020

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: **Mastin Moor**

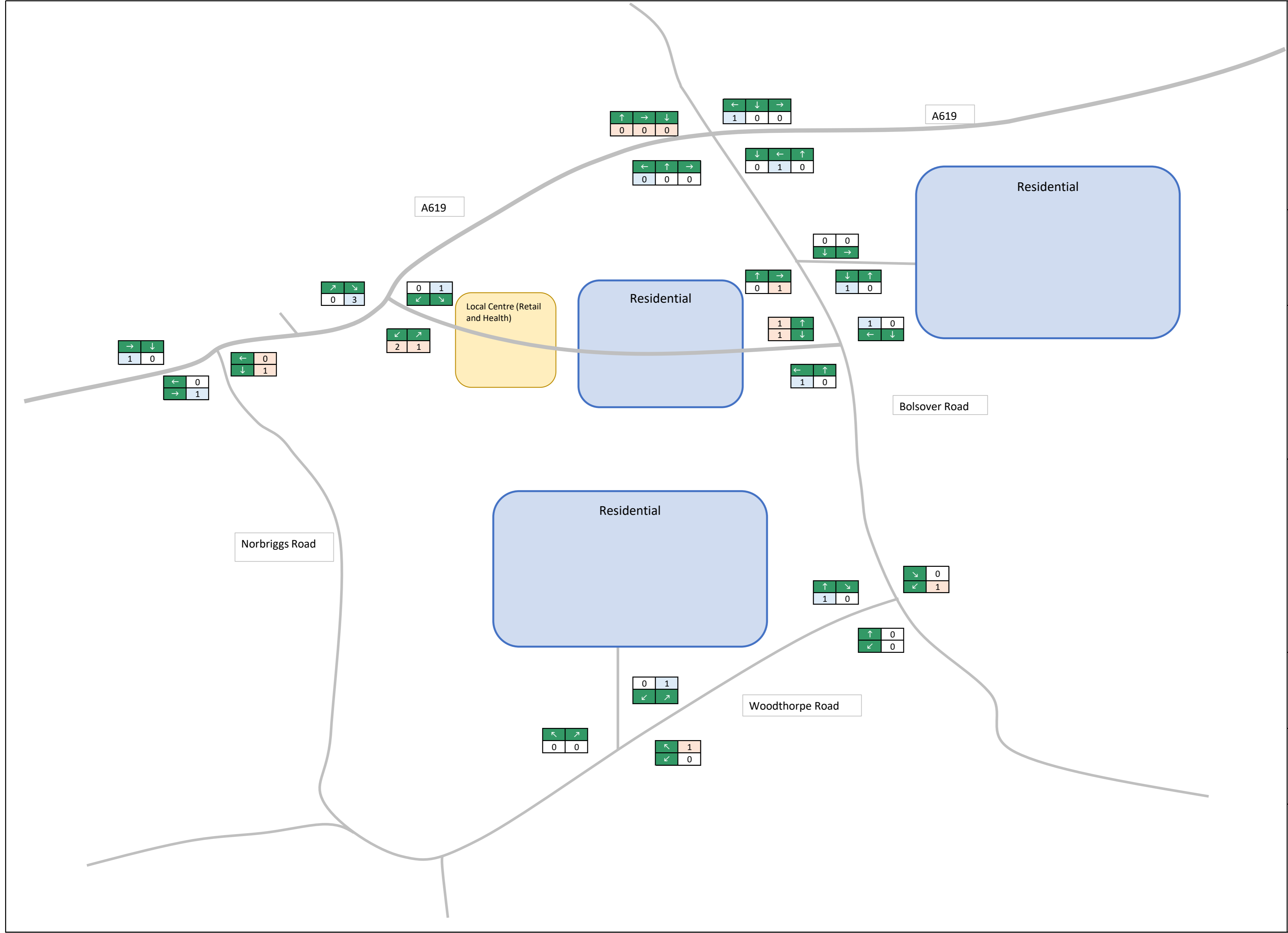
Drawing Title: Health Centre - GP Traffic Flows PM

Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 15



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Admiral House, Rose Wharf
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Issue: 1

Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: **Mastin Moor**

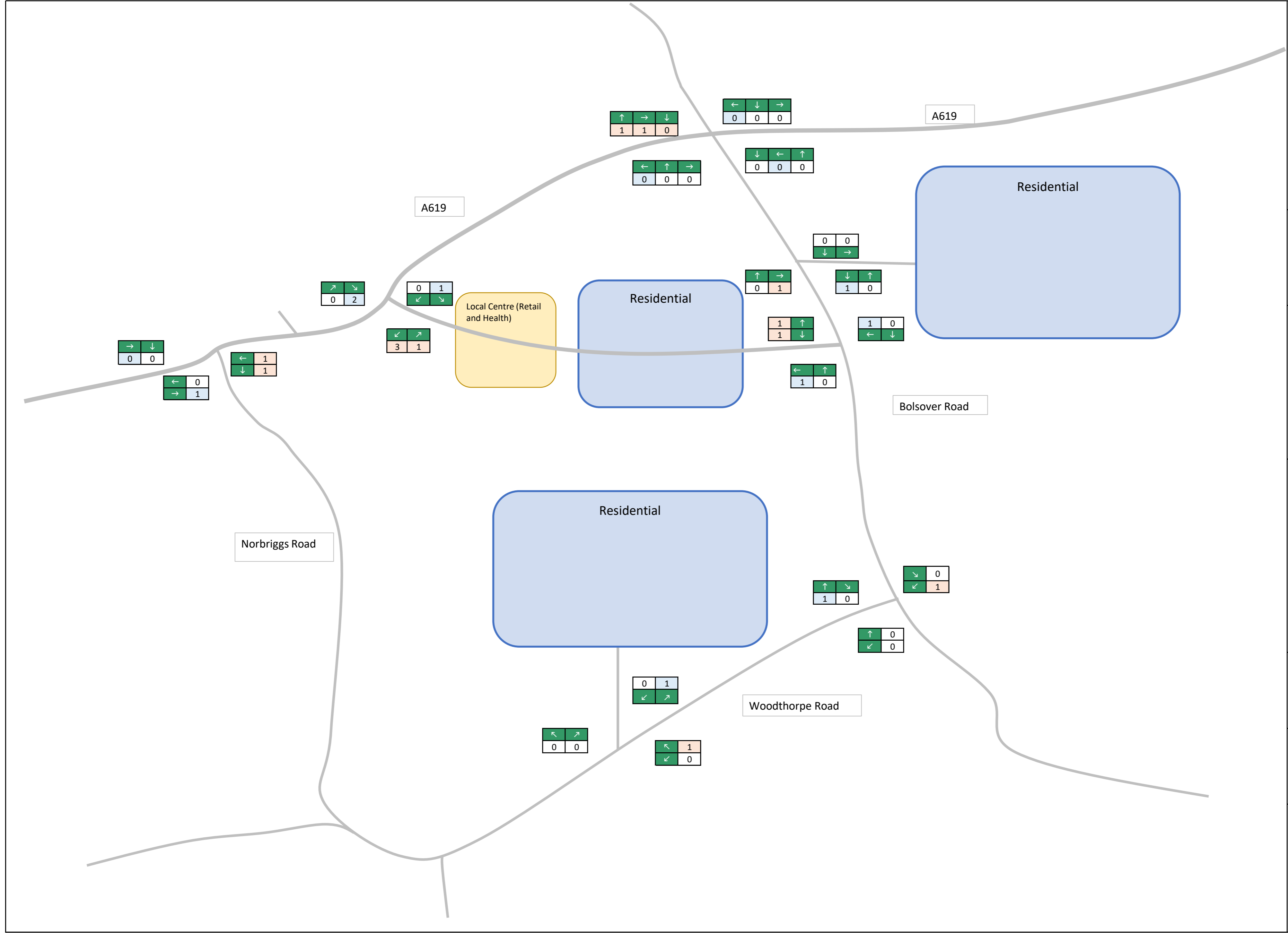
Drawing Title: Care Home Traffic Flow AM

Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 16



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Admiral House, Rose Wharf
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Issue: 1

Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: Mastin Moor

Drawing Title: Care Home Traffic Flow PM

Scale @ A3

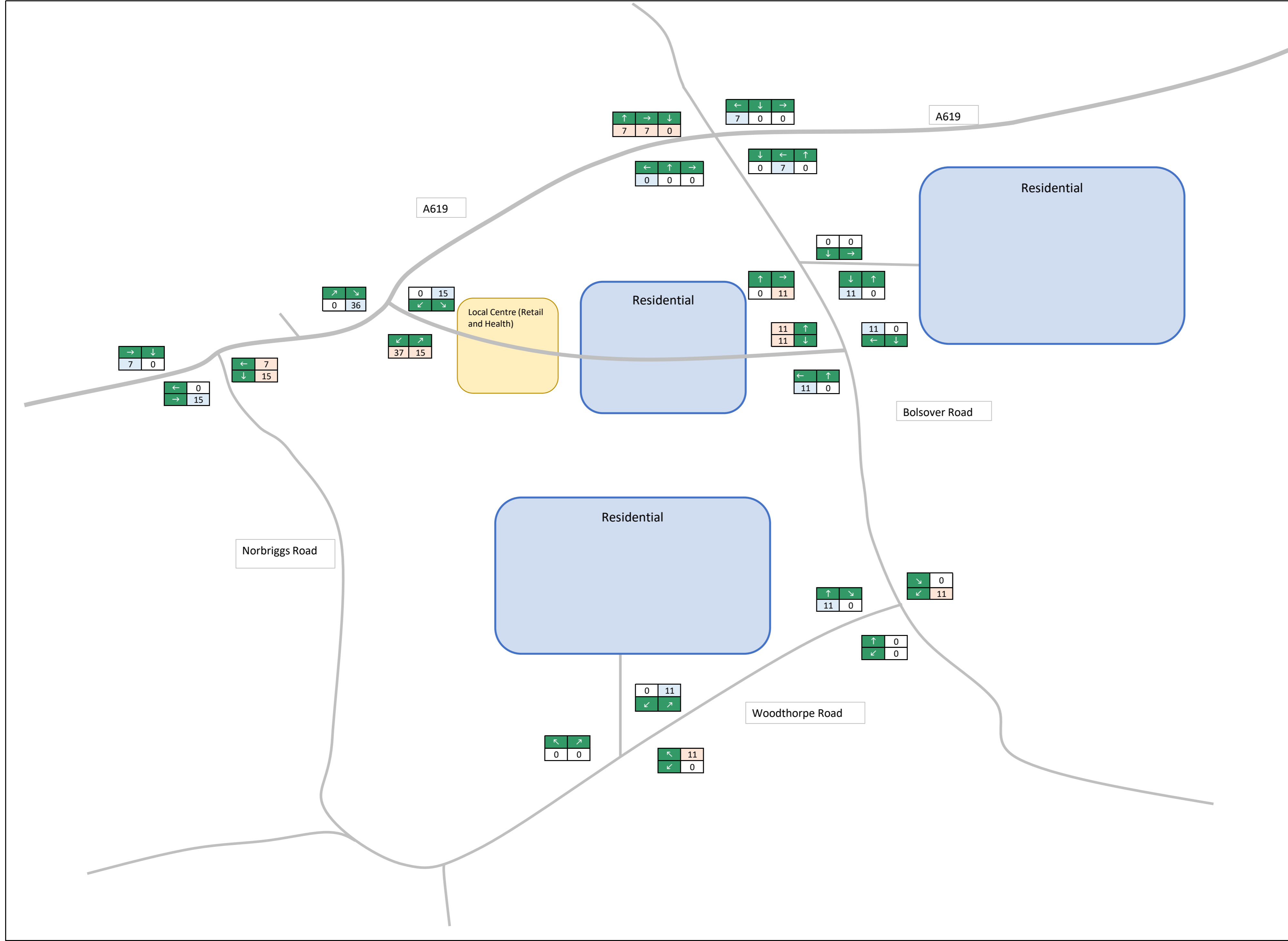
Not to Scale

Drawing Status

For Planning

Job Number: 276927-00

Drawing number: Figure 17



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Tel: +44 (0)113 242 8498
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Issue: 1
Date: 29/09/2020

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: Mastin Moor

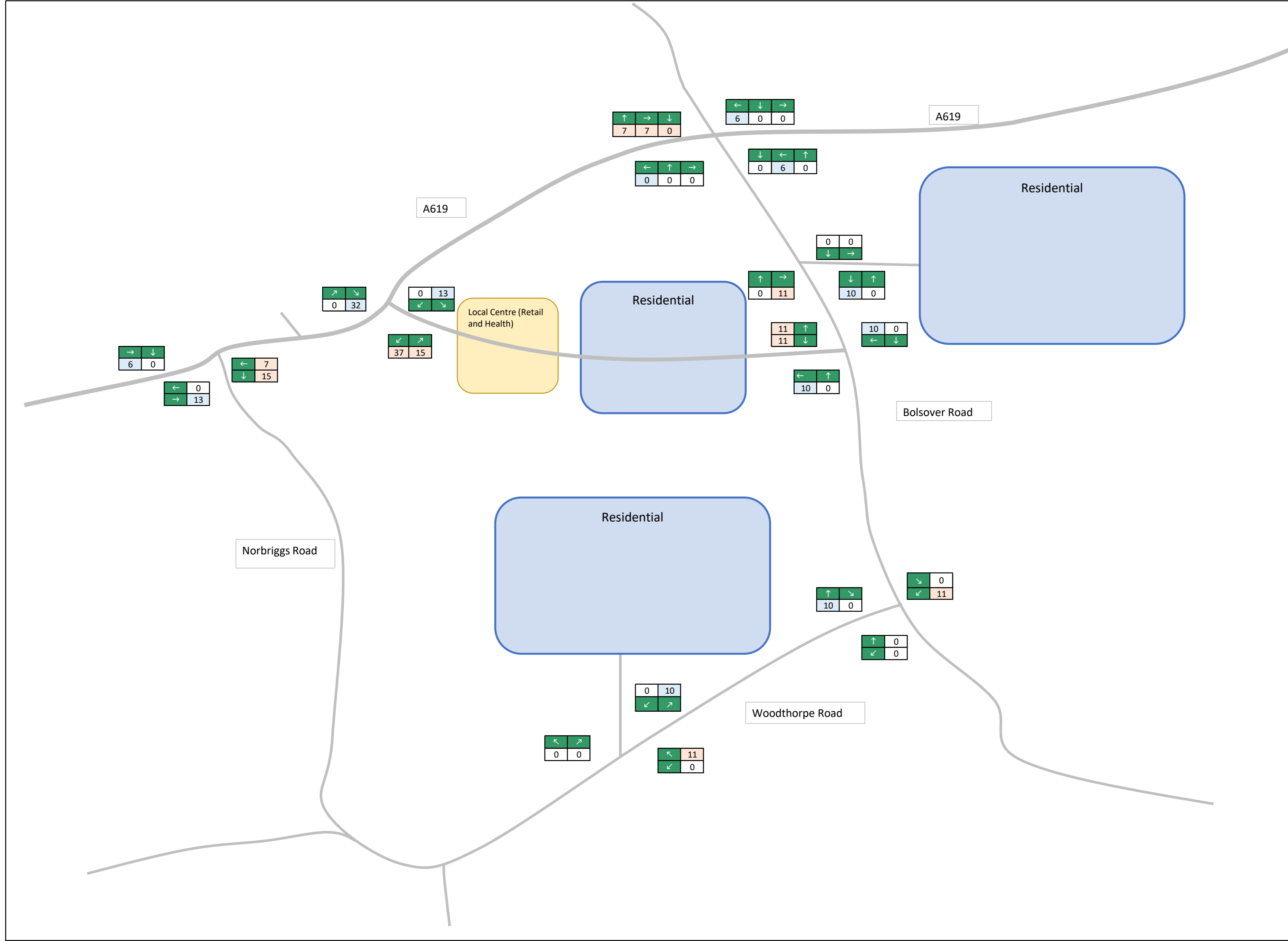
Drawing Title: Retail Traffic Flows AM

Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 18



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Admiral House, Rose Wharf
78 East Street, Leeds, LS9 8EE
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Fax: +44 (0)1132428573
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Issue: 1
Date: 29/09/2020

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: **Mastin Moor**

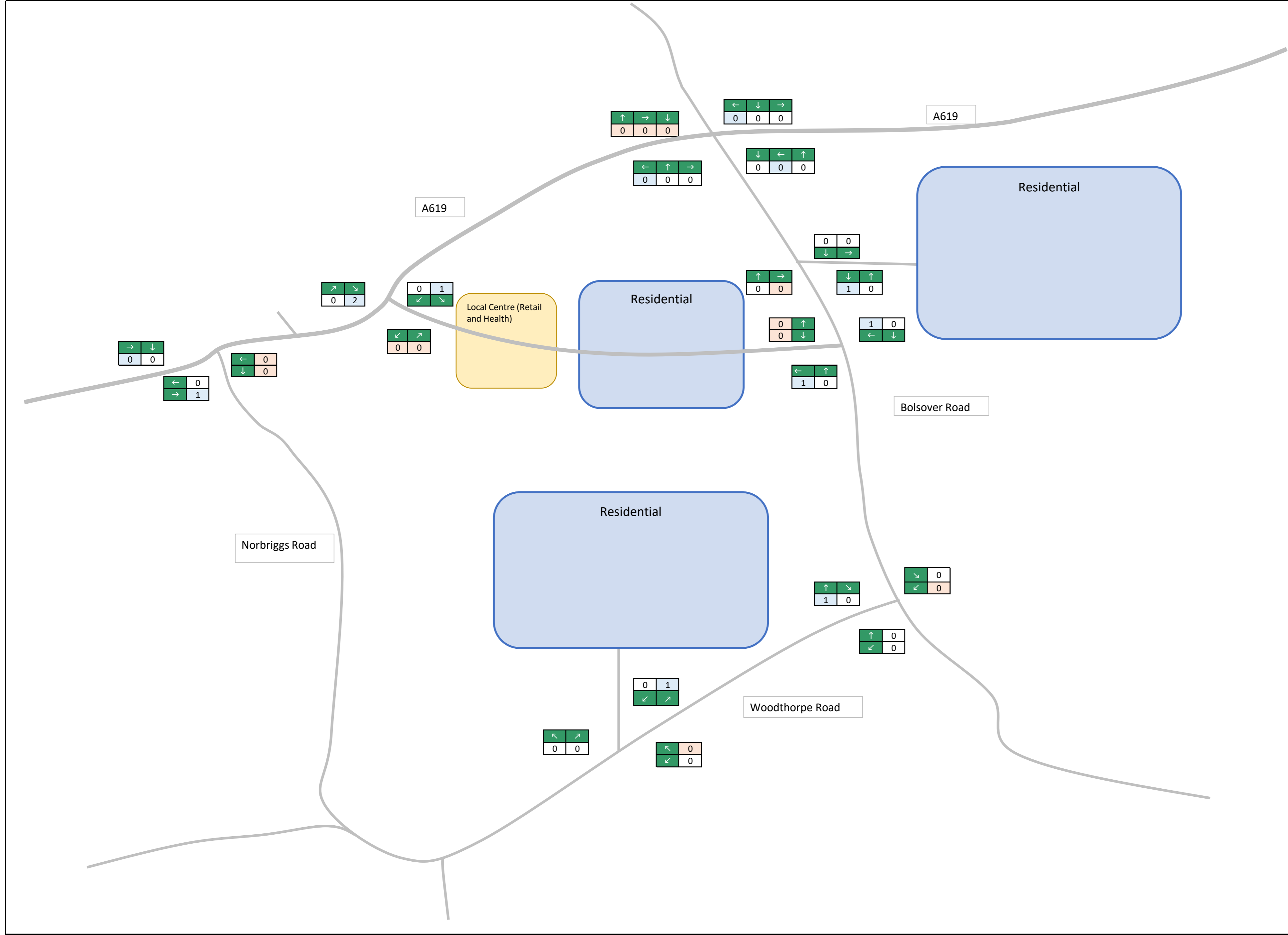
Drawing Title: Retail Traffic Flows PM

Scale @ A3
Not to Scale

Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 19



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Issue: 1

Date: 29/09/2020

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: Mastin Moor

Drawing Title: Office Traffic Flow AM

Scale @ A3

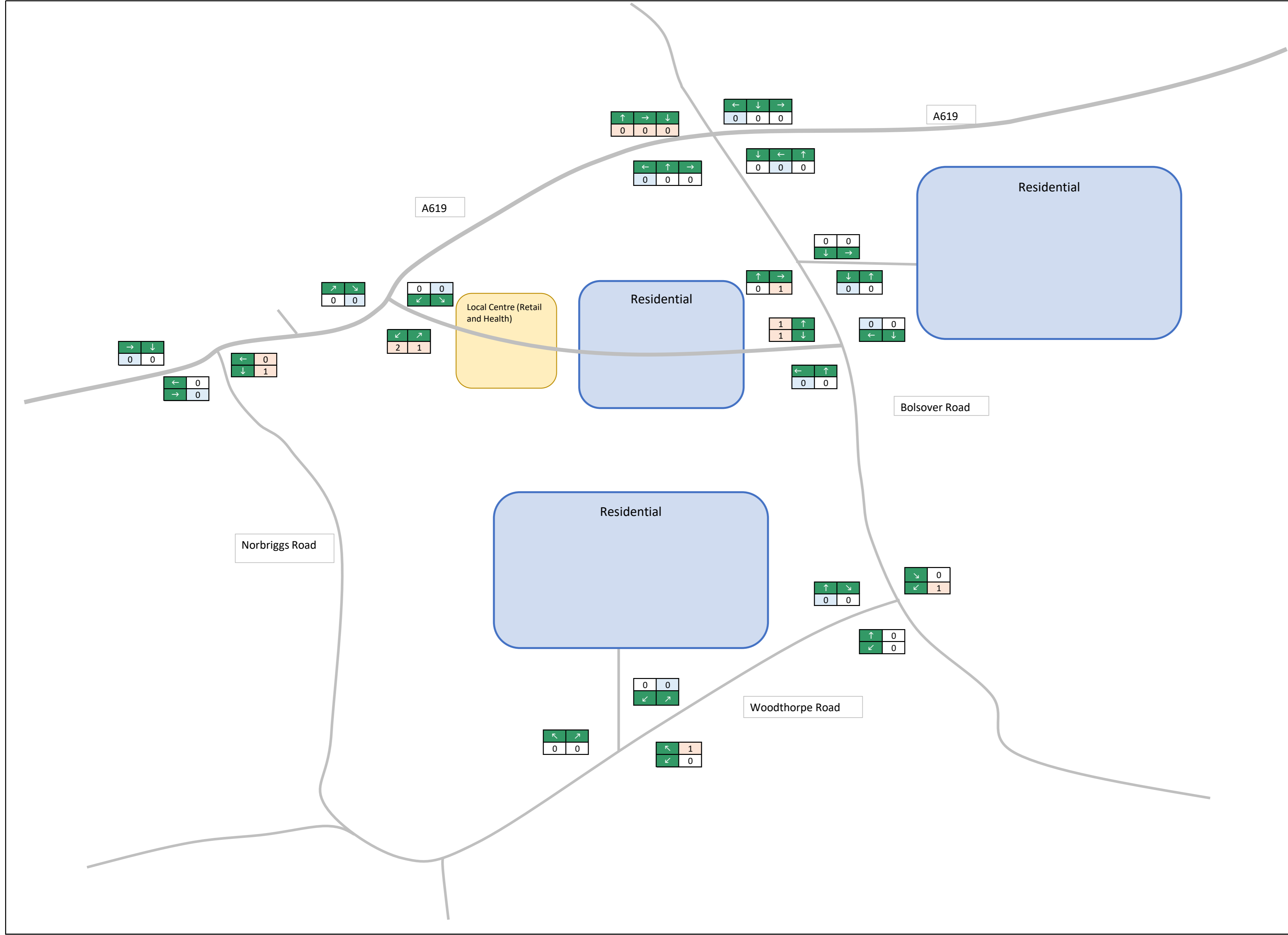
Not to Scale

Drawing Status

For Planning

Job Number: 276927-00

Drawing number: Figure 20



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Admiral House, Rose Wharf
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Tel: +44 (0)113 242 8498
Fax: +44 (0)1132428573
www.arup.com

Issue: 1

Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: Mastin Moor

Drawing Title: Office Traffic Flow PM

Scale @ A3

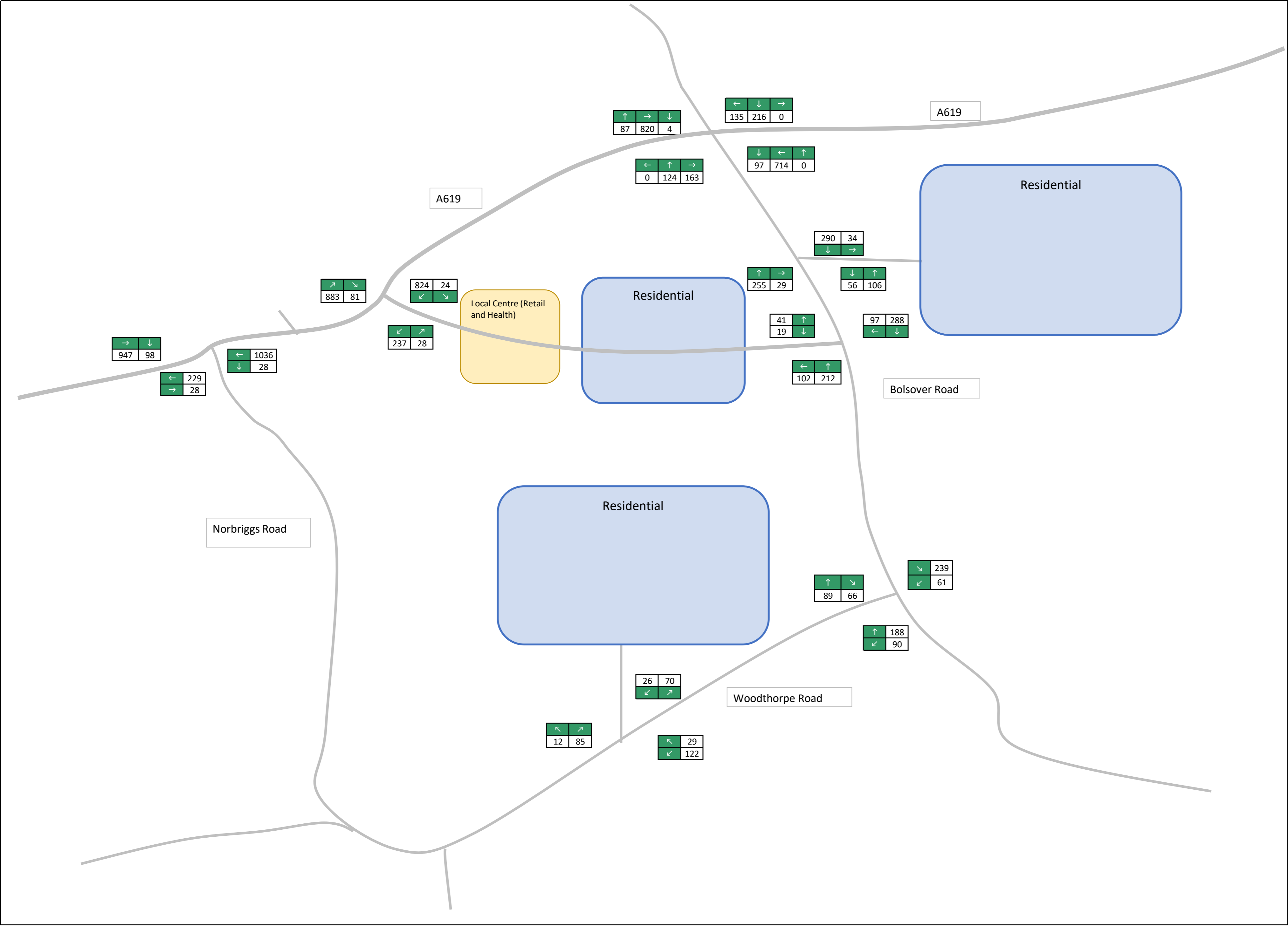
Not to Scale

Drawing Status

For Planning

Job Number: 276927-00

Drawing number: Figure 21



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Tel: +44 (0)113 242 8498
Fax: +44 (0)1132428573
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Issue:

1

Date:

2020-09-29

Checked:

SB

Approved:

AG

Client:

Devonshire Property (MM) Ltd

Project Title:

Mastin Moor

Drawing Title:

2026 Total Do Something
Traffic Flows AM

Scale @ A3

Not to Scale

Drawing Status

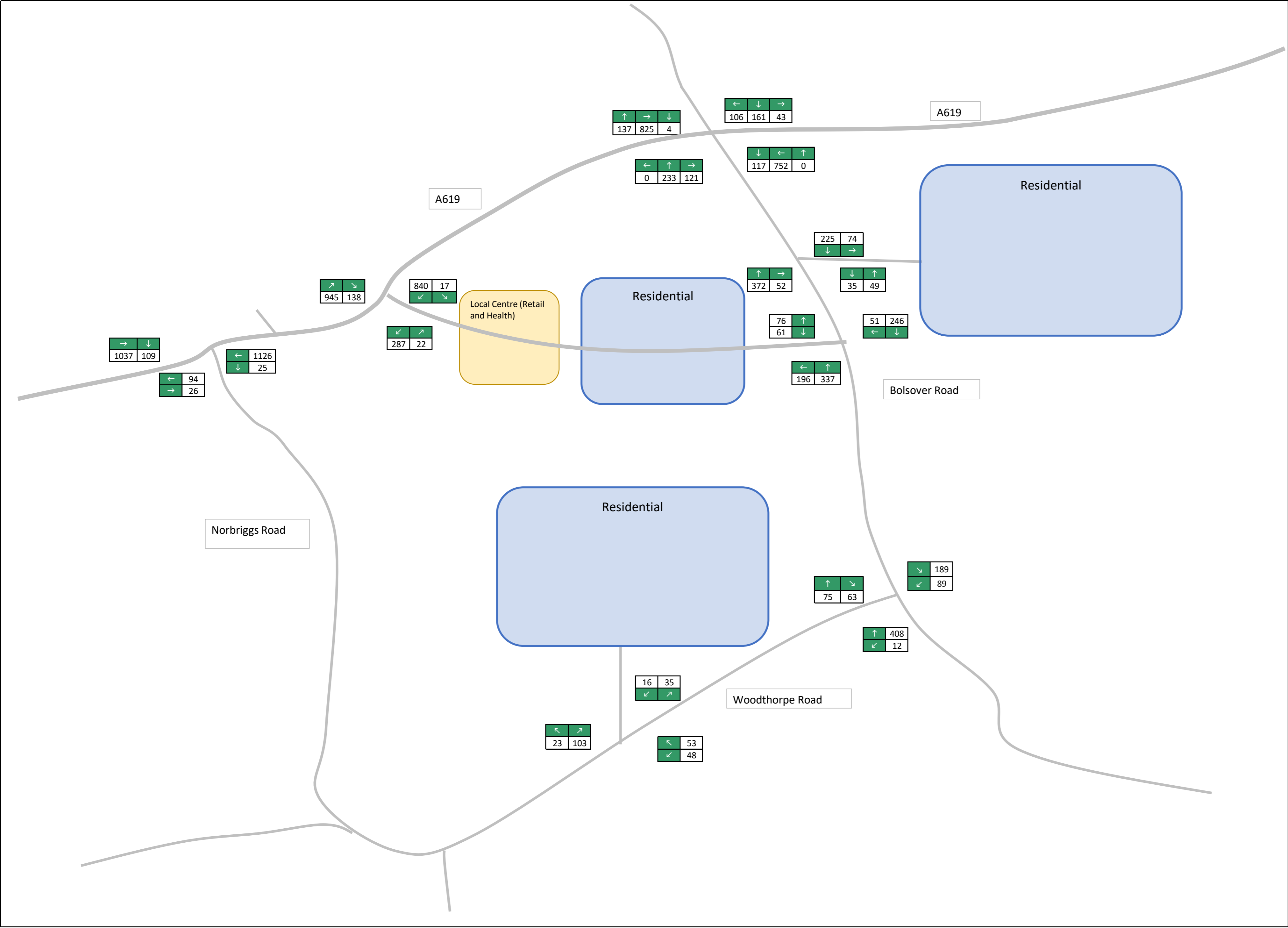
For Planning

Job Number:

276927-00

Drawing number:

Figure 22



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Issue: 1

Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: Mastin Moor

Drawing Title: 2026 Total Do Something Traffic Flows PM

Scale @ A3

Not to Scale

Drawing Status

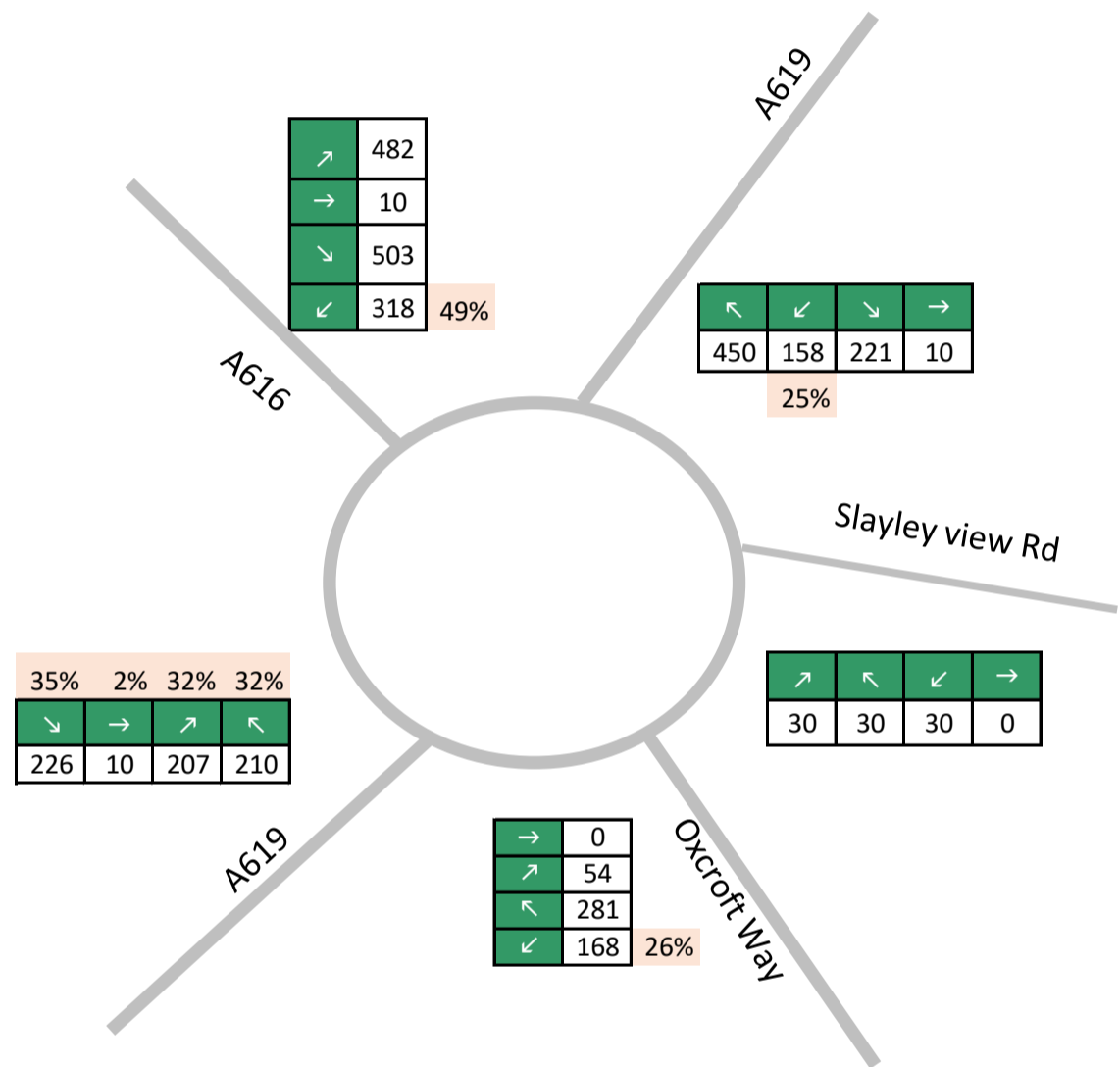
For Planning

Job Number: 276927-00

Drawing number: Figure 23

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78 East Street, Leeds, LS9 8EE
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Fax: +44 (0)1132428573
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Issue: 1
Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: Mastin Moor

Drawing Title: 2016 Treble Bob Roundabout AM

Scale @ A4
Not to Scale

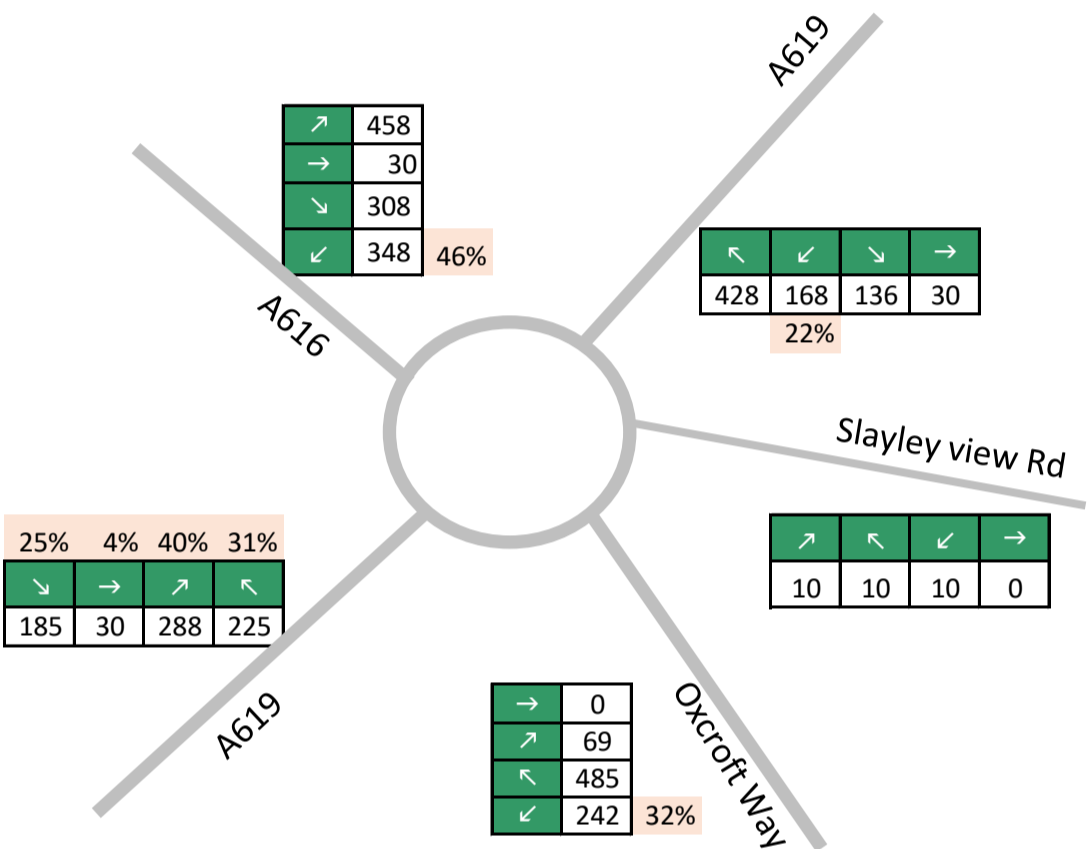
Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 24



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Tel: +44 (0)113 242 8498
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Issue: 1 Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: Mastin Moor

Drawing Title: 2016 Treble Bob Roundabout PM

Scale @ A4
Not to Scale

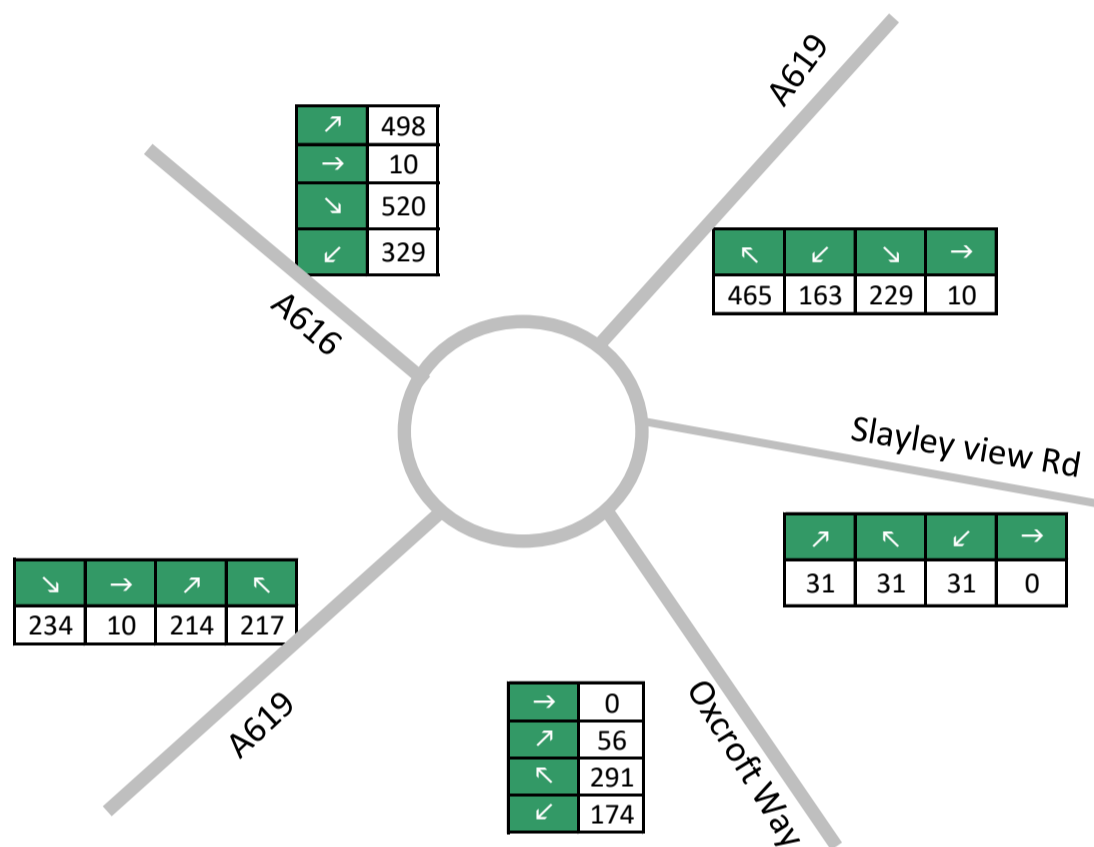
Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 25

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Tel: +44 (0)113 242 8498
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Issue: 1
Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: **Mastin Moor**

Drawing Title: 2019 Treble Bob Roundabout AM

Scale @ A4
Not to Scale

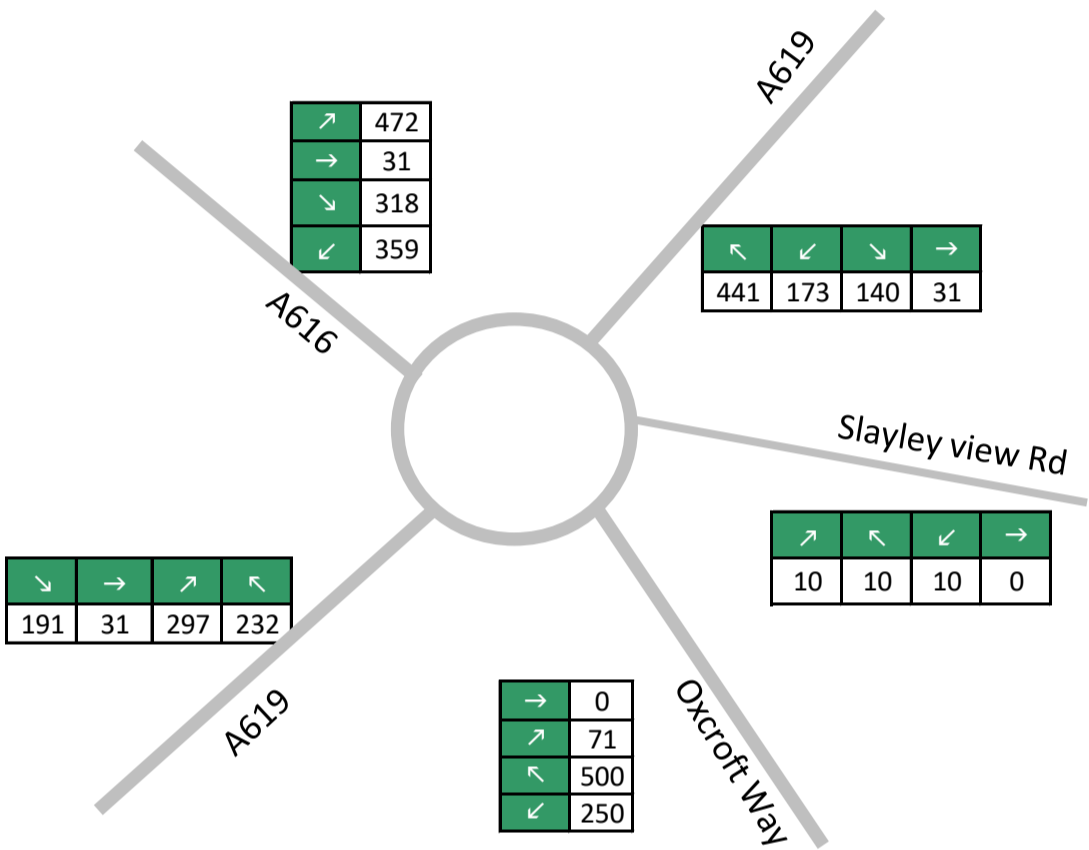
Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 26



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Tel: +44 (0)113 242 8498
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Issue: 1 Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: Mastin Moor

Drawing Title: 2019 Treble Bob Roundabout PM

Scale @ A4
Not to Scale

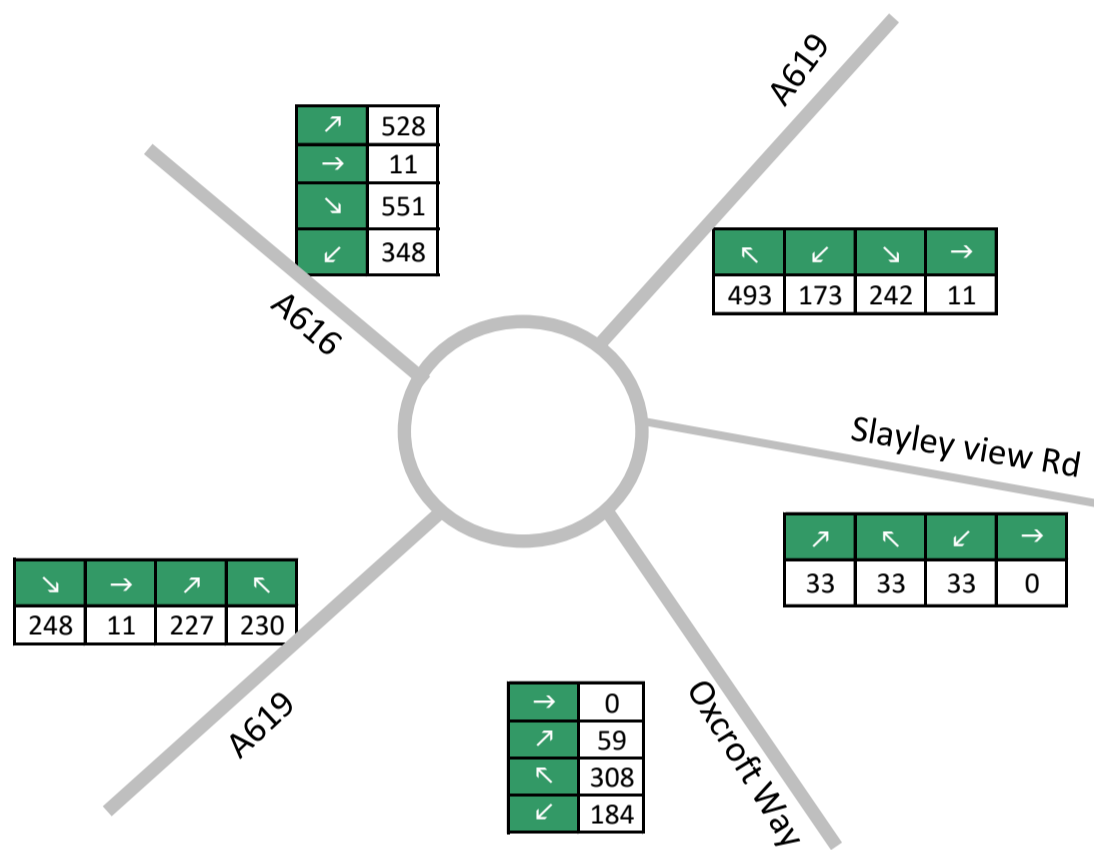
Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 27

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Fax: +44 (0)1132428573
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Issue: 1
Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: **Mastin Moor**

Drawing Title: 2026 Do Minimum Treble Bob Roundabout AM

Scale @ A4
Not to Scale

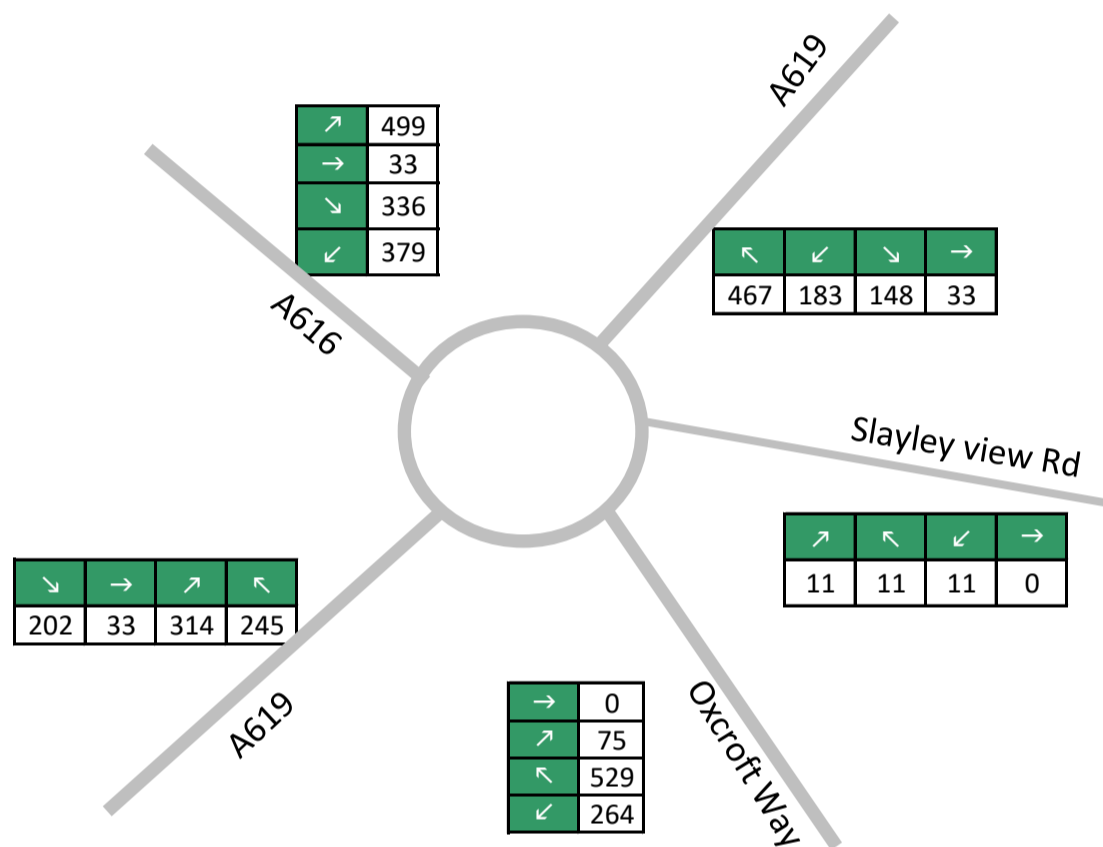
Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 28

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Issue: 1
Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: **Mastin Moor**

Drawing Title: 2026 Do Minimum Treble Bob Roundabout PM

Scale @ A4
Not to Scale

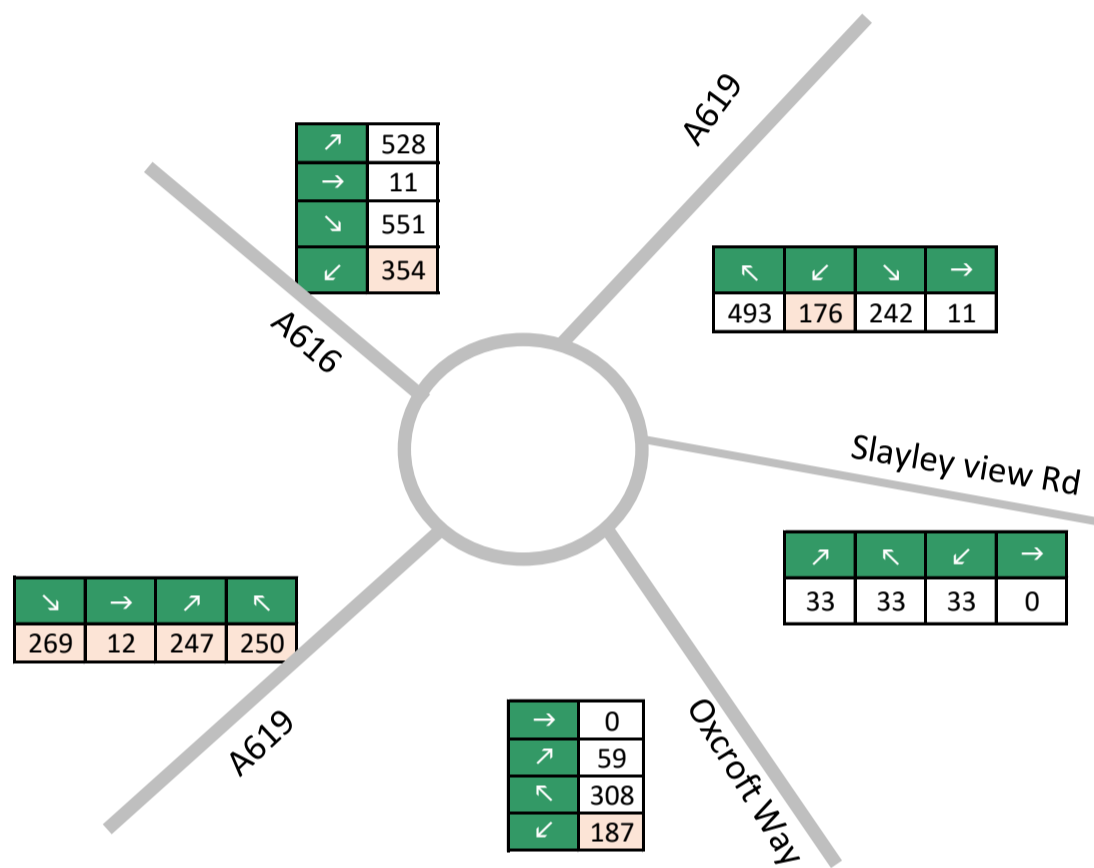
Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 29

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Issue: 1
Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: **Mastin Moor**

Drawing Title: 2026 Do Something Treble
Bob Roundabout AM

Scale @ A4
Not to Scale

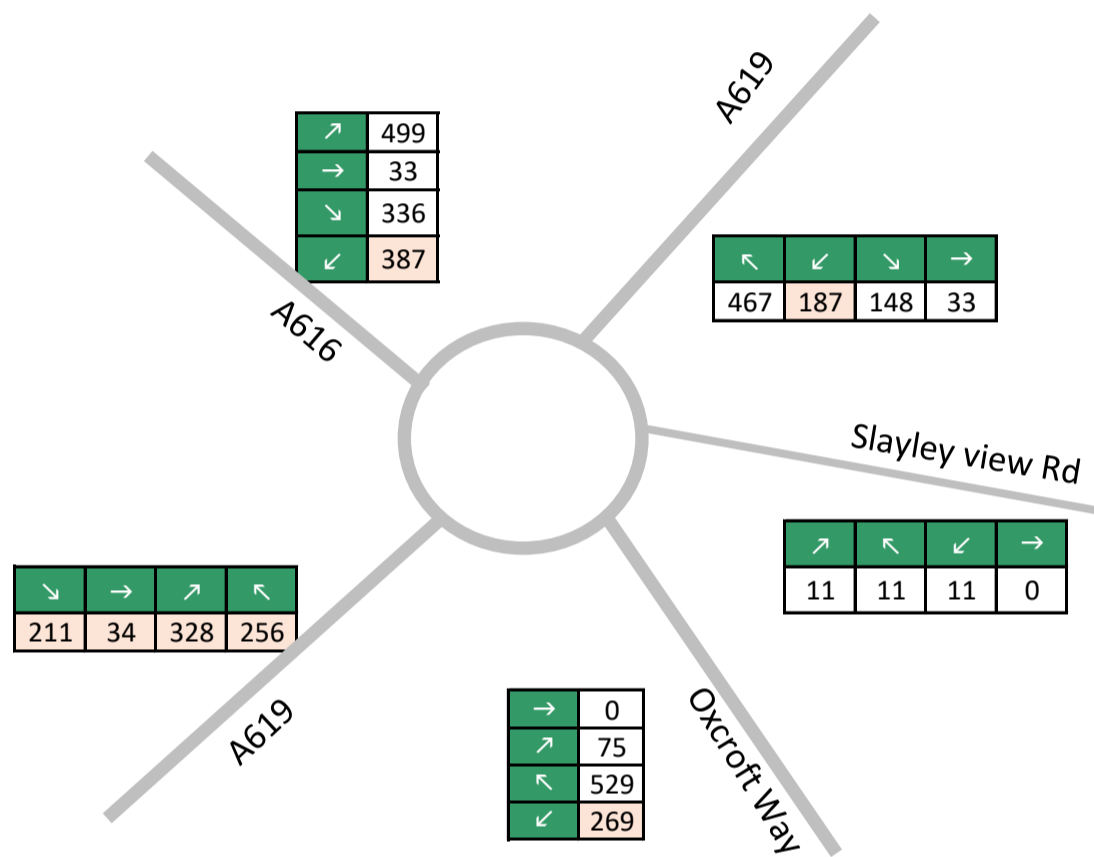
Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 30

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Issue: 1
Date: 2020-09-29

Checked: SB

Approved: AG

Client: Devonshire Property (MM) Ltd

Project Title: **Mastin Moor**

Drawing Title: 2026 Do Something Treble
Bob Roundabout PM

Scale @ A4
Not to Scale

Drawing Status
For Planning

Job Number: 276927-00

Drawing number: Figure 31



Mastin Moor

Woodthorpe

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Key:

Bus Stop

B

400m walking catchment



Issue:	Date:	Originator:	Checked:	Approved:
P1	08.10.20	SM	SB	AG
D1	25/05/17	EC	SB	AG

