



mosodi
mobility solutions through design and innovation

Proposed Employment Development
Rockingham Phase 2 and 3, Hoyland
for Harworth Group
Transport Assessment

December 2019

Quality Management

Rockingham Phase 2 and 3, Hoyland, Transport Assessment Project No: 18005				
File reference	L:\Rockingham - 18005\TEXT\REPORTS\191213 Rockingham Transport Assessment Final.docx			
Issue/revision	Initial Issue	Revision 1	Revision 2	Revision 3
Remarks				
Date	13/12/2019			
Prepared by	K Griffiths			
Signature				
Checked by	S Phillips			
Signature				
Authorised by	R Murphy			
Signature				

This document has been prepared for the exclusive use of the Client and unless otherwise agreed in writing by them or by Mosodi, no other party may use, make use of or rely on the contents of this document. This document cannot be assigned or transferred to any third party without the written agreement of Mosodi and the client

Contents

1. Introduction.....	3
2. Baseline Conditions	6
3. Development Proposals and Access Strategy	16
4. Site Accessibility	19
5. Baseline Trip Assessment and Distributions.....	22
6. Junction Capacity Analysis	31
7. Summary and Conclusions.....	33

IMAGES

Image 1.1	Site Location.....	3
Image 1.2	Hoyland North Masterplan	4
Image 2.1	Recently Improved Highway Network (Extract from Google Maps)	7
Image 2.2	Shortwood Roundabout (Google Maps Extract).....	8
Image 2.3	Hoyland Road/Sheffield Road Junction (Google Maps Extract).....	9
Image 2.4	BMBC Public Rights of Way Extract.....	10
Image 2.5	Bus Stop Location Plan.....	11
Image 2.6	Bus Stop Location Plan.....	14

TABLES

Table 2.1	Existing Bus Services on Sheffield Road	12
Table 2.2	Existing Bus Services on Hoyland Road	13
Table 2.3	Elsecar Weekday Trains Service Summary.....	14
Table 2.4	Summary of Classified Turning Counts	15
Table 5.1	Vehicular Trip Rates (Total Vehicles).....	23
Table 5.2	HGV Trip Rates	23
Table 5.3	Total Vehicular Trip Generations.....	23
Table 5.4	HGV Trip Generations.....	23
Table 5.5	Hoyland Masterplan Development.....	24
Table 5.6	B1 Trip Rates.....	26
Table 5.7	B2 Trip Rates.....	26
Table 5.8	B8 Trip Rates.....	26
Table 5.9	Hotel Trip Rates.....	26
Table 5.10	Residential Trip Rates.....	26
Table 5.11	ES14 Hartwood Trip Generations.....	27
Table 5.12	ES14 Waddington Trip Generations	27
Table 5.13	ES14 BMBC Trip Generations.....	27
Table 5.14	HS56 Residential Trip Generations.....	27
Table 5.15	HS66 Residential Trip Generations.....	27
Table 5.16	HS64 Residential Trip Generations.....	27
Table 6.1	Summary of New Access Roundabout.....	31
Table 6.2	Summary of Shortwood Roundabout Assessment.....	32

FIGURES

Figure 1	Site Location Plan
Figure 2	Pedestrian Accessibility
Figure 3	Cycle Accessibility
Figure 4	Bus Stop Accessibility
Figure 5	Rail Station Accessibility

TRAFFIC FLOWS FIGURES

Figure 10	AM 2019 Count
Figure 11	PM 2019 Count
Figure 12	AM Committed Development Flows
Figure 13	PM Committed Development Flows
Figure 14	Proposed Phase 2 Distribution – No link Road
Figure 15	Proposed Phase 3 Distribution – No Link Road
Figure 16	Proposed phase 2 Distribution – With Link Road
Figure 17	Proposed Phase 3 Distribution – With Link Road
Figure 26	AM Total Development Traffic – No Link Road
Figure 27	PM Total Development Traffic – No Link Road
Figure 28	AM Total Development Traffic – With Link Road
Figure 29	PM Total Development Traffic – With Link Road
Figure 30	ES14 Hartwood Trip Distribution – No Link Road
Figure 31	ES14 Waddington Trip Distribution – No Link Road
Figure 32	ES14 BMBC Trip Distribution – No Link Road
Figure 33	HS56 Residential Trip Distribution – No Link Road
Figure 34	HS66 Residential Trip Distribution – No Link Road
Figure 35	HS64 Residential Trip Distribution – No Link Road
Figure 36	HS56 Residential Trip Distribution – With Link Road
Figure 37	HS66 Residential Trip Distribution – With Link Road
Figure 38	HS64 Residential Trip Distribution – With Link Road
Figure 39	ES14 Hartwood AM Trip Generation – No Link Road
Figure 40	ES14 Hartwood PM Trip Generation – No Link Road
Figure 41	ES14 Waddington AM Trip Generation – No Link Road
Figure 42	ES14 Waddington PM Trip Generation – No Link Road
Figure 43	ES14 BMBC AM Trip Generation – No Link Road
Figure 44	ES14 BMBC PM Trip Generation – No Link Road
Figure 45	HS56 Residential AM Trip Generation – No Link Road
Figure 46	HS56 Residential PM Trip Generation – No Link Road
Figure 47	HS66 Residential AM Trip Generation – No Link Road
Figure 48	HS66 Residential PM Trip Generation – No Link Road
Figure 49	HS64 Residential AM Trip Generation – No Link Road
Figure 50	HS64 Residential PM Trip Generation – No Link Road
Figure 51	HS64 Residential AM Trip Generation – With Link Road
Figure 52	HS64 Residential PM Trip Generation – With Link Road
Figure 53	HS64 Residential AM Trip Generation – With Link Road
Figure 54	HS64 Residential PM Trip Generation – With Link Road
Figure 55	HS64 Residential AM Trip Generation – With Link Road
Figure 56	HS64 Residential PM Trip Generation – With Link Road
Figure 57	Total AM Hoyland North Trip Generation – With Link Road
Figure 58	Total AM Hoyland North Trip Generation – With Link Road
Figure 59	Total AM Hoyland North Trip Generation – No Link Road

Figure 60	Total AM Hoyland North Trip Generation – No Link Road
Figure 61	2029 AM Base
Figure 62	2029 PM Base
Figure 63	2029 AM Design
Figure 64	2029 PM Design
Figure 65	2029 AM Design Sensitivity – with Link Road
Figure 66	2029 PM Design Sensitivity – with Link Road
Figure 67	2029 AM Design Sensitivity – No Link Road
Figure 68	2029 PM Design Sensitivity – No Link Road

APPENDICES

Appendix A	Masterplan
Appendix B	Not Used
Appendix C	Phase 3 Access Arrangement Drawing
Appendix D	Shortwood Roundabout Access Drawing
Appendix E	Committed Development Flows
Appendix F	TEMPro Growth Assessment
Appendix G	Modelling Outputs

Contents

1. Introduction.....	3
2. Baseline Conditions	6
3. Development Proposals and Access Strategy	16
4. Site Accessibility	19
5. Baseline Trip Assessment and Distributions.....	22
6. Junction Capacity Analysis	31
7. Summary and Conclusions.....	33

IMAGES

Image 1.1	Site Location.....	3
Image 1.2	Hoyland North Masterplan	4
Image 2.1	Recently Improved Highway Network (Extract from Google Maps)	7
Image 2.2	Shortwood Roundabout (Google Maps Extract)	8
Image 2.3	Hoyland Road/Sheffield Road Junction (Google Maps Extract)	9
Image 2.4	BMBC Public Rights of Way Extract.....	10
Image 2.5	Bus Stop Location Plan	11
Image 2.6	Bus Stop Location Plan	14

TABLES

Table 2.1	Existing Bus Services on Sheffield Road	12
Table 2.2	Existing Bus Services on Hoyland Road	13
Table 2.3	Elsecar Weekday Trains Service Summary	14
Table 2.4	Summary of Classified Turning Counts	15
Table 5.1	Vehicular Trip Rates (Total Vehicles).....	23
Table 5.2	HGV Trip Rates	23
Table 5.3	Total Vehicular Trip Generations	23
Table 5.4	HGV Trip Generations.....	23
Table 5.5	Hoyland Masterplan Development	24
Table 5.6	B1 Trip Rates.....	26
Table 5.7	B2 Trip Rates.....	26
Table 5.8	B8 Trip Rates.....	26
Table 5.9	Hotel Trip Rates.....	26
Table 5.10	Residential Trip Rates.....	26
Table 5.11	ES14 Hartwood Trip Generations.....	27
Table 5.12	ES14 Waddington Trip Generations	27
Table 5.13	ES14 BMBC Trip Generations.....	27
Table 5.14	HS56 Residential Trip Generations.....	27
Table 5.15	HS66 Residential Trip Generations.....	27
Table 5.16	HS64 Residential Trip Generations.....	27
Table 6.1	Summary of New Access Roundabout	31
Table 6.2	Summary of Shortwood Roundabout Assessment	32

FIGURES

Figure 1	Site Location Plan
Figure 2	Pedestrian Accessibility
Figure 3	Cycle Accessibility
Figure 4	Bus Stop Accessibility
Figure 5	Rail Station Accessibility

TRAFFIC FLOWS FIGURES

Figure 10	AM 2019 Count
Figure 11	PM 2019 Count
Figure 12	AM Committed Development Flows
Figure 13	PM Committed Development Flows
Figure 14	Proposed Phase 2 Distribution – No link Road
Figure 15	Proposed Phase 3 Distribution – No Link Road
Figure 16	Proposed phase 2 Distribution – With Link Road
Figure 17	Proposed Phase 3 Distribution – With Link Road
Figure 26	AM Total Development Traffic – No Link Road
Figure 27	PM Total Development Traffic – No Link Road
Figure 28	AM Total Development Traffic – With Link Road
Figure 29	PM Total Development Traffic – With Link Road
Figure 30	ES14 Hartwood Trip Distribution – No Link Road
Figure 31	ES14 Waddington Trip Distribution – No Link Road
Figure 32	ES14 BMBC Trip Distribution – No Link Road
Figure 33	HS56 Residential Trip Distribution – No Link Road
Figure 34	HS66 Residential Trip Distribution – No Link Road
Figure 35	HS64 Residential Trip Distribution – No Link Road
Figure 36	HS56 Residential Trip Distribution – With Link Road
Figure 37	HS66 Residential Trip Distribution – With Link Road
Figure 38	HS64 Residential Trip Distribution – With Link Road
Figure 39	ES14 Hartwood AM Trip Generation – No Link Road
Figure 40	ES14 Hartwood PM Trip Generation – No Link Road
Figure 41	ES14 Waddington AM Trip Generation – No Link Road
Figure 42	ES14 Waddington PM Trip Generation – No Link Road
Figure 43	ES14 BMBC AM Trip Generation – No Link Road
Figure 44	ES14 BMBC PM Trip Generation – No Link Road
Figure 45	HS56 Residential AM Trip Generation – No Link Road
Figure 46	HS56 Residential PM Trip Generation – No Link Road
Figure 47	HS66 Residential AM Trip Generation – No Link Road
Figure 48	HS66 Residential PM Trip Generation – No Link Road
Figure 49	HS64 Residential AM Trip Generation – No Link Road
Figure 50	HS64 Residential PM Trip Generation – No Link Road
Figure 51	HS64 Residential AM Trip Generation – With Link Road
Figure 52	HS64 Residential PM Trip Generation – With Link Road
Figure 53	HS64 Residential AM Trip Generation – With Link Road
Figure 54	HS64 Residential PM Trip Generation – With Link Road
Figure 55	HS64 Residential AM Trip Generation – With Link Road
Figure 56	HS64 Residential PM Trip Generation – With Link Road
Figure 57	Total AM Hoyland North Trip Generation – With Link Road
Figure 58	Total AM Hoyland North Trip Generation – With Link Road
Figure 57	Total AM Hoyland North Trip Generation – No Link Road

Figure 58	Total AM Hoyland North Trip Generation – No Link Road
Figure 61	2029 AM Base
Figure 62	2029 PM Base
Figure 63	2029 AM Design
Figure 64	2029 PM Design
Figure 65	2029 AM Design Sensitivity – with Link Road
Figure 66	2029 PM Design Sensitivity – with Link Road
Figure 67	2029 AM Design Sensitivity – No Link Road
Figure 68	2029 PM Design Sensitivity – No Link Road

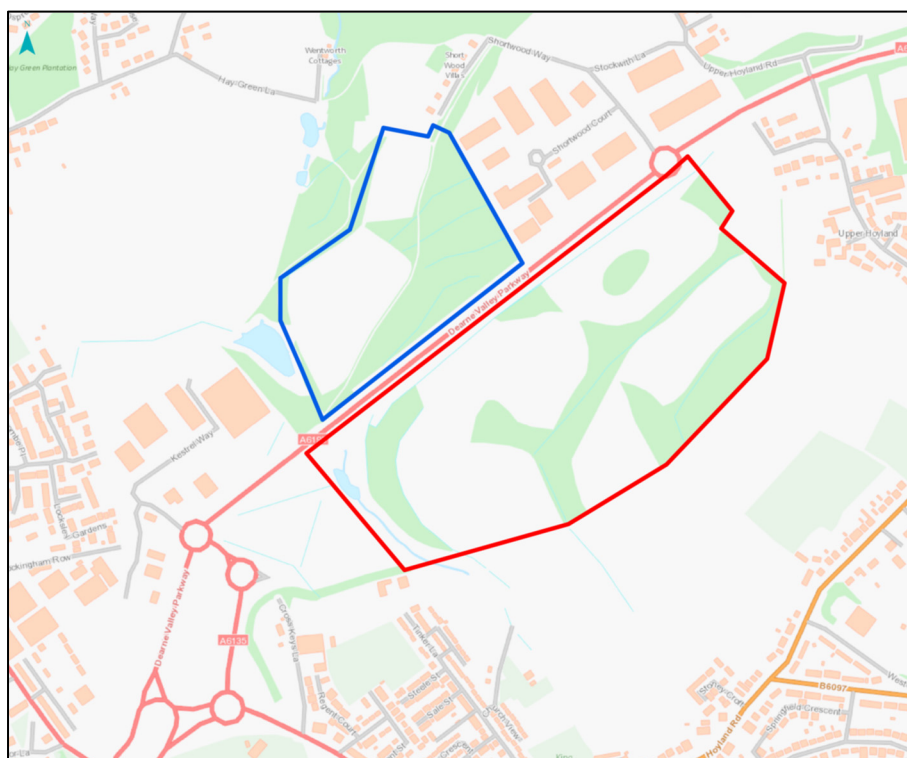
APPENDICES

Appendix A	Masterplan
Appendix B	Not Used
Appendix C	Phase 3 Access Arrangement Drawing
Appendix D	Shortwood Roundabout Access Drawing
Appendix E	Committed Development Flows
Appendix F	TEMPro Growth Assessment
Appendix G	Modelling Outputs

1. Introduction

1.1.1 This Transport Assessment (TA) has been prepared by Mosodi Limited on behalf of Harworth Group to consider the highways and transportation issues raised by a hybrid planning application at Rockingham Phase 2 and 3 for employment. The Site is located to the north and south of the A6195 Dearne Valley Parkway as shown in Figure 1, an extract is shown in Image 1.1.

Image 1.1 Site Location



1.1.2 The planning application seeks permission for the following:

- Detailed permission for earthworks and creation of access points (including new roundabout to access site ES15).
- Outline permission for up to 1.1 million square foot (102,193sqm) of employment land (use class B1/B2 and B8) with associated internal access roads, landscaping and drainage at sites ES15 and ES17 (land north and south of the Dearne Valley Parkway).

1.1.3 An indicative masterplan is attached in Appendix A.

1.1.4 In order to provide flexibility for future tenants and minimise delay on any future reserved matters application, the worst case trip generation assessment will be undertaken within this report. Trip generation details are provided in Chapter 5.

1.1.5 The Site is allocated as ES15 (north of the A6195 and known as Shortwood Extension) and ES17 (Land South of Dearne Valley Parkway) within Barnsley Local Plan (2019-2033).

1.1.6 Site ES17 is part of the Hoyland North Masterplan area where community consultation exercises took place in 2019. Following these consultation events, the

proposed link road between the A6195 and the B6096 was selected to connect to the Shortwood Roundabout to the east of allocation ES17.

1.1.7 As part of the allocation of the Hoyland North Masterplan area, Barnsley Council commissioned a Transport and Access Appraisal Report (TAAR) (produced by Fore Consulting in May 2019) and this Transport Assessment and accompanying Travel Plan has taken cognisance of these documents.

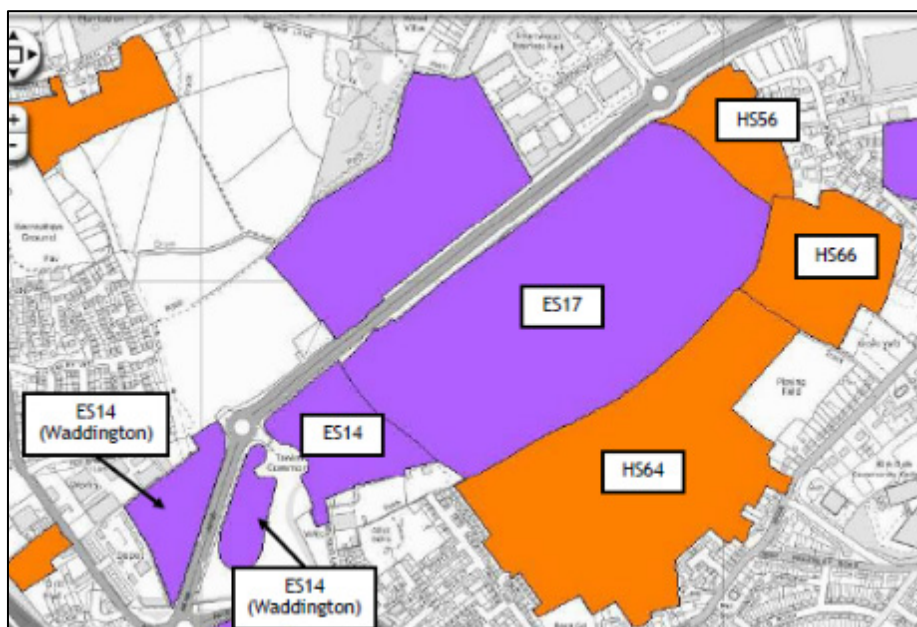
1.1.8 An initial scoping note has been submitted to stakeholders with follow up meetings being held with Barnsley Council and Highways England to agree the extent of the capacity analysis. The following principles were agreed prior to submission of the reports:

- Trip Rates;
- Trip Distributions;
- Committed Developments;
- Assessment of the Hoyland Masterplan area trips;
- Traffic Growth Rates; and
- Assessment Scenarios.

1.1.9 Discussions with Highways England and Barnsley Council confirmed a requirement to model the full build out of the Hoyland Masterplan area as per the development quantum's outlined in the Fore TAAS.

1.1.10 The allocations within the Hoyland North Masterplan area are shown in Image 1.2.

Image 1.2 Hoyland North Masterplan



1.1.11 This TA has been prepared in accordance with guidance relating to transport statements prepared and issued by the Department for Communities and Local Government (DCLG)".

1.1.12 The report should be read in conjunction with the Framework Travel Plan (FTP) that also supports the application and gives a detailed description of the measures that will be implemented to achieve mode shift away from single occupancy car when compared with baseline travel surveys that will be undertaken post occupation.

1.1.13 This report sets out the transport issues relating to the proposed development Site and identifies what measures will be provided to accommodate the anticipated transport impacts of the scheme. The TA considers the sustainability of the Site, reviewing the provision and quality of facilities and connections to and from the surrounding areas. It covers a variety of topics which are set out in the following chapters:

- Chapter 2 - describes the Site and the existing transport conditions;
- Chapter 3 – defines the development proposals including the access strategies/arrangements;
- Chapter 4 – describes the accessibility of the Site by non-car modes;
- Chapter 5 – describes the methodology employed to arrive at the baseline trips generated by the development as well as the distribution/assignment of these trips on the highway network;
- Chapter 6 – this chapter explains the junction capacity assessments undertaken to determine the impact of the residual development trips on the local highway network; and
- Chapter 7 – highlights the conclusions of the TA.

2. Baseline Conditions

2.1.1 This chapter describes the Site and considers the baseline conditions on the surrounding highway network for a range of transport modes.

2.2 Existing Site

2.2.1 The development Site is located within and adjacent to the Hoyland North Masterplan area. Phase 2 (ES17) of the development is located to the south of the A6195 Dearne Valley parkway and Phase 3 (ES15) is located to the north of this highway.

2.2.2 The Site is approximately 5.3km south of Barnsley and 11km north west of Rotherham. It lies to the east of the M1 and is located approximately 1km journey from Junction 36.

2.2.3 The land south and east of Phase 2 is allocated for residential use, whilst the area to the south of the allocation is predominantly residential, with employment uses to the east and north, with a mixture of retail and employment uses to the west.

2.3 Existing Local Highway Network

A6195 Dearne Valley Parkway / A61 Sheffield Road / Kestrel Way – Rockingham Roundabout

2.3.1 The A6195 Dearne Valley Parkway runs on an east-west axis to the north of Phase 2 and south of Phase 3. It is an adopted dual carriageway road subject to the national speed limit as it passes the site frontage. Approximately 500m west of the Site entrance the A6195 joins with Sheffield Road via a 4-arm standard roundabout (Rockingham Roundabout).

2.3.2 The eastern Sheffield Road arm has provisions for a shared footway / cycleway on either side of the highway.

2.3.3 Kestrel Way on the western arm also has the provisions of a shared footway / cycleway on either side of the highway and has a pedestrian splitter island.

2.3.4 The A6195 northbound and southbound arms are dual carriageway with two lanes in each direction, separated by a central reservation. It has a shared footway / cycleway on both sides of the carriageway to the south. No footway is currently provided to the north of the roundabout, however Image 2.4 shows Public Rights of Ways in the vicinity which are set back from the carriageway.

2.3.5 Recent improvements to the highway network between the Rockingham Roundabout and J36 of the M1 have taken place in order to accommodate the predicted growth in traffic associated with the Hoyland North Masterplan, amongst other developments. These improvements have been implemented and are shown in Image 2.1 (extract from Google maps).

Image 2.1 Recently Improved Highway Network (Extract from Google Maps)



A61 Sheffield Road / A6195 Dearne Valley Parkway – Birdwell Junction

2.3.6 Located approximately 900m to the west of the development Site the Birdwell Junction is an elongated roundabout connecting the A6195 and the A61. The existing layout of this junction is shown in Image 2.1.

2.3.7 The A6195 Dearne Valley Parkway northern arm is separated into segregated entry and exit only arms both of which are signal controlled and provide pedestrian crossing facilities. There is a shared footway / cycleway on the nearside lanes on both the northbound and southbound carriageways.

2.3.8 Similarly, the A6195 eastern arm is separated into segregated entry and exit lanes. The exit lane is single carriageway approximately 5m in width with a shared cycleway / footpath on the nearside of the carriageway. The A6195 entry lane is a dual carriageway approximately 10m in width, the approach to the roundabout is controlled by a signalised pedestrian crossing. There is also a shared cycleway / footway on the nearside lane.

2.3.9 The A61 southbound arm is separated into two segregated entry lanes and one exit lane. The entry left only lane is a single carriageway and the ahead lane is a dual carriageway, access onto the roundabout for all movements is signal controlled. The exit carriageway is exit only and has no pedestrians or cyclist provision in order to restrict access to J36 of the M1.

2.3.10 The A61 Sheffield Road westbound arm has a triple entry carriageway and a single exit carriageway. Access onto the roundabout is signal controlled. There is a shared pedestrian / cycleway on the westbound carriageway.

Northern Sheffield Road Roundabout

2.3.11 The Northern Sheffield Road Roundabout is a 4-arm standard roundabout. All arms are single carriageways of approximately 9m in width. Pedestrian splitter islands are provided approximately 5m from the entrance of the roundabout on all 4 arms. Shared pedestrian / cycleways are also provided on all arms of the roundabout.

Southern Sheffield Road Roundabout

2.3.12 The Southern Sheffield Road Roundabout follows the same alignment as the Northern Sheffield Road Roundabout except on the western arm (A6195) which is segregated into entry and exit lanes and provides no pedestrian crossing facilities unlike the other 3 arms.

Junction 36 M1

2.3.13 Junction 36 is located approximately 1km to the west of the development Site the A6195 joins the M1 slip roads and the A61 via the Tankersley Roundabout.

2.3.14 The west A61 arm is a two-lane dual carriageway which is separated by a central reservation. The width of the highway is approximately 7.7m. A shared pedestrian / cycleway is provided on the eastbound carriageway on the offside lane. Access onto the roundabout is controlled by signals.

2.3.15 The M61 northbound and southbound slip roads consist of two lanes and are approximately 6m in width, the access onto the roundabout is again controlled by signals.

2.3.16 A61 access and egress are by separate arms (entry and exit only) to the north east of the roundabout, the movement of which is also controlled by signals.

Shortwood Roundabout

2.3.17 The Shortwood Roundabout is a three-arm roundabout and forms the north eastern boundary of the Phase 2 Site and is approximately 600m to the east of the phase 3 Site, the layout is shown in Image 2.2.

Image 2.2 Shortwood Roundabout (Google Maps Extract)



2.3.18 The A6195 is a two-lane dual carriageway with a central barrier which routes through the junction, no provisions for pedestrians or cyclists are provided on either the eastbound or westbound carriageway.

2.3.19 Shortwood Way is the northern arm, which is subject to a 30mph speed limit and has a shared pedestrian /cycleway on both sides of the highway. A pedestrian crossing is provided by a splitter island approximately 10m from the roundabout entrance.

Sheffield Road / Hoyland Road / Tankersley Lane

2.3.20 Sheffield Road routes south from the junction with the A6195 and meets Hoyland Road and Tankersley Lane at a 4-way signalised junction.

2.3.21 All arms of the junction are single carriageways and are subject to a 30mph speed limit. Parking is prohibited on all arms with the provision of double yellow line markings. Shared footways are provided on each arm of the junction which measure approximately 2m in width.

2.3.22 On Sheffield Road a signalised pedestrian crossing is provided on the northern arm approximately 100m from the junction. Similarly, a pedestrian crossing is situated approximately 75m from the junction on Hoyland Road.

2.3.23 The existing junction layout can be seen in Image 2.3.

Image 2.3 Hoyland Road/Sheffield Road Junction (Google Maps Extract)



2.4 Public Rights of Way

2.4.1 In addition to the footways and cycle facilities that form part of the adopted highway network there are numerous public rights of way that route through the proposed development connecting to and from the road network.

2.4.2 The image below shows an image of the extract of the Public Rights of Way map taken from Barnsley Metropolitan Borough Council's (BMB) website. Footpaths are shown in blue and bridleways in green.

2.4.3 Where possible the design team have sought to ensure that the public rights of way can be accommodated with the need to amend their alignment. However, the proposals if approved at reserved matters stage will require diversion of some of the public rights of way that cross the Site.

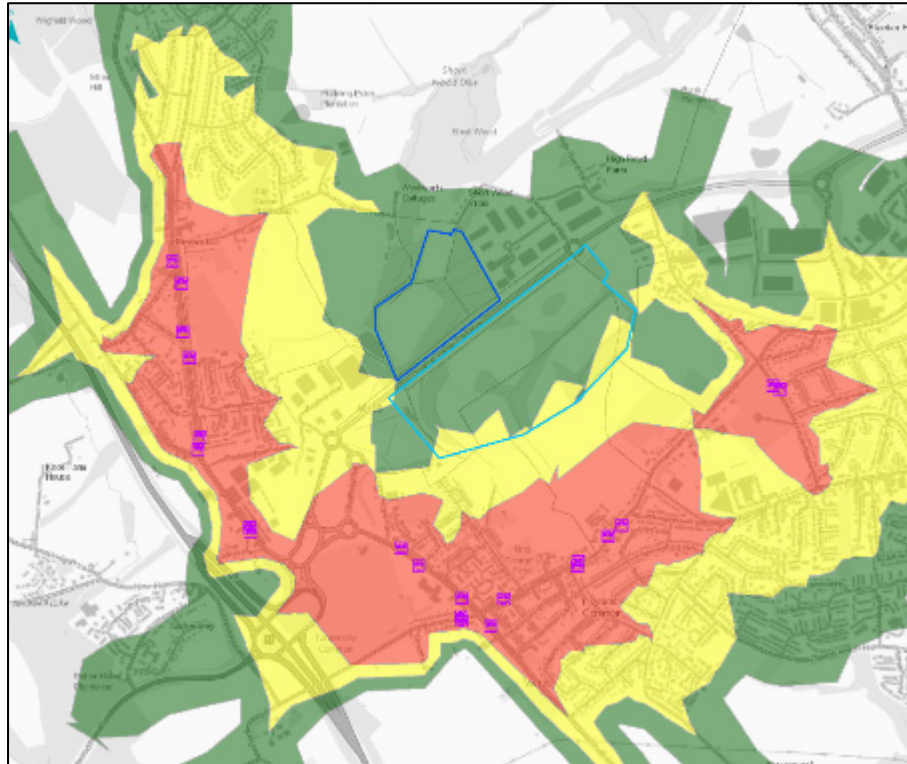
Image 2.4 BMB Public Rights of Way Extract



2.5 Accessibility by Bus

2.5.1 There are numerous bus services operating within the vicinity of the site, with the most accessible stops being located on the A61 Sheffield Road to the west of the Site. Figure 4 shows the location of nearby bus stops and the walk distance – an extract of figure 4 is shown in Image 2.5.

Image 2.5 Bus Stop Location Plan



2.5.2 The whole of Phase 2 and 3 are within a 15 minute walk of the nearest bus stops.

2.5.3 Further services are also available from bus stops located to the south of Phase 3 on Hoyland Road/Hawshaw Lane, which are accessible via the existing public right of way network and the future link road. Table 2.1 and 2.2 summarise the existing bus services within the vicinity of the Site.

Table 2.1 Existing Bus Services on Sheffield Road

Service	Route	Day of Operation	One Way Service Frequency*	Comments
2	Bromhill to Barnsley	Weekday	05:59 and 06:47 then 18:29 then every hour to 23:13	This service is a joint service with the X2
		Saturday	09:12 then 1832 then every hour to 23:13	
		Sunday	09:21 then every hour to 23:13	
X2	Bromhill to Barnsley	Weekday	05:57 then every half hour to 17:50	This service is a joint service with the 2
		Saturday	06:20 then every half hour to 17:55	
		Sunday	No Service	
2	Barnsley to Bromhill	Weekday	17:15 then every hour to 22:55	This service is a joint service with the X2
		Saturday	17:28 then every hour to 22:55	
		Sunday	08:49 then every hour to 22:55	
X2	Barnsley to Bromhill	Weekday	06:07 then every half hour to 16:45	This service is a joint service with the 2
		Saturday	07:37 then every hour to 17:28	
		Sunday	No Service	
66	Barnsley to Barnsley via Elsecar	Weekday	06:00 then every 15-30 minutes to 23:40	This service is a loop
		Saturday	06:20 then every 20-30 minutes to 23:40	
		Sunday	08:30 then every half an hour to 23:40	
67 / 67a / 67c	Barnsley to Wombwell	Weekday	05:25 then every half an hour to 23:15	
		Saturday	05:25 then every half an hour to 23:15	
		Sunday	08:17 then every hour to 22:34	
67 / 67a / 67c	Wombwell to Barnsley	Weekday	04:25 then every half an hour to 18:30 then every hour from 19:15 to 23:15	
		Saturday	04:52 then every half an hour to 18:30 then every hour from 19:15 to 23:15	
		Sunday	08:35 then every hour to 23:32	
X17 Gold	Barnsley to Sheffield via Meadowhall	Weekday	06:50 then every hour to 20:48	Generally Hourly
		Saturday	07:15 then every hour to 20:48	
		Sunday	09:40 then every hour to 17:47	
X17 Gold	Sheffield to Barnsley via Meadowhall	Weekday	05:55 then every hour to 18:10	Generally Hourly
		Saturday	06:10 then every hour to 18:08	
		Sunday	08:35 then every hour to 17:40	
Total		Weekday	8 per hour each way	
		Saturday	7 per hour each way	
		Sunday	5 per hour each way	

Table 2.2 Existing Bus Services on Hoyland Road

Service	Route	Day of Operation	One Way Service Frequency*	Comments
2	Bromhill to Barnsley	Weekday	05:59 and 06:47 then 18:29 then every hour to 23:13	This service is a joint service with the X2
		Saturday	09:12 then 1832 then every hour to 23:13	
		Sunday	09:21 then every hour to 23:13	
X2	Bromhill to Barnsley	Weekday	05:57 then every half hour to 17:50	This service is a joint service with the 2
		Saturday	06:20 then every half hour to 17:55	
		Sunday	No Service	
2	Barnsley to Bromhill	Weekday	17:15 then every hour to 22:55	This service is a joint service with the X2
		Saturday	17:28 then every hour to 22:55	
		Sunday	08:49 then every hour to 22:55	
X2	Barnsley to Bromhill	Weekday	06:07 then every half hour to 16:45	This service is a joint service with the 2
		Saturday	07:37 then every hour to 17:28	
		Sunday	No Service	
66	Barnsley to Barnsley via Elsecar	Weekday	06:00 then every 15-30 minutes to 23:40	This service is a loop
		Saturday	06:20 then every 20-30 minutes to 23:40	
		Sunday	08:30 then every half an hour to 23:40	
72 / 72A	Chapelton to Manvers	Weekday	05:47 then every hour to 17:16	
		Saturday	06:06 then every hour to 17:06	
		Sunday	No service	
72 / 72A	Manvers to Chapelton	Weekday	06:40 then every hour to 18:15	
		Saturday	07:05 then every hour to 18:07	
		Sunday	No service	
Total		Weekday	7 per hour each way	
		Saturday	7 per hour each way	
		Sunday	5 per hour each way	

2.5.4 During the weekday, the services set out above combine to provide an overall hourly frequency of 7/8 buses in each direction, similarly on a Saturday there are 7 buses in each direction within close proximity to the Site.

2.5.5 These services operate for the vast majority of the day commencing between 04:30 to 07:00 and running through until 23:00.

2.5.6 On a Sunday the services combine to provide an overall hourly frequency of 5 buses in each direction.

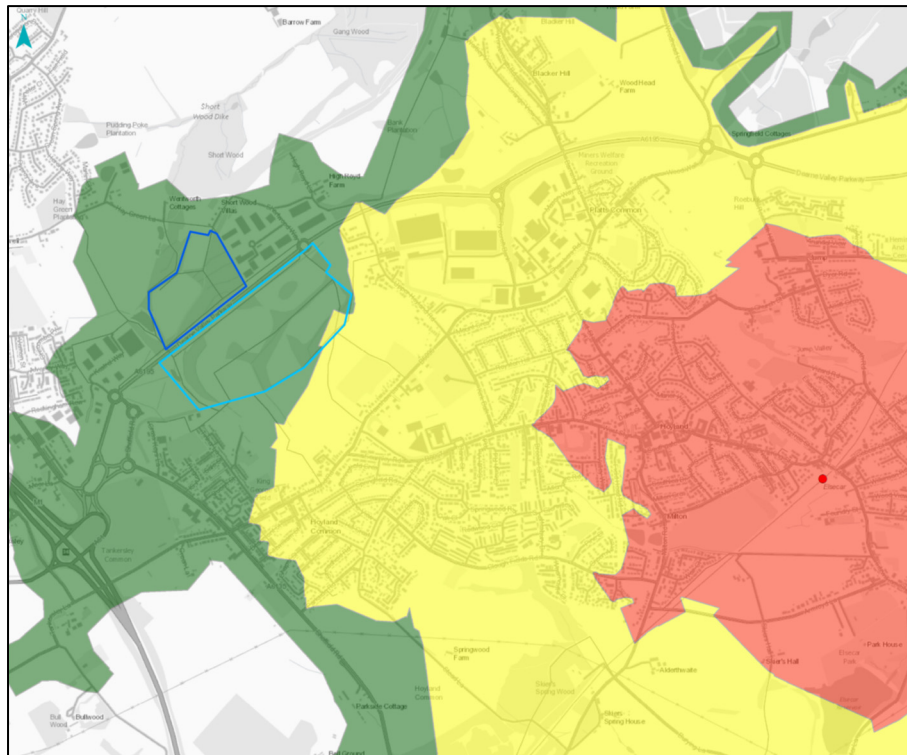
2.5.7 It is considered that the frequency available from the services on both Hoyland Road and Sheffield Road offer excellent connectivity for a development where many of the employees will work fixed shift patterns.

2.5.8 The bus services provide regular connections to Sheffield Interchange, Barnsley, Elsecar and Wombwell. Further connections to the rest of the region and beyond are available from these destinations.

2.6 Accessibility by Rail

2.6.1 Elsecar station is located some 2.7km to the south east of Phase 2 as shown on Figure 5 an extract of which is shown in Image 2.6. Elsecar station is situated on the Hallam and Penistone Line and is within a 15 minute cycle of Phases 2 and 3.

Image 2.6 Bus Stop Location Plan



2.6.2 Trains from Elsecar serve destinations including Barnsley, Wakefield, Sheffield, Leeds and Huddersfield.

2.6.1 Elsecar station benefits from cycle storage, ticket machines, CCTV and step-free access.

2.6.2 A summary of the available services are contained in Table 2.3.

Table 2.3 Elsecar Weekday Trains Service Summary

Origin/Destination	First Arrival	Last Departure	Journey Time (minutes)	Frequency (minutes)
Barnsley	05:32	23:35	10	30
Wakefield Kirkgate	06:54	23:35	30 - 45	30
Sheffield	05:35	00:01	20	20 - 40
Huddersfield	06:51	23:35	60 - 80	60
Leeds	06:47	22:48	60	10 - 30

Source – www.nationalrail.co.uk

2.7 Existing Traffic Counts

2.7.1 Traffic surveys were undertaken in March 2019 on the local highway network. These locations are described in table 2.4 below with a summary of the surveys.

Table 2.4 Summary of Classified Turning Counts

Location	Type	Date Undertaken	Assessment Periods
A6135 Sheffield Rd / Hoyland Rd / Tankersley Ln	Fully Classified Manual Turning Count	Wednesday 13 th March 2019	07:00-09:45 & 15:00-18:45
Rockingham Roundabout (Sheffield Rd / A6195)	Fully Classified Manual Turning Count	Wednesday 13 th March 2019	07:00-09:45 & 15:00-18:45
Shortwood Way/A6195 Dearne Valley Parkway	Fully Classified Manual Turning Count	Wednesday 13 th March 2019	07:00-09:45 & 15:00-18:45
M1 Junction 36	Fully Classified Manual Turning Count	Wednesday 13 th March 2019	07:00-09:45 & 15:00-18:45

2.7.2 The traffic count surveys identified the existing weekday morning and evening peak hour periods as follows:

- Weekday AM Peak – 07:15 to 08:15; and
- Weekday PM Peak – 16:30 to 17:30.

2.7.3 The count flows associated with each junction are shown on Figures 10 and 11 for the AM and PM peak hour periods respectively.

3. Development Proposals and Access Strategy

3.1.1 This section of the report provides details of the proposed development scheme including the uses on the Site and the proposed access arrangements for pedestrians, cyclists, buses and cars.

3.1.2 As previously mentioned, this TA is for the Rockingham Phase 2 and 3 development proposals situated on land within the Hoyland North Masterplan. The development comprises B1C, B2 and B8 employment floorspace with a development quantum of up to 1.1m sqft (102,193sqm).

3.2 The Commercial Development Proposals

3.2.1 The planning application is in the outline stages (except for the earthworks and access) and as such the development quantum that has been applied is 1.1m sqft.

- Detailed permission for earthworks and creation of access points (including new roundabout to access site ES15).
- Outline permission for up to 1.1 million square foot (102,193sqm) of employment land (use class B1/B2 and B8) with associated internal access roads, landscaping and drainage at sites ES15 and ES17 (land north and south of the Dearne Valley Parkway).

3.2.2 The above development proposals are shown indicatively on the Masterplan drawing contained in Appendix A.

3.2.3 Although the sites use is a combination of B1C, B2 and B8 for robustness in the capacity assessments the whole development has been assessed as being B1C/B8 use.

3.2.4 Overarching Masterplan

3.2.5 It should be recognised from the outset that the masterplan attached at Appendix A is an indicative layout and that the plot sizes, building footprint locations and the land uses classifications of the various plots will be subject to on-going reserved matters applications that will be determined by market forces. The purpose of developing a masterplan at this stage is to illustrate how the proposed development layout may look in the future.

3.3 Vehicular Access Strategy

As previously mentioned, this TA supports Rockingham Phase 2 and 3 as such it discusses the vehicular access strategy to both sites.

3.4 Phase 3 Access – Proposed New Roundabout on A6195

3.4.1 This proposed junction meets with the standards set out in DMRB CD116 provides the only access for traffic accessing and egressing Phase 3 of the development. The layout is shown in Appendix C.

3.4.2 The access is proposed to be a three-arm roundabout with the following:

- Two lane entry on both A6195 approach arms;
- Two lane exit on both A6195 approach arms;
- Single lane entry with flare from the north;
- Inscribed Circle Diameter of 60m.

3.4.3 The capacity of the junction has been assessed in Chapter 6 and has determined that the roundabout can accommodate traffic that will route through it in the proposed development scenarios.

3.5 Phase 2 Access – Proposed Alterations to Shortwood Roundabout and Link Road First Phase

3.5.1 Chapter 2 describes the existing arrangements of the junction that connects the A6195 and Shortwood Way.

3.5.2 Full details of the proposed improvement works are attached in Appendix D including a layout drawing.

3.5.3 The link road has the following properties:

- 6% max gradient within 100m of the roundabout. 8% beyond
- Lane widths provided at 3.65m;
- Eastern footway 2.0m;
- Western footway/cycleway 3.0m;
- 30m approach to roundabout at 2.5%;
- DMRB compliant.

3.6 Pedestrian/Cycle Connectivity to External Network

3.6.1 In addition to primary access and in order to ensure that pedestrians and cyclists are afforded the most direct and convenient routes to/from the Site, several additional non-vehicular access points / connections are proposed. These routes will be provided in stages as the development is built out can be summarised as follows:

- A new multi user route running to the south of, and parallel to, the A6195 will connect to Bridleway 6 the pedestrian/cycle provision on the proposed link road;
- A new multi user connection running to the north of, and parallel to, the A6195 will connect Bridleway 6 to Footpath 5;
- A section of Footpath No. 6 is proposed to be diverted around the northern boundary of the development. It is proposed that this will be diverted within land controlled by Harworth Group; and

- Segregated cycle facilities will be provided on the proposed link road and the internal highways.

