

Proposed Industrial Estate  
Land West of Dearne Valley Parkway,  
Birdwell, Barnsley  
Transport Assessment

July 2023

Client: Carnell Management Services Ltd

Ref: RHC-22-065-TA

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### Revision History

Revision	Comments	Written By
- July 2023	Initial submission	Andrew Roberts BA (Hons) MCIHT MTPS

## 1.0 INTRODUCTION

- 1.1 Roberts Highway Consultants Limited has been appointed by Carnell Management Services Ltd to provide transport planning support in relation to a planning application for a proposed industrial estate located on land to the west of Dearne Valley Parkway, Birdwell, Barnsley. The broad extent of the site is outlined on **Plan 1**, with a proposed site plan contained within **Appendix A**.

### Plan 1: Contextual Site Location Plan



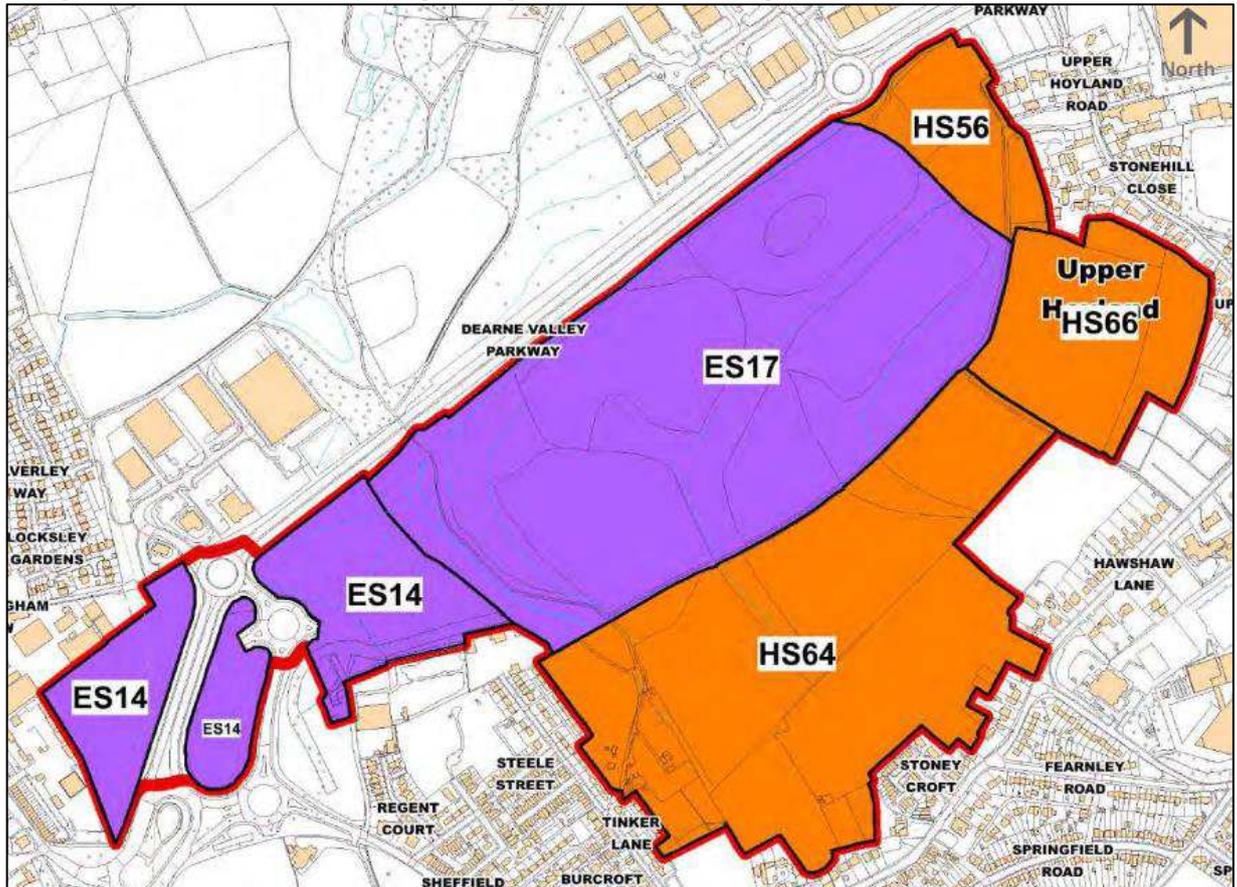
© Google Maps

- 1.2 The site is located within the unitary authority of Barnsley Metropolitan Borough Council, who act as both the Local Planning Authority and the Local Highway Authority for the area. This report will be submitted to Barnsley Metropolitan Borough Council's highways department for consultation.

### **Hoyland North Masterplan Framework**

- 1.3 The application site is allocated within the Barnsley Metropolitan Borough Council Local Plan and forms part of the wider Hoyland North Masterplan Framework. This site is allocated for employment use within policy ES14 (Western Parcel), as can be seen from **Image 1**.

**Image 1: Local Plan Polices Map / Hoyland North Masterplan**



Source: Barnsley Metropolitan Borough Council

- 1.4 The Hoyland North Masterplan Framework was informed by various technical supporting documents. Fore Consulting provided a Transport and Access Appraisal Report which details the various land uses and trip rates associated with the allocated sites within the Hoyland North Masterplan area, including the proposed Industrial Estate on site ES14 (Waddington), which is the subject of this Transport Assessment.
- 1.5 In addition to the above, an outline planning application (ref: 2019/1573) for 102,193sq.m of employment land uses on allocated sites ES15 and ES17 (land to the north and south of Dearne Valley Parkway) known as The Rockingham Phase 2 and 3 development, was approved in August 2020.
- 1.6 The Transport Assessment submitted in support of the planning application was prepared by Mosodi Limited and considers the full impacts of the Hoyland North Masterplan Framework, including the impact of the proposed Industrial Estate, on site ES14 (Waddington) which is the subject of this Transport Assessment.
- 1.7 The principle of employment development on the site and the impact on the local Strategic Road Network have already been established and accepted by both Barnsley Metropolitan Borough Council and National Highways, with this Transport Assessment providing further information in relation to likely vehicle

impacts specific to the site.

### **Methodology and Scoping**

- 1.8 This Transport Assessment has been prepared in accordance with the National Planning Policy Framework (NPPF) and seeks to demonstrate that:
- Appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location.
  - Safe and suitable access to the site can be achieved for all users.
  - Any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.
- 1.9 In addition to the above, this report has been prepared with reference to the following national policy/guidance documents:
- National Planning Policy Framework (July 2021).
  - Inclusive Mobility - A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure.
  - Design Manual for Roads and Bridges.
  - National Highways 'The Strategic Road Network: Planning for The Future' document.
  - Planning Policy Paper (Circular 01/2022) 'Strategic road network and the delivery of sustainable development'.
  - Manual for Streets / Manual for Streets 2.
- 1.10 Engagement with Barnsley Metropolitan Borough Council as Local Highway Authority and National Highways has been undertaken to inform the preparation of this Transport Assessment. The aim has been to establish an agreed set of principles and assumptions upon which the assessments included within this Transport Assessment are based.
- 1.11 A scoping note was issued to Barnsley Metropolitan Borough Council highways on 11<sup>th</sup> April 2023. The scoping note set out the methodological approach for assessing the potential transport impacts of the proposed development on both the local and Strategic Road Network in regards to capacity, road safety and sustainable travel modes. Comments were received from the Barnsley Metropolitan Borough Council highways' Highway Officer on 2<sup>nd</sup> May 2023 (see **Appendix B**).
- 1.12 The same scoping note was also issued to National Highways on 11<sup>th</sup> April 2023, with a formal response received on 5<sup>th</sup> May 2023 (see **Appendix B**).

1.13 In summary, the methodology presented within the scoping note was accepted by both Barnsley Metropolitan Borough Council highways and National Highways as a basis for further assessment therefore, this report will use the principles outlined within the scoping note presented.

### **Report Structure**

1.14 This Transport Assessment will review all existing and proposed highway elements, providing appropriate conclusions to assess the impact of proposed development upon the local highway network. The structure of this report is as follows:

- A summary of relevant national and local planning policy and guidance is located within **Chapter 2.0**.
- A review of the existing site, alongside the local highway network, collisions records and accessibility are covered within **Chapter 3.0**.
- The development proposals, which will include for: development quantum, the proposed site access and car parking arrangements are included within **Chapter 4.0**.
- Analysis of the projected vehicle movements associated with the development proposals and their distribution onto the highway network will be outlined within **Chapter 5.0**.
- Junction Capacity Assessments are included within **Chapter 6.0**.
- Mitigation Measures can be found within **Chapter 7.0**.
- The summary and conclusions of the report can be found within **Chapter 8.0**.

1.15 A separate Framework Travel Plan document has been prepared by Roberts Highway Consultants for the proposed development (report reference: RHC-22-065-TP), and this should be read in conjunction with this Transport Assessment.

### **Disclaimer**

1.16 Roberts Highway Consultants Limited has completed this report for the benefit of the individuals referred to in paragraph 1.1, and any relevant statutory authority, which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from Roberts Highway Consultants Limited.

1.17 Roberts Highway Consultants Limited accepts no responsibility or liability for:

- a) The consequence of this documentation being used for any purpose or project other than that for which it was commissioned.
- b) The issue of this document to any third party with whom approval for use has not been agreed.

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## 2.0 PLANNING POLICY

2.1 This section provides a summary of key national and local policy and guidance relevant to the development and it demonstrates how the development proposals align with these policies and guidance.

### **National Planning Policy Framework**

2.2 The National Planning Policy Framework (NPPF) constitutes guidance for local planning authorities and decision-takers both in drawing up development plans and as a material consideration in determining applications.

2.3 The revised National Planning Policy Framework (NPPF) came into force in July 2021 which updated the February 2019 edition of the NPPF. The presumption in favour of sustainable development remains the core objective of the NPPF.

2.4 Section 9 of the NPPF covers 'Promoting Sustainable Transport'. The NPPF advises that developments should be located and designed where practical to:

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

2.5 The NPPF states, in paragraph 113, that all developments which generate significant amounts of movement should be required to provide a Travel Plan, and the application should be supported by a Transport Statement or Transport Assessment so that the likely impacts of the proposal can be assessed. The document also states that development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.

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**Planning Practice Guidance**

2.6 The Planning Practice Guidance (PPG) supports the NPPF by stating that:

*"Transport Assessments and Statements are ways of assessing the potential transport impacts of developments...The Transport Assessment or Transport Statement may propose mitigation measures where these are necessary to avoid unacceptable or "severe" impacts. Travel Plans can play a pivotal role in taking forward those mitigation measures which relate to on-going and operation of the development".*

2.7 Transport Statements, Transport Assessments and Travel Plans are important as they:

- promote and encourage sustainable travel;
- create "accessible, connected, inclusive communities";
- reduce the impact of trip generation;
- reduce the impact on the environment through reducing carbon emissions;
- improve quality of life, health and road safety, and;
- reduce "the need for new development to increase existing road capacity or provide new roads".

**Planning Practice Guidance**

2.8 The DfT's Local Transport White Paper "Creating Growth, Cutting Carbon – Making Sustainable Transport Happen" set out the framework within which detailed policies could be taken forward with the aim of creating:

*"...a transport system that is an engine for economic growth, but one that is also greener and safer and improves quality of life in our communities."*

2.9 The document supports the continued development of integrated transport policies and seeks to deliver growth whilst reducing the environmental impacts of transport. It also particularly targets shorter journeys, many of which could be undertaken by non-car modes where realistic alternatives are provided, and where interchange between modes can be readily achieved.

**DfT Circular 01/2022 'Strategic Road Network and the Delivery of Sustainable Development'**

2.10 The Strategic Road Network (SRN) and the Delivery of Sustainable Development document sets out the way in which National Highways (formerly Highways England) will engage with the development industry, public bodies and communities to deliver sustainable development and, thus, economic growth, whilst safeguarding the primary function and purpose of the SRN.

2.11 The approach of the DfT Circular 'seeks to make the most efficient use of capacity within the overall

transport network, improve health and wellbeing, and support government policies, strategies and guidance that aim to reduce the negative environmental impacts of development.

2.12 The key policy aims and applications are as follows:

- **12.** *New development should be facilitating a reduction in the need to travel by private car and focused on locations that are or can be made sustainable*
- **42.** *Local planning authorities and development promoters are encouraged to identify any potential impacts on the SRN that may result from development proposals and discuss them with the company at the earliest opportunity. In the first instance, new developments should give priority to walking, wheeling and cycle movements and facilitate access to high-quality public transport where possible. The needs of people with disabilities and reduced mobility should be appropriately addressed in relation to all modes of transport. This can be achieved through good design and proper consideration of the needs of our communities in accordance with local design codes and Manual for Streets.*
- **47.** *Where the company is requested to do so, it will engage with local planning authorities and development promoters at the pre-application stage on the scope of transport assessments / statements and travel plans. This process should determine the inputs and methodology relevant to establishing the potential impacts on the SRN and net zero principles that will inform the design and use of the scheme. Development promoters are strongly encouraged to engage with the company to resolve any potential issues and maximise opportunities for walking, wheeling, cycling, public transport and shared travel, as early as possible.*
- **49.** *A transport assessment for consideration by the company must also consider existing and forecast levels of traffic on the SRN, alongside any additional trips from committed developments that would impact on the same sections (link or junction) as the proposed development. Assumptions underpinning projected levels of traffic should be clearly stated to avoid the default factoring up of baseline traffic. The scenario(s) to be assessed, which depending on the development and local circumstances may include sensitivity testing, should be agreed with the company; where a scenario with particularly high or low growth is proposed, this should be supported by appropriate evidence. Planned improvements to the SRN or local road network should also be considered in any assessment where there is a high degree of certainty that this will be delivered.*

### **Barnsley Local Plan 2019-2033**

2.13 The Barnsley Local Plan was adopted in January 2019 with one of the objectives of the plan to:

*'...to create more and better jobs to improve earnings and increase opportunities for local residents...'*

- 2.14 The proposed site is allocated for employment use within the Councils Adopted Local Plan, site reference ES14. With reference to the allocation, the specific considerations of the site should be as follows:

**Site ES14 Rockingham 8.9ha** – *'The development will be subject to the production of a Masterplan Framework covering a number of sites including housing site references: HS64; HS66; HS56 and employment site references: ES14 and ES17. The development will be expected to: Provide appropriate access to employment site ES17 and housing site HS64; Consider the impact on residential amenity and include appropriate mitigation where necessary; and consider the potential impact on the nearby Shortwood and Hay Green Local Wildlife Sites and include appropriate mitigation where necessary; and Retain the hedgerow along the north edge.'*

- 2.15 There are several policies within the Local Plan which are applicable to this Transport Assessment. A summary of these policies are as follows:

- 2.16 **Policy I1** - Infrastructure and Planning Obligations Development, states that development proposals:

*'...must be supported by appropriate physical, social, economic and communications infrastructure, including provision for broadband. Development must contribute as necessary to meet all on and off-site infrastructure requirements to enable development to take place satisfactorily. Where the necessary provision is not made directly by the developer, contributions will be secured through planning obligations. Where appropriate, pooled contributions will be used to facilitate delivery of the necessary infrastructure.'*

- 2.17 **Policy T1** - Accessibility Priority, states that developers will work with city region partners and other stakeholders transport investment will be set out in Transport Strategy programmes focused on development-transport corridors to:

*'Improve sustainable transport and circulation in the Accessibility Improvement Zone (AIZ) area particularly between Principal Towns'*

*'Implement transport network improvements as supported by evidence from modelling, feasibility studies, consultation, surveys, community engagement etc'*

*'Facilitate sustainable transport links to and from existing and proposed employment, interchange, community and leisure and tourism facilities in the borough, including provision for car parking and enhancing the non-car role of the transport corridor shown on the Accessibility Priorities diagram as 'potential enhanced road based public transport corridor'*

*'Promote high quality public transport linking the AIZ to significant places of business, employment and national / international interchange in the Leeds - Sheffield City Region corridor including neighbouring Wakefield, Kirklees, Doncaster, Sheffield and Rotherham'*

*'Improve direct public transport and freight links to London, Manchester, other Core Cities, national / international interchanges and the Humber ports.'*

2.18 **Policy T3** - New Development and Sustainable Travel, states that new development will be expected to:

*'Be located and designed to reduce the need to travel, be accessible to public transport and meet the needs of pedestrians and cyclists'.*

*'Provide at least the minimum levels of parking for cycles, motorbikes, scooters, mopeds and disabled people set out in the relevant Supplementary Planning Document'.*

*'Provide a Transport Statement or Assessment in line with guidance set out in the National Planning Policy Framework and guidance including where appropriate regard for cross boundary local authority impact'.*

*'Provide a Travel Plan Statement or a Travel Plan in accordance with guidance set out in National Planning Policy Framework including where appropriate regard for cross boundary local authority impacts. Travel plans will be secured through a planning obligation or a planning condition.'*

2.19 The policy goes on to explain that where levels of accessibility through public transport, cycling and walking are unacceptable, developers will be expected to act or make financial contributions, secured through a planning obligation or planning condition.

2.20 **Policy T4** - New development and Transport Safety, states that:

*'New development will be expected to be designed and built to provide all transport users within and surrounding the development with safe, secure and convenient access and movement. If a development is not suitably served by the existing highway, or would create or add to problems of safety or the efficiency of the highway or any adjoining rail infrastructure for users, we will expect developers to take mitigating action or to make a financial contribution to make sure the necessary improvements go ahead. Any contributions will be secured through a planning obligation or planning condition'.*

2.21 **Policy T5** - Reducing the Impact of Road Travel requires that developments will reduce the impact of road travel by:

*'Developing and implementing robust, evidence based air quality action plans to improve air quality'.*

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*'Working with our sub regional partners, fleet and freight operators to improve the efficiency of vehicles and goods delivery, and reduce exhaust emissions'.*

*'Implementing measures to ensure the current road system is used efficiently'*

### **Barnsley Transport Strategy 2014-2033**

2.22 The Barnsley Transport Strategy was developed to improve transport links and public transport offered in the area.

2.23 There are four key transport priorities within the strategy, which the Local Plan supports. These are:

- Promote Economic Growth and Strategic Connections.
- Promote Inclusion, Accessibility, and Better Quality of Life.
- Promote High Quality Natural Environment, Local Air Quality and Climate Change.
- Promote Safety, Security and Health.

2.24 The report states that by 2033 Barnsley will have:

- Enhanced connectivity to the international airports and ports serving the city regions.
- Improved connections between Barnsley, the city regions and other economic centres especially Leeds, Manchester and London.
- A transport system that will meet the needs of businesses to access markets and their supply chains.
- A well-connected employment, recreation, social and housing locations.
- Connections to High-Speed rail and the regional transport hubs.
- Targeted improvements that enable our road network to perform in the most effective way.
- Promote High Quality Natural Environment, Local Air Quality and Climate Change.
- Promote Safety, Security and Health.

### **Policy Summary**

2.25 This Transport Assessment and accompanying Framework Travel Plan have been prepared in accordance with the sustainable development principles set out in national and local policy documents.

### 3.0 EXISTING CONDITIONS

#### Existing Site

- 3.1 The development site, which is irregular in shape, is located to the west of the A6195 Dearne Valley Parkway, circa 400m north of Junction 36 of the M1 Motorway and 1.4km to the southeast of Birdwell.
- 3.2 The site is bound to the north by the existing Costa Coffee, to the northwest by existing industrial buildings, to the southwest by the Council Depot and to the east by the A6195 Dearne Valley Parkway, as shown within **Plan 1**. Access to the site can be achieved via Kestrel Way, to the north.
- 3.3 As previously mentioned, the application site is allocated within the Barnsley Metropolitan Borough Council Local Plan and forms part of the wider Hoyland North Masterplan Framework. This site is allocated for employment use within policy ES14 (Waddington), as can be seen from **Image 1**.
- 3.4 Access to the site can be achieved via the continuation of the southern spur of Kestrel Way, as shown within **Image 2**.

#### **Image 2: Access Location**



© Google. Image dated August 2022.

#### Local Highway Network

- 3.5 The site can be accessed via Kestrel Way, located to the north of the site. Kestrel Way is a cul-de-sac which currently provides access to two separate development parcels to the north and to the south.

- 3.6 To the south, Kestrel Way serves a Petrol Filling Station (PFS), a Costa Coffee drive-thru and a Taco Bell drive-thru fast-food restaurant. To the north, Kestrel Way serves a mix of uses comprising employment and food/drink units.
- 3.7 The carriageway of Kestrel Way measures circa 7.3m in width and comprises of 30mph speed limit. Parking restrictions are located along the carriageway in the form of double yellow lines, with several access points to the commercial premises located directly via the carriageway.
- 3.8 Street-lit footways greater than 2m in width are located along either side of the carriageway, which provide an unbroken pedestrian link to the wider footway network along Dearne Valley Parkway. Dropped kerb crossings, which are located across the access roads into both Costa Coffee and the PFS, benefit from tactile paving. **Image 3** and **Image 4** outline the existing characteristics of the carriageway close to the site.

**Image 3: Kestrel Way (View: North)**



**Image 4: Kestrel Way (View: South)**



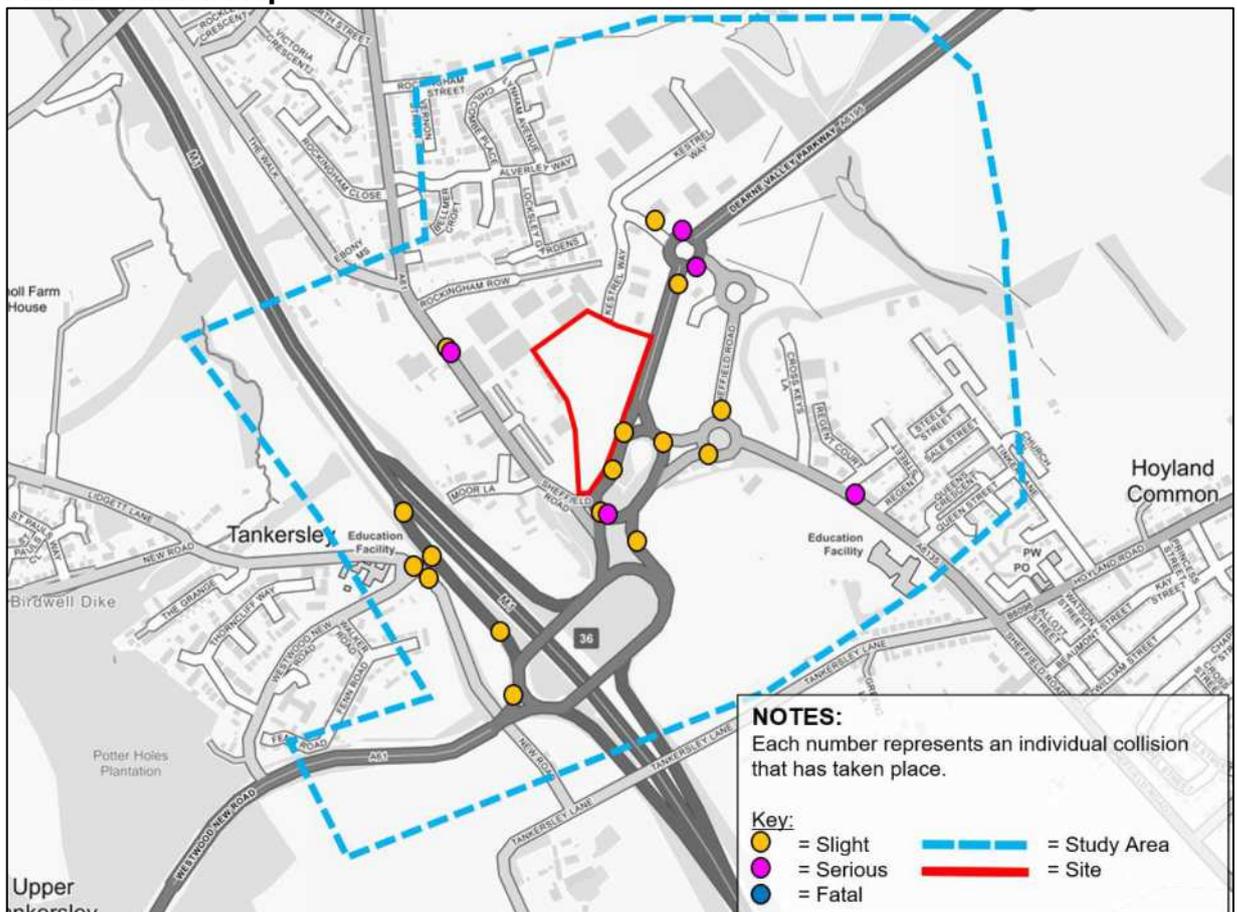
© Google. Images Dated: August 2022.

- 3.9 Kestrel Way links with Rockingham Roundabout, which is a four-arm roundabout connecting with the A6195 Dearne Valley Parkway, located to the east of the site. The A6195 Dearne Valley Parkway is an adopted dual carriageway road subject to the national speed limit along the eastern boundary of the site.
- 3.10 Both the A6195 Dearne Valley Parkway northbound and southbound arms are dual carriageway, with two lanes in each direction, separated by a central reservation. Shared footways/cycleways are situated along both sides of the carriageway adjacent to the site to the south of the Rockingham Roundabout, with no footways provided to the north. However, it is noted that a Public Right of Way (reference: 11) does proceed to the north of the roundabout, setback from the carriageway edge.
- 3.11 The Birdwell Roundabout, located circa 320m to the south of the Rockingham Roundabout is a four-arm signalised roundabout benefitting from a series of bypass lanes. This roundabout was converted from a conventional roundabout to a signalised roundabout as part of the Dearne Valley regeneration, which was completed in September 2017. The A6195 Dearne Valley Parkway forms the northern arm as described previously, with the junction linking with the Tankersley Roundabout (M1 Junction 36) to the south.

**Road Collision Data**

3.12 Personal Injury Collision (PIC) data has been obtained from Crashmap.co.uk for collisions recorded by local police forces using the STATS19 form. The results have been obtained for the most recently available five-year period (01/01/2017 to 31/12/2021) and indicate that 21 collisions occurred within the chosen study area. **Plan 2** outlines the locations of these collisions in context to the site.

**Plan 2: Collision Map**



© OS Mapping

3.13 A single 'slight' vehicle collision occurred along Kestrel Way outside of KFC, involving two vehicles during 2019. A 'serious' collision also occurred along Kestrel Way at the junction with Rockingham Roundabout and involved a single vehicle during 2017. A further two collisions were recorded at the junction along different approach arms.

3.14 A total of five vehicle collisions were recorded at the Birdwell Roundabout however, it should be noted that some of the PIC's outlined within **Plan 2** may have occurred before the reconfiguration of the junction to its signal state.

3.15 With regards to the remainder of the highway network within the study area, and based on the level of information available through the Crashmap, the severity of collisions, and the average accident rate per

annum, there is no available evidence to suggest an existing road safety concern which would be exacerbated by the development proposals.

### **Sustainable Transport Opportunities**

- 3.16 An accessibility assessment has been undertaken to determine the location of key local facilities and amenities in relation to walking and cycling to highlight travel time to these services. **Table 1** provides a summary of key amenities and facilities using these travel modes.

**Table 1: Accessibility Assessment to Local Amenities/Facilities**

Amenity/Facility	Approx. Distance (m)	Approx. Walking Time	Approx. Cycling Time
<b>Retail</b>			
Co-Op Convenience Store	120	1	1
Mace Convenience Store	760	9	3
Aldi	900	11	4
<b>Leisure &amp; Hospitality</b>			
Costa Coffee	80	1	0
Greggs	100	1	0
Taco Bell	160	2	1
Dunkin	280	3	1
KFC	280	3	1
Dearne Valley Farm- Dining and Carvery	360	4	2
McDonalds	460	5	2
Starbucks	500	6	2
The Keys Restaurant	760	9	3
Café 334	900	11	4
Master Fryer Takeaway	900	11	4
The Hare and Hounds Pub	960	11	4
Saville Square Pub	1000	12	4
Mayfair Chinese Takeaway	1100	13	5
<b>Health</b>			
Well Pharmacy	1100	13	5
<b>Other Facilities</b>			
InPost Parcel Locker	80	1	0
BP Petrol Station	140	2	1
Shell Petrol Station	760	9	3
Evri ParcelShop	760	9	3

*\*Assumes a walking speed of 1.4m/s (3.2mph or 5.0kph) taken from the Guidance for Providing for Journeys on Foot (IHT, 2000) and cycling speed of 4m/s (9mph or 14.4kph), taken from Local Transport Note 1/86.*

### **Accessibility on Foot**

- 3.17 The DfT National Travel Survey (England) 2021 found that walking constitutes 31% of all journeys made in a year, and that the average walking trip time was 19 minutes (1.6km). **Table 1** demonstrates that there are numerous key facilities and amenities prospective employees of the site may require within the local area which are located within the 1.6km distance desired by the DfT.

- 3.18 There are yet further facilities and amenities located beyond those outlined within **Table 1**. Diagram 001, attached within **Appendix C**, outlines the location of these facilities and amenities in context to the site.

- 3.19 Direct access to the site can be achieved via Kestrel Way, which adjoins with the A6195 (Dearne Valley Parkway) to the north of the site. Established street-lit footways can be found either side of the carriageway, deemed of suitable width for pedestrians. Dropped kerbs with tactile paving can be found at various junctions surrounding the site, with a crossing in place at the Rockingham Roundabout/Kestrel Way junction. Various Toucan Crossings can be found along both Dearne Valley Parkway to the south of the site and at the Birdwell Roundabout, providing onward travel to Sheffield Road and other surrounding footway networks.
- 3.20 A footpath can be found approximately 200m from the site, which connects the westbound side of Kestrel way with that of Alverley Way. This footpath provides pedestrian access to the site from the well-developed residential area to the west (Birdwell).

### Plan 3: 2km Walking Map Shown in 1km Isochrones

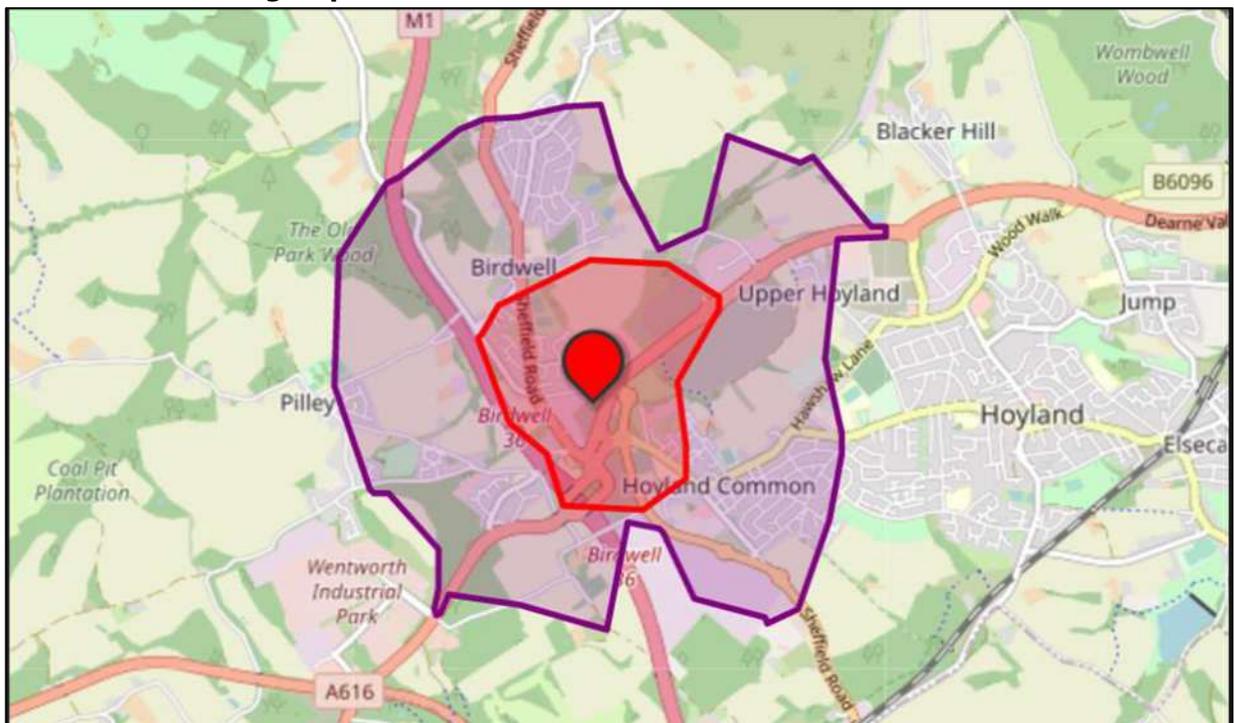


Image Source: [Openrouteservice.org](http://Openrouteservice.org)

- 3.21 **Plan 3** illustrates that the residential areas of Birdwell, Hoyland Common and Upper Hoyland are located within a 2km walking distance of the site. These areas provide further facilities, amenities and public transports opportunities which employees and visitors could utilise as part of a journey to the site.

### **Accessibility by Cycle**

- 3.22 A review of [Sustrains.org.uk](http://Sustrains.org.uk) indicates that National Cycle Route 67 can be joined approximately 1km south of the site. **Plan 4** illustrates that journeys by cycling connect Upper Tankersley with residential areas to the south and east. National Cycle Route 62 can be located approximately 3km to the North of

the site, to the south of Worsbrough. This route forms the west and central sections of The Trans Pennine Trail which is a long-distance path running from coast to coast across northern England.

- 3.23 A local cycle route can be found to the south of the site, at Hoyland Common. This route provides cyclists with an on-road route of travel which terminates at Elsecar Railway Station approximately 3km to the east.

#### Plan 4: National Cycle Network Route Map

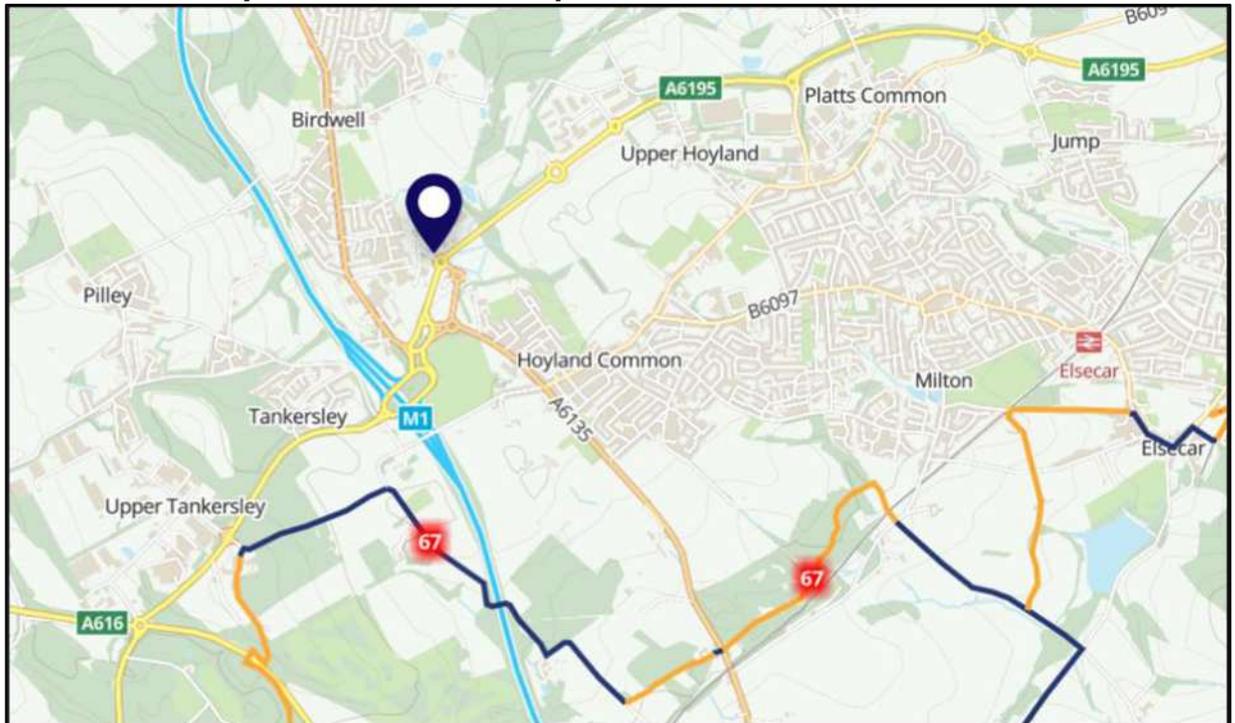


Image Source: Sustrans.org / Map Layer: OS Maps

#### **Accessibility by Bus**

- 3.24 The nearest bus stops to the site are located about 750m eastward, along Sheffield Road, with both an eastbound and a westbound stop available. Each stop is marked by a flag-and-pole displaying bus timetable information. The stops have raised kerbs and a bus cage along the carriageway to indicate their location.
- 3.25 A summary of the bus services which operate from the Sheffield Road bus stops can be found within **Table 2**, alongside additional services which operate within proximity of the site. A public transport plan identifying these stops can be found within **Appendix D**.

**Table 2: Summary of Bus Service Adjacent to Site**

Service	Operating Days	Approx. Operating Times	Approx. Frequency (up to)	Route	Provider
2	Mon-Fri	06:56-22:47	60 mins	Barnsley Town Centre – Sheffield Centre	Stagecoach Yorkshire
	Sat	08:13-22:08			
	Sun	08:27-21:38			
2a	Mon-Fri	06:33-23:33	Six services	Grimethorpe – Sheffield Centre	
	Sat				
	Sun				
66	Mon-Fri	05:44-23:55	60 mins	Barnsley Town Centre- Barnsley Town Centre	
	Sat	06:39-23:55			
	Sun	08:46-23:54			
67	Mon-Fri	05:48-22:41	120 mins	Barnsley Town Centre - Wombwell	
	Sat				
	Sun				18:56-22:56
67a	Mon-Fri	08:03-23:41	120 mins		
	Sat	08:03-23:40			
	Sun	09:51-21:56			
67c	Mon-Fri	17:43	Single Service	Wombwell – Barnsley Town Centre	
	Sat	17:42			
	Sun	09:21-17:21	120 mins		
67b	Mon-Fri	05:44-22:15	Three Services	Maple Road – Barnsley Town Centre	
	Sat				
482	Mon-Fri	14:50	Single Service	Kendray - Kendray	Peter Hodgson Travel
X17	Mon-Fri	07:08-20:53	60 mins	Barnsley Town Centre – Pond Street	Stagecoach Yorkshire
	Sat	07:26-20:53			
	Sun	09:55-17:45			

*Timetable data taken from 'traveline.info' accessed 03/06/2023*

3.26 The bus timetable information demonstrates that employees of the site will be able to use the aforementioned bus services to access residential villages and towns, as well as Sheffield City Centre.

### **Accessibility by Rail**

3.27 The nearest railway station to the site is Elsecar Railway Station, approximately 4km walking distance to the east. Bus service No. 66 provides direct travel from the site to Elsecar Railway Station, with travel times of approximately 20 minutes during peak hours.

3.28 The station benefits from several facilities, with a summary as follows:

- Ticket Machines.
- ATM Machines.
- Bicycle Parking (18 covered spaces and CCTV).
- Car Park (79 Spaces).
- Information services.

- Customer Help Points.

3.29 **Table 3** provides details on rail services to the major destinations from Elsecar Railway Station.

**Table 3: Summary of Main Services Operating from Elsecar Railway Station**

Destination	Frequency (Peak Hours)
Barnsley	30 mins
Sheffield	30 mins
Huddersfield	30 mins

*Timetable data taken from 'traveline.info' accessed 03/06/2023*

3.30 Direct travel from Elsecar Railway Station to destinations such as Barnsley and Sheffield can be achieved within 20 minutes during peak hours. Direct travel to Huddersfield Railway Station can be achieved within an hour.

### **Sustainability Conclusion**

3.31 Upon reviewing the information within this chapter, the site can be described as being in accordance with Paragraph 105 of the NPPF which states:

*'Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes.'*

3.32 The proposed development would be well accommodated by the existing infrastructure within the site's locale, with direct access to public transport links as well as existing amenities.

## 4.0 PROPOSED DEVELOPMENT

### Schedule of Accommodation

4.1 The development proposals will seek planning permission for seven separate units with a total Gross Floor Area (GFA) of 7,253sq.m. A summary of the land uses proposed are as follows:

- E(g)(ii) – Research and development of products or processes.
- E(g)(iii) – Industrial Processes.
- B2 – General Industrial.
- B8 – Storage and distribution.

4.2 The units are likely to be a mix of warehouse/distribution and traditional industrial, with ancillary office space totalling 867sq.m of the 7,253sq.m proposed. A breakdown of the GFA for each of the units is provided within **Table 4**.

**Table 4: Schedule of Accommodation**

	GFA (sq.m)	Parking Spaces	Cycle Spaces	Motorcycle Spaces
Unit 1	945	17	12	2
Unit 2	1,574	24	12	2
Unit 3	1,529	23	12	2
Unit 4	1,911	32	12	2
Unit 5	645	11	12	2
Unit 6	316	6	Shared	Shared
Unit 7	333	6	Shared	Shared
<b>Total</b>	<b>7,253</b>	<b>119</b>	<b>60</b>	<b>10</b>

### Vehicle and Pedestrian Access

4.3 Access to the site for both vehicles and pedestrians will be via the continuation of the industrial access road off Kestrel Way, as outlined within **Image 2**.

4.4 The access road will continue to measure 7.3m width, in keeping with the existing carriageway which serves the commercial units and PFS to the north of the site. Footways measuring a minimum of 2m width will be located either side of the carriageway, with these footways being the only point of access for pedestrians.

### Vehicle Parking

4.5 Page five of the Barnsley Metropolitan Borough Council Parking Supplementary Planning Document (November 2019) sets out the Local Planning Authority's adopted parking standards for B2/B8 developments.

4.6 The site is situated within the 'borough wide' area therefore, the below standards are recommended for developments over 1,000sqm.

- B2 – One Space per 50sq.m
- B8 – One Space per 3 staff or one space per 150sq.m.

4.7 The above standards recommend parking provision could range between 145 car parking spaces should the proposals be solely B2 land use, to 48 vehicle car parking spaces should the proposals be solely B8 land use. Given the likely mix of occupiers at the site, the proposed allocation of 119 spaces (one space per 61sq.m) is considered appropriate.

4.8 The proposed level of car parking will also help to promote access by alternative modes of transport, especially when considering the sustainable location of the development and the potential impacts of the Framework Travel Plan.

4.9 Accessible parking will also be provided at each of the proposed units in accordance with the required Parking Supplementary Planning Document.

#### **Cycle Parking/Storage**

4.10 Cycle storage will be provided within the car parking areas of each unit, with the number of spaces provided in accordance with the Parking Supplementary Planning Document.

#### **Servicing**

4.11 Servicing will be carried out within the site. Refuse vehicles and delivery vehicles will therefore need access to the site via the proposed access point previously mentioned.

4.12 The access road will be designed to adoptable highway standards, with a suitably designed turning head positioned at the end of the internal road. The turning head will allow for the councils refuse vehicle, along with other service vehicles, to turn suitably, being able to exit onto Kestrel Way within a forward gear.

4.13 Waste receptacles will be located within 10m of the highway, in accordance with BS 5906: 2005. This distance is considered suitable for waste operatives to carry a four wheeled container to the refuse vehicle. Where suitable, sufficient turning space will be available within each unit area to allow for refuse vehicle movements.

4.14 Sufficient turning space will be provided within each of the parking areas for HGVs to enter and exit within a forward gear. These areas are marked out as concrete areas on the proposed site plan.

## 5.0 VEHICLE IMPACT

### Traffic Generation

- 5.1 Development traffic from the site has been calculated using the Trip Rate Information Computer System (TRICS), a computer program which assists in estimating trip rates to and from sites. Given that the site will be a mix of B2, B8, E(g)(ii) and E(g)(iii) land uses, it is important to apply the appropriate professional judgement by selecting surveys of sites that are comparable, in terms of scale, type, location and accessibility.
- 5.2 Upon reviewing the TRICS database, the closest land use classification considered replicable to the development proposals would be the land use '02 Employment, Class D Industrial Estate'. Trip rates associated with sites in 'suburban' or 'out of town' locations have been used.
- 5.3 The proposals will comprise a total of 7,253sq.m GFA, with 6,386sq.m being of industrial use and 867sq.m GFA being designated office space within each of the buildings. To ensure for a robust assessment, separate TRICS assessments have been undertaken for the office areas of the buildings, using the TRICS land use '02 Employment, Class A Office'. Trip rates associated with sites in 'suburban' or 'out of town' locations were again used.
- 5.4 A summary of the calculated trip rates and flows can be found within **Table 5** and **Table 6**, with the full TRICS outputs, which have been agreed with both Barnsley Metropolitan Borough Council and National Highways, contained within **Appendix E**.

**Table 5: Vehicle Trip Rates and Trip Generation (Industrial Uses)**

	AM Peak (8am to 9am)			PM Peak (5pm to 6pm)		
	Arrival	Departure	Two-Way	Arrival	Departure	Two-Way
Trip Rates (per 100sq.m)	0.417	0.137	0.554	0.137	0.367	0.504
Trip Generation (6,386q.m)	27	9	36	9	23	32

**Table 6: Vehicle Trip Rates and Trip Generation (Office Uses)**

	AM Peak (8am to 9am)			PM Peak (5pm to 6pm)		
	Arrival	Departure	Two-Way	Arrival	Departure	Two-Way
Trip Rates (per 100sq.m)	2.637	0.177	2.814	0.044	1.817	1.861
Trip Generation (867sq.m)	23	2	25	0	16	16

- 5.5 **Table 7** provides the combined vehicle flows likely to be associated with the proposed development during the generic AM and PM peak periods. These flows have been taken forward as part of the forthcoming development distribution analysis work, to determine the development impact upon local junctions.

**Table 7: Total Development Trip Generation**

	Arrivals	Departures	Two-Way
AM Peak (08:00-09:00)	50	11	61
PM Peak (17:00-18:00)	9	39	48

**Development Distribution & Assignment**

- 5.6 The distribution and assignment of traffic associated with the proposed development has been predicted utilising a gravity model derived from analysis of travel to work patterns for workers within the Barnsley 028 Medium Super Output Area (MSOA), in which the site is situated. Both Barnsley Metropolitan Borough Council and National Highways agreed during the scoping discussions what this approach was acceptable when determining distribution from the proposed development.
- 5.7 The development will be accessed via Kestrel Way, therefore, this will be the point where all development traffic joins the highway network. The resulting distribution model considers traffic travelling between the site and MSOAs for the district of Barnsley, coupled with all districts throughout the rest of the UK.
- 5.8 Google Maps route finder has been used to make route choices based on the distance and/or time taken. Details of proposed assigned distributions are included in **Appendix F**, along with the results of the gravity model. A summary of the distribution is shown in **Table 8**.

**Table 8: Gravity Model Results**

Route	Route	Percentage Split
A	Dearne Valley Parkway	15.1%
B	Ryecroft Bank	4.1%
C	Shortwood Way	0.0%
D	Sheffield Road (E)	4.0%
E	Olympus Way	9.3%
F	M1 SOUTH	30.3%
G	A61	8.9%
H	M1 NORTH	17.8%
I	Sheffield Road (W)	10.6%
ALL		100.0%

- 5.9 Using the results of the gravity model, it was agreed with both Barnsley Metropolitan Borough Council and National Highways during the scoping discussions that the following junctions would require further assessment, based on anticipated vehicle movements associated with the proposed development. The study area is as follows:
- Junction 1: Rockingham Roundabout
  - Junction 2: Bidwell Roundabout (Signal Junction)
  - Junction 3: Tankersley Roundabout (Signal Junction)

5.10 The following section of the report considers the impact of the proposed development on each individual junction.

## 6.0 JUNCTION CAPACITY ASSESSMENTS

6.1 This section of the report lists junctions within the project study area that have been assessed based on the development impact outlined within **Section 5.0** of this report. It includes a summary of the performance of these junctions, based on the model outputs from the baseline junction capacity assessment.

### **Traffic Surveys**

6.2 Manual Classified Turning Counts (CTCs) were undertaken by PCC Traffic Information Consultancy on Tuesday 23<sup>rd</sup> May 2023 to determine the vehicle movements (by classification) at each of the junctions identified within the study area.

6.3 The traffic surveys were undertaken on a neutral weekday within a neutral month (during school term time) and therefore, it is considered that the number of vehicles upon the network is representative of typical traffic conditions. **Plan 5** outlines the location of the CTCs undertaken, with full traffic survey data contained within **Appendix G**.

### **Plan 5: Traffic Survey Locations**



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### **Peak Hours**

6.4 To establish baseline peak hours, the total volume of traffic at the surveyed junctions has been analysed, with the results disaggregated to 15-minute accuracy in accordance with industry practice. The results of

the surveys indicated that the network peak hours across the study junctions were 08:00-09:00 during the weekday AM (12,496 movements) and 16:30-17:30 during the weekday PM (13,600 movements). These peak hours reflect the largest total number of vehicle movements, in terms of Passenger Car Units (PCUs), recorded across the combined surveyed junctions.

- 6.5 During the AM survey period, it was noted that there was an incident along the M1 southbound, which resulted in standstill queuing along the slip road, backing up towards the Rockingham Roundabout. The queuing on the slip road commenced at 07:43, lasting for approximately 17 minutes before clearing at 07:55.
- 6.6 As a result of the incident on the M1, queues were noted to back up to the Rockingham Road roundabout, commencing at 07:52 before clearing at 08:15, lasting for 23 minutes. No such queuing was noted during the PM peak hour. A video log evidencing this can be found within **Appendix H**.
- 6.7 During the PM peak hour (the busiest peak), there were 1,104 more movements on the network when compared to the AM peak hour. Therefore, when evaluating assessment results during the AM peak hour, caution should be taken because of the abnormal conditions recorded. The PM peak hour is a more reliable indicator of "normal" highway conditions and should be given greater consideration as a result.

**TEMPro Factors**

- 6.8 To achieve a 2028 future year, the 2023 baseline flows have been factored using rates obtained from TEMPro 7.2c/NTM dataset RTF 2018 Scenario 1 - Reference for MSOA Barnsley 028. These growth rates are illustrated within **Table 9**.

**Table 9: TEMPro Growth Rates**

Period	AM Peak	PM Peak
2023 - 2028	1.041	1.042

**Committed Developments**

- 6.9 Barnsley Metropolitan Borough Council outlined a series of committed developments which should be included within any assessment work undertaken, above the growth rates outlined within **Table 9**.
- 6.10 A summary of the committed developments which have been considered as part of the assessment work can be found within **Table 10**.

**Table 10: Committed Developments**

Allocation	Allocation/ Application No.	Development Description
ES15, ES17	2019/1573, 2021/1007, 2021/1691, 2023/0015	Hybrid planning application for a development up to 102,193sqm of employment uses (use classes B1/B2 and B8)
ES14	2021/0479	Erection of 3no industrial/warehouse units (use classes B2 and B8 and E(g)(ii) and E(g)(iii) totaling 11,585sqm floorspace
ES13, HS57	2020/0647, 2021/1159	Hybrid planning application for a development up to 103,086sqm of employment uses (use classes B1/B2 and B8)
HS59	2020/0577	Residential development of up to 118 dwellings accessed via Hay Green Lane
-	2021/1150	Residential development of 83 dwellings accessed via Wood Walk

6.11 Vehicle movements associated with the above committed developments have been extracted from the Transport Assessments submitted as part of each planning application and implemented upon the highway network in addition to the 2023 surveyed flows. These committed development flows can be found on the committed development flow diagrams attached within **Appendix I**.

**Modelling Software**

- 6.12 Junctions 10 is a traffic analysis software developed by UK-based transportation engineering company, TRL Limited. The software allows users to formally assess the operational capacity of non-signal junctions along a road network.
- 6.13 The Junctions 10 software has been used within this report to undertake an assessment of the Rockingham Roundabout, to determine the operation of the junction. Junctions 10 software allows a range of traffic flow profiles to be adopted when undertaking peak period model runs. Generally, an RFC (Ratio of Flow to Capacity) of below 0.85 (for roundabout and priority junctions) indicates that a junction operates within capacity for the assessed flows. An RFC of over 1.0 indicates that a junction is operating over capacity.
- 6.14 LinSig3 is a traffic analysis software developed by JCT Consultancy. The software is widely used within the industry to model and analyse signal junctions, allowing users to simulate and optimise the performance of signal-controlled junctions.
- 6.15 LinSig3 has been used within this report to analyse the two signalised junctions within the study area (Birdwell Roundabout and Tankersley Roundabout). For signalised junctions, a Max Degree of Saturation (DOS) value of 0.90 (90%) or less typically demonstrate that a junction arm is operating “within capacity” and is therefore unlikely to experience regular queuing. The Practical Reserve Capacity (PRC) of the whole junction is measured as a percentage, with a positive percentage illustrating that the junction can accept further traffic. A negative percentage states that the junction is operating over capacity.

6.16 The geometry measurements entered into the Junctions 10 and LinSig v3 models have been measured using Ordnance Survey mapping measured in AutoCAD (Junction 1) or through measurements taken from Google earth (Birdwell Roundabout and Tankersley Roundabout).

### **Assessment Scenarios**

6.17 The operational capacity of the study area junctions has been assessed in the following traffic flow scenarios:

- 2023 Base.
- 2028 'Do Minimum' (without the proposed development but with committed developments).
- 2028 'Do Something' (as above but with the proposed development flows).

6.18 As outlined above, the assessments will consider junction operation at a base survey year of 2023 and a future year of 2028 (with and without development). Flow diagrams of the above scenarios can be found within **Appendix J**.

### **Junction 1 Assessment**

6.19 An assessment of the Rockingham Roundabout junction has been undertaken using the industry recognised Junctions 10 modelling software. The junction is located circa 150m to the northeast of the site and comprises of four arms. The layout of the junction is shown within **Plan 6**.

#### **Plan 6: Aerial Image of Junction 1**



© Google Maps

6.20 **Table 11** provides a summary of predicted RFC values and queue lengths for the Rockingham Roundabout during all three scenarios. A geometry measurement drawing along with the capacity assessment results, can be found in **Appendix K**.

**Table 11: Assessment Results of Junction 1**

Arm	2023 Base			
	AM Peak		PM Peak	
	RFC	Queue	RFC	Queue
A6195 North	0.56	1.3	0.61	1.6
Sheffield Road	0.18	0.2	0.22	0.3
A6195 South	0.59	1.6	0.71	2.5
Kestrel Way	0.21	0.3	0.30	0.4
	2028 'Do Minimum'			
A6195 North	0.67	2.1	0.70	2.3
Sheffield Road	0.26	0.4	0.31	0.4
A6195 South	0.70	2.5	0.78	3.4
Kestrel Way	0.25	0.3	0.35	0.5
	2028 'Do Something'			
A6195 North	0.68	2.2	0.71	2.4
Sheffield Road	0.27	0.4	0.32	0.5
A6195 South	0.72	2.7	0.78	3.5
Kestrel Way	0.26	0.4	0.39	0.6

6.21 **Table 11** demonstrates how the Rockingham Roundabout operates within capacity during the AM and PM peak periods during all scenarios considered. The AM peak hour assumed no incident occurred on the M1, representing 'typical' operations at the junction, confirmed by the PM peak hour results.

6.22 Between the 2028 'Do Minimum' scenario and the 2028 'Do Something' scenario, the highest increase in RFC was observed to be 0.04 along the Kestrel Way arm during the PM peak hour. The results outline how the proposed development will have negligible impacts upon the operation of the junction and therefore, no further assessment work has been undertaken.

### **Junction 2 Assessment**

6.23 An assessment of the Birdwell Roundabout has been undertaken using the industry recognised LinSig3 modelling software. The junction is located circa 50m to the south of the site and comprises of four arms.

6.24 The Birdwell Roundabout underwent improvements during 2017, becoming an elongated signalised roundabout junction replacing what was a conventional four arm roundabout linking the A6195 with Junction 36 of the M1. The layout of the junction is shown within **Plan 7**.

**Plan 7: Aerial Image of Junction 2**



© Google Maps

6.25 The councils signal partner Yunex Traffic provided the datasheet for the junction which sets out the junction phasing, staging and intergreens. Saturation flows for each arm were calculated within LinSig based on geometry.

6.26 **Table 12** provides a summary of the LinSig results for the three scenarios considered, with full LinSig results provided within **Appendix L**.