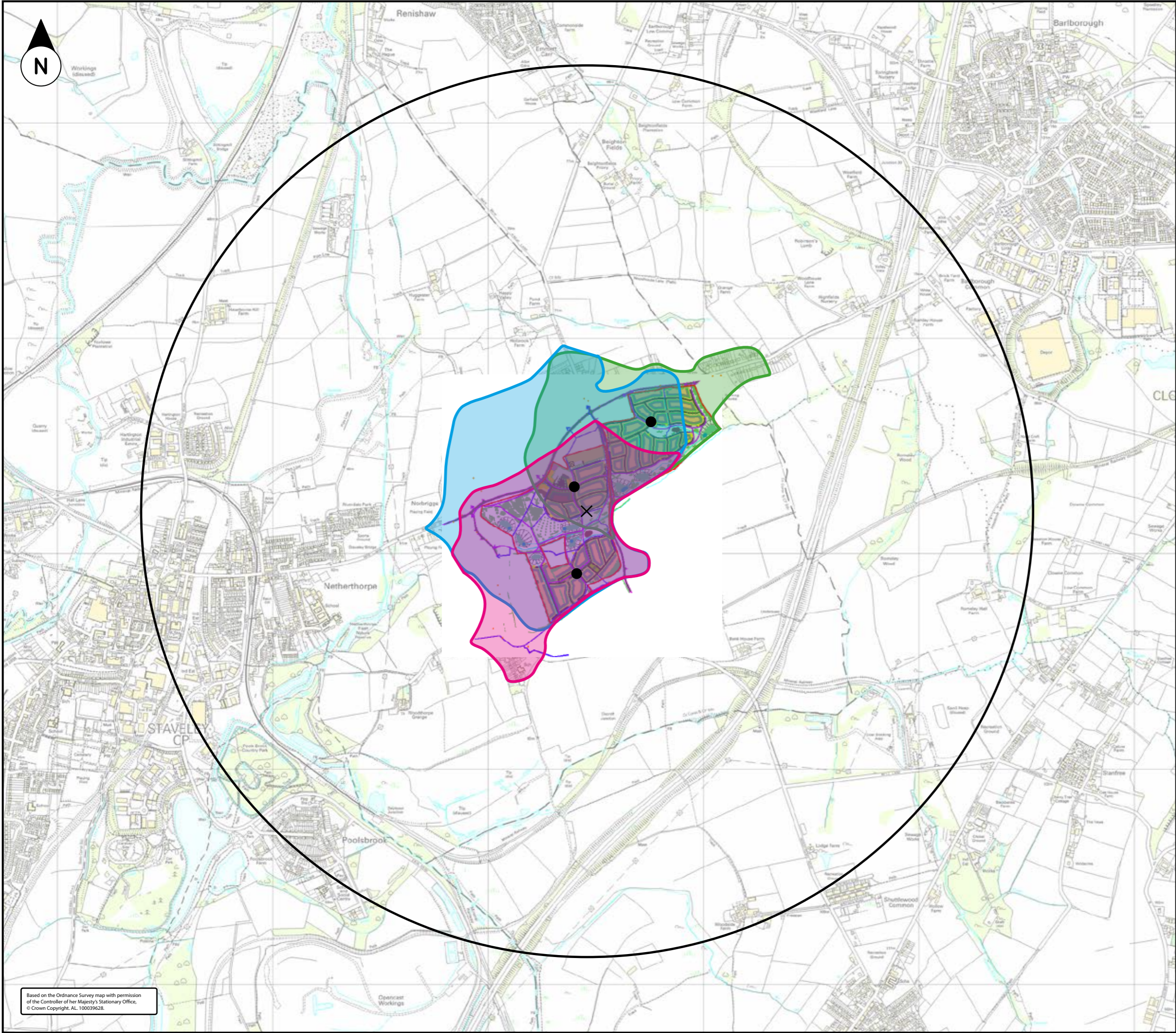
Devonshire Property (MM) Ltd
MASTIN MOOR
Bus Stop Accessibility

Scale @ A3:
Not to Scale

Drawing Status:
For Planning

Job Number:
276927-00

Drawing Number:
Figure 32



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Key:
800m Walking Catchment:
-Eastern Parcel
-Southern Parcel
-Western Parcel
2km Catchment



Issue:	Date:	Originator:	Checked:	Approved:
P1	08.10.20	SM	SB	AG

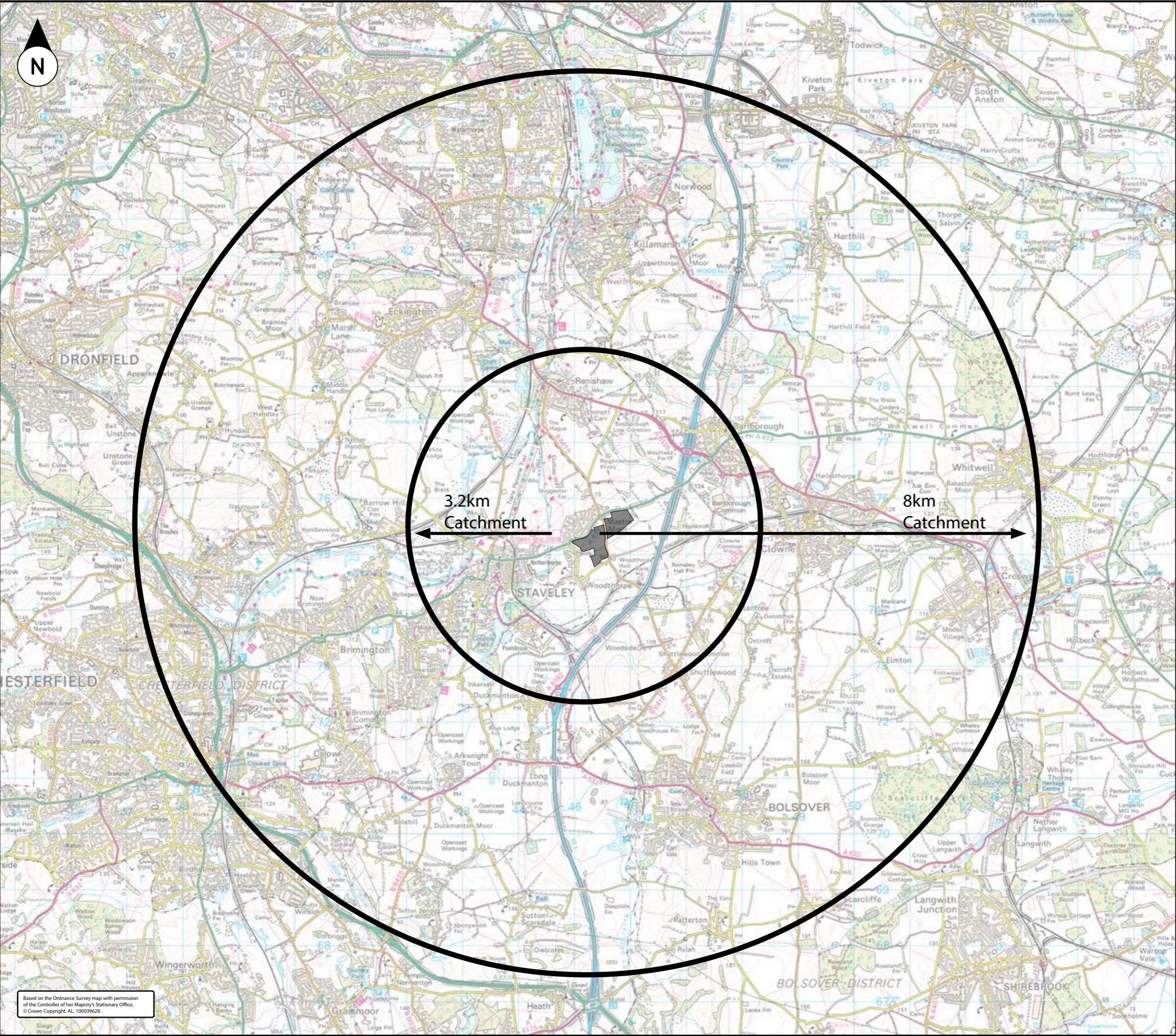
Devonshire Property (MM) Ltd
Mastin Moor
800m & 2km walking catchment

Scale @ A3:
Not to Scale

Drawing Status:
For Planning

Job Number:
276927-00

Drawing Number:
Figure 33



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Admiral House, Rose Wharf
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Tel: +44 (0)113 2428498 Fax: +44 (0)113 2428573
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Key:
Site location



Issue:	Date:	Originator:	Checked:	Approved:
P1	08.10.20	SM	SB	AG

Devonshire Property (MM) Ltd
Mastin Moor
3.2km and 8km Cycling Catchment

Scale @ A3:
Not to Scale

Drawing Status:
For Planning

Job Number:
276927-00

Drawing Number:
Figure 34

Drawings

Drawing 1 276927-SK-200

Drawing 2 276927-SK-100

Drawing 3 276927-SK-101

Drawing 4 276927-SK-102



Key:

- Existing layout
- Proposed layout

01	08/10/20	SM	SB	AG
----	----------	----	----	----

Draft

Issue	Date	By	Chkd	Appd
-------	------	----	------	------

ARUP

Admiral House, Rose Wharf,
78 East Street, Leeds, LS9 8EE
Tel +44(0)113 242 5498 Fax +44(0)113 242 8573
www.arup.com

Client
Devonshire Property (MM) Ltd

Project Title
Mastin Moor

Drawing Title
Site Wide

Scale at A1 1:1250

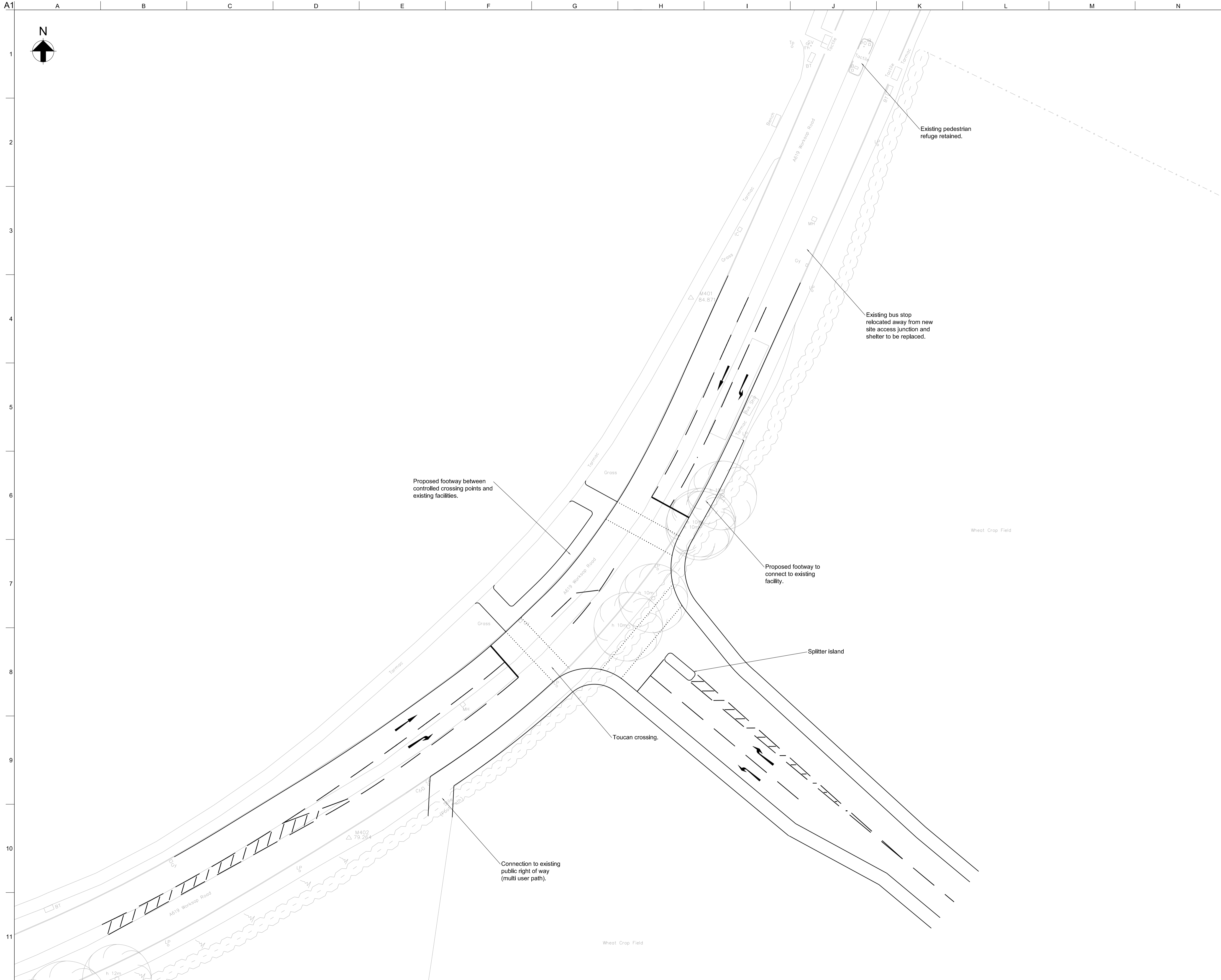
Role Civil

Suitability - For Planning

Arup Job No
276927-00

Rev
01

Name
SK-200



Do not scale

Key:

Existing layout

Proposed layout

01	08/10/20	SM	SB	AG
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Rev	Date	By	Chkd	Appd
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www.arup.com

Client

Chatsworth Settlement Trustees

Project Title

Mastin Moor

Drawing Title

Potential Site Access onto Bolsover Road

Scale at A1

1:250

Role

Civil

Suitability

- For Planning

Arup Job No

276927-00

Rev

01

Name

SK-100

global-arup\leeds\Jobs\23000\236145-000 Arup\20 CAD\Drawings\SK-100.dgn

© Arup



Key:

- Existing layout
- Proposed layout
- 4.5m x 160m visibility splay

01	08/10/20	SM	SB	AG
Draft				
Rev	Date	By	Chkd	Appd

ARUP

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78 East Street, Leeds, LS9 8EE
Tel +44(0)113 242 8498 Fax +44(0)113 242 8573
www.arup.com

Client
Devonshire Property (MM) Ltd

Project Title
Mastin Moor

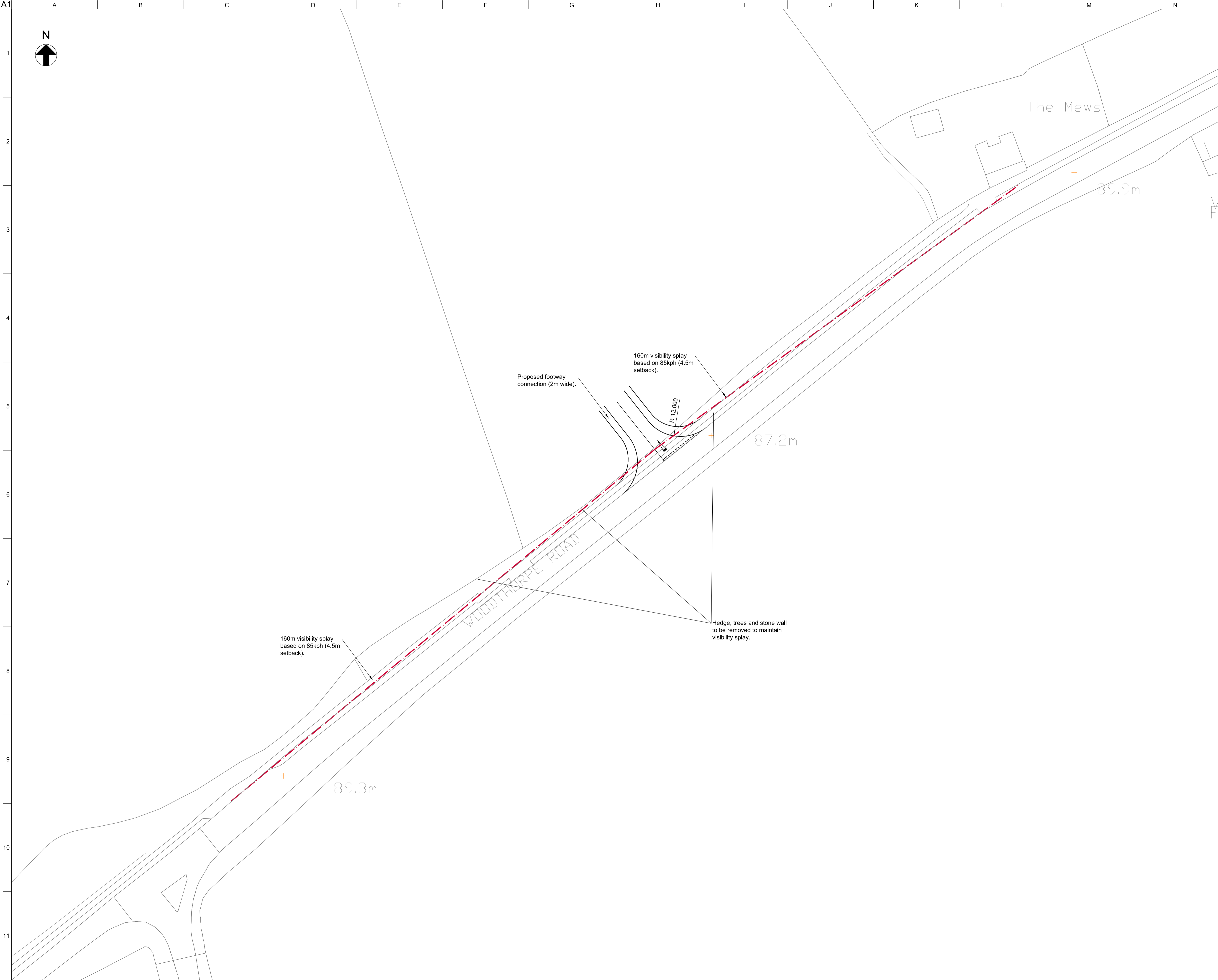
Drawing Title
**Potential Site Access onto
Bolsover Road
(Site Access 2 and 4)**

Scale at A1
1:500

Role
Civil

Suitability
- For Planning

Arup Job No 276927-00	Rev 01
Name SK-101	



Do not scale

Key:

- Existing layout
- Proposed layout
- 4.5m x 160m visibility display

01	08/10/20	SM	SB	AG
Draft				

Rev	Date	By	Chkd	Appd

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Client
Devonshire Property (MM) Ltd

Project Title
Mastin Moor

Drawing Title
Potential Site Access onto
Woodthorpe Road
(Site Access 3)

Scale at A1
1:500

Role
Civil

Suitability
- For Planning

Arup Job No 276927-00	Rev 01
---------------------------------	------------------

Name
SK-102

Appendix A

Speed Survey Data



Midlands

Haseley Office Centre,
Firs Lane, Haseley,
Warwick,
CV35 7LS

Tel: 01926 485504
Fax: 01926 485537

ARUP MASTIN MOOR SPEED SURVEY

SURVEY REPORT JUNE 2016

PROJECT NO.	6377
CHECKED	N. TOONE
DATE	16/06/2016
CONTACT	M. NORRIS
REVISION	A

Contents

Introduction

Appendix A – Speed Survey Results

INTRODUCTION

Nationwide Data Collection (NDC) was commissioned by Arup to undertake a speed survey in Mastin Moor, Derbyshire.

A general location plan is given in Diagram 1.

Survey Specification & Conduct

Surveys were carried out at the following location:

Site 1 – B6419 Bolsover Road, northbound layby.

Site 2 – B6419 Bolsover Road, southbound layby.

Site 1 was surveyed on Tuesday 7th June 2016 and survey hours were 11:25 to 14:45. Site 2 was surveyed on Wednesday 15th June, from 09:15 to 11:35. The results of the survey are contained in Appendix A.

Speed measurements were recorded in free-flow traffic conditions using a hand-held 'Speedar' speed gun.

Free-flow is defined in Departmental Advice Note TA 22/81 as driving conditions where drivers are in no way prevented, by the close proximity of other vehicles, from driving at the speed of their choice. For example, if a group of five vehicles approaches the survey site, only the speed of the lead vehicle will be measured. As the lead vehicle dictates the speeds of all other vehicles in the group, the following vehicles are not considered to be free-flow and are therefore ignored.

The results have been tabulated, and the 85th percentile speeds calculated for both wet and dry conditions in accordance with TA 22/81. The lowest and highest speeds and the calculated average and 85th percentile speeds are detailed in Table 1 below:

Table 1 – Summary

Site	Time	Direction	Sample	Speed limit	Lowest Speed	Highest Speed	Average Speed	85th % Dry Speed	85th % Wet Speed
1	11:25 to 14:45	NORTHBOUND	200	40	17	48	30.4	34.6	32.1
1	11:25 to 14:45	SOUTHBOUND	200	40	17	43	31.1	35.4	32.9

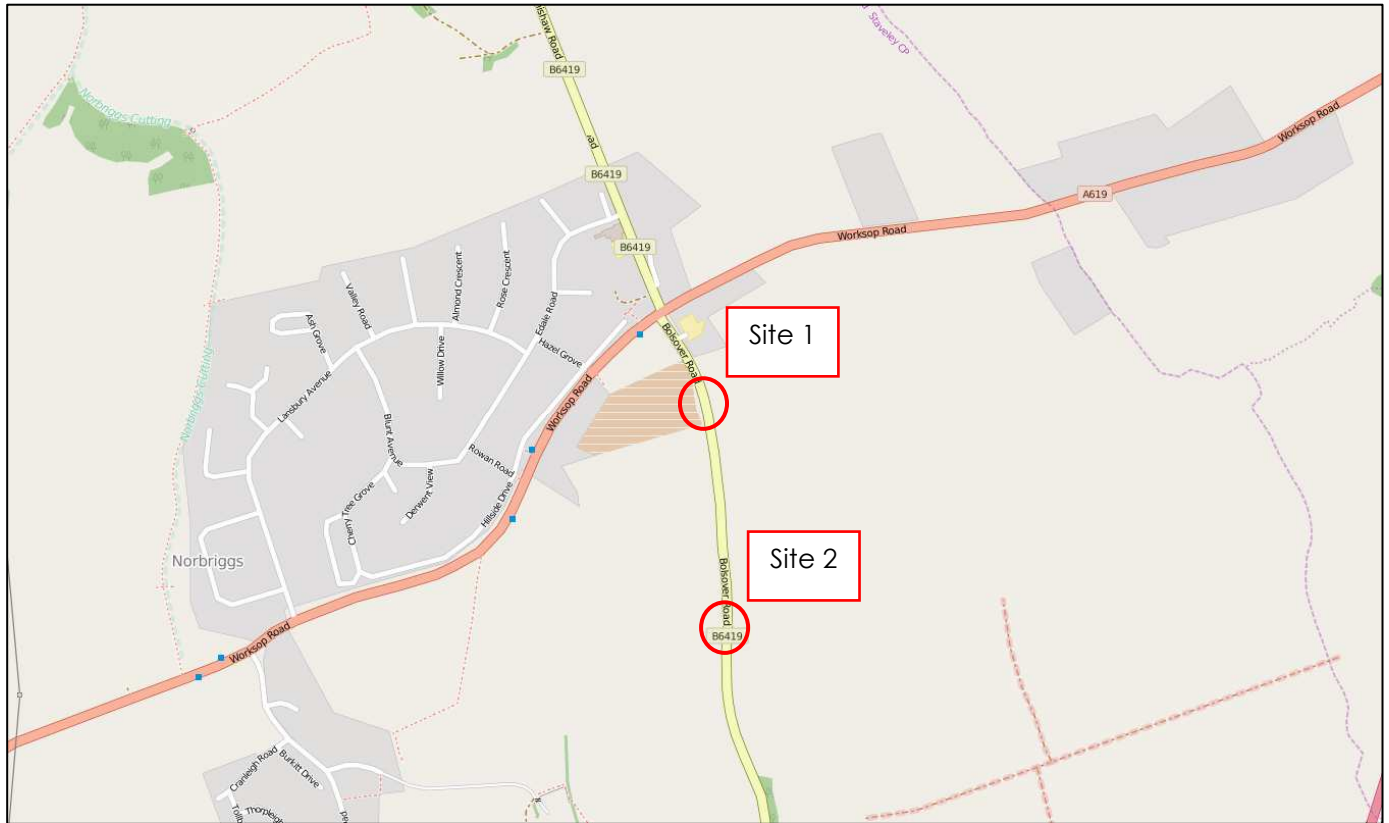
Site	Time	Direction	Sample	Speed limit	Lowest Speed	Highest Speed	Average Speed	85th % Dry Speed	85th % Wet Speed
2	09:15 to 11:35	NORTHBOUND	200	50	31	61	47.3	56.1	53.6
2	11:25 to 14:45	SOUTHBOUND	200	50	33	62	48.1	55.4	52.9

Notes

Traffic was free-flowing throughout the survey period. Weather conditions were recorded as sunny and dry on 7th June, overcast and wet on 15th June. There were no accidents, roadworks or parked vehicles likely to affect the survey results.

All data has been emailed to Andrew Carson at Andrew.Carson@arup.com

Diagram 1 – General Location Plan





APPENDIX A

Speed Survey Results

SITE: 1

DATE: 07/06/2016

LOCATION: B6419 Bolsover Road

DAY: Tuesday

SPEED LIMIT: 40 MPH

WEATHER: Sunny

Direction : Northbound	
	Time Period
Speed (mph)	11:25 to 14:45
15	0
16	0
17	1
18	0
19	0
20	0
21	0
22	2
23	2
24	3
25	10
26	11
27	23
28	20
29	17
30	18
31	17
32	24
33	13
34	15
35	4
36	7
37	1
38	5
39	2
40	1
41	0
42	2
43	0
44	0
45	0
46	0
47	0
48	2
49	0
50	0

Direction : Southbound	
	Time Period
Speed (mph)	11:25 to 14:45
15	0
16	0
17	1
18	0
19	0
20	1
21	1
22	1
23	3
24	7
25	2
26	4
27	13
28	20
29	16
30	21
31	30
32	13
33	12
34	14
35	10
36	13
37	3
38	5
39	2
40	1
41	4
42	2
43	1
44	0
45	0

Sample 200
 85th %ile (mph)- DRY 34.6
 85th %ile (mph)- WET 32.1

Sample 200
 85th %ile (mph)- DRY 35.4
 85th %ile (mph)- WET 32.9

SITE: 2

DATE: 15/6/2016

LOCATION: B6419 Bolsover Road

DAY: Wednesday

SPEED LIMIT: 50 MPH

WEATHER: Rain

Direction : Northbound	
	Time Period
Speed (mph)	09:15 to 11:35
30	0
31	1
32	2
33	2
34	3
35	2
36	3
37	3
38	3
39	3
40	5
41	4
42	7
43	11
44	9
45	12
46	14
47	15
48	14
49	13
50	14
51	15
52	9
53	6
54	4
55	4
56	3
57	6
58	6
59	5
60	1
61	1
62	0
63	0
64	0
65	0

Direction : Southbound	
	Time Period
Speed (mph)	11:25 to 14:45
30	0
31	0
32	0
33	1
34	0
35	0
36	0
37	1
38	5
39	5
40	7
41	5
42	7
43	8
44	6
45	8
46	14
47	9
48	9
49	23
50	32
51	19
52	14
53	6
54	5
55	6
56	5
57	2
58	1
59	1
60	0
61	0
62	1
63	0
64	0
65	0

Sample 200
85th %ile (mph)- WET 53.6
85th %ile (mph)- DRY 56.1

Sample 200
85th %ile (mph)- WET 52.9
85th %ile (mph)- DRY 55.4

Appendix B

Indicative Masterplan



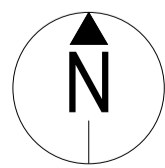
- Key
- Planning Boundary
 - Multi User Path
 - Footpath
 - Footpath Existing Retained
 - Garden Footpath
 - Main Street & Avenues
 - Secondary Street
 - Tertiary Street
 - Park-edge Road
 - Private Drive
 - Parking Areas
 - Residential Plots
 - Elderly Care Plot
 - Local Centre
 - Public Square
 - Naturalistic Parkland
 - Community Garden
 - Community Orchard
 - Rose Gardens
 - Play Space
 - Formal Open Space
 - Apartment Block
 - Housing Frontage
 - Featheredge Frontage
 - Retail, Community and Services with Apartments Above
 - Safeguarded Site for Health Centre
 - Elderly Care Facility
 - Community Garden Building
 - SUDs. Attenuation and Grading
 - SUDs. Open Water with Attenuation
 - SUDs. Swale
 - Nodes
 - Bus Stop
 - Proposed Trees
 - Retained Trees
 - Existing hedge retained
 - replacement hedgerow
 - Existing hedge removed
 - Historic remains

rev	details	by	date
00	FIRST ISSUE FOR COMMENT	SK	06.08.20
01	Footpath update	MC	14.08.20
02	Seymour link updated to multi user path	MC	02.10.20

rev	details	by	date

- Notes
- Do not scale from drawing, use figured dimensions only.
 - All dimensions to be checked onsite.
 - This drawing to be read in conjunction with all other Gillespies drawings and specifications.

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Project title
MASTIN MOOR

Drawing title
INDICATIVE MASTERPLAN

Drawing number
P20181-00-001-100

Drawing Status	Revision		
PLANNING	02		
Date	Scale	Drawn	Checked
06.08.20	1:2500 @ A1	SK	MC

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Client

Appendix C

Aecom Modelling Methodology

Mastin Moor SATURN Modelling

This document summarises the methodology used to produce the SATURN modelling work used to assess the Mastin Moor Development. The Base Model Update, along with the 'Do-Minimum' (DM) and 'Do-Something' (DS) scenarios are described below.

Base Model

The North Derbyshire SATURN traffic model was initially built in 2011 and is calibrated & validated to data for a 2010 Base Year. The 2010 traffic model validation process is fully described in the Local Model Validation Report (LMVR: D133513/4/007, July 2013). Subsequently the traffic model has been used to test various potential development and highway schemes in the detailed model area. This has resulted in ad-hoc model updates to provide an improved level of fit and model confidence for each scheme as required.

As part of the Staveley Base Model Update, TrafficMaster Origin-Destination data for 2014 and Bluetooth movement data were used to replace the cells in the previous 2010 matrix where TrafficMaster data was collected.

Additional details regarding the Base Model updates are contained in '*TN_Model_Update_2014_Issue_151022.pdf*'. This report concluded that the 2014 Base Year model is a suitable base from which to produce traffic forecasts.

The Staveley AAP Do-Something model had four scenarios to test, with different levels of development and associated highway infrastructure, they are; Scenario 1, 2, 3 and A. The scenarios are summarised in Table 1 below.

Table 1: Staveley AAP Do Something (DS) Scenarios

	Scenario 1	Scenario 3	Scenario A	Scenario 2
Base to Design Year Growth	✓	✓	✓	✓
Committed Development	✓	✓	✓	✓
St. Gobain/Ominvale - 560 Houses	✓	✓		✓
Strategic Route		✓		
Chatsworth Phase 1		✓	✓	✓
Chatsworth Phase 2		✓		

Mastin Moor Do-Minimum (DM)

The Mastin Moor DM model was created by taking the DS Scenario 2 model for the Staveley AAP which contains the levels of known developments in the study area up to the 2026 forecast year and removing from the model 600 houses associated with Mastin Moor.

In terms of producing growth, this is led by a combination of planned developments identified by the three district planning authorities and National Trip End Model's (NTEM) (using TEMPRO software). The three authorities are; Chesterfield Borough Council, North East Derbyshire District Council and Bolsover District Council. Appendices A, B and C contain the uncertainty logs which were developed by the three district planning authorities. Planned development employment areas and residential unit numbers were converted into trips

Table 2: TRICS generation rates, peak hour (Veh/hr)

	Time Period	Origin Factor	Destination Factor
Residential (per unit)	AM	0.377	0.111
	IP	0.153	0.159
	PM	0.186	0.318
Employment (per hectare)	AM	1.400	1.533
	IP	1.322	1.606
	PM	0.867	0.633

Where the planned development (by district) identified by the planning authorities was less than NTEM growth, the planned development growth has been supplemented by NTEM growth (applied to existing trips, not planned development) to ensure that the overall growth in each district is not less than NTEM growth.

Goods Vehicle growth was determined by Factors from NTM for the "East Midlands" region were used in the study area and "England" factors were used on the larger outer zones.

Mastin Moor Do Something (DS)

The DS model uses the DM model and adds the developments or scenarios under test into the networks and matrices.

A total of 650 dwellings were split between 3 zones to represent the 3 development blocks of south of Worksop Road/west of Bolsover Road, north of Woodthorpe Road/west of Bolsover Road and south of Worksop Road/east of Bolsover Road each with 150, 175 and 325 dwellings in respectively.

The dwellings were converted into trips by using the factors shown in Table 3.

Table 3: Factors applied to each dwelling to obtain the additional number of trips

	Origin Factor	Destination Factor
AM Peak	0.445	0.148
PM Peak	0.218	0.338

The trip distributions which represent the Mastin Moor site have been calculated from adjacent model zones for residential development types. These trip distributions were then factored to the trip generation rates. The trip distributions used for the development site are presented below in Table 4.

Table 4: Mastin Moor Trip Distribution

Sector	Location	Mastin Moor Trip Distributions (%)			
		AM Or (From Mastin Moor)	AM Des (To Mastin Moor)	PM Or (From Mastin Moor)	PM Des (To Mastin Moor)
1	Chesterfield Town Centre	6.8	18.1	6.8	6.8
2	Brimington/Tapton	5.0	13.9	8.9	8.6
3	Calow/Hasland/Spital	3.1	0.0	1.7	2.2
4	Walton/Boythorpe	0.0	0.0	0.0	0.6
5	Brampton/Newbold	3.2	0.1	0.1	2.6
6	Dronfield/New Whittington/Apperknowle	6.6	7.1	7.9	12.7
7.1	Staveley	11.3	4.9	15.6	5.2
7.2	Duckmanton	1.8	0.7	2.9	8.1
7.3	Markham Vale	12.6	4.9	16.9	5.2
8	S. Bolsover/Clay Cross/Pilsley/Alfreton	5.2	7.5	1.7	4.0
9	South West	0.1	2.0	0.0	0.0
10	Peak District	1.6	2.0	0.8	1.8
11	Sheffield	22.9	16.3	17.7	4.7
12	East	4.7	3.2	3.3	0.5
13	South	2.0	13.2	6.8	10.7
14	West	0.3	1.4	1.9	2.3
15	North	12.8	4.7	7.0	23.8
	Total	100.0	100.0	100.0	100.0

In summary the changes made to the Mastin Moor DM network to create the Mastin Moor DS network are:

- A link for the new developments has been added between A619 Worksop Road and B6419 Bolsover Road;
- The sum of the distributions in zones 419-421 were added to the spare zones 445-447 to be used as the proposed developments residential zones; and
- Zone's 445-447 were then factored to add the proposed development.

AM and PM matrix totals for the Base Year, Staveley DS Scenario 2, Mastin Moor DM and Mastin Moor DS are shown in Table 5.

Table 5: Matrix Totals

	2014 Base Year	Staveley AAP DS Sc2	Mastin Moor DM	Mastin Moor DS
AM	85,031.85	105,695.23	105,415.27	105,801.12
PM	91,833.91	113,412.84	113,083.59	113,409.72

The matrices for each of the scenarios were assigned onto the corresponding networks. Outputs from the modelling work consist of:

- **Difference Plots v2.zip** - SATURN Difference plots showing the change in flows between scenarios DM and DS scenarios.
- **Junctions 5%_v2.zip** – An assessment showing the percentage change in volume/capacity ratio at junctions in comparison to the DM. Methodology used identifies modelled junctions in the DM with a V/C > 80%. These junctions are reviewed to see if the V/C change by more than 5% in the DS case.
- **Model_Outputs.xlsx** – Link and Junction turning (demand) **flows** for the links and junctions adjacent to the development (I have also included all those junctions previously supplied during the AAP modelling). The spreadsheets also include **Volume/Capacity ratios, Queues, Delays** and **%HGVs** by turn and link by time periods. Data provided for Base Year, Do Minimum and Do Something scenarios.
- **Dev SLs v2.zip** - Select links from the proposed development showing development traffic only.

APPENDIX A

Uncertainty Log

**Chesterfield Borough,
North East Derbyshire District &
Bolsover District**

Bolsover Residential

Application Reference		Study Reference	Location	District	Parish	Settlement	Status	Use Class	Easting	Northing	Comm Res No	Comm Res Area	Comm Emp Area	Comm Emp FS	Pot Res No	Pot Res Area	Pot Emp Area	Pot Emp FS	SiteSource	Approved	Expires	Site No	InZone	Near Certain?
03/00483/OUTMAJ	RES	COM/RES/001	Land West Of Cragg Lane Rear Of 1A To 19 Alfreton Road, Thurgaton Way, Newton	Bolsover	Blackwell	Newton	N/S 2011	C3	444219	359077	45	1.988	0	0	0	0	0	0	Permission	20081208	20111208	B0036	304	Near Certain
08/00656/FUL	RES	COM/RES/028	Land To The Rear Of 61 Ringer Lane, Clowne	Bolsover	Clowne	Clowne	U/C	C3	449275	375169	1	0.165	0	0	0	0	0	0	Permission	20081210	20111210	B1796	287	Near Certain
07/00770/FUL	RES	COM/RES/039	The Health Centre, Brook Lane, Clowne	Bolsover	Clowne	Clowne	U/C	C3	449933	375852	4	0.179	0	0	0	0	0	0	Permission	20080213	20110213	B1873	286	Near Certain
08/00475/FUL	RES	COM/RES/086	Land To The Side Of 75 Mitchell Street, Clowne	Bolsover	Clowne	Clowne	N/S 2011	C3	449868	375650	2	0.086	0	0	0	0	0	0	Permission	20080819	20110819	B2067	287	Near Certain
07/00326/REMAJ	RES	COM/RES/018	Land South Of Model Village, Creswell	Bolsover	Creswell	Creswell	U/C	C3	452068	373612	190	6.249	0	0	0	0	0	0	Permission	20071205	20110509	B1577	290	Near Certain
08/00139/FUL	RES	COM/RES/038	11 - 13 Elmton Road, Creswell	Bolsover	Creswell	Creswell	N/S 2011	C3	452062	374025	2	0.041	0	0	0	0	0	0	Permission	20050104	20110429	B1866	290	Near Certain
08/00021/OUTMAJ	RES	COM/RES/096	R Staley And Son Garage, Mansfield Road, Glapwell	Bolsover	Glapwell	Glapwell	N/S 2011	C3	448415	365989	19	0.644	0	0	0	0	0	0	Permission	20080728	20110728	B2079	299	Near Certain
07/00662/REMAJ	RES	COM/RES/055	Land to the rear of 88 To 92 Moor Lane, Bolsover	Bolsover	Old Bolsover	Bolsover	N/S 2011	C3	448156	370286	23	0.561	0	0	0	0	0	0	Permission	20080124	20110502	B1941	297	Near Certain
08/00059/FUL	RES	COM/RES/073	Land Adjacent 80 Charlesworth Street, Carr Vale	Bolsover	Old Bolsover	Bolsover	N/S 2011	C3	446417	369864	2	0.037	0	0	0	0	0	0	Permission	20080404	20110404	B2031	293	Near Certain
08/00048/FUL	RES	COM/RES/080	26 Iron Cliff Road, Bolsover	Bolsover	Old Bolsover	Bolsover	N/S 2011	C3	446718	371365	1	0.025	0	0	0	0	0	0	Permission	20080429	20110429	B2059	292	Near Certain
08/00614/FUL	RES	COM/RES/105	Bolsover Market, Cotton Street, Bolsover	Bolsover	Old Bolsover	Bolsover	N/S 2011	C3	447373	370432	4	0.047	0	0	0	0	0	0	Permission	20081120	20111120	B2089	292	Near Certain
08/00407/FUL	RES	COM/RES/088	Land Adjacent 1 Adin Avenue, Shuttlewood	Bolsover	Old Bolsover	Shuttlewood	U/C	C3	446701	372842	1	0.019	0	0	0	0	0	0	Permission	20080821	20110821	B2069	289	Near Certain
08/00494/FUL	RES	COM/RES/091	Land Adjacent 32 Adin Avenue, Shuttlewood	Bolsover	Old Bolsover	Shuttlewood	N/S 2011	C3	446566	372897	2	0.089	0	0	0	0	0	0	Permission	20080908	20110908	B2073	289	Near Certain
08/00451/FUL	RES	COM/RES/051	Land Between 26 And 28 Church Road, Stanfree	Bolsover	Old Bolsover	Stanfree	N/S 2011	C3	447788	373931	2	0.077	0	0	0	0	0	0	Permission	20080822	20110822	B1934	289	Near Certain
08/00449/REM	RES	COM/RES/053	Land On The North Side Of 28 Church Road, Stanfree	Bolsover	Old Bolsover	Stanfree	N/S 2011	C3	447810	373913	1	0.103	0	0	0	0	0	0	Permission	20080822	20110822	B1938	289	Near Certain
08/00450/REM	RES	COM/RES/054	Garden Land To The Front Of 28 Church Road, Stanfree	Bolsover	Old Bolsover	Stanfree	N/S 2011	C3	447779	373906	2	0.079	0	0	0	0	0	0	Permission	20080822	20110822	B1939	289	Near Certain
08/00054/FUL	RES	COM/RES/030	Land Adjacent To No 10 Hilltop Road, Pinxton	Bolsover	Pinxton	Pinxton	U/C	C3	445480	355499	1	0.022	0	0	0	0	0	0	Permission	20080416	20110416	B1813	318	Near Certain
08/00254/FUL	RES	COM/RES/083	81 Town Street, Pinxton	Bolsover	Pinxton	Pinxton	N/S 2011	C3	445846	355546	0	0.047	0	0	0	0	0	0	Permission	20080625	20110625	B2063	318	Near Certain
08/00478/FUL	RES	COM/RES/090	The George Inn, 174 Wharf Road, Pinxton	Bolsover	Pinxton	Pinxton	N/S 2011	C3	445829	354926	8	0.158	0	0	0	0	0	0	Permission	20080829	20110829	B2072	318	Near Certain
08/00546/OUT	RES	COM/RES/097	Land To The Rear Of 28 To 30 Victoria Road, Pinxton	Bolsover	Pinxton	Pinxton	N/S 2011	C3	445956	355140	4	0.196	0	0	0	0	0	0	Permission	20081007	20111007	B2080	318	Near Certain
07/00420/FULMAJ	RES	COM/RES/093	Appleby Guest House, Chesterfield Road, New Houghton	Bolsover	Pleasley	New Houghton	N/S 2011	C3	449739	364963	24	1.354	0	0	0	0	0	0	Permission	20080930	20110930	B2076	300	Near Certain
08/00121/FUL	RES	COM/RES/024	65 Newboundmill Lane, Pleasley	Bolsover	Pleasley	Pleasley	N/S 2011	C3	450135	363883	1	0.048	0	0	0	0	0	0	Permission	20080506	20110506	B1690	300	Near Certain
09/00367/REMAJ	RES	COM/RES/047	New Terrace, Pleasley	Bolsover	Pleasley	Pleasley	U/C	C3	449948	364125	10	1.673	0	0	0	0	0	0	Permission	20080910	20110910	B1910	300	Near Certain
07/00653/FUL	RES	COM/RES/078	44 Newboundmill Lane, Pleasley	Bolsover	Pleasley	Pleasley	U/C	C3	450145	364004	3	0.284	0	0	0	0	0	0	Permission	20080320	20110320	B2052	300	Near Certain
08/00102/OUTMAJ	RES	COM/RES/104	A J S Autos, 1 Pit Hill, Whaley Thorns	Bolsover	Scarcliffe	Langwith & Whaley Thorns	N/S 2011	C3	453052	370590	28	0.947	0	0	0	0	0	0	Permission	20081209	20111209	B2087	298	Near Certain
07/00696/OUT	RES	COM/RES/008	Land To Rear Of 34 Back Lane, Palterton	Bolsover	Scarcliffe	Palterton	N/S 2011	C3	447602	368427	1	0.164	0	0	0	0	0	0	Permission	20080103	20110103	B0890	298	Near Certain
08/00402/FUL	RES	COM/RES/087	Land Between Hilltop Farm & 4 Crow Hill, Palterton	Bolsover	Scarcliffe	Palterton	N/S 2011	C3	447450	368111	1	0.121	0	0	0	0	0	0	Permission	20080917	20110917	B2068	298	Near Certain
08/00504/FUL	RES	COM/RES/098	Hill Crest, Carcroft Lane, Scarcliffe	Bolsover	Scarcliffe	Scarcliffe	N/S 2011	C3	449745	368717	2	0.088	0	0	0	0	0	0	Permission	20081017	20111017	B2081	298	Near Certain
08/00204/FULMAJ	RES	COM/RES/035	Empire Bingo, Station Road, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	C3	452931	367839	16	0.104	0	0	0	0	0	0	Permission	20080620	20110620	B1835	301	Near Certain
10/00197/FUL	RES	COM/RES/043	The Old Bakery, Thickley Close, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	C3	452923	367875	9	0.076	0	0	0	0	0	0	Permission	20070830	20110116	B1903	301	Near Certain
08/00216/FULMAJ	RES	COM/RES/061	Bowling Green To Rear Of The Miners Welfare Club, Central Drive, Shirebrook	Bolsover	Shirebrook	Shirebrook	U/C	C3	452271	367495	5	0.387	0	0	0	0	0	0	Permission	20080704	20110704	B1966	301	Near Certain
08/00185/FUL	RES	COM/RES/062	80 Main Street, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	C3	451926	367469	6	0.097	0	0	0	0	0	0	Permission	20080515	20110515	B1973	301	Near Certain
08/00065/FUL	RES	COM/RES/077	Land Adjacent 1 Acreage Lane, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	C3	452624	366964	1	0.034	0	0	0	0	0	0	Permission	20080331	20110331	B2051	301	Near Certain
08/00540/FREG4	RES	COM/RES/099	Garage Block, Elm Tree Avenue, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	C3	451624	367666	3	0.103	0	0	0	0	0	0	Permission	20081103	20111103	B2082	301	Near Certain
07/00622/FULMAJ	RES	COM/RES/101	Site Of Demolished Houses, 46 - 110 Church Drive, Shirebrook	Bolsover	Shirebrook	Shirebrook	U/C	C3	452464	367108	9	1.511	0	0	0	0	0	0	Permission	20081217	20111217	B2084	301	Near Certain
01/00569/REM	RES	COM/RES/020	Garden Of 44 Red Lane, South Normanton	Bolsover	South Normanton	South Normanton	U/C	C3	443530	355458	1	0.303	0	0	0	0	0	0	Permission	20020116	20110903	B1659	314	Near Certain
08/00513/OUT	RES	COM/RES/092	The Old Church Hall, Downing Street, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	444258	356846	5	0.106	0	0	0	0	0	0	Permission	20080923	20110923	B2074	312	Near Certain
07/00753/OUTMAJ	RES	COM/RES/094	Jacques Brickyard, Water Lane, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	444798	356823	0	0.925	0	0	0	0	0	0	Permission	20080627	20110627	B2077	316	Near Certain
08/00184/OUTMAJ	RES	COM/RES/095	Jacques Brickyard, Water Lane, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	444786	356811	39	0.87	0	0	0	0	0	0	Permission	20080627	20110627	B2077	316	Near Certain
08/00526/FULMAJ	RES	COM/RES/100	113 - 115 Alfreton Road, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	443457	356030	11	0.372	0	0	0	0	0	0	Permission	20081219	20111219	B2083	313	Near Certain
08/00315/OUT	RES	COM/RES/084	1 Skye Gardens, Tibshelf	Bolsover	Tibshelf	Tibshelf	N/S 2011	C3	443777	360382	2	0.083	0	0	0	0	0	0	Permission	20080714	20110714	B2064	302	Near Certain
08/00431/FUL	RES	COM/RES/089	137 - 139 High Street, Tibshelf	Bolsover	Tibshelf	Tibshelf	U/C	C3	444297	361057	0	0.036	0	0	0	0	0	0	Permission	20080819	20110819	B2070	303	Near Certain
07/00759/FUL	RES	COM/RES/079	Land To Rear Of Hangar Hill Farm And 27 To 33 Hangar Hill, Whitwell	Bolsover	Whitwell	Whitwell	N/S 2011	C3	453108	376741	1	0.053	0	0	0	0	0	0	Permission	20080404	20110404	B2057	382	Near Certain
08/00220/FULMAJ	RES	COM/RES/103	15 Hangar Hill, Whitwell	Bolsover	Whitwell	Whitwell	U/C	C3	453044	376746	12	0.425	0	0	0	0	0	0	Permission	20081212	20111212	B2086	382	Near Certain
08/00751/OUT	RES	COM/RES/110	Fairytales Day Nursery 36 Chesterfield Road, Barlborough	Bolsover	Barlborough	Barlborough	N/S 2011	C3	447227	376632	1	0.041	0	0	0	0	0	0	Permission	20090205	20120205	B2097	283	Near Certain
09/00348/OUT	RES	COM/RES/118	Land To The Rear Of 114 Main Street, Newton	Bolsover	Blackwell	Newton	N/S 2011	C3	444276	359477	1	0.061	0	0	0	0	0	0	Permission	20090908	20120908	B2118	304	Near Certain
09/00398/FUL	RES	COM/RES/050	207 Creswell Road, Clowne	Bolsover	Clowne	Clowne	N/S 2011	C3	449997	375896	4	0.148	0	0	0	0	0	0	Permission	20091106	20121106	B1931	286	Near Certain
09/00372/FUL	RES	COM/RES/106	7 Barton Street, Clowne	Bolsover	Clowne	Clowne	U/C	C3	449661	375762	6	0.171	0	0	0	0	0	0	Permission	20091110	20121110	B2090	285	Near Certain
09/00217/OUTMAJ	RES	COM/RES/115	High Ash Farm, Mansfield Road, Clowne	Bolsover	Clowne	Clowne	N/S 2011	C3	448893	374629	41	1.183	0	0	0	0	0	0	Permission	20090717	20120717	B2112	288	Near Certain
10/00572/FUL	RES	COM/RES/121	Land To The South Of Field View House, 108 Mansfield Road, Clowne	Bolsover	Clowne	Clowne	U/C	C3	449051	374766	1	0.08	0	0	0	0	0	0	Permission	20091021	20121021	B2123	288	Near Certain
08/00277/OUT	RES	COM/RES/108	Creswell Methodist Church, Elmton Road, Creswell	Bolsover	Creswell	Creswell	N/S 2011	C3	452253	374130	10	0.222	0	0	0	0	0	0	Permission	20090109	20120109	B2092	290	Near Certain
09/00188/OUT	RES	COM/RES/058	Glapwell Nurseries, Glapwell Lane, Glapwell	Bolsover	Glapwell	Glapwell	N/S 2011	C3	447970	366311	5	0.142	0	0	0	0	0	0	Permission	20090612	20120612	B1947	299	Near Certain
09/00133/OUT	RES	COM/RES/112	Land Between 57 And 63 Charlesworth Street, Carr Vale	Bolsover	Old Bolsover	Bolsover	N/S 2011	C3	446441	369928	2	0.106	0	0	0	0	0	0	Permission	20090511	20120511	B2104	293	Near Certain
09/00181/FUL	RES	COM/RES/025	Land Adjacent 18 Wilson Street, Pinxton	Bolsover	Pinxton	Pinxton	N/S 2011	C3	445877	355091	1	0.035	0	0	0	0	0	0	Permission	20090526	20120526	B1706	318	Near Certain
09/00277/FUL	RES	COM/RES/117	Land Adjacent 2 Wilson Street, Pinxton	Bolsover	Pinx																			

Bolsover Residential

Application Reference		Study Reference	Location	District	Parish	Settlement	Status	Use Class	Easting	Northing	Comm Res No	Comm Res Area	Comm Emp Area	Comm Emp FS	Pot Res No	Pot Res Area	Pot Emp Area	Pot Emp FS	SiteSource	Approved	Expires	Site No	InZone	Near Certain?	
10/00165/FUL	RES	COM/RES/037	Land Between Lea Vale And 7 Broadlands, Broadmeadows	Bolsover	South Normanton	South Normanton	N/S 2011	C3	444284	355653	1	0.031	0	0	0	0	0	0	Permission	20100608	20130608	B1860	314	Near Certain	
10/00169/VARM	RES	COM/RES/068	Land To The Rear Of 1 To 35 Red Lane, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	443761	355445	45	1.588	0	0	0	0	0	0	Permission	20100714	20130714	B2014	314	Near Certain	
09/00563/OUTM	RES	COM/RES/102	Land To The South Of 191 Carter Lane East, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	445694	357035	34	0.684	0	0	0	0	0	0	Permission	20100716	20130716	B2085	311	Near Certain	
09/00641/OUT	RES	COM/RES/122	7 Buntingbank Close, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	443552	355805	1	0.039	0	0	0	0	0	0	Permission	20100317	20130317	B2129	314	Near Certain	
10/00278/FUL	RES	COM/RES/133	13 Lees Lane, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	444002	356597	1	0.034	0	0	0	0	0	0	Permission	20101012	20131012	B2143	313	Near Certain	
10/00200/OUT	RES	COM/RES/139	Land To The Rear Of 28 Sporton Lane, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	444491	357144	2	0.162	0	0	0	0	0	0	Permission	20100629	20130629	B2149	311	Near Certain	
08/00055/OUTMAJ	RES	COM/RES/143	Land Between Corn Close And The M1 Motorway & South Of 18 To 20 Ball Hill, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	445011	356653	150	4.231	0	0	0	0	0	0	Permission	20100713	20130713	B2153	311	Near Certain	
10/00061/OUT	RES	COM/RES/161	Land To Side Of 14 Duke Street, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	444543	356855	1	0.02	0	0	0	0	0	0	Permission	20100423	20130423	B2161	312	Near Certain	
10/00046/FUL	RES	COM/RES/016	Plot 6 Land Off King Street, Tibshelf	Bolsover	Tibshelf	Tibshelf	N/S 2011	C3	444438	361376	1	0.092	0	0	0	0	0	0	Permission	20100427	20130427	B1371	302	Near Certain	
10/00192/FUL	RES	COM/RES/141	105 High Street, Tibshelf	Bolsover	Tibshelf	Tibshelf	U/C	C3	444196	360974	1	0.03	0	0	0	0	0	0	Permission	20100625	20130625	B2151	303	Near Certain	
10/00479/FUL	RES	COM/RES/123	Jug And Glass Inn, 13 Portland Street, Whitwell	Bolsover	Whitwell	Whitwell	U/C	C3	452833	376632	1	0.13	0	0	0	0	0	0	Permission	20101210	20131210	B2131	382	Near Certain	
10/00050/FUL	RES	COM/RES/160	22A Bakestone Moor, Whitwell	Bolsover	Whitwell	Whitwell	N/S 2011	C3	452678	376314	1	0.074	0	0	0	0	0	0	Permission	20100419	20130419	B2160	382	Near Certain	
11/00275/FUL	RES	COM/RES/127	Bow Wood End, Hawking Lane, Stainsby	Bolsover	Ault Hucknall	Countryside	N/S 2011	C3	444975	365419	1	0.161	0	0	0	0	0	0	Permission	20110803	20140803	B2135	261	Near Certain	
11/00274/VAR	RES	COM/RES/017	Land Between 10b Church Street & 23 New Road, Barlborough	Bolsover	Barlborough	Barlborough	N/S 2011	C3	447587	377125	1	0.071	0	0	0	0	0	0	Permission	20110720	20140720	B1429	284	Near Certain	
11/00291/VAR	RES	COM/RES/107	Land at 4 Church Street, Barlborough	Bolsover	Barlborough	Barlborough	N/S 2011	C3	447622	377212	1	0.114	0	0	0	0	0	0	Permission	20110810	20140810	B2091	284	Near Certain	
09/00370/OUTMAJ	RES	COM/RES/155	Rear Of 16 To 124 & South West Of 124 & Between Brickyard Farm & Barlborough Links	Bolsover	Barlborough	Countryside	N/S 2011	C3	447094	376551	150	7.065	0	0	0	0	0	0	Permission	20110323	20140323	B2155	283	Near Certain	
10/00312/VAR	RES	COM/RES/131	Blackwell House Farm, Huthwaite Lane, Old Blackwell	Bolsover	Blackwell	Countryside	N/S 2011	C3	444577	358519	2	0.192	0	0	0	0	0	0	Permission	20110218	20140218	B2141	305	Near Certain	
10/00542/VAR	RES	COM/RES/076	Land To The Rear Of Littlemoor Farm, Littlemoor Lane, Newton	Bolsover	Blackwell	Newton	N/S 2011	C3	444652	359508	4	0.279	0	0	0	0	0	0	Permission	20110215	20140215	B2044	304	Near Certain	
11/00199/FUL	RES	COM/RES/166	26 - 28 Main Street, Carr Vale	Bolsover	Bolsover	Bolsover	N/S 2011	C3	446655	369961	2	0.015	0	0	0	0	0	0	Permission	20110701	20140701	B2171	293	Near Certain	
10/00516/OUT	RES	COM/RES/165	Land To South West Of 51 Clowne Road, Stanfree	Bolsover	Bolsover	Stanfree	N/S 2011	C3	447216	373716	2	0.042	0	0	0	0	0	0	Permission	20110406	20140406	B2170	289	Near Certain	
11/00048/VARMAJ	RES	COM/RES/002	Land Rear Of 59 To 81 Boughton Lane, Westlea	Bolsover	Clowne	Clowne	N/S 2011	C3	448642	375789	18	0.352	0	0	0	0	0	0	Permission	20110424	20140421	B0122	285	Near Certain	
11/00038/FUL	RES	COM/RES/128	Land Adjacent 25 Bentinck Drive, Clowne	Bolsover	Clowne	Clowne	N/S 2011	C3	450208	375675	1	0.019	0	0	0	0	0	0	Permission	20110325	20140325	B2137	286	Near Certain	
10/00586/OUT	RES	COM/RES/130	57 Ringer Lane, Clowne	Bolsover	Clowne	Clowne	N/S 2011	C3	449236	375200	4	0.129	0	0	0	0	0	0	Permission	20110207	20140207	B2140	287	Near Certain	
10/00564/FUL	RES	COM/RES/132	56 - 58 High Street, Clowne	Bolsover	Clowne	Clowne	N/S 2011	C3	448962	375352	4	0.024	0	0	0	0	0	0	Permission	20110128	20140128	B2142	288	Near Certain	
11/00217/FUL	RES	COM/RES/168	Stud Farm, Spring Lane, Elmtun	Bolsover	Creswell	Countryside	N/S 2011	C3	449925	373287	1	0.195	0	0	0	0	0	0	Permission	20110822	20140822	B2173	290	Near Certain	
11/00284/VAR	RES	COM/RES/082	Land Between And To The Rear Of 71 To 83 Duke Street, Creswell	Bolsover	Creswell	Creswell	N/S 2011	C3	452720	374111	2	0.093	0	0	0	0	0	0	Permission	20110726	20140726	B2062	290	Near Certain	
11/00009/FUL	RES	COM/RES/126	24 Elmtun Road, Creswell	Bolsover	Creswell	Creswell	N/S 2011	C3	452562	374375	3	0.015	0	0	0	0	0	0	Permission	20110303	20140303	B2134	290	Near Certain	
10/00552/FULMAJ	RES	COM/RES/066	99 To 101 Moor Lane, Bolsover	Bolsover	Old Bolsover	Bolsover	N/S 2011	C3	448244	370128	12	0.458	0	0	0	0	0	0	Permission	20110613	20140613	B2005	297	Near Certain	
10/00362/FULM	RES	COM/RES/070	Former Mercol Site, Carr Vale Road, Carr Vale	Bolsover	Old Bolsover	Bolsover	U/C	C3	446790	370029	64	1.624	0	0	0	0	0	0	Permission	20110225	20140225	B2022	293	Near Certain	
10/00115/FULM	RES	COM/RES/010	Land To The Rear Of The Rectory, Town Street, Pinxton	Bolsover	Pinxton	Pinxton	N/S 2011	C3	446075	355341	9	0.496	0	0	0	0	0	0	Permission	20110512	20140512	B0907	318	Near Certain	
11/00002/REM	RES	COM/RES/116	Holmes Yard, Brookhill Lane, Pinxton	Bolsover	Pinxton	Pinxton	N/S 2011	C3	445634	355660	1	0.098	0	0	0	0	0	0	Permission	20110428	20140428	B2114	318	Near Certain	
10/00333/FUL	RES	COM/RES/125	11 Plymouth Avenue, Pinxton Pinxton	Bolsover	Pinxton	Pinxton	N/S 2011	C3	446013	354562	6	0.428	0	0	0	0	0	0	Permission	20110217	20140217	B2133	318	Near Certain	
11/00104/OUT	RES	COM/RES/167	Land To The West Of Sun Inn Public House, Town Street, Pinxton	Bolsover	Pinxton	Pinxton	N/S 2011	C3	445835	355620	4	0.13	0	0	0	0	0	0	Permission	20110610	20140610	B2172	318	Near Certain	
11/00369/DISC	RES	COM/RES/129	28 Chesterfield Road, New Houghton	Bolsover	Pleasley	New Houghton	N/S 2011	C3	449545	365205	3	0.148	0	0	0	0	0	0	Permission	20110610	20140610	B2139	300	Near Certain	
11/00053/FULMAJ	RES	COM/RES/169	The Great Northern, Main Street, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	C3	452475	367579	10	0.196	0	0	0	0	0	0	Permission	20110720	20140720	B2174	301	Near Certain	
11/00213/FUL	RES	COM/RES/026	Land Adjacent 1 Duke Street & 2 Water Lane, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	444619	356853	3	0.042	0	0	0	0	0	0	Permission	20110715	20140715	B1732	312	Near Certain	
11/00086/REM	RES	COM/RES/064	109 Alfretun Road, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	443500	356060	1	0.029	0	0	0	0	0	0	Permission	20110609	20140609	B1982	313	Near Certain	
11/00351/VAR	RES	COM/RES/085	Land To The East Of 21, Alfred Street, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	443845	356062	1	0.027	0	0	0	0	0	0	Permission	20110831	20140831	B2065	315	Near Certain	
10/00393/OUT	RES	COM/RES/138	Land To Rear Of 10 To 16 Red Lane & South Of Briary Court Development, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	443770	355617	11	0.448	0	0	0	0	0	0	Permission	20110225	20140225	B2148	314	Near Certain	
11/00214/FUL	RES	COM/RES/170	72 Market Street, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	444083	356414	1	0.009	0	0	0	0	0	0	Permission	20110831	20140831	B2175	315	Near Certain	
11/00210/OUT	RES	COM/RES/171	Land Between 53 And 57 Downing Street, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	C3	444310	356697	1	0.056	0	0	0	0	0	0	Permission	20110905	20140905	B2176	316	Near Certain	
10/00045/FUL	RES159	COM/RES159	8 Neale Street, Clowne	Bolsover	Clowne	Clowne	U/C	C3	449880	375801	1	0.074	0	0	0	0	0	0	Permission	20100415	20130415	B2159	286	Near Certain	
Allocation /302	RES	COM/RES/176	Land of Skinner Street, Creswell	Bolsover	Creswell	Creswell	N/S 2011	C3	452198	374607	135	6.528	0	0	0	0	0	0	Allocation	-	-	-	-	290	Near Certain
Allocation /524	RES	COM/RES/173	Land off Main Street, Carr Vale	Bolsover	Old Bolsover	Bolsover	N/S 2011	C3	446661	369797	50	1.81	0	0	0	0	0	0	Allocation	-	-	-	-	293	Near Certain
Allocation /833	RES	COM/RES/172	Land off Adin Avenue, Shuttlewood	Bolsover	Old Bolsover	Shuttlewood	N/S 2011	C3	446570	372823	27	0.895	0	0	0	0	0	0	Allocation	-	-	-	-	289	Near Certain
90/00583*	RES	COM/RES/009	Land off Primrose Way, Langwith Junction	Bolsover	Scarcliffe	Shirebrook	HOLD	C3	452646	368749	69	1.884	0	0	0	0	0	0	Permission	19910820	-	-	B0906	298	Near Certain
Allocation /690	RES	COM/RES/175	Land North of Church Street, Pinxton	Bolsover	Pinxton	Pinxton	N/S 2011	C3	445619	355355	20	0.56	0	0	0	0	0	0	Allocation	-	-	-	-	318	Near Certain
Allocation /186	RES	COM/RES/174	Land off Long Lane, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	C3	452531	367470	10	0.575	0	0	0	0	0	0	Allocation	-	-	-	-	301	Near Certain

