



# Transport Assessment

Kingmoor, Wrexham Industrial Estate,  
Wrexham, Clwyd

Client: FI Real Estate Management



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# 1 INTRODUCTION

## 1.1 Purpose of Report

- 1.1.1 This Transport Assessment (TA) considers the highways and transportation implications associated with a:

*Hybrid planning application for detailed and outline planning permission for employment development with ancillary offices for Use Class B8; detailed elements to comprise: revised and upgraded access off existing access into site off Bryn Lane, new circulation roads, drainage infrastructure, ecology mitigation, landscaping and ancillary development and infrastructure; outline elements to comprise: new employment units (up to 3 units) comprising in total up to 93,019 sqm GIA (1,001,250 sqft GIA) of floorspace for Use Class B8, related servicing/service yards with HGV parking and car parking and ancillary development and infrastructure.*

- 1.1.2 Wrexham County Borough Council (WCBC) is the Local Highway Authority (LHA) and the Local Planning Authority (LPA). Prime Transport Planning ('Prime') has produced this TA on behalf of the applicant, FI Real Estate Management ('FIREM').
- 1.1.3 The document has been prepared in accordance with *Planning Policy Wales* and *Technical Advice Note 18: Transport* as well as a number of local policy documents. It considers the accessibility of the site and the safety for all modes of travel with an emphasis on walking cycling and public transport, while assessing the potential impact on the highway network.
- 1.1.4 A previous draft of this document was provided to WCBC as part of the consultation process.
- 1.1.5 The conclusions and recommendations contained herein have been drawn based on information available and obtained in advance of the planning submission to which this report relates.
- 1.1.6 Reasonable checks have been carried out on any third-party information used in the preparation of the report but, nonetheless, Prime Transport Planning accepts no liability for the accuracy or otherwise of this data.
- 1.1.7 Third-party rights are excluded for the use of information contained within this report.

## 1.2 Scope of Report

- 1.2.1 To help define the extent of the study area for the purpose of this TA, an initial scoping email was sent to WCBC on 9<sup>th</sup> June 2022 which was then forwarded to Mott MacDonald (MM), their consultant. Unfortunately an administrative error meant that the response was not issued to Prime until 13<sup>th</sup> September 2022, but it was largely in agreement with the suggested scope. A copy of this email chain is provided in Appendix A.

- 1.2.2 Two main changes have been made in this version of the TA compared to the earlier draft submitted for DMO pre-application submission. The first being the changing of the opening year from 2025 to 2027 which is based on the updated aspirations of FIREM. The second being the use of TEMPro Version 8 which has been officially released by the DfT in February 2023 and Road Traffic Projections (RTP) released by the DfT in December 2022. Further details of these changes are provided in Section 6 with the updated traffic impact assessment presented in Section 7. Additional analysis of the impact of the development proposals on the B5130 is also provided in Section 7 which was an issue raised by members of the public during the DMO pre-application submission.
- 1.2.3 Following the initial drafting of this TA, a more detailed Scoping Report has been issued to WCBC, MM, Welsh Government (WG), National Highways (NH) and Cheshire West and Chester Council (CWaCC) for their pre-application input. Several of the abovementioned highway authorities responded to this request. A copy of the Scoping Note is provided in Appendix A. A summary of the responses, which are provided in Appendix A, is as follows:
- WG – concerns that junction 6 of the A483 is approaching capacity. A capacity assessment of this junction is requested;
  - NH – Content with the scope of assessment and numbers at Posthouse Roundabout noted;
  - CWaCC – Potential concern regarding increase in HGVs and staff trips on A534, A41 roundabout and B5130 past Farndon;
  - WCBC – no response; and
  - MM – no response.
- 1.2.4 The assessment study area follows that suggested in the initial scoping note.
- 1.2.5 The remainder of this report is structured as follows:
- **Section 2** describes the relevant local and national transport policy and guidance;
  - **Section 3** describes the existing situation in terms of the site, local highway network and traffic conditions whilst also reviewing recent accident records for the local highway network;
  - **Section 4** details the development proposal including the access strategy and parking arrangements;
  - **Section 5** details access to the site by sustainable modes of travel including walking, cycling and public transport and provides a summary of the Travel Plan;
  - **Section 6** discusses the forecasting methodology and trip generation of the site. The section then provides the traffic impact assessment which includes the results of a junction capacity assessment of the site access and off-site junctions; and
  - **Section 7** concludes the findings of the Transport Assessment.

## 2 TRANSPORT POLICY AND GUIDANCE

### 2.1 Introduction

- 2.1.1 It is important that any new developments conform to and complement national and local planning policy. This section details the policies that are relevant to this development.

### 2.2 Planning Policy Wales

- 2.2.1 The document *Planning Policy Wales* (PPW) sets out the land use planning policies of the Welsh Government and is supported by a series of Technical Advice Notes (TANs). The most recent version of PPW is Edition 11, published in February 2021.

- 2.2.2 Transport is considered in Chapter 3, Chapter 4 and Chapter 5 of PPW. The document sets out a primary objective, 'to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales'.

- 2.2.3 Chapter 3 outlines the importance of strategic placemaking, with early decisions having the greatest impact on contributing towards a sustainable development. The chapter continues to state:

*'Good design is about avoiding the creation of car-based developments. It contributes to minimising the need to travel and reliance on the car, whilst maximising opportunities for people to make sustainable and healthy travel choices for their daily journeys.'*

- 2.2.4 The chapter addresses place-making within rural areas, with it being acknowledged that for rural areas, 'opportunities for reducing car use and increasing walking, cycling and use of public transport are more limited than in urban areas'.

- 2.2.5 Chapter 4 highlights the importance of cohesive communities, with such considerations through placemaking contributing towards a 'prosperous', 'resilient' and 'healthier' Wales. The chapter discusses transport in detail, with the need for the people to access jobs and services through 'shorter, more efficient and sustainable journeys, by walking, cycling and public transport'.

- 2.2.6 Chapter 4 also addresses the following:

- Integrated planning and transport strategies;
- Sustainable transport and reduction in private car reliance;
- Active/social streets designed to be publicly orientated;
- Active travel and the encouragement of walking/cycling;
- Public transport and its availability;
- The encouragement of ultra-low emission vehicles;
- Traffic management and improved forecasting;
- The availability of car parking; and

- Transport Assessments as an important mechanism for considering traffic impact.

2.2.7 Chapter 5 discusses the economic components of placemaking and the creation of ‘*productive and enterprising places*’. The chapter continues to state that such enterprising places are ‘*designed and sited to promote healthy lifestyles*’ with this being done by making them ‘*easy to walk and cycle to and around*’, and easy to access by public transport.

2.2.8 Transport infrastructure is discussed in detail, with the importance of such infrastructure towards sustainable development stated below:

*‘The provision of sustainable transport infrastructure is essential in order to build prosperity, tackle the climate emergency, reduce airborne pollution and to improve the social, economic, environmental and cultural well-being of Wales. The planning system should facilitate the delivery, decarbonisation and improvement of transport infrastructure in a way which reduces the need to travel, particularly by private vehicles, and facilitates and increases the use of active and sustainable transport.’*

2.2.9 Accordingly, this TA has been structured to include an assessment of accessibility by sustainable modes including walking, cycling and public transport, road safety and the impacts of the development on the local highway network.

## 2.3 Technical Advice Note 18: Transport

2.3.1 TAN 18 (2007) outlines the need for, and the required content of TAs for some classifications and scales of development in Wales. The document outlines the following aims to be considered when producing a TA:

- Understand the transport impacts of the development;
- Clearly communicate the impacts to assist the decision-making process;
- Demonstrate the development is sited in a location that will produce a desired and predicted output (for example in terms of target modal split);
- Mitigate negative transport impacts through the design process and secure through planning conditions or obligations; and
- Maximise the accessibility of the development by non-car mode

2.3.2 TAN 18 provides detailed guidance on visibility standards, and essentially provides for visibility to be based upon the standards in the *Design Manual for Road and Bridges (DMRB)* for roads where actual road speeds are unknown or where the speed limit is >60kph (37mph), and the standards in *Manual for Streets (MfS)* where speeds are known and are <60kph (37mph).

2.3.3 In relation to accessibility, TAN 18 emphasises the utility of using ‘*accessibility profiles*’, which consider whether a site has the potential to minimise travel by the private car. In accordance with this, GIS software has been utilised to generate accessibility isochrones for walking and cycling trips, while the



site's accessibility by public transport has been considered in the context of timetables services in the area.

- 2.3.4 TAN 18 goes on to outline the requirement for a 'Transport Implementation Strategy' (TIS) to be produced as an output of the TP. The document summarises the requirements of the TIS as follows:

*'[The TIS] should set objectives and targets relating to managing travel demand for the development and set out the infrastructure, demand management measures and financial contributions necessary to achieve them. The TIS should set a framework for monitoring the objectives and targets, including the future modal split of transport to development sites.'*

- 2.3.5 In relation to how a TIS interfaces with the production of a TA and TP, the guidance states that:

*'TISs resulting from the TA process are intended to incorporate all the components of a travel plan and ensure these are integrated with design elements of the new development.'*

- 2.3.6 In the light of the above, a TIS is included within the contents of the Framework TP which has been produced to accompany this TA, and draws upon the findings and conclusions of this TA, in addition to the potential sustainable travel measures described within the TP.

## 2.4 North Wales Joint Local Transport Plan 2015

- 2.4.1 The North Wales Joint Transport Plan (LTP) was prepared by the North Wales Local Authorities in response to the Welsh Government requirement for LTPs to be submitted by the end of January 2015. The LTP's stated 'vision' is to 'remove barriers by delivering safe, sustainable, affordable and effective transport networks'.

- 2.4.2 The LTP aims to address the following key issues for North Wales:

- The ability of the strategic road and rail corridors to provide the necessary good connectivity, for people and freight, within North Wales, to the ports and the rest of the UK to support the economy and jobs, including tourism;
- The lack of resilience of the road and rail networks to planned and unplanned events including extreme weather;
- The need for good access to and between the three Enterprise Zones in North Wales;
- The lack of viable and affordable alternatives to the car to access key employment sites and other services; and
- The need for good road links to / from the trunk road network into the rural areas to help retain the viability of local businesses and support the Welsh language and culture.

- 2.4.3 This plan therefore provides the strategic baseline for considering developments that have transportation element within the wider area. In terms of the proposed/refurbished industrial and retail units within this application, consideration will be made of the wider integration within the highways network and access by sustainable modes.

## 2.5 Wrexham Unitary Development Plan (1996-2011)

- 2.5.1 The Unitary Development Plan (UDP) 1996 - 2011 was adopted by WCBC in February 2005. The document reflects the council's corporate vision for the County Borough's future based on:

- Aspiring city status, with Wrexham centre as its civic hub;
- Rural revitalised distinct towns and villages and attractive viable hinterland;
- Modern robust economy across all sectors;
- Improve quality of life for residents with an emphasis on supporting access to a variety of education and employment opportunities; and
- Institutions of growing stature: for example, the Council itself.

- 2.5.2 Part 1 of the strategic policies within this document outlines policies PS1, PS2, PS3, PS4. These policies outline the broad locations of where developments should be sought as follows:

- **Policy PS1:** New development for housing, employment, and community services will be directed to within defined settlement limits/employment areas;
- **Policy PS2:** Development must not materially detrimentally affect countryside, landscape/townscape character, open space, or the quality of the natural environment;
- **Policy PS3:** Development should use previously developed brownfield land comprising vacant, derelict or underused land in preference to the use of greenfield land, wherever possible, particularly so where greenfield land is of ecological, landscape or amenity value, or comprises agricultural land of grades 1, 2 or 3a quality; and
- **Policy PS4:** Development should maintain the existing settlement pattern and character and be integrated with the existing transport network to help reduce the overall need to travel and encourage the use of alternatives to the car.

- 2.5.3 In addition to these, Policy PS8 outlines the development targets for transportation:

- **Policy PS8:** The transport network will be developed by providing an integrated range of travel options to and from principal residential, commercial, employment and education centres by making the best use of the existing road and rail network, including, where necessary, the provision of facilities for both passenger and freight interchange and by the encouragement of public transport, cycling and walking.

- 2.5.4 It is noted that the Unitary Development Plan (1996-2011) is currently outdated, however, the Wrexham Local Development Plan 2 (2013-2028) is still undergoing consultation and is yet to be

released. As such, the Unitary Development Plan (1966-2011), as the only document available, shall be used for reference when completing this TA.

## 2.6 Wrexham Local Development Plan 2 (2013-2028)

2.6.1 WCBC is preparing the Local Development Plan (LDP) which will replace the current adopted Unitary Development Plan. The LDP will be a long-term land use and development strategy focused on achieving sustainable development and will:

- Guide development for housing, employment, retail and other uses;
- Set out policies that will be used to decide planning applications;
- Safeguard areas of land requiring protection or enhancement.

## 2.7 Local Planning Guidance Note 16 – Parking Standards

2.7.1 This guidance note explains the parking standards the Council applies to new development. It amplifies Unitary Development PLAN (UDP 1966-2011) policies and will be a material consideration in the determination of planning applications. This guidance note was revised by the council in July 2011, subject to external consultation in September 2011 and was formally adopted for use by the Executive Board in November 2011.

2.7.2 Through a review of this document, the parking standards required for the B8 land use proposed for the development are noted. These standards can be seen below within Table 2.1.

**Table 2.1 Parking Standards**

| Type of Development                                                                                                                                                                                                                                                                                                                                              | Parking Standard                                    | Cycle Parking Standard                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------|
| <b>B1 Business and light industry</b>                                                                                                                                                                                                                                                                                                                            | 1 car space per 30m <sup>2</sup> gross floor space  | 1 cycle space per 300m <sup>2</sup> gross floor space  |
| <b>B2 General Industry</b>                                                                                                                                                                                                                                                                                                                                       | 1 car space per 50m <sup>2</sup> gross floor space  | 1 cycle space per 500m <sup>2</sup> gross floor space  |
| <b>B8 Storage and Distribution</b>                                                                                                                                                                                                                                                                                                                               | 1 car space per 100m <sup>2</sup> gross floor space | 1 cycle space per 1000m <sup>2</sup> gross floor space |
| An area suitable for HGVs to load/unload and turn within the site will normally be required for B2 and B8 uses, particularly for sites accessed from a classified road. Any extensions to industrial or warehouse premises should not result in the loss of HGV loading/unloading/turning spaces unless an adequate alternative can be provided within the site. |                                                     |                                                        |

## 2.8 Wrexham Connected: Our Sustainable Urban Mobility Plan 2016

2.8.1 The *Wrexham Connected* document sets a clear vision for the future of transport for the area. It brings together the Council's overall direction of transport planning.

2.8.2 The document outlines the importance of the council's *Sustainable Urban Mobility Plan* (SUMP). This is discussed in specific reference to WIE, and the councils concern for the public's ability to connect in and around the town centre, as well as corridors outside of the town.

2.8.3 Stated within the document are the *Wrexham Connected* objectives, which are set to maximise how the Council can contribute to the national well-being goals contained within the *Future Generations Act*, being that they support a cohesive Wales and more resilient Wales. The objectives are as follows:

- **Safer Places** – working with partners to create safer environments for people to live, work and play;
- **Sustainable Places** – will embrace a ‘sustainable’, transport-first approach to new development;
- **Healthy Places** – reduce the impacts of air and noise pollution;
- **Affordable Places** – stimulate inward investment and regeneration that leads to job creation; and
- **Well Connected Places** – enhance connectivity to, from and within Wrexham to improve the attractiveness and quality of the area.

## 2.9 DfT Circular 01/2022 The Strategic Road Network and the Delivery of Sustainable Development (2022)

2.9.1 Written by the DfT for its executive arm NH, this document provides an update of Circular 02/2013, and therefore sets out the way in which NH will engage in the planning system to deliver sustainable development, whilst safeguarding the primary purpose of the strategic road network.

2.9.2 The Circular aligns with NPPF in recognising the ‘*specific locational requirements of different economic sectors*’, with specific recognition of the logistics sector, as well as implying the need for mitigation when development would have an ‘*unacceptable safety impact or the residual cumulative impacts would be severe*’.

2.9.3 The Circular does however move away from the ‘predict and provide’ approach and prioritises vision-led approaches including ‘vision and validate’, ‘decide and provide’ and ‘monitor and manage’. It also places a clear ethos on the importance of maximising the potential for sustainable travel initiatives and places this ahead of capacity enhancements on the SRN. Travel Plans are cited as being an effective means to help incentivise the use of sustainable modes.

2.9.4 Early engagement with NH is encouraged and overarching details of acceptable assessment methodologies are presented.

2.9.5 There is further reference to the logistics sector by acknowledging that some distribution hubs ‘*serve regions and tend to be located out-of-town near the SRN*’, such as the proposed development.

## 2.10 The Strategic Road Network Planning for the Future (2015)

2.10.1 The Guide to Working with Highways England (now NH) on Planning Matters provides something of an update and an expansion on the planning aspects of Circular 02/2013. It recommends early

engagement between developers and NH whilst highlighting NH's regulatory duty to co-operate in the planning process as a statutory consultee. It talks of sharing knowledge and experience as well as collaborative working. The Guide also provides further details on the impact of the development on the SRN in line with NPPF and Circular 02/2013, the predecessor to 01/2022.

## 2.11 Summary

- 2.11.1 This section has outlined national and local transport policies and guidance which are applicable to the development site. The production of this TA is consistent with the requirement for TAs set out in PPW, TAN 18 and the UDP for Wrexham. How the site conforms to and complements the other policies and guidance described above is discussed in the following sections of this report, where relevant.

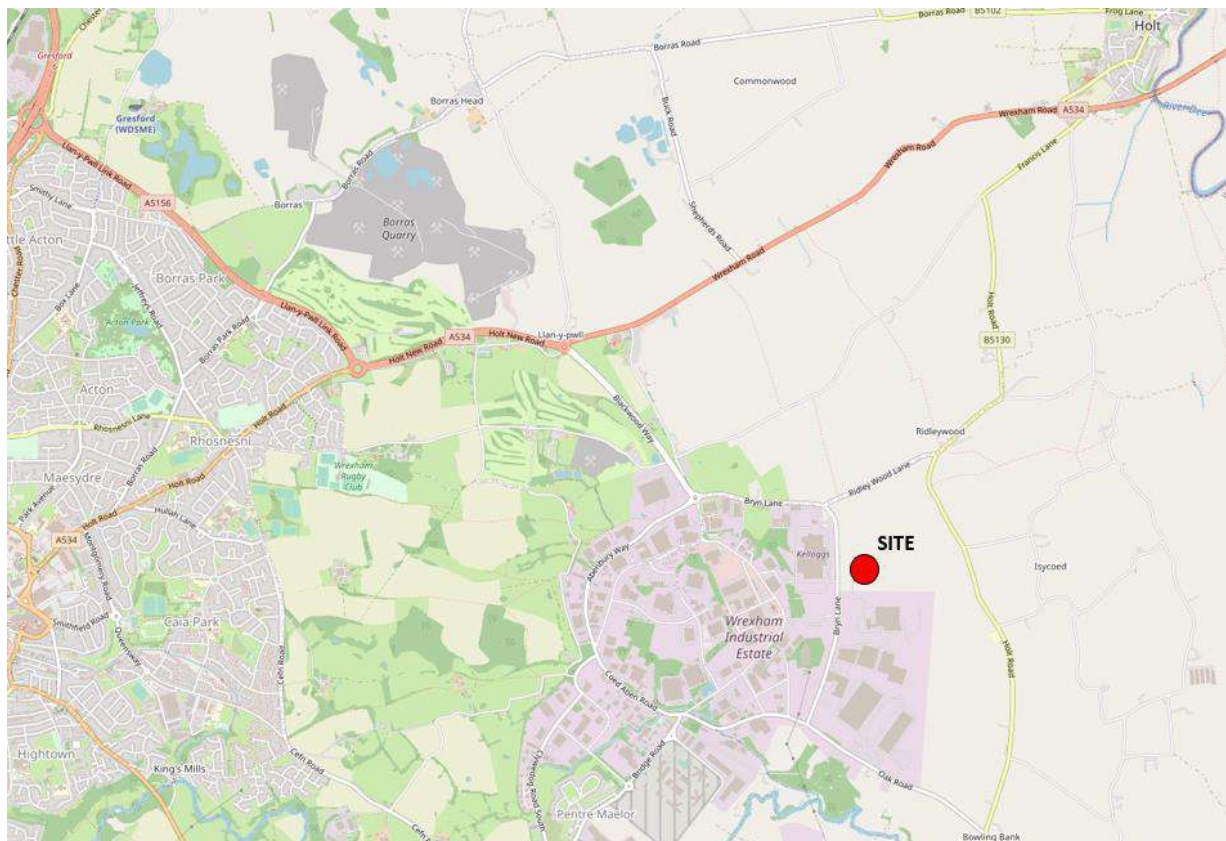
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## 3 EXISTING SITUATION

### 3.1 Site Description

- 3.1.1 The application site lies to the east of Bryn Lane on WIE and comprises agricultural fields and an area of hardstanding that is currently used for the storage of HGV trailers. The site is bound by Bryn Lane to the west, the construction of the Net World Sports scheme (planning application number 2020/01670) to the north, agricultural land to the east and the access road to the Very Group site to the south.
- 3.1.2 The current access to the site is via a priority controlled junction onto the access road to the Very Group site, while access to the main road network is provided via an advanced ghost island priority controlled junction onto Bryn Lane.
- 3.1.3 The location of the site in the context of the local highway network is shown on Image 3.1.

**Image 3.1: Site Location Plan**



Source: <https://www.openstreetmap.org/copyright>

## 3.2 Local Highway Network

### Bryn Lane

- 3.2.1 Bryn Lane traverses the western boundary of the site and forms a site frontage of circa 200m in length. In the vicinity of the site, Bryn Lane runs in a north to south direction forming an advanced ghost island priority controlled junction with Oak Road to the south. To the north, Bryn Lane turns through a 90 degree bend where it then runs in a westerly direction forming a 4 armed roundabout with Industrial Estate Road/Abenbury Way/Ash Road North.
- 3.2.2 Bryn Lane is circa 7m to 8m in width but widens to circa 10m at the site access/access to Very Group site junction to accommodate the ghost island associated with the advanced priority controlled junction. Moving south, the ghost island remains, providing a right turn to the recycling centre circa 120m from the site access/access to Very Group site junction.
- 3.2.3 A 3m wide combined footway/cycleway is provided in the western verge of Bryn Lane, this running from circa 500m north of the Bryn Lane/Oak Road junction towards the Industrial Estate Road/Abenbury Way/Ash Road North roundabout mentioned above. This facility is in a good state of repair and offers the opportunity for potential employees/visitors to walk or cycle to the site.
- 3.2.4 Bryn Lane is restricted to 40mph with numerous other industrial buildings taking access from Bryn Lane. There is also a lay-by provided along the site frontage approximately 115m from the site access/access to Very Group junction.

### Access Road to the Very Group site

- 3.2.5 As mentioned above, the access road to the Very Group site runs along the southern boundary of the proposed development. This is not a public highway, it is a private road over which the applicant has rights of access.
- 3.2.6 It travels on a west to east alignment from the advanced priority controlled junction of Bryn Lane in the west, passing the security gates and into the site of the Very Group site to the east. Access/egress to/from the Very Group site is controlled by barriers.
- 3.2.7 The road is circa 7m in width, no footways are provided and the junction radii and visibility splays at its junction with Bryn Lane having been constructed to accommodate the movement of large HGV vehicles.

### Oak Road/Redwither Road

- 3.2.8 Oak Road is single carriageway, running in a general east to west alignment. The carriageway is circa 7m/8m in width, with footways circa 2m in width being provided on both sides of the carriageway. Oak Road transitions to Redwither Road to the west of the Bryn Lane junction where similar geometric



characteristics as described above can be found. Both roads are subject to a 40mph speed limit and street lighting is provided.

#### Industrial Estate Road

- 3.2.9 Industrial Estate Road is a dual carriageway measuring approximately 20m in width. Running in a generally north to south alignment and connects the local WIE highway network to the A534 Wrexham Road and the strategic highway network beyond.

### 3.3 Strategic Highway Network

#### A534 Wrexham Road

- 3.3.1 The A534 provides a strategic connection with the A5156 to the west and to the A41, the A49, and the towns of Nantwich and Crewe to the east. This is generally a single carriageway road, however the section of road between the A5156 and Industrial Estate Road has been widened to dual carriageway standards as part of a scheme to improve access to WIE from the strategic highway network.

#### A5156

- 3.3.2 The A5156 is a dual carriageway which links the A534 to the south to the A483 at the Gresford Interchange to the north. This road has also been recently widened as part of a scheme to improve access to WIE from the strategic highway network.

#### A483

- 3.3.3 The A483 is a major strategic road which runs through central Wales and connects Chester to Swansea. This road therefore forms the main connection from WIE to Wales and the North West of England.

### 3.4 Existing Traffic Conditions

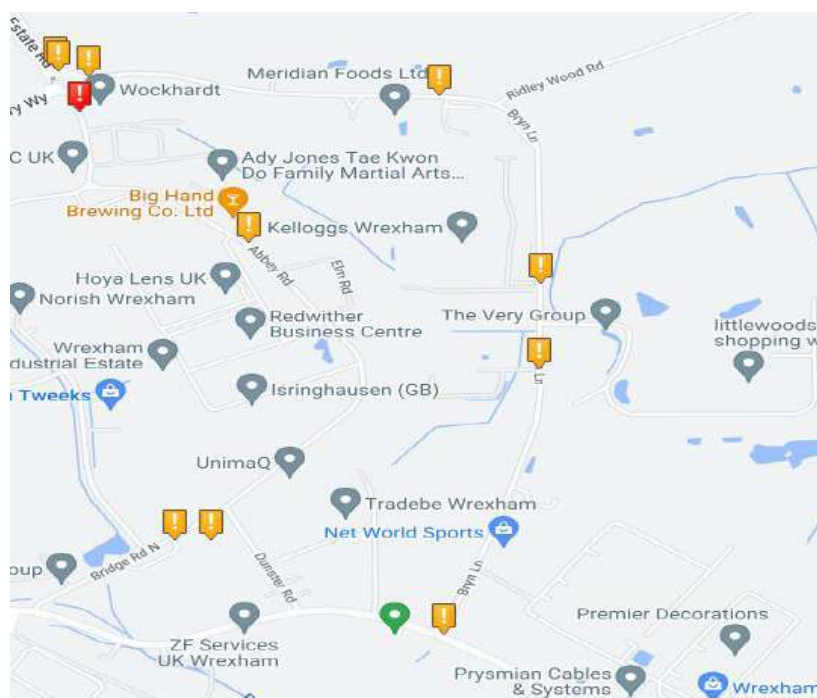
- 3.4.1 Numerous site visits have been undertaken to WIE since late 2017 as part of our input to the various projects on WIE we have been involved with, the most recent visit being on 2<sup>nd</sup> September 2022. During the site visits, traffic was observed to move freely throughout the estate with no issues noted at the majority of the key junctions.
- 3.4.2 Both the A483 route and the A534/A5156 route toward the A483 were also observed to be busy but with no major queues and delays being witnessed. From the site visits there would appear to be spare capacity for additional demand should this scheme receive planning consent. No safety concerns with the operation of the existing highway network were noted during the various site visits.

- 3.4.3 As part of the assessment of the impact of this proposed development, classified turning counts were undertaken at a number of junctions in the vicinity of the proposed development, the location of these surveys having been agreed with WCBC. The traffic surveys were undertaken by external traffic data collection specialist 360TSL Traffic Data Collection on behalf of Prime.
- 3.4.4 The manual classified turning counts were undertaken on Tuesday 28<sup>th</sup> June 2022, between the hours of 06:30 and 09:30 and 15:30 and 18:30 to ensure that the commuter peaks were surveyed allowing the morning (AM) and evening (PM) peak hours to be determined. A survey of queue lengths on the various approaches to these junctions was also undertaken as part of the surveys, though no notably long queues were recorded.
- 3.4.5 The utilisation of the results of these surveys, in ascertaining the capacity of the site accesses and the need for mitigation measures at off-site junctions is detailed in Section 6. The raw survey data can be provided on request.

### 3.5 Road Safety

- 3.5.1 To allow for this road safety review to be undertaken, the highways officers at WCBC were approached to supply the required data. It should be noted that at the time of writing this TA no response to our request for this data had been received. In the absence of this data, Crashmap has therefore been utilised to undertake the following review.
- 3.5.2 Crashmap data covering the last 5 years i.e. 2017 and 2021 (the latest data available) has been reviewed for the local highway network. This includes roads such as Industrial Estate Road, Bryn Lane and Oak Road. The extent of the accident study area is shown in Image 3.2 below.

**Image 3.2: Accident Study Area**



- 3.5.3 The results of the analysis are described below, with the Crashmap output being provided in Appendix B.

Industrial Estate Road/Bryn Lane/Abenbury Way/Ash Road North Junction

- 3.5.4 There have been 3 injury accidents at this junction over the above mentioned 5 year period, all of which have resulted in slight injuries being sustained. The first occurred in January 2017 and involved 3 cars in collision with each other. It would appear from the data contained on Crashmap that Vehicle 1 was slowing down on the approach to the junction with Vehicle 2 colliding with the rear of Vehicle 1 and Vehicle 3 colliding with the rear of Vehicle 2. The incident occurred in darkness with wet road conditions.
- 3.5.5 The second incident occurred in October 2021 and involved a car entering the roundabout in collision with a cyclist on the circulatory carriageway with a slight injury being sustained by the cyclist. The incident occurred in darkness with wet road conditions.
- 3.5.6 The third incident occurred in April 2021 in daylight and dry road conditions. No other data was available on the Crashmap website in relation to this incident.

Bryn Lane

- 3.5.7 There have been 2 injury accidents on Bryn Lane in the above mentioned 5 year period. All of which have resulted in slight injuries being sustained.
- 3.5.8 The first incident occurred in October 2017 and involved a vehicle travelling along Bryn Lane in collision with a stationary vehicle waiting to turn right into the Kellogg's factory. The weather was fine and the road conditions were dry.
- 3.5.9 The second incident occurred in June 2021 in daylight and dry road conditions. No other data was available on the Crashmap website in relation to this incident.

Bryn Lane/Oak Road Junction

- 3.5.10 There has been 1 injury accident at the Bryn Lane/Oak Road junction. This incident involved a collision between a car turning right out of Bryn Lane into the path of a vehicle on Oak Road and resulted in a slight injury being sustained by the driver of one of the vehicles. The weather was fine, and the road conditions were dry.

Summary

- 3.5.11 The above demonstrates that between 2017 and 2021 there have been 6 injury accidents on the local highway network covered by Industrial Estate Road/Bryn Lane/Oak Road, all of which have resulted in slight injuries having been sustained with only 1 incident involving a vulnerable road user.

- 3.5.12 From a review of the data obtained via Crashmap, it is therefore concluded that there are no deficiencies in the existing highway network, or existing safety issues within the vicinity of the site, that would be exacerbated by the development proposals.

## 4 DEVELOPMENT PROPOSAL

### 4.1 Development Description

#### 4.1.1 FIREM is seeking planning permission for the following:

*Hybrid planning application for detailed and outline planning permission for employment development with ancillary offices for Use Class B8; detailed elements to comprise: revised and upgraded access off existing access into site off Bryn Lane, new circulation roads, drainage infrastructure, ecology mitigation, landscaping and ancillary development and infrastructure; outline elements to comprise: new employment units (up to 3 units) comprising in total up to 93,019 sqm GIA (1,001,250 sqft GIA) of floorspace for Use Class B8, related servicing/service yards with HGV parking and car parking and ancillary development and infrastructure.*

#### 4.1.2 Whilst outline planning permission is sought for the buildings themselves, the indicative arrangement currently under considerations consists of three units of the following floor area and parking provision:

- Unit 1: 19,335 sqm (208,125 sqft), 175 parking spaces and 22 HGV loading bays;
- Unit 2: 21,425 sqm (230,625 sqft), 183 parking spaces and 22 HGV loading bays; and
- Unit 3: 52,257 sqm (562,500 sqft), 296 parking spaces and 26 loading bays.

#### 4.1.3 A site masterplan drawing has been produced by MCAU architects and forms part of the supporting documentation for the planning application. It is not included within this document as it has the potential to be revised up to the point of submission and therefore to avoid conflicting and superseded layouts being submitted within the various planning documents, it is omitted from this report. The planning documents should be available via the LPA's planning portal.

### 4.2 Main Site Access

#### 4.2.1 The main entrance to the site is proposed to be taken via a priority controlled junction from the access road to the Very Group site. The proposed site access is shown on Drawing P21066-100E in Appendix C.

#### 4.2.2 An examination of this drawing shows that the access is located 50m to the east of the Bryn Lane junction, this distance being in accordance with DMRB junction spacing criteria and provides the maximum distance possible from the barrier controlled access to the Very Group site. The proposed access location also gives cognisance to the potential location of an additional access to the parcel of land that lies to the south of the access road to the Very Group site. A scheme to develop on this parcel of land is subject to a separate planning application by another 3<sup>rd</sup> party.

- 4.2.3 The access road into the proposed development consists of a 7.3m carriageway, a 15m radius to the west and an 8m radius to the east. These differing radii reflect the need for HGV traffic to be turning to/from the west to access Bryn Lane rather than turning to/from the east toward the Very Group site.
- 4.2.4 A 4.5m x 90m visibility splay to the left on exit can be provided. However, it is noted that the 'y' distance requirement of the visibility splay will be substantially less given the proximity of the barriers at the entrance to the Very Group. The proximity of this barrier means that the approach speeds of vehicles from the east will likely be less than 10mph.
- 4.2.5 A visibility splay of 4.5m x 50m to the right on exit can be provided, this being the maximum 'y' distance achievable given the proximity of Bryn Lane to the west. Again, this 'y' distance of 50m will be more than adequate given the speed of approaching vehicles will be less than 20mph, these vehicles having just negotiated a turning manoeuvre from Bryn Lane. Drawing P21066-100E in Appendix C also shows a forward visibility of 70m which allows vehicles approaching the site from the north can see vehicles waiting at the site access. This forward visibility is based on a design speed of 50kph which is not an unreasonable representation of the speed of vehicles approaching the site from the north. The area of land at the corner of Bryn lane and the site access/access to Very Group site junction will be kept clear of all obstruction to ensure adequate visibility can be maintained.

#### 4.3 Proposed Pedestrian/Cycle Access

- 4.3.1 A 3m combined footway/cycleway is provided in the western verge of the site access, this running westwards to the Bryn Lane junction where it connects with a proposed pedestrian island that facilitates access to the existing combined footway/cycleway that is currently provided in the western verge of Bryn Lane. A 2m footway is provided in the eastern verge of the site access, this continuing to connect into the existing footway on the northern side of the Very Group site access road.
- 4.3.2 Footways will be provided along each side of the internal access roads with dropped kerbs and tactile paving being provided to delineate safe crossing points at both the proposed site access and within the site itself. Safe pedestrian routes will also be provided within each of the car parks to facilitate safe access to the front door of the various buildings contained within the scheme.
- 4.3.3 Safe and secure cycle parking facilities will be also be provided near to the access points to the various buildings.

#### 4.4 Internal Site Circulation

- 4.4.1 The main access spine road will run directly through the middle of the site. This will consist of a 7.3m carriageway with local widening to 10m being provided on bends to accommodate the swept path of two HGV's passing each other.

- 4.4.2 Unit 1 is located toward the southern boundary of the site. Separate accesses are to be provided from the southern side of this spine road into the 175 space car park and 22 HGV docking bays that are located along the northern boundary of the building.
- 4.4.3 Unit 2 is located toward the northern boundary of the site. Separate accesses are to be provided from the northern side of this spine road into the 183 space car park and 22 HGV docking bays that are located along the southern boundary of this building.
- 4.4.4 Unit 3 is located toward the eastern boundary of the site. Separate accesses are to be provided from the eastern end of this spine road into the 296 space car park and 26 HGV docking bays that are located along the western boundary of this building.
- 4.4.5 Access points to car parks will consist of a 6m carriageway, 6m junction radii and adequate visibility splays. Access points to HGV docking bays have been designed to allow for the swept path of 2 HGV's passing each other.

## 4.5 Swept Path Analysis

### Site Access

- 4.5.1 To demonstrate that above mentioned access will be safe to serve the site for their intended purposes, a swept path analysis using the industry approved AutoTrack software package has been undertaken. The site access has been assessed with a 16.5m articulated HGV, this being the largest vehicle expected to regularly use this access point. Drawing P21066-101A contained in Appendix C demonstrates that the HGV can utilise this access to safely access and egress the site in forward gear.

### Unit 1

- 4.5.2 A swept path analysis has also been undertaken showing the access to the car park and HGV docking bays associated with Unit 1. The left-hand window of Drawing P21066-102 in Appendix C shows a large car accessing and circulating around the car park of Unit 1, while the right-hand window shows a 16.5m articulated HGV accessing and circulating around the service area of Unit 1. The drawing demonstrates that the vehicles utilising the proposed car park and servicing area of Unit 1 can safely enter and exit these facilities in forward gear.

### Unit 2

- 4.5.3 A swept path analysis has also been undertaken showing the access to the car park and HGV docking bays associated with Unit 2. The left-hand window of Drawing P21066-103 in Appendix C shows a large car accessing and circulating around the car park of Unit 2, while the right-hand window shows a 16.5m articulated HGV accessing and circulating around the service area of Unit 2. The drawing demonstrates that the vehicles utilising the proposed car park and servicing area of Unit 2 can safely enter and exit these facilities in forward gear.

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Unit 3

- 4.5.4 A swept path analysis has also been undertaken showing the access to the car park and HGV docking bays associated with Unit 3. The left-hand window of Drawing P21066-104 in Appendix C shows a large car accessing and circulating around the car park of Unit 3, while the right-hand window shows a 16.5m articulated HGV accessing and circulating around the service area of Unit 3. The drawing demonstrates that the vehicles utilising the proposed car park and servicing area of Unit 3 can safely enter and exit these facilities in forward gear.

## 4.6 Parking Provision

Car Parking

- 4.6.1 A total of 654 car parking spaces will be provided as part to the overall development. This is split across the 3 Units as follows:
- Unit 1 – 175 spaces;
  - Unit 2 – 183 spaces; and
  - Unit 3 – 296 spaces.
- 4.6.2 The parking provided for Units 1 and 2 are at a ratio of circa 1 space per 100sqm as per WCBC's parking standards.
- 4.6.3 Parking is to be provided at a ratio of circa 1 space per 150sqm for the Unit 3. We acknowledge that this is less than WCBC's maximum parking standards for B8 usage of 1 space per 100sqm. It should be noted that the calculation of the maximum parking requirements contained within the WCBC requirement for B8 uses is based on the provision usually required for more common smaller units. The direct application of the WCBC's maximum parking standards to a circa 50,000sqm site is questionable as the rate of parking provision per sqm is likely to decrease as the buildings increase in size.
- 4.6.4 The use of a lower parking standard for larger B8 developments has been investigated by Prime. As mentioned in the Scoping Study, Prime has undertaken a study into recently approved large scale logistics developments in the UK to inform this application and other future applications by FIREM across the UK. The focus of the study was to consider typical levels of parking provision proposed for larger scale B8 uses across the UK and the levels of trip generation forecast for such developments. A copy of this study was provided with the above mentioned Scoping Study.
- 4.6.5 Given the above, the aforementioned logistics study has been used to justify the parking provision which is less than WCBC's maximum standards. The average parking provision for large scale 100% B8 developments according to the study was 1 space per 182sqm. The proposal for Unit 3 at 1 space per 150sqm is therefore in excess of this value.



- 4.6.6 EV charging points will be provided in each of the proposed car parks in accordance with WCBC standards.

Cycle Parking

- 4.6.7 Secure cycle parking spaces are also to be provided and we are aware of WCBC's standards of 1 space per 1,000sqm. These will be located near to the entrance of each building.

## 4.7 Summary

- 4.7.1 The development is proposed to be served by a priority controlled access onto the access road to the Very Group site. Access to the wider highway network is provided at the priority controlled junction onto Bryn Lane located circa 50m to the west of the site entrance.
- 4.7.2 It has been demonstrated that the site is able to accommodate all likely vehicle types which will regularly access the development.
- 4.7.3 The car parking provision to be delivered on Units 1 and 2 is in accordance with WCBC's standards. Parking for Unit3 will be provided in line with other large scale B8 schemes across the UK. The cycle parking provision also accords with WCBC's standards, these parking facilities being located near to the access points of each of the buildings.

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## 5 ACCESS BY SUSTAINABLE MODES

### 5.1 Introduction

- 5.1.1 National and local transport planning policy centres on the importance of sustainable development, meaning that new developments should be located in areas where there is access to sustainable modes of travel, or where sustainable modes of travel can be introduced. The *National Design Guide* (2021) defines sustainable transport modes as:

*‘Any efficient, safe and accessible means of transport with overall low impact on the environment, including walking and cycling, low and ultra-low emission vehicles, car sharing and public transport.’*

- 5.1.2 Walking, cycling and public transport are commonly regarded to be the most sustainable modes of transportation. This section of the report will describe how the site can be accessed by these modes.

### 5.2 Access by Foot

- 5.2.1 As described in the sections above, the site is proposed to take access from the existing Very Group access road off Bryn Lane. Street lighting is provided along Bryn Lane in the vicinity of the site and a combined footway/cycleway is provided along the western verge of Bryn Lane. Pedestrian/cycle connections are provided from the site to the above mentioned pedestrian/cycle infrastructure on Bryn Lane.
- 5.2.2 Research has indicated that acceptable walking distances depend on several factors, including the quality of the street environment, the type of amenity offered, the surrounding area, and other local facilities. The Chartered Institution of Highways and Transportation (CIHT) document entitled *Providing for Journeys on Foot* (2000) suggests walking distances which are relevant to this application. These distances are shown in Table 5.1.

**Table 5.1: Suggested Acceptable Walking Distances**

| Criteria          | Commuting (m) | Local Services (m) |
|-------------------|---------------|--------------------|
| Desirable         | 500           | 400                |
| Acceptable        | 1000          | 800                |
| Preferred Maximum | 2000          | 1200               |

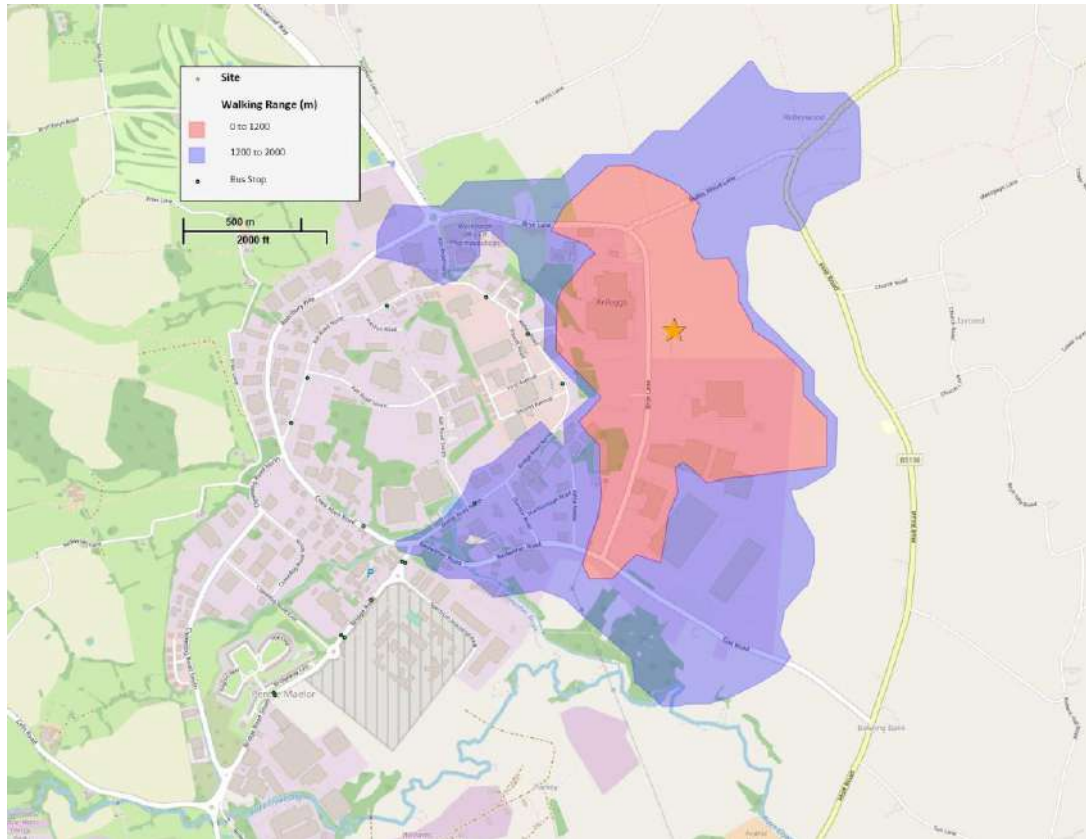
*Source: CIHT Document ‘Providing for Journeys on Foot’ (2000)*

- 5.2.3 Whilst Table 5.1 provides useful guidance on walking distances, Manual for Streets provides a context for interpreting them. Manual for Streets states that:

*‘The propensity to walk is influenced not only by distance, but also by the quality of the walking experience. A 20-minute walk alongside a busy highway can seem endless, yet in a rich and stimulating street... it can pass without noticing.’*

- 5.2.4 The accessibility for pedestrians to and from the site, in relation to WIE, has been considered in the above context. In order to highlight the site's accessibility on foot, an indicative walking isochrone has been produced using the Geographic Information System (GIS) software Visography TRACC. Image 5.1 represents the site's walking catchment with the CIHT's 'Preferred Maximum' distances of 1,200m and 2,000m for local service and commuting trips respectively illustrated.

**Image 5.1: Walking Isochrone – 1,200m and 2,000m ranges**



- 5.2.5 An examination of Image 5.1 shows the site is accessible by a large proportion of WIE. Just outside a 2,000m walking range includes the proposed and refurbished retail units that can be found at the Bridgeway Centre which are particularly important in serving the wider estate. Having such local amenities reduces the trip numbers and distances for ancillary retail use, such as lunchtime meals, tea/coffee breaks and convenience shopping, leading to higher levels of trip containment within the site. This is more sustainable than staff and visitors having to travel further distances, particularly by car, for such trip types.
- 5.2.6 The local bus stops are also highlighted within Image 5.1, with the nearest pairs of stops located on Bridge Road, a circa 2,000m walk from the site. The services provided by these bus stops are further detailed in Section 5.4 below.
- 5.2.7 All footways surrounding the site are of reasonable width and quality, with pedestrian dropped kerbs and tactile paving provided at some junctions to aid in pedestrian movements.

- 5.2.8 Given the evidence presented above, walking can be considered a realistic method of travel to/from the site to access the surrounding area of WIE and vice versa.

### 5.3 Access by Cycle

- 5.3.1 It is widely recognised that cycling can offer an attractive alternative to short car trips, particularly those under 5km, but also as part of longer journeys by public transport.

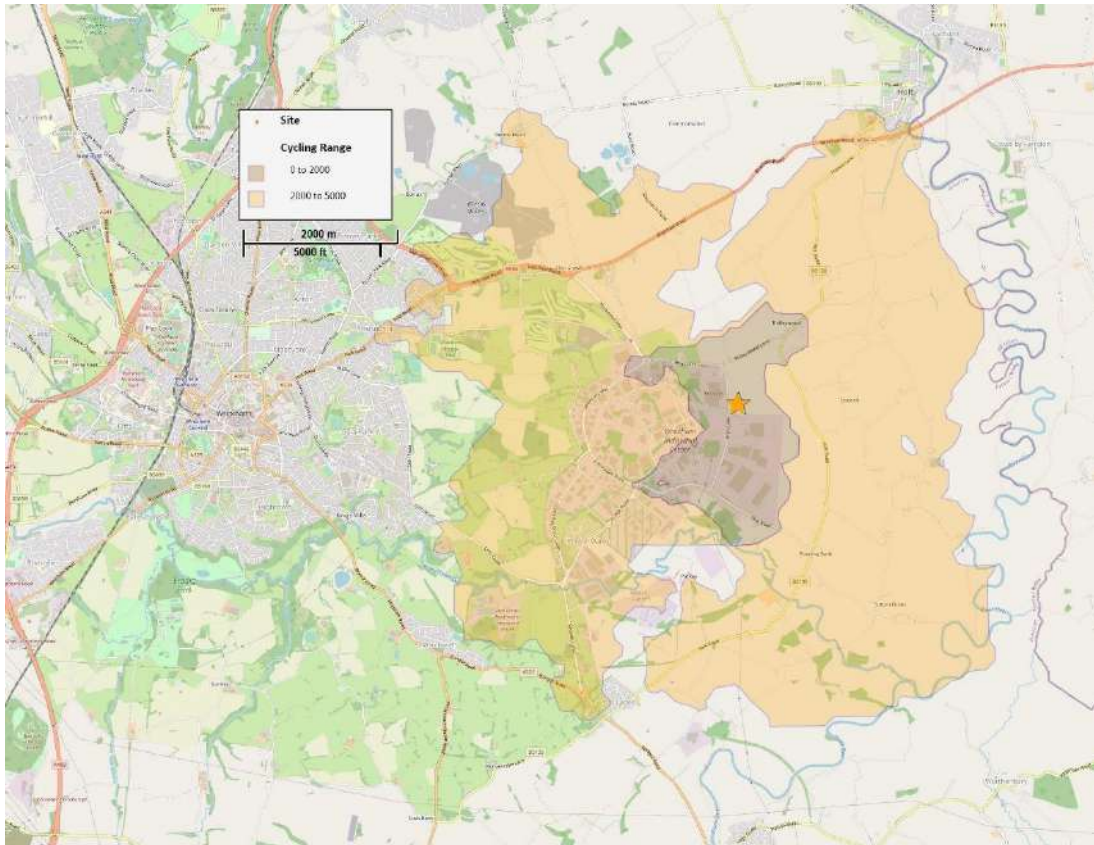
- 5.3.2 The CIHT document Cycle Friendly Infrastructure (2004) states in paragraph 2.3 that:

*‘Three quarters of journeys by all modes of travel are less than five miles (8km) and half under two miles (3.2km) (DoT 1993, table 2a). These are distances that can be cycled comfortably by a reasonably fit person.’*

- 5.3.3 Local Transport Note 1/20 Cycle Infrastructure Design states similar, that ‘Two out of every three personal trips are less than five miles [8km] in length – an achievable distance to cycle for most people’.

- 5.3.4 It is noted that a combined footway/cycleway is provided in the western verge of Bryn Lane in the vicinity of the site. A combined footway/cycleway is proposed as part of the site access strategy to connect the proposed development into the existing cycling infrastructure on Bryn Lane, thus maximising the connectivity of the proposed development by cycle.

- 5.3.5 A cycling isochrone showing the site’s catchment has also been produced using TRACC and is shown as Image 5.2. The figure illustrates 2,000m and 5,000m catchment ranges, which equate to 10-minute and 25-minute journey times respectively which are based on the somewhat conservative cycle speed of 12kph. Commuting cyclists are in fact more typically considered to travel at speeds between 15-20kph so a greater catchment may be more realistic.

**Image 5.2: Cycling Isochrone – 2,000m and 5,000m ranges**

5.3.6 It is clear that the whole of WIE and the residential areas of Cross Lanes and Holt are within the 5,000m catchment. Whilst parts of Wrexham and Marchwiell are outside of the 5,000m distance, the site may still be within a reasonable cycling distance for many staff who live there given the CIHT and DfT advice.

5.3.7 It is considered that commuting to the site via cycling is a viable option for future employees. Appropriate levels of cycle parking will be provided in line with local standards.

## 5.4 Access by Public Transport

5.4.1 As mentioned above the nearest bus stops are known as 'Barclays Bank' which is located on Bridge Road and 'Bridge Road North' which is situated on its namesake. The west bound stop at Barclays Bank provides a shelter, bus stop 'flag' and a raised boarding area which aids access for mobility impaired passengers while the eastbound stop comes in the form of a bus stop 'flag' and raised boarding area. These stops are circa 2,000m from the site access. The bus stop on Bridge Road North offers a bus shelter and a raised boarding area.

5.4.2 A summary of the bus service available from these stops, using the January 2023 timetable, is provided in Table 5.2.

**Table 5.2: Summary of Bus Services from ‘Barclays Bank’ Stop**

| Bus Service       | Route                                               | Weekday Period                                                           | Weekend                                                                  |        |
|-------------------|-----------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------|--------|
|                   |                                                     |                                                                          | Saturday                                                                 | Sunday |
| <b>41<br/>42W</b> | Ridley View/Redwither Tower – Wrexham (bus station) | <b>05:42 – 18:42</b><br>Approx.<br>1-2 services/hr<br>Last: <b>21:42</b> | <b>05:42 – 18:42</b><br>Approx.<br>1-2 services/hr<br>Last: <b>21:42</b> | -      |
|                   | Wrexham (bus station) – Ridley View/Redwither Tower | <b>05:53 – 19:25</b><br>Approx.<br>1-2 services/hr<br>Last: <b>22:20</b> | <b>05:53 – 19:25</b><br>Approx.<br>1-2 services/hr<br>Last: <b>22:20</b> | -      |

- 5.4.3 The 41/42W bus route shown in Table 5.2 above provides services to and from Wrexham with a frequent service of up to two per hour Monday to Saturday. Wrexham town centre can be reached in circa 20-minutes from the ‘Barclay’s Bank’ stop, with a similar journey time from the town to Wrexham Industrial Estate. However, to access this bus stop will require a 25-minute walk from the site.
- 5.4.4 It is understood that the public transport provision is limited within the vicinity of the proposed development with a 25-minute walk between the site and the nearest bus stop.
- 5.4.5 Given the above, we would like to engage with the public transport officers at WCBC and the local bus operators to discuss how effective improvements to public transport provision can be facilitated. These improvements would need to form part of an overall strategy for improved public transport access to WIE and would need to seek potential contributions from other developers in the area. At the time of writing, we have contacted the public transport officer at WCBC to discuss potential improvements but are yet to receive a response.
- 5.4.6 In respect of rail travel, Wrexham General train station can be reached via the abovementioned bus service with a short, circa 7-minute, walk from Wrexham bus station. The train station provides access to a wider range of locations, with Cardiff Central, Holyhead, Bidston, Birmingham International, Shrewsbury, Chester and Manchester all having services from this station. The station provides 20 CCTV protected bicycle storage spaces with 68 car parking spaces also provided<sup>1</sup>.
- 5.4.7 The North Wales Metro project intends to enhance rail service frequencies across North Wales, with significant improvements to Wrexham’s stations being part of the plans, which should further encourage travel by rail in the area.
- 5.4.8 In summary, both bus and rail services, combined with walking/cycling as part of a multimodal commute are likely to provide a realistic travel option for commuters and visitors to the site at peak times and throughout the day.

<sup>1</sup> <https://www.nationalrail.co.uk/stations/WRX/details.html> accessed 21/03/2023

## 5.5 Travel Plan

- 5.5.1 A Travel Plan has been prepared alongside this TA which outlines the applicant's commitment to encouraging sustainable travel. Various potential measures to help achieve this are suggested in the Travel Plan with perhaps the most important one being the provision of Staff Travel Information Packs containing details of the sustainable travel options available to future employees. These packs will contain walking, cycling and public transport maps detailing the location of key supporting amenities and neighbouring residential areas as well as the travel time to/from them.

## 5.6 Summary

- 5.6.1 This section of the report has demonstrated the site's level of accessibility by sustainable modes, from which it can be concluded that realistic options exist for access to local residential areas and local amenities on foot, by cycle and by public transport.
- 5.6.2 It should be noted, however, that bus access to the site is limited and the applicant is attempting to engage with the public transport officers at WCBC to discuss how effective improvements to public transport provision can be facilitated. These improvements would need to form part of an overall strategy for improved public transport access to WIE and would need to seek potential contributions from other developers in the area.



## 6 TRAFFIC FORECASTING

### 6.1 Introduction

- 6.1.1 This section of the report details the methodology used to predict the demand associated with the development, whilst considering traffic growth and traffic associated with committed developments.
- 6.1.2 An initial suggested scope of assessment was provided to WCBC and MM via email on 9<sup>th</sup> June 2022 (Appendix A), with the main purpose of this to agree the extent of the study area for the junction capacity assessment. An administrative error meant that the response was only provide on 13<sup>th</sup> September 2022, after the associated traffic surveys had taken place, but the response was largely in agreement with the suggested scope. A more detailed Scoping Note has been submitted following the drafting of this TA.

### 6.2 Vehicular Trip Generation

- 6.2.1 The Logistics Study discussed earlier in this report found that trip rates derived from the TRICS database was the most commonly used methodology for traffic generation forecasting. However, an interrogation of the TRICS database found that there was a limited number of sites of a similar size to the development proposals.
- 6.2.2 From further interrogation of the sites within the Scoping Study, it was found that NH had requested the use of hybrid trip rates in assessment submitted to support the now consented Florida Farm scheme in Haydock (St Helens Council Planning ref. P/2016/0608/HYBR), with this proposal comprising 1,453,128sqft of B2/B8 use. The Florida Farm trip rates were a combination of TRICS and the surveyed traffic generation at the Omega North development off junction 8 of the M62, Warrington. The same trip rates were then used in two more applications included in the logistics study, these being a 1,442,000ft<sup>2</sup> B8 development in Wigan (Wigan Council ref. A/18/85947/MAJES) and a 1,224,717ft<sup>2</sup> B8/B2 scheme in Haydock (St Helens council planning ref. P/2017/0254/OUP). Given the acceptance of the use of these hybrid trip rates in support of at least three consented schemes in the North West, it is felt that they are suitable for use in this assessment.
- 6.2.3 It is important to note that these trip rates are robust by virtue of all three above consented developments being located adjacent to busy motorways, while they are also similar to the average of the AM peak and higher than the average of the PM peak trip rates within the Logistics Study. It would seem reasonable to assume that these trip rates will be higher than those of the proposed development which does not sit as close to the SRN and with the A483 not being as heavily trafficked as the M6 or M62, with the former being adjacent to locations that used the hybrid trip rates and the latter being adjacent to where the Omega trip rates were surveyed.

- 6.2.4 A summary of these trip rates and resultant trip generation associated with the proposed 93,019sqm floor area is shown in Table 6.1

**Table 6.1: Proposed Trip Rates and Resultant Trip Generation**

| Time                | Trip Rates   |              |              | Trip Generation |            |             |
|---------------------|--------------|--------------|--------------|-----------------|------------|-------------|
|                     | Arrivals     | Departures   | Total        | Arrivals        | Departures | Total       |
| <b>Lights</b>       |              |              |              |                 |            |             |
| 07:00-08:00         | 0.106        | 0.072        | 0.178        | 99              | 67         | 166         |
| <b>08:00-09:00</b>  | <b>0.072</b> | <b>0.047</b> | <b>0.119</b> | <b>67</b>       | <b>44</b>  | <b>111</b>  |
| 09:00-10:00         | 0.078        | 0.053        | 0.131        | 73              | 49         | 122         |
| 10:00-11:00         | 0.056        | 0.054        | 0.110        | 52              | 50         | 102         |
| 11:00-12:00         | 0.068        | 0.054        | 0.122        | 63              | 50         | 113         |
| 12:00-13:00         | 0.059        | 0.071        | 0.130        | 55              | 66         | 121         |
| 13:00-14:00         | 0.180        | 0.134        | 0.314        | 167             | 125        | 292         |
| 14:00-15:00         | 0.097        | 0.151        | 0.248        | 90              | 140        | 230         |
| 15:00-16:00         | 0.075        | 0.109        | 0.184        | 70              | 101        | 171         |
| 16:00-17:00         | 0.069        | 0.123        | 0.192        | 64              | 114        | 178         |
| <b>17:00-18:00</b>  | <b>0.060</b> | <b>0.088</b> | <b>0.148</b> | <b>56</b>       | <b>82</b>  | <b>138</b>  |
| 18:00-19:00         | 0.040        | 0.066        | 0.106        | 37              | 61         | 98          |
| <b>Daily (12hr)</b> | <b>0.960</b> | <b>1.022</b> | <b>1.982</b> | <b>893</b>      | <b>949</b> | <b>1842</b> |
| <b>Heavies</b>      |              |              |              |                 |            |             |
| 07:00-08:00         | 0.018        | 0.013        | 0.031        | 17              | 12         | 29          |
| <b>08:00-09:00</b>  | <b>0.016</b> | <b>0.017</b> | <b>0.033</b> | <b>15</b>       | <b>16</b>  | <b>31</b>   |
| 09:00-10:00         | 0.020        | 0.023        | 0.043        | 19              | 21         | 40          |
| 10:00-11:00         | 0.023        | 0.021        | 0.044        | 21              | 20         | 41          |
| 11:00-12:00         | 0.027        | 0.026        | 0.053        | 25              | 24         | 49          |
| 12:00-13:00         | 0.022        | 0.024        | 0.046        | 20              | 22         | 42          |
| 13:00-14:00         | 0.029        | 0.020        | 0.049        | 27              | 19         | 46          |
| 14:00-15:00         | 0.029        | 0.027        | 0.056        | 27              | 25         | 52          |
| 15:00-16:00         | 0.027        | 0.022        | 0.049        | 25              | 20         | 45          |
| 16:00-17:00         | 0.023        | 0.019        | 0.042        | 21              | 18         | 39          |
| <b>17:00-18:00</b>  | <b>0.015</b> | <b>0.015</b> | <b>0.030</b> | <b>14</b>       | <b>14</b>  | <b>28</b>   |
| 18:00-19:00         | 0.013        | 0.015        | 0.028        | 12              | 14         | 26          |
| <b>Daily (12hr)</b> | <b>0.262</b> | <b>0.242</b> | <b>0.504</b> | <b>243</b>      | <b>225</b> | <b>468</b>  |

- 6.2.5 To align the peak development trip generation hours with the network peak hours mentioned earlier, 25% (15-minutes) of the 0700-0800 trip generation will be added to 75% (45-minutes) of the 0800-0900 trip generation to derive the AM peak trip generation. For the PM peak trip generation, 50% (30-minutes) of the 1600-1700 will be added 50% of the 1700-1800. The resultant trip generation is shown in Table 6.2.

**Table 6.2: Aligned Peak Hour Trip Generation**

| Peak           | Trip Generation |            |       |
|----------------|-----------------|------------|-------|
|                | Arrivals        | Departures | Total |
| <b>Lights</b>  |                 |            |       |
| AM             | 75              | 50         | 125   |
| PM             | 60              | 98         | 158   |
| <b>Heavies</b> |                 |            |       |
| AM             | 16              | 15         | 31    |
| PM             | 18              | 16         | 34    |
| <b>Total</b>   |                 |            |       |
| AM             | 91              | 65         | 156   |
| PM             | 78              | 114        | 192   |

- 6.2.6 As the above table shows, using this robust methodology, the site is likely to generate in the region of 156 two-way total vehicle trips in the AM peak hour and 192 two-way total vehicle trips in the PM peak hour, of which 31 and 34 are expected to be two-way HGV trips respectively.

### 6.3 Multimodal Trip Generation

- 6.3.1 The number of non-car trips has been forecast using 2011 census Method of Travel to Work (MTW) data for the local mid layer super output (MSOA) area Wrexham 020 (W02000420) as a workplace destination. Factors have been derived by dividing the TRICS car/van trips (total vehicles minus HGVs) by the census equivalent, with these factors (0.0116 AM and 0.0147 PM) applied to the other census travel modes to forecast the site's likely modal split. As HGV (OGV) trips were calculated using TRICS and do not appear in the census data, the TRICS values have been shown, as have the TRICS values for cars/vans. A summary of these multimodal trips is shown in Table 6.3.

**Table 6.3: Forecast Multimodal Person Trips**

| Method                       | Census Trips | Modal Split   | AM Trips      | PM Trips      |
|------------------------------|--------------|---------------|---------------|---------------|
| Driving a car or van         | 10760        | 79.1%         | 125           | 158           |
| Passenger in a car or van    | 1406         | 10.3%         | 16            | 21            |
| Bus, minibus or coach        | 478          | 3.5%          | 6             | 7             |
| On foot                      | 414          | 3.0%          | 5             | 6             |
| Bicycle                      | 307          | 2.3%          | 4             | 5             |
| Motorcycle, scooter or moped | 142          | 1.0%          | 2             | 2             |
| Taxi                         | 58           | 0.4%          | 1             | 1             |
| Train                        | 44           | 0.3%          | 1             | 1             |
| <b>Total travel to work</b>  | <b>13609</b> | <b>100.0%</b> | <b>160</b>    | <b>201</b>    |
| <i>Factors</i>               |              |               | <i>0.0116</i> | <i>0.0147</i> |
| HGVs                         | -            | -             | 31            | 34            |
| <b>Total Trips</b>           | -            | -             | <b>191</b>    | <b>235</b>    |

- 6.3.2 The above suggests that the proposed development will generate 191 and 235 total person trips in the respective AM and PM peak hours. Following driving a car/van being the most popular mode, 31

and 34 will be HGV drivers, 16 and 21 trips will be as car/van passengers, 6 and 7 will be bus passengers, 5 and 6 will travel on foot, 4 and 5 via bicycle, 2 in each peak via motorcycle/scooter and 2 in each peak via train and taxi. It is hoped that the Travel Plan, produced alongside this TA, will help to increase the use of the non-car driver modes.

## 6.4 Traffic Growth

6.4.1 The first forecast year of assessment is 2027, which represents the opening year, while the second forecast year of assessment is 2036, which aligns with other assessments recently undertaken within WIE and allows for an assessment of the opening year plus 11 years.

6.4.2 The 2022 Observed traffic flows (Traffic Flow Diagrams 1 and 2 in Appendix D) have been factored to the 2027 and 2036 assessment years, using the DfT software TEMPro (Trip End Model Presentation Program) version 8. This package allows access to data used in the National Trip End Model (NTEM) and can be used to provide summaries of traffic growth using data from the National Transport Model (NTM) (<https://www.gov.uk/government/collections/tempro>).

6.4.3 In order to derive local traffic growth factors, the 'Wrexham 020' (W02000420) Mid Layer Super Output Area (MSOA) was selected. Trip end growth factors for car drivers were derived for each forecast year from the 2022 base.

6.4.4 As TEMPro is not strictly applicable to heavy vehicles, the DfT's Road Traffic Projections (RTP) have been used to derive factors to consider HGV growth. As the level of growth for HGVs in Wales between 2022 and 2027 is negative with a factor of 0.9971, a factor of 1.00 has been applied instead. A calculated factor of 1.0047 has been applied between 2022 and 2036.

## 6.5 Committed Development

6.5.1 Before applying traffic growth, the traffic generated by committed developments has been considered. We have treated the following recent consents within WIE by FIREM as being committed developments:

- Site 2 - 25,069 sqft B2/B8 (Clywedog Rd N);
- Site 3 - 45,079 sqft B2/B8 (Clywedog Rd E); and
- Site 4 - 35,015 sqft B2 (Clywedog Rd N).

6.5.2 Prime have worked on other schemes within WIE, thus, are also aware of a number of other consented or pending applications. These have also been included as committed developments and are as follows:

- Site 1 (Bridgeway Centre) (P/2022/0065) - 120,000 sqft B2/B8 (Bridge Rd);
- Site 5 - 152,000 sqft B8 (Clwedog Rd S);

- The Oaks (P/2019/0877) - 184,000 sqft B1, B2 and B8 (Oak Rd);
- Net World Sports (P/2020/0167); and
- Land to the east of Bryn Lane (P/2020/0017) - 97,500 sqft B2/B8.

6.5.3 When considering the traffic impact of developments, it is important not to double-count trips. The TEMPro database includes job based planning growth. As the committed development and the development site itself sit within an allocated employment area, it is logical to assume that the job growth in TEMPro somewhat aligns with the number of jobs that the committed developments and the proposed development will generate.

6.5.4 The total floor area of the committed developments is 99,374sqm. Applying a density of 1 job per 77sqm to the total floor area as per the *Employment Densities Guide* (2015) for regional distribution centres (B8), which is conservative given that B2 elements would have a greater density, results in a forecast of almost 1,300 jobs. This figure excludes the proposed development.