4. Site Accessibility

4.1 Introduction

4.1.1 This chapter describes the accessibility of the Site by non-car modes and should be read in conjunction with the Framework Travel Plan (FTP).

4.1.2 The measures proposed accord with and meet specific policy objectives contained within the following national and local documentation:

- National Planning Policy Framework (NPPF);
- Manual for Streets; and
- South Yorkshire Local Transport Plan 2011-2026.

4.2 Pedestrian Accessibility

4.2.1 It is generally considered that an acceptable walking distance from home to a place of work is 2km.

4.2.2 The IHT document Guideline for Providing for Journeys on Foot recommends various thresholds for desired, acceptable and preferred maximum distances to various services as shown in Table 4.1.

Table 4.1 Accessibility by Foot

	Town Centre's (m)	School/Work (m)	Elsewhere (m)
Desirable	200	500	400
Acceptable	400	1000	800
Preferred Maximum	800	2000	1200

Notes - Source Table 3.2 in 'Guidelines for Providing for Journeys on Foot' published by IHT

4.2.3 Using GIS software typical walk times (up to 30 mins) from the proposed Site centre are shown on Figure 2. This figure demonstrates that:

- The Site is within the preferred maximum walk distance to the residential areas of Hoyland Common, Hoyland, Birdwell and Tankersley;
- The local and district centres of Hoyland Common and Hoyland are within the preferred maximum walk distance and contain amenities which staff could use;
- There are numerous cafes, fast food outlets and dining options around Rockingham Roundabout within a 10 minute walk of the Site;
- There are 5 supermarkets within a 25-minute walk of the Site; and
- There is a GP surgery within a 20-minute walk of the Site;

4.2.4 It is therefore concluded that the Site is accessible for the local residents of Hoyland and future employees of the Site by foot. It is also considered that the more active employees will choose to walk further than this guideline distance.

4.2.5 Furthermore, the travel planning measures proposed in the travel plan will have a positive influence on the sustainable travel choices made by employees of the development Site.

4.3 Accessibility by Cycle

4.3.1 An acceptable and comfortable distance for general cycling trips is considered to be up to 5 kilometres as referred to in Local Transport Note 2/08 (published by the Department for Transport (DfT)). However, the same guidance also refers to commuting cycle trips up to 8km. Using GIS Network Analyst software typical cycle times (with 20 mins approximating to just over a 5km distance) from the Site are shown on Figure 3. This figure shows that:

- The Site is accessible from Hoyland Common Centre and Hoyland District Centre within a 10-minute cycle time;
- The residential areas of Hoyland and Birdswell can be reached within a 10-minute cycle time;
- Further residential areas of Elsecar, Worsbrough, Wombwell, High Green, Chapeltown and Thorpe Hesley can be reached within a 25 minute cycle time;
- Barnsley Town Centre, with numerous facilities and rail station, is accessible within a 30 minute cycle of the Site;
- The nearest rail station at Elsecar can be reached in a 15 minute cycle ride, with Wombwell station within a 25 minute cycle time;
- A further 2 stations are within a 30 minute cycle of the Site.

4.3.2 It is also considered that the more active employees will choose to cycle further than this guideline distance.

4.3.3 Several cycle measures will be provided internally within the Site and these are discussed in the Framework Travel Plan.

4.4 Accessibility by Bus

4.4.1 As detailed in Chapter 2 there are several bus services offering frequent services along Hawshaw Lane to the south of the Site and the A61 Sheffield Road to the west. A summary of the existing service times is shown in Tables 2.1 and 2.2.

4.4.2 The nearest bus stops are shown on Figure 4 and are provided on Hawshaw Lane approximately 800m to the south of the Site and provide access to the Site from the following destinations:

- Wombwell – 40 minute journey every half an hour;
- Barnsley Town Centre – 15 minute journey every 10 minutes; and
- Chapeltown – 15 minute journey every 60 minutes;

4.4.3 The existing bus services on the A61 Sheffield Road will provide users of the site with access to/from Sheffield, Barnsley, Wombwell and Chapeltown within a short journey time, whilst connecting to public transport interchanges in Barnsley and Sheffield and Sheffield Meadowhall.

4.4.4 It is therefore concluded that the proposed Site is accessible by bus from the local and surrounding residential areas.

4.4.5 Overall it is clear that employees and visitors alike will have an opportunity to access the Site by public transport and this will reduce the reliance on the private car.

4.4.6 Furthermore, the travel planning measures will have a positive influence on the sustainable travel choices made by users of the development Site.

4.5 Accessibility by Rail

4.5.1 The nearest train station to the Site is situated at Elsecar on the Elland and Penistone Line. It is located an approximate 15 minute cycling distance from the Site as shown in Figure 3.

4.5.2 Trains from Elsecar serve destinations including Barnsley, Leeds, Wakefield, Huddersfield and Sheffield among others.

4.5.3 Elsecar Station benefits from cycle storage, ticket machines, CCTV and step-free access.

5. Baseline Trip Assessment and Distributions

5.1 Introduction

5.1.1 As outlined in the preceding chapters it is proposed to develop the overall Site for a large commercial park comprised primarily of B1C, B2 and B8 employment floorspace with a development quantum of up to 1.1m sqft (102,193sqm).

5.1.2 This Transport Assessment has analysed the full quantum of development (1.1msqf) as B2 commercial employment development as this provides the worst-case scenario. This chapter sets out the methodologies used.

5.1.3 The methodologies used in this assessment have been discussed and agreed with Highways England and Barnsley Council through pre-application discussions.

5.2 Existing Traffic Flow Data

5.2.1 The 2019 traffic surveys identified the following peak hour periods across the network:

- Weekday AM Peak – 07:15 to 08:15; and
- Weekday PM peak – 16:30 to 17:30.

5.2.2 The traffic survey flows for these periods are shown in Figures 10 and 11 respectively.

5.3 Committed Development

5.3.1 Following discussions with Barnsley Council, only one committed development scheme was considered to have a material impact on the base traffic flows.

5.3.2 One plot on Rockingham Phase 1 (Ref: 2014/1452) has not yet been built out and this has approval for a 2,700sqm hotel. The trips associated with this plot have been taken from the Transport Assessment produced by Optima. An extract of the flows is attached in Appendix E. The consented trips have been distributed across the network for the AM and PM Peak period and are shown in Figures 12 and 13 respectively.

5.4 Proposed Development Distribution

5.4.1 The proposed Phase 2 and 3 development trip distribution have been taken from the overall distribution identified in the Fore Report. This information is based on the 2011 census. The distribution has been calculated for a scenario with and without a link road and these are shown in the following figures:

- Figure 14 Proposed Phase 2 Distribution – No Link Road;
- Figure 15 Proposed Phase 3 Distribution – No Link Road;
- Figure 16 Proposed Phase 2 Distribution – With Link Road; and
- Figure 17 Proposed Phase 3 Distribution – With Link Road.

5.5 B2 Trip Generations

5.5.1 The trip generations over the entire Site (Phase 2 and 3) have been calculated using the B2 trip rate identified in the Fore report and agreed with Highways England and Barnsley in pre-application discussions. The trip rates for total vehicles have been taken from the 2019 Fore Report (Table 6) and are shown in Table 5.1. The HGV trip rate for the B2 use has also been identified from the TRICS information in the Fore report and these are shown in Table 5.2.

Table 5.1 Vehicular Trip Rates (Total Vehicles)

	B2 Total Vehicular Trip Rates (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	0.211	0.059	0.270
PM Peak	0.067	0.194	0.261

Table 5.2 HGV Trip Rates

	B2 Total HGV Trip Generations (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	0.025	0.026	0.051
PM Peak	0.006	0.002	0.008

5.5.2 By multiplying the trip rates set out in Tables 5.1 and 5.2 by 1021.93 (total floor space of 102,193sqm divided by 100 as the trip rates are per 100sqm) results in the proposed Total Development Traffic as set out in Table 5.3 and 5.4.

Table 5.3 Total Vehicular Trip Generations

	B2 Total Vehicular Trip Generations (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	216	60	276
PM Peak	68	198	267

Table 5.4 HGV Trip Generations

	B2 Total HGV Trip Generations (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	26	27	52
PM Peak	6	2	8

5.5.3 The trip generations in Table 5.3 and 5.4 have then been distributed in accordance with the proposed development distribution (Figures 14-17) and have resulted in the following figures for the development traffic:

- Figure 18 Phase 2 Development Traffic AM – No Link Road;
- Figure 19 Phase 2 Development Traffic PM – No Link Road;
- Figure 20 Phase 3 Development Traffic AM – No Link Road;
- Figure 21 Phase 3 Development Traffic PM – No Link Road;
- Figure 22 Phase 2 Development Traffic AM – With Link Road;
- Figure 23 Phase 2 Development Traffic PM – With Link Road;
- Figure 24 Phase 3 Development Traffic AM – With Link Road;
- Figure 25 Phase 3 Development Traffic PM – With Link Road;
- Figure 26 Total Development Traffic AM – No Link Road;
- Figure 27 Total Development Traffic PM – No Link Road;
- Figure 28 Total Development Traffic AM – With Link Road; and
- Figure 29 Total Development Traffic PM – With Link Road.

5.5.4 It should be noted that these are considered to be worse case trip generations as they assume that the development is 100% B2 for the entire 1.1m sqft and no reduction has been taken account of for reductions in travel planning or for double counting of trips between the proposed residential developments in the Hoyland Masterplan and the Site.

5.6 Hoyland Masterplan Area

5.6.1 As the proposed development is part of the Hoyland North Masterplan Area, it has been agreed with Barnsley and Highways England that the impact of the entire Masterplan area is assessed to understand the total impact from the allocation. The potential development in each parcel was identified in Table 2 and 3 of the 2019 Fore Report and this is summarised in Table 5.5.

Table 5.5 Hoyland Masterplan Development

Plot	Use Class	Capacity
HS56	Residential	80 Dwellings
HS64	Residential	615 Dwellings
HS66	Residential	70 Dwellings
ES14	B1	700sqm
	B2	14,400sqm
ES14 Waddington	B1	501sqm
	B8	2,843sqm
	Hotel	69 Rooms
ES14 Hartwood	B1	836sqm
	B8	4,734sqm

5.6.2 It should be noted that the Drive Thru on Waddington and the Petrol Filling Station and Drive Thru on Hartwood have not been included as these have already been built out on Site.

5.7 Hoyland Masterplan Trip Distribution

5.7.1 The trip distributions for each allocation within the Hoyland Masterplan have been taken from the 2019 Fore Report and have been distributed and assigned throughout the network with and without the Link Road where appropriate. This has resulted in the following Figures:

- Figure 30 ES14 Hartwood Trip Distribution – No Link Road;
- Figure 31 ES14 Waddington Trip Distribution – No Link Road;
- Figure 32 ES14 BMBC Trip Distribution – No Link Road;
- Figure 33 HS56 Residential Trip Distribution – No Link Road;
- Figure 34 HS66 Residential Trip Distribution – No Link Road;
- Figure 35 HS64 Residential Trip Distribution – No Link Road;
- Figure 36 HS56 Residential Trip Distribution – With Link Road;
- Figure 37 HS66 Residential Trip Distribution – With Link Road; and
- Figure 38 HS64 Residential Trip Distribution – With Link Road.

5.7.2 It should be noted that the introduction of the link road will not affect the distribution of traffic associated with the ES14 development.

5.8 Hoyland Masterplan Trip Generation

5.8.1 The trip rates for each development on the Hoyland Masterplan have been taken from the 2019 Fore report which have been calculated using B1, B2, B8, hotel and residential development types. The trip rates are shown in Tables 5.6 – 5.10.

Table 5.6 B1 Trip Rates

	B1 Trip Rates (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	1.164	0.126	1.290
PM Peak	0.099	1.075	1.174

Table 5.7 B2 Trip Rates

	B2 Trip Rates (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	0.211	0.059	0.270
PM Peak	0.067	0.194	0.261

Table 5.8 B8 Trip Rates

	B8 Trip Rates (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	0.187	0.071	0.258
PM Peak	0.061	0.159	0.220

Table 5.9 Hotel Trip Rates

	Hotel Trip Rates (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	0.288	0.458	0.746
PM Peak	0.338	0.203	0.541

Table 5.10 Residential Trip Rates

	Residential Trip Rates (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	0.134	0.381	0.515
PM Peak	0.330	0.162	0.492

5.8.2 By multiplying the above trip rates by the appropriate sqm's, hotel room or dwellings as set out in Table 5.5 for each allocation. The expected number of trips for each individual site are shown in Tables 5.11 to 5.16.

Table 5.11 ES14 Hartwood Trip Generations

	ES14 Hartwood Trip Generation (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	19	4	23
PM Peak	4	17	21

Table 5.12 ES14 Waddington Trip Generations

	ES14 Waddington Trip Generation (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	22	21	43
PM Peak	15	18	33

Table 5.13 ES14 BMBC Trip Generations

	ES14 BMBC Trip Generation (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	39	9	48
PM Peak	10	35	45

Table 5.14 HS56 Residential Trip Generations

	HS56 Residential Trip Generation (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	11	30	41
PM Peak	26	13	39

Table 5.15 HS66 Residential Trip Generations

	HS66 Residential Trip Generation (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	9	27	36
PM Peak	23	11	34

Table 5.16 HS64 Residential Trip Generations

	HS64 Residential Trip Generation (per 100m2) GFA		
	Arrivals	Departures	Total
AM Peak	82	234	316
PM Peak	203	100	303

5.8.3 The trip generations in Table 5.11 to 5.16 have then been distributed in accordance with the proposed Hoyland Masterplan Trip Distributions (Figures 30-38) and have resulted in the following traffic generation figures for the Total Hoyland North Masterplan Area:

- Figure 39 ES14 Hartwood AM Trip Generation – No Link Road;
- Figure 40 ES14 Hartwood PM Trip Generation – No Link Road;
- Figure 41 ES14 Waddington AM Trip Generation – No Link Road;
- Figure 42 ES14 Waddington PM Trip Generation – No Link Road;
- Figure 43 ES14 BMBC AM Trip Generation – No Link Road;
- Figure 44 ES14 BMBC PM Trip Generation – No Link Road;
- Figure 45 HS56 Residential AM Trip Generation – No Link Road;
- Figure 46 HS56 Residential PM Trip Generation – No Link Road;
- Figure 47 HS66 Residential AM Trip Generation – No Link Road;
- Figure 48 HS66 Residential PM Trip Generation – No Link Road;
- Figure 49 HS64 Residential AM Trip Generation – No Link Road;
- Figure 50 HS64 Residential PM Trip Generation – No Link Road;
- Figure 51 HS56 Residential AM Trip Generation – With Link Road;
- Figure 52 HS56 Residential PM Trip Generation – With Link Road;
- Figure 53 HS66 Residential AM Trip Generation – With Link Road;
- Figure 54 HS66 Residential PM Trip Generation – With Link Road;
- Figure 55 and HS64 Residential AM Trip Generation – With Link Road;
- Figure 56 HS64 Residential PM Trip Generation – With Link Road.

5.8.4 Combining the trips set out in each allocation for each scenario results in the Total Hoyland North Masterplan Area trip generations in Figures 57-60. It should be noted that these figures don't include the proposed Phase 2 Site.

- Figure 57 Total AM Hoyland North Trip Generation – With Link Road;
- Figure 58 Total AM Hoyland North Trip Generation – With Link Road;
- Figure 59 and Total AM Hoyland North Trip Generation – No Link Road;
- Figure 60 Total AM Hoyland North Trip Generation – No Link Road.

5.9 Future Year Assessments

5.9.1 The proposed development will take a number of years to be fully built out. It is anticipated that first occupation of the Site will be in 2021 with full occupation in 2028/2029.

5.9.2 Highways England have requested that the development is assessed in the year of first occupation (2021) and 10 years following planning submission (2029). Whilst Barnsley have requested that the assessment of the network occurs at full occupation of the Site and that the assessment of the proposed Site accesses are assessed up until the end of the plan period (2033).

5.10 Traffic Growth

5.10.1 A TEMPro growth assessment for the future design years of 2021, 2029 and 2033 has been undertaken and the results are attached in Appendix F. As the Hoyland Masterplan area is allocated for development, TEMPro has already considered the overall impact of the flows. As such it is appropriate to apply alternative assumptions to the TEMPro assessment to ensure that double counting of the development doesn't occur. As such the number of jobs created by the proposed allocation and the number of residences within the assessment for the masterplan have been deducted from the future year assessment.

5.10.2 The TEMPro assessments demonstrated that there would be no background growth on the highway network in excess of the growth accounted for through the build out of the masterplan area. Barnsley and Highways England have reviewed the assessment and agreed at the scoping meetings that there will be no additional growth on the network over and above that associated with the masterplan area and committed development sites throughout the plan period.

5.10.3 The following assessment scenarios have therefore been agreed with the highway authorities for the local road networks:

- 2029 Base;
- 2029 Design; and
- 2029 Design Sensitivity (including the whole of the Hoyland Masterplan area).

5.10.4 The 2029 Base traffic flows have been calculated by adding the 2019 Count flows and the committed development together resulting in the following Figures:

- Figure 61 2029 AM Base; and
- Figure 62 2029 PM Base.

5.10.5 Following this the 2029 Design scenarios were calculated by adding the 2029 Base to the proposed development flows, which is shown in the following Figures:

- Figure 63 2029 AM Design; and
- Figure 64 2029 PM Design.

5.10.6 Finally, the 2029 Design flows have been added to the Total Hoyland North Trip Generation Flows to create the 2029 Design Sensitivity scenario, which are displayed in the following Figures:

- Figure 65 2029 AM Design Sensitivity – with Link Road;
- Figure 66 2029 PM Design Sensitivity – with Link Road;
- Figure 67 2029 AM Design Sensitivity – No Link Road; and
- Figure 68 2029 PM Design Sensitivity – No Link Road.

6. Junction Capacity Analysis

6.1 Introduction

6.1.1 This chapter assesses the impact of the development trips on the highway network in the vicinity of the Site. It has been agreed with Barnsley and Highways England that the assessment of the network will be undertaken using ARCADY software for the Site access junctions, whilst the validated VISSIM model for the Birdwell Interchange will be utilised for the assessment of the impact at the other junctions. A report detailing the impact of the Site away from the Site accesses will be completed and provided separately.

6.2 New Access Roundabout to Phase 3

6.2.1 The new access is proposed to be a 3-arm standard roundabout as shown in Appendix C. It has been modelled using the ARCADY function within Junctions 9 software, the outputs of which are available in Appendix G.

6.2.2 The junction has been modelled for the AM and PM peak hours for the following scenarios:

- 2029 Design;
- 2029 Design Sensitivity with Link Road; and
- 2029 Design Sensitivity no Link Road.

6.2.3 The results are summarised in Table 6.1.

Table 6.1 Summary of New Access Roundabout

Scenario	Lane	AM Peak Hour			PM Peak Hour		
		RFC	Ave Queue	Observed Queue	RFC	Ave Queue	Observed Queue
2029 Design	A6195 South	0.54	1.1	2.99	0.61	1.6	3.56
	New Access	0.02	0.0	3.16	0.05	0.1	3.71
	A6195 North	0.59	1.4	3.33	0.52	1.1	2.87
2029 Design Sensitivity with Link Road	A6195 South	0.55	1.2	3.10	0.65	1.8	3.95
	New Access	0.02	0.0	3.23	0.05	0.1	3.95
	A6195 North	0.63	1.7	3.72	0.54	1.2	2.99
2029 Design Sensitivity No Link Road	A6195 South	0.54	1.2	3.04	0.65	1.8	3.95
	New Access	0.02	0.0	3.20	0.10	0.1	4.14
	A6195 North	0.61	1.5	3.50	0.57	1.3	3.26

6.2.4 A Ratio of Flow to Capacity value below 0.85 indicates that a junction or arm operates within its predicted capacity. An RFC value between 0.85 and 1.00 indicates that there may be occasions during the period modelled when queues will develop and delays will occur. An RFC value greater than 1.00 indicates that the junction or arm operates beyond its theoretical capacity.

6.2.5 Table 6.1 demonstrates the junction operates well within capacity in all scenarios.

6.3 Shortwood Roundabout

6.3.1 The proposals for Shortwood Roundabout are to add a 4th arm on the eastern extent to provide access to the Phase 2 of the Rockingham Development and to provide direct access to the A6195 for the Hoyland North Masterplan area. The proposed Site access is shown in Appendix D. It has been modelled using the ARCADY function within Junctions 9 software, the outputs of which are available in Appendix G.

6.3.2 The junction has been modelled for the AM and PM peak hours for the following scenarios:

- 2029 Design;
- 2029 Design Sensitivity with Link Road; and
- 2029 Design Sensitivity no Link Road.

6.3.3 The results are summarised in Table 6.2.

Table 6.2 Summary of Shortwood Roundabout Assessment

Scenario	Lane	AM Peak Hour		PM Peak Hour	
		RFC	Queue	RFC	Queue
2029 Design	A6195 South	0.50	1.0	0.63	1.7
	Shortwood Way	0.06	0.1	0.21	0.3
	A6195 North	0.61	1.5	0.49	1.0
	New Access	0.00	0.0	0.00	0.0
2029 Design Sensitivity with Link Road	A6195 South	0.56	1.3	0.68	2.1
	Shortwood Way	0.07	0.1	0.24	0.3
	A6195 North	0.65	1.9	0.51	1.0
	New Access	0.10	0.1	0.16	0.2
2029 Design Sensitivity No Link Road	A6195 South	0.57	1.3	0.74	2.8
	Shortwood Way	0.07	0.1	0.29	0.4
	A6195 North	0.69	2.2	0.54	1.2
	New Access	0.21	0.3	0.40	0.7

6.3.4 Table 6.2 demonstrates the junction operates well within capacity in all scenarios.

7. Summary and Conclusions

7.1.1 This Transport Assessment (TA) has been undertaken by Mosodi on behalf of Harworth and has considered the highways and transportation issues raised by a proposed 1.1m sqft B1C/B2/B8 employment park on land located immediately to the north and south of the A6195 in Hoyland.

7.1.2 The TA has identified what measures will be undertaken to deal with the anticipated impacts of the scheme proposals and has defined what improvements and initiatives will be implemented to improve accessibility to the Site by all modes of travel.

7.1.3 Phase 2 of the proposed development is to be served from a new arm (4th) onto the Shortwood Roundabout. This new access will also provide a connection into the majority of the Hoyland North Masterplan area and connect through to the B6096 to the south. Phase 2 will be served from the link road via ghost island priority junctions.

7.1.4 Phase 3 of the proposed development is to be served from a new roundabout junction on the A6195 Dearne Valley Parkway. The roundabout will have a 60m inscribed circle diameter and provide a two lane approach and exit on the Dearne Valley Parkway.

7.1.5 As part of the development there is likely to be a requirement to divert public footpaths. Any public rights of way diversions will be subject to a separate application process that cannot be certified until after planning approval has been granted.

7.1.6 Although the layout is in outline, the principles of the masterplan have been designed to encourage pedestrian and cycling trips. These principles will be adhered to through reserved matters applications for individual plots:

- Providing direct pedestrian/cycle links through the Site and to cycle parking;
- Ensuring the internal links also connect with the external pedestrian routes;
- Ensuring that individual plot accesses & side road junctions are provided with priority pedestrian/cycle crossovers;
- Provision of secure cycle parking spaces at convenient, visible locations; and
- Providing shower/changing/locker facilities.

7.1.7 The proposals will result in improved pedestrian and cycling facilities in the immediate vicinity of the Site thereby enhancing accessibility not just to the development but to other users of the local network, particularly staff and visitors to the existing Rockingham Phase 1 and Shortwood Way Industrial Estates.

7.1.8 A Framework Travel Plan that accompanies this TA sets out in detail the proposed (and potential) facilities/initiatives for incorporation into future detailed Travel Plans to encourage all staff and visitors to use sustainable transport to access the respective sites. A Lead Travel Plan Co-ordinator will be appointed by Harworth (or the management company as appropriate) to drive this process forward. Individual tenants will be required to appoint their own tenant TPC who will be required to meet with the travel plan steering group and ensure that their employer

meets with the requirements set out in the FTP and the overarching Hoyland North Masterplan TP.

7.1.9 A comprehensive assessment of the proposed development trip generations and distributions has been undertaken.

7.1.10 The principles employed in this TA have broad agreement from the highways stakeholders and with the trip rates and distributions being based on the Hoyland North Masterplan work.

7.1.11 Weekday morning and evening peak hour capacity assessments have been carried out for the junctions within the study network for the following scenarios:

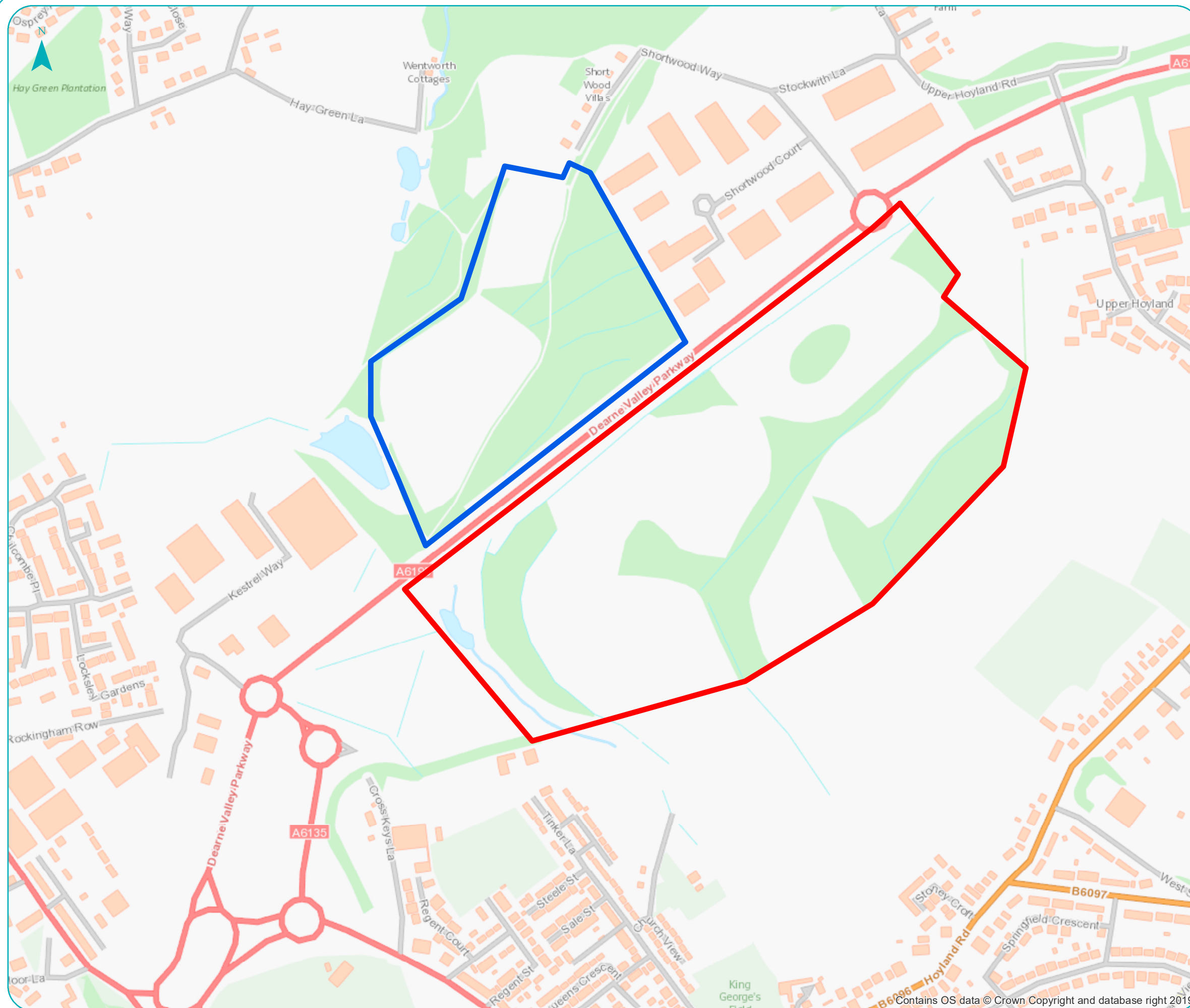
- Traffic Count Flows;
- 2029 Base Flows;
- 2029 Design Flows; and
- 2029 Design Sensitivity Flows to include the full Masterplan area.

7.1.12 Junction capacity assessments have been undertaken at the Site accesses, using industry standard software for various scenarios. It is considered that the design traffic flows which have been modelled are robust for the following reasons:

- The development has assumed the worst case use class (B2) in order to calculate the trip generations;
- The trip rates have been compounded with the network peak hours, which creates a worst case scenario;
- No discount has been applied to allow for the effect of the Travel Plan or the proposed measures to influence travel behaviour outlined in previous chapters;
- No discount has been applied to the trip rates to account for proposed trips between the employment and residential elements of the Hoyland Masterplan and therefore an element of double counting will occur.

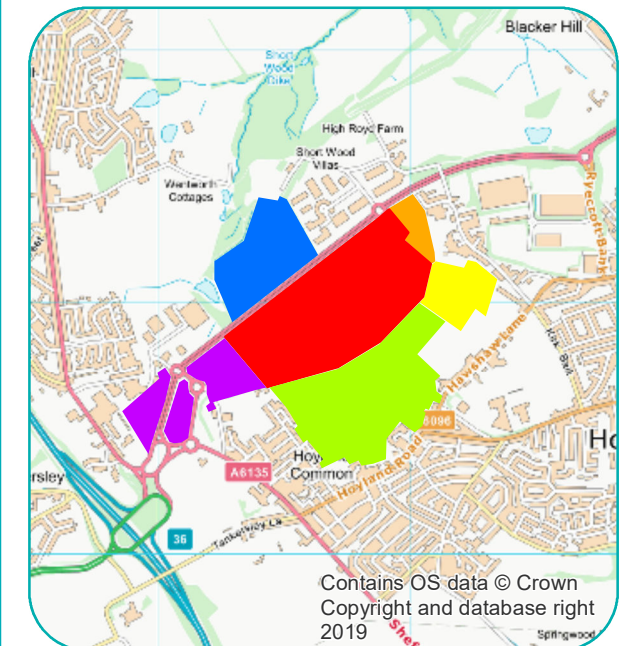
7.1.13 From the extensive work undertaken it is concluded that there are no reasons on highways or transport grounds why the development Site should not be granted planning permission for commercial purposes.

Figures



Key

- Phase 2 Boundary
- Phase 3 Boundary
- ES14 Hoyland North Allocation
- HS64 Hoyland North Allocation
- HS66 Hoyland North Allocation
- HS56 Hoyland North Allocation



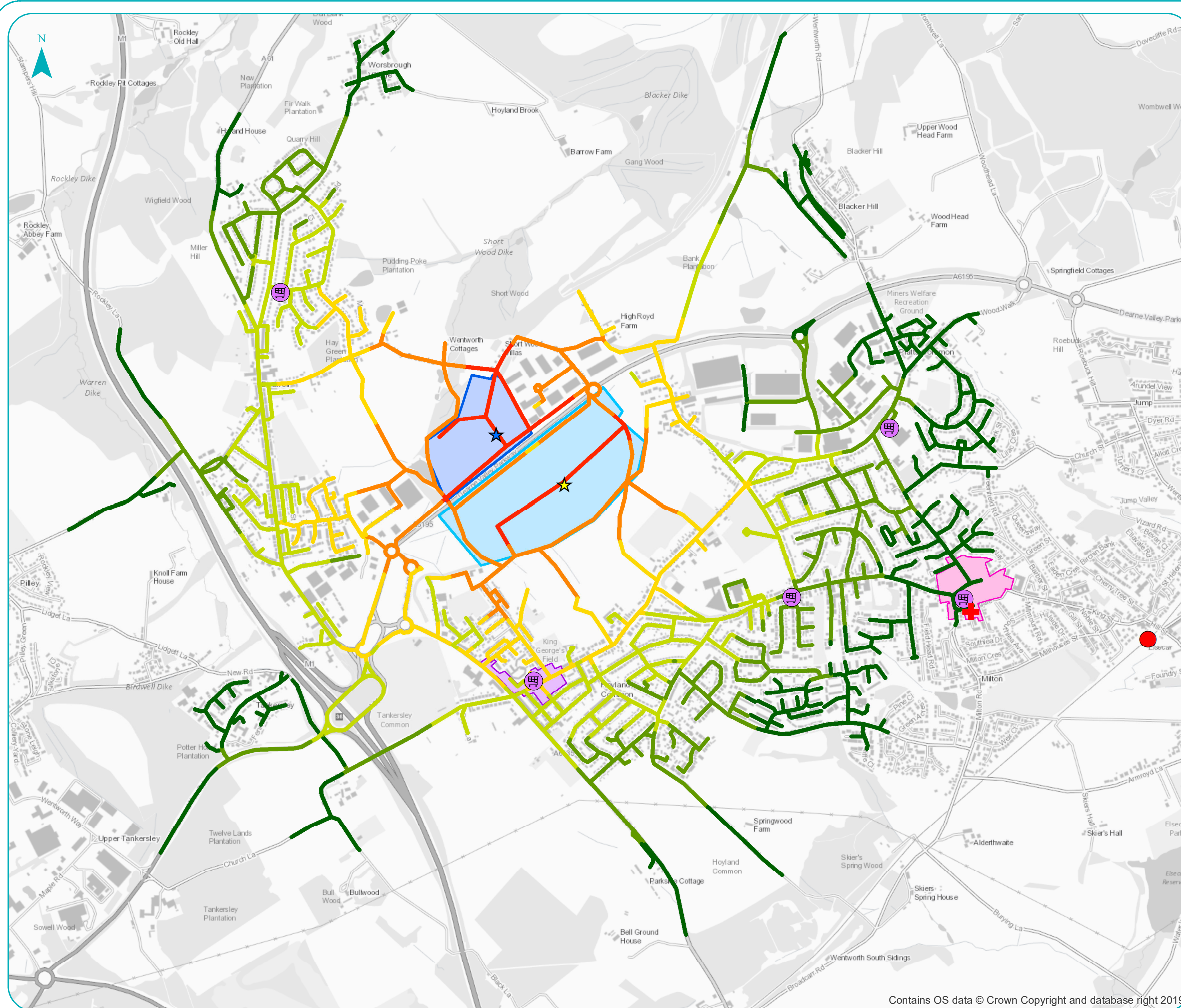
Rockingham Phase 2 & 3,
Hoyland, Barnsley
Employment Development
Site Location Plan

Figure 1

Scale @ A3 1:5,000

mosodi
mobility solutions through design and innovation

Contains OS data © Crown Copyright and database right 2019



Key

- Phase 2 Boundary
- Phase 3 Boundary
- Railway Stations
- Ⓜ Supermarkets
- + GP
- ★ Hoyland Common Centre
- ★ Hoyland District Centre

Walk Accessibility (4.8kph)

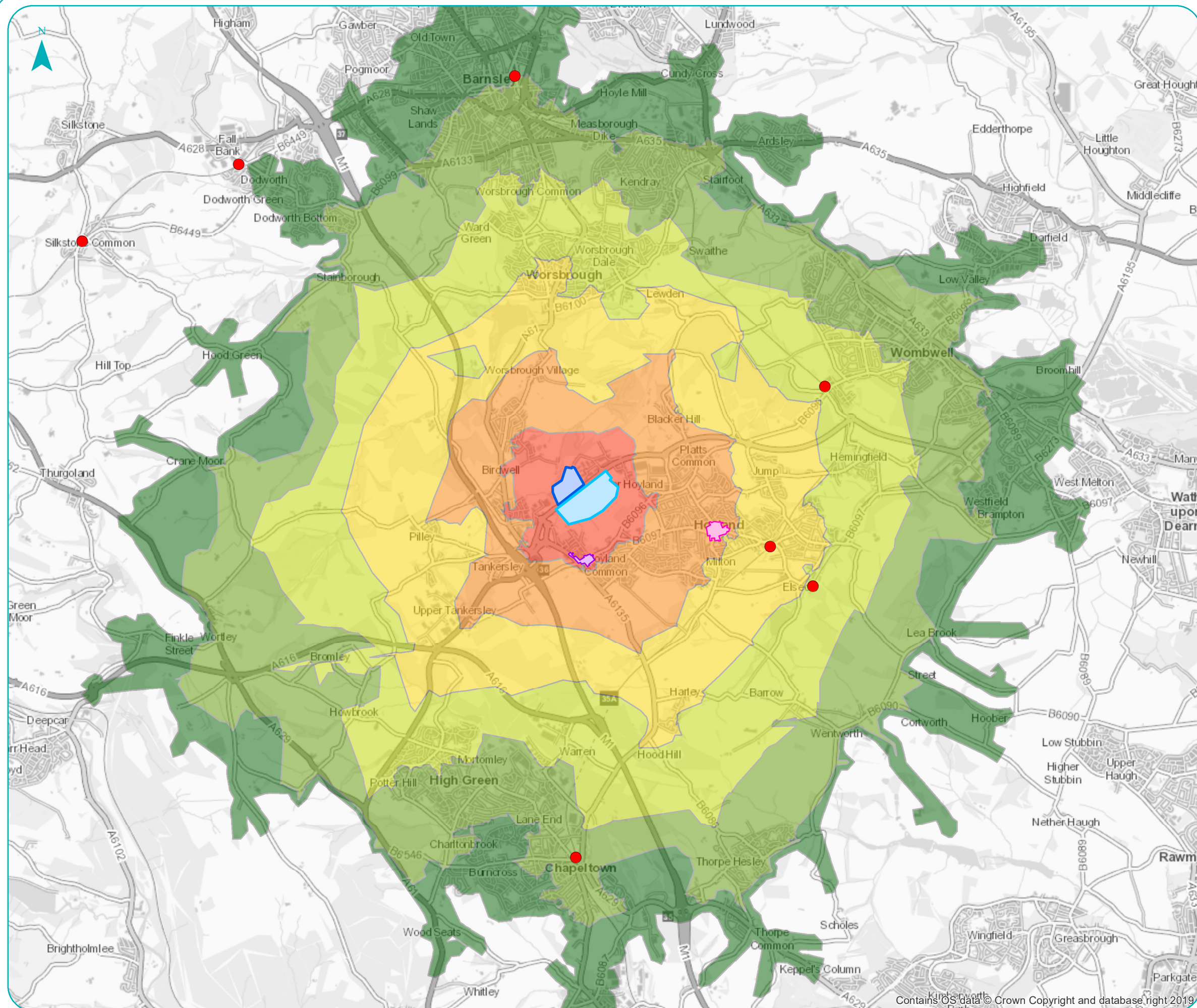
- 0-5 Minutes
- 5-10 Minutes
- 10-15 Minutes
- 15-20 Minutes
- 20-25 Minutes
- 25-30 Minutes

Rockingham Phase 2 & 3,
Hoyland, Barnsley
Employment Development
Pedestrian Accessibility

Figure 2

Scale @ A3 1:15,000

mosodi
mobility solutions through design and innovation



Key

- Phase 2 Boundary
- Phase 3 Boundary
- Railway Stations
- Hoyland Common Centre
- Hoyland District Centre

Cycle Accessibility (16kph)

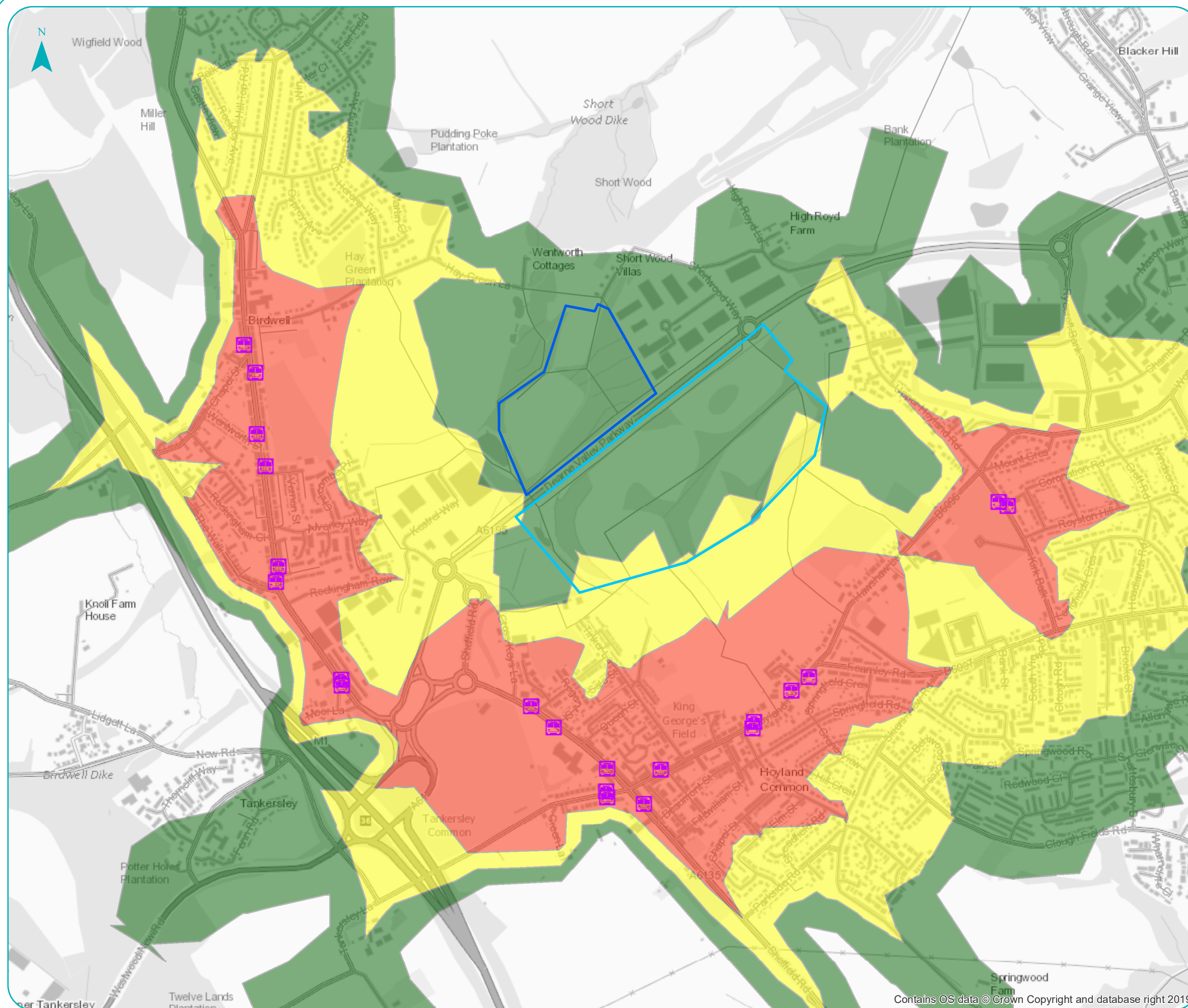
- 0-5 Minutes
- 5-10 Minutes
- 10-15 Minutes
- 15-20 Minutes
- 20-25 Minutes
- 25-30 Minutes