Location	District	Parish	Settlement	Status	Use Class	Easting	Northing	Comm Res No	Comm Res Area	Comm Emp Area	Comm Emp FS	Pot Res No	Pot Res Area	Pot Emp Area	Pot Emp FS	SiteSource	Approved	Expires	Site No	InZone	Near Certain?
Former Swift Levick Magnets, High Hazels Road, Barlborough	Bolsover	Barlborough	Barlborough	N/S 2011	B1, B2, B8	447312	376132	0	0	2.954	7537	0	0	0	0	Permission	20081008	20111008	-	283	Near Certain
Bolsover Market, Cotton Street, Bolsover	Bolsover	Old Bolsover	Bolsover	N/S 2011	A1, C3	447373	370432	0	0	0.047	370	0	0	0	0	Permission	20081120	20111120	-	292	Near Certain
Plot 2 Brook Park, Blacksmith Way, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	B1, B2	452855	366683	0	0	0.425	1910	0	0	0	0	Permission	20080820	20110820	-	301	Near Certain
Land To The South West Of 191 Carter Lane East, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	B1, B2, B8	445611	357064	0	0	0.287	1082	0	0	0	0	Permission	20080512	20110512	-	311	Near Certain
Land To The East Of 191 Carter Lane East, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	B1	445820	357115	0	0	0.351	0	0	0	0	0	Permission	20080410	20110410	-	311	Near Certain
Carr Vale United Reformed Church, Main Street, Carr Vale	Bolsover	Old Bolsover	Bolsover	N/S 2011	B1	446620	369888	0	0	0.052	150	0	0	0	0	Permission	20090401	20120401	-	293	Near Certain
Oxcroft Industrial Estate, Clowne Road, Stanfree	Bolsover	Old Bolsover	Stanfree	N/S 2011	B1, B8	447260	373596	0	0	0.12	425	0	0	0	0	Permission	20090409	20120409	-	289	Near Certain
4-6 Grange Court, Pinxton	Bolsover	Pinxton	Clover Nook I E	N/S 2011	B8	443641	354765	0	0	0.219	93	0	0	0	0	Permission	20091007	20121007	-	318	Near Certain
Top Cat Carter Lane, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	A1	452706	367798	0	0	0.874	1651	0	0	0	0	Permission	20090706	20120706	-	301	Near Certain
Cotes Park Commercials Ltd, 8 Clover Nook Road, Clover Nook Industrial Estate	Bolsover	South Normanton	Clover Nook I E	N/S 2011	B8	443526	355090	0	0	0.426	112	0	0	0	0	Permission	20090721	20120721	-	314	Near Certain
55 Church Street, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	B8	444371	357021	0	0	0.092	0	0	0	0	0	Permission	20090123	20120123	-	312	Near Certain
Land At Junction Of Sporton Lane & High View Road, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	B1, B2, B8	445002	357443	0	0	0.271	746	0	0	0	0	Permission	20090810	20120810	-	311	Near Certain
2 Wincobank Way, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	B8	445524	357330	0	0	0.04	330	0	0	0	0	Permission	20091001	20121001	-	311	Near Certain
SAPA Limited, 1 Saw Pit Industrial Estate, Tibshelf	Bolsover	Tibshelf	Sawpit Lane I E	N/S 2011	B2	445281	361018	0	0	0.06	613	0	0	0	0	Permission	20090611	20120611	-	302	Near Certain
Glapwell Nurseries, Glapwell Lane, Glapwell	Bolsover	Glapwell	Countryside	N/S 2011	A3	448037	366360	0	0	0.011	75	0	0	0	0	Permission	20101007	20131008	-	299	Near Certain
Land To Southeast Of Grange Close, Pinxton	Bolsover	Pinxton	Clover Nook I E	N/S 2011	B1, B2, B8	443663	354771	0	0	0.64	742	0	0	0	0	Permission	20101209	20131210	-	318	Near Certain
Slimming World, Clover Nook Road, Clover Nook Industrial Estate	Bolsover	Pinxton	Clover Nook I E	N/S 2011	B8	443614	355010	0	0	0.31	1185	0	0	0	0	Permission	20100827	20130827	-	318	Near Certain
MEDC Limited, Colliery Road, Brookhill Industrial Estate, Pinxton	Bolsover	Pinxton	Pinxton	N/S 2011	B1	445997	354895	0	0	0	80	0	0	0	0	Permission	20100510	20130510	-	318	Near Certain
Mansfield Minimix, Langwith Road, Langwith Junction	Bolsover	Scarcliffe	Shirebrook	N/S 2011	B8	452768	368553	0	0	0.119	54	0	0	0	0	Permission	20100608	20130608	-	298	Near Certain
Land To East Of Weighbridge Road & South Of Allotment Gardens, Brook Park, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	B1	452875	366912	0	0	1.115	2308	0	0	0	0	Permission	20100315	20130315	-	301	Near Certain
EPC UK Explosives, Carnfield Hill, South Normanton	Bolsover	South Normanton	Countryside	N/S 2011	B1	442509	356330	0	0	0.159	27	0	0	0	0	Permission	20100217	20130217	-	313	Near Certain
SAPA Limited, 1 Saw Pit Industrial Estate, Tibshelf	Bolsover	Tibshelf	Sawpit Lane I E	N/S 2011	B2	445281	361018	0	0	0.22	2267	0	0	0	0	Permission	20100915	20130915	-	302	Near Certain
Arrow Farm, Worksop Road, Nr Whitwell	Bolsover	Whitwell	Whitwell	N/S 2011	A1, A3	453667	378026	0	0	0.464	198	0	0	0	0	Permission	20100625	20130625	-	382	Near Certain
11 - 13 High Street, Barlborough	Bolsover	Barlborough	Barlborough	N/S 2011	A1	447522	377260	0	0	0.015	40	0	0	0	0	Permission	20110411	20140411	-	284	Near Certain
Barlborough Links	Bolsover	Barlborough	Barlborough	N/S 2011	-	447225	376398	0	0	1.645	0	0	0	0	0	Allocation	-	-	-	283	Near Certain
Barlborough Links	Bolsover	Barlborough	Barlborough	N/S 2011	-	447503	376183	0	0	0.339	0	0	0	0	0	Allocation	-	-	-	283	Near Certain
Barlborough Links	Bolsover	Barlborough	Barlborough	N/S 2011	-	447373	375935	0	0	0.366	0	0	0	0	0	Allocation	-	-	-	283	Near Certain
Rear Of 16 To 124 & South West Of 124 & Between Brickyard Farm & Barlborough Links	Bolsover	Barlborough	Countryside	N/S 2011	B1, B2, B8	447226	376259	0	0	4.453	15850	0	0	0	0	Permission	20110323	20140323	-	283	Near Certain
Tesco Retail Store, Mill Green Way, Clowne	Bolsover	Clowne	Clowne	N/S 2011	A1	449064	375568	0	0	2.296	1222	0	0	0	0	Permission	20110321	20140321	-	288	Near Certain
Colliery Road, Creswell	Bolsover	Elmton	Creswell	N/S 2011	-	452369	373779	0	0	1.508	0	0	0	0	0	Allocation	-	-	-	290	Near Certain
Creswell Colliery, Creswell	Bolsover	Elmton	Creswell	N/S 2011	-	452371	373432	0	0	1.569	0	0	0	0	0	Allocation	-	-	-	290	Near Certain
Former Chilli Lounge, 15 Castle Street, Bolsover	Bolsover	Old Bolsover	Bolsover	N/S 2011	A3	447244	370566	0	0	0.107	17	0	0	0	0	Permission	20110110	20140111	-	292	Near Certain
Direct Services Depot, Mill Lane, Bolsover	Bolsover	Old Bolsover	Bolsover	N/S 2011	B1, B2, B8	447508	371316	0	0	1.121	0	0	0	0	0	Permission	20110325	20140325	-	291	Near Certain
Bolsover Business Park, Bolsover	Bolsover	Old Bolsover	Bolsover	N/S 2011	-	446347	371163	0	0	1.649	0	0	0	0	0	Allocation	-	-	-	292	Near Certain
Bolsover Colliery, Bolsover	Bolsover	Old Bolsover	Bolsover	N/S 2011	-	446167	370756	0	0	1.238	0	0	0	0	0	Allocation	-	-	-	293	Near Certain
Brookhill, Pinxton	Bolsover	Pinxton	Pinxton	N/S 2011	-	446526	354862	0	0	3.067	0	0	0	0	0	Allocation	-	-	-	318	Near Certain
Hillstown Business Centre, Mansfield Rd, Bolsover	Bolsover	Scarcliffe	Bolsover	N/S 2011	-	448012	369403	0	0	1.253	0	0	0	0	0	Allocation	-	-	-	298	Near Certain
Langwith Colliery, Whaley Thorns	Bolsover	Scarcliffe	Whaley Thorns	N/S 2011	-	452929	371114	0	0	1.674	0	0	0	0	0	Allocation	-	-	-	298	Near Certain
Unit B, Brook Park East Road, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	B8	453208	366561	0	0	4.904	37774	0	0	0	0	Permission	20110819	20140819	-	301	Near Certain
Land At Portland Road, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	A1	452843	367564	0	0	2.968	3304	0	0	0	0	Permission	20110316	20140316	-	301	Near Certain
49 Market Street, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	A1	444018	356308	0	0	0.019	0	0	0	0	0	Permission	20110303	20140303	-	313	Near Certain
21 Berristow Lane, Berristow Lane Industrial Estate, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	B1	445241	357412	0	0	0.015	160	0	0	0	0	Permission	20110614	20140614	-	311	Near Certain
21 Berristow Lane, Berristow Lane Industrial Estate, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	B1	445150	357502	0	0	0.005	16	0	0	0	0	Permission	20110905	20140905	-	311	Near Certain
Berristow Lane, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	-	444940	357372	0	0	1.28	0	0	0	0	0	Allocation	-	-	-	311	Near Certain
Carter Lane East, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	-	445812	356996	0	0	0.243	0	0	0	0	0	Allocation	-	-	-	311	Near Certain
SAPA Limited, 1 Saw Pit Industrial Estate, Tibshelf	Bolsover	Tibshelf	Sawpit Lane I E	N/S 2011	B2	445281	361018	0	0	0	774	0	0	0	0	Permission	20110607	20140607	-	302	Near Certain
Former Armstrong Quarry Steetly	Bolsover	Whitwell	Countryside	N/S 2011	-	454882	378401	0	0	5	0	0	0	0	0	SHLAA	-	-	-	382	
Carter Lane East, South Normanton	Bolsover	South Normanton	South Normanton	N/S 2011	-	445596	356693	0	0	0.783	0	0	0	0	0	Allocation	-	-	-	311	Near Certain
Sportsworld Complex, Brook Park, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	B1, B8, A1	453050	366802	0	0	8.08	56558	0	0	0	0	Permission	20040518	20091201	-	301	Near Certain
Portland Road, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	-	453116	367573	0	0	4.519	0	0	0	0	0	Allocation	-	-	-	301	Near Certain
Wincobank Farm, South Normanton	Bolsover	South Normanton	Countryside	N/S 2011	-	445975	357467	0	0	12.853	0	0	0	0	0	Allocation	-	-	-	311	Near Certain
Plot B Castlewood Grange Land Adjacent To A38 M1 Junction 28, Brookhill Lane, Pinxton	Bolsover	South Normanton	Pinxton	N/S 2011	B1, B2, B8	445864	356333	0	0	17.727	44500	0	0	0	0	Permission	20110818	20140818	-	318	Near Certain
Brookhill, Pinxton	Bolsover	Pinxton	Pinxton	N/S 2011	-	446231	355093	0	0	0.961	0	0	0	0	0	Allocation	-	-	-	318	Near Certain
Pleasley Colliery, Pleasley	Bolsover	Pleasley	Pleasley	N/S 2011	-	449984	364349	0	0	0.73	0	0	0	0	0	Allocation	-	-	-	300	Near Certain
Land off Weighbridge Road, Shirebrook	Bolsover	Shirebrook	Shirebrook	N/S 2011	-	452874	366824	0	0	0.911	0	0	0	0	0	Allocation	-	-	-	301	Near Certain
Whitwell Colliery, Southfield Lane, Whitwell	Bolsover	Whitwell	Whitwell	N/S 2011	-	453261	375812	0	0	3.342	0	0	0	0	0	Allocation	-	-	-	382	Near Certain
Whitwell Colliery, Southfield Lane, Whitwell	Bolsover	Whitwell	Whitwell	N/S 2011	-	453443	375840	0	0	4.108	0	0	0	0	0	Allocation	-	-	-	382	Near Certain

Chesterfield Residential

Development Name	Start Year	Completion Year	Should trips be prorated between start and completion? (Y or N)	Development Type (e.g. C3)*	Development Size (e.g. GFA or dwelling numbers)	Location (either model zone or easting/northing)	District	Trip rates if known (AM & PM, generation & attraction)	X	Y
CS - LAND OFF DOCK WALK	2011	2015	Y	C3	57	(437,384) (370,823)	CBC		437384	370823
PA - WATERSIDE		2015	Y	C3	210	(438,772) (372,425)	CBC		438772	372425
PA - WATERSIDE		2025	Y	C3	1290	(438,772) (372,425)	CBC		438772	372425
CS - DEATONS	2013	2017	Y	C3	50	(443,928) (374,357)	CBC		443928	374357
CS - SHEFFIELD ROAD BOAT SALES	2011	2015	Y	C3	50	(437,589) (376,059)	CBC		437589	376059
COM - WALTON WORKS	2011	2016	Y	C3	150	(436,838) (370,739)	CBC		436838	370739
COM - WHEATBRIDGE MILLS	2011	2015	Y	C3	70	(437,453) (370,939)	CBC		437453	370939
COM - WALTON HOSPITAL NORTH	2011	2015	Y	C3	60	(437,187) (369,499)	CBC		437187	369499
COM - WALTON HOSPITAL SOUTH	2011	2015	Y	C3	60	(437,527) (369,378)	CBC		437527	369378
COM - NEWBOLD SCHOOL	2011	2015	Y	C3	60	(436,792) (372,860)	CBC		436792	372860
Mastin Moor (Chatsworth Site)	-	2026	-	C3	600	-	CBC		-	-

Chesterfield Employment

Development Name	Start Year	Completion Year	Should trips be prorated between start and completion? (Y or N)	Development Type (e.g. C3)*	Development Size (e.g. GFA or dwelling numbers)	Location (either model zone or easting/northing)	District	Trip rates if known (AM & PM, generation & attraction)	X	Y
COM - Land at Donkins	2010	2015	Y	B1a	23000	(438514), (370449)	CBC		438514	370449
PA - Chesterfield Waterside	2015	2015	Y	B1a	4500	(438733), (371778)	CBC		438733	371778
PA - Chesterfield Waterside	2015	2018	Y	B1a	25500	(438733), (371778)	CBC		438733	371778
COM - Former Pearson Pottery	2010	2013	Y	B1	37000	(438621), (373361)	CBC		438621	373361
CS - Staveley Works Area Action Plan Area	2012	2026	Y	B8	200000	(442312), (374916)	CBC		442312	374916
Northern Gateway	2013	2015			44000					
Wagon Works		2022			56000					
Ecodome		2022			Trips added individually					

North East Derbyshire Residential

Development reference number	Development Name	Start Year	Completion Year	Should trips be prorated between start and completion? (Y or N)	Development Type (e.g. C3)*	Development Size (e.g. GFA or dwelling numbers) - NET	Location (either model zone or easting/northing)	District	Trip rates if known (AM & PM, generation & attraction)	Comments	Development Name	PostCode Only X	PostCode Only Y
WW / 201	Land adj CPL Headquarters, Mill Lane, Wingerworth, S42 6NG	2013/14	2014/15	Y	C3	97	159	NEDDC	COM	northern part 159	Land adj CPL Headquarters	439070	367192
CX / 1607	BIWATER INDUSTRIES LTD, MARKET STREET, CLAY CROSS	2012/13	2019/20	Y	C3	980	431	NEDDC	PA	Subject to S106	BIWATER INDUSTRIES LTD		
DRO LDF 4	Dronfield Small Urban Infill	2020/21	2024/25	Y	C3	75	303	NEDDC	LDF		Dronfield Small Urban Infill		
ECK LDF 2	Eckington southern extension (non Green Belt)	2015/16	2024/25	Y	C3	200	427	NEDDC	LDF		Eckington southern extension (non Green Belt)		
KIL LDF 1	Killamarsh Urban Infill	2015/16	2024/25	Y	C3	50	427	NEDDC	LDF		Killamarsh Urban Infill		
KIL LDF 2	Norwood	2015/16	2024/25	Y	C3	270	427	NEDDC	LDF		Norwood		
CX LDF 1	Clay Cross Urban Infill	2015/16	2024/25	Y	C3	100	431	NEDDC	LDF		Clay Cross Urban Infill		
CX LDF 2	Clay Cross Southern Extension	2015/16	2024/25	Y	C3	900	431	NEDDC	LDF		Clay Cross Southern Extension		
WW LDF 1	Wingerworth Eastern Extension	2015/16	2024/25	Y	C3	500	159	NEDDC	LDF	northern part 159	Wingerworth Eastern Extension		
TUP LDF 1	Tupton Urban Infill	2015/16	2024/25	Y	C3	30	430	NEDDC	LDF		Tupton Urban Infill		
TUP LDF 2	Tupton Western Extension	2015/16	2024/25	Y	C3	245	431	NEDDC	LDF	majority in 431, some in 159	Tupton Western Extension		
TUP LDF 3	Tupton Eastern Extension	2015/16	2024/25	Y	C3	245	431	NEDDC	LDF	majority in 431, some in 430	Tupton Eastern Extension		
NW LDF 1	North Wingfield Urban Infill	2015/16	2024/25	Y	C3	80	430	NEDDC	LDF	majority in 430, some in 431	North Wingfield Urban Infill		
NW LDF 2	North Wingfield Eastern Extension	2015/16	2024/25	Y	C3	520	431	NEDDC	LDF		North Wingfield Eastern Extension		
GRA LDF 1	Grassmoor Urban Infill	2015/16	2024/25	Y	C3	30	430	NEDDC	LDF		Grassmoor Urban Infill		
GRA LDF 2	Grassmoor Southern Extension	2015/16	2024/25	Y	C3	170	430	NEDDC	LDF		Grassmoor Southern Extension		
H&H LDF 1	Holmewood Urban Infill	2015/16	2024/25	Y	C3	85	430	NEDDC	LDF		Holmewood Urban Infill		
H&H LDF 2	Holmewood Western Extension	2015/16	2024/25	Y	C3	165	430	NEDDC	LDF		Holmewood Western Extension		
PIL LDF 2	Pilsley Extension	2015/16	2024/25	Y	C3	115	431	NEDDC	LDF		Pilsley Extension		
CAL LDF 2	Calow Extension - majority eastern	2015/16	2024/25	Y	C3	335	430	NEDDC	LDF		Calow Extension - majority eastern		
ScD LDF 1	Long Duckmanton Extension	2015/16	2024/25	Y	C3	80	430	NEDDC	LDF		Long Duckmanton Extension		
S&H LDF 2	Shirland extension	2015/16	2024/25	Y	C3	250	159	NEDDC	LDF	southern part 159	Shirland extension		
MOR LDF 1	Morton Urban Infill	2015/16	2024/25	Y	C3	35	159	NEDDC	LDF	southern part 159	Morton Urban Infill		
S&H LDF 3	Stonebroom Urban Infill	2015/16	2024/25	Y	C3	20	159	NEDDC	LDF	southern part 159	Stonebroom Urban Infill		
S&H LDF 4	Stonebroom Extension	2015/16	2024/25	Y	C3	300	159	NEDDC	LDF	southern part 159	Stonebroom Extension		

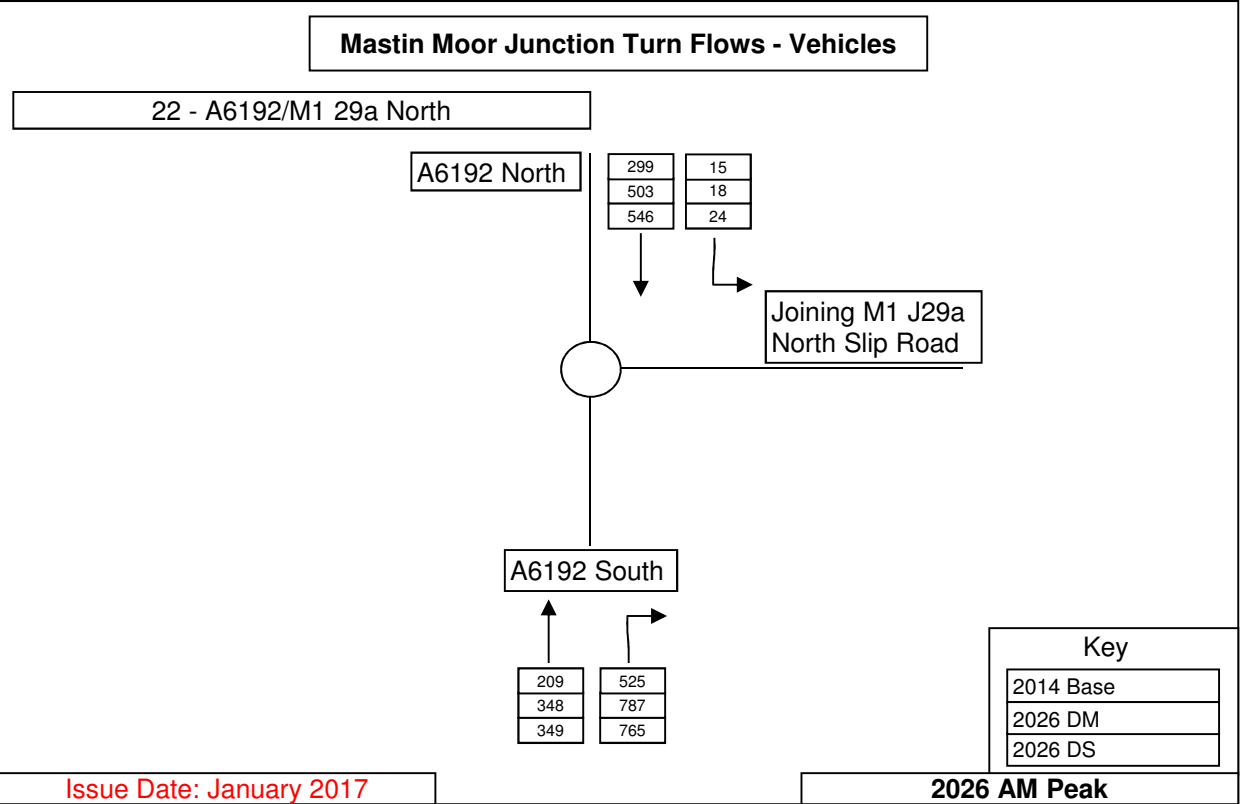
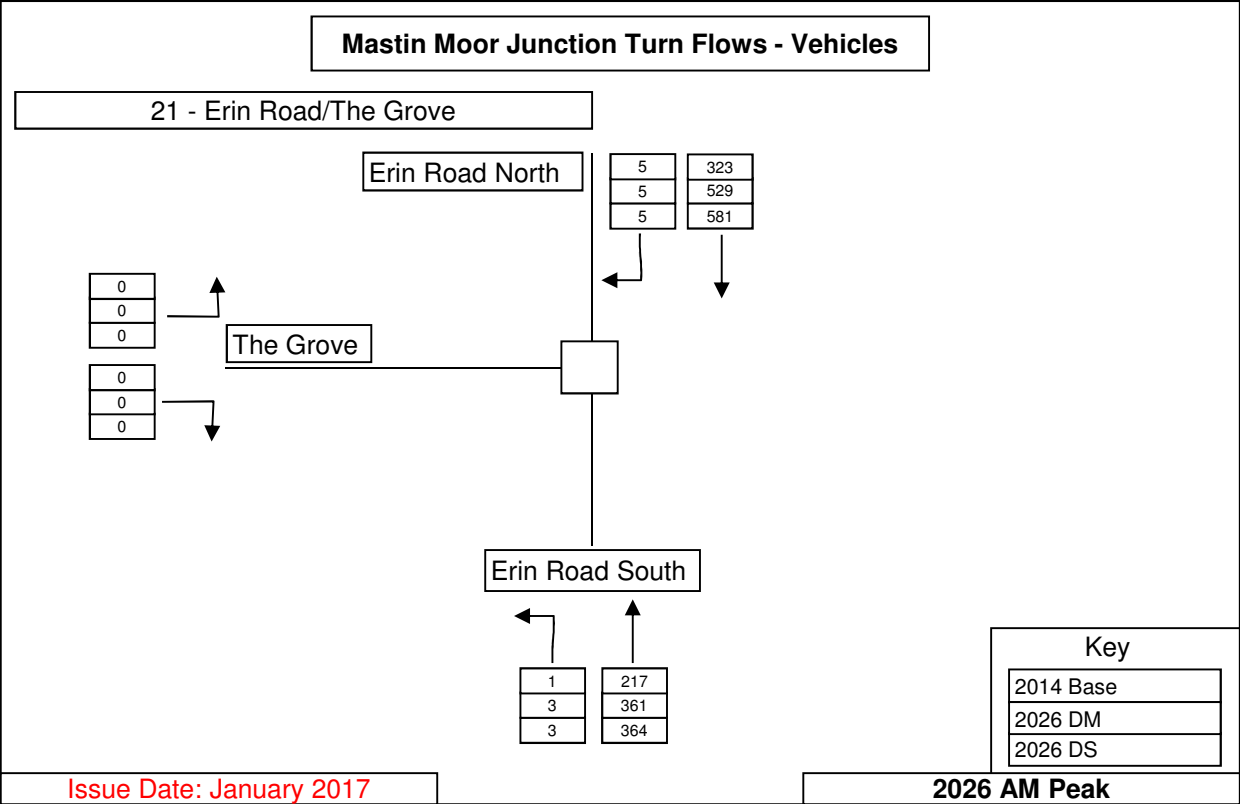
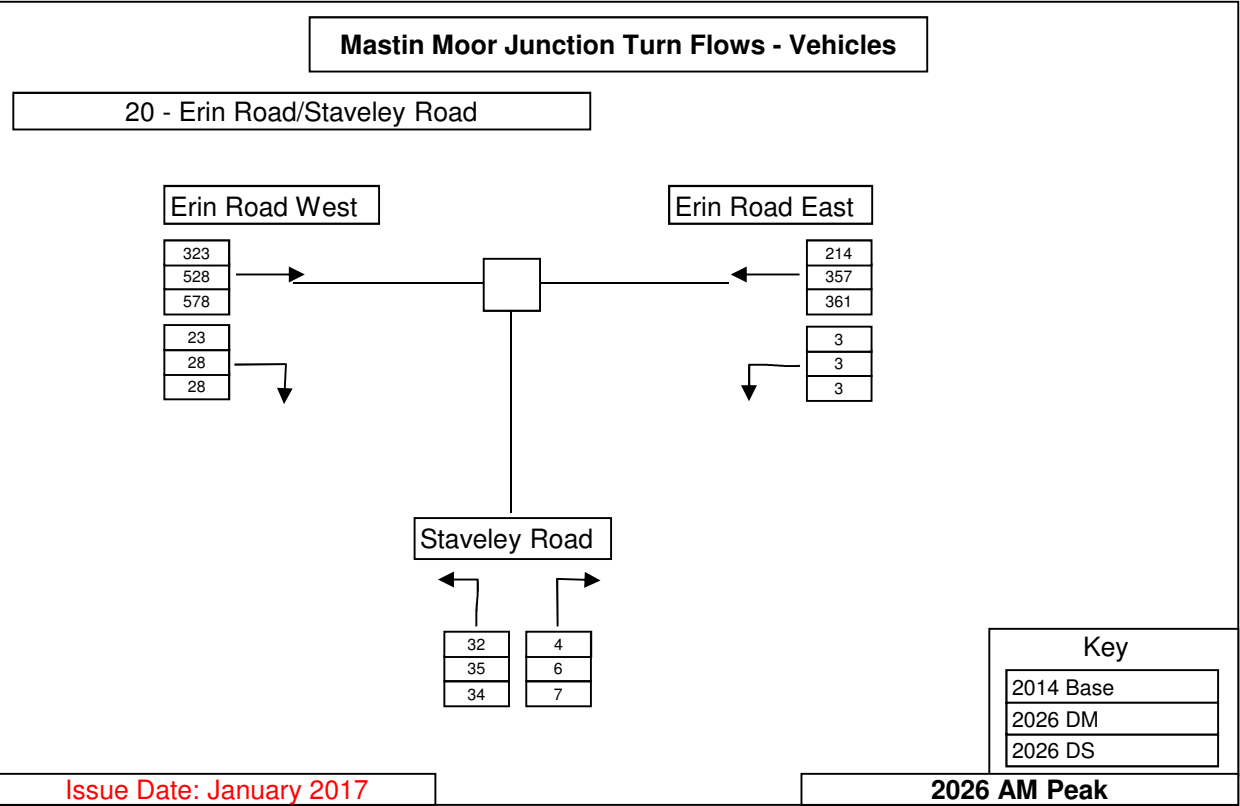
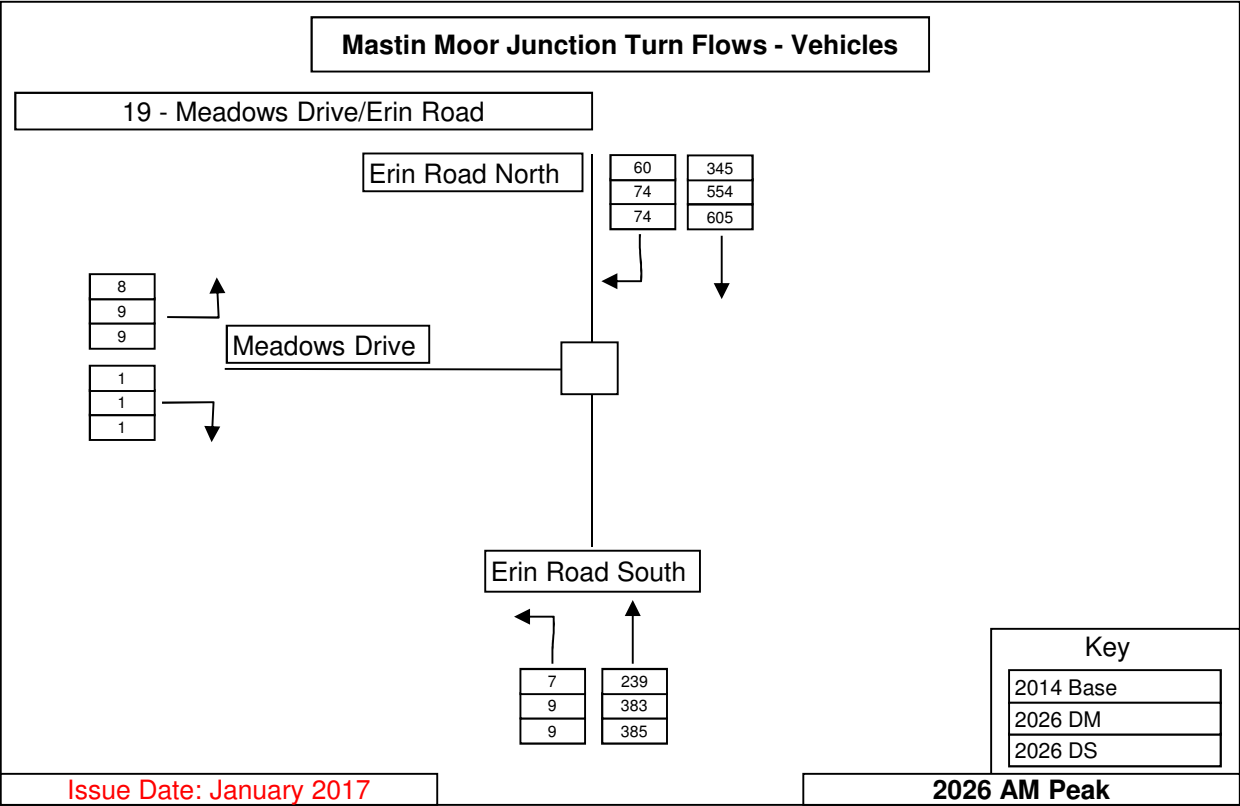
North East Derbyshire Employment

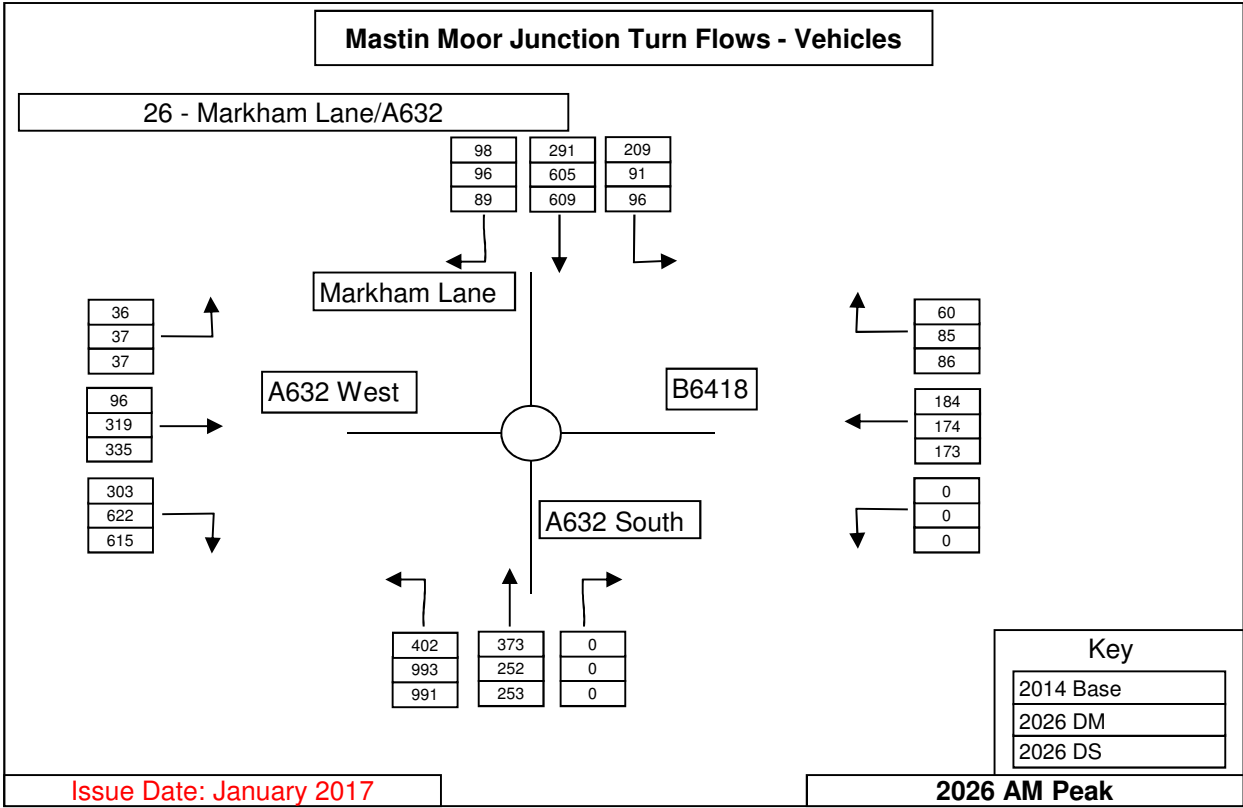
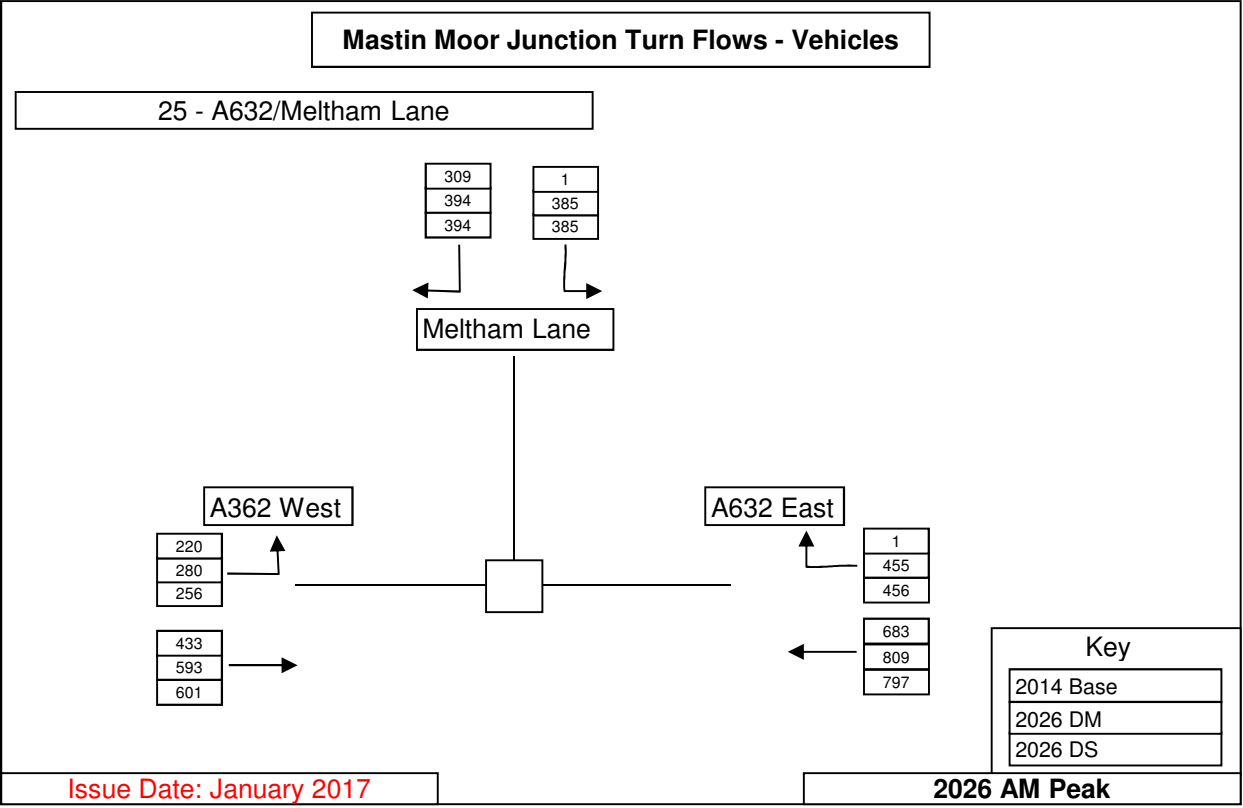
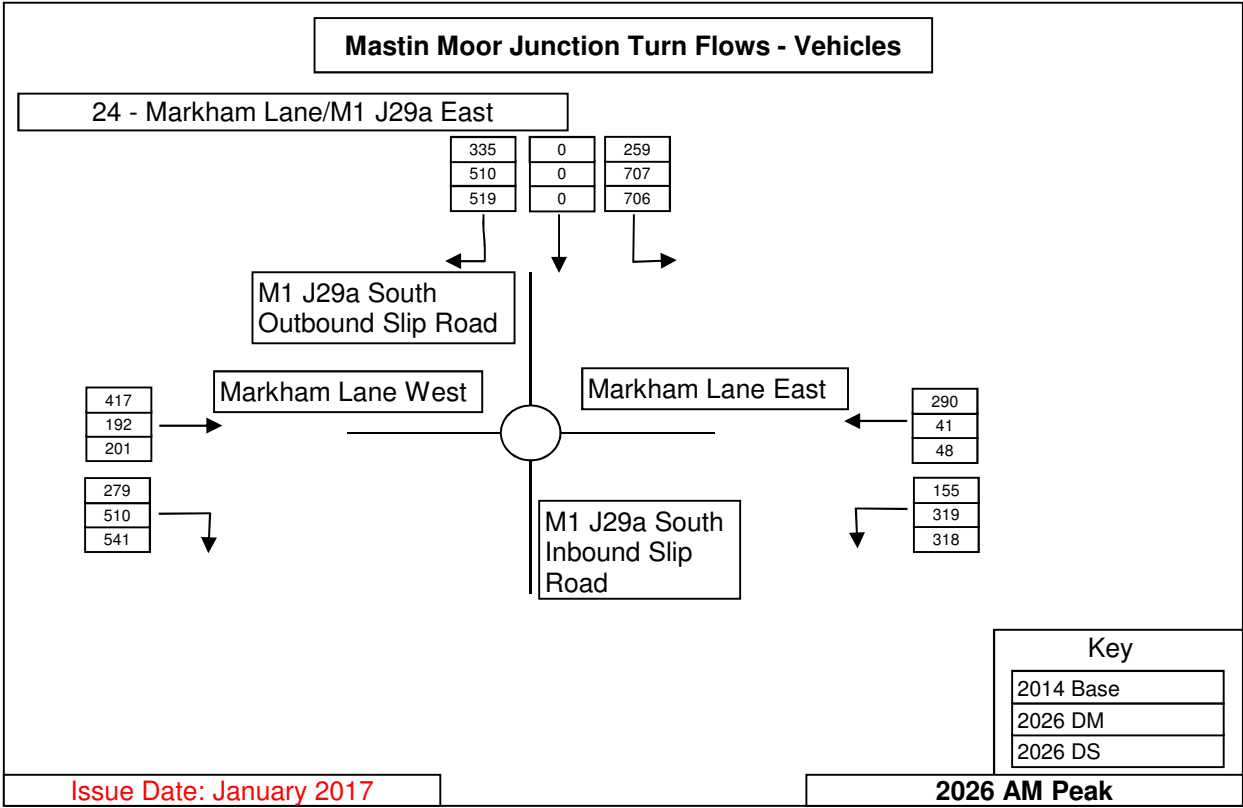
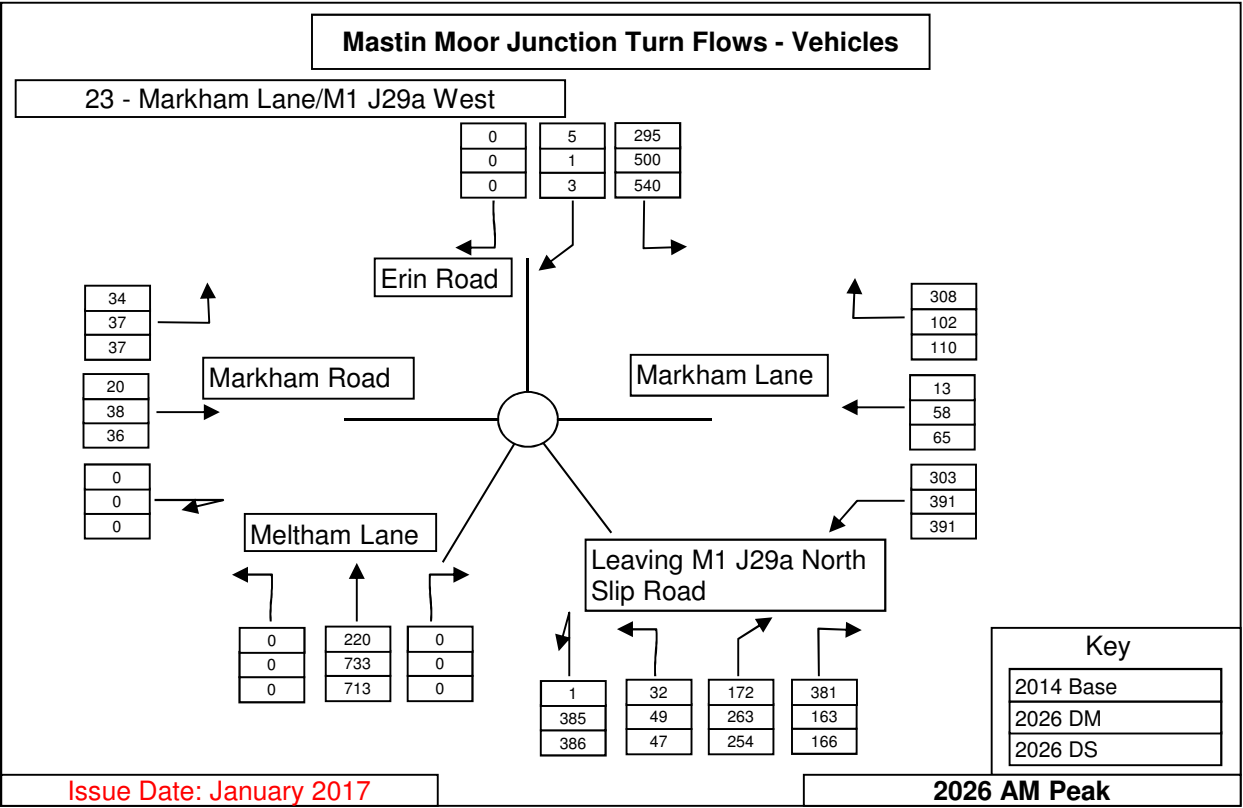
Development reference number	Development Name	Start Year	Completion Year	Should trips be prorated between start and completion? (Y or N)	Development Type (e.g. C3)*	Development Size (e.g. GFA or dwelling numbers) - NET	Location (either model zone or easting/northing)	District	Trip rates if known (AM & PM, generation & attraction)	Comments	Development Name	PostCode Only X	PostCode Only Y
N13	Coney Green, Clay Cross	2009/10	2019/20	Y	B1	13.34 ha	431	NEDDC	LDF		Coney Green		
NED 4	Biwaters and Derby Road land, Clay Cross	2012/13	2019/20	Y	B1, B2, B8	9 ha	431	NEDDC	PA	Equal distribution. Subject to S106	Biwaters and Derby Road land		
NED 1	Callywhite Lane Extension,Dronfield	2015/16	2025/26	Y	B1, B2	8.9 ha	425	NEDDC	LDF	Equal distribution	Callywhite Lane Extension		
NED 2	Land Adj Norwood Industrial Estate	2013/14	2025/26	Y	B1	5.4 ha	427	NEDDC	LDF		Land Adj Norwood Industrial Estate		
LDF A 159	Land at zone 159	2015/16	2025/26	Y	B1, B2, B8	2.28 ha	159	NEDDC	LDF	Equal distribution	Land at zone 159		
LDF A 303	Land at zone 303	2015/16	2025/26	Y	B1, B2, B8	0.28 ha	303	NEDDC	LDF	Equal distribution	Land at zone 303		
LDF A 427	Land at zone 427	2015/16	2025/26	Y	B1, B2, B8	1.96 ha	427	NEDDC	LDF	Equal distribution	Land at zone 427		
LDF A 430	Land at zone 430	2015/16	2025/26	Y	B1, B2, B8	3.67 ha	430	NEDDC	LDF	Equal distribution	Land at zone 430		
LDF A 431	Land at zone 431	2015/16	2025/26	Y	B1, B2, B8	8.0 ha	431	NEDDC	LDF	Equal distribution	Land at zone 431		
NED 5	Avenue Coking Works	2014/15	2017/18	Y	B1, B2, B8	4 ha	159	NEDDC	LDF	Equal distribution	Avenue Coking Works		
NED 6	MEGZ	2009/10	2019/20	Y	B1, B2	4.7 ha	430	NEDDC	LDF	Equal distribution	MEGZ		
WW LDF 2	Further land at Avenue Coking Works	2015/16	2025/26	Y	B1, B2, B8	15 ha	159	NEDDC	LDF	Equal distribution	Further land at Avenue Coking Works		
Other													
08/01055/OL	Biwaters Hotel	2012/13	2019/20	Y	D2	60 rooms	431	NEDDC	PA	Subject to S 106	Biwaters Hotel		
DRO LDF 5	Dronfield Food Superstore	2015/16	2025/26	Y	A1	4,424 sqm	303	NEDDC	LDF		Dronfield Food Superstore		

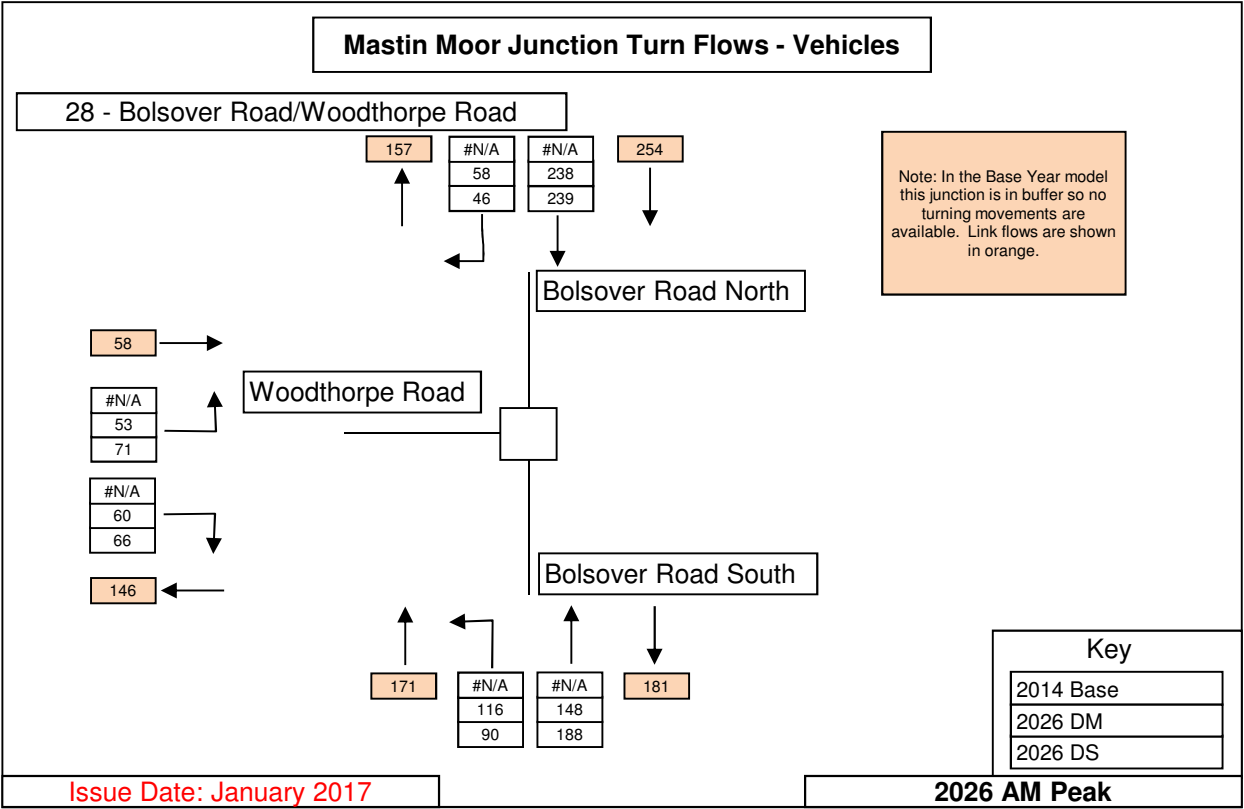
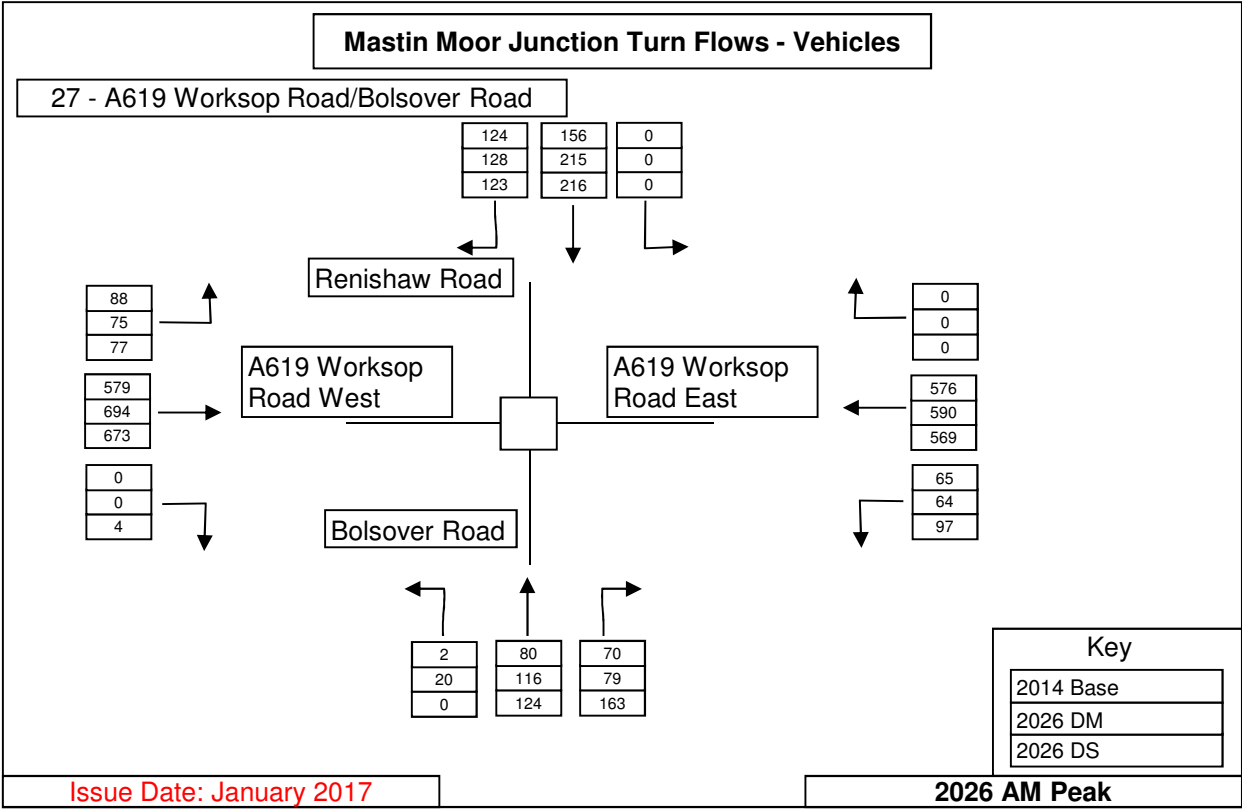
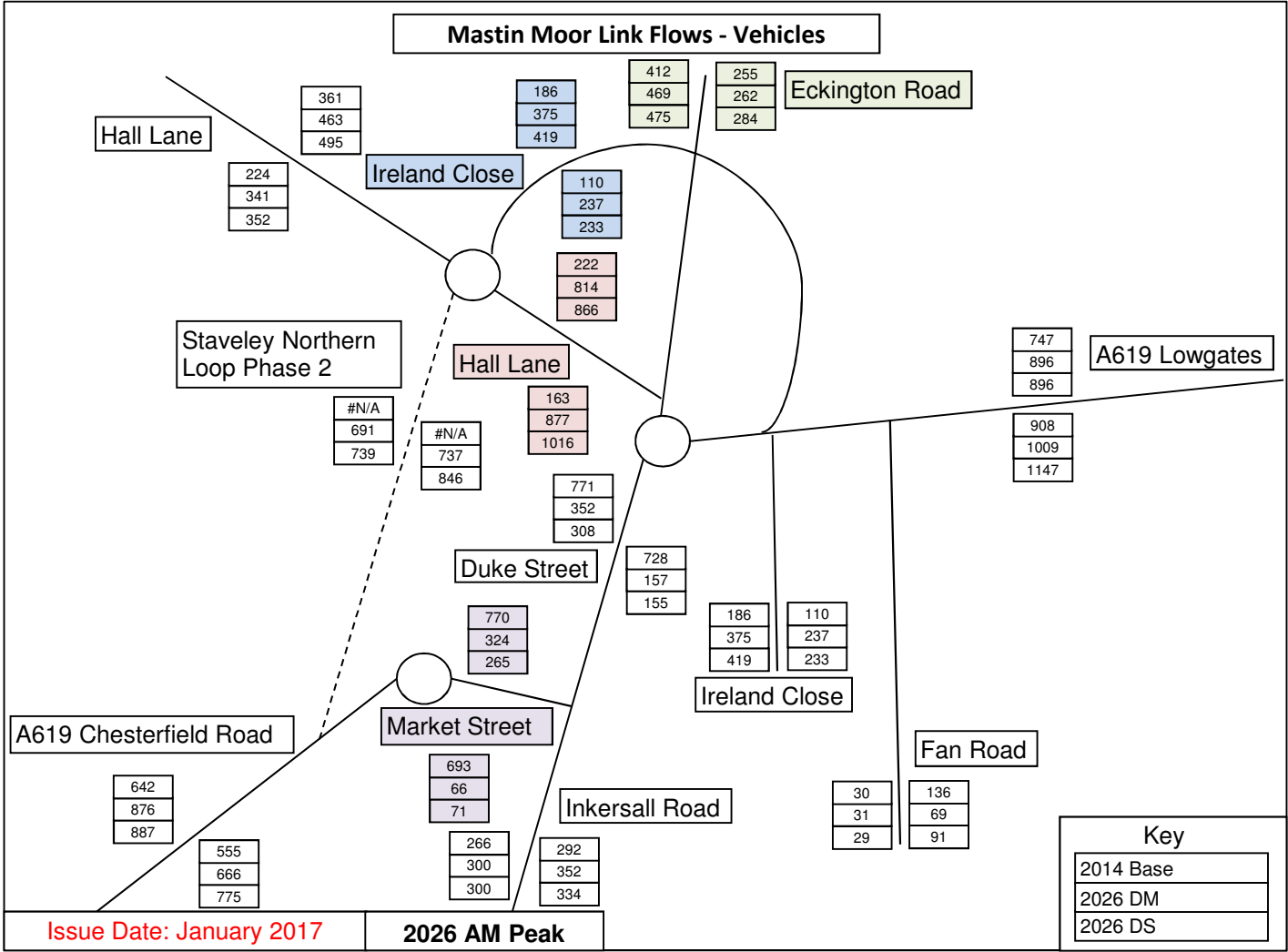
Do Minimum Highway Schemes included in 2026		
1	Staveley Northern Loop Phase 2	Phase II forms a new link between the A619 at the Lime Avenue junction, connecting to the fourth arm of the Northern Loop roundabout along Hall Lane.
2	M1 J28-J31 All Lane Running.	Included in DM 2026. 4 lane capacity.
3	A61 Whittington Moor roundabout	Minor capacity upgrades included in DM 2026 model test