**Table 12: Assessment Results of Junction 2**

Lane Description	2023 Base			
	AM Peak		PM Peak	
	DoS%	Queue	DoS%	Queue
A61 Sheffield Rd (NW) Left	33.5%	3.5	39.8%	3.6
A61 Sheffield Rd (NW) Ahead	82.3%	10.8	79.7%	9.1
A6195 Dearne Valley Pkwy Ahead Left	99.8%	21.8	87.0%	14.2
A6195 Dearne Valley Pkwy Ahead	99.7%	21.5	87.1%	14.3
A6195 Sheffield Rd (E) Ahead	97.0%	14.9	68.7%	5.7
A6195 Sheffield Rd (E) Ahead	81.3%	8.1	93.1%	10.0
A61 (S) Left	53.1%	7.5	59.5%	9.5
A61 (S) Ahead	83.4%	26.3	97.6%	28.3
NW Circ Right	76.8%	10.3	86.6%	16.4
NW Circ Right	98.1%	14.1	28.1%	0.2
NW Circ Right	85.3%	5.6	35.1%	0.3
SW Circ Right	70.4%	0.2	79.3%	0.1
SW Circ Right Right2	70.3%	0.1	80.1%	0.1
NE Circ Right	85.6%	15.9	72.5%	5.9
NE Circ Right Right2	83.9%	15.1	79.0%	7.6
SE Circ Right	85.6%	10.1	95.2%	16.4
SE Circ Right Right2	2.0%	0.1	23.6%	1.9

A6195 Exit Peds Ahead	50.2%	3.5	65.6%	0.0
A6195 Exit Peds Ahead	41.6%	10.8	43.2%	1.1
Practical Reserve Capacity	-10.9%		-11.3%	
<b>2028 'Do Minimum'</b>				
A61 Sheffield Rd (NW) Left	38.3%	4.1	42.9%	3.9
A61 Sheffield Rd (NW) Ahead	88.9%	13.2	82.8%	9.9
A6195 Dearne Valley Pkway Ahead Left	121.8%	75.0	97.8%	23.0
A6195 Dearne Valley Pkway Ahead	127.9%	87.5	97.5%	22.4
A6195 Sheffield Rd (E) Ahead	134.4%	85.2	103.2%	21.2
A6195 Sheffield Rd (E) Ahead	88.9%	10.2	125.7%	40.8
A61 (S) Left	55.9%	8.1	59.1%	9.6
A61 (S) Ahead	85.9%	26.9	99.5%	28.2
NW Circ Right	80.7%	11.0	87.6%	16.9
NW Circ Right	96.4%	12.6	28.0%	0.2
NW Circ Right	98.4%	14.1	36.1%	0.3
SW Circ Right	71.7%	0.2	76.9%	0.2
SW Circ Right Right2	72.4%	0.1	82.0%	0.0
NE Circ Right	82.6%	15.2	79.1%	6.6
NE Circ Right Right2	83.6%	16.1	86.1%	9.0
SE Circ Right	84.5%	9.8	95.8%	16.7
SE Circ Right Right2	1.9%	0.1	21.0%	1.6
A6195 Exit Peds Ahead	51.0%	0.8	63.6%	1.1
A6195 Exit Peds Ahead	46.7%	1.7	46.6%	2.0
Practical Reserve Capacity	-49.3%		-39.6%	
<b>2028 'Do Something'</b>				
A61 Sheffield Rd (NW) Left	39.2%	4.2	43.0%	3.9
A61 Sheffield Rd (NW) Ahead	88.9%	13.2	82.8%	9.9
A6195 Dearne Valley Pkway Ahead Left	122.9%	78.3	99.3%	25.5
A6195 Dearne Valley Pkway Ahead	128.1%	88.1	99.6%	26.1
A6195 Sheffield Rd (E) Ahead	134.4%	85.2	103.2%	21.2
A6195 Sheffield Rd (E) Ahead	88.9%	10.2	125.7%	40.8
A61 (S) Left	55.9%	8.1	59.1%	9.6
A61 (S) Ahead	85.9%	26.9	99.5%	28.2
NW Circ Right	79.8%	10.6	87.4%	16.8
NW Circ Right	96.4%	12.6	28.0%	0.2
NW Circ Right	98.4%	14.1	36.1%	0.3
SW Circ Right	71.7%	0.2	76.9%	0.2
SW Circ Right Right2	72.3%	0.1	81.9%	0.0
NE Circ Right	82.6%	15.2	80.1%	6.7
NE Circ Right Right2	83.6%	16.1	87.5%	9.4
SE Circ Right	84.6%	9.8	96.6%	17.4
SE Circ Right Right2	1.9%	0.1	21.0%	1.6
A6195 Exit Peds Ahead	51.4%	0.8	63.7%	1.1
A6195 Exit Peds Ahead	47.0%	1.8	46.7%	2.0
Practical Reserve Capacity	-49.3%		-39.6%	

### **Junction 3 Assessment**

- 6.27 An assessment of the Tankersley Roundabout junction has been undertaken using the industry recognised LinSig3 modelling software. The junction is located circa 200m to the south of the site and comprises of four arms. The layout of the junction is shown within **Plan 8**.

**Plan 8: Aerial Image of Junction 3**



© Google Maps

6.28 The councils signal partner Yunex Traffic provided the datasheet for the junction which sets out the junction phasing, staging and intergreens. Saturation flows for each arm were calculated within LinSig based on geometry.

6.29 **Table 13** provides a summary of the LinSig results for the three scenarios considered, with full LinSig results provided within **Appendix L**.

**Table 13: Assessment Results of Junction 3**

Lane Description	2023 Base			
	AM Peak		PM Peak	
	DoS%	Queue	DoS%	Queue
M1 SB offslip Left	98.3%	20.1	95.5%	21.0
M1 SB offslip Ahead	71.4%	8.2	64.5%	8.4
A61 (NE) Ahead Ahead2	99.3%	31.8	93.3%	21.8
A61 (NE) Ahead	97.9%	28.8	78.7%	10.5
M1 NB offslip Ahead Ahead2	76.7%	8.6	99%	18.2
A61 (W) Ahead Left	96.9%	21.7	100.1%	24.1
A61 (W) Ahead	91.2%	14.1	96.3%	14.9
North Overbridge Circ Ahead	39.3%	4.2	98.1%	22.7
North Overbridge Circ Ahead	96.4%	18.0	99.2%	29.1
North Overbridge Circ Right	17.6%	2.8	15.9%	2.6
East Circ Right Ahead	92.3%	12.9	74.0%	6.3
South Overbridge Circ Ahead	47.6%	5.2	76.1%	11.8
South Overbridge Circ Right Ahead	73.7%	13.2	96.3%	19.0
South Overbridge Circ Right	31.8%	5.6	34.7%	3.1
West Circ Ahead	33.2%	0.4	30.7%	4.2
West Circ Right Ahead	56.8%	9.3	77.6%	12.8
West Circ Right	47.9%	8.5	61.5%	11.5

Practical Reserve Capacity	-10.9%		-11.3%	
	2028 'Do Minimum'			
M1 SB offslip Left	126.0%	101.6	107.3%	56.8
M1 SB offslip Ahead	74.4%	8.8	64.5%	8.4
A61 (NE) Ahead Ahead2	100.4%	35.1	99.5%	32.3
A61 (NE) Ahead	98.4%	30.0	99.0%	31.2
M1 NB offslip Ahead Ahead2	121.6%	63.6	115.7%	97.5
A61 (W) Ahead Left	100.7%	28.6	101.1%	26.0
A61 (W) Ahead	121.6%	74.0	116.9%	48.2
North Overbridge Circ Ahead	40.7%	4.3	99.5%	23.3
North Overbridge Circ Ahead	101.5%	33.1	99.3%	29.2
North Overbridge Circ Right	15.1%	1.8	13.6%	2.2
East Circ Right Ahead	92.5%	10.2	94.7%	10.0
South Overbridge Circ Ahead	47.4%	5.3	88.4%	17.0
South Overbridge Circ Right Ahead	68.9%	11.5	99.0%	19.7
South Overbridge Circ Right	39.3%	7.4	53.0%	5.6
West Circ Ahead	25.5%	0.3	24.3%	4.2
West Circ Right Ahead	66.6%	11.6	89.4%	14.6
West Circ Right	88.9%	12.0	60.6%	11.3
Practical Reserve Capacity	-49.3%		-39.6%	
	2028 'Do Something'			
M1 SB offslip Left	127.8%	107.4	107.5%	58.0
M1 SB offslip Ahead	74.4%	8.8	64.5%	8.4
A61 (NE) Ahead Ahead2	100.3%	34.6	101.1%	37.2
A61 (NE) Ahead	98.6%	30.3	99.7%	33.0
M1 NB offslip Ahead Ahead2	125.0%	72.6	116.2%	99.0
A61 (W) Ahead Left	100.7%	28.6	101.1%	26.0
A61 (W) Ahead	122.5%	76.7	117.2%	48.7
North Overbridge Circ Ahead	40.7%	4.3	99.5%	23.3
North Overbridge Circ Ahead	101.6%	33.5	99.3%	29.3
North Overbridge Circ Right	15.0%	1.8	13.6%	2.2
East Circ Right Ahead	92.5%	10.1	94.7%	10.0
South Overbridge Circ Ahead	47.4%	5.3	88.3%	17.0
South Overbridge Circ Right Ahead	69.1%	11.5	100.3%	21.9
South Overbridge Circ Right	39.3%	7.4	53.0%	5.7
West Circ Ahead	25.7%	0.3	25.0%	4.3
West Circ Right Ahead	66.5%	11.6	89.4%	14.6
West Circ Right	88.9%	12.0	60.6%	11.3
Practical Reserve Capacity	-49.3%		-39.6%	

6.30 Both **Table 12** and **Table 13** demonstrates how the Birdwell Roundabout and Tankersley Roundabout operate over capacity during both the AM and PM weekday peak hours. During the 2023 Base Scenario, a Practical Reserve Capacity (PRC) of -10.9% during the AM peak hour and -11.3% during the PM peak hour were noted across both junctions. This is significantly exacerbated in the 2028 'Do Minimum' scenario, where the PRC during the AM peak hour decreases to -49.3% and -39.6% during the PM peak hour.

6.31 The addition of the proposed development traffic will not impact upon the PRC during either the AM or PM peak period, indicating that the proposals will not result in a severe impact upon the immediate highway network.

- 6.32 In addition to the above, it is worth highlighting that both junctions operate under MOVA control, which would adjust the green times on a cycle-by-cycle basis, depending on demand, to allow the most efficient operation at the junctions. Therefore, the operation of both junctions would operate better than that forecast by LinSig and that summarised within **Tables 12** and **13**.
- 6.33 Overall, the proposed development would not result in a severe impact on the operation of the junctions, and no mitigation measures are required as a result of the proposed development. This is consistent with the conclusion reached as part of historic modelling, which has been accepted by Barnsley Metropolitan Borough Council (discussed below).

#### **Wider Highway Modelling**

- 6.34 As previously outlined, the site forms part of the Barnsley Local Plan as site ES14 (Waddington), and forms part of the wider Hoyland North Masterplan which was produced in December 2019.
- 6.35 The impact of an employment allocation within the site has previously been modelled (VISSIM) and accepted by both Barnsley Metropolitan Borough Council and National Highways as part of the Fore Consulting Transport and Access Appraisal Report.
- 6.36 In addition to the above, vehicle movements associated with the site were also considered within the Mosodi Transport Assessment which was submitted in support of the approved Rockingham Phase 2 and 3 development. The Mosodi Transport Assessment considered the impact of all sites within the Hoyland North Masterplan, including for the application site ES14 (Waddington).
- 6.37 Within the Mosodi Transport Assessment, the report considered the application site to comprise of 501sq.m B1 use, 2,843sq.m B8 use with a 69-room hotel, resulting in a trip generation of 43 two-way movements during the AM peak period and 33 two-way movements during the PM peak period. The TRICS assessment undertaken as part of this report outlines that the proposed development would only result in an increase of 18 two-way movements during the AM peak hour and 15 two-way movements during the PM hour to what was previously accepted as part of the Mosodi assessment.
- 6.38 When considering the junction assessments undertaken as part of this Transport Assessment, in addition to the previous modelling work undertaken as part of the Fore Consulting Transport and Access Appraisal Report and the Mosodi Transport Assessment, the development proposals will not result in a severe impact upon the operation of the immediate highway network and therefore, cannot be refused in accordance with Paragraph 111 of the National Planning Policy Framework.

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## 7.0 MITIGATION PROPOSALS

- 7.1 Based on the information provided in this report, this section will list all improvements deemed necessary to help facilitate the development.

### **Framework Travel Plan**

- 7.2 A Framework Travel Plan has been prepared alongside this Transport Assessment to assist in reducing the number of single car occupancy vehicle trips associated with the application site.
- 7.3 The Framework Travel Plan, which will be adopted by all units within the site, provides a package of measures to encourage all staff and visitors to use sustainable transport modes, reducing the sites impact upon the immediate highway network.
- 7.4 A Framework Travel Plan can offer substantial gains towards sustainable transport objectives of central and local government, as well as providing several benefits to staff of the proposed development. The overarching aim of the framework RTP is:

*"To create a sustainable, community-driven environment that promotes a range of lifestyle and travel choices and reduces reliance on the private car."*

- 7.5 Travel planning is an on-going process which will grow and develop with time. The Framework Travel Plan and each individual Travel Plan prepared by the occupiers of each unit, will reflect the changing circumstances faced by the occupiers, and the environment in which they operate.

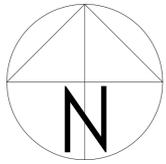
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## 8.0 CONCLUSION

- 8.1 This Transport Assessment has been produced to provide information in support of a proposed industrial estate located on land to the west of Dearne Valley Parkway, Birdwell, Barnsley.
- 8.2 A review of available collision data supplied by [crashmap.co.uk](http://crashmap.co.uk) highlights that there are no road safety concerns within the study area.
- 8.3 The site is well located in terms of access to local amenities and facilities by foot, cycle or public transport. Access to residential areas are within a suitable commute via alternative transport modes other than use of the car, adhering to policies T1 and T3 within the Barnsley Local Plan.
- 8.4 Access to the site for both vehicles and pedestrians will be via the continuation of the industrial access road off Kestrel Way. The access road will be designed to adoptable highway standards, with a suitably designed turning head positioned at the end of the road.
- 8.5 The recommend parking provision within the site could range between 145 car parking spaces should the proposals be solely B2 land use, to 48 vehicle car parking spaces should the proposals be solely B8 land use. Given the likely mix of occupiers at the site, the proposed allocation of 119 spaces (one space per 61sq.m) is considered appropriate to meet with likely demand.
- 8.6 When considering the junction assessments undertaken as part of this Transport Assessment, in addition to previous modelling work undertaken as part of the wider Hoyland North Masterplan, the proposed development will not result in a severe impact upon the operation of the immediate highway network and therefore, cannot be refused in accordance with Paragraph 111 of the National Planning Policy Framework.
- 8.7 Transport policy (detailed in **Chapter 2.0**) seeks to maximise travel by public transport and active modes. Therefore, the mitigation measures proposed through a Framework Travel Plan, focus on maximising future staff and visitor travel opportunities by sustainable and active modes, rather than increasing vehicle capacity on the local network which would not support the policy objectives.
- 8.8 The Framework Travel Plan that accompanies this Transport Assessment sets out in detail a package of measures for incorporation into future detailed Travel Plans associated with each unit, to encourage all staff and visitors to use sustainable transport, avoiding single car occupancy vehicle trips.
- 8.9 Based on the information provided above and attached, it is considered that there are no highways or transportation reasons why the Local Highway Authority cannot provide an 'in principle' support for the proposed planning application.

## Appendix A: -

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Williams Saunders is the trading name of Wm Saunders Partnership LLP. Wm Saunders Partnership Limited Liability Partnership is registered in England and Wales with the Registration number OC 388533. The Registered Office is Sheppard Lockton House, Cafferata Way, Newark-on-Trent, Nottingham, NG24 2TN.

This drawing & any design thereon is the copyright of Wm Saunders Partnership LLP and must not be reproduced without their written consent.

Contractors must verify all dimensions, levels and co-ordinates of the site before commencing any work or making any shop drawings; no dimensions to be taken from drawing.

Note. This drawing is based on the topographical survey, by Ramowski Clarke Ltd, ref. 3508-02-a, dated 04/221.

Line of extg. sewers & easments as shown on dwg. no. 10-336-PH1-DE-500-001-REV J, (Hartwood).

This drawing is subject to Client & Planning approval, and is to be read in conjunction with all other consultants drawings.

Site boundary line to be confirmed.  
Floor areas shown are 'footprint' areas.

Easement to extg. overhead electricity cables - 4.6m from each conductor or earth wire.



P12	Minor changes to the layout. Area schedule updated.	SW	SW	03/23
P11	Trees and additional notes to western boundary added. Additional landscape area added to unit 3 car park.	SW	SW	02/23
P10	Roof slopes added.	SW	SW	01/23
P9	Units 7/8 combined into one.	SW	SW	01/23
P8	Site plan updated based on comments from Planning/Highways.	SW	SW	10/22

Rev	Description	Drn	Vfd	Date
As outlined in section 2.3 of the CIB Industry Guidance to Designers, insignificant risks can usually be ignored, as can risks arising from routine construction activities, unless the design compounds or significantly alters these risks. In accordance with CDM Regulations 8, 9 and 11, any significant risks relating to the design features shown on this drawing have been identified and are annotated thus: <input checked="" type="checkbox"/>				
<input checked="" type="checkbox"/> No significant risks have been identified.				
<input type="checkbox"/> Significant risks have been identified - refer to notes on drawing for information on residual risks and any control measures to be employed.				
Refer to the current Designer's Risk Assessment sheets for further detail.				
Designer's Signature				Date

Drawing Status: INFORMATION.

**williamsaunders**  
architecture: engineering: building consultancy  
Sheppard Lockton House Tel: 01636 704361  
Cafferata Way Fax: 01636 702809  
Newark-on-Trent W: wm-saunders.co.uk  
Nottinghamshire, NG24 2TN  
Also at Leeds, Lincoln, Wirksworth

Project	Proposed Development, Rockingham.		
Client	Carnell Management Services Ltd.		
Title	Proposed Site Plan.		
Wm's Project Ref.	Drawn	Date	Scale
12215	SW	Feb. 2022	1:500 @ A1
Drawing/Document Reference			
Project	Originator	Zone	Level
12215 - WMS - XX - XX - DR - A - 10003 - S2 - P12			

UNIT	GROUND		FIRST		TOTAL		OFFICE AREA, excl. circ./toilets		OFFICE % TO GIA	CARS	CYCLES	M/CYCLES	EAVES/HAUNCH HEIGHT
	sq.m	sq.ft	sq.m	sq.ft	sq.m	sq.ft	sq.m	sq.ft					
1	822	8,848	123	1,332	945	10,180	99.00	1,066.00	10.50	17	12	2	8m
2	1,395	15,015	179	1,926	1,574	16,941	197.00	2,120.00	12.50	24	12	2	8m
3	1,351	14,542	178	1,932	1,529	16,474	192.40	2,093.00	12.50	23	12	2	8m
4	1,731	18,632	180	1,941	1,911	20,573	224.00	2,410.00	11.70	32	12	2	8m
5	558	6,006	87	936	645	6,942	83.35	897.00	12.90	11	12	2	6m
6	316	3,401	0	0	316	3,401	35.85	386.00	11.35	6	Shared.	Shared.	6m
7	333	3,584	0	0	333	3,584	35.85	386.00	10.76	6	Shared.	Shared.	6m
TOTAL	6,506	70,028	747	8,067	7,253	78,095	867	9,358		119	60	10	

## Appendix B: -

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Our ref: SE 349 005  
Your ref: 2022/ENQ/00280

Barnsley Metropolitan Borough Council  
1 Westgate  
Western Street  
Barnsley  
S70 2DR

Batool Menaz  
National Highways  
8 City Walk  
Leeds  
LS11 9AT

Direct Line: +44 (0) 300 4702420

**FAO: Elaine Ward**

May 5 2023

Dear Elaine,

### **Scoping: Land West of Dearne Valley Parkway, Birdwell, Barnsley**

Thank you for engaging in pre-application discussions with National Highways for the proposed development located in a parcel of the ES14 allocation of the Barnsley Local Plan [2019].

We note that the gross floor area [GFA] is stated to be 7,963sqm in the Highway Scoping Note [Note], however, there are alternative figures presented in the appendices. Any future submission should provide clarification on the GFA.

We are content with the trip rates presented, however, the assessed development quantum [6,386sqm] is lower than the 7,963sqm stated in the Note. Clarification should be provided on this point in any future submission. Further, we note that any proposed development within the Masterplan area should not exceed any of the previously approved trip generations set out, as this could then result in significant impacts on the SRN, namely junction 36 of the M1. Information should be presented comparing the previously assessed figures with the proposed development trip generation.

We also note that in any future submissions, multi-modal [person] trip rates should be presented before and after the implementation of measures / initiatives to maximise active and sustainable travel, and in line with the vision for the proposed development; this is in accordance with Circular 01/2022 and is detailed later in this letter.

With regards to traffic distribution, we request that the traffic distribution is presented on a traffic flow diagram including percentages of traffic routing via Tankersley Roundabout, including M1 on and off-slips. We will withhold comment on the traffic distribution until this information is presented.

We do, however, note that on the basis of the number of trips potentially routing via M1 Junction 36 [Tankersley Roundabout], this should be formally assessed as part of any future submission, this information should be presented in a Transport Assessment developed in accordance with prevailing policy, particularly Circular 01/2022.

We request that the applicant should review and include any relevant committed development traffic flows in the area that are likely to affect the flows at the relevant junctions in the assessment years. We also note that any assumptions underpinning the projected levels of traffic should be clearly stated so as to avoid the default factoring up of baseline traffic.

### Transport Assessment

The transport impacts of the development should be assessed based on relevant regional and national planning policy. In terms of the impact on the SRN, the applicant should make reference to at least the following policies:

- Barnsley Local Plan (January 2019);
- DfT Circular 01/2022 The Strategic Road Network and the Delivery of Sustainable Development. Particularly paragraphs 47 to 54 which relate to the assessment of development proposals; and
- National Highways' guidance document 'The Strategic Road Network: Planning for The Future'. The following paragraphs from this guidance are particularly relevant to the scoping stage
  - Paragraph 37. "Transport assessments should generally be carried out in line with prevailing government guidance in agreement with us [National Highways], through preapplication and scoping, such as a Road Safety Audit (Stage 1)".
  - Paragraphs 87 and 88. "If the development is in an approved local plan and has had an appropriate level of assessment of the impact of the development undertaken, we do not anticipate the need to repeat the full assessment process at the planning application stage. If, however, the development proposed has not been subject to an appropriate level of assessment or is not included or consistent with an approved local plan, then we would anticipate agreeing the scope of work required to make a full assessment. For those sites that have been considered at local plan stage, we will take into account any assessment already undertaken.
  - Paragraph 94. "Formal pre-application discussions are an effective means of gaining a good, early understanding of the development, its benefits, its likely impacts and its infrastructure needs. By consulting with us pre-application, you will ensure that the transport assessment you prepare is appropriately scoped and is based on the most relevant and up-to-date data. It will also ensure that you are made aware of, and can take account of, any SRN issues that might have a bearing on the way in which the development is planned and/or delivered. This, in turn, helps avoid delays and difficulties further into the application process".
  - Paragraph 98. "If a scoping report is to be prepared, we would advise that this includes:
    - Details of the development, such as location, access arrangements, use class, size or number of units, likely phasing, maximum number of parking spaces and any other relevant information;

- Proposed methodology for estimating the vehicular trip generation and distribution on the SRN, and resulting trip generation figures;
- Proposed methodology for assessing the impact of this trip generation on the SRN; and
- Proposed methodology for assessing the environmental consequences of the transport impacts of the development”

Further, in accordance with the Circular 01/2022 the Transport Assessment should set out a vision for the development and how the vision will be achieved. Significant emphasis should be given to reducing the need to travel, especially by car, and maximising the use of active modes and public transport. Hence, the trip generation set out in the Transport Assessment should accord with that established in the Travel Plan. We would expect to see multi-modal [person] trip rates before and after the implementation of measures to maximise active and sustainable travel and limit the use of the private car.

Should conflicting requirements be identified, it is important to note that the Planning Policy Paper ‘Circular 01/2022’ will take precedence over the National Highways document ‘The Strategic Road Network Planning for the Future’ (2015) which is due to be amended.

### Travel Plan

A Travel Plan, developed in accordance with prevailing policy, should also accompany any future submission.

With regards to the preparation of a Travel Plan, we note the following paragraphs from the Planning Policy Paper (Circular 01/2022) ‘Strategic road network and the delivery of sustainable development’:

*44. Travel plans are an effective means of incentivising the use of sustainable modes of transport. Where these are required, development promoters must put forward clear targets and commitments to manage down the traffic impact of development and maximise the accessibility of and within sites by walking, wheeling, cycling, public transport and shared travel. Targets for achieving a modal shift to sustainable transport will need to be subject to sustained monitoring and management by an appointed travel plan coordinator. Advice on preparing and monitoring travel plans is contained in the planning practice guidance.*

*47. Where the company is requested to do so, it will engage with local planning authorities and development promoters at the pre-application stage on the scope of transport assessments/statements and travel plans. This process should determine the inputs and methodology relevant to establishing the potential impacts on the SRN and net zero principles that will inform the design and use of the scheme. Development promoters are strongly encouraged to engage with the company to resolve any potential issues and maximise opportunities for walking, wheeling, cycling, public transport and shared travel, as early as possible.*

As discussed, National Highways requires that the Applicant set out a vision for the development, clearly describe any aims, in terms of transport, and explain how these aims will be achieved and why they accord with the prevailing policy.

Particularly, National Highways will expect the Applicant to promote and enable a reduction in the need to travel, especially by private car, and prioritise sustainable transport opportunities ahead of capacity enhancements.

With reference to the Circular 01/2022, National Highways *“will support initiatives that reduce the need to travel by private car and enable the necessary behavioural change to make walking, wheeling, cycling and public transport the natural first choice for all who can take it”*.

The Travel Plan should include targets for mode shift away from the private car and confirmation of person trips by mode; the plan must set out clear targets and commitments to manage down the traffic impact of development and maximise the accessibility by walking, wheeling, cycling, public transport, and shared travel.

Hence, suitable multi-modal (person) trip rates should be set out alongside any travel planning targets. This approach will enable an assessment of residual transport impacts relative to the current land use (see Circular 01/2022, particularly, paragraphs 47-54).

National Highways will support the preparation of a robust Travel Plan designed to limit the volume of private vehicle trips to and from the development and to promote sustainable modes of travel. To ensure a robust and effective Travel Plan, we request that the Travel Plan includes but not be limited to:

- Quantifiable mode shift targets which relate to the trip generation and mode share set out;
- A firm financial commitment with regards to funding for a range of measures (including infrastructure, incentive and information-based measures) proposed in the short, medium and long term;
- Details of the phasing of any proposed measures relative to any phasing of the development itself;
- A clear outline of the responsibilities of the different parties involved in implementing, monitoring and funding the Travel Plan;
- A strategy designed to monitor the volume of vehicle trips; and
- The funding to be committed and made available for the implementation of further measures should the Travel Plan fail to achieve its stated targets.

With reference to the DfT document ‘Decarbonising Transport: A Better, Greener Britain’ (July 2021), the Travel Plan should also consider how the design of the development will facilitate and ensure that ‘public transport and active travel are the natural first choice for daily activities.’ National Highways will look favourably at initiatives to encourage employees to work from home where possible and, thereby, reduce the need to travel in peak periods.

## Assessments

Subject to the impact of the proposed development on the Strategic Road Network, further assessments may be required. With regards to a threshold which may warrant a junction capacity assessment, the applicant should make reference to the following guidance:

- [National Planning Policy Framework](#) (Ministry of Housing, Communities and Local Government, 2021);
- National Highways' document '[The Strategic Road Network: planning for the future](#)' (National Highways, 2015); and
- [The Department for Transport's Circular 01/2022](#).

In particular, we refer the applicant to 'The Strategic Road Network: Planning for the Future', which states that National Highways will look at planning applications assessed as being 'severe' on a case-by-case basis. This will take into account the performance and character of the relevant section of the SRN and the predicted effects of the development on its safe operation."

We also refer the applicant to Paragraph 34 of the document which states that *"assessments should consider the likely impact of residual trips (once measures to reduce the need to travel by car and improve access by sustainable modes have been considered) and ensure that what is proposed promotes sustainable transport and avoids unnecessary works to the SRN"*. Hence, the developer's commitment to promoting sustainable modes of transport is an important consideration as part of junction assessments.

Further, the Applicant should note that the 2007 DfT guidance that describes a '30-vehicle threshold for discussions' does not, for National Highways, justify junction capacity assessments not being undertaken.

If assessments are required, we offer the following comments:

- Weekday peak hours – the applicant should take into account that the peak hour periods at SRN junctions may differ to those of the local highway network, and these should be agreed prior to the assessments being carried out;
- A weekday inter-peak period assessment may be required subject to the operation of the development, shift change patterns, and the volume of traffic on the network compared with the typical peak periods;
- Assessment years – in accordance with paragraph 50 of the Circular 01/2022, assessments should be conducted at an opening year to include trips generated by the proposed development, forecasted growth and committed development. Further, for multi-phase developments, additional assessments shall be provided based on the opening of each phase; and
- In accordance with the Circular 01/2022 – *"Planned improvements to the SRN or local road network should also be considered in any assessment where there is a high degree of certainty that this will be delivered"*. Confirmation of any planned transport improvements should be agreed with BMBC.

### Committed Development

The applicant should review and include any relevant committed development traffic flows in the area that are likely to affect the flows at the relevant junctions in the assessment years. In accordance with Planning Practice Guidance, these should include development that is consented or allocated where there is a reasonable degree of certainty will proceed within the next 3 years. Appropriate committed development flows should be agreed with BMBC.

### Forecasted Growth

Any assumptions underpinning the projected levels of traffic should be clearly stated so as to avoid the default factoring up of baseline traffic.

### Mitigation

If the opening year assessments demonstrate that a mitigation scheme is required in order to accommodate the impact of the proposed development, there will be a number of requirements prior to determination of the planning application:

- GG142 walking, cycling and horse-riding assessment should be undertaken at the outset to inform the design of any mitigation scheme;
- The design of road improvements should meet DMRB standards or clearly identify any departures from standard required;
- A Departure from Standards application may be required if the standards set out in DMRB are not achieved. This applies equally to over and under achievement of design standards; and
- A Stage 1 Road Safety Audit should be undertaken prior to the submission of the planning application.

### Conclusion

In summary, the forthcoming planning application should be accompanied by Transport Assessment and Travel Plan, both to be prepared with reference to and in accordance with this correspondence.

I trust this response is helpful, and I look forward to hearing from you once the proposed transport documents have been prepared. Should you require any further information please do not hesitate to contact me.

Yours sincerely



**Simon GP Geoghegan**

For: Batool Menaz

Email: [batool.menaz@nationalhighways.co.uk](mailto:batool.menaz@nationalhighways.co.uk)

## Andy Roberts

---

**From:** Lake , Wayne (GROUP LEADER HDC) <WayneLake@barnsley.gov.uk>  
**Sent:** 02 May 2023 16:09  
**To:** Andy Roberts  
**Cc:** Ward , Elaine (SENIOR PLANNING OFFICER); HighwaysPInGApps  
**Subject:** RE: 2022/ENQ/00280 (TA-1) - Pre-application land off Dearne Valley Parkway

Good afternoon Andy,

Further to previous correspondence and following a review of the Highway Scoping Note, please find the following comments. These are provided without prejudice to any further comments that may be received by the planning officer from National Highways as it is noted within the report that no consultation has been had with National Highways. You should therefore await a response from the planning officer in respect of this.

With regards the content it is noted that access to the site will be via Kestrel Way, however Kestrel Way is not adopted public highway and therefore there is a need to ensure that the developer has a right of access over it.

I acknowledge the use of the TRICS datasets , however they are presented incorrectly in Tables 1 and 2 as the AM trip generation figures are PM trip rates and PM trip rates are AM trip generation figures. Notwithstanding this, I have recalculated and confirm the trip rates do accord with the relevant trip generation figures. However, I note from the TRICS data that the AM period 09:00-10:00 trip rates for Class D are greater that during the AM peak period selected and a similar scenario (not same time periods) exist for the PM peak.

The use of the MSOA 028 is considered suitable and distribution patterns seem sensible, however it is noted that the Tankerseley roundabout is omitted from your list of junctions requiring assessment and refer you to my previous comments in that:

*Current adopted supplementary planning guidance provides the underlying thresholds of assessment. This includes any development generating 30 or more two-way vehicles movements in any hour and/or any development generating 100 or more two-way vehicle movements per day. Where there are no firm threshold figures within current TAG guidance for practitioners and appraisers, current policy conforms to the now withdrawn Department for Transport document Guidance on Transport Assessment. This is not purely used to determine the need for a transport assessment but should also be considered as the appropriate metric for determining network impact and therefore the need for individual junction assessment with the TA submission.*

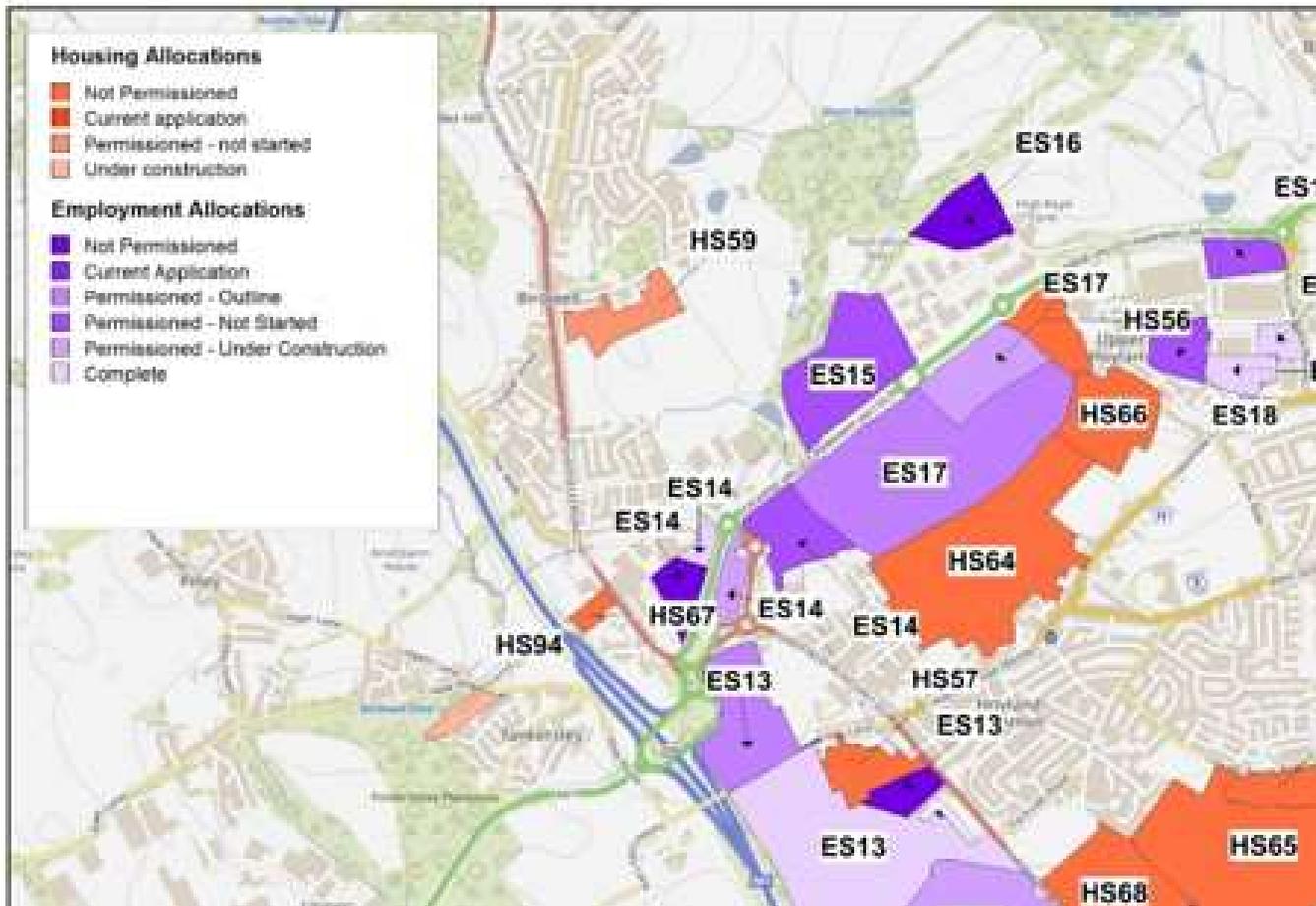
Traffic Surveys are to be undertaken in neutral months, however given the current position in relation to Trade Union strike action, you are to be mindful of future dates whereby the traffic could be affected by any industrial action or similar being undertaken. Should survey dates clash with any forthcoming days affected by industrial action, there will be a need for these to be re-done. The surveys are to capture queue lengths by observation or video in order to calibrate and validate the base model(s).

Comment is made in reference to committed developments are assumed to be included in the rates, however this should not be taken as an assumption. Whilst appropriate NTEM / Tempro growth factors are to be applied to background traffic growth, there will be a need to determine the planning assumptions associated with these in order to avoid double counting when adding in committed development traffic flows. Committed development traffic is to be included in the future year scenario and flows obtained from the associated Transport Assessments where available. You will no doubt be aware of latest government guidance which reads:

*It is important to give appropriate consideration to the cumulative impacts arising from other committed development (i.e. development that is consented or allocated where there is a reasonable degree of certainty will proceed within the*

next 3 years). At the decision-taking stage this may require the developer to carry out an assessment of the impact of those adopted Local Plan allocations which have the potential to impact on the same sections of transport network as well as other relevant local sites benefitting from as yet unimplemented planning approval.

Please see image below in relation to recent planning status for allocated sites in and around J36 / Hoyland. Further to the above, there will need to be a definitive list of committed developments to be agreed for inclusion in consideration of cumulative impact.



In response to your two questions – please find below:

***Do highways have an existing LinSig model for the Bidwell Roundabout? If so, could this be sent over to us to use for the modelling. If there is no existing model, could you advise on how to obtain signal timing specifications for the junction.***

Having liaised with our traffic signals section, I can confirm that they do not have an existing Linsig model for the Birdwell / Tankersley roundabouts. However signal timings and specifications can be provided by Yunex, who are the Councils traffic signal contractors and they can provide a price for obtaining any data as required. We also have the details for the National Highways roundabout with us being responsible for it at the minute,

The most appropriate contact is:

Nick Rule  
**Yunex Traffic | Consultancy Services**  
Principal Engineer  
Mobile: +44 7808 824137  
[nick.rule@yunextraffic.com](mailto:nick.rule@yunextraffic.com)

***Are you able to pass this note onto National Highways given the proximity of the site to the M1 junction (if you believe they will require consultation)?***

This note was passed on to the planning officer for forwarding to National Highways.

I trust this is satisfactory,

Kind Regards

Wayne

Wayne Lake MSc MCIHT  
Group Leader - Highways Development Control  
Transport  
Growth and Sustainability  
Barnsley Council

Telephone: 01226 772587

Email: [waynelake@barnsley.gov.uk](mailto:waynelake@barnsley.gov.uk)

Mail: PO Box 634, BARNSELEY. S70 9GG

\*Sat Nav reference: S70 2DR

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**From:** Andy Roberts <[andy@robertshighwayconsultants.co.uk](mailto:andy@robertshighwayconsultants.co.uk)>

**Sent:** 11 April 2023 11:18

**To:** Lake , Wayne (GROUP LEADER HDC) <[WayneLake@barnsley.gov.uk](mailto:WayneLake@barnsley.gov.uk)>

**Subject:** 2022/ENQ/00280 (TA) - Pre-application land off Dearne Valley Parkway

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Good morning Wayne,

We have been commissioned to assist with an upcoming planning application for the development of several industrial units at land to the west of Dearne Valley Parkway.

As part of the planning submission, we will prepare the Transport Assessment and Travel Plan requested as part of the above enquiry and your response to Stuart Willows dated 4<sup>th</sup> April.

I am contacting you to agree the scope of the off-site junction assessments required as per the development.

We have undertaken initial analysis of projected vehicle movements from the site, in addition to undertaking a distribution and assignment exercise for vehicles travelling to the area.

The attached scope note outlines the findings of the analysis work which identifies the following junctions for assessment:

- Junction 1: Rockingham Roundabout
- Junction 2: Bidwell Roundabout (Signal Junction)

Do highways have an existing LinSig model for the Bidwell Roundabout? If so, could this be sent over to us to use for the modelling. If there is no existing model, could you advise on how to obtain signal timing specifications for the junction.

Are you able to pass this note onto National Highways given the proximity of the site to the M1 junction (if you believe they will require consultation)?

I will welcome any comments you have regarding the above/attached prior to commencement of the reports.

Kind Regards,

**Andy Roberts BA (Hons) MCIHT MTPS**  
Managing Director

**Roberts Highway Consultants Limited**

**T: 07935 229 255**

**E: [andy@robertshighwayconsultants.co.uk](mailto:andy@robertshighwayconsultants.co.uk)**

**W: [www.robertshighwayconsultants.co.uk](http://www.robertshighwayconsultants.co.uk)**



**Transport Assessments/Statements ~ Travel Plans ~ Swept Path Analysis ~ Access Designs ~ Access Feasibility Studies ~ Construction Traffic Management Plans ~ Travel Plan Coordinator Services ~ Public Consultation Services ~ Road Safety Audits ~ Traffic, Parking & Speed Surveys**

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## Appendix C: -

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**Scale:**  
Not To Scale.



- Notes:**
1. Do Not Scale From This Figure.
  2. This Figure May Include Data Provided By 3<sup>rd</sup> Parties No Liability Is Accepted For The Accuracy Of Such Data.
  3. This Figure Is Not Intended As A Comprehensive Listing, And Shows Only Selected Local Facilities Considered Of Significance.
  4. Paved Footways May Not Be Available On All Routes.

 Site Location

**Local Facilities Key**

- |   |   |
|---|---|
|  Costa Coffee              |  Mayfair Takeaway        |
|  Starbucks                 |  Well Pharmacy           |
|  BP Petrol Station         |  Co-Op Convenience Store |
|  Taco Bell                 |   |
|  Greggs                    |   |
|  Dunkin                    |   |
|  Deane Valley Farm-Dining  |   |
|  McDonalds                 |   |
|  Aldi                      |   |
|  Café 334                  |   |
|  Bus Stop                  |   |
|  InPost Parcel Locker      |   |
|  Evri Parcel Shop          |   |
|  The Keys Restaurant       |   |
|  Mace Convenience Store  |   |
|  Shell Petrol Station    |   |
|  KFC                     |   |
|  Master Fryer Takeaway   |   |
|  The Hare and Hounds Pub |   |
|  Saville Square Pub      |   |

Client: Carnell Management Services Ltd

Project: Dearne Valley Parkway  
Birdwell  
Barnsley

Diagram Title: Facilities & Amenities Plan  
Diagram 001

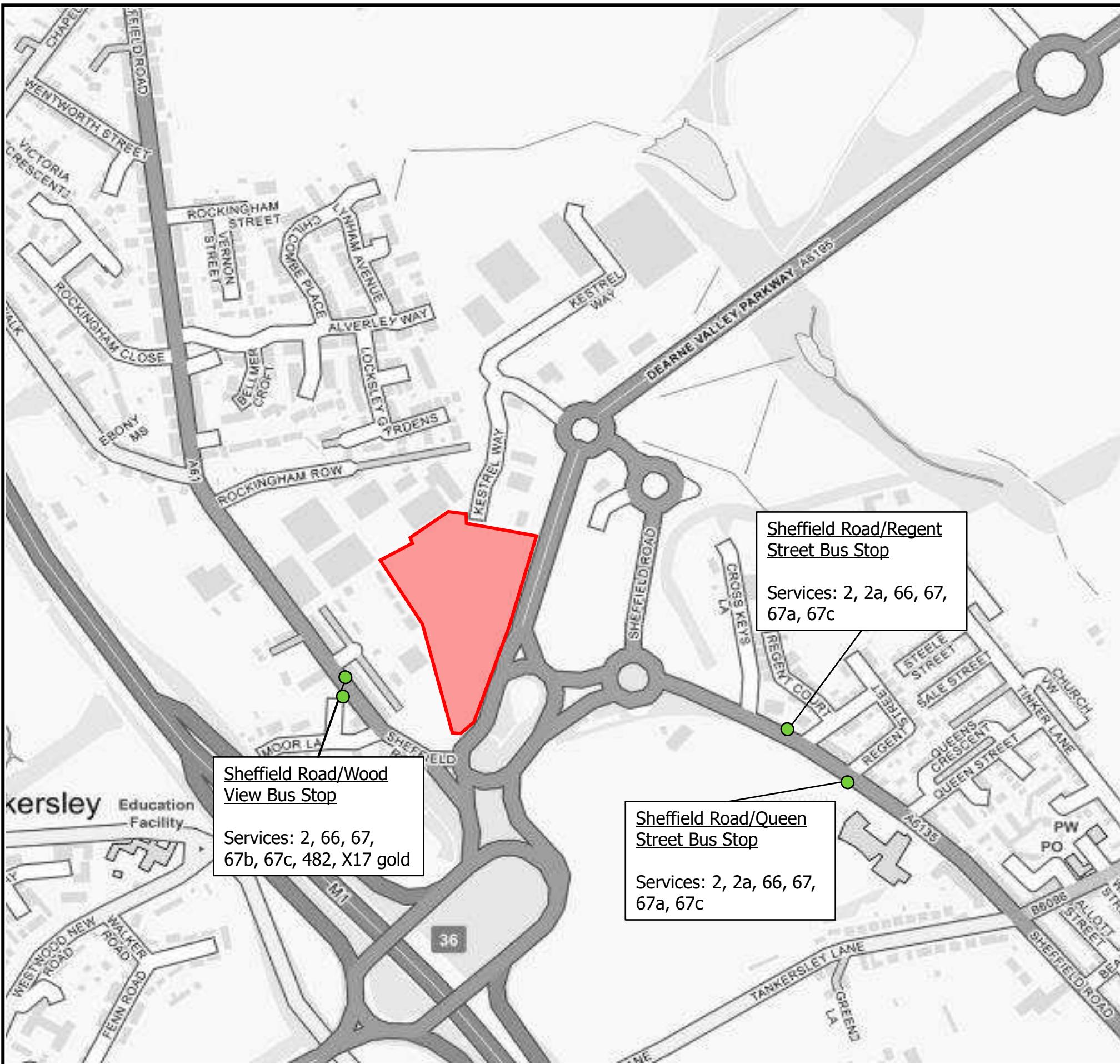
Drawn & Checked By: AR	Date: 03/06/2023
---------------------------	---------------------

T: +44 (0) 7935229255  
[enquiries@robertshighwayconsultants.co.uk](mailto:enquiries@robertshighwayconsultants.co.uk)  
[www.robertshighwayconsultants.co.uk](http://www.robertshighwayconsultants.co.uk)



# Appendix D: -





**Scale:**  
Not To Scale.



- Notes:**
1. Do Not Scale From This Figure.
  2. This Figure May Include Data Provided By 3<sup>rd</sup> Parties No Liability Is Accepted For The Accuracy Of Such Data.
  3. This Figure Is Not Intended As A Comprehensive Listing, And Shows Only Selected Local Facilities Considered Of Significance.
  4. Paved Footways May Not Be Available On All Routes.

- Site Location
- Selected Bus Stops Close To Site

**Sheffield Road/Regent Street Bus Stop**  
Services: 2, 2a, 66, 67, 67a, 67c

**Sheffield Road/Wood View Bus Stop**  
Services: 2, 66, 67, 67b, 67c, 482, X17 gold

**Sheffield Road/Queen Street Bus Stop**  
Services: 2, 2a, 66, 67, 67a, 67c

Client: Carnell Management Services Ltd

Project: Dearne Valley Parkway  
Birdwell  
Barnsley

Diagram Title: Public Transport Plan  
Diagram 002

Drawn & Checked By: AR	Date: 03/06/2023
---------------------------	---------------------

T: +44 (0) 7935229255  
[enquiries@robertshighwayconsultants.co.uk](mailto:enquiries@robertshighwayconsultants.co.uk)  
[www.robertshighwayconsultants.co.uk](http://www.robertshighwayconsultants.co.uk)

# Appendix E: -



Calculation Reference: AUDIT-608801-230405-0435

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT  
 Category : D - INDUSTRIAL ESTATE  
 TOTAL VEHICLES

Selected regions and areas:

02	SOUTH EAST EX ESSEX	1 days
03	SOUTH WEST SD SWINDON	1 days
05	EAST MIDLANDS DY DERBY	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE SY SOUTH YORKSHIRE	1 days
08	NORTH WEST GM GREATER MANCHESTER LC LANCASHIRE	1 days 1 days
09	NORTH TW TYNE & WEAR	1 days

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

Primary Filtering selection:

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

Parameter: Gross floor area  
 Actual Range: 4400 to 10000 (units: sqm)  
 Range Selected by User: 708 to 12000 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/15 to 18/11/22

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

Selected survey days:

Tuesday	3 days
Wednesday	1 days
Thursday	2 days
Friday	1 days

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

Selected survey types:

Manual count	7 days
Directional ATC Count	0 days

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

Selected Locations:

Edge of Town Centre	1
Suburban Area (PPS6 Out of Centre)	6

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

Selected Location Sub Categories:

Industrial Zone	2
Development Zone	1
Residential Zone	3
No Sub Category	1

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

Secondary Filtering selection:

Use Class:

Not Known 7 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order (England) 2020 has been used for this purpose, which can be found within the Library module of TRICS®.

Filter by Site Operations Breakdown:

All Surveys Included

Population within 500m Range:

All Surveys Included

Population within 1 mile:

5,001 to 10,000 2 days  
15,001 to 20,000 1 days  
25,001 to 50,000 4 days

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

Population within 5 miles:

25,001 to 50,000 1 days  
125,001 to 250,000 4 days  
250,001 to 500,000 2 days

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

Car ownership within 5 miles:

0.6 to 1.0 3 days  
1.1 to 1.5 3 days  
1.6 to 2.0 1 days

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

Travel Plan:

No 7 days

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

PTAL Rating:

No PTAL Present 7 days

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



Trip Rates for Key Periods		Trips per 100 sqm GFA	
Period	Inbound	Outbound	Total
0800-0900	0.417	0.137	0.554
1700-1800	0.137	0.367	0.504

TRIP RATE for Land Use 02 - EMPLOYMENT/D - INDUSTRIAL ESTATE  
TOTAL VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	2	6212	0.274	2	6212	0.008	2	6212	0.282
06:00 - 07:00	2	6212	0.048	2	6212	0.032	2	6212	0.080
07:00 - 08:00	7	7402	0.332	7	7402	0.056	7	7402	0.388
08:00 - 09:00	7	7402	0.417	7	7402	0.137	7	7402	0.554
09:00 - 10:00	7	7402	0.340	7	7402	0.297	7	7402	0.637
10:00 - 11:00	7	7402	0.239	7	7402	0.232	7	7402	0.471
11:00 - 12:00	7	7402	0.199	7	7402	0.197	7	7402	0.396
12:00 - 13:00	7	7402	0.286	7	7402	0.289	7	7402	0.575
13:00 - 14:00	7	7402	0.297	7	7402	0.328	7	7402	0.625
14:00 - 15:00	7	7402	0.280	7	7402	0.322	7	7402	0.602
15:00 - 16:00	7	7402	0.193	7	7402	0.371	7	7402	0.564
16:00 - 17:00	7	7402	0.141	7	7402	0.340	7	7402	0.481
17:00 - 18:00	7	7402	0.137	7	7402	0.367	7	7402	0.504
18:00 - 19:00	7	7402	0.041	7	7402	0.087	7	7402	0.128
19:00 - 20:00	2	6212	0.024	2	6212	0.105	2	6212	0.129
20:00 - 21:00	2	6212	0.000	2	6212	0.008	2	6212	0.008
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
<b>Total Rates:</b>			3.248			3.176			6.424

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

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

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#### Parameter summary

Trip rate parameter range selected:	4400 - 10000 (units: sqm)
Survey date range:	01/01/15 - 18/11/22
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	3

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

Calculation Reference: AUDIT-608801-230405-0429

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT  
 Category : A - OFFICE  
 TOTAL VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	ES EAST SUSSEX	1 days
04	EAST ANGLIA	
	NF NORFOLK	1 days
06	WEST MIDLANDS	
	WK WARWICKSHIRE	1 days
	WM WEST MIDLANDS	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	WY WEST YORKSHIRE	1 days

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

Primary Filtering selection:

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

Parameter: Gross floor area  
 Actual Range: 186 to 1800 (units: sqm)  
 Range Selected by User: 118 to 2000 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/15 to 23/11/22

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

Selected survey days:

Tuesday	3 days
Wednesday	2 days

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

Selected survey types:

Manual count	5 days
Directional ATC Count	0 days

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

Selected Locations:

Suburban Area (PPS6 Out of Centre)	2
Edge of Town	3

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

Selected Location Sub Categories:

Industrial Zone	1
Commercial Zone	1
Residential Zone	2
No Sub Category	1

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

Inclusion of Servicing Vehicles Counts:

Servicing vehicles Included	3 days - Selected
Servicing vehicles Excluded	4 days - Selected

Secondary Filtering selection:

Use Class:

Not Known 5 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order (England) 2020 has been used for this purpose, which can be found within the Library module of TRICS®.