Rockingham Phase 2 & 3,
Hoyland, Barnsley
Employment Development
Cycle Accessibility

Figure 3

Scale @ A3 1:50,000

mosodi
mobility solutions through design and innovation



Key

- Phase 2 Boundary
- Phase 3 Boundary
- Local Bus Stops

Walk Distance

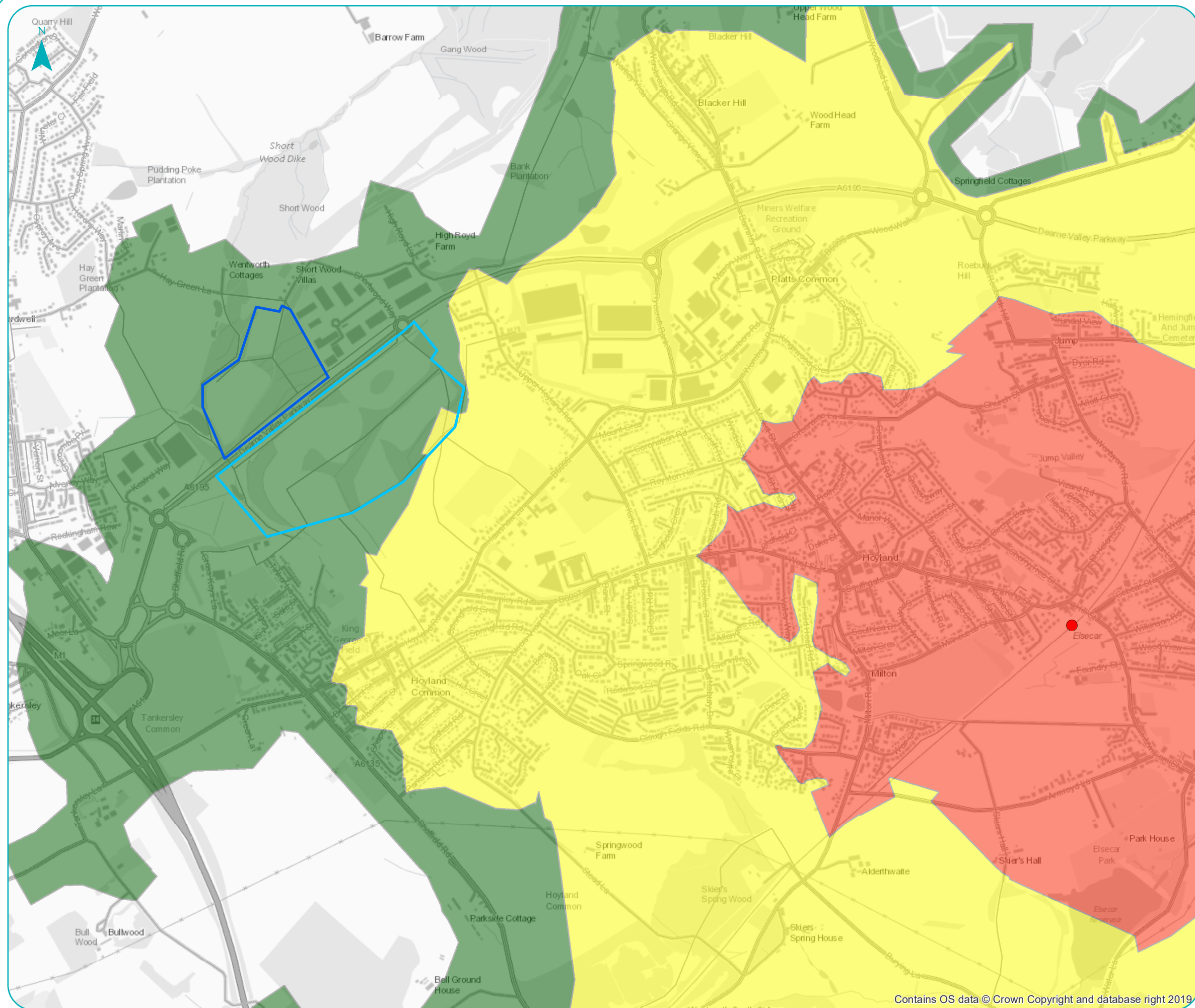
- 0-400m
- 400-800m
- 800-1200m

Rockingham Phase 2 & 3,
Hoyland, Barnsley
Employment Development
Bus Stop Accessibility

Figure 4

Scale @ A3 1:10,000

mosodi
mobility solutions through design and innovation



Key

- Phase 2 Boundary
- Phase 3 Boundary
- Railway Stations

Cycle Time

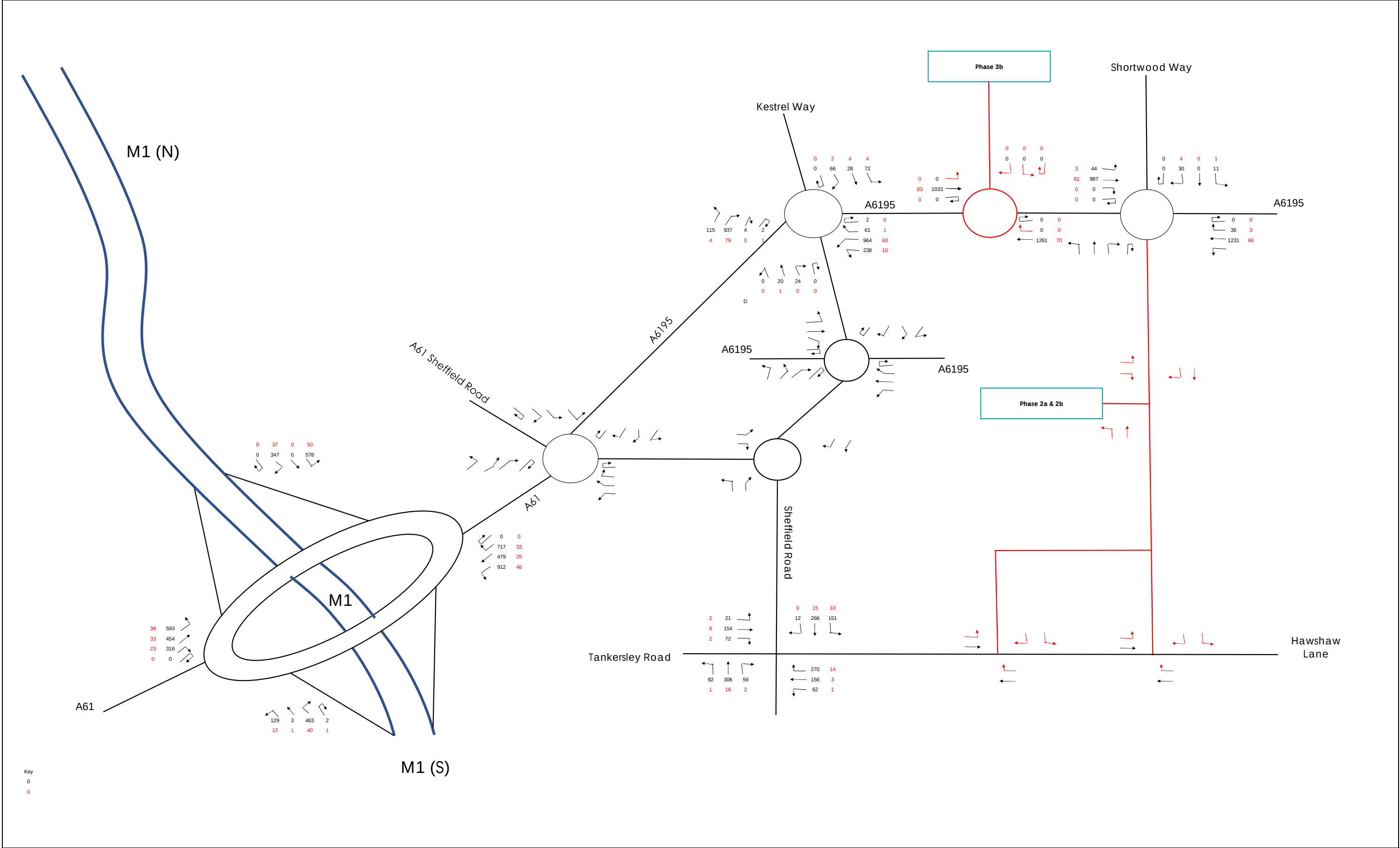
- 0-5 Minutes
- 5-10 Minutes
- 10-15 Minutes

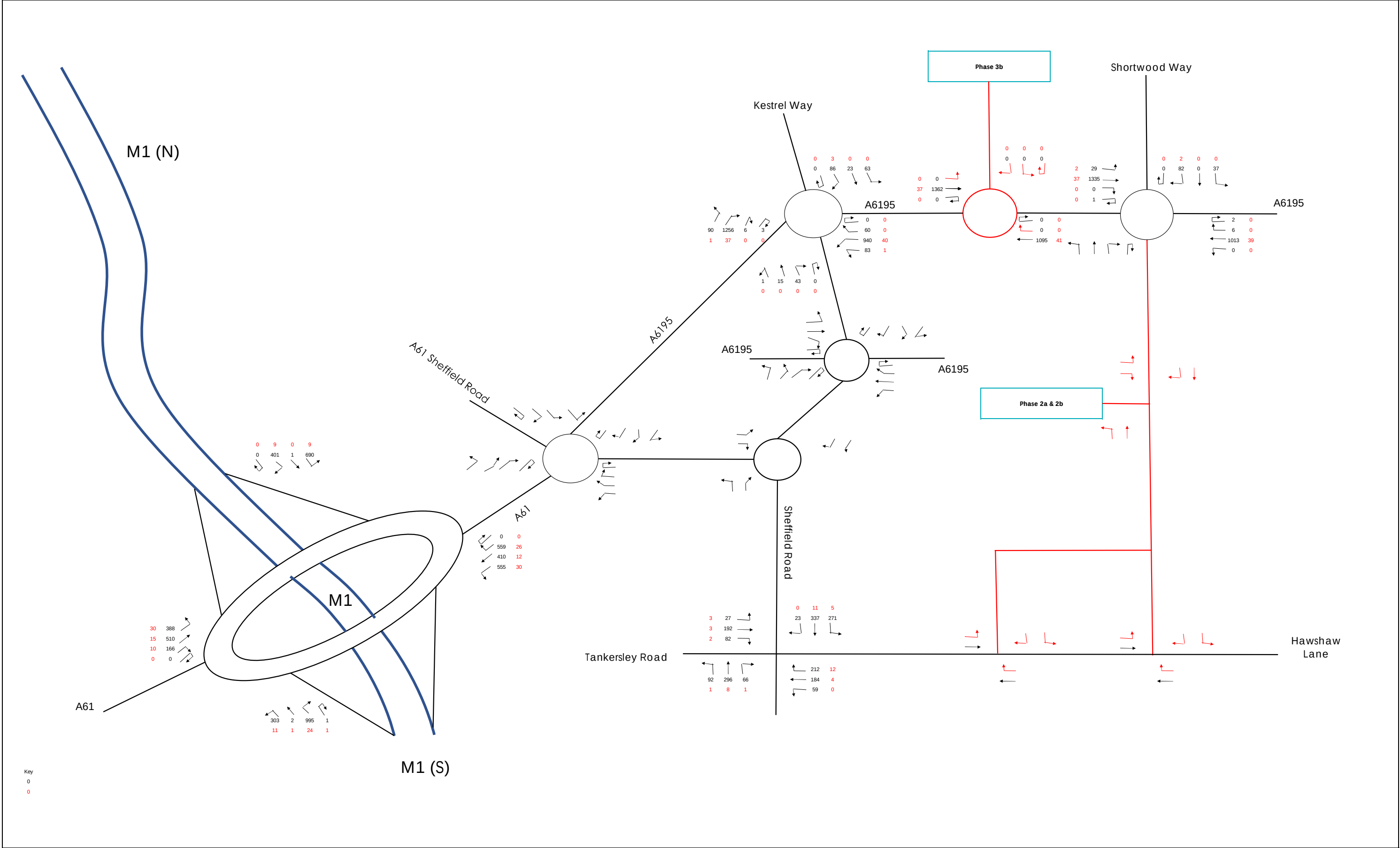
Rockingham Phase 2 & 3,
Hoyland, Barnsley
Employment Development
Rail Station Accessibility

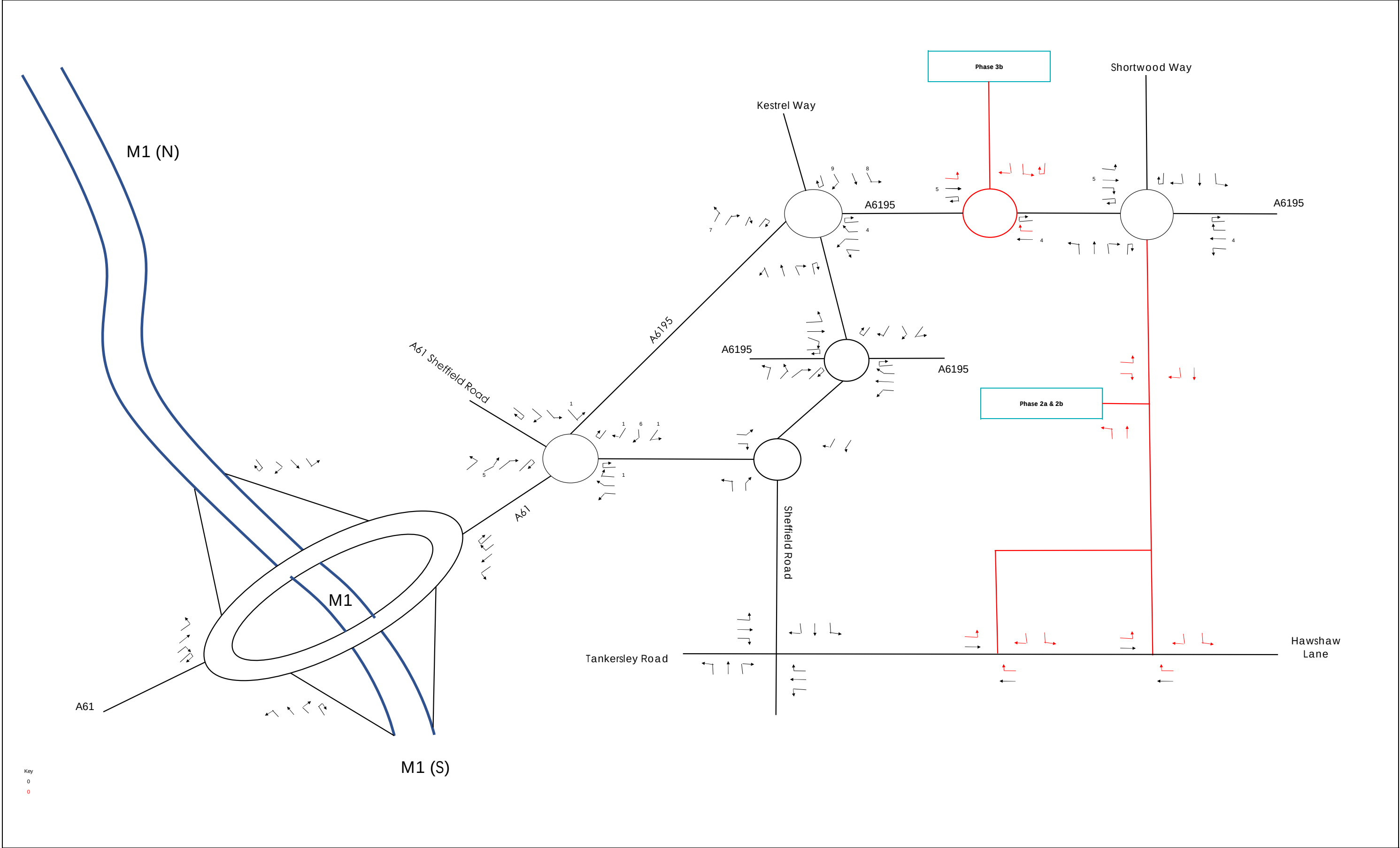
Figure 5

Scale @ A3 1:12,500

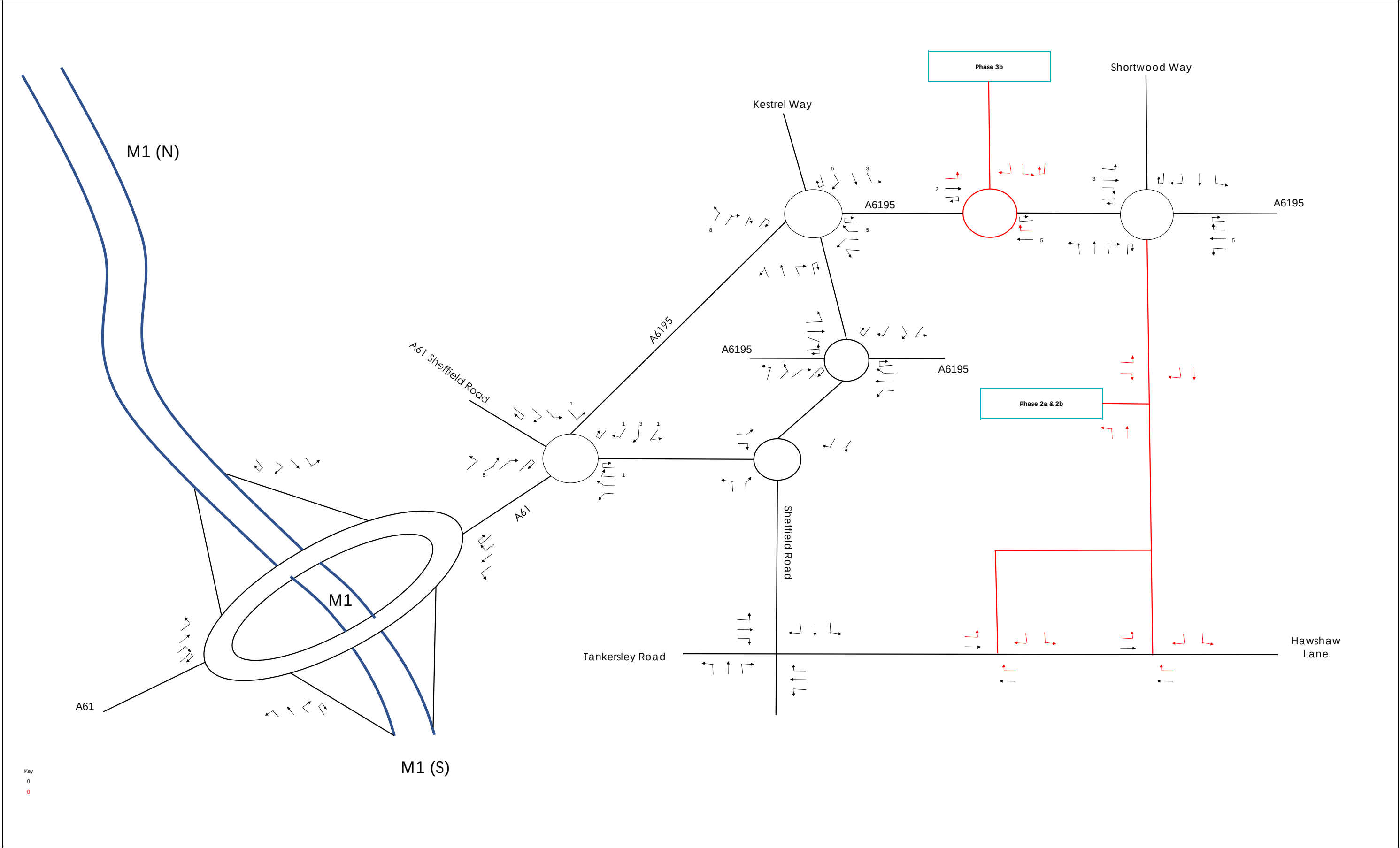
mosodi
mobility solutions through design and innovation



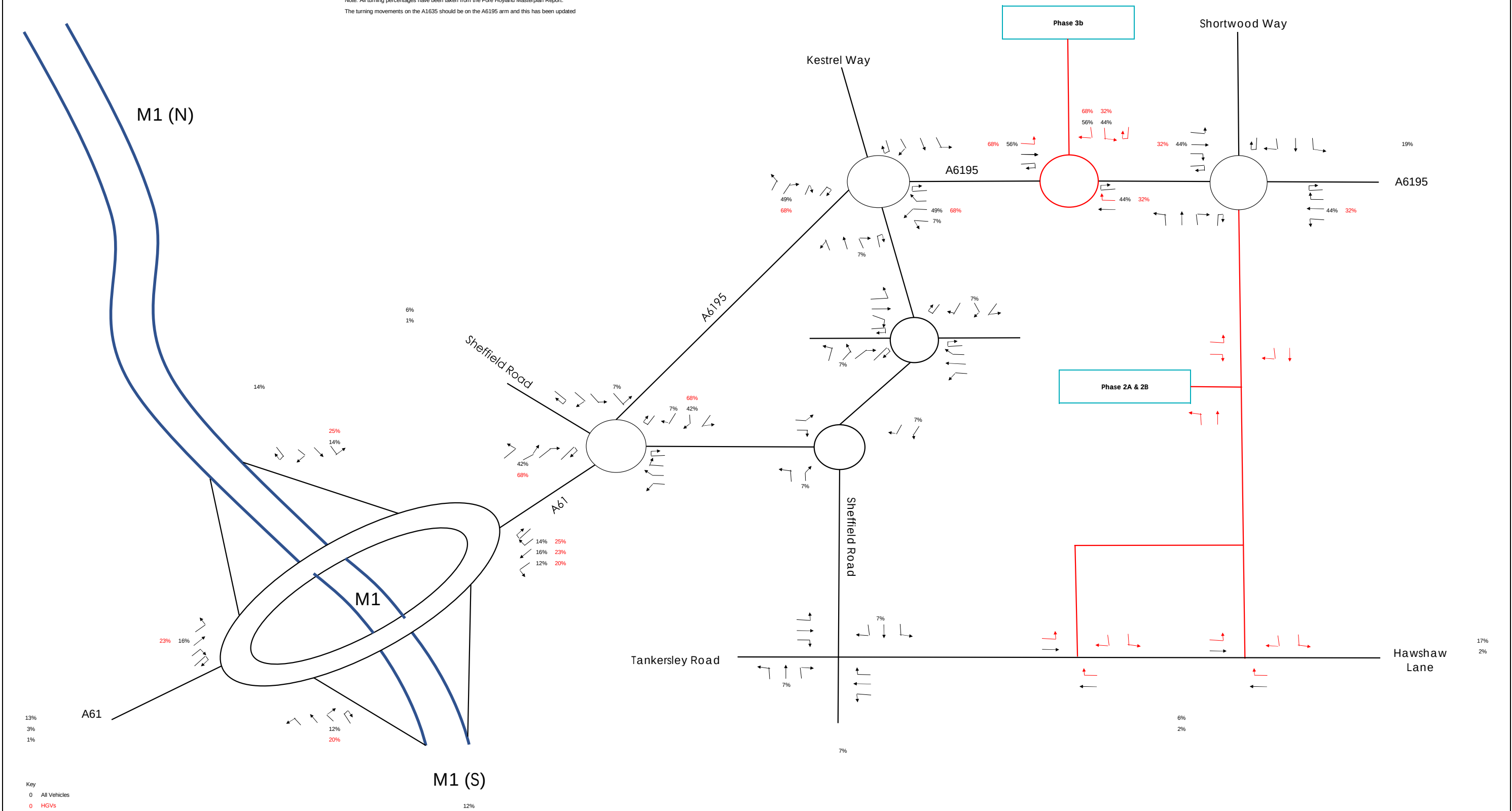


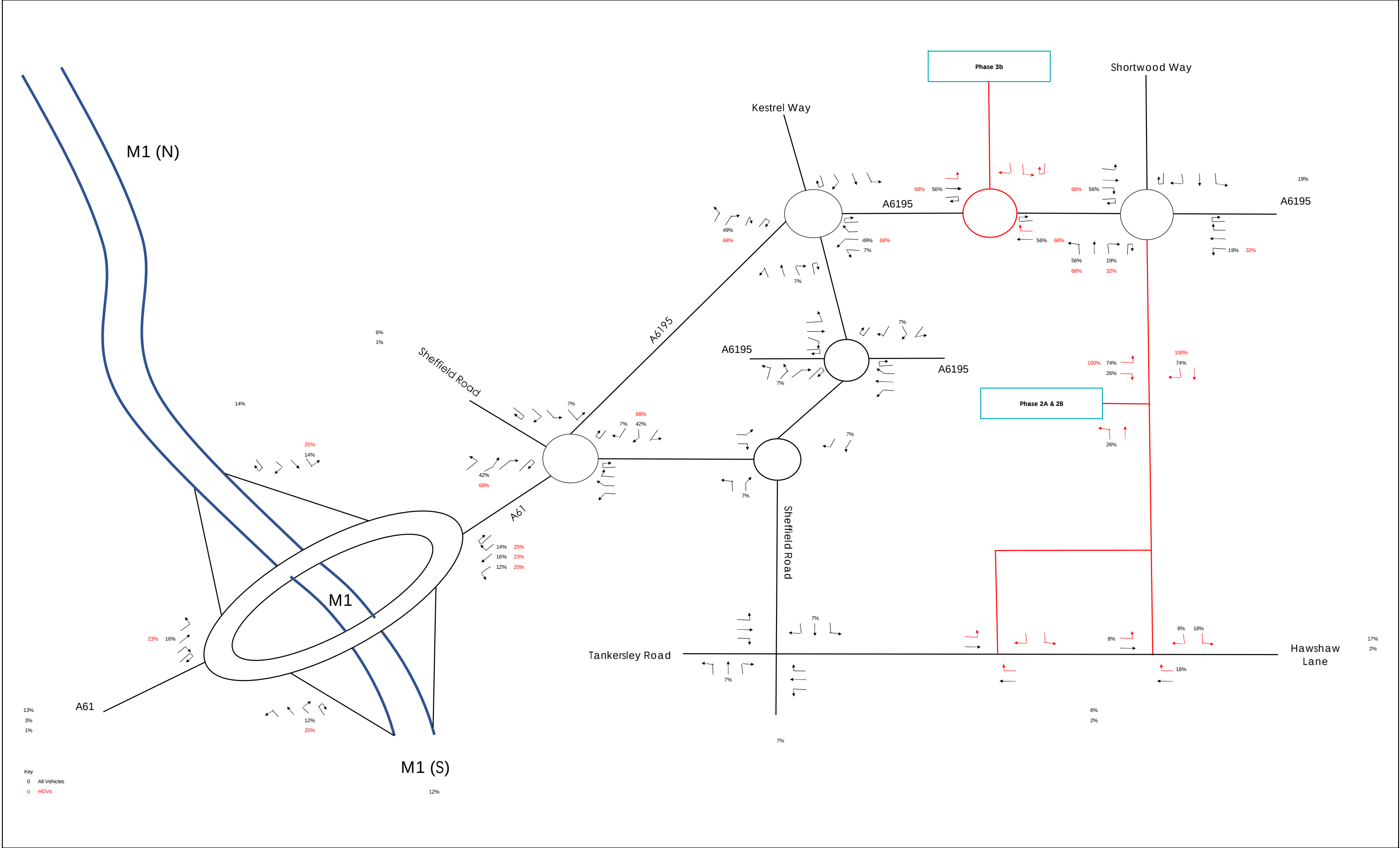


Key
0
0

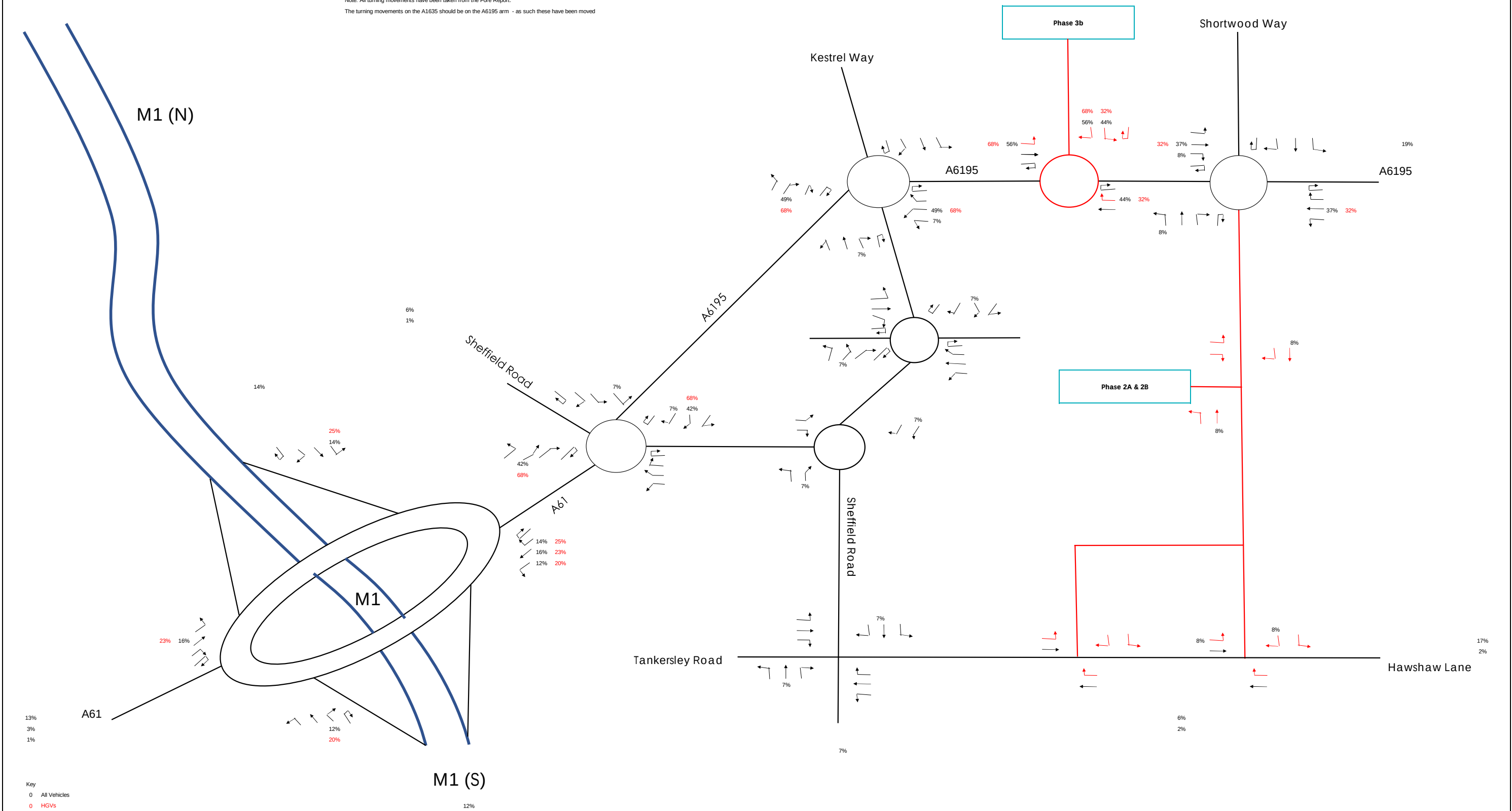


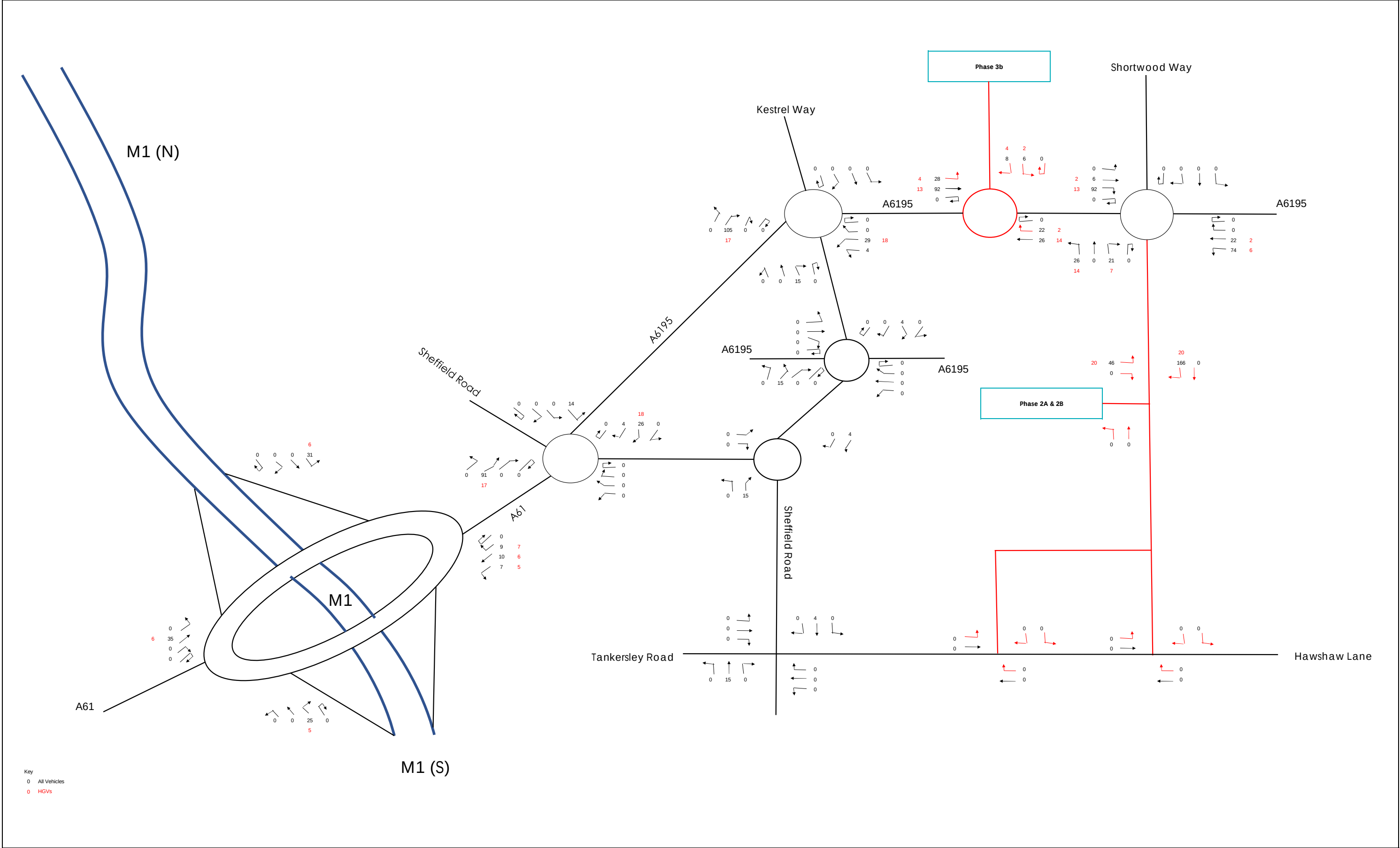
Note: All turning percentages have been taken from the Fore Hoyland Masterplan Report.
The turning movements on the A1635 should be on the A6195 arm and this has been updated

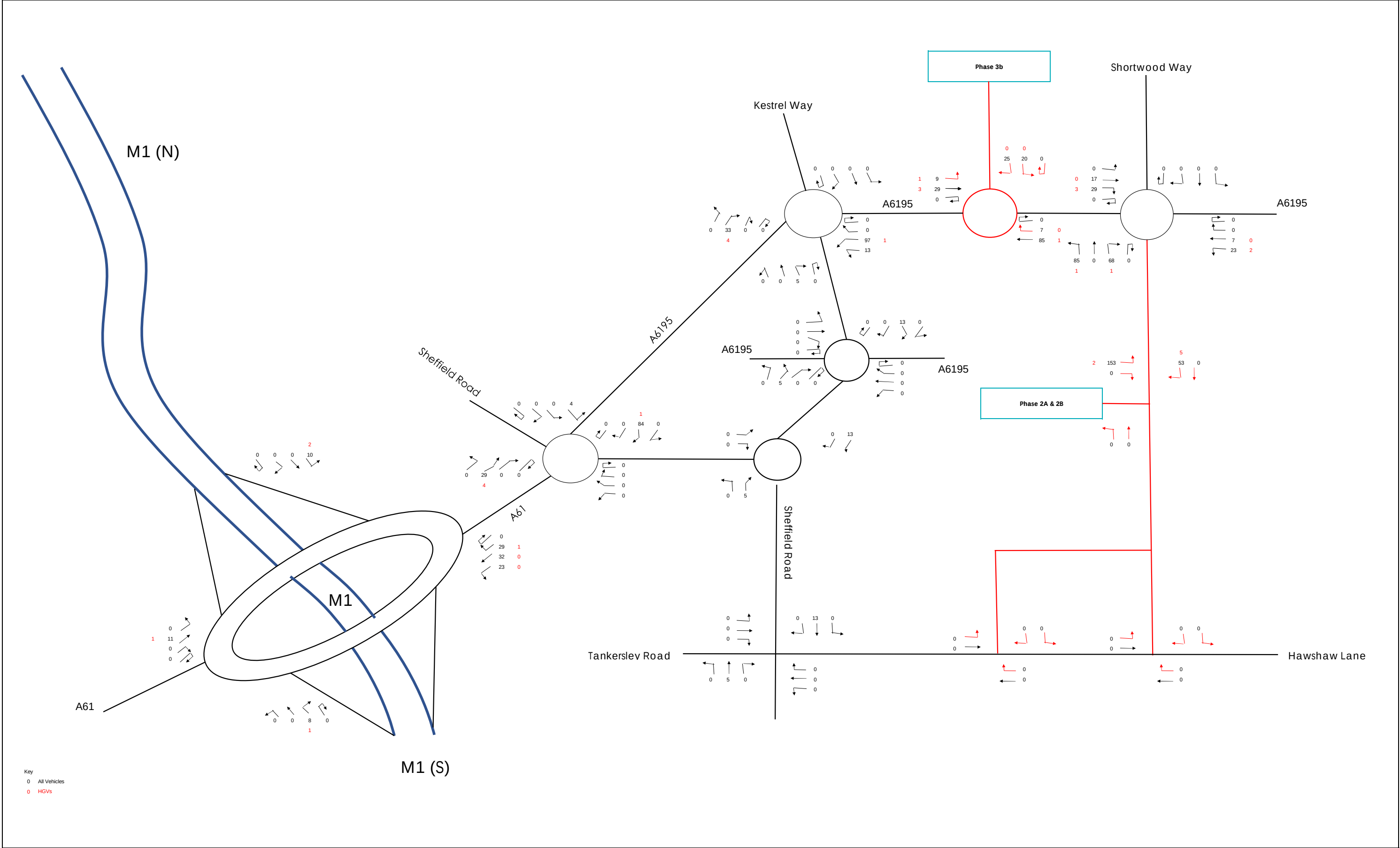


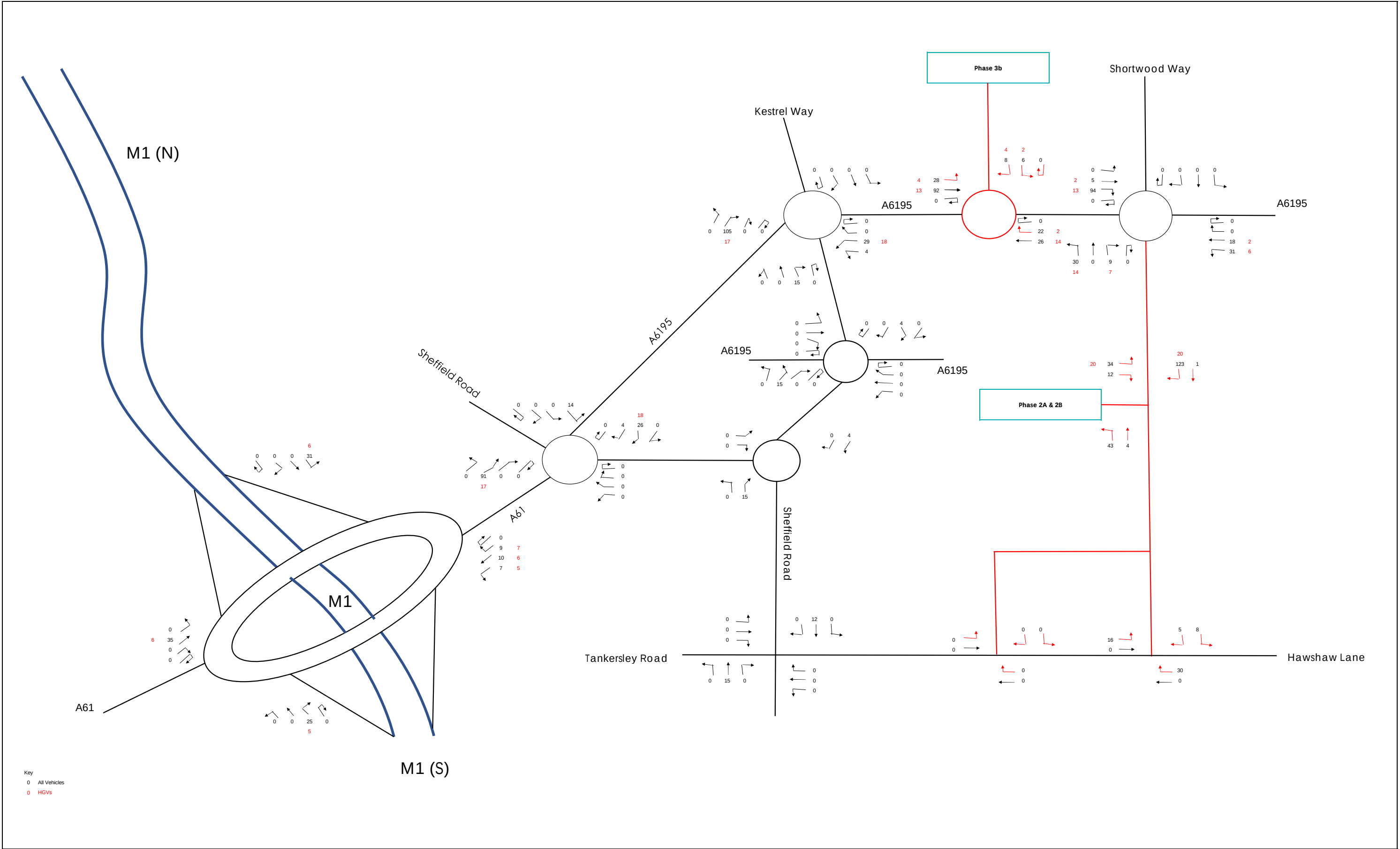


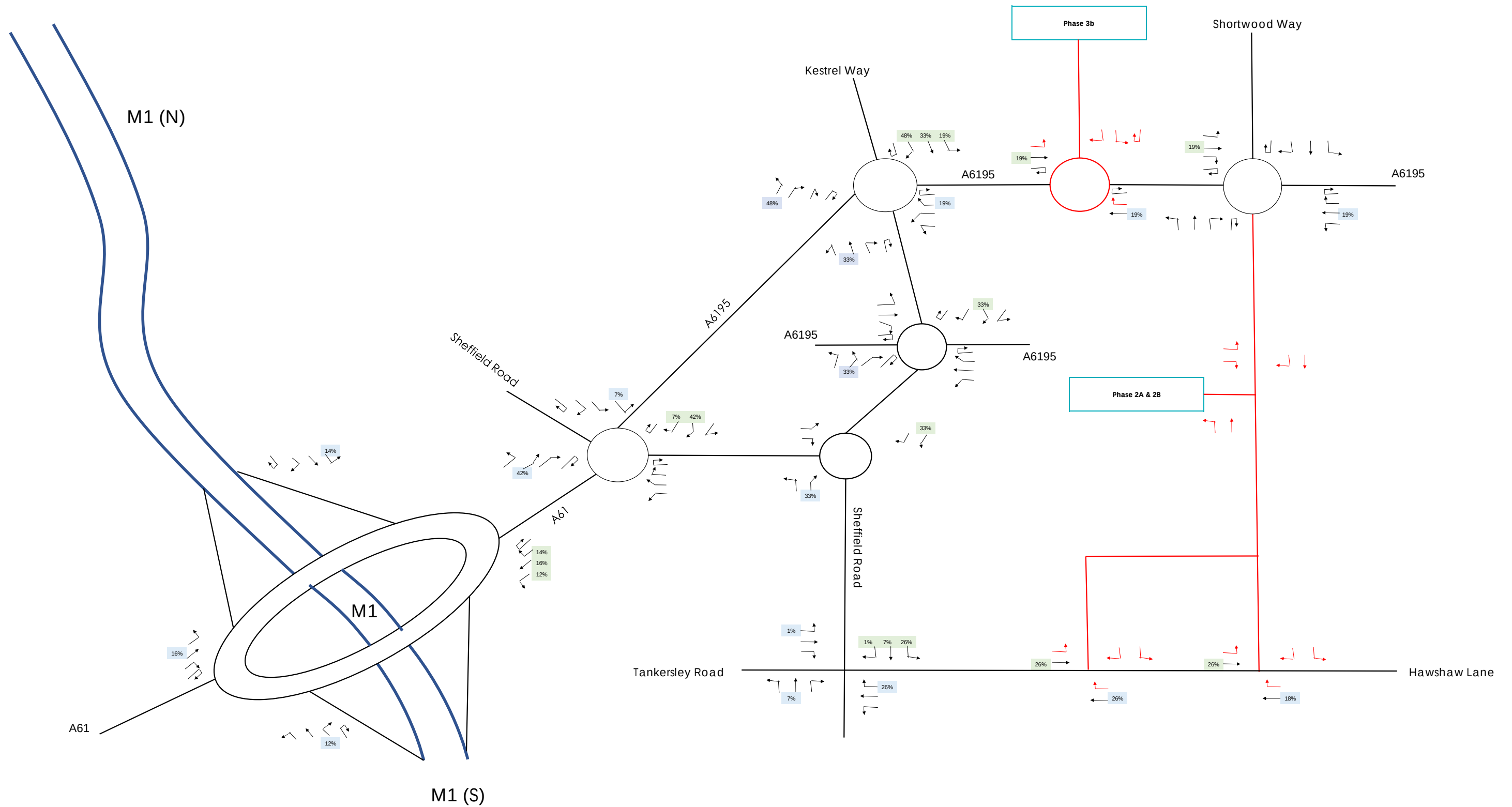
Note: All turning movements have been taken from the Fore Report.
The turning movements on the A1635 should be on the A6195 arm - as such these have been moved