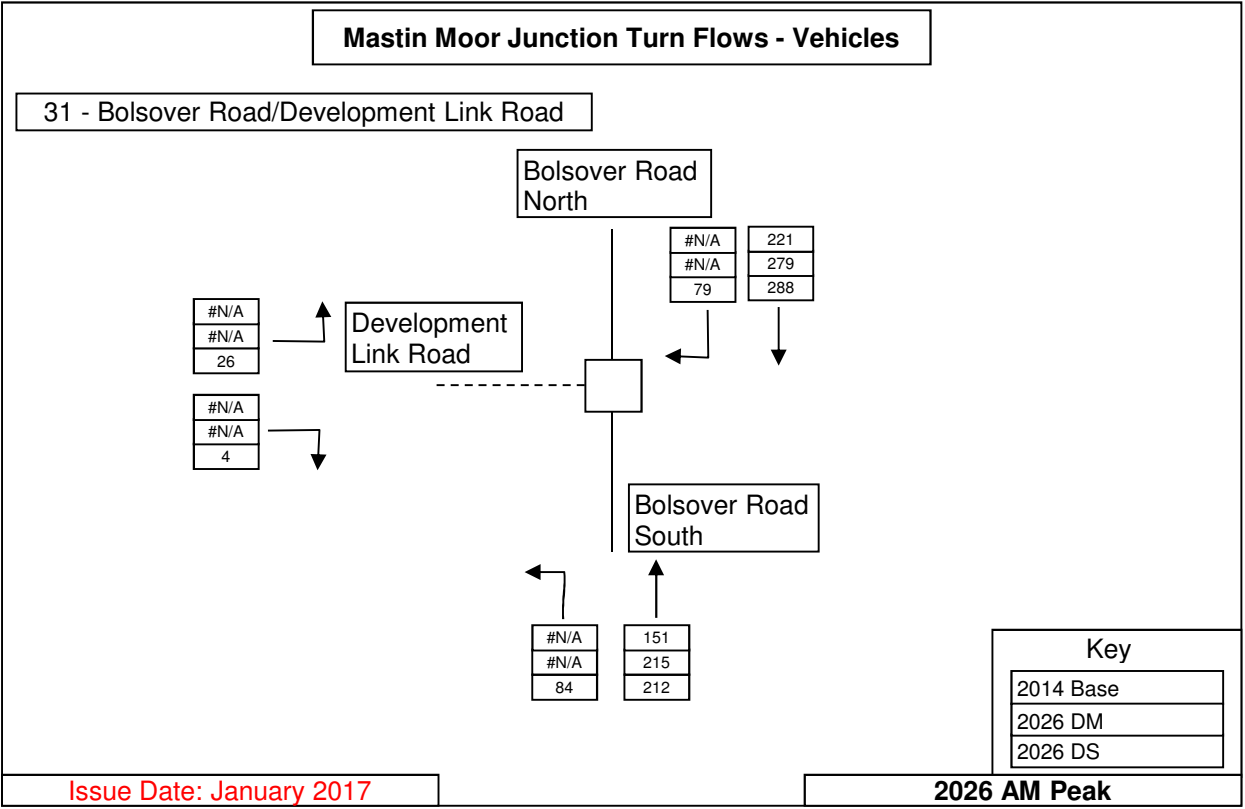
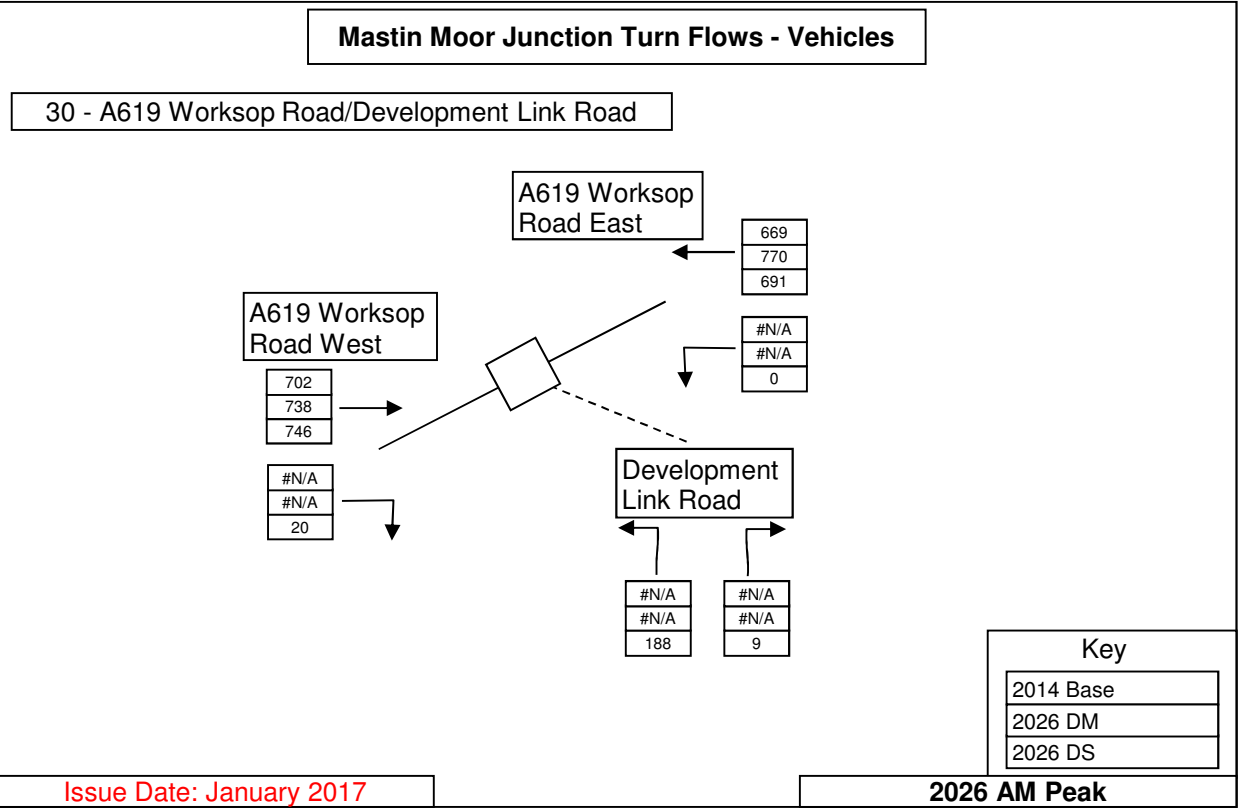
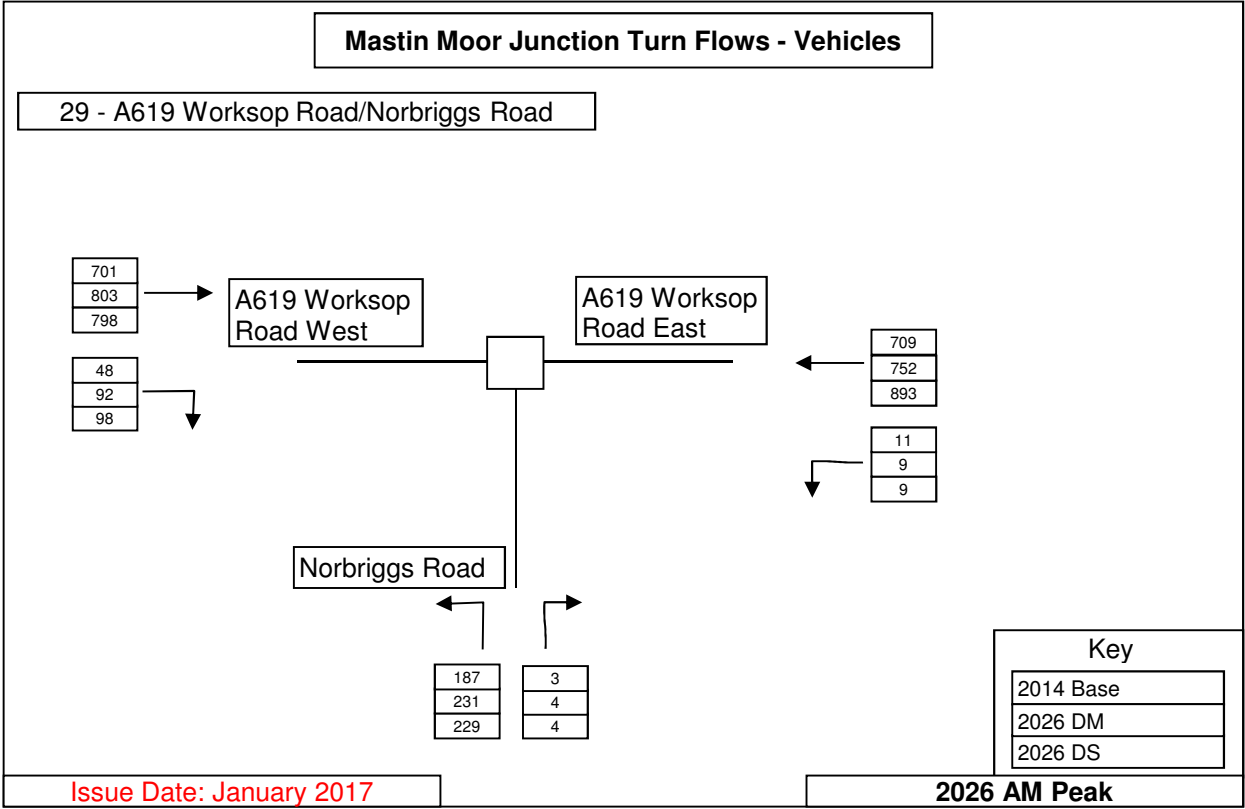
Appendix D

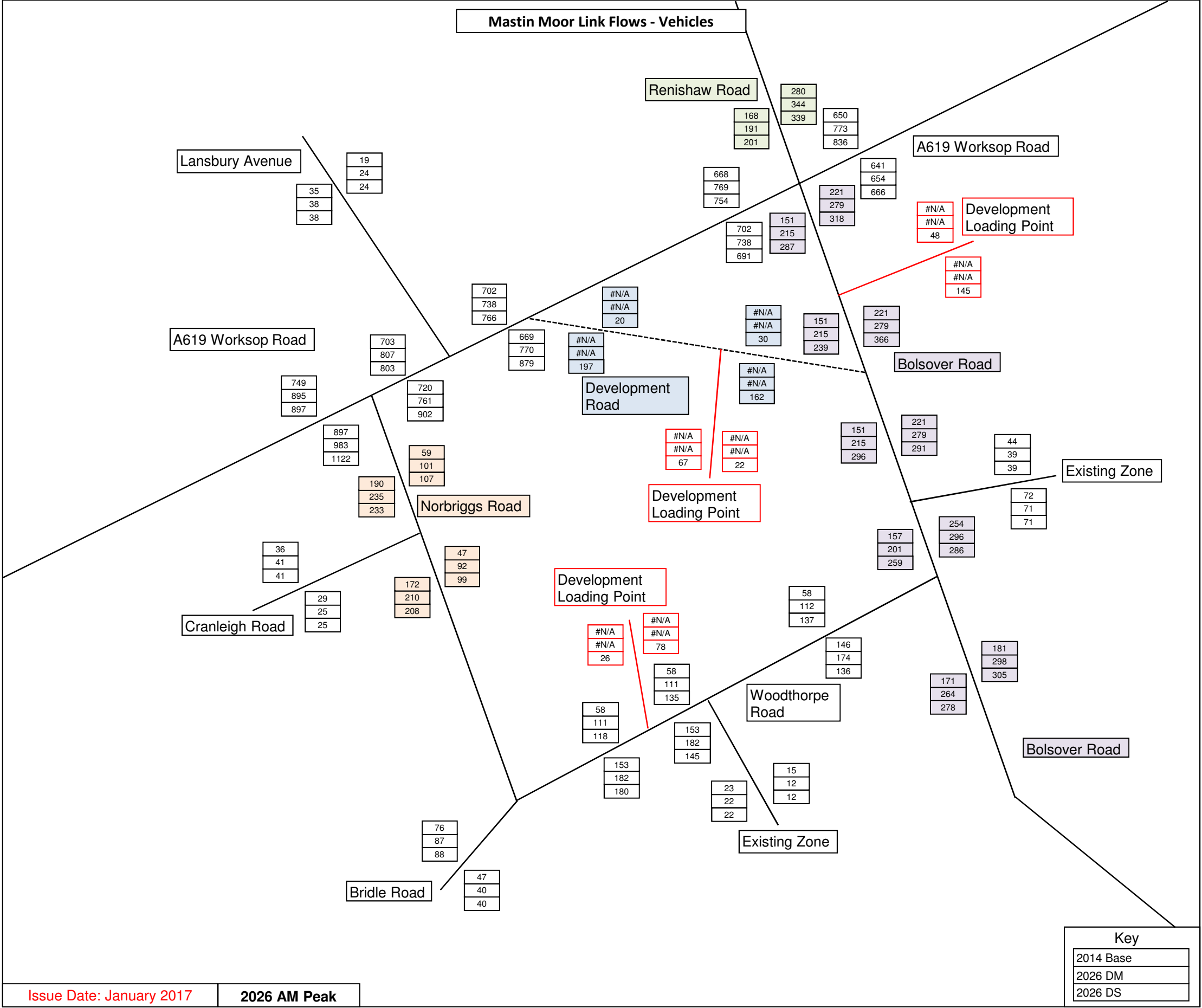
Aecom Data Outputs

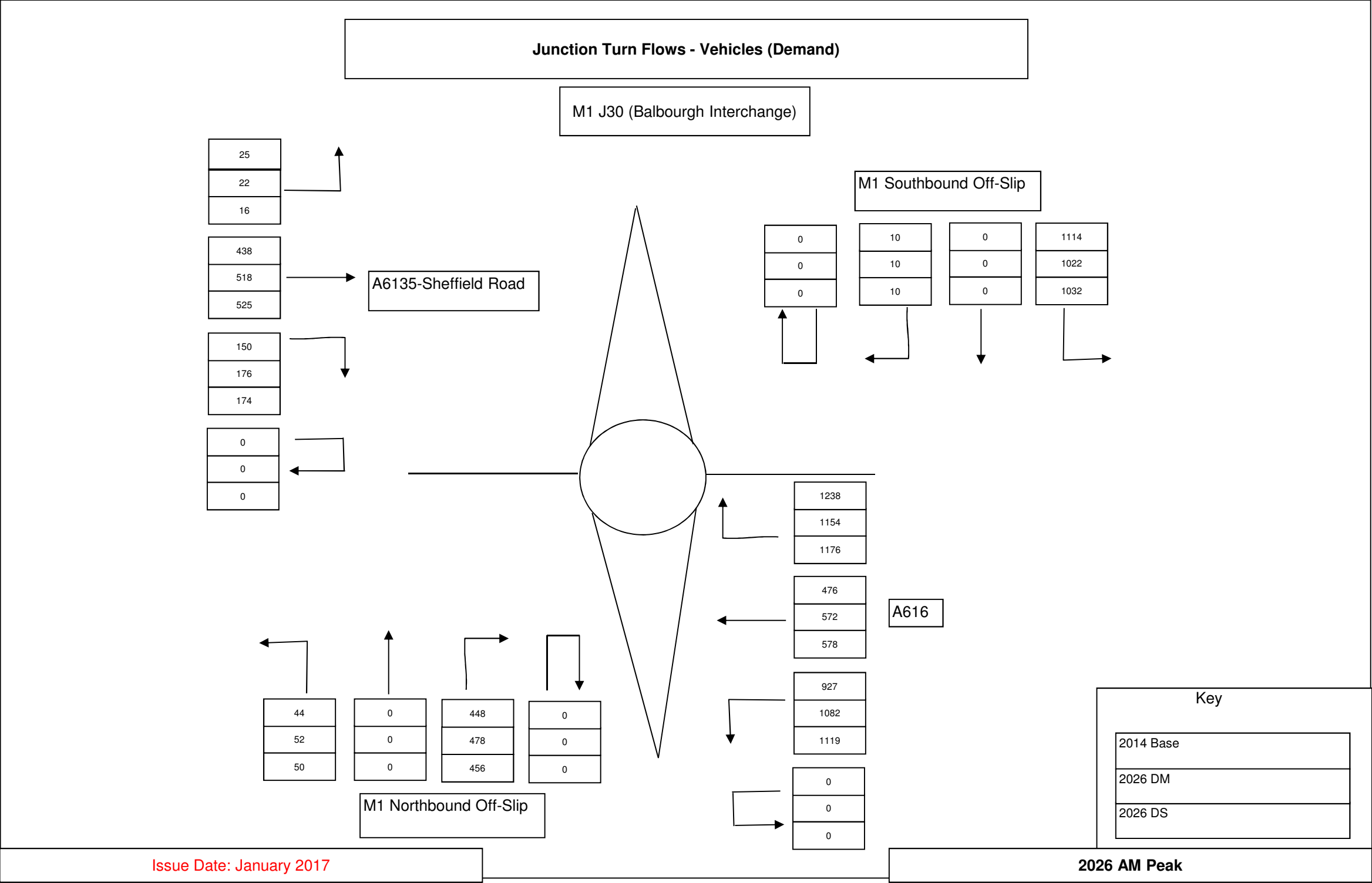


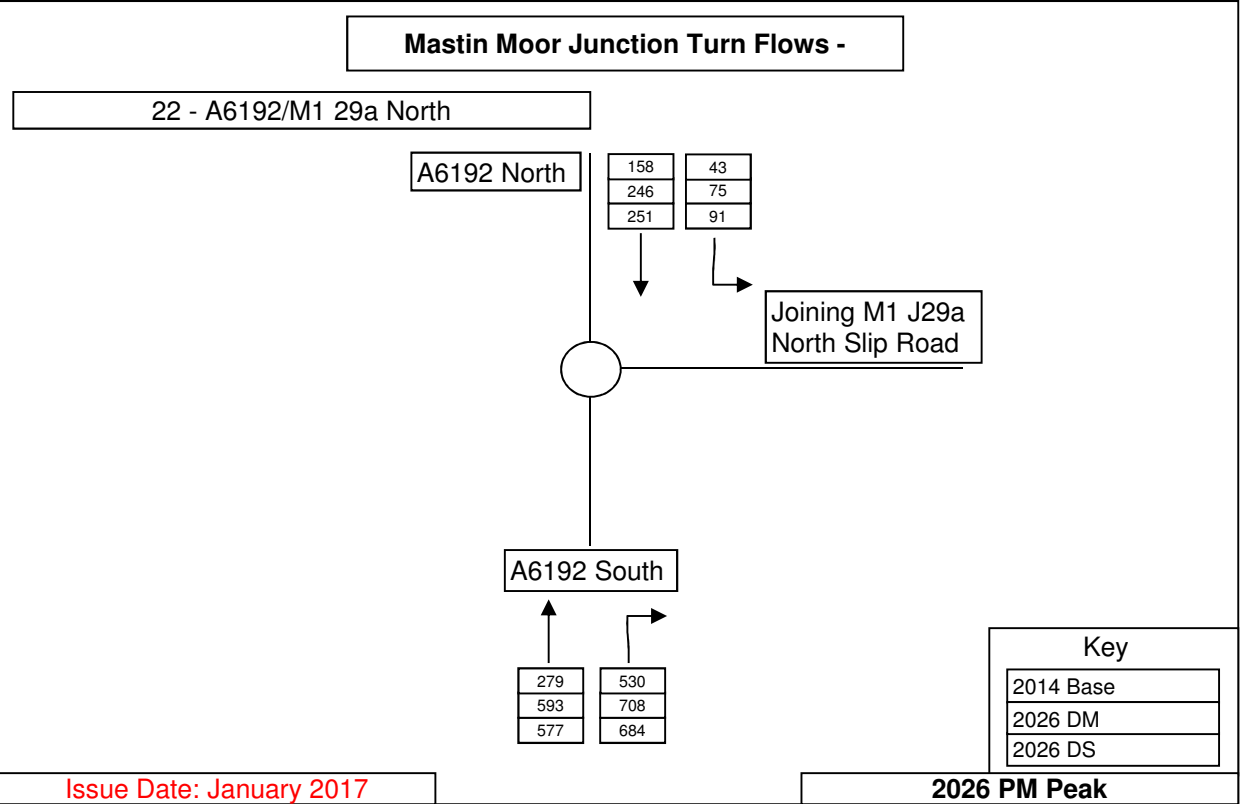
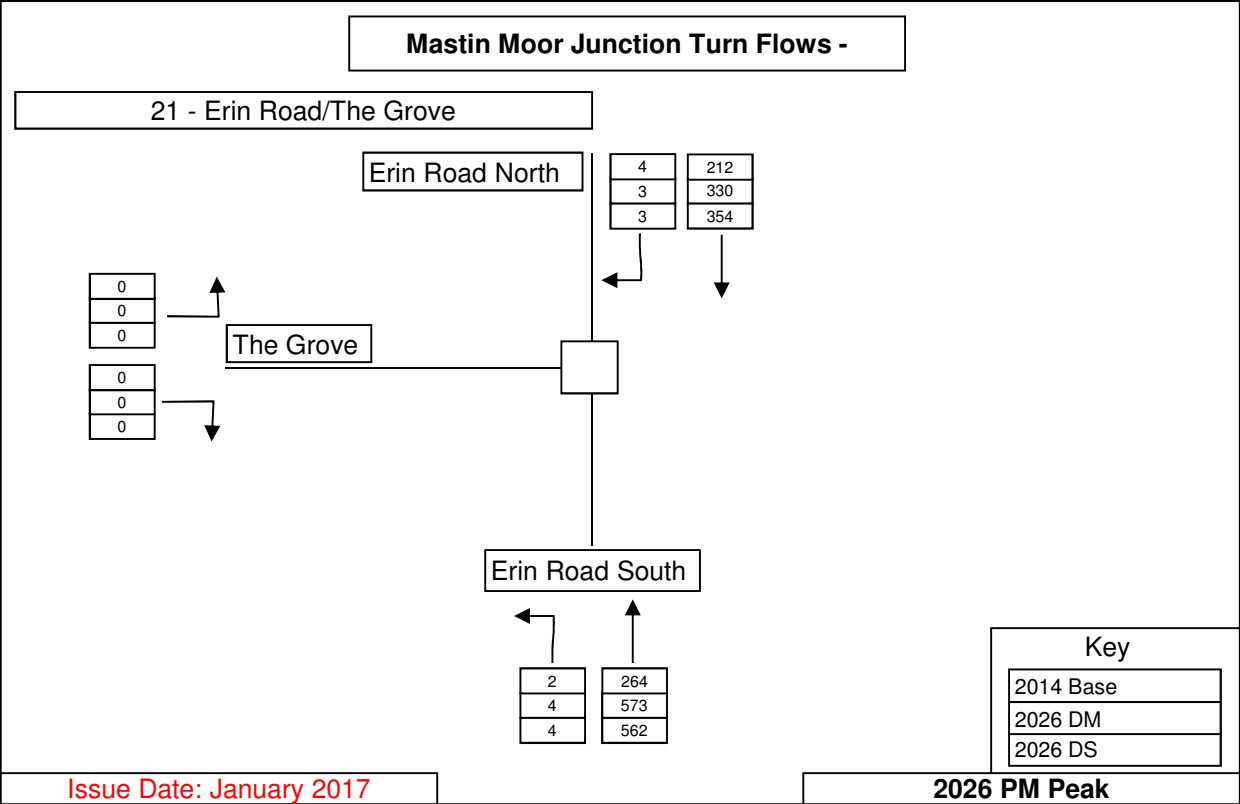
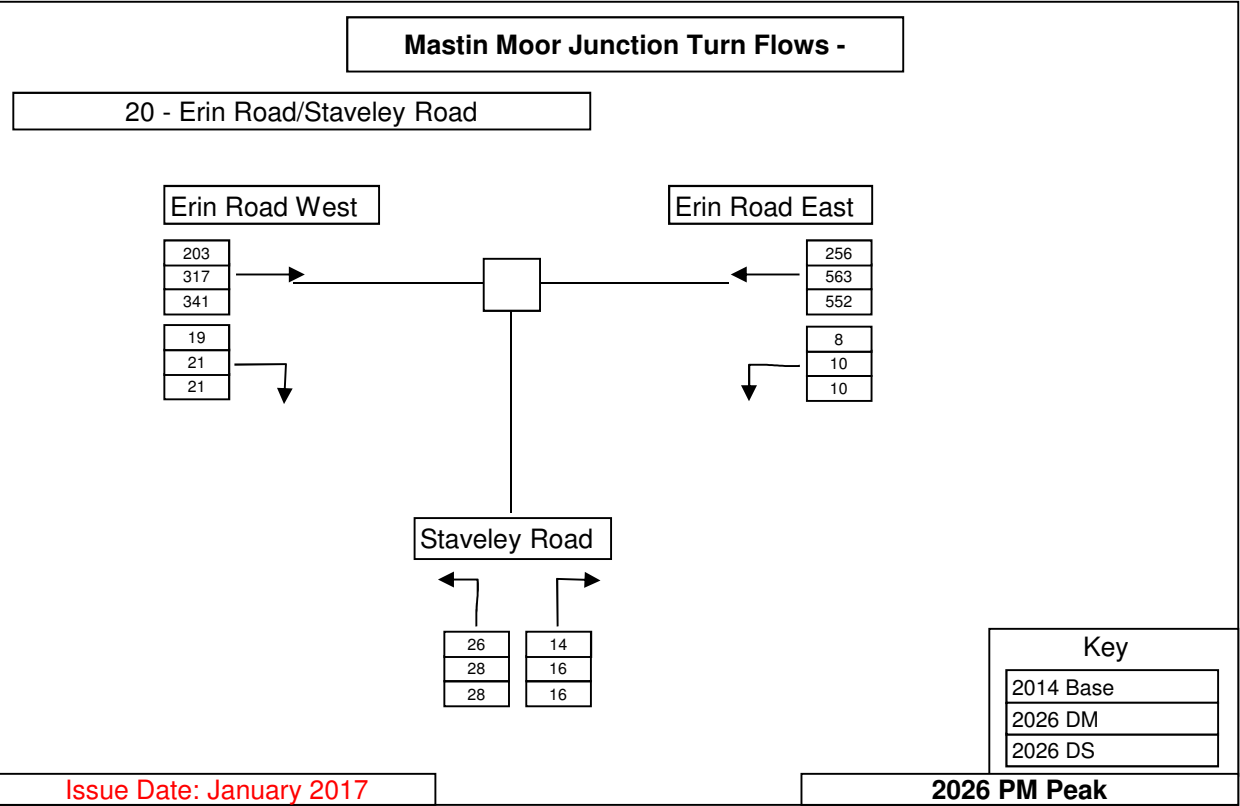
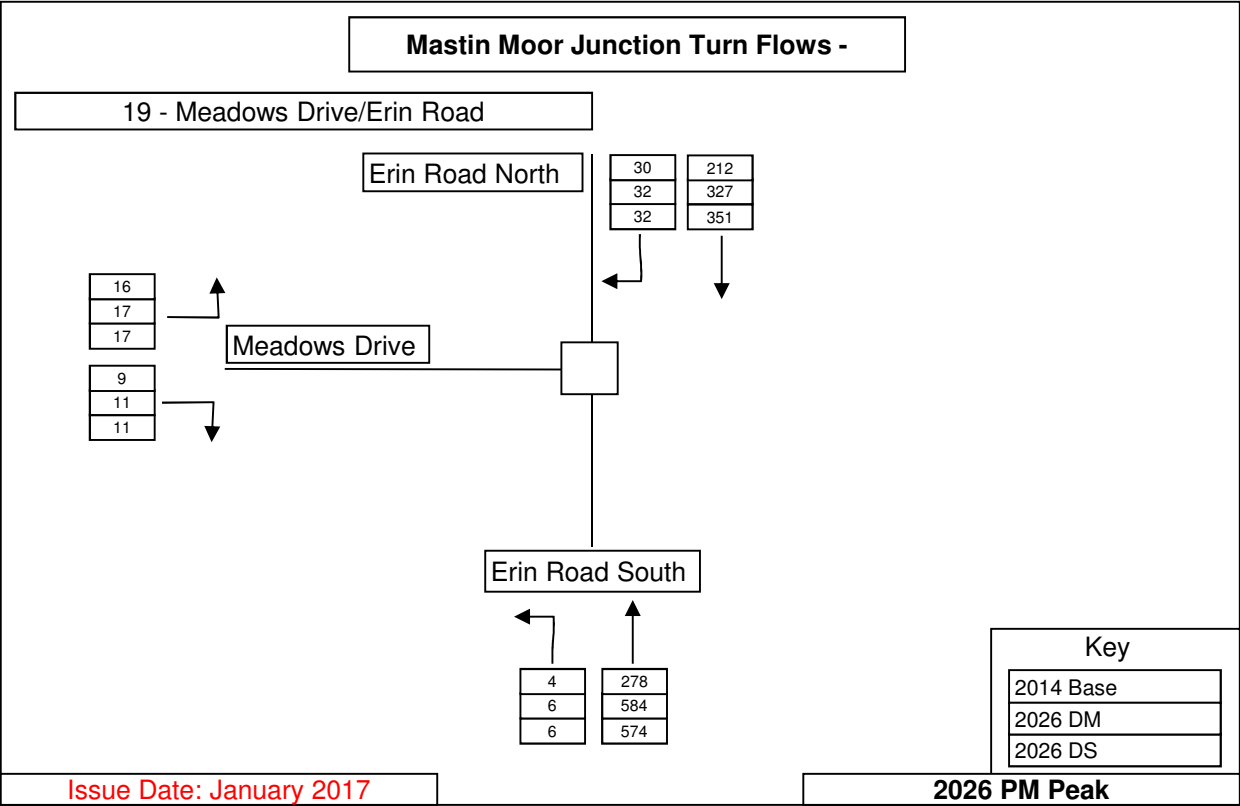


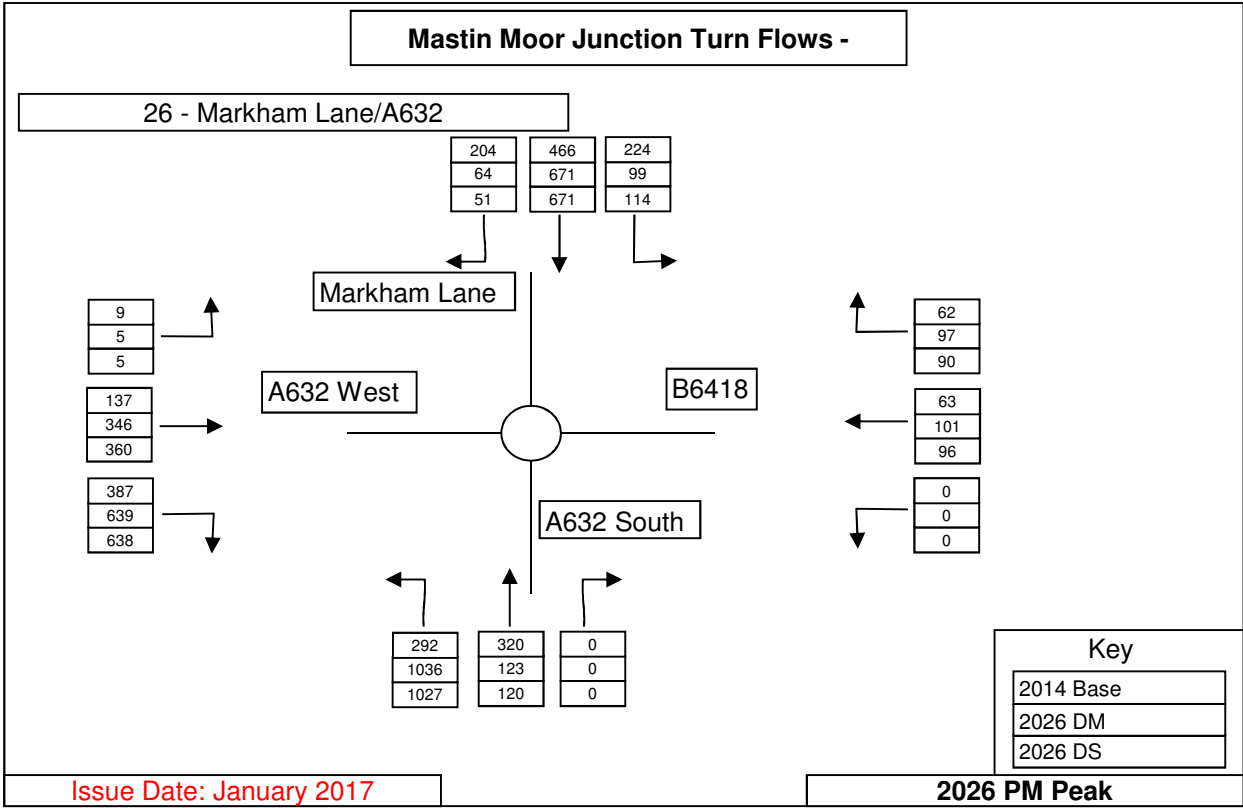
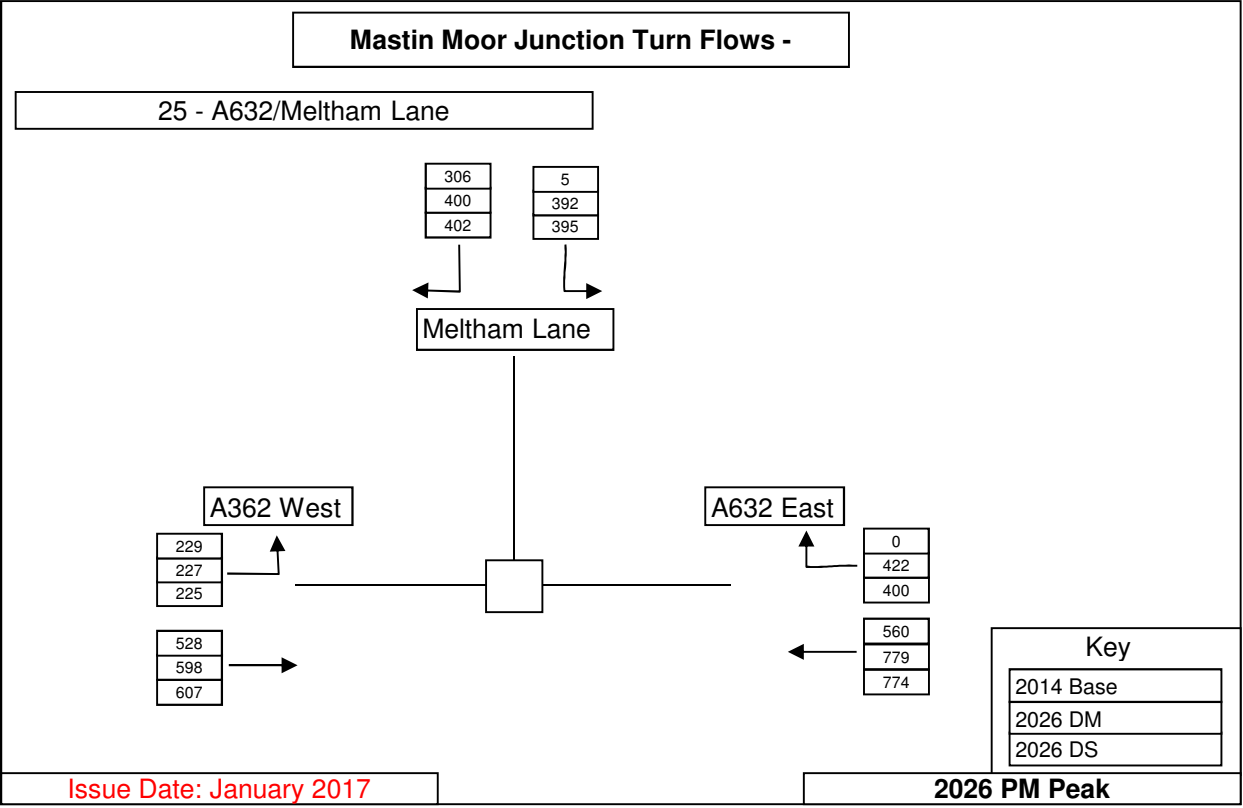
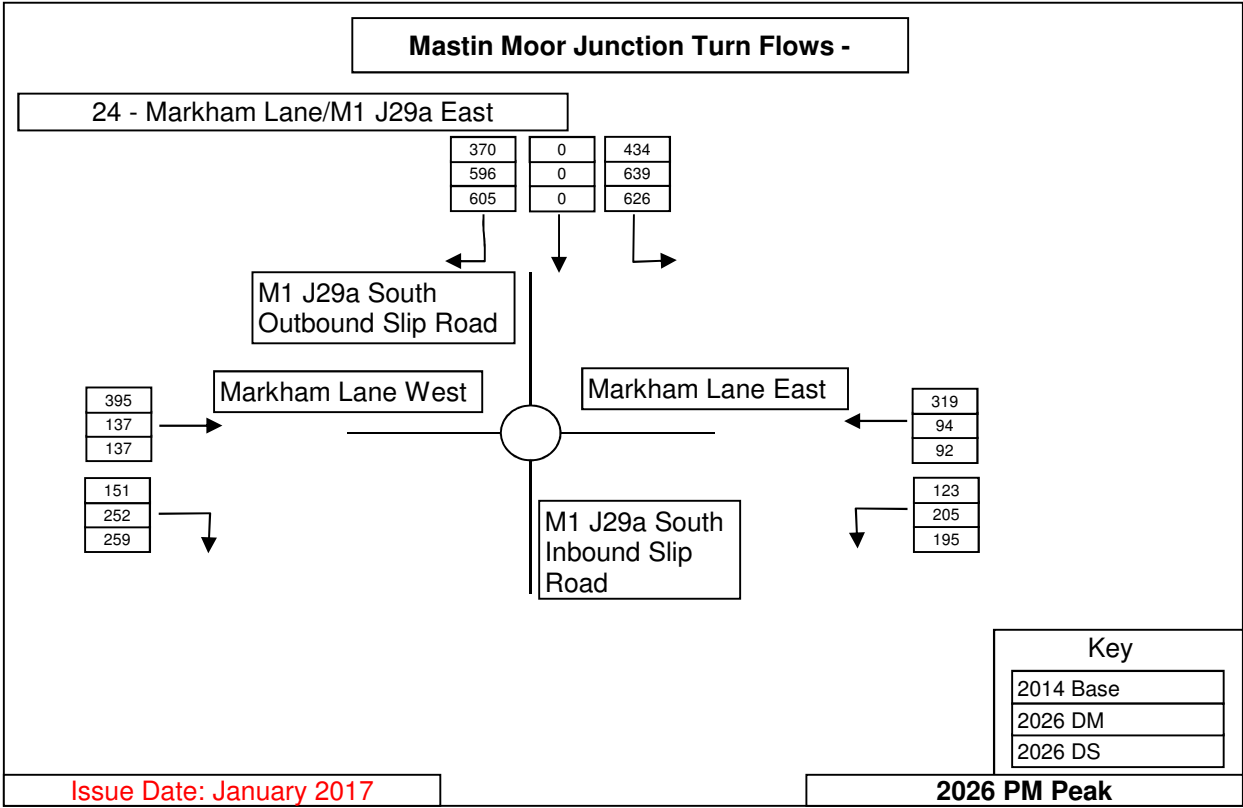
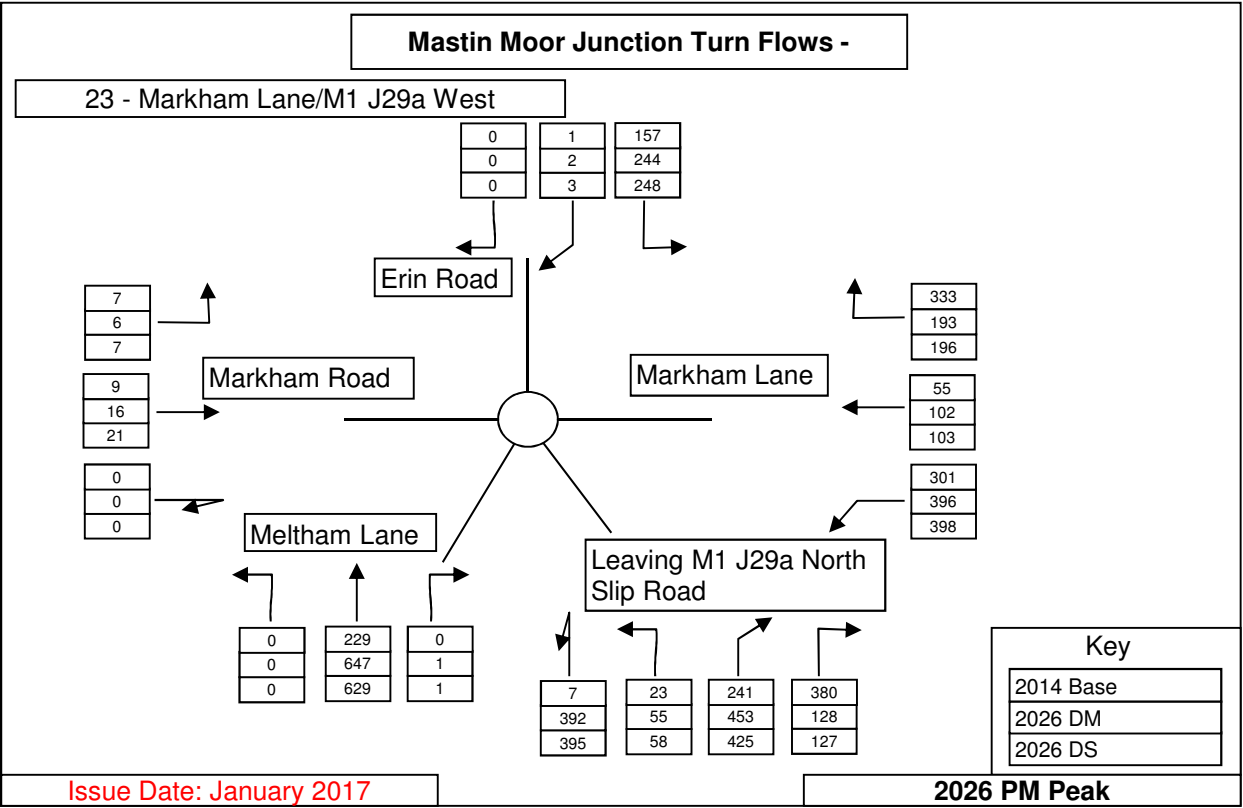


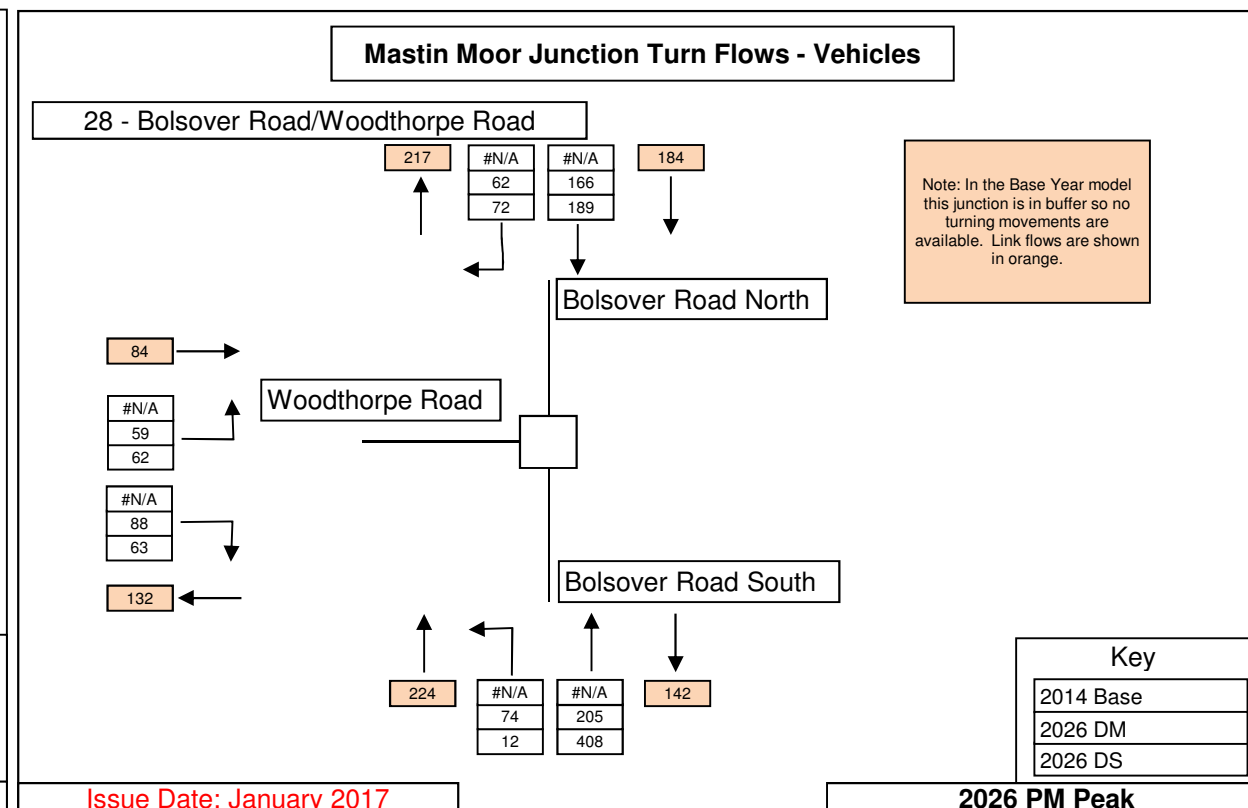
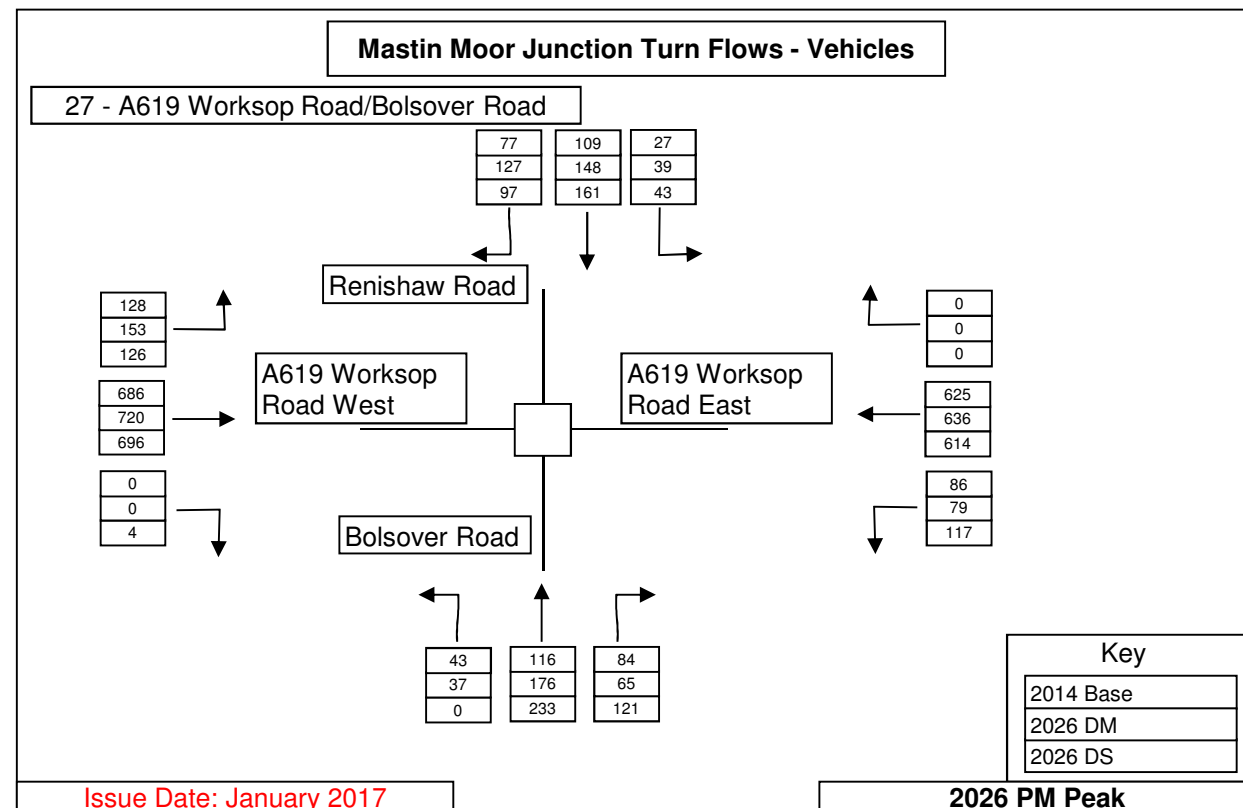
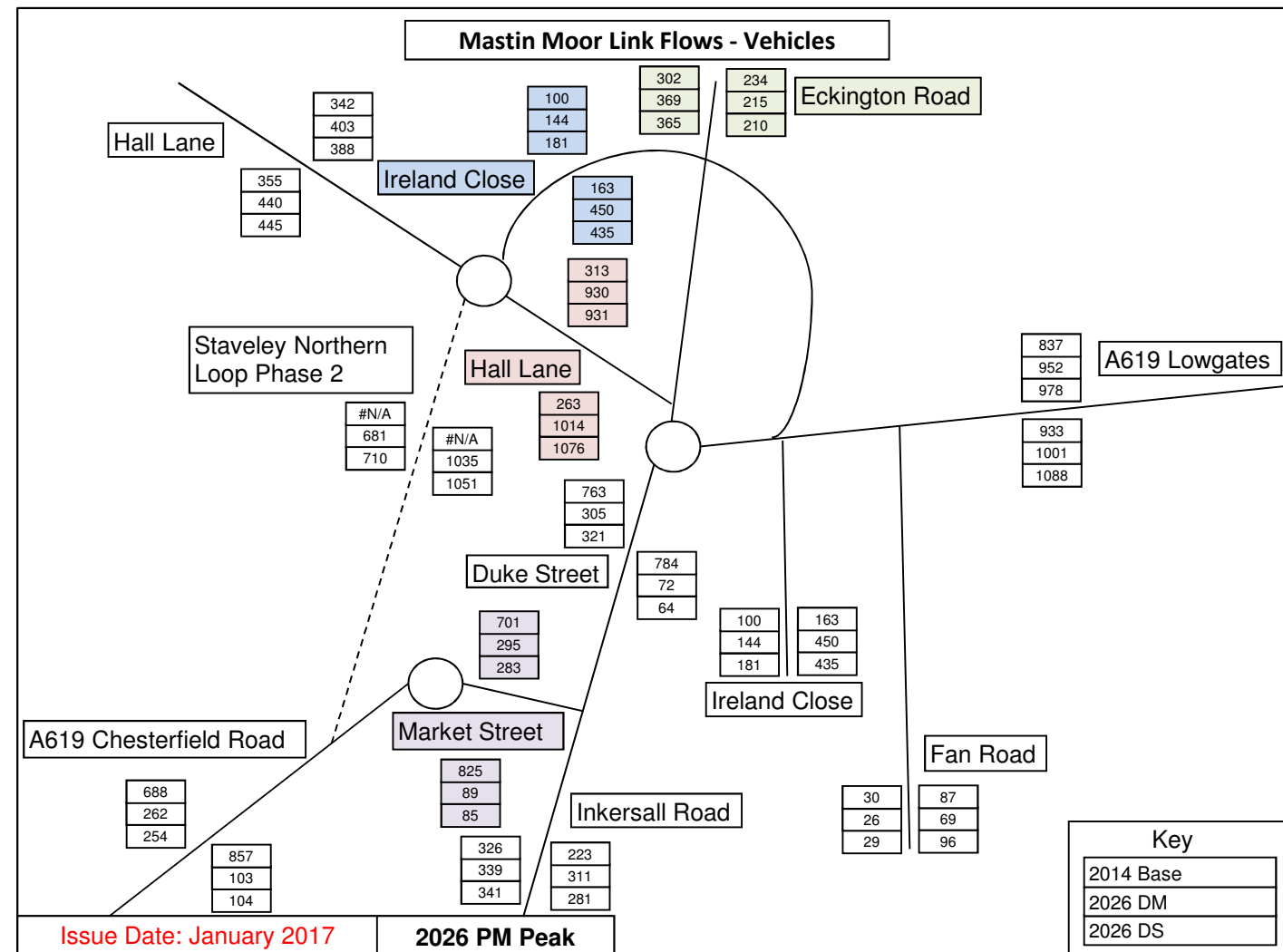