6.5.5 The job assumptions in TEMPro for the 'Wrexham 020' MSOA show an increase in 186 jobs between 2022 and 2027 and 637 between 2022 and 2036, as such, the future job forecasts within TEMPro will be adjusted to match the base jobs, effectively removing job growth from the traffic growth factors to reduce double-counting. The household planning assumptions will not be adjusted, with this growth accounting for housing developments in the area. A summary of the TEMPro job assumptions is provided in Table 6.4.

**Table 6.4: TEMPro Default & Alternative Planning Assumptions between 2022-2027 and 2022-2036**

| Forecast Year | Default Assumptions |             |      | Adjusted Assumptions |             |      |
|---------------|---------------------|-------------|------|----------------------|-------------|------|
|               | Base Jobs           | Future Jobs | Diff | Base Jobs            | Future Jobs | Diff |
| 2027          | 16630               | 16816       | 186  | 16228                | 16228       | 0    |
| 2036          | 16228               | 16865       | 637  | 16228                | 16228       | 0    |

6.5.6 The subsequent growth factors derived from the above and the RTP data to be applied to the 2022 Observed traffic flows are shown in Table 6.5.

**Table 6.5: Traffic Growth Factors**

| Source | TEMPro |        | RTP    |
|--------|--------|--------|--------|
|        | AM     | PM     | Both   |
| 2027   | 1.0225 | 1.0225 | 1.0133 |
| 2036   | 1.0432 | 1.0413 | 1.0412 |

6.5.7 The above growth factors have been applied to the 2022 Observed traffic flows forming the 2027 and 2036 Base traffic flows, as shown in Traffic Flow Diagrams 3 and 4 and Traffic Flow Diagrams 5 and 6 respectively.

6.5.8 The traffic associated with the committed developments is shown in Traffic Flow Diagrams 7-22, with the total committed development traffic flows shown in Traffic Flow Diagrams 23 and 24 added to the 2027 and 2036 Base traffic flows, forming the 2027 and 2036 Without Development traffic flows, shown in Traffic Flow Diagrams 25 and 26 and Traffic Flow Diagrams 26 and 27 respectively. All traffic flows are provided in Appendix D.

## 6.6 Trip Distribution

6.6.1 Light vehicle development trips have been distributed across the local highway network using 2011 census MTW data for the local MSOA and web-based route planning software (Google Maps) as per the previous FIREM developments within WIE.

6.6.2 Heavy vehicles have been distributed on the assumption that all will travel to/from the north of the site via Industrial Estate Road. Beyond this point a simple gravity model has been derived using recorded HGV flows on strategic links derived from DfT count data. The following three links have been identified:

- A534 in Holt;
- A483 south of Gresford Interchange; and
- A483 north of Gresford Interchange.

6.6.3 The HGVs have been assigned based on the proportionate HGV flows at the above count sites.

6.6.4 Further details of the distribution calculations are provided in the Scoping Note.

6.6.5 This distribution is shown in Traffic Flow Diagrams 29 and 30, with the distributed employment development traffic shown in Traffic Flow Diagrams 31 and 32 in Appendix D.

6.6.6 The development trips have been added to the 2027 and 2036 Without Development traffic flows, forming the 2027 and 2036 With Development traffic flows shown in Traffic Flow Diagrams 33 and 34 and Traffic Flow Diagrams 35 and 36 respectively. All traffic flows are provided in Appendix D. The impact of the development traffic on the local highway network is considered in detail in the following section.

## 7 TRAFFIC IMPACT ASSESSMENT

### 7.1 Absolute and Percentage Assessment

- 7.1.1 The number of trips that the development is forecast to add to key local junctions in the AM and PM network peaks is summarised in absolute and percentage terms in Tables 7.1 and 7.2.

**Table 7.1: Comparison of Two-way Traffic Flows - 2027 Without Development and 2027 With Development**

| Junction                                                        | 2027 AM Peak |          |          |        | 2027 PM Peak |          |          |        |
|-----------------------------------------------------------------|--------------|----------|----------|--------|--------------|----------|----------|--------|
|                                                                 | Without Dev  | With Dev | Abs Diff | % Diff | Without Dev  | With Dev | Abs Diff | % Diff |
| 1. The Very Group Site Access/Bryn Lane                         | 354          | 510      | 156      | 44.1%  | 440          | 632      | 192      | 43.6%  |
| 2. Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | 2384         | 2515     | 131      | 5.5%   | 2394         | 2554     | 160      | 6.7%   |
| 3. A534/Industrial Estate Road/Sandy Lane/Borras Hall Lane      | 3001         | 3132     | 131      | 4.4%   | 3064         | 3224     | 160      | 5.2%   |
| 4. A534/A5156/A534 Holt Road                                    | 3303         | 3419     | 116      | 3.5%   | 3364         | 3507     | 143      | 4.3%   |
| 5. A5156/Borras Park Road                                       | 3129         | 3231     | 102      | 3.3%   | 3011         | 3138     | 127      | 4.2%   |
| 6. Gresford Interchange                                         | 4081         | 4181     | 100      | 2.5%   | 4179         | 4303     | 124      | 3.0%   |
| 7. A55 Junction 38 Posthouse RB                                 | 6355         | 6383     | 28       | 0.4%   | 6638         | 6673     | 35       | 0.5%   |
| 8. Oak Road/Bryn Lane                                           | 380          | 402      | 22       | 5.8%   | 445          | 474      | 29       | 6.5%   |
| 9. Coed Aben Road/Redwither Road/Bridge Road                    | 816          | 831      | 15       | 1.8%   | 802          | 821      | 19       | 2.4%   |

**Table 7.2: Comparison of Two-way Traffic Flows - 2036 Without Development and 2036 With Development**

| Junction                                                        | 2036 AM Peak |          |          |        | 2036 PM Peak |          |          |        |
|-----------------------------------------------------------------|--------------|----------|----------|--------|--------------|----------|----------|--------|
|                                                                 | Without Dev  | With Dev | Abs Diff | % Diff | Without Dev  | With Dev | Abs Diff | % Diff |
| 1. The Very Group Site Access/Bryn Lane                         | 362          | 518      | 156      | 43.1%  | 448          | 640      | 192      | 42.9%  |
| 2. Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | 2430         | 2561     | 131      | 5.4%   | 2437         | 2597     | 160      | 6.6%   |
| 3. A534/Industrial Estate Road/Sandy Lane/Borras Hall Lane      | 3062         | 3193     | 131      | 4.3%   | 3117         | 3277     | 160      | 5.1%   |
| 4. A534/A5156/A534 Holt Road                                    | 3372         | 3488     | 116      | 3.4%   | 3421         | 3564     | 143      | 4.2%   |
| 5. A5156/Borras Park Road                                       | 3192         | 3294     | 102      | 3.2%   | 3062         | 3189     | 127      | 4.1%   |
| 6. Gresford Interchange                                         | 4160         | 4260     | 100      | 2.4%   | 4254         | 4378     | 124      | 2.9%   |
| 7. A55 Junction 38 Posthouse                                    | 6487         | 6515     | 28       | 0.4%   | 6761         | 6796     | 35       | 0.5%   |
| 8. Oak Road/Bryn Lane                                           | 387          | 409      | 22       | 5.7%   | 452          | 481      | 29       | 6.4%   |
| 9. Coed Aben Road/Redwither Road/Bridge Road                    | 830          | 845      | 15       | 1.8%   | 813          | 832      | 19       | 2.3%   |

- 7.1.2 The greatest increase in traffic as a result of the development is shown to be at the Very Group site access/Bryn Lane junction with the development resulting in 156 and 192 additional two-way trips in

the respective AM and PM peak hours. All traffic associated with the proposed development will have to utilise this junction when travelling to and from the site.

- 7.1.3 The Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way junction and A534/Industrial Estate Road/Sandy Lane/Borras Hall Lane junction will both experience an increase of 131 and 160 additional two-way trips in the respective AM and PM peak hours (4.3-6.7%). The A534/A5156/A534 Holt Road/Services Access, A5156/Borras Park Road/Borras Road and Gresford Interchange junctions will all experience an increase of between 100 and 143 additional two-way trips (2.4-4.3%), while the A55 Junction 38, Oak Road/Bryn Lane and Coed Aben Road/Redwither Road/Bridge Road will all experience an increase of between 15 and 35 additional two-way trips (0.4-6.5%).
- 7.1.4 During scoping discussions for the Site 1 redevelopment, MM requested that capacity assessments be undertaken at junctions where the increase is greater than 5% or 30 two-way trips. As such, capacity assessments have been undertaken at junctions 1-6 and junction 8. In relation to the A55 Junction 38/A483 (Posthouse Roundabout) junction, the increase in trips exceeds the 30 two-way trip threshold in the PM peak. However, given this increase equates to just 0.5%, the large scale and strategic nature of the junction, we find it reasonable to not undertake detailed capacity assessments at this junction as the impact of the development traffic is likely to be negligible and considerably less than the typical daily fluctuation in traffic flow.

## 7.2 Junction Capacity Assessments

- 7.2.1 All assessment junctions, with the exception of Gresford Interchange, have been modelled using the industry standard software Junctions 9, development by TRL Software. This software includes the PICADY module which has been used to model the priority-controlled junctions and the ARCADY module which has been used to model the roundabouts. The Gresford Interchange signalised junction has been modelled using LinSig V3.
- 7.2.2 When interpreting the Junctions 9 results, the capacity of each arm or movement is calculated as the Ratio of Flow to Capacity (RFC) with 0.85 representing the practical capacity threshold of the arm and 1.00 representing the theoretical capacity threshold. It is above the practical capacity threshold where capacity problems may begin to occur while exceeding the theoretical capacity means that arms are over capacity.
- 7.2.3 It should be noted that when the theoretical capacity threshold (RFC=1.00) is exceeded, the algorithms in the software can cause an almost exponential deterioration in performance which is known to be unrealistic, so any RFCs greater than 1.00 and the associated queue lengths should be treated with caution. However, even when the threshold is exceeded, the modelling software remains a suitable tool for impact comparison purposes.
- 7.2.4 Modelled queues are shown in passenger car units (PCUs), this being equivalent to a distance of 5.75m which is the length of road space (car length plus gap length) that a typical car will occupy when



queuing. In order to convert the traffic flows into PCUs, which is the requisite input flow unit required in the modelling software, a factor of 2.0 has been applied to the heavy vehicle user class, while cars effectively have a factor of 1.0. These factors are commonly accepted in transport modelling.

- 7.2.5 When interpreting LinSig results, the capacity of each lane is calculated as a degree of saturation (DoS) with 90% representing the practical capacity threshold of the lane and 100% representing the theoretical capacity threshold. The capacity of the junction as a whole is indicated by the practical reserve capacity (PRC) with negative values indicating that the practical capacity threshold has been exceeded and a PRC less than -10% indicating that a junction is operating above the theoretical capacity threshold. Queues are the mean maximum queue (MMQ) over the hour modelled.
- 7.2.6 The junction geometry has been coded based on a mixture of OS mapping and aerial photography. Where appropriate, some geometries have also been extracted from the models associated with other applications in WIE. Slight adjustments have been made to some of the measured geometry in order to improve the level of model calibration.
- 7.2.7 All model report outputs are included in Appendix E.

#### Traffic Flow Profiles

- 7.2.8 The modelling software allows a variety of flow input methods. The roundabouts were originally modelled using the 'ONE HOUR' option which synthesises a 'peak within a peak' whereby the traffic flows during central 15-minute periods are artificially increased, however this led to a poor degree of calibration on one or more arms of each roundabout, with some arms experiencing long modelled queues where much shorter ones were observed during the traffic surveys or vice versa. The hourly flow profiles of each roundabout to be assessed based on their 15-minute flow subtotals are presented in Table 7.3.

**Table 7.3: Assessment Junction Flow Profiles**

| Time                | Junction 2  |             | Junction 3  |             | Junction 4  |             | Junction 5  |             |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                     | Flow        | %           | Flow        | %           | Flow        | %           | Flow        | %           |
| 0745 - 0800         | 757         | 26.2%       | 814         | 26.7%       | 738         | 27.0%       | 623         | 29.2%       |
| 0800 - 0815         | 746         | 25.8%       | 766         | 25.1%       | 699         | 25.5%       | 512         | 24.0%       |
| 0815 - 0830         | 738         | 25.5%       | 783         | 25.7%       | 697         | 25.5%       | 543         | 25.5%       |
| 0830 - 0845         | 653         | 22.6%       | 686         | 22.5%       | 603         | 22.0%       | 454         | 21.3%       |
| <b>AM Total</b>     | <b>2894</b> | <b>100%</b> | <b>3049</b> | <b>100%</b> | <b>2737</b> | <b>100%</b> | <b>2132</b> | <b>100%</b> |
| <b>AM Variation</b> | <b>104</b>  | <b>3.6%</b> | <b>128</b>  | <b>4.2%</b> | <b>135</b>  | <b>4.9%</b> | <b>169</b>  | <b>7.9%</b> |
| 1630 - 1645         | 754         | 27.3%       | 836         | 27.0%       | 741         | 26.7%       | 568         | 26.7%       |
| 1645 - 1700         | 601         | 21.7%       | 695         | 22.5%       | 625         | 22.5%       | 454         | 21.4%       |
| 1700 - 1715         | 711         | 25.7%       | 784         | 25.4%       | 713         | 25.7%       | 574         | 27.0%       |
| 1715 - 1730         | 698         | 25.3%       | 776         | 25.1%       | 700         | 25.2%       | 529         | 24.9%       |
| <b>PM Total</b>     | <b>2764</b> | <b>100%</b> | <b>3091</b> | <b>100%</b> | <b>2779</b> | <b>100%</b> | <b>2125</b> | <b>100%</b> |
| <b>PM Variation</b> | <b>153</b>  | <b>5.5%</b> | <b>141</b>  | <b>4.6%</b> | <b>116</b>  | <b>4.2%</b> | <b>114</b>  | <b>5.4%</b> |

- 7.2.9 The hourly profiles at each junction are relatively flat or uniform i.e. no or limited sharp peaks/spikes or contrasts in flow and close to equal 25% proportions of the hourly total flow. Given the findings presented in Table 7.3 above, the use of a 'FLAT' profile for the roundabouts numbered junctions 2-5 in Tables 7.1 and 7.2 is appropriate and justified. This also aligns with the FLAT profile used by LinSig. The default ONE HOUR profile has been used in the priority junction models as the level of calibration was reasonable.

Junction 1: The Very Group Site Access/Bryn Lane

- 7.2.10 The results of the model are summarised in Table 7.4.

**Table 7.4: Junction Capacity Assessment Results - The Very Group Site Access/Bryn Lane**

| Arm                                 | AM   |         | PM   |         |
|-------------------------------------|------|---------|------|---------|
|                                     | RFC  | Q (PCU) | RFC  | Q (PCU) |
| <b>Observed 2022</b>                |      |         |      |         |
| The Very Group Site Access Nearside | 0.02 | 0.0     | 0.02 | 0.0     |
| The Very Group Site Access Offside  | 0.03 | 0.1     | 0.02 | 0.0     |
| Bryn Lane (Southern Arm)            | 0.02 | 0.0     | 0.00 | 0.0     |
| <b>2027 Without Development</b>     |      |         |      |         |
| The Very Group Site Access Nearside | 0.03 | 0.0     | 0.03 | 0.0     |
| The Very Group Site Access Offside  | 0.04 | 0.1     | 0.09 | 0.1     |
| Bryn Lane (Southern Arm)            | 0.02 | 0.0     | 0.00 | 0.0     |
| <b>2036 Without Development</b>     |      |         |      |         |
| The Very Group Site Access Nearside | 0.03 | 0.0     | 0.03 | 0.0     |
| The Very Group Site Access Offside  | 0.04 | 0.1     | 0.09 | 0.1     |
| Bryn Lane (Southern Arm)            | 0.02 | 0.0     | 0.00 | 0.0     |
| <b>2027 With Development</b>        |      |         |      |         |
| The Very Group Site Access Nearside | 0.05 | 0.1     | 0.07 | 0.1     |
| The Very Group Site Access Offside  | 0.24 | 0.4     | 0.38 | 0.7     |
| Bryn Lane (Southern Arm)            | 0.04 | 0.0     | 0.02 | 0.0     |
| <b>2036 With Development</b>        |      |         |      |         |
| The Very Group Site Access Nearside | 0.05 | 0.1     | 0.07 | 0.1     |
| The Very Group Site Access Offside  | 0.24 | 0.4     | 0.38 | 0.7     |
| Bryn Lane (Southern Arm)            | 0.04 | 0.0     | 0.02 | 0.0     |

- 7.2.11 The results show that the junction will continue to operate with considerable level of spare capacity with the development in place in 2036, with the highest RFC being 0.38 on the offside of the Very Group site access in the PM peak.

Junction 2: Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way

- 7.2.12 The results of the model are summarised in Table 7.5.

**Table 7.5: Junction Capacity Assessment Results - Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way**

| Arm                             | AM   |         | PM   |         |
|---------------------------------|------|---------|------|---------|
|                                 | RFC  | Q (PCU) | RFC  | Q (PCU) |
| <b>Observed 2022</b>            |      |         |      |         |
| 1 - Bryn Lane                   | 0.21 | 0.3     | 0.25 | 0.4     |
| 2 - Ash Road North              | 0.14 | 0.2     | 0.57 | 1.3     |
| 3 - Abenbury Way                | 0.24 | 0.4     | 0.68 | 2.2     |
| 4 - Industrial Estate Road      | 0.72 | 2.7     | 0.24 | 0.3     |
| <b>2027 Without Development</b> |      |         |      |         |
| 1 - Bryn Lane                   | 0.30 | 0.5     | 0.33 | 0.5     |
| 2 - Ash Road North              | 0.15 | 0.3     | 0.62 | 1.6     |
| 3 - Abenbury Way                | 0.30 | 0.5     | 0.84 | 5.5     |
| 4 - Industrial Estate Road      | 0.80 | 4.3     | 0.28 | 0.4     |
| <b>2036 Without Development</b> |      |         |      |         |
| 1 - Bryn Lane                   | 0.31 | 0.6     | 0.34 | 0.6     |
| 2 - Ash Road North              | 0.16 | 0.3     | 0.63 | 1.7     |
| 3 - Abenbury Way                | 0.30 | 0.6     | 0.87 | 6.9     |
| 4 - Industrial Estate Road      | 0.82 | 4.8     | 0.29 | 0.5     |
| <b>2027 With Development</b>    |      |         |      |         |
| 1 - Bryn Lane                   | 0.39 | 0.8     | 0.41 | 0.8     |
| 2 - Ash Road North              | 0.16 | 0.3     | 0.65 | 1.9     |
| 3 - Abenbury Way                | 0.31 | 0.6     | 0.92 | 10.6    |
| 4 - Industrial Estate Road      | 0.84 | 5.7     | 0.32 | 0.5     |
| <b>2036 With Development</b>    |      |         |      |         |
| 1 - Bryn Lane                   | 0.41 | 0.8     | 0.42 | 0.8     |
| 2 - Ash Road North              | 0.16 | 0.3     | 0.66 | 2.0     |
| 3 - Abenbury Way                | 0.31 | 0.6     | 0.96 | 15.9    |
| 4 - Industrial Estate Road      | 0.86 | 6.4     | 0.33 | 0.6     |

- 7.2.13 The results show that Industrial Estate Road will operate slightly above practical capacity (0.85) in the AM peak in 2036, with an RFC of 0.86, with the development in place.
- 7.2.14 In the PM peak, the Abenbury Way arm is shown to operate over the practical capacity threshold, however, manual adjustment has been made on the Abenbury Way arm in order to achieve a greater level of calibration with the observed queues shown in Traffic Flow Diagrams 1 and 2 in Appendix D. From considering the 2022 Observed flows in the Traffic Flow Diagrams, it would appear that the offside flare is underutilised given the low second and third exit flows compared to the much higher first exit flows. From review of the queue lengths, it appears that only the nearside lane is regularly used for this movement despite the first exit having two lanes. In order to better reflect this and improve the level of calibration, this arm has been modelled as a single lane, taking the modelled queues more in line with the observed queues.
- 7.2.15 A potential improvement could consist of a simple lining and signing scheme to allow and encourage the first exit to be used by both approach lanes on Abenbury Way. An initial test of this suggests that the Abenbury Way arm would operate below the practical capacity threshold.

Junction 3: A534/Industrial Estate Road/Sandy Lane/Borras Hall Lane

7.2.16 The results of the model are summarised in Table 7.6.

**Table 7.6: Junction Capacity Assessment Results - A534/Industrial Estate Road/Sandy Lane/Borras Hall Lane**

| Arm                             | AM   |         | PM   |         |
|---------------------------------|------|---------|------|---------|
|                                 | RFC  | Q (PCU) | RFC  | Q (PCU) |
| <b>Observed 2022</b>            |      |         |      |         |
| 1 - Borras Hall Lane            | 0.13 | 0.2     | 0.02 | 0.0     |
| 2 - Wrexham Road                | 0.69 | 2.3     | 0.36 | 0.6     |
| 3 - Industrial Estate Road      | 0.24 | 0.4     | 0.71 | 2.5     |
| 4 - Sandy Lane                  | 0.03 | 0.1     | 0.06 | 0.1     |
| 5 - A534                        | 0.76 | 3.3     | 0.33 | 0.5     |
| <b>2027 Without Development</b> |      |         |      |         |
| 1 - Borras Hall Lane            | 0.18 | 0.2     | 0.02 | 0.0     |
| 2 - Wrexham Road                | 0.81 | 4.4     | 0.39 | 0.7     |
| 3 - Industrial Estate Road      | 0.29 | 0.5     | 0.80 | 4.2     |
| 4 - Sandy Lane                  | 0.03 | 0.1     | 0.07 | 0.1     |
| 5 - A534                        | 0.83 | 5.3     | 0.37 | 0.7     |
| <b>2036 Without Development</b> |      |         |      |         |
| 1 - Borras Hall Lane            | 0.19 | 0.2     | 0.02 | 0.0     |
| 2 - Wrexham Road                | 0.85 | 5.7     | 0.40 | 0.7     |
| 3 - Industrial Estate Road      | 0.30 | 0.5     | 0.82 | 4.6     |
| 4 - Sandy Lane                  | 0.03 | 0.1     | 0.07 | 0.1     |
| 5 - A534                        | 0.85 | 6.0     | 0.38 | 0.7     |
| <b>2027 With Development</b>    |      |         |      |         |
| 1 - Borras Hall Lane            | 0.21 | 0.3     | 0.03 | 0.0     |
| 2 - Wrexham Road                | 0.88 | 7.1     | 0.40 | 0.7     |
| 3 - Industrial Estate Road      | 0.33 | 0.6     | 0.85 | 6.0     |
| 4 - Sandy Lane                  | 0.03 | 0.1     | 0.08 | 0.1     |
| 5 - A534                        | 0.87 | 7.0     | 0.41 | 0.8     |
| <b>2036 With Development</b>    |      |         |      |         |
| 1 - Borras Hall Lane            | 0.22 | 0.3     | 0.03 | 0.0     |
| 2 - Wrexham Road                | 0.92 | 10.7    | 0.41 | 0.7     |
| 3 - Industrial Estate Road      | 0.33 | 0.6     | 0.87 | 6.8     |
| 4 - Sandy Lane                  | 0.04 | 0.1     | 0.09 | 0.1     |
| 5 - A534                        | 0.89 | 8.3     | 0.42 | 0.8     |

7.2.17 The results show that Wrexham Road (west) and the A534 (east) arms are forecast to operate at the practical capacity threshold (0.85) in the AM peak in 2036 without the development and the Industrial Estate Road will operate just below it in the PM peak in 2036. The development traffic in 2036 is forecast to increase the RFCs by 0.07, 0.04 and 0.05 in these arms respectively, which is notably less than respective increases of 0.16, 0.09 and 0.11 associated with the traffic growth between 2022 and 2036. All other arms are forecast to operate below the practical capacity with the development in place. The theoretical capacity is not exceeded with the development in place.

Junction 4: A534/A5156/A534 Holt Road

7.2.18 The results of the model are summarised in Table 7.7.

**Table 7.7: Junction Capacity Assessment Results - A534/A5156/A534 Holt Road**

| Arm                             | AM   |         | PM   |         |
|---------------------------------|------|---------|------|---------|
|                                 | RFC  | Q (PCU) | RFC  | Q (PCU) |
| <b>Observed 2022</b>            |      |         |      |         |
| 1 - Services Access             | 0.33 | 0.6     | 0.17 | 0.2     |
| 2 - A534                        | 0.30 | 0.5     | 0.70 | 2.4     |
| 3 - Stryt Holt                  | 0.44 | 0.8     | 0.44 | 0.8     |
| 4 - A5156                       | 0.73 | 2.9     | 0.34 | 0.5     |
| <b>2027 Without Development</b> |      |         |      |         |
| 1 - Services Access             | 0.40 | 0.8     | 0.18 | 0.2     |
| 2 - A534                        | 0.34 | 0.6     | 0.78 | 3.7     |
| 3 - Stryt Holt                  | 0.48 | 0.9     | 0.50 | 1.0     |
| 4 - A5156                       | 0.80 | 4.3     | 0.38 | 0.7     |
| <b>2036 Without Development</b> |      |         |      |         |
| 1 - Services Access             | 0.44 | 0.9     | 0.19 | 0.2     |
| 2 - A534                        | 0.35 | 0.7     | 0.80 | 4.0     |
| 3 - Stryt Holt                  | 0.49 | 1.0     | 0.51 | 1.1     |
| 4 - A5156                       | 0.82 | 4.9     | 0.39 | 0.7     |
| <b>2027 With Development</b>    |      |         |      |         |
| 1 - Services Access             | 0.44 | 0.9     | 0.19 | 0.2     |
| 2 - A534                        | 0.37 | 0.7     | 0.82 | 4.9     |
| 3 - Stryt Holt                  | 0.49 | 1.0     | 0.53 | 1.1     |
| 4 - A5156                       | 0.83 | 5.4     | 0.41 | 0.8     |
| <b>2036 With Development</b>    |      |         |      |         |
| 1 - Services Access             | 0.48 | 1.1     | 0.19 | 0.3     |
| 2 - A534                        | 0.38 | 0.8     | 0.84 | 5.4     |
| 3 - Stryt Holt                  | 0.51 | 1.1     | 0.54 | 1.2     |
| 4 - A5156                       | 0.85 | 6.2     | 0.42 | 0.8     |

7.2.19 The results show that the A5156 will operate at practical capacity (0.85) in the AM peak in 2036 with the development in place. The other three arms in the AM peak, and all arms in the PM peak will operate below the practical capacity threshold.

Junction 5: A5156/Borras Park Road

7.2.20 The results of the model are summarised in Table 7.8.

**Table 7.8: Junction Capacity Assessment Results - A5156/Borras Park Road**

| Arm                             | AM   |         | PM   |         |
|---------------------------------|------|---------|------|---------|
|                                 | RFC  | Q (PCU) | RFC  | Q (PCU) |
| <b>Observed 2022</b>            |      |         |      |         |
| 1 - Borras Road                 | 0.17 | 0.2     | 0.05 | 0.1     |
| 2 - A5156 (Eastern Arm)         | 0.39 | 0.8     | 0.72 | 2.7     |
| 3 - Borras Park Road            | 0.43 | 0.7     | 0.45 | 0.8     |
| 4 - A5156 (Western Arm)         | 0.87 | 7.3     | 0.48 | 1.0     |
| <b>2027 Without Development</b> |      |         |      |         |
| 1 - Borras Road                 | 0.34 | 0.6     | 0.06 | 0.1     |
| 2 - A5156 (Eastern Arm)         | 0.44 | 0.9     | 0.80 | 4.3     |
| 3 - Borras Park Road            | 0.48 | 0.9     | 0.59 | 1.4     |
| 4 - A5156 (Western Arm)         | 0.95 | 20.0    | 0.53 | 1.2     |
| <b>2036 Without Development</b> |      |         |      |         |
| 1 - Borras Road                 | 0.45 | 0.8     | 0.06 | 0.1     |
| 2 - A5156 (Eastern Arm)         | 0.45 | 1.0     | 0.82 | 4.7     |
| 3 - Borras Park Road            | 0.50 | 1.0     | 0.63 | 1.7     |
| 4 - A5156 (Western Arm)         | 0.97 | 30.3    | 0.54 | 1.2     |
| <b>2027 With Development</b>    |      |         |      |         |
| 1 - Borras Road                 | 0.54 | 1.2     | 0.06 | 0.1     |
| 2 - A5156 (Eastern Arm)         | 0.47 | 1.1     | 0.85 | 5.8     |
| 3 - Borras Park Road            | 0.50 | 1.0     | 0.71 | 2.4     |
| 4 - A5156 (Western Arm)         | 0.99 | 44.4    | 0.56 | 1.4     |
| <b>2036 With Development</b>    |      |         |      |         |
| 1 - Borras Road                 | 0.68 | 1.9     | 0.06 | 0.1     |
| 2 - A5156 (Eastern Arm)         | 0.48 | 1.1     | 0.86 | 6.6     |
| 3 - Borras Park Road            | 0.52 | 1.1     | 0.76 | 3.1     |
| 4 - A5156 (Western Arm)         | 1.01 | 78.3    | 0.57 | 1.4     |

- 7.2.21 The results show that the A5156 western arm in the AM peak is expected to operate slightly below theoretical capacity (1.00) in 2036 without the development in place. However, it is important to note that the level of calibration on this arm is limited, with a modelled queue of 7.3 PCUs and an observed queue of zero, meaning that the associated modelled RFC value is likely to be higher than the associated performance in reality. We have attempted to adjust the geometry to reduce the modelled queue length on this arm, however due to a quirk in the software, the Borras Road arm would experience an unrealistically high level of RFC and queue increase.
- 7.2.22 Whilst the calibration is limited, the model still serves as a suitable tool for quantifying impact. The development traffic is forecast to increase the RFCs on the A5156 arms by up to 0.03 and 0.04, however the traffic growth increases the RFCs on these arms by up to 0.28 and 0.10. Greater increases are forecast to occur on the Borras Road and Borras Park Road arms but they are forecast to operate with spare capacity.

Junction 6: Gresford Interchange

- 7.2.23 A summary of the PRC and delay is provided in Table 7.9 with the full lane-by-lane results provided in Appendix E. The model has been constructed using the traffic signal controller specs obtained from WCBC.
- 7.2.24 The modelled cyletimes are based on an average of the signal cycles recorded during the 2022 traffic surveys as shown in Appendix F. The average AM peak cycletime was 54 seconds, ranging from 46 to 66 seconds. The average PM peak cycletime was 63 seconds, ranging from 46 to 75 seconds. This variation in cycletimes is associated with optimised vehicle actuation whereby the signal controlled assigns greentime based on real time traffic flow feedback from detector loops.
- 7.2.25 Video footage undertaken at the time of the traffic surveys has been used to aid model calibration, particularly in terms of lane choice.

**Table 7.9: Junction Capacity Assessment Results - Gresford Interchange**

| Item                            | AM Peak | PM Peak |
|---------------------------------|---------|---------|
| <b>2022 Observed</b>            |         |         |
| PRC (%)                         | 0.5     | 12.3    |
| Delay (pcuHr)                   | 56.46   | 50.72   |
| <b>2027 Without Development</b> |         |         |
| PRC (%)                         | -6.5    | 7.5     |
| Delay (pcuHr)                   | 70.78   | 58.81   |
| <b>2036 Without Development</b> |         |         |
| PRC (%)                         | -8.6    | 5.4     |
| Delay (pcuHr)                   | 79.24   | 61.85   |
| <b>2027 With Development</b>    |         |         |
| PRC (%)                         | -9.5    | 2.1     |
| Delay (pcuHr)                   | 82.87   | 63.89   |
| <b>2036 With Development</b>    |         |         |
| PRC (%)                         | -11.8   | 0.4     |
| Delay (pcuHr)                   | 95.50   | 67.61   |

- 7.2.26 The junction is forecast to operate close to the theoretical capacity threshold (PRC = -10%) in the AM peak in 2036 without the development in place. The traffic growth and the committed developments result in a greater impact than the development proposals, reducing the PRC in the AM peak by 7.0% at 2027 and 9.1% at 2036, compared to the 3.0% and 3.2% of the development traffic respectively. We have however assessed a longer 63 second cycletime in line with the observed PM peak cycletime. Applying a 63 second cycletime results in a PRC of -8.7% which is comparable with the 2036 Without Development performance using the observed cycletimes. The signal controller is likely to reassign greentime as traffic flows increase.
- 7.2.27 The junction is forecast to operate with spare capacity in all scenarios in the PM peak, however it is the traffic growth and background traffic that has a greater impact, reducing the PRC by 4.8% at 2027

and 6.9% at 2036, whereas the equivalent PRC reductions caused by the development traffic are 5.4% and 5.0% in the respective forecast years.

- 7.2.28 It can be concluded that the impact of the development traffic is minimal and mitigation associated with the development proposals should not be required.

Junction 8: Oak Road/Bryn Lane

- 7.2.29 The results of the model are summarised in Table 7.10.

**Table 7.10: Junction Capacity Assessment Results - Oak Road/Bryn Lane**

| Arm                             | AM   |         | PM   |         |
|---------------------------------|------|---------|------|---------|
|                                 | RFC  | Q (PCU) | RFC  | Q (PCU) |
| <b>Observed 2022</b>            |      |         |      |         |
| Bryn Lane Nearside              | 0.12 | 0.1     | 0.10 | 0.1     |
| Bryn Lane Offside               | 0.16 | 0.2     | 0.17 | 0.2     |
| Oak Road (Eastern Arm)          | 0.08 | 0.1     | 0.11 | 0.1     |
| <b>2027 Without Development</b> |      |         |      |         |
| Bryn Lane Nearside              | 0.13 | 0.2     | 0.11 | 0.1     |
| Bryn Lane Offside               | 0.24 | 0.4     | 0.23 | 0.3     |
| Oak Road (Eastern Arm)          | 0.08 | 0.1     | 0.12 | 0.1     |
| <b>2036 Without Development</b> |      |         |      |         |
| Bryn Lane Nearside              | 0.14 | 0.2     | 0.12 | 0.1     |
| Bryn Lane Offside               | 0.24 | 0.4     | 0.23 | 0.3     |
| Oak Road (Eastern Arm)          | 0.09 | 0.1     | 0.12 | 0.1     |
| <b>2027 With Development</b>    |      |         |      |         |
| Bryn Lane Nearside              | 0.14 | 0.2     | 0.13 | 0.1     |
| Bryn Lane Offside               | 0.25 | 0.4     | 0.26 | 0.4     |
| Oak Road (Eastern Arm)          | 0.09 | 0.1     | 0.13 | 0.1     |
| <b>2036 With Development</b>    |      |         |      |         |
| Bryn Lane Nearside              | 0.14 | 0.2     | 0.13 | 0.2     |
| Bryn Lane Offside               | 0.26 | 0.4     | 0.27 | 0.4     |
| Oak Road (Eastern Arm)          | 0.09 | 0.1     | 0.13 | 0.2     |

- 7.2.30 The results show that the junction will continue to operate with considerable level of spare capacity with the development in place in 2036, with the highest RFC being 0.27 on the offside of Bryn Lane in the PM peak.

Proposed Site Access

- 7.2.31 The results of the model are summarised in Table 7.11.



**Table 7.11: Junction Capacity Assessment Results – Proposed Site Access**

| Movement                                 | AM   |         | PM   |         |
|------------------------------------------|------|---------|------|---------|
|                                          | RFC  | Q (PCU) | RFC  | Q (PCU) |
| <b>2027 With Development</b>             |      |         |      |         |
| Proposed Site Access                     | 0.21 | 0.3     | 0.34 | 0.6     |
| The Very Group Access Road (Eastern Arm) | 0.00 | 0.0     | 0.00 | 0.0     |
| <b>2036 With Development</b>             |      |         |      |         |
| Proposed Site Access                     | 0.21 | 0.3     | 0.34 | 0.6     |
| The Very Group Access Road (Eastern Arm) | 0.00 | 0.0     | 0.00 | 0.0     |

- 7.2.32 The results show that the proposed site access is expected to operate with a considerable level of spare capacity, with the highest RFC being 0.34 in the PM peak. It is important to note that all development traffic will be entering/exiting the site from/to Bryn Lane to the west.

### 7.3 Impact on CWaCC Network

- 7.3.1 During scoping discussions, CWaCC Highways expressed potential concern regarding increase in HGVs and staff trips on the A534, A41 roundabout and B5130 past Farndon.
- 7.3.2 With reference to Traffic Flow Diagrams 31 and 32 in Appendix D, just 10 two-way (6 lights and 4 heavies) are forecast to travel via the A534 east of WIE at the Sandy Lane/Borras Hall Lane roundabout, with the equivalent figure in the PM also being 10 two-way trips (8 lights and 2 heavies). The majority of the light vehicle trips will be to Holt and Farndon with the heavy vehicle trips continuing to/from parts of Cheshire.
- 7.3.3 3 two-way light vehicles in each peak are forecast to travel on the A534 via Ridley Wood Lane. These also include trips to Holt and Farndon as well as parts of Chester and Cheshire.
- 7.3.4 Collectively, these figures equate to 13 trips in each peak hour, with many leaving/joining the A534 at Holt, Farndon and Broxton.
- 7.3.5 The impact on this section of CWaCC's network will therefore be negligible.

### 7.4 Impact on B5310 (Ridleywood and Isycoed)

- 7.4.1 The applicant is aware of local concerns regarding the use of the B5130 with Ridley Wood Road and/or Oak Road as a shortcut. We do not anticipate many HGV drivers associated with the development choosing to travel this way, and as landlord, FIREM will have the ability to discourage their tenants from travelling via this route. Whilst it is not the applicant's responsibility to address existing issues, they are willing to work with the local highway authority to consider other measures to discourage use of this route, such as traffic regulation orders, traffic calming measures and/or improved signage.

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## 8 SUMMARY AND CONCLUSION

### 8.1 Summary

- 8.1.1 This TA has been produced by Prime to consider the highways and transportation implications associated with a proposal by FIREM for the development of a 93,019 sqm (1,001,250 sqft) of B8 logistics use on land adjacent to Bryn Lane in Wrexham Industrial Estate (WIE). The scheme will consist of 3 separate units.
- 8.1.2 This document has been prepared in accordance with *Planning Policy Wales* and *Technical Advice Note 18: Transport* as well as a number of local policy documents. It considers the accessibility of the site and safety for all modes of travel from the private car to more sustainable modes such as walking, cycling and public transport.
- 8.1.3 A review of personal injury accidents that have occurred on the local highway network has been undertaken for the most recent five-year period. An analysis of those accidents showed that there does not appear to be a proliferation of accidents at any one location suggesting that highway safety is not an issue that would preclude the development of the site.
- 8.1.4 The main vehicular access to the site will be facilitated via a priority controlled junction from the access road to the Very Group site. This is a private road for which the applicant has rights of access. This road provides an access onto the main road network at an advanced ghost island right turn priority controlled junction on Bryn Lane. This route also provides the main pedestrian/cycle access to the proposed development.
- 8.1.5 Car parking for Units 1 and 2 and cycle parking for all the units are to be provided in accordance with WCBC's parking standards. Car parking for Unit 3 will be provided in line with other large scale B8 schemes across the UK.
- 8.1.6 An assessment has been undertaken of the site's level of accessibility by sustainable modes, from which it can be concluded that realistic options exist for access to local residential areas and local amenities on foot, by cycle and by public transport. However, it should be noted that bus access to the site is limited and the applicant is prepared to engage with the public transport officers at WCBC and the local bus operators to discuss how effective improvements to public transport provision can be facilitated. These improvements would need to form part of an overall strategy for improved public transport access to WIE and would need to seek potential contributions from other developers in the area.
- 8.1.7 An assessment of the capacity of the proposed site access has been undertaken this confirming that the access will have ample capacity to accommodate the predicted traffic flows in 2036 with the development in place.

- 8.1.8 The development traffic will also have a negligible to minor impact on the surrounding highway network.

## 8.2 Conclusion

- 8.2.1 This report and the associated appendices conclude that that there are no highway safety concerns that would preclude the delivery of the development proposals, the site is accessible by a variety of modes of transport, an appropriate level of car and cycle parking will be provided, and that the development would have a negligible to minor impact on the operation of the surrounding highway network.
- 8.2.2 As the proposal complies with local and national planning policy and guidance with respect to sustainable accessibility, safety and impact on the highway network, there are no highways or transportation related reasons why planning permission should not be granted. Should the highway authority have any concerns, we are happy to consult further with them.

## APPENDIX A

### SCOPING CORRESPONDENCE

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## David Stoddart

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**From:** Casey.Dunn@gov.wales  
**Sent:** 29 November 2022 18:37  
**To:** David Stoddart; NorthandMidWalesDevelopmentControlMailbox@gov.wales  
**Subject:** RE: Highways Pre-application Request - Wrexham Logistics Development

Good afternoon David

Thank you for providing opportunity to comment on the scoping report. I am content with the approach proposed, however as the Welsh Government is aware that Junction 6 of the A483 may be approaching capacity, would request that a capacity assessment is carried out. I appreciate the additional movements would result in an increase of less than 5% of the existing vehicle movements, but believe you need to demonstrate the impact the development will have on the operation of the junction.

Regards

**Casey Dunn**

Is-adran Rheoli'r Rhwydwaith - Network Management Division  
Trafnidiaeth - Transport  
Seilwaith yr Economi - Economic Infrastructure  
Llywodraeth Cymru - Welsh Government  
Sarn Mynach  
Llandudno Junction  
LL31 9RZ

Ffôn - Phone 0300 062 5616  
Symudol - Mobile 07896 302504

---

**From:** David Stoddart <D.Stoddart@primetp.co.uk>  
**Sent:** 08 November 2022 17:37  
**To:** North and Mid Wales Development Control Mailbox  
<NorthandMidWalesDevelopmentControlMailbox@gov.wales>  
**Subject:** Highways Pre-application Request - Wrexham Logistics Development

Good Afternoon,

I would like to seek the pre-application advice of your highway officers regarding a major logistics development off Bryn Lane in Wrexham Industrial Estate. The development will add traffic to the A483.

We are the transport consultant working on behalf of the applicant.

The attached Highways Scoping Chapter provides further details on the scheme and our proposed scope of assessment.

The applicant intends to submit the application for the formal DMO process, so you may be formally consulted on this before you can respond to this request.

Feel free to contact me for any additional information. I am happy to discuss the proposals over the phone/Teams or in person.

Kind regards

David

**David Stoddart**  
Associate Director

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## David Stoddart

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**From:** Laverick, Benjamin <Benjamin.Laverick@nationalhighways.co.uk>  
**Sent:** 09 November 2022 10:15  
**To:** David Stoddart  
**Subject:** FW: SJ391507 - P21066 A hybrid planning application for a logistics development on land east of Bryn Lane k in Wrexham Industrial Estate - ID:7707 - Reply by 29.11.2022  
**Attachments:** Highways Scoping Chapter - Kingsmoor, Wrexham Industrial Estate.pdf  
**Follow Up Flag:** Follow up  
**Flag Status:** Completed

Hello Dave,

Thanks for sending through the scoping note for the proposed logistics site at Wrexham Industrial Estate.

I am content with the scoping note and have nothing to add at this stage, noting the proposed numbers of movements at the Posthouse Roundabout. However, if this number were to rise then we may need you to look at the junction in more detail.

Kind regards

Ben

**Benjamin Laverick, Assistant Spatial Planner**  
Operations North West Spatial Planning Team  
National Highways | Atlantic House | Birchwood Boulevard | Warrington | WA3 7WE  
Web: <https://nationalhighways.co.uk/>

For information and guidance on planning and the Strategic Road Network in England please visit:

<https://nationalhighways.co.uk/our-work/planning-and-the-strategic-road-network-in-england/>

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**From:** David Stoddart <[D.Stoddart@primetp.co.uk](mailto:D.Stoddart@primetp.co.uk)>  
**Sent:** 08 November 2022 17:44  
**To:** Planning NW <[planningNW@highwaysengland.co.uk](mailto:planningNW@highwaysengland.co.uk)>  
**Subject:** Pre-application Request - Major Logistics Development: Wrexham

Good afternoon,

My client will soon be submitting a hybrid application for a major logistics development in Wrexham Industrial Estate. The scheme will add a small amount of traffic to the A55 at the Posthouse Roundabout. We do not envisage a need to undertake a detailed capacity assessment at the junction but we have surveyed it and we will present the number of trips forecast to be added to it in our assessment (circa 30 two-way).

I just wanted to make your team aware of the proposal should you have any comments or concerns at this stage. Attached is our scoping note which provides details of the scheme. This has been provided to Wrexham County Borough Council and Welsh Government. We will also provide it to Cheshire West and Chester Council.

Kind regards

Dave

**David Stoddart**  
Associate Director

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## David Stoddart

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**From:** PARRY, Paul <Paul.Parry@cheshirewestandchester.gov.uk>  
**Sent:** 09 November 2022 09:40  
**To:** David Stoddart  
**Subject:** RE: Major Logistics Development - Wrexham

**Follow Up Flag:** Follow up  
**Flag Status:** Completed

Hi David

The Posthouse Roundabout itself is National Highways. CWaC's responsibility is from the northern side the roundabout heading in to Chester.

I note there is no commentary on the length of A534 in CWAC and then the A41 roundabout with the A534 or B5130 past Farndon, as I'd expect all those will see impacts on them from HGVs and/or staff.

Regards

Paul

**Paul Parry IEng FIHE**  
Principal Development Officer - Team Leader, Highways Development Management  
Cheshire West and Chester Council

**Tel:** 01244 976136

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**From:** David Stoddart <D.Stoddart@primetp.co.uk>  
**Sent:** 08 November 2022 17:48  
**To:** PARRY, Paul <Paul.Parry@cheshirewestandchester.gov.uk>  
**Subject:** Major Logistics Development - Wrexham

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Hi Paul,

I hope you are keeping well. We are currently providing highways support for a major logistics scheme in Wrexham Industrial Estate. I appreciate it is over the boarder but it will add a small amount of traffic to your network at the Posthouse Roundabout (circa 30 trips) so I just wanted to make you aware of the proposals out of courtesy. The attached scoping note provides further details of the scheme and our suggested scope of assessment.

Happy to take on board any comments you may have at this stage.

Kind regards

Dave

**David Stoddart**  
Associate Director

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## 1 BACKGROUND

### 1.1 Introduction

1.1.1 This is a pre-application document produced to solicit a response from the various technical departments within Wrexham County Borough Council (WCBC) and/or their consultant Mott MacDonald (MM) on their behalf, to support a hybrid planning application for a logistics development on land east of Bryn Lane, known as Kingmoor Park in Wrexham Industrial Estate (WIE).

1.1.2 As the proposed development will add traffic to the A483 and A55, the Scoping Note will also be issued to Welsh Government (WG), National Highways (NH) and Cheshire West and Chester Council (CWaCC) for their pre-application input.

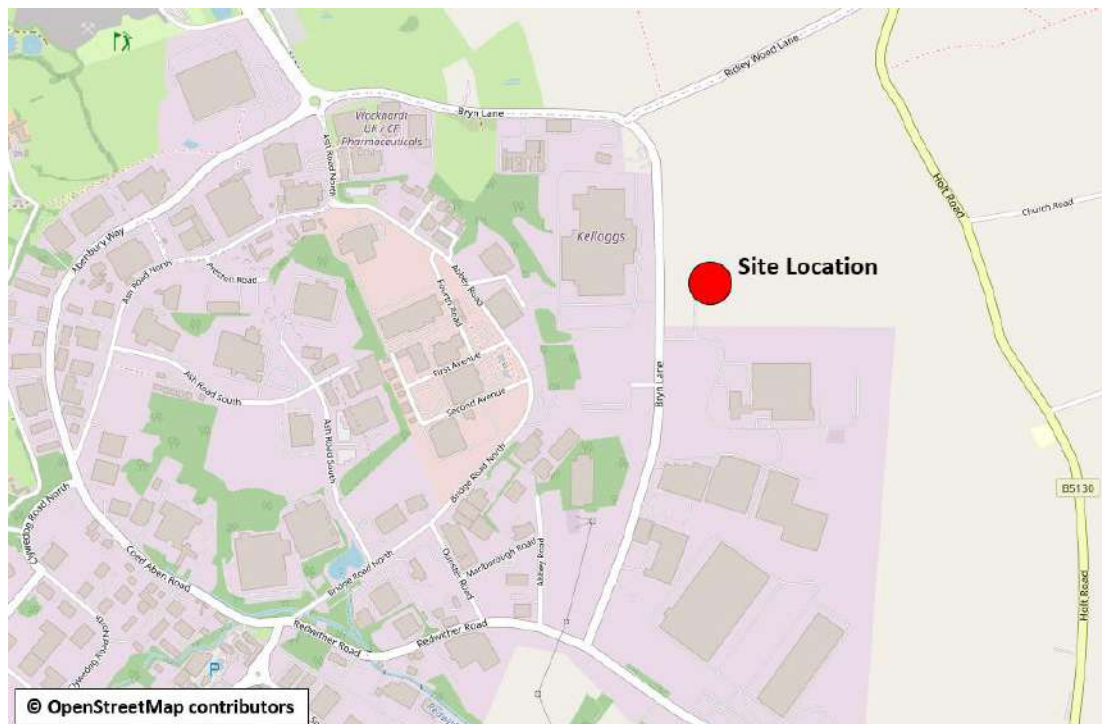
1.1.3 Permission is sought for a:

*Hybrid planning application for detailed and outline planning permission for employment development with ancillary offices for Use Class B8; detailed elements to comprise: revised and upgraded access off existing access into site off Bryn Lane, new circulation roads, drainage infrastructure, ecology mitigation, landscaping and ancillary development and infrastructure; outline elements to comprise: new employment units (up to 3 units) comprising in total up to 93,019 sqm GIA (1,001,250 sqft GIA) of floorspace for Use Class B8, related servicing/service yards with HGV parking and car parking and ancillary development and infrastructure.*

1.1.4 Whilst outline planning permission is sought for the buildings themselves, the indicative arrangement currently under considerations consists of three units of the following floor area and parking provision:

- Unit 1: 19,335 sqm (208,125 sqft), 175 parking spaces and 22 HGV loading bays;
- Unit 2: 21,425 sqm (230,625 sqft), 183 parking spaces; and 22 HGV loading bays; and
- Unit 3: 52,257 sqm (562,500 sqft), 296 parking spaces and 26 loading bays.

1.1.5 A site location plan is provided as Image 1.1 and an indicative proposed site layout is provided in Appendix I.

**Image 1.1: Site Location Plan**

- 1.1.6 Given the size and location of the proposed development, it is envisaged that a Transport Assessment (TA) and Travel Plan (TP) will be required as the main documents that will need to be submitted to support this scheme through the planning process.
- 1.1.7 Outlined below are the Chapters we intend to include within the TA and TP and the content of those Chapters. Where possible within this document, we will provide as much detail as possible with regards to the scheme proposals, obviously these may be subject to change as the scheme evolves through the consultation and feedback processes. We also intend to provide as much detail as possible with regards to the methodology to be adopted in the TA.
- 1.1.8 This is very much an initial review of the requirements of the TA/TP and feedback from the highway officers at the various authorities welcomed. A separate EIA scoping request has been issued to WCBC.

## 1.2 Logistics Study

- 1.2.1 Prime has undertaken a study into recent large scale logistics developments in the UK to inform this application and other future applications by FIREM across the country. A copy of this study is provided in Appendix II. The focus of the study was to consider typical levels of parking provision and trip generation for such developments and will be referenced where appropriate.

## 2 TRANSPORT ASSESSMENT

### 2.1 Introduction to the Transport Assessment

- 2.1.1 The Introduction to the TA will describe the purpose of the TA and set out the areas that the remaining Chapters will cover.

### 2.2 Transport Policy and Guidance

- 2.2.1 This Chapter will provide a description of the national and local policies that are relevant to the proposed development. Policies described in detail will include:

- Planning Policy Wales;
- Technical Advice Note 18: Transport;
- North Wales Joint Local Transport Plan 2015;
- Wrexham Unitary Development Plan (1996-2011);
- Wrexham Local Development Plan 2 (2013-2028);
- Local Planning Guidance Note 16 - Parking Standards;
- Wrexham Connected: Our Sustainable Urban Mobility Plan 2016; and
- WebTAG Unit M1.2 Data Sources and Surveys (2013);
- The Strategic Road Network Planning for the Future (2015); and
- Design Manual for Roads and Bridges (DMRB) (various dates) – relevant road layout sections will be referenced depending on form of access junction and any off-site junction mitigation.

- 2.2.2 Guidance from WCBC is required as whether any other national or local policies need to be reviewed.

### 2.3 Existing Situation

#### Site Description

- 2.3.1 This section will describe the location of WIE, the location of the site within WIE and provide a description of the setting of the application site within WIE.

#### Local Highway Network

- 2.3.2 The section will provide a detailed description of the road network in the vicinity of the site. This will include details of the roads on the approach to and surrounding the application site including Bryn Lane, Oak Road and Wrexham Industrial Estate Road. These details will include the following:

- Basic description of the location of the road in the proximity of the site, the roads and junctions it connects into and role it plays in the hierarchy of roads in the area;
- The frontage development;
- Its general width;
- The location and general condition of the footway and cycle infrastructure provision in the area; and
- Speed limit.

2.3.3 WCBC to advise if there are any improvements proposed to the local highway network that would have an impact on the proposed development and any assessment undertaken to support the planning application for this scheme.

Existing Traffic Conditions

2.3.4 This will provide a commentary of the traffic conditions noted during the various site visits undertaken during various times of the day. It will provide a general summary of the levels of traffic witnessed and if any congestion was witnessed at local junctions. A commentary will also be provided with regards to the general levels of pedestrian/cycle activity in the area.

2.3.5 Following a traffic generation and distribution exercise detailed later in this Scoping Note, the study area has been defined as the following junctions:

- Existing Very Group access/Bryn Lane (priority junction);
- Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way (roundabout);
- A534/Industrial Estate Road/Sandy Lane/Borras Hall Lane (roundabout);
- A534/A5156/A534 Holt Road (roundabout);
- A5156/Borras Park Road (roundabout);
- Gresford Interchange (signal controlled grade separated roundabout);
- A55 Junction 38 (signal controlled grade separated roundabout);
- Oak Road/Bryn Lane (priority junction); and
- Coed Aben Road/Redwither Road/Bridge Road (staggered priority junctions).

2.3.6 An initial response from MM suggested that the above survey locations were acceptable.

2.3.7 Classified turning counts and queue length surveys have been undertaken at the above junctions by an independent traffic survey consultant. The traffic surveys were undertaken on Tuesday 28<sup>th</sup> June 2022, a neutral day by definition of WebTAG Unit M1.2 Data Sources and Surveys. The periods 0630-0930 and 1530-1830 were surveyed which encompasses the network peak hours identified during earlier surveys undertaken for the assessments of other local developments in WIE. The data has been



interrogated to derive updated network peak hours for use in junction capacity assessment and will be detailed in the TA. The peak hours were found to be:

- 0745-0845; and
- 1630-1730

2.3.8 In addition to the above, automatic traffic count (ATC) surveys were undertaken for 7-days from 28<sup>th</sup> June 2022 on Bryn Lane and Industrial Estate Road, the former to inform the access junction design and the latter for use in deriving annual average daily traffic flows.

2.3.9 WCBC's views on the list of survey locations is welcomed.

#### Road Safety

2.3.10 A review of accident data for the last 5 years will be undertaken and will cover the following geographical area:

- Oak Road from Bridge Road to the west to the B5130 to the east;
- Bryn Lane from Oak Road in the south to Industrial Estate Road/Ash Road North/Abenbury Way to the north;
- Industrial Estate Road from Bryn Lane/Ash Road North/Abenbury Way to the south to A534 Wrexham Road to the north.

2.3.11 WCBC to advise if the geographic coverage of the study area for the road safety review is acceptable.

## 2.4 Development Proposals

#### Development Description

2.4.1 This section of the TA will provide a general description of the proposed scheme.

#### Site Access

2.4.2 The main entrance to the site is proposed to be taken via a priority controlled junction from the access road to the Very Group site. The proposed site access is shown on Drawing P21066-100E in Appendix III.

2.4.3 Each unit will take access from a new internal 7.3m wide spine road, with separate accesses provided for parking areas and service yards.

2.4.4 WCBC's views on the acceptability of the proposed access is welcomed as are any comments on the indicative internal layout which is subject to change at this stage.

---

Parking Provision

- 2.4.5 A total of 654 car parking spaces will be provided as part to the overall development. This is split across the 3 Units as follows:
- Unit 1 – 175 spaces;
  - Unit 2 – 183 spaces; and
  - Unit 3 – 296 spaces.
- 2.4.6 The parking provided for Units 1 and 2 are at a ratio of circa 1 space per 100sqm as per WCBC's parking standards.
- 2.4.7 Parking is to be provided at a ratio of circa 1 space per 150sqm for the Unit 3. We acknowledge that this is less than WCBC's maximum parking standards for B8 usage of 1 space per 100sqm. It should be noted that the calculation of the maximum parking requirements contained within the WCBC requirement for B8 uses is based on the provision usually required for more common smaller units. The direct application of the WCBC's maximum parking standards to a circa 50,000sqm site is questionable as the rate of parking provision per sqm is likely to decrease as the buildings increase in size.
- 2.4.8 The use of a lower parking standard for larger B8 developments has been investigated by Prime. In the aforementioned Logistics Study in Appendix II, it was shown that the average parking provision for large scale 100% B8 developments according to the study was 1 space per 182sqm. The proposal for Unit 3 at 1 space per 150sqm is therefore in excess of this value.
- 2.4.9 EV charging points will be provided in each of the proposed car parks in accordance with WCBC standards.
- 2.4.10 Secure cycle parking spaces are also to be provided and we are aware of WCBC's standards of 1 space per 1,000sqm.

HGV Provision

- 2.4.11 Each unit will have a service yard with an appropriate number of loading bays for HGVs.

Swept Path Analysis

- 2.4.12 Whilst the internal layout will be subject to reserved matters, we acknowledge the WCBC will require assurance that the site can accommodate the proposed level of parking and the vehicle movements, as such, various swept paths will be provided. This will include:
- HGV access to the site and movements through the site;

- HGV access to the various loading bays and parking bays;
- Car accessing the car park; and
- Cars accessing the more difficult parking spaces.

## 2.5 Access by Sustainable Modes of Transport

### Access on Foot

- 2.5.1 The accessibility for pedestrians to and from the site will be considered. In order to highlight the site's accessibility on foot, an indicative walking isochrone will be produced using the Geographic Information System (GIS) software Visography TRACC. This will cover the site's walking catchment within the CIHT's 'Preferred Maximum' distances of 1200m and 2000m for local service and commuting trips respectively. A narrative will be produced explaining the various residential areas and facilities that can be accessed within the abovementioned walk distances, the latter for lunch trips, convenience shopping etc.

### Access by Cycle

- 2.5.2 A cycling isochrone showing the site's catchment will also be produced using TRACC. This will illustrate 2000m and 5000m catchment ranges, which equate to 10-minute and 25-minute journey times respectively which are based on the somewhat conservative cycle speed of 12kph. A narrative will also be produced explaining the various facilities that can be accessed within the abovementioned cycle distances.

### Access by Public Transport

- 2.5.3 This section will provide a commentary of the location of the nearest bus stops, the facilities provided at those bus stops and a summary of the bus services that can be accessed via those stops. With regards to the bus services, a separate commentary will be provided with regards to the service number, the locations that can be accessed via those bus services and the frequency of service provision.
- 2.5.4 Through the other schemes we have been involved with on WIE, it is understood that the public transport provision is limited. It is proposed as part of the pre-application discussion that we speak to the public transport officers at WCBC to discuss how effective improvements to public transport provision can be facilitated. These improvements would need to form part of an overall strategy for improved public transport access to WIE and would need seek potential contributions from other developers in the area.

## 2.6 Traffic Forecasting

### Vehicular Trip Generation

- 2.6.1 The aforementioned Logistics Study found that trip rates derived from the TRICS database was the most commonly used methodology for traffic generation forecasting. We undertook our own TRICS interrogation but there are very limited sites of a similar size within the database.
- 2.6.2 From further review of the supporting TAs for two other developments in North West England, a 1,442,000ft<sup>2</sup> B8 development in Wigan (Wigan Council ref. A/18/85947/MAJES) and a 1,224,717ft<sup>2</sup> B8/B2 scheme in Haydock (St Helens council planning ref. P/2017/0254/OUP), NH requested both assessments utilise the trip rates used to support a scheme at Florida Farm in Haydock (St Helens Council planning ref. P/2016/0608/HYBR) which included 1,453,128ft<sup>2</sup> of B2/B8 use. The Florida Farm trip rates were a combination of TRICS and surveyed traffic generation at the OMEGA North development off junction 8 of the M62, Warrington. All three of these sites are consented.
- 2.6.3 As these sites sit adjacent to busy motorways, use of these rates should be particularly robust. The trip rates are similar to the average of the AM peak and higher than the average of the PM peak trip rates within the Logistics Study.
- 2.6.4 A summary of these trip rates and resultant trip generation associated with the proposed 93,019sqm floor area is shown in Table 2.1.

**Table 2.1: Proposed Trip Rates and Resultant Trip Generation**

| Time                | Trip Rates   |              |              | Trip Generation |            |             |
|---------------------|--------------|--------------|--------------|-----------------|------------|-------------|
|                     | Arrivals     | Departures   | Total        | Arrivals        | Departures | Total       |
| <b>Lights</b>       |              |              |              |                 |            |             |
| 07:00-08:00         | 0.106        | 0.072        | 0.178        | 99              | 67         | 166         |
| <b>08:00-09:00</b>  | <b>0.072</b> | <b>0.047</b> | <b>0.119</b> | <b>67</b>       | <b>44</b>  | <b>111</b>  |
| 09:00-10:00         | 0.078        | 0.053        | 0.131        | 73              | 49         | 122         |
| 10:00-11:00         | 0.056        | 0.054        | 0.110        | 52              | 50         | 102         |
| 11:00-12:00         | 0.068        | 0.054        | 0.122        | 63              | 50         | 113         |
| 12:00-13:00         | 0.059        | 0.071        | 0.130        | 55              | 66         | 121         |
| 13:00-14:00         | 0.180        | 0.134        | 0.314        | 167             | 125        | 292         |
| 14:00-15:00         | 0.097        | 0.151        | 0.248        | 90              | 140        | 230         |
| 15:00-16:00         | 0.075        | 0.109        | 0.184        | 70              | 101        | 171         |
| 16:00-17:00         | 0.069        | 0.123        | 0.192        | 64              | 114        | 178         |
| <b>17:00-18:00</b>  | <b>0.060</b> | <b>0.088</b> | <b>0.148</b> | <b>56</b>       | <b>82</b>  | <b>138</b>  |
| 18:00-19:00         | 0.040        | 0.066        | 0.106        | 37              | 61         | 98          |
| <b>Daily (12hr)</b> | <b>0.960</b> | <b>1.022</b> | <b>1.982</b> | <b>893</b>      | <b>949</b> | <b>1842</b> |
| <b>Heavies</b>      |              |              |              |                 |            |             |
| 07:00-08:00         | 0.018        | 0.013        | 0.031        | 17              | 12         | 29          |
| <b>08:00-09:00</b>  | <b>0.016</b> | <b>0.017</b> | <b>0.033</b> | <b>15</b>       | <b>16</b>  | <b>31</b>   |
| 09:00-10:00         | 0.020        | 0.023        | 0.043        | 19              | 21         | 40          |
| 10:00-11:00         | 0.023        | 0.021        | 0.044        | 21              | 20         | 41          |
| 11:00-12:00         | 0.027        | 0.026        | 0.053        | 25              | 24         | 49          |
| 12:00-13:00         | 0.022        | 0.024        | 0.046        | 20              | 22         | 42          |
| 13:00-14:00         | 0.029        | 0.020        | 0.049        | 27              | 19         | 46          |
| 14:00-15:00         | 0.029        | 0.027        | 0.056        | 27              | 25         | 52          |
| 15:00-16:00         | 0.027        | 0.022        | 0.049        | 25              | 20         | 45          |
| 16:00-17:00         | 0.023        | 0.019        | 0.042        | 21              | 18         | 39          |
| <b>17:00-18:00</b>  | <b>0.015</b> | <b>0.015</b> | <b>0.030</b> | <b>14</b>       | <b>14</b>  | <b>28</b>   |
| 18:00-19:00         | 0.013        | 0.015        | 0.028        | 12              | 14         | 26          |
| <b>Daily (12hr)</b> | <b>0.262</b> | <b>0.242</b> | <b>0.504</b> | <b>243</b>      | <b>225</b> | <b>468</b>  |

- 2.6.5 To align the peak development trip generation hours with the network peak hours mentioned earlier, 25% (15-minutes) of the 0700-0800 trip generation will be added to 75% (45-minutes) of the 0800-0900 trip generation to derive the AM peak trip generation. For the PM peak trip generation, 50% (30-minutes) of the 1600-1700 will be added 50% of the 1700-1800. The resultant trip generation is shown in Table 2.2.

**Table 2.2: Aligned Peak Hour Trip Generation**

| Peak           | Trip Generation |            |       |
|----------------|-----------------|------------|-------|
|                | Arrivals        | Departures | Total |
| <b>Lights</b>  |                 |            |       |
| AM             | 75              | 50         | 125   |
| PM             | 60              | 98         | 158   |
| <b>Heavies</b> |                 |            |       |
| AM             | 16              | 15         | 31    |
| PM             | 18              | 16         | 34    |
| <b>Total</b>   |                 |            |       |
| AM             | 91              | 65         | 156   |
| PM             | 78              | 114        | 192   |

2.6.6 A PCU factor of 1 will be applied to light vehicles with a factor of 2.5 applied to heavy vehicles in line with TAG Unit M3.1.

2.6.7 We welcome the view of the highway authorities regarding the proposed trip rates.

#### Multimodal Trip Generation

2.6.8 Multimodal trips will be forecast by modifying the above trip rates by census method of travel to work (MTW) data for the local area as a place of work.

#### Traffic Growth

2.6.9 The base traffic flows recorded as part of the abovementioned data collection exercise will be growthed to 2025 and 2036 using TEMPro factors for the local MSOA. 2025 will be the opening year while 2036 aligns with other assessments recently undertaken within WIE and will allow for the consideration of the year of opening plus 11 years.

2.6.10 Version 8 of the NTEM datasets and the associated the NTM data will be used when available. Should our assessment be completed and the application submitted before then, we will use the 7.2 NTEM datasets and 2018 RTF. We recognise that we may need to update the growth factors during the DMO process.

2.6.11 As TEMPro is not strictly applicable to heavy vehicles, the DfT's Regional Traffic Forecasts (RTF) will be used to derive factors to consider HGV growth.

2.6.12 We welcome the view of the highway authorities regarding the proposed traffic growth methodology.

---

Committed Developments

- 2.6.13 Before applying traffic growth, the traffic generated by committed developments will need to be considered. We will therefore treat the following recent consents on WIE by FIREM as being committed developments:
- Site 2 – 25,069 sqft B2/B8 (Clywedog Rd N);
  - Site 3 – 45,079 sqft B2/B8 (Clywedog Rd E); and
  - Site 4 – 35,015 sqft B2 (Clywedog Rd N).
- 2.6.14 Through our work on other schemes on WIE, we are also aware of a number of other consented or pending applications which we will include as committed developments, these include:
- Site 1 (Bridgeway Centre) (P/2022/0065) – 120,000 sqft B2/B8 (Bridge Rd);
  - Site 5 – 152,000 sqft B8 (Clwedog Rd S);
  - The Oaks (P/2019/0877) – 184,000 sqft B1, B2 and B8 (Oak Rd);
  - Net World Sports (P/2020/0167); and
  - Land to the east of Bryn Lane (P/2020/0017) – 97,500 sqft B2/B8.
- 2.6.15 When considering the traffic impact of developments, it is important not to double-count trips. The TEMPro database includes job based planning growth. As the committed development and the development site itself sit within an allocated employment area, it is logical to assume that the job growth in TEMPro somewhat aligns with the number of jobs that the committed developments and the proposed development will generate.
- 2.6.16 The total floor area of the committed developments is 99,374sqm. Applying a density of 1 job per 77sqm to the total floor area as per the *Employment Densities Guide* (2015) for regional distribution centres (B8), which is conservative given that B2 elements would have a greater density, results in a forecast of almost 1,300 jobs. This figure excludes the proposed development.
- 2.6.17 The job assumptions in TEMPro for the local mid layer super output area (MSOA) show an increase in 142 jobs between 2022 and 2025 and 637 between 2022 and 2036, as such, the future job forecasts within TEMPro will be adjusted to match the base jobs, effectively removing job growth from the traffic growth factors to reduce double-counting. The household planning assumptions will not be adjusted, with this growth accounting for housing developments in the area. A summary of the TEMPro job assumptions is provided in Table 2.3.