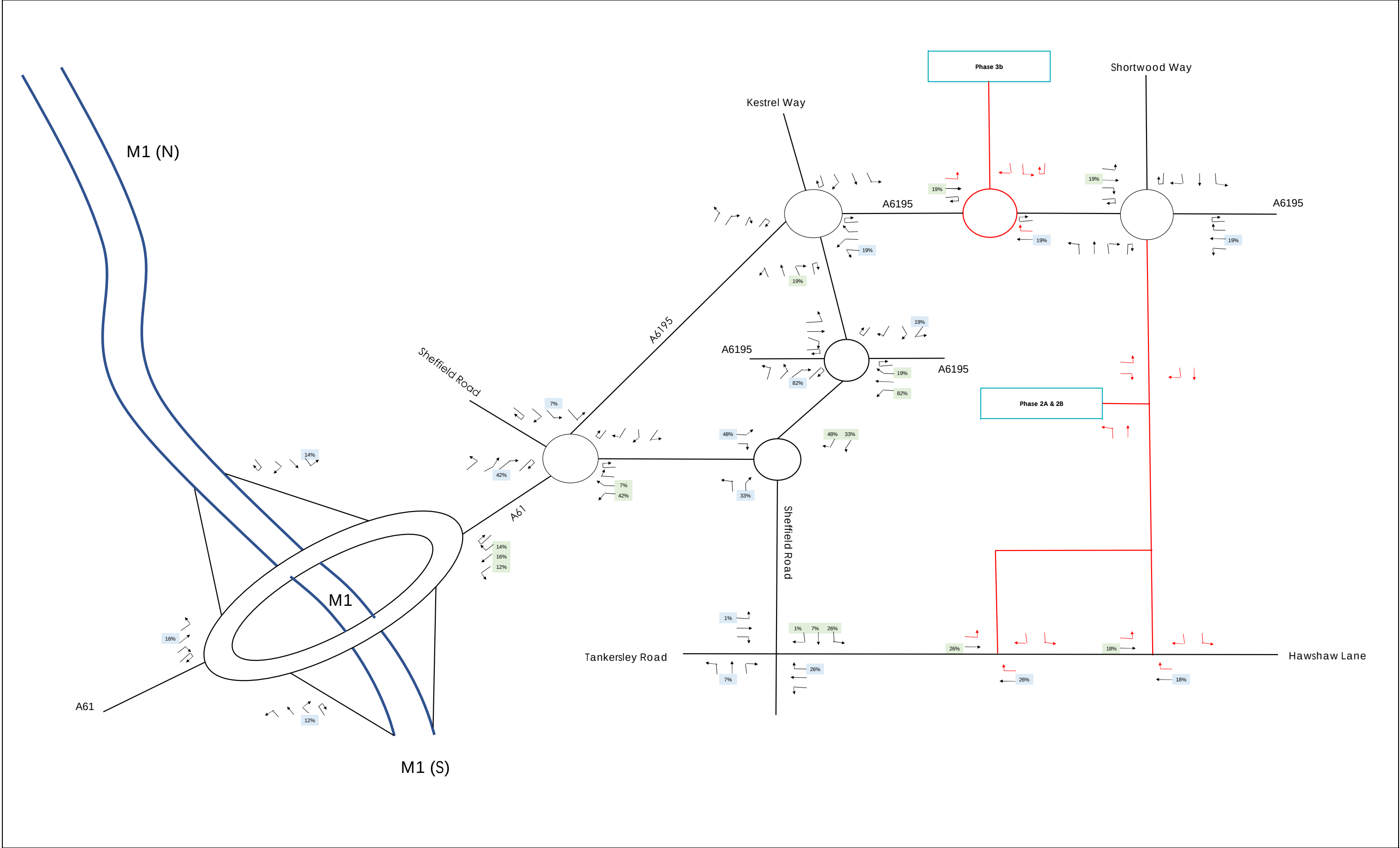


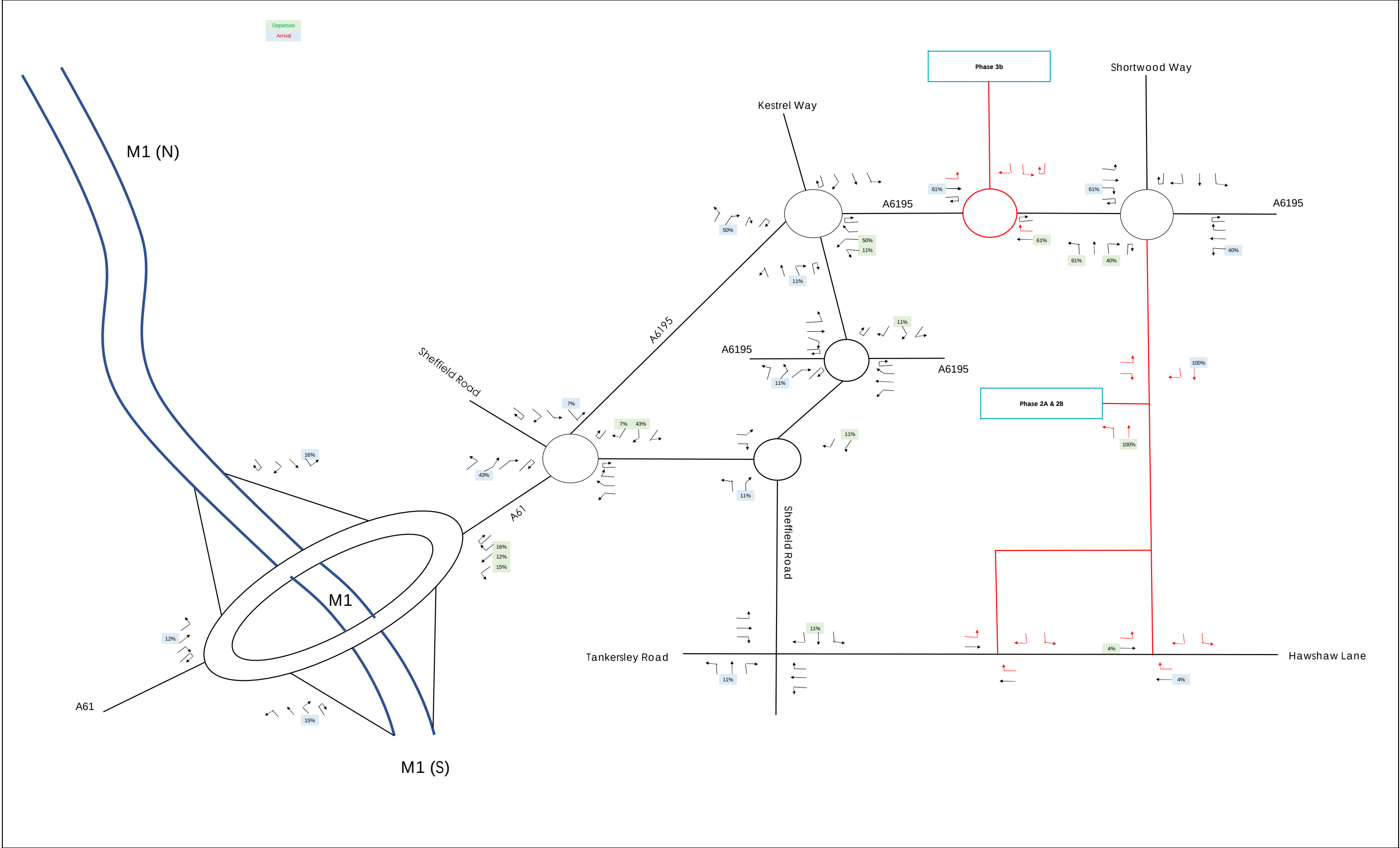


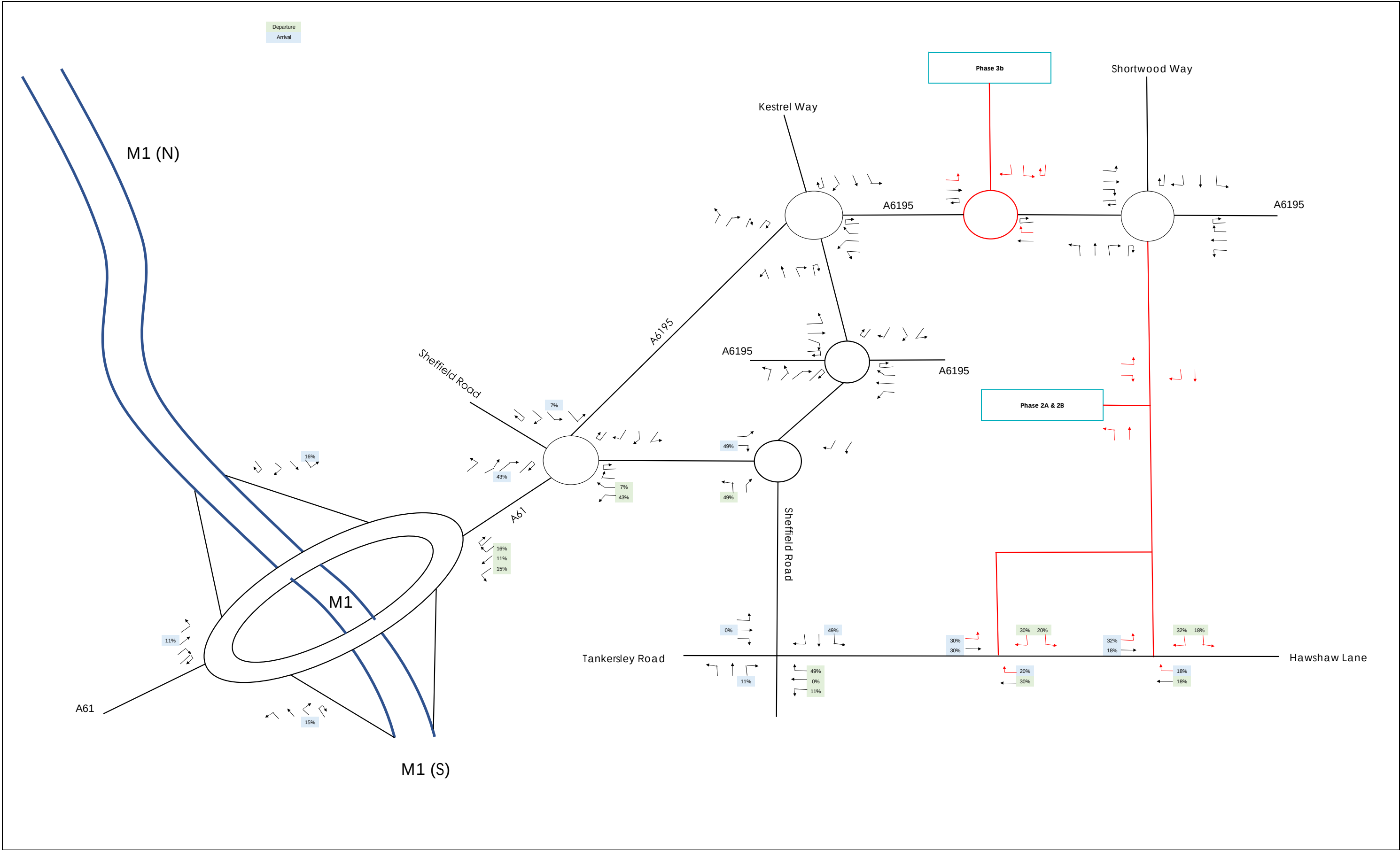


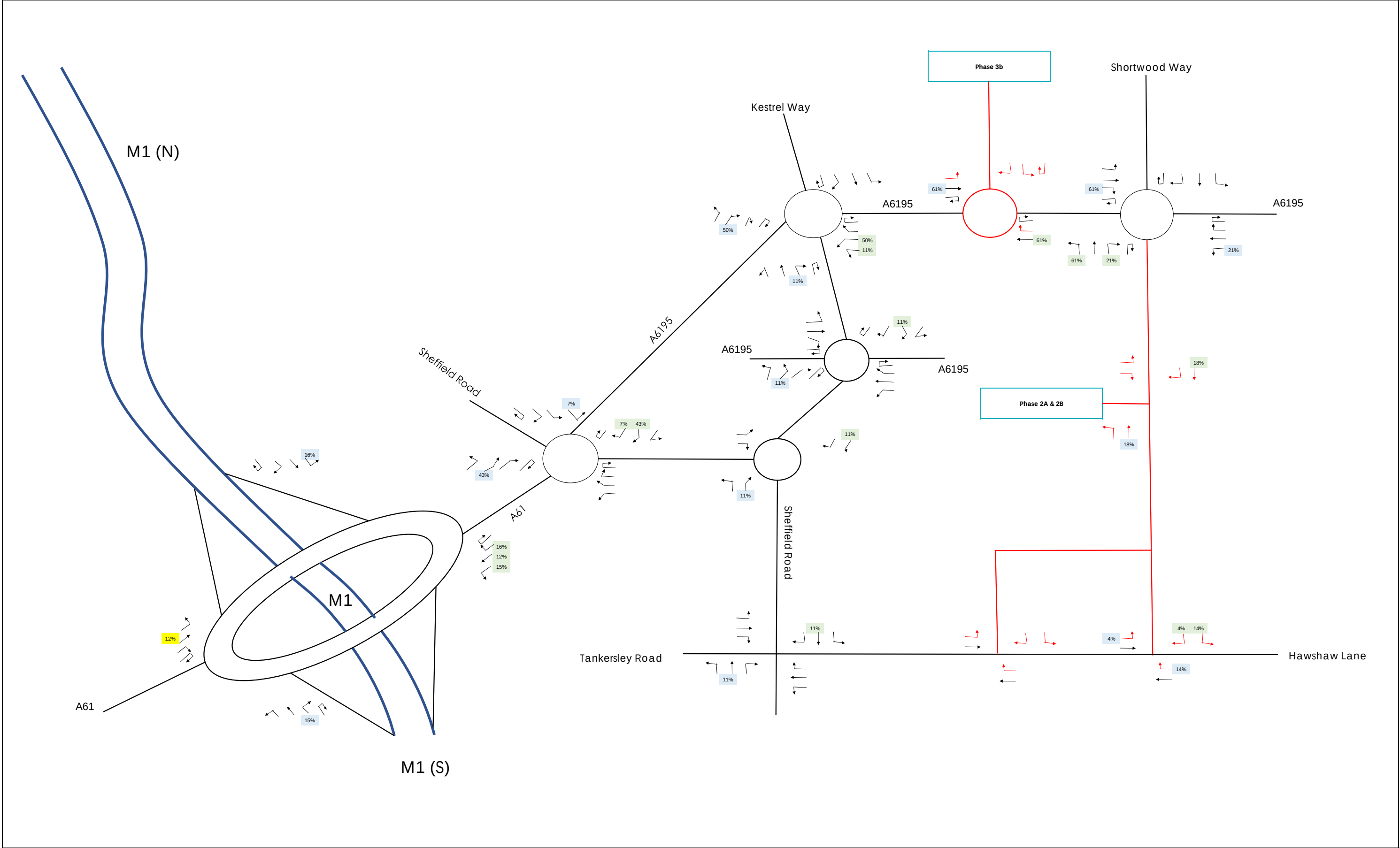


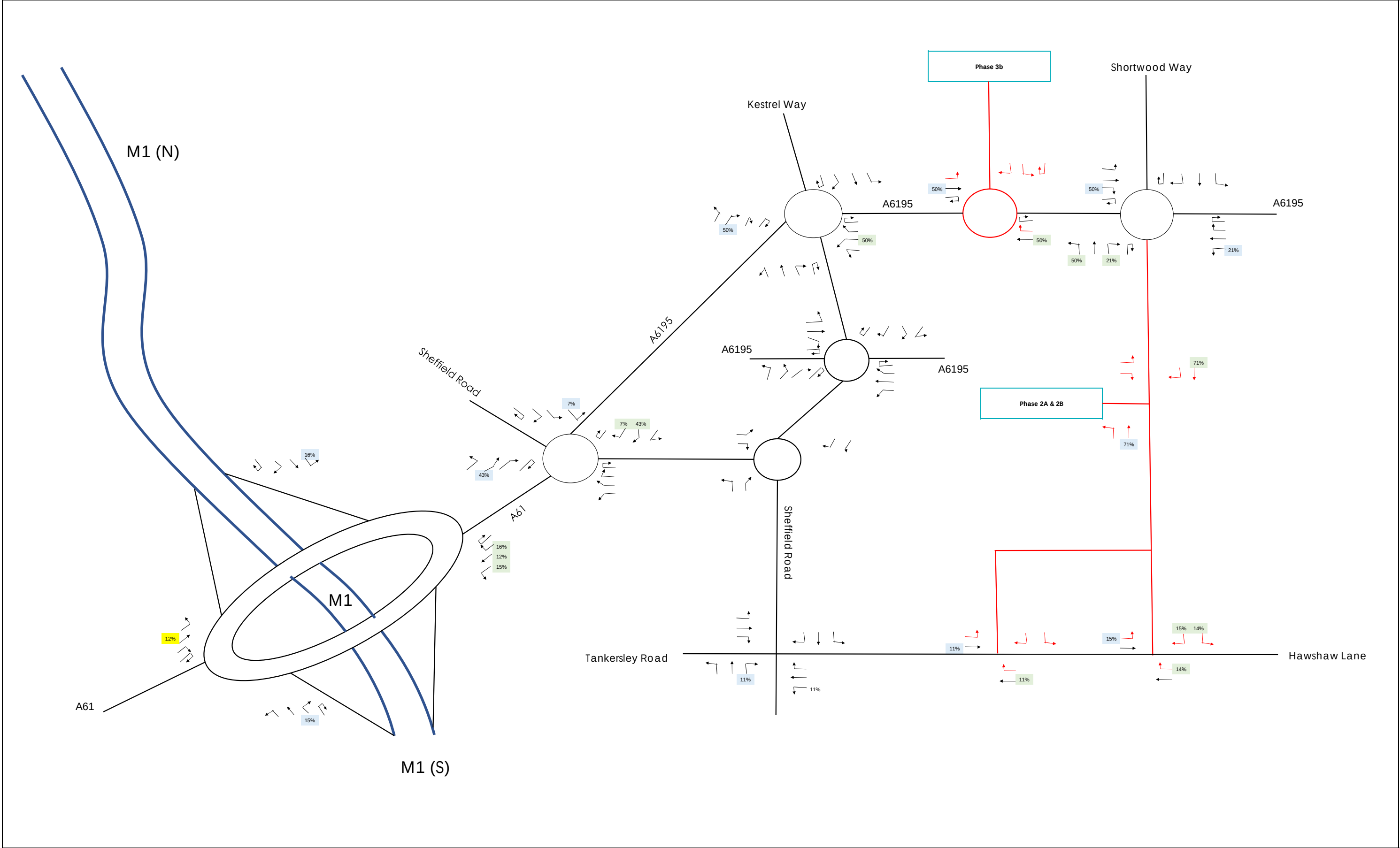


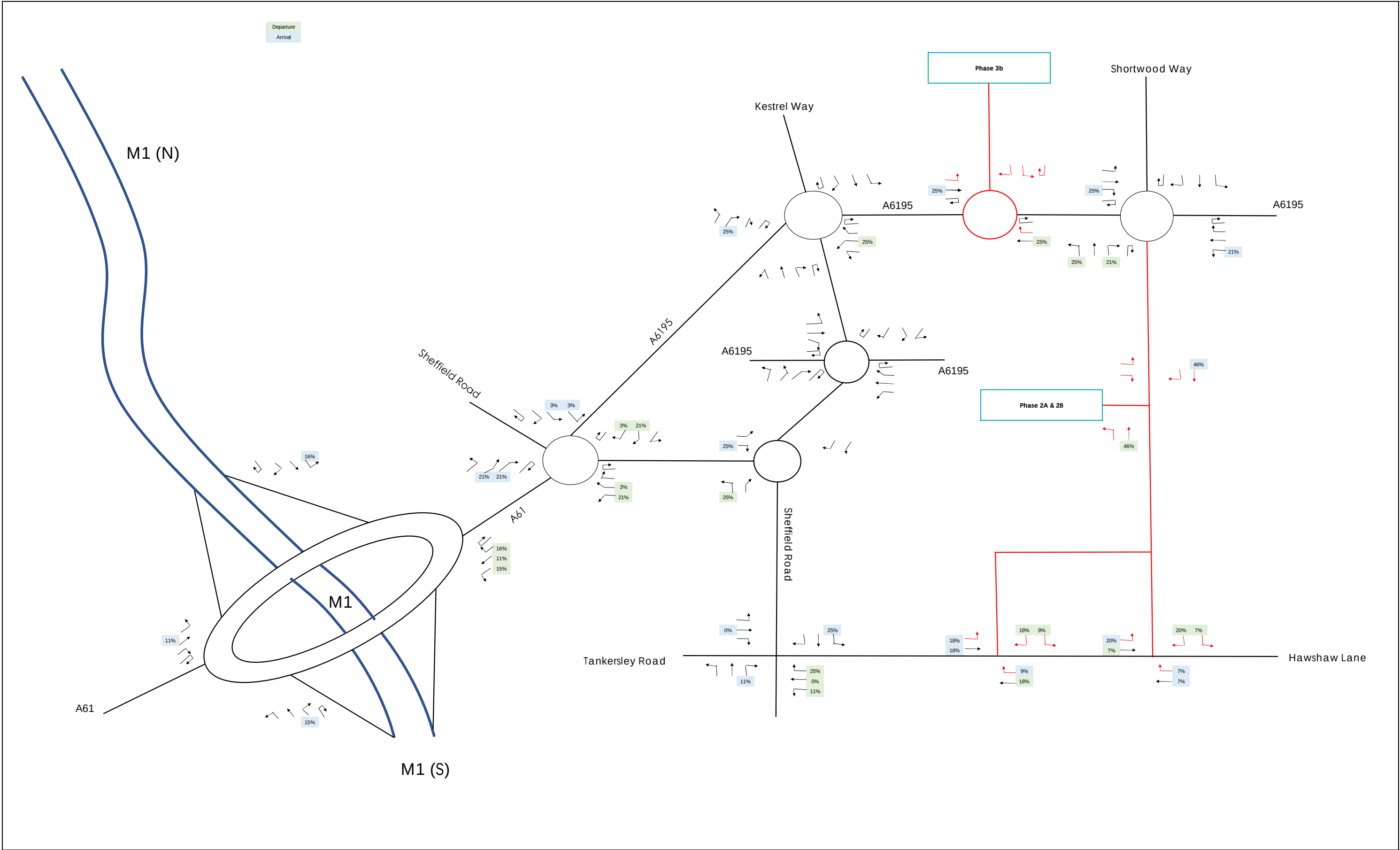




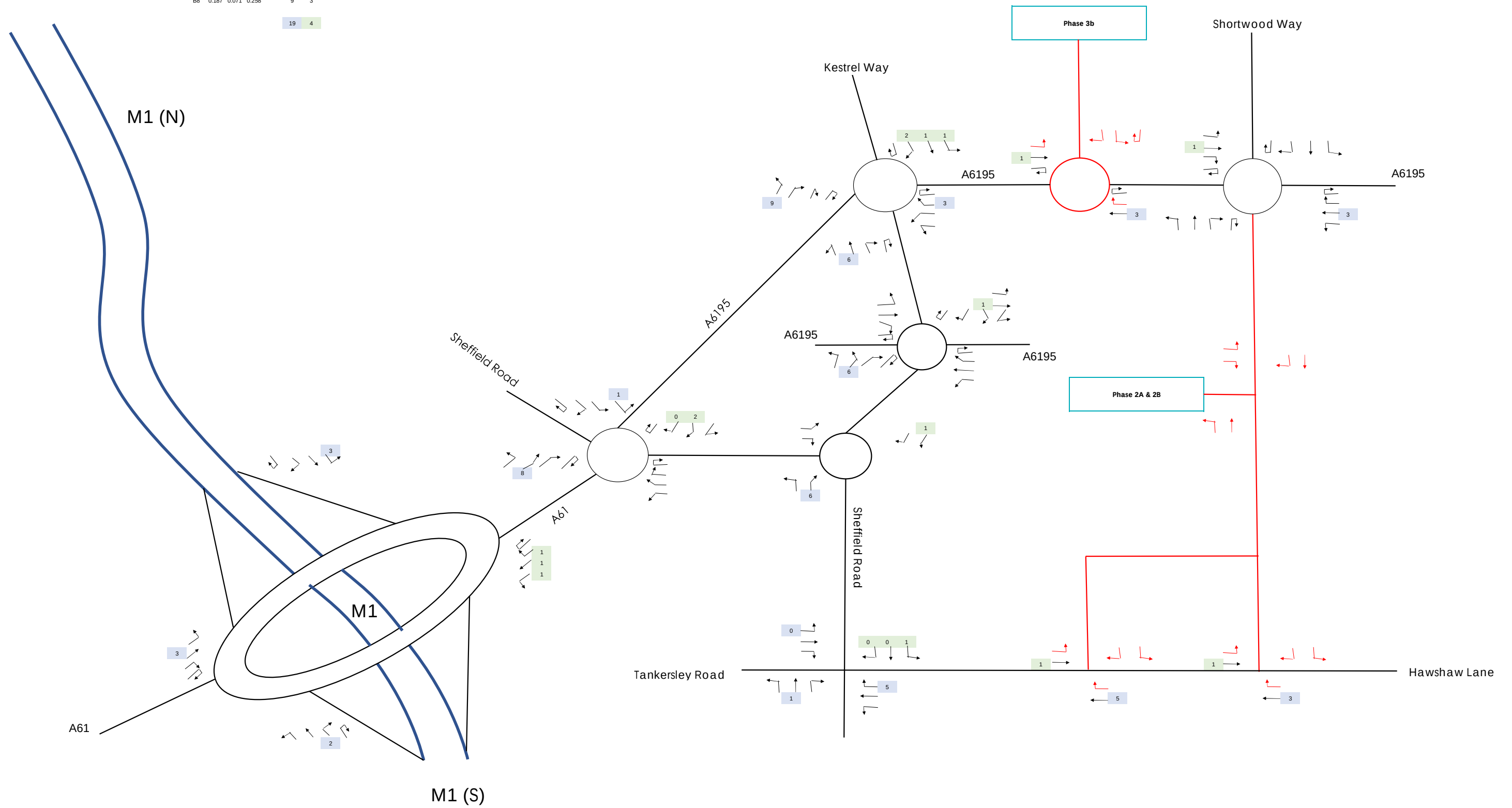




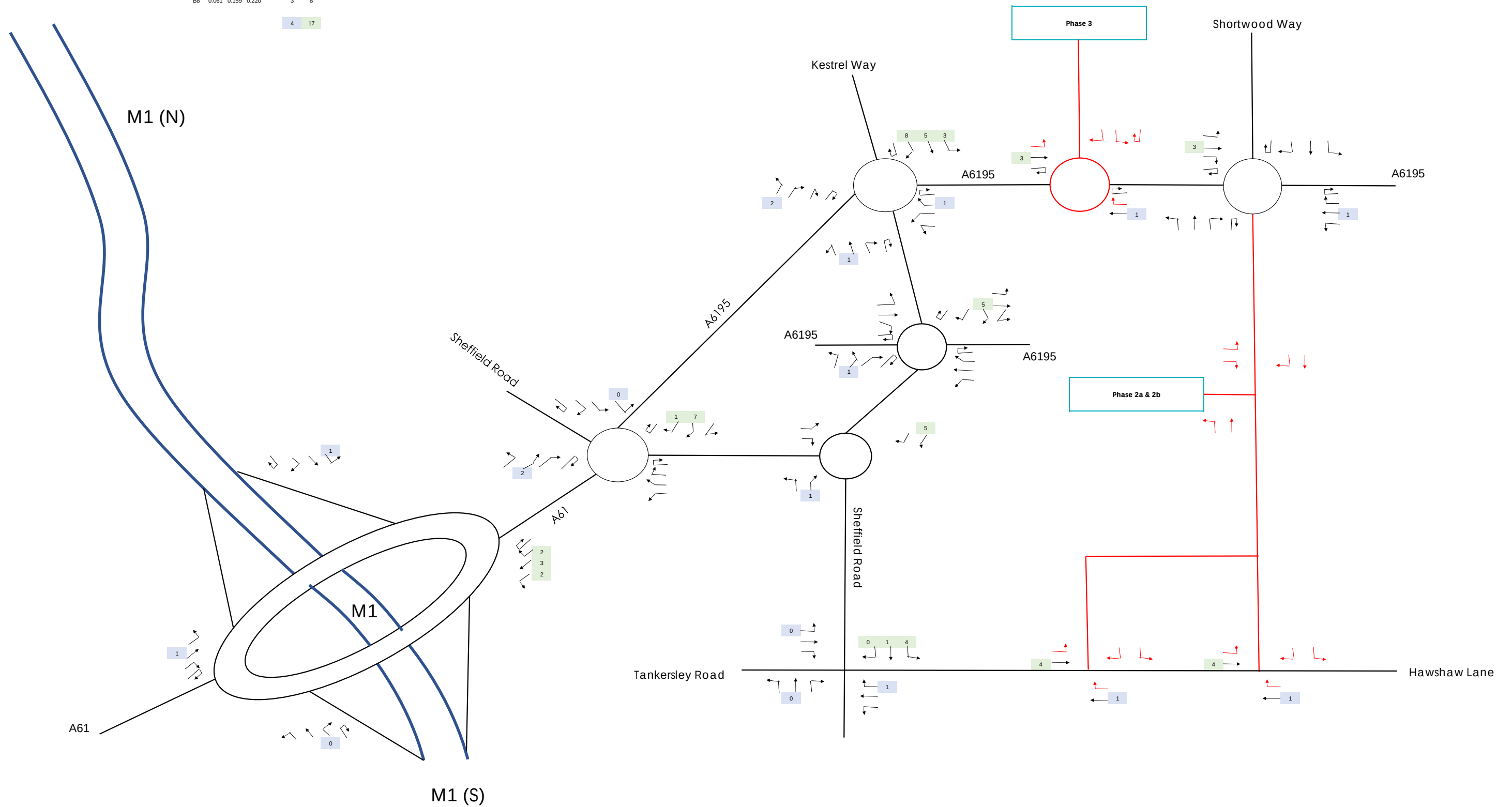




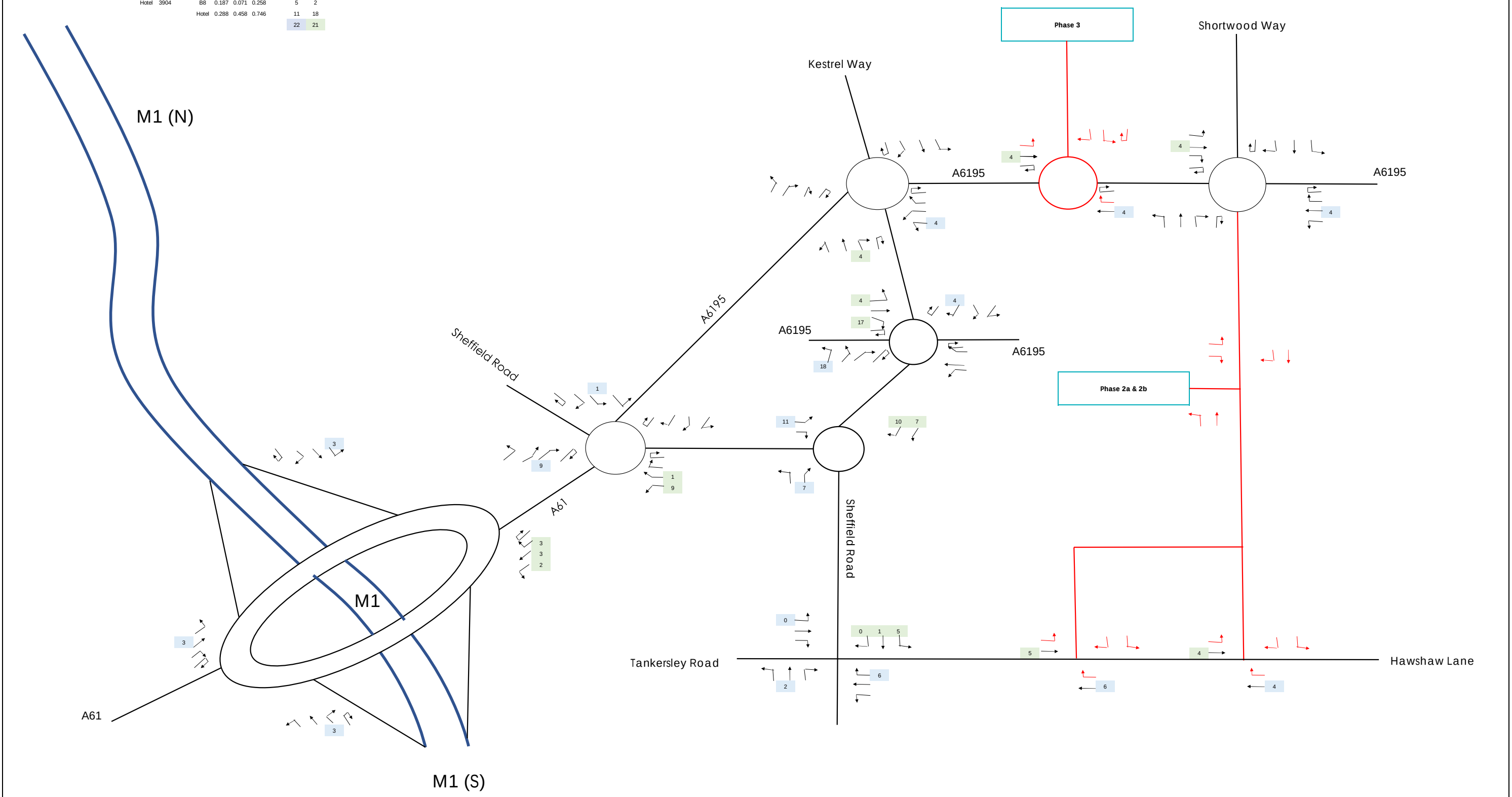
Land Use		AM Growth Rates			Trip Rates	
	SQM	Arr	Dep	Total	Arr	Dep
B1	836					
B8	4734	1.164	0.126	1.290	10	1
		0.187	0.071	0.258	9	3
					19	4



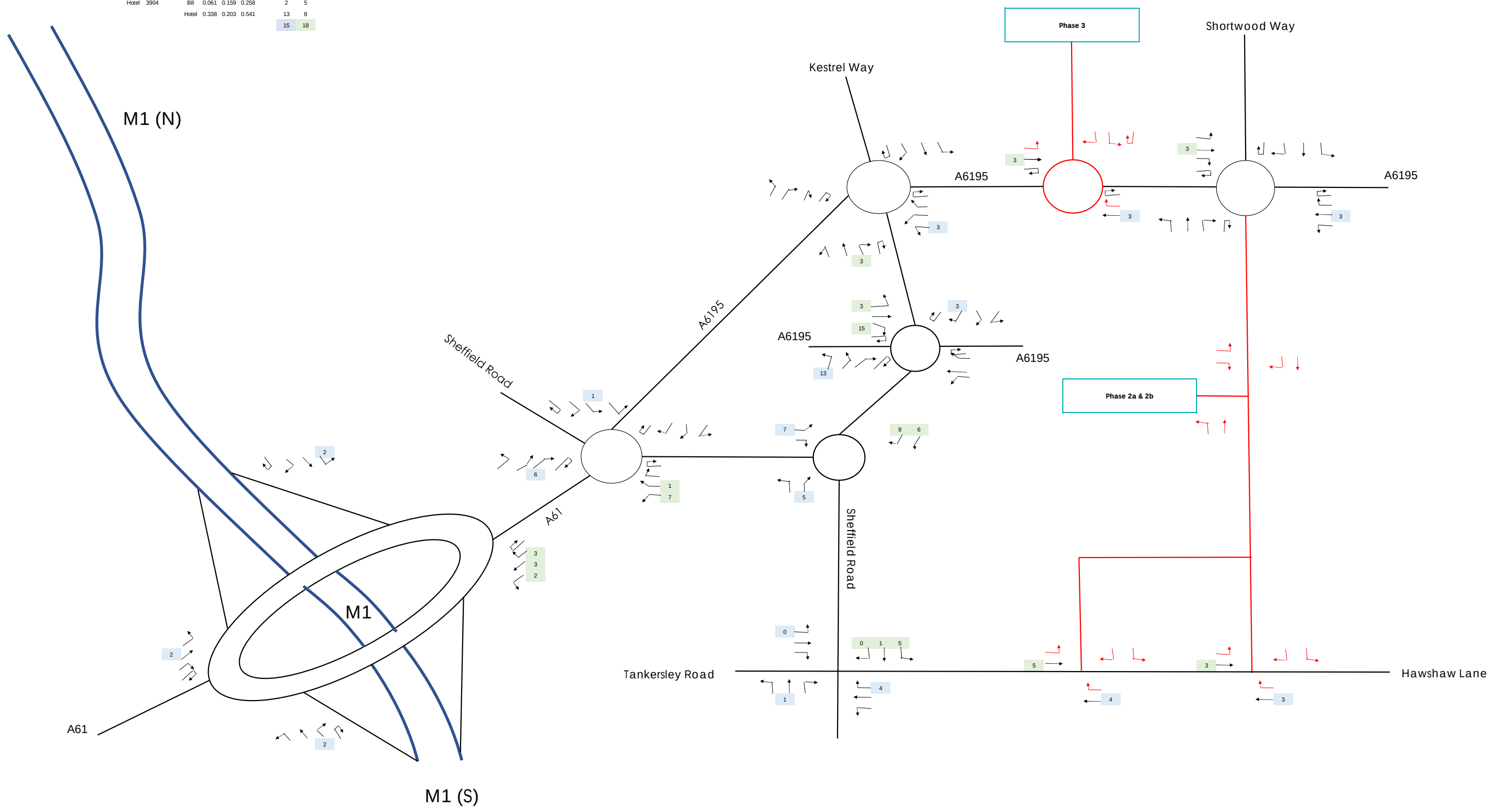
Land Use		PM Growth Rates			Trip Rates	
	SQM	Arr	Dep	Total	Arr	Dep
B1	836				1	9
B8	4734	0.099	1.075	1.174	3	8
		0.061	0.159	0.220		
					4	17