Filter by Site Operations Breakdown:

All Surveys Included

Population within 500m Range:

All Surveys Included

Population within 1 mile:

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

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

Population within 5 miles:

75,001 to 100,000 1 days  
100,001 to 125,000 1 days  
125,001 to 250,000 2 days  
500,001 or More 1 days

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

Car ownership within 5 miles:

0.6 to 1.0 5 days

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

Travel Plan:

Yes 1 days  
No 4 days

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

PTAL Rating:

No PTAL Present 5 days

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

LIST OF SITES relevant to selection parameters

- |   |   |                |                     |
|---|---|----------------|---------------------|
| 1 | ES-02-A-11 HOUSING COMPANY<br>THE SIDINGS<br>HASTINGS<br>ORE VALLEY<br>Suburban Area (PPS6 Out of Centre)<br>Residential Zone<br>Total Gross floor area: 186 sqm<br>Survey date: TUESDAY 17/11/15 | EAST SUSSEX    | Survey Type: MANUAL |
| 2 | NF-02-A-04 BUILDING CONSULTANT<br>WHITING ROAD<br>NORWICH<br><br>Edge of Town<br>Commercial Zone<br>Total Gross floor area: 500 sqm<br>Survey date: WEDNESDAY 13/11/19                            | NORFOLK        | Survey Type: MANUAL |
| 3 | WK-02-A-03 ENGINEERING CONSULTANTS<br>BUDBROOKE ROAD<br>WARWICK<br><br>Edge of Town<br>Industrial Zone<br>Total Gross floor area: 796 sqm<br>Survey date: WEDNESDAY 23/11/22                      | WARWICKSHIRE   | Survey Type: MANUAL |
| 4 | WM-02-A-04 OFFICE<br>BOURNVILLE LANE<br>BIRMINGHAM<br><br>Suburban Area (PPS6 Out of Centre)<br>Residential Zone<br>Total Gross floor area: 1800 sqm<br>Survey date: TUESDAY 10/11/15             | WEST MIDLANDS  | Survey Type: MANUAL |
| 5 | WY-02-A-05 OFFICES<br>PIONEER WAY<br>CASTLEFORD<br>WHITWOOD<br>Edge of Town<br>No Sub Category<br>Total Gross floor area: 1230 sqm<br>Survey date: TUESDAY 23/05/17                               | WEST YORKSHIRE | Survey Type: MANUAL |

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

MANUALLY DESELECTED SITES

Site Ref	Reason for Deselection
GM-02-A-10	Covid
MS-02-A-03	Covid

Trip Rates for Key Periods		Trips per 100 sqm GFA	
Period	Inbound	Outbound	Total
0800-0900	2.637	0.177	2.814
1700-1800	0.044	1.817	1.861

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE  
**TOTAL VEHICLES**

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	5	902	1.020	5	902	0.022	5	902	1.042
08:00 - 09:00	5	902	2.637	5	902	0.177	5	902	2.814
09:00 - 10:00	5	902	0.842	5	902	0.355	5	902	1.197
10:00 - 11:00	5	902	0.510	5	902	0.244	5	902	0.754
11:00 - 12:00	5	902	0.443	5	902	0.443	5	902	0.886
12:00 - 13:00	5	902	0.621	5	902	1.130	5	902	1.751
13:00 - 14:00	5	902	0.887	5	902	0.576	5	902	1.463
14:00 - 15:00	5	902	0.443	5	902	0.355	5	902	0.798
15:00 - 16:00	5	902	0.377	5	902	0.709	5	902	1.086
16:00 - 17:00	5	902	0.488	5	902	2.150	5	902	2.638
17:00 - 18:00	5	902	0.044	5	902	1.817	5	902	1.861
18:00 - 19:00	4	821	0.091	4	821	0.579	4	821	0.670
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
<b>Total Rates:</b>			8.403			8.557			16.960

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

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

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Parameter summary

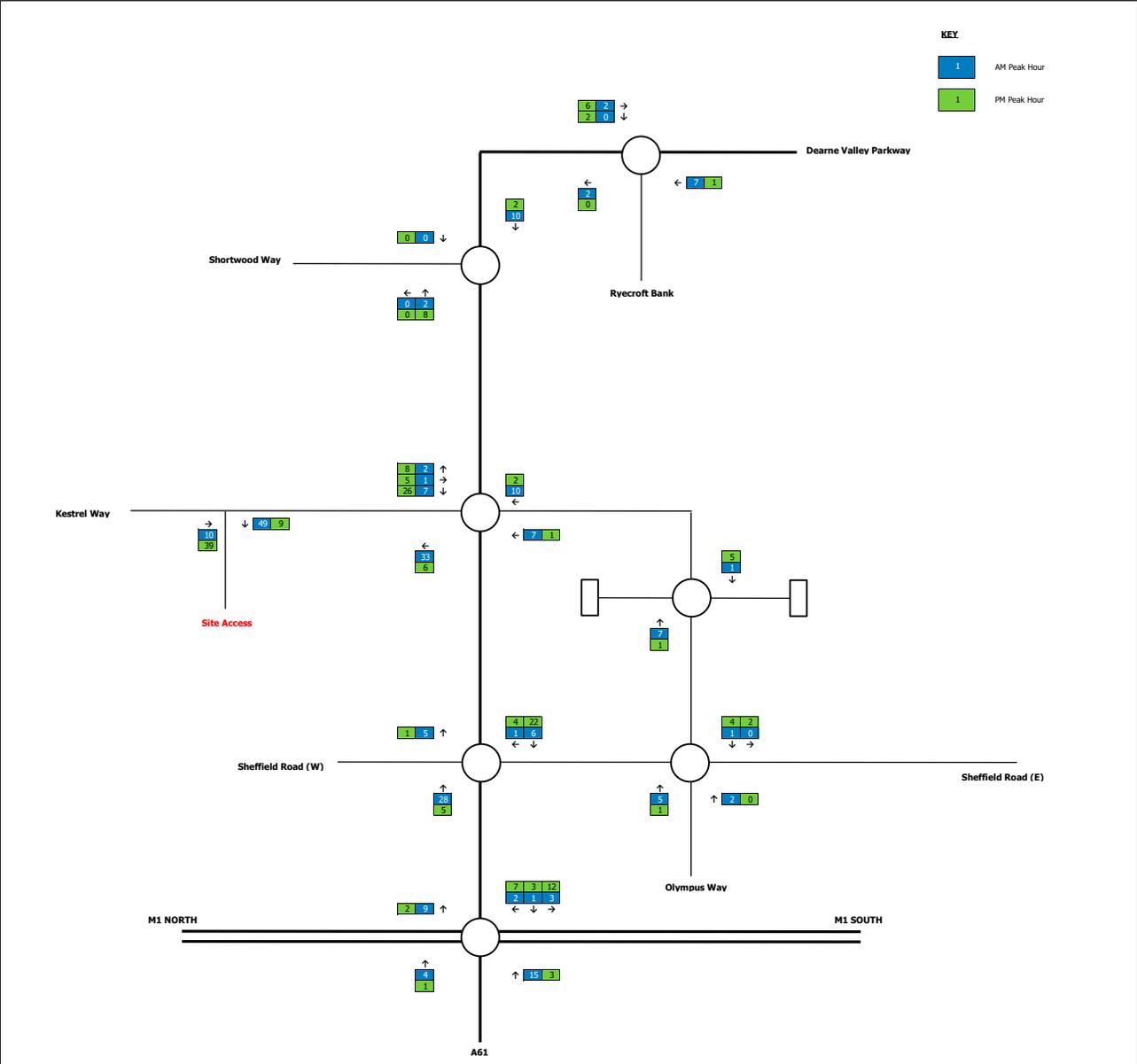
Trip rate parameter range selected:	186 - 1800 (units: sqm)
Survey date date range:	01/01/15 - 23/11/22
Number of weekdays (Monday-Friday):	5
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	2

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

## Appendix F: -

---





**KEY**

1	AM Peak Hour
1	PM Peak Hour

**Notes**  
All Flows Provided in PCLs

Diagram 01: Development Distribution

Project Title: Land West of Dearne Valley Parkway, Birdwell, Barnsley



# Appendix G: -



Junction: 1

**U-Turn**

Vehicle Class: **All Vehicles**

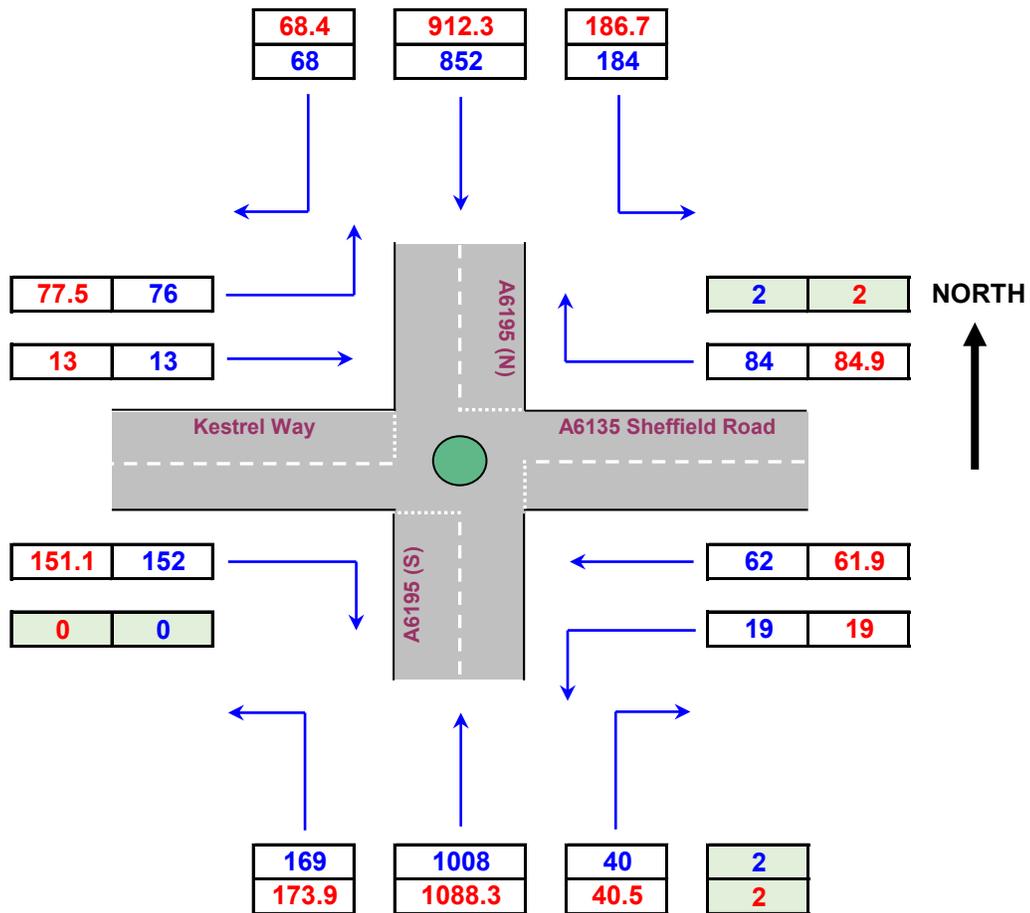
Show Peak Hour:

Start Time: **1) 08:00**

Show PCUs:

End Time: **1) 09:00**

Show Session 2



Junction: 1

**U-Turn**

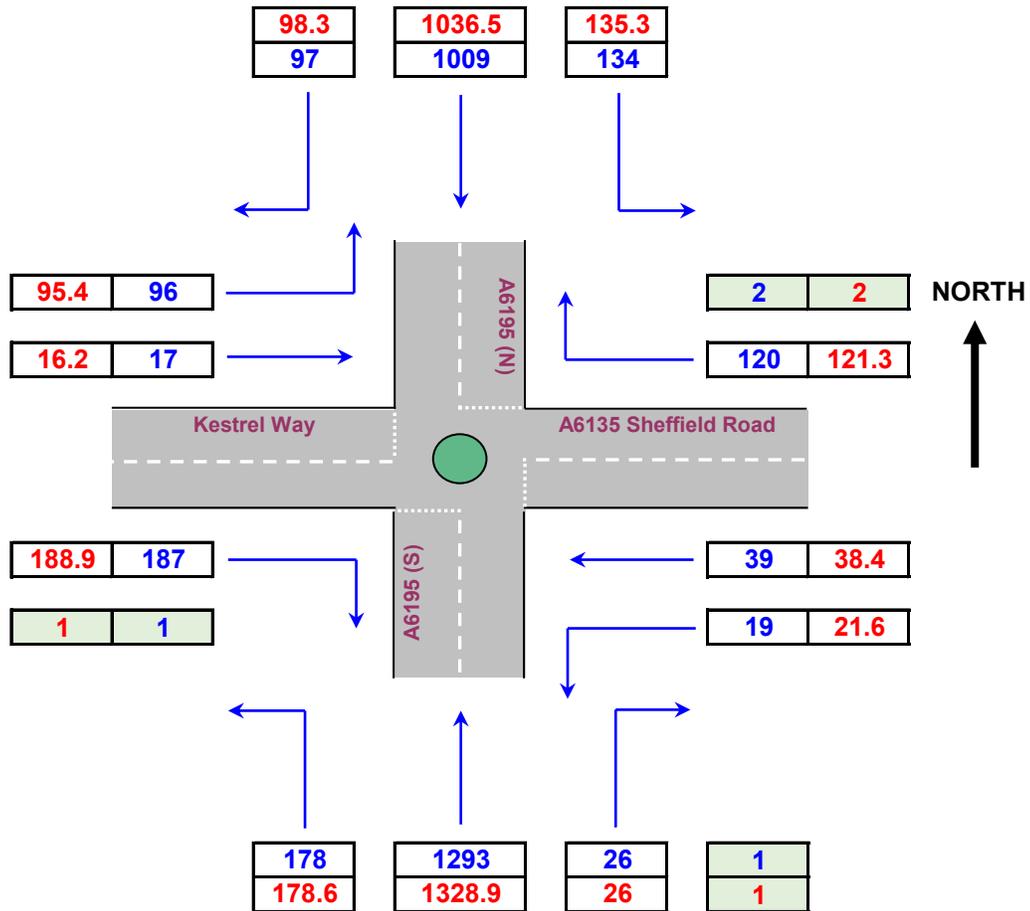
Vehicle Class:

Show Peak Hour:

Start Time:

Show PCUs:

End Time:



Junction: 2

**U-Turn**

Vehicle Class: **All Vehicles**

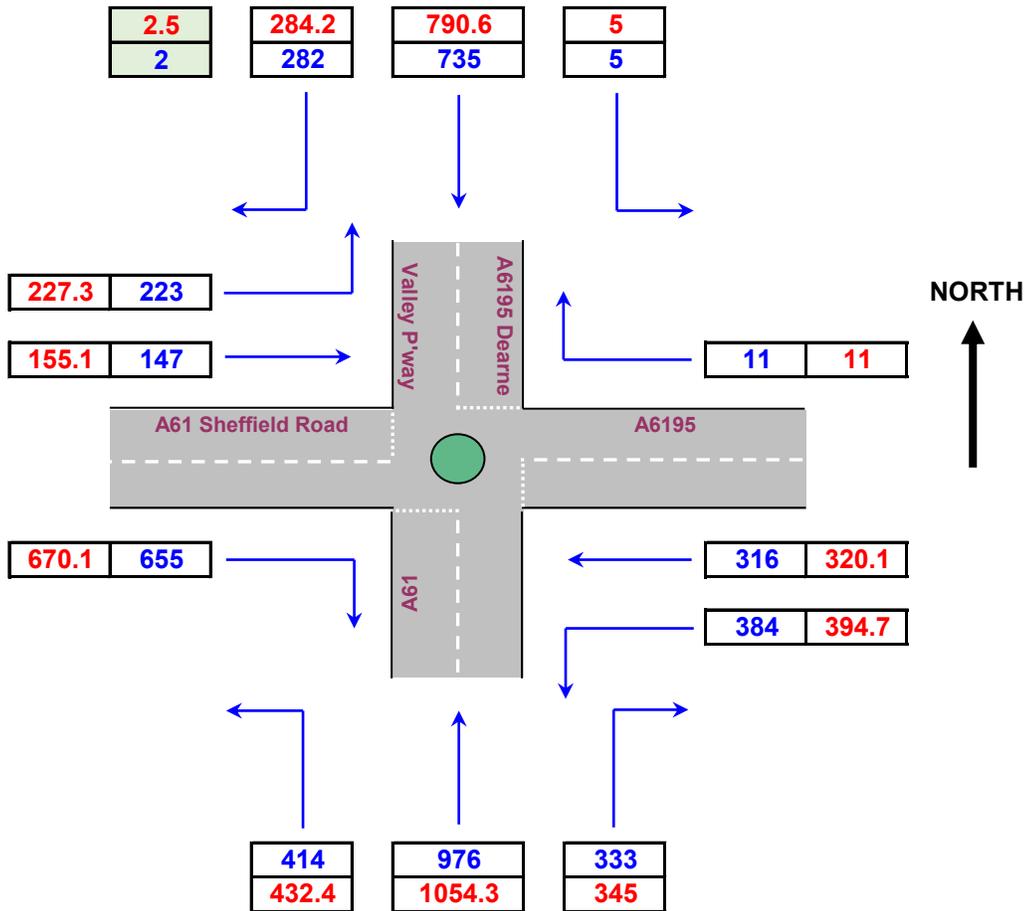
Show Peak Hour:

Start Time: **1) 08:00**

Show PCUs:

End Time: **1) 09:00**

Show Session 2



Junction: 2

**U-Turn**

Vehicle Class: **All Vehicles**

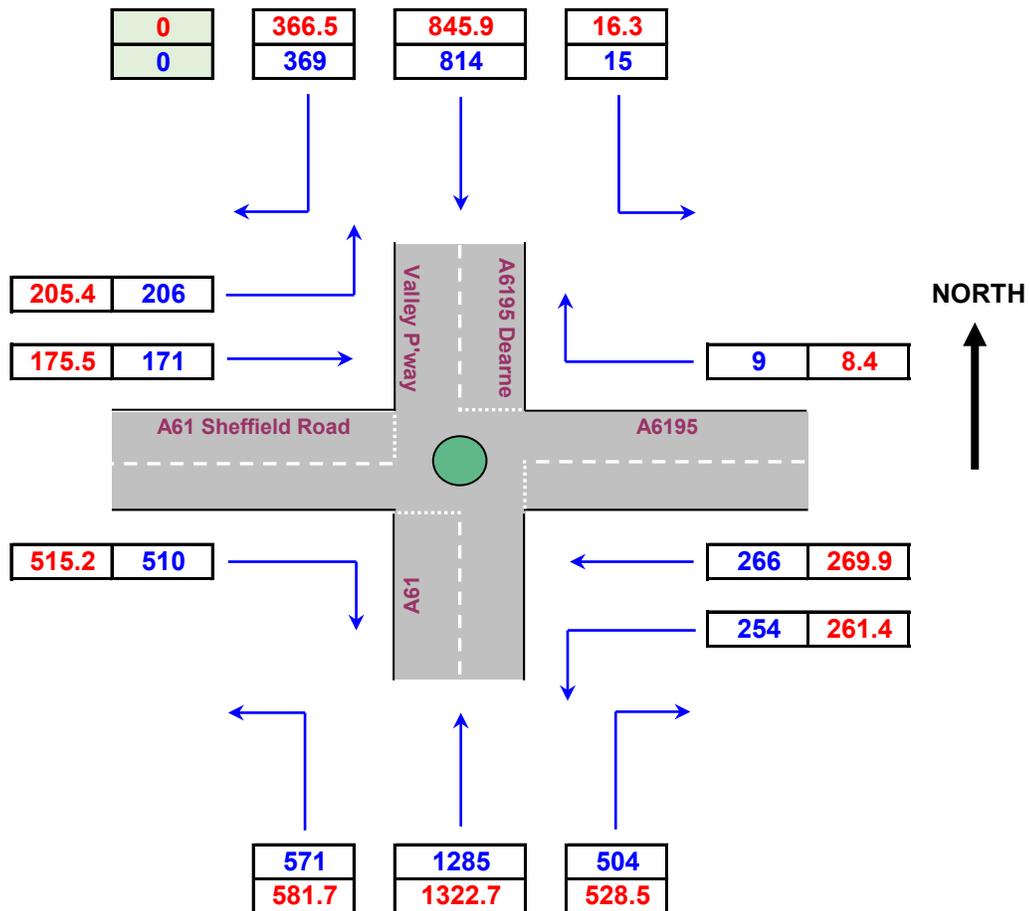
Show Peak Hour:

Start Time: **2) 16:30**

Show PCUs:

End Time: **2) 17:30**

Show Session 2



Junction: 3

Vehicle Class: All Vehicles

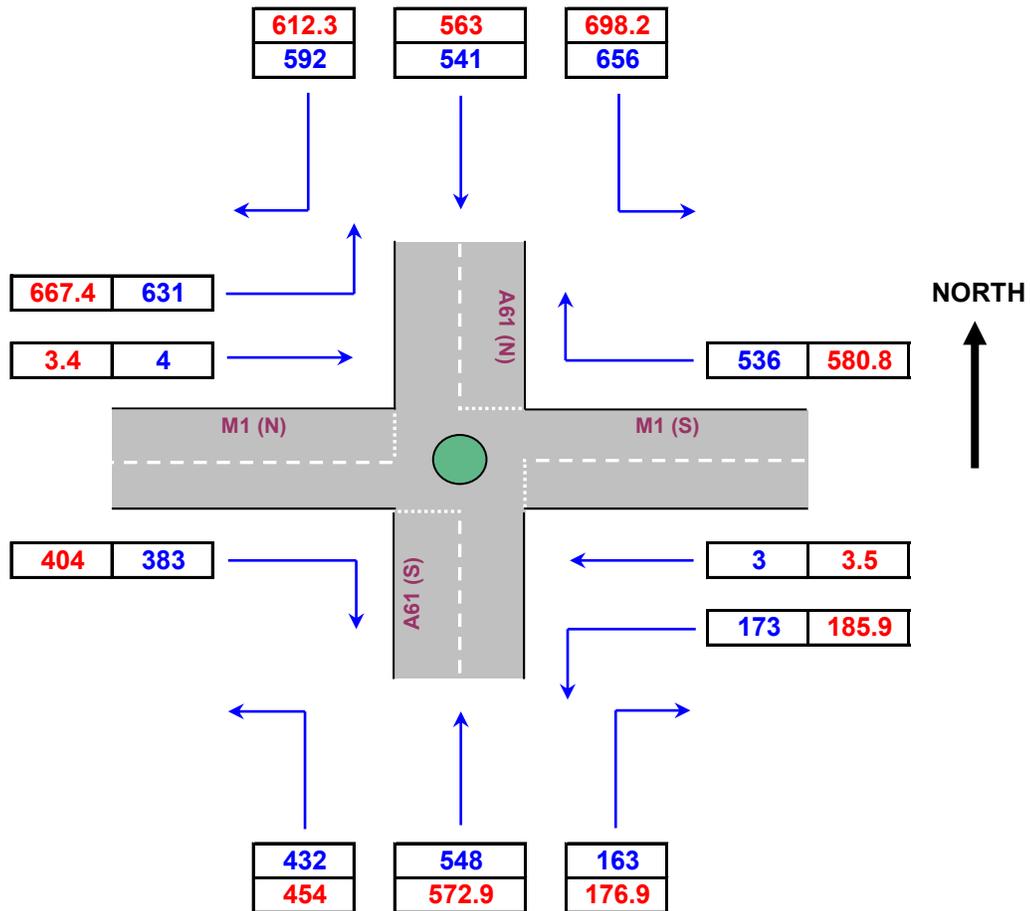
Show Peak Hour:

Start Time: 1) 08:00

Show PCUs:

End Time: 1) 09:00

Show Session 2



Junction: 3

Vehicle Class: All Vehicles

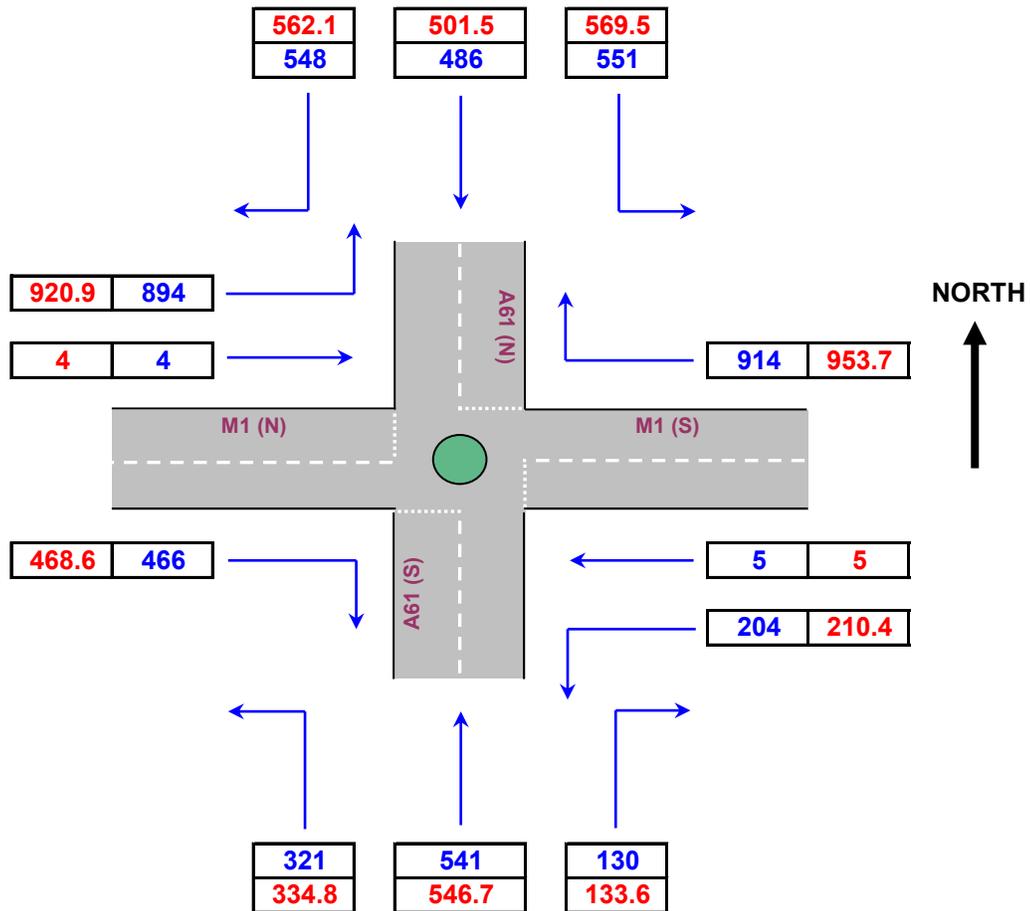
Show Peak Hour:

Start Time: 2) 16:30

Show PCUs:

End Time: 2) 17:30

Show Session 2



## Appendix H: -

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# Video Log

**Plate 1:** Incident on M1 southbound resulting in slip road queuing (40mph sign lit) 07:43



**Plate 2:** M1 southbound queue clear at 07:55. Queue duration 17 minutes (40mph sign still lit)



# Video Log

**Plate 3:** M1 incident resulting in queues back to the Rockingham Roundabout at 07:52



**Plate 4:** Rockingham Roundabout Queue Clear at 08:15 (duration 23 minutes)



# Video Log

**Plate 5:** No incident on M1 during the PM peak hours, with junction (and network) clear.

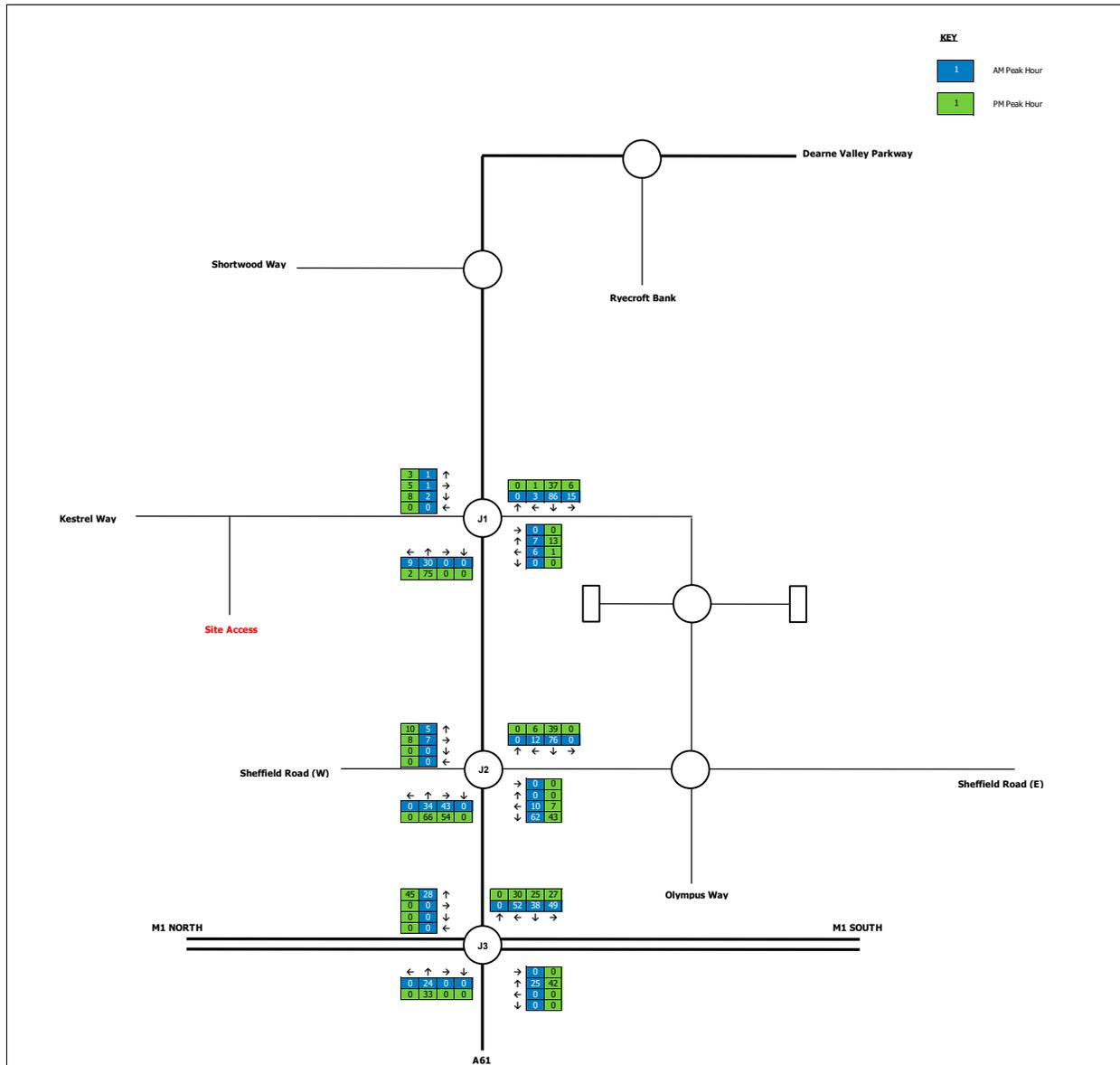


**Plate 6:** Rockingham Roundabout operating clear with no queues.



## Appendix I: -

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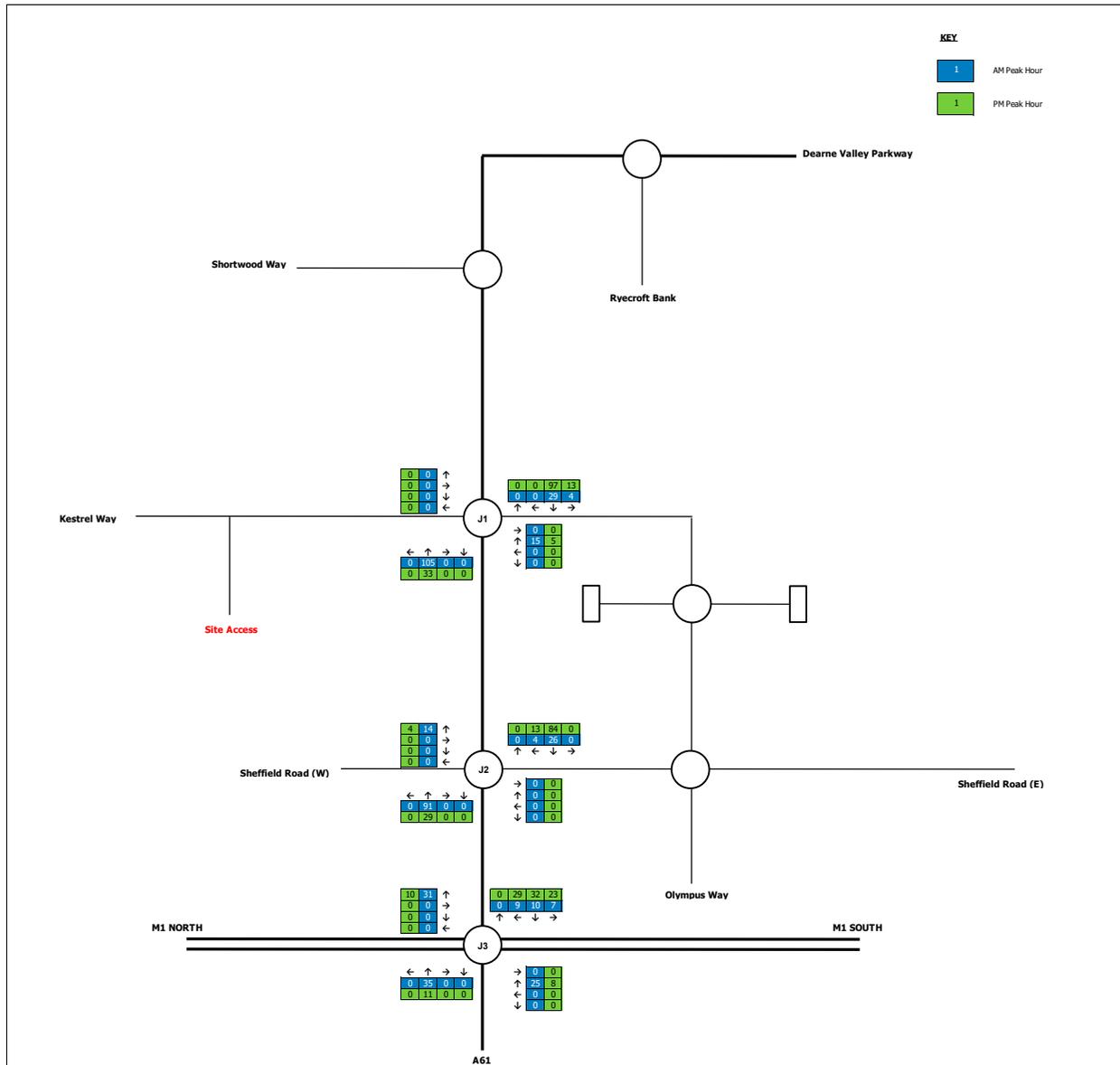


**Notes**  
 All flows provided in PCU  
 Information Obtained From Moadd Transport Assessment Ref: 18005; May 2020 Figures 57 & 58 (ES)14 All Sites, H056, H064, H066)

Diagram 03: Committed Development 'Total Hoyland North Masterplan Area' Trip Generation

Project Title: Land West of Dearne Valley Parkway, Birdwell, Barnsley



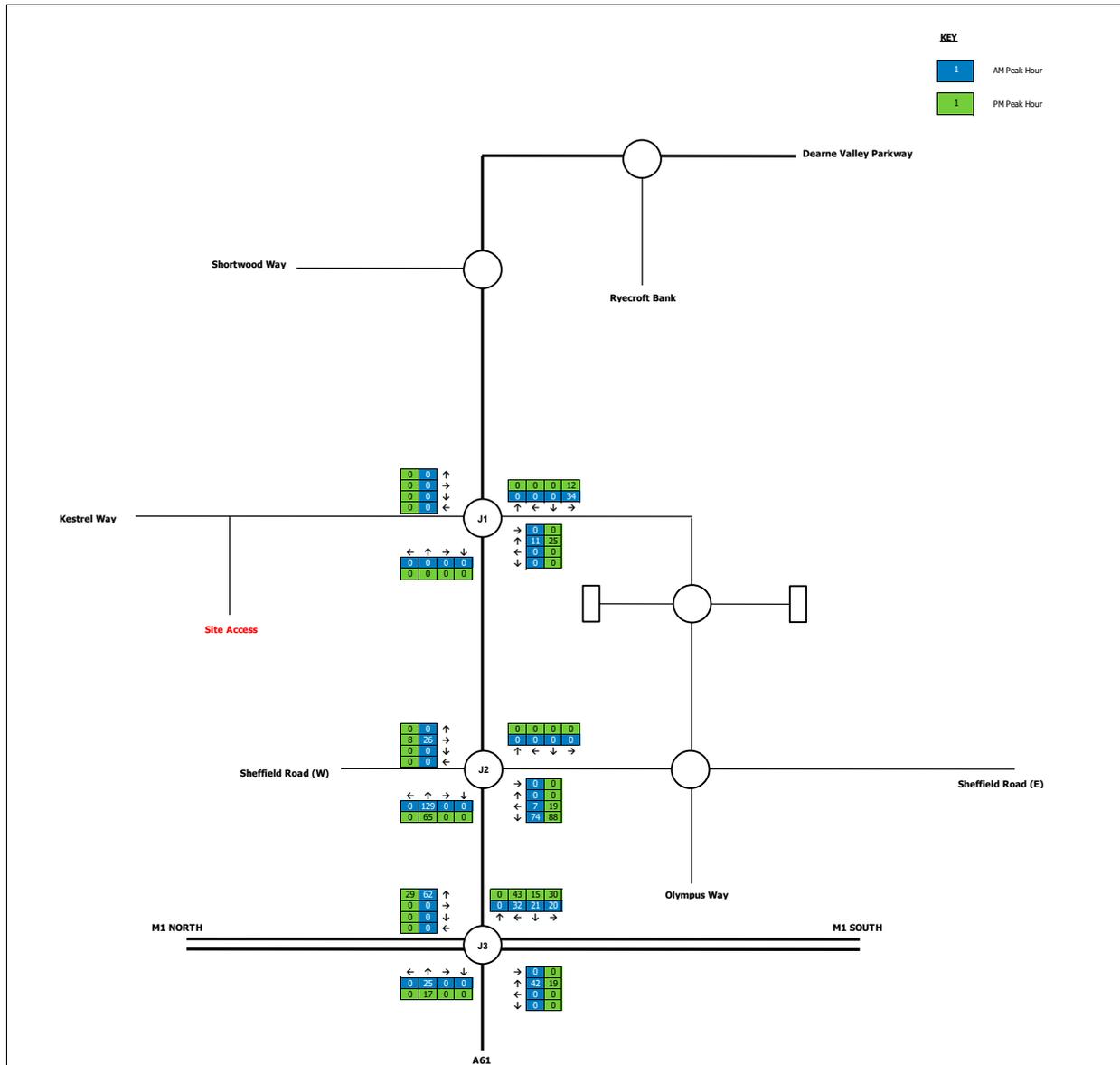


**Notes**  
 All flows provided in PCU  
 Information Obtained From Moaddi Transport Assessment Ref: 18005; May 2020; Figures 28 & 29

Diagram 04: Committed Development 'Total Development Traffic ES14, ES15 & ES17'

Project Title: Land West of Dearn Valley Parkway, Birdwell, Barnsley



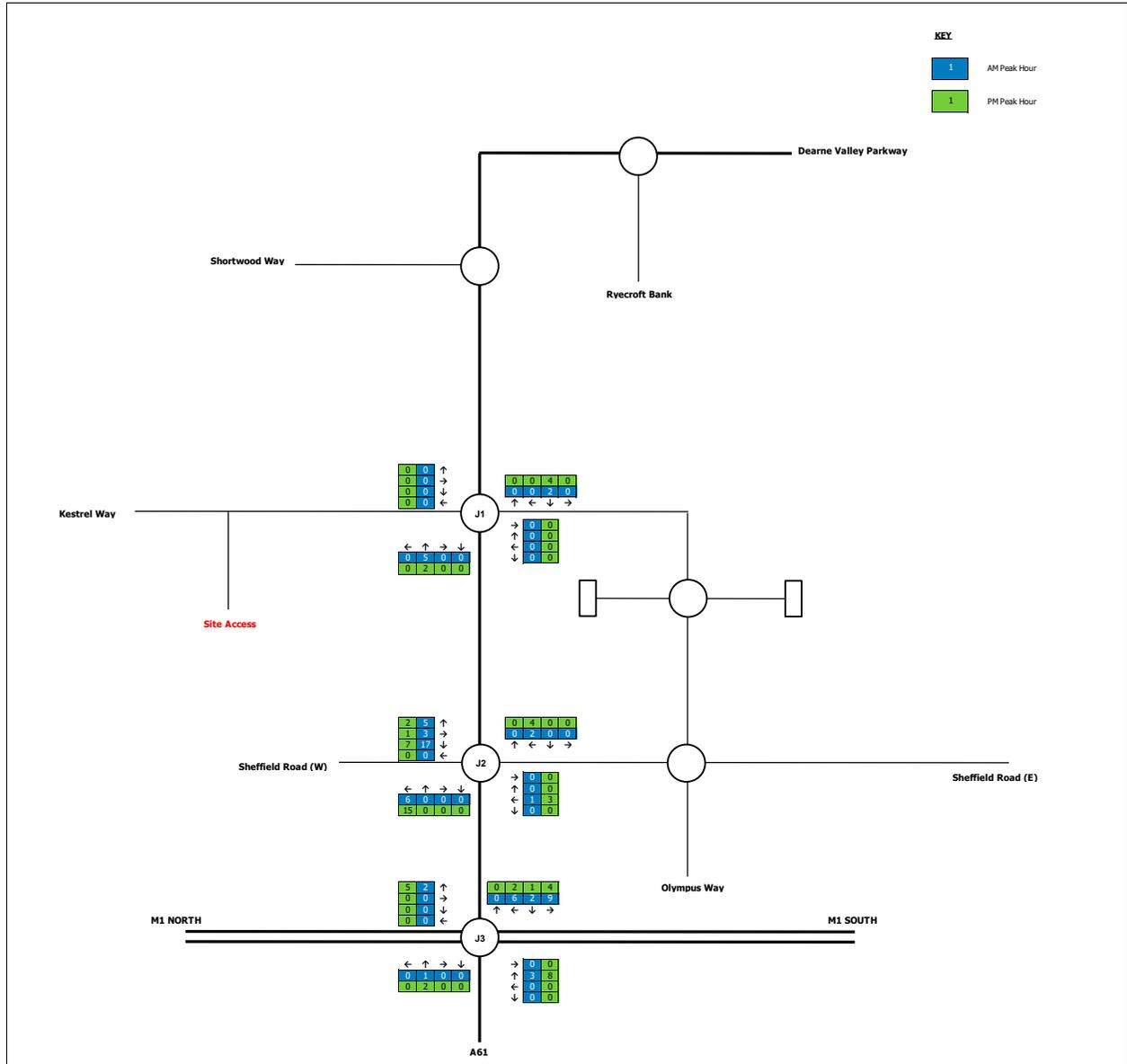


**Notes**  
 All flows provided in FC3  
 Information Obtained From FORE Transport Assessment Ref: 3560 October 2020 Rev C Figures 6 & 7 (FS13 & HS7)

Diagram 05: Committed Development 'Total Hoyland West Development Traffic'

Project Title: Land West of Dearne Valley Parkway, Birdwell, Barnsley

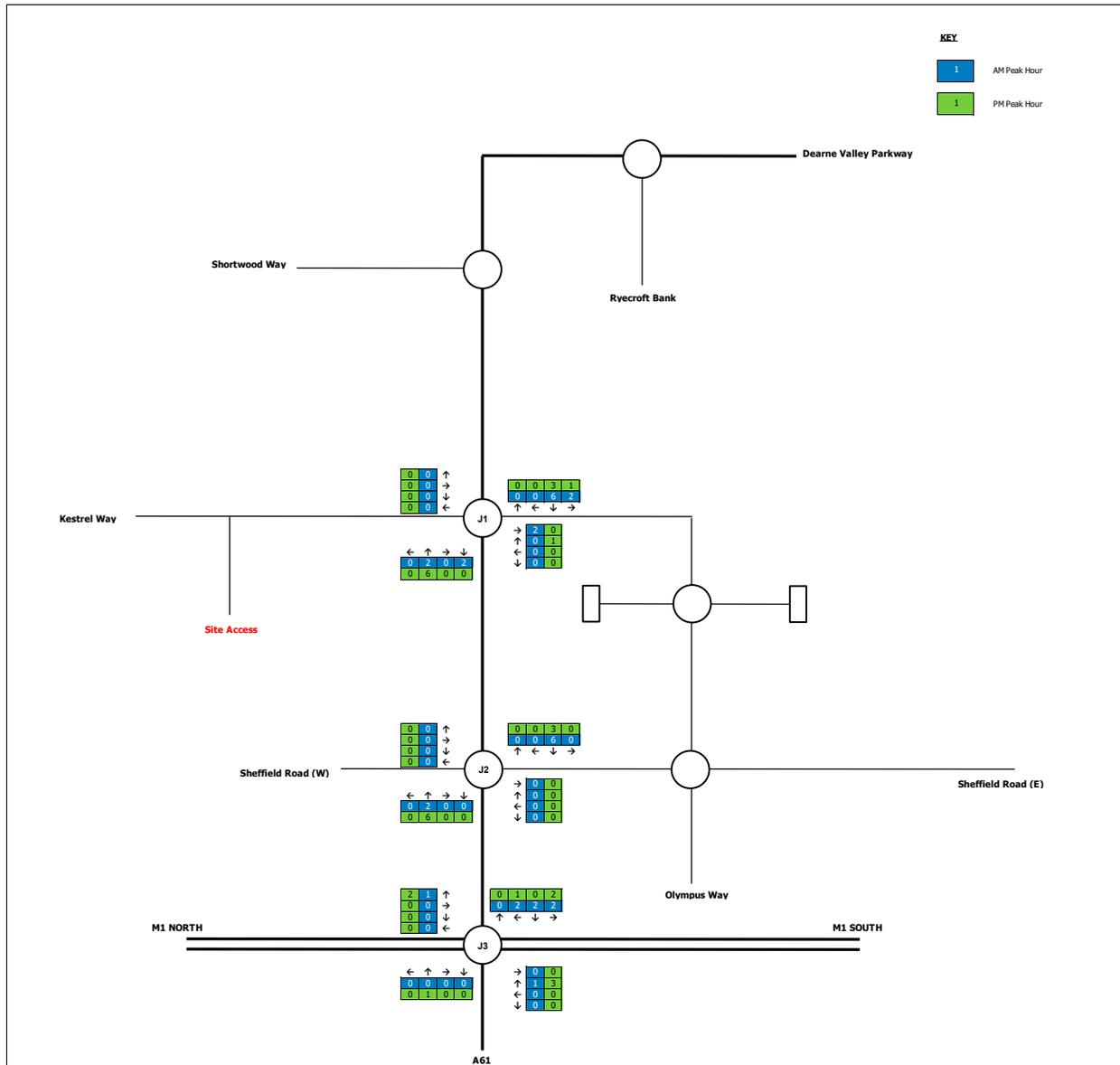




**Notes**  
 All flows provided in PCUs  
 Information Obtained From Moaddi Transport Assessment Ref: 18039 January 2021 (Rev 3) Figures 13 & 14

Diagram 06: Committed Development 'HS59'  
 Project Title: Land West of Dearne Valley Parkway, Birdwell, Barnsley





**Notes**  
 All flows provided in PCMs  
 Information Obtained From Va Solutions Transport Assessment Ref: 21002 May 2021 Figures 6 & 7

Diagram 07: Committed Development 'Land North of Wood Walk, Platts Common'

Project Title: Land West of Dearn Valley Parkway, Birdwell, Barnsley



## Appendix J: -

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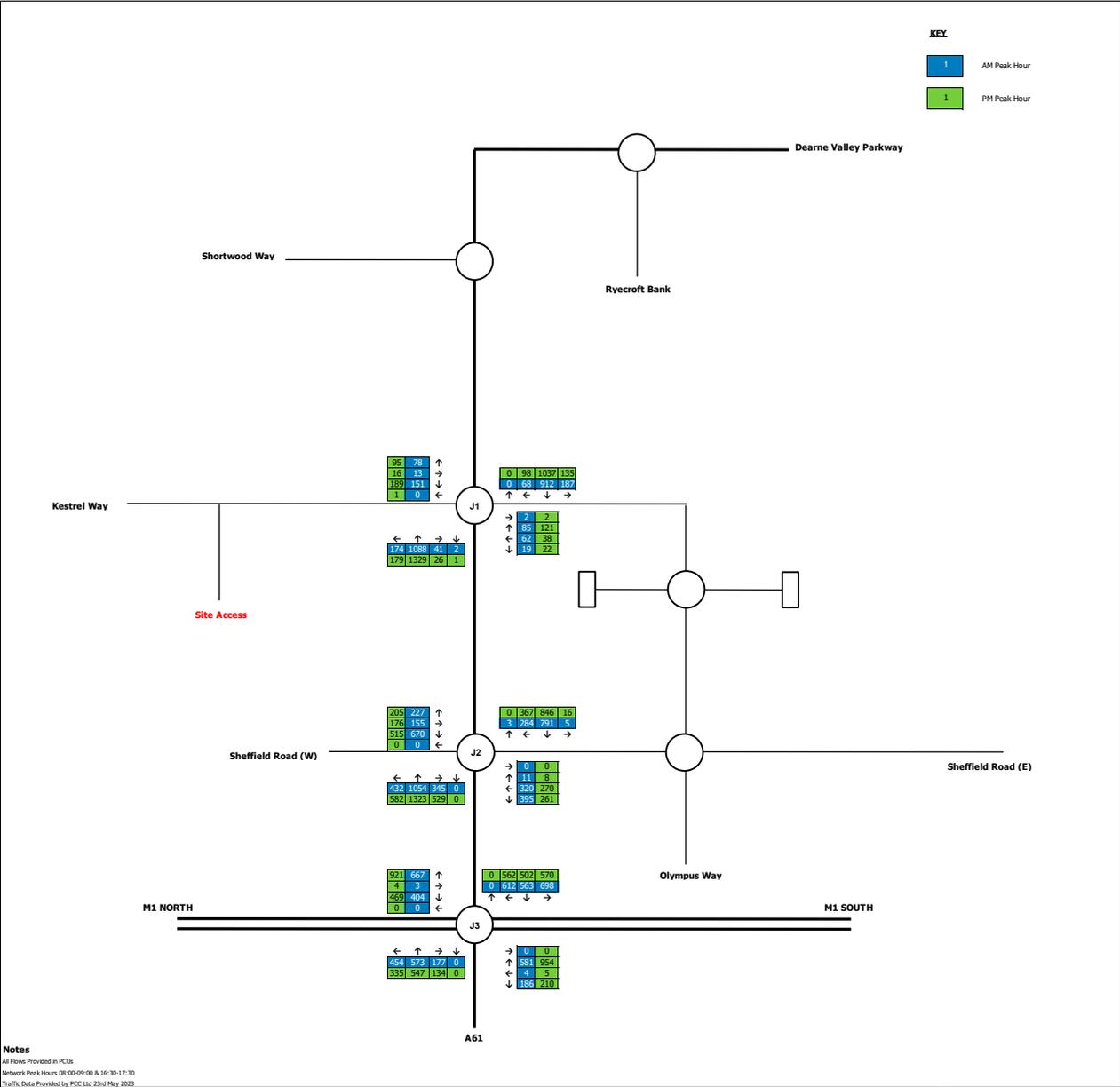
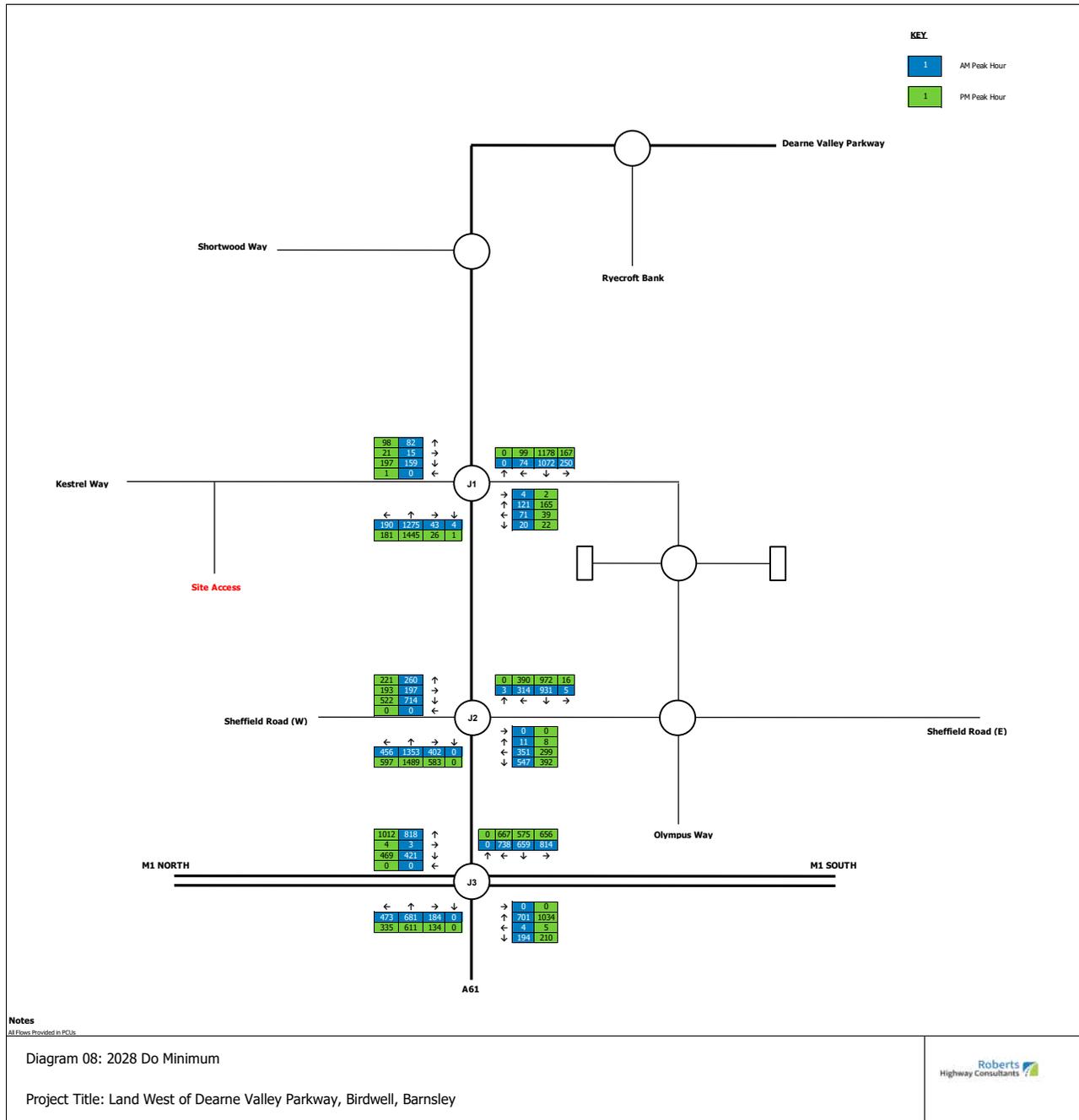
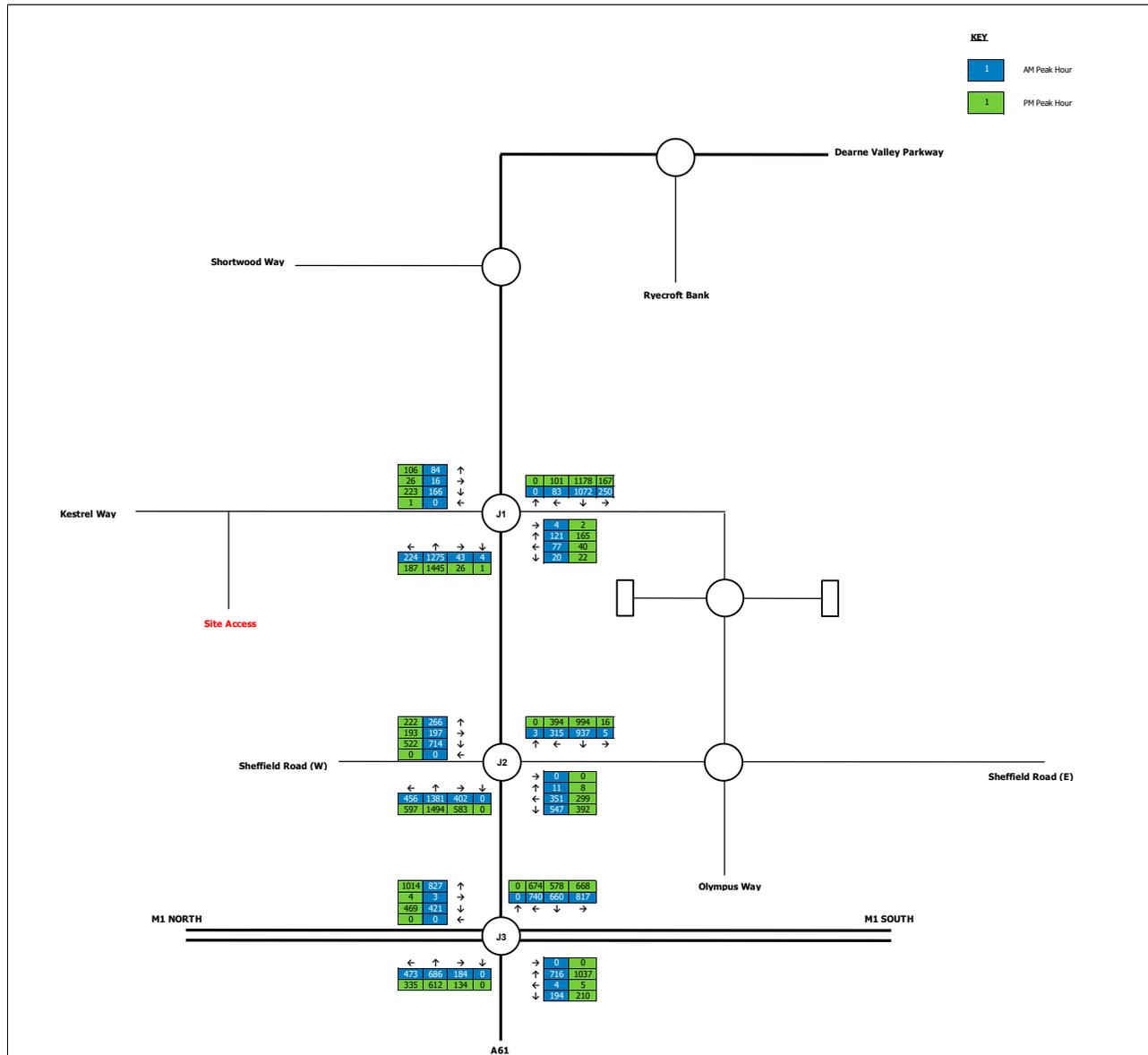


Diagram 02: 2023 Base Flows

Project Title: Land West of Dearne Valley Parkway, Birdwell, Barnsley







**Notes**  
All Flows Provided in FCUs

Diagram 09: 2028 Do Something

Project Title: Land West of Dearne Valley Parkway, Birdwell, Barnsley



# Appendix K: -





Notes:

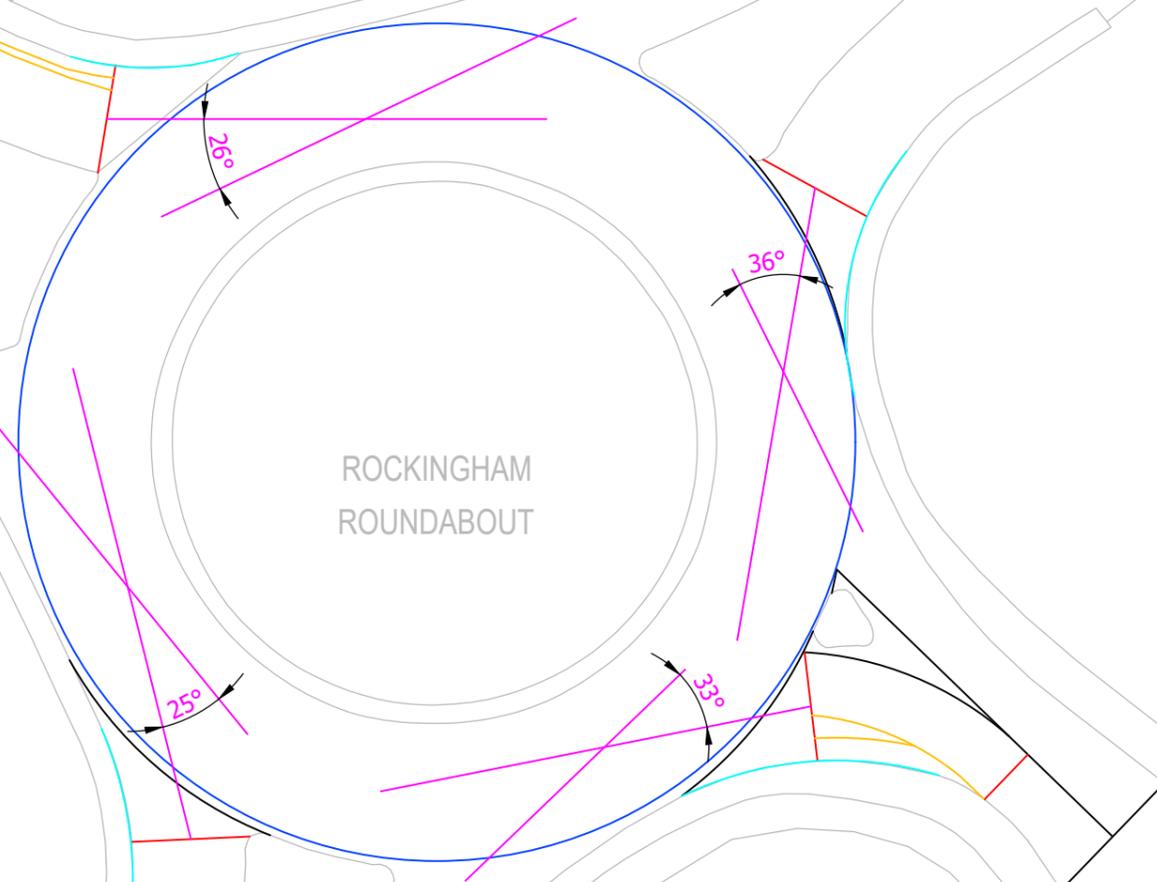
1. Do Not Scale This Drawing Unless For Planning Purposes Only. Any Dimensions Shown Are Indicative Only And Are Subject To Verification Onsite.
2. The Design Shown Is Aligned With Ordnance Survey ProMap Data And Not Topographical Survey Data. This Drawing Is For Information Only And Should Not Be Used For Construction.