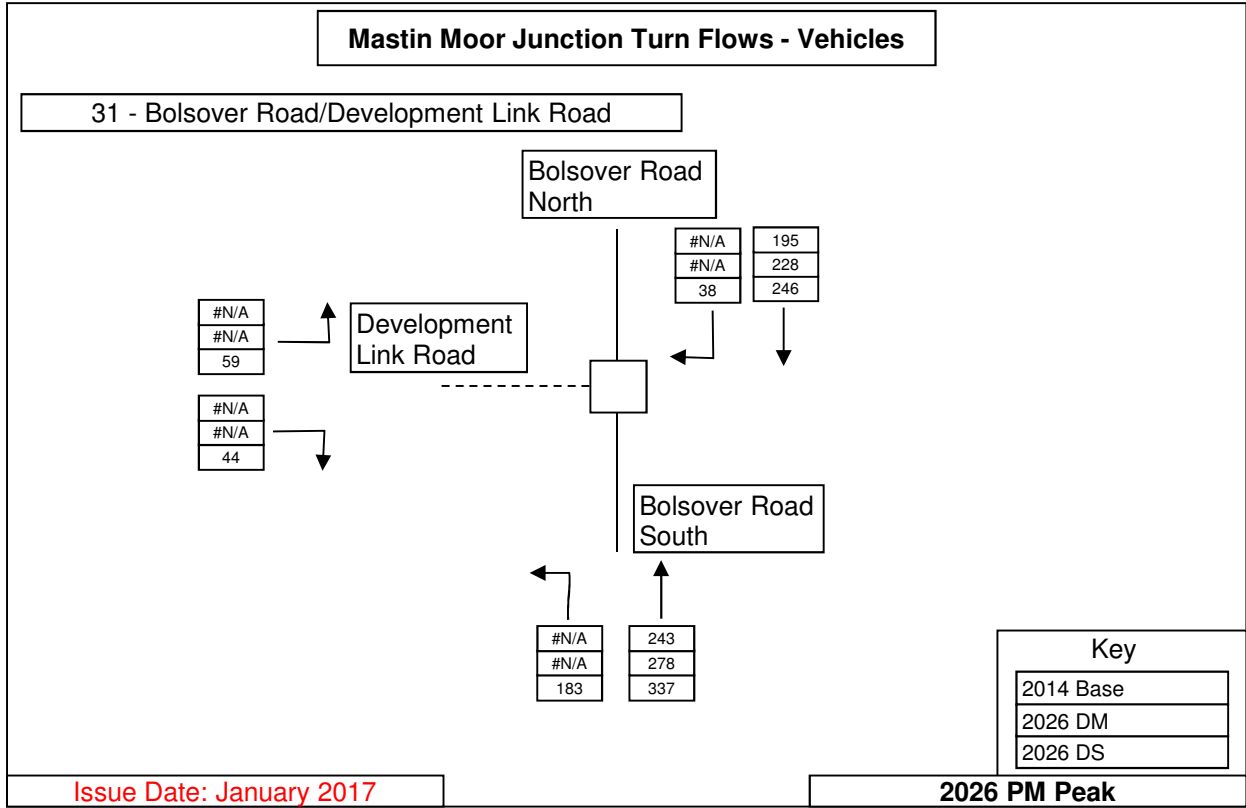
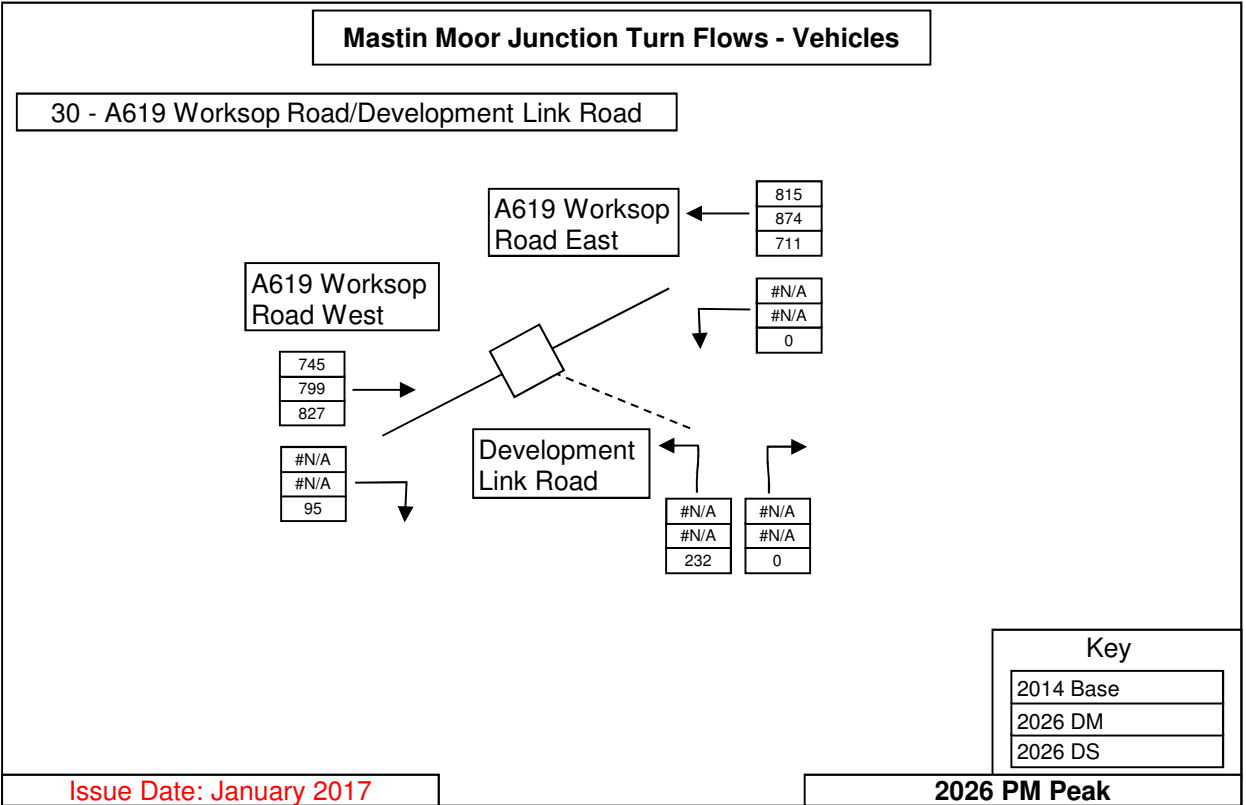
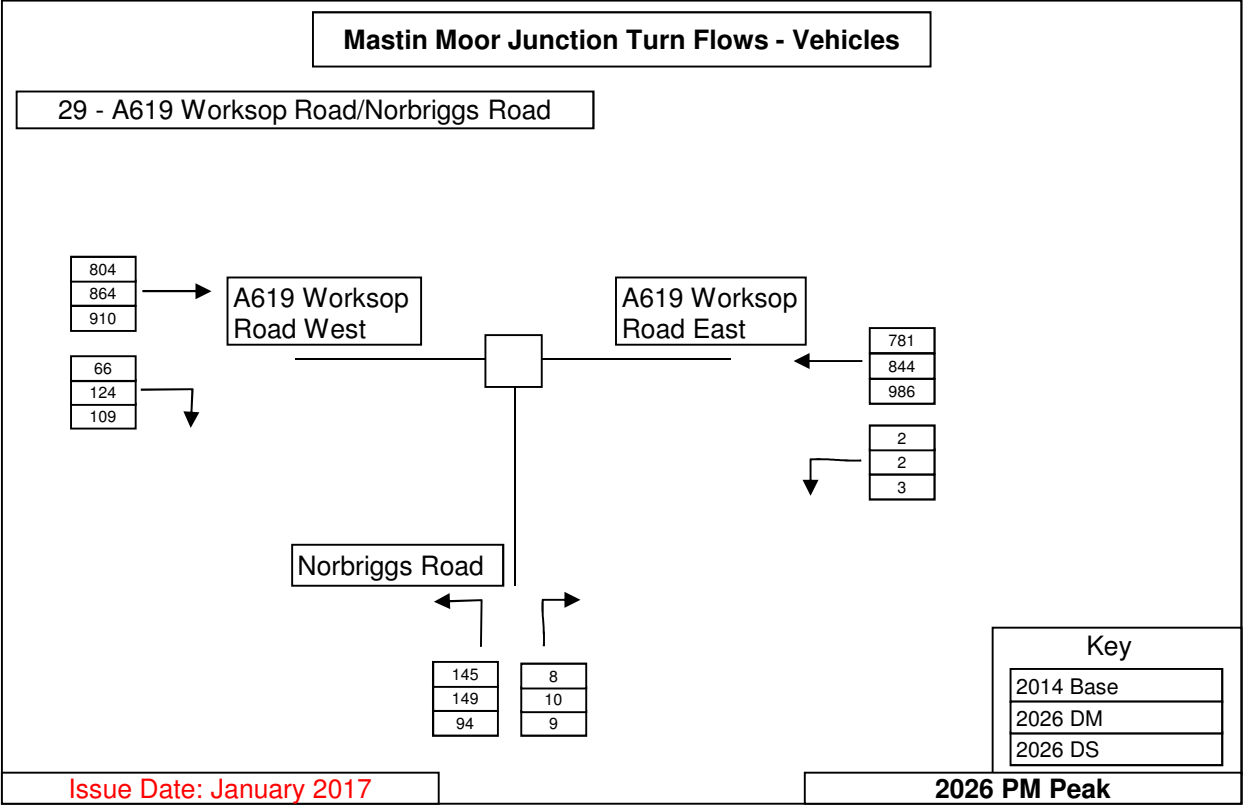


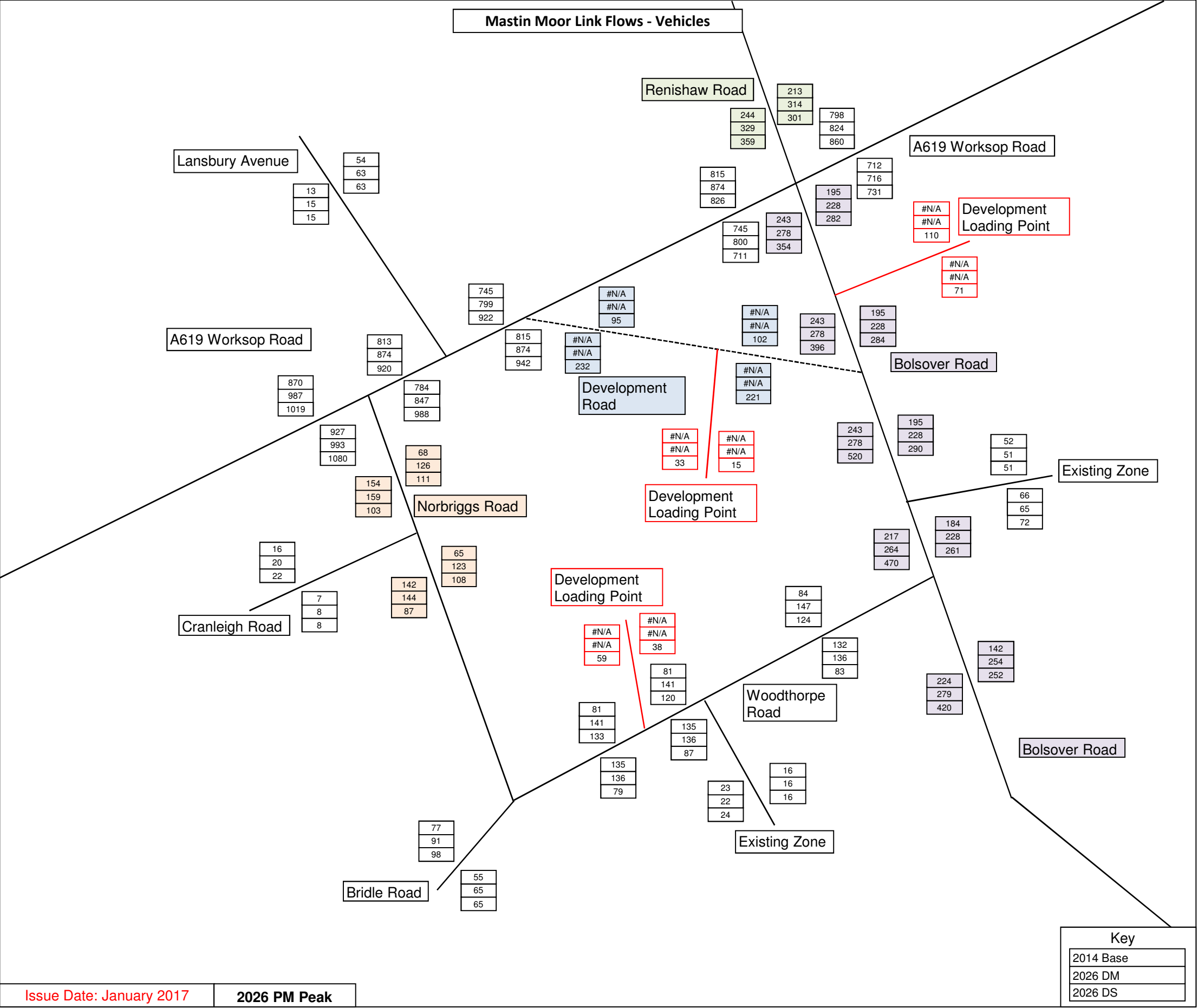


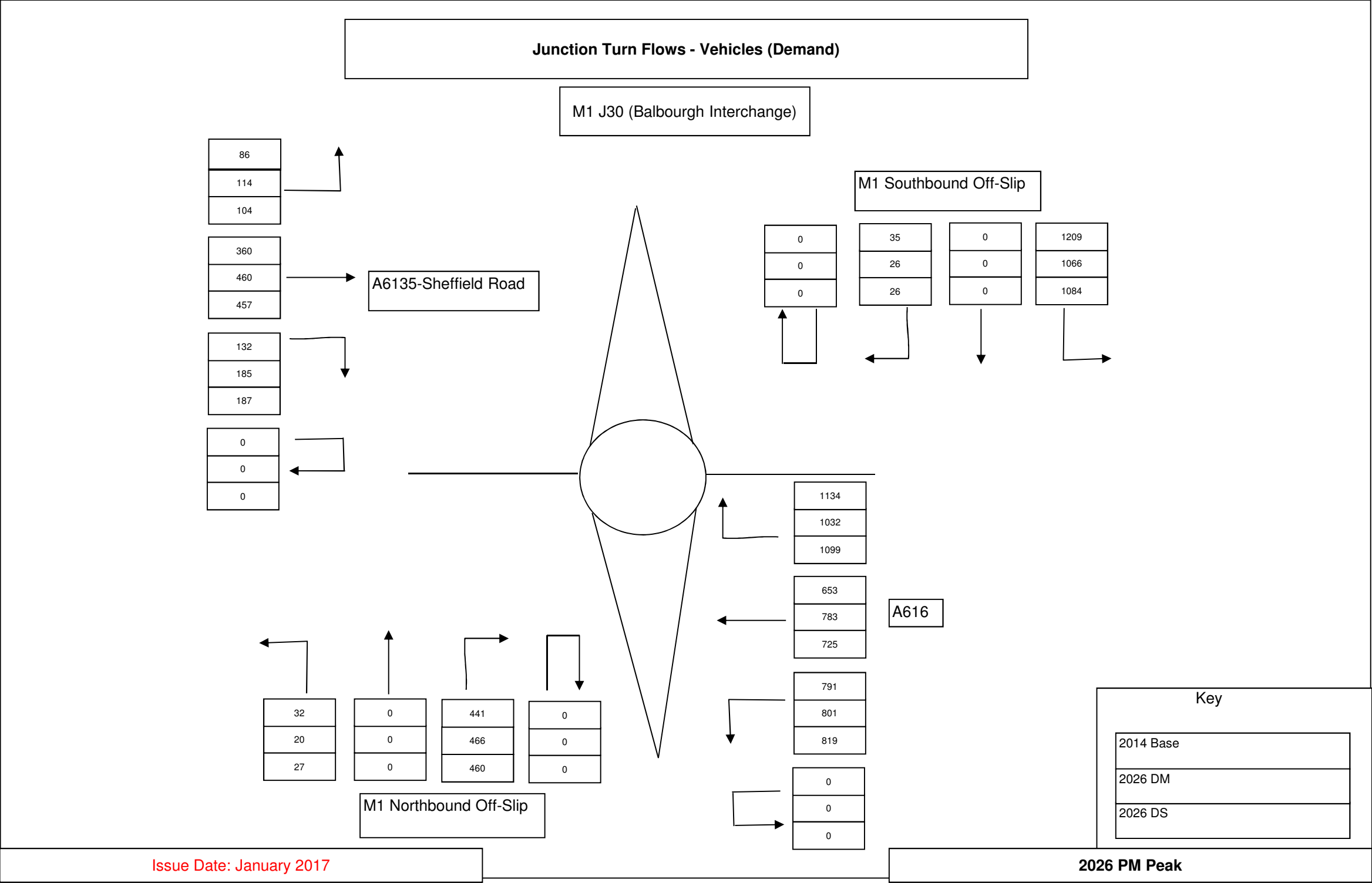












V/C data was extracted from the DM and DS model for individual nodes and filtered to show the nodes with a V/C greater than 80%
Comparisons were then made between the filtered nodes in the DS and DM models and nodes with a difference greater than 5% highlighted

AM

Node Location	Node	DM	DS	Change
Highfield Lane/B6051 Newbold Rd	1192	87.6	86.47	-1.31%
Brimington Rd/A61 Roundabout	1245	109.81	109.43	-0.35%
Lockoford Rd/Sheffield Rd Roundabout	1247	81.08	81.39	0.38%
Brimington Rd/Brewery St Roundabout	1277	83.06	83.25	0.23%
A61 Offslip onto Hollis Ln	1278	104.84	104.95	0.10%
A61/A617 Roundabout-A617 WB Off the Roundabout	1279	84.23	83.03	-1.45%
Spital Ln/Hady Hill Signalised Junction	1287	81.37	82.73	1.64%
A61/Nethermoor Rd Roundabout	1296	97.38	97.05	-0.34%
B6425 Hassocky Ln/A617 Off/Onslip	1384	79.79	80.6	1.00%
A632 Chesterfield Rd/Staveley Rd	1431	96.58	96.58	0.00%
M1 J28	1474	81.69	81.85	0.20%
A38 WB Approaching J28	1478	103.4	103.43	0.03%
A38/Cartwright Ln/Berristow Ln Roundabout	1494	89.06	89.11	0.06%
A38/Common Rd (in buffer)	1509	98.78	98.82	0.04%
A617 Chesterfield Rd/Green Ln	1562	90.94	91.09	0.16%
Hall Ln	2003	96.81	101.05	4.20%
A619 Markham Rd/A619 Chatworth Rd Roundabout-A619 WB Approaching Roundabout	2022	81.41	81.91	0.61%
A619 Markham Rd/A619 Chatworth Rd Roundabout-A619 EB Approaching Roundabout	2025	81.93	82.46	0.64%
A61/A619 Rother way Roundabout-A619 EB Approaching Roundabout	2028	92.89	92.34	-0.60%
A61/A619 Rother way Roundabout-A61 NB Approaching Roundabout	2093	86.23	85.55	-0.79%
A61/A617 Roundabout-circulatory	2094	52.35	98.31	46.75%
M1 J30-M1 SB Onslip	2115	83	84.85	2.18%

PM

Node Location	Node	DM	DS	Change
Highfield Lane/B6051 Newbold Rd	1192	86	86	0.00%
Brimington Rd/A61 Roundabout	1245	82.31	82.39	0.10%
Lordsmill Roundabout	1271	92.03	92.74	0.77%
Brimington Rd/Brewery St Roundabout	1277	92.55	92.72	0.18%
A61 Offslip onto Hollis Ln	1278	93.54	93.62	0.09%
A61/Nethermoor Rd Roundabout	1296	101.9	101.93	0.03%
A619 Chesterfield Rd/Hall Rd Brimington Gyratory	1343	89.6	89.95	0.39%
A619 Ringwood Road/High Street	1356	81.62	82.12	0.61%
B6425 Hassocky Ln/A617 Off/Onslip	1384	91.32	91.35	0.03%
A38 WB nr Alfreton	1395	88.23	88.45	0.25%
A632 Chesterfield Rd/Staveley Rd	1431	99.47	99.54	0.07%
M1 J28	1474	84.77	84.81	0.05%
M1 NB Approaching J28	1475	100.23	100.33	0.10%
A38 WB Approaching J28	1478	101.19	101.15	-0.04%
A38/Cartwright Ln/Berristow Ln Roundabout	1494	91.37	91.37	0.00%
A38/Common Rd	1509	100.71	100.65	-0.06%
A617 Chesterfield Rd/Green Ln	1562	91.93	91.95	0.02%
Hall Ln	2003	101.55	100.54	-1.00%
A619 Markham Rd/A619 Chatworth Rd Roundabout-A619 WB Approaching Roundabout	2022	87.29	87.56	0.31%
M1 J29 NB Offslip onto Rounabout	2107	106.35	106.42	0.07%

Appendix E

Highways England - M1 J30

From: [Freek, Steve](#)
To: [Susanna Bathe](#)
Cc: [Law, Daniel](#)
Subject: [External] FW: Mastin Moor - Revised Scheme
Date: 21 September 2020 09:09:18
Attachments: [image001.png](#)
[image002.png](#)

Hi Susie,

Thank you for clarifying your proposals. Please see below our resulting comments:

You propose to use data collected from more recent traffic surveys carried out the Treble Bob roundabout undertaken in 2016/2017 in relation to the Clowne Garden Village assessment. On the assumption that this data complies with the WebTAG guidance on neutral survey periods, this will be acceptable. For ease of reference, paragraph 3.3.6 WebTAG Unit M1.2 states:

"Surveys should be carried out during a 'neutral', or representative, month avoiding main and local holiday periods, local school holidays and half terms, and other abnormal traffic periods. National experience is that the following Monday to Thursdays can be neutral: late March and April – excluding the weeks before and after Easter; May - excluding the Thursday before and all of the week of each Bank Holiday; June; September – excluding school holidays or return to school weeks; all of October; and all of November – provided adequate lighting is available."

Should any assessment be based on non-neutral month survey data, the suitability of this should first be evidenced before modelling commences, to demonstrate that these traffic flows are representative of typical demands. This could be done through carrying out spot checks against survey data which is from a neutral period to demonstrate whether this is representative of typical traffic demands and therefore appropriate for use.

Regarding our request that the impact upon M1 J30 should be investigated, this is mainly due to the highly sensitive interaction between the motorway junction and the Treble Bob roundabout as queues have been known to extend back to J30 from Treble Bob. The link capacity eastbound from M1 J30 to Treble Bob is therefore our greatest concern. We would propose that initially, assessment of development impacts on the Treble Bob junction and its resultant performance should be agreed with the highway authorities. Following this, the results would inform the need, if any, for further assessment of M1 J30. Should there be no material worsening of the performance on this eastbound link, further assessment of M1 J30 would not be necessary.

I trust this is helpful, but please get back to me if you wish to discuss.

Regards

Steve Freek

Assistant Spatial Planner

Highways England (Area 7), Stirling House, Lakeside Court, Osier Drive, Sherwood Business Park Nottingham NG15 0DS

Tel: 0300 470 4457

Mob: 07712 543047

Email: steve.freek@highwaysengland.co.uk

From: Susanna Bathe [<mailto:Susanna.Bathe@arup.com>]
Sent: 03 September 2020 16:57
To: Freek, Steve <Steve.Freek@highwaysengland.co.uk>
Cc: Law, Daniel <Daniel.Law@aecom.com>
Subject: RE: Mastin Moor - Revised Scheme

Steve,

Thank you for your comments – please see our response below in green.

I would welcome your further comments so that we can agree the assessment.

We are aiming for planning submission in early October so your quick turnaround would be appreciated.

I would be happy to discuss if helpful.

Regards

Susie

Susie Bathe

Senior Transport Planner | Development Planning

Arup

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d: +44 113 242 8498 m: +44 7341 129847

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From: Freek, Steve <Steve.Freek@highwaysengland.co.uk>
Sent: 21 August 2020 14:47
To: Susanna Bathe <Susanna.Bathe@arup.com>
Cc: Law, Daniel <Daniel.Law@aecom.com>
Subject: [External] RE: Mastin Moor - Revised Scheme

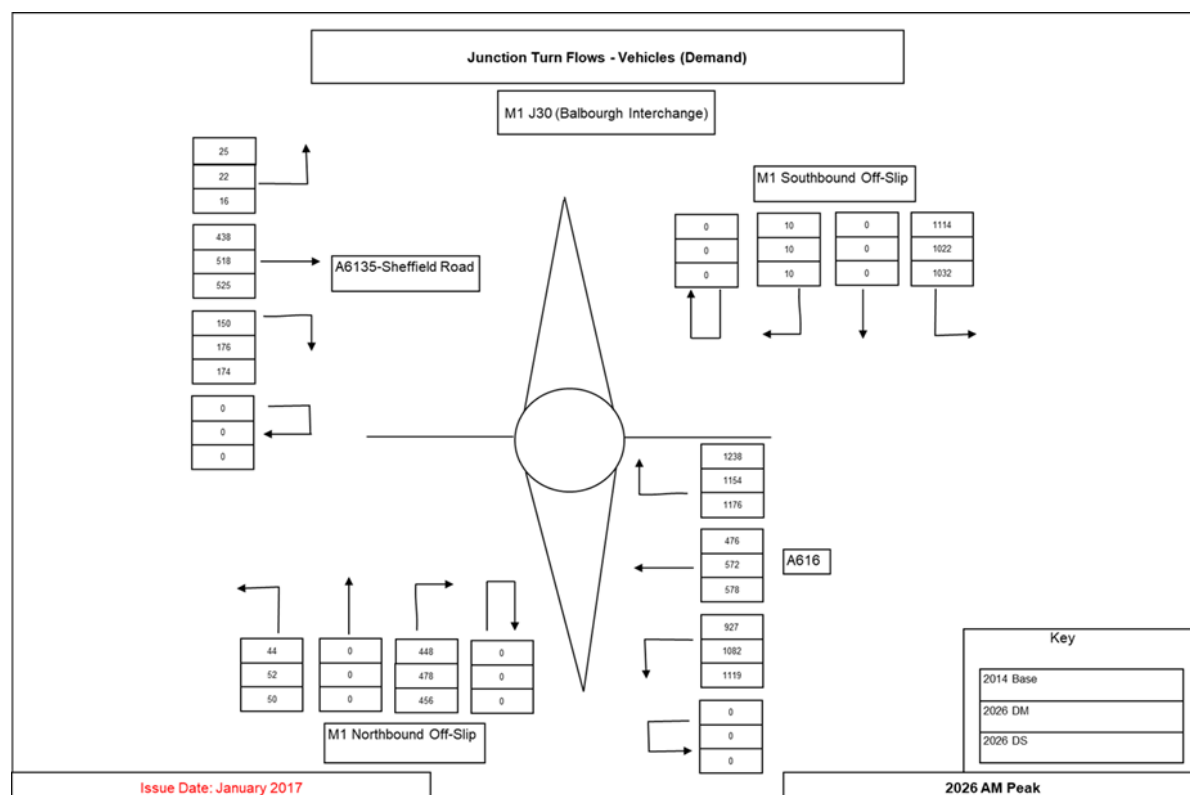
Hi Susie,

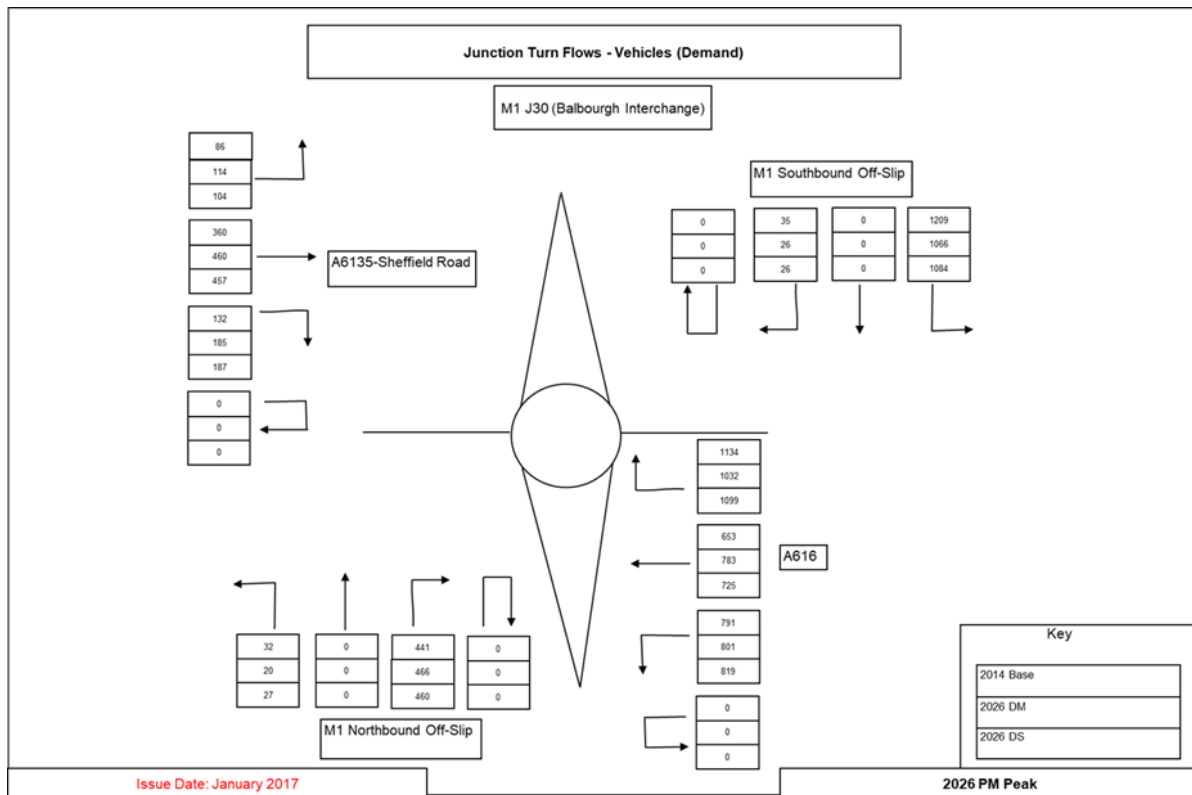
We have reviewed the Transport Assessment Scoping Note dated 4th August 2020 regarding the revised scheme for the proposed residential development of up to 650 dwellings, a residential care facility with extra care, a Local Centre (including local retail, health facilities, leisure facilities, other local facilities and services, offices), open space, community garden extension, community building, parking and associated infrastructure and earthworks located at the Mastin Moor site.

We note that Highways England reviewed the original planning application CHE/17/00469/OUT to which we responded with no objections in July 2017, due to the minimal levels of traffic generated by the site impacting on the Strategic Road Network, namely M1 junctions 29a & 30.

Having reviewed the information provided in the submitted Scoping Note, we have the following comments:

- We note that you propose to use a new set of trip generation figures for the proposed retail, care home and office aspects of the development, while maintaining the previously agreed trip generation figures for the residential and healthcare elements of the site. These trip generation figures appear appropriate. **Noted**
- From review of section 5.2.1 which considers 2014 base year suitability, whilst we would agree that this demonstrates there has been no increase in traffic demands between 2014 and 2019, the scope of the survey only covers a few links on the local network in the Mastin Moor area. This may be appropriate therefore for assessing junctions in this location and using 2014 data as a 2019 proxy as proposed, but it would not be suitable for assessing junctions elsewhere such as at Treble Bob or M1 J30 unless additional data is provided demonstrating the same lack of growth. **We reviewed available local traffic data to understand recent (pre-Covid) traffic patterns, however highlight that in using the SATURN modelling for the future year, 2026 traffic growth is included in the assessment. This includes committed developments identified by each planning authority as well as applying TEMPRO growth where the committed development traffic flows are below forecast growth. Therefore, the comparison of the 2026 Do Minimum and Do Something for the M1 J30 (see below) takes account of growth. We note that there has been more recent surveys at the Treble Bob roundabout undertaken in 2016/2017 in relation to the Clowne Garden Village assessment. We will use these in our assessment.**
- The proposed development changes do appear to result in minor increases in the traffic generated from each of the elements within the site (with the exception of the retail element increasing from 500sqm to 1,000sqm, increasing two-way vehicle trips by around 50). Cumulatively these increase the total traffic generation in the worst case AM peak by 80 vehicles. **Agreed**
- As the Clowne Garden Village development and its associated proposed mitigation at Treble Bob and M1 J30 are not committed, impacts on these junctions by the Mastin Moor development cannot be dismissed. We advise that as proposed under section 5.3, impact assessment at Treble Bob should be carried out, as well as investigating the likely increase in traffic impact upon M1 J30 as a result of the new development proposals. **The proposed development at Mastin Moor comprises 650 dwellings as well as new local centre. The 650 dwellings is the same as the 2017 submitted scheme and these trips are included within the strategic modelling. The local centre comprising, predominantly health facilities and local shops retail, are considered to impact local junctions only. Trips associated with the local centre are not distributed on the wider highway network, therefore the forecast flows at M1 J30 will remain as in the 2017 assessment - see below information from 2017 which show a very small predicted impact (total approach flows DS-DM = +50 in AM and +35 in PM, both less than 1% total). In terms of the Treble Bob roundabout, we will use the SATURN forecast flow differences to/from A619 to north east of Mastin Moor to determine predicted trips through the junction.**





- The Scoping Note outlines the continued use of the previously agreed SATURN model for trip distribution. This is considered acceptable, as is the proposed 2026 opening year. **Noted**
- We recommend that the TA is agreed in a staged approach, with the overall methodology and elements such as assessment years, trip generation and distribution being agreed prior to further assessment work being carried out. This approach should avoid any abortive work. **Based on the above, the assessment years, trip generation and distribution are agreed. Further comments and information is provided in relation to M1J30 to confirm if more detailed assessment is required. Assessment of the Treble Bob roundabout will be undertaken.**

Please do not hesitate to contact us should you have any queries.

Regards

Steve Freek

Assistant Spatial Planner

Highways England (Area 7), Stirling House, Lakeside Court, Osier Drive, Sherwood Business Park Nottingham NG15 0DS

Tel: 0300 470 4457

Mob: 07712 543047

Email: steve.freek@highwaysengland.co.uk

From: Susanna Bathe [<mailto:Susanna.Bathe@arup.com>]

Sent: 18 August 2020 12:49

To: Planning M <PlanningM@highwaysengland.co.uk>; Freek, Steve <Steve.Freek@highwaysengland.co.uk>

Subject: FW: Mastin Moor - Revised Scheme

Steve, further to my previous email, having just looked at the report I sent, I note the traffic data graph (at 5.2.1) seems to be corrupted (somewhere converting from word to pdf) which is not helpful – apologies.

Please see the attached spreadsheet which shows the data in more detail – this was taken from the Drakewell's C2 database provided by DCC. I would welcome your comments in relation to the TA Scope for the proposed Mastin Moor scheme.

Kind Regards

Susie

Susie Bathe

Senior Transport Planner | Development Planning

Arup

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From: Susanna Bathe

Sent: 05 August 2020 15:17

To: Geoff Blissett (Economy Transport and Environment) <Geoff.Blissett@derbyshire.gov.uk>; Nick Knowles (Economy Transport and Environment) <Nick.Knowles@derbyshire.gov.uk>; planningm@highwaysengland.co.uk

Subject: Mastin Moor - Revised Scheme

Geoff, Nick, Steve,

Further to recent correspondence, we have been asked to prepare a Transport Assessment for a Revised Scheme application for proposed development at Mastin Moor.

The Revised Scheme will essentially be the same as the scheme submitted in 2017 in terms of provision of up to 650 residential dwellings, development parcels and new highway accesses. Some minor modifications to the Local Centre (health, retail) are now proposed.

Please find attached our Transport Assessment Scoping Report for your review. As discussed with Geoff, the methodology is based on the agreed Transport Assessment, submitted in 2017, however we have reviewed and updated elements as considered appropriate.

I would welcome your response to the TA Scoping Report so that we can progress with an agreed methodology.

Please do not hesitate to contact me if you have any queries.

Kind Regards

Susie

Susie Bathe

Senior Transport Planner | Development Planning

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Appendix F

Trip Generation Data and Calcs

Calculation Reference: AUDIT-637801-150806-0803

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
 Category : A - HOUSES PRIVATELY OWNED

MULTI-MODAL VEHICLESSelected regions and areas:

04 EAST ANGLIA	
SF SUFFOLK	1 days
05 EAST MIDLANDS	
LN LINCOLNSHIRE	2 days
06 WEST MIDLANDS	
SH SHROPSHIRE	1 days
07 YORKSHIRE & NORTH LINCOLNSHIRE	
NE NORTH EAST LINCOLNSHIRE	1 days
NY NORTH YORKSHIRE	1 days
08 NORTH WEST	
CH CHESHIRE	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of dwellings
 Actual Range: 108 to 432 (units:)
 Range Selected by User: 100 to 432 (units:)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/07 to 20/05/14

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	2 days
Tuesday	2 days
Thursday	2 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	7 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	4
Edge of Town	3

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	4
No Sub Category	3

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:Use Class:

C3

7 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000	1 days
10,001 to 15,000	1 days
15,001 to 20,000	3 days
20,001 to 25,000	2 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	1 days
50,001 to 75,000	1 days
75,001 to 100,000	1 days
100,001 to 125,000	3 days
125,001 to 250,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	1 days
1.1 to 1.5	6 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No

7 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1	CH-03-A-06	SEMI-DET./BUNGALOWS	CHESHIRE
	CREWE ROAD		
	CREWE		
	Suburban Area (PPS6 Out of Centre)		
	No Sub Category		
	Total Number of dwellings:	129	
	Survey date: TUESDAY	14/10/08	Survey Type: MANUAL
2	LN-03-A-01	MIXED HOUSES	LINCOLNSHIRE
	BRANT ROAD		
	BRACEBRIDGE		
	LINCOLN		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	150	
	Survey date: TUESDAY	15/05/07	Survey Type: MANUAL
3	LN-03-A-02	MIXED HOUSES	LINCOLNSHIRE
	HYKEHAM ROAD		
	LINCOLN		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total Number of dwellings:	186	
	Survey date: MONDAY	14/05/07	Survey Type: MANUAL
4	NE-03-A-02	SEMI DETACHED & DETACHED	NORTH EAST LINCOLNSHIRE
	HANOVER WALK		
	SCUNTHORPE		
	Edge of Town		
	No Sub Category		
	Total Number of dwellings:	432	
	Survey date: MONDAY	12/05/14	Survey Type: MANUAL
5	NY-03-A-06	BUNGALOWS & SEMI DET.	NORTH YORKSHIRE
	HORSEFAIR		
	BOROUGHBRIDGE		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total Number of dwellings:	115	
	Survey date: FRIDAY	14/10/11	Survey Type: MANUAL
6	SF-03-A-02	SEMI DET./TERRACED	SUFFOLK
	STOKE PARK DRIVE		
	MAIDENHALL		
	IPSWICH		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	230	
	Survey date: THURSDAY	24/05/07	Survey Type: MANUAL
7	SH-03-A-04	TERRACED	SHROPSHIRE
	ST MICHAEL'S STREET		
	SHREWSBURY		
	Suburban Area (PPS6 Out of Centre)		
	No Sub Category		
	Total Number of dwellings:	108	
	Survey date: THURSDAY	11/06/09	Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED

MULTI-MODAL TOTAL PEOPLE**Calculation factor: 1 DWELLS****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	193	0.133	7	193	0.359	7	193	0.492
08:00 - 09:00	7	193	0.237	7	193	0.713	7	193	0.950
09:00 - 10:00	7	193	0.249	7	193	0.319	7	193	0.568
10:00 - 11:00	7	193	0.244	7	193	0.304	7	193	0.548
11:00 - 12:00	7	193	0.264	7	193	0.274	7	193	0.538
12:00 - 13:00	7	193	0.279	7	193	0.281	7	193	0.560
13:00 - 14:00	7	193	0.247	7	193	0.239	7	193	0.486
14:00 - 15:00	7	193	0.298	7	193	0.299	7	193	0.597
15:00 - 16:00	7	193	0.618	7	193	0.361	7	193	0.979
16:00 - 17:00	7	193	0.516	7	193	0.294	7	193	0.810
17:00 - 18:00	7	193	0.541	7	193	0.350	7	193	0.891
18:00 - 19:00	7	193	0.399	7	193	0.359	7	193	0.758
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			4.025			4.152			8.177

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP*FACT$. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	108 - 432 (units:)
Survey date date range:	01/01/07 - 20/05/14
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Dwellings **650**

Mode	Car Driver			Car Passenger			Bus			Walk			Cycle		
Mode Share	62.9%			10.6%			15.3%			8.9%			1.0%		
	Arrivals	Departure	Total	Arrivals	Departure	Total	Arrivals	Departure	Total	Arrivals	Departure	Total	Arrivals	Departure	Total
AM Peak	97	292	388	16	49	65	24	71	94	14	41	55	2	5	6
PM Peak	221	143	364	37	24	61	54	35	89	31	20	52	4	2	6

Trip Rate per Person	AM			PM		
	Arrivals	Departure	Total	Arrivals	Departure	Total
Trip Rate per Person	0.237	0.713	0.95	0.541	0.35	0.891
Trip Generation	154	463	618	352	228	579

Vehicular Trip Rate	AM			PM		
	Arrivals	Departure	Total	Arrivals	Departure	Total
Trip Rate per Person	0.148	0.445	0.593	0.338	0.218	0.556
Trip Generation	96	289	385	220	142	361

QS701EW - Method of travel to work

Source

ONS Crown Copyright Reserved [from Nomis on 13 October 2016]

Population

All usual residents aged 16 to 74

Units

Persons

date	2011													
geography	Chesterfield, Derbyshire, East Midlands, England													
measures	value													
Method of Travel to Work	All categories: Method of travel to work	Work mainly at or from home	Underground, metro, light rail, tram	Train	Bus, minibus or coach	Taxi	Motorcycle, scooter or moped	Driving a car or van	Passenger in a car or van	Bicycle	On foot	Other method of travel to work	Not in employment	
England	38,881,374	1,349,568	1,027,625	1,343,684	1,886,539	131,465	206,550	14,345,882	1,264,553	742,675	2,701,453	162,727	13,718,653	
East Midlands	3,336,532	108,977	6,537	28,777	132,073	8,823	15,557	1,409,030	129,471	58,995	236,719	11,582	1,189,991	
Derbyshire	567,798	19,980	688	6,479	17,788	1,372	3,216	257,675	21,204	5,606	36,145	1,858	195,787	
Chesterfield Rural	1,326	19	3	2	95	7	9	440	74	7	62	4	604	

	Chesterfield Rural	Derbyshire	East Midlands	England
PT	15.3%	7.5%	8.7%	18.6%
Motorcycle / scooter	1.3%	0.9%	0.8%	0.9%
Driving car/van	62.9%	73.6%	69.5%	60.7%
Passenger car/van	10.6%	6.1%	6.4%	6.4%
bicycle	1.0%	1.6%	2.9%	3.1%
foot	8.9%	10.3%	11.7%	11.4%

Calculation Reference: AUDIT-701005-161012-1030

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 05 - HEALTH
 Category : G - GP SURGERIES
 MULTI-MODAL TOTAL PEOPLE

Selected regions and areas:

02	SOUTH EAST	
	BU BUCKINGHAMSHIRE	2 days
03	SOUTH WEST	
	GS GLOUCESTERSHIRE	1 days
	SM SOMERSET	1 days
04	EAST ANGLIA	
	NF NORFOLK	1 days
05	EAST MIDLANDS	
	LN LINCOLNSHIRE	1 days
	NT NOTTINGHAMSHIRE	1 days
06	WEST MIDLANDS	
	WK WARWICKSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	NO NORTH LINCOLNSHIRE	1 days
	NY NORTH YORKSHIRE	1 days
	WY WEST YORKSHIRE	1 days
08	NORTH WEST	
	CH CHESHIRE	1 days
09	NORTH	
	TW TYNE & WEAR	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area
 Actual Range: 350 to 1592 (units: sqm)
 Range Selected by User: 200 to 1592 (units: sqm)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/08 to 24/06/15

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	4 days
Wednesday	3 days
Thursday	3 days
Friday	3 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	13 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Edge of Town Centre	4
Suburban Area (PPS6 Out of Centre)	6
Edge of Town	3

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Filtering Stage 3 selection:

Use Class:

D1

13 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

5,001 to 10,000	2 days
10,001 to 15,000	4 days
15,001 to 20,000	2 days
20,001 to 25,000	2 days
25,001 to 50,000	3 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	1 days
25,001 to 50,000	1 days
75,001 to 100,000	3 days
100,001 to 125,000	1 days
125,001 to 250,000	4 days
250,001 to 500,000	2 days
500,001 or More	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.5 or Less	1 days
0.6 to 1.0	4 days
1.1 to 1.5	8 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

Yes	1 days
No	12 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

1	BU-05-G-01 HANNON ROAD	GP SURGERY	BUCKINGHAMSHIRE
	AYLESBURY Edge of Town Residential Zone Total Gross floor area: 620 sqm Survey date: THURSDAY 03/12/09		Survey Type: MANUAL
2	BU-05-G-02 HINDHEAD KNOLL WALNUT TREE MILTON KEYNES Suburban Area (PPS6 Out of Centre) Residential Zone Total Gross floor area: 601 sqm Survey date: TUESDAY 19/10/10	GP SURGERY	BUCKINGHAMSHIRE
3	CH-05-G-03 HEATH LANE BOUGHTON HEATH CHESTER Suburban Area (PPS6 Out of Centre) Residential Zone Total Gross floor area: 800 sqm Survey date: TUESDAY 29/05/12	GP SURGERY	CHESHIRE
4	GS-05-G-01 ABBOTSWOOD ROAD BROCKWORTH GLOUCESTER Edge of Town Residential Zone Total Gross floor area: 475 sqm Survey date: TUESDAY 27/04/10	GP SURGERY	GLOUCESTERSHIRE
5	LN-05-G-01 95 MONKS ROAD	GP SURGERY	LINCOLNSHIRE
	LINCOLN Edge of Town Centre Residential Zone Total Gross floor area: 506 sqm Survey date: TUESDAY 25/06/13		Survey Type: MANUAL
6	NF-05-G-02 OAK STREET	GP SURGERY	NORFOLK
	NORWICH Edge of Town Centre Residential Zone Total Gross floor area: 575 sqm Survey date: FRIDAY 24/09/10		Survey Type: MANUAL
7	NO-05-G-02 FERRY ROAD WEST	GP SURGERY	NORTH LINCOLNSHIRE
	SCUNTHORPE Edge of Town Residential Zone Total Gross floor area: 350 sqm Survey date: THURSDAY 17/09/09		Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

8	NT-05-G-01	GP SURGERY		NOTTINGHAMSHIRE
	MANSFIELD ROAD			
	NOTTINGHAM			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Gross floor area:	460 sqm		
	Survey date: WEDNESDAY	24/06/15		Survey Type: MANUAL
9	NY-05-G-01	GP SURGERY		NORTH YORKSHIRE
	CHAPEL STREET			
	THIRSK			
	Edge of Town Centre			
	No Sub Category			
	Total Gross floor area:	900 sqm		
	Survey date: WEDNESDAY	12/10/11		Survey Type: MANUAL
10	SM-05-G-01	GP SURGERY		SOMERSET
	MANTLE STREET			
	WELLINGTON			
	NEAR TAUNTON			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Gross floor area:	1592 sqm		
	Survey date: FRIDAY	06/07/12		Survey Type: MANUAL
11	TW-05-G-01	GP SURGERY		TYNE & WEAR
	DURHAM ROAD			
	SUNDERLAND			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Gross floor area:	600 sqm		
	Survey date: FRIDAY	30/11/12		Survey Type: MANUAL
12	WK-05-G-01	GP SURGERY		WARWICKSHIRE
	COURT STREET			
	LEAMINGTON SPA			
	Edge of Town Centre			
	No Sub Category			
	Total Gross floor area:	530 sqm		
	Survey date: THURSDAY	25/10/12		Survey Type: MANUAL
13	WY-05-G-01	GP SURGERY		WEST YORKSHIRE
	BURLEY ROAD			
	BURLEY			
	LEEDS			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total Gross floor area:	940 sqm		
	Survey date: WEDNESDAY	09/06/10		Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 05 - HEALTH/G - GP SURGERIES

MULTI-MODAL TOTAL PEOPLE

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	12	707	1.496	12	707	0.294	12	707	1.790
08:00 - 09:00	13	688	6.537	13	688	3.162	13	688	9.699
09:00 - 10:00	13	688	7.599	13	688	6.872	13	688	14.471
10:00 - 11:00	13	688	7.140	13	688	7.241	13	688	14.381
11:00 - 12:00	13	688	6.247	13	688	6.649	13	688	12.896
12:00 - 13:00	13	688	4.917	13	688	5.755	13	688	10.672
13:00 - 14:00	13	688	3.542	13	688	3.632	13	688	7.174
14:00 - 15:00	13	688	5.911	13	688	5.218	13	688	11.129
15:00 - 16:00	13	688	6.883	13	688	6.660	13	688	13.543
16:00 - 17:00	13	688	4.738	13	688	6.202	13	688	10.940
17:00 - 18:00	13	688	2.950	13	688	4.660	13	688	7.610
18:00 - 19:00	13	688	0.391	13	688	1.888	13	688	2.279
19:00 - 20:00	1	620	0.000	1	620	0.000	1	620	0.000
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:		58.351			58.233			116.584	

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

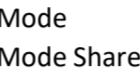
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP*FACT$. Trip rates are then rounded to 3 decimal places.

Parameter summary

Trip rate parameter range selected:	350 - 1592 (units: sqm)
Survey date range:	01/01/08 - 24/06/15
Number of weekdays (Monday-Friday):	13
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Trip Rate Parameter: Gross floor area
TRIP RATE for Land Use 05 - HEALTH/G - GP SURGERIES
Calculation Factor: 1000 sqm
Count Type: TOTAL PEOPLE

Mode
Mode ShareMode
Mode ShareMode
Mode Share

Calculation Reference: AUDIT-701005-200722-0726

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 01 - RETAIL
 Category : I - SHOPPING CENTRE - LOCAL SHOPS
 MULTI-MODAL VEHICLES

Selected regions and areas:

05	EAST MIDLANDS	
	LE LEICESTERSHIRE	1 days
06	WEST MIDLANDS	
	SH SHROPSHIRE	1 days
08	NORTH WEST	
	CH CHESHIRE	2 days
09	NORTH	
	TV TEES VALLEY	2 days
	TW TYNE & WEAR	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area
 Actual Range: 260 to 1840 (units: sqm)
 Range Selected by User: 240 to 1840 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/12 to 28/10/14

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	1 days
Tuesday	2 days
Wednesday	1 days
Thursday	2 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	7 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Edge of Town	2
Neighbourhood Centre (PPS6 Local Centre)	5

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	7
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This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

A1	1 days
----	--------

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

5,001 to 10,000	1 days
10,001 to 15,000	1 days
20,001 to 25,000	2 days
25,001 to 50,000	3 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

100,001 to 125,000	3 days
125,001 to 250,000	1 days
250,001 to 500,000	3 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	2 days
1.1 to 1.5	5 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Petrol filling station:

Included in the survey count	0 days
Excluded from count or no filling station	7 days

This data displays the number of surveys within the selected set that include petrol filling station activity, and the number of surveys that do not.

Travel Plan:

No	7 days
----	--------

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	7 days
-----------------	--------

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1	CH-01-I-02	LOCAL SHOPS		CHESHIRE
	CHRISTLETON ROAD			
	CHESTER			
	BOUGHTON HEATH			
	Neighbourhood Centre (PPS6 Local Centre)			
	Residential Zone			
	Total Gross floor area:	260 sqm		
	Survey date: TUESDAY	15/05/12	Survey Type: MANUAL	
2	CH-01-I-03	LOCAL SHOPS		CHESHIRE
	MILL LANE			
	CHESTER			
	BACHE			
	Neighbourhood Centre (PPS6 Local Centre)			
	Residential Zone			
	Total Gross floor area:	365 sqm		
	Survey date: THURSDAY	17/05/12	Survey Type: MANUAL	
3	LE-01-I-02	LOCAL SHOPS		LEICESTERSHIRE
	RYDER ROAD			
	LEICESTER			
	Edge of Town			
	Residential Zone			
	Total Gross floor area:	550 sqm		
	Survey date: TUESDAY	28/10/14	Survey Type: MANUAL	
4	SH-01-I-02	LOCAL SHOPS		SHROPSHIRE
	WREKIN DRIVE			
	TELFORD			
	DONNINGTON			
	Edge of Town			
	Residential Zone			
	Total Gross floor area:	900 sqm		
	Survey date: THURSDAY	24/10/13	Survey Type: MANUAL	
5	TV-01-I-03	LOCAL SHOPS		TEES VALLEY
	ACKLAM ROAD			
	MIDDLESBROUGH			
	ACKLAM			
	Neighbourhood Centre (PPS6 Local Centre)			
	Residential Zone			
	Total Gross floor area:	1840 sqm		
	Survey date: FRIDAY	04/10/13	Survey Type: MANUAL	
6	TV-01-I-04	LOCAL SHOPS		TEES VALLEY
	CARGO FLEET LANE			
	MIDDLESBROUGH			
	ORMESBY			
	Neighbourhood Centre (PPS6 Local Centre)			
	Residential Zone			
	Total Gross floor area:	585 sqm		
	Survey date: MONDAY	07/10/13	Survey Type: MANUAL	
7	TW-01-I-02	LOCAL SHOPS		TYNE & WEAR
	DURHAM ROAD			
	SUNDERLAND			
	BARNES PARK			
	Neighbourhood Centre (PPS6 Local Centre)			
	Residential Zone			
	Total Gross floor area:	540 sqm		
	Survey date: WEDNESDAY	21/11/12	Survey Type: MANUAL	

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

Arup Rose Wharf Leeds

Licence No: 701005

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS

MULTI-MODAL VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	1.296	1	540	1.296	1	540	2.592
07:00 - 08:00	7	720	5.040	7	720	4.286	7	720	9.326
08:00 - 09:00	7	720	5.556	7	720	5.317	7	720	10.873
09:00 - 10:00	7	720	6.726	7	720	6.032	7	720	12.758
10:00 - 11:00	7	720	6.528	7	720	5.913	7	720	12.441
11:00 - 12:00	7	720	7.698	7	720	7.976	7	720	15.674
12:00 - 13:00	7	720	9.623	7	720	8.968	7	720	18.591
13:00 - 14:00	7	720	7.976	7	720	7.758	7	720	15.734
14:00 - 15:00	7	720	6.964	7	720	7.321	7	720	14.285
15:00 - 16:00	7	720	6.389	7	720	6.825	7	720	13.214
16:00 - 17:00	7	720	6.845	7	720	6.706	7	720	13.551
17:00 - 18:00	7	720	7.282	7	720	8.036	7	720	15.318
18:00 - 19:00	7	720	7.857	7	720	8.393	7	720	16.250
19:00 - 20:00	5	883	7.633	5	883	7.384	5	883	15.017
20:00 - 21:00	5	883	5.436	5	883	5.844	5	883	11.280
21:00 - 22:00	5	883	3.851	5	883	4.507	5	883	8.358
22:00 - 23:00									
23:00 - 24:00									
Total Rates:		102.700			102.562			205.262	

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP*FACT$. Trip rates are then rounded to 3 decimal places.

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Parameter summary

Trip rate parameter range selected:	260 - 1840 (units: sqm)
Survey date range:	01/01/12 - 28/10/14
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Arup Rose Wharf Leeds

Licence No: 701005

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS

MULTI-MODAL TOTAL PEOPLE

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	6.667	1	540	5.926	1	540	12.593
07:00 - 08:00	7	720	9.782	7	720	7.817	7	720	17.599
08:00 - 09:00	7	720	16.508	7	720	16.766	7	720	33.274
09:00 - 10:00	7	720	15.258	7	720	13.175	7	720	28.433
10:00 - 11:00	7	720	15.417	7	720	14.504	7	720	29.921
11:00 - 12:00	7	720	17.004	7	720	17.262	7	720	34.266
12:00 - 13:00	7	720	20.972	7	720	20.079	7	720	41.051
13:00 - 14:00	7	720	18.095	7	720	18.016	7	720	36.111
14:00 - 15:00	7	720	16.627	7	720	17.123	7	720	33.750
15:00 - 16:00	7	720	19.702	7	720	20.536	7	720	40.238
16:00 - 17:00	7	720	15.675	7	720	15.377	7	720	31.052
17:00 - 18:00	7	720	14.563	7	720	16.706	7	720	31.269
18:00 - 19:00	7	720	16.746	7	720	17.480	7	720	34.226
19:00 - 20:00	5	883	15.402	5	883	15.379	5	883	30.781
20:00 - 21:00	5	883	10.442	5	883	11.189	5	883	21.631
21:00 - 22:00	5	883	8.086	5	883	8.788	5	883	16.874
22:00 - 23:00									
23:00 - 24:00									
Total Rates:		236.946			236.123				473.069

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP*FACT$. Trip rates are then rounded to 3 decimal places.

Count Type: TOTAL PEOPLE

Mode	Car Driver			Car Passenger			Bus/Rail			Walk			Cycle		
Mode Share	44.0%			12.7%			1.8%			40.3%			1.3%		
	Arrivals	Dep	Total				Arrivals	Dep	Total	Arrivals	Dep	Total	Arrivals	Dep	Total
	73	74	146	73	74	15	3	3	6	67	68	134	2	2	4
	64	73	137	64	73	137	3	3	6	59	67	126	2	2	4

A pie chart illustrating the percentage of road deaths by mode of transport. The chart is divided into six segments: Pedestrians (40.3%, grey), Single Vehicle Occupants (31.3%, blue), Multi Vehicle Occupants (25.3%, light blue), Cyclists (1.3%, pink), Bus/Tram Passengers (1.7%, light green), and Total Rail Passengers (0.1%, very light green). Callout boxes with leader lines point to each segment, providing the category name and its percentage.

Mode of Transport	Percentage
Pedestrians	40.3 %
Single Vehicle Occupants	31.3 %
Multi Vehicle Occupants	25.3 %
Cyclists	1.3 %
Bus/Tram Passengers	1.7 %
Total Rail Passengers	0.1 %

TRICS Mode Share		Calculated mode Share	
Single Car	31.30%	Vehicle Driver	43.95%
Multi Car	25.30%	Vehicle Passenger	12.65%
Cyclists	1.30%	Cyclists	1.30%
Peds	40.30%	Peds	40.30%
Bus	1.70%	Bus/Rail	1.70%
Rail	0.10%	Rail	0.10%
		Total	100.00%

Calculation Reference: AUDIT-701005-200722-0747

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 05 - HEALTH
 Category : F - CARE HOME (ELDERLY RESIDENTIAL)
 MULTI-MODAL VEHICLES

Selected regions and areas:

06	WEST MIDLANDS	
	WK WARWICKSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	NY NORTH YORKSHIRE	1 days
08	NORTH WEST	
	LC LANCASHIRE	1 days
09	NORTH	
	TW TYNE & WEAR	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Number of residents
 Actual Range: 31 to 52 (units:)
 Range Selected by User: 17 to 180 (units:)

Parking Spaces Range: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/12 to 02/05/19

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	1 days
Tuesday	1 days
Thursday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	4 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	2
Edge of Town	2

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	4
------------------	---

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Secondary Filtering selection:

Use Class:

C2	4 days
----	--------

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Arup Rose Wharf Leeds

Licence No: 701005

Secondary Filtering selection (Cont.):

Population within 1 mile:

5,001 to 10,000	2 days
15,001 to 20,000	1 days
25,001 to 50,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

25,001 to 50,000	1 days
75,001 to 100,000	1 days
125,001 to 250,000	1 days
250,001 to 500,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	3 days
1.1 to 1.5	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	4 days
----	--------

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	4 days
-----------------	--------

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1	LC-05-F-02 LYTHAM ROAD BLACKPOOL SQUIRES GATE Edge of Town Residential Zone Total Number of residents: <i>Survey date: TUESDAY</i>	NURSING HOME 31 27/09/16	LANCASHIRE <i>Survey Type: MANUAL</i>
2	NY-05-F-05 SEAGRIM CRESCENT RICHMOND Edge of Town Residential Zone Total Number of residents: <i>Survey date: MONDAY</i>	NURSING HOME 37 04/03/19	NORTH YORKSHIRE <i>Survey Type: MANUAL</i>
3	TW-05-F-03 MOORE STREET GATESHEAD FELLING SHORE Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of residents: <i>Survey date: THURSDAY</i>	NURSING HOME 52 02/05/19	TYNE & WEAR <i>Survey Type: MANUAL</i>
4	WK-05-F-01 CLARENDON SQUARE LEAMINGTON SPA Suburban Area (PPS6 Out of Centre) Residential Zone Total Number of residents: <i>Survey date: THURSDAY</i>	NURSING HOME 32 25/10/12	WARWICKSHIRE <i>Survey Type: MANUAL</i>

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

Arup Rose Wharf Leeds

Licence No: 701005

TRIP RATE for Land Use 05 - HEALTH/F - CARE HOME (ELDERLY RESIDENTIAL)

MULTI-MODAL VEHICLES

Calculation factor: 1 RESIDE

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	38	0.033	4	38	0.046	4	38	0.079
08:00 - 09:00	4	38	0.059	4	38	0.066	4	38	0.125
09:00 - 10:00	4	38	0.099	4	38	0.033	4	38	0.132
10:00 - 11:00	4	38	0.046	4	38	0.099	4	38	0.145
11:00 - 12:00	4	38	0.086	4	38	0.105	4	38	0.191
12:00 - 13:00	4	38	0.066	4	38	0.059	4	38	0.125
13:00 - 14:00	4	38	0.118	4	38	0.033	4	38	0.151
14:00 - 15:00	4	38	0.079	4	38	0.138	4	38	0.217
15:00 - 16:00	4	38	0.092	4	38	0.105	4	38	0.197
16:00 - 17:00	4	38	0.066	4	38	0.079	4	38	0.145
17:00 - 18:00	4	38	0.072	4	38	0.079	4	38	0.151
18:00 - 19:00	4	38	0.059	4	38	0.072	4	38	0.131
19:00 - 20:00	4	38	0.039	4	38	0.046	4	38	0.085
20:00 - 21:00	4	38	0.033	4	38	0.039	4	38	0.072
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.947			0.999			1.946

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: $COUNT/TRP*FACT$. Trip rates are then rounded to 3 decimal places.