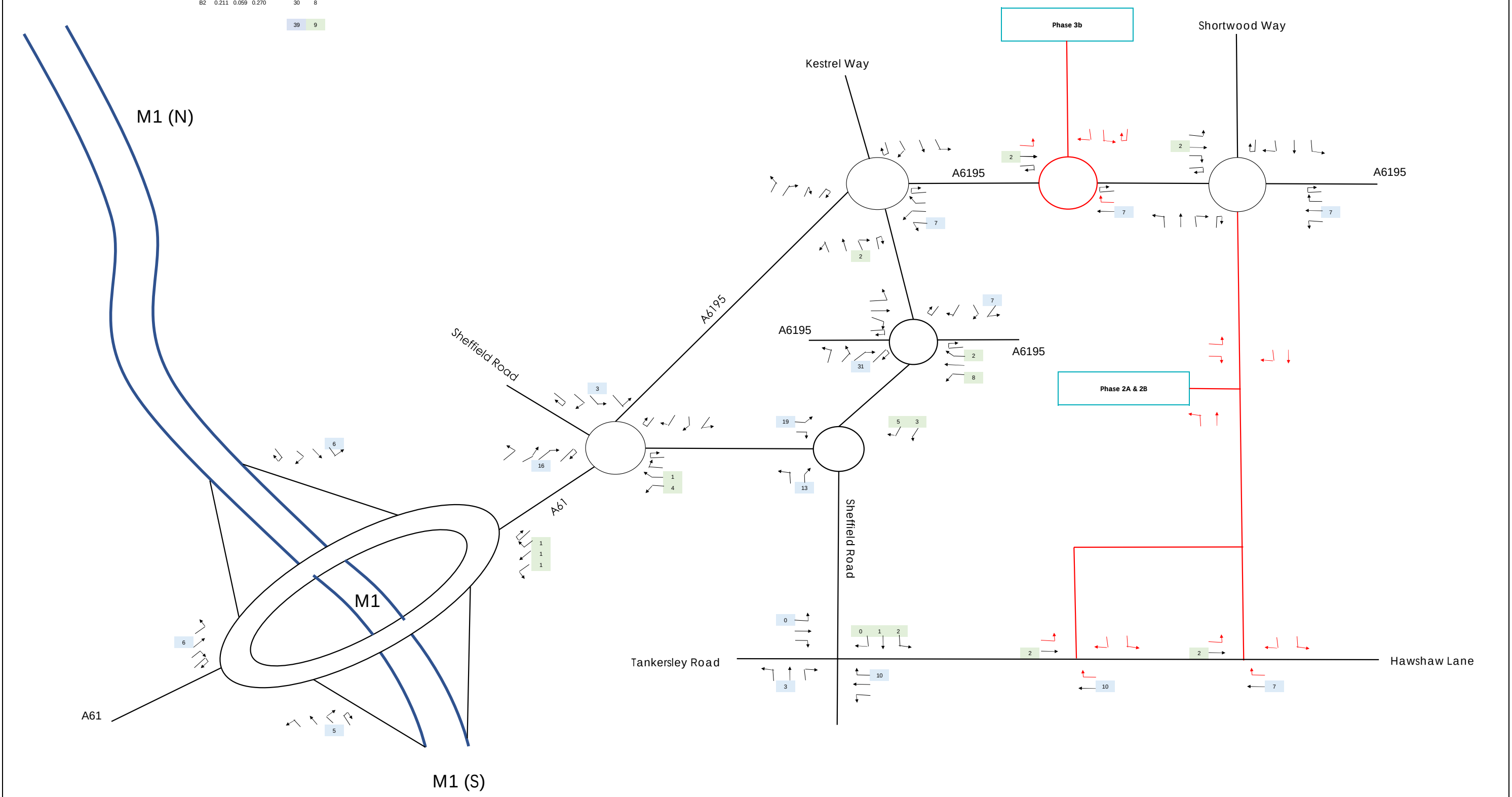
Land Use		AM Growth Rates			Trip Rates		
B1	501	Arr	Dep	Total	Arr	Dep	
B8	2843	B1	1.164	0.126	1.290	6	1
Hotel	3904	B8	0.187	0.071	0.258	5	2
		Hotel	0.288	0.458	0.746	11	18
					22	21	



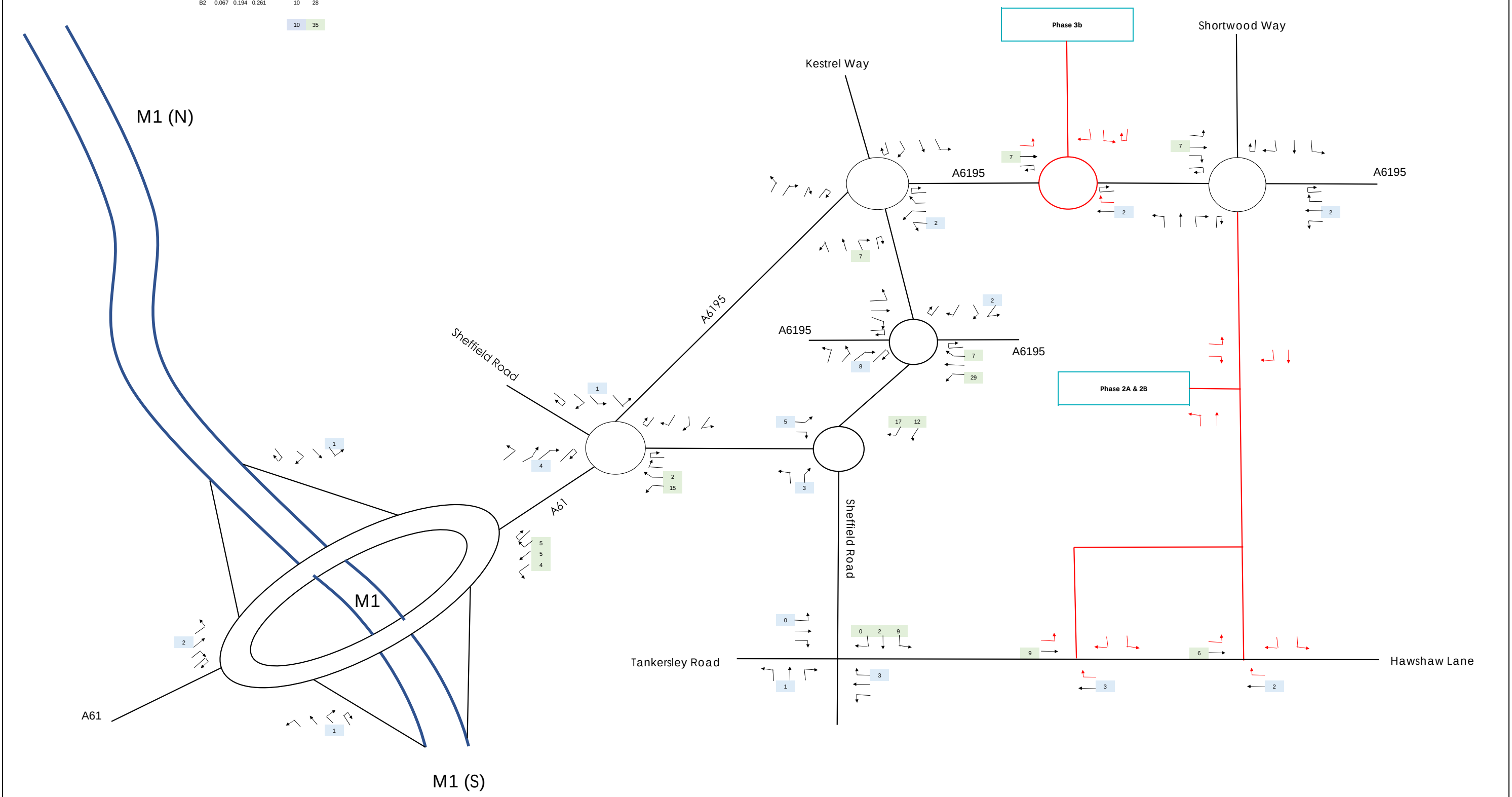
Land Use	SQM	PM Growth Rates			Trip Rates	
		Arr	Dep	Total	Arr	Dep
B1	501				0	5
B8	2843	B1	0.099	1.075	1.174	
		B8	0.061	0.159	0.258	
Hotel	3904				2	5
		Hotel	0.338	0.203	0.541	
					13	8
					15	18



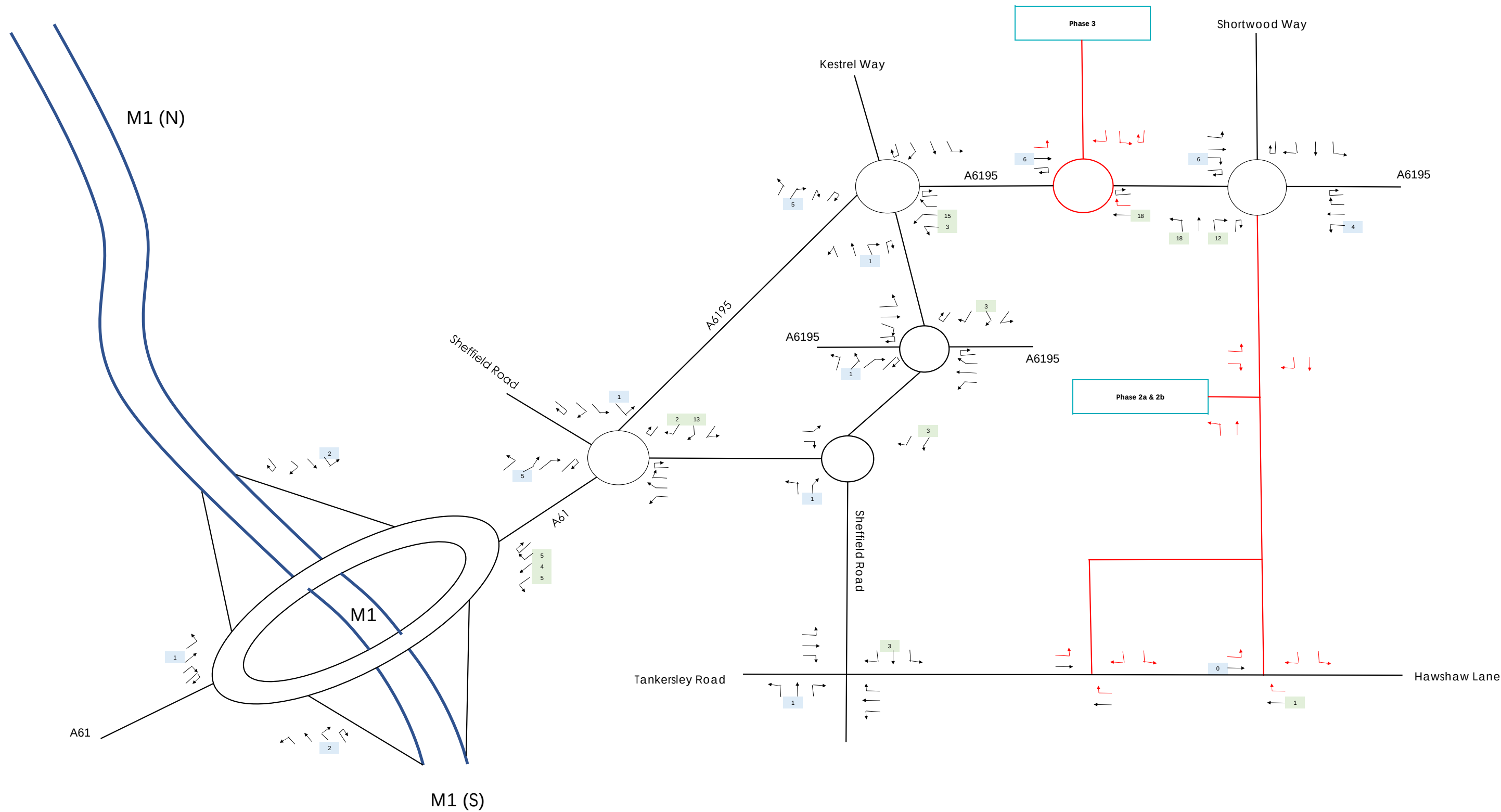
Land Use	SQM	AM Growth Rates			Trip Rates	
		Arr	Dep	Total	Arr	Dep
B1	700				8	1
B2	14400	B1 1.164	0.126	1.290	30	8
		B2 0.211	0.059	0.270		
					39	9



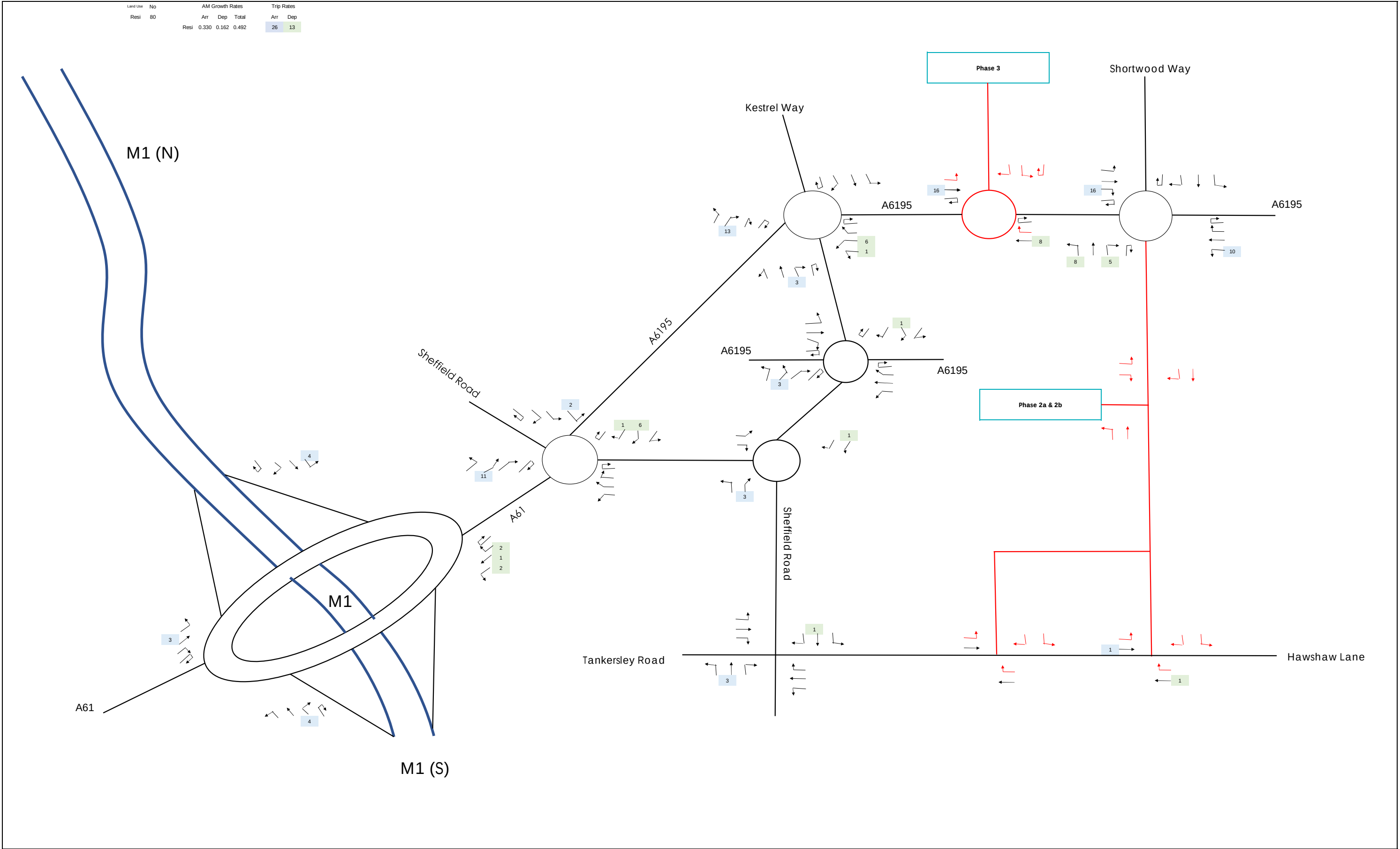
Land Use	SQM	PM Growth Rates			Trip Rates	
		Arr	Dep	Total	Arr	Dep
B1	700				1	8
B2	14400	0.099	1.075	1.174	10	28
B2		0.067	0.194	0.261		
					10	35



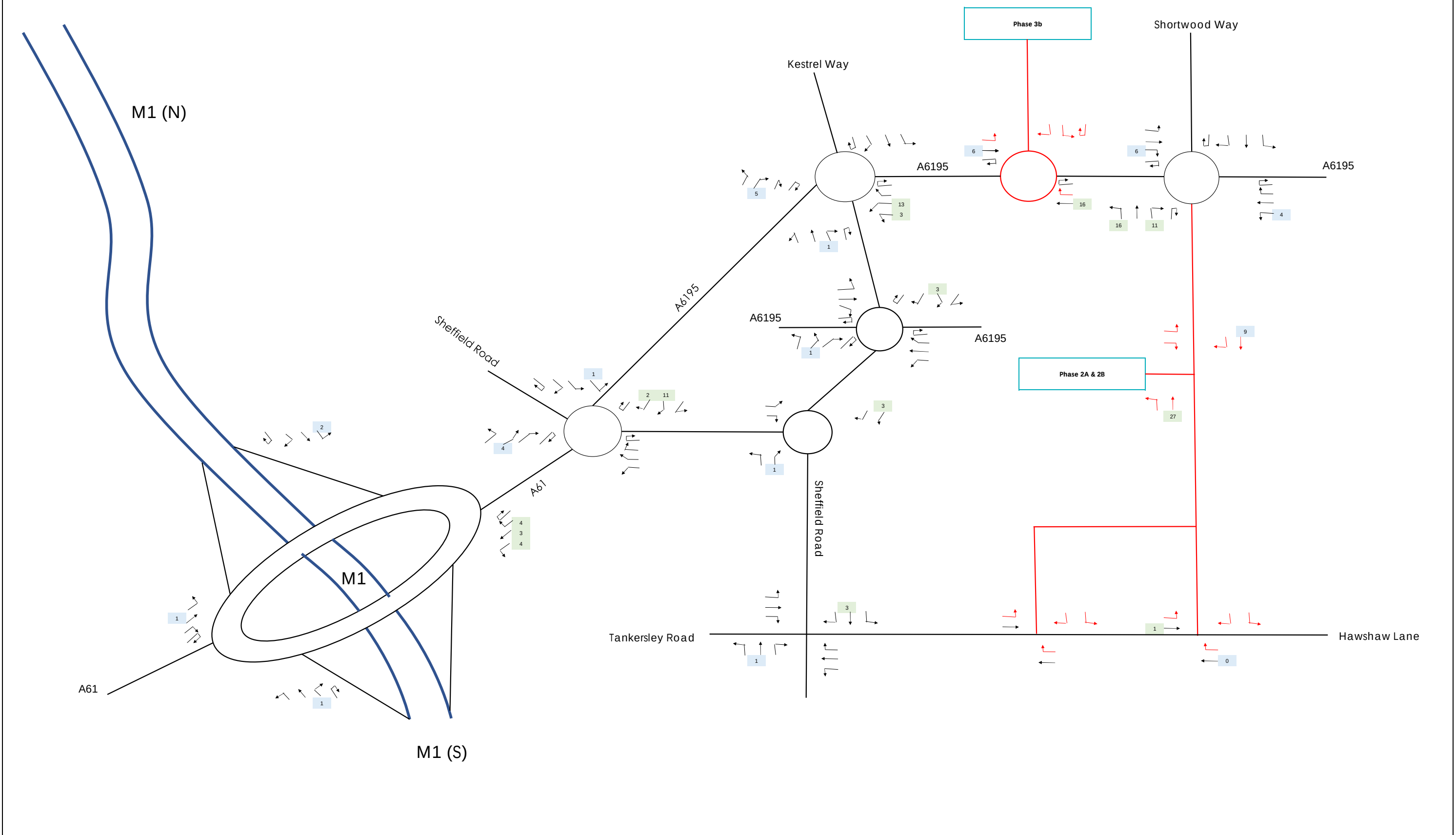
Land Use	No	AM Growth Rates			Trip Rates	
		Arr	Dep	Total	Arr	Dep
Resi	80				11	30
Resi		0.134	0.381	0.515		



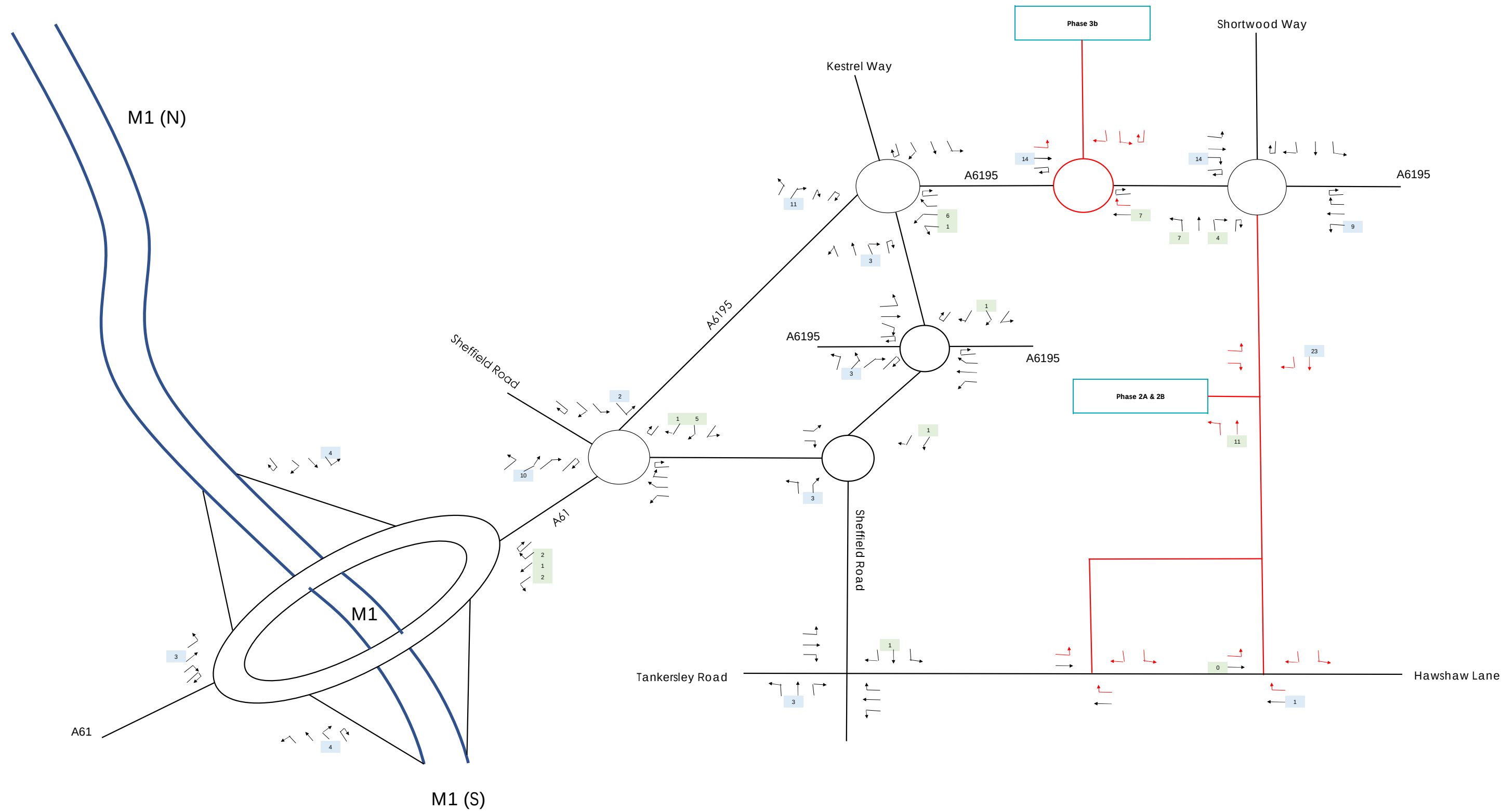
Land Use	No	AM Growth Rates			Trip Rates	
		Arr	Dep	Total	Arr	Dep
Resi	80				26	13
Resi		0.330	0.162	0.492		



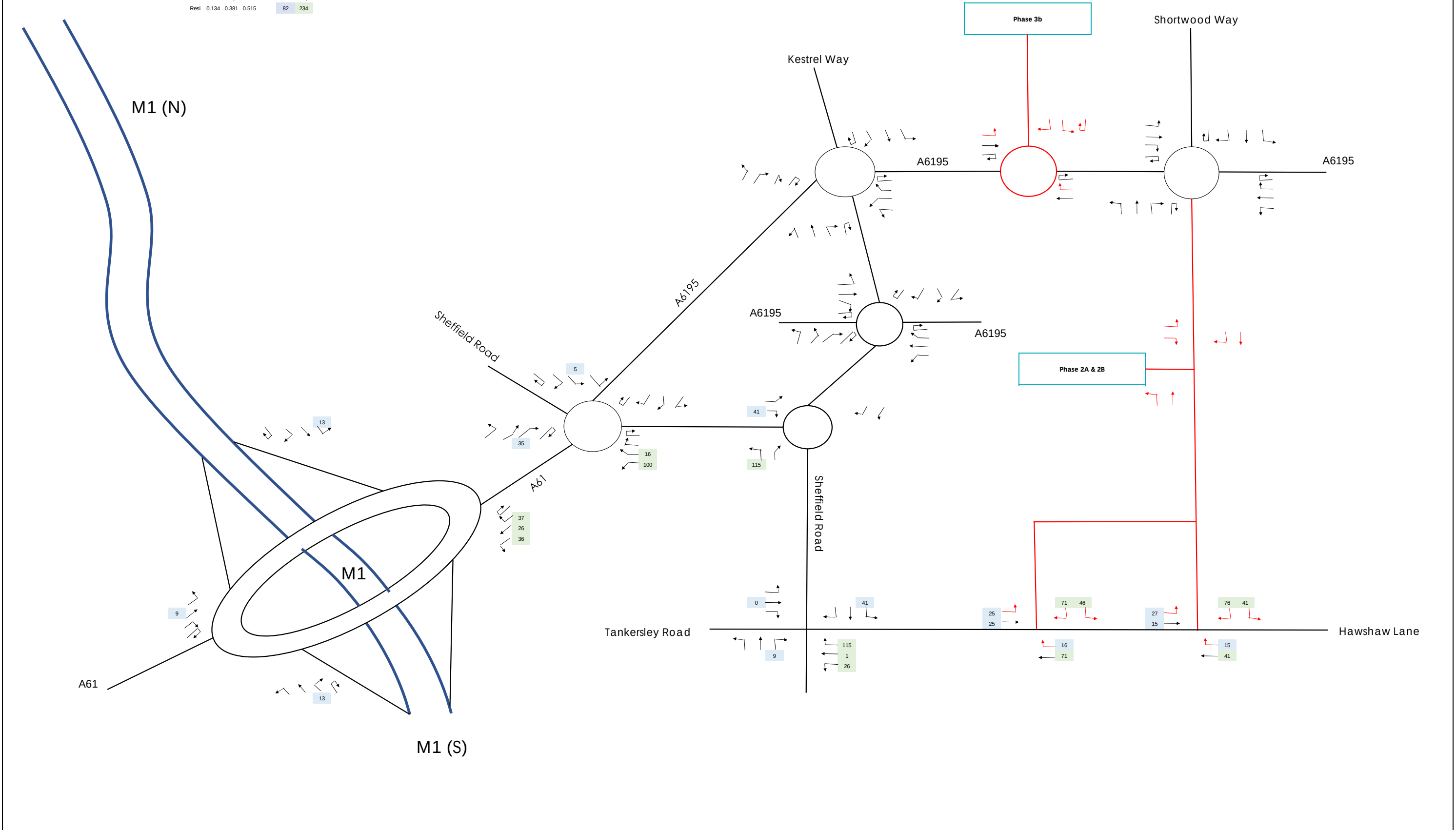
Land Use	No	AM Growth Rates			Trip Rates	
		Arr	Dep	Total	Arr	Dep
Resi	70	0.134	0.381	0.515	9	27



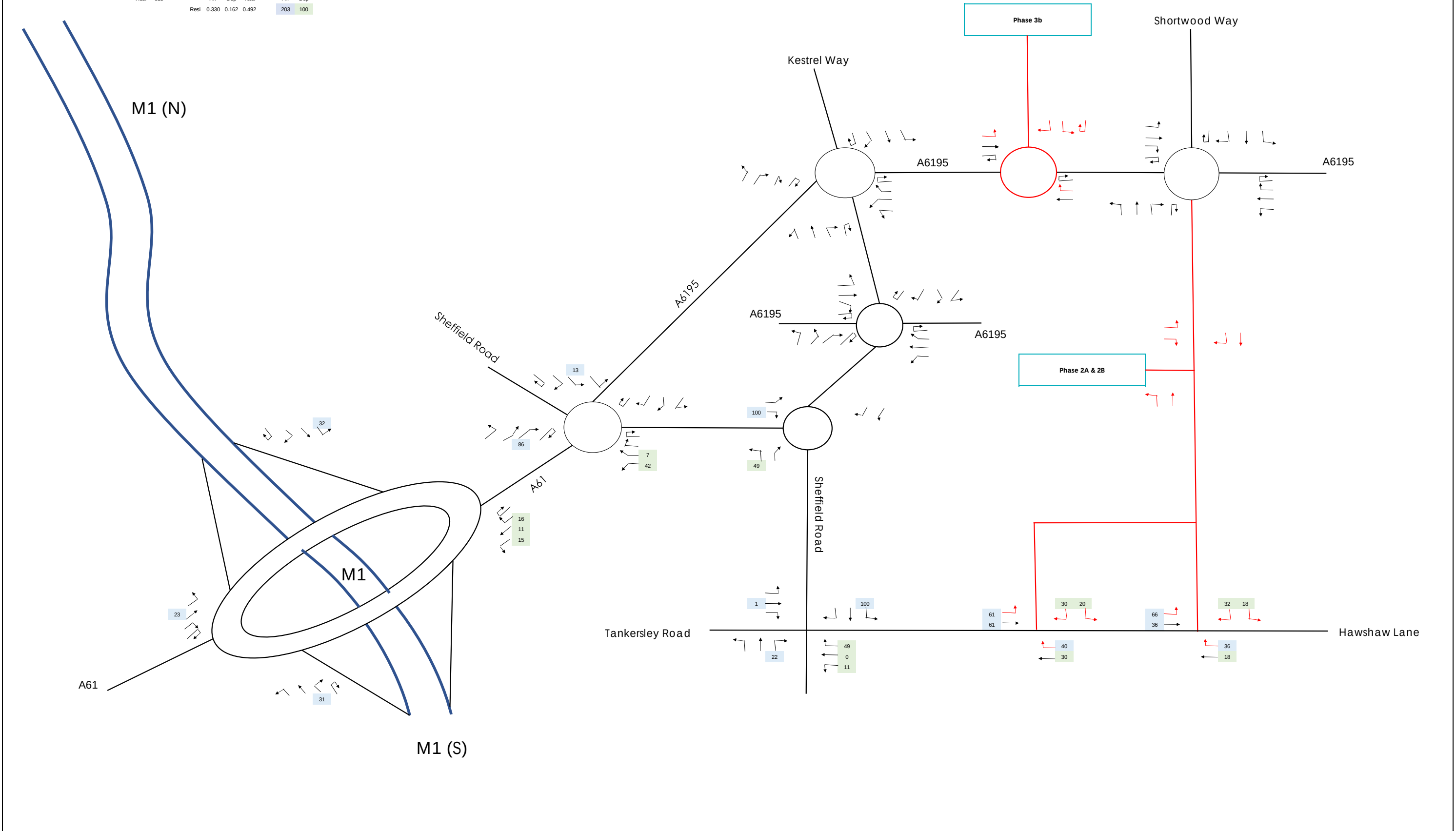
Land Use	No	PM Growth Rates			Trip Rates		
Resi	70	Arr	Dep	Total	Arr	Dep	
		Resi	0.330	0.162	0.492	23	11



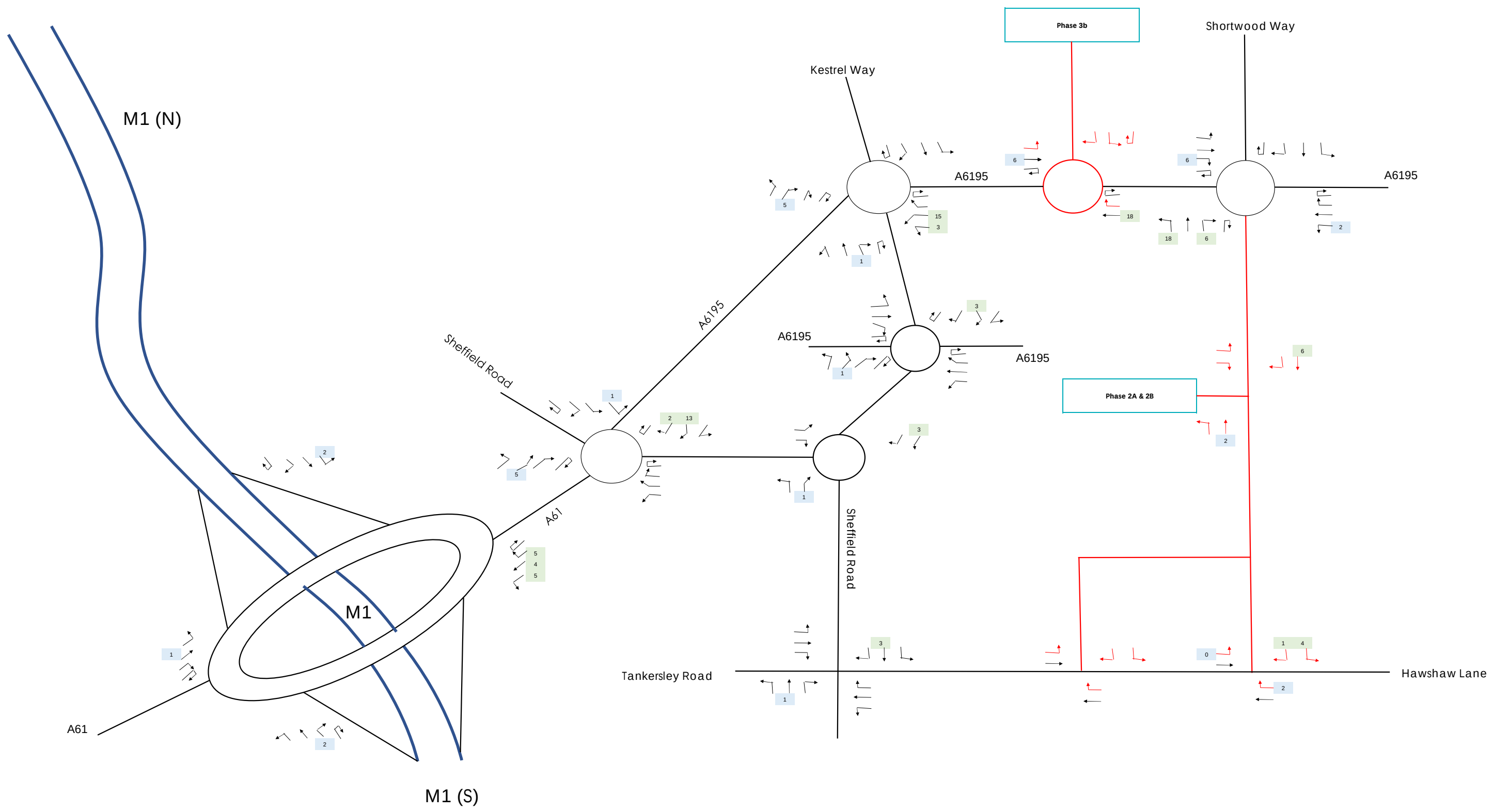
Land Use	No	AM Growth Rates			Trip Rates		
Resi	615	Arr	Dep	Total	Arr	Dep	
		Resi	0.134	0.381	0.515	82	234



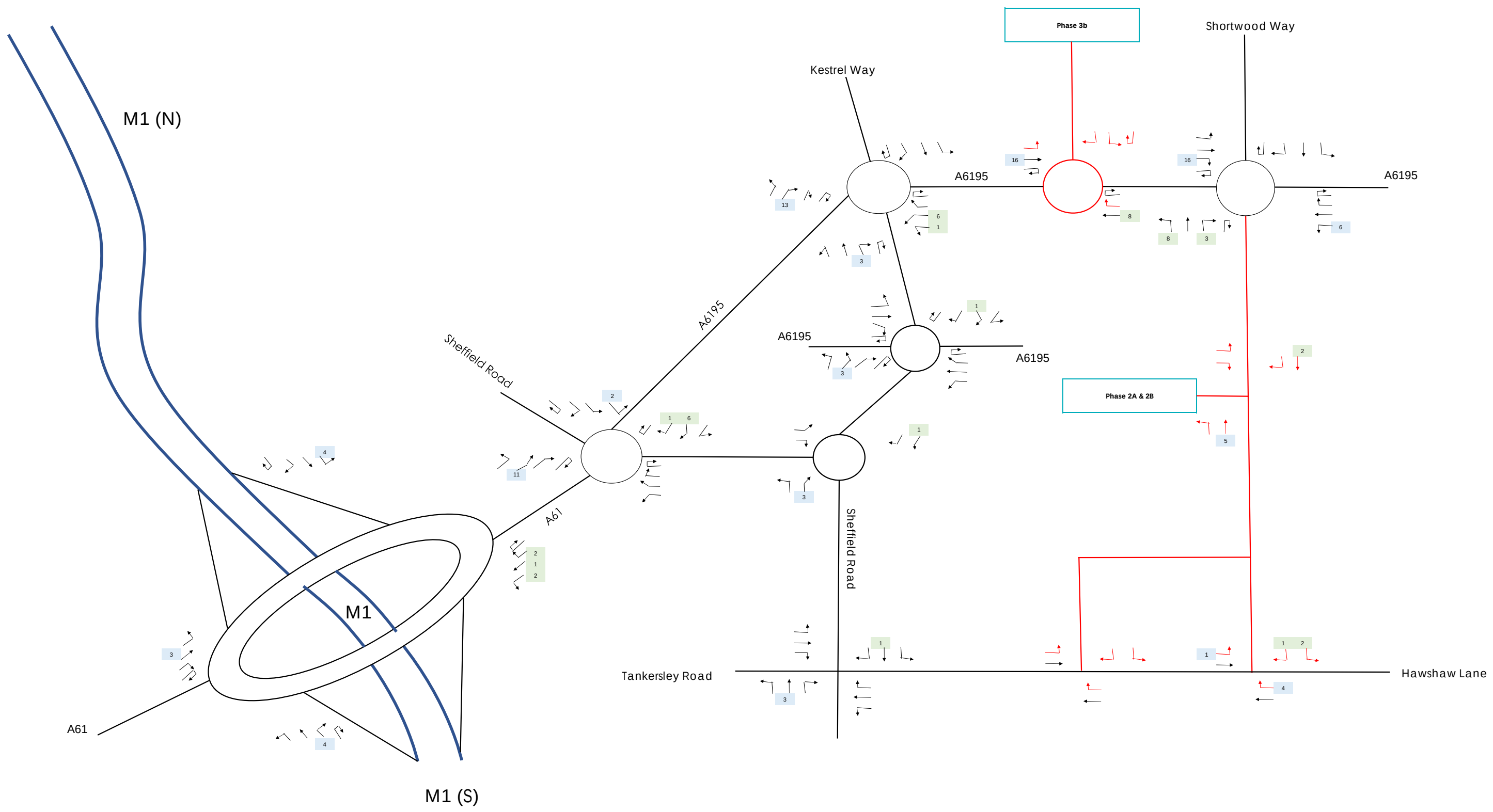
Land Use	No	PM Growth Rates			Trip Rates		
Resi	615	Arr	Dep	Total	Arr	Dep	
		Resi	0.330	0.162	0.492	203	100



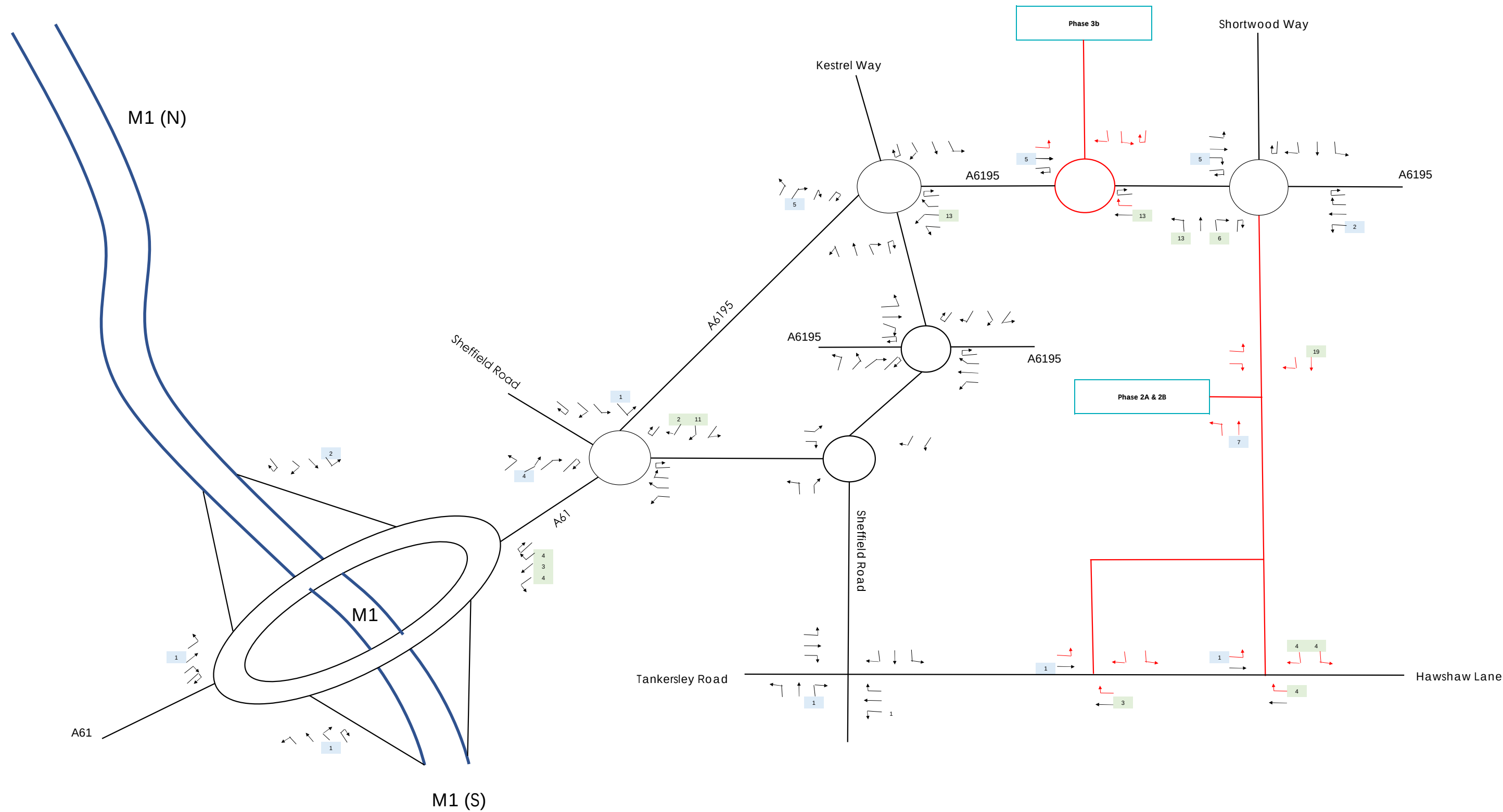
Land Use	No	AM Growth Rates			Trip Rates	
		Arr	Dep	Total	Arr	Dep
Resi	80				11	30
		Resi	0.134	0.381	0.515	