V: 5.8m  
 E: 7.7m  
 I: 11.6m  
 R: 19.6m  
 D: 59.2m  
 PHI: 26°

V: 8.3m  
 E: 8.3m  
 I: 0m  
 R: 19.4m  
 D: 59.2m  
 PHI: 36°

V: 8.3m  
 E: 8.3m  
 I: 0m  
 R: 27.6m  
 D: 59.2m  
 PHI: 25°

V: 4.4m  
 E: 7.7m  
 I: 7.1m  
 R: 25.2m  
 D: 59.2m  
 PHI: 33°



ROCKINGHAM  
 ROUNDABOUT

A6195

Rev	Description	Date
Client: Carnell Management Services Ltd		
Project: Land West Of Dearne Valley Parkway Birdwell Barnsley		
Drawing Title: Rockingham Roundabout Junction Geometries		
Drawing Number: RHC-22-065-01		
Revision: -	Sheet Size: A3	Scale: 1:500
Drawn & Checked By: AR	Date: 02/06/2023	Status: Information

Junctions 10
ARCADY 10 - Roundabout Module
Version: 10.0.4.1693 © Copyright TRL Software Limited, 2021
For sales and distribution information, program advice and maintenance, contact TRL Software: +44 (0)1344 379777 software@trl.co.uk trlsoftware.com
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:** Junction 1.j10

**Path:** C:\Users\cland\Documents\Roberts Highway Consultants\Project Folder\RHC-22-065 Land West of Dearne Valley Parkway, Birdwell, Barnsley\Calculations\Junction Modelling

**Report generation date:** 02/06/2023 17:23:42

- »2023 Base, AM
- »2023 Base, PM
- »2028 Do Minimum, AM
- »2028 Do Minimum, PM
- »2028 Do Something, AM
- »2028 Do Something, PM

**Summary of junction performance**

	AM			PM		
	Queue (PCU)	Delay (s)	RFC	Queue (PCU)	Delay (s)	RFC
2023 Base						
1 - A6195 North	1.3	3.73	0.56	1.6	4.19	0.61
2 - Sheffield Road	0.2	4.39	0.18	0.3	5.19	0.22
3 - A6195 South	1.6	3.93	0.59	2.5	5.32	0.71
4 - Kestrel Way	0.3	3.58	0.21	0.4	4.67	0.30
2028 Do Minimum						
1 - A6195 North	2.1	5.04	0.67	2.3	5.28	0.70
2 - Sheffield Road	0.4	5.45	0.26	0.4	6.41	0.31
3 - A6195 South	2.5	5.42	0.70	3.4	6.81	0.78
4 - Kestrel Way	0.3	4.33	0.25	0.5	5.55	0.35
2028 Do Something						
1 - A6195 North	2.2	5.15	0.68	2.4	5.49	0.71
2 - Sheffield Road	0.4	5.59	0.27	0.5	6.63	0.32
3 - A6195 South	2.7	5.82	0.72	3.5	6.92	0.78
4 - Kestrel Way	0.4	4.39	0.26	0.6	5.94	0.39

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 average delay per arriving vehicle.

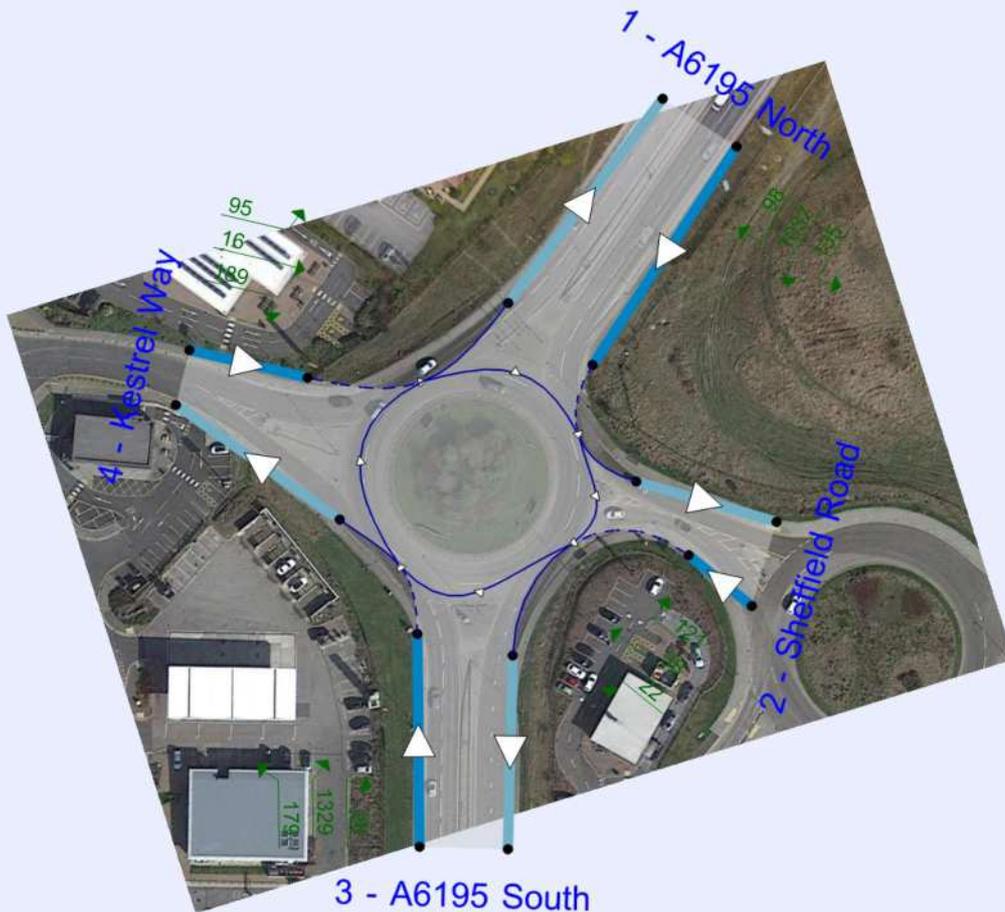
**File summary**

**File Description**

<b>Title</b>	Rockingham Roundabout
<b>Location</b>	Birdwell, Barnsley
<b>Site number</b>	
<b>Date</b>	02/06/2023
<b>Version</b>	
<b>Status</b>	(new file)
<b>Identifier</b>	
<b>Client</b>	Carnell Management Services Ltd
<b>Jobnumber</b>	RHC-22-065
<b>Enumerator</b>	AR
<b>Description</b>	

**Units**

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



Flows show original traffic demand (PCU/hr).

The junction diagram reflects the last run of Junctions.

### Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Show lane queues in feet / metres	Show all PICADY stream intercepts	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)	Use iterations with HCM roundabouts	Max number of iterations for roundabouts
5.75						0.85	36.00	20.00		500

### Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2023 Base	AM	ONE HOUR	07:45	09:15	15	✓
D2	2023 Base	PM	ONE HOUR	16:45	18:15	15	✓
D3	2028 Do Minimum	AM	ONE HOUR	07:45	09:15	15	✓
D4	2028 Do Minimum	PM	ONE HOUR	16:45	18:15	15	✓
D5	2028 Do Something	AM	ONE HOUR	07:45	09:15	15	✓
D6	2028 Do Something	PM	ONE HOUR	16:45	18:15	15	✓

### Analysis Set Details

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

# 2023 Base, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rockingham Roundabout	Standard Roundabout		1, 2, 3, 4	3.85	A

### Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	3.85	A

## Arms

### Arms

Arm	Name	Description	No give-way line
1	A6195 North		
2	Sheffield Road		
3	A6195 South		
4	Kestrel Way		

### Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Entry only	Exit only
1 - A6195 North	8.30	8.30	0.0	19.4	59.2	36.0		
2 - Sheffield Road	4.40	7.70	7.1	25.2	59.2	33.0		
3 - A6195 South	8.30	8.30	0.0	27.6	59.2	25.0		
4 - Kestrel Way	5.80	7.70	11.6	19.6	59.2	26.0		

## Slope / Intercept / Capacity

### Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - A6195 North	0.688	2459
2 - Sheffield Road	0.567	1735
3 - A6195 South	0.726	2592
4 - Kestrel Way	0.646	2163

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
D1	2023 Base	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 North		ONE HOUR	✓	1167	100.000
2 - Sheffield Road		ONE HOUR	✓	168	100.000
3 - A6195 South		ONE HOUR	✓	1305	100.000
4 - Kestrel Way		ONE HOUR	✓	242	100.000

### Origin-Destination Data

#### Demand (PCU/hr)

		To			
		1 - A6195 North	2 - Sheffield Road	3 - A6195 South	4 - Kestrel Way
From	1 - A6195 North	0	187	912	68
	2 - Sheffield Road	85	2	19	62
	3 - A6195 South	1088	41	2	174
	4 - Kestrel Way	78	13	151	0

### Vehicle Mix

#### Heavy Vehicle Percentages

		To			
		1 - A6195 North	2 - Sheffield Road	3 - A6195 South	4 - Kestrel Way
From	1 - A6195 North	0	3	6	3
	2 - Sheffield Road	4	0	0	2
	3 - A6195 South	8	2	0	4
	4 - Kestrel Way	4	0	2	0

### Results

#### Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - A6195 North	0.56	3.73	1.3	A	1071	1606
2 - Sheffield Road	0.18	4.39	0.2	A	154	231
3 - A6195 South	0.59	3.93	1.6	A	1197	1796
4 - Kestrel Way	0.21	3.58	0.3	A	222	333

#### Main Results for each time segment

##### 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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	879	220	157	2351	0.374	876	939	0.0	0.6	2.567	A
2 - Sheffield Road	126	32	851	1252	0.101	126	182	0.0	0.1	3.282	A
3 - A6195 South	982	246	163	2474	0.397	980	814	0.0	0.7	2.579	A
4 - Kestrel Way	182	46	914	1572	0.116	182	228	0.0	0.1	2.654	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1049	262	188	2330	0.450	1048	1124	0.6	0.9	2.958	A
2 - Sheffield Road	151	38	1018	1157	0.131	151	218	0.1	0.2	3.675	A
3 - A6195 South	1173	293	195	2451	0.479	1172	974	0.7	1.0	3.015	A
4 - Kestrel Way	218	54	1094	1456	0.149	217	273	0.1	0.2	2.978	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1285	321	230	2301	0.559	1283	1375	0.9	1.3	3.720	A
2 - Sheffield Road	185	46	1246	1028	0.180	185	267	0.2	0.2	4.386	A
3 - A6195 South	1437	359	239	2419	0.594	1435	1192	1.0	1.6	3.914	A
4 - Kestrel Way	266	67	1339	1298	0.205	266	334	0.2	0.3	3.576	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1285	321	230	2300	0.559	1285	1377	1.3	1.3	3.733	A
2 - Sheffield Road	185	46	1247	1027	0.180	185	268	0.2	0.2	4.393	A
3 - A6195 South	1437	359	239	2419	0.594	1437	1193	1.6	1.6	3.930	A
4 - Kestrel Way	266	67	1341	1297	0.205	266	335	0.3	0.3	3.581	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1049	262	188	2329	0.450	1051	1127	1.3	0.9	2.972	A
2 - Sheffield Road	151	38	1020	1156	0.131	151	219	0.2	0.2	3.682	A
3 - A6195 South	1173	293	195	2451	0.479	1175	976	1.6	1.0	3.034	A
4 - Kestrel Way	218	54	1097	1454	0.150	218	274	0.3	0.2	2.985	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	879	220	158	2350	0.374	880	943	0.9	0.6	2.581	A
2 - Sheffield Road	126	32	854	1250	0.101	127	183	0.2	0.1	3.291	A
3 - A6195 South	982	246	164	2474	0.397	984	817	1.0	0.7	2.592	A
4 - Kestrel Way	182	46	918	1570	0.116	182	229	0.2	0.1	2.662	A

# 2023 Base, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rockingham Roundabout	Standard Roundabout		1, 2, 3, 4	4.82	A

### Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	4.82	A

## Traffic Demand

### Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2023 Base	PM	ONE HOUR	16:45	18:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 North		ONE HOUR	✓	1270	100.000
2 - Sheffield Road		ONE HOUR	✓	183	100.000
3 - A6195 South		ONE HOUR	✓	1535	100.000
4 - Kestrel Way		ONE HOUR	✓	301	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		1 - A6195 North	2 - Sheffield Road	3 - A6195 South	4 - Kestrel Way
From	1 - A6195 North	0	135	1037	98
	2 - Sheffield Road	121	2	22	38
	3 - A6195 South	1329	26	1	179
	4 - Kestrel Way	95	16	189	1

## Vehicle Mix

### Heavy Vehicle Percentages

		To			
		1 - A6195 North	2 - Sheffield Road	3 - A6195 South	4 - Kestrel Way
From	1 - A6195 North	0	1	3	1
	2 - Sheffield Road	1	0	9	0
	3 - A6195 South	3	0	0	1
	4 - Kestrel Way	0	0	2	0

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - A6195 North	0.61	4.19	1.6	A	1165	1748
2 - Sheffield Road	0.22	5.19	0.3	A	168	252
3 - A6195 South	0.71	5.32	2.5	A	1409	2113
4 - Kestrel Way	0.30	4.67	0.4	A	276	414

### Main Results for each time segment

#### 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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	956	239	176	2337	0.409	953	1159	0.0	0.7	2.663	A
2 - Sheffield Road	138	34	995	1170	0.118	137	134	0.0	0.1	3.542	A
3 - A6195 South	1156	289	195	2451	0.472	1152	937	0.0	0.9	2.838	A
4 - Kestrel Way	227	57	1110	1446	0.157	226	237	0.0	0.2	2.986	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1142	285	211	2314	0.493	1141	1387	0.7	1.0	3.147	A
2 - Sheffield Road	165	41	1191	1059	0.155	164	161	0.1	0.2	4.090	A
3 - A6195 South	1380	345	233	2423	0.570	1378	1122	0.9	1.3	3.532	A
4 - Kestrel Way	271	68	1328	1305	0.207	270	284	0.2	0.3	3.522	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1398	350	258	2281	0.613	1396	1697	1.0	1.6	4.162	A
2 - Sheffield Road	201	50	1457	908	0.222	201	197	0.2	0.3	5.178	A
3 - A6195 South	1690	423	286	2385	0.709	1686	1373	1.3	2.4	5.252	A
4 - Kestrel Way	331	83	1624	1114	0.298	331	347	0.3	0.4	4.650	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1398	350	259	2281	0.613	1398	1701	1.6	1.6	4.186	A
2 - Sheffield Road	201	50	1460	906	0.222	201	197	0.3	0.3	5.193	A
3 - A6195 South	1690	423	286	2385	0.709	1690	1375	2.4	2.5	5.320	A
4 - Kestrel Way	331	83	1628	1111	0.298	331	348	0.4	0.4	4.673	A

#### 17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1142	285	212	2313	0.494	1144	1393	1.6	1.0	3.166	A
2 - Sheffield Road	165	41	1195	1057	0.156	165	161	0.3	0.2	4.107	A
3 - A6195 South	1380	345	234	2422	0.570	1384	1125	2.5	1.4	3.575	A
4 - Kestrel Way	271	68	1334	1301	0.208	271	285	0.4	0.3	3.542	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	956	239	177	2337	0.409	957	1165	1.0	0.7	2.679	A
2 - Sheffield Road	138	34	1000	1167	0.118	138	135	0.2	0.1	3.555	A
3 - A6195 South	1156	289	196	2450	0.472	1157	941	1.4	0.9	2.865	A
4 - Kestrel Way	227	57	1115	1443	0.157	227	238	0.3	0.2	2.998	A

# 2028 Do Minimum, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rockingham Roundabout	Standard Roundabout		1, 2, 3, 4	5.19	A

### Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.19	A

## 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	2028 Do Minimum	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 North		ONE HOUR	✓	1396	100.000
2 - Sheffield Road		ONE HOUR	✓	216	100.000
3 - A6195 South		ONE HOUR	✓	1512	100.000
4 - Kestrel Way		ONE HOUR	✓	256	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		1 - A6195 North	2 - Sheffield Road	3 - A6195 South	4 - Kestrel Way
From	1 - A6195 North	0	250	1072	74
	2 - Sheffield Road	121	4	20	71
	3 - A6195 South	1275	43	4	190
	4 - Kestrel Way	82	15	159	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To			
		1 - A6195 North	2 - Sheffield Road	3 - A6195 South	4 - Kestrel Way
From	1 - A6195 North	0	3	6	3
	2 - Sheffield Road	4	0	0	2
	3 - A6195 South	8	2	0	4
	4 - Kestrel Way	4	0	2	0

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - A6195 North	0.67	5.04	2.1	A	1281	1921
2 - Sheffield Road	0.26	5.45	0.4	A	198	297
3 - A6195 South	0.70	5.42	2.5	A	1387	2081
4 - Kestrel Way	0.25	4.33	0.3	A	235	352

### Main Results for each time segment

#### 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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1051	263	169	2343	0.449	1048	1109	0.0	0.9	2.920	A
2 - Sheffield Road	163	41	982	1177	0.138	162	234	0.0	0.2	3.646	A
3 - A6195 South	1138	285	202	2445	0.465	1135	942	0.0	0.9	2.937	A
4 - Kestrel Way	193	48	1086	1462	0.132	192	251	0.0	0.2	2.905	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1255	314	202	2320	0.541	1253	1327	0.9	1.2	3.550	A
2 - Sheffield Road	194	49	1175	1068	0.182	194	280	0.2	0.2	4.238	A
3 - A6195 South	1359	340	242	2417	0.562	1358	1127	0.9	1.4	3.640	A
4 - Kestrel Way	230	58	1299	1324	0.174	230	301	0.2	0.2	3.373	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1537	384	247	2289	0.672	1533	1623	1.2	2.1	4.995	A
2 - Sheffield Road	238	59	1438	919	0.259	237	343	0.2	0.4	5.433	A
3 - A6195 South	1665	416	297	2377	0.700	1660	1379	1.4	2.5	5.354	A
4 - Kestrel Way	282	70	1589	1137	0.248	281	368	0.2	0.3	4.314	A

#### 08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1537	384	248	2288	0.672	1537	1627	2.1	2.1	5.044	A
2 - Sheffield Road	238	59	1441	917	0.259	238	344	0.4	0.4	5.454	A
3 - A6195 South	1665	416	297	2377	0.700	1665	1382	2.5	2.5	5.421	A
4 - Kestrel Way	282	70	1593	1134	0.249	282	369	0.3	0.3	4.330	A

#### 08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1255	314	203	2319	0.541	1259	1333	2.1	1.3	3.584	A
2 - Sheffield Road	194	49	1180	1065	0.182	195	281	0.4	0.2	4.259	A
3 - A6195 South	1359	340	243	2416	0.563	1364	1131	2.5	1.4	3.684	A
4 - Kestrel Way	230	58	1305	1320	0.174	231	302	0.3	0.2	3.388	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1051	263	170	2342	0.449	1053	1114	1.3	0.9	2.944	A
2 - Sheffield Road	163	41	987	1175	0.138	163	235	0.2	0.2	3.660	A
3 - A6195 South	1138	285	204	2445	0.466	1140	946	1.4	0.9	2.966	A
4 - Kestrel Way	193	48	1091	1458	0.132	193	253	0.2	0.2	2.919	A

# 2028 Do Minimum, 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	Rockingham Roundabout	Standard Roundabout		1, 2, 3, 4	6.07	A

### Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.07	A

## 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	2028 Do Minimum	PM	ONE HOUR	16:45	18:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 North		ONE HOUR	✓	1444	100.000
2 - Sheffield Road		ONE HOUR	✓	228	100.000
3 - A6195 South		ONE HOUR	✓	1653	100.000
4 - Kestrel Way		ONE HOUR	✓	317	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		1 - A6195 North	2 - Sheffield Road	3 - A6195 South	4 - Kestrel Way
From	1 - A6195 North	0	167	1178	99
	2 - Sheffield Road	165	2	22	39
	3 - A6195 South	1445	26	1	181
	4 - Kestrel Way	98	21	197	1

## Vehicle Mix

### Heavy Vehicle Percentages

From	To			
	1 - A6195 North	2 - Sheffield Road	3 - A6195 South	4 - Kestrel Way
1 - A6195 North	0	0	0	0
2 - Sheffield Road	0	0	0	0
3 - A6195 South	0	0	0	0
4 - Kestrel Way	0	0	0	0

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - A6195 North	0.70	5.28	2.3	A	1325	1988
2 - Sheffield Road	0.31	6.41	0.4	A	209	314
3 - A6195 South	0.78	6.81	3.4	A	1517	2275
4 - Kestrel Way	0.35	5.55	0.5	A	291	436

### Main Results for each time segment

#### 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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1087	272	186	2331	0.466	1084	1281	0.0	0.9	2.878	A
2 - Sheffield Road	172	43	1108	1106	0.155	171	162	0.0	0.2	3.849	A
3 - A6195 South	1244	311	229	2426	0.513	1240	1049	0.0	1.0	3.027	A
4 - Kestrel Way	239	60	1230	1369	0.174	238	240	0.0	0.2	3.182	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1298	325	223	2306	0.563	1296	1533	0.9	1.3	3.561	A
2 - Sheffield Road	205	51	1325	983	0.209	205	194	0.2	0.3	4.625	A
3 - A6195 South	1486	372	275	2393	0.621	1484	1255	1.0	1.6	3.949	A
4 - Kestrel Way	285	71	1471	1213	0.235	285	287	0.2	0.3	3.877	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1590	397	272	2271	0.700	1586	1874	1.3	2.3	5.220	A
2 - Sheffield Road	251	63	1621	815	0.308	250	237	0.3	0.4	6.369	A
3 - A6195 South	1820	455	336	2349	0.775	1813	1535	1.6	3.3	6.638	A
4 - Kestrel Way	349	87	1798	1002	0.348	348	351	0.3	0.5	5.500	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1590	397	273	2271	0.700	1590	1880	2.3	2.3	5.283	A
2 - Sheffield Road	251	63	1625	812	0.309	251	238	0.4	0.4	6.411	A
3 - A6195 South	1820	455	337	2348	0.775	1820	1539	3.3	3.4	6.806	A
4 - Kestrel Way	349	87	1804	998	0.350	349	352	0.5	0.5	5.550	A

**17:45 - 18:00**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1298	325	224	2305	0.563	1302	1542	2.3	1.3	3.606	A
2 - Sheffield Road	205	51	1331	979	0.209	206	195	0.4	0.3	4.657	A
3 - A6195 South	1486	372	276	2392	0.621	1493	1261	3.4	1.7	4.035	A
4 - Kestrel Way	285	71	1480	1207	0.236	286	289	0.5	0.3	3.913	A

**18:00 - 18:15**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1087	272	187	2330	0.467	1089	1288	1.3	0.9	2.905	A
2 - Sheffield Road	172	43	1113	1103	0.156	172	163	0.3	0.2	3.868	A
3 - A6195 South	1244	311	231	2425	0.513	1247	1054	1.7	1.1	3.061	A
4 - Kestrel Way	239	60	1236	1364	0.175	239	241	0.3	0.2	3.199	A

# 2028 Do Something, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rockingham Roundabout	Standard Roundabout		1, 2, 3, 4	5.42	A

### Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	5.42	A

## 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	2028 Do Something	AM	ONE HOUR	07:45	09:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 North		ONE HOUR	✓	1405	100.000
2 - Sheffield Road		ONE HOUR	✓	222	100.000
3 - A6195 South		ONE HOUR	✓	1546	100.000
4 - Kestrel Way		ONE HOUR	✓	266	100.000

## Origin-Destination Data

### Demand (PCU/hr)

		To			
		1 - A6195 North	2 - Sheffield Road	3 - A6195 South	4 - Kestrel Way
From	1 - A6195 North	0	250	1072	83
	2 - Sheffield Road	121	4	20	77
	3 - A6195 South	1275	43	4	224
	4 - Kestrel Way	84	16	166	0

## Vehicle Mix

### Heavy Vehicle Percentages

		To			
		1 - A6195 North	2 - Sheffield Road	3 - A6195 South	4 - Kestrel Way
From	1 - A6195 North	0	3	6	3
	2 - Sheffield Road	4	0	0	2
	3 - A6195 South	8	2	0	4
	4 - Kestrel Way	4	0	2	0

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - A6195 North	0.68	5.15	2.2	A	1289	1934
2 - Sheffield Road	0.27	5.59	0.4	A	204	306
3 - A6195 South	0.72	5.82	2.7	A	1419	2128
4 - Kestrel Way	0.26	4.39	0.4	A	244	366

### Main Results for each time segment

#### 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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1058	264	175	2338	0.452	1054	1110	0.0	0.9	2.944	A
2 - Sheffield Road	167	42	994	1170	0.143	166	235	0.0	0.2	3.686	A
3 - A6195 South	1164	291	214	2437	0.478	1160	947	0.0	1.0	3.013	A
4 - Kestrel Way	200	50	1086	1462	0.137	200	288	0.0	0.2	2.922	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1263	316	209	2315	0.546	1262	1329	0.9	1.3	3.594	A
2 - Sheffield Road	200	50	1190	1060	0.188	199	281	0.2	0.2	4.303	A
3 - A6195 South	1390	347	256	2407	0.577	1388	1133	1.0	1.5	3.782	A
4 - Kestrel Way	239	60	1299	1324	0.181	239	345	0.2	0.2	3.401	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1547	387	256	2283	0.678	1543	1625	1.3	2.2	5.101	A
2 - Sheffield Road	244	61	1455	909	0.269	244	344	0.2	0.4	5.564	A
3 - A6195 South	1702	426	313	2365	0.720	1697	1386	1.5	2.7	5.735	A
4 - Kestrel Way	293	73	1589	1137	0.258	292	422	0.2	0.4	4.366	A

#### 08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1547	387	257	2282	0.678	1547	1629	2.2	2.2	5.151	A
2 - Sheffield Road	244	61	1459	907	0.270	244	345	0.4	0.4	5.589	A
3 - A6195 South	1702	426	314	2365	0.720	1702	1389	2.7	2.7	5.821	A
4 - Kestrel Way	293	73	1593	1134	0.258	293	423	0.4	0.4	4.386	A

#### 08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1263	316	210	2314	0.546	1267	1335	2.2	1.3	3.629	A
2 - Sheffield Road	200	50	1195	1057	0.189	200	282	0.4	0.2	4.326	A
3 - A6195 South	1390	347	257	2406	0.578	1395	1138	2.7	1.5	3.837	A
4 - Kestrel Way	239	60	1305	1320	0.181	240	346	0.4	0.2	3.417	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1058	264	176	2338	0.452	1059	1116	1.3	0.9	2.969	A
2 - Sheffield Road	167	42	999	1168	0.143	167	236	0.2	0.2	3.701	A
3 - A6195 South	1164	291	215	2436	0.478	1166	952	1.5	1.0	3.043	A
4 - Kestrel Way	200	50	1091	1458	0.137	201	290	0.2	0.2	2.934	A

# 2028 Do Something, 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	Rockingham Roundabout	Standard Roundabout		1, 2, 3, 4	6.25	A

### Junction Network

Driving side	Lighting	Network delay (s)	Network LOS
Left	Normal/unknown	6.25	A

## 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	2028 Do Something	PM	ONE HOUR	16:45	18:15	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	Average Demand (PCU/hr)	Scaling Factor (%)
1 - A6195 North		ONE HOUR	✓	1446	100.000
2 - Sheffield Road		ONE HOUR	✓	229	100.000
3 - A6195 South		ONE HOUR	✓	1659	100.000
4 - Kestrel Way		ONE HOUR	✓	356	100.000

## Origin-Destination Data

### Demand (PCU/hr)

From	To			
	1 - A6195 North	2 - Sheffield Road	3 - A6195 South	4 - Kestrel Way
1 - A6195 North	0	167	1178	101
2 - Sheffield Road	165	2	22	40
3 - A6195 South	1445	26	1	187
4 - Kestrel Way	106	26	223	1

## Vehicle Mix

### Heavy Vehicle Percentages

From	To			
	1 - A6195 North	2 - Sheffield Road	3 - A6195 South	4 - Kestrel Way
1 - A6195 North	0	0	0	0
2 - Sheffield Road	0	0	0	0
3 - A6195 South	0	0	0	0
4 - Kestrel Way	0	0	0	0

## Results

### Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1 - A6195 North	0.71	5.49	2.4	A	1327	1990
2 - Sheffield Road	0.32	6.63	0.5	A	210	315
3 - A6195 South	0.78	6.92	3.5	A	1522	2283
4 - Kestrel Way	0.39	5.94	0.6	A	327	490

### Main Results for each time segment

#### 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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1089	272	209	2315	0.470	1085	1287	0.0	0.9	2.919	A
2 - Sheffield Road	172	43	1129	1094	0.158	172	166	0.0	0.2	3.898	A
3 - A6195 South	1249	312	232	2424	0.515	1245	1069	0.0	1.1	3.040	A
4 - Kestrel Way	268	67	1230	1369	0.196	267	247	0.0	0.2	3.265	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1300	325	250	2286	0.569	1298	1540	0.9	1.3	3.637	A
2 - Sheffield Road	206	51	1350	968	0.213	206	198	0.2	0.3	4.716	A
3 - A6195 South	1491	373	277	2391	0.624	1489	1278	1.1	1.6	3.980	A
4 - Kestrel Way	320	80	1471	1213	0.264	320	295	0.2	0.4	4.029	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1592	398	306	2248	0.708	1588	1882	1.3	2.4	5.417	A
2 - Sheffield Road	252	63	1651	798	0.316	251	243	0.3	0.5	6.582	A
3 - A6195 South	1827	457	339	2346	0.779	1820	1564	1.6	3.4	6.745	A
4 - Kestrel Way	392	98	1798	1002	0.391	391	361	0.4	0.6	5.882	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 side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1592	398	307	2247	0.708	1592	1889	2.4	2.4	5.490	A
2 - Sheffield Road	252	63	1656	795	0.317	252	243	0.5	0.5	6.630	A
3 - A6195 South	1827	457	340	2346	0.779	1826	1568	3.4	3.5	6.924	A
4 - Kestrel Way	392	98	1804	998	0.393	392	362	0.6	0.6	5.944	A

**17:45 - 18:00**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1300	325	252	2286	0.569	1304	1550	2.4	1.3	3.683	A
2 - Sheffield Road	206	51	1357	965	0.213	207	199	0.5	0.3	4.752	A
3 - A6195 South	1491	373	279	2390	0.624	1499	1284	3.5	1.7	4.068	A
4 - Kestrel Way	320	80	1480	1207	0.265	321	297	0.6	0.4	4.071	A

**18:00 - 18:15**

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1 - A6195 North	1089	272	210	2314	0.470	1090	1294	1.3	0.9	2.948	A
2 - Sheffield Road	172	43	1134	1091	0.158	173	167	0.3	0.2	3.921	A
3 - A6195 South	1249	312	233	2423	0.515	1251	1074	1.7	1.1	3.077	A
4 - Kestrel Way	268	67	1236	1364	0.196	268	248	0.4	0.2	3.288	A

# Appendix L: -

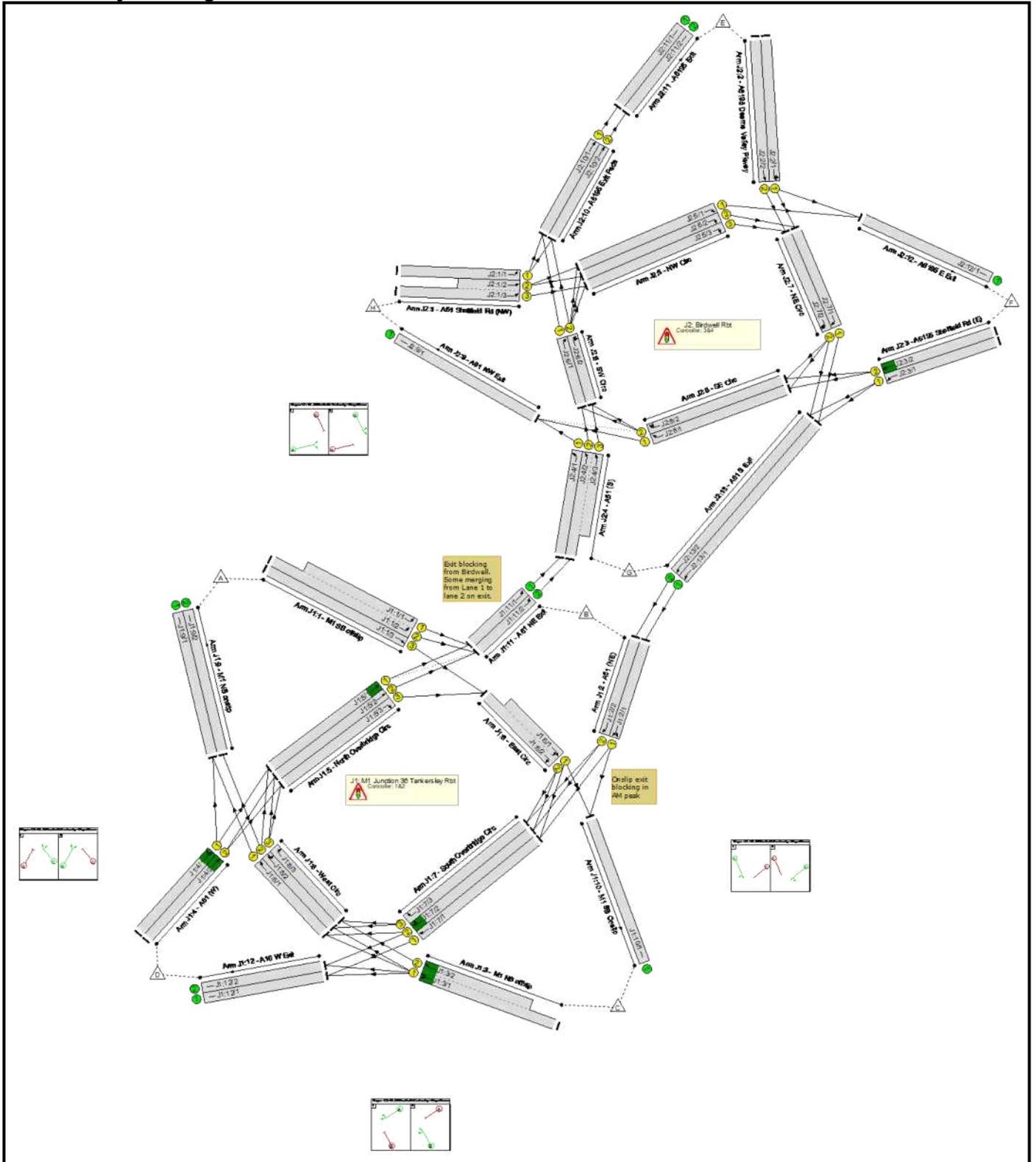


**Full Input Data And Results**

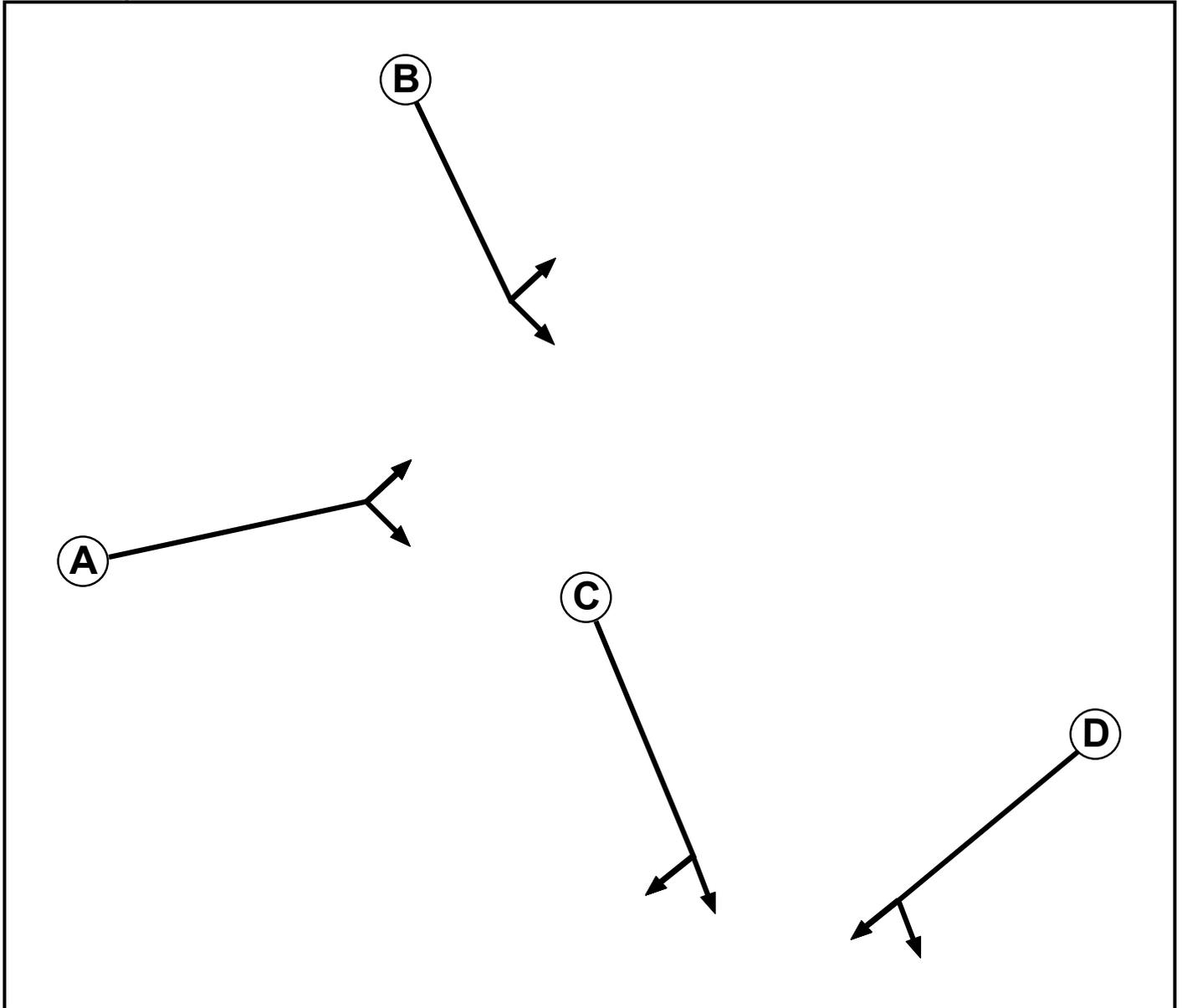
**User and Project Details**

<b>Project:</b>	
<b>Title:</b>	<b>M1 J36 Tankersley Rbt + Birdwell Rbt</b>
<b>Location:</b>	
<b>Additional detail:</b>	
<b>File name:</b>	M1J36 Tankersley + Birdwell Rbt.lsg3x
<b>Author:</b>	al
<b>Company:</b>	
<b>Address:</b>	

### Network Layout Diagram



**C1 - M1 J36 Northside Tankersley  
Phase Diagram**



**Phase Input Data**

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		7	7
B	Traffic	1		7	7
C	Traffic	2		7	7
D	Traffic	2		7	7

Full Input Data And Results

**Phase Intergrens Matrix**

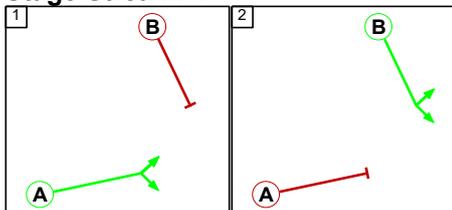
		Starting Phase			
		A	B	C	D
Terminating Phase	A		7	-	-
	B	7		-	-
	C	-	-		7
	D	-	-	7	

**Phases in Stage**

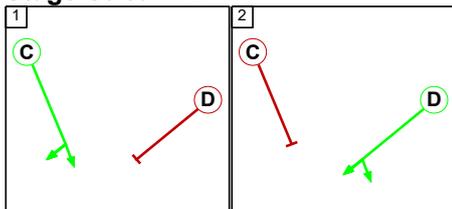
Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D

**Stage Diagram**

**Stage Stream: 1**



**Stage Stream: 2**



**Phase Delays**

**Stage Stream: 1**

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

**Stage Stream: 2**

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

**Prohibited Stage Change**

**Stage Stream: 1**

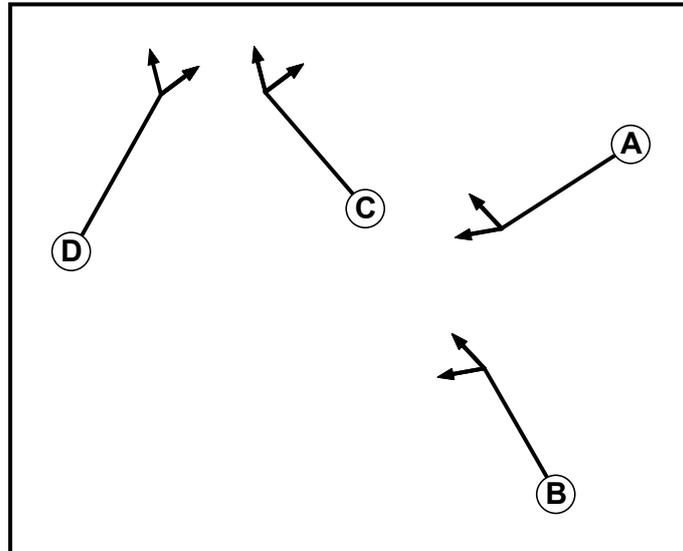
		To Stage	
		1	2
From Stage	1		7
	2	7	

Full Input Data And Results

**Stage Stream: 2**

	To Stage	
	1	2
From Stage	1	7
	2	7

**C2 - M1 J36 Southside Tankersley  
Phase Diagram**



**Phase Input Data**

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		-9999	7
B	Traffic	1		-9999	7
C	Traffic	2		-9999	7
D	Traffic	2		-9999	7

**Phase Intergreens Matrix**

	Starting Phase				
	A	B	C	D	
Terminating Phase	A	7	-	-	
	B	7	-	-	
	C	-	-	7	
	D	-	-	7	

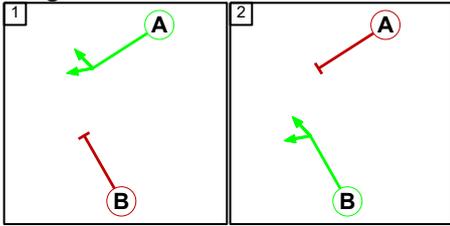
**Phases in Stage**

Stream	Stage No.	Phases in Stage
1	1	A
1	2	B
2	1	C
2	2	D

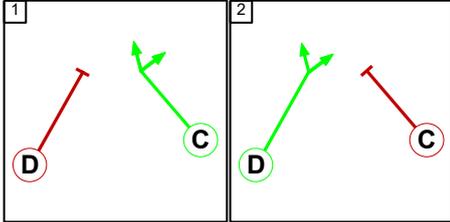
Full Input Data And Results

**Stage Diagram**

**Stage Stream: 1**



**Stage Stream: 2**



**Phase Delays**

**Stage Stream: 1**

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

**Stage Stream: 2**

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

**Prohibited Stage Change**

**Stage Stream: 1**

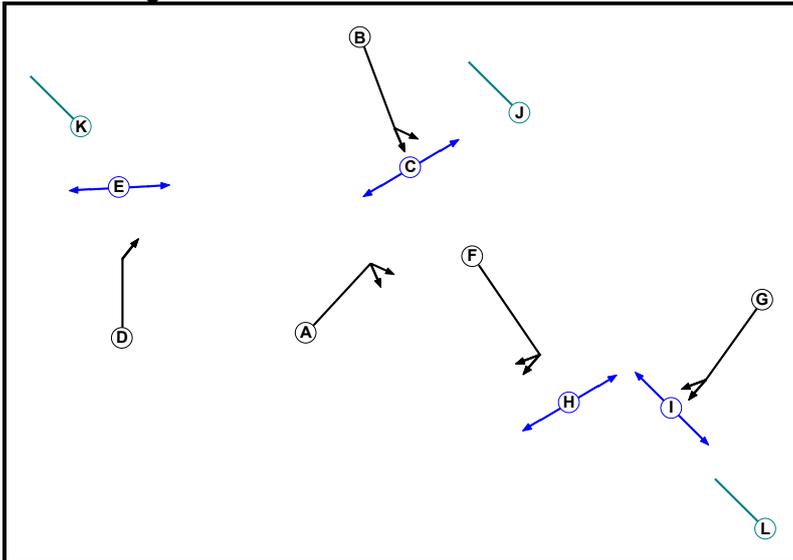
		To Stage	
		1	2
From Stage	1		7
	2	7	

**Stage Stream: 2**

		To Stage	
		1	2
From Stage	1		7
	2	7	

Full Input Data And Results

**C3 - Birdwell North**  
**Phase Diagram**



**Phase Input Data**

Phase Name	Phase Type	Stage Stream	Assoc. Phase	Street Min	Cont Min
A	Traffic	1		-9999	7
B	Traffic	1		-9999	7
C	Pedestrian	1		-9999	6
D	Traffic	2		-9999	7
E	Pedestrian	2		-9999	6
F	Traffic	3		-9999	7
G	Traffic	3		-9999	7
H	Pedestrian	3		-9999	6
I	Pedestrian	3		-9999	6
J	Dummy	1		-9999	3
K	Dummy	2		-9999	3
L	Dummy	3		-9999	3

**Phase Intergrens Matrix**

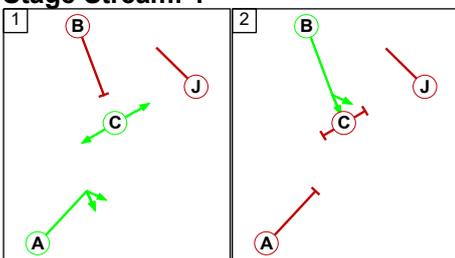
		Starting Phase											
		A	B	C	D	E	F	G	H	I	J	K	L
Terminating Phase	A		5	-	-	-	-	-	-	-	3	-	-
	B	6		5	-	-	-	-	-	-	3	-	-
	C	-	10		-	-	-	-	-	-	3	-	-
	D	-	-	-		5	-	-	-	-	-	3	-
	E	-	-	-	8		-	-	-	-	-	3	-
	F	-	-	-	-	-		5	5	-	-	-	3
	G	-	-	-	-	-	5		-	5	-	-	3
	H	-	-	-	-	-	8	-		-	-	-	3
	I	-	-	-	-	-	-	8	-		-	-	3
	J	2	2	2	-	-	-	-	-	-		-	-
	K	-	-	-	2	2	-	-	-	-	-		-
	L	-	-	-	-	-	2	2	2	2	-	-	

**Phases in Stage**

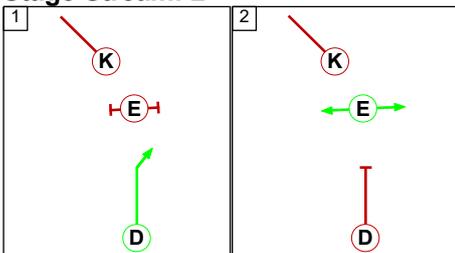
Stream	Stage No.	Phases in Stage
1	1	A C
1	2	B
2	1	D
2	2	E
3	1	F I
3	2	G H

**Stage Diagram**

**Stage Stream: 1**

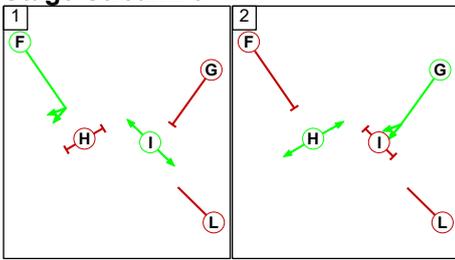


**Stage Stream: 2**



Full Input Data And Results

**Stage Stream: 3**



**Phase Delays**

**Stage Stream: 1**

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

**Stage Stream: 2**

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

**Stage Stream: 3**

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

**Prohibited Stage Change**

**Stage Stream: 1**

		To Stage	
		1	2
From Stage	1		10
	2	6	

**Stage Stream: 2**

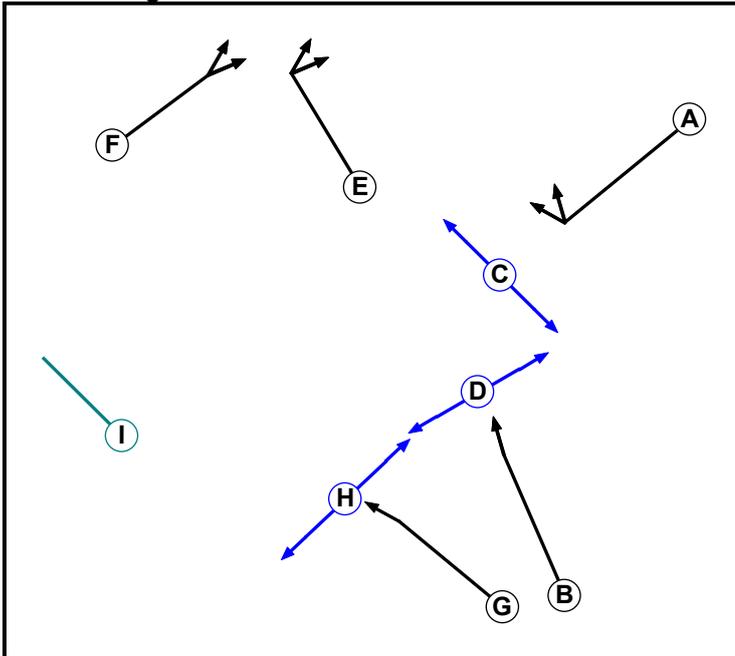
		To Stage	
		1	2
From Stage	1		5
	2	8	

**Stage Stream: 3**

		To Stage	
		1	2
From Stage	1		8
	2	8	

Full Input Data And Results

**C4 - Birdwell South  
Phase Diagram**



**Phase Input Data**

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		-9999	7
B	Traffic		-9999	7
C	Pedestrian		-9999	5
D	Pedestrian		-9999	5
E	Traffic		-9999	7
F	Traffic		-9999	7
G	Traffic		-9999	7
H	Pedestrian		-9999	5
I	Dummy		-9999	3

Full Input Data And Results

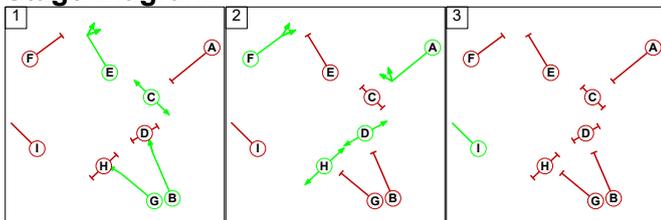
**Phase Intergrens Matrix**

		Starting Phase								
		A	B	C	D	E	F	G	H	I
Terminating Phase	A		5	5	-	-	-	8	-	3
	B	5		-	5	-	-	-	-	3
	C	8	-		-	-	-	-	-	3
	D	-	7	-		-	-	-	-	3
	E	-	-	-	-		5	-	-	3
	F	-	-	-	-	5		-	-	3
	G	5	-	-	-	-	-		5	3
	H	-	-	-	-	-	-	7		3
	I	2	2	2	2	2	2	2	2	

**Phases in Stage**

Stage No.	Phases in Stage
1	B C E G
2	A D F H
3	I

**Stage Diagram**



**Phase Delays**

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	E	Losing	4	4
1	3	E	Losing	4	4

**Prohibited Stage Change**

		To Stage		
		1	2	3
From Stage	1		9	7
	2	8		3
	3	2	2	

Full Input Data And Results

**Give-Way Lane Input Data**

**Junction: J1: M1 Junction 36 Tankersley Rbt**

There are no Opposed Lanes in this Junction

**Junction: J2: Birdwell Rbt**

There are no Opposed Lanes in this Junction

Full Input Data And Results  
**Lane Input Data**

Full Input Data And Results

Junction: J1: M1 Junction 36 Tankersley Rbt												
Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
J1:1/1 (M1 SB offslip)	U	B	2	3	19.8	User	1900	-	-	-	-	-
J1:1/2 (M1 SB offslip)	U	B	2	3	62.6	User	1900	-	-	-	-	-
J1:1/3 (M1 SB offslip)	U	B	2	3	90.4	User	1900	-	-	-	-	-
J1:2/1 (A61 (NE))	U	D	2	3	20.5	User	1900	-	-	-	-	-
J1:2/2 (A61 (NE))	U	D	2	3	20.5	User	1900	-	-	-	-	-
J1:3/1 (M1 NB offslip)	U	B	2	3	71.3	User	1900	-	-	-	-	-
J1:3/2 (M1 NB offslip)	U	B	2	3	48.7	User	1900	-	-	-	-	-
J1:4/1 (A61 (W))	U	D	2	3	60.0	User	1900	-	-	-	-	-
J1:4/2 (A61 (W))	U	D	2	3	60.0	User	1900	-	-	-	-	-
J1:5/1 (North Overbridge Circ)	U	A	2	3	28.2	User	1900	-	-	-	-	-
J1:5/2 (North Overbridge Circ)	U	A	2	3	28.2	User	1900	-	-	-	-	-
J1:5/3 (North Overbridge Circ)	U	A	2	3	28.2	User	1900	-	-	-	-	-
J1:6/1 (East Circ)	U	C	2	3	13.9	User	1900	-	-	-	-	-
J1:6/2 (East Circ)	U	C	2	3	30.4	User	1900	-	-	-	-	-
J1:7/1 (South Overbridge Circ)	U	A	2	3	43.5	User	1900	-	-	-	-	-
J1:7/2 (South Overbridge Circ)	U	A	2	3	43.5	User	1900	-	-	-	-	-
J1:7/3 (South Overbridge Circ)	U	A	2	3	43.5	User	1900	-	-	-	-	-
J1:8/1 (West Circ)	U	C	2	3	13.0	User	1900	-	-	-	-	-

Full Input Data And Results

J1:8/2 (West Circ)	U	C	2	3	13.0	User	1900	-	-	-	-	-
J1:8/3 (West Circ)	U	C	2	3	13.0	User	1900	-	-	-	-	-
J1:9/1 (M1 NB onslip)	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:9/2 (M1 NB onslip)	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:10/1 (M1 SB Onslip)	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:11/1 (A61 NE Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
J1:11/2 (A61 NE Exit)	U		2	3	8.7	Inf	-	-	-	-	-	-
J1:12/1 (A16 W Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
J1:12/2 (A16 W Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-

Full Input Data And Results

Junction: J2: Birdwell Rbt												
Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
J2:1/1 (A61 Sheffield Rd (NW))	U	F	2	3	8.9	User	1900	-	-	-	-	-
J2:1/2 (A61 Sheffield Rd (NW))	U	F	2	3	8.9	User	1900	-	-	-	-	-
J2:1/3 (A61 Sheffield Rd (NW))	U	F	2	3	60.0	User	1900	-	-	-	-	-
J2:2/1 (A6195 Dearne Valley Pkway)	U	B	2	3	41.7	User	1900	-	-	-	-	-
J2:2/2 (A6195 Dearne Valley Pkway)	U	B	2	3	41.7	User	1900	-	-	-	-	-
J2:3/1 (A6195 Sheffield Rd (E))	U	G	2	3	13.0	User	1900	-	-	-	-	-
J2:3/2 (A6195 Sheffield Rd (E))	U	G	2	3	13.0	User	1900	-	-	-	-	-
J2:4/1 (A61 (S))	U	G	2	3	20.0	User	1900	-	-	-	-	-
J2:4/2 (A61 (S))	U	B	2	3	17.4	User	1900	-	-	-	-	-
J2:4/3 (A61 (S))	U	B	2	3	17.4	User	1900	-	-	-	-	-
J2:5/1 (NW Circ)	U	A	2	3	24.3	User	1900	-	-	-	-	-
J2:5/2 (NW Circ)	U	A	2	3	24.3	User	1900	-	-	-	-	-
J2:5/3 (NW Circ)	U	A	2	3	24.3	User	1900	-	-	-	-	-
J2:6/1 (SW Circ)	U	E	2	3	6.1	User	1900	-	-	-	-	-
J2:6/2 (SW Circ)	U	E	2	3	6.1	User	1900	-	-	-	-	-
J2:7/1 (NE Circ)	U	F	2	3	15.3	User	1900	-	-	-	-	-
J2:7/2 (NE Circ)	U	F	2	3	15.3	User	1900	-	-	-	-	-
J2:8/1 (SE Circ)	U	A	2	3	20.3	User	1900	-	-	-	-	-
J2:8/2 (SE Circ)	U	A	2	3	20.3	User	1900	-	-	-	-	-
J2:9/1 (A61 NW Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-