**Table 2.3: TEMPro Job Adjustment (2022 Base)**

| Forecast Year | Default Assumptions |             |      | Adjusted Assumptions |             |      |
|---------------|---------------------|-------------|------|----------------------|-------------|------|
|               | Base Jobs           | Future Jobs | Diff | Base Jobs            | Future Jobs | Diff |
| 2025          | 16228               | 16370       | 142  | 16228                | 16228       | 0    |
| 2036          | 16228               | 16865       | 637  | 16228                | 16228       | 0    |

- 2.6.18 A summary of the proposed growth factors using the current 7.2 NTM dataset and 2018 RTF is provided in Table 2.4.

**Table 2.4: Growth Factors**

| Source      | TEMPro |        | RTF    |
|-------------|--------|--------|--------|
|             | AM     | PM     | Both   |
| <b>2025</b> | 1.0254 | 1.0254 | 1.0000 |
| <b>2036</b> | 1.0965 | 1.0964 | 1.0047 |

- 2.6.19 We request that WCBC provides information with regard to any other committed developments and/or allocations that need to be taken account of in deriving the appropriate traffic growth factors.

- 2.6.20 We welcome the thoughts of the highway authorities regarding the traffic forecasting methodology.

#### Trip Distribution

- 2.6.21 Light vehicle development trips will be distributed across the local highway network using census method of travel to work (MTW) data for the local MSOA and web-based route planning software (Google Maps) as per the previous FIREM developments on WIE.

- 2.6.22 Heavy vehicles have been distributed on the assumption that all will travel to/from the north of the site via Industrial Estate Road. Beyond this point a simple gravity model has been derived using recorded HGV flows on strategic links derived from DfT count data. The following three links have been identified:

- A534 in Holt;
- A483 south of Gresford Interchange; and
- A483 north of Gresford Interchange.

- 2.6.23 The HGVs have been assigned based on the proportionate HGV flows at the above count sites. Details of the distribution calculations for light and heavy vehicles are provided in Appendix IV.

- 2.6.24 WCBC's views of this methodology are appreciated.



### Traffic Flow Diagrams

- 2.6.25 Traffic flow diagrams have been prepared based on the above methodology and are provided in Appendix V.

## 2.7 Traffic Impact Assessment

- 2.7.1 The impact of the forecast development trips in absolute and percentage terms at the study area junctions in the AM and PM network peaks is summarised in Table 2.5. This is shown for 2025, with the absolute impact remaining the same at 2036 but the percentage increase reducing.

**Table 2.5: Absolute and Percentage Impact Summary**

| Junction                                                        | 2025 AM Peak |          |          |        | 2025 PM Peak |          |          |        |
|-----------------------------------------------------------------|--------------|----------|----------|--------|--------------|----------|----------|--------|
|                                                                 | Without Dev  | With Dev | Abs Diff | % Diff | Without Dev  | With Dev | Abs Diff | % Diff |
| 1. The Very Group Site Access/Bryn Lane                         | 356          | 512      | 156      | 43.8%  | 441          | 633      | 192      | 43.5%  |
| 2. Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | 2387         | 2518     | 131      | 5.5%   | 2400         | 2560     | 160      | 6.7%   |
| 3. A534/Industrial Estate Road/Sandy Lane/Borras Hall Lane      | 3006         | 3137     | 131      | 4.4%   | 3069         | 3229     | 160      | 5.2%   |
| 4. A534/A5156/A534 Holt Road/Services Access                    | 3310         | 3426     | 116      | 3.5%   | 3370         | 3513     | 143      | 4.2%   |
| 5. A5156/Borras Park Road/Borras Road                           | 3133         | 3235     | 102      | 3.3%   | 3015         | 3142     | 127      | 4.2%   |
| 6. Gresford Interchange                                         | 4087         | 4187     | 100      | 2.4%   | 4190         | 4314     | 124      | 3.0%   |
| 7. A55 Junction 38/A483                                         | 6365         | 6393     | 28       | 0.4%   | 6653         | 6688     | 35       | 0.5%   |
| 8. Oak Road/Bryn Lane                                           | 381          | 403      | 22       | 5.8%   | 447          | 476      | 29       | 6.5%   |
| 9. Coed Aben Road/Redwither Road/Bridge Road                    | 818          | 833      | 15       | 1.8%   | 802          | 821      | 19       | 2.4%   |

- 2.7.2 During scoping discussions for the Site 1 redevelopment, MM requested that capacity assessments be undertaken at junctions where the increase is greater than 5% or 30 two-way trips. As such, capacity assessments have been undertaken at junctions 1-6 and junction 8. In relation to the A55 Junction 38/A483 junction (junction 7), the increase in trips exceeds the 30 two-way trip threshold in the PM peak. However, given this increase equates to just 0.5%, the large scale and strategic nature of the junction, we find it reasonable to not undertake detailed capacity assessments at this junction as the impact of the development traffic is likely to be negligible and considerably less than the typical daily fluctuation in traffic flow.
- 2.7.3 Junction geometry will be coded into the models based on a mixture of OS mapping and aerial photography. Existing models prepared by Prime or other consultants will be used as the starting point where available. The traffic signal controller specification has been obtained from WCBC for the Gresford Interchange and observed peak hour cycle times will be used.

2.7.4 The base year models will be calibrated against the observed queues recorded in the abovementioned surveys where possible.

2.7.5 The view of the highway authorities on the above is welcomed.

## 2.8 Summary and Conclusions

2.8.1 This will provide a summary of the findings of the TA and the conclusions drawn from those findings.

### 3 TRAVEL PLAN

#### 3.1 Introduction

3.1.1 As per the TA.

#### 3.2 Transport Policy and Guidance

3.2.1 As per the TA

#### 3.3 Existing Situation

3.3.1 As per the TA but with the exclusion of the Road Safety Review

#### 3.4 Development Proposals

3.4.1 As per the TA but without the detailed description of the provision for HGV's.

#### 3.5 Access by Sustainable Modes of Transport

3.5.1 As per the TA.

3.5.2 As mentioned above, we welcome discussions with public transport officers at WCBC to discuss opportunities to provide improved services to the benefit of the site. It should be noted that potential improvements are likely to be detailed post-submission given the complexities involved, but we are willing to work with WCBC to provide the optimum service improvement commensurate to the scale of the site.

#### 3.6 Transport Implementation Plan

3.6.1 This Section will provide a summary of the following that constitute the Transport Implementation Plan (TIP):

- The provision of Staff Travel Packs;
- Other Methods of Awareness Raising and Marketing;
- Identification of Measures to Encourage Walking;
- Identification of Measures to Promote Cycling;
- Identification of Measures to Encourage Public Transport;
- Identification of Measure to reduce Single occupancy car trips;
- Reducing the Need and Distance to Travel;
- Details of how the TIP will be Managed;

- Provide details of how the TIP will be Monitored and Reviewed;
- Provide an Interim Action Plan.

3.6.2 WCBC's view on the TP are appreciated.

## APPENDIX II

### LOGISTICS STUDY

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# RESEARCH NOTE

Major Logistics Development Study

Client: FI Real Estate Management



| Document Control      |                           |                            |
|-----------------------|---------------------------|----------------------------|
| Report Reference      | P22026/RN                 |                            |
| Document Version      | Revision A                |                            |
| Date                  | August 2022               |                            |
| Client                | FI Real Estate Management |                            |
|                       | Name                      | Position                   |
| Written By            | Conor Mackin              | Graduate Transport Planner |
| Checked & Approved By | David Stoddart            | Associate Director         |

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# 1 INTRODUCTION

## 1.1 Preamble

- 1.1.1 Prime Transport Planning (Prime) has been commissioned by FI Real Estate Management (FIREM) to undertake research into recent planning applications for major logistics led developments, often referred to as 'big sheds', to help inform their proposals for similar schemes across the country.
- 1.1.2 FIREM is currently considering several sites for logistics developments of B8 land use with floor areas greater than 900,000ft<sup>2</sup>. Developments of such scale have increased in frequency in recent years, but they are still relatively small in number across the UK. As such, typical design and assessment tools, such as local parking standards and the TRICS trip generation database, may not be wholly applicable or subject to further validation and may result in a significant over estimation of the required parking provision and trip generation associated with such large developments.

## 1.2 Purpose of Report

- 1.2.1 Prime has therefore undertaken this study to consider what parking provision and trip generation methods other developers and their consultants have been using across the country which have been acceptable to the relevant highway authorities. This builds on our own experience of supporting B8 led developments throughout the UK.
- 1.2.2 The purpose of this study is not to challenge local parking standards or TRICS derived trip rates, but to form a foundation and evidence base for appropriate levels of car parking provision and realistic traffic impact assessments that should be acceptable to planning and highway authorities. This evidence base potentially also helps to support a departure from either method.
- 1.2.3 We accept that both parking provision and trip generation can vary based on a development site's geographical characteristics, along with factors such as accessibility by sustainable modes of transport, but large scale logistics developments tend to be located out of towns and cities meaning that accessibility by sustainable modes is often limited, and in locations with excellent access to the strategic road network (SRN) given the need to move goods via road.
- 1.2.4 This report will be appended to scoping documents and/or Transport Assessments (TA) used to support future large scale logistics led developments by FIREM, forming an important part of the evidence base.
- 1.2.5 The conclusions and recommendations contained herein have been drawn based on information available and obtained in advance of the completion of this report.
- 1.2.6 Reasonable checks have been carried out on any third-party information used in the preparation of this report but, nonetheless, Prime accepts no liability for the accuracy or otherwise of this data.

1.2.7 Third-party rights are excluded for the use of information contained within this report.

### 1.3 Scope of Report

1.3.1 Following this introduction, Section 2 outlines the sample selection criteria for this study, Section 3 presents the findings on car parking provision; and Section 4 presents the finding for trip generation methodologies and resultant trip rates.

1.3.2 Summaries for each aspect are provided in each section.

1.3.3 A conclusion has not been provided in this document, as it will be the accompanying Scoping Notes and Transport Assessment which will conclude how the finding of this report align with the associated parking provision and traffic impact assessment of future applications.

## 2 SAMPLE SELECTION CRITERIA

### 2.1 Sample Size

- 2.1.1 Generally speaking, the larger the sample size the more reliable the dataset should be statistically. In order to maximise the sample size of this study, the criteria was relatively flexible and was somewhat led by our early research along with our professional opinion and experience.
- 2.1.2 Given that FIREM are considering sites with floor areas of >900,000ft<sup>2</sup> (circa 83,613m<sup>2</sup>), we consider sites with floor areas 80,000m<sup>2</sup> to be considered as 'major' (noting that 'major' for this study exceeds what would normally be considered to be 'major' in planning applications terms).
- 2.1.3 It should also be noted that when considering floor areas, some of the sites will contain one large unit while others will contain a number of smaller units. At the time of writing, FIREM was considering different options for their sites i.e. one substantial unit or a small number of large units, we have therefore considered sites based on total gross internal area (GIA) or gross floor area (GFA). Note we have listed all measurements as GIA which is the most common measure, though some may have been listed in their supporting documents as GFA, although the difference between the two measures for B8 units is minimal.
- 2.1.4 For some of the hybrid applications we have included the detailed elements of the applications where the specific details of the parking numbers and trip generation have been provided in the associated supporting documents. Where we have included the detailed elements, we have excluded the outline elements given that the associated figures were indicative only with many not specify parking numbers.

### 2.2 Site Identification Methodology

- 2.2.1 Sites have been identified based on the following:
- Our knowledge of the locations of such developments from travelling across the UK;
  - Our knowledge of such locations when included as committed development in our assessments of other developments;
  - Industry press releases and news articles;
  - Identification of the locations of such development from online mapping and aerial photography; and
  - Provision of application details by FIREM and their planning consultant.
- 2.2.2 Once sites were identified, the associated planning applications were searched for on the relevant planning portals for each local planning authority in which the site is located. The TAs, proposed site layouts and other supporting documents that included information on parking provision and trip rates

were downloaded and can be provided on request. Amendments and discharges of conditions have largely been excluded to keep the sample manageable.

2.2.3 The oldest application in the sample is from 2015 although the majority are from 2020 onwards.

2.2.4 Whilst every attempt has been made to tabulate the most accurate and up-to-date information, this is third-party data on applications we have not been involved with, and as such, we accept no liability for the accuracy or otherwise of this data.

## 2.3 Sample Completion & Initial Findings

2.3.1 Appendix 1 contains a tabulated summary of our research.

2.3.2 A total sample of 16 sites was obtained.

2.3.3 The average floor area of the sample was 1,880,792ft<sup>2</sup> (174,730m<sup>2</sup>).

2.3.4 Logistics developments tend to be for 'B' land uses, particularly B8 (storage and distribution), B2 (general industrial) and B1 (office and light industrial), with the latter normally being ancillary to the main B8 and/or B2 uses (<=5%). B1 is now part of use class E in England but for the purpose of this study, with many of the applications being submitted prior to the change in the use class order and with E not applicable to Wales or Scotland, the term B1 has been used.

2.3.5 The sample contains a variety of land use splits or mixes. 13 of the 16 sites specified a particular split with 10 of the sites being 100% B8. The others ranged from 70%-80% B8 with the remainder being B2, except for one site which included 10% B1.

2.3.6 The land use splits applied for are important as this can have a significant bearing on parking provision and trip generation. Separate summaries of the B8 and B2 uses will be provided where appropriate.

2.3.7 The following sections provide a summary of the parking provision and trip generation methodologies.

### 3 PARKING PROVISION

#### 3.1 General Provision

3.1.1 The parking provision is of particular interest, as parking standards for B use tend to be maximum standards, which naturally suggests some flexibility to provide fewer spaces than the maximum, though, from our experience, some highway authorities also treat maximum standards as target standards and additional evidence can be required to support an under provision.

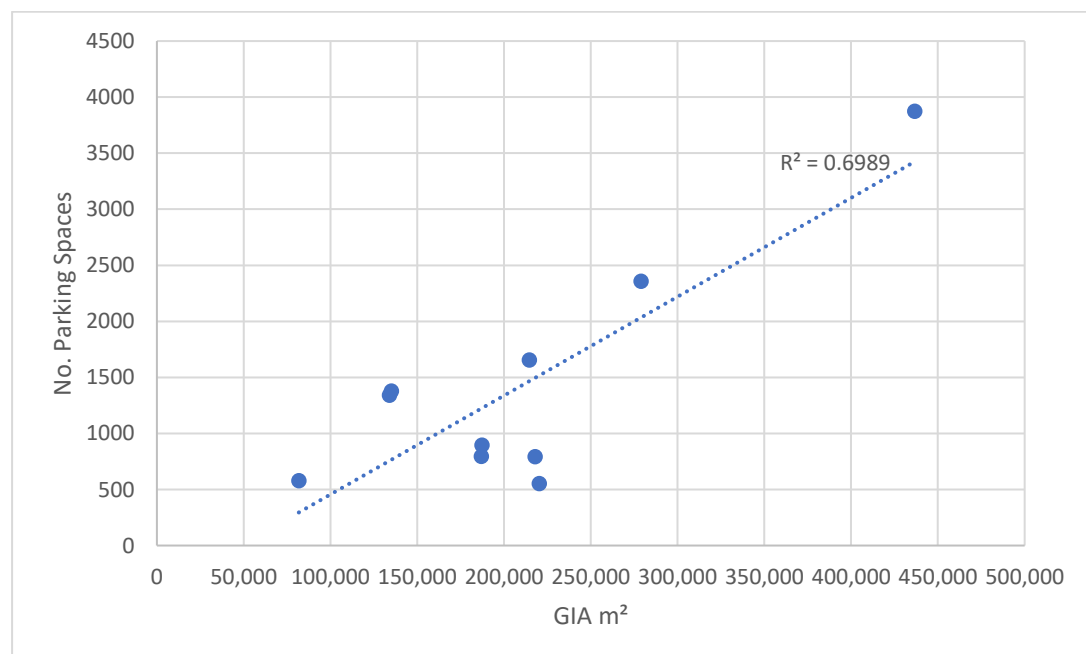
3.1.2 Two of the developments in the sample did not state the number of parking spaces in their applications as they were generally speculative and seeking outline consent, with the provision to be detailed at the reserved matters stage but reportedly in line with the relevant local standards. These sites have been excluded from the figures presented below.

#### 3.2 Average Provision

##### 100% B8

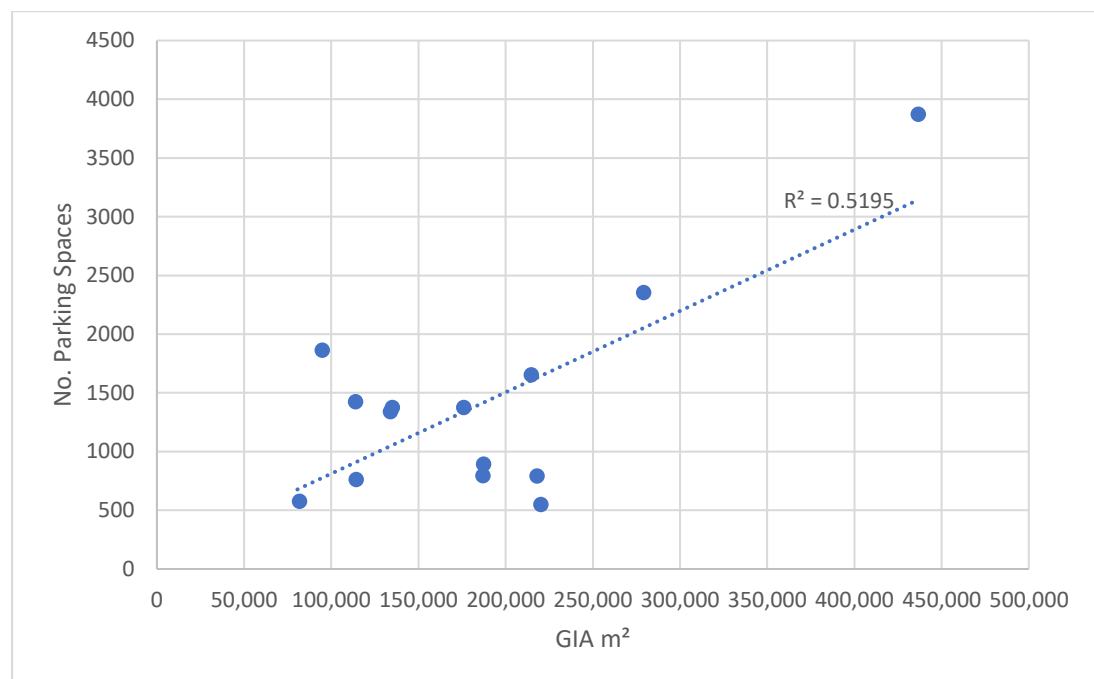
3.2.1 The average provision for the 100% specified B8 applications was **1 space per 182m<sup>2</sup> GIA**. Chart 3.1 shows the trend between GIA (m<sup>2</sup>) and the number of parking spaces for the 100% B8 sites.

**Chart 3.1: Parking Provision 100% B8**



##### B8/B2 Mix

3.2.2 The average provision for the full sample which contains a mix of B8 and B2 was **1 space per 159m<sup>2</sup>**. Chart 3.2 shows the trend between GIA (m<sup>2</sup>) and the number of parking spaces for the mixed B8/B2 sites.

**Chart 3.2: Parking Provision B8/B2 Mix**

3.2.3 Both charts show a fairly positive correlation between the GIA and the number of parking spaces, with the 100% B8 showing a slightly stronger correlation than the mixed B8/B2. A positive correlation is when the values/variables on one axis increase, so do the values/variables on the other.

### 3.3 Summary

3.3.1 The sample shows a positive correlation between the GIA and the number of parking spaces. This notable relationship gives validity to the use of the average parking provision values for future developments.

## 4 TRIP GENERATION

### 4.1 Trip Generation Method

- 4.1.1 The TAs associated with 8 of the 16 sites solely utilised the TRICS database to forecast the likely trip generation. TRICS was used for an element of four of the other sites, three of which were supplemented by bespoke traffic surveys and the other one included the local highway authority's preferred rates for B8. Three sites used bespoke traffic surveys while one used the rates from another application but details of the origin are limited.
- 4.1.2 It would seem reasonable to conclude that the TRICS database is the most commonly accepted method for trip generation forecasts for large logistics led schemes, however in the North West there appears to be a preference from National Highways for use of previously approved trip rates which consisted of TRICS supplemented by surveys of an existing site (Omega North off junction 8 of the M62, Warrington), with these rates applied to three sites in the sample.

### 4.2 Trip Rates

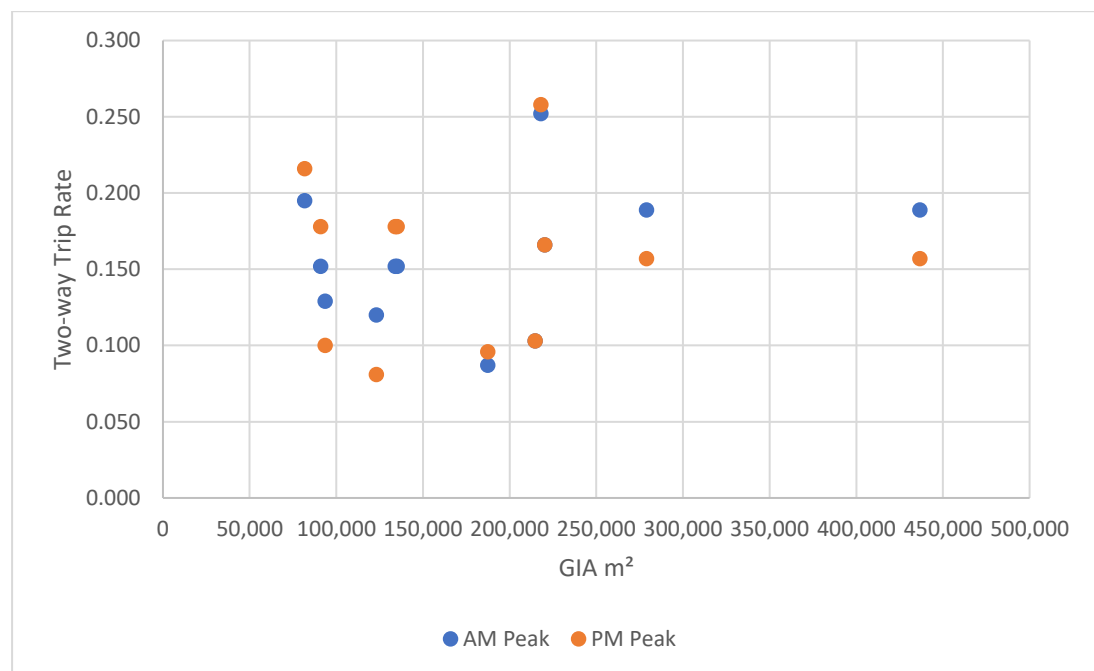
#### B8 Trip Rates

- 4.2.1 A summary of the trip rates used in the sample is provided in Table 4.1 with a scatter plot showing the relationship between GIA (per 100m<sup>2</sup>) for each site in the sample provided as Chart 4.1. Note that the GIA used is that associated with the relevant B8 proportion. The three sites which did not specify the proportions of each land use have been excluded. This data is provided for the 12 sites in the sample which included trip rates for B8 use in their assessments and specified a particular mix.

**Table 4.1: B8 Trip Rate Summary**

| Trip Rate (per 100m <sup>2</sup> ) | AM Peak  |            |       | PM Peak  |            |       |
|------------------------------------|----------|------------|-------|----------|------------|-------|
|                                    | Arrivals | Departures | Total | Arrivals | Departures | Total |
| <b>Average:</b>                    | 0.103    | 0.054      | 0.157 | 0.055    | 0.101      | 0.156 |
| <b>85th Percentile:</b>            | 0.141    | 0.071      | 0.191 | 0.078    | 0.113      | 0.191 |



**Chart 4.1: B8 Trip Rate Correlation**

4.2.2 An examination of Table 4.1 shows that the average two-way (total) B8 trip rates were **0.157** and **0.156** in the respective AM and PM peak hours, with the respective 85<sup>th</sup> percentile B8 trip rates being **0.191** and **0.191**.

4.2.3 Chart 4.1 shows very limited positive or arguably no correlation between floor area and B8 trip rate. This is not unexpected given that TRICS has been used in the majority of the assessments, with TRICS rates being averages of samples of varying sizes. Whilst it may be debateable as to whether trip rates for B8 use increase with increases in GIA, as increases in GIA does not necessarily result in more staff and more deliveries and can often be associated with more automated/mechanised processes, the sample shows that fairly common rates were used in the respective impact assessments.

4.2.4 It is clear that the assessments associated with the sites appear to have used broadly similar trip rates, with the scatter plot showing something of a cluster between two-way rates of 0.100 and 0.200.

#### B2 Trip Rates

4.2.5 A summary of the trip rates used in the sample is provided in Table 4.2. The relationship between the trip rates and the GIA has not been presented as only three sites in the sample specified a B2 mix. Such a low number would not present a reliable correlation to draw conclusions from.

**Table 4.2: B2 Trip Rate Summary**

| Trip Rate (per 100m <sup>2</sup> ) | AM Peak  |            |       | PM Peak  |            |       |
|------------------------------------|----------|------------|-------|----------|------------|-------|
|                                    | Arrivals | Departures | Total | Arrivals | Departures | Total |
| Average:                           | 0.340    | 0.110      | 0.450 | 0.097    | 0.339      | 0.436 |
| 85th Percentile:                   | 0.465    | 0.197      | 0.662 | 0.189    | 0.451      | 0.640 |

4.2.6 An examination of Table 4.2 shows that the average two-way (total) B2 trip rates were **0.450 and 0.436** in the respective AM and PM peak hours, with the respective 85<sup>th</sup> percentile B2 trip rates being **0.662 and 0.640**.

4.2.7 There is also a notably greater range in the B2 trip rates than the B8 but the sample size is limited to three sites.

### 4.3 Summary

4.3.1 TRICS was the predominant trip generation methodology in the sample, having been solely utilised in the assessments of 8 of the 16 sites included in the sample. Four of the sites included TRICS based trip rates for elements of the assessment or supplemented TRICS with other data.

4.3.2 The B2 trip rates were notably higher than the B8 rates, with both the averages and 85<sup>th</sup> percentile rates being more than double.

4.3.3 The trip rates for B8 show limited positive or no correlation between GIA and trip rates.

## 5 SUMMARY STATISTICS

### 5.1 General

5.1.1 Planning permission for 100% B8 use was the most common land use sought in the sample where applicant's had specified a particular land use or mix of uses.

5.1.2 Any B1 (E) was commonly ancillary to the main use.

### 5.2 Parking

5.2.1 The average car parking provision for the 100% specified B8 applications was 1 space per 182m<sup>2</sup> GIA.

5.2.2 The average car parking provision for the B8/B2 mix applications was 1 space per 159m<sup>2</sup> GIA.

### 5.3 Trip Rates

5.3.1 The TRICS database was the most common trip generation methodology used in the impact assessments of the major logistics developments.

5.3.2 A summary of the average and 85<sup>th</sup> percentiles used in the assessments presented in this study is shown in Table 5.1.

**Table 5.1: Trip Rate Summary**

| Trip Rate (per 100m <sup>2</sup> ) | AM Peak  |            |       | PM Peak  |            |       |
|------------------------------------|----------|------------|-------|----------|------------|-------|
|                                    | Arrivals | Departures | Total | Arrivals | Departures | Total |
| <b>100% B8</b>                     |          |            |       |          |            |       |
| <b>Average:</b>                    | 0.103    | 0.054      | 0.157 | 0.055    | 0.101      | 0.156 |
| <b>85th Percentile:</b>            | 0.141    | 0.071      | 0.191 | 0.078    | 0.113      | 0.191 |
| <b>B8/B2 Mix</b>                   |          |            |       |          |            |       |
| <b>Average:</b>                    | 0.340    | 0.110      | 0.450 | 0.097    | 0.339      | 0.436 |
| <b>85th Percentile:</b>            | 0.465    | 0.197      | 0.662 | 0.189    | 0.451      | 0.640 |

## APPENDIX 1

### STUDY SUMMARY TABLE

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| Development                                          | GIA (sqft) | GIA (sqm) | No. of Units | LPA Reference    | LPA                         | Split |     |     | Split GIA |        | Parking Nos. | GIA sqft per Space | GIA sqm per Space |
|------------------------------------------------------|------------|-----------|--------------|------------------|-----------------------------|-------|-----|-----|-----------|--------|--------------|--------------------|-------------------|
|                                                      |            |           |              |                  |                             | B8    | B2  | B1  | B8        | B2     |              |                    |                   |
| Haydock, St Helens (NE of E Lancashire Road)         | 1,224,717  | 113,779   | 3            | P/2017/0254/OUP  | St. Helens                  | 80%   | 20% |     | 91,023    | 22,756 | 1426         | 859                | 80                |
| Florida Farm (Haydock, St Helens)                    | 1,453,135  | 135,000   | 2            | P/2016/0608/HYBR | St. Helens                  | 100%  |     |     | 135,000   | 0      | 1375         | 1057               | 98                |
| Omega Zone 8 (Omega Drive, St Helens)                | 880,000    | 81,754    | 1            | P/2020/0061/HYBR | St. Helens                  | 100%  |     |     | 81,754    | 0      | 576          | 1528               | 142               |
| Ma6nitide Phase 3, Middlewich                        | 867,000    | 80,546    | 1            | 21/1065C         | Cheshire East               |       |     |     | 0         | 0      |              |                    |                   |
| Radway Green 2, Duchy Land, Crewe                    | 1,020,000  | 94,760    | 5            | 21/5724C         | Cheshire East               |       |     |     | 0         | 0      | 1863         | 548                | 51                |
| Wood Farm Stanton Lane, Stanton Under Bardon         | 1,229,238  | 114,199   | 5            | 20/00407/HYB     | Hinckley & Bosworth         |       |     |     | 0         | 0      | 761          | 1615               | 150               |
| MeltonWest, SE of Brickyard Lane                     | 2,012,205  | 186,938   | 1            | 20/03555/STPLFE  | East Riding of Yorkshire    | 100%  |     |     | 186,938   | 0      | 794          | 2534               | 235               |
| Panettoni Park Aylesford, Kent                       | 1,893,820  | 175,940   | 7            | 20/01820/OAEA    | Tonbridge & Malling         | 70%   | 20% | 10% | 123,158   | 35,188 | 1375         | 1377               | 128               |
| Equite's Park, Basingstoke                           | 2,346,037  | 217,952   | 1            | 20/02586/FUL     | Basingstoke & Deane         | 100%  |     |     | 217,952   | 0      | 791          | 2966               | 276               |
| Mercia Park, Appleby Magna/Swadlincote               | 3,003,206  | 279,005   | 5            | 19/02017/VCUM    | NW Leicestershire DC        | 100%  |     |     | 279,005   | 0      | 2355         | 1275               | 118               |
| W of Wingate Industrial Estate, Chorley Road, Bolton | 1,323,961  | 122,999   | 7            | 04766/18         | Bolton Council              | 76%   | 24% |     | 93,479    | 29,520 |              |                    |                   |
| Tritax Symmetry, Wigan, J25 M6.                      | 1,442,000  | 133,965   | 8            | A/18/85947/MAJES | Wigan Council               | 100%  |     |     | 133,965   | 0      | 1340         | 1076               | 100               |
| Magna Park, North Lutterworth                        | 4,700,331  | 436,671   | 8            | 15/01531/OUT     | Harborough District Council | 100%  |     |     | 436,671   | 0      | 3872         | 1214               | 113               |
| Tritax Symmetry, Kettering (Unit 04)                 | 2,310,000  | 214,604   | 1            | KET/2018/0965    | Northants Council           | 100%  |     |     | 214,604   | 0      | 1653         | 1397               | 130               |
| Panattoni Park, Swindon (Unit 5)                     | 2,370,318  | 220,208   | 1            | S/OUT/22/0284    | Swindon Borough Council     | 100%  |     |     | 220,208   | 0      | 550          | 4310               | 400               |
| Former Outokumpu Site, Shepcote Lane (Phase 2)       | 2,016,705  | 187,356   | 1            | 22/01031/FUL     | Sheffield City Council      | 100%  |     |     | 187,356   | 0      | 893          | 2258               | 210               |

|                  |           |         |
|------------------|-----------|---------|
| Average:         | 1,880,792 | 174,730 |
| 85th Percentile: | 2,364,248 | 219,644 |
| Max:             | 4,700,331 | 436,671 |
| Min:             | 867,000   | 80,546  |

|                              |      |     |
|------------------------------|------|-----|
| B8/B2 Mixed Average:         | 1715 | 159 |
| B8/B2 Mixed 85th Percentile: | 1047 | 97  |
| B8/B2 Mixed Max:             | 548  | 51  |
| 100% B8 spaces:              | 1962 | 182 |
| 100% B8 85th Percentile:     | 1124 | 104 |
| 100% B8 Mixed Max:           | 1057 | 98  |

| Trip Gen Source/Method        | B8 Trip Rates |                |            |              |                |            | B2 Trip Rates |                |            |              |                |            |
|-------------------------------|---------------|----------------|------------|--------------|----------------|------------|---------------|----------------|------------|--------------|----------------|------------|
|                               | Arrival (AM)  | Departure (AM) | Total (AM) | Arrival (PM) | Departure (PM) | Total (PM) | Arrival (AM)  | Departure (AM) | Total (AM) | Arrival (PM) | Departure (PM) | Total (PM) |
| TRICS & Omega                 | 0.088         | 0.064          | 0.152      | 0.075        | 0.103          | 0.178      | 0.349         | 0.155          | 0.504      | 0.151        | 0.310          | 0.461      |
| TRICS & Omega                 | 0.088         | 0.064          | 0.152      | 0.075        | 0.103          | 0.178      |               |                |            |              |                |            |
| Existing Omega Surveys        | 0.112         | 0.083          | 0.195      | 0.101        | 0.115          | 0.216      |               |                |            |              |                |            |
| TRICS                         |               |                |            |              |                |            | 0.312         | 0.047          | 0.359      | 0.027        | 0.259          | 0.286      |
| LHA supplied B8 & TRICS B2    |               |                |            |              |                |            | 0.202         | 0.050          | 0.252      | 0.018        | 0.196          | 0.214      |
| Bardon 2 agreed with LHA & NH |               |                |            |              |                |            |               |                |            |              |                |            |
| TRICS                         |               |                |            |              |                |            |               |                |            |              |                |            |
| TRICS                         | 0.076         | 0.044          | 0.120      | 0.023        | 0.058          | 0.081      | 0.196         | 0.037          | 0.233      | 0.042        | 0.269          | 0.311      |
| TRICS                         | 0.158         | 0.094          | 0.252      | 0.083        | 0.175          | 0.258      |               |                |            |              |                |            |
| TRICS                         | 0.141         | 0.048          | 0.189      | 0.045        | 0.112          | 0.157      |               |                |            |              |                |            |
| 2018 Traffic Survey           | 0.119         | 0.010          | 0.129      | 0.022        | 0.078          | 0.100      | 0.640         | 0.260          | 0.900      | 0.245        | 0.663          | 0.908      |
| TRICS & Omega                 | 0.088         | 0.064          | 0.152      | 0.075        | 0.103          | 0.178      |               |                |            |              |                |            |
| Previous Survey (2013)        | 0.141         | 0.048          | 0.189      | 0.045        | 0.112          | 0.157      |               |                |            |              |                |            |
| TRICS                         | 0.062         | 0.041          | 0.103      | 0.029        | 0.074          | 0.103      |               |                |            |              |                |            |
| TRICS                         | 0.109         | 0.057          | 0.166      | 0.058        | 0.108          | 0.166      |               |                |            |              |                |            |
| TRICS                         | 0.055         | 0.032          | 0.087      | 0.027        | 0.069          | 0.096      |               |                |            |              |                |            |
| Average:                      | 0.103         | 0.054          | 0.157      | 0.055        | 0.101          | 0.156      | 0.340         | 0.110          | 0.450      | 0.097        | 0.339          | 0.436      |
| 85th Percentile:              | 0.141         | 0.071          | 0.191      | 0.078        | 0.113          | 0.191      | 0.465         | 0.197          | 0.662      | 0.189        | 0.451          | 0.640      |
| Max:                          | 0.158         | 0.094          | 0.252      | 0.101        | 0.175          | 0.258      | 0.640         | 0.260          | 0.900      | 0.245        | 0.663          | 0.908      |
| Min:                          | 0.055         | 0.010          | 0.087      | 0.022        | 0.058          | 0.081      | 0.196         | 0.037          | 0.233      | 0.018        | 0.196          | 0.214      |

## APPENDIX IV

### DISTRIBUTION CALCULATIONS

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| MSOA      | Trips | MSOA Name                     | Local Area                                                                       | Pri. Route                     | Pri % | Sec. Route                     | Sec % | Notes                                                       |
|-----------|-------|-------------------------------|----------------------------------------------------------------------------------|--------------------------------|-------|--------------------------------|-------|-------------------------------------------------------------|
| W02000420 | 834   | Wrexham 020                   | Wrexham Industrial Estate, Holt, Marford, Gresford                               | 1B, 2C, 4C                     | 4.42% | 1B, 2C, 4D                     | 4.42% | 50/50 Holt/Marford                                          |
| W02000089 | 576   | Wrexham 012                   | Whitegate Industrial Estate, Wrexham South East                                  | 1A, 3B, 7A, 8B, 9A             | 6.10% |                                |       |                                                             |
| W02000080 | 566   | Wrexham 003                   | Rhosrobin, Llay                                                                  | 1B, 2C, 4B, 11B, 12B, 13C      | 5.99% |                                |       |                                                             |
| W02000085 | 525   | Wrexham 008                   | Little Acton, Glyndwr University, Wrexham Tennis Centre                          | 1B, 2C, 4B, 11B, 12B, 13B      | 2.78% | 1B, 2C, 4B, 11A                | 2.78% |                                                             |
| W02000083 | 482   | Wrexham 006                   | Coedpoeth, Brymbo, Tanyfron                                                      | 1B, 2C, 4B, 11B, 12B, 13B      | 5.10% |                                |       |                                                             |
| W02000088 | 441   | Wrexham 011                   | Puleston Industrial Estate, Wrexham Maelor Hospital, Wrexham Technology Park     | 1A, 3B, 7A, 8B, 9A             | 2.80% | 1B, 2C, 4B, 11B, 12B, 13B      | 1.87% |                                                             |
| W02000082 | 435   | Wrexham 005                   | New Broughton, southsea, Brynteg, Pentre Broughton, cerney                       | 1B, 2C, 4B, 11B, 12B, 13B      | 3.68% | 1A, 3B, 7A, 8B, 9A             | 0.92% |                                                             |
| W02000081 | 367   | Wrexham 004                   | summerhill, Sydalit, Gwersyllt                                                   | 1B, 2C, 4B, 11B, 12B, 13B      | 1.94% | 1B, 2C, 4B, 11B, 12B, 13C      | 1.94% |                                                             |
| W02000084 | 351   | Wrexham 007                   | Borras, Rhosnesni                                                                | 1B, 2C, 4B, 11B, 12A           | 1.86% | 1B, 2C, 4B, 11A                | 1.86% |                                                             |
| W02000093 | 350   | Wrexham 016                   | Crabtree Green, Ruabon, Eytton, Marchwiel                                        | 1A, 3A, 5B                     | 1.85% | 1A, 3B, 7A, 8B, 9A             | 1.85% |                                                             |
| W02000091 | 345   | Wrexham 014                   | Bersham, Johnstown, Ruabon tile Works                                            | 1B, 2C, 4B, 11B, 12B, 13B      | 3.65% |                                |       |                                                             |
| W02000092 | 340   | Wrexham 015                   | Rhosllannerchrugog                                                               | 1B, 2C, 4B, 11B, 12B, 13B      | 3.60% |                                |       |                                                             |
| W02000090 | 312   | Wrexham 013                   | Pen-y-cae, Minera, New Brighton, Bwchgmyn                                        | 1B, 2C, 4B, 11B, 12B, 13B      | 3.30% |                                |       |                                                             |
| W02000087 | 311   | Wrexham 010                   | Caia Park, Queensway Sports Centre                                               | 1B, 2C, 4B, 11A                | 3.29% |                                |       |                                                             |
| W02000094 | 302   | Wrexham 017                   | cefn Mawr, Froncysyllte, Trefor, Garth                                           | 1B, 2C, 4B, 11B, 12B, 13B      | 3.20% |                                |       |                                                             |
| W02000086 | 267   | Wrexham 009                   | Acton                                                                            | 1B, 2C, 4B, 11A                | 2.83% |                                |       |                                                             |
| W02000077 | 240   | Flintshire 020                | Llanfynydd, cymau, Caerwrie, Abermorddu, Caergwrie                               | 1B, 2C, 4B, 11B, 12B, 13C      | 2.54% |                                |       |                                                             |
| W02000095 | 228   | Wrexham 018                   | Bangor on Dee, Horsemans Green, Overton, Hanmer                                  | 1A, 3A, 5B                     | 2.41% |                                |       |                                                             |
| W02000096 | 144   | Wrexham 019                   | Chirk, Pontfadog, Glyn Ceiriog, Llwynmawr, Tregeiriog                            | 1B, 2C, 4B, 11B, 12B, 13B      | 1.52% |                                |       |                                                             |
| E02003810 | 121   | Cheshire West and Chester 047 | Farnold, Churton, Barton, Malpas, Malpas Castle Hill                             | 1B, 2D, 15A, 6B, 16B           | 0.90% | 1B, 2C, 4D                     | 0.38% | More direct route through Ridley Wood, better standard A534 |
| E02006023 | 111   | Shropshire 003                | Gobowen, Ifton Heath, Brongarth, Weston Rhyn                                     | 1B, 2C, 4B, 11B, 12B, 13B      | 0.59% | 1A, 3A, 5B                     | 0.59% | Similar travel time,                                        |
| W02000075 | 105   | Flintshire 018                | Higher Kinnerton, Penyffordd                                                     | 1B, 2C, 4B, 11B, 12B, 13C      | 1.11% |                                |       |                                                             |
| W02000057 | 93    | Denbighshire 016              | Llangollen, Llandrillo, Cynwyd, Glyndyfrdwy                                      | 1B, 2C, 4B, 11B, 12B, 13B      | 0.59% | 1A, 3B, 7A, 8B, 9A             | 0.39% |                                                             |
| W02000074 | 90    | Flintshire 017                | Drury, Buckley, Padeswood Cement Works                                           | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.95% |                                |       |                                                             |
| W02000076 | 78    | Flintshire 019                | Gwernaffield, Gwernymynydd, Leeswood, Treuddyn                                   | 1B, 2C, 4B, 11B, 12B, 13C      | 0.83% |                                |       |                                                             |
| W02000070 | 74    | Flintshire 013                | Ewloe, Hawarden, Hawarden Castle                                                 | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.78% |                                |       |                                                             |
| W02000071 | 73    | Flintshire 014                | Mynydd Isa, Argoed High School                                                   | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.77% |                                |       |                                                             |
| W02000072 | 72    | Flintshire 015                | Broughton, Hawarden Airport, Bretton, Saltney Ferry                              | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.76% |                                |       |                                                             |
| W02000073 | 66    | Flintshire 016                | Mold                                                                             | 1B, 2C, 4B, 11B, 12B, 13C      | 0.70% |                                |       |                                                             |
| E02006017 | 59    | Shropshire 004                | Ellesmere, Dudleston Heath, Welshampton                                          | 1A, 3A, 5B                     | 0.62% |                                |       |                                                             |
| W02000066 | 59    | Flintshire 009                | Shotton, Garden City                                                             | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.62% |                                |       |                                                             |
| E02003809 | 58    | Cheshire West and Chester 046 | Chester Business Park, Dodleston, Aldford, Tattenhall                            | 1B, 2D, 15A, 6B, 16B           | 0.31% | 1B, 2C, 4B, 11B, 12B, 13D, 14B | 0.31% | More direct through Ridleywood                              |
| W02000063 | 47    | Flintshire 006                | Caerwys, Pentre Halkyn, Rhosesmor                                                | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.50% |                                |       |                                                             |
| W02000069 | 47    | Flintshire 012                | Northop, Sychdyn, Northop College                                                | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.50% |                                |       |                                                             |
| W02000054 | 46    | Denbighshire 013              | Llandymog, Llanbedr Dyffryn Clwyd                                                | 1B, 2C, 4B, 11B, 12B, 13B      | 0.49% |                                |       |                                                             |
| E02003807 | 45    | Cheshire West and Chester 043 | Hough Green, Handbridge, Westminster Park                                        | 1B, 2C, 4B, 11B, 12B, 13D, 14B | 0.48% |                                |       |                                                             |
| W02000065 | 45    | Flintshire 008                | Connahs Quay Health Center, Connahs Quay                                         | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.48% |                                |       |                                                             |
| W02000067 | 44    | Flintshire 010                | Northop Hall, Aston                                                              | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.47% |                                |       |                                                             |
| E02006024 | 43    | Shropshire 006                | Mile Oak Industrial Estate, Oswestry Cattle Market, Oswestry Minor Injuries Unit | 1B, 2C, 4B, 11B, 12B, 13B      | 0.46% |                                |       |                                                             |
| W02000068 | 41    | Flintshire 011                | Sandycroft, Queensferry, Mancot, Queensferry Industrial Estate                   | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.43% |                                |       |                                                             |
| W02000060 | 40    | Flintshire 003                | Bagillt, Holywell, Walwen, Greenfield Business Park                              | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.42% |                                |       |                                                             |
| E02006025 | 39    | Shropshire 007                | Oswestry                                                                         | 1B, 2C, 4B, 11B, 12B, 13B      | 0.41% |                                |       |                                                             |
| W02000059 | 36    | Flintshire 002                | Rhewl-Mostyn, Mostyn Docks                                                       | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.38% |                                |       |                                                             |
| E02006015 | 35    | Shropshire 001                | Whitchurch, Whitchurch Community Hospital                                        | 1A, 3B, 7A, 8B, 9A             | 0.37% |                                |       |                                                             |
| W02000064 | 35    | Flintshire 007                | Connahs Quay, Sealand Rifle Range, Deeside Power Station                         | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.37% |                                |       |                                                             |
| E02003803 | 33    | Cheshire West and Chester 034 | Chester, Greyhound Retail Park, Sealand Industrial Estate,                       | 1B, 2C, 4B, 11B, 12B, 13D, 14B | 0.35% |                                |       |                                                             |
| W02000062 | 33    | Flintshire 005                | Flint Mountain, Aber Park Industrial Centre, Aber Park Industrial Estate         | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.35% |                                |       |                                                             |
| E02003797 | 30    | Cheshire West and Chester 028 | North Chester                                                                    | 1B, 2C, 4B, 11B, 12B, 13D, 14B | 0.32% |                                |       |                                                             |
| E02003801 | 30    | Cheshire West and Chester 032 | Vicars Cross, East Chester                                                       | 1B, 2D, 15A, 6B, 16B           | 0.32% |                                |       |                                                             |
| E02003805 | 29    | Cheshire West and Chester 039 | Waverton, Christleton, Brown Heath, Guilden Sutton                               | 1B, 2D, 15A, 6B, 16B           | 0.21% | 1B, 2C, 4B, 11B, 12B, 13D, 14C | 0.09% |                                                             |
| E02003804 | 28    | Cheshire West and Chester 036 | East Chester                                                                     | 1B, 2C, 4B, 11B, 12B, 13D, 14B | 0.30% |                                |       |                                                             |
| E02003794 | 27    | Cheshire West and Chester 022 | Dunham on the Hill, Elton, Great Barrow                                          | 1B, 2C, 4B, 11B, 12B, 13D, 14C | 0.29% |                                |       |                                                             |
| E02003802 | 27    | Cheshire West and Chester 033 | Newtown, Northgate Village, Chester Train Station                                | 1B, 2C, 4B, 11B, 12B, 13D, 14C | 0.29% |                                |       |                                                             |
| E02003800 | 25    | Cheshire West and Chester 030 | Tarvin, Oscroft, Kellsall, Ashton Hayes                                          | 1B, 2C, 4B, 11B, 12B, 13D, 14C | 0.26% |                                |       |                                                             |
| E02003806 | 25    | Cheshire West and Chester 041 | Boughton Heath, Huntington, Caldly Valley                                        | 1B, 2D, 15A, 6B, 16B           | 0.26% |                                |       |                                                             |
| W02000056 | 25    | Denbighshire 015              | Kinglsey, Helsby, Flaxmere                                                       | 1B, 2C, 4B, 11B, 12B, 13D, 14C | 0.26% |                                |       |                                                             |
| W02000061 | 25    | Flintshire 004                | Flint, Oakenholt Paper Mill, Ashmount Industrial Centre                          | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 0.26% |                                |       |                                                             |
| E02003808 | 24    | Cheshire West and Chester 044 | Lache                                                                            | 1B, 2C, 4B, 11B, 12B, 13D, 14B | 0.25% |                                |       |                                                             |
| E02006026 | 23    | Shropshire 011                | Ruyton-Xi-Towns, Rednal Industrial Estate, Whittington, West Felton              | 1B, 2C, 4B, 11B, 12B, 13B      | 0.24% |                                |       |                                                             |
| E02006027 | 22    | Shropshire 012                | Maesbury, Trefonen, Llanyblodwel                                                 | 1B, 2C, 4B, 11B, 12B, 13B      | 0.23% |                                |       |                                                             |
| E02003796 | 20    | Cheshire West and Chester 027 | Upton Grange, Upton-by-Chester High School                                       | 1B, 2C, 4B, 11B, 12B, 13D, 14B | 0.21% |                                |       |                                                             |
| 9444      |       |                               |                                                                                  |                                | 82.6% |                                | 17.4% | 100.0%                                                      |

| Junc. No | Junctions                                                        | Turn             |                   |                  |                     |          |
|----------|------------------------------------------------------------------|------------------|-------------------|------------------|---------------------|----------|
|          |                                                                  | A                | B                 | C                | D                   | E        |
| 1        | Main Site Access (priority)                                      | Left             | Right             |                  |                     |          |
| 2        | Bryn Lane N (Roundabout and separate junction)                   | 1st Exit         | 2nd Exit          | 3rd Exit         | Right to Ridleywood |          |
| 3        | Bryn Lane/Oak Rd                                                 | Left             | Right             |                  |                     |          |
| 4        | A534/Industrial Estate Road/Sandy Ln/Borras Hall Ln (Roundabout) | 1st Exit         | 2nd Exit          | 3rd Exit         | 4th Exit            |          |
| 5        | Oak Rd/B5130 Holt Rd                                             | Left             | Right             | Ahead            |                     |          |
| 6        | B5130 Holt Rd                                                    | Left             | Right             | Ahead            |                     |          |
| 7        | Bridge Rd S/Redwither Road                                       | Left             | Right             | Ahead            |                     |          |
| 8        | Bridge Road (Roundabout)                                         | 1st Exit         | 2nd Exit          |                  |                     |          |
| 9        | Bridge Road South (Roundabout)                                   | 1st Exit         | 2nd Exit          | 3rd Exit         |                     |          |
| 10       | Borras Hall Lane                                                 | Left             | Ahead             |                  |                     |          |
| 11       | A534/A5156/Stryt Holt (Roundabout)                               | 1st Exit         | 2nd Exit          |                  |                     |          |
| 12       | A5156 SE (Roundabout)                                            | 1st Exit         | 2nd Exit          | 3rd Exit         |                     |          |
| 13       | A483 (Roundabout)                                                | 1st Exit (A5152) | 2nd Exit (A483 S) | 3rd Exit (BB Ln) | 4th Exit (A483 N)   | 5th Exit |
| 14       | A55 Junction 38                                                  | 1st Exit         | 2nd Exit          | 3rd Exit         |                     |          |
| 15       | Ridley Wood                                                      | Left             | Right             |                  |                     |          |
| 16       | Francis' Lane                                                    | Left             | Right             |                  |                     |          |

| Main Direction | Route                          | PRI % | SEC % | Total  |
|----------------|--------------------------------|-------|-------|--------|
| North          | 1B, 2C, 4B, 11A                | 6.1%  | 4.6%  | 10.8%  |
| North          | 1B, 2C, 4B, 11B, 12A           | 1.9%  | 0.0%  | 1.9%   |
| North          | 1B, 2C, 4B, 11B, 12B, 13B      | 31.8% | 1.9%  | 33.7%  |
| North          | 1B, 2C, 4B, 11B, 12B, 13C      | 11.2% | 1.9%  | 13.1%  |
| North          | 1B, 2C, 4B, 11B, 12B, 13D, 14A | 8.1%  | 0.0%  | 8.1%   |
| North          | 1B, 2C, 4B, 11B, 12B, 13D, 14B | 1.9%  | 0.3%  | 2.2%   |
| North          | 1B, 2C, 4B, 11B, 12B, 13D, 14C | 1.1%  | 0.1%  | 1.2%   |
| North          | 1B, 2C, 4C                     | 4.4%  | 0.0%  | 4.4%   |
| North          | 1B, 2C, 4D                     | 0.0%  | 4.8%  | 4.8%   |
| North          | 1B, 2D, 15A, 6B, 16B           | 2.0%  | 0.0%  | 2.0%   |
| South          | 1A, 3A, 5B                     | 4.9%  | 0.6%  | 5.5%   |
| South          | 1A, 3B, 7A, 8B, 9A             | 9.3%  | 3.2%  | 12.4%  |
|                |                                | 82.6% | 17.4% | 100.0% |

| Main Direction            | Primary | Secondary | Total  |
|---------------------------|---------|-----------|--------|
| Trips entering from North | 68.4%   | 13.6%     | 82.1%  |
| Trips entering from South | 14.2%   | 3.8%      | 17.9%  |
|                           | 82.6%   | 17.4%     | 100.0% |

| Entry roads to WIE used: |        |
|--------------------------|--------|
| Industrial Estate Road   | 80.1%  |
| Ridleywood               | 2.0%   |
| Oak Road                 | 5.5%   |
| Bridge Road              | 12.4%  |
|                          | 100.0% |

| count_poir | direction_c_year | count_date | hour       | region_id | region_nar | local_auth | local_auth | road_name | road_type | start_junct | end_junct | easting   | northing | latitude | longitude | link_length | link_length | pedal_cycl | two_wheel | cars_and_t | buses_and | lgvs | hgvs_2_rig | hgvs_3_rig | hgvs_4_or | hgvs_3_or | hgvs_5_art | hgvs_6_art | all_hgvs | all_motor |     |
|------------|------------------|------------|------------|-----------|------------|------------|------------|-----------|-----------|-------------|-----------|-----------|----------|----------|-----------|-------------|-------------|------------|-----------|------------|-----------|------|------------|------------|-----------|-----------|------------|------------|----------|-----------|-----|
| 99269      | E                | 2019       | 25/06/2019 | 7         | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 1         | 0          | 280       | 2    | 112        | 6          | 1         | 4         | 2          | 2          | 10       | 25        | 419 |
| 99269      | E                | 2019       | 25/06/2019 | 8         | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 2          | 348       | 4    | 129        | 15         | 5         | 8         | 4          | 5          | 18       | 55        | 538 |
| 99269      | E                | 2019       | 25/06/2019 | 9         | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 0          | 168       | 2    | 52         | 6          | 3         | 4         | 2          | 6          | 5        | 26        | 248 |
| 99269      | E                | 2019       | 25/06/2019 | 10        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 0          | 136       | 1    | 32         | 10         | 3         | 5         | 2          | 8          | 4        | 32        | 201 |
| 99269      | E                | 2019       | 25/06/2019 | 11        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 0          | 172       | 0    | 31         | 9          | 2         | 5         | 5          | 9          | 6        | 36        | 239 |
| 99269      | E                | 2019       | 25/06/2019 | 12        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 0          | 202       | 1    | 46         | 7          | 2         | 2         | 4          | 2          | 7        | 24        | 273 |
| 99269      | E                | 2019       | 25/06/2019 | 13        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 1          | 180       | 1    | 52         | 4          | 0         | 0         | 1          | 9          | 5        | 19        | 253 |
| 99269      | E                | 2019       | 25/06/2019 | 14        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 2          | 200       | 0    | 38         | 3          | 2         | 1         | 1          | 7          | 1        | 15        | 255 |
| 99269      | E                | 2019       | 25/06/2019 | 15        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 1          | 253       | 2    | 40         | 2          | 0         | 2         | 1          | 2          | 1        | 8         | 304 |
| 99269      | E                | 2019       | 25/06/2019 | 16        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 0          | 319       | 4    | 44         | 6          | 1         | 0         | 1          | 4          | 5        | 17        | 384 |
| 99269      | E                | 2019       | 25/06/2019 | 17        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 1         | 2          | 360       | 2    | 55         | 6          | 0         | 1         | 1          | 2          | 3        | 13        | 432 |
| 99269      | E                | 2019       | 25/06/2019 | 18        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 1         | 3          | 238       | 1    | 69         | 1          | 0         | 0         | 1          | 0          | 6        | 8         | 319 |
| 99269      | W                | 2019       | 25/06/2019 | 7         | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 3          | 189       | 4    | 39         | 6          | 2         | 0         | 3          | 7          | 8        | 26        | 261 |
| 99269      | W                | 2019       | 25/06/2019 | 8         | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 0          | 288       | 1    | 49         | 11         | 3         | 4         | 1          | 3          | 9        | 31        | 369 |
| 99269      | W                | 2019       | 25/06/2019 | 9         | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 0          | 212       | 1    | 34         | 3          | 3         | 6         | 1          | 4          | 5        | 22        | 269 |
| 99269      | W                | 2019       | 25/06/2019 | 10        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 0          | 149       | 1    | 87         | 5          | 2         | 5         | 4          | 6          | 8        | 30        | 267 |
| 99269      | W                | 2019       | 25/06/2019 | 11        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 0          | 146       | 1    | 42         | 3          | 2         | 4         | 3          | 4          | 7        | 23        | 212 |
| 99269      | W                | 2019       | 25/06/2019 | 12        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 2          | 173       | 0    | 48         | 6          | 3         | 2         | 0          | 4          | 2        | 17        | 240 |
| 99269      | W                | 2019       | 25/06/2019 | 13        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 1          | 175       | 1    | 43         | 7          | 3         | 2         | 2          | 8          | 1        | 23        | 243 |
| 99269      | W                | 2019       | 25/06/2019 | 14        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 2          | 136       | 1    | 58         | 1          | 2         | 1         | 1          | 2          | 6        | 13        | 210 |
| 99269      | W                | 2019       | 25/06/2019 | 15        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 0          | 202       | 5    | 91         | 2          | 2         | 5         | 1          | 5          | 7        | 22        | 320 |
| 99269      | W                | 2019       | 25/06/2019 | 16        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 1          | 249       | 0    | 78         | 6          | 1         | 4         | 0          | 2          | 1        | 14        | 342 |
| 99269      | W                | 2019       | 25/06/2019 | 17        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 0         | 0          | 324       | 2    | 69         | 4          | 0         | 2         | 2          | 2          | 2        | 12        | 407 |
| 99269      | W                | 2019       | 25/06/2019 | 18        | 4          | Wales      | 26         | Wrexham   | A534      | Major       | A5156     | LA Bounda | 339962   | 353280   | 53.07336  | -2.89757    | 5.7         | 3.54       | 1         | 0          | 211       | 0    | 33         | 1          | 1         | 0         | 0          | 3          | 1        | 6         | 250 |

Traffic statistics > Manual count points > 99269

Manual count points

Site number: 99269

Site details

|                     |                          |
|---------------------|--------------------------|
| Region              | Wales                    |
| Local authority     | Wrexham                  |
| Road name           | A534                     |
| Road classification | 'A' road                 |
| Managed by          | Local authority          |
| Road type           | Major                    |
| Start junction      | A5156                    |
| End junction        | LA Boundary              |
| Link length         | 5.70km (3.54 miles)      |
| Easting, northing   | 339962, 353280           |
| Latitude, longitude | 53.07336200, -2.89757100 |

Location



| Direction | Hour  | All HGVs | Dir % |       |
|-----------|-------|----------|-------|-------|
| E         |       | 8        | 55    | 64.0% |
| W         |       | 8        | 31    | 36.0% |
|           | Total |          | 86    |       |
| E         |       | 17       | 13    | 52.0% |
| W         |       | 17       | 12    | 48.0% |
|           | Total |          | 25    |       |

| count_poir | direction_c_year | count_date | hour       | region_id | region_nar | local_auth | local_auth | road_name | road_type | start_junct | end_junct | easting | northing | latitude | longitude | link_length | link_length | pedal_cycl | two_wheel | cars_and | buses_and | lgvs | hgv_2_rig | hgv_3_rig | hgv_4_or | hgv_3_or | hgv_5_art | hgv_6_art | all_hgvs | all_motor_ |      |
|------------|------------------|------------|------------|-----------|------------|------------|------------|-----------|-----------|-------------|-----------|---------|----------|----------|-----------|-------------|-------------|------------|-----------|----------|-----------|------|-----------|-----------|----------|----------|-----------|-----------|----------|------------|------|
| 30560      | N                | 2017       | 03/07/2017 | 7         | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 14       | 1985      | 5    | 476       | 28        | 10       | 13       | 4         | 28        | 37       | 120        | 2600 |
| 30560      | N                | 2017       | 03/07/2017 | 8         | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 11       | 1756      | 11   | 333       | 37        | 11       | 12       | 10        | 20        | 31       | 121        | 2232 |
| 30560      | N                | 2017       | 03/07/2017 | 9         | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 4        | 1137      | 2    | 265       | 44        | 5        | 8        | 10        | 35        | 33       | 135        | 1543 |
| 30560      | N                | 2017       | 03/07/2017 | 10        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 10       | 1068      | 5    | 246       | 40        | 18       | 12       | 13        | 24        | 27       | 134        | 1463 |
| 30560      | N                | 2017       | 03/07/2017 | 11        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 5        | 1173      | 1    | 255       | 47        | 14       | 11       | 8         | 32        | 34       | 146        | 1580 |
| 30560      | N                | 2017       | 03/07/2017 | 12        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 12       | 1203      | 1    | 253       | 39        | 10       | 6        | 2         | 30        | 27       | 114        | 1583 |
| 30560      | N                | 2017       | 03/07/2017 | 13        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 14       | 1139      | 5    | 244       | 41        | 9        | 8        | 3         | 34        | 29       | 124        | 1526 |
| 30560      | N                | 2017       | 03/07/2017 | 14        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 12       | 1227      | 16   | 289       | 48        | 23       | 11       | 6         | 32        | 23       | 143        | 1687 |
| 30560      | N                | 2017       | 03/07/2017 | 15        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 6        | 1324      | 8    | 334       | 34        | 17       | 8        | 4         | 20        | 37       | 120        | 1792 |
| 30560      | N                | 2017       | 03/07/2017 | 16        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 8        | 1494      | 7    | 337       | 21        | 8        | 6        | 12        | 26        | 17       | 90         | 1936 |
| 30560      | N                | 2017       | 03/07/2017 | 17        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 12       | 1629      | 1    | 235       | 18        | 5        | 4        | 4         | 18        | 20       | 69         | 1946 |
| 30560      | N                | 2017       | 03/07/2017 | 18        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 10       | 1152      | 3    | 136       | 8         | 5        | 1        | 3         | 20        | 17       | 54         | 1355 |
| 30560      | S                | 2017       | 03/07/2017 | 7         | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 4        | 1140      | 3    | 388       | 62        | 17       | 10       | 9         | 28        | 45       | 171        | 1706 |
| 30560      | S                | 2017       | 03/07/2017 | 8         | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 3        | 1712      | 7    | 413       | 47        | 15       | 13       | 8         | 37        | 40       | 160        | 2295 |
| 30560      | S                | 2017       | 03/07/2017 | 9         | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 3        | 1142      | 7    | 333       | 58        | 13       | 9        | 2         | 29        | 43       | 154        | 1639 |
| 30560      | S                | 2017       | 03/07/2017 | 10        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 8        | 1114      | 8    | 282       | 57        | 14       | 10       | 11        | 43        | 34       | 169        | 1581 |
| 30560      | S                | 2017       | 03/07/2017 | 11        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 11       | 1161      | 6    | 275       | 51        | 17       | 9        | 6         | 30        | 32       | 145        | 1598 |
| 30560      | S                | 2017       | 03/07/2017 | 12        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 6        | 1169      | 3    | 260       | 45        | 5        | 2        | 3         | 29        | 29       | 113        | 1551 |
| 30560      | S                | 2017       | 03/07/2017 | 13        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 7        | 1256      | 3    | 249       | 27        | 12       | 16       | 7         | 22        | 23       | 107        | 1622 |
| 30560      | S                | 2017       | 03/07/2017 | 14        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 12       | 1320      | 6    | 289       | 30        | 8        | 12       | 3         | 36        | 32       | 121        | 1748 |
| 30560      | S                | 2017       | 03/07/2017 | 15        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 10       | 1490      | 11   | 322       | 29        | 10       | 12       | 5         | 18        | 28       | 102        | 1935 |
| 30560      | S                | 2017       | 03/07/2017 | 16        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 14       | 2035      | 6    | 470       | 10        | 5        | 12       | 3         | 26        | 28       | 84         | 2609 |
| 30560      | S                | 2017       | 03/07/2017 | 17        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 17       | 2426      | 5    | 336       | 11        | 4        | 4        | 2         | 16        | 33       | 70         | 2854 |
| 30560      | S                | 2017       | 03/07/2017 | 18        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A541      | A5156   | 333200   | 352540   | 53.06591  | -2.99833    | 2.6         | 1.62       | 0         | 13       | 1599      | 2    | 189       | 12        | 2        | 4        | 1         | 20        | 15       | 54         | 1857 |

Traffic statistics > Manual count points > 30560

Manual count points

Site number: 30560

### Site details

|                     |                          |
|---------------------|--------------------------|
| Region              | Wales                    |
| Local authority     | Wrexham                  |
| Road name           | A483                     |
| Road classification | 'A' road                 |
| Managed by          | Welsh Government         |
| Road type           | Major                    |
| Start junction      | A541                     |
| End junction        | A5156                    |
| Link length         | 2.70km (1.68 miles)      |
| Easting, northing   | 333200, 352540           |
| Latitude, longitude | 53.06590600, -2.99832990 |

### Location



| Direction | Hour  | All HGVs | Dir % |       |
|-----------|-------|----------|-------|-------|
| N         |       | 8        | 121   | 43.1% |
| S         |       | 8        | 160   | 56.9% |
|           | Total |          | 281   |       |
| N         |       | 17       | 69    | 49.6% |
| S         |       | 17       | 70    | 50.4% |
|           | Total |          | 139   |       |

| count_poir | direction_c_year | count_date | hour       | region_id | region_nar | local_auth | local_auth | road_name | road_type | start_junct | end_junct | easting | northing | latitude | longitude | link_length | link_length | pedal_cycl | two_wheel | cars_and | t_buses_and | lgvs | hgv_2_rig | hgv_3_rig | hgv_4_or | hgv_3_or | hgv_5_art | hgv_6_art | all_hgvs | all_motor_vehicles |      |
|------------|------------------|------------|------------|-----------|------------|------------|------------|-----------|-----------|-------------|-----------|---------|----------|----------|-----------|-------------|-------------|------------|-----------|----------|-------------|------|-----------|-----------|----------|----------|-----------|-----------|----------|--------------------|------|
| 10560      | N                | 2017       | 22/05/2017 | 7         | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 4        | 1697        | 3    | 383       | 35        | 9        | 17       | 6         | 41        | 52       | 160                | 2247 |
| 10560      | N                | 2017       | 22/05/2017 | 8         | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 6        | 1323        | 5    | 270       | 33        | 11       | 9        | 8         | 37        | 46       | 144                | 1748 |
| 10560      | N                | 2017       | 22/05/2017 | 9         | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 2        | 1034        | 5    | 232       | 42        | 8        | 27       | 12        | 48        | 47       | 184                | 1457 |
| 10560      | N                | 2017       | 22/05/2017 | 10        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 5        | 1035        | 11   | 213       | 53        | 14       | 20       | 11        | 48        | 48       | 194                | 1458 |
| 10560      | N                | 2017       | 22/05/2017 | 11        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 18       | 915         | 4    | 251       | 40        | 22       | 17       | 10        | 41        | 42       | 172                | 1360 |
| 10560      | N                | 2017       | 22/05/2017 | 12        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 24       | 1051        | 5    | 244       | 35        | 8        | 17       | 7         | 58        | 33       | 158                | 1482 |
| 10560      | N                | 2017       | 22/05/2017 | 13        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 12       | 955         | 5    | 262       | 47        | 17       | 18       | 8         | 52        | 53       | 195                | 1429 |
| 10560      | N                | 2017       | 22/05/2017 | 14        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 8        | 1012        | 12   | 277       | 44        | 9        | 17       | 4         | 53        | 46       | 173                | 1482 |
| 10560      | N                | 2017       | 22/05/2017 | 15        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 9        | 1195        | 4    | 296       | 36        | 13       | 20       | 10        | 50        | 38       | 167                | 1671 |
| 10560      | N                | 2017       | 22/05/2017 | 16        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 13       | 1521        | 9    | 345       | 35        | 6        | 7        | 10        | 35        | 46       | 139                | 2027 |
| 10560      | N                | 2017       | 22/05/2017 | 17        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 8        | 1636        | 0    | 254       | 30        | 8        | 2        | 5         | 28        | 29       | 102                | 2000 |
| 10560      | N                | 2017       | 22/05/2017 | 18        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 5        | 966         | 2    | 135       | 6         | 2        | 2        | 4         | 9         | 23       | 46                 | 1154 |
| 10560      | S                | 2017       | 22/05/2017 | 7         | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 8        | 1350        | 6    | 419       | 52        | 15       | 16       | 8         | 40        | 51       | 182                | 1965 |
| 10560      | S                | 2017       | 22/05/2017 | 8         | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 4        | 1642        | 4    | 400       | 37        | 14       | 19       | 4         | 51        | 38       | 163                | 2213 |
| 10560      | S                | 2017       | 22/05/2017 | 9         | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 1        | 1041        | 3    | 325       | 47        | 17       | 20       | 13        | 36        | 52       | 185                | 1555 |
| 10560      | S                | 2017       | 22/05/2017 | 10        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 4        | 852         | 4    | 257       | 43        | 12       | 20       | 7         | 54        | 64       | 200                | 1317 |
| 10560      | S                | 2017       | 22/05/2017 | 11        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 9        | 830         | 7    | 253       | 42        | 8        | 16       | 10        | 50        | 45       | 171                | 1270 |
| 10560      | S                | 2017       | 22/05/2017 | 12        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 8        | 869         | 1    | 248       | 45        | 12       | 11       | 6         | 73        | 46       | 193                | 1319 |
| 10560      | S                | 2017       | 22/05/2017 | 13        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 7        | 993         | 0    | 227       | 47        | 6        | 17       | 3         | 42        | 58       | 173                | 1400 |
| 10560      | S                | 2017       | 22/05/2017 | 14        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 4        | 1033        | 7    | 273       | 42        | 19       | 17       | 2         | 50        | 57       | 187                | 1504 |
| 10560      | S                | 2017       | 22/05/2017 | 15        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 0        | 1178        | 4    | 272       | 40        | 16       | 25       | 5         | 34        | 51       | 171                | 1625 |
| 10560      | S                | 2017       | 22/05/2017 | 16        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 8        | 1723        | 1    | 404       | 23        | 4        | 12       | 1         | 39        | 27       | 106                | 2242 |
| 10560      | S                | 2017       | 22/05/2017 | 17        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 4        | 1932        | 5    | 265       | 9         | 6        | 9        | 5         | 19        | 36       | 84                 | 2290 |
| 10560      | S                | 2017       | 22/05/2017 | 18        | 4          | Wales      | 26         | Wrexham   | A483      | Major       | A5156     | B5102   | 335399   | 355929   | 53.09664  | -2.9662     | 4.6         | 2.86       | 0         | 5        | 1224        | 6    | 164       | 8         | 2        | 4        | 1         | 19        | 25       | 59                 | 1458 |

[Traffic statistics](#) > [Manual count points](#) > 10560

Manual count points

Site number: 10560

## Site details

|                     |                         |
|---------------------|-------------------------|
| Region              | <a href="#">Wales</a>   |
| Local authority     | <a href="#">Wrexham</a> |
| Road name           | A483                    |
| Road classification | 'A' road                |
| Managed by          | Welsh Government        |
| Road type           | Major                   |
| Start junction      | A5156                   |
| End junction        | B5102                   |
| Link length         | 4.70km (2.92 miles)     |
| Easting, northing   | 335399, 355929          |
| Latitude, longitude | 53.09663700,-2.96620070 |

## Location



| Direction | Hour  | All HGVs | Dir % |       |
|-----------|-------|----------|-------|-------|
| N         |       | 8        | 144   | 46.9% |
| S         |       | 8        | 163   | 53.1% |
|           | Total |          | 307   |       |
| N         |       | 17       | 102   | 54.8% |
| S         |       | 17       | 84    | 45.2% |
|           | Total |          | 186   |       |

# DfT Count Based HGV Distribution

| Location              | Direction | AM Peak  |        | PM Peak  |        |
|-----------------------|-----------|----------|--------|----------|--------|
|                       |           | HGV Flow | HGV %  | HGV Flow | HGV %  |
| Outbound (Departures) |           |          |        |          |        |
| A534 Holt             | E         | 55       | 15.3%  | 13       | 7.0%   |
| A483 S                | S         | 160      | 44.6%  | 70       | 37.8%  |
| A483 N                | N         | 144      | 40.1%  | 102      | 55.1%  |
| Total                 |           | 359      | 100.0% | 185      | 100.0% |
| Inbound (Arrivals)    |           |          |        |          |        |
| A534 Holt             | W         | 31       | 9.8%   | 12       | 7.3%   |
| A483 S                | N         | 121      | 38.4%  | 69       | 41.8%  |
| A483 N                | S         | 163      | 51.7%  | 84       | 50.9%  |
| Total                 |           | 315      | 100.0% | 165      | 100.0% |

| Peak | Arrivals | Departures | Total |
|------|----------|------------|-------|
| AM   | 37       | 44         | 81    |
| PM   | 45       | 23         | 68    |

| Route     | AM Peak  |            |       | PM Peak  |            |       |
|-----------|----------|------------|-------|----------|------------|-------|
|           | Arrivals | Departures | Total | Arrivals | Departures | Total |
| A534 Holt | 4        | 7          | 11    | 3        | 2          | 5     |
| A483 S    | 14       | 20         | 34    | 19       | 9          | 28    |
| A483 N    | 19       | 18         | 37    | 23       | 13         | 36    |
| Total     | 37       | 45         | 82    | 45       | 24         | 69    |

## David Stoddart

---

**From:** Claudia Currie <Claudia.Currie@mottmac.com>  
**Sent:** 13 September 2022 15:40  
**To:** David Stoddart  
**Cc:** Margaret Henderson; Dominic Jones; Phil Palmer  
**Subject:** FW: Initial Scoping Request - Kingmoor, Wrexham Industrial Estate

Hi,

I have been asked by Phil to forward the initial comments that MM provided to WCBC back in July. My apologies as there seems to have been a bit of a misunderstanding on the communication side as our advice is normally issued by WCBC rather than direct from ourselves..... below is the latest set of comments issued to WCBC.