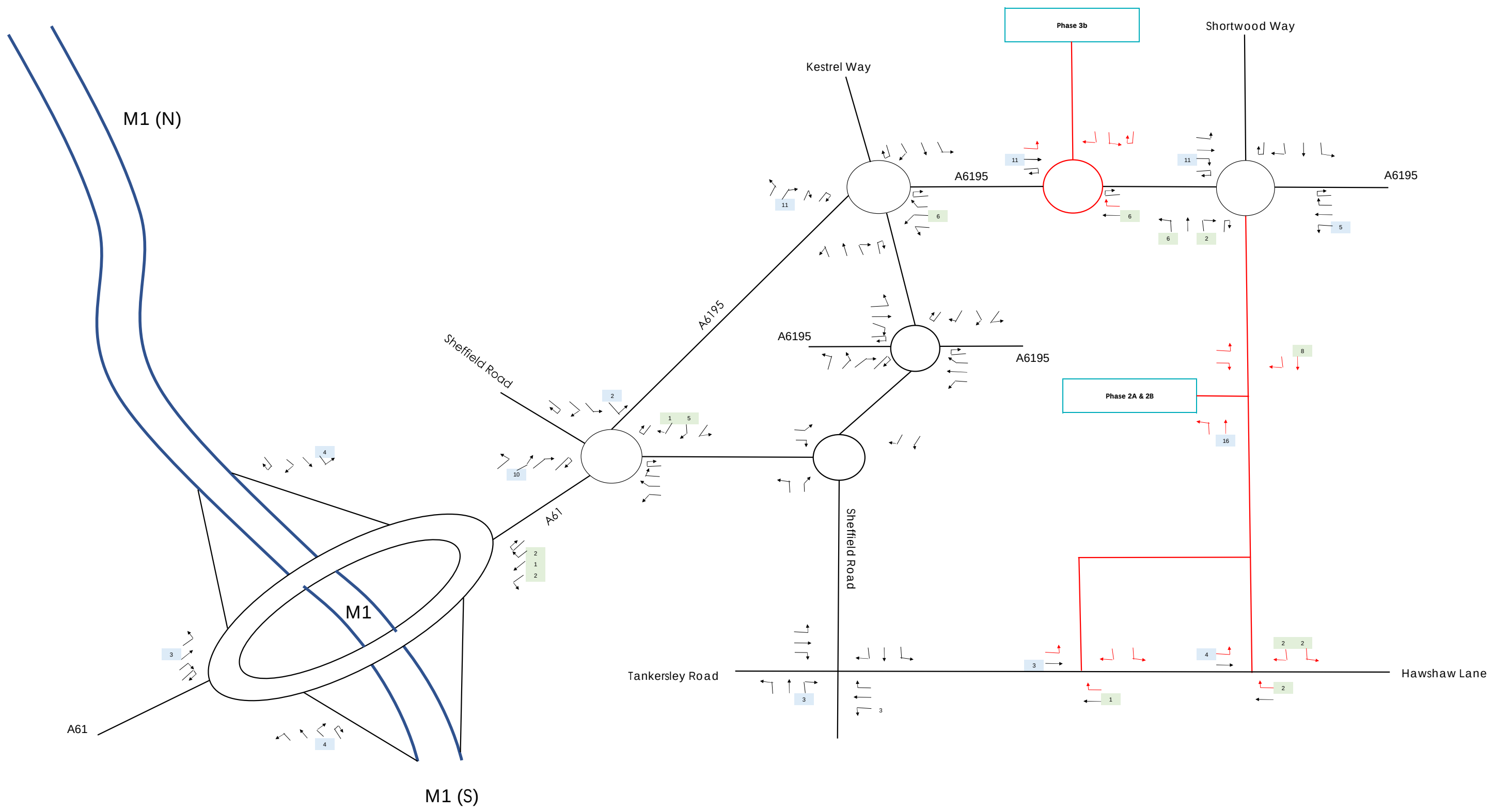
Land Use	No	PM Growth Rates			Trip Rates	
		Arr	Dep	Total	Arr	Dep
Resi	80	0.330	0.162	0.492	26	13



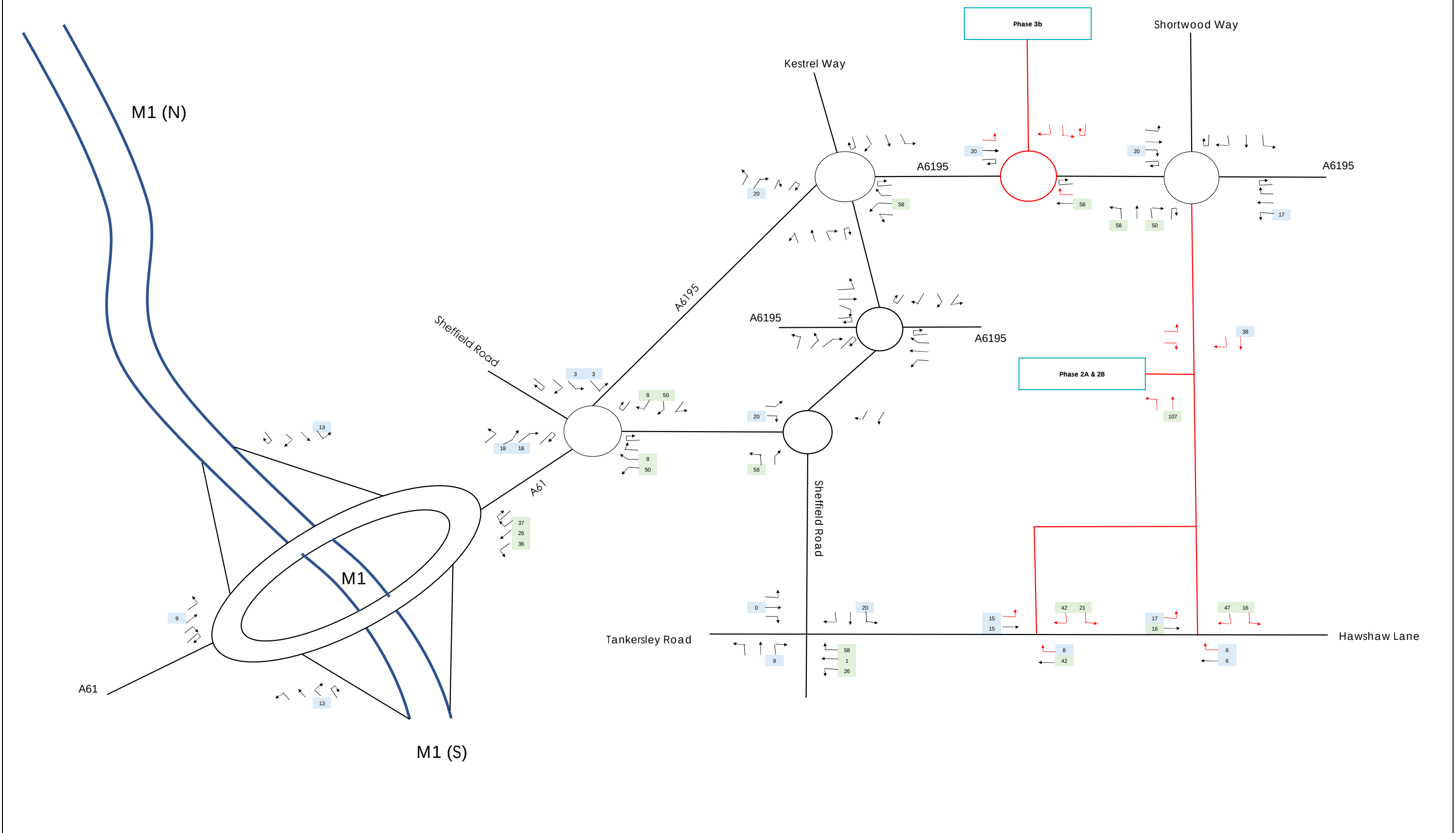
Land Use	No	AM Growth Rates			Trip Rates	
		Arr	Dep	Total	Arr	Dep
Resi	70				9	27
		Resi	0.134	0.381	0.515	



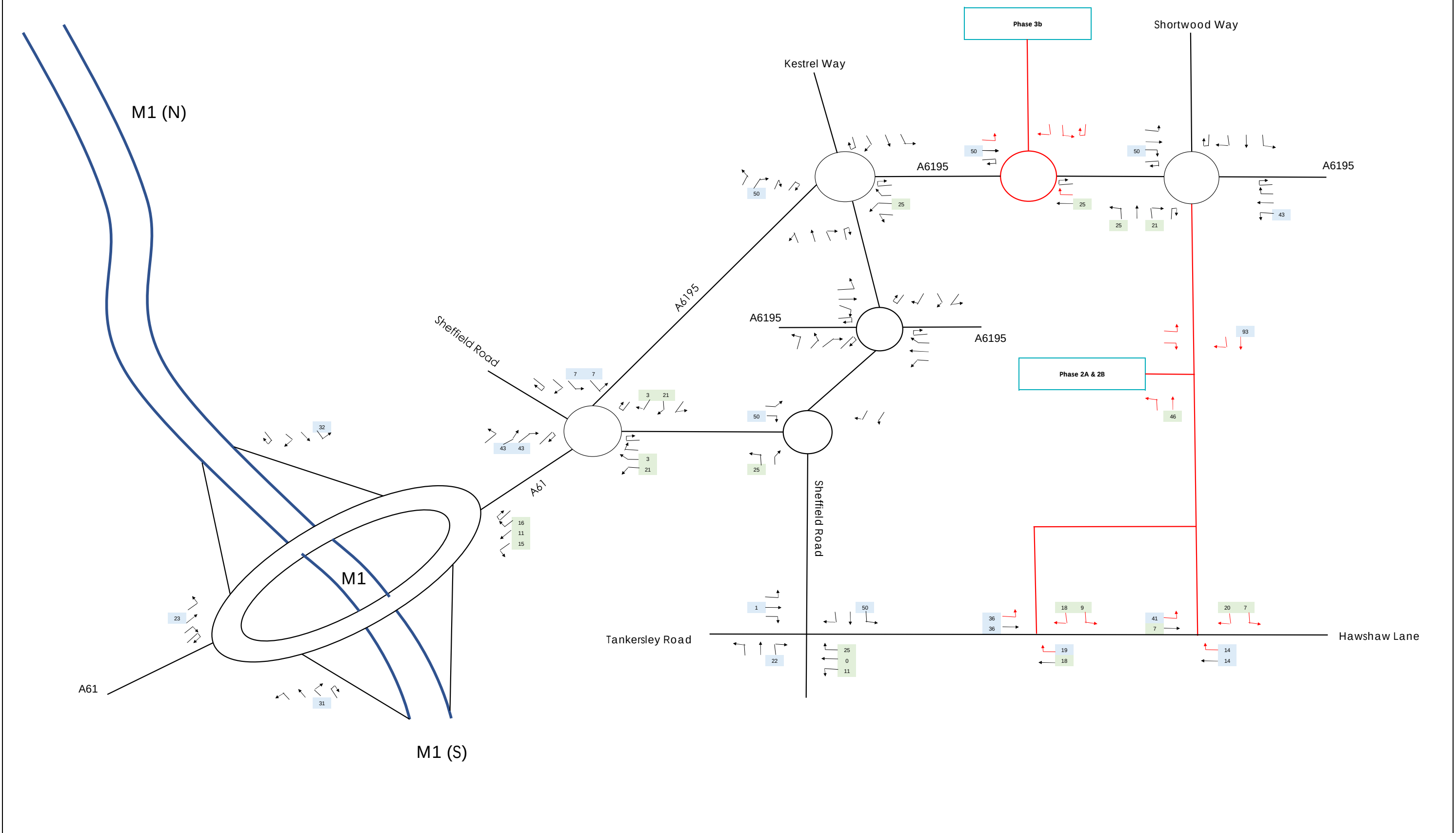
Land Use	No	PM Growth Rates			Trip Rates	
		Arr	Dep	Total	Arr	Dep
Resi	70				23	11
		Resi	0.330	0.162	0.492	

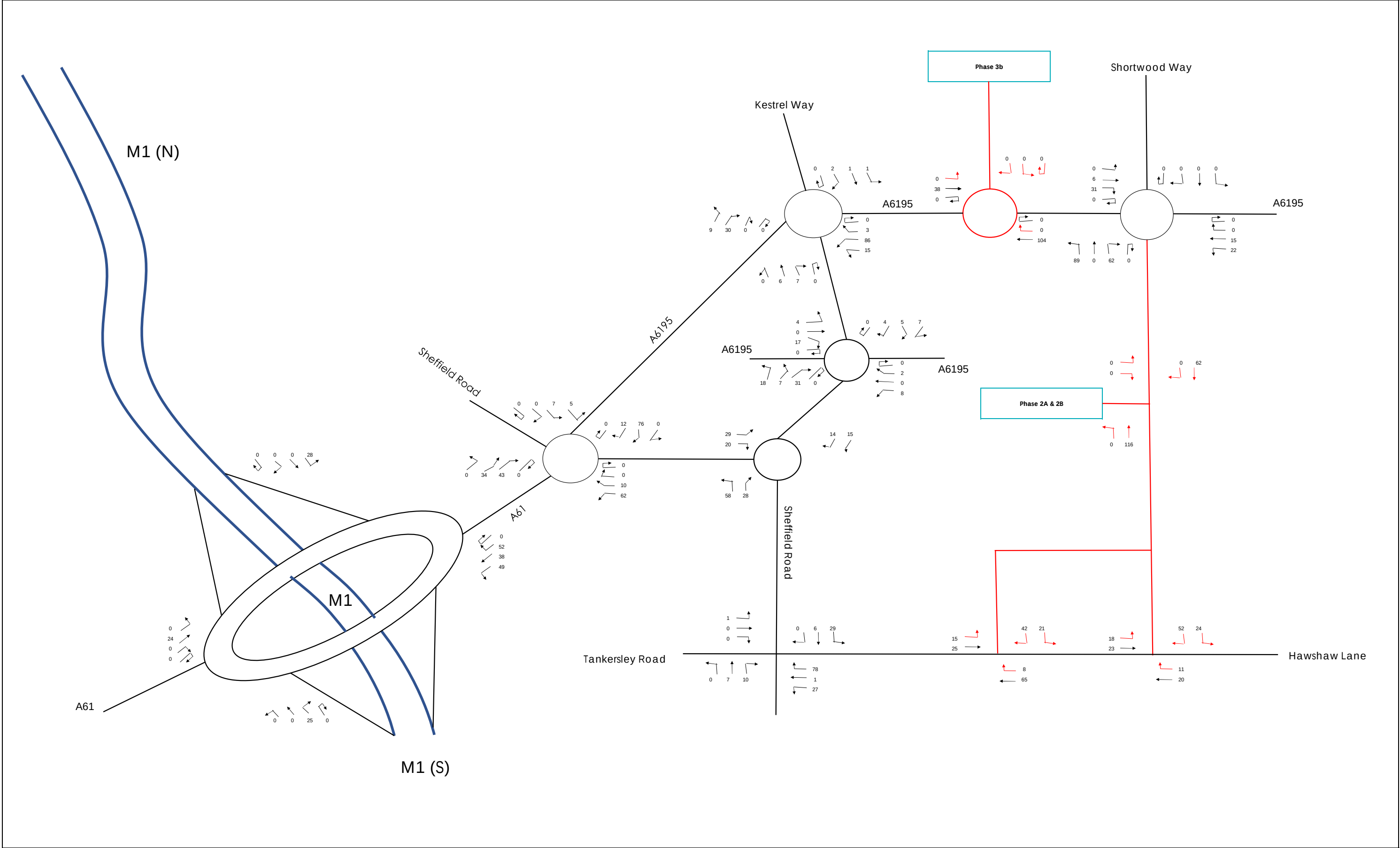


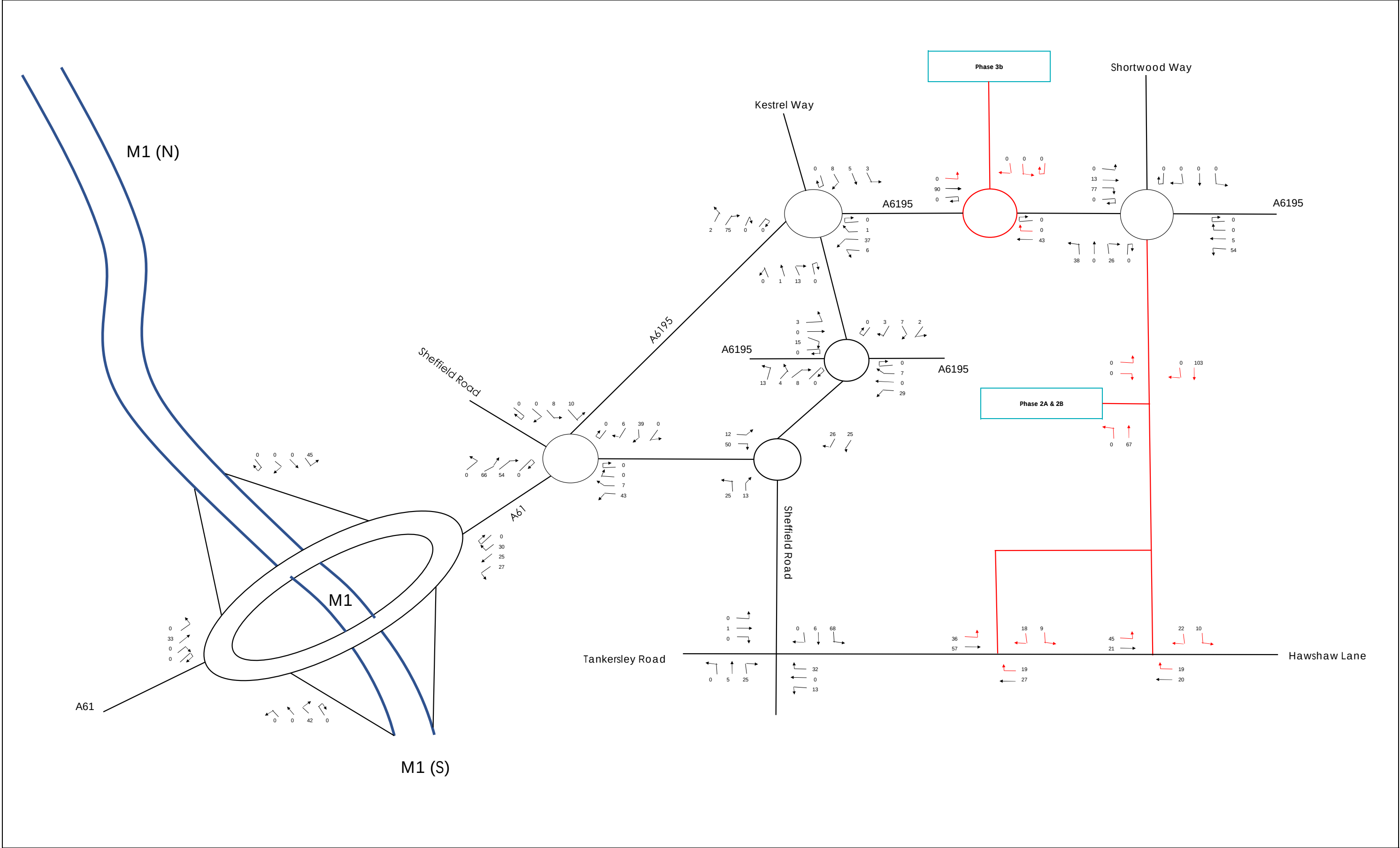
Land Use	No	AM Growth Rates			Trip Rates	
		Arr	Dep	Total	Arr	Dep
Resi	615				82	234
		Resi	0.134	0.381	0.515	

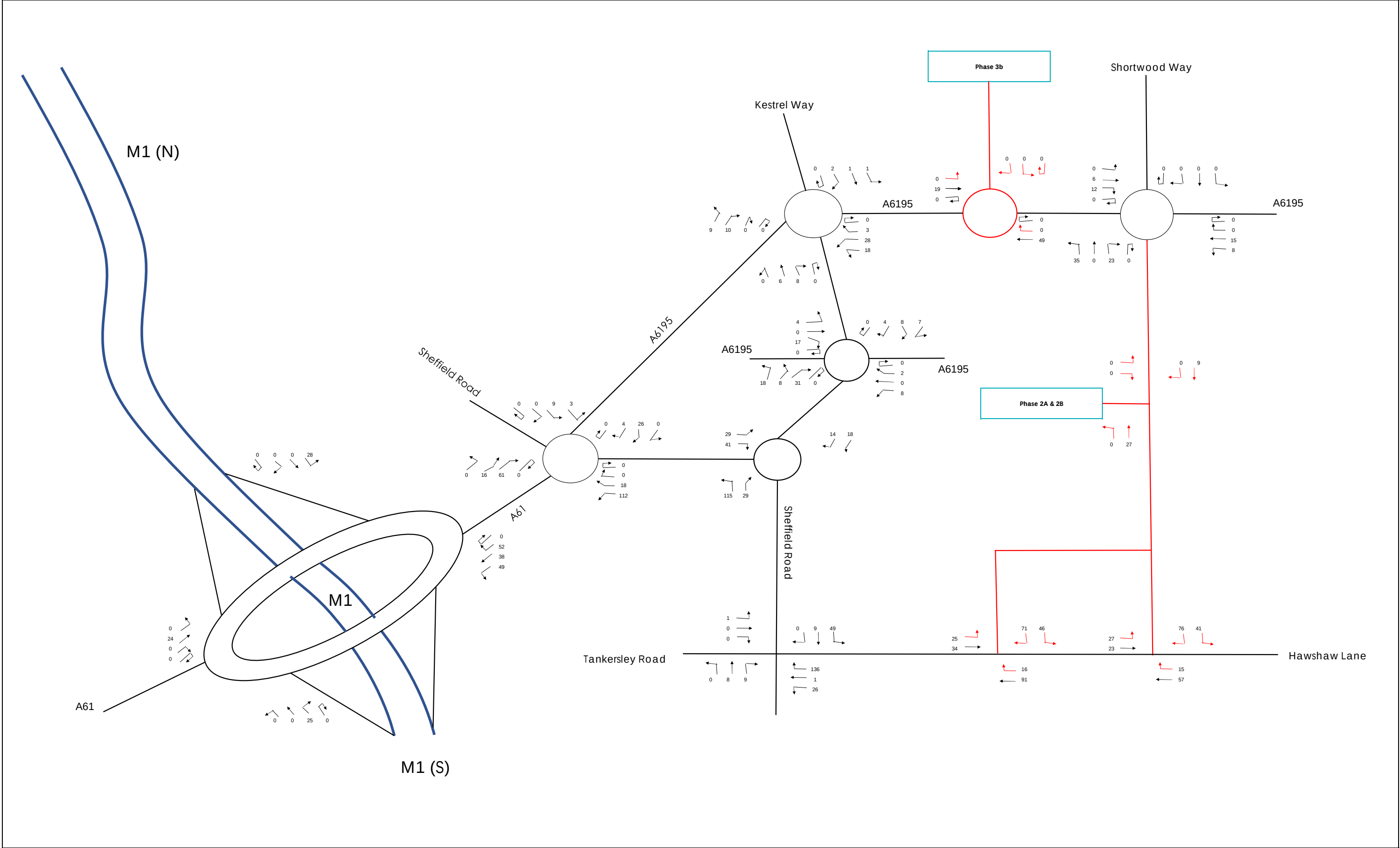


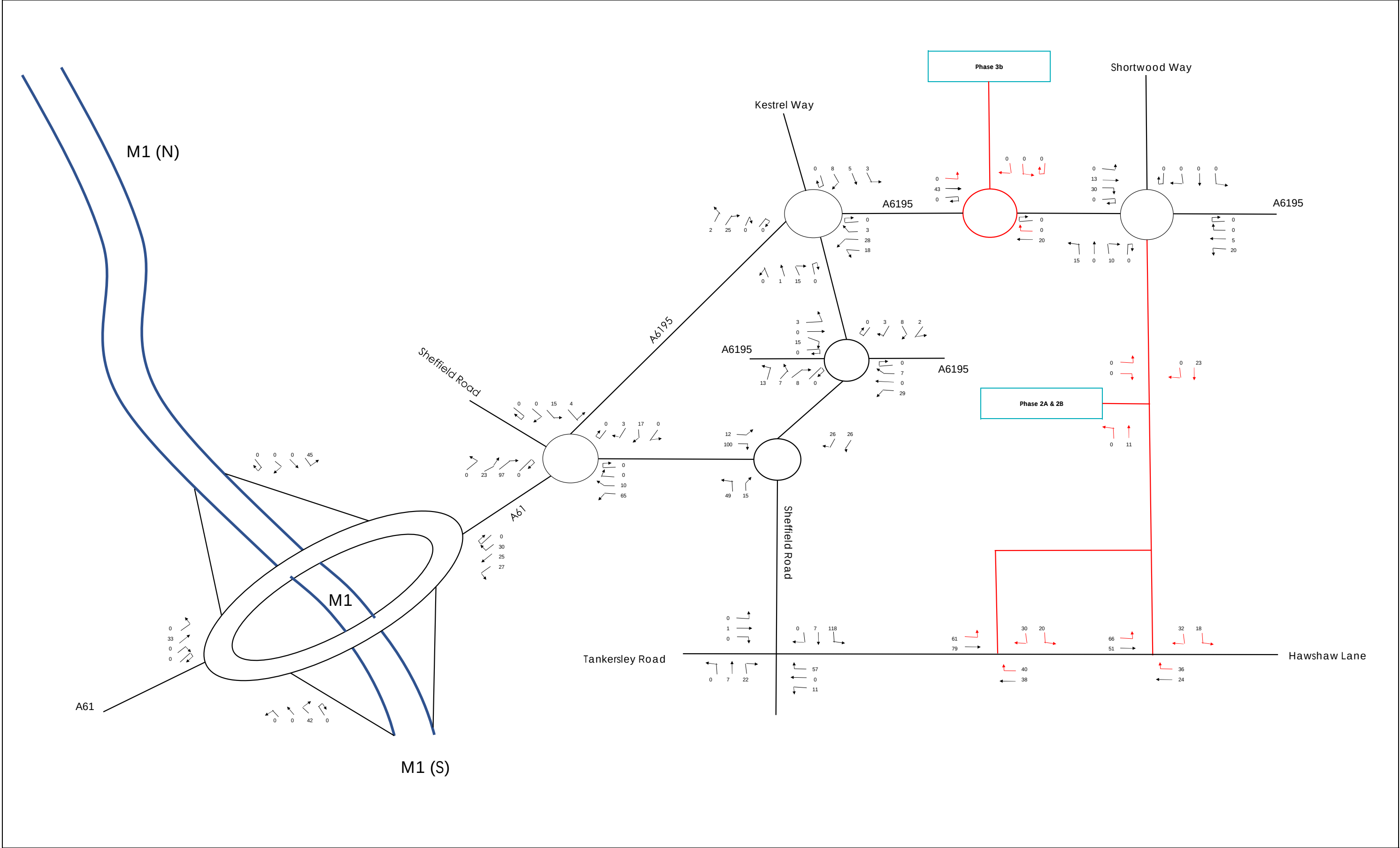
Land Use	No	PM Growth Rates			Trip Rates	
		Arr	Dep	Total	Arr	Dep
Resi	615				203	100
		Resi	0.330	0.162	0.492	