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Parameter summary

Trip rate parameter range selected:	31 - 52 (units:)
Survey date range:	01/01/12 - 02/05/19
Number of weekdays (Monday-Friday):	4
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Arup Rose Wharf Leeds

Licence No: 701005

TRIP RATE for Land Use 05 - HEALTH/F - CARE HOME (ELDERLY RESIDENTIAL)

MULTI-MODAL TOTAL PEOPLE

Calculation factor: 1 RESIDE

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate	No. Days	Ave. RESIDE	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	38	0.072	4	38	0.072	4	38	0.144
08:00 - 09:00	4	38	0.145	4	38	0.099	4	38	0.244
09:00 - 10:00	4	38	0.178	4	38	0.072	4	38	0.250
10:00 - 11:00	4	38	0.112	4	38	0.164	4	38	0.276
11:00 - 12:00	4	38	0.125	4	38	0.125	4	38	0.250
12:00 - 13:00	4	38	0.118	4	38	0.125	4	38	0.243
13:00 - 14:00	4	38	0.197	4	38	0.053	4	38	0.250
14:00 - 15:00	4	38	0.112	4	38	0.237	4	38	0.349
15:00 - 16:00	4	38	0.138	4	38	0.178	4	38	0.316
16:00 - 17:00	4	38	0.105	4	38	0.138	4	38	0.243
17:00 - 18:00	4	38	0.099	4	38	0.132	4	38	0.231
18:00 - 19:00	4	38	0.145	4	38	0.158	4	38	0.303
19:00 - 20:00	4	38	0.059	4	38	0.138	4	38	0.197
20:00 - 21:00	4	38	0.039	4	38	0.059	4	38	0.098
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.644			1.750			3.394

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

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Count Type: TOTAL PEOPLE

[illegible]

A pie chart illustrating the percentage distribution of road deaths by mode of transport. The chart is divided into seven segments, each with a label and a percentage value. The segments are: Single Vehicle Occupants (45.7%, blue), Multi Vehicle Occupants (24.4%, light blue), Pedestrians (19%, grey), Cyclists (1.6%, pink), Total Rail Passengers (3.7%, yellow), Bus/Tram Passengers (5.6%, light green), and an unlabeled segment (0.9%, dark blue).

Mode of Transport	Percentage
Single Vehicle Occupants	45.7 %
Multi Vehicle Occupants	24.4 %
Pedestrians	19 %
Cyclists	1.6 %
Total Rail Passengers	3.7 %
Bus/Tram Passengers	5.6 %
Unlabeled	0.9 %

TRICS Mode Share		Calculated mode Share	
Single Car	45.70%	Vehicle Driver	57.90%
Multi Car	24.40%	Vehicle Passenger	12.20%
Cyclists	1.60%	Cyclists	1.60%
Peds	19.00%	Peds	19.00%
Bus	5.60%	Bus	5.60%
Rail	3.70%	Rail	3.70%
		Total	100.00%

Appendix G

Junction Models

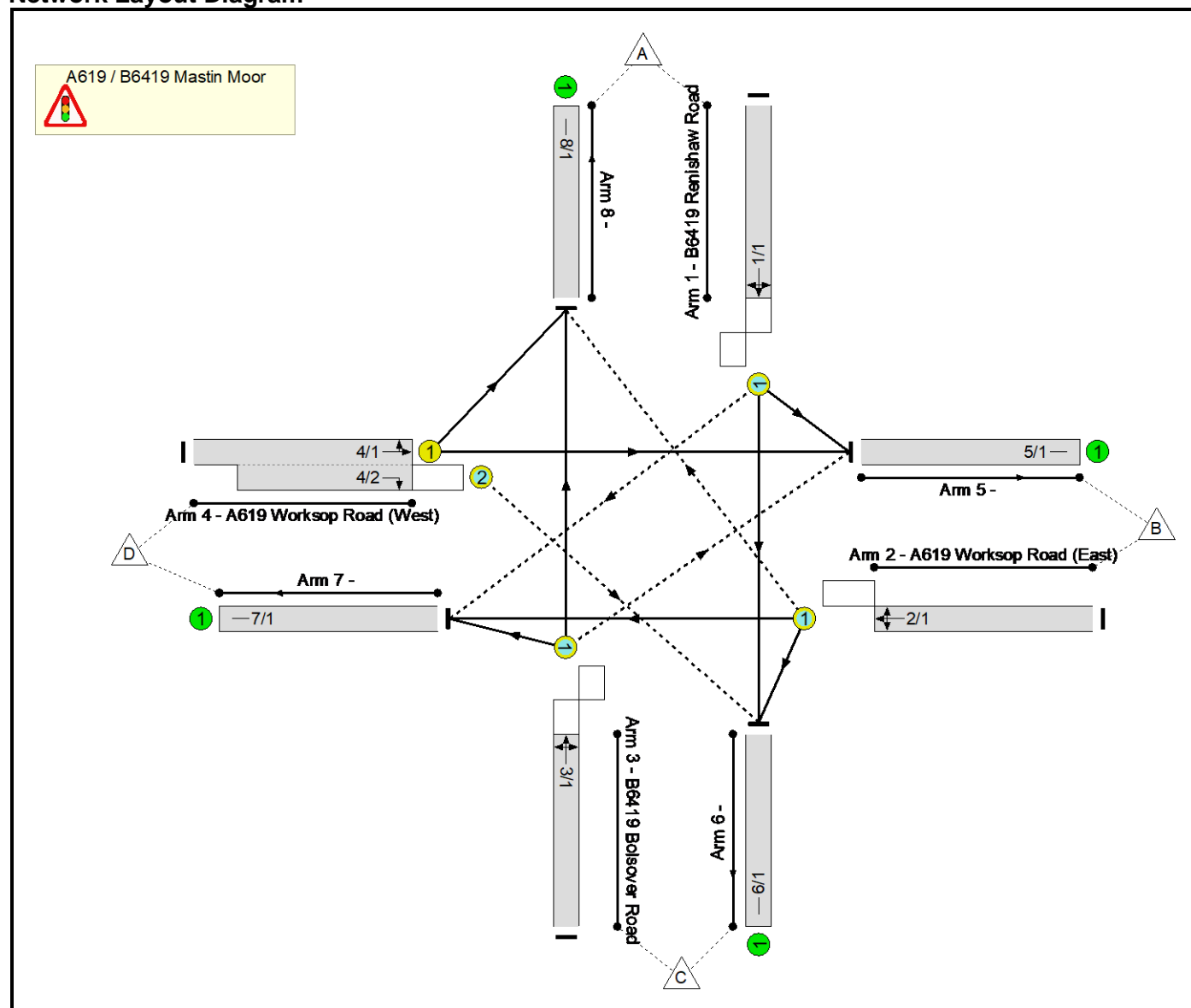
Full Input Data And Results

Full Input Data And Results

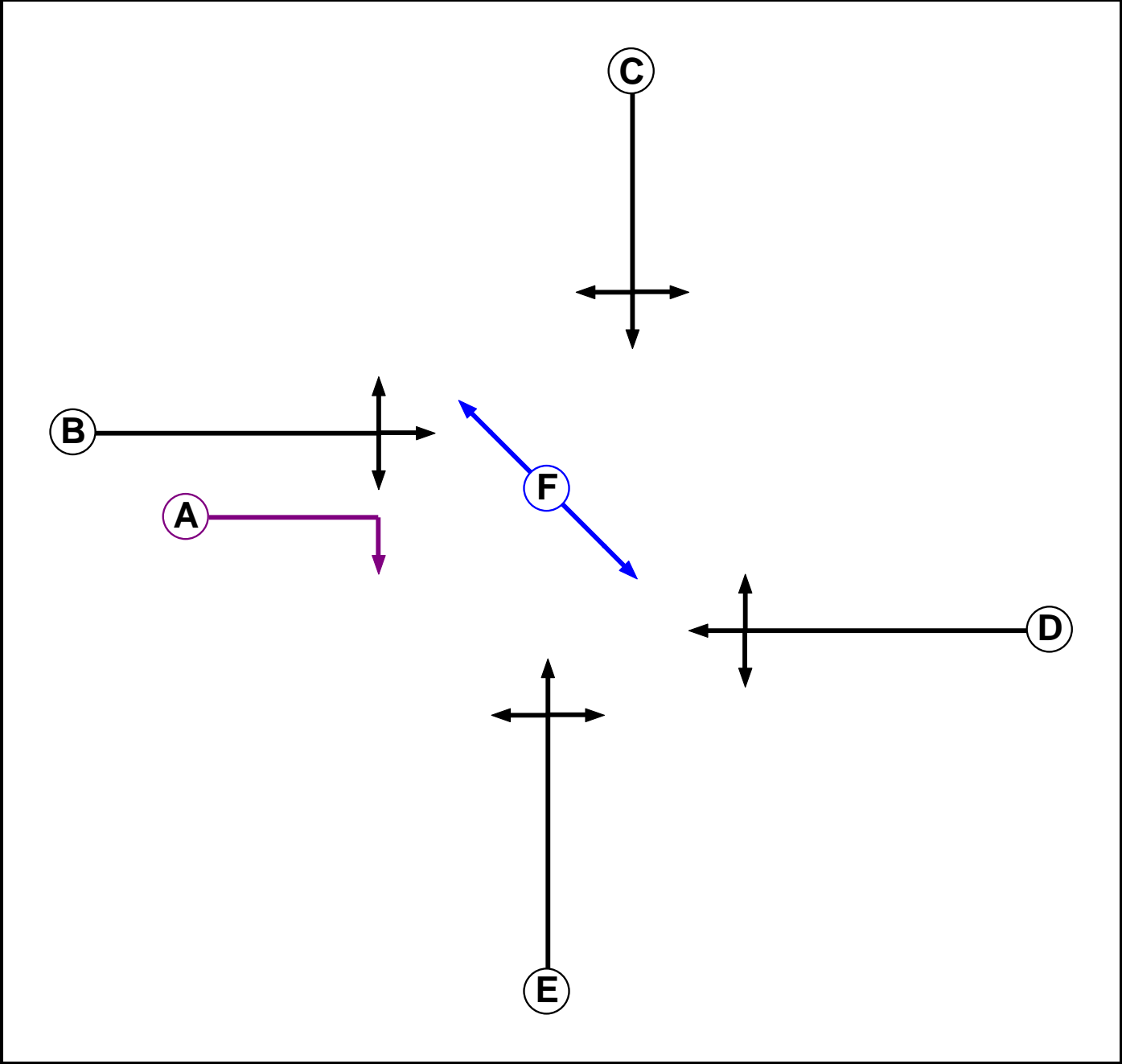
User and Project Details

Project:	Mastin Moor
Title:	A619 Worksoo Rd/B6419 Bolsover Rd/Renishaw Road
Location:	
Additional detail:	
File name:	2020-09-22 A619_B6419_Bolsover Road Signals_DM.lsg3x
Author:	
Company:	Arup
Address:	Leeds Office

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Ind. Arrow	B	4	4
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		7	7
F	Pedestrian		5	5

Full Input Data And Results

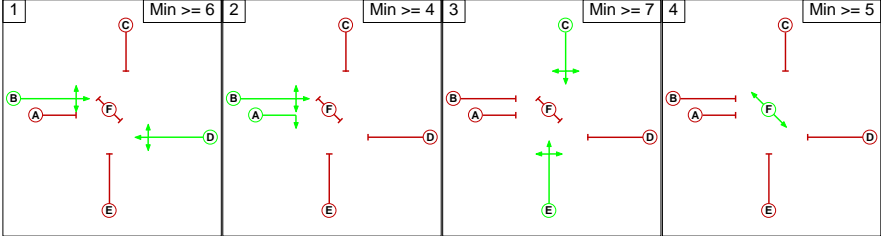
Phase Intergreens Matrix

Terminating Phase	Starting Phase						
		A	B	C	D	E	F
	A		-	6	6	6	7
	B	-		6	-	7	7
	C	7	7		6	-	8
	D	5	-	7		6	7
	E	6	6	-	6		8
	F	11	11	11	11	11	

Phases in Stage

Stage No.	Phases in Stage
1	B D
2	A B
3	C E
4	F

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

From Stage	To Stage				
		1	2	3	4
	1		5	7	7
	2	6		7	7
	3	7	7		8
	4	11	11	11	

Full Input Data And Results

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'AM BASE'	08:00	09:00	01:00	
2: 'PM BASE'	17:00	18:00	01:00	
3: 'AM DM 2026'	08:00	09:00	01:00	
4: 'PM DM 2026'	17:00	18:00	01:00	
5: 'AM DS 2026'	08:00	09:00	01:00	
6: 'PM DS 2026'	17:00	18:00	01:00	

Traffic Flows, Desired

Scenario 1: 'AM BASE' (FG1: 'AM BASE', Plan 1: 'Network Control Plan 1')

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	0	156	124	280
	B	0	0	65	576	641
	C	80	70	0	2	152
	D	88	579	0	0	667
	Tot.	168	649	221	702	1740

Scenario 2: 'PM BASE' (FG2: 'PM BASE', Plan 1: 'Network Control Plan 1')

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	27	109	77	213
	B	0	0	86	625	711
	C	116	84	0	43	243
	D	128	686	0	0	814
	Tot.	244	797	195	745	1981

Scenario 3: 'AM DM 2026' (FG3: 'AM DM 2026', Plan 1: 'Network Control Plan 1')

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	0	215	128	343
	B	0	0	64	723	787
	C	116	79	0	20	215
	D	75	831	0	0	906
	Tot.	191	910	279	871	2251

Full Input Data And Results

Scenario 4: 'PM DM 2026' (FG4: 'PM DM 2026', Plan 1: 'Network Control Plan 1')

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	39	148	127	314
	B	0	0	79	765	844
	C	176	65	0	37	278
	D	153	838	0	0	991
	Tot.	329	942	227	929	2427

Scenario 5: 'AM DS 2026' (FG5: 'AM DS 2026', Plan 1: 'Network Control Plan 1')

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	0	216	135	351
	B	0	0	97	714	811
	C	124	163	0	0	287
	D	87	820	4	0	911
	Tot.	211	983	317	849	2360

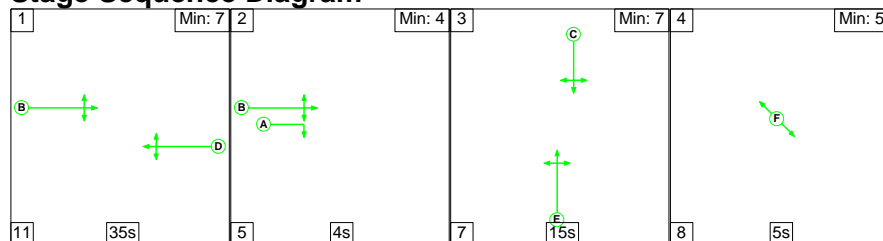
Scenario 6: 'PM DS 2026' (FG6: 'PM DS 2026', Plan 1: 'Network Control Plan 1')

Desired Flow :

	Destination					
		A	B	C	D	Tot.
Origin	A	0	43	161	106	310
	B	0	0	117	752	869
	C	233	121	0	0	354
	D	137	825	4	0	966
	Tot.	370	989	282	858	2499

Scenario 1: 'AM BASE' (FG1: 'AM BASE', Plan 1: 'Network Control Plan 1')

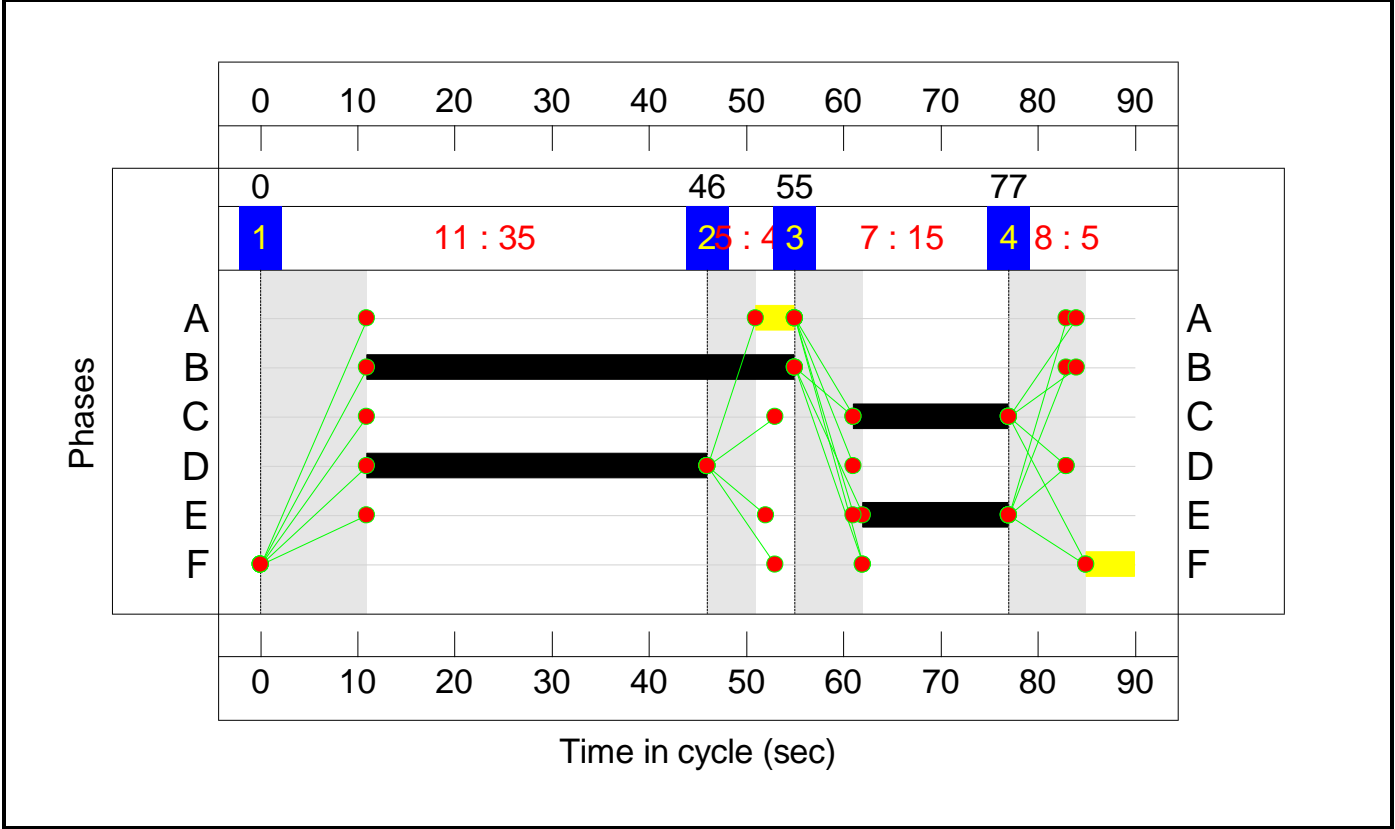
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	35	4	15	5
Change Point	0	46	55	77

Signal Timings Diagram

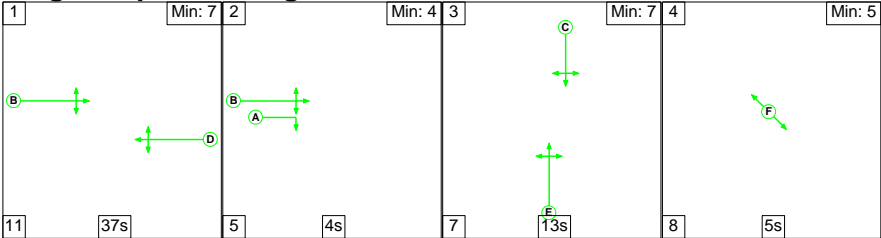


Network Results

Full Input Data And Results

Scenario 2: 'PM BASE' (FG2: 'PM BASE', Plan 1: 'Network Control Plan 1')

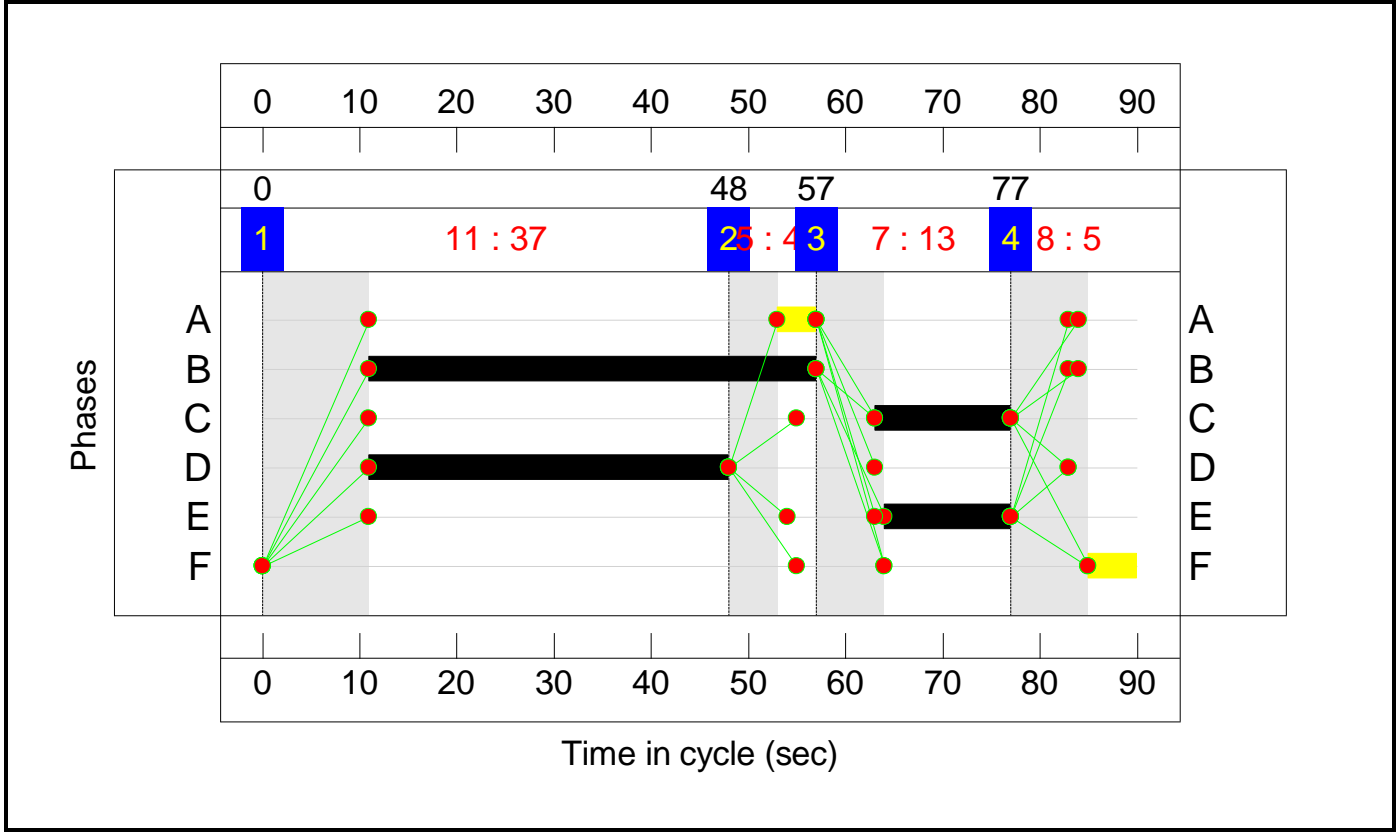
Stage Sequence Diagram



Stage Timings

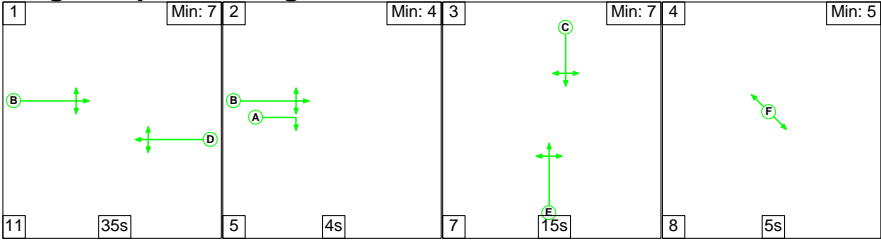
Stage	1	2	3	4
Duration	37	4	13	5
Change Point	0	48	57	77

Signal Timings Diagram



Network Results

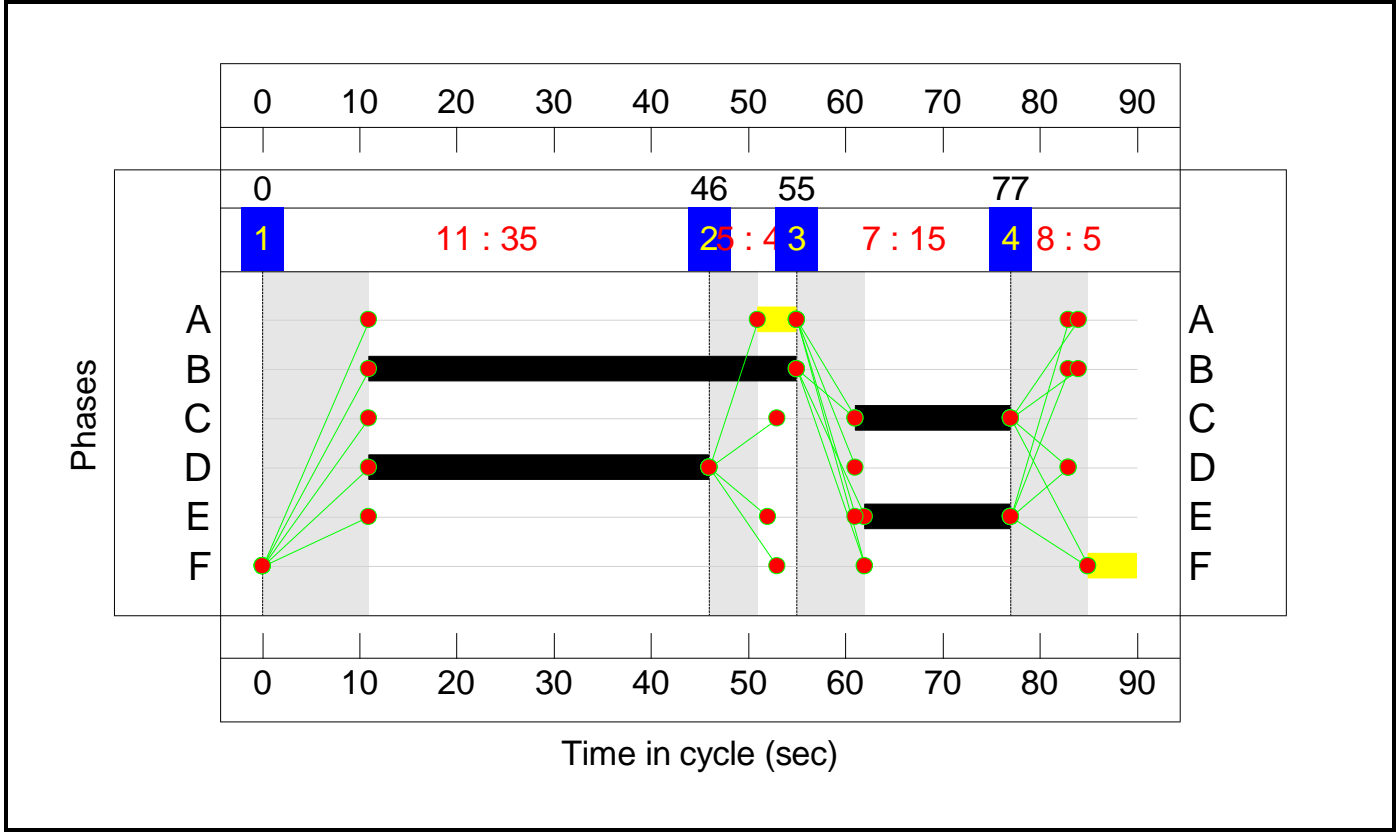
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	35	4	15	5
Change Point	0	46	55	77

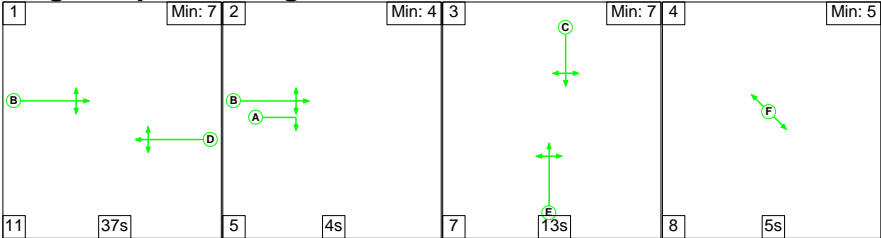
Signal Timings Diagram



Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A619 Worksop Rd/B6419 Bolsover Rd/Renishaw Road	-	-	-		-	-	-	-	-	-	100.6%	115	0	92	48.2	-	-
A619 / B6419 Mastin Moor	-	-	-		-	-	-	-	-	-	100.6%	115	0	92	48.2	-	-
1/1	B6419 Renishaw Road Left Ahead Right	O	C		1	16	-	343	1901	359	95.5%	87	0	41	9.7	101.5	14.6
2/1	A619 Worksop Road (East) Left Ahead Right	O	D		1	35	-	787	1956	782	100.6%	0	0	0	21.3	97.5	35.0
3/1	B6419 Bolsover Road Right Left Ahead	O	E		1	15	-	215	1855	330	65.2%	29	0	50	3.1	52.2	5.9
4/1+4/2	A619 Worksop Road (West) Ahead Right Left	U+O	B	A	1	44	4	906	1882:1915	941+0	96.3 : 0.0%	0	0	0	14.1	56.1	30.3
5/1		U	-		-	-	-	910	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0
6/1		U	-		-	-	-	279	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0
7/1		U	-		-	-	-	871	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0
8/1		U	-		-	-	-	191	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0
C1 PRC for Signalled Lanes (%): -11.8 Total Delay for Signalled Lanes (pcuHr): 48.22 Cycle Time (s): 90 PRC Over All Lanes (%): -11.8 Total Delay Over All Lanes(pcuHr): 48.22																	

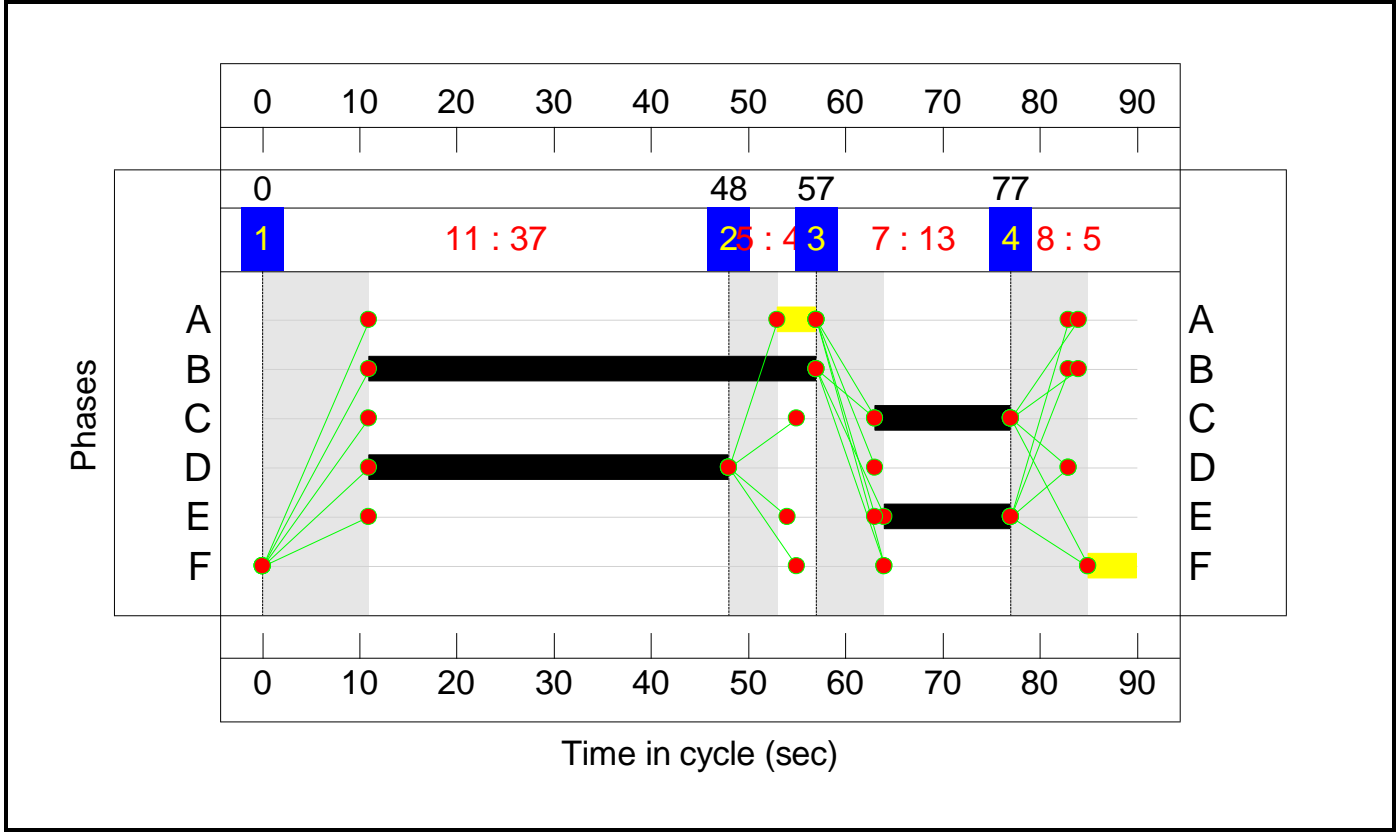
Stage Sequence Diagram



Stage Timings

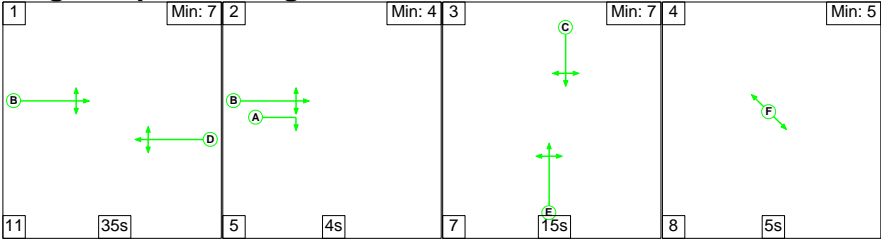
Stage	1	2	3	4
Duration	37	4	13	5
Change Point	0	48	57	77

Signal Timings Diagram



Network Results

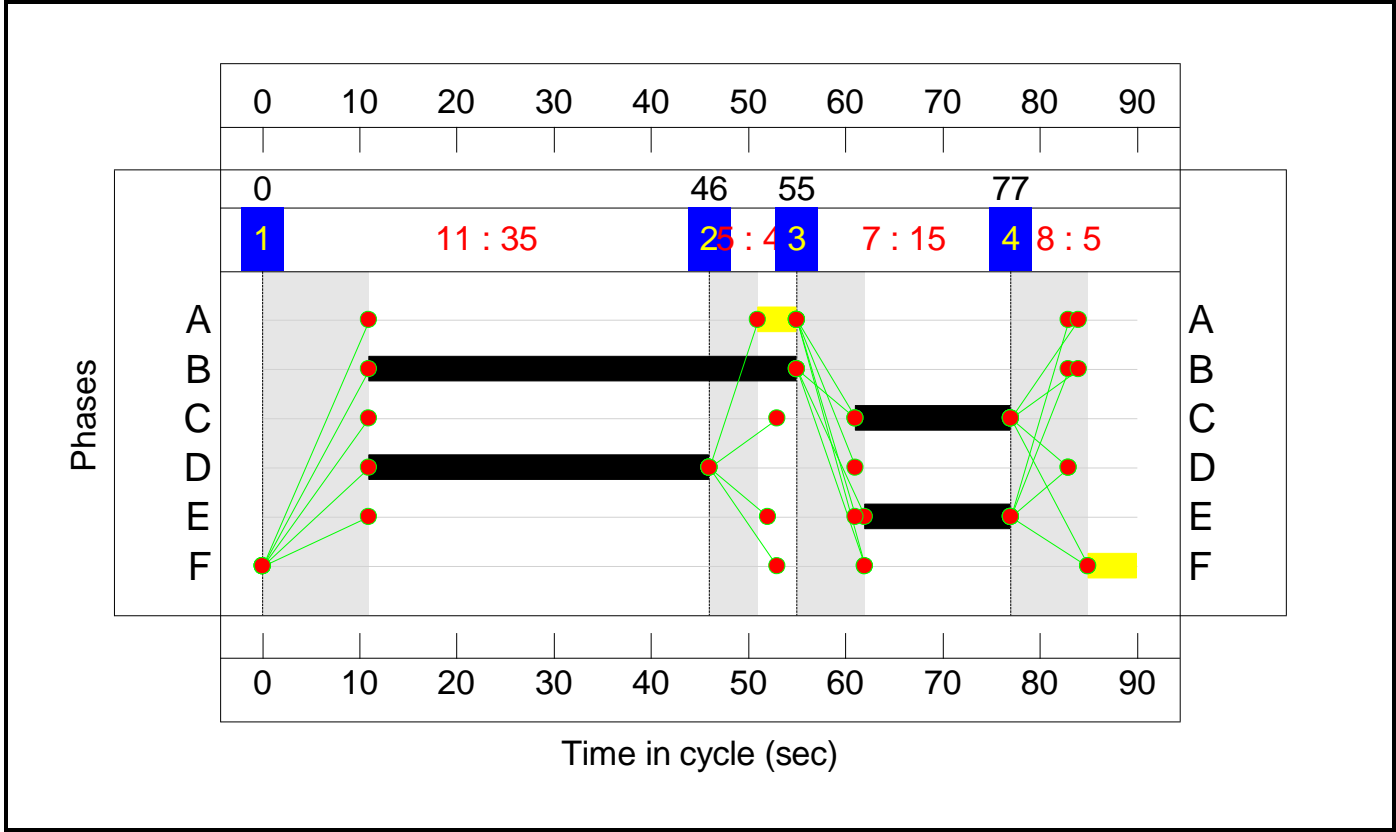
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	35	4	15	5
Change Point	0	46	55	77

Signal Timings Diagram



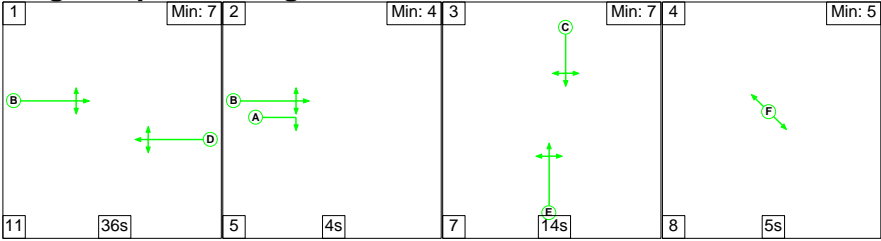
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A619 Worksop Rd/B6419 Bolsover Rd/Renishaw Road	-	-	-		-	-	-	-	-	-	106.6%	151	4	137	76.7	-	-
A619 / B6419 Mastin Moor	-	-	-		-	-	-	-	-	-	106.6%	151	4	137	76.7	-	-
1/1	B6419 Renishaw Road Left Ahead Right	O	C		1	16	-	351	1899	359	97.9%	119	0	16	11.2	115.0	16.3
2/1	A619 Worksop Road (East) Left Ahead Right	O	D		1	35	-	811	1940	776	104.5%	0	0	0	33.0	146.5	46.6
3/1	B6419 Bolsover Road Right Left Ahead	O	E		1	15	-	287	1834	269	106.6%	33	0	120	17.7	222.6	21.6
4/1+4/2	A619 Worksop Road (West) Ahead Right Left	U+O	B	A	1	44	4	911	1876:1665	938+4	96.7 : 96.7%	0	4	0	14.7	58.2	31.1
5/1		U	-		-	-	-	983	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0
6/1		U	-		-	-	-	317	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0
7/1		U	-		-	-	-	849	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0
8/1		U	-		-	-	-	211	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0
C1 PRC for Signalled Lanes (%): -18.4 Total Delay for Signalled Lanes (pcuHr): 76.68 Cycle Time (s): 90 PRC Over All Lanes (%): -18.4 Total Delay Over All Lanes(pcuHr): 76.68																	

Full Input Data And Results

Scenario 6: 'PM DS 2026' (FG6: 'PM DS 2026', Plan 1: 'Network Control Plan 1')

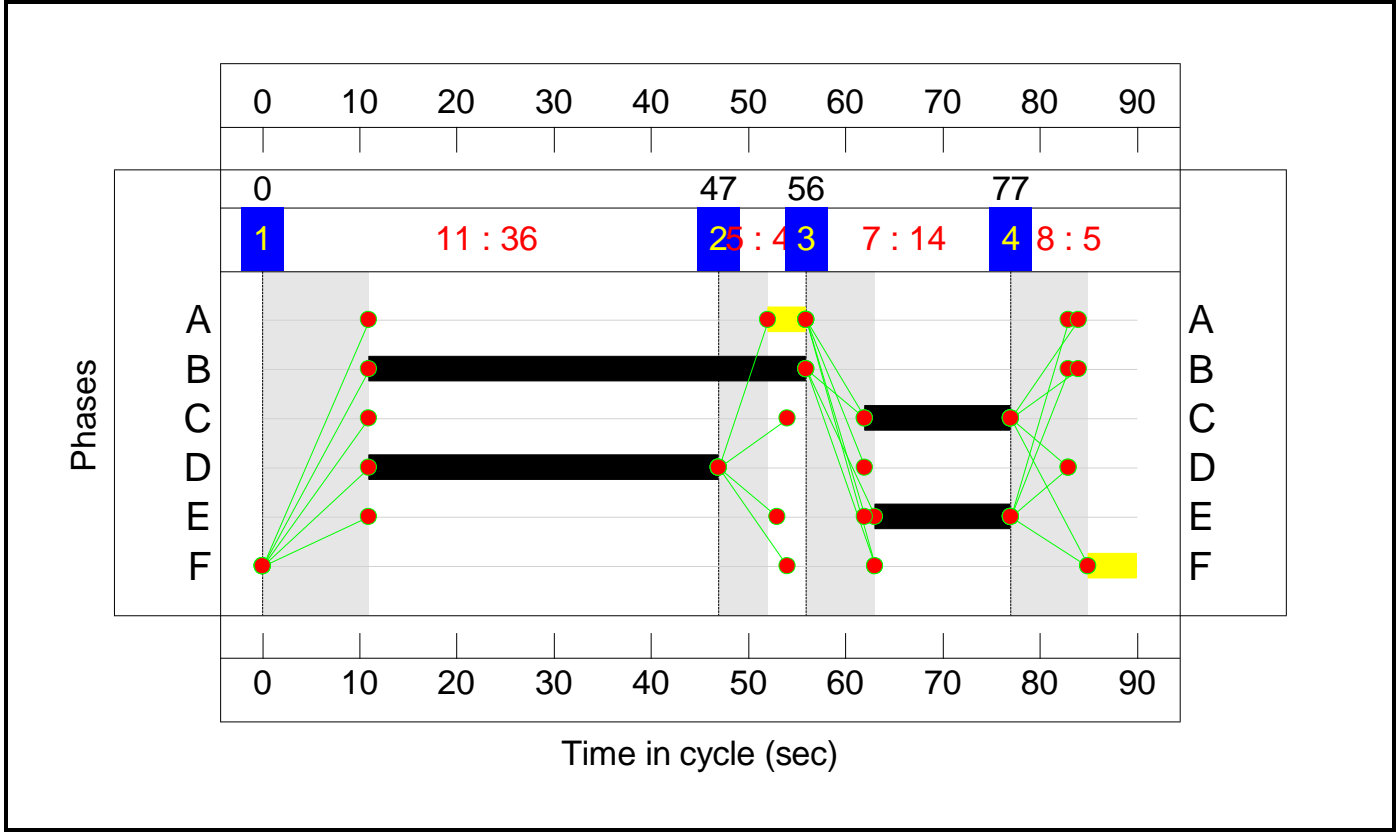
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	36	4	14	5
Change Point	0	47	56	77

Signal Timings Diagram



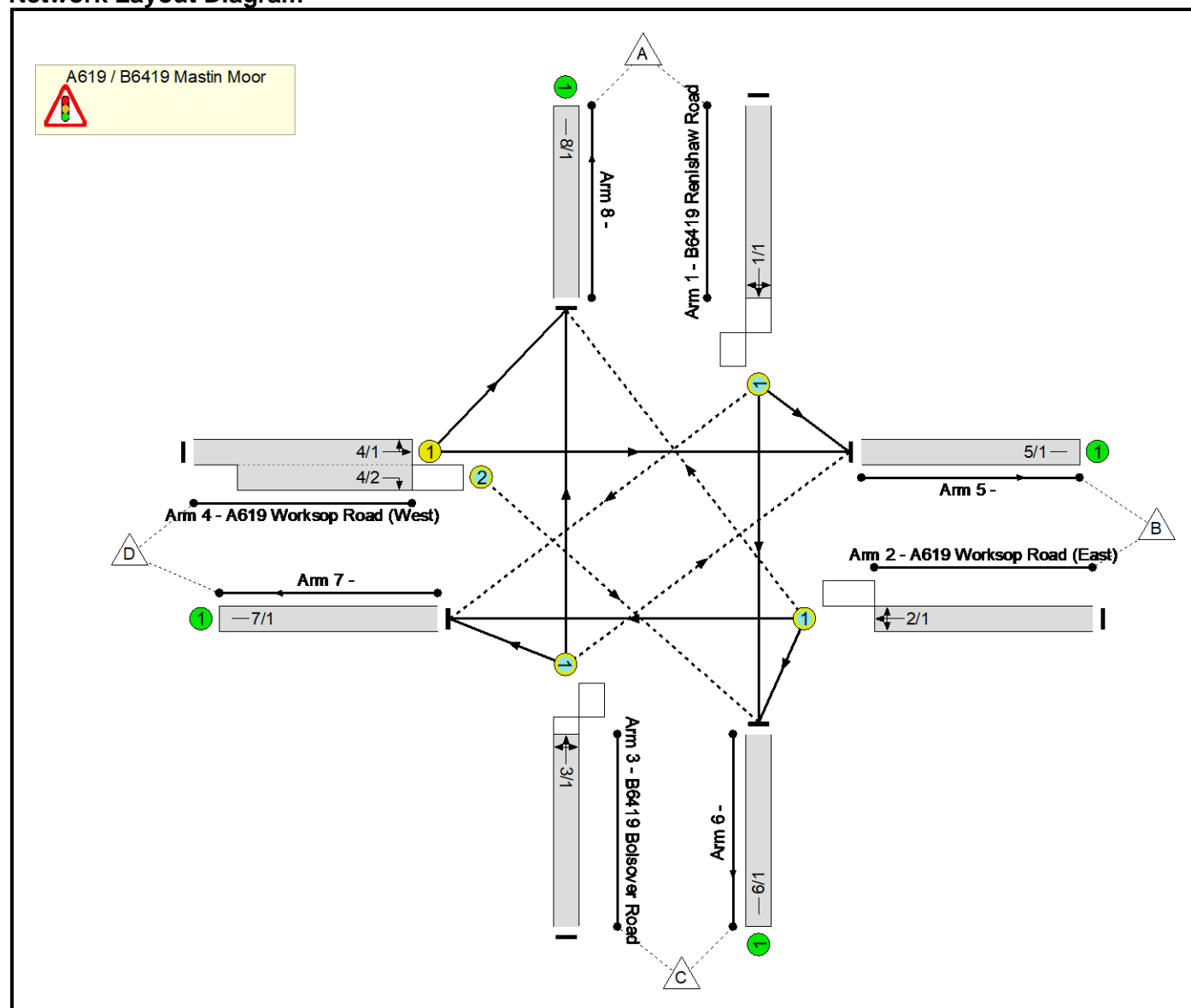
Network Results

Full Input Data And Results
Full Input Data And Results

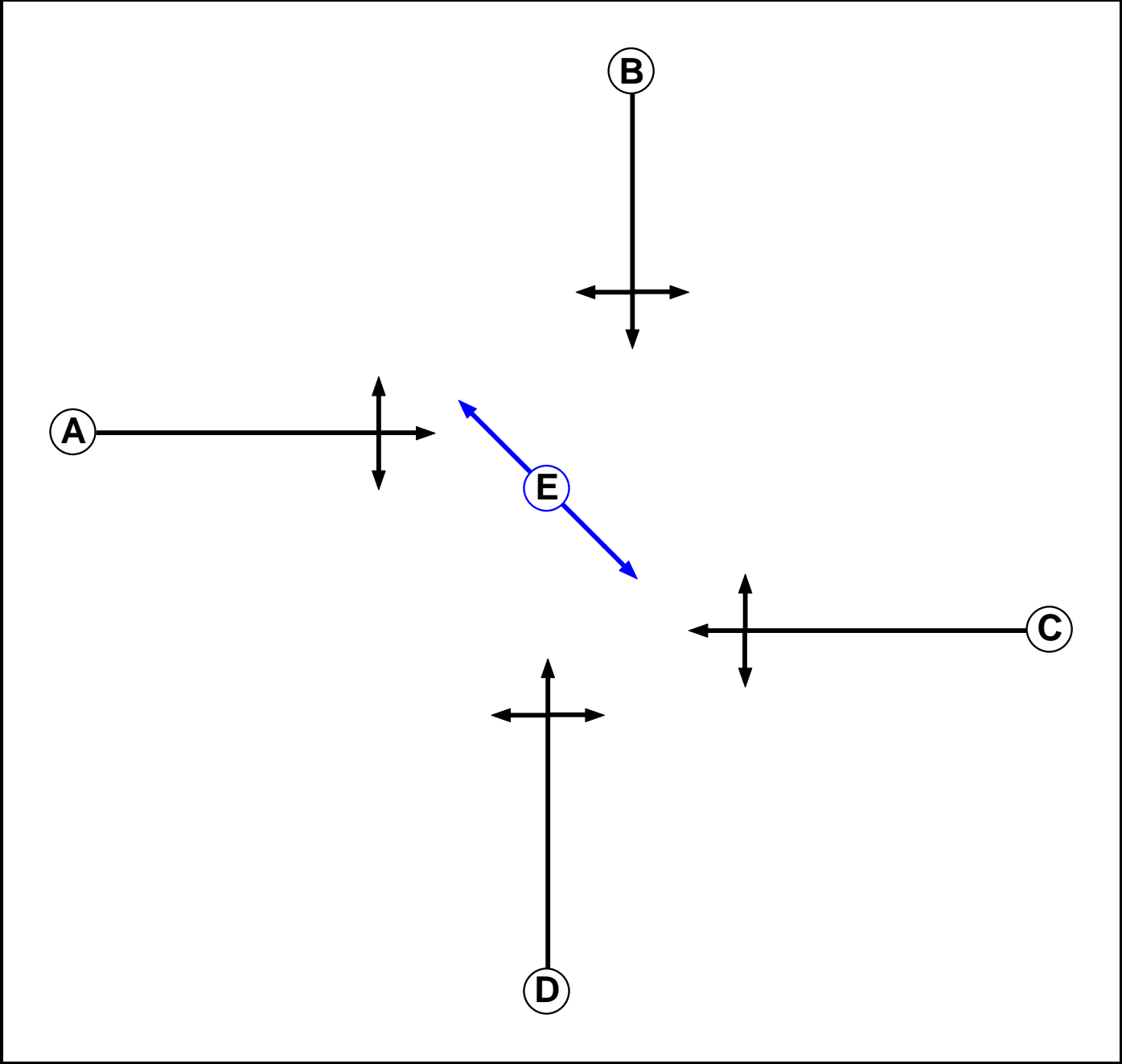
User and Project Details

Project:	Mastin Moor
Title:	A619 Worksoop Rd/B6419 Bolsover Rd/Renishaw Road
Location:	
Additional detail:	
File name:	2020-09-22 A619_B6419_Bolsover Road Signals_Mitigation_DS.lsg3x
Author:	
Company:	Arup
Address:	Leeds Office

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Pedestrian		5	5

Full Input Data And Results

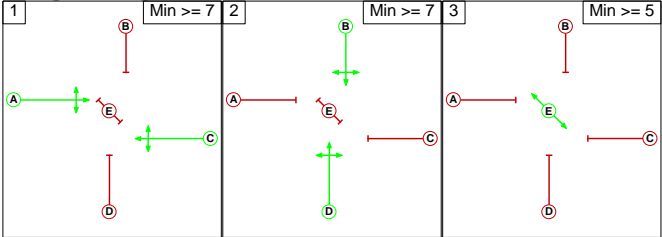
Phase Intergreens Matrix

Terminating Phase	Starting Phase					
		A	B	C	D	E
	A		6	-	7	7
	B	7		6	-	8
	C	-	7		6	7
	D	6	-	6		8
	E	11	11	11	11	

Phases in Stage

Stage No.	Phases in Stage
1	A C
2	B D
3	E

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

From Stage	To Stage		
	1	2	3
	1	7	7
	2	7	8
3	11	11	

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'AM DS 2026'	08:00	09:00	01:00	
2: 'PM DS 2026'	17:00	18:00	01:00	

Traffic Flows, Desired

Scenario 1: 'AM DS 2026' (FG1: 'AM DS 2026', Plan 1: 'Network Control Plan 1')

Desired Flow :

		Destination				
Origin		A	B	C	D	Tot.
	A	0	0	216	135	351
	B	0	0	97	714	811
	C	124	163	0	0	287
	D	87	820	4	0	911
	Tot.	211	983	317	849	2360

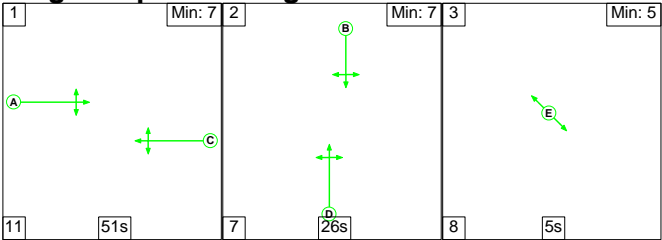
Scenario 2: 'PM DS 2026' (FG2: 'PM DS 2026', Plan 1: 'Network Control Plan 1')

Desired Flow :

		Destination				
Origin		A	B	C	D	Tot.
	A	0	43	161	106	310
	B	0	0	117	752	869
	C	233	121	0	0	354
	D	137	825	4	0	966
	Tot.	370	989	282	858	2499

Scenario 1: 'AM DS 2026' (FG1: 'AM DS 2026', Plan 1: 'Network Control Plan 1')

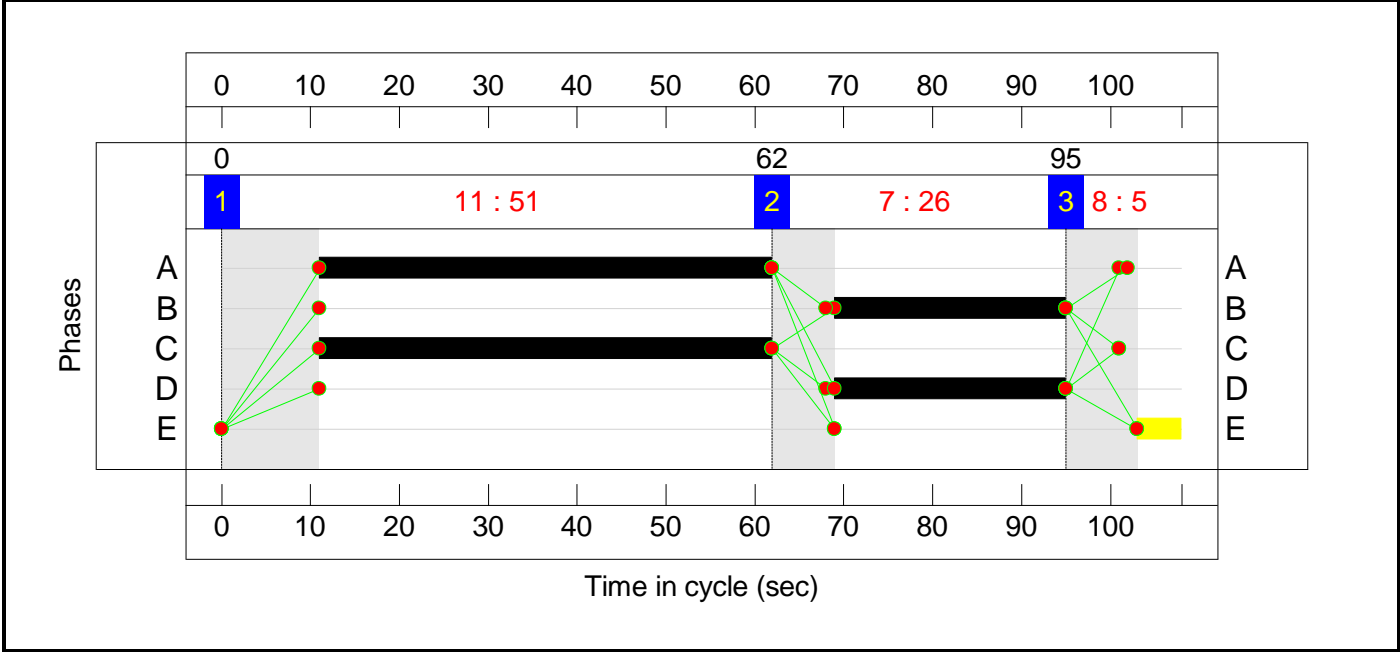
Stage Sequence Diagram



Stage Timings

Stage	1	2	3
Duration	51	26	5
Change Point	0	62	95

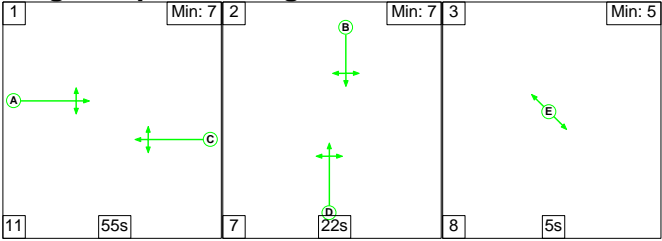
Signal Timings Diagram



Network Results

C1	PRC for Signalled Lanes (%):	-11.6	Total Delay for Signalled Lanes (pcuHr):	47.78	Cycle Time (s): 108
	PRC Over All Lanes (%):	-11.6	Total Delay Over All Lanes(pcuHr):	47.78	