Full Input Data And Results

J2:10/1 (A6195 Exit Peds)	U	D	2	3	23.0	User	1900	-	-	-	-	-
J2:10/2 (A6195 Exit Peds)	U	D	2	3	23.0	User	1900	-	-	-	-	-
J2:11/1 (A6195 Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:11/2 (A6195 Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:12/1 (A6195 E Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
J2:13/1 (A61 S Exit)	U		2	3	13.9	Inf	-	-	-	-	-	-
J2:13/2 (A61 S Exit)	U		2	3	13.9	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2023 AM Baseline'	08:00	09:00	01:00	
2: '2023 PM Baseline'	16:30	17:30	01:00	
3: '2028 AM Do Minimum'	08:00	09:00	01:00	
4: '2028 PM Do Minimum'	16:30	17:30	01:00	
5: '2028 AM Do Something'	08:00	09:00	01:00	
6: '2028 PM Do Something'	16:30	17:30	01:00	

Scenario 1: '1' (FG1: '2023 AM Baseline', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

	Destination									
	A	B	C	D	E	F	G	H	Tot.	
Origin	A	0	667	3	404	0	0	0	0	1074
	B	612	0	698	563	0	0	0	0	1873
	C	4	581	0	186	0	0	0	0	771
	D	454	573	177	0	0	0	0	0	1204
	E	0	0	0	0	3	5	791	284	1083
	F	0	0	0	0	11	0	395	320	726
	G	0	0	0	0	1054	345	0	432	1831
	H	0	0	0	0	227	155	670	0	1052
	Tot.	1070	1821	878	1153	1295	505	1856	1036	9614

Full Input Data And Results

**Traffic Lane Flows**

Full Input Data And Results

Lane	Scenario 1: 1
<b>Junction: J1: M1 Junction 36 Tankersley Rbt</b>	
J1:1/1 (short)	160
J1:1/2 (with short)	667(In) 507(Out)
J1:1/3	407
J1:2/1	943
J1:2/2	930
J1:3/1 (with short)	771(In) 355(Out)
J1:3/2 (short)	416
J1:4/1	684
J1:4/2	520
J1:5/1	395
J1:5/2	759
J1:5/3	177
J1:6/1 (short)	426
J1:6/2 (with short)	584(In) 158(Out)
J1:7/1	491
J1:7/2	760
J1:7/3	328
J1:8/1	288
J1:8/2	493
J1:8/3	416
J1:9/1	742
J1:9/2	328
J1:10/1	878
J1:11/1	432
J1:11/2	1389
J1:12/1	584
J1:12/2	569
<b>Junction: J2: Birdwell Rbt</b>	
J2:1/1	227
J2:1/2 (short)	501
J2:1/3 (with short)	825(In) 324(Out)
J2:2/1	542
J2:2/2	541
J2:3/1	395
J2:3/2	331
J2:4/1	432

## Full Input Data And Results

J2:4/2 (with short)	1399(In) 697(Out)
J2:4/3 (short)	702
J2:5/1	500
J2:5/2	346
J2:5/3	324
J2:6/1	707
J2:6/2	706
J2:7/1	883
J2:7/2	865
J2:8/1	604
J2:8/2	14
J2:9/1	1036
J2:10/1	708
J2:10/2	587
J2:11/1	708
J2:11/2	587
J2:12/1	505
J2:13/1	931
J2:13/2	925

Full Input Data And Results

**Lane Saturation Flows**

Full Input Data And Results

Junction: J1: M1 Junction 36 Tankersley Rbt									
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)	
J1:1/1 (M1 SB offslip Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:1/2 (M1 SB offslip Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:1/3 (M1 SB offslip Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:2/1 (A61 (NE) Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:2/2 (A61 (NE) Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:3/1 (M1 NB offslip Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:3/2 (M1 NB offslip Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:4/1 (A61 (W) Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:4/2 (A61 (W) Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/1 (North Overbridge Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/2 (North Overbridge Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/3 (North Overbridge Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:6/1 (East Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:6/2 (East Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/1 (South Overbridge Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/2 (South Overbridge Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/3 (South Overbridge Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/1 (West Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/2 (West Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/3 (West Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:9/1 (M1 NB onslip Lane 1)		Infinite Saturation Flow						Inf	Inf
J1:9/2 (M1 NB onslip Lane 2)		Infinite Saturation Flow						Inf	Inf
J1:10/1 (M1 SB Onslip Lane 1)		Infinite Saturation Flow						Inf	Inf
J1:11/1 (A61 NE Exit Lane 1)		Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

J1:11/2 (A61 NE Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
J1:12/1 (A16 W Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J1:12/2 (A16 W Exit Lane 2)	Infinite Saturation Flow	Inf	Inf

Full Input Data And Results

Junction: J2: Birdwell Rbt								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J2:1/1 (A61 Sheffield Rd (NW) Lane 1)							1900	1900
J2:1/2 (A61 Sheffield Rd (NW) Lane 2)							1900	1900
J2:1/3 (A61 Sheffield Rd (NW) Lane 3)							1900	1900
J2:2/1 (A6195 Dearne Valley Pkway Lane 1)							1900	1900
J2:2/2 (A6195 Dearne Valley Pkway Lane 2)							1900	1900
J2:3/1 (A6195 Sheffield Rd (E) Lane 1)							1900	1900
J2:3/2 (A6195 Sheffield Rd (E) Lane 2)							1900	1900
J2:4/1 (A61 (S) Lane 1)							1900	1900
J2:4/2 (A61 (S) Lane 2)							1900	1900
J2:4/3 (A61 (S) Lane 3)							1900	1900
J2:5/1 (NW Circ Lane 1)							1900	1900
J2:5/2 (NW Circ Lane 2)							1900	1900
J2:5/3 (NW Circ Lane 3)							1900	1900
J2:6/1 (SW Circ Lane 1)							1900	1900
J2:6/2 (SW Circ Lane 2)							1900	1900
J2:7/1 (NE Circ Lane 1)							1900	1900
J2:7/2 (NE Circ Lane 2)							1900	1900
J2:8/1 (SE Circ Lane 1)							1900	1900
J2:8/2 (SE Circ Lane 2)							1900	1900
J2:9/1 (A61 NW Exit Lane 1)							Inf	Inf
J2:10/1 (A6195 Exit Peds Lane 1)							1900	1900
J2:10/2 (A6195 Exit Peds Lane 2)							1900	1900
J2:11/1 (A6195 Exit Lane 1)							Inf	Inf

Full Input Data And Results

J2:11/2 (A6195 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
J2:12/1 (A6195 E Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J2:13/1 (A61 S Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J2:13/2 (A61 S Exit Lane 2)	Infinite Saturation Flow	Inf	Inf

Scenario 2: '2' (FG2: '2023 PM Baseline', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination								
		A	B	C	D	E	F	G	H	Tot.
Origin	A	0	921	4	469	0	0	0	0	1394
	B	562	0	570	502	0	0	0	0	1634
	C	5	954	0	210	0	0	0	0	1169
	D	335	547	134	0	0	0	0	0	1016
	E	0	0	0	0	0	16	846	367	1229
	F	0	0	0	0	8	0	261	270	539
	G	0	0	0	0	1323	529	0	582	2434
	H	0	0	0	0	205	176	515	0	896
	Tot.	902	2422	708	1181	1536	721	1622	1219	10311

Full Input Data And Results

**Traffic Lane Flows**

Full Input Data And Results

Lane	Scenario 2: 2
<b>Junction: J1: M1 Junction 36 Tankersley Rbt</b>	
J1:1/1 (short)	221
J1:1/2 (with short)	921(In) 700(Out)
J1:1/3	473
J1:2/1	886
J1:2/2	748
J1:3/1 (with short)	1169(In) 618(Out)
J1:3/2 (short)	551
J1:4/1	598
J1:4/2	418
J1:5/1	666
J1:5/2	835
J1:5/3	134
J1:6/1 (short)	462
J1:6/2 (with short)	607(In) 145(Out)
J1:7/1	640
J1:7/2	601
J1:7/3	292
J1:8/1	275
J1:8/2	695
J1:8/3	551
J1:9/1	610
J1:9/2	292
J1:10/1	708
J1:11/1	582
J1:11/2	1840
J1:12/1	745
J1:12/2	436
<b>Junction: J2: Birdwell Rbt</b>	
J2:1/1	205
J2:1/2 (short)	405
J2:1/3 (with short)	691(In) 286(Out)
J2:2/1	614
J2:2/2	615
J2:3/1	261
J2:3/2	278
J2:4/1	582

## Full Input Data And Results

J2:4/2 (with short)	1852(In) 921(Out)
J2:4/3 (short)	931
J2:5/1	705
J2:5/2	229
J2:5/3	286
J2:6/1	925
J2:6/2	935
J2:7/1	827
J2:7/2	901
J2:8/1	517
J2:8/2	128
J2:9/1	1219
J2:10/1	926
J2:10/2	610
J2:11/1	926
J2:11/2	610
J2:12/1	721
J2:13/1	878
J2:13/2	744

Full Input Data And Results

**Lane Saturation Flows**

Full Input Data And Results

Junction: J1: M1 Junction 36 Tankersley Rbt									
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)	
J1:1/1 (M1 SB offslip Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:1/2 (M1 SB offslip Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:1/3 (M1 SB offslip Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:2/1 (A61 (NE) Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:2/2 (A61 (NE) Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:3/1 (M1 NB offslip Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:3/2 (M1 NB offslip Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:4/1 (A61 (W) Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:4/2 (A61 (W) Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/1 (North Overbridge Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/2 (North Overbridge Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/3 (North Overbridge Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:6/1 (East Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:6/2 (East Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/1 (South Overbridge Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/2 (South Overbridge Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/3 (South Overbridge Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/1 (West Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/2 (West Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/3 (West Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:9/1 (M1 NB onslip Lane 1)		Infinite Saturation Flow						Inf	Inf
J1:9/2 (M1 NB onslip Lane 2)		Infinite Saturation Flow						Inf	Inf
J1:10/1 (M1 SB Onslip Lane 1)		Infinite Saturation Flow						Inf	Inf
J1:11/1 (A61 NE Exit Lane 1)		Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

J1:11/2 (A61 NE Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
J1:12/1 (A16 W Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J1:12/2 (A16 W Exit Lane 2)	Infinite Saturation Flow	Inf	Inf

Full Input Data And Results

Junction: J2: Birdwell Rbt								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J2:1/1 (A61 Sheffield Rd (NW) Lane 1)							1900	1900
J2:1/2 (A61 Sheffield Rd (NW) Lane 2)							1900	1900
J2:1/3 (A61 Sheffield Rd (NW) Lane 3)							1900	1900
J2:2/1 (A6195 Dearne Valley Pkway Lane 1)							1900	1900
J2:2/2 (A6195 Dearne Valley Pkway Lane 2)							1900	1900
J2:3/1 (A6195 Sheffield Rd (E) Lane 1)							1900	1900
J2:3/2 (A6195 Sheffield Rd (E) Lane 2)							1900	1900
J2:4/1 (A61 (S) Lane 1)							1900	1900
J2:4/2 (A61 (S) Lane 2)							1900	1900
J2:4/3 (A61 (S) Lane 3)							1900	1900
J2:5/1 (NW Circ Lane 1)							1900	1900
J2:5/2 (NW Circ Lane 2)							1900	1900
J2:5/3 (NW Circ Lane 3)							1900	1900
J2:6/1 (SW Circ Lane 1)							1900	1900
J2:6/2 (SW Circ Lane 2)							1900	1900
J2:7/1 (NE Circ Lane 1)							1900	1900
J2:7/2 (NE Circ Lane 2)							1900	1900
J2:8/1 (SE Circ Lane 1)							1900	1900
J2:8/2 (SE Circ Lane 2)							1900	1900
J2:9/1 (A61 NW Exit Lane 1)							Inf	Inf
J2:10/1 (A6195 Exit Peds Lane 1)							1900	1900
J2:10/2 (A6195 Exit Peds Lane 2)							1900	1900
J2:11/1 (A6195 Exit Lane 1)							Inf	Inf

Full Input Data And Results

J2:11/2 (A6195 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
J2:12/1 (A6195 E Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J2:13/1 (A61 S Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J2:13/2 (A61 S Exit Lane 2)	Infinite Saturation Flow	Inf	Inf

Scenario 3: '3' (FG3: '2028 AM Do Minimum', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination								
		A	B	C	D	E	F	G	H	Tot.
Origin	A	0	818	3	421	0	0	0	0	1242
	B	738	0	814	659	0	0	0	0	2211
	C	4	701	0	194	0	0	0	0	899
	D	473	681	184	0	0	0	0	0	1338
	E	0	0	0	0	3	5	931	314	1253
	F	0	0	0	0	11	0	547	351	909
	G	0	0	0	0	1353	402	0	456	2211
	H	0	0	0	0	260	197	714	0	1171
	Tot.	1215	2200	1001	1274	1627	604	2192	1121	11234

Full Input Data And Results

**Traffic Lane Flows**

Full Input Data And Results

Lane	Scenario 3: 3
<b>Junction: J1: M1 Junction 36 Tankersley Rbt</b>	
J1:1/1 (short)	168
J1:1/2 (with short)	818(In) 650(Out)
J1:1/3	424
J1:2/1	1103
J1:2/2	1108
J1:3/1 (with short)	899(In) 371(Out)
J1:3/2 (short)	528
J1:4/1	711
J1:4/2	627
J1:5/1	411
J1:5/2	971
J1:5/3	184
J1:6/1 (short)	427
J1:6/2 (with short)	608(In) 181(Out)
J1:7/1	529
J1:7/2	809
J1:7/3	480
J1:8/1	262
J1:8/2	653
J1:8/3	528
J1:9/1	735
J1:9/2	480
J1:10/1	1001
J1:11/1	456
J1:11/2	1744
J1:12/1	626
J1:12/2	648
<b>Junction: J2: Birdwell Rbt</b>	
J2:1/1	260
J2:1/2 (short)	537
J2:1/3 (with short)	911(In) 374(Out)
J2:2/1	628
J2:2/2	625
J2:3/1	547
J2:3/2	362
J2:4/1	456

## Full Input Data And Results

J2:4/2 (with short)	1755(In) 870(Out)
J2:4/3 (short)	885
J2:5/1	599
J2:5/2	340
J2:5/3	374
J2:6/1	880
J2:6/2	889
J2:7/1	963
J2:7/2	999
J2:8/1	665
J2:8/2	14
J2:9/1	1121
J2:10/1	880
J2:10/2	747
J2:11/1	880
J2:11/2	747
J2:12/1	604
J2:13/1	1117
J2:13/2	1075

Full Input Data And Results

**Lane Saturation Flows**

Full Input Data And Results

Junction: J1: M1 Junction 36 Tankersley Rbt									
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)	
J1:1/1 (M1 SB offslip Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:1/2 (M1 SB offslip Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:1/3 (M1 SB offslip Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:2/1 (A61 (NE) Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:2/2 (A61 (NE) Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:3/1 (M1 NB offslip Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:3/2 (M1 NB offslip Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:4/1 (A61 (W) Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:4/2 (A61 (W) Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/1 (North Overbridge Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/2 (North Overbridge Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/3 (North Overbridge Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:6/1 (East Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:6/2 (East Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/1 (South Overbridge Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/2 (South Overbridge Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/3 (South Overbridge Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/1 (West Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/2 (West Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/3 (West Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:9/1 (M1 NB onslip Lane 1)		Infinite Saturation Flow						Inf	Inf
J1:9/2 (M1 NB onslip Lane 2)		Infinite Saturation Flow						Inf	Inf
J1:10/1 (M1 SB Onslip Lane 1)		Infinite Saturation Flow						Inf	Inf
J1:11/1 (A61 NE Exit Lane 1)		Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

J1:11/2 (A61 NE Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
J1:12/1 (A16 W Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J1:12/2 (A16 W Exit Lane 2)	Infinite Saturation Flow	Inf	Inf

Full Input Data And Results

Junction: J2: Birdwell Rbt								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J2:1/1 (A61 Sheffield Rd (NW) Lane 1)							1900	1900
J2:1/2 (A61 Sheffield Rd (NW) Lane 2)							1900	1900
J2:1/3 (A61 Sheffield Rd (NW) Lane 3)							1900	1900
J2:2/1 (A6195 Dearne Valley Pkway Lane 1)							1900	1900
J2:2/2 (A6195 Dearne Valley Pkway Lane 2)							1900	1900
J2:3/1 (A6195 Sheffield Rd (E) Lane 1)							1900	1900
J2:3/2 (A6195 Sheffield Rd (E) Lane 2)							1900	1900
J2:4/1 (A61 (S) Lane 1)							1900	1900
J2:4/2 (A61 (S) Lane 2)							1900	1900
J2:4/3 (A61 (S) Lane 3)							1900	1900
J2:5/1 (NW Circ Lane 1)							1900	1900
J2:5/2 (NW Circ Lane 2)							1900	1900
J2:5/3 (NW Circ Lane 3)							1900	1900
J2:6/1 (SW Circ Lane 1)							1900	1900
J2:6/2 (SW Circ Lane 2)							1900	1900
J2:7/1 (NE Circ Lane 1)							1900	1900
J2:7/2 (NE Circ Lane 2)							1900	1900
J2:8/1 (SE Circ Lane 1)							1900	1900
J2:8/2 (SE Circ Lane 2)							1900	1900
J2:9/1 (A61 NW Exit Lane 1)							Inf	Inf
J2:10/1 (A6195 Exit Peds Lane 1)							1900	1900
J2:10/2 (A6195 Exit Peds Lane 2)							1900	1900
J2:11/1 (A6195 Exit Lane 1)							Inf	Inf

Full Input Data And Results

J2:11/2 (A6195 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
J2:12/1 (A6195 E Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J2:13/1 (A61 S Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J2:13/2 (A61 S Exit Lane 2)	Infinite Saturation Flow	Inf	Inf

Scenario 4: '4' (FG4: '2028 PM Do Minimum', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination								
		A	B	C	D	E	F	G	H	Tot.
Origin	A	0	1012	4	469	0	0	0	0	1485
	B	667	0	656	575	0	0	0	0	1898
	C	5	1034	0	210	0	0	0	0	1249
	D	335	611	134	0	0	0	0	0	1080
	E	0	0	0	0	0	16	972	390	1378
	F	0	0	0	0	8	0	392	299	699
	G	0	0	0	0	1489	583	0	597	2669
	H	0	0	0	0	221	193	522	0	936
	Tot.	1007	2657	794	1254	1718	792	1886	1286	11394

Full Input Data And Results

**Traffic Lane Flows**

Full Input Data And Results

Lane	Scenario 4: 4
<b>Junction: J1: M1 Junction 36 Tankersley Rbt</b>	
J1:1/1 (short)	226
J1:1/2 (with short)	1012(In) 786(Out)
J1:1/3	473
J1:2/1	947
J1:2/2	951
J1:3/1 (with short)	1249(In) 621(Out)
J1:3/2 (short)	628
J1:4/1	604
J1:4/2	476
J1:5/1	675
J1:5/2	970
J1:5/3	134
J1:6/1 (short)	591
J1:6/2 (with short)	607(In) 16(Out)
J1:7/1	744
J1:7/2	516
J1:7/3	451
J1:8/1	221
J1:8/2	857
J1:8/3	628
J1:9/1	556
J1:9/2	451
J1:10/1	794
J1:11/1	596
J1:11/2	2061
J1:12/1	849
J1:12/2	405
<b>Junction: J2: Birdwell Rbt</b>	
J2:1/1	221
J2:1/2 (short)	421
J2:1/3 (with short)	715(In) 294(Out)
J2:2/1	690
J2:2/2	688
J2:3/1	392
J2:3/2	307
J2:4/1	597

## Full Input Data And Results

J2:4/2 (with short)	2072(In) 999(Out)
J2:4/3 (short)	1073
J2:5/1	776
J2:5/2	228
J2:5/3	294
J2:6/1	1007
J2:6/2	1073
J2:7/1	902
J2:7/2	982
J2:8/1	569
J2:8/2	128
J2:9/1	1286
J2:10/1	1007
J2:10/2	711
J2:11/1	1007
J2:11/2	711
J2:12/1	792
J2:13/1	958
J2:13/2	928

Full Input Data And Results

**Lane Saturation Flows**

Full Input Data And Results

Junction: J1: M1 Junction 36 Tankersley Rbt									
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)	
J1:1/1 (M1 SB offslip Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:1/2 (M1 SB offslip Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:1/3 (M1 SB offslip Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:2/1 (A61 (NE) Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:2/2 (A61 (NE) Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:3/1 (M1 NB offslip Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:3/2 (M1 NB offslip Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:4/1 (A61 (W) Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:4/2 (A61 (W) Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/1 (North Overbridge Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/2 (North Overbridge Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/3 (North Overbridge Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:6/1 (East Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:6/2 (East Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/1 (South Overbridge Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/2 (South Overbridge Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/3 (South Overbridge Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/1 (West Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/2 (West Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/3 (West Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:9/1 (M1 NB onslip Lane 1)		Infinite Saturation Flow						Inf	Inf
J1:9/2 (M1 NB onslip Lane 2)		Infinite Saturation Flow						Inf	Inf
J1:10/1 (M1 SB Onslip Lane 1)		Infinite Saturation Flow						Inf	Inf
J1:11/1 (A61 NE Exit Lane 1)		Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

J1:11/2 (A61 NE Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
J1:12/1 (A16 W Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J1:12/2 (A16 W Exit Lane 2)	Infinite Saturation Flow	Inf	Inf

Full Input Data And Results

Junction: J2: Birdwell Rbt								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J2:1/1 (A61 Sheffield Rd (NW) Lane 1)							1900	1900
J2:1/2 (A61 Sheffield Rd (NW) Lane 2)							1900	1900
J2:1/3 (A61 Sheffield Rd (NW) Lane 3)							1900	1900
J2:2/1 (A6195 Dearne Valley Pkway Lane 1)							1900	1900
J2:2/2 (A6195 Dearne Valley Pkway Lane 2)							1900	1900
J2:3/1 (A6195 Sheffield Rd (E) Lane 1)							1900	1900
J2:3/2 (A6195 Sheffield Rd (E) Lane 2)							1900	1900
J2:4/1 (A61 (S) Lane 1)							1900	1900
J2:4/2 (A61 (S) Lane 2)							1900	1900
J2:4/3 (A61 (S) Lane 3)							1900	1900
J2:5/1 (NW Circ Lane 1)							1900	1900
J2:5/2 (NW Circ Lane 2)							1900	1900
J2:5/3 (NW Circ Lane 3)							1900	1900
J2:6/1 (SW Circ Lane 1)							1900	1900
J2:6/2 (SW Circ Lane 2)							1900	1900
J2:7/1 (NE Circ Lane 1)							1900	1900
J2:7/2 (NE Circ Lane 2)							1900	1900
J2:8/1 (SE Circ Lane 1)							1900	1900
J2:8/2 (SE Circ Lane 2)							1900	1900
J2:9/1 (A61 NW Exit Lane 1)							Inf	Inf
J2:10/1 (A6195 Exit Peds Lane 1)							1900	1900
J2:10/2 (A6195 Exit Peds Lane 2)							1900	1900
J2:11/1 (A6195 Exit Lane 1)							Inf	Inf

Full Input Data And Results

J2:11/2 (A6195 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
J2:12/1 (A6195 E Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J2:13/1 (A61 S Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J2:13/2 (A61 S Exit Lane 2)	Infinite Saturation Flow	Inf	Inf

Scenario 5: '5' (FG5: '2028 AM Do Something', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination								
		A	B	C	D	E	F	G	H	Tot.
Origin	A	0	827	3	421	0	0	0	0	1251
	B	740	0	817	660	0	0	0	0	2217
	C	4	716	0	194	0	0	0	0	914
	D	473	686	184	0	0	0	0	0	1343
	E	0	0	0	0	3	5	937	315	1260
	F	0	0	0	0	11	0	547	351	909
	G	0	0	0	0	1381	402	0	456	2239
	H	0	0	0	0	266	197	714	0	1177
	Tot.	1217	2229	1004	1275	1661	604	2198	1122	11310

Full Input Data And Results

**Traffic Lane Flows**

Full Input Data And Results

Lane	Scenario 5: 5
<b>Junction: J1: M1 Junction 36 Tankersley Rbt</b>	
J1:1/1 (short)	168
J1:1/2 (with short)	827(In) 659(Out)
J1:1/3	424
J1:2/1	1107
J1:2/2	1110
J1:3/1 (with short)	914(In) 371(Out)
J1:3/2 (short)	543
J1:4/1	711
J1:4/2	632
J1:5/1	411
J1:5/2	991
J1:5/3	184
J1:6/1 (short)	427
J1:6/2 (with short)	608(In) 181(Out)
J1:7/1	530
J1:7/2	811
J1:7/3	480
J1:8/1	264
J1:8/2	653
J1:8/3	543
J1:9/1	737
J1:9/2	480
J1:10/1	1004
J1:11/1	456
J1:11/2	1773
J1:12/1	627
J1:12/2	648
<b>Junction: J2: Birdwell Rbt</b>	
J2:1/1	266
J2:1/2 (short)	537
J2:1/3 (with short)	911(In) 374(Out)
J2:2/1	634
J2:2/2	626
J2:3/1	547
J2:3/2	362
J2:4/1	456

## Full Input Data And Results

J2:4/2 (with short)	1783(In) 884(Out)
J2:4/3 (short)	899
J2:5/1	599
J2:5/2	340
J2:5/3	374
J2:6/1	894
J2:6/2	903
J2:7/1	969
J2:7/2	1000
J2:8/1	666
J2:8/2	14
J2:9/1	1122
J2:10/1	900
J2:10/2	761
J2:11/1	900
J2:11/2	761
J2:12/1	604
J2:13/1	1123
J2:13/2	1075

Full Input Data And Results

**Lane Saturation Flows**

Full Input Data And Results

Junction: J1: M1 Junction 36 Tankersley Rbt									
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)	
J1:1/1 (M1 SB offslip Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:1/2 (M1 SB offslip Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:1/3 (M1 SB offslip Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:2/1 (A61 (NE) Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:2/2 (A61 (NE) Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:3/1 (M1 NB offslip Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:3/2 (M1 NB offslip Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:4/1 (A61 (W) Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:4/2 (A61 (W) Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/1 (North Overbridge Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/2 (North Overbridge Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/3 (North Overbridge Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:6/1 (East Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:6/2 (East Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/1 (South Overbridge Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/2 (South Overbridge Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/3 (South Overbridge Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/1 (West Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/2 (West Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/3 (West Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:9/1 (M1 NB onslip Lane 1)		Infinite Saturation Flow						Inf	Inf
J1:9/2 (M1 NB onslip Lane 2)		Infinite Saturation Flow						Inf	Inf
J1:10/1 (M1 SB Onslip Lane 1)		Infinite Saturation Flow						Inf	Inf
J1:11/1 (A61 NE Exit Lane 1)		Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

J1:11/2 (A61 NE Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
J1:12/1 (A16 W Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J1:12/2 (A16 W Exit Lane 2)	Infinite Saturation Flow	Inf	Inf

Full Input Data And Results

Junction: J2: Birdwell Rbt								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J2:1/1 (A61 Sheffield Rd (NW) Lane 1)							1900	1900
J2:1/2 (A61 Sheffield Rd (NW) Lane 2)							1900	1900
J2:1/3 (A61 Sheffield Rd (NW) Lane 3)							1900	1900
J2:2/1 (A6195 Dearne Valley Pkway Lane 1)							1900	1900
J2:2/2 (A6195 Dearne Valley Pkway Lane 2)							1900	1900
J2:3/1 (A6195 Sheffield Rd (E) Lane 1)							1900	1900
J2:3/2 (A6195 Sheffield Rd (E) Lane 2)							1900	1900
J2:4/1 (A61 (S) Lane 1)							1900	1900
J2:4/2 (A61 (S) Lane 2)							1900	1900
J2:4/3 (A61 (S) Lane 3)							1900	1900
J2:5/1 (NW Circ Lane 1)							1900	1900
J2:5/2 (NW Circ Lane 2)							1900	1900
J2:5/3 (NW Circ Lane 3)							1900	1900
J2:6/1 (SW Circ Lane 1)							1900	1900
J2:6/2 (SW Circ Lane 2)							1900	1900
J2:7/1 (NE Circ Lane 1)							1900	1900
J2:7/2 (NE Circ Lane 2)							1900	1900
J2:8/1 (SE Circ Lane 1)							1900	1900
J2:8/2 (SE Circ Lane 2)							1900	1900
J2:9/1 (A61 NW Exit Lane 1)							Inf	Inf
J2:10/1 (A6195 Exit Peds Lane 1)							1900	1900
J2:10/2 (A6195 Exit Peds Lane 2)							1900	1900
J2:11/1 (A6195 Exit Lane 1)							Inf	Inf

Full Input Data And Results

J2:11/2 (A6195 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
J2:12/1 (A6195 E Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J2:13/1 (A61 S Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J2:13/2 (A61 S Exit Lane 2)	Infinite Saturation Flow	Inf	Inf

Scenario 6: '6' (FG6: '2028 PM Do Something', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination								
		A	B	C	D	E	F	G	H	Tot.
Origin	A	0	1014	4	469	0	0	0	0	1487
	B	674	0	668	578	0	0	0	0	1920
	C	5	1037	0	210	0	0	0	0	1252
	D	335	612	134	0	0	0	0	0	1081
	E	0	0	0	0	0	16	994	394	1404
	F	0	0	0	0	8	0	392	299	699
	G	0	0	0	0	1494	583	0	597	2674
	H	0	0	0	0	222	193	522	0	937
	Tot.	1014	2663	806	1257	1724	792	1908	1290	11454

Full Input Data And Results

**Traffic Lane Flows**

Full Input Data And Results

Lane	Scenario 6: 6
<b>Junction: J1: M1 Junction 36 Tankersley Rbt</b>	
J1:1/1 (short)	226
J1:1/2 (with short)	1014(In) 788(Out)
J1:1/3	473
J1:2/1	962
J1:2/2	958
J1:3/1 (with short)	1252(In) 621(Out)
J1:3/2 (short)	631
J1:4/1	604
J1:4/2	477
J1:5/1	675
J1:5/2	974
J1:5/3	134
J1:6/1 (short)	591
J1:6/2 (with short)	607(In) 16(Out)
J1:7/1	747
J1:7/2	523
J1:7/3	451
J1:8/1	228
J1:8/2	857
J1:8/3	631
J1:9/1	563
J1:9/2	451
J1:10/1	806
J1:11/1	596
J1:11/2	2067
J1:12/1	852
J1:12/2	405
<b>Junction: J2: Birdwell Rbt</b>	
J2:1/1	222
J2:1/2 (short)	421
J2:1/3 (with short)	715(In) 294(Out)
J2:2/1	701
J2:2/2	703
J2:3/1	392
J2:3/2	307
J2:4/1	597

## Full Input Data And Results

J2:4/2 (with short)	2077(In) 1002(Out)
J2:4/3 (short)	1075
J2:5/1	776
J2:5/2	228
J2:5/3	294
J2:6/1	1010
J2:6/2	1075
J2:7/1	913
J2:7/2	997
J2:8/1	573
J2:8/2	128
J2:9/1	1290
J2:10/1	1011
J2:10/2	713
J2:11/1	1011
J2:11/2	713
J2:12/1	792
J2:13/1	969
J2:13/2	939

Full Input Data And Results

**Lane Saturation Flows**

Full Input Data And Results

Junction: J1: M1 Junction 36 Tankersley Rbt									
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)	
J1:1/1 (M1 SB offslip Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:1/2 (M1 SB offslip Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:1/3 (M1 SB offslip Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:2/1 (A61 (NE) Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:2/2 (A61 (NE) Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:3/1 (M1 NB offslip Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:3/2 (M1 NB offslip Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:4/1 (A61 (W) Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:4/2 (A61 (W) Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/1 (North Overbridge Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/2 (North Overbridge Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:5/3 (North Overbridge Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:6/1 (East Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:6/2 (East Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/1 (South Overbridge Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/2 (South Overbridge Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:7/3 (South Overbridge Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/1 (West Circ Lane 1)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/2 (West Circ Lane 2)		This lane uses a directly entered Saturation Flow						1900	1900
J1:8/3 (West Circ Lane 3)		This lane uses a directly entered Saturation Flow						1900	1900
J1:9/1 (M1 NB onslip Lane 1)		Infinite Saturation Flow						Inf	Inf
J1:9/2 (M1 NB onslip Lane 2)		Infinite Saturation Flow						Inf	Inf
J1:10/1 (M1 SB Onslip Lane 1)		Infinite Saturation Flow						Inf	Inf
J1:11/1 (A61 NE Exit Lane 1)		Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

J1:11/2 (A61 NE Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
J1:12/1 (A16 W Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J1:12/2 (A16 W Exit Lane 2)	Infinite Saturation Flow	Inf	Inf

Full Input Data And Results

Junction: J2: Birdwell Rbt								
Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
J2:1/1 (A61 Sheffield Rd (NW) Lane 1)							1900	1900
J2:1/2 (A61 Sheffield Rd (NW) Lane 2)							1900	1900
J2:1/3 (A61 Sheffield Rd (NW) Lane 3)							1900	1900
J2:2/1 (A6195 Dearne Valley Pkway Lane 1)							1900	1900
J2:2/2 (A6195 Dearne Valley Pkway Lane 2)							1900	1900
J2:3/1 (A6195 Sheffield Rd (E) Lane 1)							1900	1900
J2:3/2 (A6195 Sheffield Rd (E) Lane 2)							1900	1900
J2:4/1 (A61 (S) Lane 1)							1900	1900
J2:4/2 (A61 (S) Lane 2)							1900	1900
J2:4/3 (A61 (S) Lane 3)							1900	1900
J2:5/1 (NW Circ Lane 1)							1900	1900
J2:5/2 (NW Circ Lane 2)							1900	1900
J2:5/3 (NW Circ Lane 3)							1900	1900
J2:6/1 (SW Circ Lane 1)							1900	1900
J2:6/2 (SW Circ Lane 2)							1900	1900
J2:7/1 (NE Circ Lane 1)							1900	1900
J2:7/2 (NE Circ Lane 2)							1900	1900
J2:8/1 (SE Circ Lane 1)							1900	1900
J2:8/2 (SE Circ Lane 2)							1900	1900
J2:9/1 (A61 NW Exit Lane 1)							Inf	Inf
J2:10/1 (A6195 Exit Peds Lane 1)							1900	1900
J2:10/2 (A6195 Exit Peds Lane 2)							1900	1900
J2:11/1 (A6195 Exit Lane 1)							Inf	Inf

Full Input Data And Results

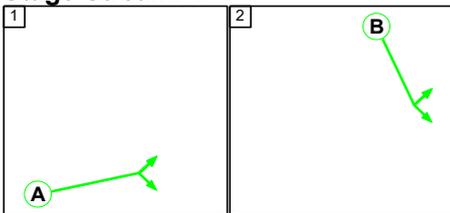
J2:11/2 (A6195 Exit Lane 2)	Infinite Saturation Flow	Inf	Inf
J2:12/1 (A6195 E Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J2:13/1 (A61 S Exit Lane 1)	Infinite Saturation Flow	Inf	Inf
J2:13/2 (A61 S Exit Lane 2)	Infinite Saturation Flow	Inf	Inf

Scenario 1: '1' (FG1: '2023 AM Baseline', Plan 1: 'Network Control Plan 1')

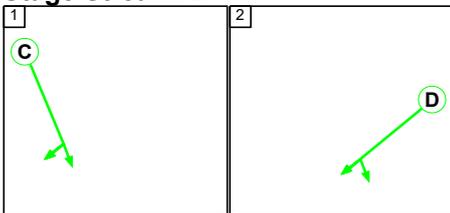
C1 - M1 J36 Northside Tankersley

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

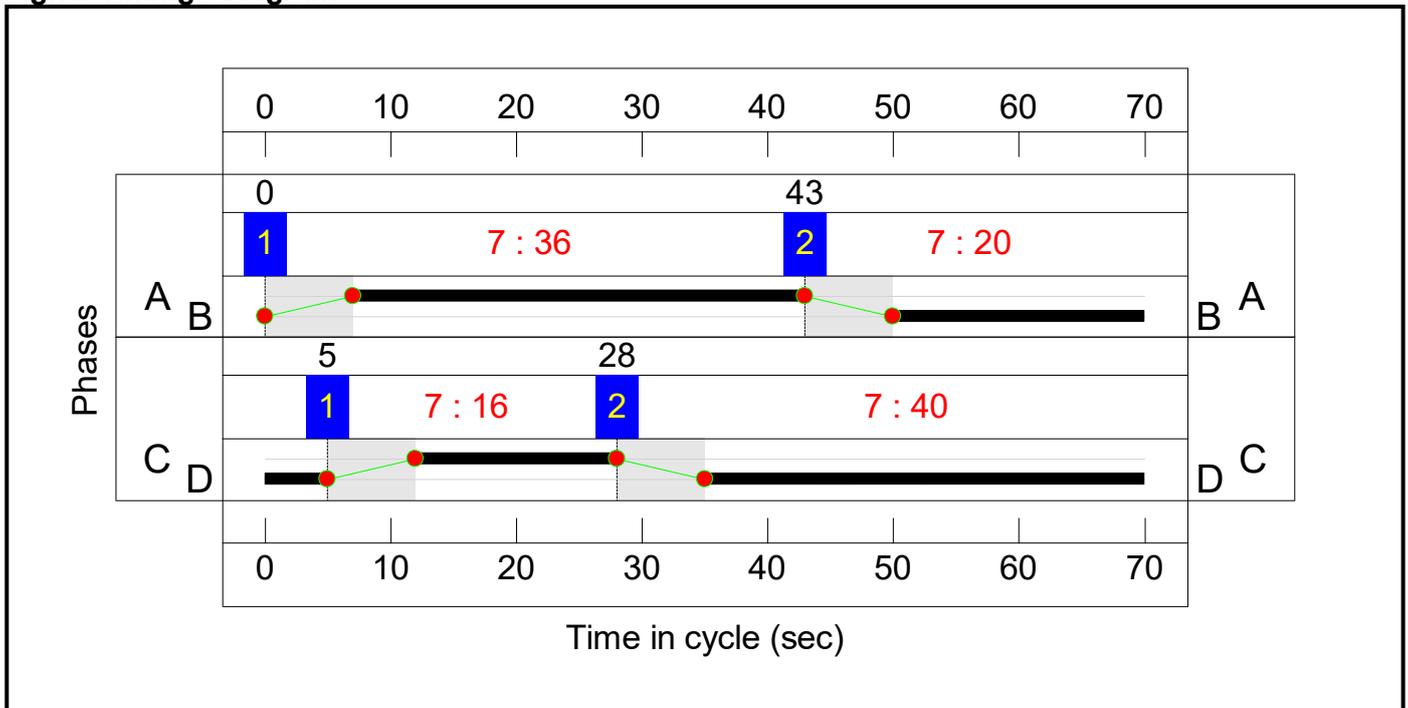
Stage Stream: 1

Stage	1	2
Duration	36	20
Change Point	0	43

Stage Stream: 2

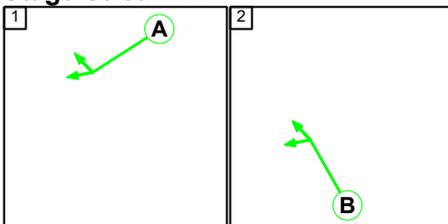
Stage	1	2
Duration	16	40
Change Point	5	28

**Signal Timings Diagram**

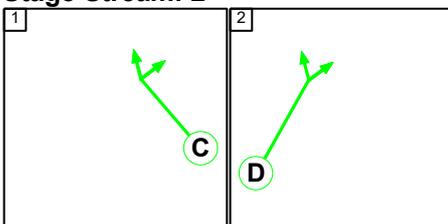


**C2 - M1 J36 Southside Tankersley  
Stage Sequence Diagram**

Stage Stream: 1



Stage Stream: 2



**Stage Timings**

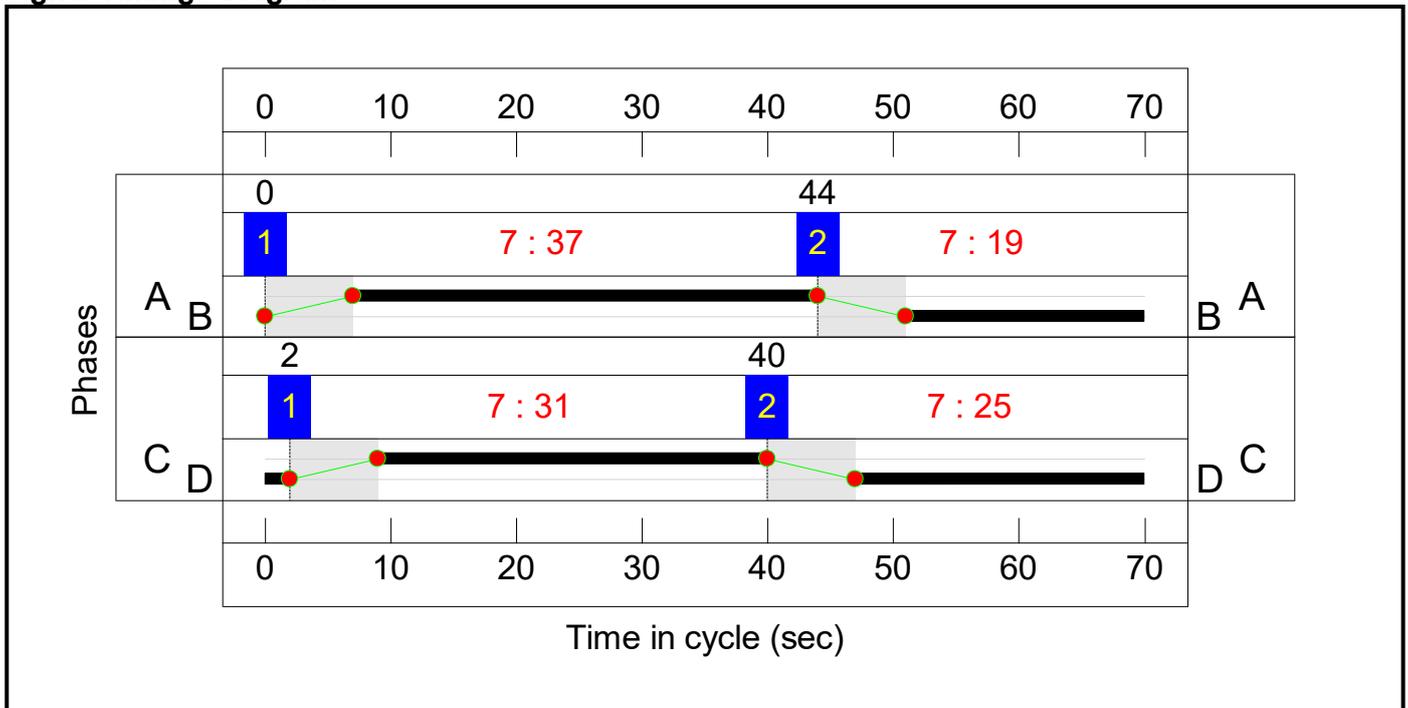
Stage Stream: 1

Stage	1	2
Duration	37	19
Change Point	0	44

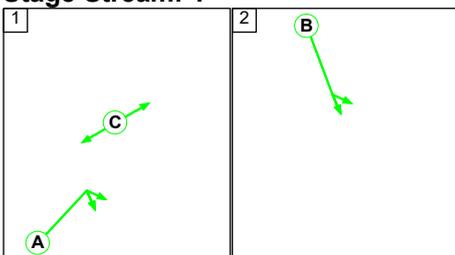
Stage Stream: 2

Stage	1	2
Duration	31	25
Change Point	2	40

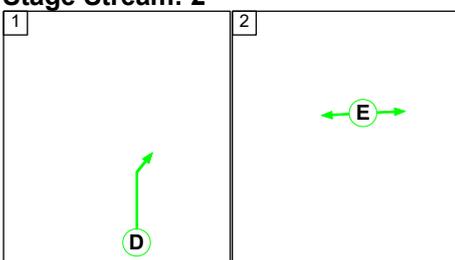
**Signal Timings Diagram**



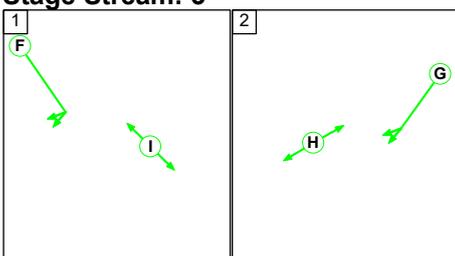
**C3 - Birdwell North  
Stage Sequence Diagram  
Stage Stream: 1**



**Stage Stream: 2**



**Stage Stream: 3**



Full Input Data And Results

**Stage Timings**

**Stage Stream: 1**

Stage	1	2
Duration	23	31
Change Point	65	24

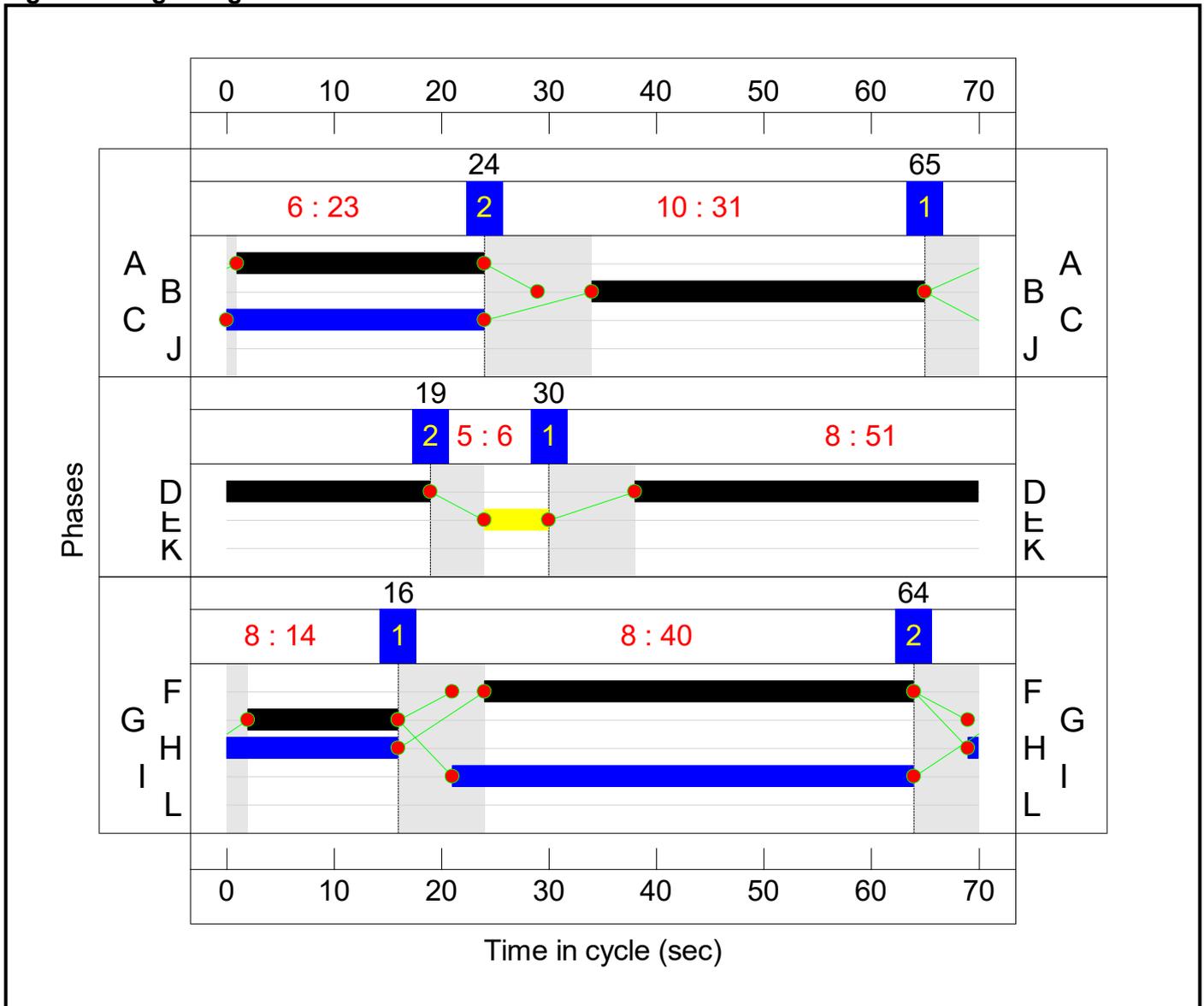
**Stage Stream: 2**

Stage	1	2
Duration	51	6
Change Point	30	19

**Stage Stream: 3**

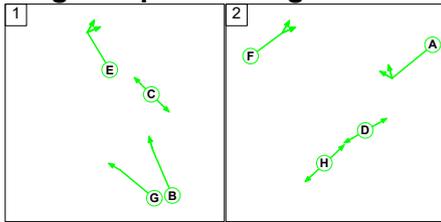
Stage	1	2
Duration	40	14
Change Point	16	64

**Signal Timings Diagram**



Full Input Data And Results

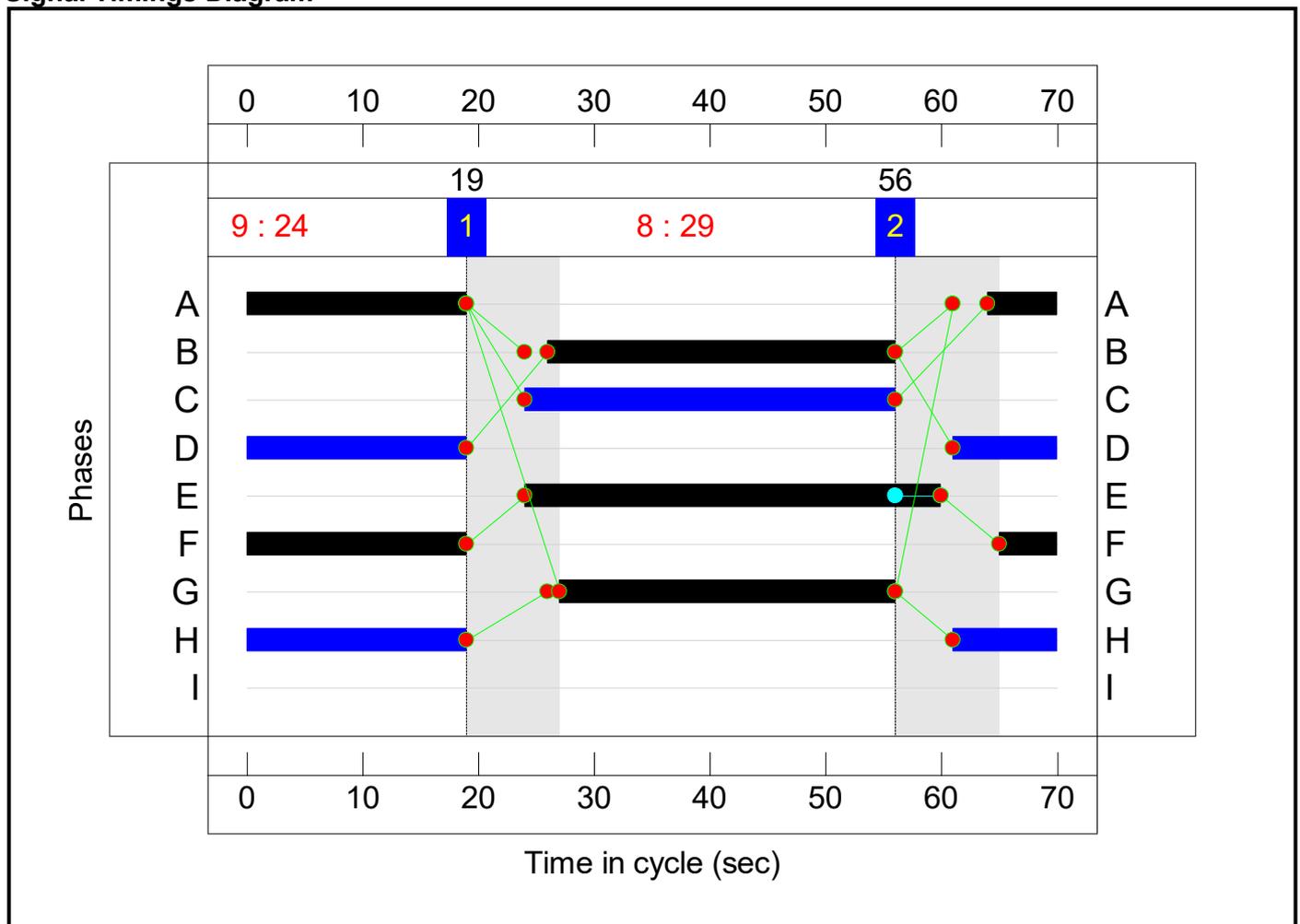
**C4 - Birdwell South**  
**Stage Sequence Diagram**



**Stage Timings**

Stage	1	2
Duration	29	24
Change Point	19	56

**Signal Timings Diagram**





Full Input Data And Results

## **Network Results**

Full Input Data And Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network: M1 J36 Tankersley Rbt + Birdwell Rbt</b>	-	-	N/A	-	-		-	-	-	-	-	-	99.8%
<b>J1: M1 Junction 36 Tankersley Rbt</b>	-	-	N/A	-	-		-	-	-	-	-	-	99.3%
1/2+1/1	M1 SB offslip Left	U	1:1	N/A	C1:B		1	20	-	667	1900:1900	516+163	98.3 : 98.3%
1/3	M1 SB offslip Ahead	U	1:1	N/A	C1:B		1	20	-	407	1900	570	71.4%
2/1	A61 (NE) Ahead Ahead2	U	1:2	N/A	C1:D		1	40	-	943	1900	950	99.3%
2/2	A61 (NE) Ahead	U	1:2	N/A	C1:D		1	40	-	930	1900	950	97.9%
3/1+3/2	M1 NB offslip Ahead Ahead2	U	2:1	N/A	C2:B		1	19	-	771	1900:1900	543+543	65.4 : 76.6%
4/1	A61 (W) Ahead Left	U	2:2	N/A	C2:D		1	25	-	684	1900	706	96.9%
4/2	A61 (W) Ahead	U	2:2	N/A	C2:D		1	25	-	520	1900	570	91.2%
5/1	North Overbridge Circ Ahead	U	1:1	N/A	C1:A		1	36	-	395	1900	1004	39.3%
5/2	North Overbridge Circ Ahead	U	1:1	N/A	C1:A		1	36	-	759	1900	787	96.4%
5/3	North Overbridge Circ Right	U	1:1	N/A	C1:A		1	36	-	177	1900	1004	17.6%
6/2+6/1	East Circ Right Ahead	U	1:2	N/A	C1:C		1	16	-	584	1900:1900	171+461	92.3 : 92.3%
7/1	South Overbridge Circ Ahead	U	2:1	N/A	C2:A		1	37	-	491	1900	1031	47.6%
7/2	South Overbridge Circ Right Ahead	U	2:1	N/A	C2:A		1	37	-	760	1900	1031	73.7%
7/3	South Overbridge Circ Right	U	2:1	N/A	C2:A		1	37	-	328	1900	1031	31.8%

Full Input Data And Results

8/1	West Circ Ahead	U	2:2	N/A	C2:C		1	31	-	288	1900	869	33.2%
8/2	West Circ Right Ahead	U	2:2	N/A	C2:C		1	31	-	493	1900	869	56.8%
8/3	West Circ Right	U	2:2	N/A	C2:C		1	31	-	416	1900	869	47.9%
9/1	M1 NB onslip	U	N/A	N/A	-		-	-	-	742	Inf	Inf	0.0%
9/2	M1 NB onslip	U	N/A	N/A	-		-	-	-	328	Inf	Inf	0.0%
10/1	M1 SB Onslip	U	N/A	N/A	-		-	-	-	878	Inf	Inf	0.0%
11/1	A61 NE Exit Ahead	U	N/A	N/A	-		-	-	-	432	Inf	Inf	0.0%
11/2	A61 NE Exit Ahead	U	N/A	N/A	-		-	-	-	1389	Inf	Inf	0.0%
12/1	A16 W Exit	U	N/A	N/A	-		-	-	-	584	Inf	Inf	0.0%
12/2	A16 W Exit	U	N/A	N/A	-		-	-	-	569	Inf	Inf	0.0%
<b>J2: Birdwell Rbt</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>99.8%</b>
1/1	A61 Sheffield Rd (NW) Left	U	N/A	N/A	C4:F		1	24	-	227	1900	679	33.5%
1/3+1/2	A61 Sheffield Rd (NW) Ahead	U	N/A	N/A	C4:F		1	24	-	825	1900:1900	394+609	82.3 : 82.3%
2/1	A6195 Dearne Valley Pkway Ahead Left	U	3:1	N/A	C3:B		1	31	-	542	1900	543	99.8%
2/2	A6195 Dearne Valley Pkway Ahead	U	3:1	N/A	C3:B		1	31	-	541	1900	543	99.7%
3/1	A6195 Sheffield Rd (E) Ahead	U	3:3	N/A	C3:G		1	14	-	395	1900	407	97.0%
3/2	A6195 Sheffield Rd (E) Ahead	U	3:3	N/A	C3:G		1	14	-	331	1900	407	81.3%
4/1	A61 (S) Left	U	N/A	N/A	C4:G		1	29	-	432	1900	814	53.1%
4/2+4/3	A61 (S) Ahead	U	N/A	N/A	C4:B		1	30	-	1399	1900:1900	841+841	82.8 : 83.4%
5/1	NW Circ Right	U	3:1	N/A	C3:A		1	23	-	500	1900	651	76.8%
5/2	NW Circ Right	U	3:1	N/A	C3:A		1	23	-	346	1900	353	98.1%
5/3	NW Circ Right	U	3:1	N/A	C3:A		1	23	-	324	1900	380	85.3%
6/1	SW Circ Right	U	N/A	N/A	C4:E		1	36	-	707	1900	1004	70.4%