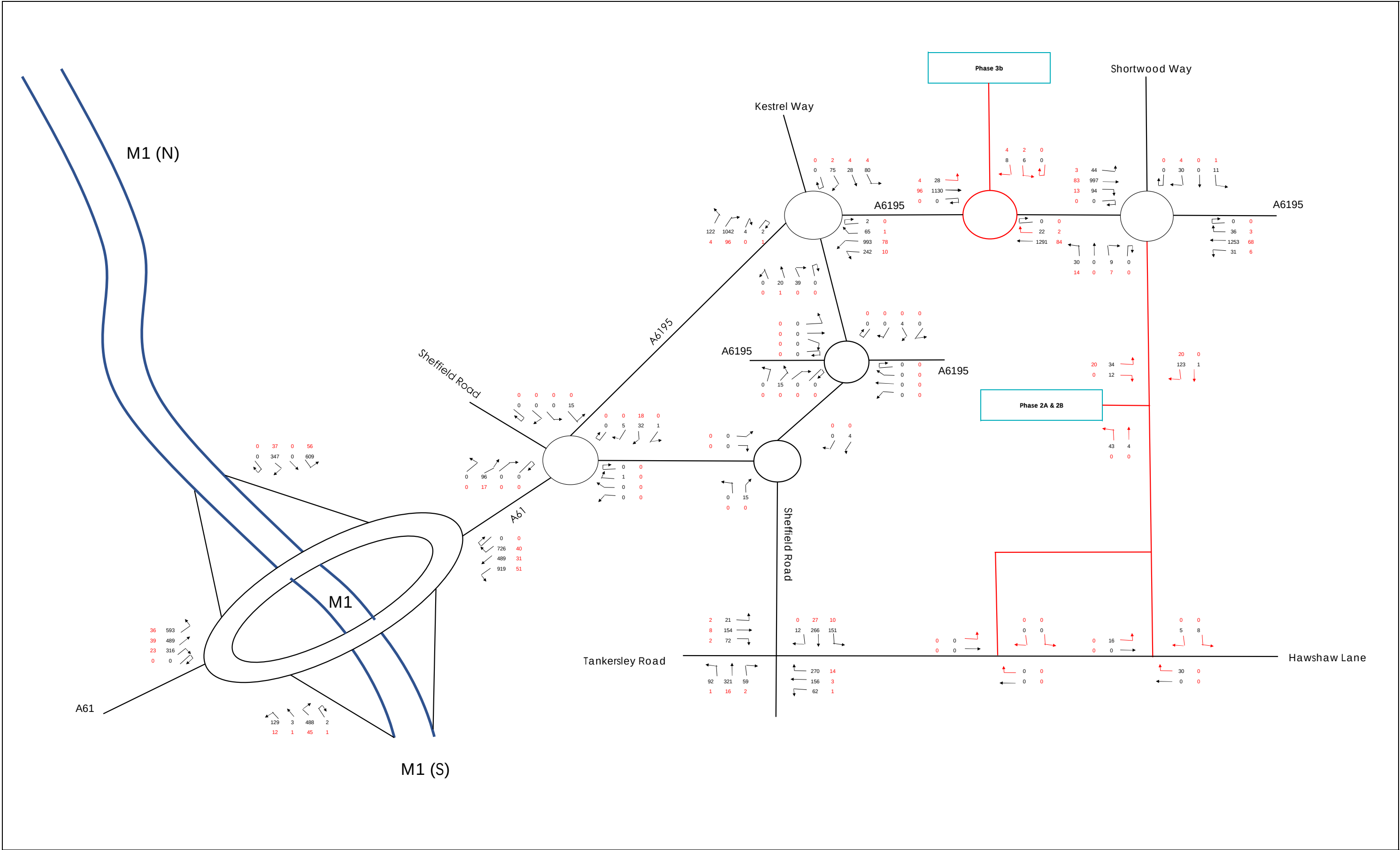


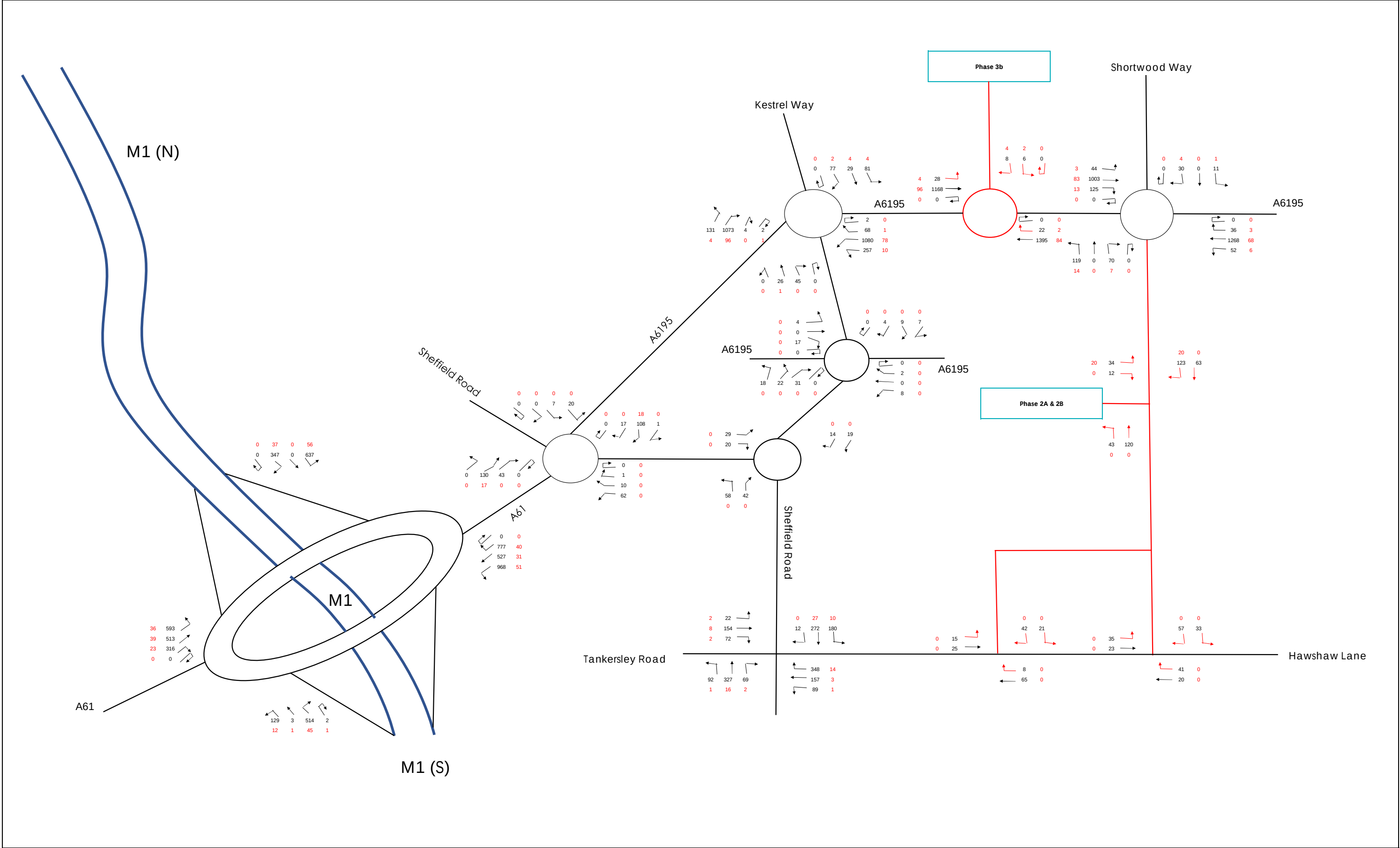


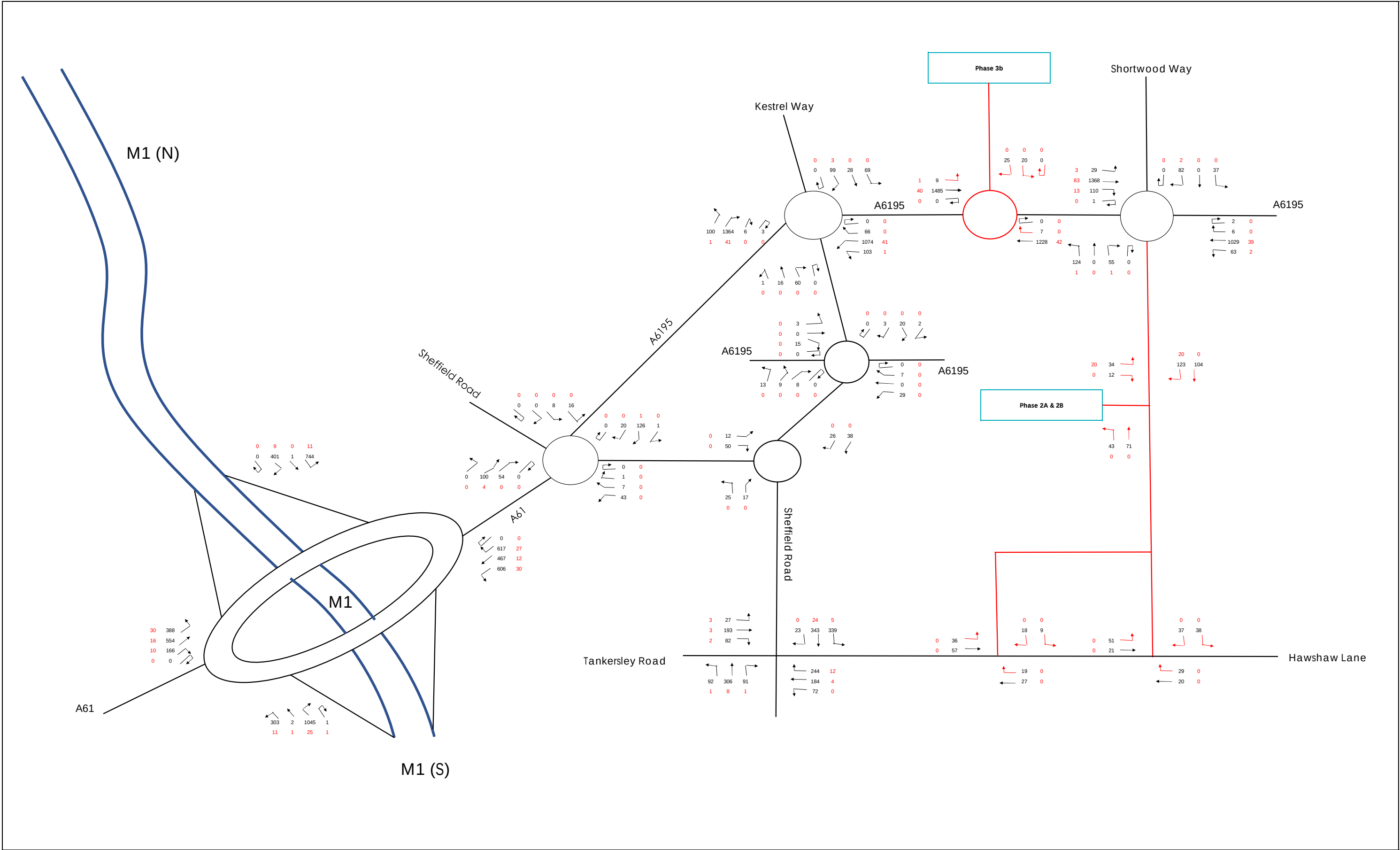


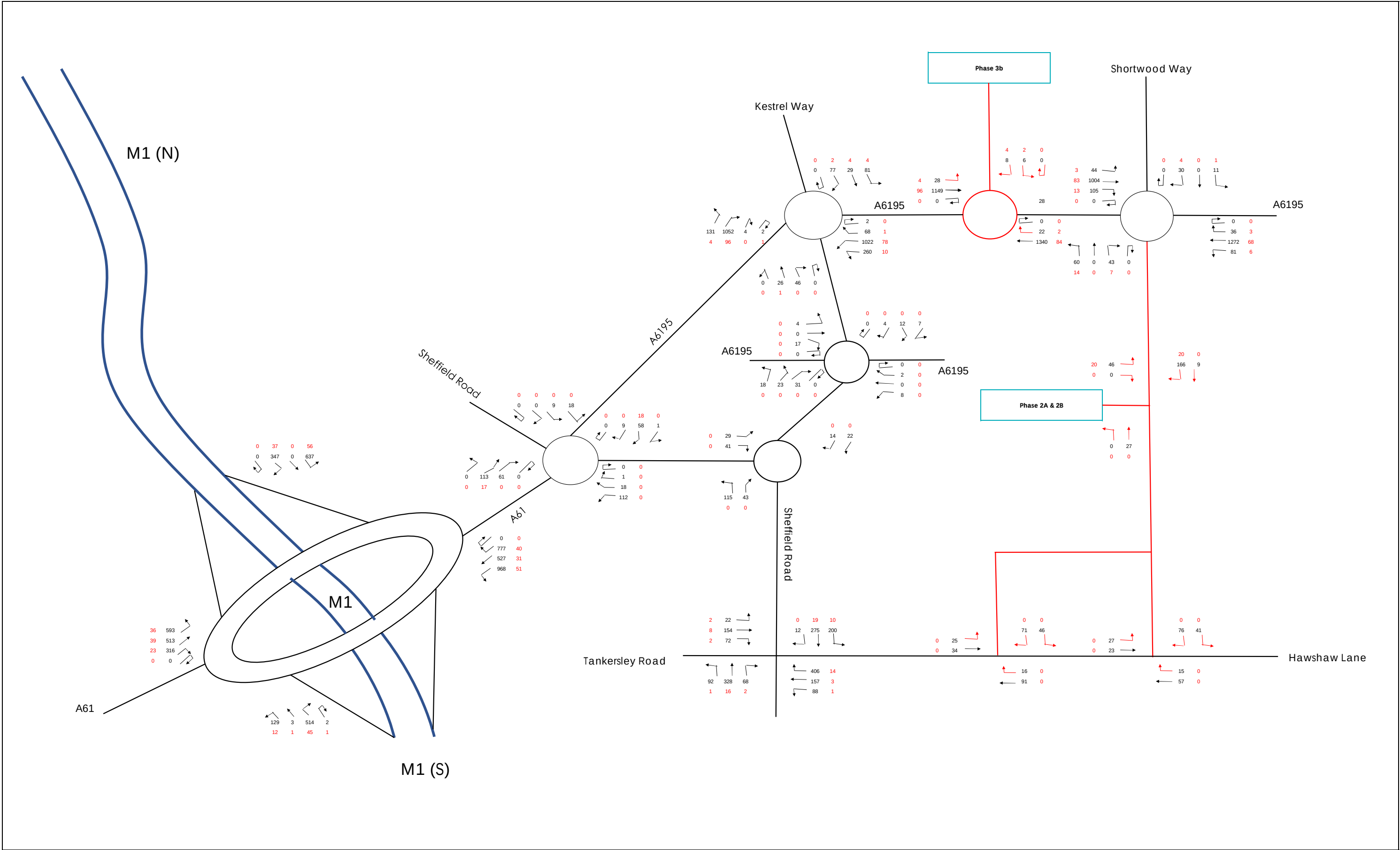


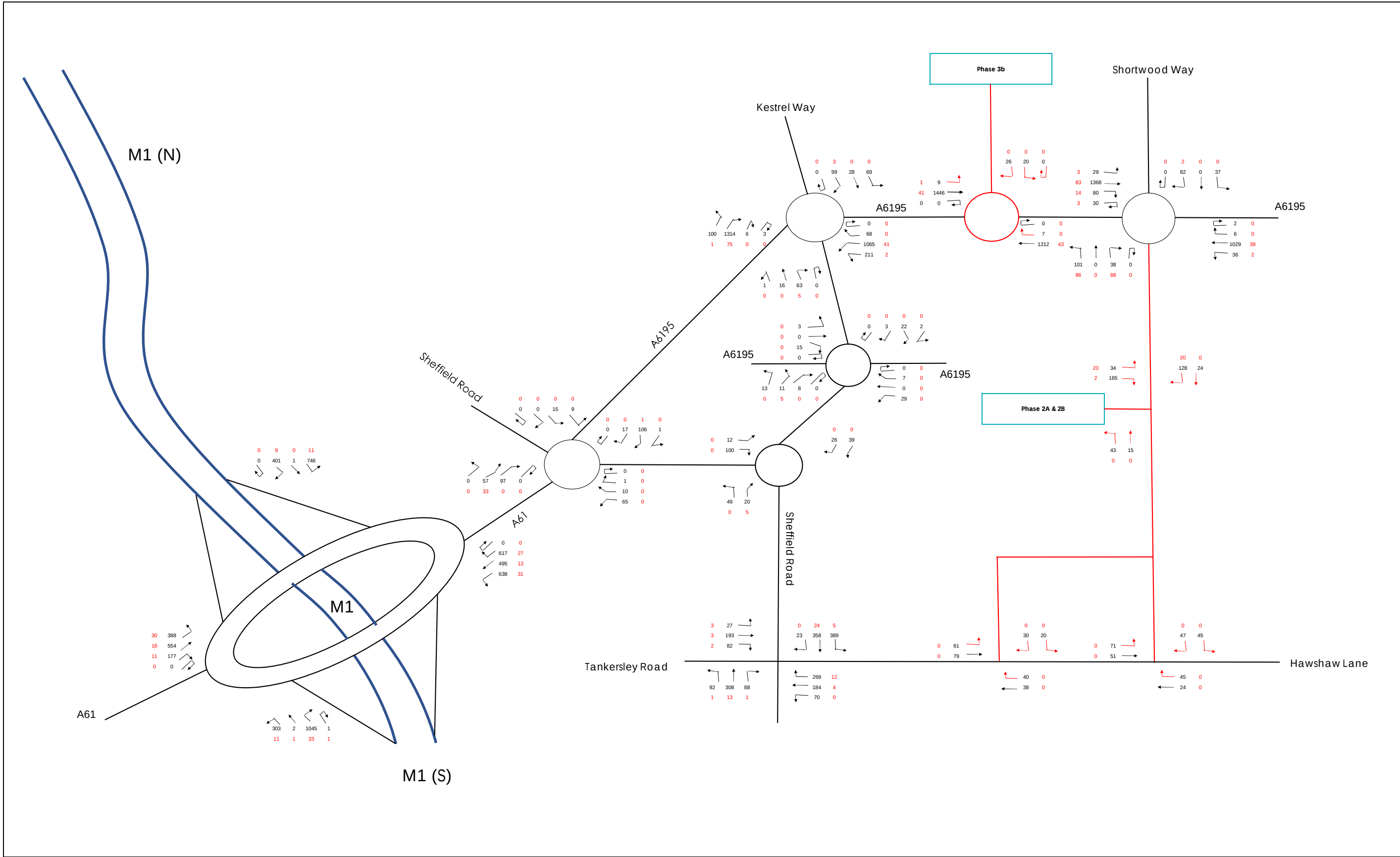






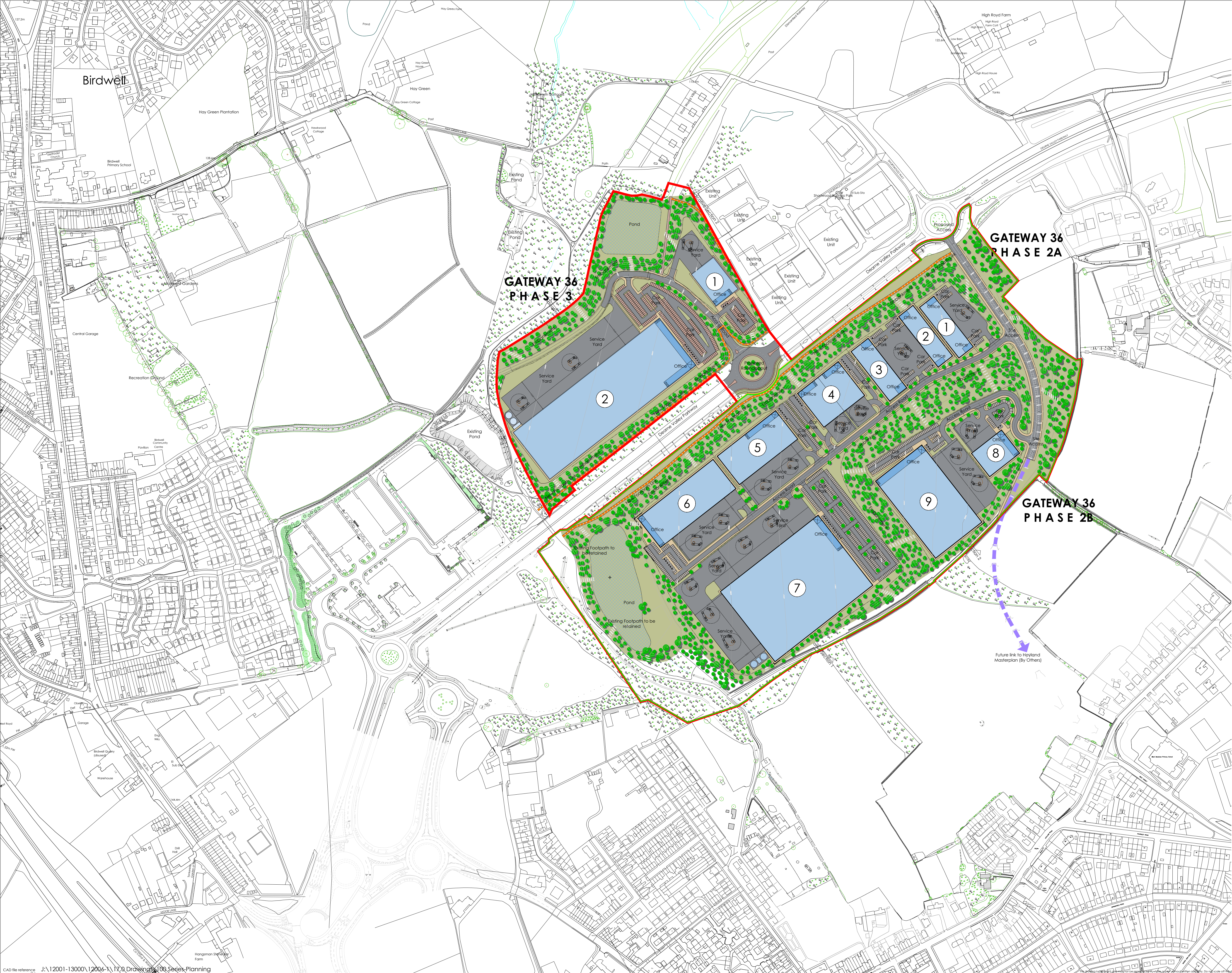






Appendices

Appendix A Masterplan



Schedule of Accommodation

Phase 2		
Unit 1	26,000	2,415.5
Unit 2	26,000	2,415.5
Unit 3	30,000	2,787.1
Unit 4	50,000	4,645.2
Unit 5	60,000	5,574.2
Unit 6	80,000	7,432.3
Unit 7	250,000	23,225.8
Unit 8	25,000	2,322.6
Unit 9	130,000	12,077.4

Phase 3		
Unit 1	25,000	2,322.6
Unit 2	250,000	23,225.8

Total **952,000 ft²** **88,443.8 m²**

Office content (10% of upper levels)
95,200 ft² 8,844.4 m²

Development Total (inc Office content)
1,047,200 ft² **97,288.2 m²**

Area Schedule

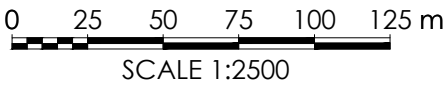
Planning Boundary (Red Line)
95.10 Acres 38.49 Hectares

Phase Boundaries

Phase 2 (Green line)
69.65 Acres 28.19 Hectares

Phase 3 (Orange line)
25.45 Acres 10.30 Hectares

Note:
Information is based on OS map and received information and is subject to full topographical and building survey.
Assumed site boundary and site constraints subject to confirmation.
All Legal easements and extent of existing underground services locations are subject to confirmation.



B	13.12.19	Updated		NBB	JMR
A	05.12.19	Updated for planning submission		NBB	JMR
Rev	Date	Description		Rev By	Chk'd By

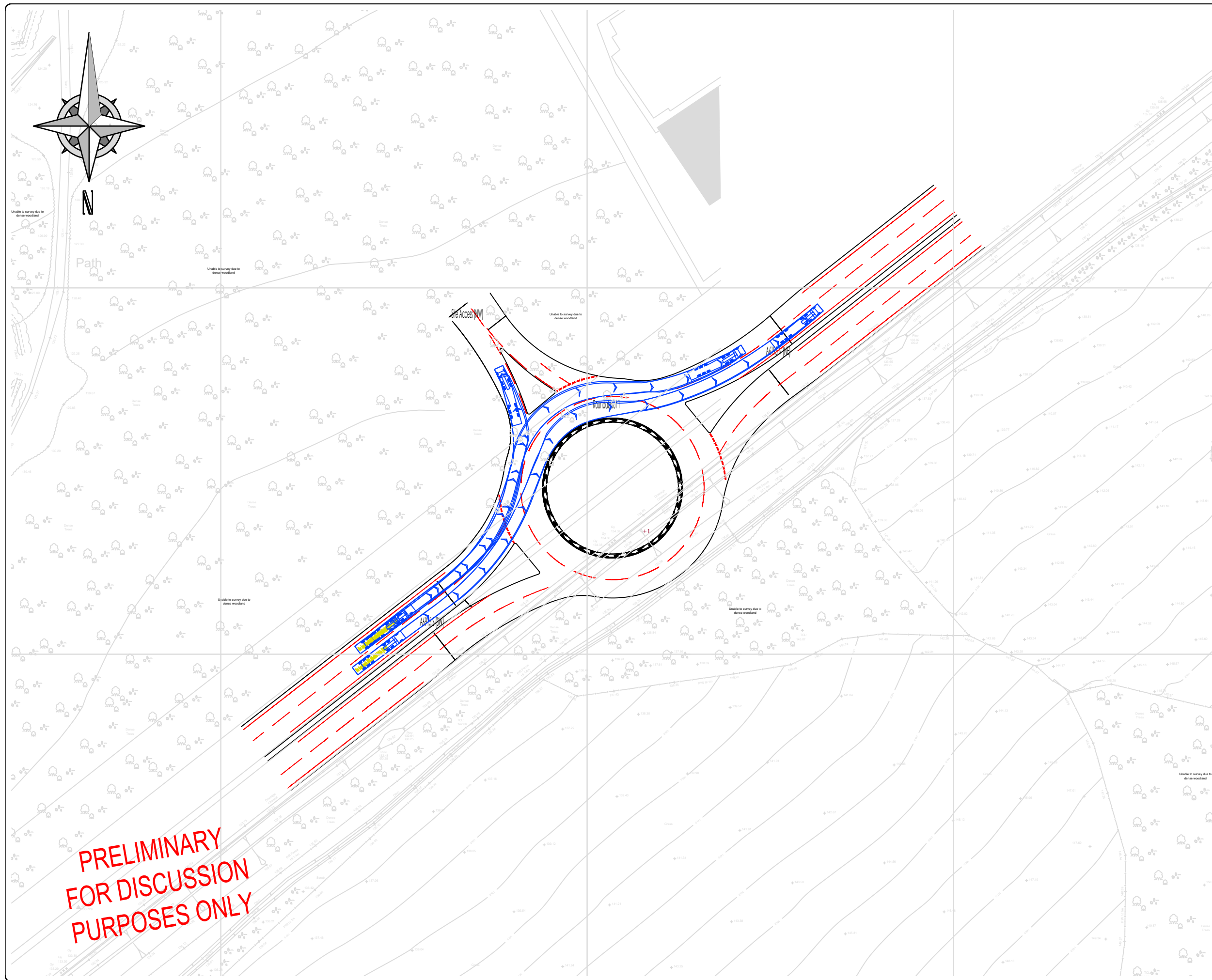
Project Title	PROPOSED INDUSTRIAL DEVELOPMENT Dearne Valley Parkway Rockingham Barnsley				
Client	HARWORTH GROUP				
Status	FOR PLANNING				
Scale	1:2500	Drawing Size	A1		
Date	11.2019	Drawn By	NBB	Checked	JMR
Drawing Title	PROPOSED MASTERPLAN				
Job/Dwg No	12006-1-110				Rev B

- 2 St. Johns North, Wakefield, WF1 3GA t. 01924 291800
- Carvers Warehouse, 77 Dale Street, Manchester, M1 2HG t. 0161 236555
- The Old Rectory, 79 High Street, Newport Pagnell, MK16 6AB t. 01908 211577
- 101 London Road, Reading, RG1 5BY t. 0118 9507700
- 10 Gress Court, St Christophers Place, London, W1U 1JJ t. 0207 4091215



Appendix B Not Used

Appendix C Phase 3 Access Arrangement Drawing



Notes:

1. This drawing is subject to copyright and is not to be reproduced in part or whole without approval.
2. Do not scale this drawing - check all dimensions on site.

Rev:	05.12.19	INITIAL ISSUE	RAM
Date:	Status/Amendments:		By:

mobility solutions through design and innovation

Manchester
0161 413 5168

Leeds
0113 323 0854

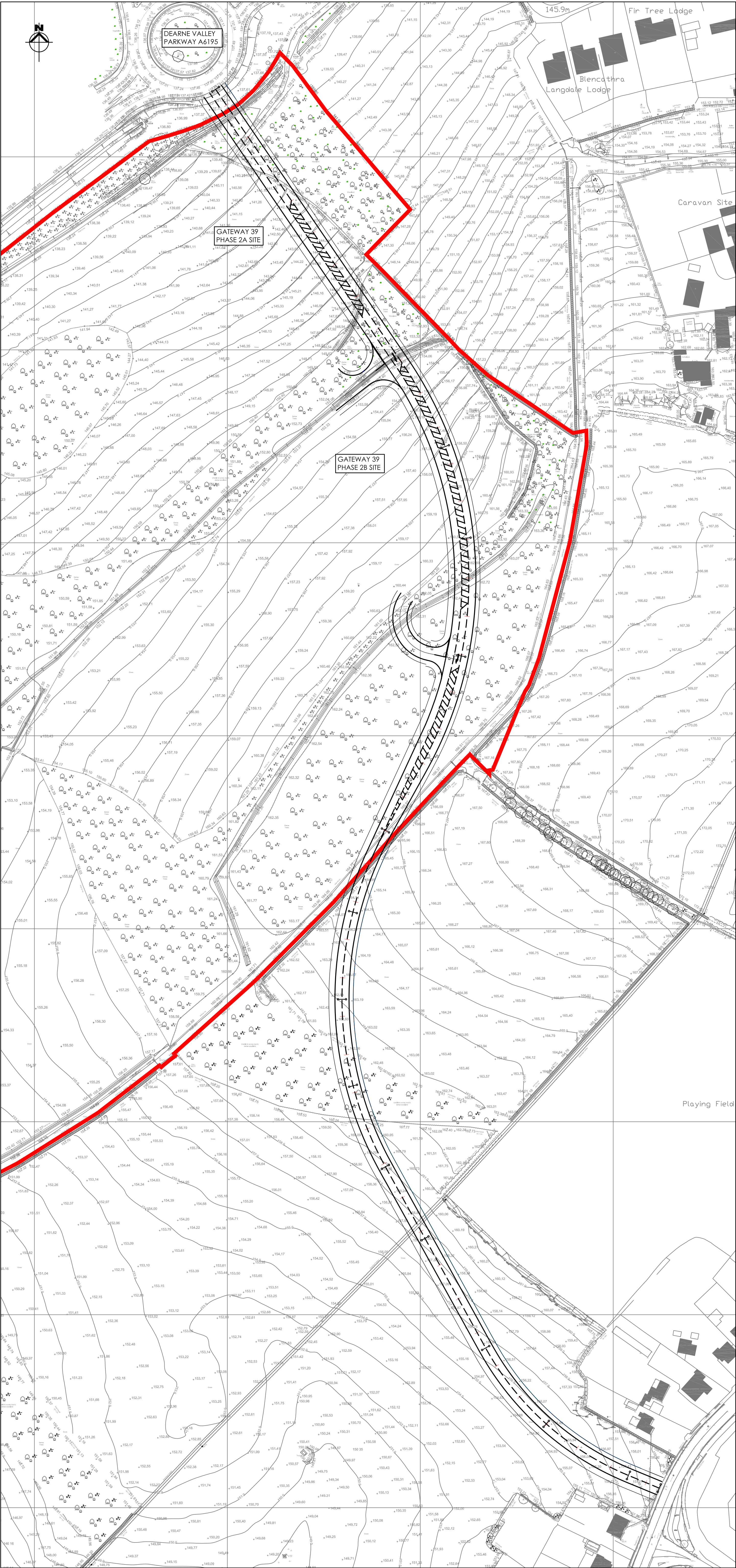
Client:
HARWORTH

Project:
ROCKINGHAM

Drawing Title:
PROPOSED ROUNDABOUT ACCESS
PRELIMINARY DESIGN

Drawn By: RAM	Checked By: SJP	Approved By: RAM
Scale: 1:1000	Paper Size: A3	Date Created: 05.12.19
Drawing Number: 18005.GA.04		Drawing Revision: -

Appendix D Shortwood Roundabout Access Drawing



DO NOT SCALE

NOTES

GENERAL NOTES

0. ALL SETTING OUT IS TO NATIONAL GRID AND ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM (OSBM).

DESIGN NOTES

- ALL DESIGN AND WORKS TO COMPLY WITH CURRENT VERSION OF THE FOLLOWING DOCUMENTS:
 - DESIGN MANUAL FOR ROADS AND BRIDGES (DMRB);
 - SPECIFICATION FOR HIGHWAY WORKS (SHW)
 - BARNESLEY HIGHWAYS DESIGN GUIDE AND SPECIFICATION
- ALL IRONWORK WITHIN EXTENT OF WORKS TO BE LOWERED / RAISED AS REQUIRED.
- EXISTING SIGN POSTS, TELEGRAPH POLES, LIGHTING COLUMNS, GATES, FENCING AND ALL OTHER PHYSICAL FEATURES TO BE REMOVED DURING SITE CLEARANCE.
- STATUTORY UNDERTAKERS NOTE:
CONTRACTOR TO LOCATE ALL STATUTORY SERVICES ON SITE. STATUTORY UNDERTAKERS EQUIPMENT TO BE PROTECTED/LOWERED OR ARRANGE DIVERSION AS NECESSARY IN ACCORDANCE WITH THE REQUIREMENTS OF THE ROADS AND STREET WORKS ACT 1991. EVIDENCE MUST BE PROVIDED TO THE LOCAL AUTHORITY THAT STATUTORY UNDERTAKERS INFORMATION IN THE LOCATION OF THE WORKS AND CONFIRM DETAILS OF ANY DIVERSIONARY WORKS REQUIRED.

PO1	INITIAL ISSUE	10.12.19	JH
REV	DESCRIPTION	DATE	BY

Project
HOYLAND NORTH,
HOYLAND

Drawing Title
PROPOSED ROAD ALIGNMENT

INFORMATION ISSUE

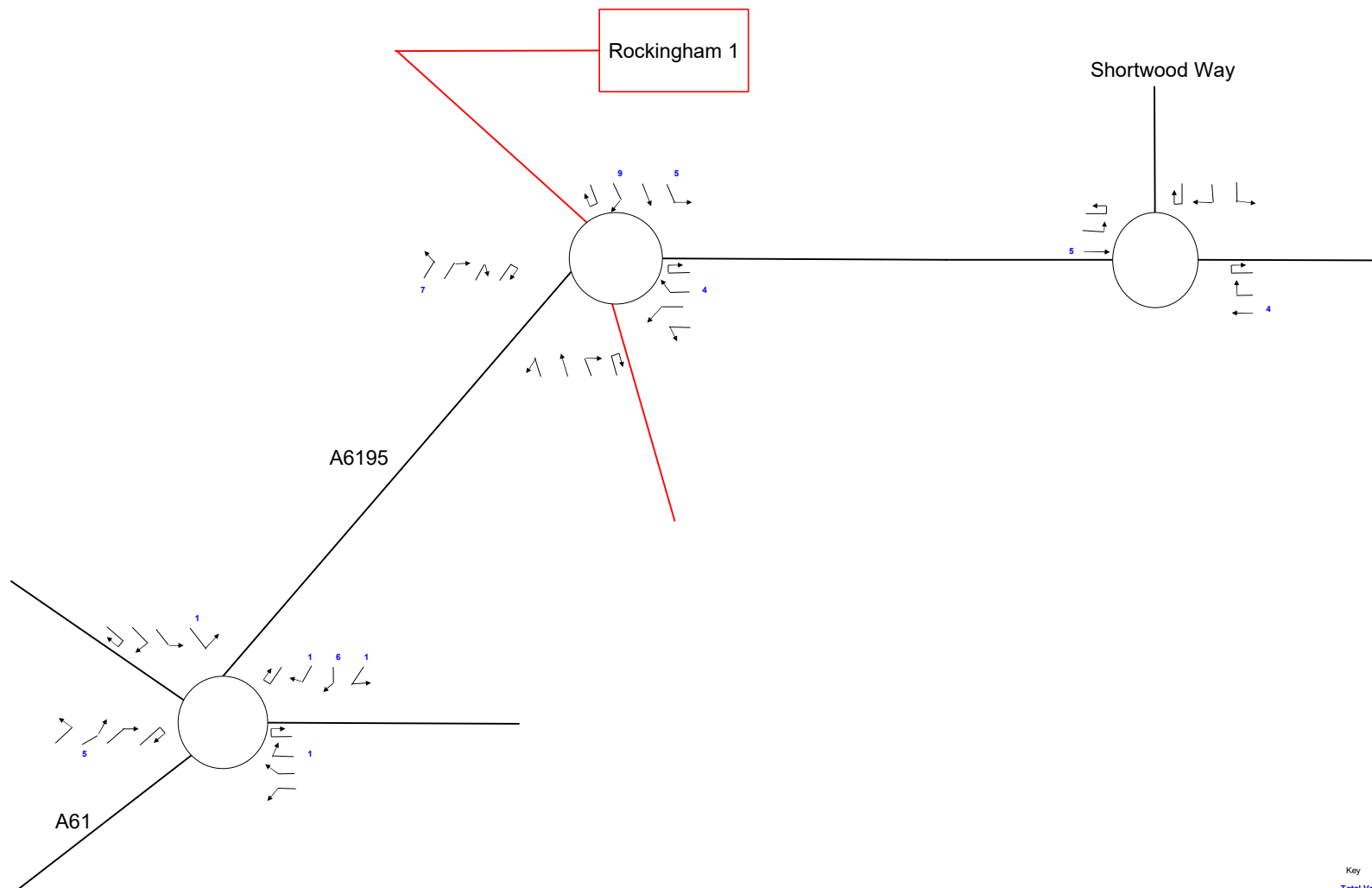
Architect



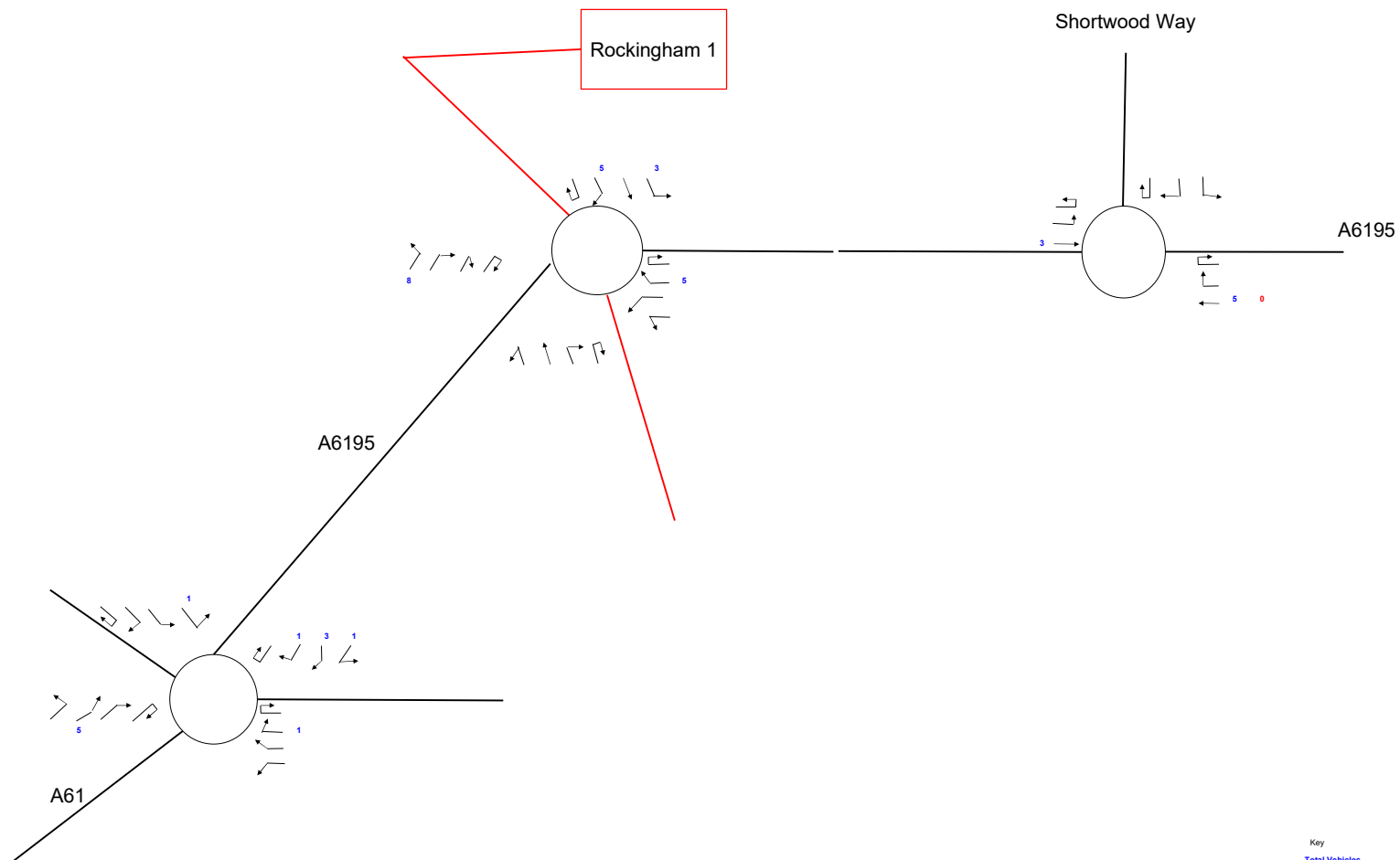
JPG Project Ref 5003	Scale at A1 1:1000	Date 12.12.19	Checked	Drawn JH
-------------------------	-----------------------	------------------	---------	-------------

5003 - JPG - ZZ - XX - DR - D - 1610 S2 PO1

Appendix E Committed Development Flows



Key
 Total Vehicles
 Total OGV (inc in Total Vehicles)
 Total PCU Value for Movement Equals Total Vehicles Plus Total OGV

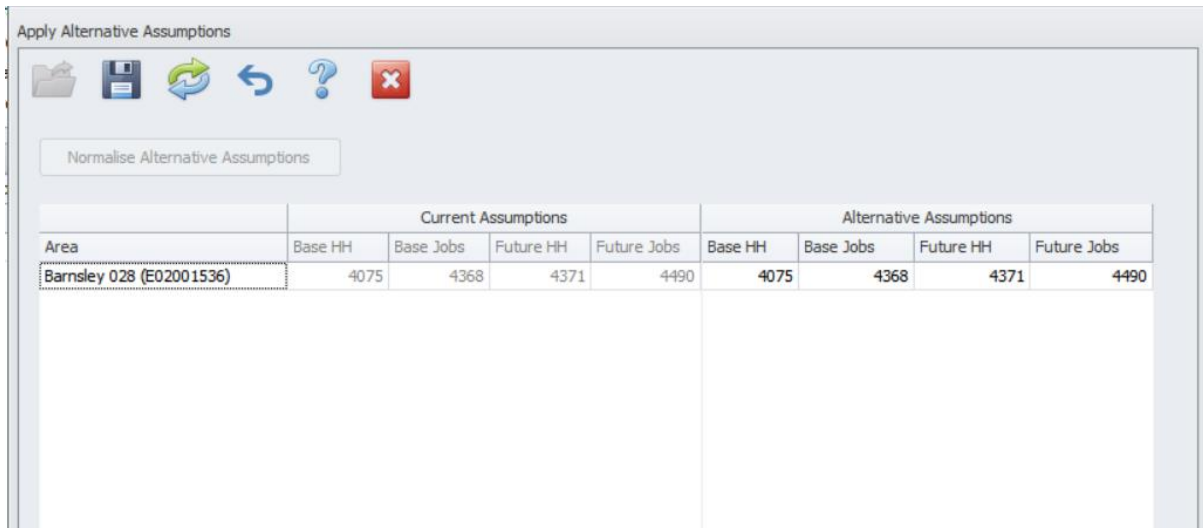


Key
 Total Vehicles
 Total OGV (inc in Total Vehicles)
 Total PCU Value for Movement Equals Total Vehicles Plus Total OGV

Appendix F TEMPro Growth Assessment

2029 Growth Rates

Figure 1 – Original Assumptions

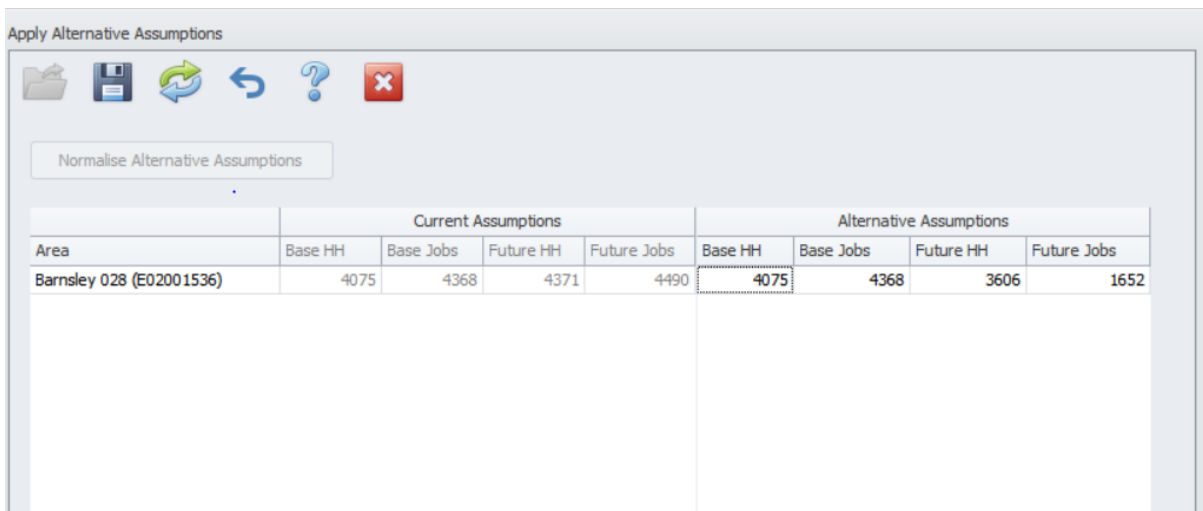


The screenshot shows a software window titled "Apply Alternative Assumptions". It contains a toolbar with icons for file operations, a "Normalise Alternative Assumptions" button, and a table with two main sections: "Current Assumptions" and "Alternative Assumptions". The table has columns for "Area", "Base HH", "Base Jobs", "Future HH", and "Future Jobs". The "Area" column contains "Barnsley 028 (E02001536)". The "Current Assumptions" section shows values: Base HH: 4075, Base Jobs: 4368, Future HH: 4371, Future Jobs: 4490. The "Alternative Assumptions" section shows identical values: Base HH: 4075, Base Jobs: 4368, Future HH: 4371, Future Jobs: 4490.

Area	Current Assumptions				Alternative Assumptions			
	Base HH	Base Jobs	Future HH	Future Jobs	Base HH	Base Jobs	Future HH	Future Jobs
Barnsley 028 (E02001536)	4075	4368	4371	4490	4075	4368	4371	4490

The alternative assumptions have been altered to take into account the residential and commercial developments at the Rockingham Site. Figure 1 shows the initial assumptions and Figure 2 shows the altered assumptions.

Figure 2 – Revised Assumptions



The screenshot shows the same "Apply Alternative Assumptions" window as Figure 1, but with revised values in the "Alternative Assumptions" section. The "Current Assumptions" remain the same: Base HH: 4075, Base Jobs: 4368, Future HH: 4371, Future Jobs: 4490. The "Alternative Assumptions" section now shows: Base HH: 4075, Base Jobs: 4368, Future HH: 3606, Future Jobs: 1652.

Area	Current Assumptions				Alternative Assumptions			
	Base HH	Base Jobs	Future HH	Future Jobs	Base HH	Base Jobs	Future HH	Future Jobs
Barnsley 028 (E02001536)	4075	4368	4371	4490	4075	4368	3606	1652

Future Households

The 765 houses proposed at the Rockingham Site (HS56, HS66 and HS64) outlined in the Fore report have been removed from the Future HH value.

Future Jobs

The number of jobs associated with the proposed commercial development at Rockingham has been calculated using the Employment Densities Guide (<https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attach>

hment_data/file/378203/employ-den.pdf) which proposes that B2 developments ratio for m² and employee is 36:1. As such, it is proposed that the development will employ 2838 employees.

The AM growth figure with the assumptions is: 0.6559, as shown in Figure 3.

Figure 3 – AM Growth Figure

The screenshot shows the 'NTM Traffic Growth Calculations' software interface. It includes a toolbar with navigation icons and five main configuration sections. Section 1, 'Select NTM Dataset', contains a table with two rows: 'RTF 2018 Scenario 1 - Reference' (From: 2015, To: 2050) and 'NTM AF15 Dataset' (From: 2010, To: 2040). Section 2, 'Select Areas to make up the geographic region:', has a list box with 'Barnsley 028 (E02001536)' selected. Section 3, 'Select area type:', has radio buttons for 'Urban' (selected), 'Rural', and 'All'. Section 4, 'Select road type:', has radio buttons for 'Motorway', 'Trunk', 'Principal', 'Minor', and 'All' (selected). Section 5, 'Select which area it serves:', has radio buttons for 'Region' (selected) and 'England'. A 'Calculate the adjusted local growth figure' button is located to the right of these sections. Below the configuration sections is a 'Results' section with a table showing the calculated growth figure.

Level	Area	Local Growth Figure
E02001536	Barnsley 028	0.6559

The PM growth figure with assumptions is: 0.6651, as shown in Figure 4.

This screenshot is identical to the one for Figure 3, showing the same configuration in the 'NTM Traffic Growth Calculations' software. The only difference is the result shown in the 'Results' table, which now displays a Local Growth Figure of 0.6651 for the same input parameters.

Level	Area	Local Growth Figure
E02001536	Barnsley 028	0.6651

The AM growth figure with assumptions is: 1.1433, as shown in Figure 5.

NTM Traffic Growth Calculations

1: Select NTM Dataset:

NTM Dataset Description	From	To
RTF 2018 Scenario 1 - Reference	2015	2050
NTM AF15 Dataset	2010	2040

2: Select Areas to make up the geographic region:

☒ Barnsley 028 (E02001536)

3. Select area type:

☒ Urban
☐ Rural
☐ All

4. Select road type:

☐ Motorway
☐ Trunk
☐ Principal
☐ Minor
☒ All

5. Select which area it serves:

☐ Region
☐ England

Calculate the adjusted local growth figure

Results

Level	Area	Local Growth Figure
E02001536	Barnsley 028	1.1433

The PM growth figure with assumptions is: 1.1441, as shown in Figure 6.

NTM Traffic Growth Calculations

1: Select NTM Dataset:

NTM Dataset Description	From	To
RTF 2018 Scenario 1 - Reference	2015	2050
NTM AF15 Dataset	2010	2040

2: Select Areas to make up the geographic region:

☒ Barnsley 028 (E02001536)

3. Select area type:

☒ Urban
☐ Rural
☐ All

4. Select road type:

☐ Motorway
☐ Trunk
☐ Principal
☐ Minor
☒ All

5. Select which area it serves:

☐ Region
☐ England

Calculate the adjusted local growth figure

Results

Level	Area	Local Growth Figure
E02001536	Barnsley 028	1.1441

Appendix G Modelling Outputs

Junctions 9							
ARCADY 9 - Roundabout Module							
Version: 9.5.0.6896 © Copyright TRL Limited, 2018							
For sales and distribution information, program advice and maintenance, contact TRL: +44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk							
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: 191216 New Access.j9

Path: L:\Rockingham - 18005\ANALYSIS\ARCADY\J9files

Report generation date: 16/12/2019 16:31:35

- »2029 Design, AM
- »2029 Design, PM
- »2029 Design Sensitivity, AM
- »2029 Design Sensitivity, PM
- »2029 Design Sensitivity - No Link Road, AM
- »2029 Design Sensitivity - No Link Road, PM

Summary of junction performance

	AM				PM			
	Q (PCU)	Delay (s)	RFC	LOS	Q (PCU)	Delay (s)	RFC	LOS
2029 Design								
1 - A6195 South	1.1	2.99	0.54	A	1.6	3.56	0.61	A
2 - New Access	0.0	3.16	0.02	A	0.1	3.71	0.05	A
3 - A6195 North	1.4	3.33	0.59	A	1.1	2.87	0.52	A
2029 Design Sensitivity								
1 - A6195 South	1.2	3.10	0.55	A	1.8	3.95	0.65	A
2 - New Access	0.0	3.23	0.02	A	0.1	3.95	0.05	A
3 - A6195 North	1.7	3.72	0.63	A	1.2	2.99	0.54	A
2029 Design Sensitivity - No Link Road								
1 - A6195 South	1.2	3.04	0.54	A	1.8	3.95	0.65	A
2 - New Access	0.0	3.20	0.02	A	0.1	4.14	0.10	A
3 - A6195 North	1.5	3.50	0.61	A	1.3	3.26	0.57	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of Av. delay per arriving vehicle.