Regards

### Claudia Currie

Associate Transport Planner

D 029 2046 7884

---

**From:** Claudia Currie  
**Sent:** 27 July 2022 16:36  
**To:** Phil Palmer <Phil.Palmer@wrexham.gov.uk>  
**Cc:** Margaret Henderson <Margaret.Henderson@mottmac.com>  
**Subject:** RE: Initial Scoping Request - Kingmoor, Wrexham Industrial Estate

Hi,

I have been updating our planning progress for Dominic and just in case we did not respond formally to this one, and noting that the surveys have already happened, the locations proposed would all appear to be fine. With the remaining documents they provide a reasonable summary of the trip rates that the developer will be proposing to use.

The only additional comment that I would make is that some sensitivity testing may be needed if/when the Developer shows that any of the junctions assessed are close to, or over capacity, with or without development to enable WCBC Highways to be comfortable in any comments they make on the formal application.

Regards

### Claudia Currie

Associate Transport Planner

D 029 2046 7884

---

**From:** Phil Palmer <[Phil.Palmer@wrexham.gov.uk](mailto:Phil.Palmer@wrexham.gov.uk)>  
**Sent:** 09 June 2022 10:22  
**To:** Margaret Henderson <[Margaret.Henderson@mottmac.com](mailto:Margaret.Henderson@mottmac.com)>  
**Cc:** Paul Walton <[Paul.Walton@mottmac.com](mailto:Paul.Walton@mottmac.com)>  
**Subject:** FW: Initial Scoping Request - Kingmoor, Wrexham Industrial Estate

Hi Margaret

Could you please confirm that you can provide a response to Prime on the attached Scoping Request at your earliest convenience?

Regards, Phil

Phil Palmer

*Peiriannydd (Rheoli Datblygiad)  
Gwasanaethau Amgylchedd a Thechnegol*

*Engineer (Development Control)  
Environment and Technical Services*



01978 729688

Cyngor Bwrdeistref Sirol Wrecsam, Neuadd y Dref, Wrecsam LL11 1AY

Wrexham County Borough Council, Guildhall, Wrexham LL11 1AY

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---

**From:** David Stoddart <[D.Stoddart@primetp.co.uk](mailto:D.Stoddart@primetp.co.uk)>

**Sent:** 09 June 2022 09:49

**To:** Phil Palmer <[Phil.Palmer@wrexham.gov.uk](mailto:Phil.Palmer@wrexham.gov.uk)>

**Subject:** Initial Scoping Request - Kingmoor, Wrexham Industrial Estate

Hi Phil,

Thanks for your time on the phone on Tuesday. As discussed, FI Real Estate are looking to develop a number of B8 (warehousing and distribution) sheds on a site off Bryn Lane, adjacent to the existing Very Group facility, who's access we will likely share. I believe this is the site you mentioned that was being considered for a power plant a few years ago. The location is shown on the attached plan.

The architect is currently drawing up options in terms of numbers of sheds but we are working to a combined gross floor area of 900,000sqft (83,613sqm). We can provide further details, including parking numbers and access arrangements in due course, but for now, we'd really appreciate your thoughts on our suggested scope for off-site junction capacity assessments.

As our client is currently looking towards a September submission, we will be undertaking traffic surveys this month as it is the last neutral month before the summer. We are aiming to survey next week, so I appreciate this is very short notice!



To inform the junctions we intend to assess and survey, we have undertaken a trip generation and distribution exercise using TRICS along with census method of travel to work data for light vehicles and HGV proportions from fixed DfT count sites on the A534 and A483 for heavies. I have attached the TRICS output and the distribution calcs. The trip rates and generation are summarised in the table below:

| Time                | Trip Rates   |              |              | Trip Generation |             |             |
|---------------------|--------------|--------------|--------------|-----------------|-------------|-------------|
|                     | Arrivals     | Departures   | Total        | Arrivals        | Departures  | Total       |
| 07:00-08:00         | 0.153        | 0.086        | 0.239        | 128             | 72          | 200         |
| <b>08:00-09:00</b>  | <b>0.156</b> | <b>0.097</b> | <b>0.253</b> | <b>130</b>      | <b>81</b>   | <b>211</b>  |
| 09:00-10:00         | 0.123        | 0.086        | 0.209        | 103             | 72          | 175         |
| 10:00-11:00         | 0.084        | 0.080        | 0.164        | 70              | 67          | 137         |
| 11:00-12:00         | 0.082        | 0.084        | 0.166        | 69              | 70          | 139         |
| 12:00-13:00         | 0.096        | 0.098        | 0.194        | 80              | 82          | 162         |
| 13:00-14:00         | 0.092        | 0.111        | 0.203        | 77              | 93          | 170         |
| 14:00-15:00         | 0.072        | 0.137        | 0.209        | 60              | 115         | 175         |
| 15:00-16:00         | 0.074        | 0.098        | 0.172        | 62              | 82          | 144         |
| 16:00-17:00         | 0.071        | 0.125        | 0.196        | 59              | 105         | 164         |
| <b>17:00-18:00</b>  | <b>0.079</b> | <b>0.139</b> | <b>0.218</b> | <b>66</b>       | <b>116</b>  | <b>182</b>  |
| 18:00-19:00         | 0.032        | 0.085        | 0.117        | 27              | 71          | 98          |
| <b>Daily (12hr)</b> | <b>1.114</b> | <b>1.226</b> | <b>2.340</b> | <b>931</b>      | <b>1026</b> | <b>1957</b> |

The attached diagram shows the routes used in the distribution exercise and how many two-way peak hour development trips we forecast through each junction. There are some minor differences due to rounding. We've used the traditional 30 two-way trip threshold to identify the junctions. We are proposing to survey two junctions to the south where this threshold isn't exceeded but this is more to inform on-going developments in WIE.

Given that developments of this scale are somewhat limited, we have undertaken our own research into recent major logistics developments, noting trip rates and parking provision. A copy of our study is attached. I believe it affirms that our trip rates are robust, with them being higher than the 85<sup>th</sup> percentile rates used in the study.

I appreciate we will have a lot to discuss in terms of other aspects of the proposals including sustainable travel opportunities, but for now I would really appreciate your initial thoughts in terms of the scope of the surveys and capacity assessments. Happy to discuss over the phone if easier.

Kind regards

Dave

**David Stoddart**  
Associate Director

D: +44 (0)151 728 1864

M: +44 (0)7944 446 528

9 Hurricane Court, Liverpool International Business Park  
Estuary Boulevard, Liverpool, L24 8RL



[www.primetp.co.uk](http://www.primetp.co.uk)



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## APPENDIX B

### CRASHMAP DATA

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crashmap.co.uk

**Validated Data**

**Crash Date:** Tuesday, January 03, 2017

**Time of Crash:** 5:11:00 PM

**Crash Reference:** 201760V001289

**Highest Injury Severity:** Slight

**Road Number:** U0

**Number of Casualties:** 4

**Highway Authority:** Wrexham

**Number of Vehicles:** 3

**Local Authority:** Wrexham County Borough

**OS Grid Reference:** 338053 350930

**Weather Description:** Fine without high winds

**Road Surface Description:** Wet or Damp

**Speed Limit:** 70

**Light Conditions:** Darkness: no street lighting

**Carriageway Hazards:** None

**Junction Detail:** Roundabout

**Junction Pedestrian Crossing:** No physical crossing facility within 50 metres

**Road Type:** Dual carriageway

**Junction Control:** Give way or uncontrolled



For more information about the data please visit: [www.crashmap.co.uk/home/Faq](http://www.crashmap.co.uk/home/Faq)

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## Validated Data

### Vehicles Involved

| Vehicle Ref | Vehicle Type                 | Vehicle Age | Driver Gender | Driver Age Band | Vehicle Maneuvre                                                 | First Point of Impact | Journey Purpose        | Hit Object - On Carriageway | Hit Object - Off Carriageway |
|-------------|------------------------------|-------------|---------------|-----------------|------------------------------------------------------------------|-----------------------|------------------------|-----------------------------|------------------------------|
| 1           | Car (excluding private hire) | -1          | Male          | 36 - 45         | Vehicle proceeding normally along the carriageway, not on a bend | Front                 | Commuting to/from work | None                        | None                         |
| 2           | Car (excluding private hire) | -1          | Male          | 46 - 55         | Vehicle is slowing down or stopping                              | Back                  | Commuting to/from work | None                        | None                         |
| 3           | Car (excluding private hire) | -1          | Female        | 46 - 55         | Vehicle is slowing down or stopping                              | Back                  | Commuting to/from work | None                        | None                         |

### Casualties

| Vehicle Ref | Casualty Ref | Injury Severity | Casualty Class               | Gender | Age Band | Pedestrian Location | Pedestrian Movement |
|-------------|--------------|-----------------|------------------------------|--------|----------|---------------------|---------------------|
| 2           | 1            | Slight          | Driver or rider              | Male   | 46 - 55  | Unknown or other    | Unknown or other    |
| 2           | 2            | Slight          | Vehicle or pillion passenger | Male   | 46 - 55  | Unknown or other    | Unknown or other    |
| 2           | 3            | Slight          | Vehicle or pillion passenger | Male   | 21 - 25  | Unknown or other    | Unknown or other    |
| 2           | 4            | Slight          | Vehicle or pillion passenger | Male   | 46 - 55  | Unknown or other    | Unknown or other    |

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## Validated Data

**Crash Date:** Tuesday, October 17, 2017 **Time of Crash:** 5:10:00 PM **Crash Reference:** 201760V158070

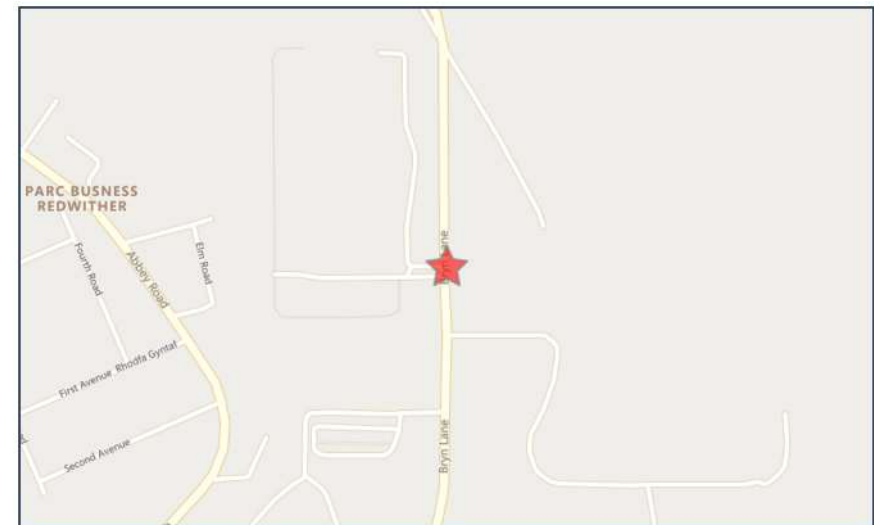
**Highest Injury Severity:** Slight  
**Highway Authority:** Wrexham  
**Local Authority:** Wrexham County Borough  
**Weather Description:** Fine without high winds  
**Road Surface Description:** Dry  
**Speed Limit:** 40  
**Light Conditions:** Daylight: regardless of presence of streetlights  
**Carriageway Hazards:** None  
**Junction Detail:** Using private drive or entrance  
**Junction Pedestrian Crossing:** No physical crossing facility within 50 metres  
**Road Type:** Single carriageway  
**Junction Control:** Give way or uncontrolled

**Road Number:** U0

**Number of Casualties:** 2

**Number of Vehicles:** 3

**OS Grid Reference:** 338967 350361



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## Validated Data

### Vehicles involved

| Vehicle Ref | Vehicle Type                 | Vehicle Age | Driver Gender | Driver Age Band | Vehicle Maneuvre                                                 | First Point of Impact | Journey Purpose         | Hit Object - On Carriageway | Hit Object - Off Carriageway |
|-------------|------------------------------|-------------|---------------|-----------------|------------------------------------------------------------------|-----------------------|-------------------------|-----------------------------|------------------------------|
| 1           | Car (excluding private hire) | -1          | Male          | 26 - 35         | Vehicle proceeding normally along the carriageway, not on a bend | Front                 | Journey as part of work | None                        | None                         |
| 2           | Car (excluding private hire) | -1          | Male          | 21 - 25         | Vehicle is waiting to turn right                                 | Back                  | Commuting to/from work  | None                        | None                         |
| 3           | Car (excluding private hire) | -1          | Female        | 26 - 35         | Vehicle proceeding normally along the carriageway, not on a bend | Front                 | Commuting to/from work  | None                        | None                         |

### Casualties

| Vehicle Ref | Casualty Ref | Injury Severity | Casualty Class  | Gender | Age Band | Pedestrian Location | Pedestrian Movement |
|-------------|--------------|-----------------|-----------------|--------|----------|---------------------|---------------------|
| 2           | 1            | Slight          | Driver or rider | Male   | 21 - 25  | Unknown or other    | Unknown or other    |
| 3           | 2            | Slight          | Driver or rider | Female | 26 - 35  | Unknown or other    | Unknown or other    |

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## Validated Data

**Crash Date:** Friday, March 23, 2018 **Time of Crash:** 8:31:00 AM **Crash Reference:** 201860W036124

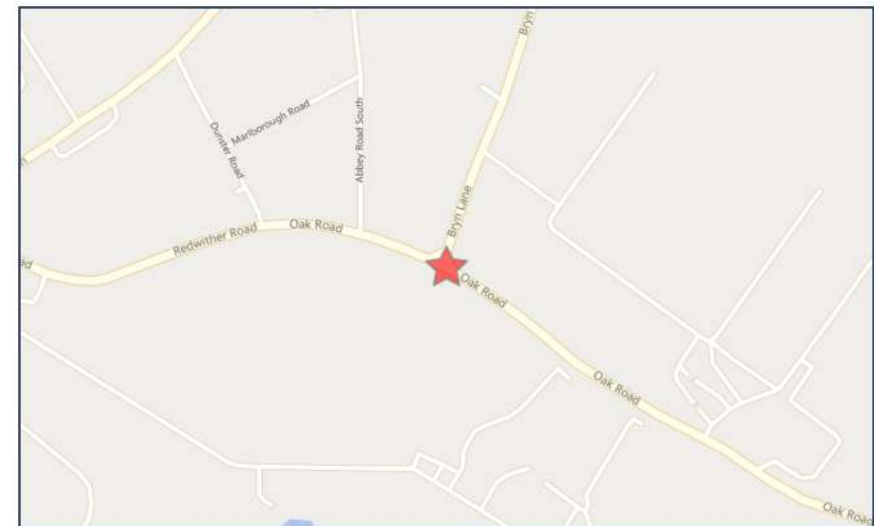
**Highest Injury Severity:** Slight  
**Highway Authority:** Wrexham  
**Local Authority:** Wrexham County Borough  
**Weather Description:** Fine without high winds  
**Road Surface Description:** Dry  
**Speed Limit:** 40  
**Light Conditions:** Daylight: regardless of presence of streetlights  
**Carriageway Hazards:** None  
**Junction Detail:** T or staggered junction  
**Junction Pedestrian Crossing:** No physical crossing facility within 50 metres  
**Road Type:** Single carriageway  
**Junction Control:** Give way or uncontrolled

**Road Number:** U0

**Number of Casualties:** 2

**Number of Vehicles:** 2

**OS Grid Reference:** 338773 349452



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## Validated Data

### Vehicles involved

| Vehicle Ref | Vehicle Type                 | Vehicle Age | Driver Gender | Driver Age Band | Vehicle Maneuvre                                                 | First Point of Impact | Journey Purpose         | Hit Object - On Carriageway | Hit Object - Off Carriageway |
|-------------|------------------------------|-------------|---------------|-----------------|------------------------------------------------------------------|-----------------------|-------------------------|-----------------------------|------------------------------|
| 1           | Car (excluding private hire) | -1          | Female        | 46 - 55         | Vehicle is in the act of turning right                           | Front                 | Commuting to/from work  | None                        | None                         |
| 2           | Taxi/Private hire car        | -1          | Male          | 26 - 35         | Vehicle proceeding normally along the carriageway, not on a bend | Front                 | Journey as part of work | None                        | None                         |

### Casualties

| Vehicle Ref | Casualty Ref | Injury Severity | Casualty Class  | Gender | Age Band | Pedestrian Location | Pedestrian Movement |
|-------------|--------------|-----------------|-----------------|--------|----------|---------------------|---------------------|
| 1           | 1            | Slight          | Driver or rider | Female | 46 - 55  | Unknown or other    | Unknown or other    |
| 2           | 2            | Slight          | Driver or rider | Male   | 26 - 35  | Unknown or other    | Unknown or other    |

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## Validated Data

**Crash Date:** Saturday, September 01, 2018 **Time of Crash:** 5:15:00 PM **Crash Reference:** 201860W127126

**Highest Injury Severity:** Serious  
**Highway Authority:** Wrexham  
**Local Authority:** Wrexham County Borough  
**Weather Description:** Fine without high winds  
**Road Surface Description:** Dry  
**Speed Limit:** 30  
**Light Conditions:** Daylight: regardless of presence of streetlights  
**Carriageway Hazards:** None  
**Junction Detail:** Using private drive or entrance  
**Junction Pedestrian Crossing:** No physical crossing facility within 50 metres  
**Road Type:** Single carriageway  
**Junction Control:** Give way or uncontrolled

**Road Number:** U0

**Number of Casualties:** 1

**Number of Vehicles:** 2

**OS Grid Reference:** 338097 350817



For more information about the data please visit: [www.crashmap.co.uk/home/Faq](http://www.crashmap.co.uk/home/Faq)

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## Validated Data

### Vehicles involved

| Vehicle Ref | Vehicle Type                 | Vehicle Age | Driver Gender | Driver Age Band | Vehicle Manoeuvre                                                | First Point of Impact | Journey Purpose | Hit Object - On Carriageway | Hit Object - Off Carriageway |
|-------------|------------------------------|-------------|---------------|-----------------|------------------------------------------------------------------|-----------------------|-----------------|-----------------------------|------------------------------|
| 1           | Pedal cycle                  | -1          | Male          | 56 - 65         | Vehicle proceeding normally along the carriageway, not on a bend | Front                 | Unknown         | None                        | None                         |
| 2           | Car (excluding private hire) | -1          | Female        | 46 - 55         | Vehicle is slowing down or stopping                              | Back                  | Unknown         | None                        | None                         |

### Casualties

| Vehicle Ref | Casualty Ref | Injury Severity | Casualty Class  | Gender | Age Band | Pedestrian Location | Pedestrian Movement |
|-------------|--------------|-----------------|-----------------|--------|----------|---------------------|---------------------|
| 1           | 1            | Serious         | Driver or rider | Male   | 56 - 65  | Unknown or other    | Unknown or other    |

For more information about the data please visit: [www.crashmap.co.uk/home/Faq](http://www.crashmap.co.uk/home/Faq)

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|                                      |                                                  |                       |            |                              |               |
|--------------------------------------|--------------------------------------------------|-----------------------|------------|------------------------------|---------------|
| <b>Crash Date:</b>                   | Friday, October 12, 2018                         | <b>Time of Crash:</b> | 2:20:00 PM | <b>Crash Reference:</b>      | 201860W145697 |
| <b>Highest Injury Severity:</b>      | Slight                                           | <b>Road Number:</b>   | U0         | <b>Number of Casualties:</b> | 1             |
| <b>Highway Authority:</b>            | Wrexham                                          |                       |            | <b>Number of Vehicles:</b>   | 2             |
| <b>Local Authority:</b>              | Wrexham County Borough                           |                       |            | <b>OS Grid Reference:</b>    | 338114 350908 |
| <b>Weather Description:</b>          | Raining without high winds                       |                       |            |                              |               |
| <b>Road Surface Description:</b>     | Wet or Damp                                      |                       |            |                              |               |
| <b>Speed Limit:</b>                  | 40                                               |                       |            |                              |               |
| <b>Light Conditions:</b>             | Daylight: regardless of presence of streetlights |                       |            |                              |               |
| <b>Carriageway Hazards:</b>          | None                                             |                       |            |                              |               |
| <b>Junction Detail:</b>              | Roundabout                                       |                       |            |                              |               |
| <b>Junction Pedestrian Crossing:</b> | No physical crossing facility within 50 metres   |                       |            |                              |               |
| <b>Road Type:</b>                    | Dual carriageway                                 |                       |            |                              |               |
| <b>Junction Control:</b>             | Give way or uncontrolled                         |                       |            |                              |               |





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## Validated Data

### Vehicles involved

| Vehicle Ref | Vehicle Type                 | Vehicle Age | Driver Gender | Driver Age Band | Vehicle Manoeuvre                                                      | First Point of Impact | Journey Purpose | Hit Object - On Carriageway | Hit Object - Off Carriageway |
|-------------|------------------------------|-------------|---------------|-----------------|------------------------------------------------------------------------|-----------------------|-----------------|-----------------------------|------------------------------|
| 1           | Car (excluding private hire) | -1          | Male          | 26 - 35         | Vehicle is in the act of turning left                                  | Nearside              | Unknown         | None                        | None                         |
| 2           | Pedal cycle                  | -1          | Male          | 36 - 45         | Vehicle proceeding normally along the carriageway, on a left hand bend | Front                 | Unknown         | None                        | None                         |

### Casualties

| Vehicle Ref | Casualty Ref | Injury Severity | Casualty Class  | Gender | Age Band | Pedestrian Location | Pedestrian Movement |
|-------------|--------------|-----------------|-----------------|--------|----------|---------------------|---------------------|
| 2           | 1            | Slight          | Driver or rider | Male   | 36 - 45  | Unknown or other    | Unknown or other    |

For more information about the data please visit: [www.crashmap.co.uk/home/Faq](http://www.crashmap.co.uk/home/Faq)

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**Provisional Data does not include vehicle and casualty records**

**Crash Date:** Monday, April 26, 2021

**Time of Crash:** 6:10:00 AM

**Crash Reference:** 202160Z057006

**Highest Injury Severity:** Slight

**Road Number:** U0

**Number of Casualties:** 1

**Highway Authority:**

**Number of Vehicles:** 2

**Local Authority:**

**OS Grid Reference:** 338057 350923

**Weather Description:** Fine without high winds

**Road Surface Description:** Dry

**Speed Limit:** 30

**Light Conditions:** Daylight: regardless of presence of streetlights

**Carriageway Hazards:** None

**Junction Detail:** Not at or within 20 metres of junction

**Junction Pedestrian Crossing:** No physical crossing facility within 50 metres

**Road Type:** Single carriageway

**Junction Control:** Not Applicable



For more information about the data please visit: [www.crashmap.co.uk/home/Faq](http://www.crashmap.co.uk/home/Faq)

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**Provisional Data does not include vehicle and casualty records**

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**Provisional Data does not include vehicle and casualty records**

**Crash Date:** Friday, June 04, 2021

**Time of Crash:** 4:13:00 PM

**Crash Reference:** 202160Z078800

**Highest Injury Severity:** Slight

**Road Number:** U0

**Number of Casualties:** 3

**Highway Authority:**

**Number of Vehicles:** 2

**Local Authority:**

**OS Grid Reference:** 338962 350140

**Weather Description:** Fine without high winds

**Road Surface Description:** Dry

**Speed Limit:** 40

**Light Conditions:** Daylight: regardless of presence of streetlights

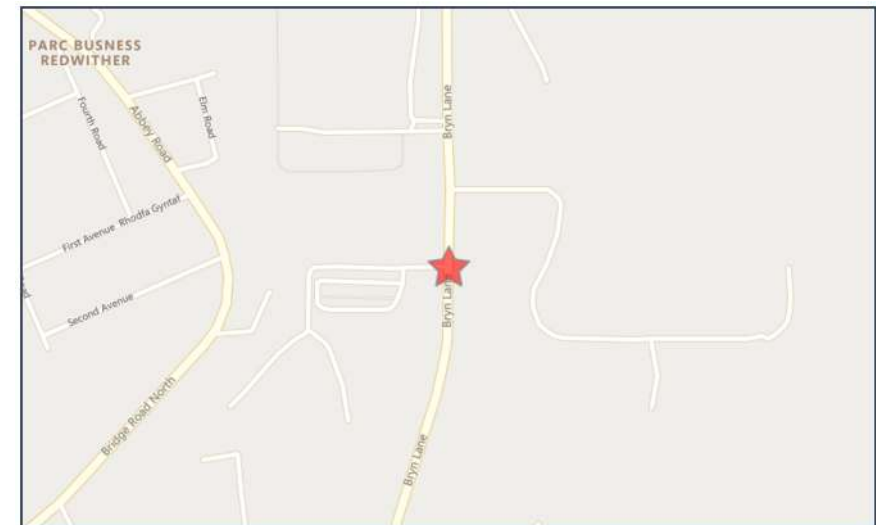
**Carriageway Hazards:** None

**Junction Detail:** Other junction

**Junction Pedestrian Crossing:** No physical crossing facility within 50 metres

**Road Type:** Single carriageway

**Junction Control:** Give way or uncontrolled



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**Provisional Data does not include vehicle and casualty records**

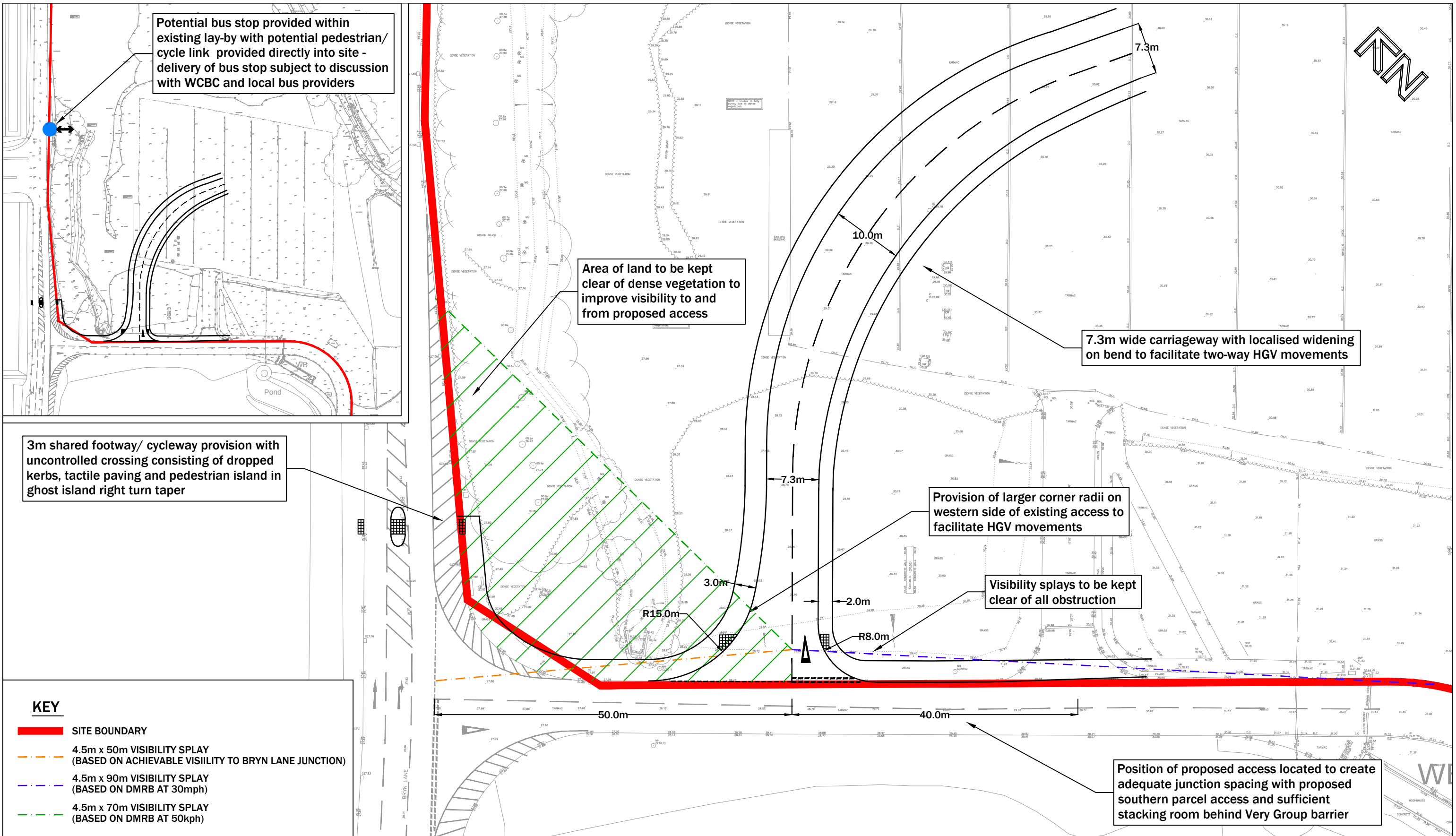
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## APPENDIX C

## DRAWINGS

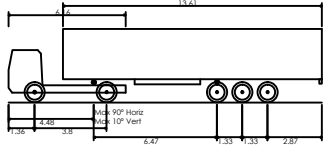
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|                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |                                                                                          |                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------|
| <div><p>9 Hurricane Court<br/>Liverpool International Business Park   Estuary Boulevard   Liverpool   L24 8RL<br/>www.primetp.co.uk   0151 728 1860</p></div> | <div><div><div>E</div><div>D</div><div>C</div><div>B</div><div>A</div></div><div><div>25.10.22</div><div>14.10.22</div><div>10.10.22</div><div>03.10.22</div><div>27.09.22</div></div><div><div>VB</div><div>VB</div><div>VB</div><div>VB</div><div>VB</div></div><div><div>SITE BOUNDARY</div><div>UPDATES TO VISIBILITY</div><div>UPDATES FOLLOWING FI COMMENTS</div><div>RELOCATION OF ACCESS</div><div>UPDATES TO TOPO</div></div></div>                                                              | <div>Project</div> <div>KINGMOOR. WREXHAM INDUSTRIAL ESTATE,<br/>WREXHAM, CLWYD</div> | <div>Drawn by</div> <div>VB</div> <div>Issue date</div> <div>02 SEPT 2022</div>          |                                              |
|                                                                                                                                                                                                                                                 | <div><div>Rev</div><div>Date</div><div>By</div><div>Revision notes</div></div>                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                       | <div>Scale(s)</div> <div>1:500 @A3</div>                                                 |                                              |
|                                                                                                                                                                                                                                                 | <div><div>DISCLAIMER</div><div><div>• PROPOSALS ARE PRELIMINARY ONLY, NOT FOR CONSTRUCTION PURPOSES</div><div>• PROPOSALS WILL BE SUBJECT TO UTILITY AND DRAINAGE INVESTIGATIONS</div><div>• PROPOSALS WILL BE SUBJECT TO EXTENT OF ADOPTED HIGHWAY</div><div>• DO NOT SCALE THIS DRAWING. DIMENSIONS ARE FOR REPRESENTATIONAL AND INFORMATIONAL PURPOSES ONLY AND SUBJECT TO DETAILED DESIGN</div><div>• THIS DRAWING MUST ONLY BE USED FOR THE PURPOSE FOR WHICH IT HAS BEEN SUPPLIED</div></div></div> |                                                                                       | <div>Title</div> <div>POTENTIAL ACCESS STRATEGY -<br/>PRIORITY CONTROLLED JUNCTION</div> | <div>Drawing No</div> <div>P21066-100E</div> |
|                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                       |                                                                                          | <div>Status</div> <div>INFORMATION</div>     |

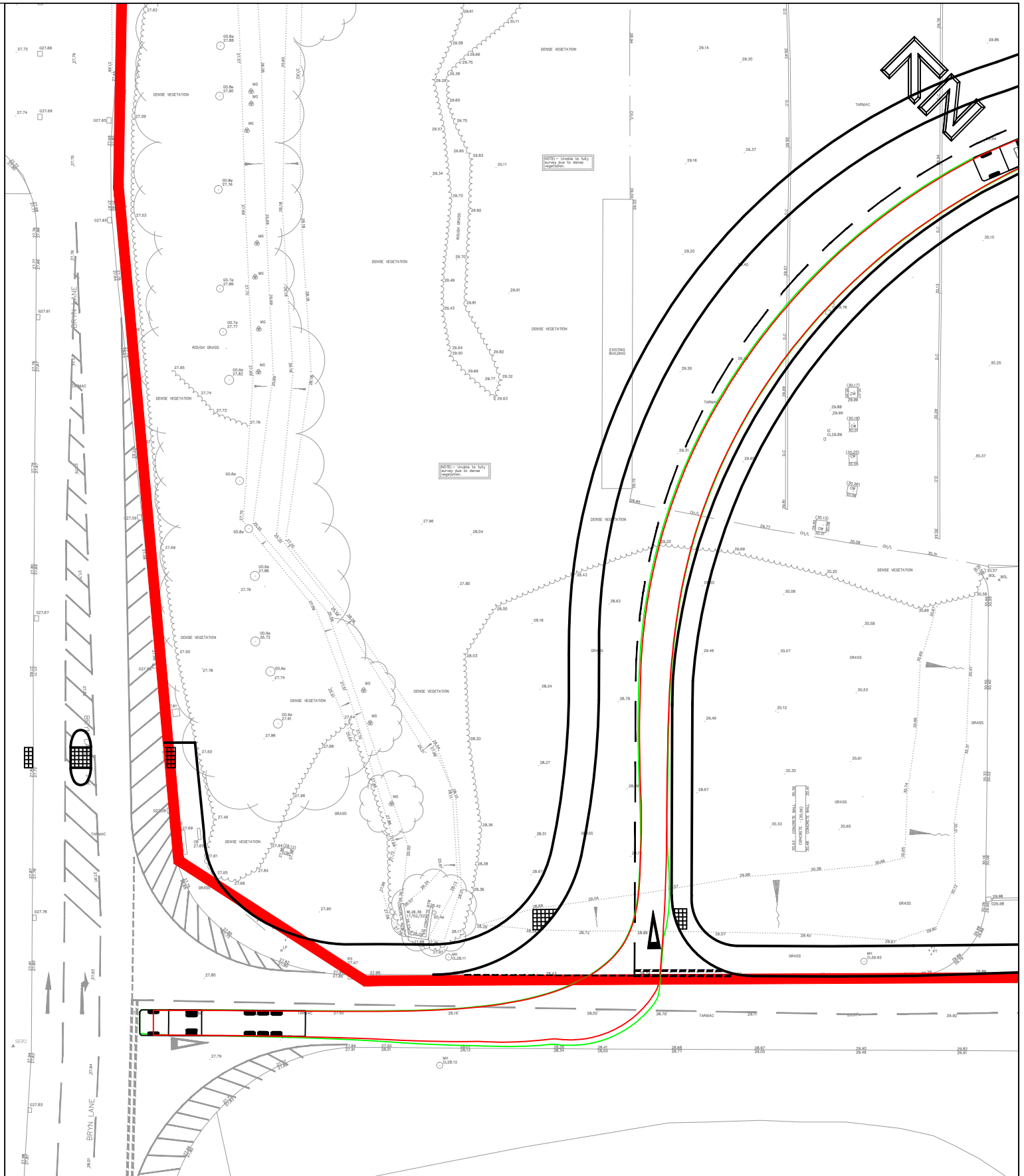
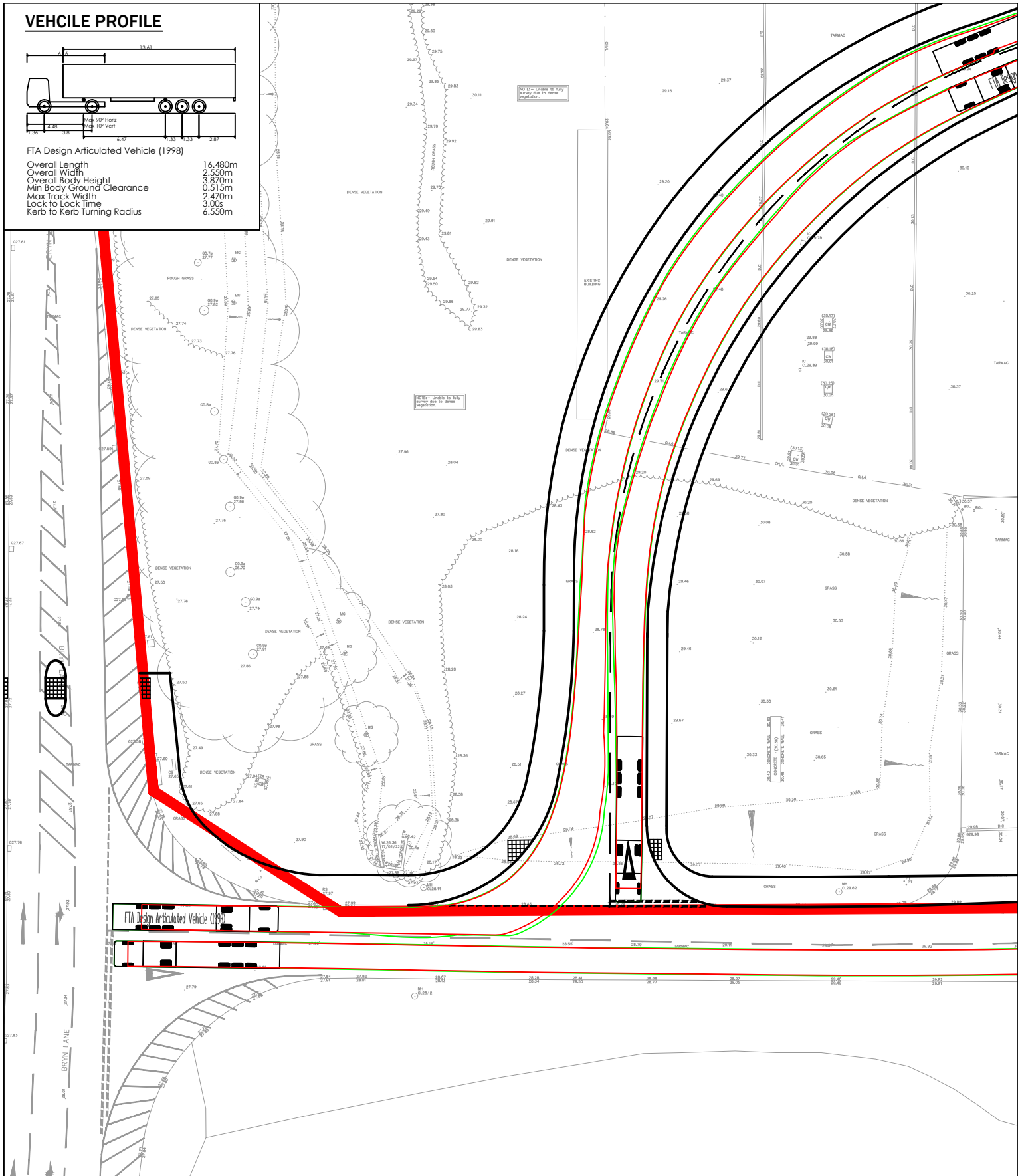
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VEHICLE PROFILE



FTA Design Articulated Vehicle (1998)

Overall Length 16.48m  
Overall Width 2.55m  
Overall Body Height 3.87m  
Min Body Ground Clearance 0.51m  
Max Track Width 2.47m  
Lock to Lock Time 3.00s  
Kerb to Kerb Turning Radius 6.550m



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|     |          |    |                         |
|-----|----------|----|-------------------------|
| A   | 25.10.22 | VB | LATEST ACCESS PROPOSALS |
| Rev | Date     | By | Revision notes          |

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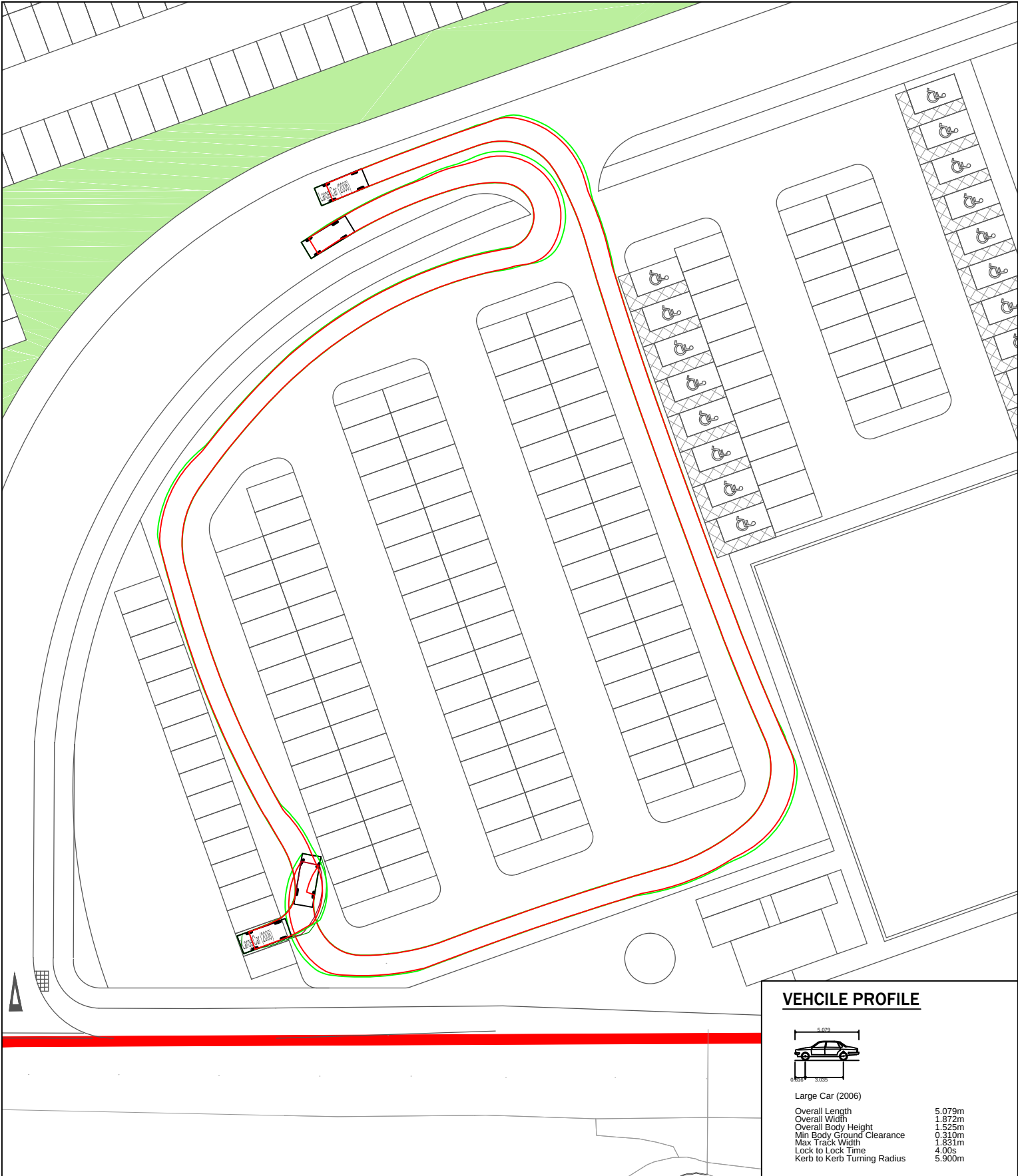
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|                           |                            |
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| Drawn by<br>VB            | Issue date<br>02 SEPT 2022 |
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| Status<br>INFORMATION     |                            |

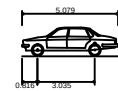


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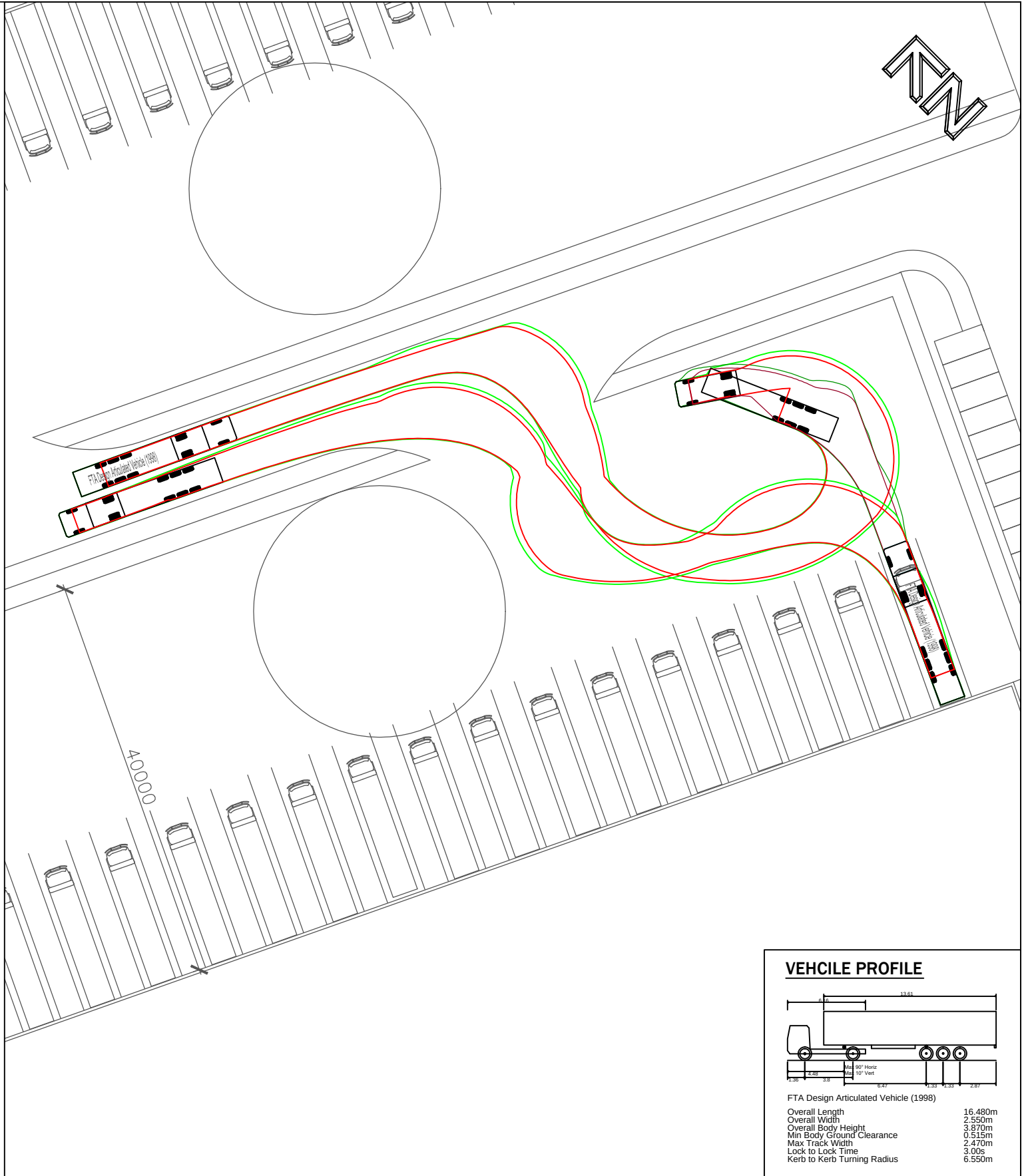




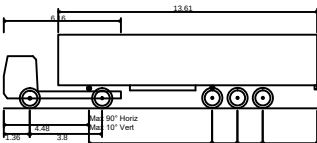
VEHCILE PROFILE



Large Car (2006)  
Overall Length 5.079m  
Overall Width 1.872m  
Overall Body Height 1.525m  
Min Body Ground Clearance 0.310m  
Max Track Width 1.831m  
Lock to Lock Time 4.00s  
Kerb to Kerb Turning Radius 5.900m



VEHCILE PROFILE



FTA Design Articulated Vehicle (1998)  
Overall Length 16.480m  
Overall Width 2.550m  
Overall Body Height 3.870m  
Min Body Ground Clearance 0.515m  
Max Track Width 2.470m  
Lock to Lock Time 3.00s  
Kerb to Kerb Turning Radius 6.550m



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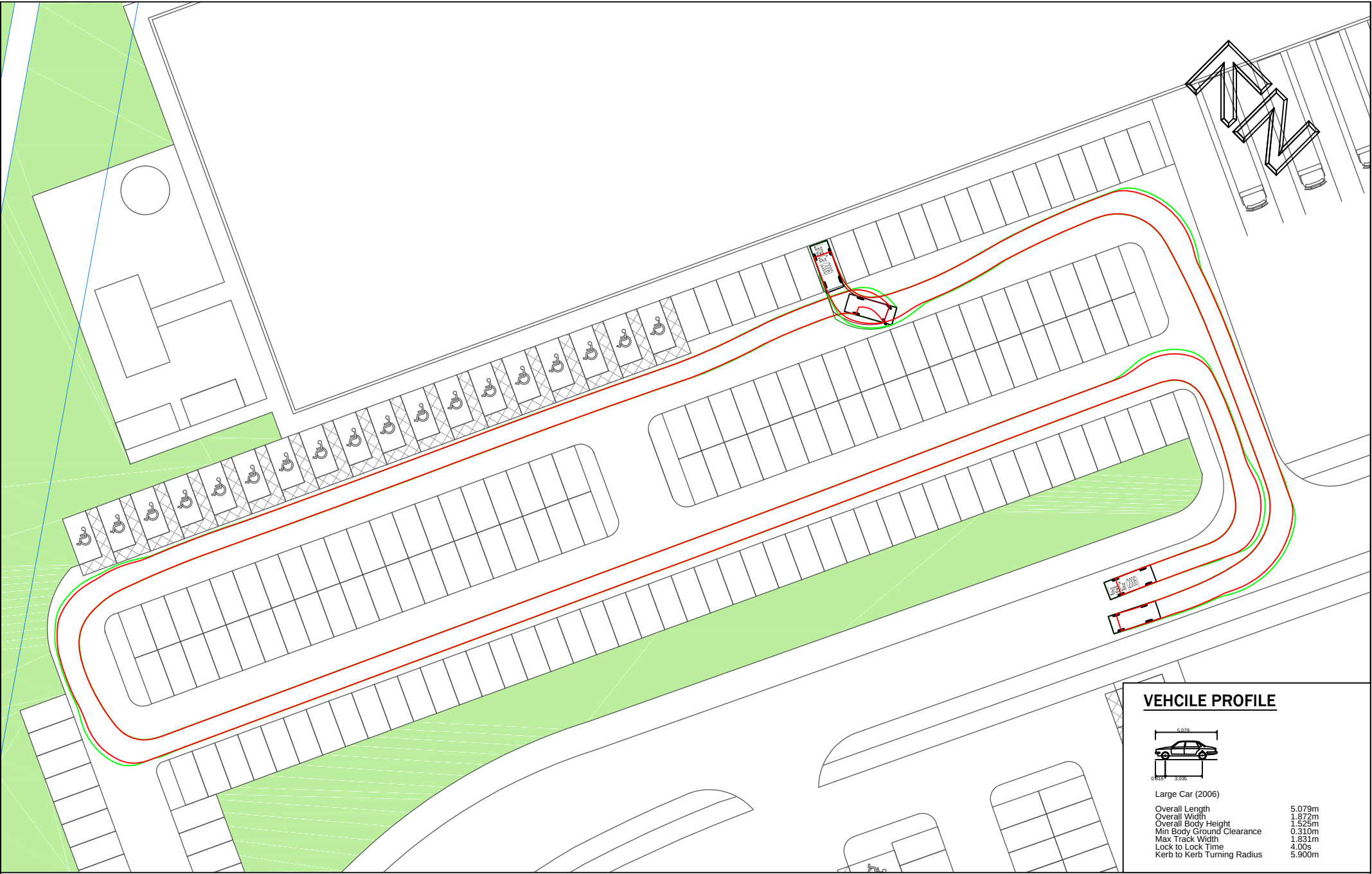
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• PROPOSALS WILL BE SUBJECT TO EXTENT OF ADOPTED HIGHWAY  
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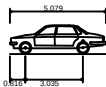
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|                          |                           |
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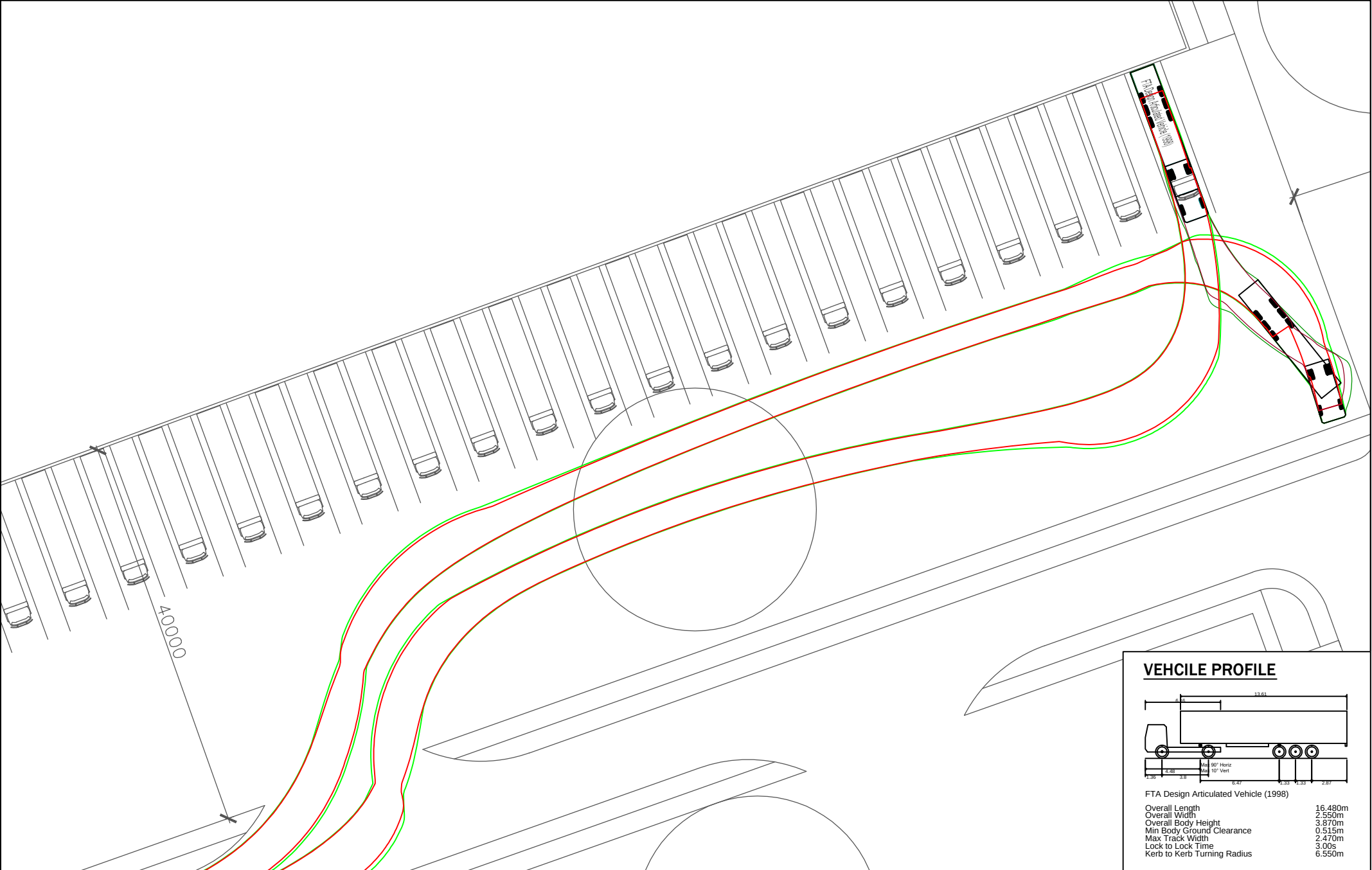


VEHICLE PROFILE

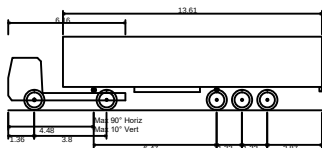


Large Car (2006)

|                             |        |
|-----------------------------|--------|
| Overall Length              | 5.079m |
| Overall Width               | 1.872m |
| Overall Body Height         | 1.525m |
| Min Body Ground Clearance   | 0.310m |
| Max Track Width             | 1.831m |
| Lock to Lock Time           | 4.00s  |
| Kerb to Kerb Turning Radius | 5.900m |



VEHICLE PROFILE



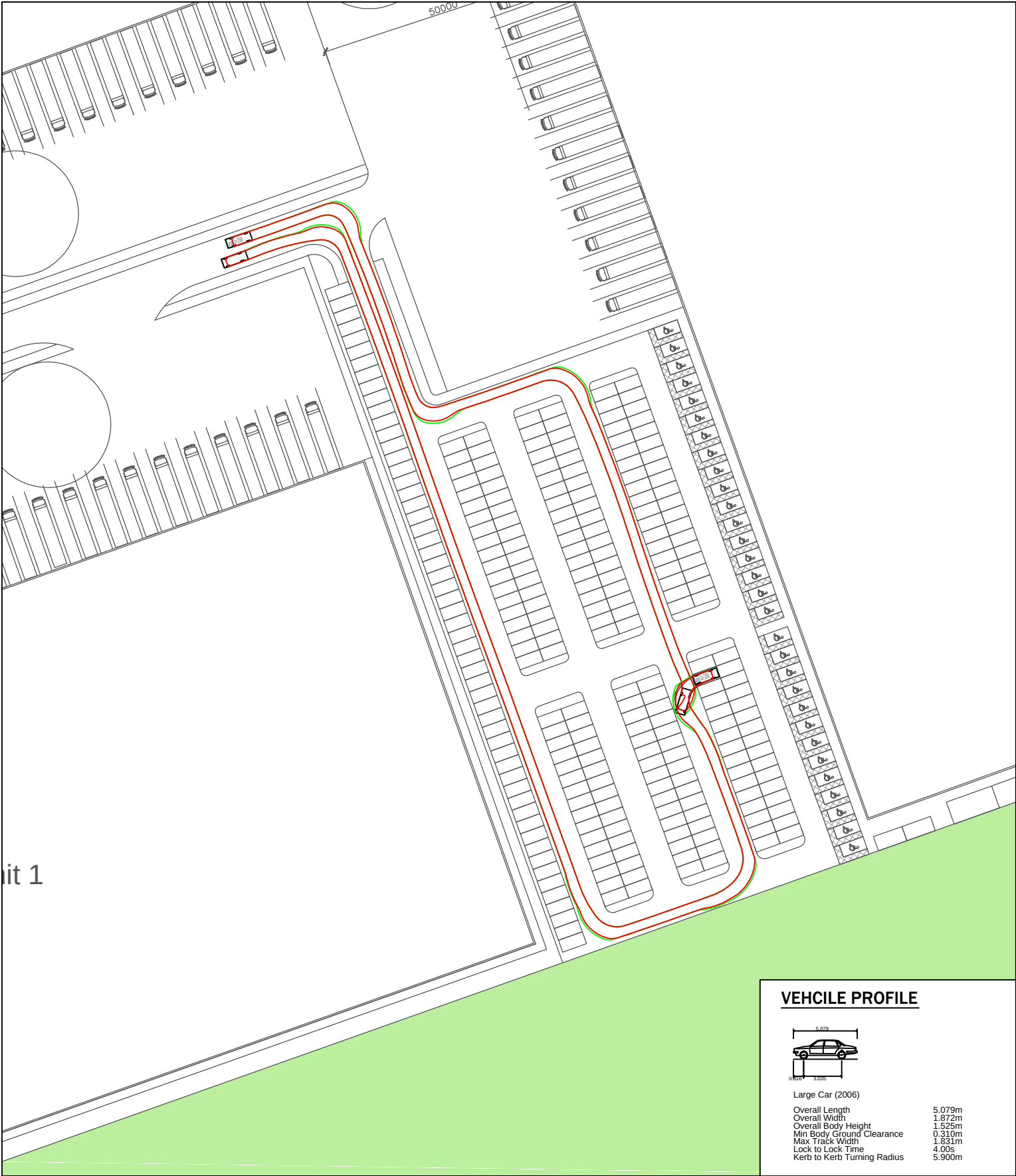
FTA Design Articulated Vehicle (1998)

|                             |         |
|-----------------------------|---------|
| Overall Length              | 16.480m |
| Overall Width               | 2.550m  |
| Overall Body Height         | 3.870m  |
| Min Body Ground Clearance   | 0.515m  |
| Max Track Width             | 2.470m  |
| Lock to Lock Time           | 3.00s   |
| Kerb to Kerb Turning Radius | 6.550m  |