Full Input Data And Results

6/2	SW Circ Right Right2	U	N/A	N/A	C4:E		1	36	-	706	1900	1004	70.3%
7/1	NE Circ Right	U	3:3	N/A	C3:F		1	40	-	883	1900	1031	85.6%
7/2	NE Circ Right Right2	U	3:3	N/A	C3:F		1	40	-	865	1900	1031	83.9%
8/1	SE Circ Right	U	N/A	N/A	C4:A		1	25	-	604	1900	706	85.6%
8/2	SE Circ Right Right2	U	N/A	N/A	C4:A		1	25	-	14	1900	706	2.0%
9/1	A61 NW Exit	U	N/A	N/A	-		-	-	-	1036	Inf	Inf	0.0%
10/1	A6195 Exit Peds Ahead	U	3:2	N/A	C3:D		1	51	-	708	1900	1411	50.2%
10/2	A6195 Exit Peds Ahead	U	3:2	N/A	C3:D		1	51	-	587	1900	1411	41.6%
11/1	A6195 Exit	U	N/A	N/A	-		-	-	-	708	Inf	Inf	0.0%
11/2	A6195 Exit	U	N/A	N/A	-		-	-	-	587	Inf	Inf	0.0%
12/1	A6195 E Exit	U	N/A	N/A	-		-	-	-	505	Inf	Inf	0.0%
13/1	A61 S Exit Ahead	U	N/A	N/A	-		-	-	-	931	Inf	Inf	0.0%
13/2	A61 S Exit Ahead	U	N/A	N/A	-		-	-	-	925	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network: M1 J36 Tankersley Rbt + Birdwell Rbt</b>	-	-	0	0	0	84.0	124.2	0.0	208.2	-	-	-	-
<b>J1: M1 Junction 36 Tankersley Rbt</b>	-	-	0	0	0	37.3	68.0	0.0	105.3	-	-	-	-
1/2+1/1	667	667	-	-	-	4.4	10.4	-	14.8 (11.4+3.3)	79.7 (81.3:74.7)	9.7	10.4	20.1
1/3	407	407	-	-	-	2.5	1.2	-	3.7	32.7	7.0	1.2	8.2
2/1	943	943	-	-	-	2.7	13.7	-	16.4	62.6	18.1	13.7	31.8
2/2	930	930	-	-	-	3.2	11.0	-	14.2	55.1	17.7	11.0	28.8
3/1+3/2	771	771	-	-	-	4.8	1.2	-	6.0 (2.7+3.3)	28.1 (27.6:28.5)	7.4	1.2	8.6
4/1	684	684	-	-	-	4.1	8.7	-	12.8	67.6	12.9	8.7	21.7
4/2	520	520	-	-	-	3.4	4.4	-	7.8	54.2	9.7	4.4	14.1
5/1	395	395	-	-	-	0.5	0.3	-	0.8	7.3	3.9	0.3	4.2
5/2	759	759	-	-	-	1.9	8.4	-	10.3	49.1	9.6	8.4	18.0
5/3	177	177	-	-	-	0.2	0.1	-	0.3	6.7	2.7	0.1	2.8
6/2+6/1	584	584	-	-	-	1.9	5.0	-	6.9 (1.9+5.0)	42.6 (43.1:42.4)	7.9	5.0	12.9
7/1	491	491	-	-	-	1.0	0.5	-	1.4	10.5	4.8	0.5	5.2
7/2	760	760	-	-	-	2.5	1.4	-	3.9	18.3	11.8	1.4	13.2
7/3	328	328	-	-	-	0.8	0.2	-	1.0	11.4	5.4	0.2	5.6
8/1	288	288	-	-	-	0.1	0.2	-	0.3	3.8	0.1	0.2	0.4
8/2	493	493	-	-	-	1.0	0.7	-	1.6	11.7	8.6	0.7	9.3
8/3	416	416	-	-	-	2.4	0.5	-	2.9	25.0	8.1	0.5	8.5
9/1	742	742	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	328	328	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	878	878	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/1	432	432	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

11/2	1389	1389	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/1	584	584	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/2	569	569	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
<b>J2: Birdwell Rbt</b>	-	-	<b>0</b>	<b>0</b>	<b>0</b>	<b>46.7</b>	<b>56.2</b>	<b>0.0</b>	<b>102.8</b>	-	-	-	-
1/1	227	227	-	-	-	1.0	0.3	-	1.3	20.4	3.2	0.3	3.5
1/3+1/2	825	825	-	-	-	4.3	2.3	-	6.6 (2.5+4.1)	28.7 (27.3:29.6)	8.5	2.3	10.8
2/1	542	542	-	-	-	3.8	11.4	-	15.2	100.9	10.4	11.4	21.8
2/2	541	541	-	-	-	3.8	11.2	-	14.9	99.3	10.4	11.2	21.5
3/1	395	395	-	-	-	3.0	7.4	-	10.3	94.3	7.6	7.4	14.9
3/2	331	331	-	-	-	2.4	2.1	-	4.5	48.6	6.1	2.1	8.1
4/1	432	432	-	-	-	1.7	0.6	-	2.3	19.2	6.9	0.6	7.5
4/2+4/3	1399	1399	-	-	-	4.7	0.0	-	4.7 (2.3+2.4)	12.0 (12.0:12.1)	26.3	0.0	26.3
5/1	500	500	-	-	-	2.6	1.6	-	4.2	30.2	8.6	1.6	10.3
5/2	346	346	-	-	-	3.6	7.7	-	11.3	117.6	6.4	7.7	14.1
5/3	324	324	-	-	-	2.0	2.6	-	4.7	52.1	2.9	2.6	5.6
6/1	707	707	-	-	-	0.1	0.0	-	0.1	0.3	0.2	0.0	0.2
6/2	706	706	-	-	-	0.0	0.0	-	0.0	0.2	0.1	0.0	0.1
7/1	883	883	-	-	-	5.4	2.9	-	8.3	33.8	13.0	2.9	15.9
7/2	865	865	-	-	-	5.2	2.5	-	7.7	32.2	12.6	2.5	15.1
8/1	604	604	-	-	-	2.9	2.8	-	5.7	33.8	7.3	2.8	10.1
8/2	14	14	-	-	-	0.0	0.0	-	0.1	15.4	0.1	0.0	0.1
9/1	1036	1036	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	708	708	-	-	-	0.0	0.5	-	0.5	2.6	0.2	0.5	0.8
10/2	587	587	-	-	-	0.2	0.4	-	0.5	3.2	1.2	0.4	1.5
11/1	708	708	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	587	587	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/1	505	505	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
13/1	931	931	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
13/2	925	925	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

## Full Input Data And Results

C1 - M1 J36 Northside Tankersley	Stream: 1 PRC for Signalled Lanes (%)	-9.2	Total Delay for Signalled Lanes (pcuHr):	29.94	Cycle Time (s):	70
C1 - M1 J36 Northside Tankersley	Stream: 2 PRC for Signalled Lanes (%)	-10.3	Total Delay for Signalled Lanes (pcuHr):	37.55	Cycle Time (s):	70
C2 - M1 J36 Southside Tankersley	Stream: 1 PRC for Signalled Lanes (%)	17.4	Total Delay for Signalled Lanes (pcuHr):	12.36	Cycle Time (s):	70
C2 - M1 J36 Southside Tankersley	Stream: 2 PRC for Signalled Lanes (%)	-7.7	Total Delay for Signalled Lanes (pcuHr):	25.47	Cycle Time (s):	70
C3 - Birdwell North	Stream: 1 PRC for Signalled Lanes (%)	-10.9	Total Delay for Signalled Lanes (pcuHr):	50.30	Cycle Time (s):	70
C3 - Birdwell North	Stream: 2 PRC for Signalled Lanes (%)	79.4	Total Delay for Signalled Lanes (pcuHr):	1.03	Cycle Time (s):	70
C3 - Birdwell North	Stream: 3 PRC for Signalled Lanes (%)	-7.8	Total Delay for Signalled Lanes (pcuHr):	30.85	Cycle Time (s):	70
C4 - Birdwell South	PRC for Signalled Lanes (%)	5.2	Total Delay for Signalled Lanes (pcuHr):	20.67	Cycle Time (s):	70
	PRC Over All Lanes (%)	-10.9	Total Delay Over All Lanes (pcuHr):	208.16		

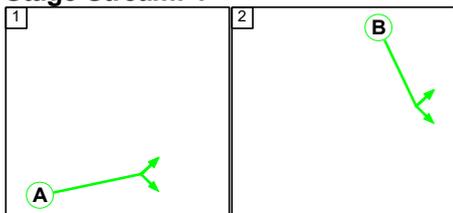
Full Input Data And Results

Scenario 2: '2' (FG2: '2023 PM Baseline', Plan 1: 'Network Control Plan 1')

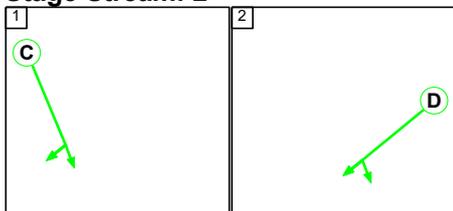
C1 - M1 J36 Northside Tankersley

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

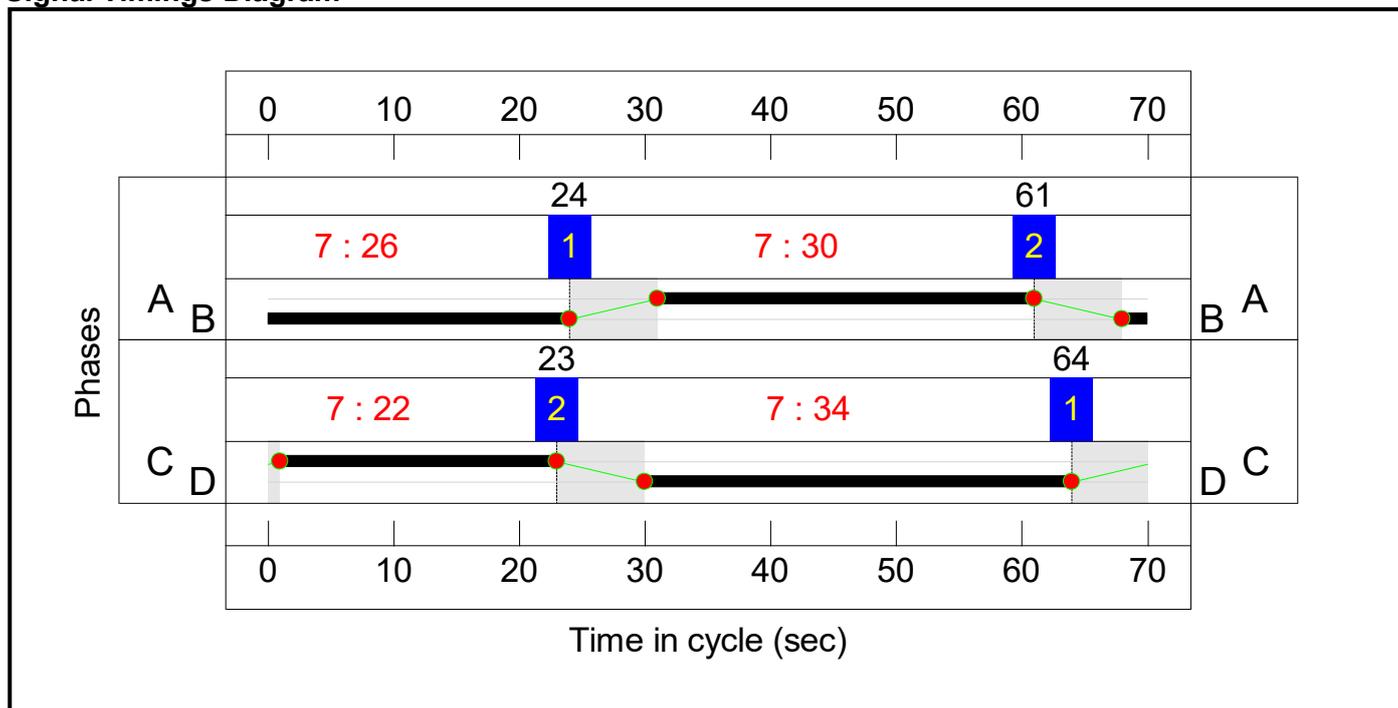
Stage Stream: 1

Stage	1	2
Duration	30	26
Change Point	24	61

Stage Stream: 2

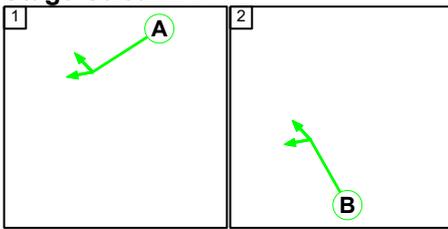
Stage	1	2
Duration	22	34
Change Point	64	23

Signal Timings Diagram

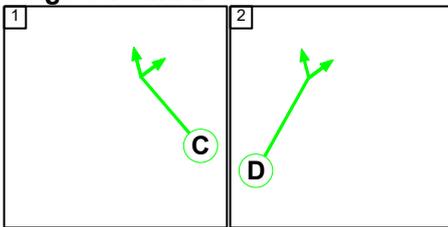


**C2 - M1 J36 Southside Tankersley  
Stage Sequence Diagram**

**Stage Stream: 1**



**Stage Stream: 2**



**Stage Timings**

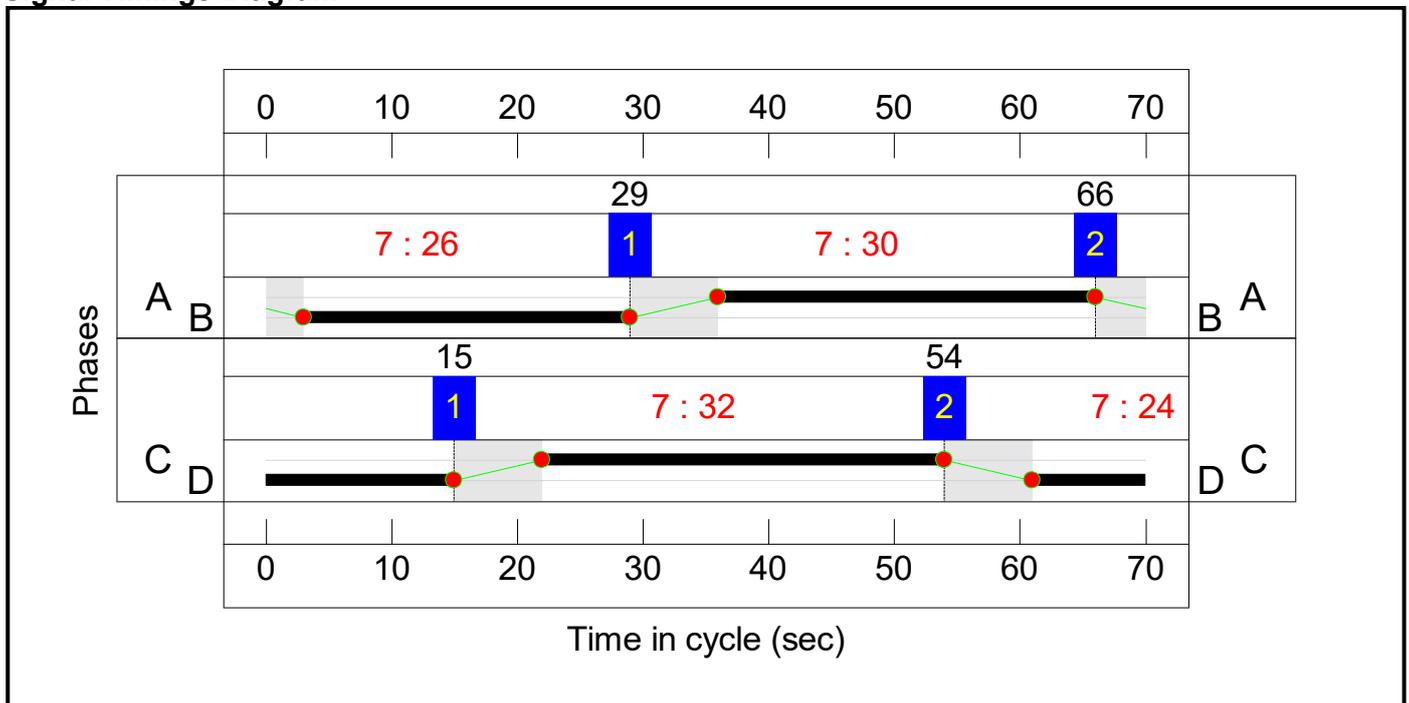
**Stage Stream: 1**

Stage	1	2
Duration	30	26
Change Point	29	66

**Stage Stream: 2**

Stage	1	2
Duration	32	24
Change Point	15	54

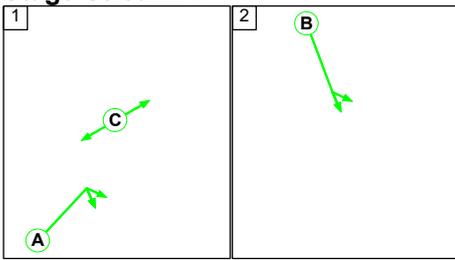
**Signal Timings Diagram**



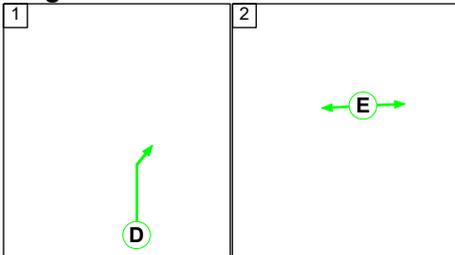
Full Input Data And Results

**C3 - Birdwell North**  
**Stage Sequence Diagram**

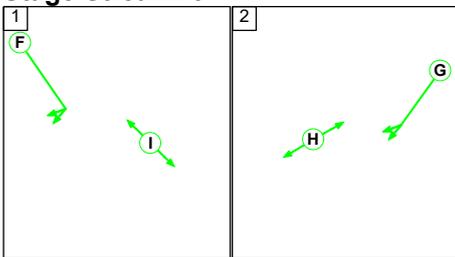
**Stage Stream: 1**



**Stage Stream: 2**



**Stage Stream: 3**



**Stage Timings**

**Stage Stream: 1**

Stage	1	2
Duration	29	25
Change Point	63	28

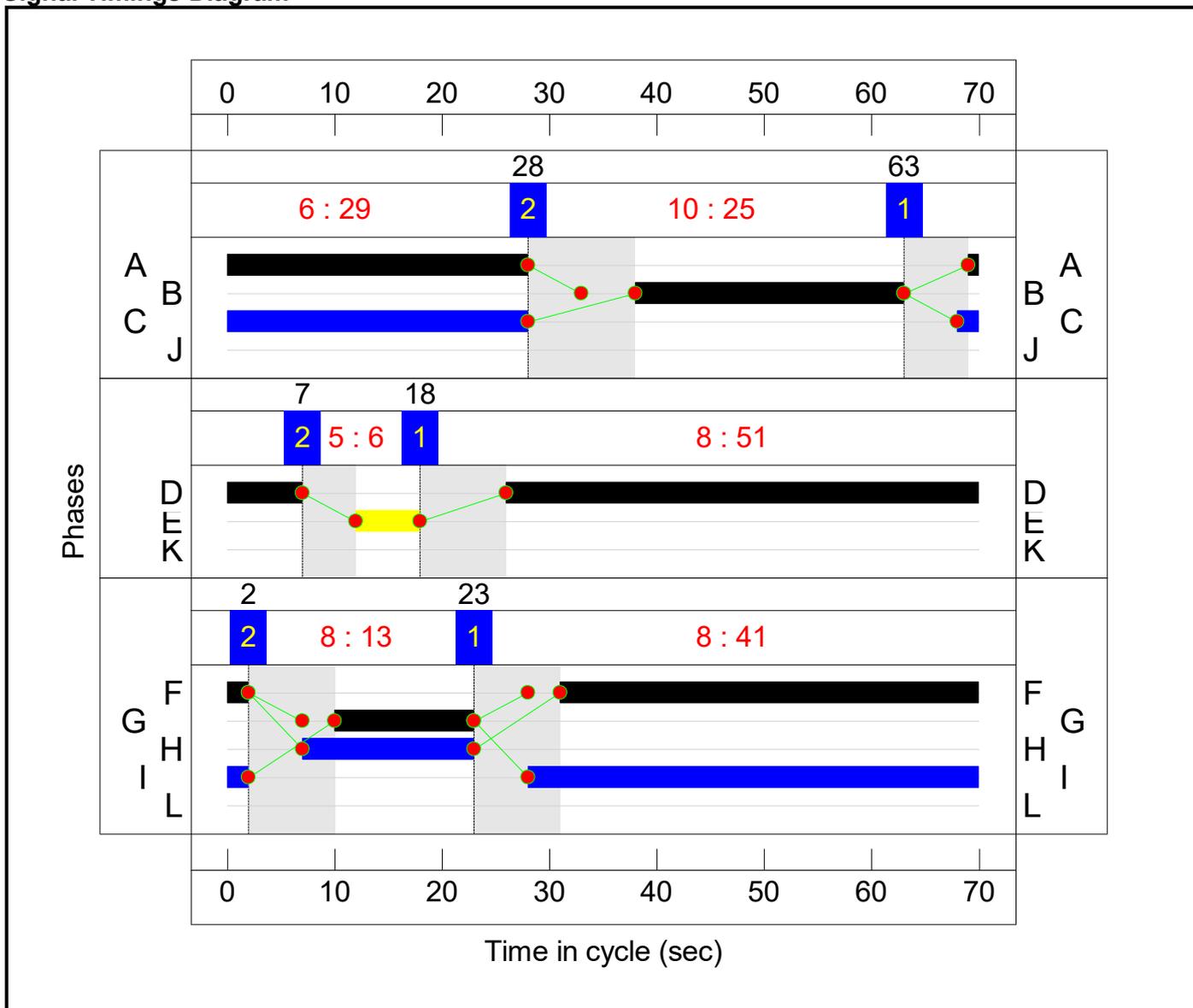
**Stage Stream: 2**

Stage	1	2
Duration	51	6
Change Point	18	7

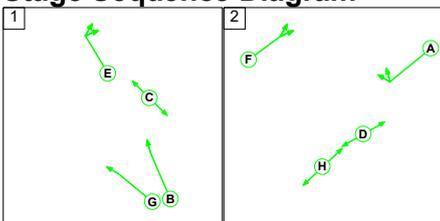
**Stage Stream: 3**

Stage	1	2
Duration	41	13
Change Point	23	2

### Signal Timings Diagram



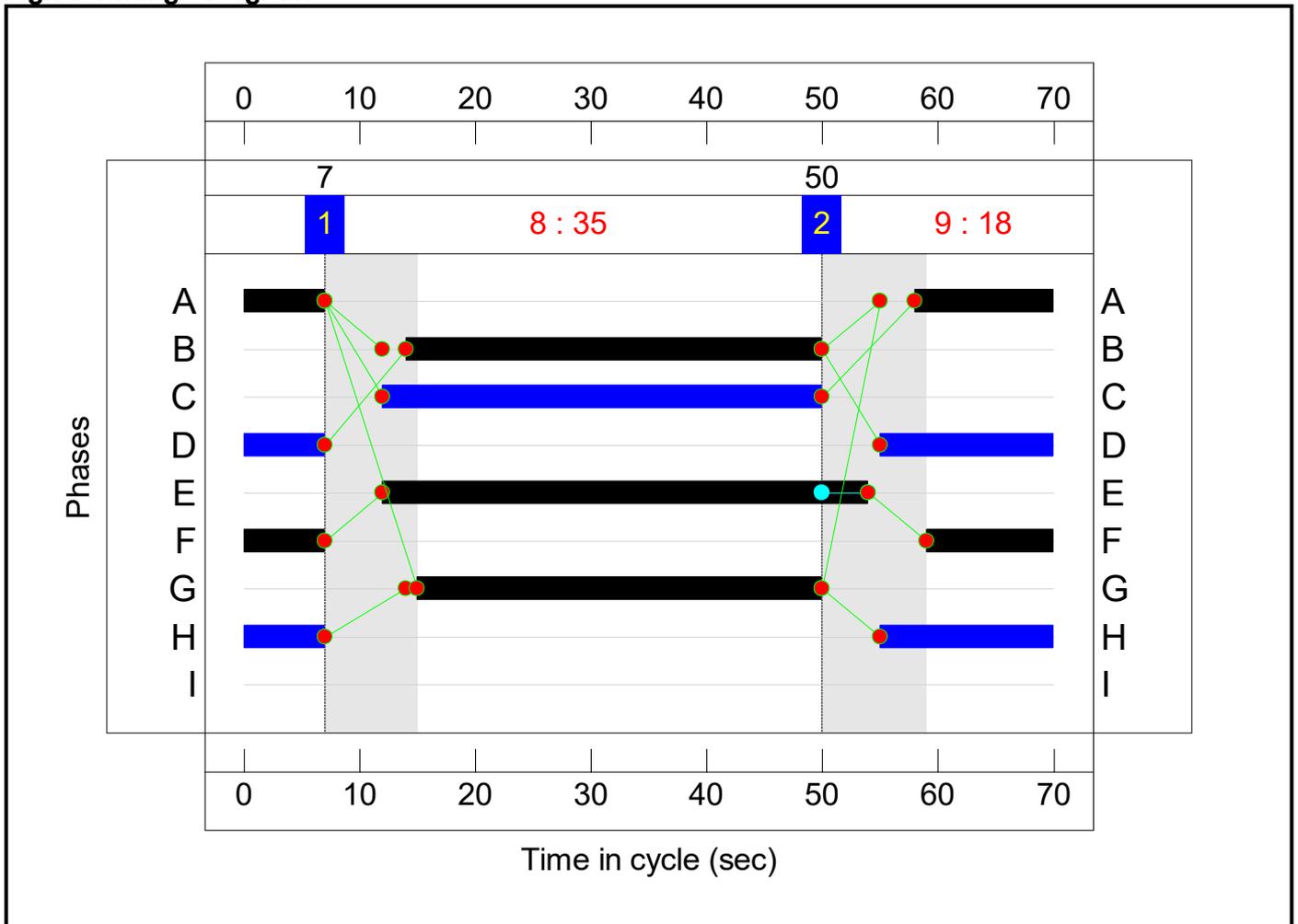
### C4 - Birdwell South Stage Sequence Diagram



### Stage Timings

Stage	1	2
Duration	35	18
Change Point	7	50

### Signal Timings Diagram





Full Input Data And Results

## **Network Results**

Full Input Data And Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network: M1 J36 Tankersley Rbt + Birdwell Rbt</b>	-	-	N/A	-	-		-	-	-	-	-	-	100.1%
<b>J1: M1 Junction 36 Tankersley Rbt</b>	-	-	N/A	-	-		-	-	-	-	-	-	100.1%
1/2+1/1	M1 SB offslip Left	U	1:1	N/A	C1:B		1	26	-	921	1900:1900	733+231	95.5 : 95.5%
1/3	M1 SB offslip Ahead	U	1:1	N/A	C1:B		1	26	-	473	1900	733	64.5%
2/1	A61 (NE) Ahead Ahead2	U	1:2	N/A	C1:D		1	34	-	886	1900	950	93.3%
2/2	A61 (NE) Ahead	U	1:2	N/A	C1:D		1	34	-	748	1900	950	78.7%
3/1+3/2	M1 NB offslip Ahead Ahead2	U	2:1	N/A	C2:B		1	26	-	1169	1900:1900	624+624	99.0 : 88.3%
4/1	A61 (W) Ahead Left	U	2:2	N/A	C2:D		1	24	-	598	1900	597	100.1%
4/2	A61 (W) Ahead	U	2:2	N/A	C2:D		1	24	-	418	1900	434	96.3%
5/1	North Overbridge Circ Ahead	U	1:1	N/A	C1:A		1	30	-	666	1900	679	98.1%
5/2	North Overbridge Circ Ahead	U	1:1	N/A	C1:A		1	30	-	835	1900	841	99.2%
5/3	North Overbridge Circ Right	U	1:1	N/A	C1:A		1	30	-	134	1900	841	15.9%
6/2+6/1	East Circ Right Ahead	U	1:2	N/A	C1:C		1	22	-	607	1900:1900	196+624	74.0 : 74.0%
7/1	South Overbridge Circ Ahead	U	2:1	N/A	C2:A		1	30	-	640	1900	841	76.1%
7/2	South Overbridge Circ Right Ahead	U	2:1	N/A	C2:A		1	30	-	601	1900	624	96.3%
7/3	South Overbridge Circ Right	U	2:1	N/A	C2:A		1	30	-	292	1900	841	34.7%

Full Input Data And Results

8/1	West Circ Ahead	U	2:2	N/A	C2:C		1	32	-	275	1900	896	30.7%
8/2	West Circ Right Ahead	U	2:2	N/A	C2:C		1	32	-	695	1900	896	77.6%
8/3	West Circ Right	U	2:2	N/A	C2:C		1	32	-	551	1900	896	61.5%
9/1	M1 NB onslip	U	N/A	N/A	-		-	-	-	610	Inf	Inf	0.0%
9/2	M1 NB onslip	U	N/A	N/A	-		-	-	-	292	Inf	Inf	0.0%
10/1	M1 SB Onslip	U	N/A	N/A	-		-	-	-	708	Inf	Inf	0.0%
11/1	A61 NE Exit Ahead	U	N/A	N/A	-		-	-	-	582	Inf	Inf	0.0%
11/2	A61 NE Exit Ahead	U	N/A	N/A	-		-	-	-	1840	Inf	Inf	0.0%
12/1	A16 W Exit	U	N/A	N/A	-		-	-	-	745	Inf	Inf	0.0%
12/2	A16 W Exit	U	N/A	N/A	-		-	-	-	436	Inf	Inf	0.0%
<b>J2: Birdwell Rbt</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>97.6%</b>
1/1	A61 Sheffield Rd (NW) Left	U	N/A	N/A	C4:F		1	18	-	205	1900	516	39.8%
1/3+1/2	A61 Sheffield Rd (NW) Ahead	U	N/A	N/A	C4:F		1	18	-	691	1900:1900	359+508	79.7 : 79.7%
2/1	A6195 Dearne Valley Pkway Ahead Left	U	3:1	N/A	C3:B		1	25	-	614	1900	706	87.0%
2/2	A6195 Dearne Valley Pkway Ahead	U	3:1	N/A	C3:B		1	25	-	615	1900	706	87.1%
3/1	A6195 Sheffield Rd (E) Ahead	U	3:3	N/A	C3:G		1	13	-	261	1900	380	68.7%
3/2	A6195 Sheffield Rd (E) Ahead	U	3:3	N/A	C3:G		1	13	-	278	1900	299	93.1%
4/1	A61 (S) Left	U	N/A	N/A	C4:G		1	35	-	582	1900	977	59.5%
4/2+4/3	A61 (S) Ahead	U	N/A	N/A	C4:B		1	36	-	1852	1900:1900	943+954	97.6 : 97.6%
5/1	NW Circ Right	U	3:1	N/A	C3:A		1	29	-	705	1900	814	86.6%
5/2	NW Circ Right	U	3:1	N/A	C3:A		1	29	-	229	1900	814	28.1%
5/3	NW Circ Right	U	3:1	N/A	C3:A		1	29	-	286	1900	814	35.1%
6/1	SW Circ Right	U	N/A	N/A	C4:E		1	42	-	925	1900	1167	79.3%

Full Input Data And Results

6/2	SW Circ Right Right2	U	N/A	N/A	C4:E		1	42	-	935	1900	1167	80.1%
7/1	NE Circ Right	U	3:3	N/A	C3:F		1	41	-	827	1900	1140	72.5%
7/2	NE Circ Right Right2	U	3:3	N/A	C3:F		1	41	-	901	1900	1140	79.0%
8/1	SE Circ Right	U	N/A	N/A	C4:A		1	19	-	517	1900	543	95.2%
8/2	SE Circ Right Right2	U	N/A	N/A	C4:A		1	19	-	128	1900	543	23.6%
9/1	A61 NW Exit	U	N/A	N/A	-		-	-	-	1219	Inf	Inf	0.0%
10/1	A6195 Exit Peds Ahead	U	3:2	N/A	C3:D		1	51	-	926	1900	1411	65.6%
10/2	A6195 Exit Peds Ahead	U	3:2	N/A	C3:D		1	51	-	610	1900	1411	43.2%
11/1	A6195 Exit	U	N/A	N/A	-		-	-	-	926	Inf	Inf	0.0%
11/2	A6195 Exit	U	N/A	N/A	-		-	-	-	610	Inf	Inf	0.0%
12/1	A6195 E Exit	U	N/A	N/A	-		-	-	-	721	Inf	Inf	0.0%
13/1	A61 S Exit Ahead	U	N/A	N/A	-		-	-	-	878	Inf	Inf	0.0%
13/2	A61 S Exit Ahead	U	N/A	N/A	-		-	-	-	744	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network: M1 J36 Tankersley Rbt + Birdwell Rbt</b>	-	-	0	0	0	92.9	108.7	0.0	201.6	-	-	-	-
<b>J1: M1 Junction 36 Tankersley Rbt</b>	-	-	0	0	0	51.1	78.9	0.0	130.0	-	-	-	-
1/2+1/1	921	921	-	-	-	5.0	7.8	-	12.8 (10.0+2.8)	50.1 (51.5:45.5)	13.2	7.8	21.0
1/3	473	473	-	-	-	2.3	0.9	-	3.2	24.5	7.5	0.9	8.4
2/1	886	886	-	-	-	5.5	5.9	-	11.3	46.1	15.9	5.9	21.8
2/2	748	748	-	-	-	2.3	1.8	-	4.2	20.0	8.7	1.8	10.5
3/1+3/2	1169	1169	-	-	-	7.4	6.3	-	13.8 (7.4+6.4)	42.4 (42.9:41.7)	11.8	6.3	18.2
4/1	598	597	-	-	-	4.0	12.4	-	16.5	99.1	11.6	12.4	24.1
4/2	418	418	-	-	-	3.1	6.9	-	10.0	86.4	8.0	6.9	14.9
5/1	666	666	-	-	-	2.0	10.1	-	12.1	65.3	12.7	10.1	22.7
5/2	835	835	-	-	-	2.1	12.9	-	15.0	64.6	16.2	12.9	29.1
5/3	134	134	-	-	-	0.4	0.1	-	0.5	13.6	2.5	0.1	2.6
6/2+6/1	607	607	-	-	-	3.1	1.4	-	4.5 (0.9+3.6)	26.6 (23.2:27.7)	4.8	1.4	6.3
7/1	640	640	-	-	-	2.8	1.6	-	4.3	24.4	10.3	1.6	11.8
7/2	601	601	-	-	-	3.6	7.7	-	11.4	68.0	11.2	7.7	19.0
7/3	292	292	-	-	-	1.3	0.3	-	1.5	18.9	2.8	0.3	3.1
8/1	275	275	-	-	-	1.7	0.2	-	1.9	25.3	4.0	0.2	4.2
8/2	695	695	-	-	-	2.7	1.7	-	4.4	22.6	11.1	1.7	12.8
8/3	551	551	-	-	-	1.9	0.8	-	2.7	17.4	10.7	0.8	11.5
9/1	610	610	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	292	292	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	708	708	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

11/1	582	582	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	1840	1840	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/1	745	745	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/2	436	436	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
<b>J2: Birdwell Rbt</b>	-	-	<b>0</b>	<b>0</b>	<b>0</b>	<b>41.7</b>	<b>29.8</b>	<b>0.0</b>	<b>71.5</b>	-	-	-	-
1/1	205	205	-	-	-	1.2	0.3	-	1.5	26.6	3.2	0.3	3.6
1/3+1/2	691	691	-	-	-	4.4	1.9	-	6.3 (2.5+3.8)	32.9 (31.9:33.6)	7.2	1.9	9.1
2/1	614	614	-	-	-	3.5	3.1	-	6.6	38.8	11.1	3.1	14.2
2/2	615	615	-	-	-	3.5	3.2	-	6.7	39.0	11.1	3.2	14.3
3/1	261	261	-	-	-	1.9	1.1	-	3.0	40.8	4.6	1.1	5.7
3/2	278	278	-	-	-	2.2	4.7	-	6.9	89.4	5.3	4.7	10.0
4/1	582	582	-	-	-	2.7	0.7	-	3.5	21.5	8.7	0.7	9.5
4/2+4/3	1852	1852	-	-	-	10.7	0.0	-	10.7 (5.3+5.4)	20.8 (20.7:20.8)	28.3	0.0	28.3
5/1	705	705	-	-	-	4.9	3.1	-	8.0	40.9	13.4	3.1	16.4
5/2	229	229	-	-	-	0.0	0.2	-	0.2	3.3	0.0	0.2	0.2
5/3	286	286	-	-	-	0.0	0.3	-	0.3	3.6	0.0	0.3	0.3
6/1	925	925	-	-	-	0.0	0.0	-	0.0	0.1	0.1	0.0	0.1
6/2	935	935	-	-	-	0.0	0.0	-	0.0	0.1	0.1	0.0	0.1
7/1	827	827	-	-	-	1.2	1.3	-	2.5	10.8	4.6	1.3	5.9
7/2	901	901	-	-	-	1.7	1.9	-	3.5	14.0	5.7	1.9	7.6
8/1	517	517	-	-	-	2.8	6.6	-	9.5	65.8	9.8	6.6	16.4
8/2	128	128	-	-	-	0.7	0.2	-	0.8	23.3	1.7	0.2	1.9
9/1	1219	1219	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	926	926	-	-	-	0.0	1.0	-	1.0	3.7	0.2	1.0	1.1
10/2	610	610	-	-	-	0.2	0.4	-	0.6	3.6	1.4	0.4	1.8
11/1	926	926	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	610	610	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/1	721	721	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
13/1	878	878	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0



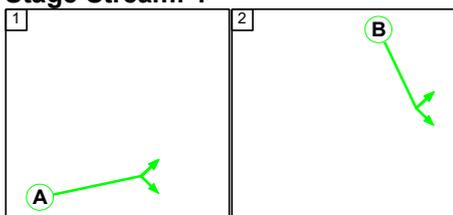
Full Input Data And Results

Scenario 3: '3' (FG3: '2028 AM Do Minimum', Plan 1: 'Network Control Plan 1')

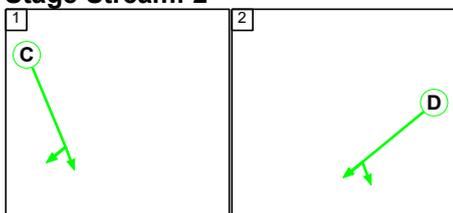
C1 - M1 J36 Northside Tankersley

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

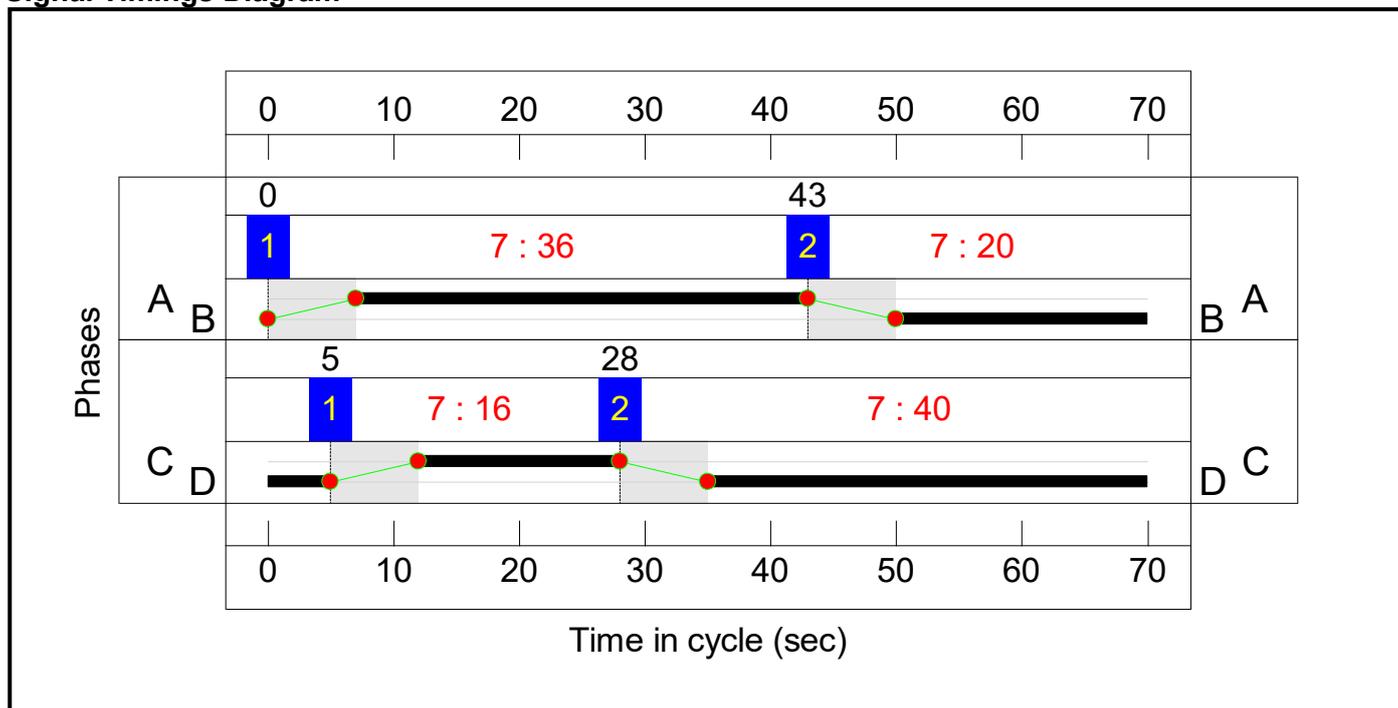
Stage Stream: 1

Stage	1	2
Duration	36	20
Change Point	0	43

Stage Stream: 2

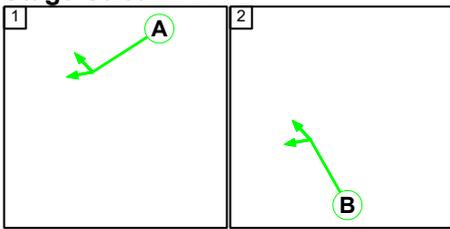
Stage	1	2
Duration	16	40
Change Point	5	28

Signal Timings Diagram

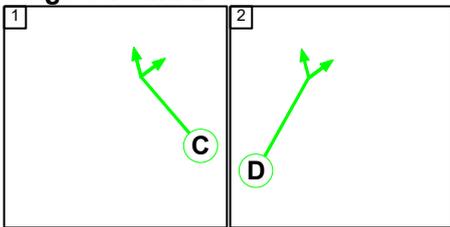


**C2 - M1 J36 Southside Tankersley  
Stage Sequence Diagram**

**Stage Stream: 1**



**Stage Stream: 2**



**Stage Timings**

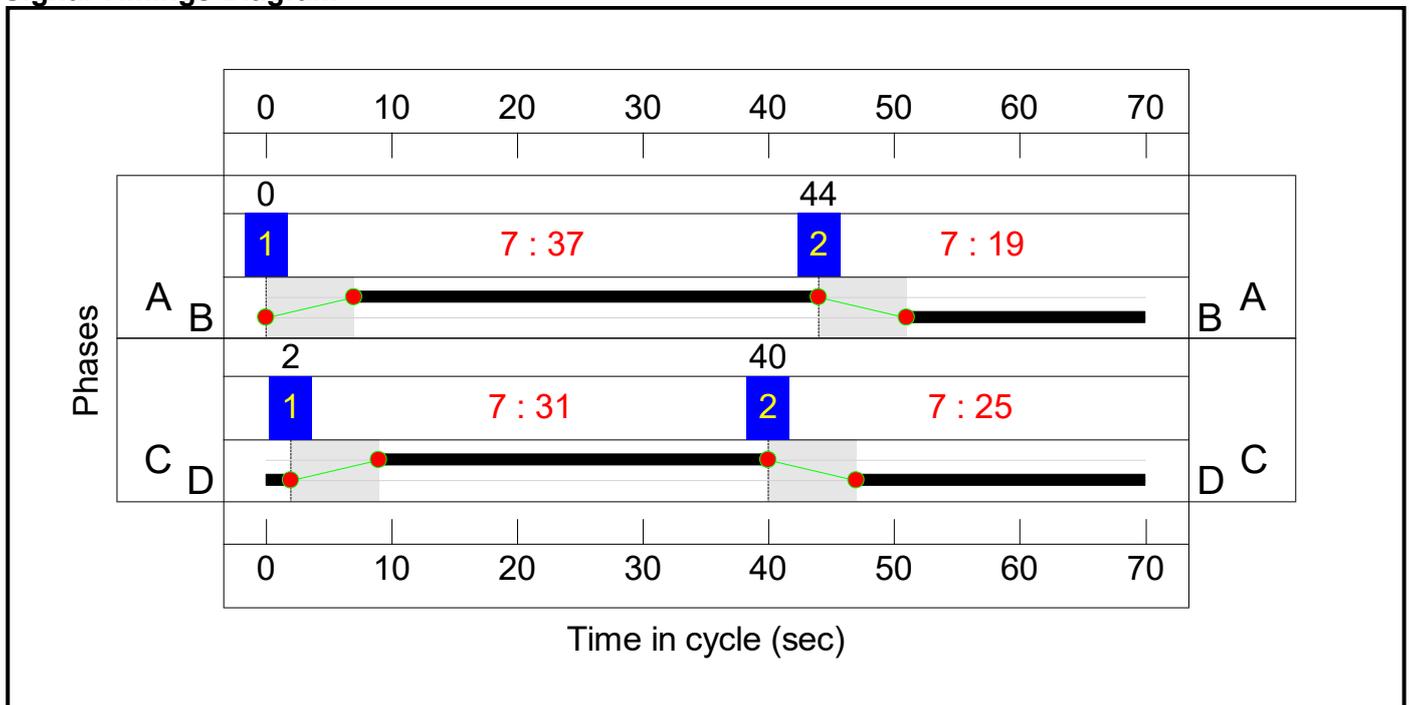
**Stage Stream: 1**

Stage	1	2
Duration	37	19
Change Point	0	44

**Stage Stream: 2**

Stage	1	2
Duration	31	25
Change Point	2	40

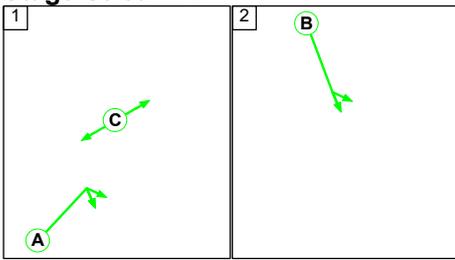
**Signal Timings Diagram**



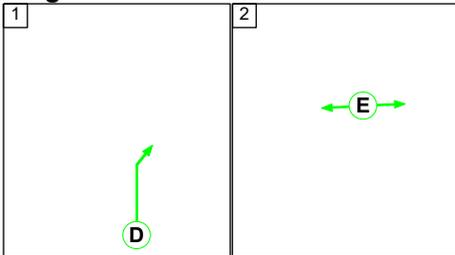
Full Input Data And Results

**C3 - Birdwell North**  
**Stage Sequence Diagram**

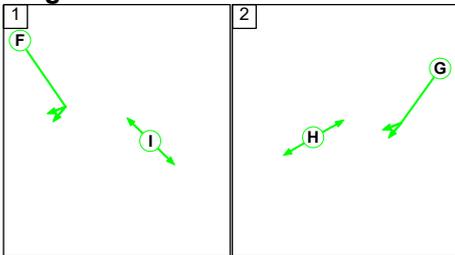
**Stage Stream: 1**



**Stage Stream: 2**



**Stage Stream: 3**



**Stage Timings**

**Stage Stream: 1**

Stage	1	2
Duration	23	31
Change Point	65	24

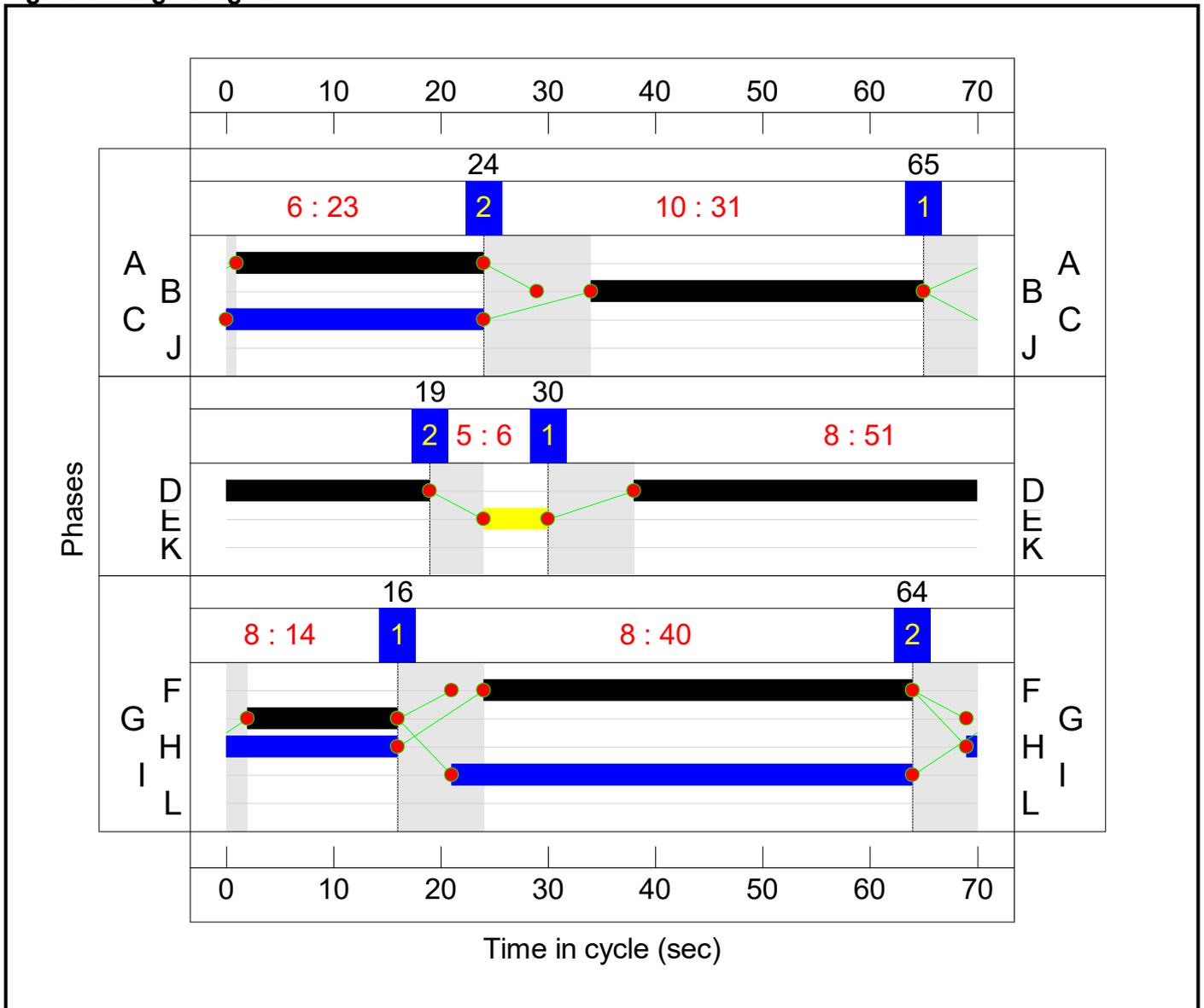
**Stage Stream: 2**

Stage	1	2
Duration	51	6
Change Point	30	19

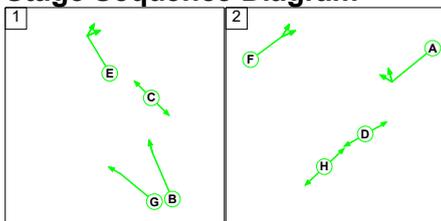
**Stage Stream: 3**

Stage	1	2
Duration	40	14
Change Point	16	64

**Signal Timings Diagram**



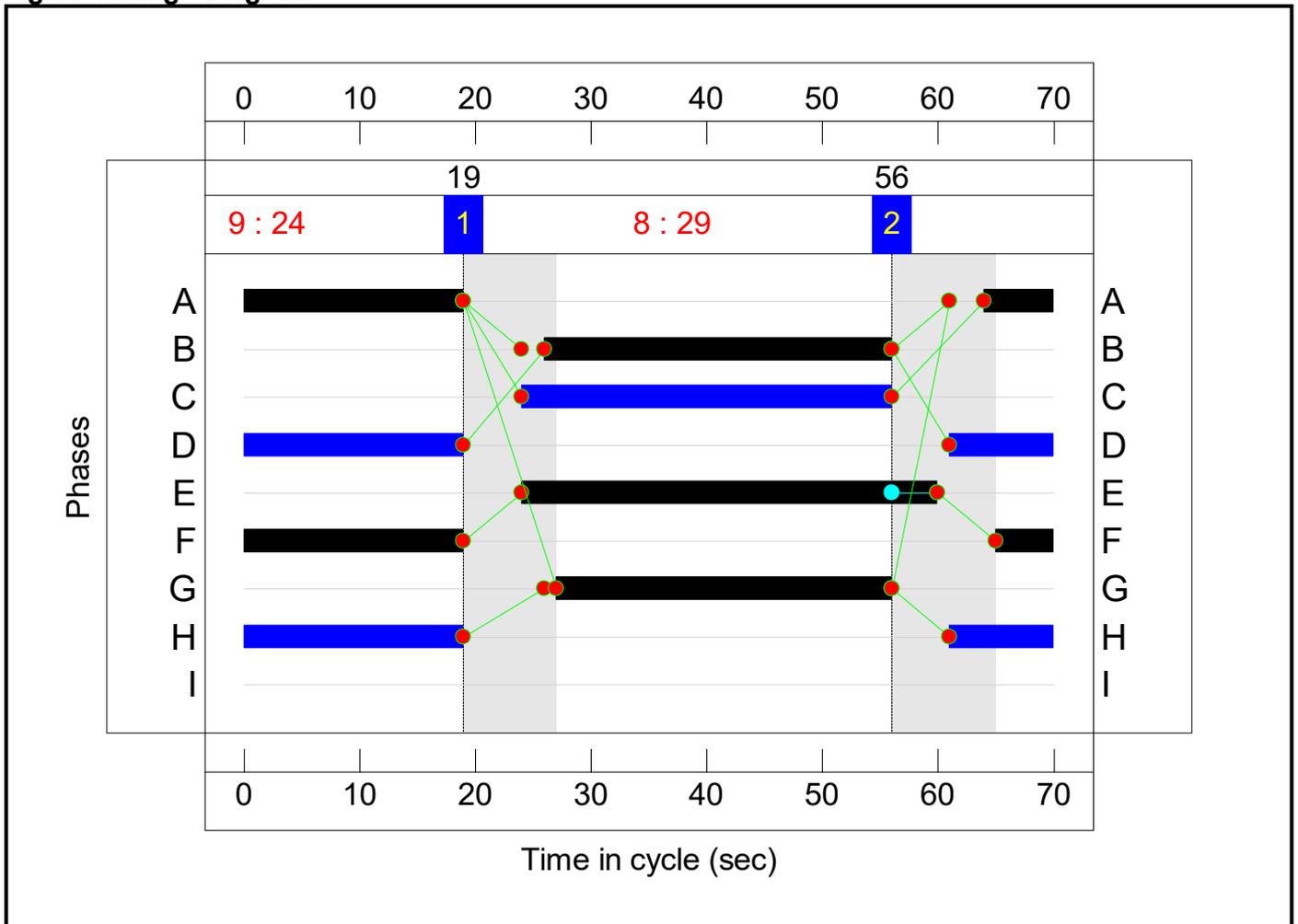
**C4 - Birdwell South Stage Sequence Diagram**