File summary

File Description

Title	
Location	
Site number	
Date	10/12/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	KG
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Av. delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Q Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q 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
D3	2029 Design	AM	ONE HOUR	07:00	08:30	15	✓
D4	2029 Design	PM	ONE HOUR	16:15	17:45	15	✓
D5	2029 Design Sensitivity	AM	ONE HOUR	07:00	08:30	15	✓
D6	2029 Design Sensitivity	PM	ONE HOUR	16:15	17:45	15	✓
D7	2029 Design Sensitivity - No Link Road	AM	ONE HOUR	07:00	08:30	15	✓
D8	2029 Design Sensitivity - No Link Road	PM	ONE HOUR	16:15	17:45	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2029 Design, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	3.17	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A6195 South	
2	New Access	
3	A6195 North	

Roundabout Geometry

Arm	V (m)	E (m)	I' (m)	R (m)	D (m)	PHI (deg)	Exit only
1 - A6195 South	8.30	8.30	0.0	37.0	57.8	25.8	
2 - New Access	6.10	7.50	4.2	43.4	57.8	47.0	
3 - A6195 North	8.30	8.30	0.0	42.3	57.8	24.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A6195 South	0.740	2608
2 - New Access	0.611	1986
3 - A6195 North	0.747	2632

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)	Run automatically
D3	2029 Design	AM	ONE HOUR	07:00	08:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	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	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 South		ONE HOUR	✓	1259	100.000
2 - New Access		ONE HOUR	✓	20	100.000
3 - A6195 North		ONE HOUR	✓	1399	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		1 - A6195 South	2 - New Access	3 - A6195 North
	1 - A6195 South	0	32	1227
	2 - New Access	12	0	8
	3 - A6195 North	1375	24	0

Vehicle Mix

HV %s

	To			
		1 - A6195 South	2 - New Access	3 - A6195 North
	1 - A6195 South	0	0	0
	2 - New Access	0	0	0
	3 - A6195 North	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - A6195 South	0.54	2.99	1.1	A	1155	1733
2 - New Access	0.02	3.16	0.0	A	18	28
3 - A6195 North	0.59	3.33	1.4	A	1284	1926

Main Results for each time segment

07:00 - 07:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	948	237	18	2595	0.365	946	1042	0.0	0.6	2.180	A
2 - New Access	15	4	922	1423	0.011	15	42	0.0	0.0	2.556	A
3 - A6195 North	1053	263	9	2625	0.401	1051	928	0.0	0.7	2.282	A

07:15 - 07:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1132	283	22	2592	0.437	1131	1246	0.6	0.8	2.462	A
2 - New Access	18	4	1102	1312	0.014	18	50	0.0	0.0	2.780	A
3 - A6195 North	1258	314	11	2624	0.479	1257	1109	0.7	0.9	2.632	A

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1386	347	26	2589	0.536	1385	1525	0.8	1.1	2.986	A

2 - New Access	22	6	1349	1161	0.019	22	62	0.0	0.0	3.159	A
3 - A6195 North	1540	385	13	2622	0.587	1538	1358	0.9	1.4	3.316	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1386	347	26	2589	0.536	1386	1527	1.1	1.1	2.993	A
2 - New Access	22	6	1351	1160	0.019	22	62	0.0	0.0	3.161	A
3 - A6195 North	1540	385	13	2622	0.587	1540	1360	1.4	1.4	3.326	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1132	283	22	2592	0.437	1133	1249	1.1	0.8	2.469	A
2 - New Access	18	4	1104	1311	0.014	18	50	0.0	0.0	2.786	A
3 - A6195 North	1258	314	11	2624	0.479	1260	1112	1.4	0.9	2.643	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	948	237	18	2595	0.365	949	1045	0.8	0.6	2.187	A
2 - New Access	15	4	925	1421	0.011	15	42	0.0	0.0	2.560	A
3 - A6195 North	1053	263	9	2625	0.401	1054	931	0.9	0.7	2.292	A

2029 Design, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	3.25	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
D4	2029 Design	PM	ONE HOUR	16:15	17:45	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	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	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 South		ONE HOUR	✓	1445	100.000
2 - New Access		ONE HOUR	✓	45	100.000
3 - A6195 North		ONE HOUR	✓	1234	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		1 - A6195 South	2 - New Access	3 - A6195 North
From	1 - A6195 South	0	10	1435
	2 - New Access	25	0	20
	3 - A6195 North	1227	7	0

Vehicle Mix

HV %s

	To			
		1 - A6195 South	2 - New Access	3 - A6195 North
From	1 - A6195 South	0	0	0
	2 - New Access	0	0	0
	3 - A6195 North	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - A6195 South	0.61	3.56	1.6	A	1326	1989
2 - New Access	0.05	3.71	0.1	A	41	62
3 - A6195 North	0.52	2.87	1.1	A	1132	1699

Main Results for each time segment

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1088	272	5	2604	0.418	1085	940	0.0	0.7	2.366	A
2 - New Access	34	8	1078	1327	0.026	34	13	0.0	0.0	2.782	A
3 - A6195 North	929	232	19	2618	0.355	927	1093	0.0	0.5	2.126	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1299	325	6	2603	0.499	1298	1125	0.7	1.0	2.755	A
2 - New Access	40	10	1289	1198	0.034	40	15	0.0	0.0	3.108	A
3 - A6195 North	1109	277	22	2615	0.424	1109	1307	0.5	0.7	2.388	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1591	398	8	2602	0.611	1589	1377	1.0	1.6	3.544	A
2 - New Access	50	12	1578	1022	0.048	49	19	0.0	0.1	3.702	A
3 - A6195 North	1359	340	27	2612	0.520	1357	1600	0.7	1.1	2.868	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1591	398	8	2602	0.611	1591	1378	1.6	1.6	3.558	A
2 - New Access	50	12	1580	1020	0.049	50	19	0.1	0.1	3.707	A
3 - A6195 North	1359	340	28	2612	0.520	1359	1602	1.1	1.1	2.872	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1299	325	6	2603	0.499	1301	1127	1.6	1.0	2.768	A
2 - New Access	40	10	1292	1196	0.034	41	15	0.1	0.0	3.114	A
3 - A6195 North	1109	277	23	2615	0.424	1111	1310	1.1	0.7	2.394	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1088	272	5	2604	0.418	1089	943	1.0	0.7	2.377	A
2 - New Access	34	8	1081	1325	0.026	34	13	0.0	0.0	2.790	A
3 - A6195 North	929	232	19	2618	0.355	930	1097	0.7	0.6	2.133	A

2029 Design Sensitivity, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	3.43	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
D5	2029 Design Sensitivity	AM	ONE HOUR	07:00	08:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	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	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 South		ONE HOUR	✓	1297	100.000
2 - New Access		ONE HOUR	✓	20	100.000
3 - A6195 North		ONE HOUR	✓	1503	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		1 - A6195 South	2 - New Access	3 - A6195 North
From	1 - A6195 South	0	32	1265
	2 - New Access	12	0	8
	3 - A6195 North	1479	24	0

Vehicle Mix

HV %s

	To			
		1 - A6195 South	2 - New Access	3 - A6195 North
From	1 - A6195 South	0	0	0
	2 - New Access	0	0	0
	3 - A6195 North	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - A6195 South	0.55	3.10	1.2	A	1190	1785
2 - New Access	0.02	3.23	0.0	A	18	28
3 - A6195 North	0.63	3.72	1.7	A	1379	2069

Main Results for each time segment

07:00 - 07:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	976	244	18	2595	0.376	974	1120	0.0	0.6	2.219	A
2 - New Access	15	4	950	1405	0.011	15	42	0.0	0.0	2.588	A
3 - A6195 North	1132	283	9	2625	0.431	1129	956	0.0	0.8	2.400	A

07:15 - 07:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1166	291	22	2592	0.450	1165	1339	0.6	0.8	2.521	A
2 - New Access	18	4	1136	1291	0.014	18	50	0.0	0.0	2.826	A
3 - A6195 North	1351	338	11	2624	0.515	1350	1144	0.8	1.1	2.823	A

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1428	357	26	2589	0.552	1426	1639	0.8	1.2	3.094	A
2 - New Access	22	6	1391	1136	0.019	22	62	0.0	0.0	3.231	A
3 - A6195 North	1655	414	13	2622	0.631	1652	1400	1.1	1.7	3.702	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1428	357	26	2589	0.552	1428	1642	1.2	1.2	3.101	A
2 - New Access	22	6	1393	1135	0.019	22	62	0.0	0.0	3.234	A
3 - A6195 North	1655	414	13	2622	0.631	1655	1402	1.7	1.7	3.720	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1166	291	22	2592	0.450	1168	1343	1.2	0.8	2.529	A
2 - New Access	18	4	1139	1290	0.014	18	50	0.0	0.0	2.831	A
3 - A6195 North	1351	338	11	2624	0.515	1354	1146	1.7	1.1	2.838	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	976	244	18	2595	0.376	977	1124	0.8	0.6	2.228	A
2 - New Access	15	4	953	1403	0.011	15	42	0.0	0.0	2.594	A
3 - A6195 North	1132	283	9	2625	0.431	1133	959	1.1	0.8	2.413	A

2029 Design Sensitivity, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	3.52	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
D6	2029 Design Sensitivity	PM	ONE HOUR	16:15	17:45	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	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	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 South		ONE HOUR	✓	1535	100.000
2 - New Access		ONE HOUR	✓	45	100.000
3 - A6195 North		ONE HOUR	✓	1278	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		1 - A6195 South	2 - New Access	3 - A6195 North
From	1 - A6195 South	0	10	1525
	2 - New Access	25	0	20
	3 - A6195 North	1271	7	0

Vehicle Mix

HV %s

	To			
		1 - A6195 South	2 - New Access	3 - A6195 North
From	1 - A6195 South	0	0	0
	2 - New Access	0	0	0
	3 - A6195 North	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - A6195 South	0.65	3.95	1.8	A	1409	2113
2 - New Access	0.05	3.95	0.1	A	41	62
3 - A6195 North	0.54	2.99	1.2	A	1173	1759

Main Results for each time segment

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1156	289	5	2604	0.444	1152	973	0.0	0.8	2.475	A
2 - New Access	34	8	1145	1286	0.026	34	13	0.0	0.0	2.874	A
3 - A6195 North	962	241	19	2618	0.368	960	1160	0.0	0.6	2.168	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1380	345	6	2603	0.530	1379	1164	0.8	1.1	2.937	A
2 - New Access	40	10	1370	1149	0.035	40	15	0.0	0.0	3.247	A
3 - A6195 North	1149	287	22	2615	0.439	1148	1388	0.6	0.8	2.452	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1690	423	8	2602	0.649	1687	1425	1.1	1.8	3.922	A
2 - New Access	50	12	1676	962	0.052	49	19	0.0	0.1	3.947	A
3 - A6195 North	1407	352	27	2612	0.539	1406	1698	0.8	1.2	2.981	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1690	423	8	2602	0.649	1690	1427	1.8	1.8	3.945	A
2 - New Access	50	12	1679	960	0.052	50	19	0.1	0.1	3.954	A
3 - A6195 North	1407	352	28	2612	0.539	1407	1701	1.2	1.2	2.988	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1380	345	6	2603	0.530	1383	1167	1.8	1.1	2.955	A
2 - New Access	40	10	1374	1146	0.035	41	15	0.1	0.0	3.257	A
3 - A6195 North	1149	287	23	2615	0.439	1150	1392	1.2	0.8	2.459	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1156	289	5	2604	0.444	1157	977	1.1	0.8	2.489	A
2 - New Access	34	8	1149	1283	0.026	34	13	0.0	0.0	2.882	A
3 - A6195 North	962	241	19	2618	0.368	963	1165	0.8	0.6	2.175	A

2029 Design Sensitivity - No Link Road, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	3.29	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	2029 Design Sensitivity - No Link Road	AM	ONE HOUR	07:00	08:30	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	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	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 South		ONE HOUR	✓	1277	100.000
2 - New Access		ONE HOUR	✓	20	100.000
3 - A6195 North		ONE HOUR	✓	1448	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		1 - A6195 South	2 - New Access	3 - A6195 North
From	1 - A6195 South	0	32	1245
	2 - New Access	12	0	8
	3 - A6195 North	1424	24	0

Vehicle Mix

HV %s

	To			
		1 - A6195 South	2 - New Access	3 - A6195 North
1 - A6195 South		0	0	0

From	2 - New Access	0	0	0
	3 - A6195 North	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - A6195 South	0.54	3.04	1.2	A	1172	1758
2 - New Access	0.02	3.20	0.0	A	18	28
3 - A6195 North	0.61	3.50	1.5	A	1329	1993

Main Results for each time segment

07:00 - 07:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	961	240	18	2595	0.371	959	1078	0.0	0.6	2.198	A
2 - New Access	15	4	935	1414	0.011	15	42	0.0	0.0	2.571	A
3 - A6195 North	1090	273	9	2625	0.415	1087	941	0.0	0.7	2.337	A

07:15 - 07:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1148	287	22	2592	0.443	1147	1290	0.6	0.8	2.490	A
2 - New Access	18	4	1118	1302	0.014	18	50	0.0	0.0	2.802	A
3 - A6195 North	1302	325	11	2624	0.496	1301	1126	0.7	1.0	2.717	A

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1406	352	26	2589	0.543	1404	1579	0.8	1.2	3.036	A
2 - New Access	22	6	1369	1149	0.019	22	62	0.0	0.0	3.193	A
3 - A6195 North	1594	399	13	2622	0.608	1592	1378	1.0	1.5	3.487	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1406	352	26	2589	0.543	1406	1581	1.2	1.2	3.043	A
2 - New Access	22	6	1371	1148	0.019	22	62	0.0	0.0	3.195	A
3 - A6195 North	1594	399	13	2622	0.608	1594	1380	1.5	1.5	3.501	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1148	287	22	2592	0.443	1150	1293	1.2	0.8	2.497	A
2 - New Access	18	4	1121	1301	0.014	18	50	0.0	0.0	2.805	A
3 - A6195 North	1302	325	11	2624	0.496	1304	1128	1.5	1.0	2.733	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	961	240	18	2595	0.371	962	1082	0.8	0.6	2.206	A

2 - New Access	15	4	938	1413	0.011	15	42	0.0	0.0	2.575	A
3 - A6195 North	1090	273	9	2625	0.415	1091	944	1.0	0.7	2.349	A

2029 Design Sensitivity - No Link Road, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3	3.64	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	2029 Design Sensitivity - No Link Road	PM	ONE HOUR	16:15	17:45	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	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	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 South		ONE HOUR	✓	1530	100.000
2 - New Access		ONE HOUR	✓	92	100.000
3 - A6195 North		ONE HOUR	✓	1348	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		1 - A6195 South	2 - New Access	3 - A6195 North
From	1 - A6195 South	0	20	1510
	2 - New Access	52	0	40
	3 - A6195 North	1333	15	0

Vehicle Mix

HV %s

	To			
		1 - A6195 South	2 - New Access	3 - A6195 North
1 - A6195 South		0	0	0

From	2 - New Access	0	0	0
	3 - A6195 North	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS	Av. Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - A6195 South	0.65	3.95	1.8	A	1404	2106
2 - New Access	0.10	4.14	0.1	A	84	127
3 - A6195 North	0.57	3.26	1.3	A	1237	1855

Main Results for each time segment

16:15 - 16:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1152	288	11	2600	0.443	1149	1040	0.0	0.8	2.476	A
2 - New Access	69	17	1134	1293	0.054	69	26	0.0	0.1	2.940	A
3 - A6195 North	1015	254	39	2603	0.390	1012	1164	0.0	0.6	2.259	A

16:30 - 16:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1375	344	13	2598	0.529	1374	1244	0.8	1.1	2.939	A
2 - New Access	83	21	1356	1157	0.071	83	31	0.1	0.1	3.349	A
3 - A6195 North	1212	303	47	2597	0.467	1211	1392	0.6	0.9	2.596	A

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1685	421	16	2596	0.649	1682	1523	1.1	1.8	3.927	A
2 - New Access	101	25	1660	972	0.104	101	38	0.1	0.1	4.136	A
3 - A6195 North	1484	371	57	2589	0.573	1482	1704	0.9	1.3	3.246	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1685	421	17	2596	0.649	1685	1525	1.8	1.8	3.950	A
2 - New Access	101	25	1662	970	0.104	101	39	0.1	0.1	4.144	A
3 - A6195 North	1484	371	57	2589	0.573	1484	1707	1.3	1.3	3.256	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1375	344	14	2598	0.529	1378	1247	1.8	1.1	2.959	A
2 - New Access	83	21	1360	1155	0.072	83	32	0.1	0.1	3.361	A
3 - A6195 North	1212	303	47	2597	0.467	1214	1396	1.3	0.9	2.605	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 South	1152	288	11	2600	0.443	1153	1044	1.1	0.8	2.490	A

2 - New Access	69	17	1138	1290	0.054	69	26	0.1	0.1	2.950	A
3 - A6195 North	1015	254	39	2603	0.390	1016	1168	0.9	0.6	2.271	A

Junctions 9			
ARCADY 9 - Roundabout Module			
Version: 9.5.0.6896 © Copyright TRL Limited, 2018			
For sales and distribution information, program advice and maintenance, contact TRL: +44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk			
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: 191023 Indicative Shortwood Way Proposed Model.j9
Path: L:\Rockingham - 18005\ANALYSIS\ARCADY\J9files
Report generation date: 16/12/2019 15:53:42

- »(Default Analysis Set) - 2029 Base, AM
- »(Default Analysis Set) - 2029 Base , PM
- »(Default Analysis Set) - 2029 Design, AM
- »(Default Analysis Set) - 2029 Design, PM
- »(Default Analysis Set) - 2029 Design Sensitivity, AM
- »(Default Analysis Set) - 2029 Design Sensitivity, PM
- »(Default Analysis Set) - 2029 Design Sensitivity - No Link Road, AM
- »(Default Analysis Set) - 2029 Design Sensitivity - No Link Road, PM

Summary of junction performance

	AM				PM			
	Q (PCU)	Delay (s)	RFC	LOS	Q (PCU)	Delay (s)	RFC	LOS
A1 - 2029 Base								
1 - A6195 (S)	1.0	2.97	0.50	A	1.7	3.92	0.63	A
2 - Shortwood Way	0.1	4.82	0.06	A	0.3	7.29	0.21	A
3 - A6195 (N)	1.5	3.77	0.61	A	1.0	2.95	0.49	A
4 - Proposed Access	0.0	0.00	0.00	A	0.0	0.00	0.00	A
A1 - 2029 Design								
1 - A6195 (S)	1.3	3.36	0.56	A	2.1	4.65	0.68	A
2 - Shortwood Way	0.1	5.34	0.07	A	0.3	8.64	0.24	A
3 - A6195 (N)	1.9	4.44	0.65	A	1.0	3.09	0.51	A
4 - Proposed Access	0.1	5.95	0.10	A	0.2	5.29	0.16	A
A1 - 2029 Design Sensitivity								
1 - A6195 (S)	1.4	3.65	0.59	A	2.7	5.49	0.73	A
2 - Shortwood Way	0.1	5.81	0.08	A	0.4	10.24	0.27	B
3 - A6195 (N)	2.1	4.81	0.68	A	1.2	3.46	0.55	A
4 - Proposed Access	0.5	8.36	0.35	A	0.3	5.95	0.25	A
A1 - 2029 Design Sensitivity - No Link Road								
1 - A6195 (S)	1.3	3.51	0.57	A	2.8	5.85	0.74	A
2 - Shortwood Way	0.1	5.58	0.07	A	0.4	11.16	0.29	B
3 - A6195 (N)	2.2	4.95	0.69	A	1.2	3.41	0.54	A
4 - Proposed Access	0.3	6.88	0.21	A	0.7	7.55	0.40	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of Av. delay per arriving vehicle.

File summary

File Description

Title	Proposed Shortwood Way Roundabout
Location	Birdwell

Site number	
Date	31/10/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	KG
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Av. delay units	Total delay units	Rate of delay units
m	kph	PCU	PCU	perHour	s	-Min	perMin

Analysis Options

Calculate Q Percentiles	Calculate residual capacity	RFC Threshold	Av. Delay threshold (s)	Q 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)
D11	2029 Base	AM	ONE HOUR	07:00	08:30	15
D12	2029 Base	PM	ONE HOUR	16:15	17:45	15
D13	2029 Design	AM	ONE HOUR	07:00	08:30	15
D14	2029 Design	PM	ONE HOUR	16:15	17:45	15
D15	2029 Design Sensitivity	AM	ONE HOUR	07:00	08:30	15
D16	2029 Design Sensitivity	PM	ONE HOUR	16:15	17:45	15
D17	2029 Design Sensitivity - No Link Road	AM	ONE HOUR	07:00	08:30	15
D18	2029 Design Sensitivity - No Link Road	PM	ONE HOUR	16:15	17:45	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	(Default Analysis Set)	100.000

(Default Analysis Set) - 2029 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout		1, 2, 3, 4	3.43	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	A6195 (S)	
2	Shortwood Way	
3	A6195 (N)	
4	Proposed Access	

Roundabout Geometry

Arm	V (m)	E (m)	I' (m)	R (m)	D (m)	PHI (deg)	Exit only
1 - A6195 (S)	8.00	8.00	0.0	21.3	60.0	25.0	
2 - Shortwood Way	3.60	6.00	5.1	20.7	60.0	27.0	
3 - A6195 (N)	8.00	8.00	0.0	14.7	60.0	21.0	
4 - Proposed Access	3.65	6.40	6.0	20.0	60.0	24.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A6195 (S)	0.696	2473
2 - Shortwood Way	0.508	1398
3 - A6195 (N)	0.692	2457
4 - Proposed Access	0.523	1474

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)
D11	2029 Base	AM	ONE HOUR	07:00	08:30	15

Vehicle mix source	PCU Factor for a HV (PCU)

HV Percentages	2.00
----------------	------

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 (S)		✓	1120	100.000
2 - Shortwood Way		✓	46	100.000
3 - A6195 (N)		✓	1340	100.000
4 - Proposed Access		✓	0	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	0	47	1073	0
	2 - Shortwood Way	34	0	12	0
	3 - A6195 (N)	1301	39	0	0
	4 - Proposed Access	0	0	0	0

Vehicle Mix

HV %s

	To				
		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	0	0	0	0
	2 - Shortwood Way	0	0	0	0
	3 - A6195 (N)	0	0	0	0
	4 - Proposed Access	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS
1 - A6195 (S)	0.50	2.97	1.0	A
2 - Shortwood Way	0.06	4.82	0.1	A
3 - A6195 (N)	0.61	3.77	1.5	A
4 - Proposed Access	0.00	0.00	0.0	A

Main Results for each time segment

07:00 - 07:15

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 - A6195 (S)	843	29	2453	0.344	841	0.5	2.230	A
2 - Shortwood Way	35	806	988	0.035	34	0.0	3.773	A
3 - A6195 (N)	1009	25	2439	0.414	1006	0.7	2.508	A
4 - Proposed Access	0	1032	934	0.000	0	0.0	0.000	A

07:15 - 07:30

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 - A6195 (S)	1007	35	2449	0.411	1006	0.7	2.494	A

2 - Shortwood Way	41	964	908	0.046	41	0.0	4.152	A
3 - A6195 (N)	1205	31	2436	0.495	1204	1.0	2.918	A
4 - Proposed Access	0	1234	828	0.000	0	0.0	0.000	A

07:30 - 07:45

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 - A6195 (S)	1233	43	2443	0.505	1232	1.0	2.969	A
2 - Shortwood Way	51	1180	798	0.063	51	0.1	4.814	A
3 - A6195 (N)	1475	37	2431	0.607	1473	1.5	3.751	A
4 - Proposed Access	0	1511	683	0.000	0	0.0	0.000	A

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 - A6195 (S)	1233	43	2443	0.505	1233	1.0	2.973	A
2 - Shortwood Way	51	1181	798	0.063	51	0.1	4.818	A
3 - A6195 (N)	1475	37	2431	0.607	1475	1.5	3.765	A
4 - Proposed Access	0	1513	682	0.000	0	0.0	0.000	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 - A6195 (S)	1007	35	2449	0.411	1008	0.7	2.502	A
2 - Shortwood Way	41	966	907	0.046	41	0.0	4.159	A
3 - A6195 (N)	1205	31	2436	0.495	1207	1.0	2.933	A
4 - Proposed Access	0	1237	826	0.000	0	0.0	0.000	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 - A6195 (S)	843	29	2453	0.344	844	0.5	2.239	A
2 - Shortwood Way	35	808	987	0.035	35	0.0	3.782	A
3 - A6195 (N)	1009	26	2439	0.414	1010	0.7	2.522	A
4 - Proposed Access	0	1036	932	0.000	0	0.0	0.000	A

(Default Analysis Set) - 2029 Base , PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout		1, 2, 3, 4	3.68	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)
D12	2029 Base	PM	ONE HOUR	16:15	17:45	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 (S)		✓	1407	100.000
2 - Shortwood Way		✓	121	100.000
3 - A6195 (N)		✓	1065	100.000
4 - Proposed Access		✓	0	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	1	31	1375	0
	2 - Shortwood Way	84	0	37	0
	3 - A6195 (N)	1057	6	2	0
	4 - Proposed Access	0	0	0	0

Vehicle Mix

HV %s

	To				
		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	0	0	0	0
	2 - Shortwood Way	0	0	0	0

3 - A6195 (N)	0	0	0	0
4 - Proposed Access	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS
1 - A6195 (S)	0.63	3.92	1.7	A
2 - Shortwood Way	0.21	7.29	0.3	A
3 - A6195 (N)	0.49	2.95	1.0	A
4 - Proposed Access	0.00	0.00	0.0	A

Main Results for each time segment

16:15 - 16:30

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 - A6195 (S)	1059	6	2469	0.429	1056	0.7	2.543	A
2 - Shortwood Way	91	1035	872	0.104	91	0.1	4.602	A
3 - A6195 (N)	802	64	2413	0.332	800	0.5	2.228	A
4 - Proposed Access	0	863	1022	0.000	0	0.0	0.000	A

16:30 - 16:45

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 - A6195 (S)	1265	7	2468	0.512	1264	1.0	2.986	A
2 - Shortwood Way	109	1238	769	0.141	109	0.2	5.448	A
3 - A6195 (N)	957	76	2404	0.398	957	0.7	2.485	A
4 - Proposed Access	0	1033	933	0.000	0	0.0	0.000	A

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 - A6195 (S)	1549	9	2467	0.628	1547	1.7	3.901	A
2 - Shortwood Way	133	1515	628	0.212	133	0.3	7.257	A
3 - A6195 (N)	1173	93	2392	0.490	1171	1.0	2.945	A
4 - Proposed Access	0	1265	812	0.000	0	0.0	0.000	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 - A6195 (S)	1549	9	2467	0.628	1549	1.7	3.921	A
2 - Shortwood Way	133	1517	627	0.212	133	0.3	7.286	A
3 - A6195 (N)	1173	94	2392	0.490	1173	1.0	2.951	A
4 - Proposed Access	0	1266	811	0.000	0	0.0	0.000	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 - A6195 (S)	1265	7	2468	0.512	1267	1.1	3.005	A
2 - Shortwood Way	109	1241	767	0.142	109	0.2	5.472	A
3 - A6195 (N)	957	77	2404	0.398	959	0.7	2.492	A
4 - Proposed Access	0	1035	932	0.000	0	0.0	0.000	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 - A6195 (S)	1059	6	2469	0.429	1060	0.8	2.559	A
2 - Shortwood Way	91	1039	870	0.105	91	0.1	4.622	A
3 - A6195 (N)	802	64	2413	0.332	802	0.5	2.236	A
4 - Proposed Access	0	867	1020	0.000	0	0.0	0.000	A

(Default Analysis Set) - 2029 Design, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout		1, 2, 3, 4	4.00	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)
D13	2029 Design	AM	ONE HOUR	07:00	08:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 (S)		✓	1234	100.000
2 - Shortwood Way		✓	46	100.000
3 - A6195 (N)		✓	1397	100.000
4 - Proposed Access		✓	60	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	0	47	1080	107
	2 - Shortwood Way	34	0	12	0
	3 - A6195 (N)	1321	39	0	37
	4 - Proposed Access	44	0	16	0

Vehicle Mix

HV %s

	To				
		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	0	0	0	0
	2 - Shortwood Way	0	0	0	0

3 - A6195 (N)	0	0	0	0
4 - Proposed Access	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS
1 - A6195 (S)	0.56	3.36	1.3	A
2 - Shortwood Way	0.07	5.34	0.1	A
3 - A6195 (N)	0.65	4.44	1.9	A
4 - Proposed Access	0.10	5.95	0.1	A

Main Results for each time segment

07:00 - 07:15

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 - A6195 (S)	929	41	2445	0.380	927	0.6	2.367	A
2 - Shortwood Way	35	903	939	0.037	34	0.0	3.980	A
3 - A6195 (N)	1052	106	2384	0.441	1049	0.8	2.691	A
4 - Proposed Access	45	1046	926	0.049	45	0.1	4.084	A

07:15 - 07:30

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 - A6195 (S)	1109	49	2439	0.455	1108	0.8	2.704	A
2 - Shortwood Way	41	1081	849	0.049	41	0.1	4.457	A
3 - A6195 (N)	1256	127	2369	0.530	1255	1.1	3.224	A
4 - Proposed Access	54	1252	819	0.066	54	0.1	4.707	A

07:30 - 07:45

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 - A6195 (S)	1359	60	2431	0.559	1357	1.3	3.345	A
2 - Shortwood Way	51	1323	726	0.070	51	0.1	5.330	A
3 - A6195 (N)	1538	155	2350	0.655	1535	1.9	4.404	A
4 - Proposed Access	66	1532	672	0.098	66	0.1	5.936	A

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 - A6195 (S)	1359	61	2431	0.559	1359	1.3	3.355	A
2 - Shortwood Way	51	1325	725	0.070	51	0.1	5.337	A
3 - A6195 (N)	1538	155	2350	0.655	1538	1.9	4.436	A
4 - Proposed Access	66	1535	671	0.099	66	0.1	5.954	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 - A6195 (S)	1109	50	2439	0.455	1111	0.8	2.716	A
2 - Shortwood Way	41	1083	848	0.049	41	0.1	4.465	A
3 - A6195 (N)	1256	127	2369	0.530	1259	1.1	3.250	A
4 - Proposed Access	54	1256	816	0.066	54	0.1	4.722	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 - A6195 (S)	929	41	2444	0.380	930	0.6	2.378	A
2 - Shortwood Way	35	907	937	0.037	35	0.0	3.988	A
3 - A6195 (N)	1052	106	2383	0.441	1053	0.8	2.708	A
4 - Proposed Access	45	1051	924	0.049	45	0.1	4.098	A

(Default Analysis Set) - 2029 Design, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout		1, 2, 3, 4	4.25	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)
D14	2029 Design	PM	ONE HOUR	16:15	17:45	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 (S)		✓	1517	100.000
2 - Shortwood Way		✓	121	100.000
3 - A6195 (N)		✓	1083	100.000
4 - Proposed Access		✓	116	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	1	32	1438	46
	2 - Shortwood Way	84	0	37	0
	3 - A6195 (N)	1063	6	2	12
	4 - Proposed Access	87	0	29	0

Vehicle Mix

HV %s

	To				
		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	0	0	0	0
	2 - Shortwood Way	0	0	0	0

3 - A6195 (N)	0	0	0	0
4 - Proposed Access	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS
1 - A6195 (S)	0.68	4.65	2.1	A
2 - Shortwood Way	0.24	8.64	0.3	A
3 - A6195 (N)	0.51	3.09	1.0	A
4 - Proposed Access	0.16	5.29	0.2	A

Main Results for each time segment

16:15 - 16:30

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 - A6195 (S)	1142	28	2454	0.465	1139	0.9	2.730	A
2 - Shortwood Way	91	1138	820	0.111	91	0.1	4.933	A
3 - A6195 (N)	815	98	2389	0.341	813	0.5	2.281	A
4 - Proposed Access	87	868	1020	0.086	87	0.1	3.857	A

16:30 - 16:45

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 - A6195 (S)	1364	33	2450	0.557	1362	1.2	3.305	A
2 - Shortwood Way	109	1361	706	0.154	109	0.2	6.021	A
3 - A6195 (N)	974	118	2376	0.410	973	0.7	2.565	A
4 - Proposed Access	104	1038	930	0.112	104	0.1	4.357	A

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 - A6195 (S)	1670	41	2445	0.683	1667	2.1	4.604	A
2 - Shortwood Way	133	1666	552	0.241	133	0.3	8.578	A
3 - A6195 (N)	1192	144	2358	0.506	1191	1.0	3.084	A
4 - Proposed Access	128	1271	809	0.158	127	0.2	5.284	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 - A6195 (S)	1670	41	2445	0.683	1670	2.1	4.646	A
2 - Shortwood Way	133	1669	550	0.242	133	0.3	8.636	A
3 - A6195 (N)	1192	144	2357	0.506	1192	1.0	3.089	A
4 - Proposed Access	128	1273	808	0.158	128	0.2	5.293	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 - A6195 (S)	1364	33	2450	0.557	1367	1.3	3.334	A
2 - Shortwood Way	109	1366	704	0.155	109	0.2	6.060	A
3 - A6195 (N)	974	118	2375	0.410	975	0.7	2.574	A
4 - Proposed Access	104	1041	929	0.112	105	0.1	4.368	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 - A6195 (S)	1142	28	2454	0.465	1144	0.9	2.752	A
2 - Shortwood Way	91	1143	817	0.111	91	0.1	4.960	A
3 - A6195 (N)	815	99	2389	0.341	816	0.5	2.291	A
4 - Proposed Access	87	871	1018	0.086	87	0.1	3.869	A

(Default Analysis Set) - 2029 Design Sensitivity, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout		1, 2, 3, 4	4.58	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)
D15	2029 Design Sensitivity	AM	ONE HOUR	07:00	08:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 (S)		✓	1271	100.000
2 - Shortwood Way		✓	46	100.000
3 - A6195 (N)		✓	1433	100.000
4 - Proposed Access		✓	210	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
From		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
	1 - A6195 (S)	0	47	1086	138
	2 - Shortwood Way	34	0	12	0
	3 - A6195 (N)	1336	39	0	58
	4 - Proposed Access	133	0	77	0

Vehicle Mix

HV %s

	To			

		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	0	0	0	0
	2 - Shortwood Way	0	0	0	0
	3 - A6195 (N)	0	0	0	0
	4 - Proposed Access	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS
1 - A6195 (S)	0.59	3.65	1.4	A
2 - Shortwood Way	0.08	5.81	0.1	A
3 - A6195 (N)	0.68	4.81	2.1	A
4 - Proposed Access	0.35	8.36	0.5	A

Main Results for each time segment

07:00 - 07:15

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 - A6195 (S)	957	87	2413	0.397	954	0.7	2.464	A
2 - Shortwood Way	35	977	902	0.038	34	0.0	4.151	A
3 - A6195 (N)	1079	129	2368	0.456	1076	0.8	2.779	A
4 - Proposed Access	158	1057	920	0.172	157	0.2	4.712	A

07:15 - 07:30

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 - A6195 (S)	1143	104	2401	0.476	1142	0.9	2.856	A
2 - Shortwood Way	41	1168	804	0.051	41	0.1	4.718	A
3 - A6195 (N)	1288	154	2350	0.548	1287	1.2	3.381	A
4 - Proposed Access	189	1265	812	0.233	188	0.3	5.771	A

07:30 - 07:45

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 - A6195 (S)	1399	127	2385	0.587	1397	1.4	3.638	A
2 - Shortwood Way	51	1430	671	0.075	51	0.1	5.798	A
3 - A6195 (N)	1578	189	2326	0.678	1574	2.1	4.766	A
4 - Proposed Access	231	1548	664	0.348	230	0.5	8.288	A

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 - A6195 (S)	1399	128	2384	0.587	1399	1.4	3.654	A
2 - Shortwood Way	51	1432	670	0.076	51	0.1	5.809	A
3 - A6195 (N)	1578	189	2326	0.678	1578	2.1	4.811	A
4 - Proposed Access	231	1551	662	0.349	231	0.5	8.356	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 - A6195 (S)	1143	105	2400	0.476	1145	0.9	2.872	A

2 - Shortwood Way	41	1172	803	0.052	41	0.1	4.730	A
3 - A6195 (N)	1288	155	2350	0.548	1292	1.2	3.412	A
4 - Proposed Access	189	1270	809	0.233	190	0.3	5.821	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 - A6195 (S)	957	88	2412	0.397	958	0.7	2.476	A
2 - Shortwood Way	35	981	900	0.038	35	0.0	4.161	A
3 - A6195 (N)	1079	130	2367	0.456	1080	0.8	2.802	A
4 - Proposed Access	158	1062	918	0.172	158	0.2	4.744	A

(Default Analysis Set) - 2029 Design Sensitivity, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout		1, 2, 3, 4	4.95	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)
D16	2029 Design Sensitivity	PM	ONE HOUR	16:15	17:45	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 (S)		✓	1607	100.000
2 - Shortwood Way		✓	121	100.000
3 - A6195 (N)		✓	1142	100.000
4 - Proposed Access		✓	181	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
From		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
	1 - A6195 (S)	1	32	1451	123
	2 - Shortwood Way	84	0	37	0
	3 - A6195 (N)	1069	6	2	65
	4 - Proposed Access	125	0	56	0

Vehicle Mix

HV %s

	To			

		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	0	0	0	0
	2 - Shortwood Way	0	0	0	0
	3 - A6195 (N)	0	0	0	0
	4 - Proposed Access	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS
1 - A6195 (S)	0.73	5.49	2.7	A
2 - Shortwood Way	0.27	10.24	0.4	B
3 - A6195 (N)	0.55	3.46	1.2	A
4 - Proposed Access	0.25	5.95	0.3	A

Main Results for each time segment

16:15 - 16:30

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 - A6195 (S)	1210	48	2440	0.496	1206	1.0	2.907	A
2 - Shortwood Way	91	1225	775	0.117	91	0.1	5.254	A
3 - A6195 (N)	860	156	2349	0.366	857	0.6	2.411	A
4 - Proposed Access	136	872	1017	0.134	136	0.2	4.080	A

16:30 - 16:45

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 - A6195 (S)	1445	57	2433	0.594	1443	1.4	3.629	A
2 - Shortwood Way	109	1466	653	0.167	109	0.2	6.607	A
3 - A6195 (N)	1027	187	2328	0.441	1026	0.8	2.763	A
4 - Proposed Access	163	1044	928	0.175	162	0.2	4.704	A

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 - A6195 (S)	1769	70	2424	0.730	1765	2.6	5.418	A
2 - Shortwood Way	133	1793	487	0.274	133	0.4	10.139	B
3 - A6195 (N)	1257	228	2299	0.547	1256	1.2	3.444	A
4 - Proposed Access	199	1277	805	0.247	199	0.3	5.932	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 - A6195 (S)	1769	70	2424	0.730	1769	2.7	5.494	A
2 - Shortwood Way	133	1798	485	0.275	133	0.4	10.243	B
3 - A6195 (N)	1257	229	2299	0.547	1257	1.2	3.456	A
4 - Proposed Access	199	1279	804	0.248	199	0.3	5.949	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 - A6195 (S)	1445	58	2433	0.594	1449	1.5	3.679	A

2 - Shortwood Way	109	1473	650	0.167	109	0.2	6.671	A
3 - A6195 (N)	1027	188	2327	0.441	1028	0.8	2.776	A
4 - Proposed Access	163	1047	926	0.176	163	0.2	4.721	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 - A6195 (S)	1210	48	2440	0.496	1212	1.0	2.938	A
2 - Shortwood Way	91	1231	772	0.118	91	0.1	5.290	A
3 - A6195 (N)	860	157	2348	0.366	861	0.6	2.420	A
4 - Proposed Access	136	876	1015	0.134	137	0.2	4.096	A

(Default Analysis Set) - 2029 Design Sensitivity - No Link Road, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout		1, 2, 3, 4	4.42	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)
D17	2029 Design Sensitivity - No Link Road	AM	ONE HOUR	07:00	08:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 (S)		✓	1252	100.000
2 - Shortwood Way		✓	46	100.000
3 - A6195 (N)		✓	1466	100.000
4 - Proposed Access		✓	124	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
From		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
	1 - A6195 (S)	0	47	1087	118
	2 - Shortwood Way	34	0	12	0
	3 - A6195 (N)	1340	39	0	87
	4 - Proposed Access	74	0	50	0

Vehicle Mix

HV %s

	To			

		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	0	0	0	0
	2 - Shortwood Way	0	0	0	0
	3 - A6195 (N)	0	0	0	0
	4 - Proposed Access	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS
1 - A6195 (S)	0.57	3.51	1.3	A
2 - Shortwood Way	0.07	5.58	0.1	A
3 - A6195 (N)	0.69	4.95	2.2	A
4 - Proposed Access	0.21	6.88	0.3	A

Main Results for each time segment

07:00 - 07:15

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 - A6195 (S)	943	67	2427	0.388	940	0.6	2.417	A
2 - Shortwood Way	35	942	919	0.038	34	0.0	4.069	A
3 - A6195 (N)	1104	114	2378	0.464	1100	0.9	2.811	A
4 - Proposed Access	93	1060	919	0.102	93	0.1	4.357	A

07:15 - 07:30

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 - A6195 (S)	1126	80	2418	0.466	1125	0.9	2.783	A
2 - Shortwood Way	41	1127	825	0.050	41	0.1	4.592	A
3 - A6195 (N)	1318	137	2363	0.558	1316	1.3	3.437	A
4 - Proposed Access	111	1269	810	0.138	111	0.2	5.152	A

07:30 - 07:45

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 - A6195 (S)	1378	98	2405	0.573	1377	1.3	3.494	A
2 - Shortwood Way	51	1380	697	0.073	51	0.1	5.569	A
3 - A6195 (N)	1614	167	2341	0.689	1610	2.2	4.899	A
4 - Proposed Access	137	1552	662	0.206	136	0.3	6.848	A

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 - A6195 (S)	1378	98	2405	0.573	1378	1.3	3.505	A
2 - Shortwood Way	51	1382	696	0.073	51	0.1	5.578	A
3 - A6195 (N)	1614	167	2341	0.689	1614	2.2	4.948	A
4 - Proposed Access	137	1556	660	0.207	137	0.3	6.880	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 - A6195 (S)	1126	80	2417	0.466	1127	0.9	2.794	A

2 - Shortwood Way	41	1130	824	0.050	41	0.1	4.602	A
3 - A6195 (N)	1318	137	2362	0.558	1322	1.3	3.470	A
4 - Proposed Access	111	1274	807	0.138	112	0.2	5.181	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 - A6195 (S)	943	67	2427	0.388	944	0.6	2.428	A
2 - Shortwood Way	35	946	917	0.038	35	0.0	4.078	A
3 - A6195 (N)	1104	115	2378	0.464	1105	0.9	2.832	A
4 - Proposed Access	93	1065	916	0.102	94	0.1	4.376	A

(Default Analysis Set) - 2029 Design Sensitivity - No Link Road, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout		1, 2, 3, 4	5.34	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)
D18	2029 Design Sensitivity - No Link Road	PM	ONE HOUR	16:15	17:45	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Av. Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 (S)		✓	1609	100.000
2 - Shortwood Way		✓	121	100.000
3 - A6195 (N)		✓	1140	100.000
4 - Proposed Access		✓	294	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	1	32	1467	109
	2 - Shortwood Way	84	0	37	0
	3 - A6195 (N)	1076	6	2	56
	4 - Proposed Access	188	0	106	0

Vehicle Mix

HV %s

	To				

		1 - A6195 (S)	2 - Shortwood Way	3 - A6195 (N)	4 - Proposed Access
From	1 - A6195 (S)	0	0	0	0
	2 - Shortwood Way	0	0	0	0
	3 - A6195 (N)	0	0	0	0
	4 - Proposed Access	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Q (PCU)	Max LOS
1 - A6195 (S)	0.74	5.85	2.8	A
2 - Shortwood Way	0.29	11.16	0.4	B
3 - A6195 (N)	0.54	3.41	1.2	A
4 - Proposed Access	0.40	7.55	0.7	A

Main Results for each time segment

16:15 - 16:30

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 - A6195 (S)	1211	85	2414	0.502	1207	1.0	2.974	A
2 - Shortwood Way	91	1264	756	0.121	91	0.1	5.408	A
3 - A6195 (N)	858	145	2356	0.364	856	0.6	2.396	A
4 - Proposed Access	221	878	1015	0.218	220	0.3	4.525	A

16:30 - 16:45

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 - A6195 (S)	1446	102	2402	0.602	1444	1.5	3.751	A
2 - Shortwood Way	109	1513	629	0.173	108	0.2	6.907	A
3 - A6195 (N)	1025	174	2337	0.439	1024	0.8	2.741	A
4 - Proposed Access	264	1050	924	0.286	264	0.4	5.447	A

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 - A6195 (S)	1772	125	2386	0.742	1766	2.8	5.758	A
2 - Shortwood Way	133	1850	458	0.291	132	0.4	11.020	B
3 - A6195 (N)	1255	213	2310	0.543	1254	1.2	3.404	A
4 - Proposed Access	324	1285	801	0.404	323	0.7	7.503	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 - A6195 (S)	1772	126	2386	0.743	1771	2.8	5.854	A
2 - Shortwood Way	133	1855	456	0.292	133	0.4	11.164	B
3 - A6195 (N)	1255	214	2309	0.544	1255	1.2	3.414	A
4 - Proposed Access	324	1287	800	0.404	324	0.7	7.553	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 - A6195 (S)	1446	103	2402	0.602	1452	1.5	3.809	A

2 - Shortwood Way	109	1520	626	0.174	110	0.2	6.986	A
3 - A6195 (N)	1025	175	2336	0.439	1026	0.8	2.752	A
4 - Proposed Access	264	1053	923	0.286	265	0.4	5.484	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 - A6195 (S)	1211	86	2413	0.502	1213	1.0	3.006	A
2 - Shortwood Way	91	1271	752	0.121	91	0.1	5.448	A
3 - A6195 (N)	858	146	2356	0.364	859	0.6	2.408	A
4 - Proposed Access	221	881	1013	0.219	222	0.3	4.556	A