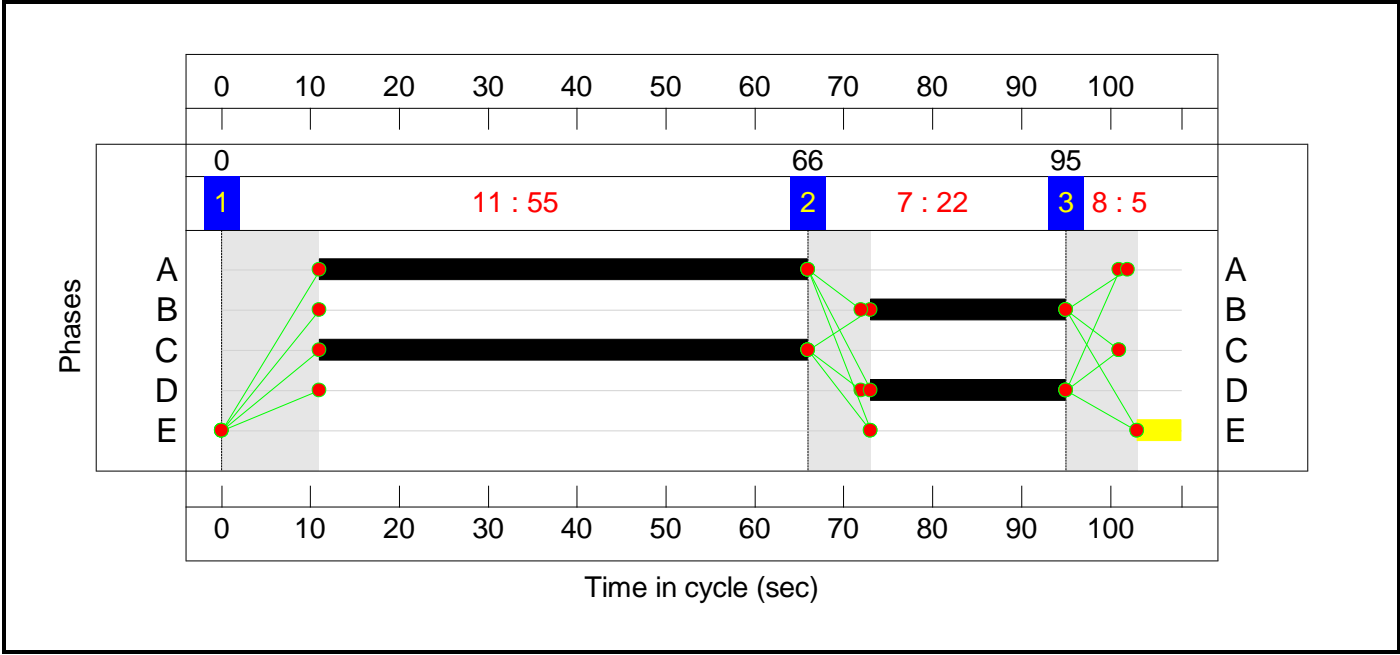
Stage Sequence Diagram



Stage Timings

Stage	1	2	3
Duration	55	22	5
Change Point	0	66	95

Signal Timings Diagram



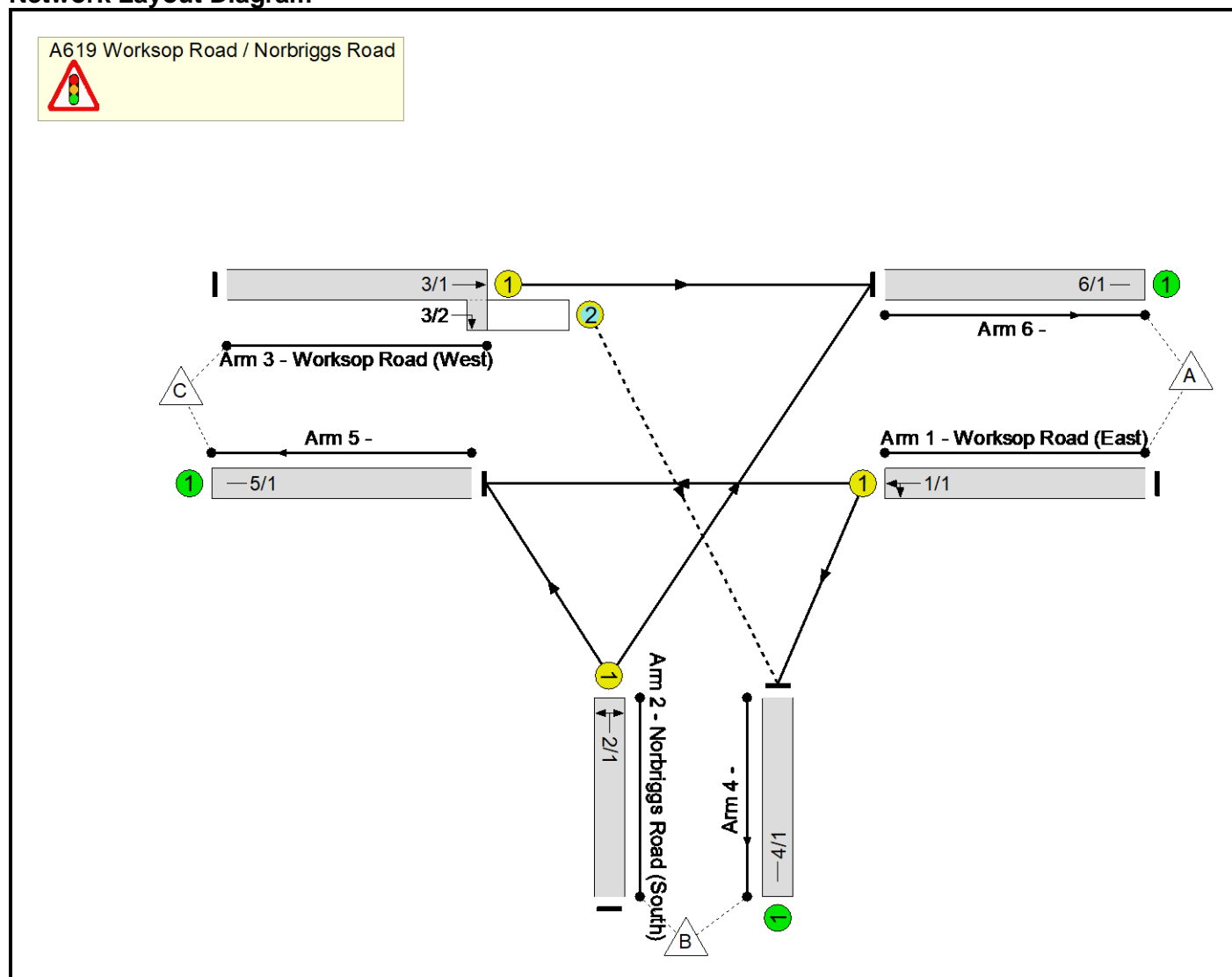
Network Results

Full Input Data And Results
Full Input Data And Results

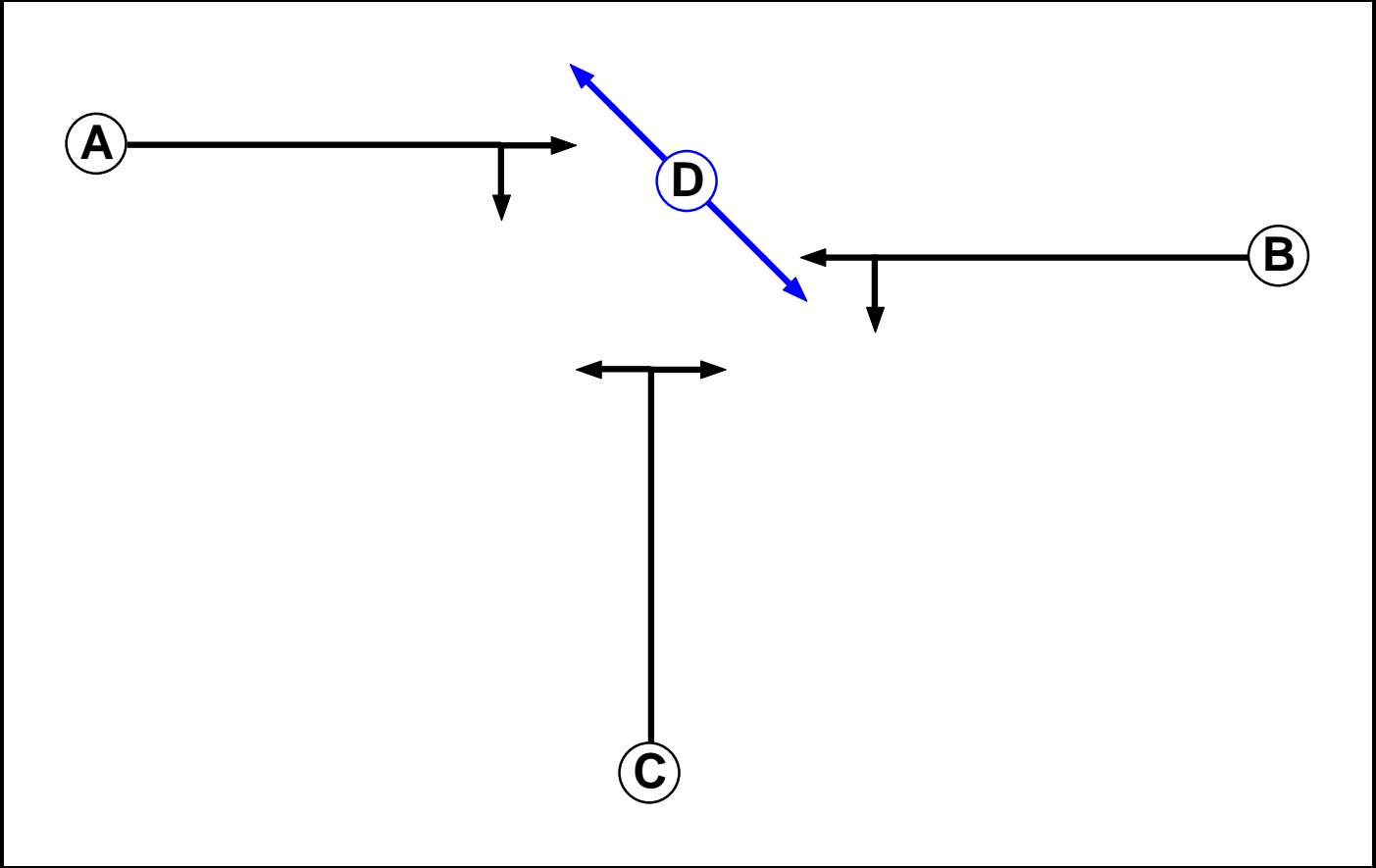
User and Project Details

Project:	Mastin Moor
Title:	A619 Worksop Road / Norbriggs Road
Location:	
Additional detail:	
File name:	2020-09-15 A619 Worksop Road_Norbriggs Road Signals.lsg3x
Author:	
Company:	Arup
Address:	Leeds Office

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Pedestrian		5	5

Phase Intergreens Matrix

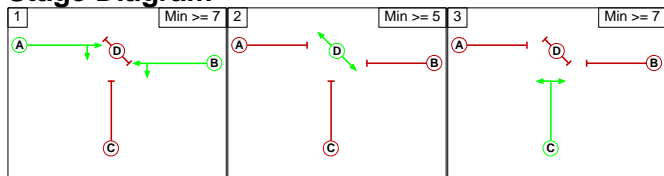
Terminating Phase	Starting Phase				
	A	B	C	D	
	A	-	7	8	
	B	-	7	8	
	C	6	7	7	
	D	13	12	12	

Phases in Stage

Stage No.	Phases in Stage
1	A B
2	D
3	C

Full Input Data And Results

Stage Diagram



Phase Delays

Term.	Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined						

Prohibited Stage Change

		To Stage			
From Stage		1	2	3	
	1		8	7	
	2	13		12	
	3	7	7		

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'AM BASE'	08:00	09:00	01:00	
2: 'PM BASE'	17:00	18:00	01:00	
3: 'AM DM 2026'	08:00	09:00	01:00	
4: 'PM DM 2026'	17:00	18:00	01:00	
5: 'AM DS 2026'	08:00	09:00	01:00	
6: 'PM DS 2026'	17:00	18:00	01:00	

Traffic Flows, Desired

Scenario 1: 'AM BASE' (FG1: 'AM BASE', Plan 1: 'Every Cycle')

Desired Flow :

		Destination			
Origin		A	B	C	Tot.
	A	0	11	709	720
	B	3	0	187	190
	C	701	48	0	749
	Tot.	704	59	896	1659

Full Input Data And Results

Scenario 2: 'PM BASE' (FG2: 'PM BASE', Plan 1: 'Every Cycle')

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	2	781	783
	B	8	0	145	153
	C	804	66	0	870
	Tot.	812	68	926	1806

Scenario 3: 'AM DM 2026' (FG3: 'AM DM 2026', Plan 1: 'Every Cycle')

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	9	885	894
	B	4	0	231	235
	C	940	92	0	1032
	Tot.	944	101	1116	2161

Scenario 4: 'PM DM 2026' (FG4: 'PM DM 2026', Plan 1: 'Every Cycle')

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	2	973	975
	B	10	0	149	159
	C	982	124	0	1106
	Tot.	992	126	1122	2240

Scenario 5: 'AM DS 2026' (FG5: 'AM DS 2026', Plan 1: 'Every Cycle')

Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	28	1036	1064
	B	28	0	229	257
	C	947	98	0	1045
	Tot.	975	126	1265	2366

Scenario 6: 'PM DS 2026' (FG6: 'PM DS 2026', Plan 1: 'Every Cycle')

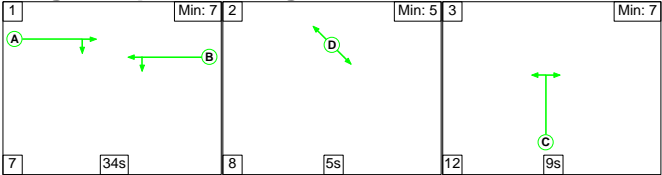
Desired Flow :

	Destination				
		A	B	C	Tot.
Origin	A	0	25	1126	1151
	B	26	0	94	120
	C	1037	109	0	1146
	Tot.	1063	134	1220	2417

Full Input Data And Results

Scenario 1: 'AM BASE' (FG1: 'AM BASE', Plan 1: 'Every Cycle')

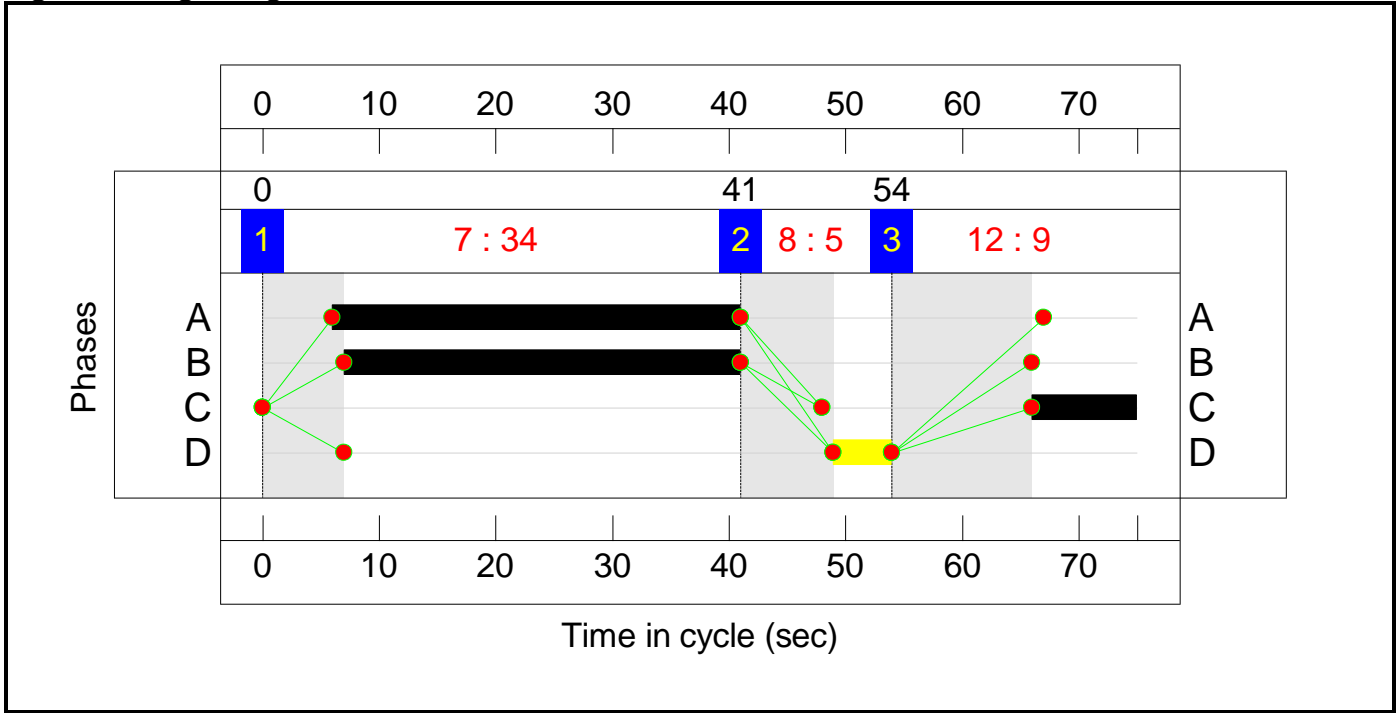
Stage Sequence Diagram



Stage Timings

Stage	1	2	3
Duration	34	5	9
Change Point	0	41	54

Signal Timings Diagram

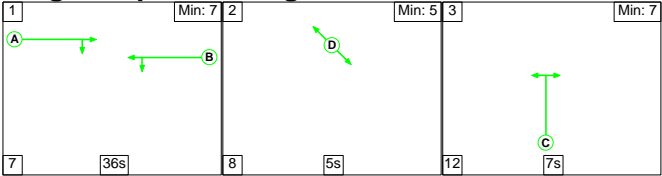


Network Results

Network Results

Full Input Data And Results
Scenario 2: 'PM BASE' (FG2: 'PM BASE', Plan 1: 'Every Cycle')

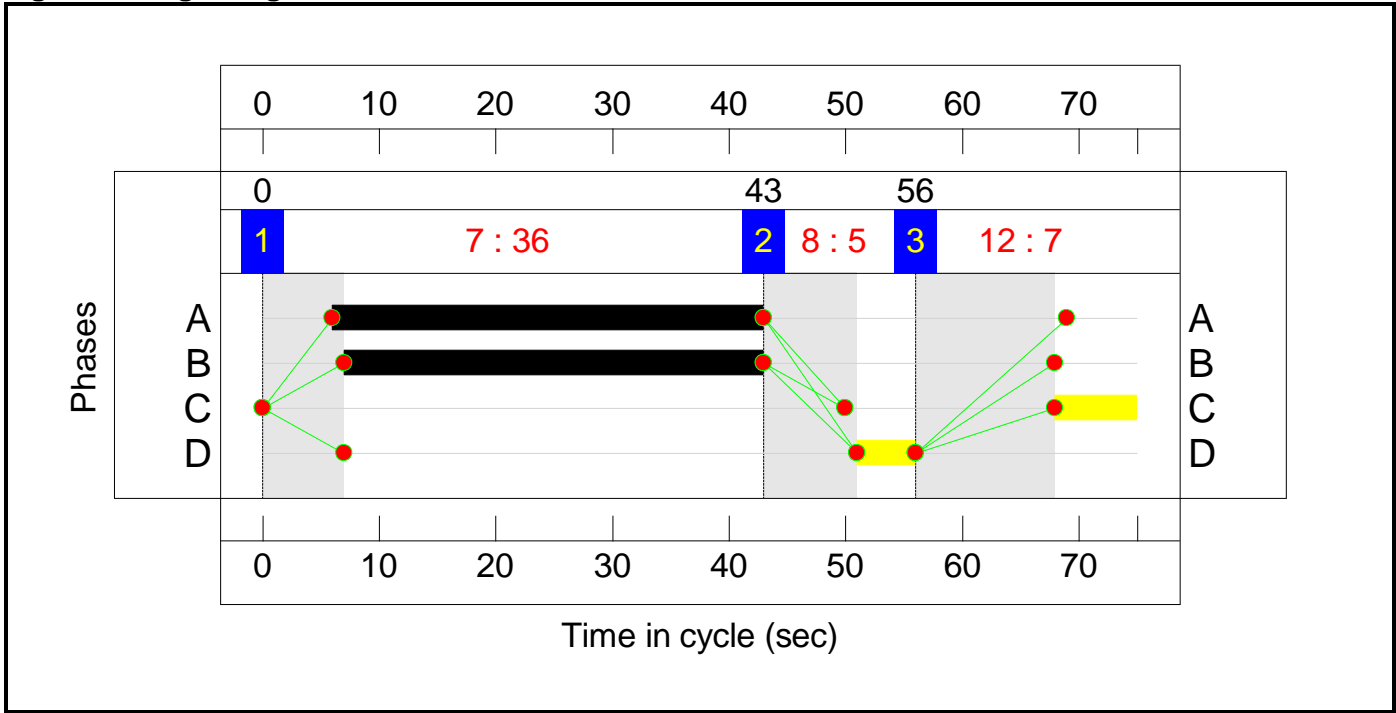
Stage Sequence Diagram



Stage Timings

Stage	1	2	3
Duration	36	5	7
Change Point	0	43	56

Signal Timings Diagram



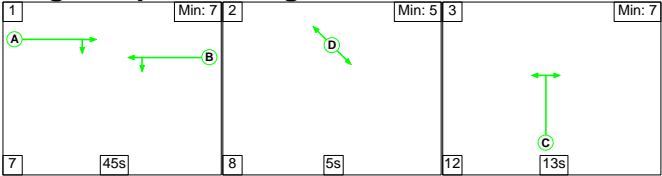
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	
Network: A619 Workstop Road / Norbriggs Road	-	-	-		-	-	-	-	-	-	91.6%	64	0	2	18.7	-	-	
A619 Workstop Road / Norbriggs Road	-	-	-		-	-	-	-	-	-	91.6%	64	0	2	18.7	-	-	
1/1	Workstop Road (East) Left Ahead	U	B		1	36	-	783	1914	944	82.9%	-	-	-	5.9	27.1	16.3	
2/1	Norbriggs Road (South) Left Right	U	C		1	7	-	153	1713	183	83.7%	-	-	-	3.6	85.5	5.3	
3/1+3/2	Workstop Road (West) Right Ahead	U+O	A		1	37	-	870	1890:1658	878+72	91.6 : 91.6%	64	0	2	9.2	38.1	21.5	
4/1		U	-		-	-	-	68	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0	
5/1		U	-		-	-	-	926	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0	
6/1		U	-		-	-	-	812	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0	
C1																		
PRC for Signalled Lanes (%):							-1.8	Total Delay for Signalled Lanes (pcuHr):					18.74	Cycle Time (s): 75				
PRC Over All Lanes (%):							-1.8	Total Delay Over All Lanes(pcuHr):					18.74					

Full Input Data And Results

Scenario 3: 'AM DM 2026' (FG3: 'AM DM 2026', Plan 1: 'Every Cycle')

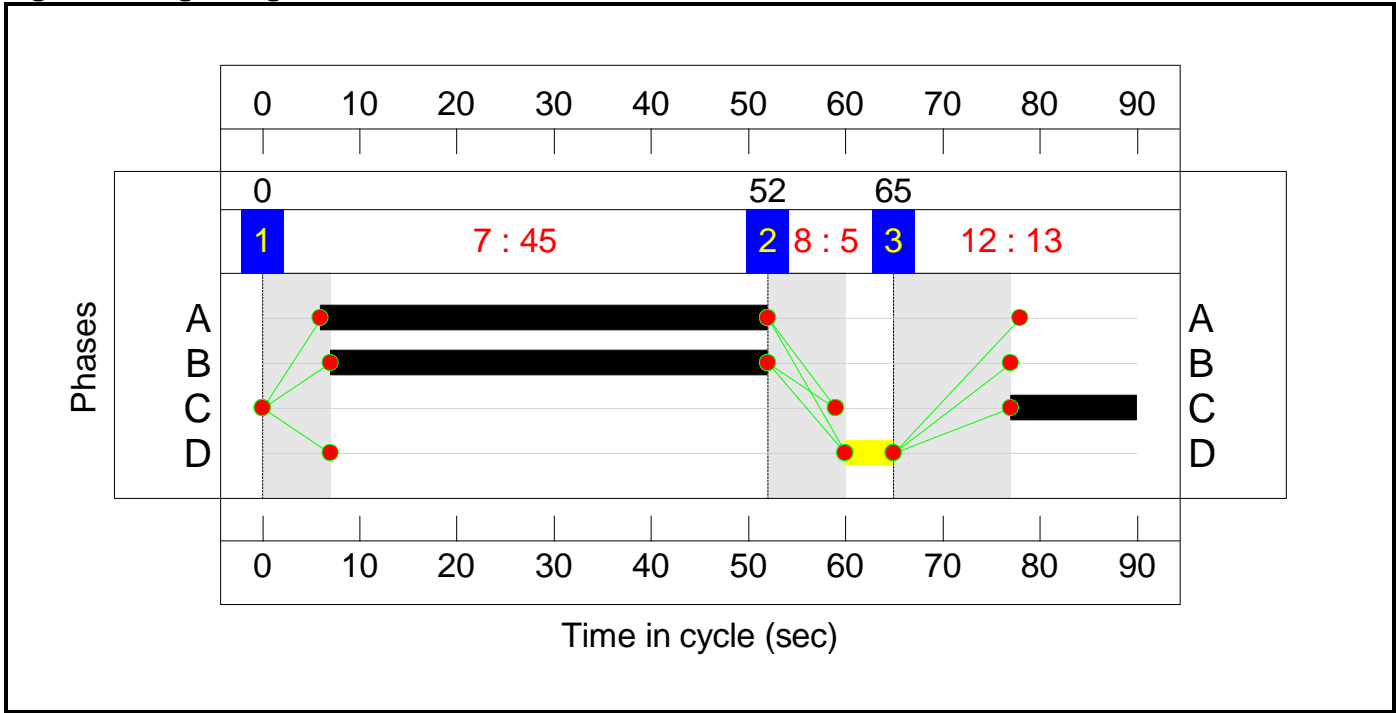
Stage Sequence Diagram



Stage Timings

Stage	1	2	3
Duration	45	5	13
Change Point	0	52	65

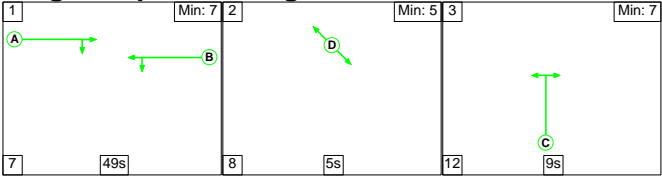
Signal Timings Diagram



Network Results

Full Input Data And Results
Scenario 4: 'PM DM 2026' (FG4: 'PM DM 2026', Plan 1: 'Every Cycle')

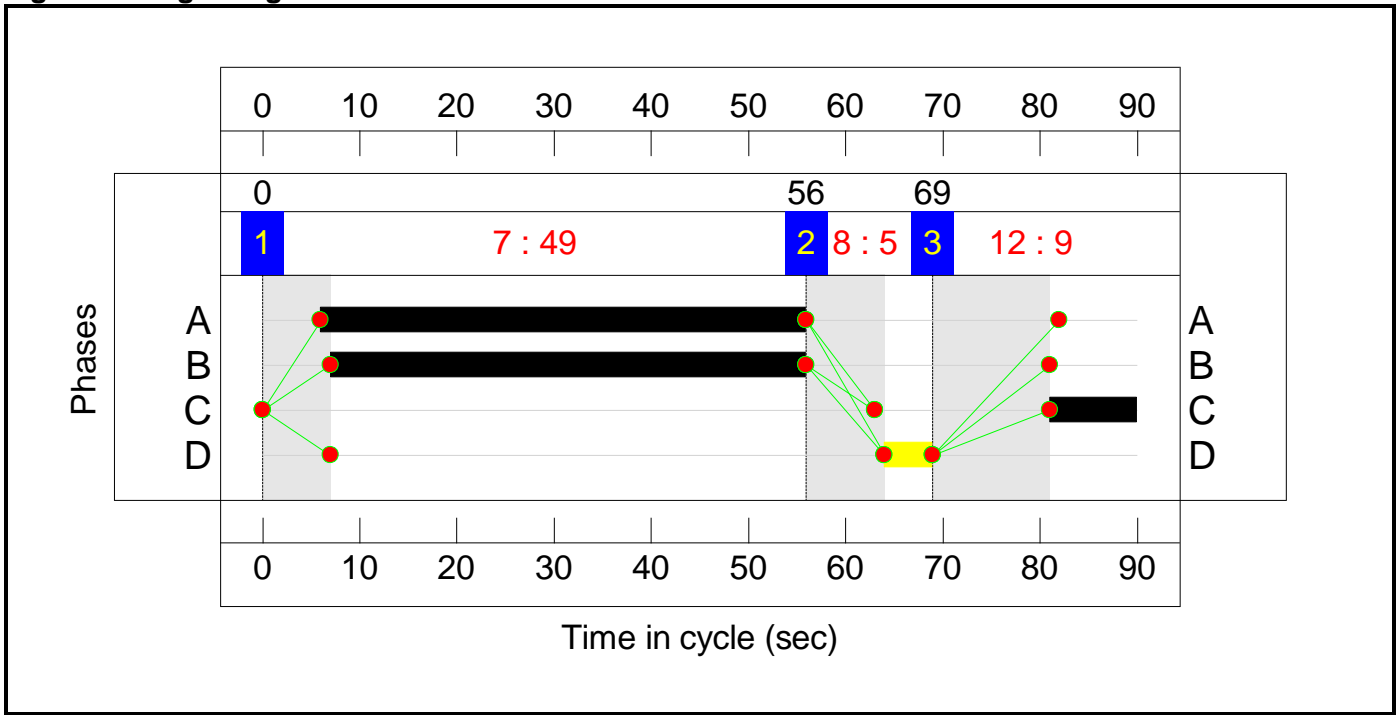
Stage Sequence Diagram



Stage Timings

Stage	1	2	3
Duration	49	5	9
Change Point	0	56	69

Signal Timings Diagram

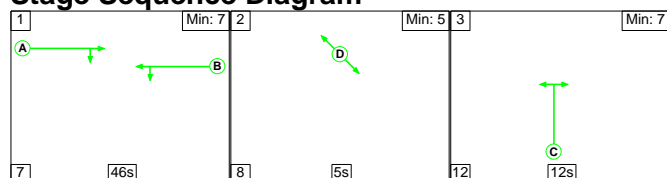


Network Results

Full Input Data And Results

Scenario 5: 'AM DS 2026' (FG5: 'AM DS 2026', Plan 1: 'Every Cycle')

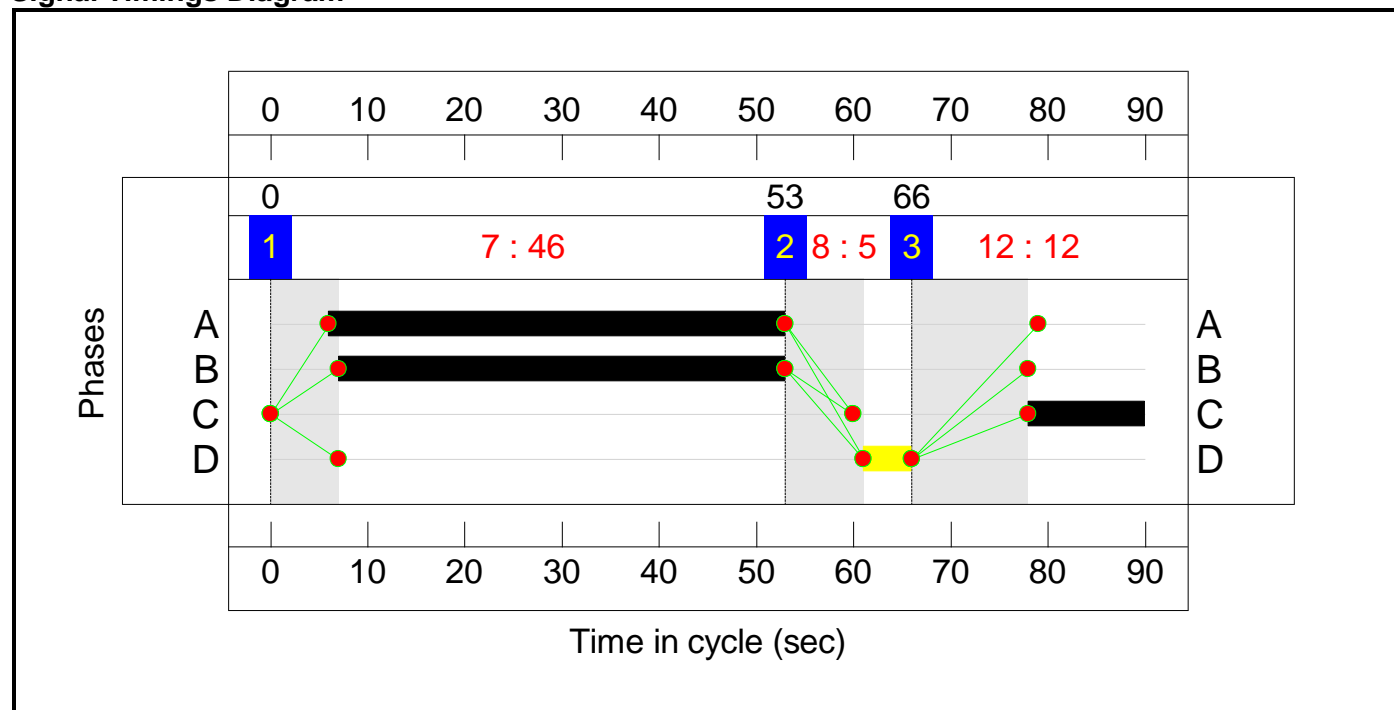
Stage Sequence Diagram



Stage Timings

Stage	1	2	3
Duration	46	5	12
Change Point	0	53	66

Signal Timings Diagram

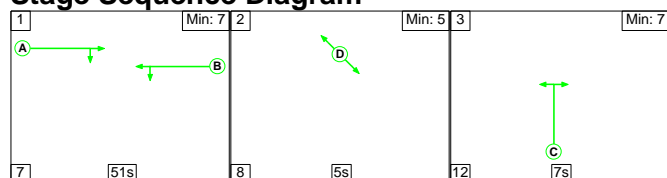


Network Results

Full Input Data And Results

Scenario 6: 'PM DS 2026' (FG6: 'PM DS 2026', Plan 1: 'Every Cycle')

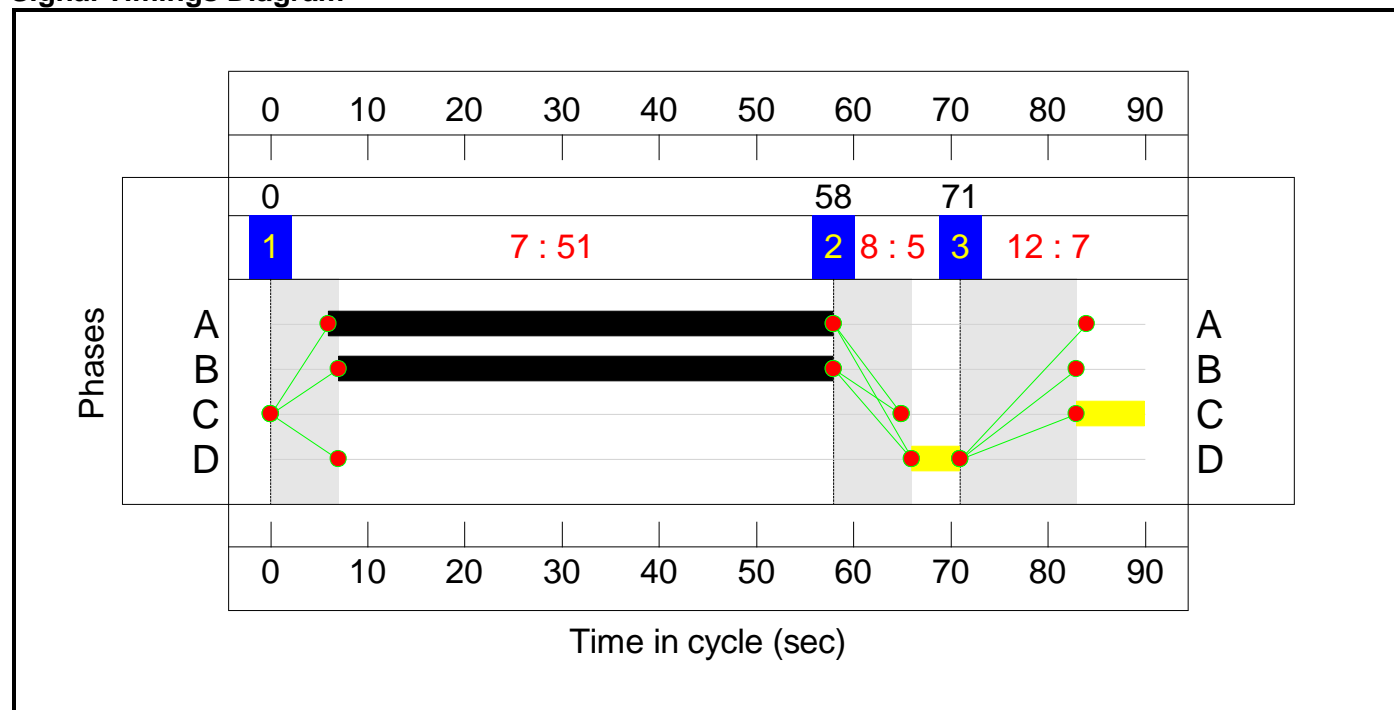
Stage Sequence Diagram



Stage Timings

Stage	1	2	3
Duration	51	5	7
Change Point	0	58	71

Signal Timings Diagram



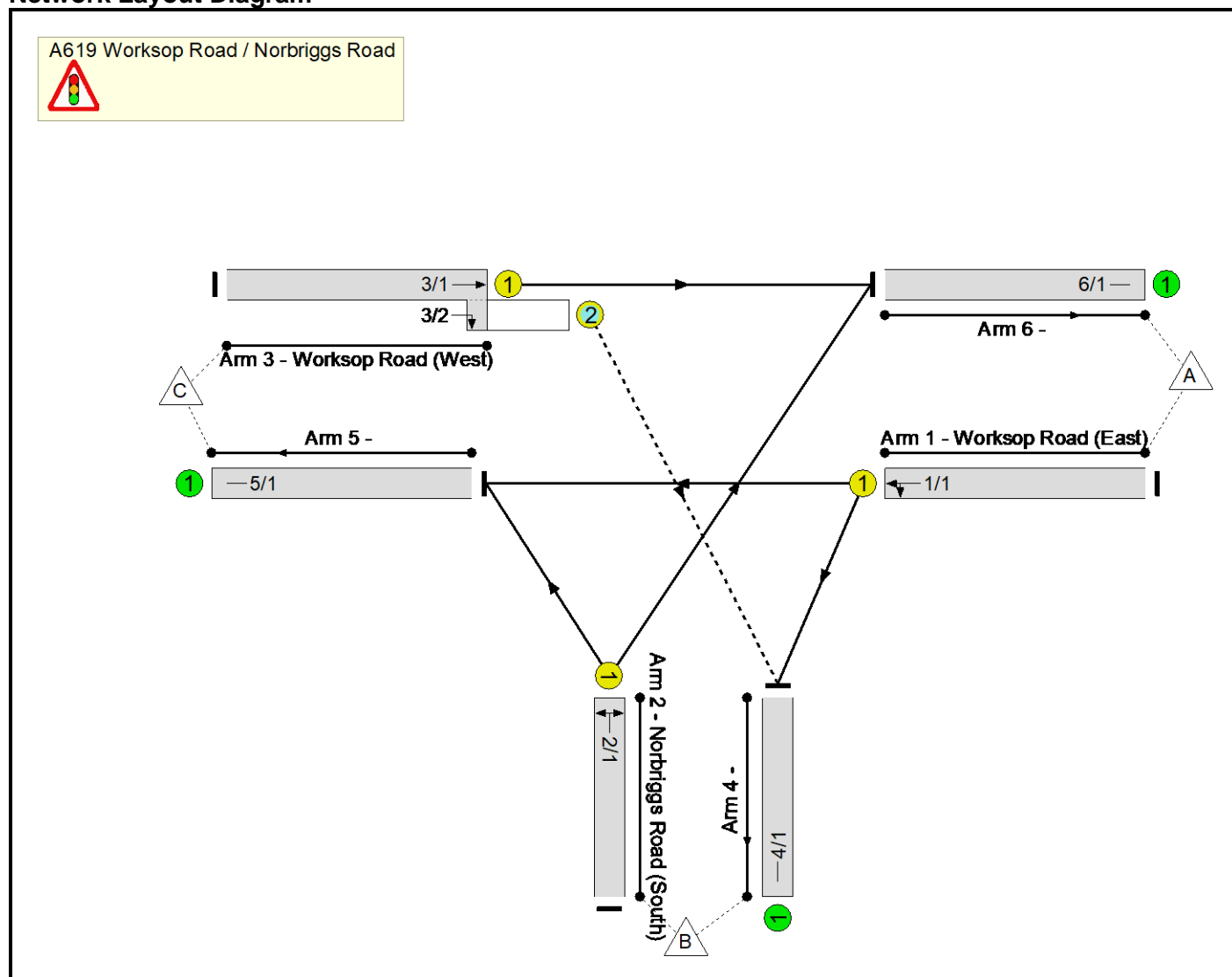
Network Results

Full Input Data And Results
Full Input Data And Results

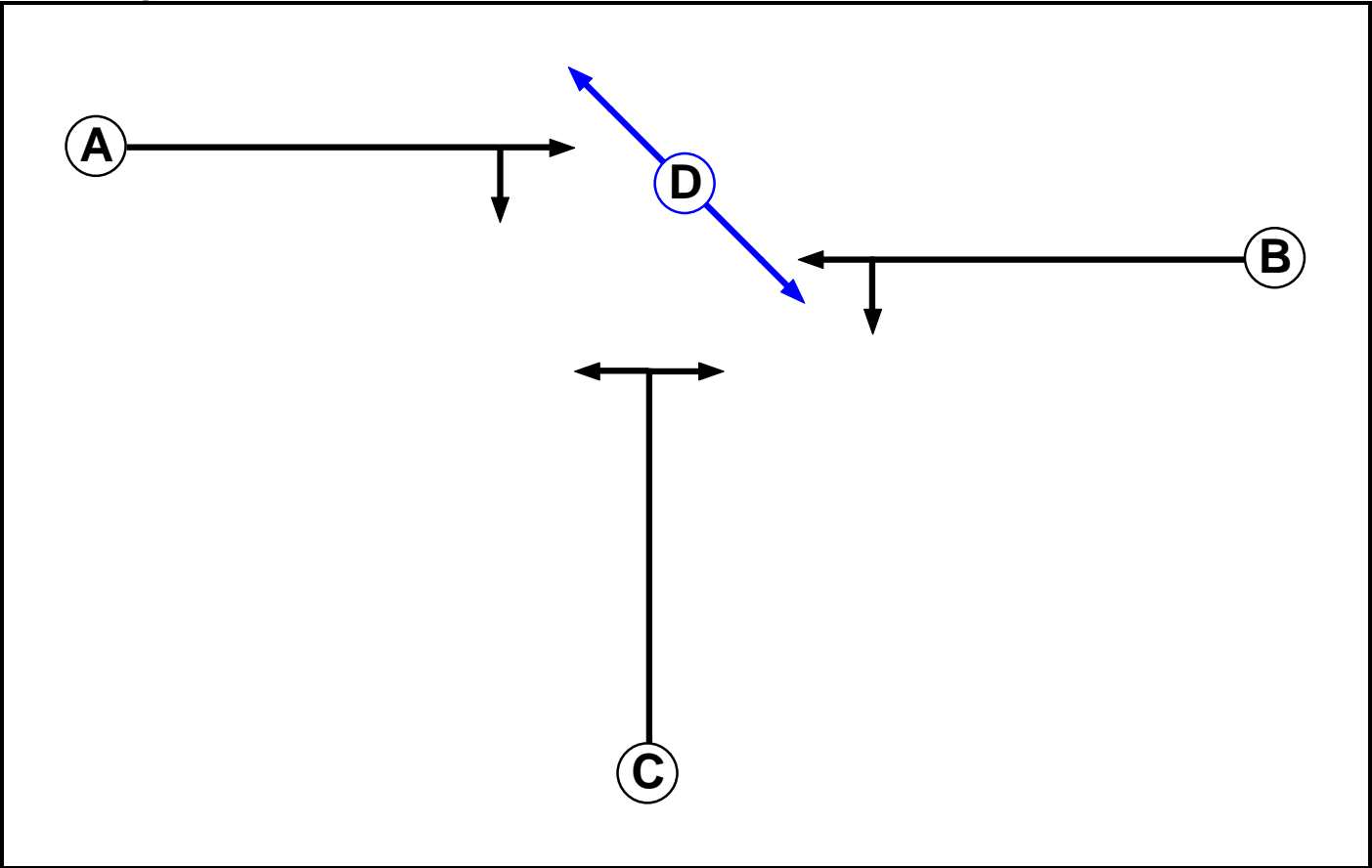
User and Project Details

Project:	Mastin Moor
Title:	A619 Worksop Road / Norbriggs Road
Location:	
Additional detail:	
File name:	2020-09-15 A619 Worksop Road_Norbriggs Road Signals_Mitigation_DS.lsg3x
Author:	
Company:	Arup
Address:	Leeds Office

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Pedestrian		5	5

Phase Intergreens Matrix

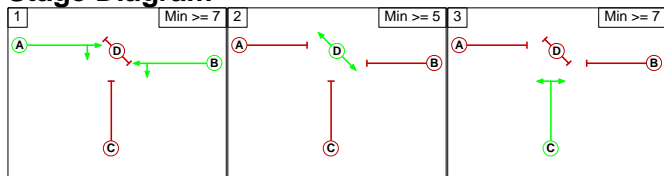
Terminating Phase	Starting Phase				
	A	B	C	D	
	A	-	7	8	
	B	-	7	8	
	C	6	7	7	
	D	10	10	10	

Phases in Stage

Stage No.	Phases in Stage
1	A B
2	D
3	C

Full Input Data And Results

Stage Diagram



Phase Delays

Term.	Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined						

Prohibited Stage Change

		To Stage			
From Stage		1	2	3	
	1		8	7	
	2	10		10	
	3	7	7		

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'AM DS 2026'	08:00	09:00	01:00	
2: 'PM DS 2026'	17:00	18:00	01:00	

Traffic Flows, Desired

Scenario 1: 'AM DS 2026' (FG1: 'AM DS 2026', Plan 1: 'Every Cycle')

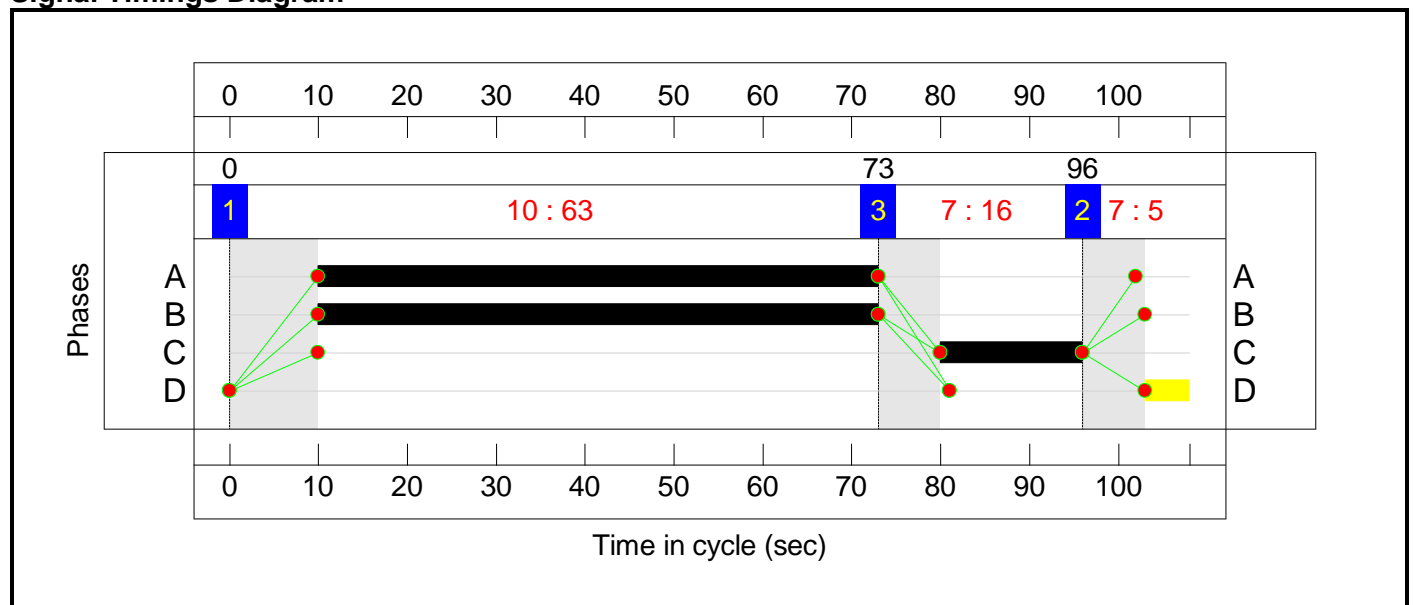
Desired Flow :

		Destination			
Origin		A	B	C	Tot.
	A	0	28	1036	1064
	B	28	0	229	257
	C	947	98	0	1045
	Tot.	975	126	1265	2366

Scenario 2: 'PM DS 2026' (FG2: 'PM DS 2026', Plan 1: 'Every Cycle')

Desired Flow :

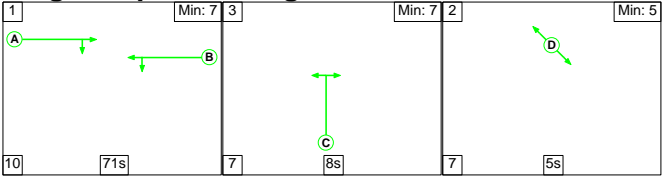
		Destination			
Origin		A	B	C	Tot.
	A	0	25	1126	1151
	B	26	0	94	120
	C	1037	109	0	1146
	Tot.	1063	134	1220	2417



Network Results

Full Input Data And Results
Scenario 2: 'PM DS 2026' (FG2: 'PM DS 2026', Plan 1: 'Every Cycle')

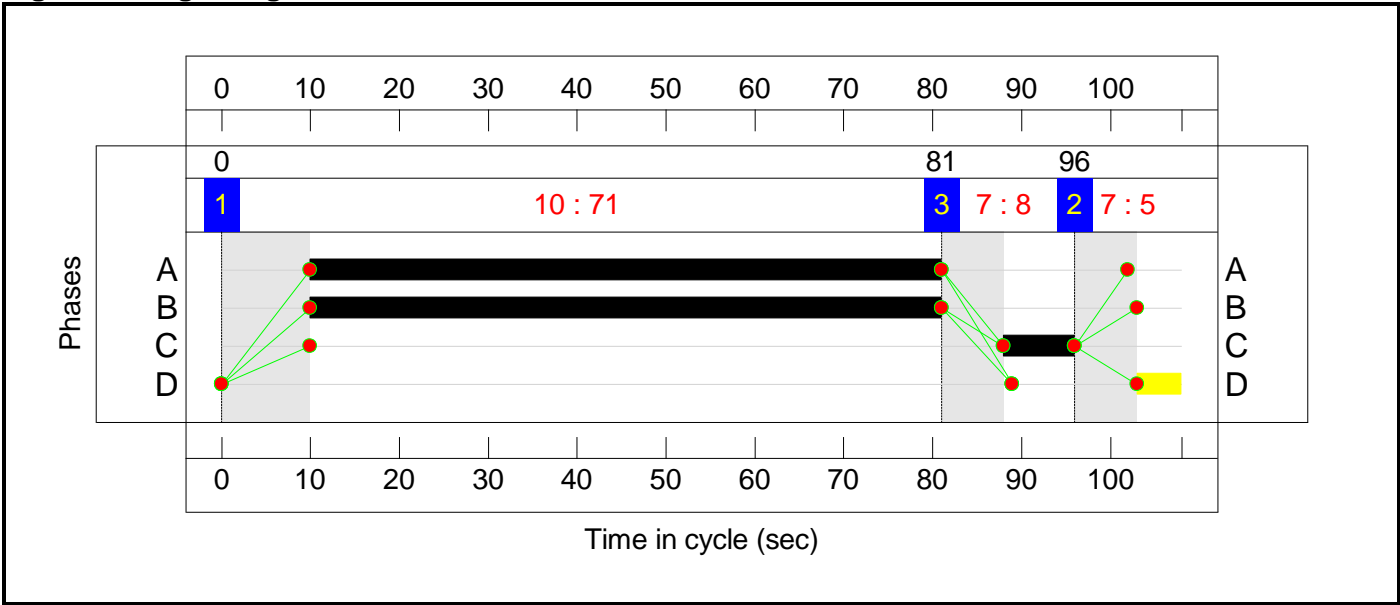
Stage Sequence Diagram



Stage Timings

Stage	1	3	2
Duration	71	8	5
Change Point	0	81	96

Signal Timings Diagram



Network Results

Junctions 9			
PICADY 9 - Priority Intersection Module			
Version: 9.5.0.6896			
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The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution			

Filename: 2020-09-22 Bolsover Road_Woodthorpe Road.j9

Path: \\global\europa\Leeds\Jobs\270000\276927-00\0 Arup\0-11 Transportation\0-11-07 Calcs-Specs\4. Junction Models 2020 Junction 3

Report generation date: 22/09/2020 14:55:45

- »Existing Layout - BASE, AM No data
- »Existing Layout - BASE, PM No data
- »Existing Layout - DM 2026, AM
- »Existing Layout - DM 2026, PM
- »Existing Layout - DS 2026, AM
- »Existing Layout - DS 2026, PM

Summary of junction performance

	AM No data		PM No data		AM		PM	
	Queue (PCU)	RFC	Queue (PCU)	RFC	Queue (PCU)	RFC	Queue (PCU)	RFC
Existing Layout - BASE								
Stream B-C	0.0	0.00	0.0	0.00				
Stream B-A	0.0	0.00	0.0	0.00				
Stream C-AB	0.0	0.00	0.0	0.00				
Existing Layout - DM 2026								
Stream B-C					0.1	0.09	0.1	0.11
Stream B-A					0.2	0.15	0.3	0.21
Stream C-AB					0.2	0.13	0.2	0.13
Existing Layout - DS 2026								
Stream B-C					0.2	0.16	0.2	0.15
Stream B-A					0.2	0.17	0.2	0.18
Stream C-AB					0.2	0.14	0.4	0.20

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

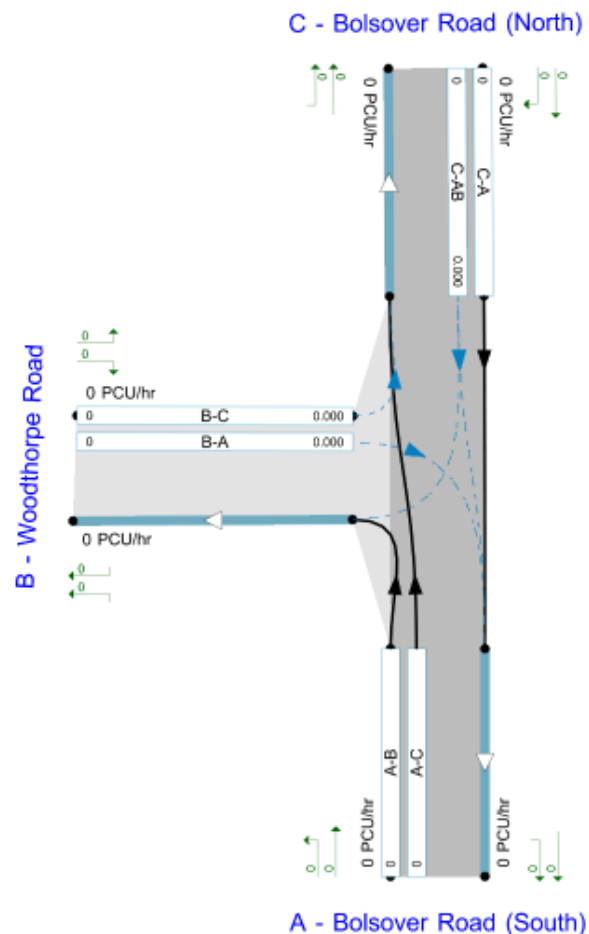
File summary

File Description

Title	Bolsover Road / Woodthorpe Rpad
Location	Mastin Moor
Site number	Junction 03
Date	22/09/2020
Version	
Status	
Identifier	
Client	
Jobnumber	
Enumerator	
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Flows show modelled flow through junction (PCU/hr).
 Streams (upstream end) show Total Demand (PCU/hr). Streams (downstream end) show RFC (s).
 Time Segment: 16:45-17:00

The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	BASE	AM No data	ONE HOUR	07:45	09:15	15	✓
D2	BASE	PM No data	ONE HOUR	16:45	18:15	15	✓
D7	DM 2026	AM	ONE HOUR	07:45	09:15	15	✓
D8	DM 2026	PM	ONE HOUR	16:45	18:15	15	✓
D9	DS 2026	AM	ONE HOUR	07:45	09:15	15	✓
D10	DS 2026	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Existing Layout	✓	100.000	100.000