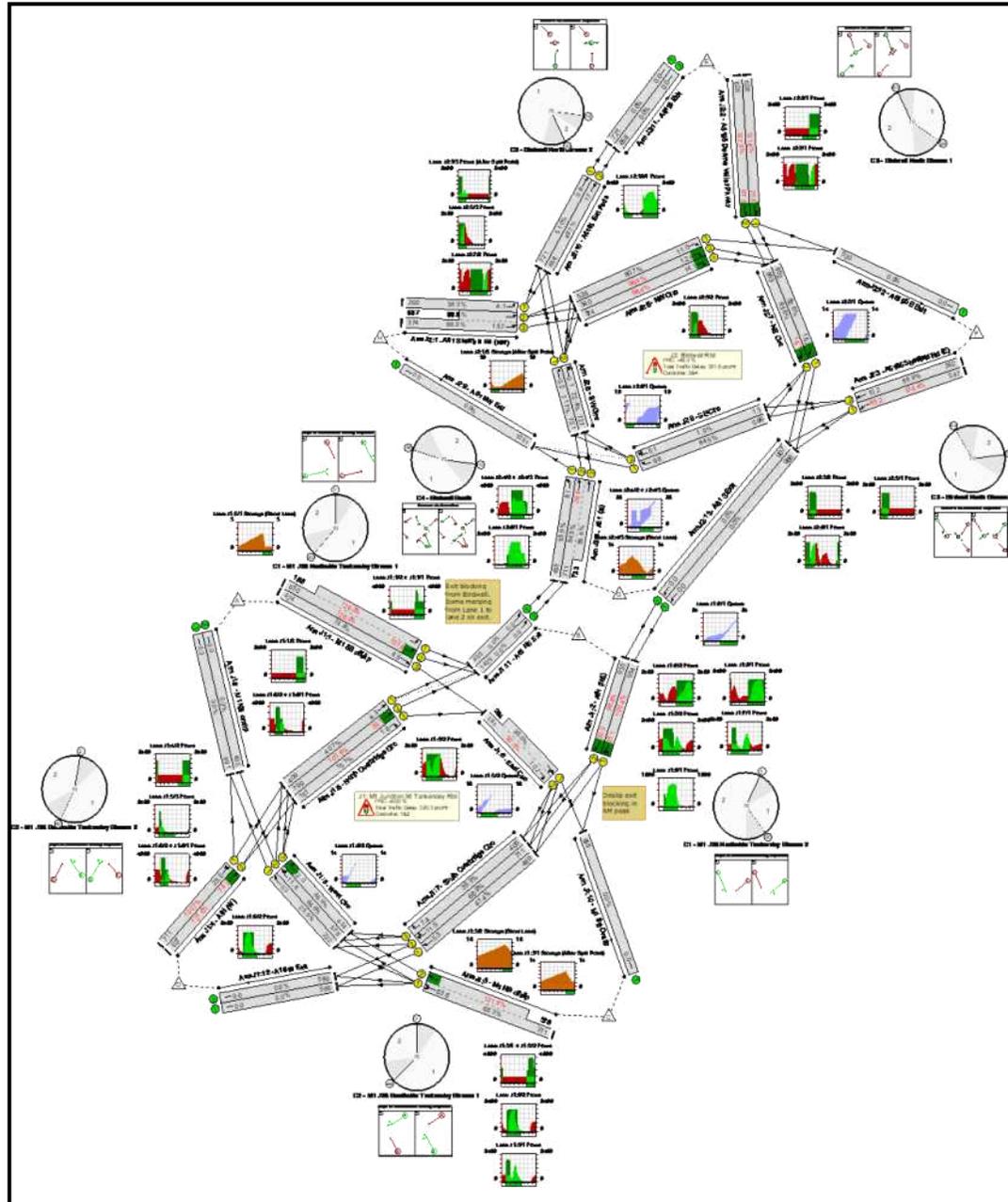
**Stage Timings**

Stage	1	2
Duration	29	24
Change Point	19	56

### Signal Timings Diagram



Full Input Data And Results  
Network Layout Diagram



Full Input Data And Results

## **Network Results**

Full Input Data And Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network: M1 J36 Tankersley Rbt + Birdwell Rbt</b>	-	-	N/A	-	-		-	-	-	-	-	-	134.4%
<b>J1: M1 Junction 36 Tankersley Rbt</b>	-	-	N/A	-	-		-	-	-	-	-	-	126.0%
1/2+1/1	M1 SB offslip Left	U	1:1	N/A	C1:B		1	20	-	818	1900:1900	516+133	126.0 : 126.0%
1/3	M1 SB offslip Ahead	U	1:1	N/A	C1:B		1	20	-	424	1900	570	74.4%
2/1	A61 (NE) Ahead Ahead2	U	1:2	N/A	C1:D		1	40	-	1103	1900	950	100.4%
2/2	A61 (NE) Ahead	U	1:2	N/A	C1:D		1	40	-	1108	1900	950	98.4%
3/1+3/2	M1 NB offslip Ahead Ahead2	U	2:1	N/A	C2:B		1	19	-	899	1900:1900	543+434	68.3 : 121.6%
4/1	A61 (W) Ahead Left	U	2:2	N/A	C2:D		1	25	-	711	1900	706	100.7%
4/2	A61 (W) Ahead	U	2:2	N/A	C2:D		1	25	-	627	1900	516	121.6%
5/1	North Overbridge Circ Ahead	U	1:1	N/A	C1:A		1	36	-	411	1900	1004	40.7%
5/2	North Overbridge Circ Ahead	U	1:1	N/A	C1:A		1	36	-	971	1900	787	101.5%
5/3	North Overbridge Circ Right	U	1:1	N/A	C1:A		1	36	-	184	1900	1004	15.1%
6/2+6/1	East Circ Right Ahead	U	1:2	N/A	C1:C		1	16	-	608	1900:1900	196+461	92.5 : 85.5%
7/1	South Overbridge Circ Ahead	U	2:1	N/A	C2:A		1	37	-	529	1900	1031	47.4%
7/2	South Overbridge Circ Right Ahead	U	2:1	N/A	C2:A		1	37	-	809	1900	1031	68.9%

Full Input Data And Results

7/3	South Overbridge Circ Right	U	2:1	N/A	C2:A		1	37	-	480	1900	1031	39.3%
8/1	West Circ Ahead	U	2:2	N/A	C2:C		1	31	-	262	1900	869	25.5%
8/2	West Circ Right Ahead	U	2:2	N/A	C2:C		1	31	-	653	1900	869	66.6%
8/3	West Circ Right	U	2:2	N/A	C2:C		1	31	-	528	1900	489	88.9%
9/1	M1 NB onslip	U	N/A	N/A	-		-	-	-	735	Inf	Inf	0.0%
9/2	M1 NB onslip	U	N/A	N/A	-		-	-	-	480	Inf	Inf	0.0%
10/1	M1 SB Onslip	U	N/A	N/A	-		-	-	-	1001	Inf	Inf	0.0%
11/1	A61 NE Exit Ahead	U	N/A	N/A	-		-	-	-	456	Inf	Inf	0.0%
11/2	A61 NE Exit Ahead	U	N/A	N/A	-		-	-	-	1744	Inf	Inf	0.0%
12/1	A16 W Exit	U	N/A	N/A	-		-	-	-	626	Inf	Inf	0.0%
12/2	A16 W Exit	U	N/A	N/A	-		-	-	-	648	Inf	Inf	0.0%
<b>J2: Birdwell Rbt</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>134.4%</b>
1/1	A61 Sheffield Rd (NW) Left	U	N/A	N/A	C4:F		1	24	-	260	1900	679	38.3%
1/3+1/2	A61 Sheffield Rd (NW) Ahead	U	N/A	N/A	C4:F		1	24	-	911	1900:1900	421+604	88.9 : 88.9%
2/1	A6195 Dearne Valley Pkway Ahead Left	U	3:1	N/A	C3:B		1	31	-	628	1900	516	121.8%
2/2	A6195 Dearne Valley Pkway Ahead	U	3:1	N/A	C3:B		1	31	-	625	1900	489	127.9%
3/1	A6195 Sheffield Rd (E) Ahead	U	3:3	N/A	C3:G		1	14	-	547	1900	407	134.4%
3/2	A6195 Sheffield Rd (E) Ahead	U	3:3	N/A	C3:G		1	14	-	362	1900	407	88.9%
4/1	A61 (S) Left	U	N/A	N/A	C4:G		1	29	-	456	1900	814	55.9%
4/2+4/3	A61 (S) Ahead	U	N/A	N/A	C4:B		1	30	-	1755	1900:1900	841+841	84.5 : 85.9%
5/1	NW Circ Right	U	3:1	N/A	C3:A		1	23	-	599	1900	651	80.7%
5/2	NW Circ Right	U	3:1	N/A	C3:A		1	23	-	340	1900	353	96.4%

Full Input Data And Results

5/3	NW Circ Right	U	3:1	N/A	C3:A		1	23	-	374	1900	380	98.4%
6/1	SW Circ Right	U	N/A	N/A	C4:E		1	36	-	880	1900	1004	71.7%
6/2	SW Circ Right Right2	U	N/A	N/A	C4:E		1	36	-	889	1900	1004	72.4%
7/1	NE Circ Right	U	3:3	N/A	C3:F		1	40	-	963	1900	1031	82.6%
7/2	NE Circ Right Right2	U	3:3	N/A	C3:F		1	40	-	999	1900	1031	83.6%
8/1	SE Circ Right	U	N/A	N/A	C4:A		1	25	-	665	1900	706	84.5%
8/2	SE Circ Right Right2	U	N/A	N/A	C4:A		1	25	-	14	1900	706	1.9%
9/1	A61 NW Exit	U	N/A	N/A	-		-	-	-	1121	Inf	Inf	0.0%
10/1	A6195 Exit Peds Ahead	U	3:2	N/A	C3:D		1	51	-	880	1900	1411	51.0%
10/2	A6195 Exit Peds Ahead	U	3:2	N/A	C3:D		1	51	-	747	1900	1411	46.7%
11/1	A6195 Exit	U	N/A	N/A	-		-	-	-	880	Inf	Inf	0.0%
11/2	A6195 Exit	U	N/A	N/A	-		-	-	-	747	Inf	Inf	0.0%
12/1	A6195 E Exit	U	N/A	N/A	-		-	-	-	604	Inf	Inf	0.0%
13/1	A61 S Exit Ahead	U	N/A	N/A	-		-	-	-	1117	Inf	Inf	0.0%
13/2	A61 S Exit Ahead	U	N/A	N/A	-		-	-	-	1075	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network: M1 J36 Tankersley Rbt + Birdwell Rbt</b>	-	-	0	0	0	118.3	503.8	0.0	622.1	-	-	-	-
<b>J1: M1 Junction 36 Tankersley Rbt</b>	-	-	0	0	0	50.9	269.4	0.0	320.3	-	-	-	-
1/2+1/1	818	684	-	-	-	8.4	86.9	-	95.3 (76.6+18.7)	419.4 (424.1:401.1)	14.8	86.9	101.6
1/3	424	424	-	-	-	2.6	1.4	-	4.0	34.2	7.4	1.4	8.8
2/1	954	950	-	-	-	3.1	16.5	-	19.6	73.9	18.6	16.5	35.1
2/2	935	935	-	-	-	2.7	12.0	-	14.7	56.8	18.0	12.0	30.0
3/1+3/2	899	805	-	-	-	8.2	51.9	-	60.2 (4.4+55.8)	240.9 (42.6:380.3)	11.6	51.9	63.6
4/1	711	706	-	-	-	4.6	14.7	-	19.3	97.6	13.9	14.7	28.6
4/2	627	516	-	-	-	8.9	58.3	-	67.3	386.1	15.6	58.3	74.0
5/1	409	409	-	-	-	0.5	0.3	-	0.8	7.2	3.9	0.3	4.3
5/2	799	787	-	-	-	2.4	17.3	-	19.7	89.0	15.8	17.3	33.1
5/3	151	151	-	-	-	0.1	0.1	-	0.2	5.1	1.7	0.1	1.8
6/2+6/1	575	575	-	-	-	2.0	3.3	-	5.3 (1.7+3.6)	33.2 (33.0:33.2)	6.9	3.3	10.2
7/1	489	489	-	-	-	1.0	0.4	-	1.4	10.5	4.8	0.4	5.3
7/2	711	711	-	-	-	2.1	1.1	-	3.2	16.0	10.4	1.1	11.5
7/3	405	405	-	-	-	1.1	0.3	-	1.4	12.8	7.1	0.3	7.4
8/1	222	222	-	-	-	0.0	0.2	-	0.2	3.4	0.1	0.2	0.3
8/2	578	578	-	-	-	1.1	1.0	-	2.1	12.8	10.6	1.0	11.6
8/3	434	434	-	-	-	2.1	3.5	-	5.6	46.6	8.4	3.5	12.0
9/1	691	691	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	405	405	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	855	855	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

11/1	455	455	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	1425	1425	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/1	586	586	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/2	590	590	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
<b>J2: Birdwell Rbt</b>	-	-	<b>0</b>	<b>0</b>	<b>0</b>	<b>67.3</b>	<b>234.5</b>	<b>0.0</b>	<b>301.8</b>	-	-	-	-
1/1	260	260	-	-	-	1.2	0.3	-	1.5	21.1	3.8	0.3	4.1
1/3+1/2	911	911	-	-	-	4.9	3.7	-	8.6 (3.4+5.2)	34.1 (32.8:35.0)	9.4	3.7	13.2
2/1	628	516	-	-	-	8.8	58.8	-	67.7	387.8	16.2	58.8	75.0
2/2	625	489	-	-	-	9.9	70.4	-	80.3	462.8	17.1	70.4	87.5
3/1	547	407	-	-	-	9.2	71.8	-	81.0	533.2	13.4	71.8	85.2
3/2	362	362	-	-	-	2.7	3.5	-	6.2	61.2	6.7	3.5	10.2
4/1	455	455	-	-	-	1.9	0.6	-	2.5	19.7	7.4	0.6	8.1
4/2+4/3	1434	1434	-	-	-	5.2	0.0	-	5.2 (2.6+2.7)	13.2 (13.1:13.2)	26.9	0.0	26.9
5/1	526	526	-	-	-	2.6	2.0	-	4.6	31.7	9.0	2.0	11.0
5/2	340	340	-	-	-	3.6	6.5	-	10.1	107.2	6.0	6.5	12.6
5/3	374	374	-	-	-	2.8	8.3	-	11.1	106.7	5.9	8.3	14.1
6/1	721	721	-	-	-	0.1	0.0	-	0.1	0.3	0.2	0.0	0.2
6/2	727	727	-	-	-	0.0	0.0	-	0.0	0.2	0.1	0.0	0.1
7/1	852	852	-	-	-	5.4	2.3	-	7.7	32.5	12.9	2.3	15.2
7/2	863	863	-	-	-	5.7	2.5	-	8.1	34.0	13.6	2.5	16.1
8/1	596	596	-	-	-	3.1	2.6	-	5.7	34.6	7.2	2.6	9.8
8/2	13	13	-	-	-	0.1	0.0	-	0.1	17.6	0.1	0.0	0.1
9/1	1051	1051	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	721	721	-	-	-	0.0	0.5	-	0.5	2.7	0.2	0.5	0.8
10/2	658	658	-	-	-	0.2	0.4	-	0.6	3.4	1.3	0.4	1.7
11/1	721	721	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
11/2	658	658	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
12/1	530	530	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
13/1	966	966	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0



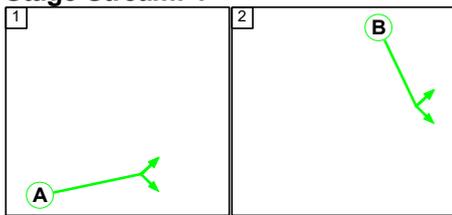
Full Input Data And Results

Scenario 4: '4' (FG4: '2028 PM Do Minimum', Plan 1: 'Network Control Plan 1')

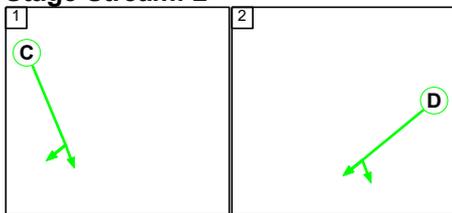
C1 - M1 J36 Northside Tankersley

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

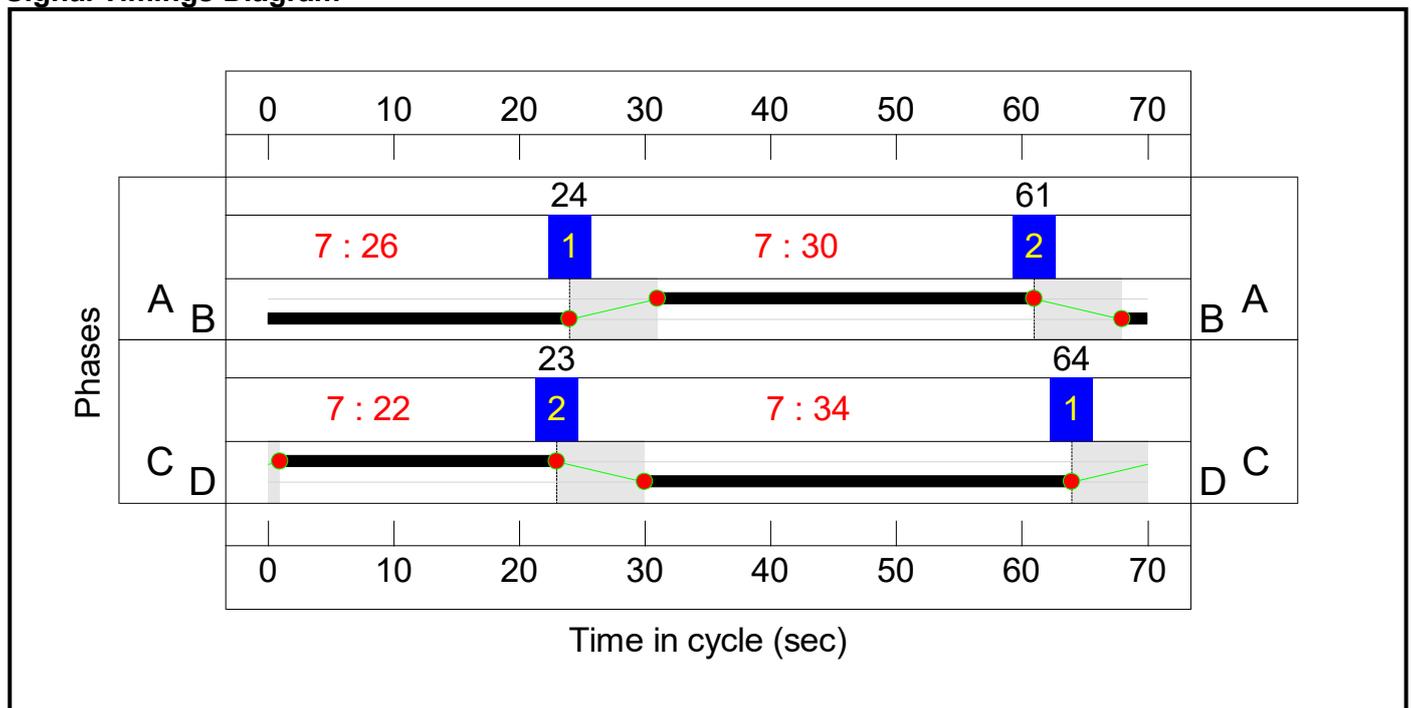
Stage Stream: 1

Stage	1	2
Duration	30	26
Change Point	24	61

Stage Stream: 2

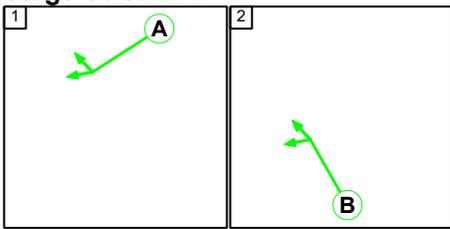
Stage	1	2
Duration	22	34
Change Point	64	23

Signal Timings Diagram

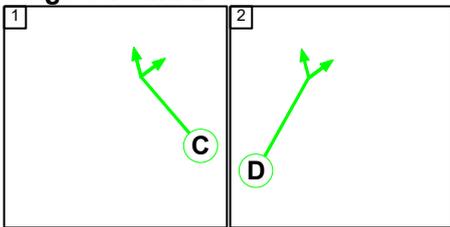


**C2 - M1 J36 Southside Tankersley  
Stage Sequence Diagram**

**Stage Stream: 1**



**Stage Stream: 2**



**Stage Timings**

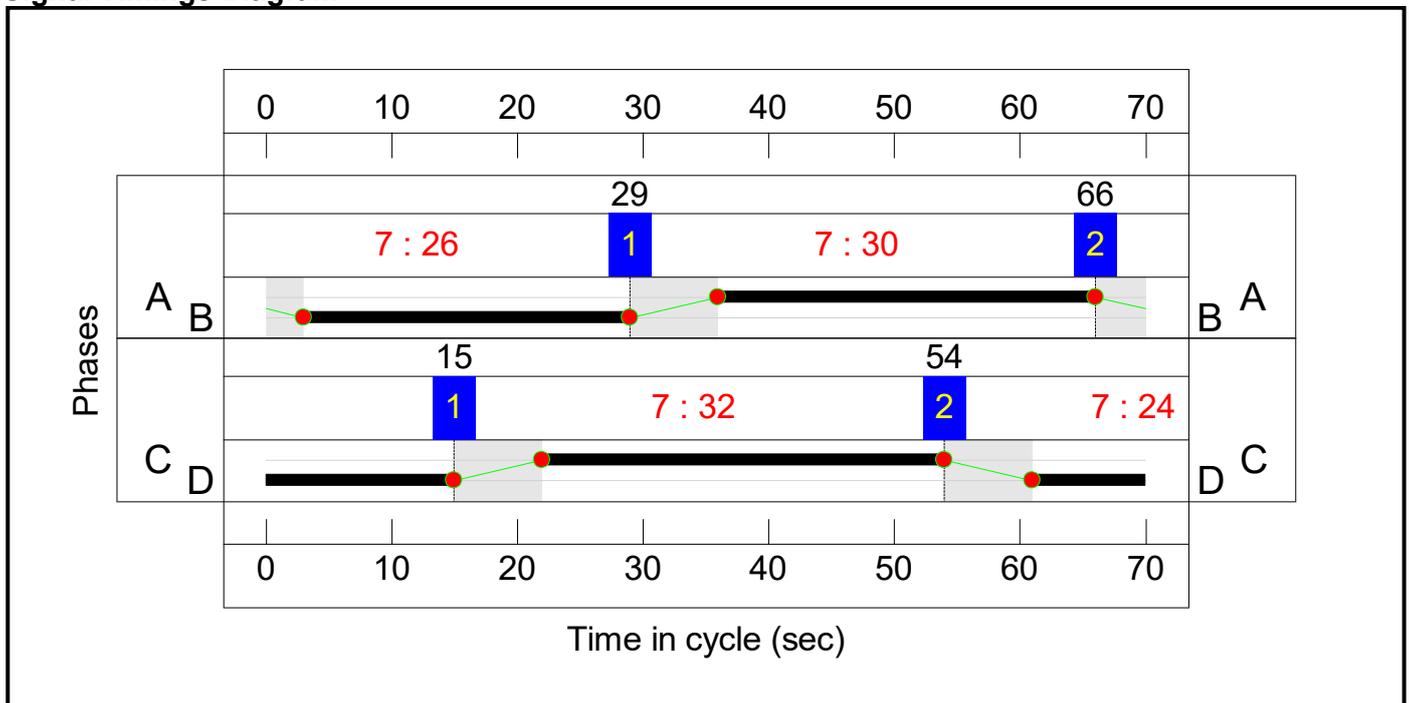
**Stage Stream: 1**

Stage	1	2
Duration	30	26
Change Point	29	66

**Stage Stream: 2**

Stage	1	2
Duration	32	24
Change Point	15	54

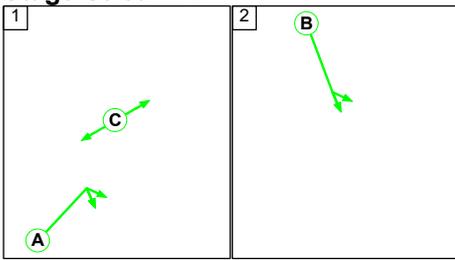
**Signal Timings Diagram**



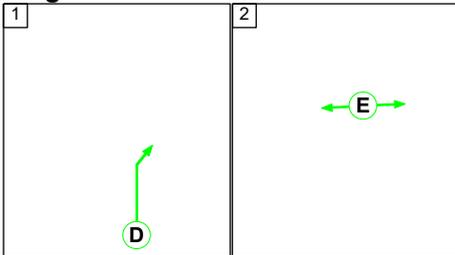
Full Input Data And Results

**C3 - Birdwell North**  
**Stage Sequence Diagram**

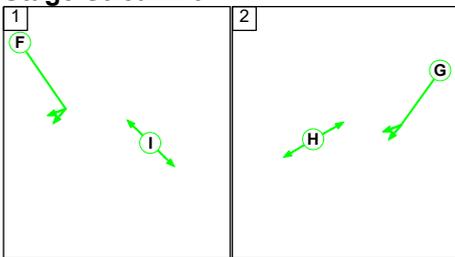
**Stage Stream: 1**



**Stage Stream: 2**



**Stage Stream: 3**



**Stage Timings**

**Stage Stream: 1**

Stage	1	2
Duration	29	25
Change Point	63	28

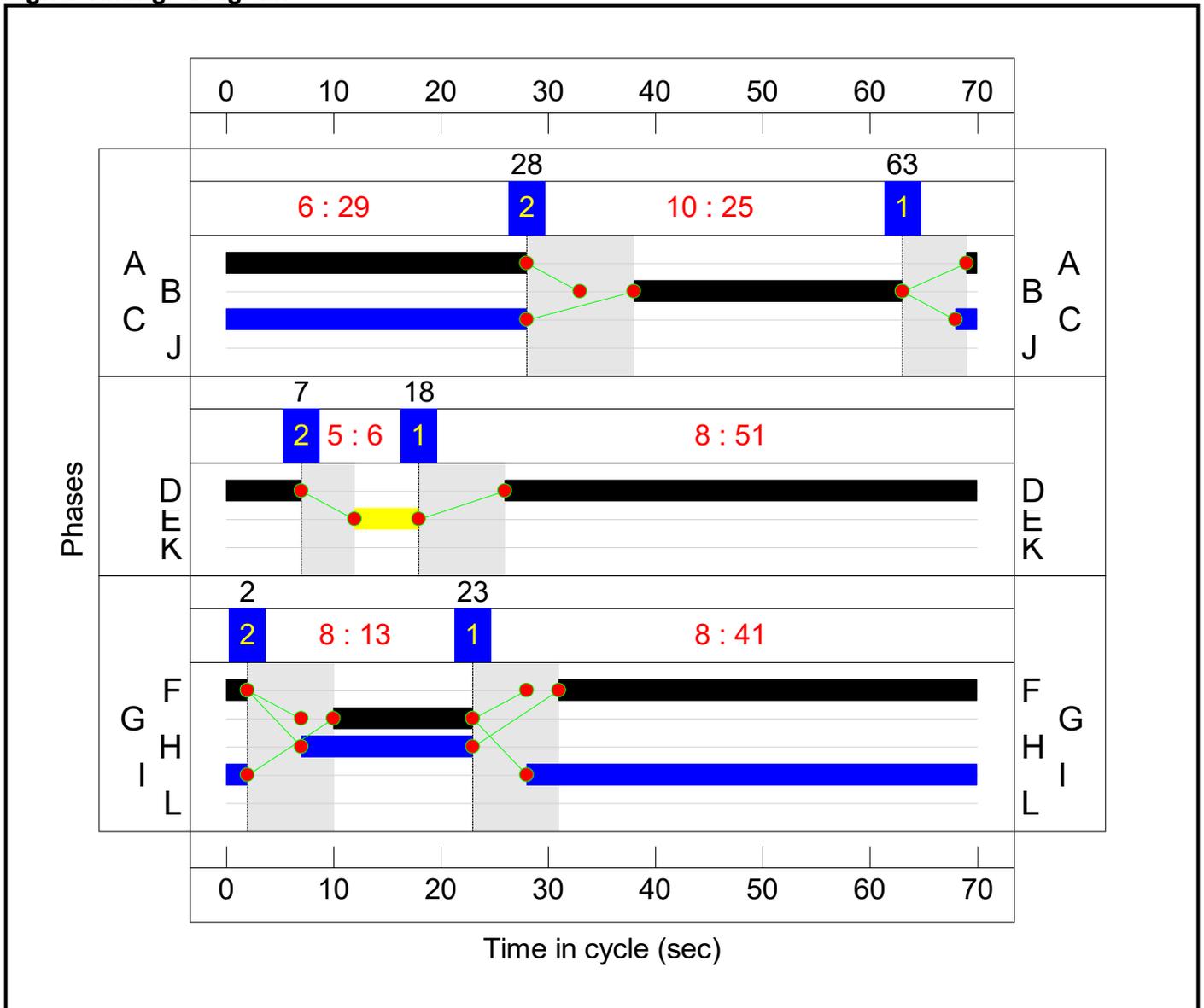
**Stage Stream: 2**

Stage	1	2
Duration	51	6
Change Point	18	7

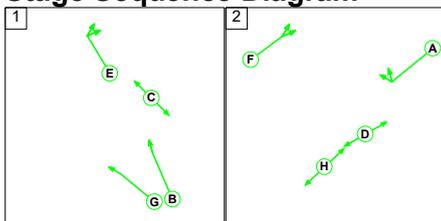
**Stage Stream: 3**

Stage	1	2
Duration	41	13
Change Point	23	2

**Signal Timings Diagram**



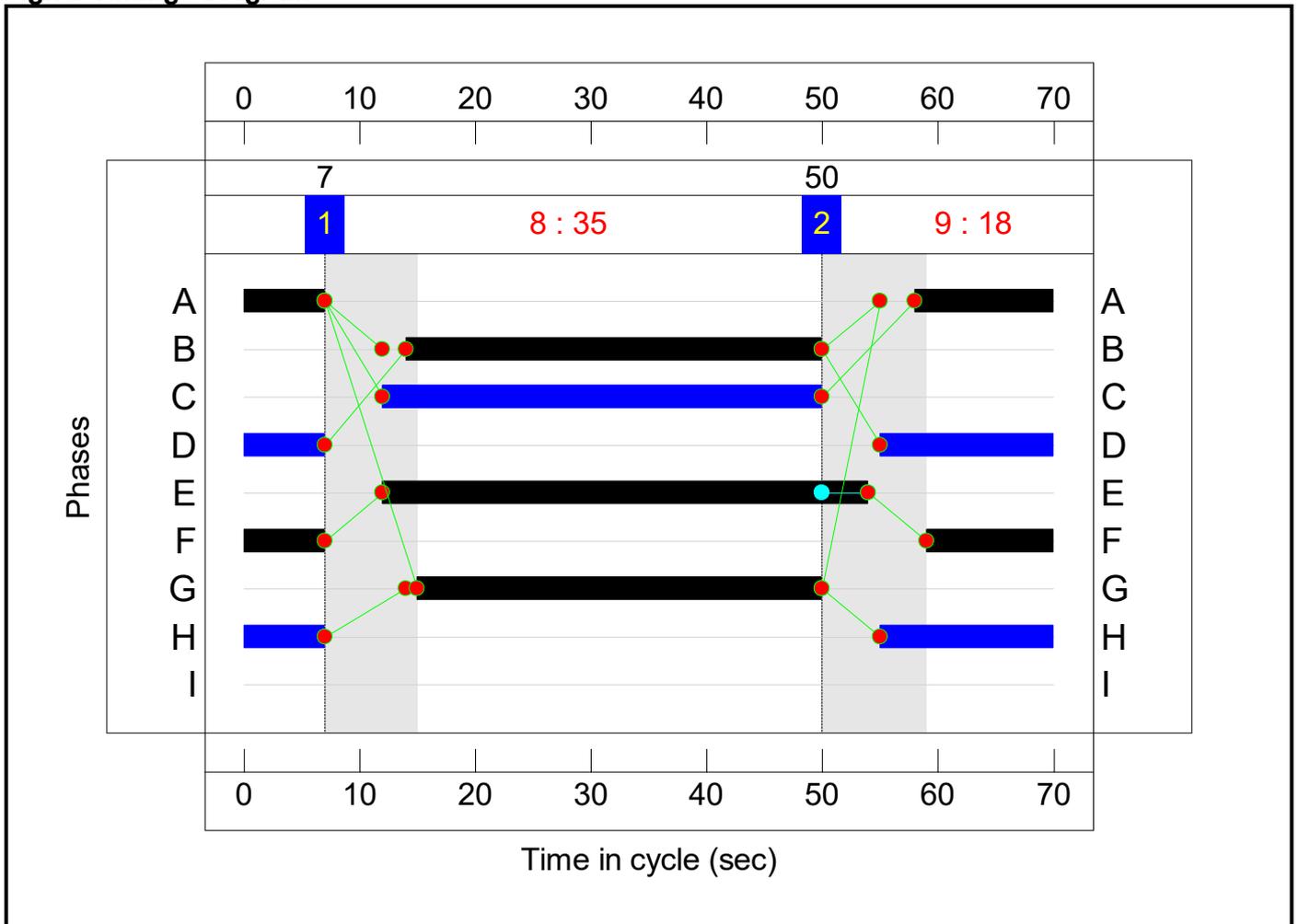
**C4 - Birdwell South  
Stage Sequence Diagram**



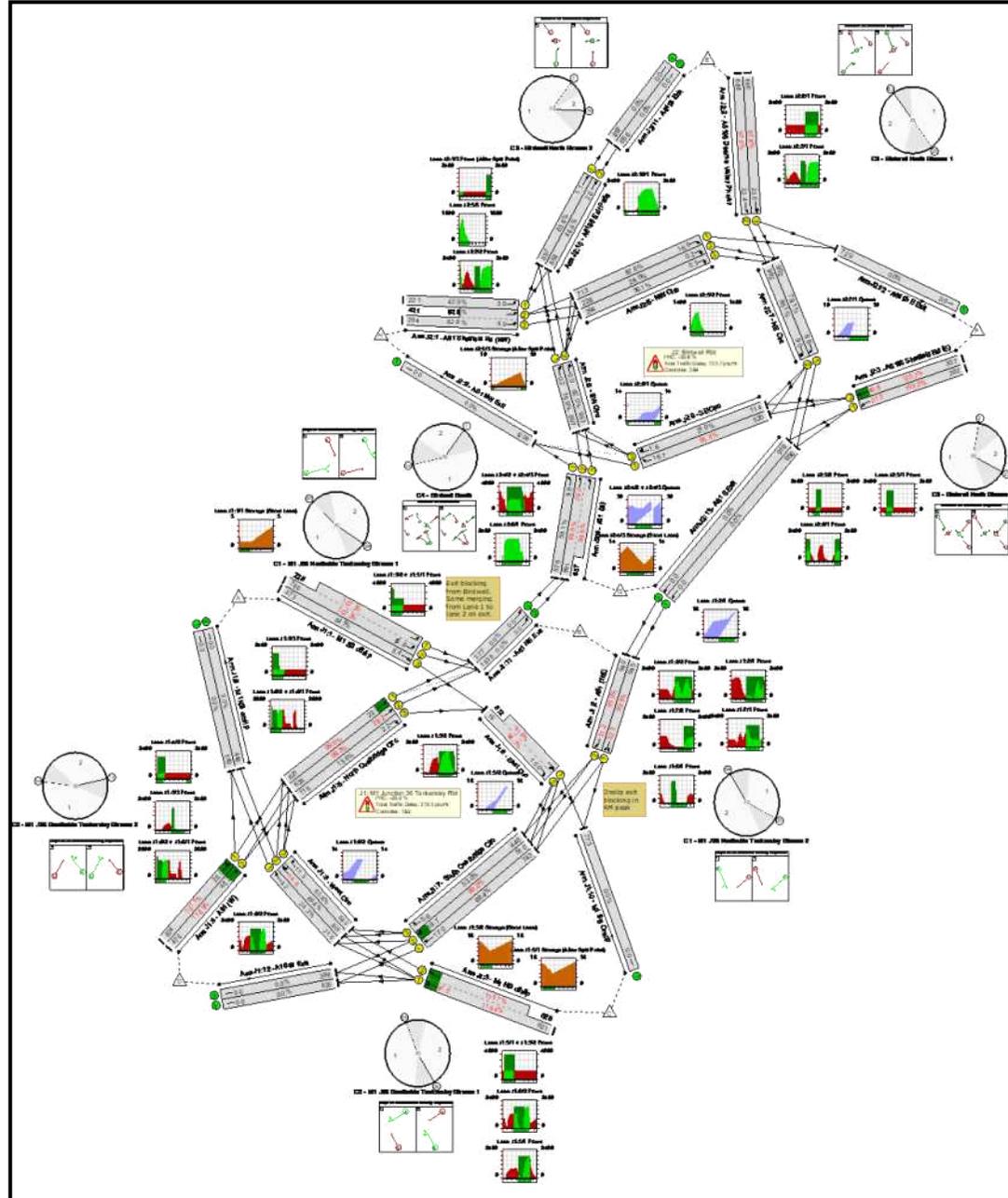
**Stage Timings**

Stage	1	2
Duration	35	18
Change Point	7	50

### Signal Timings Diagram



Full Input Data And Results  
Network Layout Diagram



Full Input Data And Results

## **Network Results**

Full Input Data And Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network: M1 J36 Tankersley Rbt + Birdwell Rbt</b>	-	-	N/A	-	-		-	-	-	-	-	-	125.7%
<b>J1: M1 Junction 36 Tankersley Rbt</b>	-	-	N/A	-	-		-	-	-	-	-	-	116.9%
1/2+1/1	M1 SB offslip Left	U	1:1	N/A	C1:B		1	26	-	1012	1900:1900	733+211	107.3 : 107.3%
1/3	M1 SB offslip Ahead	U	1:1	N/A	C1:B		1	26	-	473	1900	733	64.5%
2/1	A61 (NE) Ahead Ahead2	U	1:2	N/A	C1:D		1	34	-	947	1900	950	99.5%
2/2	A61 (NE) Ahead	U	1:2	N/A	C1:D		1	34	-	951	1900	950	99.0%
3/1+3/2	M1 NB offslip Ahead Ahead2	U	2:1	N/A	C2:B		1	26	-	1249	1900:1900	543+543	114.4 : 115.7%
4/1	A61 (W) Ahead Left	U	2:2	N/A	C2:D		1	24	-	604	1900	597	101.1%
4/2	A61 (W) Ahead	U	2:2	N/A	C2:D		1	24	-	476	1900	407	116.9%
5/1	North Overbridge Circ Ahead	U	1:1	N/A	C1:A		1	30	-	675	1900	624	99.5%
5/2	North Overbridge Circ Ahead	U	1:1	N/A	C1:A		1	30	-	970	1900	841	99.3%
5/3	North Overbridge Circ Right	U	1:1	N/A	C1:A		1	30	-	134	1900	841	13.6%
6/2+6/1	East Circ Right Ahead	U	1:2	N/A	C1:C		1	22	-	607	1900:1900	17+624	94.7 : 91.6%
7/1	South Overbridge Circ Ahead	U	2:1	N/A	C2:A		1	30	-	744	1900	841	88.4%
7/2	South Overbridge Circ Right Ahead	U	2:1	N/A	C2:A		1	30	-	516	1900	516	99.0%

Full Input Data And Results

7/3	South Overbridge Circ Right	U	2:1	N/A	C2:A		1	30	-	451	1900	841	53.0%
8/1	West Circ Ahead	U	2:2	N/A	C2:C		1	32	-	221	1900	896	24.3%
8/2	West Circ Right Ahead	U	2:2	N/A	C2:C		1	32	-	857	1900	896	89.4%
8/3	West Circ Right	U	2:2	N/A	C2:C		1	32	-	628	1900	896	60.6%
9/1	M1 NB onslip	U	N/A	N/A	-		-	-	-	556	Inf	Inf	0.0%
9/2	M1 NB onslip	U	N/A	N/A	-		-	-	-	451	Inf	Inf	0.0%
10/1	M1 SB Onslip	U	N/A	N/A	-		-	-	-	794	Inf	Inf	0.0%
11/1	A61 NE Exit Ahead	U	N/A	N/A	-		-	-	-	596	Inf	Inf	0.0%
11/2	A61 NE Exit Ahead	U	N/A	N/A	-		-	-	-	2061	Inf	Inf	0.0%
12/1	A16 W Exit	U	N/A	N/A	-		-	-	-	849	Inf	Inf	0.0%
12/2	A16 W Exit	U	N/A	N/A	-		-	-	-	405	Inf	Inf	0.0%
<b>J2: Birdwell Rbt</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>125.7%</b>
1/1	A61 Sheffield Rd (NW) Left	U	N/A	N/A	C4:F		1	18	-	221	1900	516	42.9%
1/3+1/2	A61 Sheffield Rd (NW) Ahead	U	N/A	N/A	C4:F		1	18	-	715	1900:1900	355+508	82.8 : 82.8%
2/1	A6195 Dearne Valley Pkway Ahead Left	U	3:1	N/A	C3:B		1	25	-	690	1900	706	97.8%
2/2	A6195 Dearne Valley Pkway Ahead	U	3:1	N/A	C3:B		1	25	-	688	1900	706	97.5%
3/1	A6195 Sheffield Rd (E) Ahead	U	3:3	N/A	C3:G		1	13	-	392	1900	380	103.2%
3/2	A6195 Sheffield Rd (E) Ahead	U	3:3	N/A	C3:G		1	13	-	307	1900	244	125.7%
4/1	A61 (S) Left	U	N/A	N/A	C4:G		1	35	-	597	1900	977	59.1%
4/2+4/3	A61 (S) Ahead	U	N/A	N/A	C4:B		1	36	-	2072	1900:1900	895+962	99.5 : 99.5%
5/1	NW Circ Right	U	3:1	N/A	C3:A		1	29	-	776	1900	814	87.6%
5/2	NW Circ Right	U	3:1	N/A	C3:A		1	29	-	228	1900	814	28.0%

Full Input Data And Results

5/3	NW Circ Right	U	3:1	N/A	C3:A		1	29	-	294	1900	814	36.1%
6/1	SW Circ Right	U	N/A	N/A	C4:E		1	42	-	1007	1900	1167	76.9%
6/2	SW Circ Right Right2	U	N/A	N/A	C4:E		1	42	-	1073	1900	1167	82.0%
7/1	NE Circ Right	U	3:3	N/A	C3:F		1	41	-	902	1900	1140	79.1%
7/2	NE Circ Right Right2	U	3:3	N/A	C3:F		1	41	-	982	1900	1140	86.1%
8/1	SE Circ Right	U	N/A	N/A	C4:A		1	19	-	569	1900	543	95.8%
8/2	SE Circ Right Right2	U	N/A	N/A	C4:A		1	19	-	128	1900	543	21.0%
9/1	A61 NW Exit	U	N/A	N/A	-		-	-	-	1286	Inf	Inf	0.0%
10/1	A6195 Exit Peds Ahead	U	3:2	N/A	C3:D		1	51	-	1007	1900	1411	63.6%
10/2	A6195 Exit Peds Ahead	U	3:2	N/A	C3:D		1	51	-	711	1900	1411	46.6%
11/1	A6195 Exit	U	N/A	N/A	-		-	-	-	1007	Inf	Inf	0.0%
11/2	A6195 Exit	U	N/A	N/A	-		-	-	-	711	Inf	Inf	0.0%
12/1	A6195 E Exit	U	N/A	N/A	-		-	-	-	792	Inf	Inf	0.0%
13/1	A61 S Exit Ahead	U	N/A	N/A	-		-	-	-	958	Inf	Inf	0.0%
13/2	A61 S Exit Ahead	U	N/A	N/A	-		-	-	-	928	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network: M1 J36 Tankersley Rbt + Birdwell Rbt</b>	-	-	0	0	0	112.3	340.9	0.0	453.2	-	-	-	-
<b>J1: M1 Junction 36 Tankersley Rbt</b>	-	-	0	0	0	65.4	254.2	0.0	319.5	-	-	-	-
1/2+1/1	1012	959	-	-	-	7.5	40.5	-	48.0 (38.0+10.0)	170.7 (174.0:158.9)	16.3	40.5	56.8
1/3	473	473	-	-	-	2.3	0.9	-	3.2	24.5	7.5	0.9	8.4
2/1	945	945	-	-	-	6.2	14.2	-	20.4	77.7	18.1	14.2	32.3
2/2	940	940	-	-	-	3.5	13.1	-	16.7	63.8	18.1	13.1	31.2
3/1+3/2	1249	1086	-	-	-	11.2	85.3	-	96.5 (46.4+50.1)	278.1 (269.0:287.1)	12.2	85.3	97.5
4/1	604	597	-	-	-	4.3	14.1	-	18.4	109.7	11.9	14.1	26.0
4/2	476	407	-	-	-	6.1	37.6	-	43.7	330.6	10.6	37.6	48.2
5/1	621	621	-	-	-	2.4	11.6	-	14.0	81.4	11.7	11.6	23.3
5/2	835	835	-	-	-	2.1	13.0	-	15.1	65.0	16.2	13.0	29.2
5/3	115	115	-	-	-	0.3	0.1	-	0.4	12.4	2.1	0.1	2.2
6/2+6/1	588	588	-	-	-	3.0	4.7	-	7.7 (0.2+7.5)	47.2 (43.3:47.3)	5.4	4.7	10.0
7/1	743	743	-	-	-	3.4	3.5	-	7.0	33.7	13.5	3.5	17.0
7/2	510	510	-	-	-	4.0	10.1	-	14.0	99.0	9.7	10.1	19.7
7/3	446	446	-	-	-	2.4	0.6	-	2.9	23.6	5.1	0.6	5.6
8/1	218	218	-	-	-	1.8	0.2	-	1.9	31.7	4.0	0.2	4.2
8/2	801	801	-	-	-	3.1	3.9	-	7.0	31.4	10.7	3.9	14.6
8/3	543	543	-	-	-	1.8	0.8	-	2.6	17.3	10.6	0.8	11.3
9/1	549	549	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	446	446	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	773	773	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

11/1	577	577	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
11/2	1838	1838	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
12/1	835	835	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
12/2	389	389	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
<b>J2: Birdwell Rbt</b>	-	-	<b>0</b>	<b>0</b>	<b>0</b>	<b>46.9</b>	<b>86.8</b>	<b>0.0</b>	<b>133.7</b>	-	-	-	-	-
1/1	221	221	-	-	-	1.3	0.4	-	1.7	27.1	3.5	0.4	3.9	
1/3+1/2	715	715	-	-	-	4.6	2.3	-	6.9 (2.8+4.2)	34.9 (33.8:35.7)	7.6	2.3	9.9	
2/1	690	690	-	-	-	4.2	9.8	-	13.9	72.7	13.2	9.8	23.0	
2/2	688	688	-	-	-	4.1	9.4	-	13.6	70.9	13.0	9.4	22.4	
3/1	392	380	-	-	-	3.5	13.3	-	16.8	154.3	7.9	13.3	21.2	
3/2	307	244	-	-	-	4.7	33.6	-	38.3	449.3	7.2	33.6	40.8	
4/1	578	578	-	-	-	2.8	0.7	-	3.6	22.1	8.9	0.7	9.6	
4/2+4/3	1848	1848	-	-	-	10.3	0.0	-	10.3 (4.8+5.5)	20.1 (19.6:20.7)	28.2	0.0	28.2	
5/1	713	713	-	-	-	4.8	3.3	-	8.1	41.1	13.6	3.3	16.9	
5/2	228	228	-	-	-	0.0	0.2	-	0.2	3.3	0.0	0.2	0.2	
5/3	294	294	-	-	-	0.0	0.3	-	0.3	3.6	0.0	0.3	0.3	
6/1	897	897	-	-	-	0.0	0.0	-	0.0	0.2	0.2	0.0	0.2	
6/2	957	957	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
7/1	902	902	-	-	-	1.2	1.9	-	3.1	12.3	4.7	1.9	6.6	
7/2	982	982	-	-	-	1.8	3.0	-	4.8	17.5	6.0	3.0	9.0	
8/1	520	520	-	-	-	2.7	7.1	-	9.8	67.8	9.7	7.1	16.7	
8/2	114	114	-	-	-	0.6	0.1	-	0.7	21.7	1.4	0.1	1.6	
9/1	1206	1206	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
10/1	897	897	-	-	-	0.0	0.9	-	0.9	3.5	0.2	0.9	1.1	
10/2	658	658	-	-	-	0.3	0.4	-	0.7	3.8	1.6	0.4	2.0	
11/1	897	897	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
11/2	658	658	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
12/1	729	729	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
13/1	956	956	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	



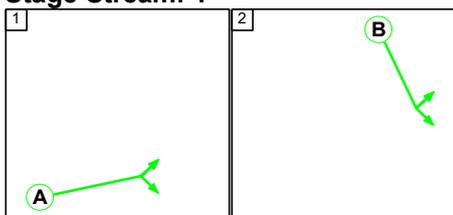
Full Input Data And Results

Scenario 5: '5' (FG5: '2028 AM Do Something', Plan 1: 'Network Control Plan 1')

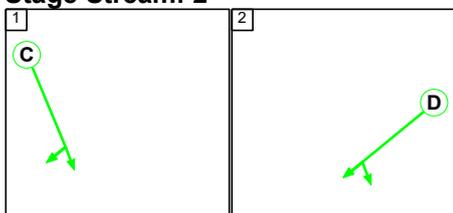
C1 - M1 J36 Northside Tankersley

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

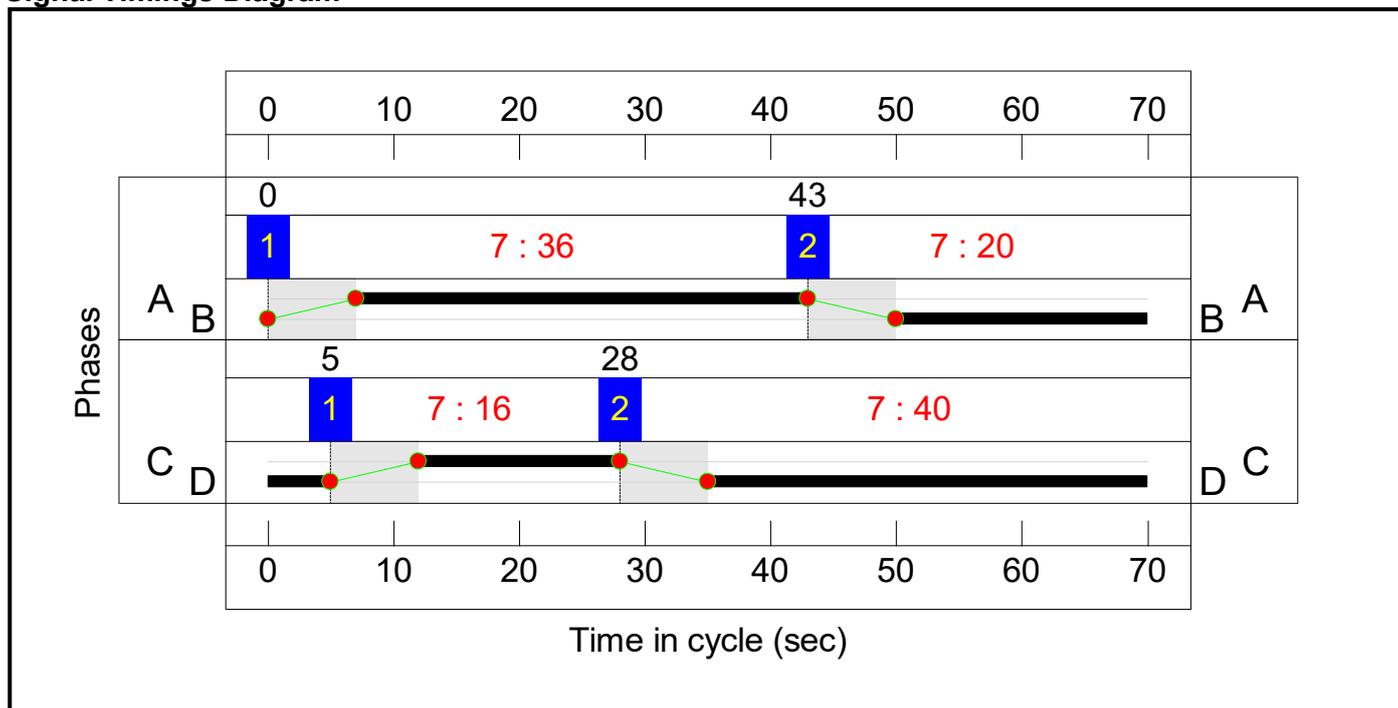
Stage Stream: 1

Stage	1	2
Duration	36	20
Change Point	0	43

Stage Stream: 2

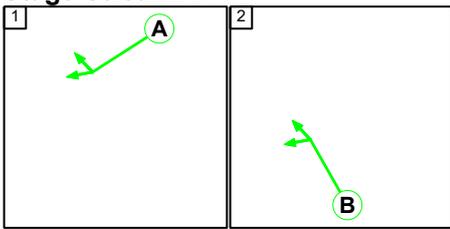
Stage	1	2
Duration	16	40
Change Point	5	28