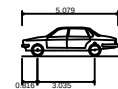
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|                                                                                                                                                                                                                                       | *                                                                                                                                                                                                                                                                                                                                                                                                                       | *    | *  | *              |                       |                                                     | Scale(s)<br>1:500 @A3        |                           |
|                                                                                                                                                                                                                                       | Rev                                                                                                                                                                                                                                                                                                                                                                                                                     | Date | By | Revision notes |                       | Title                                               | SWEPT PATH ANALYSIS - UNIT 2 | Drawing No<br>P21066-103  |
|                                                                                                                                                                                                                                       | DISCLAIMER                                                                                                                                                                                                                                                                                                                                                                                                              |      |    |                | Status<br>INFORMATION |                                                     |                              |                           |
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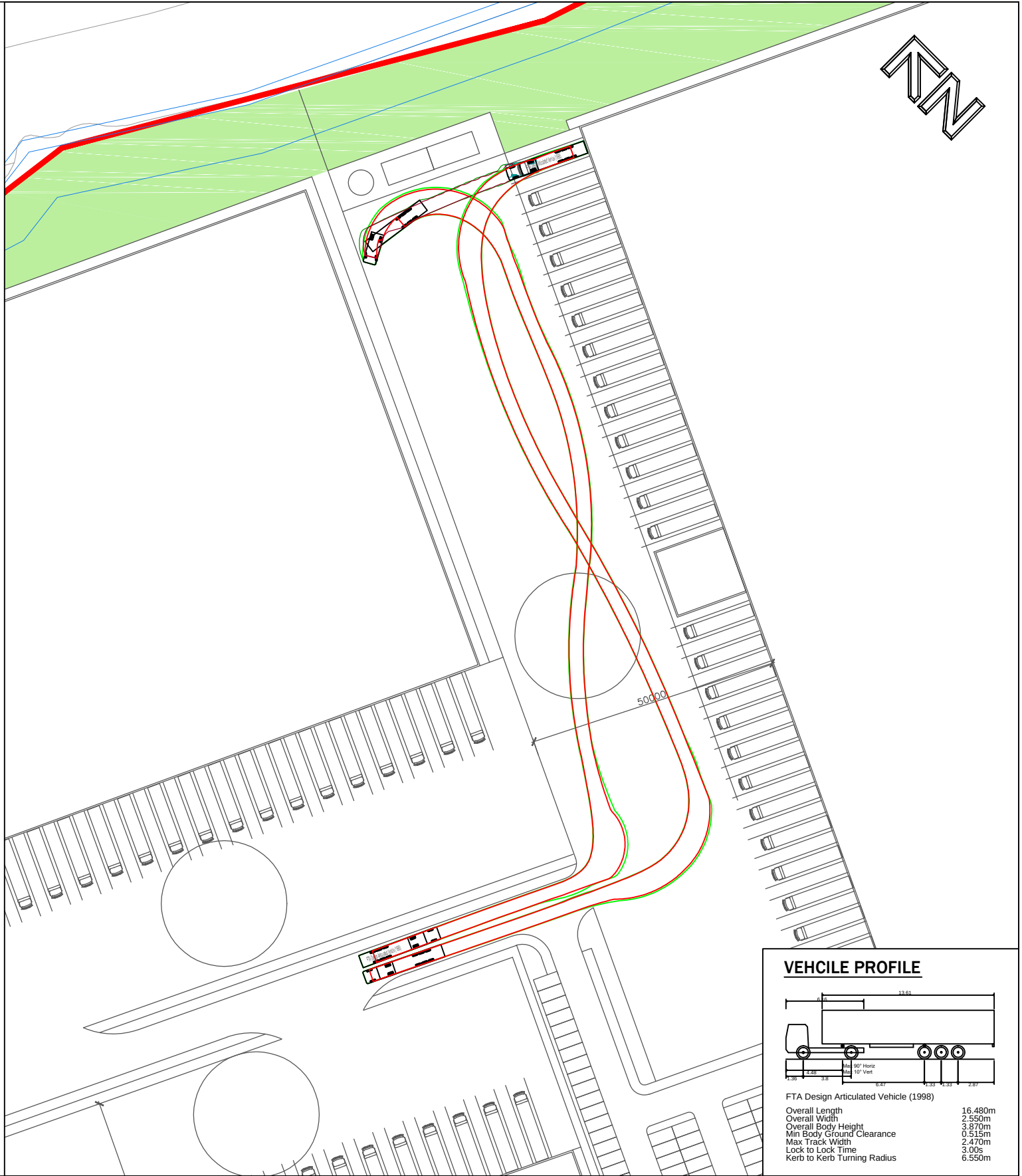




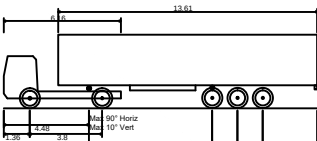
VEHICLE PROFILE



|                             |        |
|-----------------------------|--------|
| Large Car (2006)            |        |
| Overall Length              | 5.079m |
| Overall Width               | 1.872m |
| Overall Body Height         | 1.525m |
| Min Body Ground Clearance   | 0.310m |
| Max Track Width             | 1.831m |
| Lock to Lock Time           | 4.00s  |
| Kerb to Kerb Turning Radius | 5.900m |



VEHICLE PROFILE



|                                       |         |
|---------------------------------------|---------|
| FTA Design Articulated Vehicle (1998) |         |
| Overall Length                        | 16.480m |
| Overall Width                         | 2.550m  |
| Overall Body Height                   | 3.870m  |
| Min Body Ground Clearance             | 0.515m  |
| Max Track Width                       | 2.470m  |
| Lock to Lock Time                     | 3.00s   |
| Kerb to Kerb Turning Radius           | 6.550m  |



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Title  
**SWEPT PATH ANALYSIS - UNIT 3**

|                          |                           |
|--------------------------|---------------------------|
| Drawn by<br>VB           | Issue date<br>26 OCT 2022 |
| Scale(s)<br>1:1000 @A3   |                           |
| Drawing No<br>P21066-104 |                           |
| Status<br>INFORMATION    |                           |

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## APPENDIX D

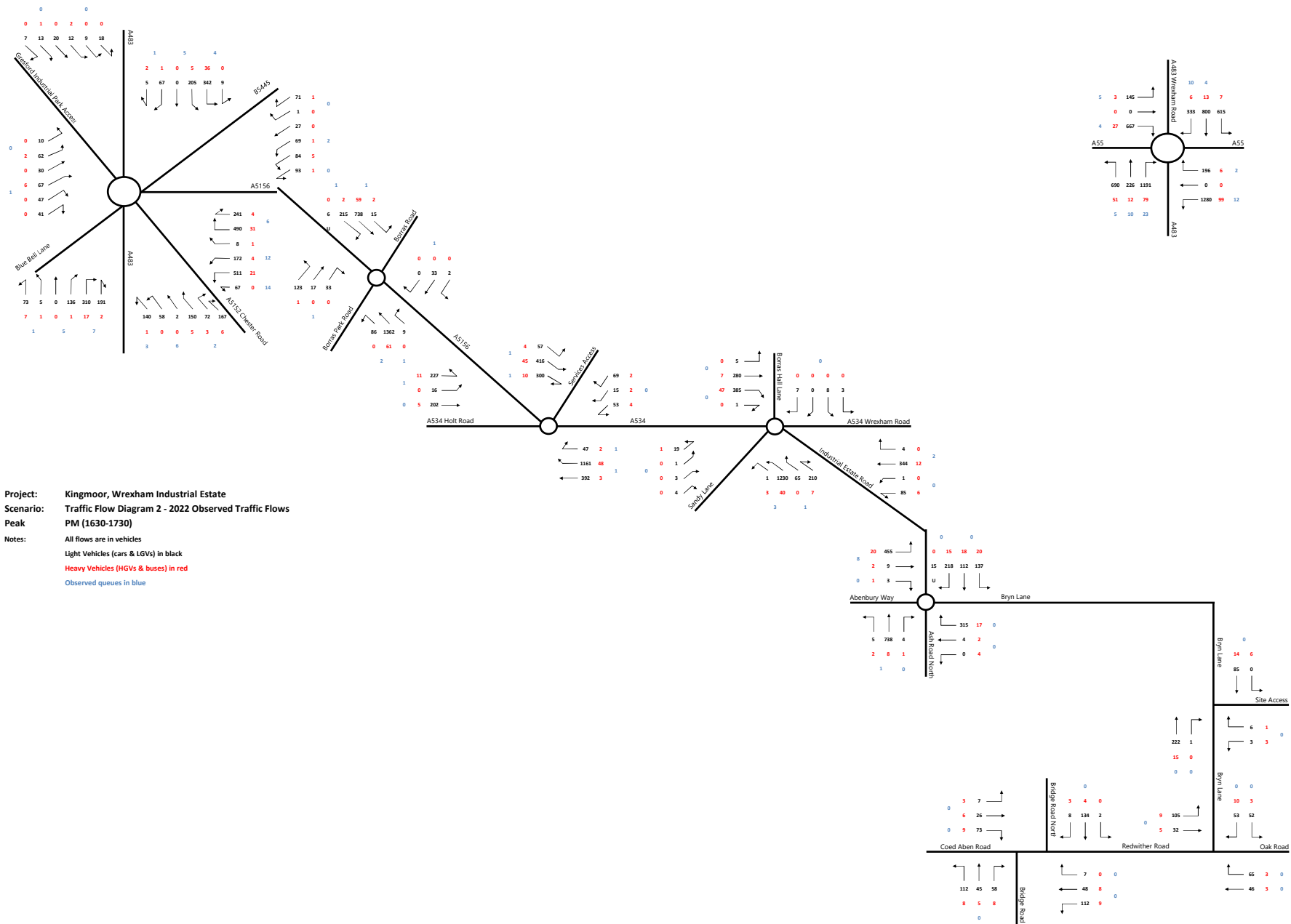
### TRAFFIC FLOW DIAGRAMS

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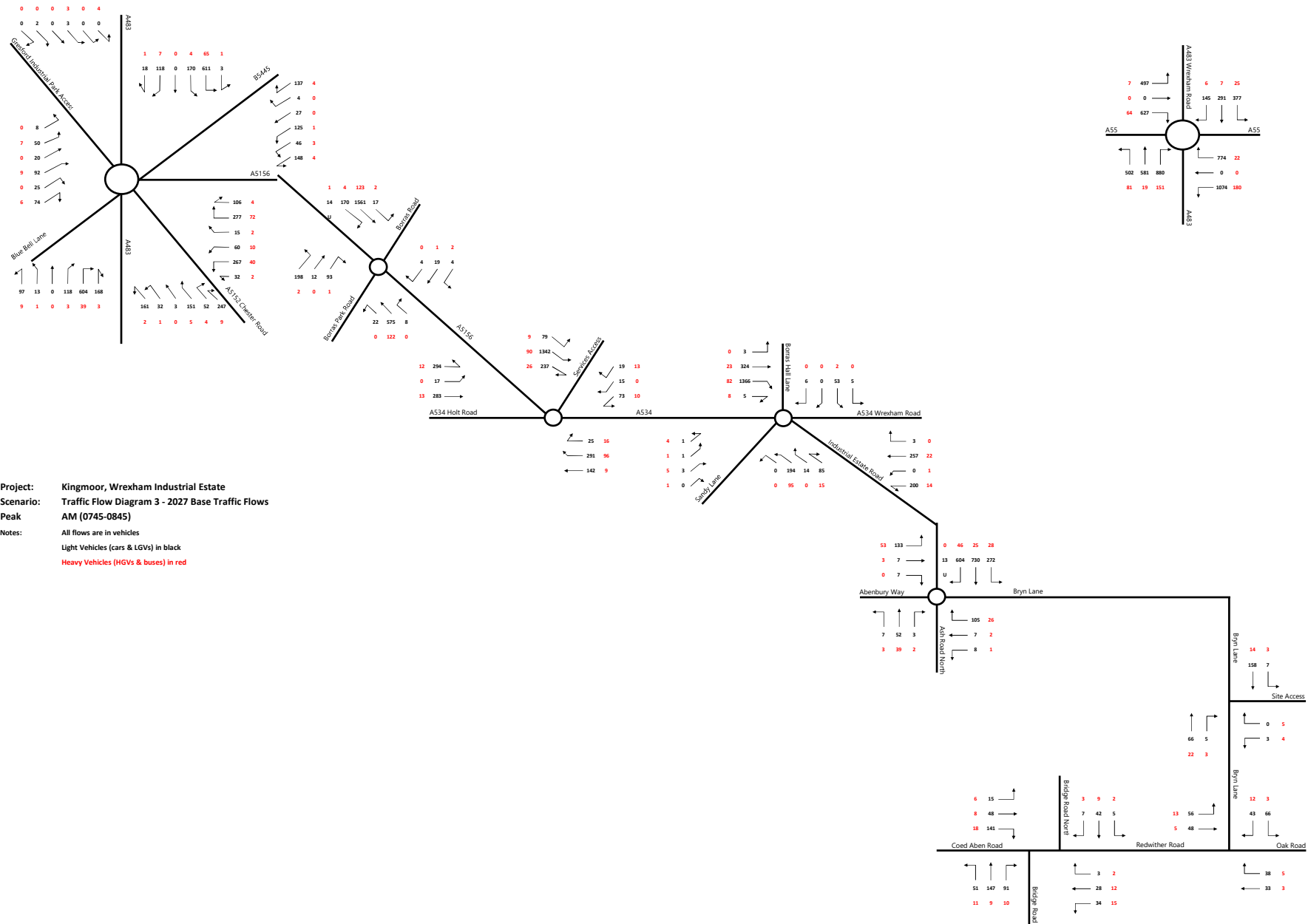


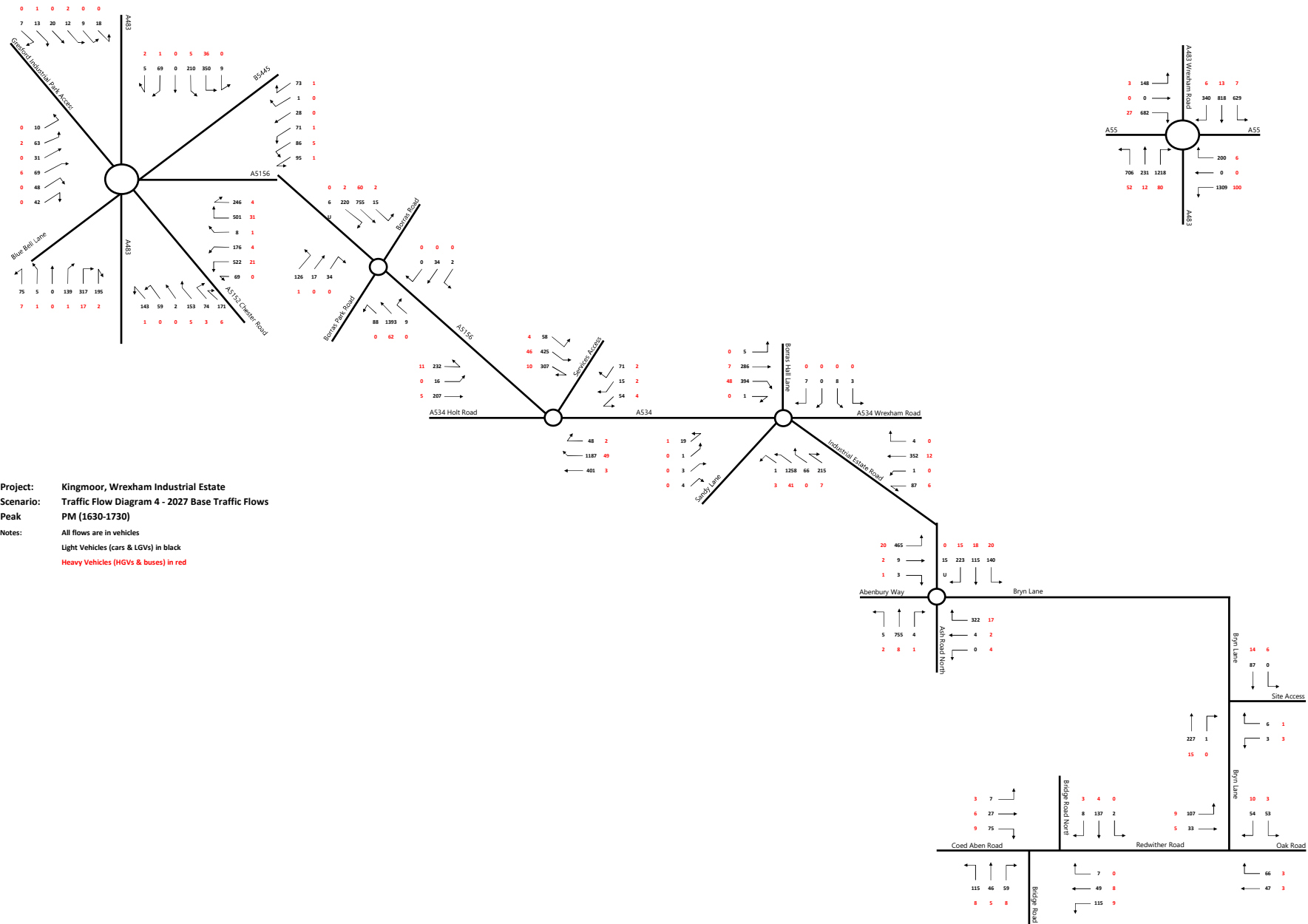
| Traffic Flow Diagrams |                                                                                                          |                |                        |
|-----------------------|----------------------------------------------------------------------------------------------------------|----------------|------------------------|
| Reference             | Scenario                                                                                                 | Peak           | Derivation             |
| 1                     | Traffic Flow Diagram 1 - 2022 Observed Traffic Flows                                                     | AM (0745-0845) | Raw Data               |
| 2                     | Traffic Flow Diagram 2 - 2022 Observed Traffic Flows                                                     | PM (1630-1730) | Raw Data               |
| 3                     | Traffic Flow Diagram 3 - 2027 Base Traffic Flows                                                         | AM (0745-0845) | 1 * TEMPro             |
| 4                     | Traffic Flow Diagram 4 - 2027 Base Traffic Flows                                                         | PM (1630-1730) | 2 * TEMPro             |
| 5                     | Traffic Flow Diagram 5 - 2036 Base Traffic Flows                                                         | AM (0745-0845) | 1 * TEMPro             |
| 6                     | Traffic Flow Diagram 6 - 2036 Base Traffic Flows                                                         | PM (1630-1730) | 2 * TEMPro             |
| 7                     | Traffic Flow Diagram 7 - Committed Development Traffic Flows: Site 2                                     | AM (0745-0845) | Site 2 TA              |
| 8                     | Traffic Flow Diagram 8 - Committed Development Traffic Flows: Site 2                                     | PM (1630-1730) | Site 2 TA              |
| 9                     | Traffic Flow Diagram 9 - Committed Development Traffic Flows: Site 3                                     | AM (0745-0845) | Site 3 TA              |
| 10                    | Traffic Flow Diagram 10 - Committed Development Traffic Flows: Site 3                                    | PM (1630-1730) | Site 3 TA              |
| 11                    | Traffic Flow Diagram 11 - Committed Development Traffic Flows: Site 4                                    | AM (0745-0845) | Site 4 TA              |
| 12                    | Traffic Flow Diagram 12 - Committed Development Traffic Flows: Site 4                                    | PM (1630-1730) | Site 4 TA              |
| 13                    | Traffic Flow Diagram 13 - Committed Development Traffic Flows: Site 5                                    | AM (0745-0845) | Site 5 TA              |
| 14                    | Traffic Flow Diagram 14 - Committed Development Traffic Flows: Site 5                                    | PM (1630-1730) | Site 5 TA              |
| 15                    | Traffic Flow Diagram 15 - Committed Development Traffic Flows: The Oaks (App. P/2019/0877)               | AM (0745-0845) | P/2019/0877            |
| 16                    | Traffic Flow Diagram 16 - Committed Development Traffic Flows: The Oaks (App. P/2019/0877)               | PM (1630-1730) | P/2019/0877            |
| 17                    | Traffic Flow Diagram 17 - Committed Development Traffic Flows: The Bridgeway (App. P/2022/0065)          | AM (0745-0845) | P/2022/0065            |
| 18                    | Traffic Flow Diagram 18 - Committed Development Traffic Flows: The Bridgeway (App. P/2022/0065)          | PM (1630-1730) | P/2022/0065            |
| 19                    | Traffic Flow Diagram 19 - Committed Development Traffic Flows: Net World Sports (App. P/2020/0167)       | AM (0745-0845) | P/2020/0167            |
| 20                    | Traffic Flow Diagram 20 - Committed Development Traffic Flows: Net World Sports (App. P/2020/0167)       | PM (1630-1730) | P/2020/0167            |
| 21                    | Traffic Flow Diagram 21 - Committed Development Traffic Flows: Land East of Bryn Lane (App. P/2020/0017) | AM (0745-0845) | P/2020/0017            |
| 22                    | Traffic Flow Diagram 22 - Committed Development Traffic Flows: Land East of Bryn Lane (App. P/2020/0017) | PM (1630-1730) | P/2020/0017            |
| 23                    | Traffic Flow Diagram 23 - Total Committed Development Traffic Flows                                      | AM (0745-0845) | 7+9+11+13+15+17+19+21  |
| 24                    | Traffic Flow Diagram 24 - Total Committed Development Traffic Flows                                      | PM (1630-1730) | 8+10+12+14+16+18+20+22 |
| 25                    | Traffic Flow Diagram 25 - 2027 Without Development Traffic Flows                                         | AM (0745-0845) | 3+23                   |
| 26                    | Traffic Flow Diagram 26 - 2027 Without Development Traffic Flows                                         | PM (1630-1730) | 4+24                   |
| 27                    | Traffic Flow Diagram 27 - 2036 Without Development Traffic Flows                                         | AM (0745-0845) | 5+23                   |
| 28                    | Traffic Flow Diagram 28 - 2036 Without Development Traffic Flows                                         | PM (1630-1730) | 6+24                   |
| 29                    | Traffic Flow Diagram 29 - Development Traffic Distribution                                               | AM (0745-0845) | MTW Census             |
| 30                    | Traffic Flow Diagram 30 - Development Traffic Distribution                                               | PM (1630-1730) | MTW Census             |
| 31                    | Traffic Flow Diagram 31 - Development Traffic Flows                                                      | AM (0745-0845) | TRICS*29               |
| 32                    | Traffic Flow Diagram 32 - Development Traffic Flows                                                      | PM (1630-1730) | TRICS*30               |
| 33                    | Traffic Flow Diagram 33 - 2027 With Development Traffic Flows                                            | AM (0745-0845) | 25+31                  |
| 34                    | Traffic Flow Diagram 34 - 2027 With Development Traffic Flows                                            | PM (1630-1730) | 26+32                  |
| 35                    | Traffic Flow Diagram 35 - 2036 With Development Traffic Flows                                            | AM (0745-0845) | 27+31                  |
| 36                    | Traffic Flow Diagram 36 - 2036 With Development Traffic Flows                                            | PM (1630-1730) | 28+32                  |

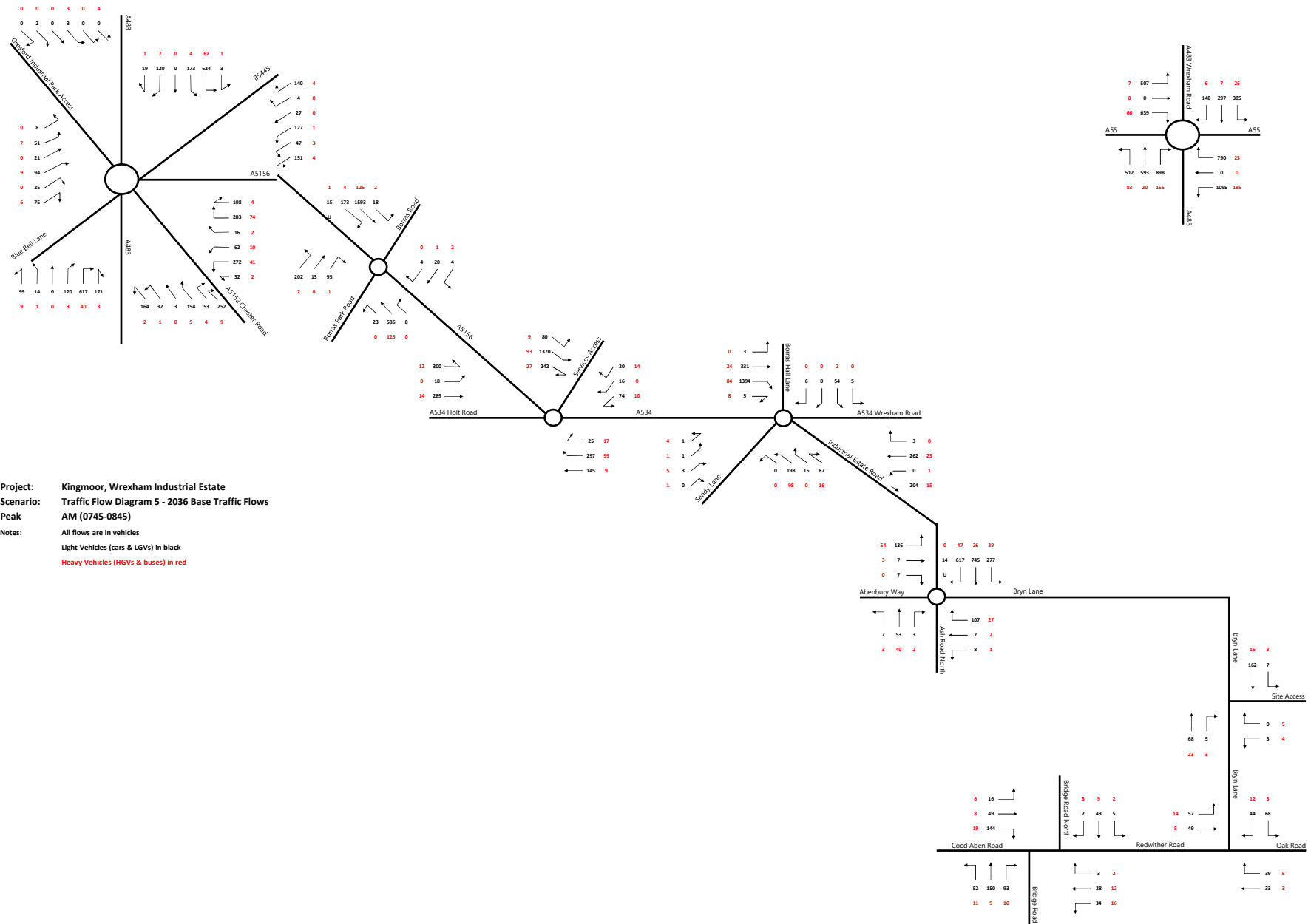


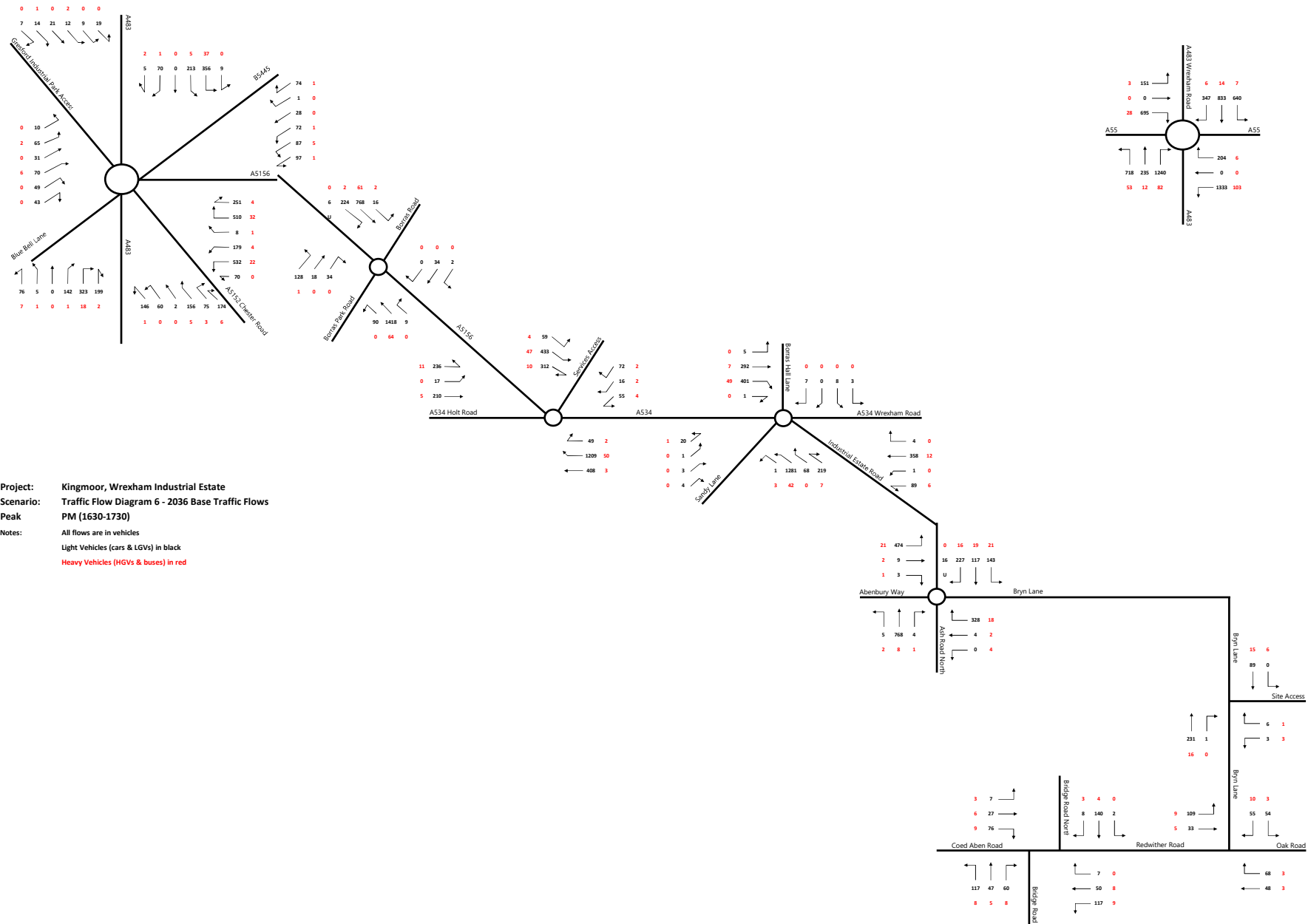


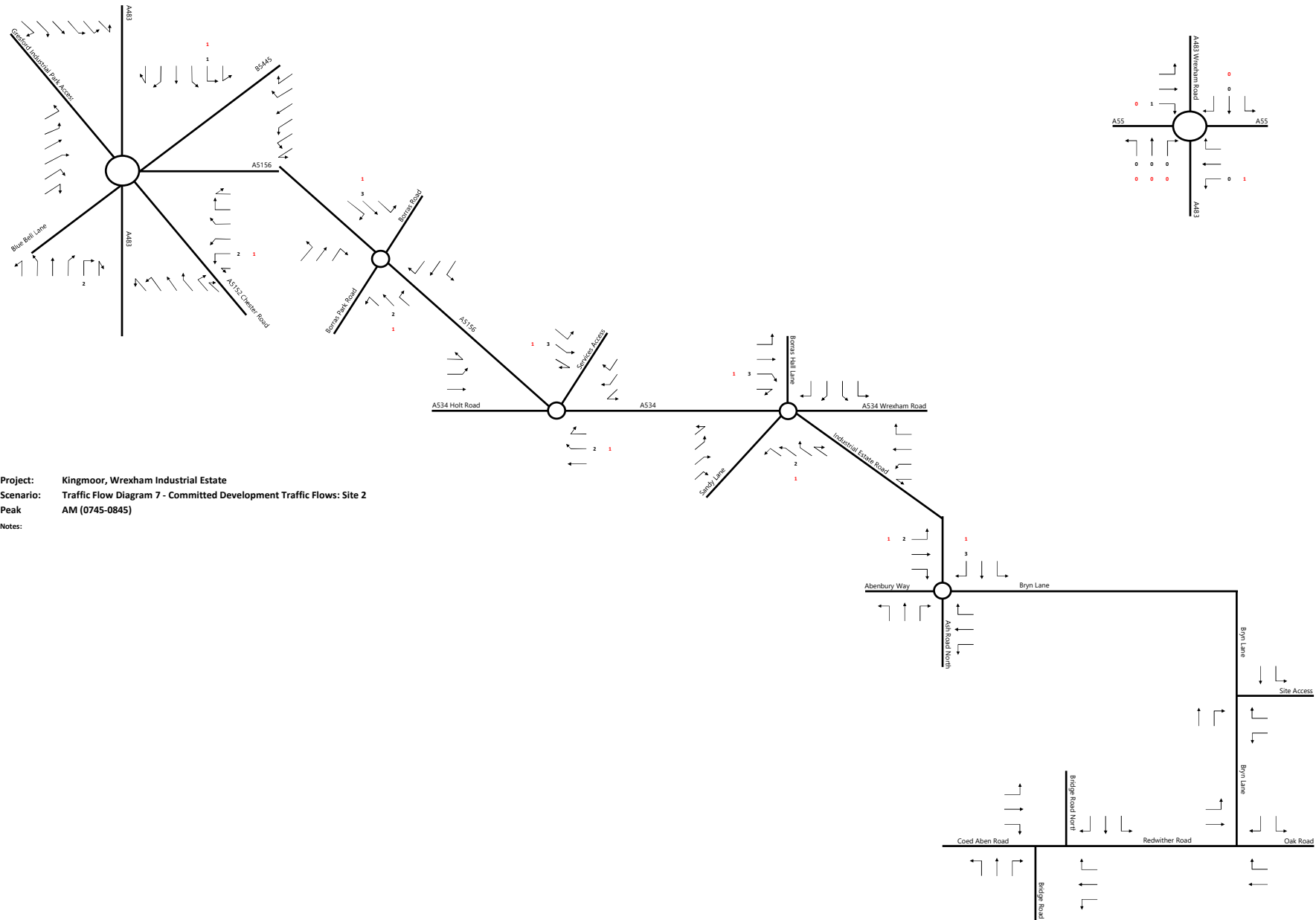
**Project:** Kingmoor, Wrexham Industrial Estate  
**Scenario:** Traffic Flow Diagram 2 - 2022 Observed Traffic Flows  
**Peak:** PM (1630-1730)  
**Notes:** All flows are in vehicles  
 Light Vehicles (cars & LGVs) in black  
 Heavy Vehicles (HGVs & buses) in red  
 Observed queues in blue







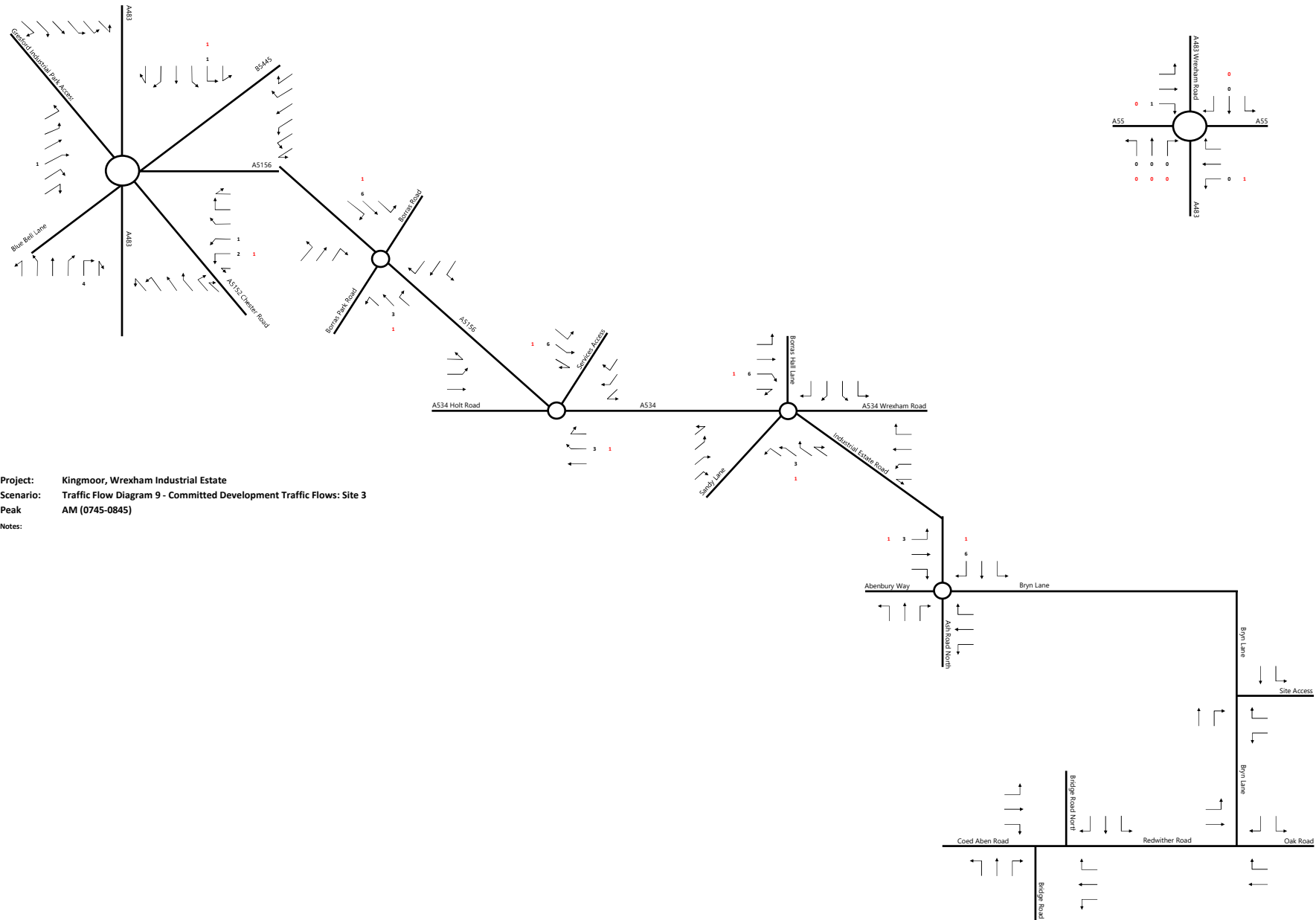




**Project:** Kingmoor, Wrexham Industrial Estate  
**Scenario:** Traffic Flow Diagram 7 - Committed Development Traffic Flows: Site 2  
**Peak:** AM (0745-0845)  
**Notes:**

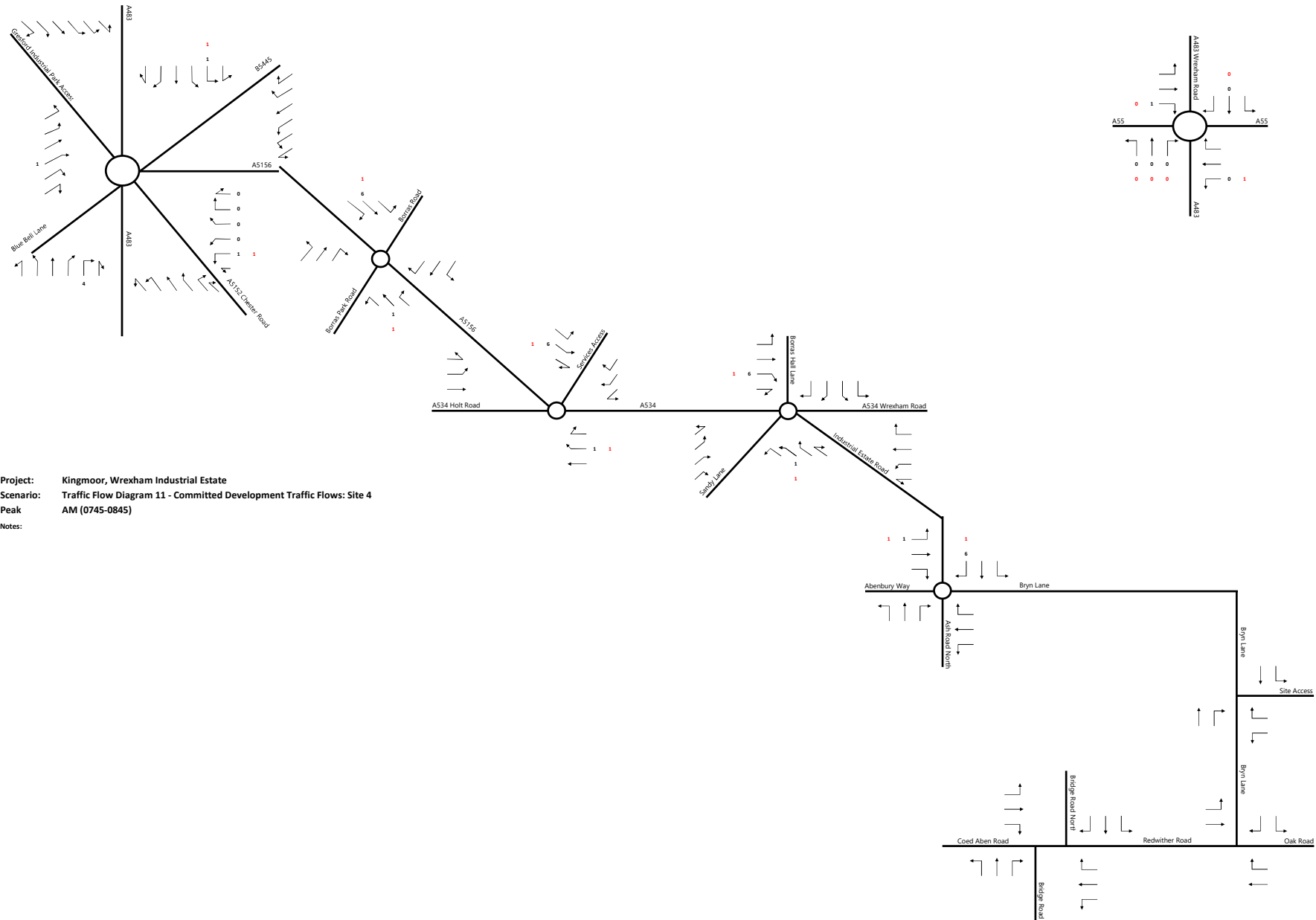




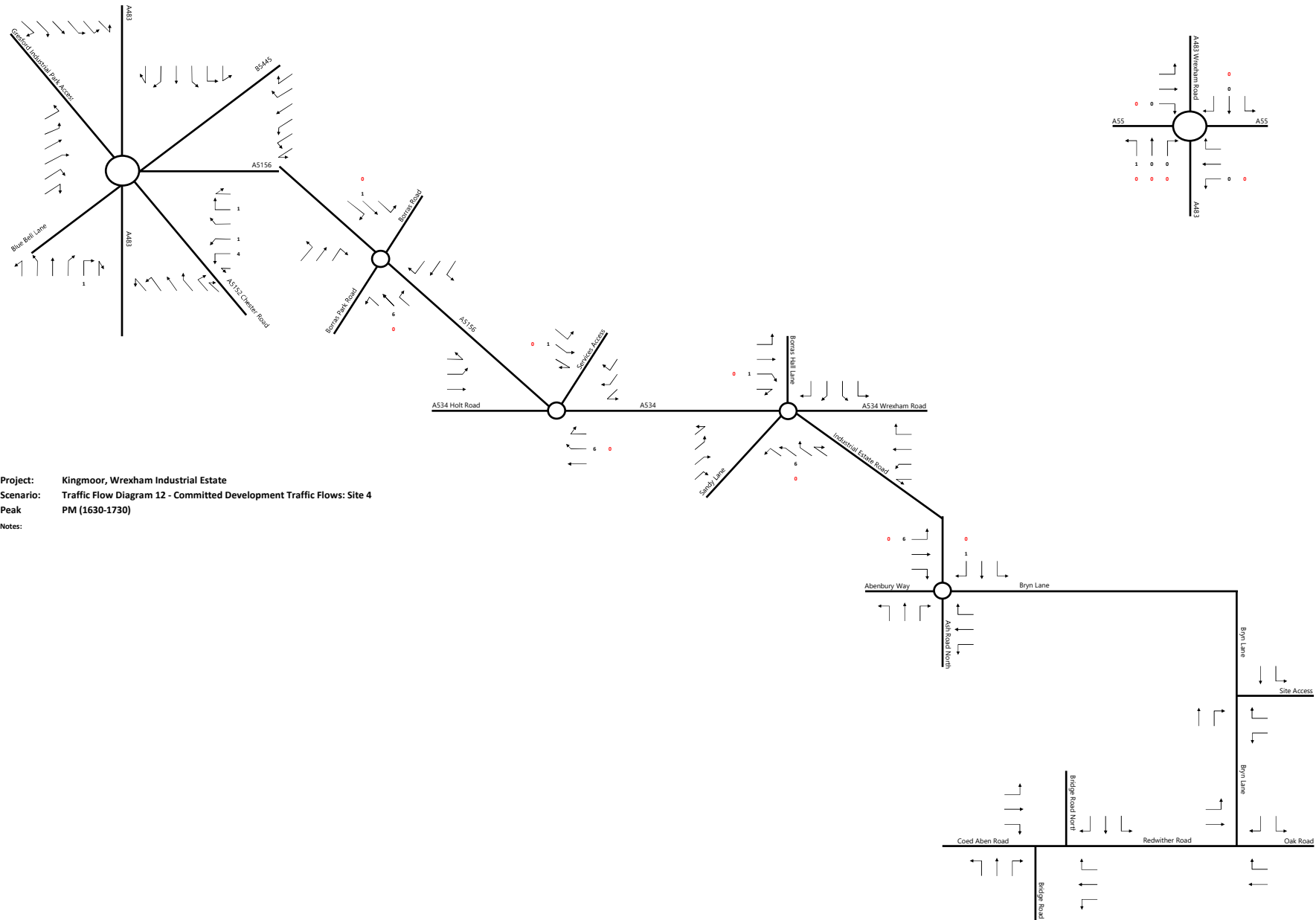


Project: Kingmoor, Wrexham Industrial Estate  
 Scenario: Traffic Flow Diagram 9 - Committed Development Traffic Flows: Site 3  
 Peak: AM (0745-0845)  
 Notes:

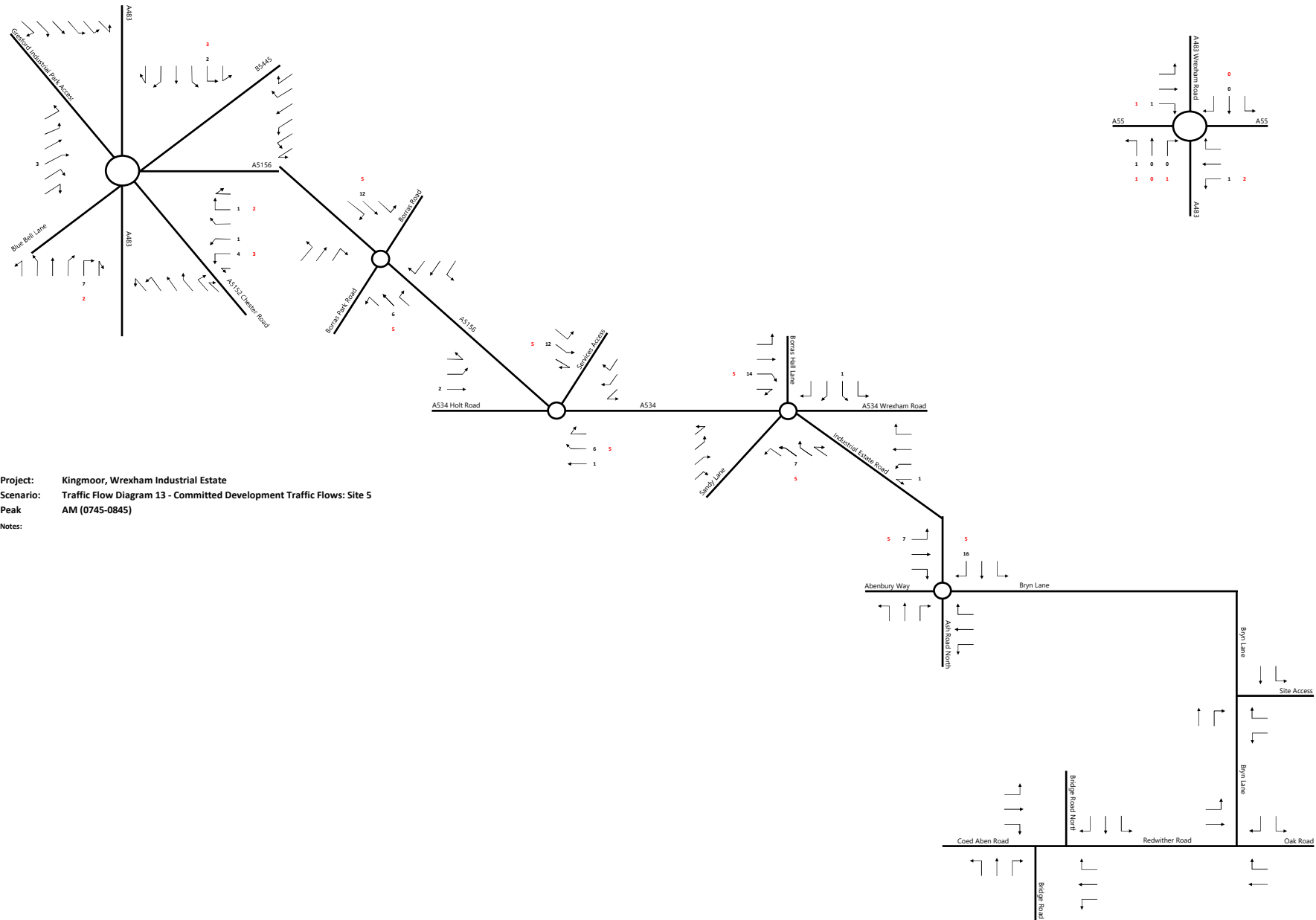




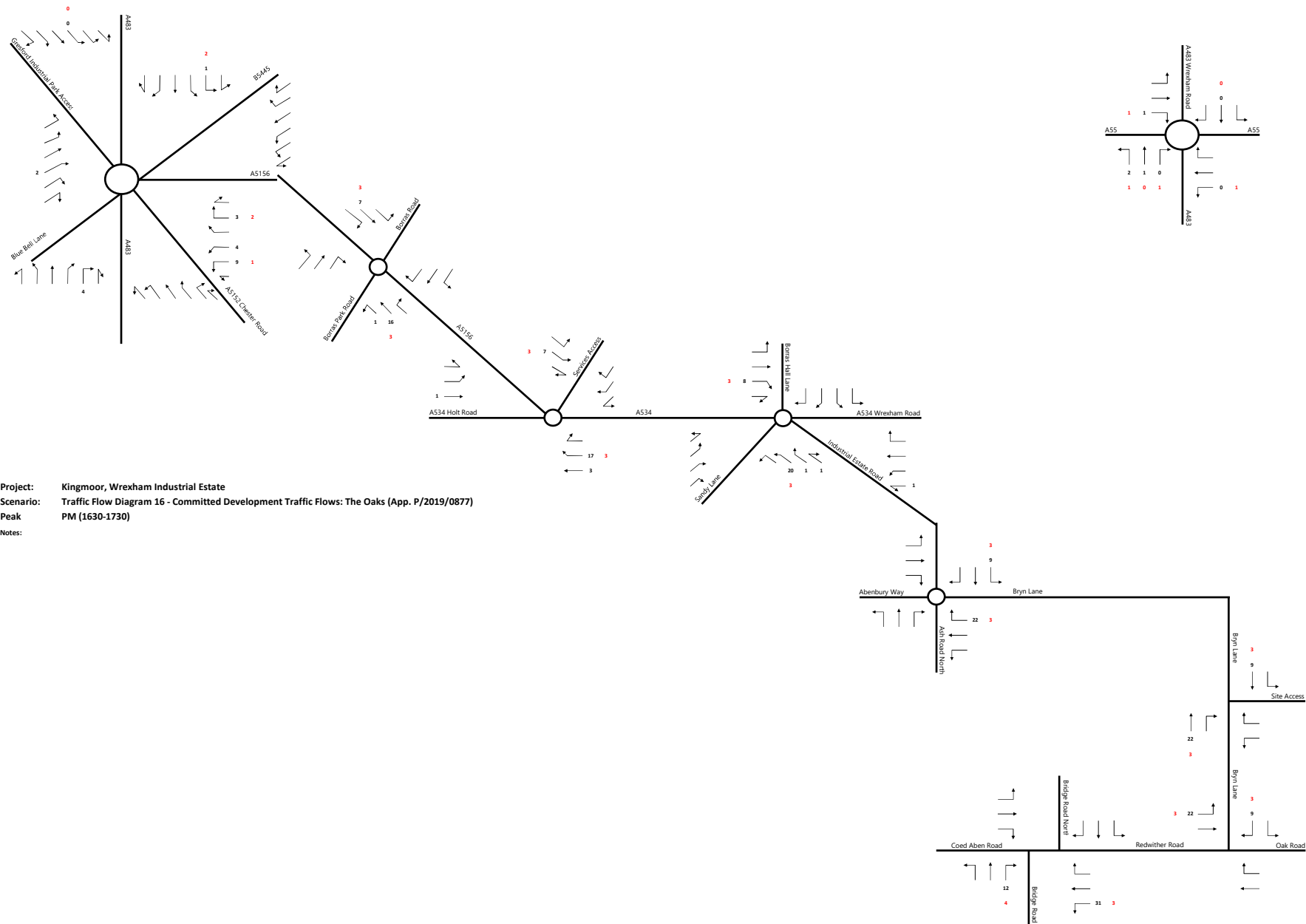
Project: Kingmoor, Wrexham Industrial Estate  
 Scenario: Traffic Flow Diagram 11 - Committed Development Traffic Flows: Site 4  
 Peak: AM (0745-0845)  
 Notes:



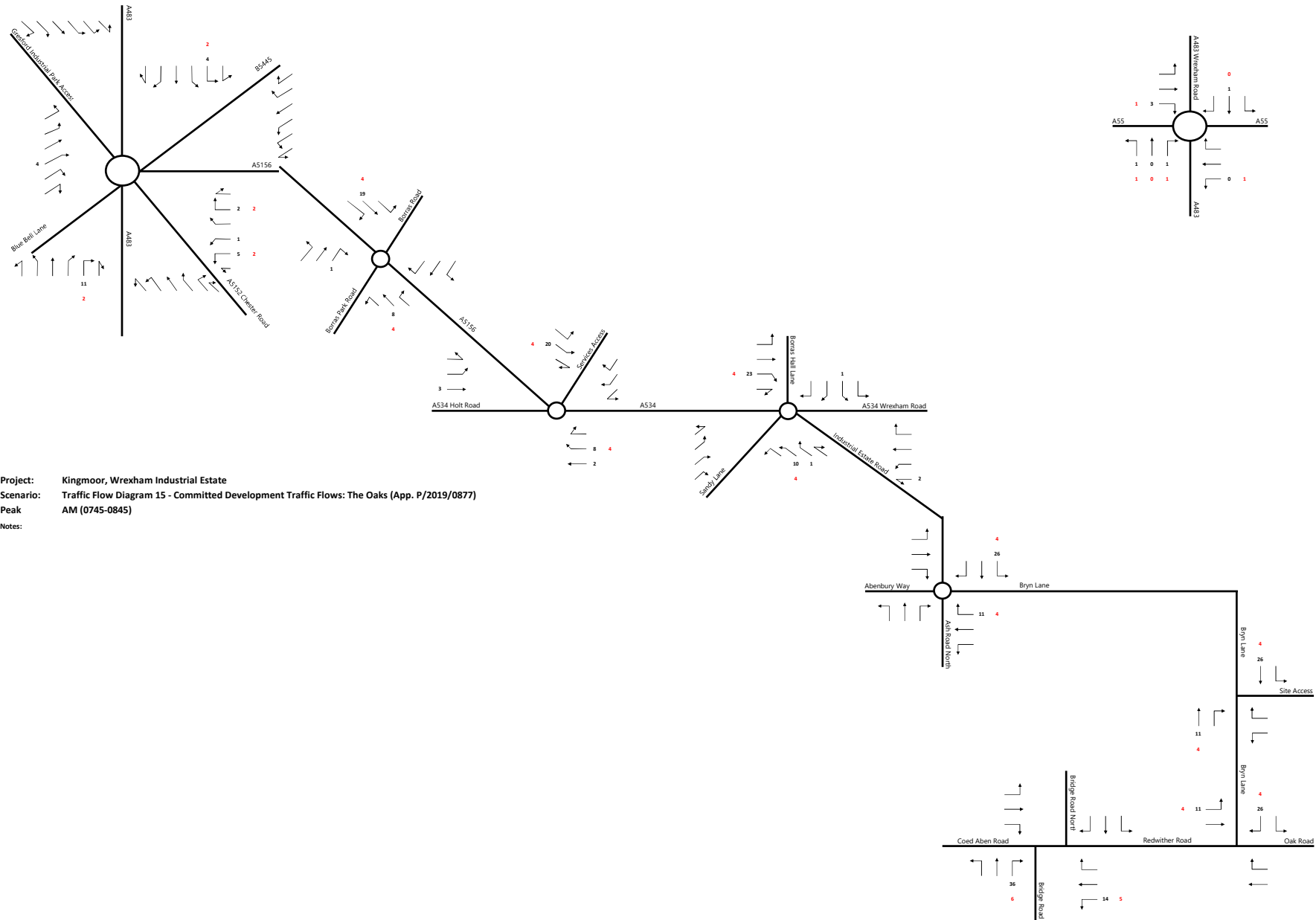
**Project:** Kingmoor, Wrexham Industrial Estate  
**Scenario:** Traffic Flow Diagram 12 - Committed Development Traffic Flows: Site 4  
**Peak:** PM (1630-1730)  
**Notes:**





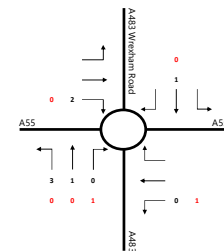




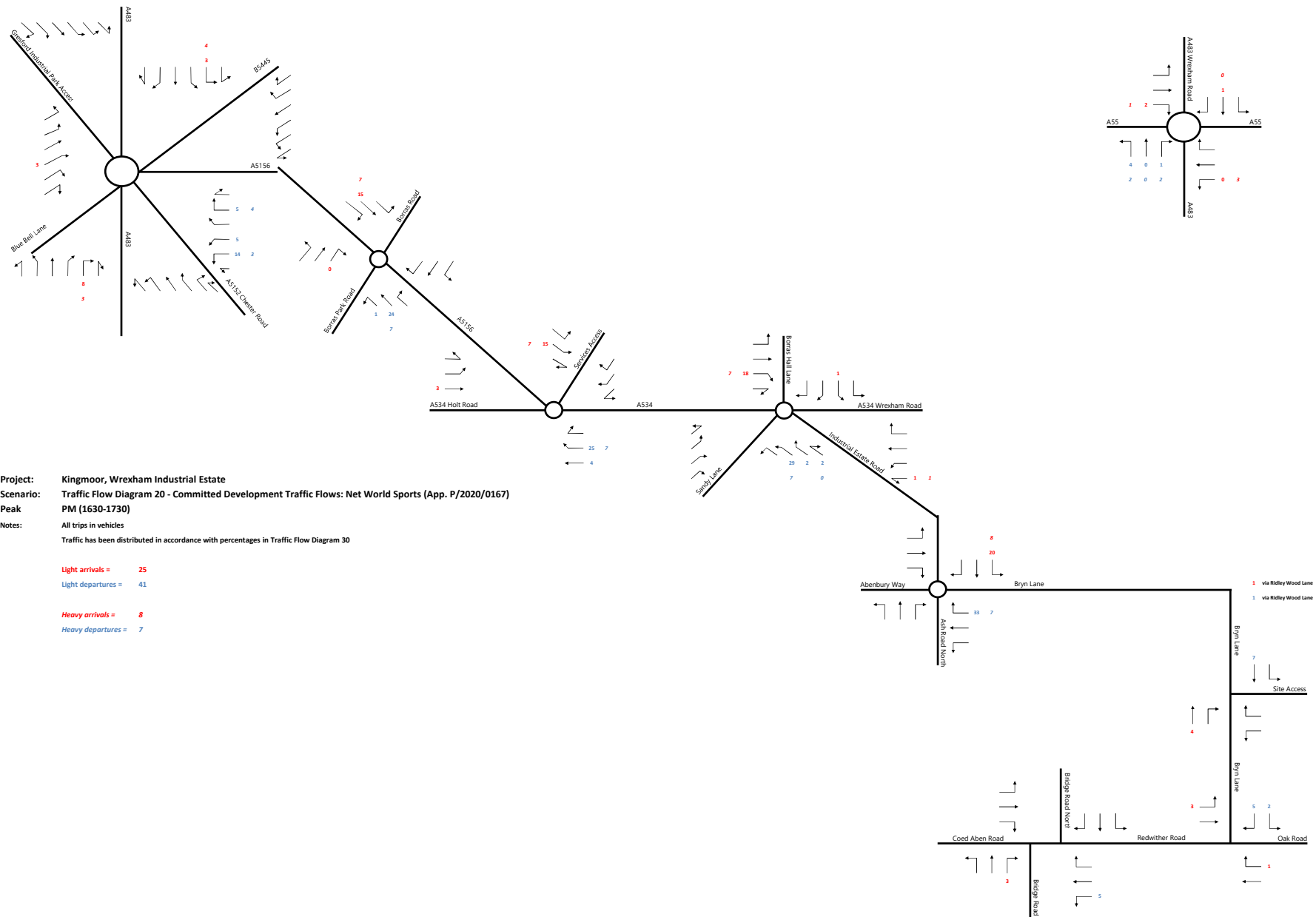


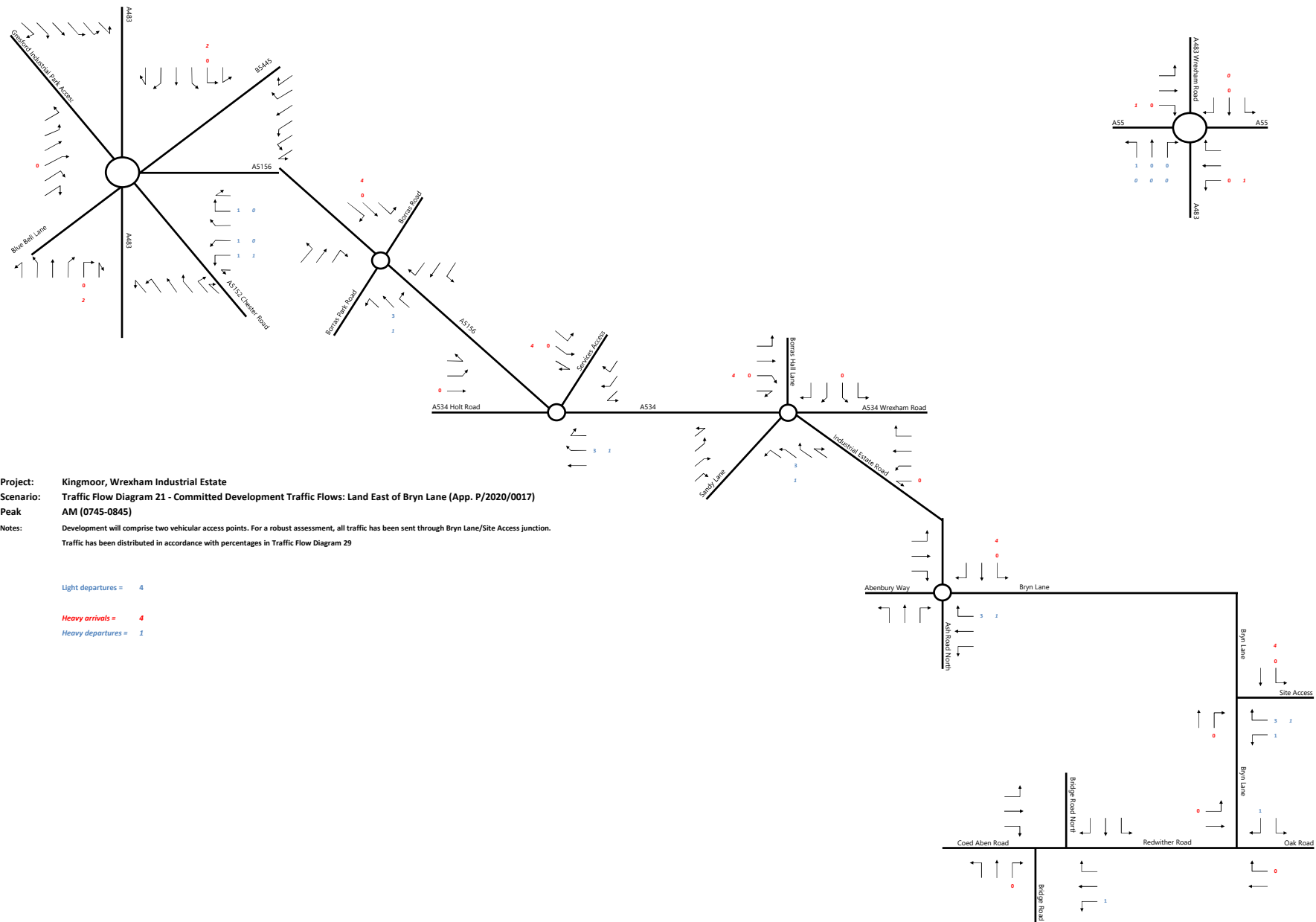
**Project:** Kingmoor, Wrexham Industrial Estate  
**Scenario:** Traffic Flow Diagram 15 - Committed Development Traffic Flows: The Oaks (App. P/2019/0877)  
**Peak:** AM (0745-0845)  
**Notes:**