Existing Layout - BASE, AM No data

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Bolsover Road / Woodthorpe Road	T-Junction	Two-way		0.00	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Bolsover Road (South)		Major
B	Woodthorpe Road		Minor
C	Bolsover Road (North)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Bolsover Road (North)	8.50			125.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B - Woodthorpe Road	One lane plus flare	10.00	5.00	3.50	3.50	3.50	✓	1.00	50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	557	0.090	0.229	0.144	0.327
1	B-C	705	0.096	0.243	-	-
1	C-B	646	0.223	0.223	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	BASE	AM No data	ONE HOUR	07:45	09:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Bolsover Road (South)		ONE HOUR	✓	0	100.000
B - Woodthorpe Road		ONE HOUR	✓	0	100.000
C - Bolsover Road (North)		ONE HOUR	✓	0	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Bolsover Road (South)	B - Woodthorpe Road	C - Bolsover Road (North)
From	A - Bolsover Road (South)	0	0	0
	B - Woodthorpe Road	0	0	0
	C - Bolsover Road (North)	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Bolsover Road (South)	B - Woodthorpe Road	C - Bolsover Road (North)
From	A - Bolsover Road (South)	0	0	0
	B - Woodthorpe Road	0	0	0
	C - Bolsover Road (North)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.00	0.00	0.0	A	0	0
B-A	0.00	0.00	0.0	A	0	0
C-AB	0.00	0.00	0.0	A	0	0
C-A					0	0
A-B					0	0
A-C					0	0

Existing Layout - BASE, PM No data

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Bolsover Road / Woodthorpe Road	T-Junction	Two-way		0.00	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	BASE	PM No data	ONE HOUR	16:45	18:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Bolsover Road (South)		ONE HOUR	✓	0	100.000
B - Woodthorpe Road		ONE HOUR	✓	0	100.000
C - Bolsover Road (North)		ONE HOUR	✓	0	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Bolsover Road (South)	B - Woodthorpe Road	C - Bolsover Road (North)
From	A - Bolsover Road (South)	0	0	0
	B - Woodthorpe Road	0	0	0
	C - Bolsover Road (North)	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Bolsover Road (South)	B - Woodthorpe Road	C - Bolsover Road (North)
From	A - Bolsover Road (South)	0	0	0
	B - Woodthorpe Road	0	0	0
	C - Bolsover Road (North)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.00	0.00	0.0	A	0	0
B-A	0.00	0.00	0.0	A	0	0
C-AB	0.00	0.00	0.0	A	0	0
C-A					0	0
A-B					0	0
A-C					0	0

Existing Layout - DM 2026, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Bolsover Road / Woodthorpe Road	T-Junction	Two-way		2.11	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	DM 2026	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Bolsover Road (South)		ONE HOUR	✓	264	100.000
B - Woodthorpe Road		ONE HOUR	✓	113	100.000
C - Bolsover Road (North)		ONE HOUR	✓	296	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
From		A - Bolsover Road (South)	B - Woodthorpe Road	C - Bolsover Road (North)
	A - Bolsover Road (South)	0	116	148
	B - Woodthorpe Road	60	0	53
	C - Bolsover Road (North)	238	58	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
From		A - Bolsover Road (South)	B - Woodthorpe Road	C - Bolsover Road (North)
	A - Bolsover Road (South)	5	5	5
	B - Woodthorpe Road	5	5	5
	C - Bolsover Road (North)	5	5	5

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.09	6.71	0.1	A	49	73
B-A	0.15	9.78	0.2	A	55	83
C-AB	0.13	5.72	0.2	A	77	115
C-A					195	293
A-B					108	160
A-C					138	204

Existing Layout - DM 2026, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Bolsover Road / Woodthorpe Road	T-Junction	Two-way		2.82	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	DM 2026	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Bolsover Road (South)		ONE HOUR	✓	279	100.000
B - Woodthorpe Road		ONE HOUR	✓	147	100.000
C - Bolsover Road (North)		ONE HOUR	✓	228	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Bolsover Road (South)	B - Woodthorpe Road	C - Bolsover Road (North)
From	A - Bolsover Road (South)	0	74	205
	B - Woodthorpe Road	88	0	59
	C - Bolsover Road (North)	166	62	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Bolsover Road (South)	B - Woodthorpe Road	C - Bolsover Road (North)
From	A - Bolsover Road (South)	5	5	5
	B - Woodthorpe Road	5	5	5
	C - Bolsover Road (North)	5	5	5

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.11	7.23	0.1	A	54	81
B-A	0.21	10.44	0.3	B	81	121
C-AB	0.13	6.21	0.2	A	74	110
C-A					136	203
A-B					68	102
A-C					188	282

Existing Layout - DS 2026, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Bolsover Road / Woodthorpe Road	T-Junction	Two-way		2.52	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D9	DS 2026	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Bolsover Road (South)		ONE HOUR	✓	278	100.000
B - Woodthorpe Road		ONE HOUR	✓	155	100.000
C - Bolsover Road (North)		ONE HOUR	✓	300	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Bolsover Road (South)	B - Woodthorpe Road	C - Bolsover Road (North)
From	A - Bolsover Road (South)	0	90	188
	B - Woodthorpe Road	66	0	89
	C - Bolsover Road (North)	239	61	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Bolsover Road (South)	B - Woodthorpe Road	C - Bolsover Road (North)
From	A - Bolsover Road (South)	5	5	5
	B - Woodthorpe Road	5	5	5
	C - Bolsover Road (North)	5	5	5

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.16	7.18	0.2	A	82	123
B-A	0.17	10.54	0.2	B	61	91
C-AB	0.14	5.79	0.2	A	81	121
C-A					195	292
A-B					83	124
A-C					173	259

Existing Layout - DS 2026, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Bolsover Road / Woodthorpe Road	T-Junction	Two-way		2.60	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D10	DS 2026	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Bolsover Road (South)		ONE HOUR	✓	420	100.000
B - Woodthorpe Road		ONE HOUR	✓	138	100.000
C - Bolsover Road (North)		ONE HOUR	✓	278	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Bolsover Road (South)	B - Woodthorpe Road	C - Bolsover Road (North)
From	A - Bolsover Road (South)	0	12	408
	B - Woodthorpe Road	63	0	75
	C - Bolsover Road (North)	189	89	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Bolsover Road (South)	B - Woodthorpe Road	C - Bolsover Road (North)
From	A - Bolsover Road (South)	5	5	5
	B - Woodthorpe Road	5	5	5
	C - Bolsover Road (North)	5	5	5

Results

Results Summary for whole modelled period

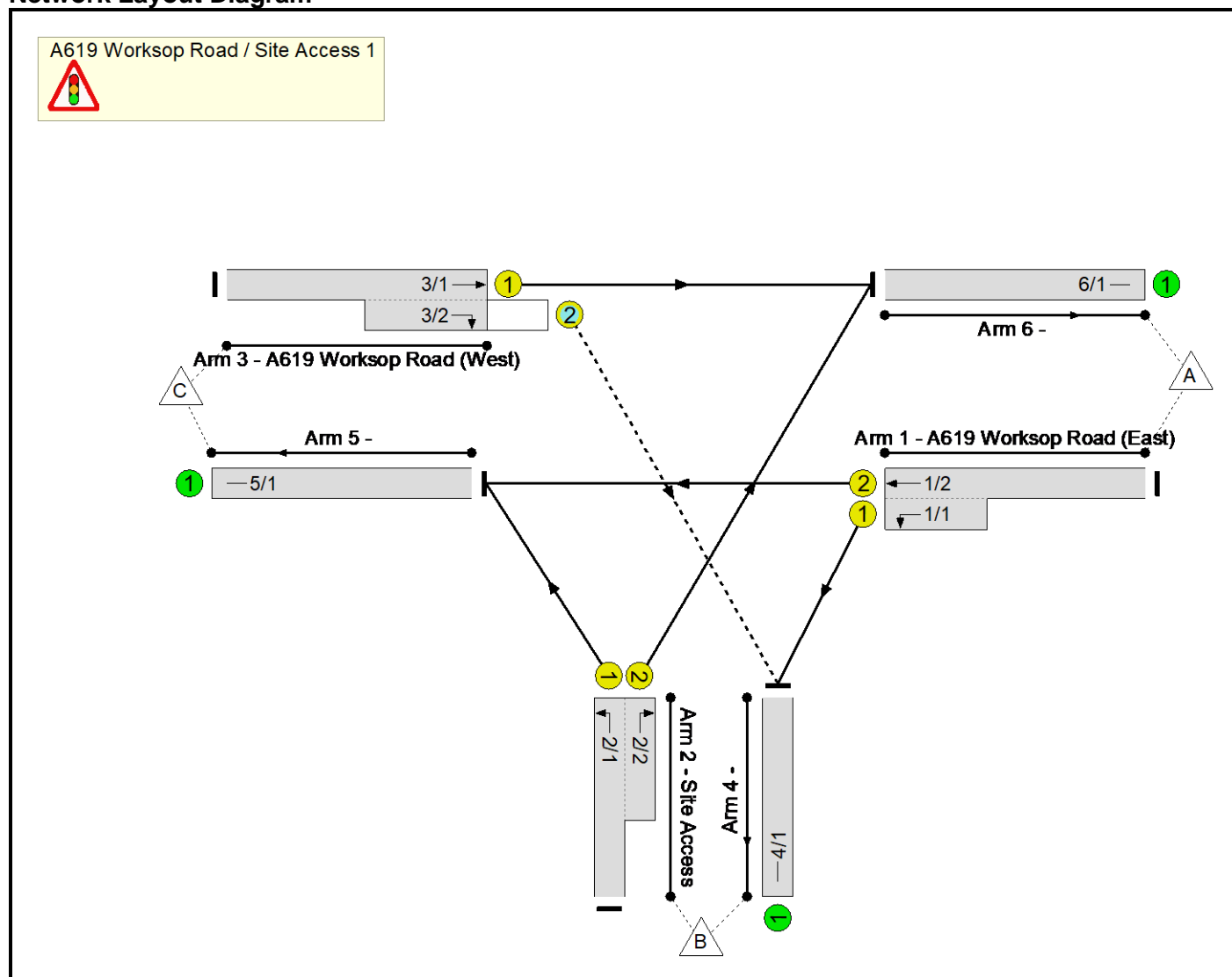
Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.15	7.77	0.2	A	69	103
B-A	0.18	11.95	0.2	B	58	87
C-AB	0.20	6.91	0.4	A	111	166
C-A					144	216
A-B					11	17
A-C					374	562

Full Input Data And Results
Full Input Data And Results

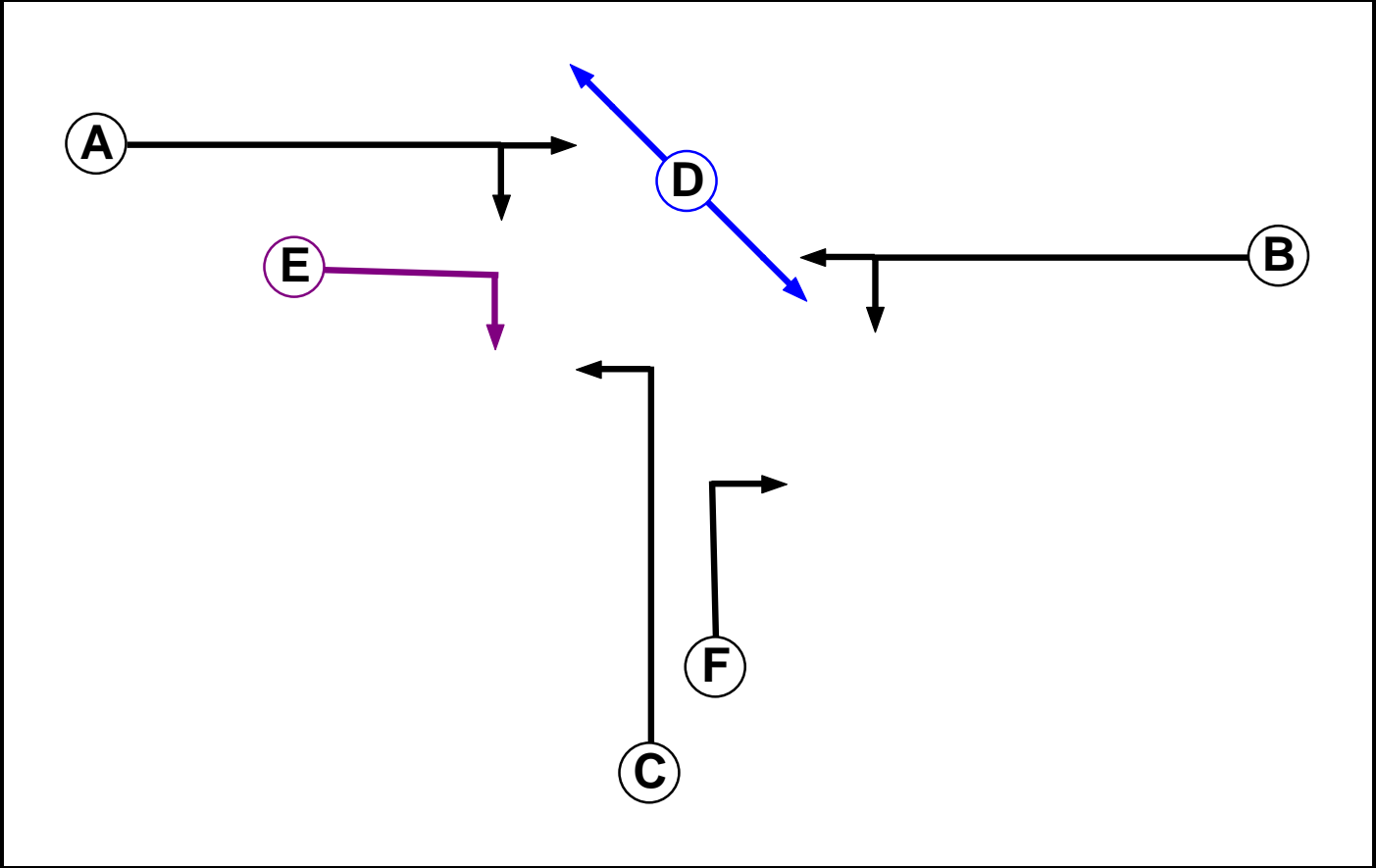
User and Project Details

Project:	Mastin Moor
Title:	A619 Worksop Road / Site Access 1
Location:	
Additional detail:	
File name:	2020-09-15 A619_Site Access.lsg3x
Author:	
Company:	Arup
Address:	Leeds Office

Network Layout Diagram



Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Pedestrian		5	5
E	Ind. Arrow	A	4	4
F	Traffic		7	7

Full Input Data And Results

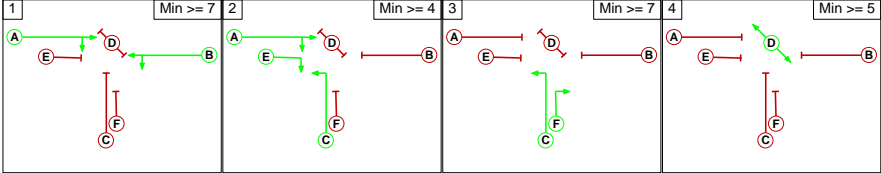
Phase Intergreens Matrix

Terminating Phase	Starting Phase						
		A	B	C	D	E	F
	A		-	-	5	-	6
	B	-		6	5	6	6
	C	-	6		5	-	-
	D	13	13	13		13	13
	E	-	6	-	5		6
	F	6	6	-	5	6	

Phases in Stage

Stage No.	Phases in Stage
1	A B
2	A C E
3	C F
4	D

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

From Stage	To Stage				
		1	2	3	4
	1		6	6	5
	2	6		6	5
	3	6	6		5
	4	13	13	13	

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: 'AM DS 2026'	08:00	09:00	01:00	
2: 'PM DS 2026'	17:00	18:00	01:00	

Traffic Flows, Desired

Scenario 1: 'AM DS 2026' (FG1: 'AM DS 2026', Plan 4: 'AM Peak')

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	24	824	848
	B	28	0	237	265
	C	883	81	0	964
	Tot.	911	105	1061	2077

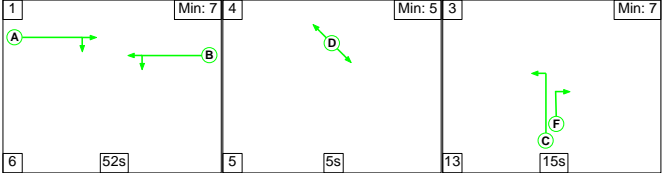
Scenario 2: 'PM DS 2026' (FG2: 'PM DS 2026', Plan 1: 'Every Cycle')

Desired Flow :

	Destination				
Origin		A	B	C	Tot.
	A	0	17	840	857
	B	22	0	287	309
	C	945	138	0	1083
	Tot.	967	155	1127	2249

Scenario 1: 'AM DS 2026' (FG1: 'AM DS 2026', Plan 4: 'AM Peak')

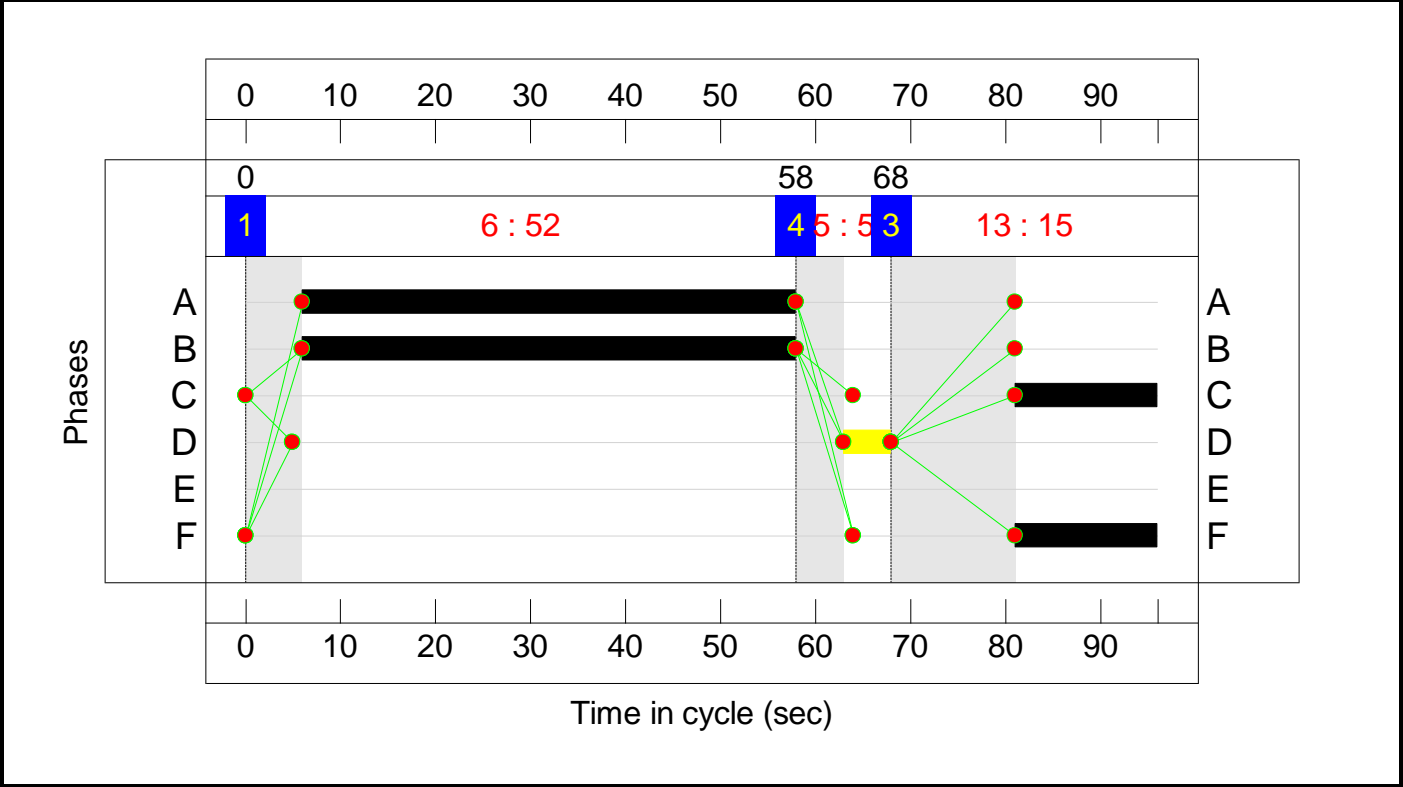
Stage Sequence Diagram



Stage Timings

Stage	1	4	3
Duration	52	5	15
Change Point	0	58	68

Signal Timings Diagram



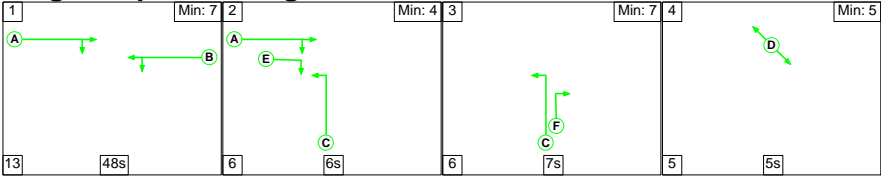
Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: A619 Worksoop Road / Site Access 1	-	-	-		-	-	-	-	-	-	89.3%	80	0	1	20.3	-	-
A619 Worksoop Road / Site Access 1	-	-	-		-	-	-	-	-	-	89.3%	80	0	1	20.3	-	-
1/2+1/1	A619 Worksoop Road (East) Left Ahead	U	B		1	52	-	848	2055:1613	1096+32	75.2 : 75.2%	-	-	-	5.4	22.8	18.6
2/1+2/2	Site Access Left Right	U	C F		1	15	-	265	1665:1702	272+32	87.2 : 87.2%	-	-	-	5.8	78.7	9.1
3/1+3/2	A619 Worksoop Road (West) Right Ahead	U+O	A	E	1	52	0	964	1915:1827	989+91	89.3 : 89.3%	80	0	1	9.2	34.2	25.8
4/1		U	-		-	-	-	105	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0
5/1		U	-		-	-	-	1061	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0
6/1		U	-		-	-	-	911	Inf	Inf	0.0%	-	-	-	0.0	0.0	0.0
C1																	
PRC for Signalled Lanes (%):							0.8	Total Delay for Signalled Lanes (pcuHr):					20.31	Cycle Time (s): 96			
PRC Over All Lanes (%):							0.8	Total Delay Over All Lanes(pcuHr):					20.31				

Full Input Data And Results
Scenario 2: 'PM DS 2026' (FG2: 'PM DS 2026', Plan 1: 'Every Cycle')

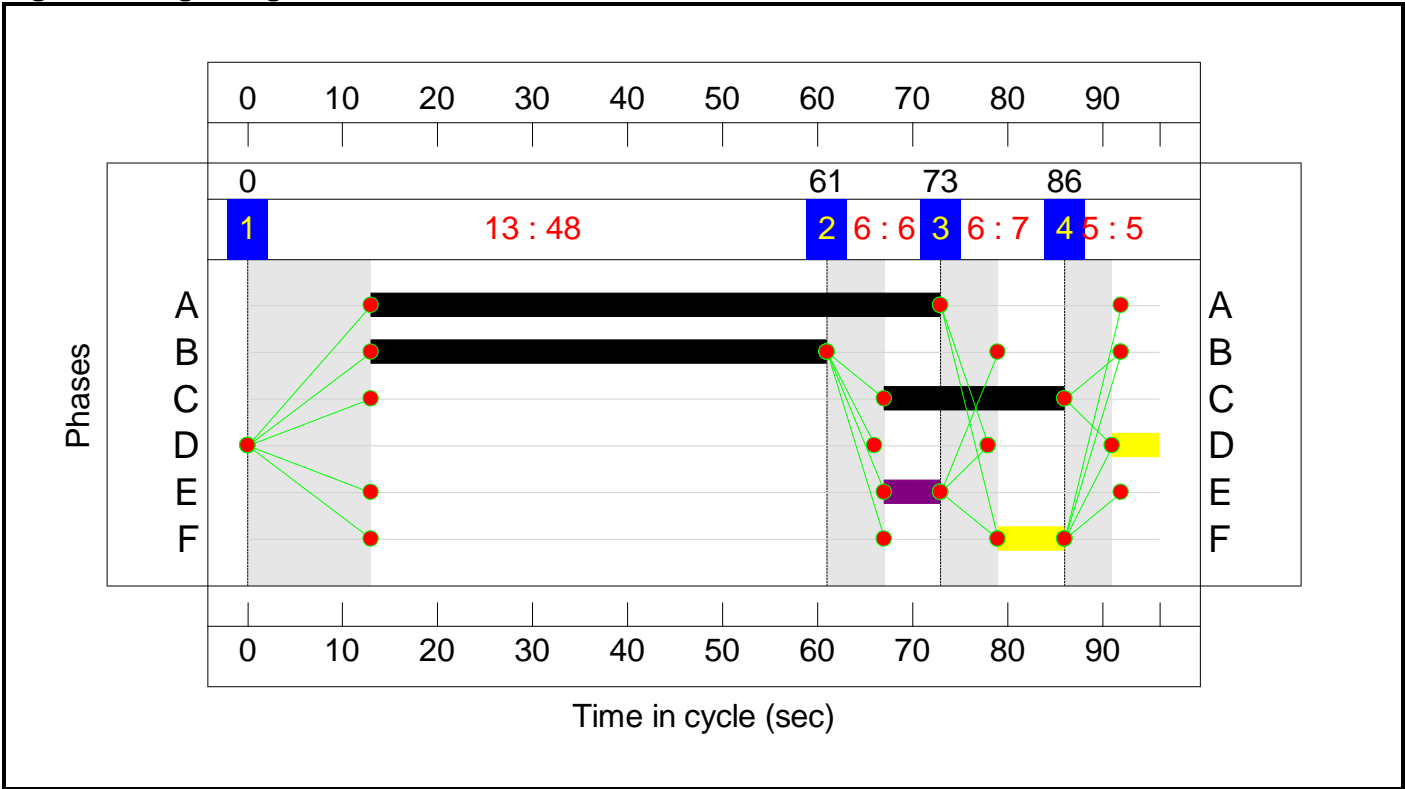
Stage Sequence Diagram



Stage Timings

Stage	1	2	3	4
Duration	48	6	7	5
Change Point	0	61	73	86

Signal Timings Diagram



Network Results

C1	PRC for Signalled Lanes (%):	3.8	Total Delay for Signalled Lanes (pcuHr):	20.57	Cycle Time (s): 96
	PRC Over All Lanes (%):	3.8	Total Delay Over All Lanes(pcuHr):	20.57	

Junctions 9	
PICADY 9 - Priority Intersection Module	
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Filename: 2020-09-22 Bolsover Road_Central Access.j9

Path: \\global\\europe\\Leeds\\Jobs\\270000\\276927-00\\0 Arup\\0-11 Transportation\\0-11-07 Calcs-Specs\\4. Junction Models 2020\\Site Access\\Site Access 2

Report generation date: 22/09/2020 14:45:47

»Proposed Layout - DS 2026, AM

»Proposed Layout - DS 2026, PM

Summary of junction performance

	AM		PM	
	Queue (PCU)	RFC	Queue (PCU)	RFC
Proposed Layout - DS 2026				
Stream B-C	0.1	0.07	0.2	0.13
Stream B-A	0.1	0.05	0.2	0.15
Stream C-AB	0.2	0.17	0.1	0.10

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

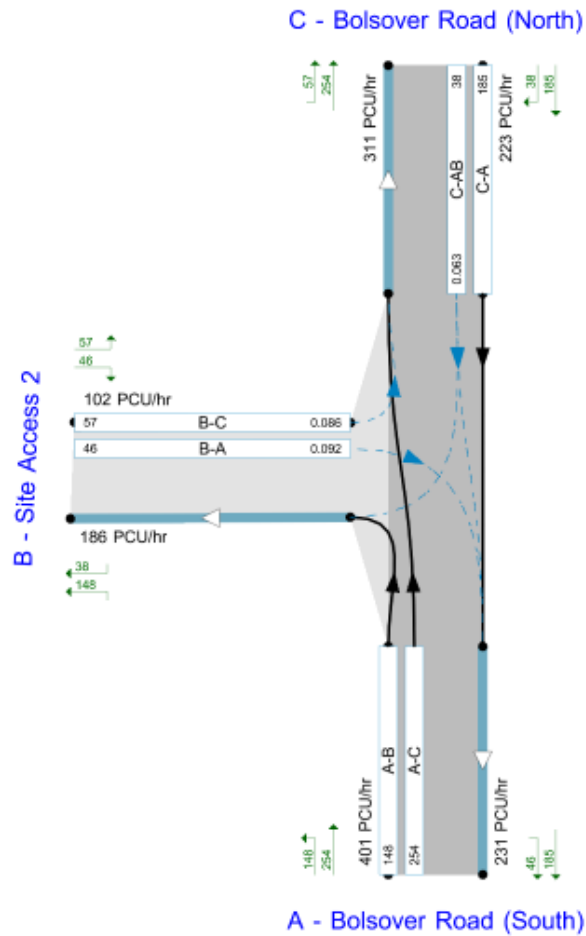
File summary

File Description

Title	Site Access 2
Location	Mastin Moor
Site number	
Date	22/09/2020
Version	
Status	Proposed Layout
Identifier	
Client	
Jobnumber	
Enumerator	
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	DS 2026	AM	ONE HOUR	07:45	09:15	15	✓
D2	DS 2026	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Proposed Layout	✓	100.000	100.000

Proposed Layout - DS 2026, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access	T-Junction	Two-way		1.49	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Bolsover Road (South)		Major
B	Site Access 2		Minor
C	Bolsover Road (North)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Bolsover Road (North)	12.00		✓	3.00	100.0	✓	13.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B - Site Access 2	One lane plus flare	10.00	5.00	3.30	3.30	3.30	✓	1.00	100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	577	0.078	0.196	0.124	0.280
1	B-C	733	0.083	0.210	-	-
1	C-B	687	0.197	0.197	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	DS 2026	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Bolsover Road (South)		ONE HOUR	✓	314	100.000
B - Site Access 2		ONE HOUR	✓	60	100.000
C - Bolsover Road (North)		ONE HOUR	✓	385	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Bolsover Road (South)	B - Site Access 2	C - Bolsover Road (North)
From	A - Bolsover Road (South)	0	102	212
	B - Site Access 2	19	0	41
	C - Bolsover Road (North)	288	97	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Bolsover Road (South)	B - Site Access 2	C - Bolsover Road (North)
From	A - Bolsover Road (South)	5	5	5
	B - Site Access 2	5	5	5
	C - Bolsover Road (North)	5	5	5

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.07	6.08	0.1	A	38	56
B-A	0.05	8.75	0.1	A	17	28
C-AB	0.17	7.38	0.2	A	89	134
C-A					264	396
A-B					94	140
A-C					195	292

Proposed Layout - DS 2026, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access	T-Junction	Two-way		1.56	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	DS 2026	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Bolsover Road (South)		ONE HOUR	✓	533	100.000
B - Site Access 2		ONE HOUR	✓	137	100.000
C - Bolsover Road (North)		ONE HOUR	✓	297	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Bolsover Road (South)	B - Site Access 2	C - Bolsover Road (North)
From	A - Bolsover Road (South)	0	196	337
	B - Site Access 2	61	0	76
	C - Bolsover Road (North)	246	51	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Bolsover Road (South)	B - Site Access 2	C - Bolsover Road (North)
From	A - Bolsover Road (South)	5	5	5
	B - Site Access 2	5	5	5
	C - Bolsover Road (North)	5	5	5

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.13	7.01	0.2	A	70	105
B-A	0.15	9.88	0.2	A	58	84
C-AB	0.10	7.33	0.1	A	47	70
C-A					228	339
A-B					180	270
A-C					309	464

Junctions 9	
PICADY 9 - Priority Intersection Module	
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Filename: 2020-09-22 Woodthorpe Road_South Access.j9

Path: \\global\europa\Leeds\Jobs\270000\276927-00\0 Arup\0-11 Transportation\0-11-07 Calcs-Specs\4. Junction Models 2020
\\Site Access\Site Access 3

Report generation date: 22/09/2020 14:48:02

»Proposed Layout - DS 2026, AM

»Proposed Layout - DS 2026, PM

Summary of junction performance

	AM		PM	
	Queue (PCU)	RFC	Queue (PCU)	RFC
Proposed Layout - DS 2026				
Stream B-C	0.1	0.11	0.1	0.06
Stream B-A	0.1	0.06	0.0	0.03
Stream C-AB	0.1	0.06	0.1	0.10

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

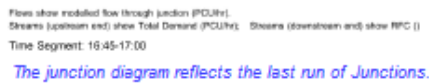
File summary

File Description

Title	Site Access 3
Location	Mastin Moor
Site number	
Date	22/09/2020
Version	
Status	Proposed Layout
Identifier	
Client	
Jobnumber	236145
Enumerator	
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	DS 2026	AM	ONE HOUR	07:45	09:15	15	✓
D2	DS 2026	PM	ONE HOUR	16:45	18:15	15	✓

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Proposed Layout	✓	100.000	100.000

Proposed Layout - DS 2026, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access	T-Junction	Two-way		2.42	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Woodthorpe Road (West)		Major
B	Site Access 3		Minor
C	Woodthorpe Road (East)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Woodthorpe Road (East)	6.50			100.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B - Site Access 3	One lane plus flare	10.00	5.00	3.30	3.30	3.30	✓	1.00	100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	571	0.102	0.257	0.162	0.367
1	B-C	736	0.110	0.279	-	-
1	C-B	632	0.240	0.240	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	DS 2026	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Woodthorpe Road (West)		ONE HOUR	✓	97	100.000
B - Site Access 3		ONE HOUR	✓	98	100.000
C - Woodthorpe Road (East)		ONE HOUR	✓	151	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Woodthorpe Road (West)	B - Site Access 3	C - Woodthorpe Road (East)
From	A - Woodthorpe Road (West)	0	12	85
	B - Site Access 3	28	0	70
	C - Woodthorpe Road (East)	122	29	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Woodthorpe Road (West)	B - Site Access 3	C - Woodthorpe Road (East)
From	A - Woodthorpe Road (West)	5	5	5
	B - Site Access 3	5	5	5
	C - Woodthorpe Road (East)	5	5	5

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.11	6.09	0.1	A	64	98
B-A	0.06	7.83	0.1	A	24	38
C-AB	0.06	5.82	0.1	A	32	48
C-A					107	160
A-B					11	17
A-C					78	117

Proposed Layout - DS 2026, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access	T-Junction	Two-way		2.53	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	DS 2026	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Woodthorpe Road (West)		ONE HOUR	✓	128	100.000
B - Site Access 3		ONE HOUR	✓	51	100.000
C - Woodthorpe Road (East)		ONE HOUR	✓	101	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Woodthorpe Road (West)	B - Site Access 3	C - Woodthorpe Road (East)
From	A - Woodthorpe Road (West)	0	23	103
	B - Site Access 3	18	0	35
	C - Woodthorpe Road (East)	48	53	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Woodthorpe Road (West)	B - Site Access 3	C - Woodthorpe Road (East)
From	A - Woodthorpe Road (West)	5	5	5
	B - Site Access 3	5	5	5
	C - Woodthorpe Road (East)	5	5	5

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.06	5.78	0.1	A	32	48
B-A	0.03	7.61	0.0	A	15	22
C-AB	0.10	6.63	0.1	A	52	79
C-A					40	60
A-B					21	32
A-C					95	142

Junctions 9	
PICADY 9 - Priority Intersection Module	
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Filename: 2020-09-22 Bolsover Road_East Access.j9

Path: \\global\europa\Leeds\Jobs\270000\276927-00\0 Arup\0-11 Transportation\0-11-07 Calcs-Specs\4. Junction Models 2020
\\Site Access\Site Access 4

Report generation date: 22/09/2020 14:50:48

»Proposed Layout - DS 2026, AM

»Proposed Layout - DS 2026, PM

Summary of junction performance

	AM		PM	
	Queue (PCU)	RFC	Queue (PCU)	RFC
Proposed Layout - DS 2026				
Stream B-C	0.1	0.11	0.1	0.06
Stream B-A	0.3	0.25	0.1	0.12
Stream C-AB	0.1	0.07	0.3	0.13

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

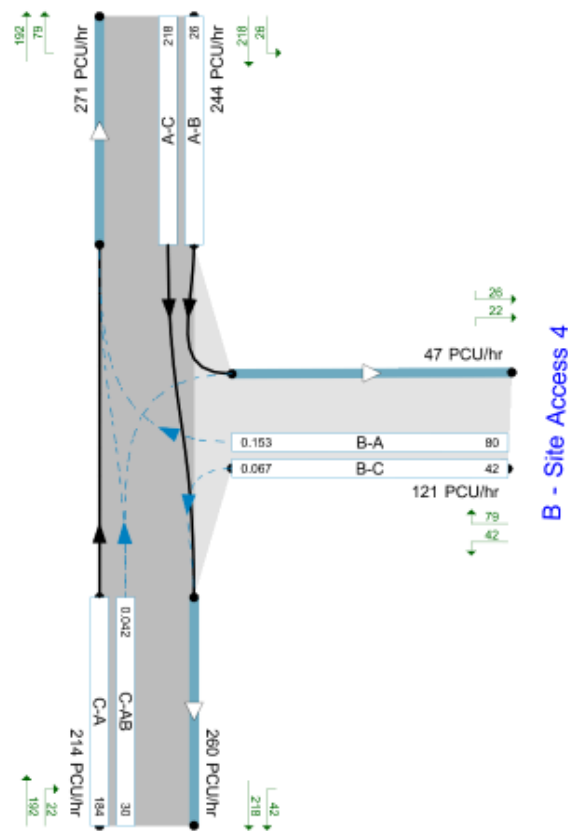
File Description

Title	Site Access 4
Location	Mastin Moor
Site number	
Date	22/09/2020
Version	
Status	Proposed Layout
Identifier	
Client	
Jobnumber	236145
Enumerator	
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

A - Bolsover Road (North)



C - Bolsover Road (South)

Flows show modelled flow through junction (PCU/hr).
Streams (upstream end) show Total Demand (PCU/hr). Streams (downstream end) show RFC (s).
Time Segment: 07:45-08:00
The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	DS 2026	AM	ONE HOUR	07:45	09:15	15	✓
D2	DS 2026	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	Proposed Layout	✓	100.000	100.000

Proposed Layout - DS 2026, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access	T-Junction	Two-way		2.31	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Bolsover Road (North)		Major
B	Site Access 4		Minor
C	Bolsover Road (South)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Bolsover Road (South)	7.50			100.0	✓	0.00

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B - Site Access 4	One lane plus flare	10.00	5.00	3.30	3.30	3.30	✓	1.00	100	100

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	625	0.106	0.269	0.169	0.384
1	B-C	712	0.102	0.258	-	-
1	C-B	632	0.229	0.229	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	DS 2026	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Bolsover Road (North)		ONE HOUR	✓	324	100.000
B - Site Access 4		ONE HOUR	✓	162	100.000
C - Bolsover Road (South)		ONE HOUR	✓	284	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Bolsover Road (North)	B - Site Access 4	C - Bolsover Road (South)
From	A - Bolsover Road (North)	0	34	290
	B - Site Access 4	106	0	56
	C - Bolsover Road (South)	255	29	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Bolsover Road (North)	B - Site Access 4	C - Bolsover Road (South)
From	A - Bolsover Road (North)	5	5	5
	B - Site Access 4	5	5	5
	C - Bolsover Road (South)	5	5	5

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.11	7.32	0.1	A	51	77
B-A	0.25	10.59	0.3	B	97	146
C-AB	0.07	5.59	0.1	A	40	60
C-A					221	331
A-B					31	47
A-C					266	399

Proposed Layout - DS 2026, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access	T-Junction	Two-way		1.47	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	DS 2026	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Bolsover Road (North)		ONE HOUR	✓	299	100.000
B - Site Access 4		ONE HOUR	✓	84	100.000
C - Bolsover Road (South)		ONE HOUR	✓	424	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A - Bolsover Road (North)	B - Site Access 4	C - Bolsover Road (South)
From	A - Bolsover Road (North)	0	74	225
	B - Site Access 4	49	0	35
	C - Bolsover Road (South)	372	52	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A - Bolsover Road (North)	B - Site Access 4	C - Bolsover Road (South)
From	A - Bolsover Road (North)	5	5	5
	B - Site Access 4	5	5	5
	C - Bolsover Road (South)	5	5	5

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-C	0.06	6.39	0.1	A	32	48
B-A	0.12	9.54	0.1	A	45	67
C-AB	0.13	5.34	0.3	A	85	127
C-A					304	456
A-B					68	102
A-C					208	310

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.1.7462

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Filename: Treble Bob Jn_AECOMGeo.j9

Path: \\global\europa\Leeds\Jobs\270000\276927-00\0 Arup\0-11 Transportation\0-11-07 Calcs-Specs\4. Junction Models 2020\Treble Bob Roundabout

Report generation date: 30/09/2020 12:24:16

»DM 2026, AM
»DS 2026, AM
»DS 2026, PM
»DM 2026, PM
»Base 2019, AM
»Base 2019, PM

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
DM 2026										
Arm 1	D1	0.3	9.39	0.21	A	D4	0.1	6.02	0.05	A
Arm 2		1.0	6.09	0.49	A		3.2	12.35	0.75	B
Arm 3		1.1	5.15	0.52	A		1.7	6.90	0.61	A
Arm 4		4.1	9.60	0.79	A		2.5	6.76	0.70	A
Arm 5		6.5	24.53	0.87	C		2.8	11.25	0.73	B
DS 2026										
Arm 1	D2	0.3	9.71	0.22	A	D3	0.1	6.12	0.05	A
Arm 2		1.0	6.16	0.49	A		3.3	12.81	0.76	B
Arm 3		1.3	5.68	0.56	A		1.9	7.40	0.64	A
Arm 4		4.5	10.47	0.81	B		2.7	7.03	0.71	A
Arm 5		7.3	27.30	0.88	D		2.9	11.74	0.74	B
Base 2019										
Arm 1	D5	0.2	8.20	0.18	A	D6	0.1	5.61	0.05	A
Arm 2		0.9	5.53	0.45	A		2.4	9.82	0.70	A
Arm 3		1.0	4.68	0.48	A		1.4	6.01	0.56	A
Arm 4		3.1	7.59	0.74	A		2.1	5.81	0.66	A
Arm 5		4.1	15.83	0.80	C		2.2	9.18	0.67	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	18/09/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	GLOBAL\Megha.Manoj
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	DM 2026	AM	ONE HOUR	07:45	09:15	15
D2	DS 2026	AM	ONE HOUR	07:45	09:15	15
D3	DS 2026	PM	ONE HOUR	16:45	18:15	15
D4	DM 2026	PM	ONE HOUR	16:45	18:15	15
D5	Base 2019	AM	ONE HOUR	07:45	09:15	15
D6	Base 2019	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

DM 2026, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Treble Bob	Standard Roundabout		1, 2, 3, 4, 5	11.91	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	
5	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	3.75	8.00	8.0	20.0	85.0	42.0	
2	4.60	9.40	9.0	18.0	85.0	46.0	
3	3.40	7.90	30.0	32.0	85.0	18.0	
4	7.40	7.40	0.0	80.0	85.0	26.0	
5	5.00	6.30	10.0	21.0	85.0	35.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.420	1467
2	0.466	1813
3	0.529	2069
4	0.568	2356
5	0.469	1766

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	DM 2026	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	99	100.000
2		✓	551	100.000
3		✓	716	100.000
4		✓	1438	100.000
5		✓	919	100.000

Origin-Destination Data

Demand (PCU/hr)

	To					
From		1	2	3	4	5
	1	0	0	33	33	33
	2	0	0	184	308	59
	3	11	248	0	230	227
	4	11	551	348	0	528
	5	11	242	173	493	0

Vehicle Mix

Heavy Vehicle Percentages

		To				
From		1	2	3	4	5
	1	0	5	5	10	5
	2	5	0	5	10	5
	3	5	0	0	10	10
	4	10	10	10	0	10
	5	5	5	5	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.21	9.39	0.3	A
2	0.49	6.09	1.0	A
3	0.52	5.15	1.1	A
4	0.79	9.60	4.1	A
5	0.87	24.53	6.5	C

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	75	1539	820	0.091	74	0.1	5.141	A
2	415	833	1426	0.291	413	0.4	3.824	A
3	539	693	1702	0.317	537	0.5	3.277	A
4	1083	433	2109	0.513	1078	1.1	3.823	A
5	692	876	1355	0.510	687	1.1	5.763	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	89	1842	693	0.128	89	0.2	6.349	A
2	495	997	1349	0.367	495	0.6	4.535	A
3	644	830	1630	0.395	643	0.7	3.872	A
4	1293	519	2061	0.627	1290	1.8	5.118	A
5	826	1049	1275	0.648	823	1.9	8.516	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	109	2240	526	0.207	109	0.3	9.184	A
2	607	1211	1250	0.485	605	1.0	6.003	A
3	788	1009	1535	0.514	787	1.1	5.100	A
4	1583	635	1995	0.794	1574	4.0	9.226	A
5	1012	1281	1166	0.868	996	6.0	21.021	C

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	109	2260	518	0.211	109	0.3	9.392	A
2	607	1224	1244	0.488	607	1.0	6.088	A
3	788	1018	1530	0.515	788	1.1	5.155	A
4	1583	636	1994	0.794	1583	4.1	9.602	A
5	1012	1287	1163	0.870	1010	6.5	24.535	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	89	1871	681	0.131	89	0.2	6.496	A
2	495	1016	1340	0.370	497	0.6	4.608	A
3	644	843	1623	0.397	645	0.7	3.919	A
4	1293	521	2060	0.628	1302	1.9	5.286	A
5	826	1057	1271	0.650	844	2.1	9.442	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	75	1553	815	0.091	75	0.1	5.188	A
2	415	841	1422	0.292	416	0.4	3.859	A
3	539	700	1699	0.317	540	0.5	3.302	A
4	1083	436	2108	0.514	1085	1.2	3.884	A
5	692	882	1353	0.511	696	1.1	5.927	A

DS 2026, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Treble Bob	Standard Roundabout		1, 2, 3, 4, 5	12.93	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	DS 2026	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	99	100.000
2		✓	554	100.000
3		✓	778	100.000
4		✓	1444	100.000
5		✓	922	100.000

Origin-Destination Data

Demand (PCU/hr)

		To				
		1	2	3	4	5
From	1	0	0	33	33	33
	2	0	0	187	308	59
	3	12	269	0	247	250
	4	11	551	354	0	528
	5	11	242	176	493	0

Vehicle Mix

Heavy Vehicle Percentages

	To					
From		1	2	3	4	5
	1	0	5	5	10	5
	2	5	0	5	10	5
	3	5	0	0	10	10
	4	10	10	10	0	10
5	5	5	5	10	0	

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.22	9.71	0.3	A
2	0.49	6.16	1.0	A
3	0.56	5.68	1.3	A
4	0.81	10.47	4.5	B
5	0.88	27.30	7.3	D

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	75	1561	811	0.092	74	0.1	5.206	A
2	417	840	1422	0.293	415	0.4	3.845	A
3	586	693	1702	0.344	584	0.6	3.412	A
4	1087	467	2090	0.520	1082	1.2	3.911	A
5	694	897	1346	0.516	690	1.1	5.867	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	89	1869	882	0.131	89	0.2	6.469	A
2	498	1005	1345	0.370	497	0.6	4.568	A
3	699	830	1630	0.429	698	0.8	4.102	A
4	1296	559	2038	0.637	1295	1.9	5.312	A
5	829	1074	1263	0.656	825	2.0	8.786	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	109	2271	513	0.212	109	0.3	9.471	A
2	610	1219	1246	0.490	608	1.0	6.069	A
3	857	1008	1535	0.558	854	1.3	5.617	A
4	1590	684	1967	0.808	1580	4.4	9.980	A
5	1015	1311	1152	0.881	997	6.6	22.761	C

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	109	2293	504	0.218	109	0.3	9.713	A
2	610	1233	1239	0.492	610	1.0	6.161	A
3	857	1018	1530	0.560	857	1.3	5.676	A
4	1590	686	1966	0.809	1589	4.5	10.474	B
5	1015	1318	1149	0.884	1012	7.3	27.298	D

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	89	1902	668	0.133	90	0.2	6.640	A
2	498	1026	1336	0.373	500	0.6	4.649	A
3	699	845	1622	0.431	702	0.8	4.164	A
4	1298	562	2036	0.637	1308	2.0	5.511	A
5	829	1083	1258	0.659	849	2.1	9.918	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	75	1576	805	0.093	75	0.1	5.258	A
2	417	848	1418	0.294	418	0.5	3.878	A
3	586	700	1699	0.345	587	0.6	3.442	A
4	1087	470	2089	0.520	1090	1.2	3.978	A
5	694	903	1343	0.517	698	1.2	6.044	A

DS 2026, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Treble Bob	Standard Roundabout		1, 2, 3, 4, 5	9.45	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	DS 2026	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	33	100.000
2		✓	873	100.000
3		✓	829	100.000
4		✓	1255	100.000
5		✓	835	100.000

Origin-Destination Data

Demand (PCU/hr)

		To				
		1	2	3	4	5
From	1	0	0	11	11	11
	2	0	0	289	529	75
	3	33	214	0	257	325
	4	33	336	387	0	499
	5	33	148	187	467	0

Vehicle Mix

Heavy Vehicle Percentages

	To					
From		1	2	3	4	5
	1	0	5	5	10	5
	2	5	0	5	10	5
	3	5	0	0	10	10
	4	10	10	10	0	10
	5	5	5	5	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.05	6.12	0.1	A
2	0.76	12.81	3.3	B
3	0.64	7.40	1.9	A
4	0.71	7.03	2.7	A
5	0.74	11.74	2.9	B

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	25	1303	920	0.027	25	0.0	4.289	A
2	657	805	1439	0.457	654	0.9	4.928	A
3	624	818	1636	0.382	621	0.7	3.789	A
4	945	493	2075	0.455	941	0.9	3.479	A
5	629	752	1414	0.445	625	0.9	4.899	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	30	1560	812	0.037	30	0.0	4.907	A
2	785	963	1365	0.575	783	1.4	6.650	A
3	745	980	1550	0.481	744	1.0	4.769	A
4	1128	590	2020	0.558	1128	1.4	4.421	A
5	751	900	1344	0.558	749	1.3	6.492	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	36	1905	667	0.054	36	0.1	6.087	A
2	961	1176	1266	0.759	954	3.2	12.192	B
3	913	1195	1437	0.635	909	1.8	7.259	A
4	1382	721	1946	0.710	1377	2.6	6.899	A
5	919	1100	1250	0.735	913	2.9	11.308	B

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17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	36	1914	663	0.055	36	0.1	6.124	A
2	961	1182	1263	0.761	961	3.3	12.814	B
3	913	1203	1433	0.637	913	1.9	7.405	A
4	1382	724	1944	0.711	1382	2.7	7.034	A
5	919	1104	1249	0.736	919	2.9	11.742	B

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	30	1573	806	0.037	30	0.0	4.945	A
2	785	972	1361	0.577	792	1.5	6.919	A
3	745	991	1545	0.483	749	1.0	4.863	A
4	1128	595	2018	0.559	1133	1.4	4.500	A
5	751	906	1342	0.560	757	1.4	6.701	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	25	1313	916	0.027	25	0.0	4.309	A
2	657	811	1436	0.458	660	0.9	5.022	A
3	624	826	1632	0.382	625	0.7	3.832	A
4	945	497	2074	0.456	947	0.9	3.522	A
5	629	757	1412	0.445	631	0.9	4.980	A

DM 2026, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Treble Bob	Standard Roundabout		1, 2, 3, 4, 5	9.05	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	DM 2026	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	33	100.000
2		✓	888	100.000
3		✓	794	100.000
4		✓	1247	100.000
5		✓	831	100.000

Origin-Destination Data

Demand (PCU/hr)

		To				
		1	2	3	4	5
From	1	0	0	11	11	11
	2	0	0	284	529	75
	3	33	202	0	245	314
	4	33	336	379	0	499
	5	33	148	183	467	0

Vehicle Mix

Heavy Vehicle Percentages

	To					
From		1	2	3	4	5
	1	0	5	5	10	5
	2	5	0	5	10	5
	3	5	0	0	10	10
	4	10	10	10	0	10
	5	5	5	5	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.05	6.02	0.1	A
2	0.75	12.35	3.2	B
3	0.61	6.90	1.7	A
4	0.70	6.76	2.5	A
5	0.73	11.25	2.8	B

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	25	1285	927	0.027	25	0.0	4.253	A
2	653	796	1443	0.453	650	0.9	4.881	A
3	598	818	1636	0.365	595	0.6	3.697	A
4	939	476	2085	0.450	935	0.9	3.434	A
5	626	737	1421	0.440	622	0.8	4.838	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	30	1539	821	0.036	30	0.0	4.851	A
2	780	953	1370	0.570	778	1.4	6.546	A
3	714	980	1550	0.460	713	0.9	4.593	A
4	1121	570	2032	0.552	1119	1.3	4.329	A
5	747	882	1353	0.552	745	1.3	6.367	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	36	1879	678	0.054	36	0.1	5.984	A
2	956	1163	1272	0.751	949	3.1	11.797	B
3	874	1195	1437	0.609	871	1.6	6.783	A
4	1373	697	1960	0.700	1368	2.5	6.639	A
5	915	1079	1261	0.726	909	2.7	10.867	B

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	36	1888	674	0.054	36	0.1	6.018	A
2	956	1169	1269	0.753	955	3.2	12.348	B
3	874	1203	1433	0.610	874	1.7	6.899	A
4	1373	699	1959	0.701	1373	2.5	6.756	A
5	915	1082	1259	0.727	915	2.8	11.246	B

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	30	1551	816	0.036	30	0.0	4.886	A
2	780	961	1366	0.571	787	1.5	6.793	A
3	714	991	1545	0.462	717	0.9	4.670	A
4	1121	573	2030	0.552	1126	1.4	4.403	A
5	747	887	1350	0.553	753	1.4	6.553	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	25	1294	923	0.027	25	0.0	4.274	A
2	653	802	1440	0.454	656	0.9	4.969	A
3	598	826	1632	0.366	599	0.6	3.737	A
4	939	479	2083	0.451	941	0.9	3.469	A
5	626	742	1419	0.441	628	0.9	4.917	A

Base 2019, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Treble Bob	Standard Roundabout		1, 2, 3, 4, 5	8.78	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	Base 2019	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	93	100.000
2		✓	521	100.000
3		✓	675	100.000
4		✓	1357	100.000
5		✓	867	100.000

Origin-Destination Data

Demand (PCU/hr)

		To				
		1	2	3	4	5
From	1	0	0	31	31	31
	2	0	0	174	291	56
	3	10	234	0	217	214
	4	10	520	329	0	498
	5	10	229	163	465	0

Vehicle Mix

Heavy Vehicle Percentages

	To					
From		1	2	3	4	5
	1	0	5	5	10	5
	2	5	0	5	10	5
	3	5	0	0	10	10
	4	10	10	10	0	10
	5	5	5	5	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.18	8.20	0.2	A
2	0.45	5.53	0.9	A
3	0.48	4.68	1.0	A
4	0.74	7.59	3.1	A
5	0.80	15.83	4.1	C

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	70	1454	856	0.082	70	0.1	4.876	A
2	392	788	1447	0.271	391	0.4	3.666	A
3	508	655	1722	0.295	506	0.4	3.141	A
4	1022	409	2123	0.481	1018	1.0	3.568	A
5	653	827	1378	0.474	649	1.0	5.283	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	84	1740	736	0.114	83	0.1	5.879	A
2	468	941	1375	0.341	468	0.6	4.272	A
3	607	784	1654	0.367	606	0.6	3.648	A
4	1220	489	2078	0.587	1218	1.5	4.594	A
5	779	990	1302	0.599	777	1.6	7.341	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	102	2123	575	0.178	102	0.2	8.094	A
2	574	1148	1279	0.448	572	0.9	5.477	A
3	743	956	1583	0.475	742	1.0	4.650	A
4	1494	599	2015	0.741	1488	3.1	7.425	A
5	955	1210	1199	0.796	945	3.9	14.760	B

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08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	102	2135	570	0.180	102	0.2	8.205	A
2	574	1158	1275	0.450	574	0.9	5.525	A
3	743	982	1580	0.478	743	1.0	4.681	A
4	1494	800	2015	0.742	1494	3.1	7.594	A
5	955	1214	1197	0.797	954	4.1	15.832	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	84	1758	729	0.115	84	0.1	5.956	A
2	488	953	1370	0.342	470	0.6	4.313	A
3	607	792	1650	0.368	608	0.6	3.675	A
4	1220	491	2077	0.587	1226	1.6	4.689	A
5	779	998	1299	0.600	789	1.6	7.730	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	70	1465	852	0.082	70	0.1	4.912	A
2	392	793	1444	0.272	393	0.4	3.693	A
3	508	680	1720	0.296	509	0.4	3.159	A
4	1022	411	2122	0.481	1024	1.0	3.614	A
5	653	832	1376	0.474	655	1.0	5.394	A

Base 2019, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Treble Bob	Standard Roundabout		1, 2, 3, 4, 5	7.51	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	Base 2019	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	30	100.000
2		✓	821	100.000
3		✓	751	100.000
4		✓	1180	100.000
5		✓	785	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
	1	2	3	4	5
From	1	0	0	10	10
	2	0	0	250	500
	3	31	191	0	232
	4	31	318	359	0
	5	31	140	173	441

Vehicle Mix

Heavy Vehicle Percentages

	To					
From		1	2	3	4	5
	1	0	5	5	10	5
	2	5	0	5	10	5
	3	5	0	0	10	10
	4	10	10	10	0	10
	5	5	5	5	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.05	5.81	0.1	A
2	0.70	9.82	2.4	A
3	0.56	6.01	1.4	A
4	0.66	5.81	2.1	A
5	0.67	9.18	2.2	A

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	23	1216	956	0.024	22	0.0	4.110	A
2	618	752	1463	0.422	615	0.8	4.566	A
3	565	773	1660	0.341	563	0.5	3.507	A
4	888	450	2100	0.423	885	0.8	3.252	A
5	591	698	1439	0.411	588	0.7	4.542	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	27	1456	856	0.032	27	0.0	4.632	A
2	738	900	1394	0.529	736	1.2	5.892	A
3	675	926	1579	0.428	674	0.8	4.254	A
4	1061	539	2050	0.518	1059	1.2	3.993	A
5	706	835	1375	0.513	704	1.1	5.771	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	33	1779	720	0.046	33	0.1	5.590	A
2	904	1100	1301	0.695	899	2.4	9.557	A
3	827	1131	1471	0.562	825	1.4	5.945	A
4	1299	659	1982	0.656	1296	2.1	5.744	A
5	884	1021	1288	0.671	860	2.1	8.993	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	33	1788	717	0.048	33	0.1	5.611	A
2	904	1104	1299	0.698	904	2.4	9.816	A
3	827	1138	1468	0.563	827	1.4	6.011	A
4	1299	661	1980	0.656	1299	2.1	5.810	A
5	864	1024	1288	0.672	864	2.2	9.182	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	27	1465	852	0.032	27	0.0	4.654	A
2	738	906	1392	0.530	743	1.2	6.034	A
3	675	933	1575	0.429	677	0.8	4.303	A
4	1061	541	2048	0.518	1064	1.2	4.040	A
5	706	839	1373	0.514	710	1.2	5.885	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	23	1224	953	0.024	23	0.0	4.125	A
2	618	757	1461	0.423	620	0.8	4.630	A
3	565	779	1657	0.341	566	0.6	3.540	A
4	888	453	2099	0.423	890	0.8	3.279	A
5	591	701	1437	0.411	593	0.8	4.599	A