Signal Timings Diagram

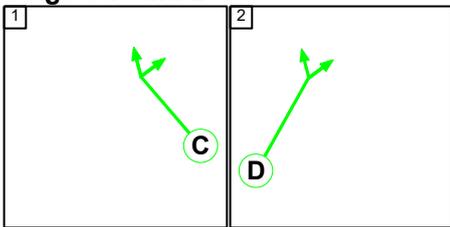


**C2 - M1 J36 Southside Tankersley  
Stage Sequence Diagram**

**Stage Stream: 1**



**Stage Stream: 2**



**Stage Timings**

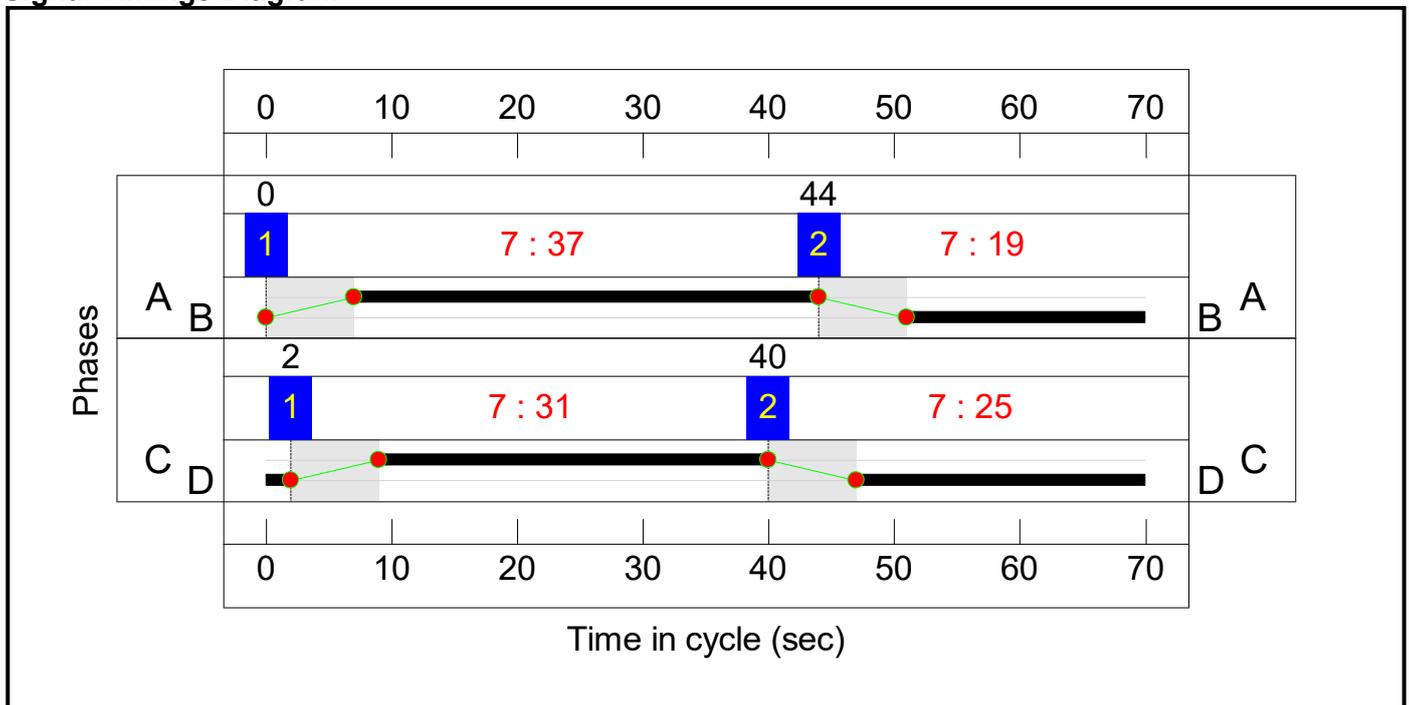
**Stage Stream: 1**

Stage	1	2
Duration	37	19
Change Point	0	44

**Stage Stream: 2**

Stage	1	2
Duration	31	25
Change Point	2	40

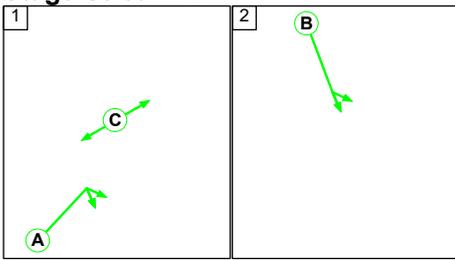
**Signal Timings Diagram**



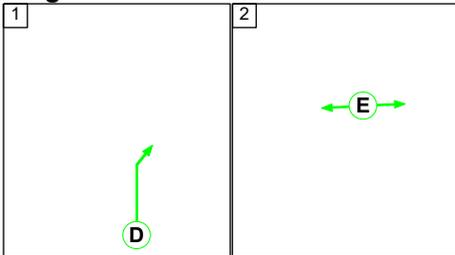
Full Input Data And Results

**C3 - Birdwell North**  
**Stage Sequence Diagram**

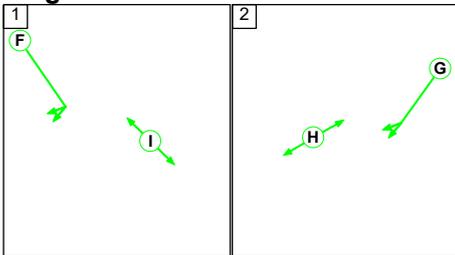
**Stage Stream: 1**



**Stage Stream: 2**



**Stage Stream: 3**



**Stage Timings**

**Stage Stream: 1**

Stage	1	2
Duration	23	31
Change Point	65	24

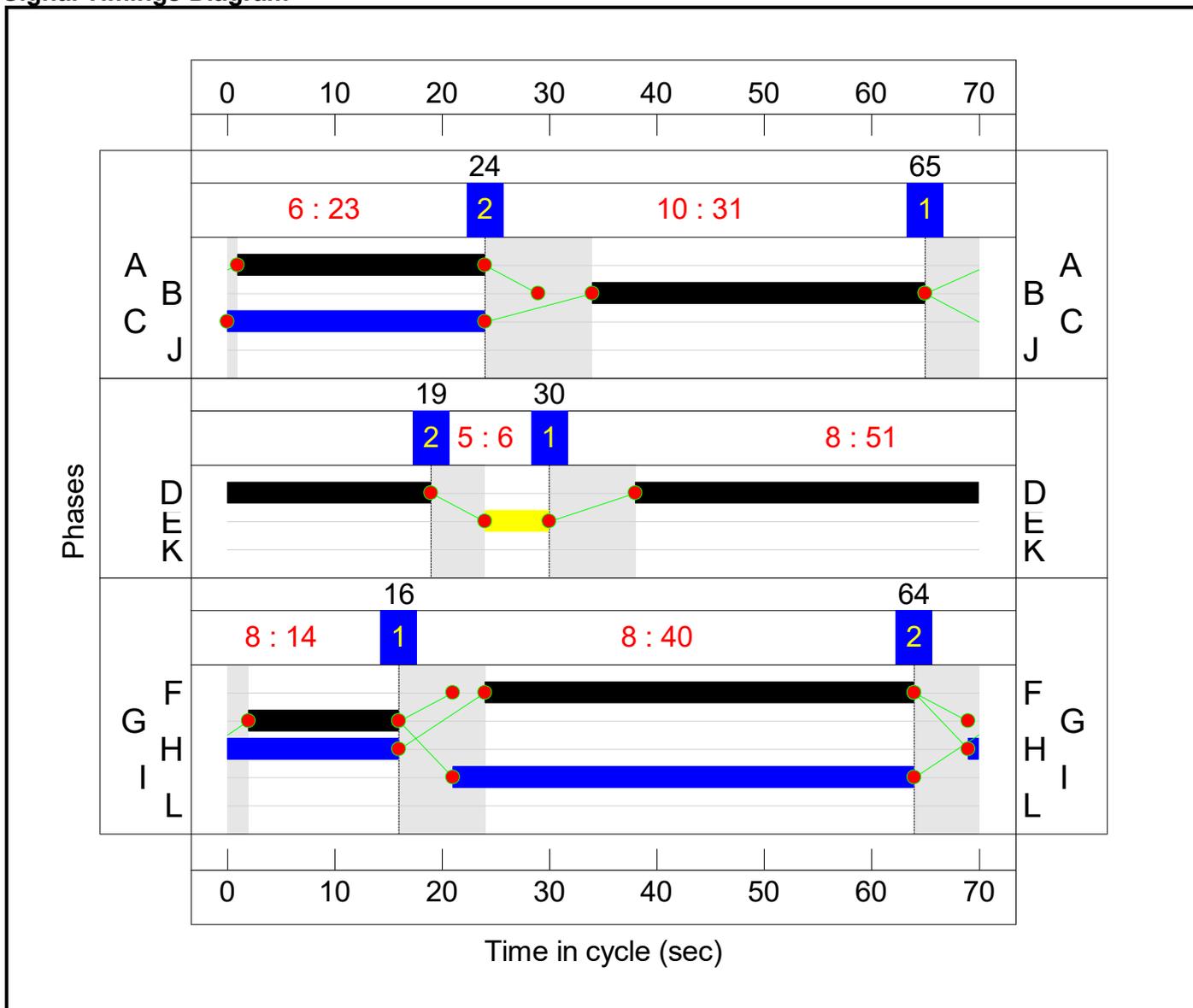
**Stage Stream: 2**

Stage	1	2
Duration	51	6
Change Point	30	19

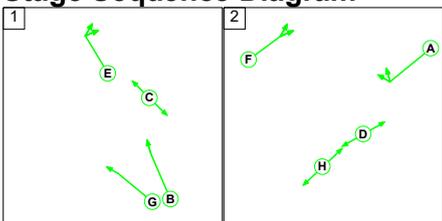
**Stage Stream: 3**

Stage	1	2
Duration	40	14
Change Point	16	64

**Signal Timings Diagram**



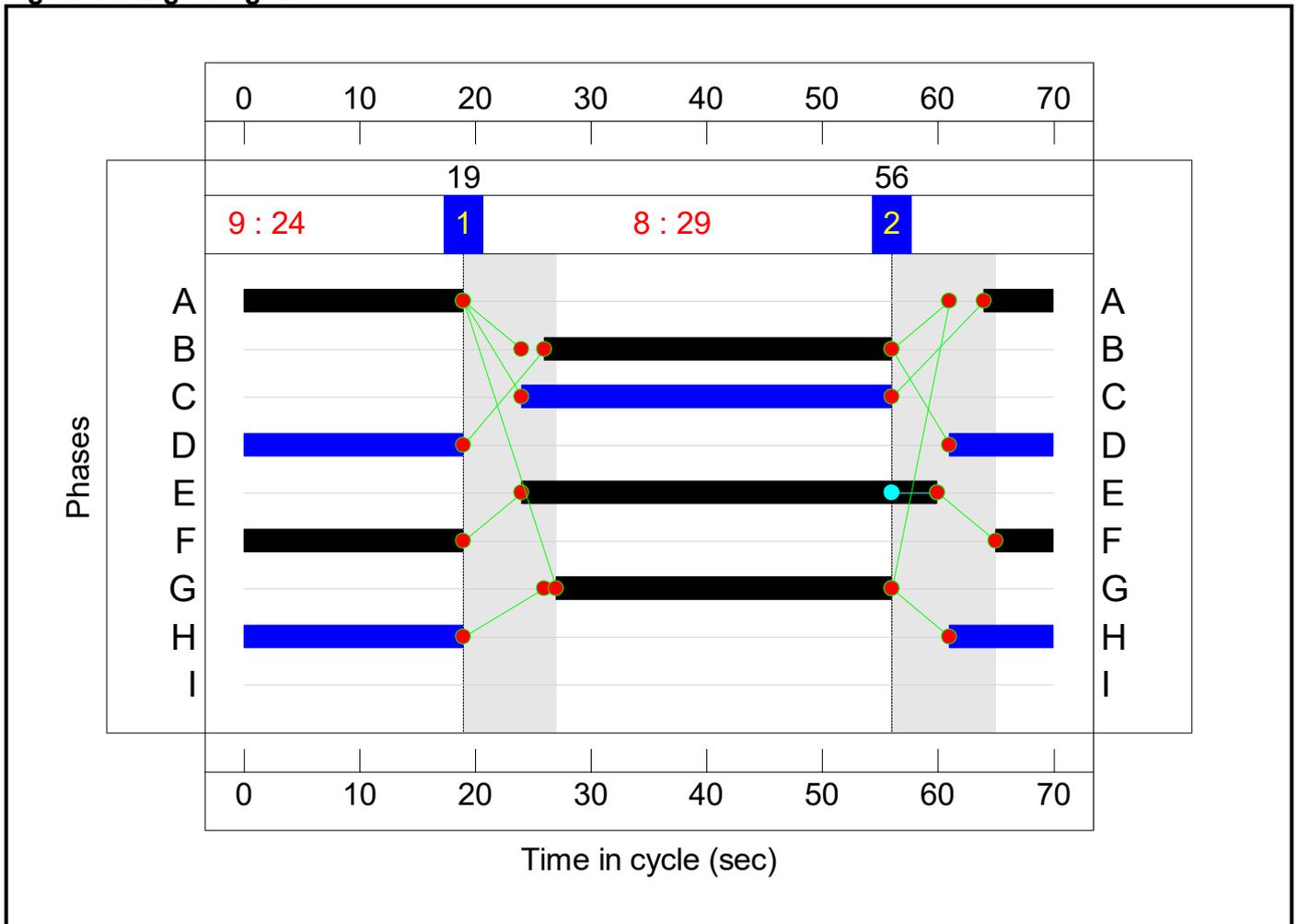
**C4 - Birdwell South Stage Sequence Diagram**



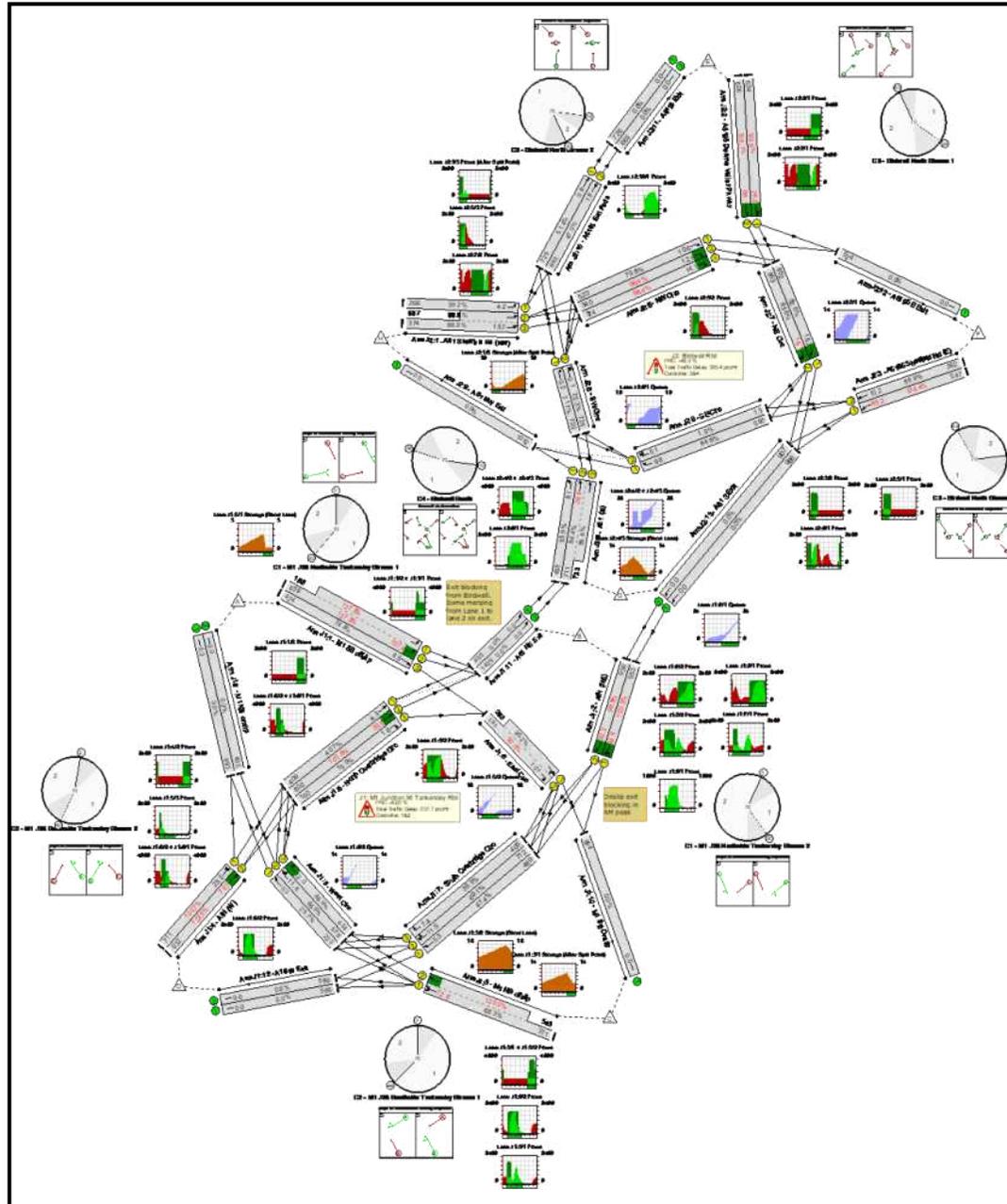
**Stage Timings**

Stage	1	2
Duration	29	24
Change Point	19	56

### Signal Timings Diagram



Full Input Data And Results  
Network Layout Diagram



Full Input Data And Results

## **Network Results**

Full Input Data And Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network: M1 J36 Tankersley Rbt + Birdwell Rbt</b>	-	-	N/A	-	-		-	-	-	-	-	-	134.4%
<b>J1: M1 Junction 36 Tankersley Rbt</b>	-	-	N/A	-	-		-	-	-	-	-	-	127.8%
1/2+1/1	M1 SB offslip Left	U	1:1	N/A	C1:B		1	20	-	827	1900:1900	516+131	127.8 : 127.8%
1/3	M1 SB offslip Ahead	U	1:1	N/A	C1:B		1	20	-	424	1900	570	74.4%
2/1	A61 (NE) Ahead Ahead2	U	1:2	N/A	C1:D		1	40	-	1107	1900	950	100.3%
2/2	A61 (NE) Ahead	U	1:2	N/A	C1:D		1	40	-	1110	1900	950	98.6%
3/1+3/2	M1 NB offslip Ahead Ahead2	U	2:1	N/A	C2:B		1	19	-	914	1900:1900	543+434	68.3 : 125.0%
4/1	A61 (W) Ahead Left	U	2:2	N/A	C2:D		1	25	-	711	1900	706	100.7%
4/2	A61 (W) Ahead	U	2:2	N/A	C2:D		1	25	-	632	1900	516	122.5%
5/1	North Overbridge Circ Ahead	U	1:1	N/A	C1:A		1	36	-	411	1900	1004	40.7%
5/2	North Overbridge Circ Ahead	U	1:1	N/A	C1:A		1	36	-	991	1900	787	101.6%
5/3	North Overbridge Circ Right	U	1:1	N/A	C1:A		1	36	-	184	1900	1004	15.0%
6/2+6/1	East Circ Right Ahead	U	1:2	N/A	C1:C		1	16	-	608	1900:1900	196+461	92.5 : 85.2%
7/1	South Overbridge Circ Ahead	U	2:1	N/A	C2:A		1	37	-	530	1900	1031	47.4%
7/2	South Overbridge Circ Right Ahead	U	2:1	N/A	C2:A		1	37	-	811	1900	1031	69.1%

Full Input Data And Results

7/3	South Overbridge Circ Right	U	2:1	N/A	C2:A		1	37	-	480	1900	1031	39.3%
8/1	West Circ Ahead	U	2:2	N/A	C2:C		1	31	-	264	1900	869	25.7%
8/2	West Circ Right Ahead	U	2:2	N/A	C2:C		1	31	-	653	1900	869	66.5%
8/3	West Circ Right	U	2:2	N/A	C2:C		1	31	-	543	1900	489	88.9%
9/1	M1 NB onslip	U	N/A	N/A	-		-	-	-	737	Inf	Inf	0.0%
9/2	M1 NB onslip	U	N/A	N/A	-		-	-	-	480	Inf	Inf	0.0%
10/1	M1 SB Onslip	U	N/A	N/A	-		-	-	-	1004	Inf	Inf	0.0%
11/1	A61 NE Exit Ahead	U	N/A	N/A	-		-	-	-	456	Inf	Inf	0.0%
11/2	A61 NE Exit Ahead	U	N/A	N/A	-		-	-	-	1773	Inf	Inf	0.0%
12/1	A16 W Exit	U	N/A	N/A	-		-	-	-	627	Inf	Inf	0.0%
12/2	A16 W Exit	U	N/A	N/A	-		-	-	-	648	Inf	Inf	0.0%
<b>J2: Birdwell Rbt</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>134.4%</b>
1/1	A61 Sheffield Rd (NW) Left	U	N/A	N/A	C4:F		1	24	-	266	1900	679	39.2%
1/3+1/2	A61 Sheffield Rd (NW) Ahead	U	N/A	N/A	C4:F		1	24	-	911	1900:1900	421+604	88.9 : 88.9%
2/1	A6195 Dearne Valley Pkway Ahead Left	U	3:1	N/A	C3:B		1	31	-	634	1900	516	122.9%
2/2	A6195 Dearne Valley Pkway Ahead	U	3:1	N/A	C3:B		1	31	-	626	1900	489	128.1%
3/1	A6195 Sheffield Rd (E) Ahead	U	3:3	N/A	C3:G		1	14	-	547	1900	407	134.4%
3/2	A6195 Sheffield Rd (E) Ahead	U	3:3	N/A	C3:G		1	14	-	362	1900	407	88.9%
4/1	A61 (S) Left	U	N/A	N/A	C4:G		1	29	-	456	1900	814	55.9%
4/2+4/3	A61 (S) Ahead	U	N/A	N/A	C4:B		1	30	-	1783	1900:1900	841+841	84.4 : 85.9%
5/1	NW Circ Right	U	3:1	N/A	C3:A		1	23	-	599	1900	651	79.8%
5/2	NW Circ Right	U	3:1	N/A	C3:A		1	23	-	340	1900	353	96.4%

Full Input Data And Results

5/3	NW Circ Right	U	3:1	N/A	C3:A		1	23	-	374	1900	380	98.4%
6/1	SW Circ Right	U	N/A	N/A	C4:E		1	36	-	894	1900	1004	71.7%
6/2	SW Circ Right Right2	U	N/A	N/A	C4:E		1	36	-	903	1900	1004	72.3%
7/1	NE Circ Right	U	3:3	N/A	C3:F		1	40	-	969	1900	1031	82.6%
7/2	NE Circ Right Right2	U	3:3	N/A	C3:F		1	40	-	1000	1900	1031	83.6%
8/1	SE Circ Right	U	N/A	N/A	C4:A		1	25	-	666	1900	706	84.6%
8/2	SE Circ Right Right2	U	N/A	N/A	C4:A		1	25	-	14	1900	706	1.9%
9/1	A61 NW Exit	U	N/A	N/A	-		-	-	-	1122	Inf	Inf	0.0%
10/1	A6195 Exit Peds Ahead	U	3:2	N/A	C3:D		1	51	-	900	1900	1411	51.4%
10/2	A6195 Exit Peds Ahead	U	3:2	N/A	C3:D		1	51	-	761	1900	1411	47.0%
11/1	A6195 Exit	U	N/A	N/A	-		-	-	-	900	Inf	Inf	0.0%
11/2	A6195 Exit	U	N/A	N/A	-		-	-	-	761	Inf	Inf	0.0%
12/1	A6195 E Exit	U	N/A	N/A	-		-	-	-	604	Inf	Inf	0.0%
13/1	A61 S Exit Ahead	U	N/A	N/A	-		-	-	-	1123	Inf	Inf	0.0%
13/2	A61 S Exit Ahead	U	N/A	N/A	-		-	-	-	1075	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
<b>Network: M1 J36 Tankersley Rbt + Birdwell Rbt</b>	-	-	0	0	0	119.6	523.5	0.0	643.1	-	-	-	-
<b>J1: M1 Junction 36 Tankersley Rbt</b>	-	-	0	0	0	52.0	285.7	0.0	337.7	-	-	-	-
1/2+1/1	827	684	-	-	-	8.8	92.2	-	101.0 (81.4+19.6)	439.6 (444.6:420.0)	15.3	92.2	107.4
1/3	424	424	-	-	-	2.6	1.4	-	4.0	34.2	7.4	1.4	8.8
2/1	953	950	-	-	-	3.0	16.1	-	19.1	72.0	18.6	16.1	34.6
2/2	936	936	-	-	-	2.7	12.3	-	15.0	57.7	18.0	12.3	30.3
3/1+3/2	914	805	-	-	-	8.6	60.4	-	69.1 (4.8+64.3)	272.0 (46.1:426.4)	12.2	60.4	72.6
4/1	711	706	-	-	-	4.6	14.7	-	19.3	97.6	13.9	14.7	28.6
4/2	632	516	-	-	-	9.2	60.7	-	69.9	398.2	15.9	60.7	76.7
5/1	409	409	-	-	-	0.5	0.3	-	0.8	7.2	3.9	0.3	4.3
5/2	800	787	-	-	-	2.5	17.7	-	20.2	90.7	15.8	17.7	33.5
5/3	150	150	-	-	-	0.1	0.1	-	0.2	5.1	1.7	0.1	1.8
6/2+6/1	574	574	-	-	-	2.0	3.2	-	5.2 (1.6+3.6)	32.9 (32.7:33.0)	6.9	3.2	10.1
7/1	489	489	-	-	-	1.0	0.4	-	1.4	10.5	4.8	0.4	5.3
7/2	712	712	-	-	-	2.1	1.1	-	3.2	16.0	10.4	1.1	11.5
7/3	405	405	-	-	-	1.1	0.3	-	1.4	12.7	7.1	0.3	7.4
8/1	223	223	-	-	-	0.0	0.2	-	0.2	3.4	0.1	0.2	0.3
8/2	578	578	-	-	-	1.1	1.0	-	2.1	12.8	10.6	1.0	11.6
8/3	434	434	-	-	-	2.1	3.5	-	5.6	46.6	8.4	3.5	12.0
9/1	693	693	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	405	405	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	854	854	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

11/1	455	455	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
11/2	1425	1425	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
12/1	586	586	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
12/2	590	590	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
<b>J2: Birdwell Rbt</b>	-	-	<b>0</b>	<b>0</b>	<b>0</b>	<b>67.6</b>	<b>237.8</b>	<b>0.0</b>	<b>305.4</b>	-	-	-	-	-
1/1	266	266	-	-	-	1.2	0.3	-	1.6	21.2	3.8	0.3	4.2	
1/3+1/2	911	911	-	-	-	4.9	3.7	-	8.6 (3.4+5.2)	34.1 (32.8:35.0)	9.4	3.7	13.2	
2/1	634	516	-	-	-	9.1	61.7	-	70.8	402.3	16.6	61.7	78.3	
2/2	626	489	-	-	-	10.0	70.9	-	80.9	465.1	17.2	70.9	88.1	
3/1	547	407	-	-	-	9.2	71.8	-	81.0	533.2	13.4	71.8	85.2	
3/2	362	362	-	-	-	2.7	3.5	-	6.2	61.2	6.7	3.5	10.2	
4/1	455	455	-	-	-	1.9	0.6	-	2.5	19.7	7.4	0.6	8.1	
4/2+4/3	1433	1433	-	-	-	5.2	0.0	-	5.2 (2.6+2.7)	13.1 (13.1:13.2)	26.9	0.0	26.9	
5/1	520	520	-	-	-	2.6	1.9	-	4.5	31.0	8.7	1.9	10.6	
5/2	340	340	-	-	-	3.6	6.5	-	10.1	107.2	6.0	6.5	12.6	
5/3	374	374	-	-	-	2.8	8.3	-	11.1	106.7	5.9	8.3	14.1	
6/1	720	720	-	-	-	0.1	0.0	-	0.1	0.3	0.2	0.0	0.2	
6/2	726	726	-	-	-	0.0	0.0	-	0.0	0.2	0.1	0.0	0.1	
7/1	852	852	-	-	-	5.4	2.3	-	7.7	32.5	12.9	2.3	15.2	
7/2	863	863	-	-	-	5.7	2.5	-	8.1	34.0	13.6	2.5	16.1	
8/1	597	597	-	-	-	3.1	2.6	-	5.7	34.7	7.2	2.6	9.8	
8/2	13	13	-	-	-	0.1	0.0	-	0.1	17.6	0.1	0.0	0.1	
9/1	1052	1052	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
10/1	726	726	-	-	-	0.0	0.5	-	0.5	2.7	0.3	0.5	0.8	
10/2	663	663	-	-	-	0.2	0.4	-	0.6	3.4	1.3	0.4	1.8	
11/1	726	726	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
11/2	663	663	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
12/1	524	524	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
13/1	966	966	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	



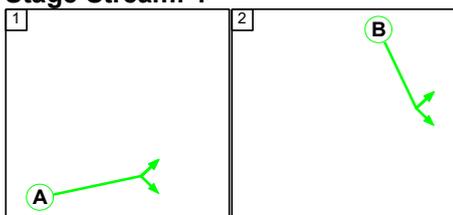
Full Input Data And Results

Scenario 6: '6' (FG6: '2028 PM Do Something', Plan 1: 'Network Control Plan 1')

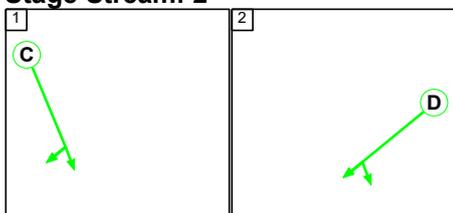
C1 - M1 J36 Northside Tankersley

Stage Sequence Diagram

Stage Stream: 1



Stage Stream: 2



Stage Timings

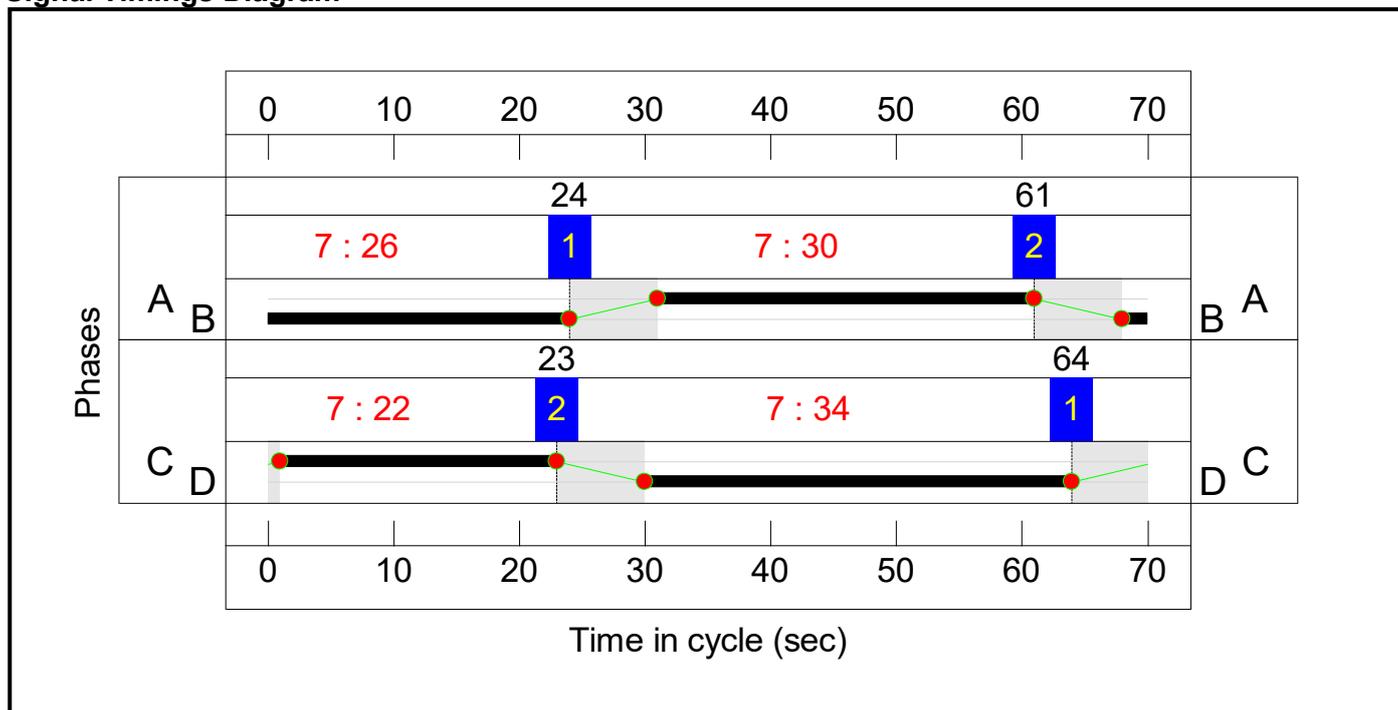
Stage Stream: 1

Stage	1	2
Duration	30	26
Change Point	24	61

Stage Stream: 2

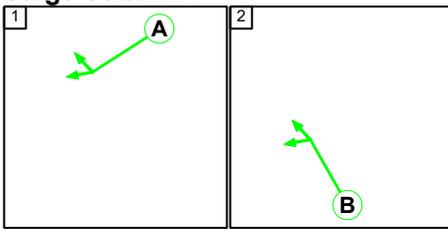
Stage	1	2
Duration	22	34
Change Point	64	23

Signal Timings Diagram

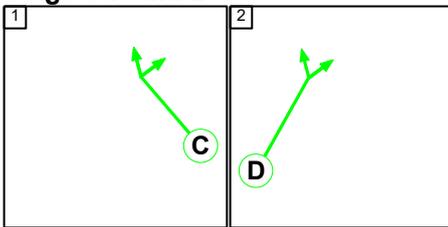


**C2 - M1 J36 Southside Tankersley  
Stage Sequence Diagram**

**Stage Stream: 1**



**Stage Stream: 2**



**Stage Timings**

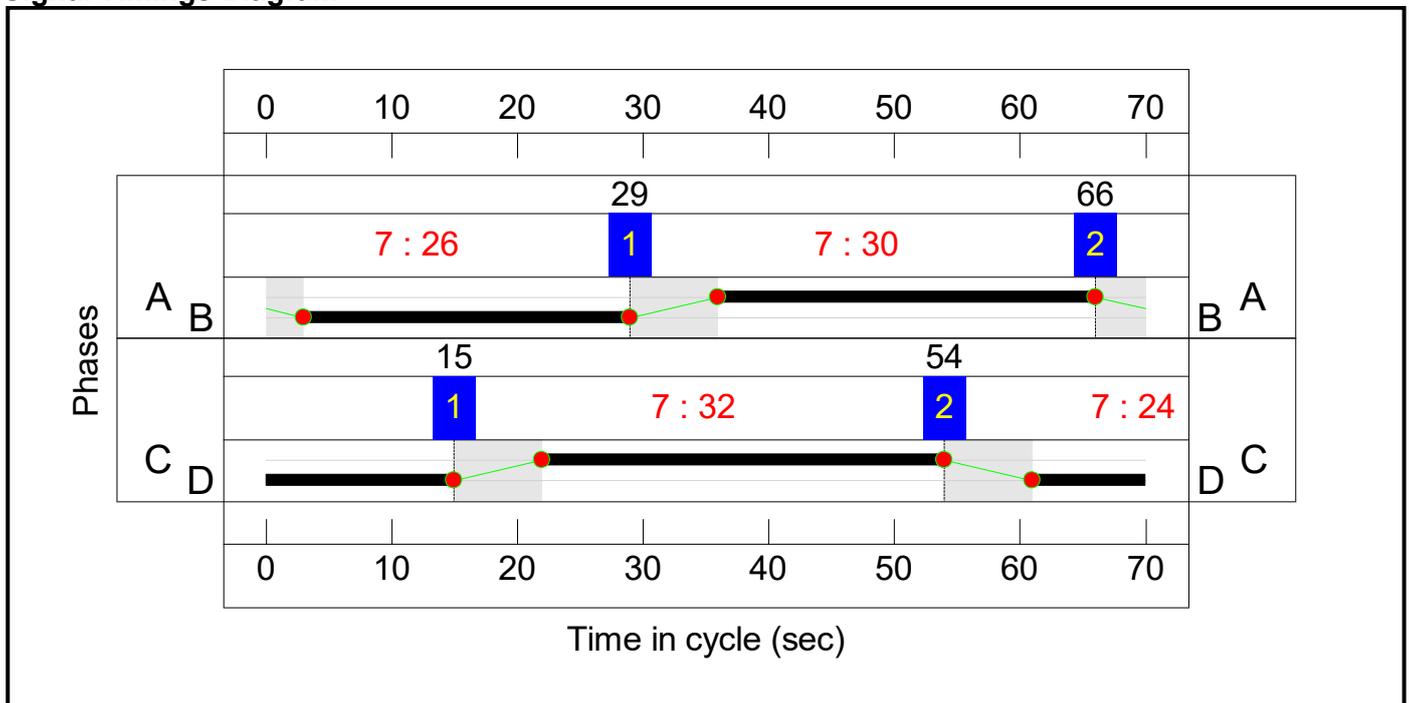
**Stage Stream: 1**

Stage	1	2
Duration	30	26
Change Point	29	66

**Stage Stream: 2**

Stage	1	2
Duration	32	24
Change Point	15	54

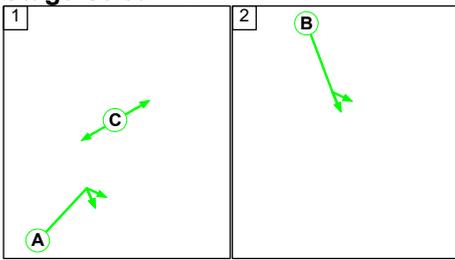
**Signal Timings Diagram**



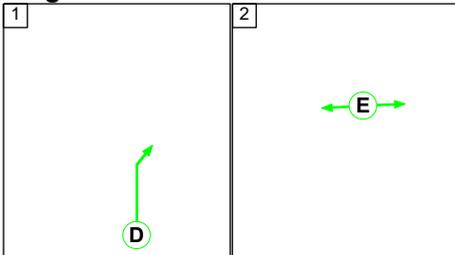
Full Input Data And Results

**C3 - Birdwell North**  
**Stage Sequence Diagram**

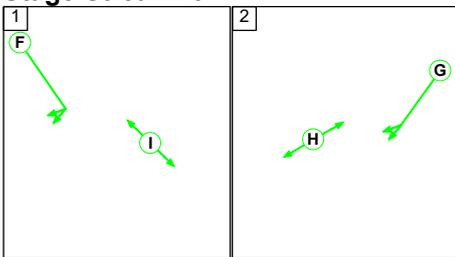
**Stage Stream: 1**



**Stage Stream: 2**



**Stage Stream: 3**



**Stage Timings**

**Stage Stream: 1**

Stage	1	2
Duration	29	25
Change Point	63	28

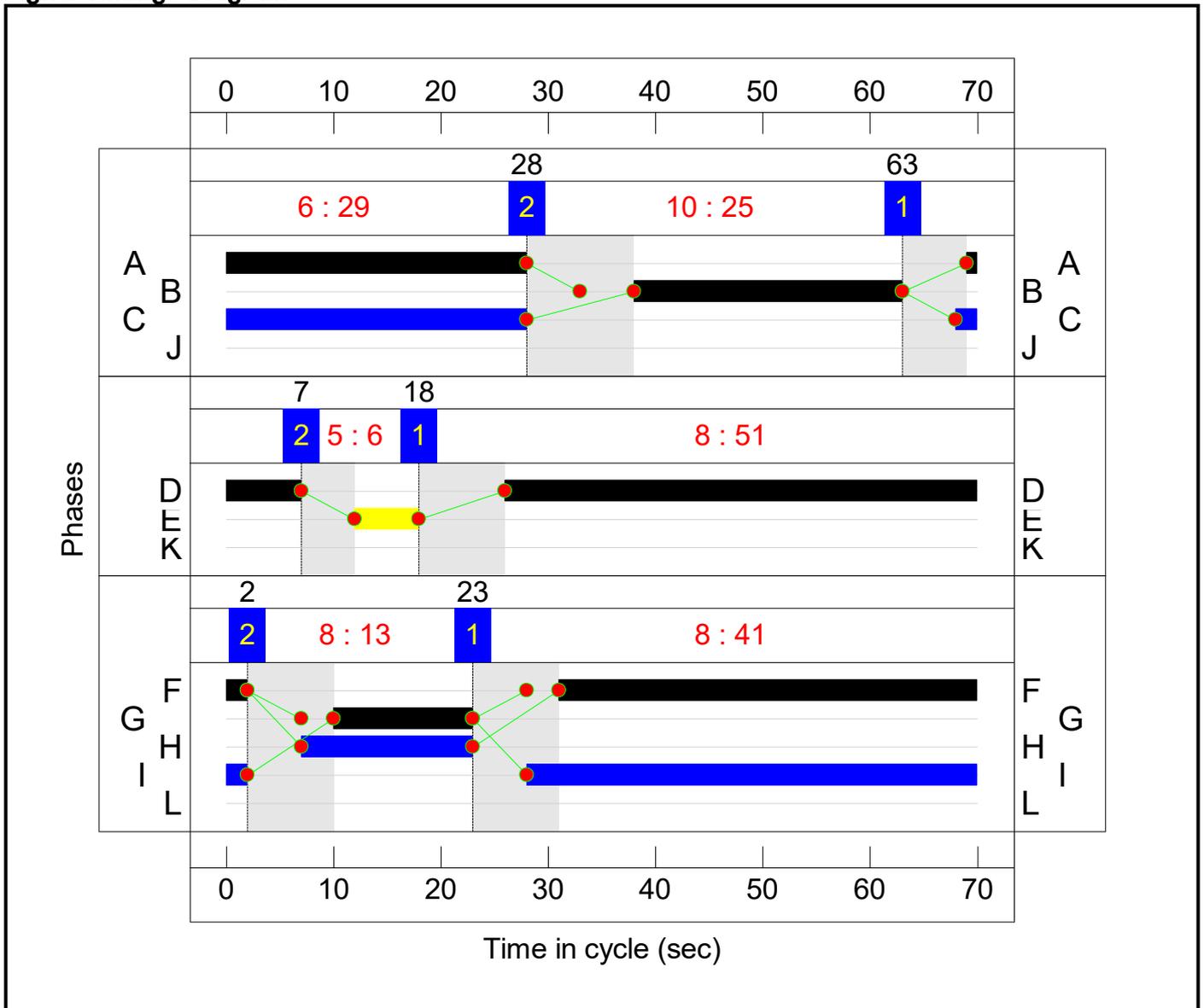
**Stage Stream: 2**

Stage	1	2
Duration	51	6
Change Point	18	7

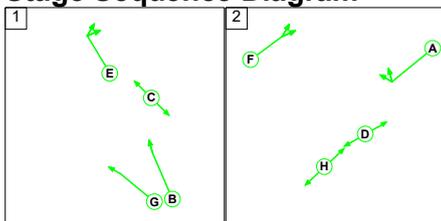
**Stage Stream: 3**

Stage	1	2
Duration	41	13
Change Point	23	2

**Signal Timings Diagram**



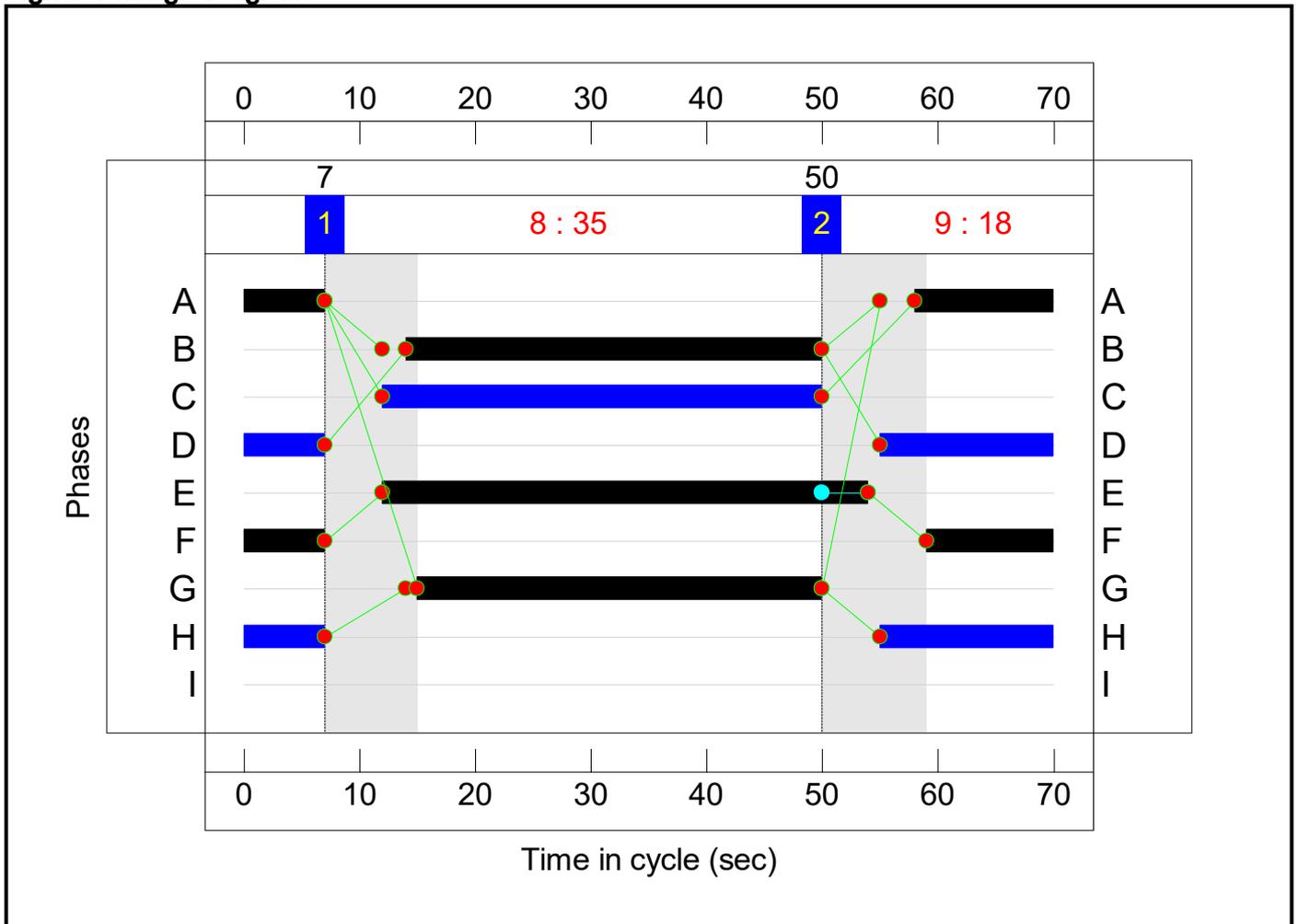
**C4 - Birdwell South  
Stage Sequence Diagram**



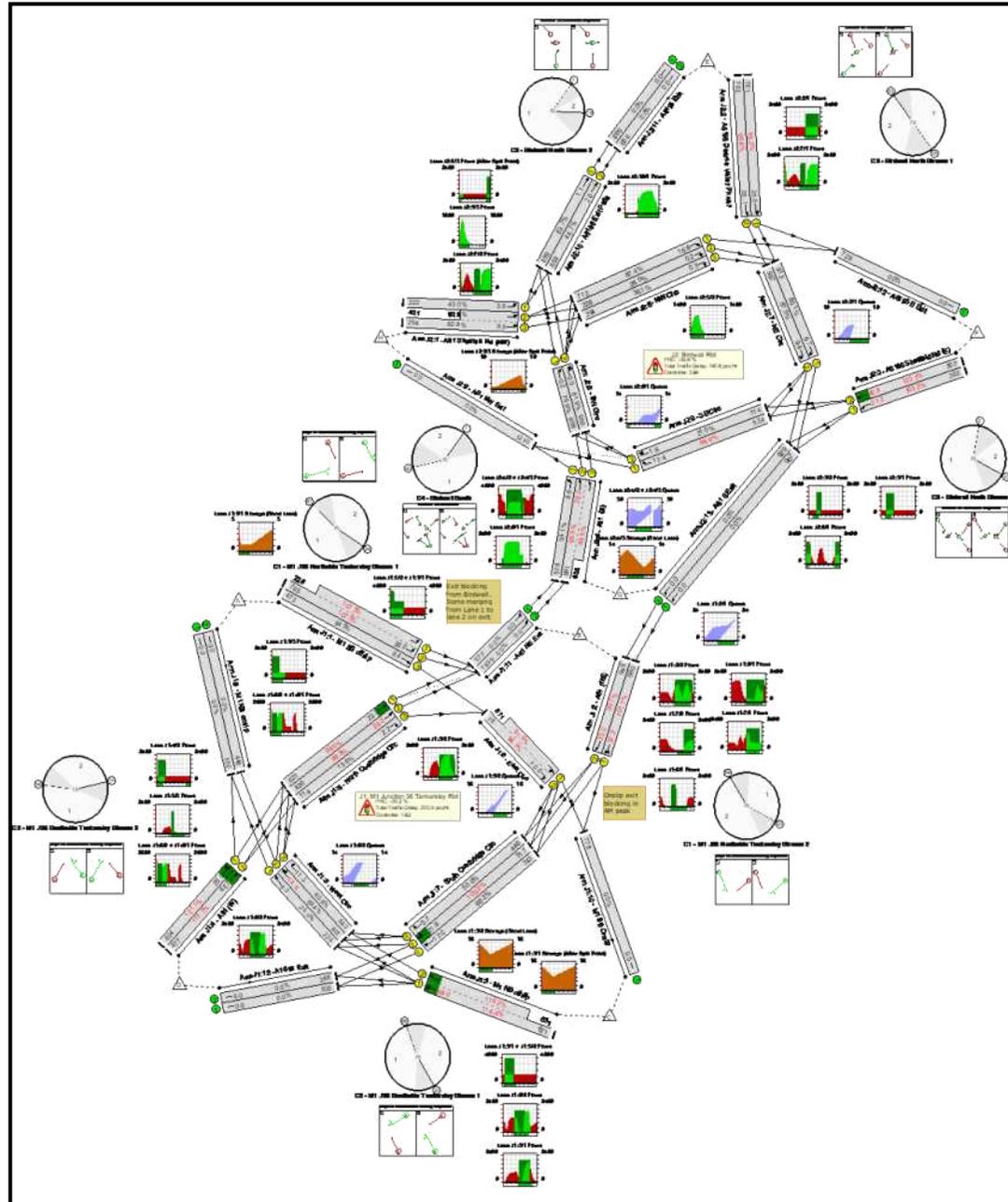
**Stage Timings**

Stage	1	2
Duration	35	18
Change Point	7	50

### Signal Timings Diagram



Full Input Data And Results  
Network Layout Diagram



Full Input Data And Results

## **Network Results**

Full Input Data And Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
<b>Network: M1 J36 Tankersley Rbt + Birdwell Rbt</b>	-	-	N/A	-	-		-	-	-	-	-	-	125.7%
<b>J1: M1 Junction 36 Tankersley Rbt</b>	-	-	N/A	-	-		-	-	-	-	-	-	117.2%
1/2+1/1	M1 SB offslip Left	U	1:1	N/A	C1:B		1	26	-	1014	1900:1900	733+210	107.5 : 107.5%
1/3	M1 SB offslip Ahead	U	1:1	N/A	C1:B		1	26	-	473	1900	733	64.5%
2/1	A61 (NE) Ahead Ahead2	U	1:2	N/A	C1:D		1	34	-	962	1900	950	101.1%
2/2	A61 (NE) Ahead	U	1:2	N/A	C1:D		1	34	-	958	1900	950	99.7%
3/1+3/2	M1 NB offslip Ahead Ahead2	U	2:1	N/A	C2:B		1	26	-	1252	1900:1900	543+543	114.4 : 116.2%
4/1	A61 (W) Ahead Left	U	2:2	N/A	C2:D		1	24	-	604	1900	597	101.1%
4/2	A61 (W) Ahead	U	2:2	N/A	C2:D		1	24	-	477	1900	407	117.2%
5/1	North Overbridge Circ Ahead	U	1:1	N/A	C1:A		1	30	-	675	1900	624	99.5%
5/2	North Overbridge Circ Ahead	U	1:1	N/A	C1:A		1	30	-	974	1900	841	99.3%
5/3	North Overbridge Circ Right	U	1:1	N/A	C1:A		1	30	-	134	1900	841	13.6%
6/2+6/1	East Circ Right Ahead	U	1:2	N/A	C1:C		1	22	-	607	1900:1900	17+624	94.7 : 91.5%
7/1	South Overbridge Circ Ahead	U	2:1	N/A	C2:A		1	30	-	747	1900	841	88.3%
7/2	South Overbridge Circ Right Ahead	U	2:1	N/A	C2:A		1	30	-	523	1900	516	100.3%

Full Input Data And Results

7/3	South Overbridge Circ Right	U	2:1	N/A	C2:A		1	30	-	451	1900	841	53.0%
8/1	West Circ Ahead	U	2:2	N/A	C2:C		1	32	-	228	1900	896	25.0%
8/2	West Circ Right Ahead	U	2:2	N/A	C2:C		1	32	-	857	1900	896	89.4%
8/3	West Circ Right	U	2:2	N/A	C2:C		1	32	-	631	1900	896	60.6%
9/1	M1 NB onslip	U	N/A	N/A	-		-	-	-	563	Inf	Inf	0.0%
9/2	M1 NB onslip	U	N/A	N/A	-		-	-	-	451	Inf	Inf	0.0%
10/1	M1 SB Onslip	U	N/A	N/A	-		-	-	-	806	Inf	Inf	0.0%
11/1	A61 NE Exit Ahead	U	N/A	N/A	-		-	-	-	596	Inf	Inf	0.0%
11/2	A61 NE Exit Ahead	U	N/A	N/A	-		-	-	-	2067	Inf	Inf	0.0%
12/1	A16 W Exit	U	N/A	N/A	-		-	-	-	852	Inf	Inf	0.0%
12/2	A16 W Exit	U	N/A	N/A	-		-	-	-	405	Inf	Inf	0.0%
<b>J2: Birdwell Rbt</b>	-	-	<b>N/A</b>	-	-		-	-	-	-	-	-	<b>125.7%</b>
1/1	A61 Sheffield Rd (NW) Left	U	N/A	N/A	C4:F		1	18	-	222	1900	516	43.0%
1/3+1/2	A61 Sheffield Rd (NW) Ahead	U	N/A	N/A	C4:F		1	18	-	715	1900:1900	355+508	82.8 : 82.8%
2/1	A6195 Dearne Valley Pkway Ahead Left	U	3:1	N/A	C3:B		1	25	-	701	1900	706	99.3%
2/2	A6195 Dearne Valley Pkway Ahead	U	3:1	N/A	C3:B		1	25	-	703	1900	706	99.6%
3/1	A6195 Sheffield Rd (E) Ahead	U	3:3	N/A	C3:G		1	13	-	392	1900	380	103.2%
3/2	A6195 Sheffield Rd (E) Ahead	U	3:3	N/A	C3:G		1	13	-	307	1900	244	125.7%
4/1	A61 (S) Left	U	N/A	N/A	C4:G		1	35	-	597	1900	977	59.1%
4/2+4/3	A61 (S) Ahead	U	N/A	N/A	C4:B		1	36	-	2077	1900:1900	896+961	99.5 : 99.5%
5/1	NW Circ Right	U	3:1	N/A	C3:A		1	29	-	776	1900	814	87.4%
5/2	NW Circ Right	U	3:1	N/A	C3:A		1	29	-	228	1900	814	28.0%

Full Input Data And Results

5/3	NW Circ Right	U	3:1	N/A	C3:A		1	29	-	294	1900	814	36.1%
6/1	SW Circ Right	U	N/A	N/A	C4:E		1	42	-	1010	1900	1167	76.9%
6/2	SW Circ Right Right2	U	N/A	N/A	C4:E		1	42	-	1075	1900	1167	81.9%
7/1	NE Circ Right	U	3:3	N/A	C3:F		1	41	-	913	1900	1140	80.1%
7/2	NE Circ Right Right2	U	3:3	N/A	C3:F		1	41	-	997	1900	1140	87.5%
8/1	SE Circ Right	U	N/A	N/A	C4:A		1	19	-	573	1900	543	96.6%
8/2	SE Circ Right Right2	U	N/A	N/A	C4:A		1	19	-	128	1900	543	21.0%
9/1	A61 NW Exit	U	N/A	N/A	-		-	-	-	1290	Inf	Inf	0.0%
10/1	A6195 Exit Peds Ahead	U	3:2	N/A	C3:D		1	51	-	1011	1900	1411	63.7%
10/2	A6195 Exit Peds Ahead	U	3:2	N/A	C3:D		1	51	-	713	1900	1411	46.7%
11/1	A6195 Exit	U	N/A	N/A	-		-	-	-	1011	Inf	Inf	0.0%
11/2	A6195 Exit	U	N/A	N/A	-		-	-	-	713	Inf	Inf	0.0%
12/1	A6195 E Exit	U	N/A	N/A	-		-	-	-	792	Inf	Inf	0.0%
13/1	A61 S Exit Ahead	U	N/A	N/A	-		-	-	-	969	Inf	Inf	0.0%
13/2	A61 S Exit Ahead	U	N/A	N/A	-		-	-	-	939	Inf	Inf	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: M1 J36 Tankersley Rbt + Birdwell Rbt	-	-	0	0	0	113.5	358.0	0.0	471.5	-	-	-	-
J1: M1 Junction 36 Tankersley Rbt	-	-	0	0	0	66.2	264.7	0.0	330.9	-	-	-	-
1/2+1/1	1014	959	-	-	-	7.6	41.6	-	49.2 (39.0+10.2)	174.6 (178.0:162.6)	16.4	41.6	58.0
1/3	473	473	-	-	-	2.3	0.9	-	3.2	24.5	7.5	0.9	8.4
2/1	960	950	-	-	-	6.5	18.3	-	24.8	93.0	18.9	18.3	37.2
2/2	948	948	-	-	-	3.6	14.8	-	18.4	70.0	18.2	14.8	33.0
3/1+3/2	1252	1086	-	-	-	11.3	86.8	-	98.0 (46.4+51.6)	281.8 (268.9:294.6)	12.3	86.8	99.0
4/1	604	597	-	-	-	4.3	14.1	-	18.4	109.7	11.9	14.1	26.0
4/2	477	407	-	-	-	6.2	38.1	-	44.2	333.8	10.6	38.1	48.7
5/1	621	621	-	-	-	2.4	11.6	-	14.0	81.4	11.7	11.6	23.3
5/2	836	836	-	-	-	2.1	13.1	-	15.1	65.2	16.2	13.1	29.3
5/3	114	114	-	-	-	0.3	0.1	-	0.4	12.4	2.1	0.1	2.2
6/2+6/1	587	587	-	-	-	3.0	4.7	-	7.7 (0.2+7.5)	47.1 (43.2:47.2)	5.3	4.7	10.0
7/1	743	743	-	-	-	3.4	3.5	-	7.0	33.7	13.5	3.5	17.0
7/2	517	516	-	-	-	4.1	11.8	-	15.9	110.7	10.1	11.8	21.9
7/3	446	446	-	-	-	2.4	0.6	-	2.9	23.6	5.1	0.6	5.7
8/1	224	224	-	-	-	1.8	0.2	-	2.0	31.8	4.1	0.2	4.3
8/2	801	801	-	-	-	3.1	3.9	-	7.0	31.4	10.7	3.9	14.6
8/3	543	543	-	-	-	1.8	0.8	-	2.6	17.3	10.6	0.8	11.3
9/1	555	555	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
9/2	446	446	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
10/1	778	778	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Full Input Data And Results

11/1	577	577	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
11/2	1839	1839	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
12/1	835	835	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
12/2	388	388	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0
<b>J2: Birdwell Rbt</b>	-	-	<b>0</b>	<b>0</b>	<b>0</b>	<b>47.3</b>	<b>93.3</b>	<b>0.0</b>	<b>140.6</b>	-	-	-	-	-
1/1	222	222	-	-	-	1.3	0.4	-	1.7	27.2	3.5	0.4	3.9	
1/3+1/2	715	715	-	-	-	4.6	2.3	-	6.9 (2.8+4.2)	34.9 (33.8:35.7)	7.6	2.3	9.9	
2/1	701	701	-	-	-	4.3	12.1	-	16.4	84.1	13.4	12.1	25.5	
2/2	703	703	-	-	-	4.3	12.6	-	16.9	86.5	13.5	12.6	26.1	
3/1	392	380	-	-	-	3.5	13.3	-	16.8	154.3	7.9	13.3	21.2	
3/2	307	244	-	-	-	4.7	33.6	-	38.3	449.3	7.2	33.6	40.8	
4/1	578	578	-	-	-	2.8	0.7	-	3.5	22.1	8.8	0.7	9.6	
4/2+4/3	1847	1847	-	-	-	10.3	0.0	-	10.3 (4.8+5.5)	20.1 (19.6:20.6)	28.2	0.0	28.2	
5/1	712	712	-	-	-	4.8	3.3	-	8.1	40.9	13.5	3.3	16.8	
5/2	228	228	-	-	-	0.0	0.2	-	0.2	3.3	0.0	0.2	0.2	
5/3	294	294	-	-	-	0.0	0.3	-	0.3	3.6	0.0	0.3	0.3	
6/1	898	898	-	-	-	0.0	0.0	-	0.0	0.2	0.2	0.0	0.2	
6/2	956	956	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
7/1	913	913	-	-	-	1.2	2.0	-	3.2	12.6	4.7	2.0	6.7	
7/2	997	997	-	-	-	1.8	3.3	-	5.1	18.6	6.0	3.3	9.4	
8/1	524	524	-	-	-	2.8	7.7	-	10.5	72.1	9.7	7.7	17.4	
8/2	114	114	-	-	-	0.6	0.1	-	0.7	22.0	1.4	0.1	1.6	
9/1	1210	1210	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
10/1	899	899	-	-	-	0.0	0.9	-	0.9	3.5	0.2	0.9	1.1	
10/2	659	659	-	-	-	0.3	0.4	-	0.7	3.8	1.6	0.4	2.0	
11/1	899	899	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
11/2	659	659	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
12/1	728	728	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	
13/1	967	967	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	