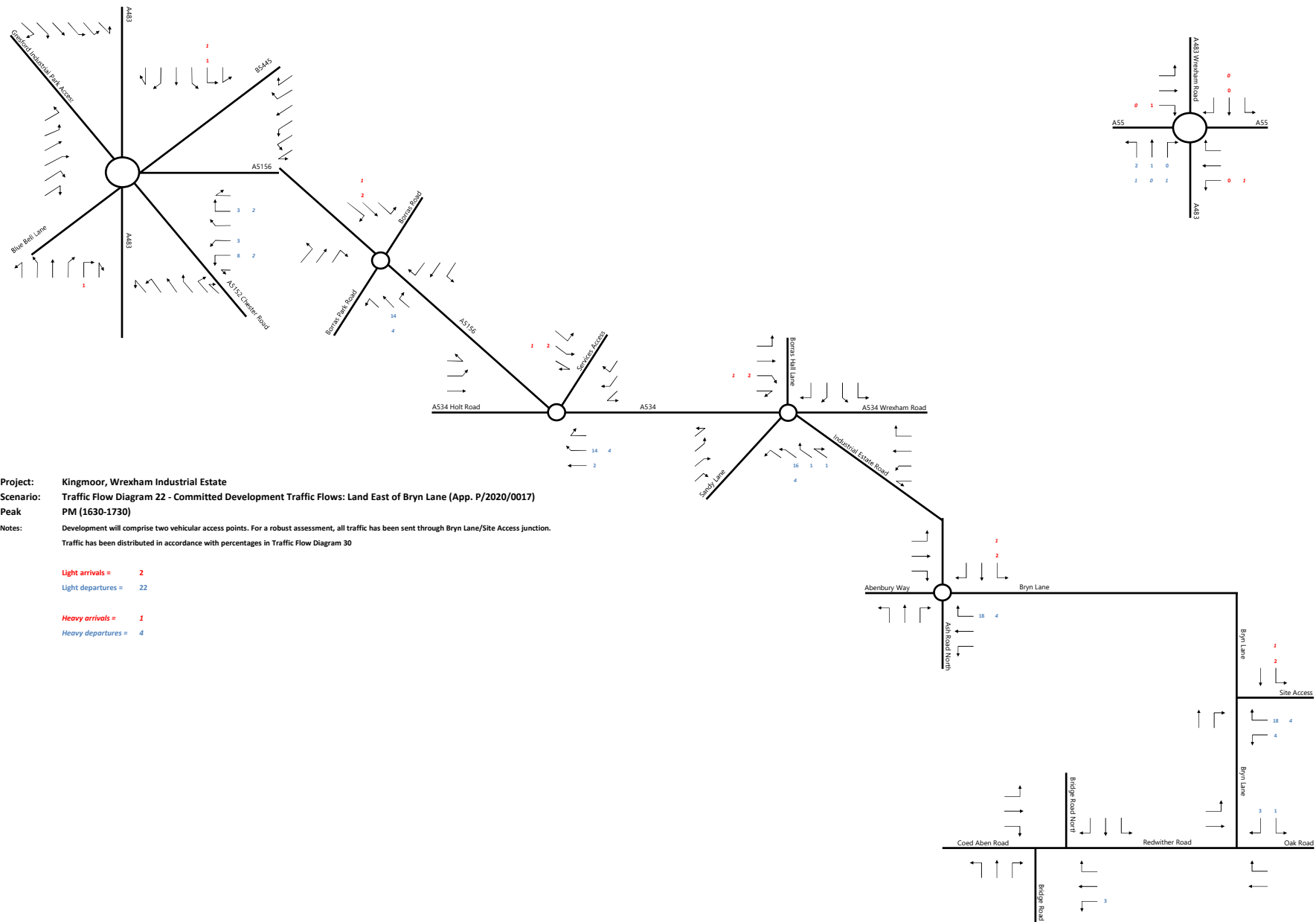








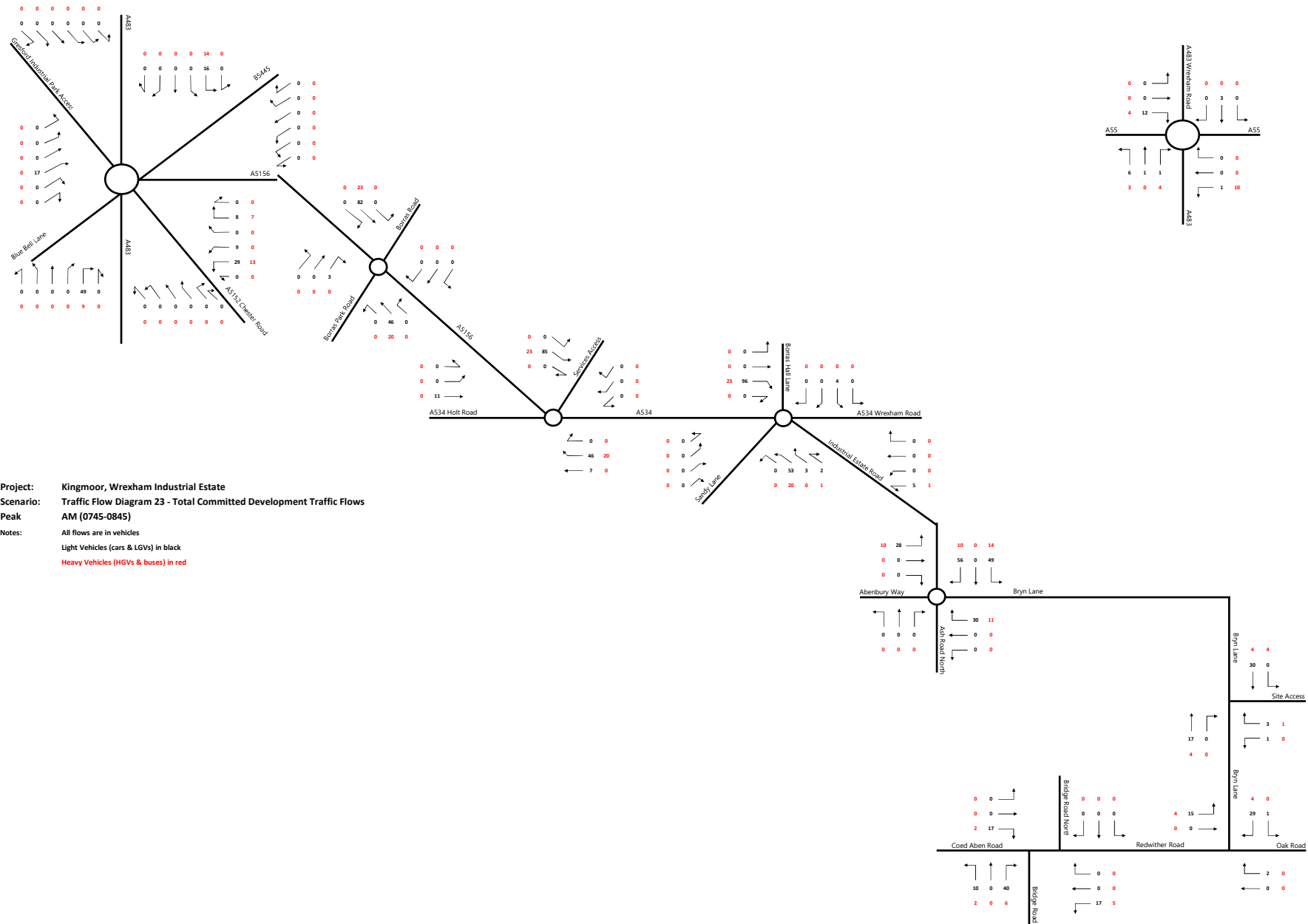




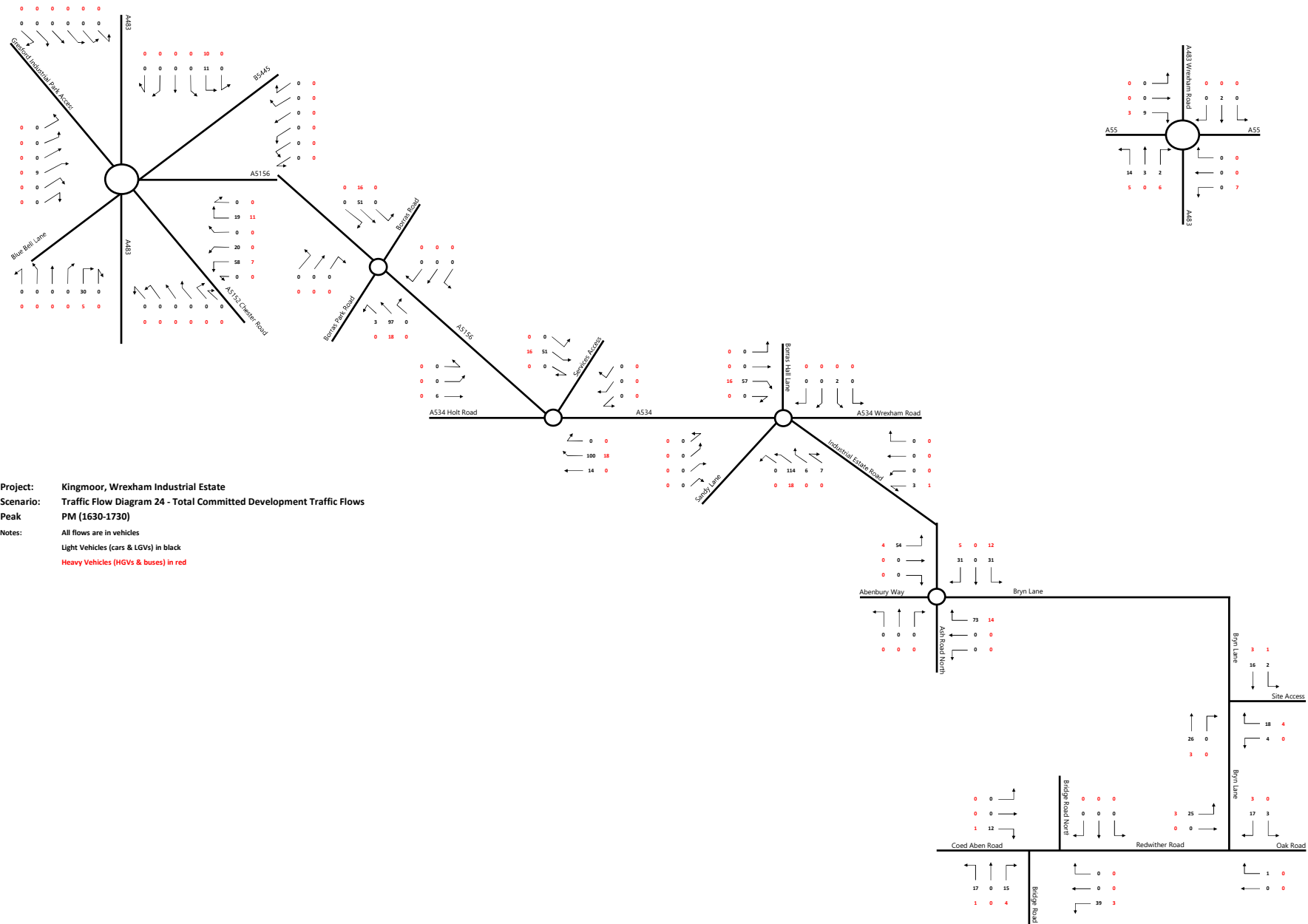
**Project:** Kingmoor, Wrexham Industrial Estate  
**Scenario:** Traffic Flow Diagram 22 - Committed Development Traffic Flows: Land East of Bryn Lane (App. P/2020/0017)  
**Peak:** PM (1630-1730)  
**Notes:** Development will comprise two vehicular access points. For a robust assessment, all traffic has been sent through Bryn Lane/Site Access junction. Traffic has been distributed in accordance with percentages in Traffic Flow Diagram 30

Light arrivals = 2  
 Light departures = 22

Heavy arrivals = 1  
 Heavy departures = 4

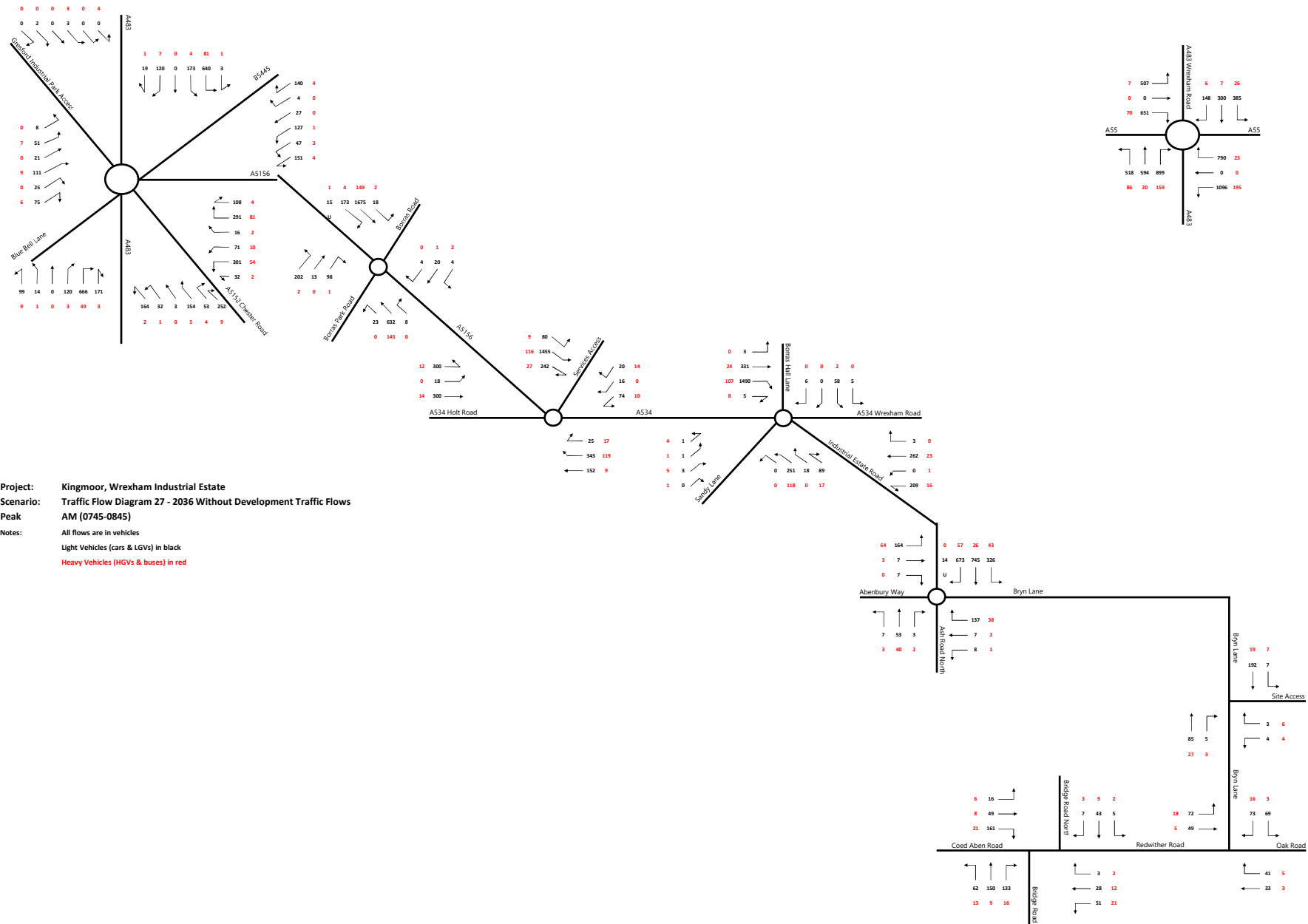




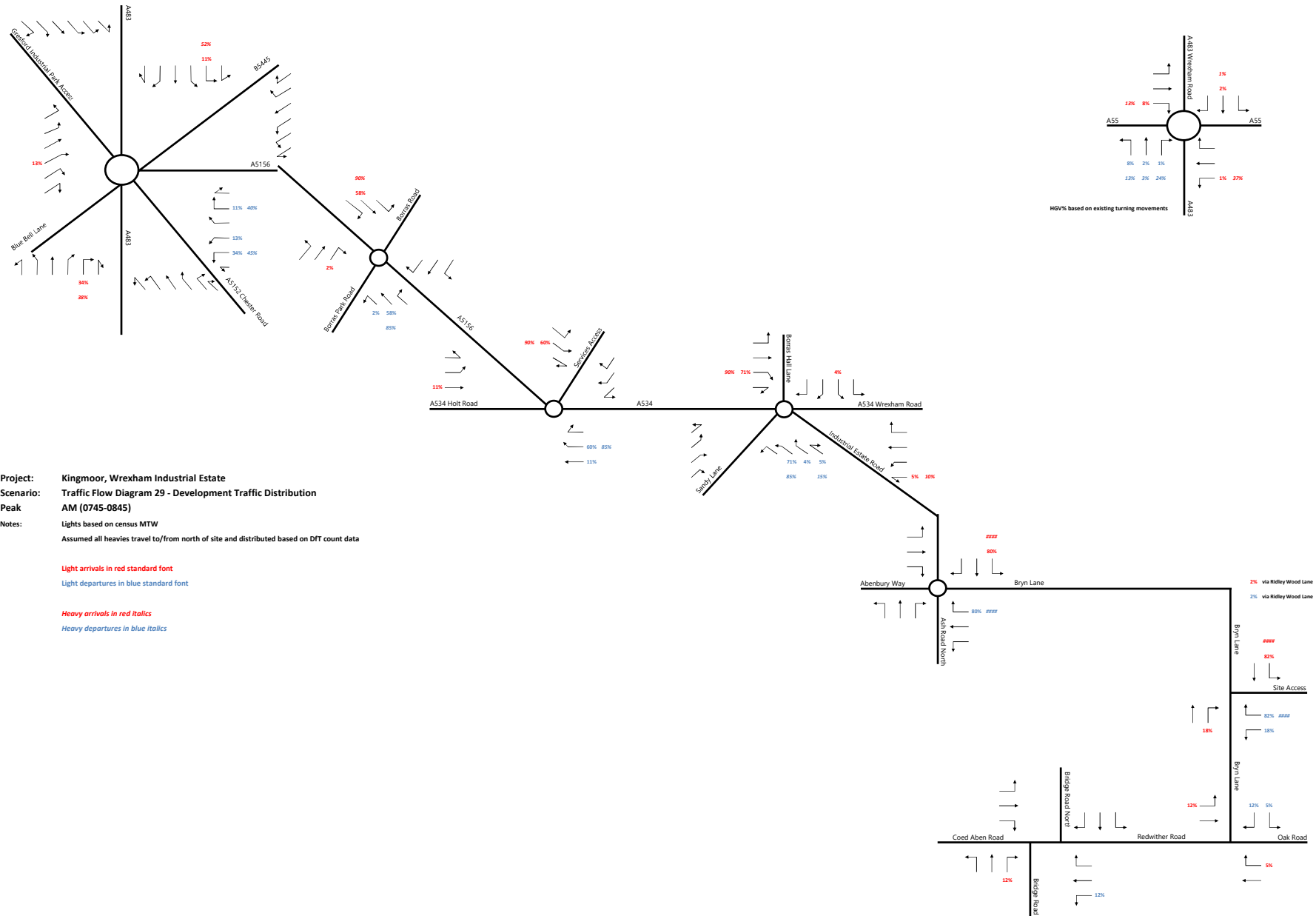


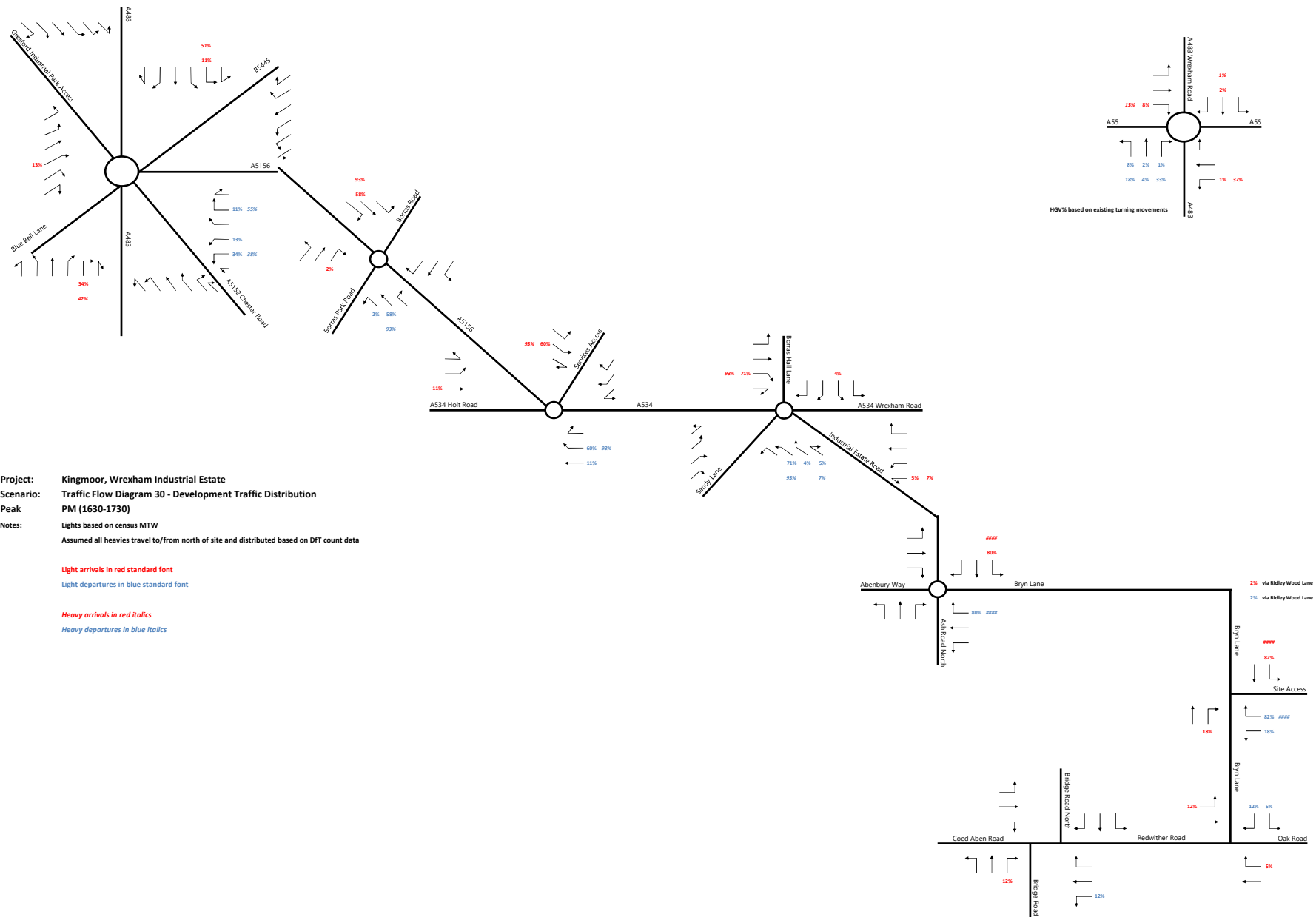


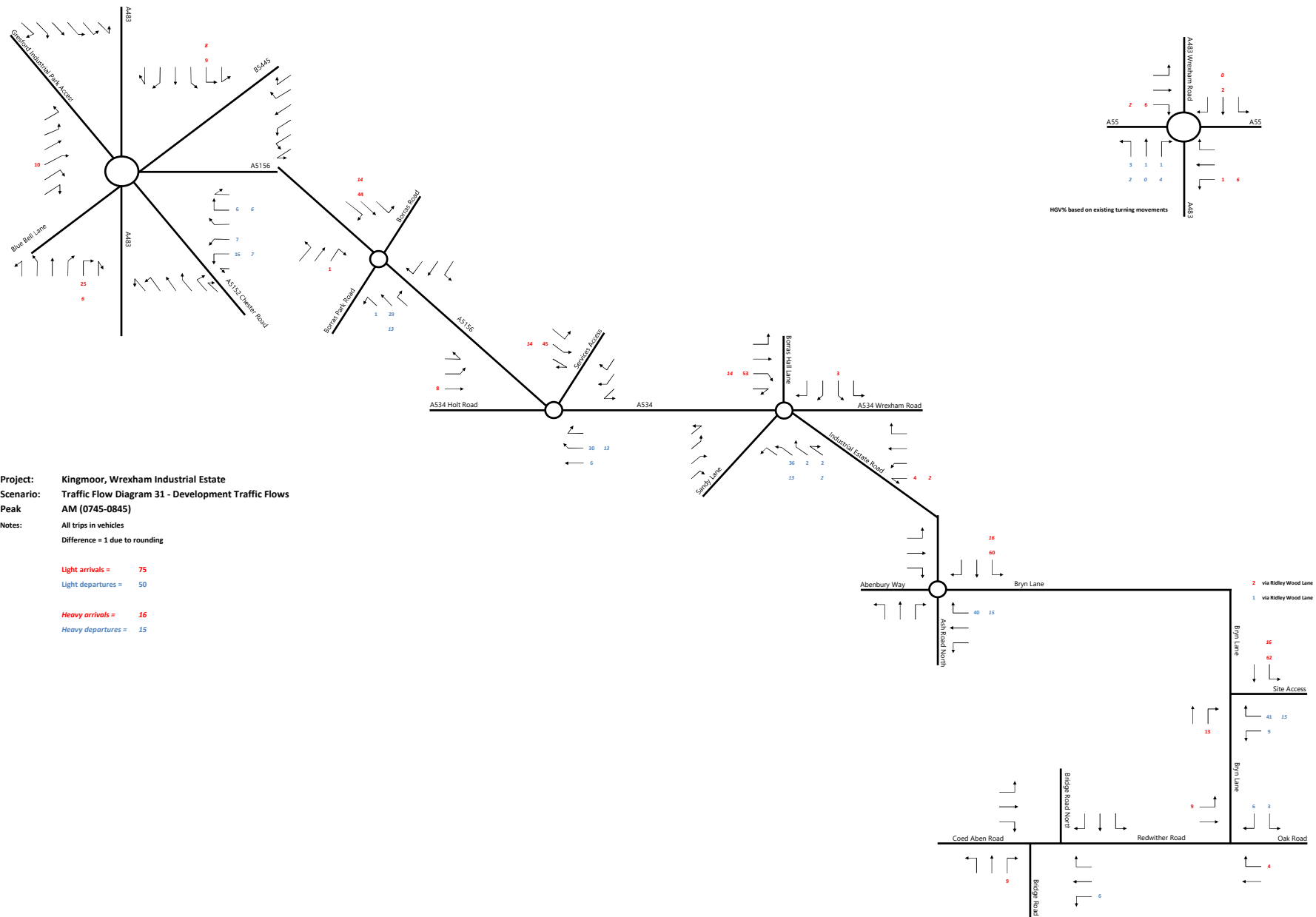




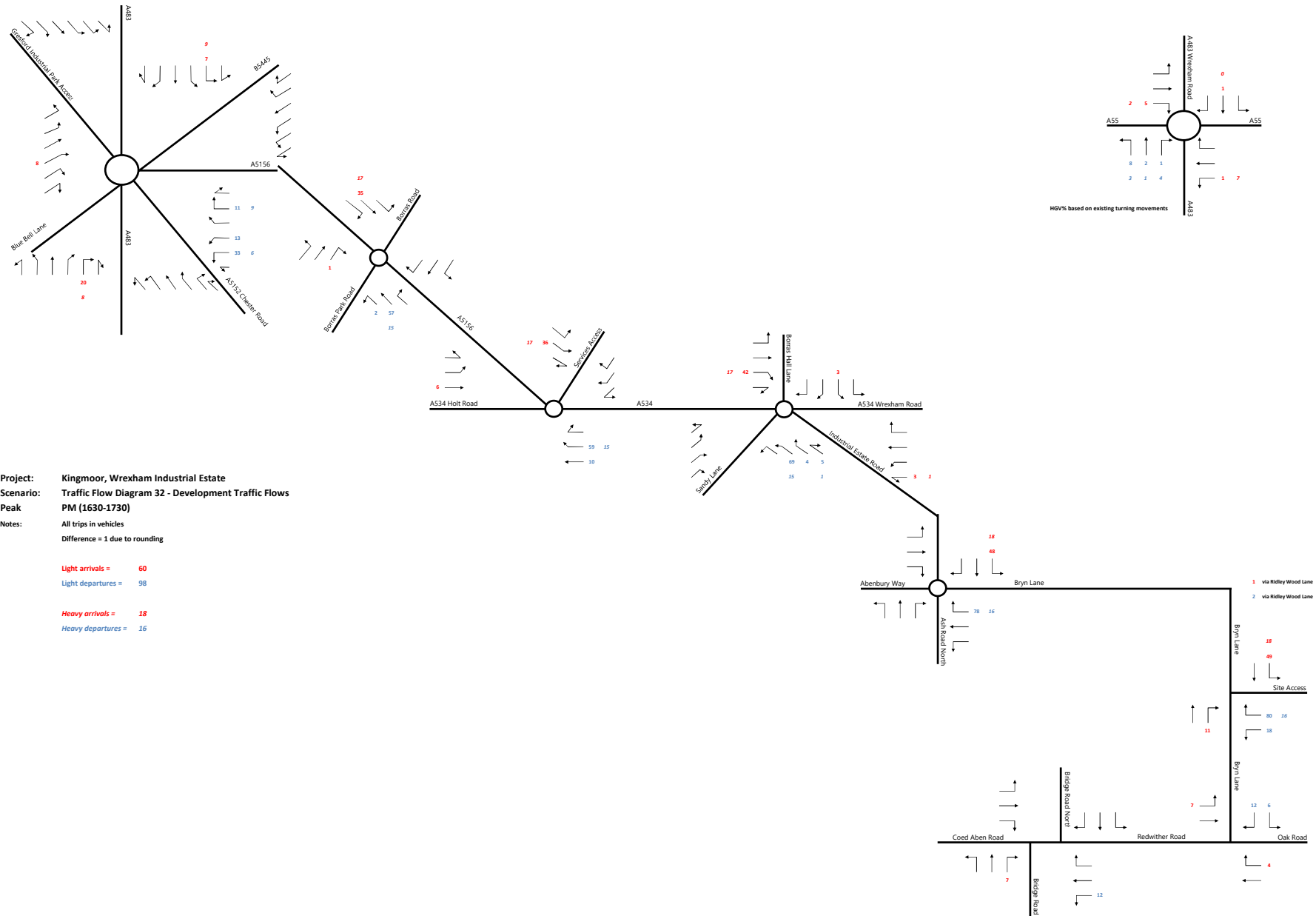


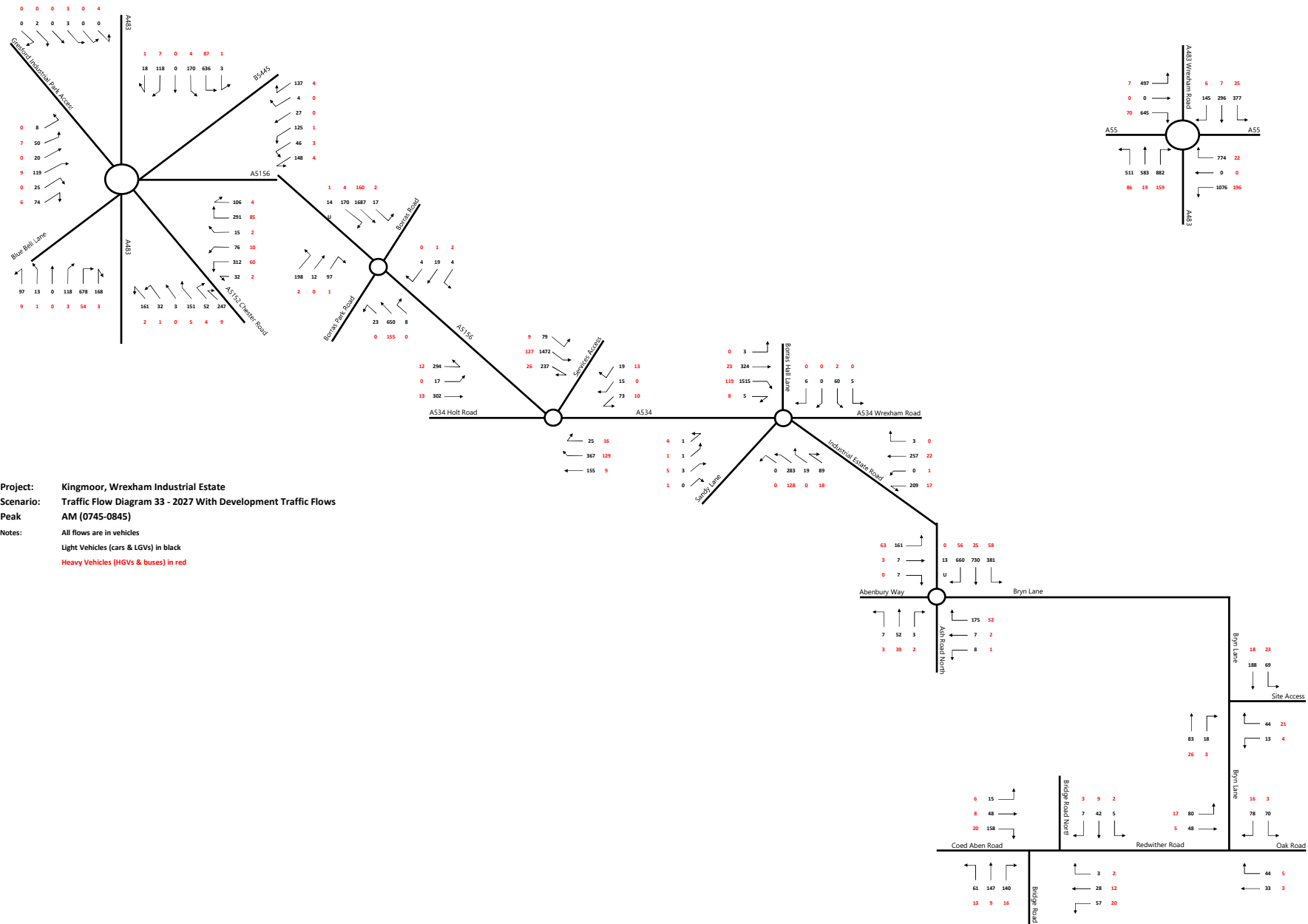


















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## APPENDIX E

### CAPACITY ASSESSMENT REPORT OUTPUTS

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| Junctions 9                                                                                                                                                      |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| PICADY 9 - Priority Intersection Module                                                                                                                          |  |
| Version: 9.5.1.7462<br>© Copyright TRL Limited, 2019                                                                                                             |  |
| For sales and distribution information, program advice and maintenance, contact TRL:<br>+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk              |  |
| The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution |  |

**Filename:** Bryn Lane\_Very Group Access Road\_Priority.j9

**Path:** N:\Projects 2021\P21066 - Kingmoor, Wrexham Industrial Estate\6.Technical\Models

**Report generation date:** 21/03/2023 16:01:07

- »Observed 2022, AM
- »Observed 2022, PM
- »Without Dev 2027, AM
- »Without Dev 2027, PM
- »Without Dev 2036, AM
- »Without Dev 2036, PM
- »With Dev 2027, AM
- »With Dev 2027, PM
- »With Dev 2036, AM
- »With Dev 2036, PM

## File summary

### File Description

|                    |                        |
|--------------------|------------------------|
| <b>Title</b>       | Bryn Lane/Site Access  |
| <b>Location</b>    | Wrexham                |
| <b>Site number</b> |                        |
| <b>Date</b>        | 21/03/2023             |
| <b>Version</b>     |                        |
| <b>Status</b>      | Final                  |
| <b>Identifier</b>  |                        |
| <b>Client</b>      | FIREM                  |
| <b>Jobnumber</b>   | P21066                 |
| <b>Enumerator</b>  | GHC\b.gaze             |
| <b>Description</b> | Checked by D. Stoddart |

## Units

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

## Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------|-----------------------------|-----------------------|
| 5.75               |                             |                                   |                             | 0.85          | 36.00                       | 20.00                 |

## Demand Set Summary

| ID  | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|-----|------------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D1  | Observed 2022    | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |
| D2  | Observed 2022    | PM               | ONE HOUR             | 16:15              | 17:45               | 15                        | ✓                 |
| D3  | Without Dev 2027 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |
| D4  | Without Dev 2027 | PM               | ONE HOUR             | 16:15              | 17:45               | 15                        | ✓                 |
| D5  | Without Dev 2036 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |
| D6  | Without Dev 2036 | PM               | ONE HOUR             | 16:15              | 17:45               | 15                        | ✓                 |
| D7  | With Dev 2027    | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |
| D8  | With Dev 2027    | PM               | ONE HOUR             | 16:15              | 17:45               | 15                        | ✓                 |
| D9  | With Dev 2036    | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |
| D10 | With Dev 2036    | PM               | ONE HOUR             | 16:15              | 17:45               | 15                        | ✓                 |

## Analysis Set Details

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

# Observed 2022, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                 | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/The Very Group Access Road | T-Junction    | Two-way              |                       | 1.11               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Arms

### Arms

| Arm | Name                       | Description | Arm type |
|-----|----------------------------|-------------|----------|
| A   | Bryn Lane (Northern Arm)   |             | Major    |
| B   | The Very Group Access Road |             | Minor    |
| C   | Bryn Lane (Southern Arm)   |             | Major    |

### Major Arm Geometry

| Arm                          | Width of carriageway (m) | Has kerbed central reserve | Has right turn bay | Width for right turn (m) | Visibility for right turn (m) | Blocks? | Blocking queue (PCU) |
|------------------------------|--------------------------|----------------------------|--------------------|--------------------------|-------------------------------|---------|----------------------|
| C - Bryn Lane (Southern Arm) | 7.20                     |                            | ✓                  | 3.50                     | 250.0                         | ✓       | 9.00                 |

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

### Minor Arm Geometry

| Arm                            | Minor arm type      | Width at give-way (m) | Width at 5m (m) | Width at 10m (m) | Width at 15m (m) | Width at 20m (m) | Estimate flare length | Flare length (PCU) | Visibility to left (m) | Visibility to right (m) |
|--------------------------------|---------------------|-----------------------|-----------------|------------------|------------------|------------------|-----------------------|--------------------|------------------------|-------------------------|
| B - The Very Group Access Road | One lane plus flare | 10.00                 | 8.80            | 5.20             | 3.30             | 2.70             | ✓                     | 2.00               | 48                     | 33                      |

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

| Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for C-A | Slope for C-B |
|--------|--------------------|---------------|---------------|---------------|---------------|
| B-A    | 560                | 0.097         | 0.245         | 0.154         | 0.349         |
| B-C    | 709                | 0.103         | 0.260         | -             | -             |
| C-B    | 820                | 0.301         | 0.301         | -             | -             |

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D1 | Observed 2022 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                            | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|--------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Bryn Lane (Northern Arm)   |            | ONE HOUR     | ✓            | 205                     | 100.000            |
| B - The Very Group Access Road |            | ONE HOUR     | ✓            | 26                      | 100.000            |
| C - Bryn Lane (Southern Arm)   |            | ONE HOUR     | ✓            | 133                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 15                             | 190                          |
|      | B - The Very Group Access Road | 13                           | 0                              | 13                           |
|      | C - Bryn Lane (Southern Arm)   | 120                          | 13                             | 0                            |
|      |                                |                              |                                |                              |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 30                             | 8                            |
|      | B - The Very Group Access Road | 100                          | 0                              | 57                           |
|      | C - Bryn Lane (Southern Arm)   | 25                           | 38                             | 0                            |
|      |                                |                              |                                |                              |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.02    | 8.93          | 0.0             | A       | 12                      | 18                            |
| B-A    | 0.03    | 15.37         | 0.1             | C       | 12                      | 18                            |
| C-AB   | 0.02    | 6.70          | 0.0             | A       | 12                      | 18                            |
| C-A    |         |               |                 |         | 110                     | 165                           |
| A-B    |         |               |                 |         | 14                      | 21                            |
| A-C    |         |               |                 |         | 174                     | 262                           |

# Observed 2022, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                 | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/The Very Group Access Road | T-Junction    | Two-way              |                       | 0.42               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D2 | Observed 2022 | PM               | ONE HOUR             | 16:15              | 17:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                            | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|--------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Bryn Lane (Northern Arm)   |            | ONE HOUR     | ✓            | 135                     | 100.000            |
| B - The Very Group Access Road |            | ONE HOUR     | ✓            | 20                      | 100.000            |
| C - Bryn Lane (Southern Arm)   |            | ONE HOUR     | ✓            | 261                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 15                             | 120                          |
|      | B - The Very Group Access Road | 9                            | 0                              | 11                           |
|      | C - Bryn Lane (Southern Arm)   | 260                          | 1                              | 0                            |
|      |                                |                              |                                |                              |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 100                            | 14                           |
|      | B - The Very Group Access Road | 14                           | 0                              | 50                           |
|      | C - Bryn Lane (Southern Arm)   | 6                            | 0                              | 0                            |
|      |                                |                              |                                |                              |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.02    | 8.04          | 0.0             | A       | 10                      | 15                            |
| B-A    | 0.02    | 8.91          | 0.0             | A       | 8                       | 12                            |
| C-AB   | 0.00    | 4.65          | 0.0             | A       | 0.92                    | 1                             |
| C-A    |         |               |                 |         | 239                     | 358                           |
| A-B    |         |               |                 |         | 14                      | 21                            |
| A-C    |         |               |                 |         | 110                     | 165                           |

# Without Dev 2027, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                 | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/The Very Group Access Road | T-Junction    | Two-way              |                       | 1.00               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D3 | Without Dev 2027 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                            | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|--------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Bryn Lane (Northern Arm)   |            | ONE HOUR     | ✓            | 258                     | 100.000            |
| B - The Very Group Access Road |            | ONE HOUR     | ✓            | 32                      | 100.000            |
| C - Bryn Lane (Southern Arm)   |            | ONE HOUR     | ✓            | 161                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 25                             | 233                          |
|      | B - The Very Group Access Road | 18                           | 0                              | 14                           |
|      | C - Bryn Lane (Southern Arm)   | 148                          | 13                             | 0                            |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 50                             | 9                            |
|      | B - The Very Group Access Road | 67                           | 0                              | 50                           |
|      | C - Bryn Lane (Southern Arm)   | 24                           | 38                             | 0                            |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.03    | 8.99          | 0.0             | A       | 13                      | 19                            |
| B-A    | 0.04    | 13.11         | 0.1             | B       | 17                      | 25                            |
| C-AB   | 0.02    | 6.87          | 0.0             | A       | 12                      | 18                            |
| C-A    |         |               |                 |         | 136                     | 204                           |
| A-B    |         |               |                 |         | 23                      | 34                            |
| A-C    |         |               |                 |         | 214                     | 321                           |



# Without Dev 2027, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                 | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/The Very Group Access Road | T-Junction    | Two-way              |                       | 0.95               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D4 | Without Dev 2027 | PM               | ONE HOUR             | 16:15              | 17:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                            | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|--------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Bryn Lane (Northern Arm)   |            | ONE HOUR     | ✓            | 166                     | 100.000            |
| B - The Very Group Access Road |            | ONE HOUR     | ✓            | 52                      | 100.000            |
| C - Bryn Lane (Southern Arm)   |            | ONE HOUR     | ✓            | 299                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 20                             | 146                          |
|      | B - The Very Group Access Road | 37                           | 0                              | 15                           |
|      | C - Bryn Lane (Southern Arm)   | 298                          | 1                              | 0                            |
|      |                                |                              |                                |                              |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 78                             | 14                           |
|      | B - The Very Group Access Road | 17                           | 0                              | 30                           |
|      | C - Bryn Lane (Southern Arm)   | 7                            | 0                              | 0                            |
|      |                                |                              |                                |                              |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.03    | 7.80          | 0.0             | A       | 14                      | 21                            |
| B-A    | 0.09    | 9.93          | 0.1             | A       | 34                      | 51                            |
| C-AB   | 0.00    | 4.71          | 0.0             | A       | 0.92                    | 1                             |
| C-A    |         |               |                 |         | 273                     | 410                           |
| A-B    |         |               |                 |         | 18                      | 28                            |
| A-C    |         |               |                 |         | 134                     | 201                           |

# Without Dev 2036, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                 | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/The Very Group Access Road | T-Junction    | Two-way              |                       | 0.98               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D5 | Without Dev 2036 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                            | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|--------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Bryn Lane (Northern Arm)   |            | ONE HOUR     | ✓            | 265                     | 100.000            |
| B - The Very Group Access Road |            | ONE HOUR     | ✓            | 32                      | 100.000            |
| C - Bryn Lane (Southern Arm)   |            | ONE HOUR     | ✓            | 166                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 25                             | 240                          |
|      | B - The Very Group Access Road | 18                           | 0                              | 14                           |
|      | C - Bryn Lane (Southern Arm)   | 153                          | 13                             | 0                            |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 50                             | 9                            |
|      | B - The Very Group Access Road | 67                           | 0                              | 50                           |
|      | C - Bryn Lane (Southern Arm)   | 24                           | 38                             | 0                            |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.03    | 9.02          | 0.0             | A       | 13                      | 19                            |
| B-A    | 0.04    | 13.19         | 0.1             | B       | 17                      | 25                            |
| C-AB   | 0.02    | 6.89          | 0.0             | A       | 12                      | 18                            |
| C-A    |         |               |                 |         | 140                     | 211                           |
| A-B    |         |               |                 |         | 23                      | 34                            |
| A-C    |         |               |                 |         | 220                     | 330                           |

# Without Dev 2036, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                 | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/The Very Group Access Road | T-Junction    | Two-way              |                       | 0.93               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D6 | Without Dev 2036 | PM               | ONE HOUR             | 16:15              | 17:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                            | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|--------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Bryn Lane (Northern Arm)   |            | ONE HOUR     | ✓            | 170                     | 100.000            |
| B - The Very Group Access Road |            | ONE HOUR     | ✓            | 52                      | 100.000            |
| C - Bryn Lane (Southern Arm)   |            | ONE HOUR     | ✓            | 306                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 20                             | 150                          |
|      | B - The Very Group Access Road | 37                           | 0                              | 15                           |
|      | C - Bryn Lane (Southern Arm)   | 305                          | 1                              | 0                            |
|      |                                |                              |                                |                              |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 78                             | 15                           |
|      | B - The Very Group Access Road | 17                           | 0                              | 30                           |
|      | C - Bryn Lane (Southern Arm)   | 7                            | 0                              | 0                            |
|      |                                |                              |                                |                              |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.03    | 7.81          | 0.0             | A       | 14                      | 21                            |
| B-A    | 0.09    | 9.99          | 0.1             | A       | 34                      | 51                            |
| C-AB   | 0.00    | 4.72          | 0.0             | A       | 0.92                    | 1                             |
| C-A    |         |               |                 |         | 280                     | 420                           |
| A-B    |         |               |                 |         | 18                      | 28                            |
| A-C    |         |               |                 |         | 138                     | 206                           |

# With Dev 2027, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                 | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/The Very Group Access Road | T-Junction    | Two-way              |                       | 2.60               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D7 | With Dev 2027 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                            | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|--------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Bryn Lane (Northern Arm)   |            | ONE HOUR     | ✓            | 360                     | 100.000            |
| B - The Very Group Access Road |            | ONE HOUR     | ✓            | 120                     | 100.000            |
| C - Bryn Lane (Southern Arm)   |            | ONE HOUR     | ✓            | 174                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      |                                | To                           |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
| From |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
|      | A - Bryn Lane (Northern Arm)   | 0                            | 127                            | 233                          |
|      | B - The Very Group Access Road | 97                           | 0                              | 23                           |
|      | C - Bryn Lane (Southern Arm)   | 148                          | 26                             | 0                            |

## Vehicle Mix

### Heavy Vehicle Percentages

|      |                                | To                           |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
| From |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
|      | A - Bryn Lane (Northern Arm)   | 0                            | 25                             | 9                            |
|      | B - The Very Group Access Road | 32                           | 0                              | 24                           |
|      | C - Bryn Lane (Southern Arm)   | 24                           | 14                             | 0                            |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.05    | 8.51          | 0.1             | A       | 21                      | 32                            |
| B-A    | 0.24    | 13.85         | 0.4             | B       | 89                      | 134                           |
| C-AB   | 0.04    | 6.12          | 0.0             | A       | 24                      | 36                            |
| C-A    |         |               |                 |         | 136                     | 204                           |
| A-B    |         |               |                 |         | 117                     | 175                           |
| A-C    |         |               |                 |         | 214                     | 321                           |



# With Dev 2027, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                 | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/The Very Group Access Road | T-Junction    | Two-way              |                       | 3.49               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D8 | With Dev 2027 | PM               | ONE HOUR             | 16:15              | 17:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                            | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|--------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Bryn Lane (Northern Arm)   |            | ONE HOUR     | ✓            | 260                     | 100.000            |
| B - The Very Group Access Road |            | ONE HOUR     | ✓            | 190                     | 100.000            |
| C - Bryn Lane (Southern Arm)   |            | ONE HOUR     | ✓            | 310                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 114                            | 146                          |
|      | B - The Very Group Access Road | 157                          | 0                              | 33                           |
|      | C - Bryn Lane (Southern Arm)   | 298                          | 12                             | 0                            |
|      |                                |                              |                                |                              |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                             |                              |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
|      |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
| From | A - Bryn Lane (Northern Arm)   | 0                            | 33                             | 14                           |
|      | B - The Very Group Access Road | 17                           | 0                              | 11                           |
|      | C - Bryn Lane (Southern Arm)   | 7                            | 0                              | 0                            |
|      |                                |                              |                                |                              |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.07    | 7.95          | 0.1             | A       | 30                      | 45                            |
| B-A    | 0.38    | 14.83         | 0.7             | B       | 144                     | 216                           |
| C-AB   | 0.02    | 4.99          | 0.0             | A       | 11                      | 17                            |
| C-A    |         |               |                 |         | 273                     | 410                           |
| A-B    |         |               |                 |         | 105                     | 157                           |
| A-C    |         |               |                 |         | 134                     | 201                           |

# With Dev 2036, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                 | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/The Very Group Access Road | T-Junction    | Two-way              |                       | 2.57               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D9 | With Dev 2036 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                            | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|--------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Bryn Lane (Northern Arm)   |            | ONE HOUR     | ✓            | 367                     | 100.000            |
| B - The Very Group Access Road |            | ONE HOUR     | ✓            | 120                     | 100.000            |
| C - Bryn Lane (Southern Arm)   |            | ONE HOUR     | ✓            | 179                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      |                                | To                           |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
| From |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
|      | A - Bryn Lane (Northern Arm)   | 0                            | 127                            | 240                          |
|      | B - The Very Group Access Road | 97                           | 0                              | 23                           |
|      | C - Bryn Lane (Southern Arm)   | 153                          | 26                             | 0                            |

## Vehicle Mix

### Heavy Vehicle Percentages

|      |                                | To                           |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
| From |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
|      | A - Bryn Lane (Northern Arm)   | 0                            | 25                             | 9                            |
|      | B - The Very Group Access Road | 32                           | 0                              | 24                           |
|      | C - Bryn Lane (Southern Arm)   | 24                           | 14                             | 0                            |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.05    | 8.54          | 0.1             | A       | 21                      | 32                            |
| B-A    | 0.24    | 13.96         | 0.4             | B       | 89                      | 134                           |
| C-AB   | 0.04    | 6.14          | 0.0             | A       | 24                      | 36                            |
| C-A    |         |               |                 |         | 140                     | 211                           |
| A-B    |         |               |                 |         | 117                     | 175                           |
| A-C    |         |               |                 |         | 220                     | 330                           |

# With Dev 2036, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                 | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/The Very Group Access Road | T-Junction    | Two-way              |                       | 3.46               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID  | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|-----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D10 | With Dev 2036 | PM               | ONE HOUR             | 16:15              | 17:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                            | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|--------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Bryn Lane (Northern Arm)   |            | ONE HOUR     | ✓            | 264                     | 100.000            |
| B - The Very Group Access Road |            | ONE HOUR     | ✓            | 190                     | 100.000            |
| C - Bryn Lane (Southern Arm)   |            | ONE HOUR     | ✓            | 317                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      |                                | To                           |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
| From |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
|      | A - Bryn Lane (Northern Arm)   | 0                            | 114                            | 150                          |
|      | B - The Very Group Access Road | 157                          | 0                              | 33                           |
|      | C - Bryn Lane (Southern Arm)   | 305                          | 12                             | 0                            |

## Vehicle Mix

### Heavy Vehicle Percentages

|      |                                | To                           |                                |                              |
|------|--------------------------------|------------------------------|--------------------------------|------------------------------|
| From |                                | A - Bryn Lane (Northern Arm) | B - The Very Group Access Road | C - Bryn Lane (Southern Arm) |
|      | A - Bryn Lane (Northern Arm)   | 0                            | 33                             | 15                           |
|      | B - The Very Group Access Road | 17                           | 0                              | 11                           |
|      | C - Bryn Lane (Southern Arm)   | 7                            | 0                              | 0                            |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.07    | 7.97          | 0.1             | A       | 30                      | 45                            |
| B-A    | 0.38    | 14.95         | 0.7             | B       | 144                     | 216                           |
| C-AB   | 0.02    | 5.00          | 0.0             | A       | 11                      | 17                            |
| C-A    |         |               |                 |         | 280                     | 420                           |
| A-B    |         |               |                 |         | 105                     | 157                           |
| A-C    |         |               |                 |         | 138                     | 206                           |

| Junctions 9                                                                                                                                                      |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| ARCADY 9 - Roundabout Module                                                                                                                                     |  |
| Version: 9.5.1.7462<br>© Copyright TRL Limited, 2019                                                                                                             |  |
| For sales and distribution information, program advice and maintenance, contact TRL:<br>+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk              |  |
| The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution |  |

Filename: Bryn-Ash-Aben-Ind Est.j9

Path: N:\Projects 2021\P21066 - Kingmoor, Wrexham Industrial Estate\6.Technical\Models

Report generation date: 22/03/2023 09:43:42

- »Observed 2022, AM
- »Observed 2022, PM
- »Without Dev 2027, AM
- »Without Dev 2027, PM
- »Without Dev 2036, AM
- »Without Dev 2036, PM
- »With Dev 2027, AM
- »With Dev 2027, PM
- »With Dev 2036, AM
- »With Dev 2036, PM

## File summary

### File Description

|             |                                                              |
|-------------|--------------------------------------------------------------|
| Title       | Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way |
| Location    | Wrexham                                                      |
| Site number |                                                              |
| Date        | 21/03/2023                                                   |
| Version     |                                                              |
| Status      | Final                                                        |
| Identifier  |                                                              |
| Client      | FIREM                                                        |
| Jobnumber   | P21066                                                       |
| Enumerator  | GHC\b.gaze                                                   |
| Description | Checked by D. Stoddart                                       |

## Units

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

## Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------|-----------------------------|-----------------------|
| 5.75               |                             |                                   |                             | 0.85          | 36.00                       | 20.00                 |

## Demand Set Summary

| ID  | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|-----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D1  | Observed 2022    | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D2  | Observed 2022    | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D3  | Without Dev 2027 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D4  | Without Dev 2027 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D5  | Without Dev 2036 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D6  | Without Dev 2036 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D7  | With Dev 2027    | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D8  | With Dev 2027    | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D9  | With Dev 2036    | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D10 | With Dev 2036    | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |

## Analysis Set Details

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



# Observed 2022, 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        | Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | Standard Roundabout |                       | 1, 2, 3, 4 | 5.43               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Arms

### Arms

| Arm | Name                   | Description |
|-----|------------------------|-------------|
| 1   | Bryn Lane              |             |
| 2   | Ash Road North         |             |
| 3   | Abenbury Way           |             |
| 4   | Industrial Estate Road |             |

### Roundabout Geometry

| Arm                        | V - Approach road half-width (m) | E - Entry width (m) | I' - Effective flare length (m) | R - Entry radius (m) | D - Inscribed circle diameter (m) | PHI - Conflict (entry) angle (deg) | Exit only |
|----------------------------|----------------------------------|---------------------|---------------------------------|----------------------|-----------------------------------|------------------------------------|-----------|
| 1 - Bryn Lane              | 3.60                             | 7.00                | 17.7                            | 40.7                 | 59.7                              | 34.6                               |           |
| 2 - Ash Road North         | 3.60                             | 7.50                | 21.0                            | 10.0                 | 59.7                              | 35.2                               |           |
| 3 - Abenbury Way           | 3.60                             | 5.00                | 5.0                             | 60.3                 | 59.7                              | 34.5                               |           |
| 4 - Industrial Estate Road | 7.00                             | 9.70                | 7.5                             | 48.0                 | 59.7                              | 34.2                               |           |

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

| Arm                        | Final slope | Final intercept (PCU/hr) |
|----------------------------|-------------|--------------------------|
| 1 - Bryn Lane              | 0.569       | 1744                     |
| 2 - Ash Road North         | 0.543       | 1709                     |
| 3 - Abenbury Way           | 0.500       | 1337                     |
| 4 - Industrial Estate Road | 0.708       | 2536                     |

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 period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D1 | Observed 2022 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Bryn Lane              |            | FLAT         | ✓            | 191                     | 100.000            |
| 2 - Ash Road North         |            | FLAT         | ✓            | 169                     | 100.000            |
| 3 - Abenbury Way           |            | FLAT         | ✓            | 282                     | 100.000            |
| 4 - Industrial Estate Road |            | FLAT         | ✓            | 1817                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
|      |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
| From | 1 - Bryn Lane              | 0             | 11                 | 12               | 168                        |
|      | 2 - Ash Road North         | 8             | 0                  | 15               | 146                        |
|      | 3 - Abenbury Way           | 15            | 7                  | 0                | 260                        |
|      | 4 - Industrial Estate Road | 336           | 777                | 704              | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
|      |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
| From | 1 - Bryn Lane              | 0             | 11                 | 22               | 20                         |
|      | 2 - Ash Road North         | 40            | 0                  | 30               | 43                         |
|      | 3 - Abenbury Way           | 30            | 0                  | 0                | 29                         |
|      | 4 - Industrial Estate Road | 10            | 3                  | 7                | 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 - Bryn Lane              | 0.21    | 6.10          | 0.3             | A       | 191                     | 287                           |
| 2 - Ash Road North         | 0.14    | 4.80          | 0.2             | A       | 169                     | 254                           |
| 3 - Abenbury Way           | 0.24    | 5.14          | 0.4             | A       | 282                     | 423                           |
| 4 - Industrial Estate Road | 0.72    | 5.46          | 2.7             | A       | 1817                    | 2726                          |

# Observed 2022, 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        | Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | Standard Roundabout |                       | 1, 2, 3, 4 | 6.67               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D2 | Observed 2022 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Bryn Lane              |            | FLAT         | ✓            | 377                     | 100.000            |
| 2 - Ash Road North         |            | FLAT         | ✓            | 775                     | 100.000            |
| 3 - Abenbury Way           |            | FLAT         | ✓            | 525                     | 100.000            |
| 4 - Industrial Estate Road |            | FLAT         | ✓            | 600                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
|      |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
| From | 1 - Bryn Lane              | 0             | 10                 | 9                | 358                        |
|      | 2 - Ash Road North         | 7             | 0                  | 10               | 758                        |
|      | 3 - Abenbury Way           | 14            | 6                  | 0                | 505                        |
|      | 4 - Industrial Estate Road | 187           | 157                | 256              | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
| From |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
|      | 1 - Bryn Lane              | 0             | 100                | 33               | 5                          |
|      | 2 - Ash Road North         | 20            | 0                  | 29               | 1                          |
|      | 3 - Abenbury Way           | 18            | 25                 | 0                | 4                          |
|      | 4 - Industrial Estate Road | 13            | 14                 | 6                | 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 - Bryn Lane              | 0.25    | 3.41          | 0.4             | A       | 377                     | 566                           |
| 2 - Ash Road North         | 0.57    | 6.13          | 1.3             | A       | 775                     | 1163                          |
| 3 - Abenbury Way           | 0.68    | 15.05         | 2.2             | C       | 525                     | 788                           |
| 4 - Industrial Estate Road | 0.24    | 2.07          | 0.3             | A       | 600                     | 900                           |

# Without Dev 2027, 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        | Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | Standard Roundabout |                       | 1, 2, 3, 4 | 7.32               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D3 | Without Dev 2027 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Bryn Lane              |            | FLAT         | ✓            | 251                     | 100.000            |
| 2 - Ash Road North         |            | FLAT         | ✓            | 173                     | 100.000            |
| 3 - Abenbury Way           |            | FLAT         | ✓            | 341                     | 100.000            |
| 4 - Industrial Estate Road |            | FLAT         | ✓            | 2019                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
|      |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
| From | 1 - Bryn Lane              | 0             | 11                 | 12               | 228                        |
|      | 2 - Ash Road North         | 8             | 0                  | 15               | 150                        |
|      | 3 - Abenbury Way           | 15            | 7                  | 0                | 319                        |
|      | 4 - Industrial Estate Road | 426           | 793                | 800              | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
| From |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
|      | 1 - Bryn Lane              | 0             | 11                 | 22               | 22                         |
|      | 2 - Ash Road North         | 40            | 0                  | 30               | 43                         |
|      | 3 - Abenbury Way           | 30            | 0                  | 0                | 28                         |
|      | 4 - Industrial Estate Road | 12            | 3                  | 8                | 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 - Bryn Lane              | 0.30    | 7.47          | 0.5             | A       | 251                     | 377                           |
| 2 - Ash Road North         | 0.15    | 5.24          | 0.3             | A       | 173                     | 260                           |
| 3 - Abenbury Way           | 0.30    | 5.71          | 0.5             | A       | 341                     | 512                           |
| 4 - Industrial Estate Road | 0.80    | 7.75          | 4.3             | A       | 2019                    | 3029                          |

# Without Dev 2027, 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        | Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | Standard Roundabout |                       | 1, 2, 3, 4 | 11.42              | B            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D4 | Without Dev 2027 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Bryn Lane              |            | FLAT         | ✓            | 492                     | 100.000            |
| 2 - Ash Road North         |            | FLAT         | ✓            | 792                     | 100.000            |
| 3 - Abenbury Way           |            | FLAT         | ✓            | 599                     | 100.000            |
| 4 - Industrial Estate Road |            | FLAT         | ✓            | 715                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
|      |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
| From | 1 - Bryn Lane              | 0             | 10                 | 9                | 473                        |
|      | 2 - Ash Road North         | 7             | 0                  | 10               | 775                        |
|      | 3 - Abenbury Way           | 14            | 6                  | 0                | 579                        |
|      | 4 - Industrial Estate Road | 251           | 160                | 304              | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
| From |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
|      | 1 - Bryn Lane              | 0             | 100                | 33               | 7                          |
|      | 2 - Ash Road North         | 20            | 0                  | 29               | 1                          |
|      | 3 - Abenbury Way           | 18            | 25                 | 0                | 4                          |
|      | 4 - Industrial Estate Road | 16            | 14                 | 7                | 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 - Bryn Lane              | 0.33    | 3.97          | 0.5             | A       | 492                     | 738                           |
| 2 - Ash Road North         | 0.62    | 7.44          | 1.6             | A       | 792                     | 1188                          |
| 3 - Abenbury Way           | 0.84    | 33.79         | 5.5             | D       | 599                     | 899                           |
| 4 - Industrial Estate Road | 0.28    | 2.23          | 0.4             | A       | 715                     | 1073                          |



# Without Dev 2036, 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        | Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | Standard Roundabout |                       | 1, 2, 3, 4 | 7.87               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D5 | Without Dev 2036 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Bryn Lane              |            | FLAT         | ✓            | 255                     | 100.000            |
| 2 - Ash Road North         |            | FLAT         | ✓            | 176                     | 100.000            |
| 3 - Abenbury Way           |            | FLAT         | ✓            | 346                     | 100.000            |
| 4 - Industrial Estate Road |            | FLAT         | ✓            | 2060                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
|      |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
| From | 1 - Bryn Lane              | 0             | 11                 | 12               | 232                        |
|      | 2 - Ash Road North         | 8             | 0                  | 15               | 153                        |
|      | 3 - Abenbury Way           | 15            | 7                  | 0                | 324                        |
|      | 4 - Industrial Estate Road | 434           | 810                | 816              | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
| From |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
|      | 1 - Bryn Lane              | 0             | 11                 | 22               | 22                         |
|      | 2 - Ash Road North         | 40            | 0                  | 30               | 43                         |
|      | 3 - Abenbury Way           | 30            | 0                  | 0                | 28                         |
|      | 4 - Industrial Estate Road | 12            | 3                  | 8                | 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 - Bryn Lane              | 0.31    | 7.79          | 0.6             | A       | 255                     | 383                           |
| 2 - Ash Road North         | 0.16    | 5.32          | 0.3             | A       | 176                     | 264                           |
| 3 - Abenbury Way           | 0.30    | 5.77          | 0.6             | A       | 346                     | 519                           |
| 4 - Industrial Estate Road | 0.82    | 8.44          | 4.8             | A       | 2060                    | 3090                          |

# Without Dev 2036, 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        | Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | Standard Roundabout |                       | 1, 2, 3, 4 | 13.42              | B            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D6 | Without Dev 2036 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Bryn Lane              |            | FLAT         | ✓            | 500                     | 100.000            |
| 2 - Ash Road North         |            | FLAT         | ✓            | 805                     | 100.000            |
| 3 - Abenbury Way           |            | FLAT         | ✓            | 611                     | 100.000            |
| 4 - Industrial Estate Road |            | FLAT         | ✓            | 733                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
|      |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
| From | 1 - Bryn Lane              | 0             | 10                 | 9                | 481                        |
|      | 2 - Ash Road North         | 7             | 0                  | 10               | 788                        |
|      | 3 - Abenbury Way           | 14            | 6                  | 0                | 591                        |
|      | 4 - Industrial Estate Road | 257           | 165                | 311              | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
| From |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
|      | 1 - Bryn Lane              | 0             | 100                | 33               | 7                          |
|      | 2 - Ash Road North         | 20            | 0                  | 29               | 1                          |
|      | 3 - Abenbury Way           | 18            | 25                 | 0                | 5                          |
|      | 4 - Industrial Estate Road | 16            | 14                 | 8                | 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 - Bryn Lane              | 0.34    | 4.04          | 0.6             | A       | 500                     | 750                           |
| 2 - Ash Road North         | 0.63    | 7.78          | 1.7             | A       | 805                     | 1208                          |
| 3 - Abenbury Way           | 0.87    | 41.93         | 6.9             | E       | 611                     | 917                           |
| 4 - Industrial Estate Road | 0.29    | 2.26          | 0.5             | A       | 733                     | 1100                          |

# With Dev 2027, 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        | Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | Standard Roundabout |                       | 1, 2, 3, 4 | 8.95               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D7 | With Dev 2027 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Bryn Lane              |            | FLAT         | ✓            | 328                     | 100.000            |
| 2 - Ash Road North         |            | FLAT         | ✓            | 173                     | 100.000            |
| 3 - Abenbury Way           |            | FLAT         | ✓            | 341                     | 100.000            |
| 4 - Industrial Estate Road |            | FLAT         | ✓            | 2119                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
|      |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
| From | 1 - Bryn Lane              | 0             | 11                 | 12               | 305                        |
|      | 2 - Ash Road North         | 8             | 0                  | 15               | 150                        |
|      | 3 - Abenbury Way           | 15            | 7                  | 0                | 319                        |
|      | 4 - Industrial Estate Road | 526           | 793                | 800              | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
| From |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
|      | 1 - Bryn Lane              | 0             | 11                 | 22               | 23                         |
|      | 2 - Ash Road North         | 40            | 0                  | 30               | 43                         |
|      | 3 - Abenbury Way           | 30            | 0                  | 0                | 28                         |
|      | 4 - Industrial Estate Road | 13            | 3                  | 8                | 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 - Bryn Lane              | 0.39    | 8.71          | 0.8             | A       | 328                     | 492                           |
| 2 - Ash Road North         | 0.16    | 5.48          | 0.3             | A       | 173                     | 260                           |
| 3 - Abenbury Way           | 0.31    | 6.00          | 0.6             | A       | 341                     | 512                           |
| 4 - Industrial Estate Road | 0.84    | 9.75          | 5.7             | A       | 2119                    | 3179                          |

# With Dev 2027, 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        | Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | Standard Roundabout |                       | 1, 2, 3, 4 | 18.33              | C            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D8 | With Dev 2027 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Bryn Lane              |            | FLAT         | ✓            | 610                     | 100.000            |
| 2 - Ash Road North         |            | FLAT         | ✓            | 792                     | 100.000            |
| 3 - Abenbury Way           |            | FLAT         | ✓            | 599                     | 100.000            |
| 4 - Industrial Estate Road |            | FLAT         | ✓            | 808                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
|      |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
| From | 1 - Bryn Lane              | 0             | 10                 | 9                | 591                        |
|      | 2 - Ash Road North         | 7             | 0                  | 10               | 775                        |
|      | 3 - Abenbury Way           | 14            | 6                  | 0                | 579                        |
|      | 4 - Industrial Estate Road | 344           | 160                | 304              | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
| From |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
|      | 1 - Bryn Lane              | 0             | 100                | 33               | 9                          |
|      | 2 - Ash Road North         | 20            | 0                  | 29               | 1                          |
|      | 3 - Abenbury Way           | 18            | 25                 | 0                | 4                          |
|      | 4 - Industrial Estate Road | 19            | 14                 | 7                | 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 - Bryn Lane              | 0.41    | 4.57          | 0.8             | A       | 610                     | 915                           |
| 2 - Ash Road North         | 0.65    | 8.56          | 1.9             | A       | 792                     | 1188                          |
| 3 - Abenbury Way           | 0.92    | 66.76         | 10.6            | F       | 599                     | 899                           |
| 4 - Industrial Estate Road | 0.32    | 2.38          | 0.5             | A       | 808                     | 1212                          |



# With Dev 2036, 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        | Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | Standard Roundabout |                       | 1, 2, 3, 4 | 9.82               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D9 | With Dev 2036 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Bryn Lane              |            | FLAT         | ✓            | 333                     | 100.000            |
| 2 - Ash Road North         |            | FLAT         | ✓            | 176                     | 100.000            |
| 3 - Abenbury Way           |            | FLAT         | ✓            | 346                     | 100.000            |
| 4 - Industrial Estate Road |            | FLAT         | ✓            | 2160                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
|      |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
| From | 1 - Bryn Lane              | 0             | 11                 | 12               | 310                        |
|      | 2 - Ash Road North         | 8             | 0                  | 15               | 153                        |
|      | 3 - Abenbury Way           | 15            | 7                  | 0                | 324                        |
|      | 4 - Industrial Estate Road | 534           | 810                | 816              | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
| From |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
|      | 1 - Bryn Lane              | 0             | 11                 | 22               | 23                         |
|      | 2 - Ash Road North         | 40            | 0                  | 30               | 43                         |
|      | 3 - Abenbury Way           | 30            | 0                  | 0                | 28                         |
|      | 4 - Industrial Estate Road | 13            | 3                  | 8                | 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 - Bryn Lane              | 0.41    | 9.15          | 0.8             | A       | 333                     | 500                           |
| 2 - Ash Road North         | 0.16    | 5.57          | 0.3             | A       | 176                     | 264                           |
| 3 - Abenbury Way           | 0.31    | 6.07          | 0.6             | A       | 346                     | 519                           |
| 4 - Industrial Estate Road | 0.86    | 10.87         | 6.4             | B       | 2160                    | 3240                          |

# With Dev 2036, 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        | Industrial Estate Road/Bryn Lane/Ash Road North/Abenbury Way | Standard Roundabout |                       | 1, 2, 3, 4 | 25.24              | D            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID  | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|-----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D10 | With Dev 2036 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Bryn Lane              |            | FLAT         | ✓            | 618                     | 100.000            |
| 2 - Ash Road North         |            | FLAT         | ✓            | 805                     | 100.000            |
| 3 - Abenbury Way           |            | FLAT         | ✓            | 611                     | 100.000            |
| 4 - Industrial Estate Road |            | FLAT         | ✓            | 826                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
|      |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
| From | 1 - Bryn Lane              | 0             | 10                 | 9                | 599                        |
|      | 2 - Ash Road North         | 7             | 0                  | 10               | 788                        |
|      | 3 - Abenbury Way           | 14            | 6                  | 0                | 591                        |
|      | 4 - Industrial Estate Road | 350           | 165                | 311              | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |               |                    |                  |                            |
|------|----------------------------|---------------|--------------------|------------------|----------------------------|
| From |                            | 1 - Bryn Lane | 2 - Ash Road North | 3 - Abenbury Way | 4 - Industrial Estate Road |
|      | 1 - Bryn Lane              | 0             | 100                | 33               | 9                          |
|      | 2 - Ash Road North         | 20            | 0                  | 29               | 1                          |
|      | 3 - Abenbury Way           | 18            | 25                 | 0                | 5                          |
|      | 4 - Industrial Estate Road | 19            | 14                 | 8                | 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 - Bryn Lane              | 0.42    | 4.66          | 0.8             | A       | 618                     | 927                           |
| 2 - Ash Road North         | 0.66    | 9.00          | 2.0             | A       | 805                     | 1208                          |
| 3 - Abenbury Way           | 0.96    | 98.32         | 15.9            | F       | 611                     | 917                           |
| 4 - Industrial Estate Road | 0.33    | 2.41          | 0.6             | A       | 826                     | 1239                          |

| Junctions 9                                                                                                                                                      |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| ARCADY 9 - Roundabout Module                                                                                                                                     |  |
| Version: 9.5.1.7462<br>© Copyright TRL Limited, 2019                                                                                                             |  |
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| The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution |  |

Filename: Borrás-Wrexham-Industrial-Sandy-A534.j9

Path: N:\Projects 2021\P21066 - Kingmoor, Wrexham Industrial Estate\6.Technical\Models

Report generation date: 21/03/2023 16:23:44

- »Observed 2022, AM
- »Observed 2022, PM
- »Without Dev 2027, AM
- »Without Dev 2027, PM
- »Without Dev 2036, AM
- »Without Dev 2036, PM
- »With Dev 2027, AM
- »With Dev 2027, PM
- »With Dev 2036, AM
- »With Dev 2036, PM

## File summary

### File Description

|             |                                                                      |
|-------------|----------------------------------------------------------------------|
| Title       | Borrás Hall Lane/Wrexham Road/Industrial Estate Road/Sandy Lane/A534 |
| Location    | Wrexham                                                              |
| Site number |                                                                      |
| Date        | 21/03/2023                                                           |
| Version     |                                                                      |
| Status      | Final                                                                |
| Identifier  |                                                                      |
| Client      | FIREM                                                                |
| Jobnumber   | P21066                                                               |
| Enumerator  | GHC\b.gaze                                                           |
| Description | Checked by D. Stoddart                                               |

## Units

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

## Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------|-----------------------------|-----------------------|
| 5.75               |                             |                                   |                             | 0.85          | 36.00                       | 20.00                 |

## Demand Set Summary

| ID  | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|-----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D1  | Observed 2022    | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D2  | Observed 2022    | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D3  | Without Dev 2027 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D4  | Without Dev 2027 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D5  | Without Dev 2036 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D6  | Without Dev 2036 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D7  | With Dev 2027    | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D8  | With Dev 2027    | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D9  | With Dev 2036    | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D10 | With Dev 2036    | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |

## Analysis Set Details

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

# Observed 2022, 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        | Borras Hall Lane/Wrexham Road/Industrial Estate Road/Sandy Lane/A534 | Standard Roundabout |                       | 1, 2, 3, 4, 5 | 7.19               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Arms

### Arms

| Arm | Name                   | Description |
|-----|------------------------|-------------|
| 1   | Borras Hall Lane       |             |
| 2   | Wrexham Road           |             |
| 3   | Industrial Estate Road |             |
| 4   | Sandy Lane             |             |
| 5   | A534                   |             |

### Roundabout Geometry

| Arm                        | V - Approach road half-width (m) | E - Entry width (m) | I' - Effective flare length (m) | R - Entry radius (m) | D - Inscribed circle diameter (m) | PHI - Conflict (entry) angle (deg) | Exit only |
|----------------------------|----------------------------------|---------------------|---------------------------------|----------------------|-----------------------------------|------------------------------------|-----------|
| 1 - Borras Hall Lane       | 3.60                             | 5.80                | 11.0                            | 17.3                 | 69.8                              | 31.3                               |           |
| 2 - Wrexham Road           | 3.50                             | 7.30                | 10.0                            | 26.2                 | 69.8                              | 31.8                               |           |
| 3 - Industrial Estate Road | 7.00                             | 8.70                | 15.7                            | 38.8                 | 69.8                              | 31.8                               |           |
| 4 - Sandy Lane             | 3.70                             | 5.30                | 18.1                            | 16.0                 | 69.8                              | 30.9                               |           |
| 5 - A534                   | 7.80                             | 10.05               | 4.9                             | 32.0                 | 69.8                              | 31.3                               |           |

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

| Arm                        | Final slope | Final intercept (PCU/hr) |
|----------------------------|-------------|--------------------------|
| 1 - Borras Hall Lane       | 0.469       | 1479                     |
| 2 - Wrexham Road           | 0.490       | 1588                     |
| 3 - Industrial Estate Road | 0.644       | 2547                     |
| 4 - Sandy Lane             | 0.468       | 1476                     |
| 5 - A534                   | 0.663       | 2676                     |

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 period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D1 | Observed 2022 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Borras Hall Lane       |            | FLAT         | ✓            | 68                      | 100.000            |
| 2 - Wrexham Road           |            | FLAT         | ✓            | 543                     | 100.000            |
| 3 - Industrial Estate Road |            | FLAT         | ✓            | 560                     | 100.000            |
| 4 - Sandy Lane             |            | FLAT         | ✓            | 34                      | 100.000            |
| 5 - A534                   |            | FLAT         | ✓            | 1942                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borras Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borras Hall Lane       | 0                    | 5                | 57                         | 0              | 6        |
|      | 2 - Wrexham Road           | 3                    | 0                | 231                        | 3              | 306      |
|      | 3 - Industrial Estate Road | 14                   | 121              | 0                          | 0              | 425      |
|      | 4 - Sandy Lane             | 4                    | 16               | 3                          | 0              | 11       |
|      | 5 - A534                   | 3                    | 375              | 1539                       | 25             | 0        |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borras Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borras Hall Lane       | 0                    | 0                | 4                          | 0              | 0        |
|      | 2 - Wrexham Road           | 0                    | 0                | 7                          | 100            | 8        |
|      | 3 - Industrial Estate Road | 0                    | 15               | 0                          | 0              | 33       |
|      | 4 - Sandy Lane             | 50                   | 63               | 100                        | 0              | 80       |
|      | 5 - A534                   | 0                    | 7                | 6                          | 62             | 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 - Borras Hall Lane       | 0.13    | 8.50          | 0.2             | A       | 68                      | 102                           |
| 2 - Wrexham Road           | 0.69    | 15.71         | 2.3             | C       | 543                     | 815                           |
| 3 - Industrial Estate Road | 0.24    | 2.60          | 0.4             | A       | 560                     | 840                           |
| 4 - Sandy Lane             | 0.03    | 5.89          | 0.1             | A       | 34                      | 51                            |
| 5 - A534                   | 0.76    | 6.11          | 3.3             | A       | 1942                    | 2913                          |





# Observed 2022, 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        | Borras Hall Lane/Wrexham Road/Industrial Estate Road/Sandy Lane/A534 | Standard Roundabout |                       | 1, 2, 3, 4, 5 | 4.51               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D2 | Observed 2022 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Borras Hall Lane       |            | FLAT         | ✓            | 18                      | 100.000            |
| 2 - Wrexham Road           |            | FLAT         | ✓            | 479                     | 100.000            |
| 3 - Industrial Estate Road |            | FLAT         | ✓            | 1632                    | 100.000            |
| 4 - Sandy Lane             |            | FLAT         | ✓            | 30                      | 100.000            |
| 5 - A534                   |            | FLAT         | ✓            | 807                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borras Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borras Hall Lane       | 0                    | 3                | 8                          | 0              | 7        |
|      | 2 - Wrexham Road           | 4                    | 0                | 100                        | 1              | 374      |
|      | 3 - Industrial Estate Road | 65                   | 228              | 0                          | 9              | 1330     |
|      | 4 - Sandy Lane             | 1                    | 3                | 4                          | 0              | 22       |
|      | 5 - A534                   | 5                    | 298              | 503                        | 1              | 0        |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
| From |                            | 1 - Borrás Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
|      | 1 - Borrás Hall Lane       | 0                    | 0                | 0                          | 0              | 0        |
|      | 2 - Wrexham Road           | 0                    | 0                | 7                          | 0              | 3        |
|      | 3 - Industrial Estate Road | 0                    | 3                | 0                          | 75             | 3        |
|      | 4 - Sandy Lane             | 0                    | 0                | 0                          | 0              | 5        |
|      | 5 - A534                   | 0                    | 2                | 11                         | 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 - Borrás Hall Lane       | 0.02    | 3.69          | 0.0             | A       | 18                      | 27                            |
| 2 - Wrexham Road           | 0.36    | 4.39          | 0.6             | A       | 479                     | 719                           |
| 3 - Industrial Estate Road | 0.71    | 5.58          | 2.5             | A       | 1632                    | 2448                          |
| 4 - Sandy Lane             | 0.06    | 7.35          | 0.1             | A       | 30                      | 45                            |
| 5 - A534                   | 0.33    | 2.32          | 0.5             | A       | 807                     | 1211                          |

# Without Dev 2027, 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        | Borras Hall Lane/Wrexham Road/Industrial Estate Road/Sandy Lane/A534 | Standard Roundabout |                       | 1, 2, 3, 4, 5 | 10.95              | B            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D3 | Without Dev 2027 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Borras Hall Lane       |            | FLAT         | ✓            | 73                      | 100.000            |
| 2 - Wrexham Road           |            | FLAT         | ✓            | 561                     | 100.000            |
| 3 - Industrial Estate Road |            | FLAT         | ✓            | 679                     | 100.000            |
| 4 - Sandy Lane             |            | FLAT         | ✓            | 34                      | 100.000            |
| 5 - A534                   |            | FLAT         | ✓            | 2135                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borras Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borras Hall Lane       | 0                    | 5                | 62                         | 0              | 6        |
|      | 2 - Wrexham Road           | 3                    | 0                | 243                        | 3              | 312      |
|      | 3 - Industrial Estate Road | 17                   | 127              | 0                          | 0              | 535      |
|      | 4 - Sandy Lane             | 4                    | 16               | 3                          | 0              | 11       |
|      | 5 - A534                   | 3                    | 382              | 1725                       | 25             | 0        |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borrás Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borrás Hall Lane       | 0                    | 0                | 3                          | 0              | 0        |
|      | 2 - Wrexham Road           | 0                    | 0                | 7                          | 100            | 8        |
|      | 3 - Industrial Estate Road | 0                    | 16               | 0                          | 0              | 32       |
|      | 4 - Sandy Lane             | 50                   | 63               | 100                        | 0              | 80       |
|      | 5 - A534                   | 0                    | 7                | 7                          | 62             | 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 - Borrás Hall Lane       | 0.18    | 10.95         | 0.2             | B       | 73                      | 110                           |
| 2 - Wrexham Road           | 0.81    | 28.53         | 4.4             | D       | 561                     | 842                           |
| 3 - Industrial Estate Road | 0.29    | 2.79          | 0.5             | A       | 679                     | 1019                          |
| 4 - Sandy Lane             | 0.03    | 6.24          | 0.1             | A       | 34                      | 51                            |
| 5 - A534                   | 0.83    | 9.00          | 5.3             | A       | 2135                    | 3203                          |

# Without Dev 2027, 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        | Borras Hall Lane/Wrexham Road/Industrial Estate Road/Sandy Lane/A534 | Standard Roundabout |                       | 1, 2, 3, 4, 5 | 6.14               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D4 | Without Dev 2027 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Borras Hall Lane       |            | FLAT         | ✓            | 20                      | 100.000            |
| 2 - Wrexham Road           |            | FLAT         | ✓            | 495                     | 100.000            |
| 3 - Industrial Estate Road |            | FLAT         | ✓            | 1841                    | 100.000            |
| 4 - Sandy Lane             |            | FLAT         | ✓            | 30                      | 100.000            |
| 5 - A534                   |            | FLAT         | ✓            | 921                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borras Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borras Hall Lane       | 0                    | 3                | 10                         | 0              | 7        |
|      | 2 - Wrexham Road           | 4                    | 0                | 108                        | 1              | 382      |
|      | 3 - Industrial Estate Road | 72                   | 240              | 0                          | 9              | 1520     |
|      | 4 - Sandy Lane             | 1                    | 3                | 4                          | 0              | 22       |
|      | 5 - A534                   | 5                    | 304              | 611                        | 1              | 0        |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
| From |                            | 1 - Borrás Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
|      | 1 - Borrás Hall Lane       | 0                    | 0                | 0                          | 0              | 0        |
|      | 2 - Wrexham Road           | 0                    | 0                | 7                          | 0              | 3        |
|      | 3 - Industrial Estate Road | 0                    | 3                | 0                          | 75             | 4        |
|      | 4 - Sandy Lane             | 0                    | 0                | 0                          | 0              | 5        |
|      | 5 - A534                   | 0                    | 2                | 12                         | 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 - Borrás Hall Lane       | 0.02    | 3.94          | 0.0             | A       | 20                      | 30                            |
| 2 - Wrexham Road           | 0.39    | 4.78          | 0.7             | A       | 495                     | 743                           |
| 3 - Industrial Estate Road | 0.80    | 8.28          | 4.2             | A       | 1841                    | 2762                          |
| 4 - Sandy Lane             | 0.07    | 9.19          | 0.1             | A       | 30                      | 45                            |
| 5 - A534                   | 0.37    | 2.54          | 0.7             | A       | 921                     | 1382                          |

# Without Dev 2036, 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        | Borras Hall Lane/Wrexham Road/Industrial Estate Road/Sandy Lane/A534 | Standard Roundabout |                       | 1, 2, 3, 4, 5 | 12.95              | B            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D5 | Without Dev 2036 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Borras Hall Lane       |            | FLAT         | ✓            | 74                      | 100.000            |
| 2 - Wrexham Road           |            | FLAT         | ✓            | 575                     | 100.000            |
| 3 - Industrial Estate Road |            | FLAT         | ✓            | 696                     | 100.000            |
| 4 - Sandy Lane             |            | FLAT         | ✓            | 34                      | 100.000            |
| 5 - A534                   |            | FLAT         | ✓            | 2177                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borras Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borras Hall Lane       | 0                    | 5                | 63                         | 0              | 6        |
|      | 2 - Wrexham Road           | 3                    | 0                | 249                        | 3              | 320      |
|      | 3 - Industrial Estate Road | 18                   | 132              | 0                          | 0              | 546      |
|      | 4 - Sandy Lane             | 4                    | 16               | 3                          | 0              | 11       |
|      | 5 - A534                   | 3                    | 391              | 1758                       | 25             | 0        |

## Vehicle Mix



### Heavy Vehicle Percentages

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borrás Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borrás Hall Lane       | 0                    | 0                | 3                          | 0              | 0        |
|      | 2 - Wrexham Road           | 0                    | 0                | 7                          | 100            | 8        |
|      | 3 - Industrial Estate Road | 0                    | 16               | 0                          | 0              | 32       |
|      | 4 - Sandy Lane             | 50                   | 63               | 100                        | 0              | 80       |
|      | 5 - A534                   | 0                    | 7                | 7                          | 62             | 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 - Borrás Hall Lane       | 0.19    | 11.74         | 0.2             | B       | 74                      | 111                           |
| 2 - Wrexham Road           | 0.85    | 36.66         | 5.7             | E       | 575                     | 863                           |
| 3 - Industrial Estate Road | 0.30    | 2.83          | 0.5             | A       | 696                     | 1044                          |
| 4 - Sandy Lane             | 0.03    | 6.32          | 0.1             | A       | 34                      | 51                            |
| 5 - A534                   | 0.85    | 10.07         | 6.0             | B       | 2177                    | 3266                          |

# Without Dev 2036, 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        | Borras Hall Lane/Wrexham Road/Industrial Estate Road/Sandy Lane/A534 | Standard Roundabout |                       | 1, 2, 3, 4, 5 | 6.55               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D6 | Without Dev 2036 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Borras Hall Lane       |            | FLAT         | ✓            | 20                      | 100.000            |
| 2 - Wrexham Road           |            | FLAT         | ✓            | 503                     | 100.000            |
| 3 - Industrial Estate Road |            | FLAT         | ✓            | 1872                    | 100.000            |
| 4 - Sandy Lane             |            | FLAT         | ✓            | 31                      | 100.000            |
| 5 - A534                   |            | FLAT         | ✓            | 937                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borras Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borras Hall Lane       | 0                    | 3                | 10                         | 0              | 7        |
|      | 2 - Wrexham Road           | 4                    | 0                | 110                        | 1              | 388      |
|      | 3 - Industrial Estate Road | 74                   | 244              | 0                          | 9              | 1545     |
|      | 4 - Sandy Lane             | 1                    | 3                | 4                          | 0              | 23       |
|      | 5 - A534                   | 5                    | 310              | 621                        | 1              | 0        |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
| From |                            | 1 - Borrás Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
|      | 1 - Borrás Hall Lane       | 0                    | 0                | 0                          | 0              | 0        |
|      | 2 - Wrexham Road           | 0                    | 0                | 7                          | 0              | 3        |
|      | 3 - Industrial Estate Road | 0                    | 3                | 0                          | 75             | 4        |
|      | 4 - Sandy Lane             | 0                    | 0                | 0                          | 0              | 5        |
|      | 5 - A534                   | 0                    | 2                | 12                         | 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 - Borrás Hall Lane       | 0.02    | 3.98          | 0.0             | A       | 20                      | 30                            |
| 2 - Wrexham Road           | 0.40    | 4.86          | 0.7             | A       | 503                     | 755                           |
| 3 - Industrial Estate Road | 0.82    | 8.97          | 4.6             | A       | 1872                    | 2808                          |
| 4 - Sandy Lane             | 0.07    | 9.61          | 0.1             | A       | 31                      | 47                            |
| 5 - A534                   | 0.38    | 2.58          | 0.7             | A       | 937                     | 1406                          |

# With Dev 2027, 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        | Borras Hall Lane/Wrexham Road/Industrial Estate Road/Sandy Lane/A534 | Standard Roundabout |                       | 1, 2, 3, 4, 5 | 15.16              | C            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D7 | With Dev 2027 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Borras Hall Lane       |            | FLAT         | ✓            | 76                      | 100.000            |
| 2 - Wrexham Road           |            | FLAT         | ✓            | 570                     | 100.000            |
| 3 - Industrial Estate Road |            | FLAT         | ✓            | 756                     | 100.000            |
| 4 - Sandy Lane             |            | FLAT         | ✓            | 34                      | 100.000            |
| 5 - A534                   |            | FLAT         | ✓            | 2223                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borras Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borras Hall Lane       | 0                    | 5                | 65                         | 0              | 6        |
|      | 2 - Wrexham Road           | 3                    | 0                | 252                        | 3              | 312      |
|      | 3 - Industrial Estate Road | 19                   | 134              | 0                          | 0              | 603      |
|      | 4 - Sandy Lane             | 4                    | 16               | 3                          | 0              | 11       |
|      | 5 - A534                   | 3                    | 382              | 1813                       | 25             | 0        |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borrás Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borrás Hall Lane       | 0                    | 0                | 3                          | 0              | 0        |
|      | 2 - Wrexham Road           | 0                    | 0                | 8                          | 100            | 8        |
|      | 3 - Industrial Estate Road | 0                    | 17               | 0                          | 0              | 31       |
|      | 4 - Sandy Lane             | 50                   | 63               | 100                        | 0              | 80       |
|      | 5 - A534                   | 0                    | 7                | 7                          | 62             | 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 - Borrás Hall Lane       | 0.21    | 12.72         | 0.3             | B       | 76                      | 114                           |
| 2 - Wrexham Road           | 0.88    | 46.28         | 7.1             | E       | 570                     | 855                           |
| 3 - Industrial Estate Road | 0.33    | 2.93          | 0.6             | A       | 756                     | 1134                          |
| 4 - Sandy Lane             | 0.03    | 6.48          | 0.1             | A       | 34                      | 51                            |
| 5 - A534                   | 0.87    | 11.56         | 7.0             | B       | 2223                    | 3335                          |

# With Dev 2027, 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        | Borras Hall Lane/Wrexham Road/Industrial Estate Road/Sandy Lane/A534 | Standard Roundabout |                       | 1, 2, 3, 4, 5 | 7.88               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D8 | With Dev 2027 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Borras Hall Lane       |            | FLAT         | ✓            | 23                      | 100.000            |
| 2 - Wrexham Road           |            | FLAT         | ✓            | 500                     | 100.000            |
| 3 - Industrial Estate Road |            | FLAT         | ✓            | 1958                    | 100.000            |
| 4 - Sandy Lane             |            | FLAT         | ✓            | 30                      | 100.000            |
| 5 - A534                   |            | FLAT         | ✓            | 1006                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borras Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borras Hall Lane       | 0                    | 3                | 13                         | 0              | 7        |
|      | 2 - Wrexham Road           | 4                    | 0                | 113                        | 1              | 382      |
|      | 3 - Industrial Estate Road | 76                   | 247              | 0                          | 9              | 1626     |
|      | 4 - Sandy Lane             | 1                    | 3                | 4                          | 0              | 22       |
|      | 5 - A534                   | 5                    | 304              | 696                        | 1              | 0        |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |                       |                  |                            |                |          |
|------|----------------------------|-----------------------|------------------|----------------------------|----------------|----------|
| From |                            | 1 - Borrass Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
|      | 1 - Borrass Hall Lane      | 0                     | 0                | 0                          | 0              | 0        |
|      | 2 - Wrexham Road           | 0                     | 0                | 8                          | 0              | 3        |
|      | 3 - Industrial Estate Road | 0                     | 3                | 0                          | 75             | 5        |
|      | 4 - Sandy Lane             | 0                     | 0                | 0                          | 0              | 5        |
|      | 5 - A534                   | 0                     | 2                | 14                         | 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 - Borrass Hall Lane      | 0.03    | 4.15          | 0.0             | A       | 23                      | 35                            |
| 2 - Wrexham Road           | 0.40    | 5.11          | 0.7             | A       | 500                     | 750                           |
| 3 - Industrial Estate Road | 0.85    | 11.23         | 6.0             | B       | 1958                    | 2937                          |
| 4 - Sandy Lane             | 0.08    | 10.62         | 0.1             | B       | 30                      | 45                            |
| 5 - A534                   | 0.41    | 2.74          | 0.8             | A       | 1006                    | 1509                          |

# With Dev 2036, 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        | Borras Hall Lane/Wrexham Road/Industrial Estate Road/Sandy Lane/A534 | Standard Roundabout |                       | 1, 2, 3, 4, 5 | 19.89              | C            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D9 | With Dev 2036 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Borras Hall Lane       |            | FLAT         | ✓            | 77                      | 100.000            |
| 2 - Wrexham Road           |            | FLAT         | ✓            | 584                     | 100.000            |
| 3 - Industrial Estate Road |            | FLAT         | ✓            | 774                     | 100.000            |
| 4 - Sandy Lane             |            | FLAT         | ✓            | 34                      | 100.000            |
| 5 - A534                   |            | FLAT         | ✓            | 2265                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borras Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borras Hall Lane       | 0                    | 5                | 66                         | 0              | 6        |
|      | 2 - Wrexham Road           | 3                    | 0                | 258                        | 3              | 320      |
|      | 3 - Industrial Estate Road | 20                   | 139              | 0                          | 0              | 615      |
|      | 4 - Sandy Lane             | 4                    | 16               | 3                          | 0              | 11       |
|      | 5 - A534                   | 3                    | 391              | 1846                       | 25             | 0        |

## Vehicle Mix



### Heavy Vehicle Percentages

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borrás Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borrás Hall Lane       | 0                    | 0                | 3                          | 0              | 0        |
|      | 2 - Wrexham Road           | 0                    | 0                | 8                          | 100            | 8        |
|      | 3 - Industrial Estate Road | 0                    | 17               | 0                          | 0              | 31       |
|      | 4 - Sandy Lane             | 50                   | 63               | 100                        | 0              | 80       |
|      | 5 - A534                   | 0                    | 7                | 7                          | 62             | 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 - Borrás Hall Lane       | 0.22    | 13.81         | 0.3             | B       | 77                      | 116                           |
| 2 - Wrexham Road           | 0.92    | 69.18         | 10.7            | F       | 584                     | 876                           |
| 3 - Industrial Estate Road | 0.33    | 2.97          | 0.6             | A       | 774                     | 1161                          |
| 4 - Sandy Lane             | 0.04    | 6.56          | 0.1             | A       | 34                      | 51                            |
| 5 - A534                   | 0.89    | 13.37         | 8.3             | B       | 2265                    | 3398                          |

# With Dev 2036, 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        | Borras Hall Lane/Wrexham Road/Industrial Estate Road/Sandy Lane/A534 | Standard Roundabout |                       | 1, 2, 3, 4, 5 | 8.65               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID  | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|-----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D10 | With Dev 2036 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Borras Hall Lane       |            | FLAT         | ✓            | 23                      | 100.000            |
| 2 - Wrexham Road           |            | FLAT         | ✓            | 508                     | 100.000            |
| 3 - Industrial Estate Road |            | FLAT         | ✓            | 1990                    | 100.000            |
| 4 - Sandy Lane             |            | FLAT         | ✓            | 31                      | 100.000            |
| 5 - A534                   |            | FLAT         | ✓            | 1021                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
|      |                            | 1 - Borras Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
| From | 1 - Borras Hall Lane       | 0                    | 3                | 13                         | 0              | 7        |
|      | 2 - Wrexham Road           | 4                    | 0                | 115                        | 1              | 388      |
|      | 3 - Industrial Estate Road | 78                   | 251              | 0                          | 9              | 1652     |
|      | 4 - Sandy Lane             | 1                    | 3                | 4                          | 0              | 23       |
|      | 5 - A534                   | 5                    | 310              | 705                        | 1              | 0        |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |                      |                  |                            |                |          |
|------|----------------------------|----------------------|------------------|----------------------------|----------------|----------|
| From |                            | 1 - Borrás Hall Lane | 2 - Wrexham Road | 3 - Industrial Estate Road | 4 - Sandy Lane | 5 - A534 |
|      | 1 - Borrás Hall Lane       | 0                    | 0                | 0                          | 0              | 0        |
|      | 2 - Wrexham Road           | 0                    | 0                | 8                          | 0              | 3        |
|      | 3 - Industrial Estate Road | 0                    | 3                | 0                          | 75             | 5        |
|      | 4 - Sandy Lane             | 0                    | 0                | 0                          | 0              | 5        |
|      | 5 - A534                   | 0                    | 2                | 14                         | 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 - Borrás Hall Lane       | 0.03    | 4.19          | 0.0             | A       | 23                      | 35                            |
| 2 - Wrexham Road           | 0.41    | 5.19          | 0.7             | A       | 508                     | 762                           |
| 3 - Industrial Estate Road | 0.87    | 12.56         | 6.8             | B       | 1990                    | 2985                          |
| 4 - Sandy Lane             | 0.09    | 11.21         | 0.1             | B       | 31                      | 47                            |
| 5 - A534                   | 0.42    | 2.77          | 0.8             | A       | 1021                    | 1532                          |

| Junctions 9                                                                                                                                                      |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| ARCADY 9 - Roundabout Module                                                                                                                                     |  |
| Version: 9.5.1.7462<br>© Copyright TRL Limited, 2019                                                                                                             |  |
| For sales and distribution information, program advice and maintenance, contact TRL:<br>+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk              |  |
| The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution |  |

Filename: Services-A534-Stryt-A5156.j9

Path: N:\Projects 2021\P21066 - Kingmoor, Wrexham Industrial Estate\6.Technical\Models

Report generation date: 21/03/2023 16:50:58

- »Observed 2022, AM
- »Observed 2022, PM
- »Without Dev 2027, AM
- »Without Dev 2027, PM
- »Without Dev 2036, AM
- »Without Dev 2036, PM
- »With Dev 2027, AM
- »With Dev 2027, PM
- »With Dev 2036, AM
- »With Dev 2036, PM

## File summary

### File Description

|             |                                |
|-------------|--------------------------------|
| Title       | Services/A534/Stryt Holt/A5156 |
| Location    | Wrexham                        |
| Site number |                                |
| Date        | 21/03/2023                     |
| Version     |                                |
| Status      | Final                          |
| Identifier  |                                |
| Client      | FIREM                          |
| Jobnumber   | P21066                         |
| Enumerator  | GHC\b.gaze                     |
| Description | Checked by D. Stoddart         |

## Units

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

## Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------|-----------------------------|-----------------------|
| 5.75               |                             |                                   |                             | 0.85          | 36.00                       | 20.00                 |

## Demand Set Summary

| ID  | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|-----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D1  | Observed 2022    | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D2  | Observed 2022    | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D3  | Without Dev 2027 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D4  | Without Dev 2027 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D5  | Without Dev 2036 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D6  | Without Dev 2036 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D7  | With Dev 2027    | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D8  | With Dev 2027    | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D9  | With Dev 2036    | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D10 | With Dev 2036    | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |

## Analysis Set Details

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

# Observed 2022, 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        | Services/A534/Stryt Holt/A5156 | Standard Roundabout |                       | 1, 2, 3, 4 | 4.99               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Arms

### Arms

| Arm | Name            | Description |
|-----|-----------------|-------------|
| 1   | Services Access |             |
| 2   | A534            |             |
| 3   | Stryt Holt      |             |
| 4   | A5156           |             |

### Roundabout Geometry

| Arm                 | V - Approach road half-width (m) | E - Entry width (m) | I' - Effective flare length (m) | R - Entry radius (m) | D - Inscribed circle diameter (m) | PHI - Conflict (entry) angle (deg) | Exit only |
|---------------------|----------------------------------|---------------------|---------------------------------|----------------------|-----------------------------------|------------------------------------|-----------|
| 1 - Services Access | 3.40                             | 5.60                | 6.9                             | 20.0                 | 89.3                              | 25.3                               |           |
| 2 - A534            | 7.10                             | 9.30                | 17.2                            | 41.6                 | 89.3                              | 25.2                               |           |
| 3 - Stryt Holt      | 3.60                             | 7.10                | 16.7                            | 24.2                 | 89.3                              | 27.7                               |           |
| 4 - A5156           | 8.00                             | 10.00               | 9.1                             | 32.0                 | 89.3                              | 26.6                               |           |

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

| Arm                 | Final slope | Final intercept (PCU/hr) |
|---------------------|-------------|--------------------------|
| 1 - Services Access | 0.415       | 1382                     |
| 2 - A534            | 0.613       | 2735                     |
| 3 - Stryt Holt      | 0.468       | 1754                     |
| 4 - A5156           | 0.629       | 2864                     |

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 period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D1 | Observed 2022 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Services Access |            | FLAT         | ✓            | 163                     | 100.000            |
| 2 - A534            |            | FLAT         | ✓            | 749                     | 100.000            |
| 3 - Stryt Holt      |            | FLAT         | ✓            | 645                     | 100.000            |
| 4 - A5156           |            | FLAT         | ✓            | 1910                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 96       | 15             | 52        |
|      | 2 - A534            | 64                  | 0        | 162            | 523       |
|      | 3 - Stryt Holt      | 17                  | 310      | 0              | 318       |
|      | 4 - A5156           | 77                  | 1536     | 297            | 0         |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 12       | 0              | 41        |
|      | 2 - A534            | 40                  | 0        | 6              | 25        |
|      | 3 - Stryt Holt      | 0                   | 4        | 0              | 4         |
|      | 4 - A5156           | 0                   | 6        | 10             | 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 - Services Access | 0.33    | 12.96         | 0.6             | B       | 163                     | 245                           |
| 2 - A534            | 0.30    | 2.48          | 0.5             | A       | 749                     | 1124                          |
| 3 - Stryt Holt      | 0.44    | 4.63          | 0.8             | A       | 645                     | 968                           |
| 4 - A5156           | 0.73    | 5.42          | 2.9             | A       | 1910                    | 2865                          |

# Observed 2022, 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        | Services/A534/Stryt Holt/A5156 | Standard Roundabout |                       | 1, 2, 3, 4 | 4.37               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D2 | Observed 2022 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Services Access |            | FLAT         | ✓            | 157                     | 100.000            |
| 2 - A534            |            | FLAT         | ✓            | 1733                    | 100.000            |
| 3 - Stryt Holt      |            | FLAT         | ✓            | 486                     | 100.000            |
| 4 - A5156           |            | FLAT         | ✓            | 911                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
| From |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
|      | 1 - Services Access | 0                   | 63       | 20             | 74        |
|      | 2 - A534            | 52                  | 0        | 400            | 1281      |
|      | 3 - Stryt Holt      | 16                  | 215      | 0              | 255       |
|      | 4 - A5156           | 57                  | 529      | 325            | 0         |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
| From |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
|      | 1 - Services Access | 0                   | 7        | 12             | 3         |
|      | 2 - A534            | 4                   | 0        | 1              | 4         |
|      | 3 - Stryt Holt      | 0                   | 2        | 0              | 5         |
|      | 4 - A5156           | 0                   | 10       | 3              | 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 - Services Access | 0.17    | 4.86          | 0.2             | A       | 157                     | 236                           |
| 2 - A534            | 0.70    | 4.99          | 2.4             | A       | 1733                    | 2600                          |
| 3 - Stryt Holt      | 0.44    | 6.11          | 0.8             | A       | 486                     | 729                           |
| 4 - A5156           | 0.34    | 2.16          | 0.5             | A       | 911                     | 1367                          |

# Without Dev 2027, 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        | Services/A534/Stryt Holt/A5156 | Standard Roundabout |                       | 1, 2, 3, 4 | 6.40               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D3 | Without Dev 2027 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Services Access |            | FLAT         | ✓            | 165                     | 100.000            |
| 2 - A534            |            | FLAT         | ✓            | 864                     | 100.000            |
| 3 - Stryt Holt      |            | FLAT         | ✓            | 668                     | 100.000            |
| 4 - A5156           |            | FLAT         | ✓            | 2091                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
| From |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
|      | 1 - Services Access | 0                   | 98       | 15             | 52        |
|      | 2 - A534            | 65                  | 0        | 172            | 627       |
|      | 3 - Stryt Holt      | 17                  | 327      | 0              | 324       |
|      | 4 - A5156           | 79                  | 1710     | 302            | 0         |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
| From |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
|      | 1 - Services Access | 0                   | 12       | 0              | 41        |
|      | 2 - A534            | 39                  | 0        | 6              | 26        |
|      | 3 - Stryt Holt      | 0                   | 4        | 0              | 4         |
|      | 4 - A5156           | 0                   | 7        | 10             | 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 - Services Access | 0.40    | 17.32         | 0.8             | C       | 165                     | 248                           |
| 2 - A534            | 0.34    | 2.67          | 0.6             | A       | 864                     | 1296                          |
| 3 - Stryt Holt      | 0.48    | 5.07          | 0.9             | A       | 668                     | 1002                          |
| 4 - A5156           | 0.80    | 7.50          | 4.3             | A       | 2091                    | 3137                          |

# Without Dev 2027, 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        | Services/A534/Stryt Holt/A5156 | Standard Roundabout |                       | 1, 2, 3, 4 | 5.60               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D4 | Without Dev 2027 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Services Access |            | FLAT         | ✓            | 160                     | 100.000            |
| 2 - A534            |            | FLAT         | ✓            | 1931                    | 100.000            |
| 3 - Stryt Holt      |            | FLAT         | ✓            | 502                     | 100.000            |
| 4 - A5156           |            | FLAT         | ✓            | 1021                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 64       | 20             | 76        |
|      | 2 - A534            | 53                  | 0        | 423            | 1455      |
|      | 3 - Stryt Holt      | 16                  | 226      | 0              | 260       |
|      | 4 - A5156           | 58                  | 631      | 332            | 0         |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 7        | 12             | 3         |
|      | 2 - A534            | 4                   | 0        | 1              | 5         |
|      | 3 - Stryt Holt      | 0                   | 2        | 0              | 5         |
|      | 4 - A5156           | 0                   | 12       | 3              | 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 - Services Access | 0.18    | 5.21          | 0.2             | A       | 160                     | 240                           |
| 2 - A534            | 0.78    | 6.91          | 3.7             | A       | 1931                    | 2897                          |
| 3 - Stryt Holt      | 0.50    | 7.29          | 1.0             | A       | 502                     | 753                           |
| 4 - A5156           | 0.38    | 2.34          | 0.7             | A       | 1021                    | 1532                          |

# Without Dev 2036, 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        | Services/A534/Stryt Holt/A5156 | Standard Roundabout |                       | 1, 2, 3, 4 | 6.99               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D5 | Without Dev 2036 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Services Access |            | FLAT         | ✓            | 170                     | 100.000            |
| 2 - A534            |            | FLAT         | ✓            | 884                     | 100.000            |
| 3 - Stryt Holt      |            | FLAT         | ✓            | 683                     | 100.000            |
| 4 - A5156           |            | FLAT         | ✓            | 2135                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 99       | 16             | 55        |
|      | 2 - A534            | 68                  | 0        | 175            | 641       |
|      | 3 - Stryt Holt      | 18                  | 335      | 0              | 330       |
|      | 4 - A5156           | 80                  | 1745     | 310            | 0         |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 12       | 0              | 41        |
|      | 2 - A534            | 40                  | 0        | 6              | 26        |
|      | 3 - Stryt Holt      | 0                   | 4        | 0              | 4         |
|      | 4 - A5156           | 0                   | 7        | 10             | 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 - Services Access | 0.44    | 19.41         | 0.9             | C       | 170                     | 255                           |
| 2 - A534            | 0.35    | 2.72          | 0.7             | A       | 884                     | 1326                          |
| 3 - Stryt Holt      | 0.49    | 5.25          | 1.0             | A       | 683                     | 1025                          |
| 4 - A5156           | 0.82    | 8.33          | 4.9             | A       | 2135                    | 3203                          |

# Without Dev 2036, 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        | Services/A534/Stryt Holt/A5156 | Standard Roundabout |                       | 1, 2, 3, 4 | 5.92               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D6 | Without Dev 2036 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Services Access |            | FLAT         | ✓            | 163                     | 100.000            |
| 2 - A534            |            | FLAT         | ✓            | 1963                    | 100.000            |
| 3 - Stryt Holt      |            | FLAT         | ✓            | 510                     | 100.000            |
| 4 - A5156           |            | FLAT         | ✓            | 1038                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 65       | 21             | 77        |
|      | 2 - A534            | 54                  | 0        | 430            | 1479      |
|      | 3 - Stryt Holt      | 17                  | 229      | 0              | 264       |
|      | 4 - A5156           | 59                  | 642      | 337            | 0         |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 7        | 11             | 3         |
|      | 2 - A534            | 4                   | 0        | 1              | 5         |
|      | 3 - Stryt Holt      | 0                   | 2        | 0              | 4         |
|      | 4 - A5156           | 0                   | 12       | 3              | 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 - Services Access | 0.19    | 5.28          | 0.2             | A       | 163                     | 245                           |
| 2 - A534            | 0.80    | 7.41          | 4.0             | A       | 1963                    | 2945                          |
| 3 - Stryt Holt      | 0.51    | 7.58          | 1.1             | A       | 510                     | 765                           |
| 4 - A5156           | 0.39    | 2.37          | 0.7             | A       | 1038                    | 1557                          |

# With Dev 2027, 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        | Services/A534/Stryt Holt/A5156 | Standard Roundabout |                       | 1, 2, 3, 4 | 7.39               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D7 | With Dev 2027 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Services Access |            | FLAT         | ✓            | 165                     | 100.000            |
| 2 - A534            |            | FLAT         | ✓            | 933                     | 100.000            |
| 3 - Stryt Holt      |            | FLAT         | ✓            | 676                     | 100.000            |
| 4 - A5156           |            | FLAT         | ✓            | 2171                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 98       | 15             | 52        |
|      | 2 - A534            | 65                  | 0        | 178            | 690       |
|      | 3 - Stryt Holt      | 17                  | 335      | 0              | 324       |
|      | 4 - A5156           | 79                  | 1790     | 302            | 0         |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 12       | 0              | 41        |
|      | 2 - A534            | 39                  | 0        | 5              | 26        |
|      | 3 - Stryt Holt      | 0                   | 4        | 0              | 4         |
|      | 4 - A5156           | 0                   | 8        | 10             | 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 - Services Access | 0.44    | 20.34         | 0.9             | C       | 165                     | 248                           |
| 2 - A534            | 0.37    | 2.79          | 0.7             | A       | 933                     | 1400                          |
| 3 - Stryt Holt      | 0.49    | 5.34          | 1.0             | A       | 676                     | 1014                          |
| 4 - A5156           | 0.83    | 9.02          | 5.4             | A       | 2171                    | 3257                          |

# With Dev 2027, 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        | Services/A534/Stryt Holt/A5156 | Standard Roundabout |                       | 1, 2, 3, 4 | 6.66               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D8 | With Dev 2027 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Services Access |            | FLAT         | ✓            | 160                     | 100.000            |
| 2 - A534            |            | FLAT         | ✓            | 2037                    | 100.000            |
| 3 - Stryt Holt      |            | FLAT         | ✓            | 508                     | 100.000            |
| 4 - A5156           |            | FLAT         | ✓            | 1100                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 64       | 20             | 76        |
|      | 2 - A534            | 53                  | 0        | 433            | 1551      |
|      | 3 - Stryt Holt      | 16                  | 232      | 0              | 260       |
|      | 4 - A5156           | 58                  | 710      | 332            | 0         |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 7        | 12             | 3         |
|      | 2 - A534            | 4                   | 0        | 1              | 6         |
|      | 3 - Stryt Holt      | 0                   | 2        | 0              | 5         |
|      | 4 - A5156           | 0                   | 13       | 3              | 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 - Services Access | 0.19    | 5.47          | 0.2             | A       | 160                     | 240                           |
| 2 - A534            | 0.82    | 8.64          | 4.9             | A       | 2037                    | 3056                          |
| 3 - Stryt Holt      | 0.53    | 8.09          | 1.1             | A       | 508                     | 762                           |
| 4 - A5156           | 0.41    | 2.50          | 0.8             | A       | 1100                    | 1650                          |

# With Dev 2036, 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        | Services/A534/Stryt Holt/A5156 | Standard Roundabout |                       | 1, 2, 3, 4 | 8.24               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D9 | With Dev 2036 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Services Access |            | FLAT         | ✓            | 170                     | 100.000            |
| 2 - A534            |            | FLAT         | ✓            | 952                     | 100.000            |
| 3 - Stryt Holt      |            | FLAT         | ✓            | 691                     | 100.000            |
| 4 - A5156           |            | FLAT         | ✓            | 2215                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 99       | 16             | 55        |
|      | 2 - A534            | 68                  | 0        | 181            | 703       |
|      | 3 - Stryt Holt      | 18                  | 343      | 0              | 330       |
|      | 4 - A5156           | 80                  | 1825     | 310            | 0         |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 12       | 0              | 41        |
|      | 2 - A534            | 40                  | 0        | 5              | 26        |
|      | 3 - Stryt Holt      | 0                   | 4        | 0              | 4         |
|      | 4 - A5156           | 0                   | 8        | 10             | 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 - Services Access | 0.48    | 23.27         | 1.1             | C       | 170                     | 255                           |
| 2 - A534            | 0.38    | 2.84          | 0.8             | A       | 952                     | 1428                          |
| 3 - Stryt Holt      | 0.51    | 5.53          | 1.1             | A       | 691                     | 1037                          |
| 4 - A5156           | 0.85    | 10.24         | 6.2             | B       | 2215                    | 3323                          |

# With Dev 2036, 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        | Services/A534/Stryt Holt/A5156 | Standard Roundabout |                       | 1, 2, 3, 4 | 7.15               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID  | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|-----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D10 | With Dev 2036 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Services Access |            | FLAT         | ✓            | 163                     | 100.000            |
| 2 - A534            |            | FLAT         | ✓            | 2070                    | 100.000            |
| 3 - Stryt Holt      |            | FLAT         | ✓            | 516                     | 100.000            |
| 4 - A5156           |            | FLAT         | ✓            | 1116                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 65       | 21             | 77        |
|      | 2 - A534            | 54                  | 0        | 440            | 1576      |
|      | 3 - Stryt Holt      | 17                  | 235      | 0              | 264       |
|      | 4 - A5156           | 59                  | 720      | 337            | 0         |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                  |                     |          |                |           |
|------|---------------------|---------------------|----------|----------------|-----------|
|      |                     | 1 - Services Access | 2 - A534 | 3 - Stryt Holt | 4 - A5156 |
| From | 1 - Services Access | 0                   | 7        | 11             | 3         |
|      | 2 - A534            | 4                   | 0        | 1              | 6         |
|      | 3 - Stryt Holt      | 0                   | 2        | 0              | 4         |
|      | 4 - A5156           | 0                   | 13       | 3              | 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 - Services Access | 0.19    | 5.55          | 0.3             | A       | 163                     | 245                           |
| 2 - A534            | 0.84    | 9.45          | 5.4             | A       | 2070                    | 3105                          |
| 3 - Stryt Holt      | 0.54    | 8.47          | 1.2             | A       | 516                     | 774                           |
| 4 - A5156           | 0.42    | 2.53          | 0.8             | A       | 1116                    | 1674                          |

| Junctions 9                                                                                                                                                      |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| ARCADY 9 - Roundabout Module                                                                                                                                     |  |
| Version: 9.5.1.7462<br>© Copyright TRL Limited, 2019                                                                                                             |  |
| For sales and distribution information, program advice and maintenance, contact TRL:<br>+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk              |  |
| The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution |  |

Filename: A5156-Borras-Borras Park.j9

Path: N:\Projects 2021\P21066 - Kingmoor, Wrexham Industrial Estate\6.Technical\Models

Report generation date: 21/03/2023 16:34:43

- »Observed 2022, AM
- »Observed 2022, PM
- »Without Dev 2027, AM
- »Without Dev 2027, PM
- »Without Dev 2036, AM
- »Without Dev 2036, PM
- »With Dev 2027, AM
- »With Dev 2027, PM
- »With Dev 2036, AM
- »With Dev 2036, PM

## File summary

### File Description

|             |                                    |
|-------------|------------------------------------|
| Title       | A5156/Borras Road/Borras Park Road |
| Location    | Wrexham                            |
| Site number |                                    |
| Date        | 21/03/2023                         |
| Version     |                                    |
| Status      | Final                              |
| Identifier  |                                    |
| Client      | FIREM                              |
| Jobnumber   | P21066                             |
| Enumerator  | GHC\b.gaze                         |
| Description | Checked by D. Stoddart             |

## Units

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

## Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------|-----------------------------|-----------------------|
| 5.75               |                             |                                   |                             | 0.85          | 36.00                       | 20.00                 |

## Demand Set Summary

| ID  | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|-----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D1  | Observed 2022    | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D2  | Observed 2022    | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D3  | Without Dev 2027 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D4  | Without Dev 2027 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D5  | Without Dev 2036 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D6  | Without Dev 2036 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D7  | With Dev 2027    | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D8  | With Dev 2027    | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |
| D9  | With Dev 2036    | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 15                        | ✓                 |
| D10 | With Dev 2036    | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 15                        | ✓                 |

## Analysis Set Details

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

# Observed 2022, 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        | A5156/Borras Road/Borras Park Road | Standard Roundabout |                       | 1, 2, 3, 4 | 10.13              | B            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Arms

### Arms

| Arm | Name                | Description |
|-----|---------------------|-------------|
| 1   | Borras Road         |             |
| 2   | A5156 (Eastern Arm) |             |
| 3   | Borras Park Road    |             |
| 4   | A5156 (Western Arm) |             |

### Roundabout Geometry

| Arm                     | V - Approach road half-width (m) | E - Entry width (m) | I' - Effective flare length (m) | R - Entry radius (m) | D - Inscribed circle diameter (m) | PHI - Conflict (entry) angle (deg) | Exit only |
|-------------------------|----------------------------------|---------------------|---------------------------------|----------------------|-----------------------------------|------------------------------------|-----------|
| 1 - Borras Road         | 3.50                             | 5.30                | 6.4                             | 23.5                 | 49.6                              | 41.2                               |           |
| 2 - A5156 (Eastern Arm) | 7.80                             | 8.40                | 1.5                             | 47.6                 | 49.6                              | 41.3                               |           |
| 3 - Borras Park Road    | 2.70                             | 5.90                | 6.1                             | 27.3                 | 49.6                              | 40.9                               |           |
| 4 - A5156 (Western Arm) | 7.80                             | 8.30                | 3.8                             | 25.3                 | 49.6                              | 40.8                               |           |

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

| Arm                     | Final slope | Final intercept (PCU/hr) |
|-------------------------|-------------|--------------------------|
| 1 - Borras Road         | 0.526       | 1305                     |
| 2 - A5156 (Eastern Arm) | 0.743       | 2417                     |
| 3 - Borras Park Road    | 0.499       | 1151                     |
| 4 - A5156 (Western Arm) | 0.736       | 2403                     |

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 period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D1 | Observed 2022 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Borrás Road         |            | FLAT         | ✓            | 35                      | 100.000            |
| 2 - A5156 (Eastern Arm) |            | FLAT         | ✓            | 892                     | 100.000            |
| 3 - Borrás Park Road    |            | FLAT         | ✓            | 305                     | 100.000            |
| 4 - A5156 (Western Arm) |            | FLAT         | ✓            | 2028                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borrás Road | 2 - A5156 (Eastern Arm) | 3 - Borrás Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borrás Road         | 0               | 9                       | 22                   | 4                       |
|      | 2 - A5156 (Eastern Arm) | 8               | 0                       | 22                   | 862                     |
|      | 3 - Borrás Park Road    | 12              | 94                      | 0                    | 199                     |
|      | 4 - A5156 (Western Arm) | 22              | 1830                    | 176                  | 0                       |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borrás Road | 2 - A5156 (Eastern Arm) | 3 - Borrás Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borrás Road         | 0               | 33                      | 5                    | 0                       |
|      | 2 - A5156 (Eastern Arm) | 0               | 0                       | 0                    | 18                      |
|      | 3 - Borrás Park Road    | 0               | 1                       | 0                    | 1                       |
|      | 4 - A5156 (Western Arm) | 11              | 7                       | 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 - Borrás Road         | 0.17    | 24.08         | 0.2             | C       | 35                      | 53                            |
| 2 - A5156 (Eastern Arm) | 0.39    | 3.06          | 0.8             | A       | 892                     | 1338                          |
| 3 - Borrás Park Road    | 0.43    | 8.87          | 0.7             | A       | 305                     | 458                           |
| 4 - A5156 (Western Arm) | 0.87    | 13.18         | 7.3             | B       | 2028                    | 3042                          |

# Observed 2022, 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        | A5156/Borras Road/Borras Park Road | Standard Roundabout |                       | 1, 2, 3, 4 | 5.56               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D2 | Observed 2022 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Borras Road         |            | FLAT         | ✓            | 35                      | 100.000            |
| 2 - A5156 (Eastern Arm) |            | FLAT         | ✓            | 1610                    | 100.000            |
| 3 - Borras Park Road    |            | FLAT         | ✓            | 176                     | 100.000            |
| 4 - A5156 (Western Arm) |            | FLAT         | ✓            | 1126                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 2                       | 33                   | 0                       |
|      | 2 - A5156 (Eastern Arm) | 9               | 0                       | 86                   | 1515                    |
|      | 3 - Borras Park Road    | 17              | 33                      | 0                    | 126                     |
|      | 4 - A5156 (Western Arm) | 20              | 886                     | 220                  | 0                       |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 0                       | 0                    | 3                       |
|      | 2 - A5156 (Eastern Arm) | 0               | 0                       | 0                    | 4                       |
|      | 3 - Borras Park Road    | 0               | 0                       | 0                    | 1                       |
|      | 4 - A5156 (Western Arm) | 12              | 7                       | 1                    | 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 - Borras Road         | 0.05    | 5.37          | 0.1             | A       | 35                      | 53                            |
| 2 - A5156 (Eastern Arm) | 0.72    | 6.05          | 2.7             | A       | 1610                    | 2415                          |
| 3 - Borras Park Road    | 0.45    | 16.88         | 0.8             | C       | 176                     | 264                           |
| 4 - A5156 (Western Arm) | 0.48    | 3.10          | 1.0             | A       | 1126                    | 1689                          |

# Without Dev 2027, 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        | A5156/Borras Road/Borras Park Road | Standard Roundabout |                       | 1, 2, 3, 4 | 23.46              | C            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D3 | Without Dev 2027 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Borras Road         |            | FLAT         | ✓            | 35                      | 100.000            |
| 2 - A5156 (Eastern Arm) |            | FLAT         | ✓            | 1006                    | 100.000            |
| 3 - Borras Park Road    |            | FLAT         | ✓            | 314                     | 100.000            |
| 4 - A5156 (Western Arm) |            | FLAT         | ✓            | 2210                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 9                       | 22                   | 4                       |
|      | 2 - A5156 (Eastern Arm) | 8               | 0                       | 22                   | 976                     |
|      | 3 - Borras Park Road    | 12              | 99                      | 0                    | 203                     |
|      | 4 - A5156 (Western Arm) | 22              | 2008                    | 180                  | 0                       |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 33                      | 5                    | 0                       |
|      | 2 - A5156 (Eastern Arm) | 0               | 0                       | 0                    | 19                      |
|      | 3 - Borras Park Road    | 0               | 1                       | 0                    | 1                       |
|      | 4 - A5156 (Western Arm) | 11              | 8                       | 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 - Borrás Road         | 0.34    | 58.85         | 0.6             | F       | 35                      | 53                            |
| 2 - A5156 (Eastern Arm) | 0.44    | 3.38          | 0.9             | A       | 1006                    | 1509                          |
| 3 - Borrás Park Road    | 0.48    | 10.57         | 0.9             | B       | 314                     | 471                           |
| 4 - A5156 (Western Arm) | 0.95    | 33.87         | 20.0            | D       | 2210                    | 3315                          |

# Without Dev 2027, 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        | A5156/Borras Road/Borras Park Road | Standard Roundabout |                       | 1, 2, 3, 4 | 7.80               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D4 | Without Dev 2027 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Borras Road         |            | FLAT         | ✓            | 36                      | 100.000            |
| 2 - A5156 (Eastern Arm) |            | FLAT         | ✓            | 1790                    | 100.000            |
| 3 - Borras Park Road    |            | FLAT         | ✓            | 180                     | 100.000            |
| 4 - A5156 (Western Arm) |            | FLAT         | ✓            | 1241                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 2                       | 34                   | 0                       |
|      | 2 - A5156 (Eastern Arm) | 9               | 0                       | 91                   | 1690                    |
|      | 3 - Borras Park Road    | 17              | 34                      | 0                    | 129                     |
|      | 4 - A5156 (Western Arm) | 20              | 996                     | 225                  | 0                       |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 0                       | 0                    | 3                       |
|      | 2 - A5156 (Eastern Arm) | 0               | 0                       | 0                    | 5                       |
|      | 3 - Borras Park Road    | 0               | 0                       | 0                    | 1                       |
|      | 4 - A5156 (Western Arm) | 12              | 9                       | 1                    | 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 - Borras Road         | 0.06    | 5.91          | 0.1             | A       | 36                      | 54                            |
| 2 - A5156 (Eastern Arm) | 0.80    | 8.68          | 4.3             | A       | 1790                    | 2685                          |
| 3 - Borras Park Road    | 0.59    | 29.34         | 1.4             | D       | 180                     | 270                           |
| 4 - A5156 (Western Arm) | 0.53    | 3.45          | 1.2             | A       | 1241                    | 1862                          |

# Without Dev 2036, 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        | A5156/Borras Road/Borras Park Road | Standard Roundabout |                       | 1, 2, 3, 4 | 34.13              | D            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D5 | Without Dev 2036 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Borras Road         |            | FLAT         | ✓            | 36                      | 100.000            |
| 2 - A5156 (Eastern Arm) |            | FLAT         | ✓            | 1026                    | 100.000            |
| 3 - Borras Park Road    |            | FLAT         | ✓            | 321                     | 100.000            |
| 4 - A5156 (Western Arm) |            | FLAT         | ✓            | 2254                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 9                       | 23                   | 4                       |
|      | 2 - A5156 (Eastern Arm) | 8               | 0                       | 23                   | 995                     |
|      | 3 - Borras Park Road    | 13              | 101                     | 0                    | 207                     |
|      | 4 - A5156 (Western Arm) | 23              | 2048                    | 183                  | 0                       |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 33                      | 5                    | 0                       |
|      | 2 - A5156 (Eastern Arm) | 0               | 0                       | 0                    | 19                      |
|      | 3 - Borras Park Road    | 0               | 1                       | 0                    | 1                       |
|      | 4 - A5156 (Western Arm) | 10              | 8                       | 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 - Borras Road         | 0.45    | 88.57         | 0.8             | F       | 36                      | 54                            |
| 2 - A5156 (Eastern Arm) | 0.45    | 3.44          | 1.0             | A       | 1026                    | 1539                          |
| 3 - Borras Park Road    | 0.50    | 11.10         | 1.0             | B       | 321                     | 482                           |
| 4 - A5156 (Western Arm) | 0.97    | 50.52         | 30.3            | F       | 2254                    | 3381                          |

# Without Dev 2036, 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        | A5156/Borras Road/Borras Park Road | Standard Roundabout |                       | 1, 2, 3, 4 | 8.52               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D6 | Without Dev 2036 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Borras Road         |            | FLAT         | ✓            | 36                      | 100.000            |
| 2 - A5156 (Eastern Arm) |            | FLAT         | ✓            | 1822                    | 100.000            |
| 3 - Borras Park Road    |            | FLAT         | ✓            | 183                     | 100.000            |
| 4 - A5156 (Western Arm) |            | FLAT         | ✓            | 1262                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 2                       | 34                   | 0                       |
|      | 2 - A5156 (Eastern Arm) | 9               | 0                       | 93                   | 1720                    |
|      | 3 - Borras Park Road    | 18              | 34                      | 0                    | 131                     |
|      | 4 - A5156 (Western Arm) | 21              | 1012                    | 229                  | 0                       |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 0                       | 0                    | 3                       |
|      | 2 - A5156 (Eastern Arm) | 0               | 0                       | 0                    | 5                       |
|      | 3 - Borras Park Road    | 0               | 0                       | 0                    | 1                       |
|      | 4 - A5156 (Western Arm) | 11              | 9                       | 1                    | 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 - Borras Road         | 0.06    | 6.02          | 0.1             | A       | 36                      | 54                            |
| 2 - A5156 (Eastern Arm) | 0.82    | 9.44          | 4.7             | A       | 1822                    | 2733                          |
| 3 - Borras Park Road    | 0.63    | 34.31         | 1.7             | D       | 183                     | 275                           |
| 4 - A5156 (Western Arm) | 0.54    | 3.52          | 1.2             | A       | 1262                    | 1893                          |

# With Dev 2027, 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        | A5156/Borras Road/Borras Park Road | Standard Roundabout |                       | 1, 2, 3, 4 | 47.58              | E            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D7 | With Dev 2027 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Borras Road         |            | FLAT         | ✓            | 35                      | 100.000            |
| 2 - A5156 (Eastern Arm) |            | FLAT         | ✓            | 1069                    | 100.000            |
| 3 - Borras Park Road    |            | FLAT         | ✓            | 315                     | 100.000            |
| 4 - A5156 (Western Arm) |            | FLAT         | ✓            | 2289                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 9                       | 22                   | 4                       |
|      | 2 - A5156 (Eastern Arm) | 8               | 0                       | 23                   | 1038                    |
|      | 3 - Borras Park Road    | 12              | 100                     | 0                    | 203                     |
|      | 4 - A5156 (Western Arm) | 22              | 2087                    | 180                  | 0                       |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 33                      | 5                    | 0                       |
|      | 2 - A5156 (Eastern Arm) | 0               | 0                       | 0                    | 19                      |
|      | 3 - Borras Park Road    | 0               | 1                       | 0                    | 1                       |
|      | 4 - A5156 (Western Arm) | 11              | 9                       | 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 - Borras Road         | 0.54    | 127.42        | 1.2             | F       | 35                      | 53                            |
| 2 - A5156 (Eastern Arm) | 0.47    | 3.57          | 1.1             | A       | 1069                    | 1604                          |
| 3 - Borras Park Road    | 0.50    | 11.65         | 1.0             | B       | 315                     | 473                           |
| 4 - A5156 (Western Arm) | 0.99    | 71.86         | 44.4            | F       | 2289                    | 3434                          |

# With Dev 2027, 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        | A5156/Borras Road/Borras Park Road | Standard Roundabout |                       | 1, 2, 3, 4 | 10.25              | B            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D8 | With Dev 2027 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Borras Road         |            | FLAT         | ✓            | 36                      | 100.000            |
| 2 - A5156 (Eastern Arm) |            | FLAT         | ✓            | 1887                    | 100.000            |
| 3 - Borras Park Road    |            | FLAT         | ✓            | 181                     | 100.000            |
| 4 - A5156 (Western Arm) |            | FLAT         | ✓            | 1319                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 2                       | 34                   | 0                       |
|      | 2 - A5156 (Eastern Arm) | 9               | 0                       | 93                   | 1785                    |
|      | 3 - Borras Park Road    | 17              | 35                      | 0                    | 129                     |
|      | 4 - A5156 (Western Arm) | 20              | 1074                    | 225                  | 0                       |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 0                       | 0                    | 3                       |
|      | 2 - A5156 (Eastern Arm) | 0               | 0                       | 0                    | 6                       |
|      | 3 - Borras Park Road    | 0               | 0                       | 0                    | 1                       |
|      | 4 - A5156 (Western Arm) | 12              | 10                      | 1                    | 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 - Borras Road         | 0.06    | 6.35          | 0.1             | A       | 36                      | 54                            |
| 2 - A5156 (Eastern Arm) | 0.85    | 11.24         | 5.8             | B       | 1887                    | 2831                          |
| 3 - Borras Park Road    | 0.71    | 48.02         | 2.4             | E       | 181                     | 272                           |
| 4 - A5156 (Western Arm) | 0.56    | 3.75          | 1.4             | A       | 1319                    | 1979                          |

# With Dev 2036, 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        | A5156/Borras Road/Borras Park Road | Standard Roundabout |                       | 1, 2, 3, 4 | 78.63              | F            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D9 | With Dev 2036 | AM               | FLAT                 | 07:45              | 09:15               | 90                       | 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 - Borras Road         |            | FLAT         | ✓            | 36                      | 100.000            |
| 2 - A5156 (Eastern Arm) |            | FLAT         | ✓            | 1088                    | 100.000            |
| 3 - Borras Park Road    |            | FLAT         | ✓            | 322                     | 100.000            |
| 4 - A5156 (Western Arm) |            | FLAT         | ✓            | 2333                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 9                       | 23                   | 4                       |
|      | 2 - A5156 (Eastern Arm) | 8               | 0                       | 24                   | 1056                    |
|      | 3 - Borras Park Road    | 13              | 102                     | 0                    | 207                     |
|      | 4 - A5156 (Western Arm) | 23              | 2127                    | 183                  | 0                       |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 33                      | 5                    | 0                       |
|      | 2 - A5156 (Eastern Arm) | 0               | 0                       | 0                    | 19                      |
|      | 3 - Borras Park Road    | 0               | 1                       | 0                    | 1                       |
|      | 4 - A5156 (Western Arm) | 10              | 9                       | 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 - Borrás Road         | 0.68    | 207.52        | 1.9             | F       | 36                      | 54                            |
| 2 - A5156 (Eastern Arm) | 0.48    | 3.63          | 1.1             | A       | 1088                    | 1632                          |
| 3 - Borrás Park Road    | 0.52    | 12.27         | 1.1             | B       | 322                     | 483                           |
| 4 - A5156 (Western Arm) | 1.01    | 120.77        | 78.3            | F       | 2333                    | 3500                          |

# With Dev 2036, 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        | A5156/Borras Road/Borras Park Road | Standard Roundabout |                       | 1, 2, 3, 4 | 11.76              | B            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID  | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time period length (min) | Time segment length (min) | Run automatically |
|-----|---------------|------------------|----------------------|--------------------|---------------------|--------------------------|---------------------------|-------------------|
| D10 | With Dev 2036 | PM               | FLAT                 | 16:30              | 18:00               | 90                       | 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 - Borras Road         |            | FLAT         | ✓            | 36                      | 100.000            |
| 2 - A5156 (Eastern Arm) |            | FLAT         | ✓            | 1919                    | 100.000            |
| 3 - Borras Park Road    |            | FLAT         | ✓            | 184                     | 100.000            |
| 4 - A5156 (Western Arm) |            | FLAT         | ✓            | 1339                    | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 2                       | 34                   | 0                       |
|      | 2 - A5156 (Eastern Arm) | 9               | 0                       | 95                   | 1815                    |
|      | 3 - Borras Park Road    | 18              | 35                      | 0                    | 131                     |
|      | 4 - A5156 (Western Arm) | 21              | 1089                    | 229                  | 0                       |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                      |                 |                         |                      |                         |
|------|-------------------------|-----------------|-------------------------|----------------------|-------------------------|
|      |                         | 1 - Borras Road | 2 - A5156 (Eastern Arm) | 3 - Borras Park Road | 4 - A5156 (Western Arm) |
| From | 1 - Borras Road         | 0               | 0                       | 0                    | 3                       |
|      | 2 - A5156 (Eastern Arm) | 0               | 0                       | 0                    | 6                       |
|      | 3 - Borras Park Road    | 0               | 0                       | 0                    | 1                       |
|      | 4 - A5156 (Western Arm) | 11              | 10                      | 1                    | 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 - Borrás Road         | 0.06    | 6.46          | 0.1             | A       | 36                      | 54                            |
| 2 - A5156 (Eastern Arm) | 0.86    | 12.53         | 6.6             | B       | 1919                    | 2879                          |
| 3 - Borrás Park Road    | 0.76    | 62.55         | 3.1             | F       | 184                     | 276                           |
| 4 - A5156 (Western Arm) | 0.57    | 3.83          | 1.4             | A       | 1339                    | 2009                          |

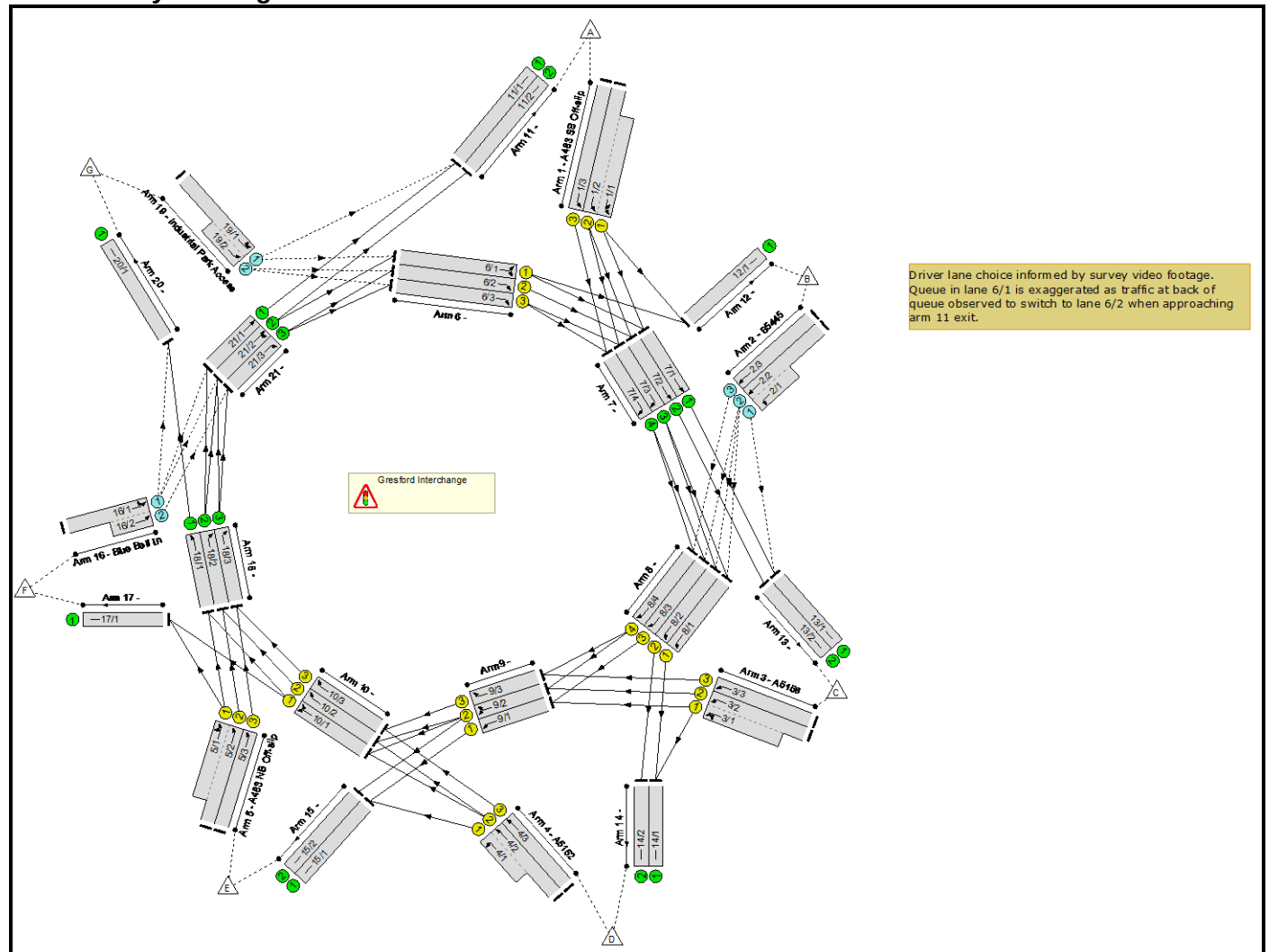
# Full Input Data And Results

## Full Input Data And Results

### User and Project Details

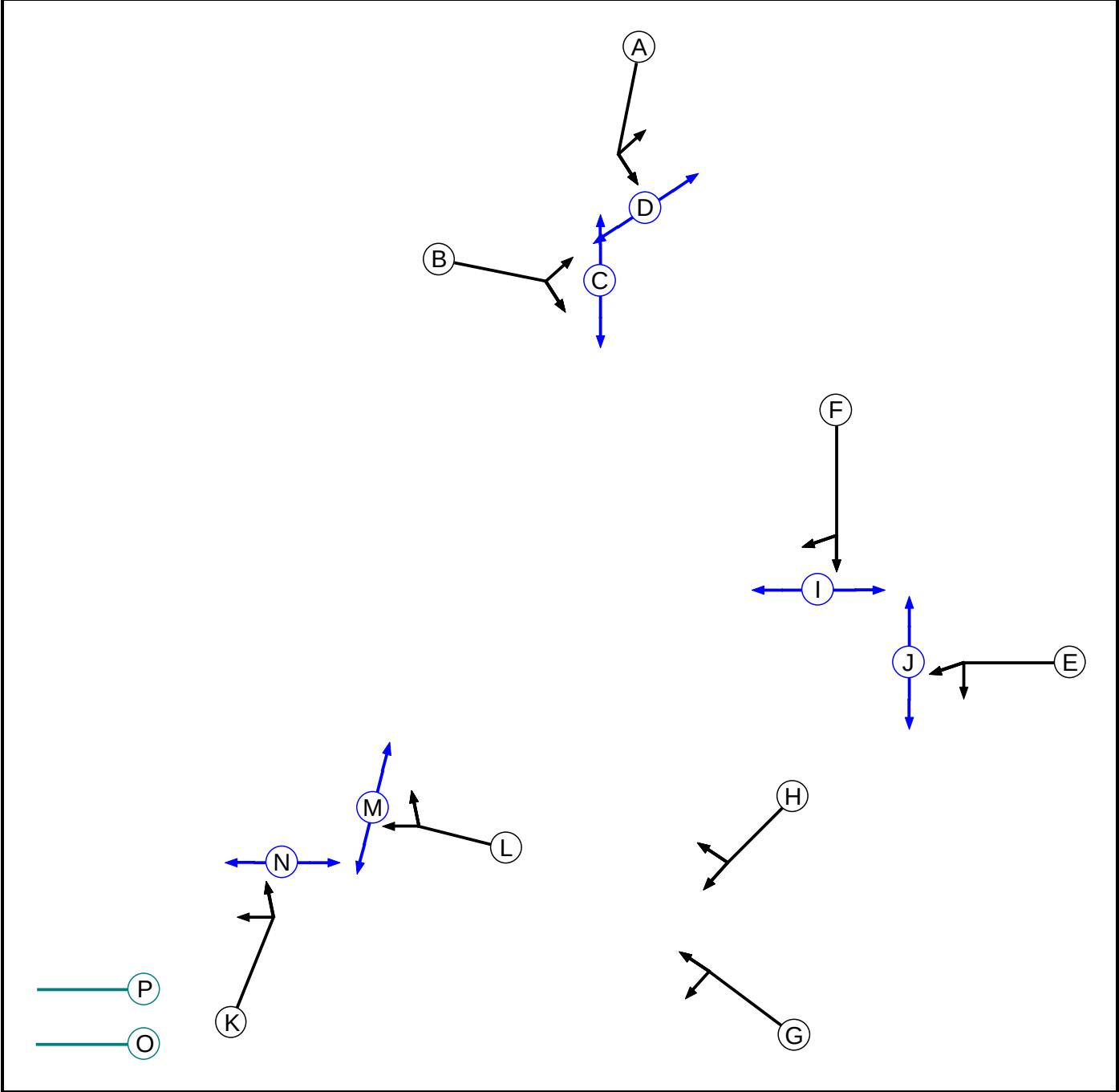
|                    |                                                |
|--------------------|------------------------------------------------|
| Project:           | Kingmoor Park                                  |
| Title:             | Gresford Interchange                           |
| Location:          |                                                |
| Client:            | FIREM                                          |
| Model Purpose:     | Capacity Assessment                            |
| Model Assumptions: | Controller specs and recorded cycle times used |
| Flow Details:      | Observed flows Tue 28th June 2022              |
| Additional detail: |                                                |
| File name:         | Gresford Interchange.lsg3x                     |
| Author:            | David Stoddart                                 |
| Company:           | Prime Transport Planning                       |
| Address:           | Liverpool                                      |

### Network Layout Diagram





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          | Pedestrian | 1            |              | 6          | 6        |
| D          | Pedestrian | 1            |              | 7          | 7        |
| E          | Traffic    | 2            |              | 7          | 7        |
| F          | Traffic    | 2            |              | 7          | 7        |
| G          | Traffic    | 2            |              | 7          | 7        |
| H          | Traffic    | 2            |              | 7          | 0        |
| I          | Pedestrian | 2            |              | 7          | 7        |
| J          | Pedestrian | 2            |              | 6          | 6        |
| K          | Traffic    | 3            |              | 7          | 7        |
| L          | Traffic    | 3            |              | 7          | 7        |
| M          | Pedestrian | 3            |              | 6          | 6        |
| N          | Pedestrian | 3            |              | 6          | 6        |
| O          | Dummy      |              |              | 10         | 10       |
| P          | Dummy      |              |              | 0          | 0        |

Phase Intergreens Matrix

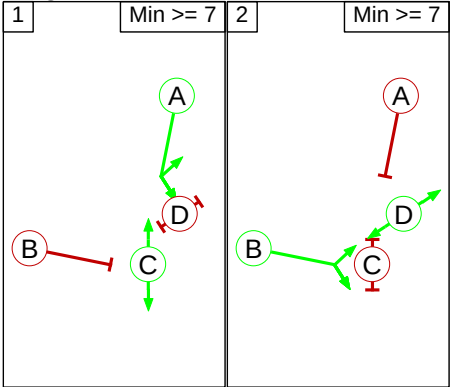
| Terminating Phase | Starting Phase |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                   |                | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |   |
|                   | A              |   | 5 | - | 5 | - | - | - | - | - | - | - | - | - | - | - | - | - |
|                   | B              | 5 |   | 5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
|                   | C              | - | 0 |   | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
|                   | D              | 0 | - | - |   | - | - | - | - | - | - | - | - | - | - | - | - | - |
|                   | E              | - | - | - | - |   | 6 | - | - | - | 5 | - | - | - | - | - | - | - |
|                   | F              | - | - | - | - | 6 |   | - | - | 5 | - | - | - | - | - | - | - | - |
|                   | G              | - | - | - | - | - | - |   | 5 | - | - | - | - | - | - | - | - | - |
|                   | H              | - | - | - | - | - | - | 5 |   | - | - | - | - | - | - | - | - | - |
|                   | I              | - | - | - | - | - | 0 | - | - |   | - | - | - | - | - | - | - | - |
|                   | J              | - | - | - | - | 0 | - | - | - | - |   | - | - | - | - | - | - | - |
|                   | K              | - | - | - | - | - | - | - | - | - | - |   | 5 | - | 5 | - | - | - |
|                   | L              | - | - | - | - | - | - | - | - | - | - | 5 |   | 5 | - | - | - | - |
|                   | M              | - | - | - | - | - | - | - | - | - | - | - | 0 |   | - | - | - | - |
|                   | N              | - | - | - | - | - | - | - | - | - | - | 0 | - | - |   | - | - | - |
|                   | O              | - | - | - | - | - | - | - | - | - | - | - | - | - | - |   | - | - |
|                   | P              | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |   |

Phases in Stage

| Stream | Stage No. | Phases in Stage |
|--------|-----------|-----------------|
| 1      | 1         | A C             |
| 1      | 2         | B D             |
| 2      | 1         | E H I           |
| 2      | 2         | F H J           |
| 2      | 3         | G J             |
| 3      | 1         | K M             |
| 3      | 2         | L N             |

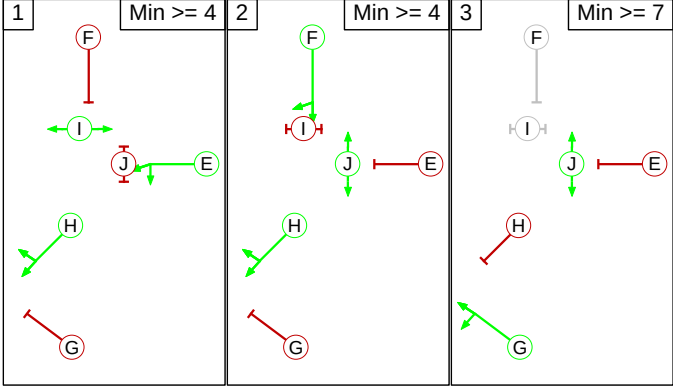
Stage Diagram

Stage Stream: 1

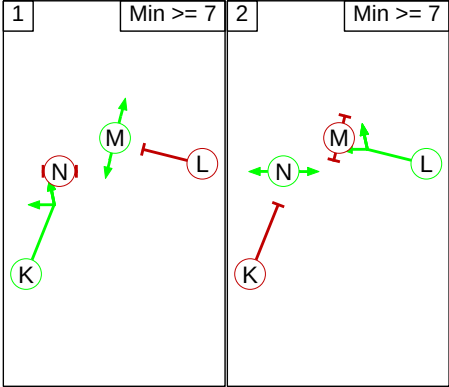


Full Input Data And Results

Stage Stream: 2



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 |
|-------------|-------------|-------|--------|-------|------------|
| 1           | 3           | H     | Losing | 7     | 7          |
| 2           | 3           | H     | Losing | 7     | 7          |

Stage Stream: 3

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

Prohibited Stage Change

Stage Stream: 1

|            |          |   |
|------------|----------|---|
| From Stage | To Stage |   |
|            | 1        | 2 |
|            | 1        | 5 |
|            | 2        | 5 |

Full Input Data And Results

Stage Stream: 2

|            |          |   |   |    |
|------------|----------|---|---|----|
|            | To Stage |   |   |    |
| From Stage |          | 1 | 2 | 3  |
|            | 1        |   | 6 | 12 |
|            | 2        | 6 |   | 12 |
|            | 3        | 5 | 5 |    |

Stage Stream: 3

|            |          |   |   |
|------------|----------|---|---|
|            | To Stage |   |   |
| From Stage |          | 1 | 2 |
|            | 1        |   | 5 |
|            | 2        | 5 |   |

## Full Input Data And Results

**Give-Way Lane Input Data**

| Junction: Gresford Interchange |             |                                            |                                            |                  |                     |                 |                             |                                  |     |                           |                                     |
|--------------------------------|-------------|--------------------------------------------|--------------------------------------------|------------------|---------------------|-----------------|-----------------------------|----------------------------------|-----|---------------------------|-------------------------------------|
| Lane                           | Movement    | Max Flow<br>when<br>Giving Way<br>(PCU/Hr) | Min Flow<br>when<br>Giving Way<br>(PCU/Hr) | Opposing<br>Lane | Opp. Lane<br>Coeff. | Opp.<br>Mvmnts. | Right Turn<br>Storage (PCU) | Non-Blocking<br>Storage<br>(PCU) | RTF | Right Turn<br>Move up (s) | Max Turns<br>in Intergreen<br>(PCU) |
| 2/1<br>(B5445)                 | 13/1 (Left) | 1000                                       | 0                                          | 7/1              | 0.33                | All             | -                           | -                                | -   | -                         | -                                   |
|                                |             |                                            |                                            | 7/2              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 7/3              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 7/4              | 0.33                | All             |                             |                                  |     |                           |                                     |
| 2/2<br>(B5445)                 | 8/1 (Ahead) | 1000                                       | 0                                          | 7/1              | 0.33                | All             | -                           | -                                | -   | -                         | -                                   |
|                                |             |                                            |                                            | 7/2              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 7/3              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 7/4              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                | 8/2 (Ahead) | 1000                                       | 0                                          | 7/1              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 7/2              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 7/3              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 7/4              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                | 8/3 (Ahead) | 1000                                       | 0                                          | 7/1              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 7/2              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 7/3              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 7/4              | 0.33                | All             |                             |                                  |     |                           |                                     |
| 2/3<br>(B5445)                 | 8/4 (Ahead) | 1000                                       | 0                                          | 7/1              | 0.33                | All             | -                           | -                                | -   | -                         | -                                   |
|                                |             |                                            |                                            | 7/2              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 7/3              | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 7/4              | 0.33                | All             |                             |                                  |     |                           |                                     |
| 16/1<br>(Blue Bell Ln)         | 20/1 (Left) | 1000                                       | 0                                          | 18/1             | 0.33                | All             | -                           | -                                | -   | -                         | -                                   |
|                                |             |                                            |                                            | 18/2             | 0.33                | All             |                             |                                  |     |                           |                                     |
|                                |             |                                            |                                            | 18/3             | 0.33                | All             |                             |                                  |     |                           |                                     |

Full Input Data And Results

|                                  |              |      |   |      |      |     |   |   |   |   |   |
|----------------------------------|--------------|------|---|------|------|-----|---|---|---|---|---|
|                                  | 21/1 (Ahead) | 1000 | 0 | 18/1 | 0.33 | All |   |   |   |   |   |
|                                  |              |      |   | 18/2 | 0.33 | All |   |   |   |   |   |
|                                  |              |      |   | 18/3 | 0.33 | All |   |   |   |   |   |
|                                  | 21/2 (Ahead) | 1000 | 0 | 18/1 | 0.33 | All |   |   |   |   |   |
|                                  |              |      |   | 18/2 | 0.33 | All |   |   |   |   |   |
|                                  |              |      |   | 18/3 | 0.33 | All |   |   |   |   |   |
| 16/2<br>(Blue Bell Ln)           | 21/3 (Ahead) | 1000 | 0 | 18/1 | 0.33 | All | - | - | - | - | - |
|                                  |              |      |   | 18/2 | 0.33 | All |   |   |   |   |   |
|                                  |              |      |   | 18/3 | 0.33 | All |   |   |   |   |   |
| 19/1<br>(Industrial Park Access) | 6/1 (Ahead)  | 1000 | 0 | 21/1 | 0.33 | All | - | - | - | - | - |
|                                  |              |      |   | 21/2 | 0.33 | All |   |   |   |   |   |
|                                  |              |      |   | 21/3 | 0.33 | All |   |   |   |   |   |
|                                  | 11/1 (Left)  | 1000 | 0 | 21/1 | 0.33 | All |   |   |   |   |   |
|                                  |              |      |   | 21/2 | 0.33 | All |   |   |   |   |   |
|                                  |              |      |   | 21/3 | 0.33 | All |   |   |   |   |   |
|                                  | 6/2 (Ahead)  | 1000 | 0 | 21/1 | 0.33 | All |   |   |   |   |   |
|                                  |              |      |   | 21/2 | 0.33 | All |   |   |   |   |   |
|                                  |              |      |   | 21/3 | 0.33 | All |   |   |   |   |   |
| 19/2<br>(Industrial Park Access) | 6/3 (Ahead)  | 1000 | 0 | 21/1 | 0.33 | All | - | - | - | - | - |
|                                  |              |      |   | 21/2 | 0.33 | All |   |   |   |   |   |
|                                  |              |      |   | 21/3 | 0.33 | All |   |   |   |   |   |

## Full Input Data And Results

## Lane Input Data

| Junction: Gresford Interchange |           |        |             |           |                       |               |                                   |                |          |               |       |                    |
|--------------------------------|-----------|--------|-------------|-----------|-----------------------|---------------|-----------------------------------|----------------|----------|---------------|-------|--------------------|
| 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) |
| 1/1<br>(A483 SB Off-slip)      | U         | A      | 2           | 3         | 11.1                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 1/2<br>(A483 SB Off-slip)      | U         | A      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 1/3<br>(A483 SB Off-slip)      | U         | A      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 2/1<br>(B5445)                 | O         |        | 2           | 3         | 5.2                   | Inf           | -                                 | -              | -        | -             | -     | -                  |
| 2/2<br>(B5445)                 | O         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -     | -                  |
| 2/3<br>(B5445)                 | O         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -     | -                  |
| 3/1<br>(A5156)                 | U         | E      | 2           | 3         | 17.4                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 3/2<br>(A5156)                 | U         | E      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 3/3<br>(A5156)                 | U         | E      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 4/1<br>(A5152)                 | U         | G      | 2           | 3         | 5.6                   | User          | 1900                              | -              | -        | -             | -     | -                  |
| 4/2<br>(A5152)                 | U         | G      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 4/3<br>(A5152)                 | U         | G      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 5/1<br>(A483 NB Off-slip)      | U         | K      | 2           | 3         | 9.7                   | User          | 1900                              | -              | -        | -             | -     | -                  |
| 5/2<br>(A483 NB Off-slip)      | U         | K      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 5/3<br>(A483 NB Off-slip)      | U         | K      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 6/1                            | U         | B      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 6/2                            | U         | B      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 6/3                            | U         | B      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 7/1                            | U         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -     | -                  |
| 7/2                            | U         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -     | -                  |
| 7/3                            | U         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -     | -                  |
| 7/4                            | U         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -     | -                  |
| 8/1                            | U         | F      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 8/2                            | U         | F      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |
| 8/3                            | U         | F      | 2           | 3         | 60.0                  | User          | 1900                              | -              | -        | -             | -     | -                  |



## Full Input Data And Results

|                                     |   |   |   |   |      |      |      |   |   |   |   |   |
|-------------------------------------|---|---|---|---|------|------|------|---|---|---|---|---|
| 8/4                                 | U | F | 2 | 3 | 60.0 | User | 1900 | - | - | - | - | - |
| 9/1                                 | U | H | 2 | 3 | 60.0 | User | 1900 | - | - | - | - | - |
| 9/2                                 | U | H | 2 | 3 | 60.0 | User | 1900 | - | - | - | - | - |
| 9/3                                 | U | H | 2 | 3 | 60.0 | User | 1900 | - | - | - | - | - |
| 10/1                                | U | L | 2 | 3 | 60.0 | User | 1900 | - | - | - | - | - |
| 10/2                                | U | L | 2 | 3 | 60.0 | User | 1900 | - | - | - | - | - |
| 10/3                                | U | L | 2 | 3 | 60.0 | User | 1900 | - | - | - | - | - |
| 11/1                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 11/2                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 12/1                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 13/1                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 13/2                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 14/1                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 14/2                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 15/1                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 15/2                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 16/1<br>(Blue Bell Ln)              | O |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 16/2<br>(Blue Bell Ln)              | O |   | 2 | 3 | 4.3  | Inf  | -    | - | - | - | - | - |
| 17/1                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 18/1                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 18/2                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 18/3                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 19/1<br>(Industrial Park<br>Access) | O |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 19/2<br>(Industrial Park<br>Access) | O |   | 2 | 3 | 4.9  | Inf  | -    | - | - | - | - | - |
| 20/1                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 21/1                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 21/2                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |
| 21/3                                | U |   | 2 | 3 | 60.0 | Inf  | -    | - | - | - | - | - |

Traffic Flow Groups

| Flow Group             | Start Time | End Time | Duration | Formula |
|------------------------|------------|----------|----------|---------|
| 1: 'AM Obs'            | 07:45      | 08:45    | 01:00    |         |
| 2: 'PM Obs'            | 16:30      | 17:30    | 01:00    |         |
| 3: 'AM Without 2027'   | 07:45      | 08:45    | 01:00    |         |
| 4: 'PM Without 2027'   | 16:30      | 17:30    | 01:00    |         |
| 5: 'AM Without 2036'   | 07:45      | 08:45    | 01:00    |         |
| 6: 'PM Without 2036'   | 16:30      | 17:30    | 01:00    |         |
| 7: 'AM With Dev 2027'  | 07:45      | 08:45    | 01:00    |         |
| 8: 'PM With Dev 2027'  | 16:30      | 17:30    | 01:00    |         |
| 9: 'AM With Dev 2036'  | 07:45      | 08:45    | 01:00    |         |
| 10: 'PM With Dev 2036' | 16:30      | 17:30    | 01:00    |         |

Scenario 1: 'AM Obs' (FG1: 'AM Obs', Plan 1: 'Staging Plan No. 1')

Traffic Flows, Desired

Desired Flow :

|        | Destination |     |     |      |     |     |     |    |      |
|--------|-------------|-----|-----|------|-----|-----|-----|----|------|
| Origin |             | A   | B   | C    | D   | E   | F   | G  | Tot. |
|        | A           | 0   | 6   | 758  | 176 | 0   | 133 | 21 | 1094 |
|        | B           | 144 | 0   | 155  | 53  | 125 | 26  | 4  | 507  |
|        | C           | 449 | 114 | 0    | 36  | 359 | 84  | 20 | 1062 |
|        | D           | 161 | 61  | 265  | 0   | 162 | 34  | 3  | 686  |
|        | E           | 0   | 123 | 686  | 172 | 0   | 118 | 16 | 1115 |
|        | F           | 67  | 20  | 113  | 24  | 87  | 0   | 8  | 319  |
|        | G           | 10  | 0   | 11   | 0   | 2   | 0   | 0  | 23   |
|        | Tot.        | 831 | 324 | 1988 | 461 | 735 | 395 | 72 | 4806 |

Traffic Lane Flows

| Lane                           | Scenario 1:<br>AM Obs |
|--------------------------------|-----------------------|
| Junction: Gresford Interchange |                       |
| 1/1<br>(short)                 | 470                   |
| 1/2<br>(with short)            | 940(In)<br>470(Out)   |
| 1/3                            | 154                   |
| 2/1<br>(short)                 | 155                   |
| 2/2<br>(with short)            | 331(In)<br>176(Out)   |
| 2/3                            | 176                   |
| 3/1<br>(short)                 | 354                   |
| 3/2<br>(with short)            | 708(In)<br>354(Out)   |
| 3/3                            | 354                   |
| 4/1<br>(short)                 | 162                   |
| 4/2<br>(with short)            | 423(In)<br>261(Out)   |
| 4/3                            | 263                   |
| 5/1<br>(short)                 | 134                   |
| 5/2<br>(with short)            | 625(In)<br>491(Out)   |
| 5/3                            | 490                   |
| 6/1                            | 977                   |
| 6/2                            | 416                   |
| 6/3                            | 285                   |
| 7/1                            | 1123                  |
| 7/2                            | 710                   |
| 7/3                            | 372                   |
| 7/4                            | 243                   |
| 8/1                            | 212                   |
| 8/2                            | 213                   |
| 8/3                            | 167                   |
| 8/4                            | 375                   |
| 9/1                            | 485                   |
| 9/2                            | 681                   |
| 9/3                            | 402                   |
| 10/1                           | 325                   |
| 10/2                           | 529                   |
| 10/3                           | 665                   |
| 11/1                           | 234                   |
| 11/2                           | 597                   |
| 12/1                           | 324                   |

Full Input Data And Results

|                      |                     |
|----------------------|---------------------|
| 13/1                 | 1278                |
| 13/2                 | 710                 |
| 14/1                 | 248                 |
| 14/2                 | 213                 |
| 15/1                 | 647                 |
| 15/2                 | 88                  |
| 16/1<br>(with short) | 319(In)<br>159(Out) |
| 16/2<br>(short)      | 160                 |
| 17/1                 | 395                 |
| 18/1                 | 64                  |
| 18/2                 | 1020                |
| 18/3                 | 1155                |
| 19/1<br>(with short) | 23(In)<br>12(Out)   |
| 19/2<br>(short)      | 11                  |
| 20/1                 | 72                  |
| 21/1                 | 224                 |
| 21/2                 | 1572                |
| 21/3                 | 690                 |

## Full Input Data And Results

## Lane Saturation Flows

| Junction: Gresford Interchange   |                                                   |          |               |               |                    |               |                   |                          |
|----------------------------------|---------------------------------------------------|----------|---------------|---------------|--------------------|---------------|-------------------|--------------------------|
| Lane                             | Lane Width (m)                                    | Gradient | Nearside Lane | Allowed Turns | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| 1/1<br>(A483 SB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/2<br>(A483 SB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/3<br>(A483 SB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 2/1<br>(B5445 Lane 1)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/2<br>(B5445 Lane 2)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/3<br>(B5445 Lane 3)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 3/1<br>(A5156 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/2<br>(A5156 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/3<br>(A5156 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/1<br>(A5152 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/2<br>(A5152 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/3<br>(A5152 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/1<br>(A483 NB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/2<br>(A483 NB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/3<br>(A483 NB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 7/1                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/2                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/3                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/4                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 8/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/4                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |

## Full Input Data And Results

|                                         |                                                   |      |      |
|-----------------------------------------|---------------------------------------------------|------|------|
| 9/3                                     | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/1                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/2                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/3                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 11/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 11/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 12/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/1<br>(Blue Bell Ln Lane 1)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/2<br>(Blue Bell Ln Lane 2)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 17/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/1<br>(Industrial Park Access Lane 1) | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/2<br>(Industrial Park Access Lane 2) | Infinite Saturation Flow                          | Inf  | Inf  |
| 20/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |

## Scenario 2: 'PM Obs' (FG2: 'PM Obs', Plan 1: 'Staging Plan No. 1')

### Traffic Flows, Desired

#### Desired Flow :

|        | Destination |     |     |      |     |     |     |    |      |
|--------|-------------|-----|-----|------|-----|-----|-----|----|------|
|        |             | A   | B   | C    | D   | E   | F   | G  | Tot. |
| Origin | A           | 0   | 9   | 432  | 218 | 0   | 70  | 10 | 739  |
|        | B           | 74  | 0   | 96   | 97  | 72  | 27  | 1  | 367  |
|        | C           | 568 | 251 | 0    | 67  | 564 | 182 | 11 | 1643 |
|        | D           | 163 | 80  | 182  | 0   | 143 | 58  | 2  | 628  |
|        | E           | 0   | 139 | 353  | 196 | 0   | 91  | 8  | 787  |
|        | F           | 67  | 30  | 82   | 47  | 41  | 0   | 10 | 277  |
|        | G           | 18  | 9   | 17   | 20  | 16  | 7   | 0  | 87   |
|        | Tot.        | 890 | 518 | 1162 | 645 | 836 | 435 | 42 | 4528 |

Traffic Lane Flows

| Lane                           | Scenario 2:<br>PM Obs |
|--------------------------------|-----------------------|
| Junction: Gresford Interchange |                       |
| 1/1<br>(short)                 | 329                   |
| 1/2<br>(with short)            | 659(In)<br>330(Out)   |
| 1/3                            | 80                    |
| 2/1<br>(short)                 | 96                    |
| 2/2<br>(with short)            | 232(In)<br>136(Out)   |
| 2/3                            | 135                   |
| 3/1<br>(short)                 | 548                   |
| 3/2<br>(with short)            | 1096(In)<br>548(Out)  |
| 3/3                            | 547                   |
| 4/1<br>(short)                 | 143                   |
| 4/2<br>(with short)            | 385(In)<br>242(Out)   |
| 4/3                            | 243                   |
| 5/1<br>(short)                 | 99                    |
| 5/2<br>(with short)            | 443(In)<br>344(Out)   |
| 5/3                            | 344                   |
| 6/1                            | 920                   |
| 6/2                            | 223                   |
| 6/3                            | 327                   |
| 7/1                            | 731                   |
| 7/2                            | 335                   |
| 7/3                            | 481                   |
| 7/4                            | 144                   |
| 8/1                            | 288                   |
| 8/2                            | 290                   |
| 8/3                            | 67                    |
| 8/4                            | 251                   |
| 9/1                            | 548                   |
| 9/2                            | 774                   |
| 9/3                            | 572                   |
| 10/1                           | 368                   |
| 10/2                           | 503                   |
| 10/3                           | 815                   |
| 11/1                           | 231                   |
| 11/2                           | 659                   |
| 12/1                           | 518                   |

## Full Input Data And Results

|                      |                     |
|----------------------|---------------------|
| 13/1                 | 827                 |
| 13/2                 | 335                 |
| 14/1                 | 355                 |
| 14/2                 | 290                 |
| 15/1                 | 691                 |
| 15/2                 | 145                 |
| 16/1<br>(with short) | 277(In)<br>139(Out) |
| 16/2<br>(short)      | 138                 |
| 17/1                 | 435                 |
| 18/1                 | 32                  |
| 18/2                 | 847                 |
| 18/3                 | 1159                |
| 19/1<br>(with short) | 87(In)<br>43(Out)   |
| 19/2<br>(short)      | 44                  |
| 20/1                 | 42                  |
| 21/1                 | 213                 |
| 21/2                 | 1554                |
| 21/3                 | 506                 |



## Full Input Data And Results

## Lane Saturation Flows

| Junction: Gresford Interchange   |                                                   |          |               |               |                    |               |                   |                          |
|----------------------------------|---------------------------------------------------|----------|---------------|---------------|--------------------|---------------|-------------------|--------------------------|
| Lane                             | Lane Width (m)                                    | Gradient | Nearside Lane | Allowed Turns | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| 1/1<br>(A483 SB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/2<br>(A483 SB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/3<br>(A483 SB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 2/1<br>(B5445 Lane 1)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/2<br>(B5445 Lane 2)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/3<br>(B5445 Lane 3)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 3/1<br>(A5156 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/2<br>(A5156 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/3<br>(A5156 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/1<br>(A5152 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/2<br>(A5152 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/3<br>(A5152 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/1<br>(A483 NB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/2<br>(A483 NB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/3<br>(A483 NB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 7/1                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/2                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/3                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/4                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 8/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/4                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |

## Full Input Data And Results

|                                         |                                                   |      |      |
|-----------------------------------------|---------------------------------------------------|------|------|
| 9/3                                     | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/1                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/2                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/3                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 11/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 11/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 12/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/1<br>(Blue Bell Ln Lane 1)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/2<br>(Blue Bell Ln Lane 2)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 17/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/1<br>(Industrial Park Access Lane 1) | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/2<br>(Industrial Park Access Lane 2) | Infinite Saturation Flow                          | Inf  | Inf  |
| 20/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |

## Scenario 3: 'AM Without 2027' (FG3: 'AM Without 2027', Plan 1: 'Staging Plan No. 1')

### Traffic Flows, Desired

#### Desired Flow :

|        | Destination |     |     |      |     |     |     |    |      |
|--------|-------------|-----|-----|------|-----|-----|-----|----|------|
|        |             | A   | B   | C    | D   | E   | F   | G  | Tot. |
| Origin | A           | 0   | 6   | 825  | 180 | 0   | 136 | 21 | 1168 |
|        | B           | 147 | 0   | 158  | 54  | 128 | 27  | 4  | 518  |
|        | C           | 483 | 116 | 0    | 37  | 429 | 94  | 20 | 1179 |
|        | D           | 164 | 62  | 270  | 0   | 166 | 35  | 3  | 700  |
|        | E           | 0   | 126 | 773  | 176 | 0   | 120 | 16 | 1211 |
|        | F           | 68  | 20  | 132  | 25  | 89  | 0   | 8  | 342  |
|        | G           | 10  | 0   | 11   | 0   | 2   | 0   | 0  | 23   |
|        | Tot.        | 872 | 330 | 2169 | 472 | 814 | 412 | 72 | 5141 |

## Full Input Data And Results

### Traffic Lane Flows

| Lane                                  | Scenario 3:<br>AM Without<br>2027 |
|---------------------------------------|-----------------------------------|
| <b>Junction: Gresford Interchange</b> |                                   |
| 1/1<br>(short)                        | 505                               |
| 1/2<br>(with short)                   | 1011(In)<br>506(Out)              |
| 1/3                                   | 157                               |
| 2/1<br>(short)                        | 158                               |
| 2/2<br>(with short)                   | 338(In)<br>180(Out)               |
| 2/3                                   | 180                               |
| 3/1<br>(short)                        | 393                               |
| 3/2<br>(with short)                   | 786(In)<br>393(Out)               |
| 3/3                                   | 393                               |
| 4/1<br>(short)                        | 166                               |
| 4/2<br>(with short)                   | 432(In)<br>266(Out)               |
| 4/3                                   | 268                               |
| 5/1<br>(short)                        | 136                               |
| 5/2<br>(with short)                   | 673(In)<br>537(Out)               |
| 5/3                                   | 538                               |
| 6/1                                   | 1042                              |
| 6/2                                   | 468                               |
| 6/3                                   | 292                               |
| 7/1                                   | 1217                              |
| 7/2                                   | 794                               |
| 7/3                                   | 381                               |
| 7/4                                   | 248                               |
| 8/1                                   | 217                               |
| 8/2                                   | 218                               |
| 8/3                                   | 171                               |
| 8/4                                   | 383                               |
| 9/1                                   | 527                               |
| 9/2                                   | 727                               |
| 9/3                                   | 442                               |
| 10/1                                  | 340                               |
| 10/2                                  | 532                               |
| 10/3                                  | 710                               |
| 11/1                                  | 237                               |
| 11/2                                  | 635                               |

## Full Input Data And Results

|                      |                     |
|----------------------|---------------------|
| 12/1                 | 330                 |
| 13/1                 | 1375                |
| 13/2                 | 794                 |
| 14/1                 | 254                 |
| 14/2                 | 218                 |
| 15/1                 | 693                 |
| 15/2                 | 121                 |
| 16/1<br>(with short) | 342(In)<br>171(Out) |
| 16/2<br>(short)      | 171                 |
| 17/1                 | 412                 |
| 18/1                 | 64                  |
| 18/2                 | 1069                |
| 18/3                 | 1248                |
| 19/1<br>(with short) | 23(In)<br>12(Out)   |
| 19/2<br>(short)      | 11                  |
| 20/1                 | 72                  |
| 21/1                 | 227                 |
| 21/2                 | 1675                |
| 21/3                 | 749                 |

## Full Input Data And Results

## Lane Saturation Flows

| Junction: Gresford Interchange   |                                                   |          |               |               |                    |               |                   |                          |
|----------------------------------|---------------------------------------------------|----------|---------------|---------------|--------------------|---------------|-------------------|--------------------------|
| Lane                             | Lane Width (m)                                    | Gradient | Nearside Lane | Allowed Turns | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| 1/1<br>(A483 SB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/2<br>(A483 SB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/3<br>(A483 SB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 2/1<br>(B5445 Lane 1)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/2<br>(B5445 Lane 2)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/3<br>(B5445 Lane 3)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 3/1<br>(A5156 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/2<br>(A5156 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/3<br>(A5156 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/1<br>(A5152 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/2<br>(A5152 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/3<br>(A5152 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/1<br>(A483 NB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/2<br>(A483 NB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/3<br>(A483 NB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 7/1                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/2                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/3                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/4                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 8/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/4                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |

## Full Input Data And Results

|                                         |                                                   |      |      |
|-----------------------------------------|---------------------------------------------------|------|------|
| 9/3                                     | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/1                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/2                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/3                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 11/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 11/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 12/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/1<br>(Blue Bell Ln Lane 1)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/2<br>(Blue Bell Ln Lane 2)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 17/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/1<br>(Industrial Park Access Lane 1) | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/2<br>(Industrial Park Access Lane 2) | Infinite Saturation Flow                          | Inf  | Inf  |
| 20/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |

## Scenario 4: 'PM Without 2027' (FG4: 'PM Without 2027', Plan 1: 'Staging Plan No. 1')

### Traffic Flows, Desired

#### Desired Flow :

|        | Destination |     |     |      |     |     |     |    |      |
|--------|-------------|-----|-----|------|-----|-----|-----|----|------|
|        |             | A   | B   | C    | D   | E   | F   | G  | Tot. |
| Origin | A           | 0   | 9   | 476  | 223 | 0   | 72  | 10 | 790  |
|        | B           | 76  | 0   | 98   | 99  | 74  | 28  | 1  | 376  |
|        | C           | 625 | 256 | 0    | 69  | 650 | 206 | 11 | 1817 |
|        | D           | 166 | 82  | 186  | 0   | 146 | 59  | 2  | 641  |
|        | E           | 0   | 142 | 402  | 200 | 0   | 93  | 8  | 845  |
|        | F           | 68  | 31  | 93   | 48  | 42  | 0   | 10 | 292  |
|        | G           | 18  | 9   | 17   | 20  | 16  | 7   | 0  | 87   |
|        | Tot.        | 953 | 529 | 1272 | 659 | 928 | 465 | 42 | 4848 |

Traffic Lane Flows

| Lane                           | Scenario 4:<br>PM Without 2027 |
|--------------------------------|--------------------------------|
| Junction: Gresford Interchange |                                |
| 1/1<br>(short)                 | 354                            |
| 1/2<br>(with short)            | 708(In)<br>354(Out)            |
| 1/3                            | 82                             |
| 2/1<br>(short)                 | 98                             |
| 2/2<br>(with short)            | 237(In)<br>139(Out)            |
| 2/3                            | 139                            |
| 3/1<br>(short)                 | 606                            |
| 3/2<br>(with short)            | 1211(In)<br>605(Out)           |
| 3/3                            | 606                            |
| 4/1<br>(short)                 | 146                            |
| 4/2<br>(with short)            | 393(In)<br>247(Out)            |
| 4/3                            | 248                            |
| 5/1<br>(short)                 | 101                            |
| 5/2<br>(with short)            | 473(In)<br>372(Out)            |
| 5/3                            | 372                            |
| 6/1                            | 966                            |
| 6/2                            | 252                            |
| 6/3                            | 333                            |
| 7/1                            | 791                            |
| 7/2                            | 383                            |
| 7/3                            | 491                            |
| 7/4                            | 147                            |
| 8/1                            | 294                            |
| 8/2                            | 296                            |
| 8/3                            | 69                             |
| 8/4                            | 257                            |
| 9/1                            | 606                            |
| 9/2                            | 837                            |
| 9/3                            | 631                            |
| 10/1                           | 396                            |
| 10/2                           | 512                            |
| 10/3                           | 879                            |
| 11/1                           | 238                            |
| 11/2                           | 715                            |
| 12/1                           | 529                            |

Full Input Data And Results

|                      |                     |
|----------------------|---------------------|
| 13/1                 | 889                 |
| 13/2                 | 383                 |
| 14/1                 | 363                 |
| 14/2                 | 296                 |
| 15/1                 | 752                 |
| 15/2                 | 176                 |
| 16/1<br>(with short) | 292(In)<br>146(Out) |
| 16/2<br>(short)      | 146                 |
| 17/1                 | 465                 |
| 18/1                 | 32                  |
| 18/2                 | 884                 |
| 18/3                 | 1251                |
| 19/1<br>(with short) | 87(In)<br>43(Out)   |
| 19/2<br>(short)      | 44                  |
| 20/1                 | 42                  |
| 21/1                 | 220                 |
| 21/2                 | 1656                |
| 21/3                 | 541                 |



## Full Input Data And Results

## Lane Saturation Flows

| Junction: Gresford Interchange   |                                                   |          |               |               |                    |               |                   |                          |
|----------------------------------|---------------------------------------------------|----------|---------------|---------------|--------------------|---------------|-------------------|--------------------------|
| Lane                             | Lane Width (m)                                    | Gradient | Nearside Lane | Allowed Turns | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| 1/1<br>(A483 SB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/2<br>(A483 SB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/3<br>(A483 SB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 2/1<br>(B5445 Lane 1)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/2<br>(B5445 Lane 2)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/3<br>(B5445 Lane 3)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 3/1<br>(A5156 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/2<br>(A5156 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/3<br>(A5156 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/1<br>(A5152 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/2<br>(A5152 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/3<br>(A5152 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/1<br>(A483 NB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/2<br>(A483 NB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/3<br>(A483 NB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 7/1                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/2                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/3                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/4                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 8/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/4                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |

## Full Input Data And Results

|                                         |                                                   |      |      |
|-----------------------------------------|---------------------------------------------------|------|------|
| 9/3                                     | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/1                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/2                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/3                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 11/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 11/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 12/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/1<br>(Blue Bell Ln Lane 1)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/2<br>(Blue Bell Ln Lane 2)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 17/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/1<br>(Industrial Park Access Lane 1) | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/2<br>(Industrial Park Access Lane 2) | Infinite Saturation Flow                          | Inf  | Inf  |
| 20/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |

## Scenario 5: 'AM Without 2036' (FG5: 'AM Without 2036', Plan 1: 'Staging Plan No. 1')

### Traffic Flows, Desired

#### Desired Flow :

|        | Destination |     |     |      |     |     |     |    |      |
|--------|-------------|-----|-----|------|-----|-----|-----|----|------|
|        |             | A   | B   | C    | D   | E   | F   | G  | Tot. |
| Origin | A           | 0   | 6   | 843  | 183 | 0   | 138 | 22 | 1192 |
|        | B           | 150 | 0   | 161  | 55  | 130 | 27  | 4  | 527  |
|        | C           | 494 | 118 | 0    | 37  | 436 | 96  | 21 | 1202 |
|        | D           | 167 | 63  | 275  | 0   | 169 | 35  | 3  | 712  |
|        | E           | 0   | 128 | 789  | 179 | 0   | 122 | 17 | 1235 |
|        | F           | 69  | 21  | 134  | 25  | 90  | 0   | 8  | 347  |
|        | G           | 10  | 0   | 11   | 0   | 2   | 0   | 0  | 23   |
|        | Tot.        | 890 | 336 | 2213 | 479 | 827 | 418 | 75 | 5238 |

Traffic Lane Flows

| Lane                           | Scenario 5:<br>AM Without<br>2036 |
|--------------------------------|-----------------------------------|
| Junction: Gresford Interchange |                                   |
| 1/1<br>(short)                 | 516                               |
| 1/2<br>(with short)            | 1032(In)<br>516(Out)              |
| 1/3                            | 160                               |
| 2/1<br>(short)                 | 161                               |
| 2/2<br>(with short)            | 344(In)<br>183(Out)               |
| 2/3                            | 183                               |
| 3/1<br>(short)                 | 401                               |
| 3/2<br>(with short)            | 801(In)<br>400(Out)               |
| 3/3                            | 401                               |
| 4/1<br>(short)                 | 169                               |
| 4/2<br>(with short)            | 441(In)<br>272(Out)               |
| 4/3                            | 271                               |
| 5/1<br>(short)                 | 139                               |
| 5/2<br>(with short)            | 687(In)<br>548(Out)               |
| 5/3                            | 548                               |
| 6/1                            | 1062                              |
| 6/2                            | 477                               |
| 6/3                            | 296                               |
| 7/1                            | 1242                              |
| 7/2                            | 810                               |
| 7/3                            | 387                               |
| 7/4                            | 252                               |
| 8/1                            | 219                               |
| 8/2                            | 223                               |
| 8/3                            | 174                               |
| 8/4                            | 389                               |
| 9/1                            | 538                               |
| 9/2                            | 739                               |
| 9/3                            | 451                               |
| 10/1                           | 346                               |
| 10/2                           | 545                               |
| 10/3                           | 722                               |
| 11/1                           | 242                               |
| 11/2                           | 648                               |

## Full Input Data And Results

|                      |                     |
|----------------------|---------------------|
| 12/1                 | 336                 |
| 13/1                 | 1403                |
| 13/2                 | 810                 |
| 14/1                 | 256                 |
| 14/2                 | 223                 |
| 15/1                 | 707                 |
| 15/2                 | 120                 |
| 16/1<br>(with short) | 347(In)<br>173(Out) |
| 16/2<br>(short)      | 174                 |
| 17/1                 | 418                 |
| 18/1                 | 67                  |
| 18/2                 | 1093                |
| 18/3                 | 1270                |
| 19/1<br>(with short) | 23(In)<br>12(Out)   |
| 19/2<br>(short)      | 11                  |
| 20/1                 | 75                  |
| 21/1                 | 232                 |
| 21/2                 | 1708                |
| 21/3                 | 762                 |

## Full Input Data And Results

## Lane Saturation Flows

| Junction: Gresford Interchange   |                                                   |          |               |               |                    |               |                   |                          |
|----------------------------------|---------------------------------------------------|----------|---------------|---------------|--------------------|---------------|-------------------|--------------------------|
| Lane                             | Lane Width (m)                                    | Gradient | Nearside Lane | Allowed Turns | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| 1/1<br>(A483 SB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/2<br>(A483 SB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/3<br>(A483 SB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 2/1<br>(B5445 Lane 1)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/2<br>(B5445 Lane 2)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/3<br>(B5445 Lane 3)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 3/1<br>(A5156 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/2<br>(A5156 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/3<br>(A5156 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/1<br>(A5152 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/2<br>(A5152 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/3<br>(A5152 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/1<br>(A483 NB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/2<br>(A483 NB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/3<br>(A483 NB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 7/1                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/2                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/3                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/4                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 8/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/4                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |

## Full Input Data And Results

|                                         |                                                   |      |      |
|-----------------------------------------|---------------------------------------------------|------|------|
| 9/3                                     | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/1                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/2                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/3                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 11/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 11/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 12/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/1<br>(Blue Bell Ln Lane 1)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/2<br>(Blue Bell Ln Lane 2)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 17/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/1<br>(Industrial Park Access Lane 1) | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/2<br>(Industrial Park Access Lane 2) | Infinite Saturation Flow                          | Inf  | Inf  |
| 20/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |

## Scenario 6: 'PM Without 2036' (FG6: 'PM Without 2036', Plan 1: 'Staging Plan No. 1')

### Traffic Flows, Desired

#### Desired Flow :

|        | Destination |     |     |      |     |     |     |    |      |
|--------|-------------|-----|-----|------|-----|-----|-----|----|------|
|        |             | A   | B   | C    | D   | E   | F   | G  | Tot. |
| Origin | A           | 0   | 9   | 485  | 226 | 0   | 73  | 10 | 803  |
|        | B           | 77  | 0   | 100  | 100 | 75  | 28  | 1  | 381  |
|        | C           | 637 | 261 | 0    | 70  | 663 | 209 | 11 | 1851 |
|        | D           | 169 | 83  | 189  | 0   | 149 | 60  | 2  | 652  |
|        | E           | 0   | 145 | 411  | 204 | 0   | 94  | 8  | 862  |
|        | F           | 70  | 31  | 94   | 49  | 43  | 0   | 10 | 297  |
|        | G           | 19  | 9   | 17   | 21  | 17  | 7   | 0  | 90   |
|        | Tot.        | 972 | 538 | 1296 | 670 | 947 | 471 | 42 | 4936 |

Traffic Lane Flows

| Lane                           | Scenario 6:<br>PM Without 2036 |
|--------------------------------|--------------------------------|
| Junction: Gresford Interchange |                                |
| 1/1<br>(short)                 | 360                            |
| 1/2<br>(with short)            | 720(In)<br>360(Out)            |
| 1/3                            | 83                             |
| 2/1<br>(short)                 | 100                            |
| 2/2<br>(with short)            | 241(In)<br>141(Out)            |
| 2/3                            | 140                            |
| 3/1<br>(short)                 | 617                            |
| 3/2<br>(with short)            | 1235(In)<br>618(Out)           |
| 3/3                            | 616                            |
| 4/1<br>(short)                 | 149                            |
| 4/2<br>(with short)            | 401(In)<br>252(Out)            |
| 4/3                            | 251                            |
| 5/1<br>(short)                 | 102                            |
| 5/2<br>(with short)            | 482(In)<br>380(Out)            |
| 5/3                            | 380                            |
| 6/1                            | 986                            |
| 6/2                            | 254                            |
| 6/3                            | 341                            |
| 7/1                            | 808                            |
| 7/2                            | 388                            |
| 7/3                            | 500                            |
| 7/4                            | 150                            |
| 8/1                            | 299                            |
| 8/2                            | 301                            |
| 8/3                            | 70                             |
| 8/4                            | 261                            |
| 9/1                            | 617                            |
| 9/2                            | 853                            |
| 9/3                            | 642                            |
| 10/1                           | 401                            |
| 10/2                           | 523                            |
| 10/3                           | 893                            |
| 11/1                           | 243                            |
| 11/2                           | 729                            |
| 12/1                           | 538                            |

## Full Input Data And Results

|                      |                     |
|----------------------|---------------------|
| 13/1                 | 908                 |
| 13/2                 | 388                 |
| 14/1                 | 369                 |
| 14/2                 | 301                 |
| 15/1                 | 766                 |
| 15/2                 | 181                 |
| 16/1<br>(with short) | 297(In)<br>149(Out) |
| 16/2<br>(short)      | 148                 |
| 17/1                 | 471                 |
| 18/1                 | 32                  |
| 18/2                 | 903                 |
| 18/3                 | 1273                |
| 19/1<br>(with short) | 90(In)<br>45(Out)   |
| 19/2<br>(short)      | 45                  |
| 20/1                 | 42                  |
| 21/1                 | 224                 |
| 21/2                 | 1689                |
| 21/3                 | 550                 |



## Full Input Data And Results

## Lane Saturation Flows

| Junction: Gresford Interchange   |                                                   |          |               |               |                    |               |                   |                          |
|----------------------------------|---------------------------------------------------|----------|---------------|---------------|--------------------|---------------|-------------------|--------------------------|
| Lane                             | Lane Width (m)                                    | Gradient | Nearside Lane | Allowed Turns | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| 1/1<br>(A483 SB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/2<br>(A483 SB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/3<br>(A483 SB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 2/1<br>(B5445 Lane 1)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/2<br>(B5445 Lane 2)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/3<br>(B5445 Lane 3)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 3/1<br>(A5156 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/2<br>(A5156 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/3<br>(A5156 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/1<br>(A5152 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/2<br>(A5152 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/3<br>(A5152 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/1<br>(A483 NB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/2<br>(A483 NB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/3<br>(A483 NB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 7/1                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/2                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/3                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/4                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 8/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/4                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |

## Full Input Data And Results

|                                         |                                                   |      |      |
|-----------------------------------------|---------------------------------------------------|------|------|
| 9/3                                     | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/1                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/2                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/3                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 11/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 11/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 12/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/1<br>(Blue Bell Ln Lane 1)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/2<br>(Blue Bell Ln Lane 2)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 17/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/1<br>(Industrial Park Access Lane 1) | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/2<br>(Industrial Park Access Lane 2) | Infinite Saturation Flow                          | Inf  | Inf  |
| 20/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |

## Scenario 7: 'AM With Dev 2027' (FG7: 'AM With Dev 2027', Plan 1: 'Staging Plan No. 1')

### Traffic Flows, Desired

#### Desired Flow :

|        | Destination |     |     |      |     |     |     |    |      |
|--------|-------------|-----|-----|------|-----|-----|-----|----|------|
|        |             | A   | B   | C    | D   | E   | F   | G  | Tot. |
| Origin | A           | 0   | 6   | 854  | 180 | 0   | 136 | 21 | 1197 |
|        | B           | 147 | 0   | 158  | 54  | 128 | 27  | 4  | 518  |
|        | C           | 504 | 116 | 0    | 37  | 462 | 101 | 20 | 1240 |
|        | D           | 164 | 62  | 270  | 0   | 166 | 35  | 3  | 700  |
|        | E           | 0   | 126 | 813  | 176 | 0   | 120 | 16 | 1251 |
|        | F           | 68  | 20  | 142  | 25  | 89  | 0   | 8  | 352  |
|        | G           | 10  | 0   | 11   | 0   | 2   | 0   | 0  | 23   |
|        | Tot.        | 893 | 330 | 2248 | 472 | 847 | 419 | 72 | 5281 |

## Full Input Data And Results

### Traffic Lane Flows

| Lane                                  | Scenario 7:<br>AM With Dev<br>2027 |
|---------------------------------------|------------------------------------|
| <b>Junction: Gresford Interchange</b> |                                    |
| 1/1<br>(short)                        | 520                                |
| 1/2<br>(with short)                   | 1040(In)<br>520(Out)               |
| 1/3                                   | 157                                |
| 2/1<br>(short)                        | 158                                |
| 2/2<br>(with short)                   | 338(In)<br>180(Out)                |
| 2/3                                   | 180                                |
| 3/1<br>(short)                        | 413                                |
| 3/2<br>(with short)                   | 827(In)<br>414(Out)                |
| 3/3                                   | 413                                |
| 4/1<br>(short)                        | 166                                |
| 4/2<br>(with short)                   | 432(In)<br>266(Out)                |
| 4/3                                   | 268                                |
| 5/1<br>(short)                        | 136                                |
| 5/2<br>(with short)                   | 694(In)<br>558(Out)                |
| 5/3                                   | 557                                |
| 6/1                                   | 1068                               |
| 6/2                                   | 492                                |
| 6/3                                   | 292                                |
| 7/1                                   | 1258                               |
| 7/2                                   | 832                                |
| 7/3                                   | 381                                |
| 7/4                                   | 248                                |
| 8/1                                   | 217                                |
| 8/2                                   | 218                                |
| 8/3                                   | 171                                |
| 8/4                                   | 383                                |
| 9/1                                   | 547                                |
| 9/2                                   | 748                                |
| 9/3                                   | 462                                |
| 10/1                                  | 347                                |
| 10/2                                  | 533                                |
| 10/3                                  | 730                                |
| 11/1                                  | 238                                |
| 11/2                                  | 655                                |

## Full Input Data And Results

|                      |                     |
|----------------------|---------------------|
| 12/1                 | 330                 |
| 13/1                 | 1416                |
| 13/2                 | 832                 |
| 14/1                 | 254                 |
| 14/2                 | 218                 |
| 15/1                 | 713                 |
| 15/2                 | 134                 |
| 16/1<br>(with short) | 352(In)<br>176(Out) |
| 16/2<br>(short)      | 176                 |
| 17/1                 | 419                 |
| 18/1                 | 64                  |
| 18/2                 | 1091                |
| 18/3                 | 1287                |
| 19/1<br>(with short) | 23(In)<br>12(Out)   |
| 19/2<br>(short)      | 11                  |
| 20/1                 | 72                  |
| 21/1                 | 228                 |
| 21/2                 | 1721                |
| 21/3                 | 773                 |

## Lane Saturation Flows

| Junction: Gresford Interchange   |                                                   |          |               |               |                    |               |                   |                          |
|----------------------------------|---------------------------------------------------|----------|---------------|---------------|--------------------|---------------|-------------------|--------------------------|
| Lane                             | Lane Width (m)                                    | Gradient | Nearside Lane | Allowed Turns | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| 1/1<br>(A483 SB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/2<br>(A483 SB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/3<br>(A483 SB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 2/1<br>(B5445 Lane 1)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/2<br>(B5445 Lane 2)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/3<br>(B5445 Lane 3)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 3/1<br>(A5156 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/2<br>(A5156 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/3<br>(A5156 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/1<br>(A5152 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/2<br>(A5152 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/3<br>(A5152 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/1<br>(A483 NB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/2<br>(A483 NB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/3<br>(A483 NB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 7/1                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/2                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/3                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/4                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 8/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/4                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |

## Full Input Data And Results

|                                         |                                                   |      |      |
|-----------------------------------------|---------------------------------------------------|------|------|
| 9/3                                     | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/1                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/2                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/3                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 11/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 11/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 12/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/1<br>(Blue Bell Ln Lane 1)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/2<br>(Blue Bell Ln Lane 2)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 17/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/1<br>(Industrial Park Access Lane 1) | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/2<br>(Industrial Park Access Lane 2) | Infinite Saturation Flow                          | Inf  | Inf  |
| 20/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |

## Scenario 8: 'PM With Dev 2027' (FG8: 'PM With Dev 2027', Plan 1: 'Staging Plan No. 1')

### Traffic Flows, Desired

#### Desired Flow :

|        | Destination |     |     |      |     |     |     |    |      |
|--------|-------------|-----|-----|------|-----|-----|-----|----|------|
|        |             | A   | B   | C    | D   | E   | F   | G  | Tot. |
| Origin | A           | 0   | 9   | 506  | 223 | 0   | 72  | 10 | 820  |
|        | B           | 76  | 0   | 98   | 99  | 74  | 28  | 1  | 376  |
|        | C           | 659 | 256 | 0    | 69  | 698 | 219 | 11 | 1912 |
|        | D           | 166 | 82  | 186  | 0   | 146 | 59  | 2  | 641  |
|        | E           | 0   | 142 | 442  | 200 | 0   | 93  | 8  | 885  |
|        | F           | 68  | 31  | 101  | 48  | 42  | 0   | 10 | 300  |
|        | G           | 18  | 9   | 17   | 20  | 16  | 7   | 0  | 87   |
|        | Tot.        | 987 | 529 | 1350 | 659 | 976 | 478 | 42 | 5021 |

## Full Input Data And Results

### Traffic Lane Flows

| Lane                                  | Scenario 8:<br>PM With Dev<br>2027 |
|---------------------------------------|------------------------------------|
| <b>Junction: Gresford Interchange</b> |                                    |
| 1/1<br>(short)                        | 369                                |
| 1/2<br>(with short)                   | 738(In)<br>369(Out)                |
| 1/3                                   | 82                                 |
| 2/1<br>(short)                        | 98                                 |
| 2/2<br>(with short)                   | 237(In)<br>139(Out)                |
| 2/3                                   | 139                                |
| 3/1<br>(short)                        | 637                                |
| 3/2<br>(with short)                   | 1274(In)<br>637(Out)               |
| 3/3                                   | 638                                |
| 4/1<br>(short)                        | 146                                |
| 4/2<br>(with short)                   | 393(In)<br>247(Out)                |
| 4/3                                   | 248                                |
| 5/1<br>(short)                        | 101                                |
| 5/2<br>(with short)                   | 493(In)<br>392(Out)                |
| 5/3                                   | 392                                |
| 6/1                                   | 992                                |
| 6/2                                   | 274                                |
| 6/3                                   | 333                                |
| 7/1                                   | 832                                |
| 7/2                                   | 420                                |
| 7/3                                   | 491                                |
| 7/4                                   | 147                                |
| 8/1                                   | 295                                |
| 8/2                                   | 295                                |
| 8/3                                   | 69                                 |
| 8/4                                   | 257                                |
| 9/1                                   | 637                                |
| 9/2                                   | 869                                |
| 9/3                                   | 663                                |
| 10/1                                  | 409                                |
| 10/2                                  | 514                                |
| 10/3                                  | 911                                |
| 11/1                                  | 240                                |
| 11/2                                  | 747                                |

## Full Input Data And Results

|                      |                     |
|----------------------|---------------------|
| 12/1                 | 529                 |
| 13/1                 | 930                 |
| 13/2                 | 420                 |
| 14/1                 | 364                 |
| 14/2                 | 295                 |
| 15/1                 | 783                 |
| 15/2                 | 193                 |
| 16/1<br>(with short) | 300(In)<br>150(Out) |
| 16/2<br>(short)      | 150                 |
| 17/1                 | 478                 |
| 18/1                 | 32                  |
| 18/2                 | 906                 |
| 18/3                 | 1303                |
| 19/1<br>(with short) | 87(In)<br>43(Out)   |
| 19/2<br>(short)      | 44                  |
| 20/1                 | 42                  |
| 21/1                 | 222                 |
| 21/2                 | 1714                |
| 21/3                 | 563                 |



## Full Input Data And Results

## Lane Saturation Flows

| Junction: Gresford Interchange   |                                                   |          |               |               |                    |               |                   |                          |
|----------------------------------|---------------------------------------------------|----------|---------------|---------------|--------------------|---------------|-------------------|--------------------------|
| Lane                             | Lane Width (m)                                    | Gradient | Nearside Lane | Allowed Turns | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| 1/1<br>(A483 SB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/2<br>(A483 SB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/3<br>(A483 SB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 2/1<br>(B5445 Lane 1)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/2<br>(B5445 Lane 2)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/3<br>(B5445 Lane 3)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 3/1<br>(A5156 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/2<br>(A5156 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/3<br>(A5156 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/1<br>(A5152 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/2<br>(A5152 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/3<br>(A5152 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/1<br>(A483 NB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/2<br>(A483 NB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/3<br>(A483 NB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 7/1                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/2                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/3                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/4                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 8/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/4                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |

## Full Input Data And Results

|                                         |                                                   |      |      |
|-----------------------------------------|---------------------------------------------------|------|------|
| 9/3                                     | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/1                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/2                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/3                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 11/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 11/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 12/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/1<br>(Blue Bell Ln Lane 1)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/2<br>(Blue Bell Ln Lane 2)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 17/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/1<br>(Industrial Park Access Lane 1) | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/2<br>(Industrial Park Access Lane 2) | Infinite Saturation Flow                          | Inf  | Inf  |
| 20/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |

## Scenario 9: 'AM With Dev 2036' (FG9: 'AM With Dev 2036', Plan 1: 'Staging Plan No. 1')

### Traffic Flows, Desired

#### Desired Flow :

|        | Destination |     |     |      |     |     |     |    |      |
|--------|-------------|-----|-----|------|-----|-----|-----|----|------|
|        |             | A   | B   | C    | D   | E   | F   | G  | Tot. |
| Origin | A           | 0   | 6   | 872  | 183 | 0   | 138 | 22 | 1221 |
|        | B           | 150 | 0   | 161  | 55  | 130 | 27  | 4  | 527  |
|        | C           | 515 | 118 | 0    | 37  | 470 | 103 | 21 | 1264 |
|        | D           | 167 | 63  | 275  | 0   | 169 | 35  | 3  | 712  |
|        | E           | 0   | 128 | 829  | 179 | 0   | 122 | 17 | 1275 |
|        | F           | 69  | 21  | 144  | 25  | 90  | 0   | 8  | 357  |
|        | G           | 10  | 0   | 11   | 0   | 2   | 0   | 0  | 23   |
|        | Tot.        | 911 | 336 | 2292 | 479 | 861 | 425 | 75 | 5379 |

Traffic Lane Flows

| Lane                           | Scenario 9:<br>AM With Dev<br>2036 |
|--------------------------------|------------------------------------|
| Junction: Gresford Interchange |                                    |
| 1/1<br>(short)                 | 530                                |
| 1/2<br>(with short)            | 1061(In)<br>531(Out)               |
| 1/3                            | 160                                |
| 2/1<br>(short)                 | 161                                |
| 2/2<br>(with short)            | 344(In)<br>183(Out)                |
| 2/3                            | 183                                |
| 3/1<br>(short)                 | 421                                |
| 3/2<br>(with short)            | 843(In)<br>422(Out)                |
| 3/3                            | 421                                |
| 4/1<br>(short)                 | 169                                |
| 4/2<br>(with short)            | 441(In)<br>272(Out)                |
| 4/3                            | 271                                |
| 5/1<br>(short)                 | 139                                |
| 5/2<br>(with short)            | 707(In)<br>568(Out)                |
| 5/3                            | 568                                |
| 6/1                            | 1087                               |
| 6/2                            | 502                                |
| 6/3                            | 296                                |
| 7/1                            | 1281                               |
| 7/2                            | 850                                |
| 7/3                            | 387                                |
| 7/4                            | 252                                |
| 8/1                            | 219                                |
| 8/2                            | 223                                |
| 8/3                            | 174                                |
| 8/4                            | 389                                |
| 9/1                            | 558                                |
| 9/2                            | 761                                |
| 9/3                            | 471                                |
| 10/1                           | 353                                |
| 10/2                           | 546                                |
| 10/3                           | 742                                |
| 11/1                           | 243                                |
| 11/2                           | 668                                |

## Full Input Data And Results

|                      |                     |
|----------------------|---------------------|
| 12/1                 | 336                 |
| 13/1                 | 1442                |
| 13/2                 | 850                 |
| 14/1                 | 256                 |
| 14/2                 | 223                 |
| 15/1                 | 727                 |
| 15/2                 | 134                 |
| 16/1<br>(with short) | 357(In)<br>178(Out) |
| 16/2<br>(short)      | 179                 |
| 17/1                 | 425                 |
| 18/1                 | 67                  |
| 18/2                 | 1114                |
| 18/3                 | 1310                |
| 19/1<br>(with short) | 23(In)<br>12(Out)   |
| 19/2<br>(short)      | 11                  |
| 20/1                 | 75                  |
| 21/1                 | 233                 |
| 21/2                 | 1753                |
| 21/3                 | 787                 |

## Full Input Data And Results

## Lane Saturation Flows

| Junction: Gresford Interchange   |                                                   |          |               |               |                    |               |                   |                          |
|----------------------------------|---------------------------------------------------|----------|---------------|---------------|--------------------|---------------|-------------------|--------------------------|
| Lane                             | Lane Width (m)                                    | Gradient | Nearside Lane | Allowed Turns | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| 1/1<br>(A483 SB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/2<br>(A483 SB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/3<br>(A483 SB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 2/1<br>(B5445 Lane 1)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/2<br>(B5445 Lane 2)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/3<br>(B5445 Lane 3)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 3/1<br>(A5156 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/2<br>(A5156 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/3<br>(A5156 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/1<br>(A5152 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/2<br>(A5152 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/3<br>(A5152 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/1<br>(A483 NB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/2<br>(A483 NB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/3<br>(A483 NB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 7/1                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/2                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/3                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/4                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 8/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/4                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |

## Full Input Data And Results

|                                         |                                                   |      |      |
|-----------------------------------------|---------------------------------------------------|------|------|
| 9/3                                     | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/1                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/2                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/3                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 11/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 11/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 12/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/1<br>(Blue Bell Ln Lane 1)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/2<br>(Blue Bell Ln Lane 2)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 17/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/1<br>(Industrial Park Access Lane 1) | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/2<br>(Industrial Park Access Lane 2) | Infinite Saturation Flow                          | Inf  | Inf  |
| 20/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |

## Scenario 10: 'PM With Dev 2036' (FG10: 'PM With Dev 2036', Plan 1: 'Staging Plan No. 1')

### Traffic Flows, Desired

#### Desired Flow :

|        | Destination |      |     |      |     |     |     |    |      |
|--------|-------------|------|-----|------|-----|-----|-----|----|------|
|        |             | A    | B   | C    | D   | E   | F   | G  | Tot. |
| Origin | A           | 0    | 9   | 514  | 226 | 0   | 73  | 10 | 832  |
|        | B           | 77   | 0   | 100  | 100 | 75  | 28  | 1  | 381  |
|        | C           | 670  | 261 | 0    | 70  | 711 | 222 | 11 | 1945 |
|        | D           | 169  | 83  | 189  | 0   | 149 | 60  | 2  | 652  |
|        | E           | 0    | 145 | 451  | 204 | 0   | 94  | 8  | 902  |
|        | F           | 70   | 31  | 102  | 49  | 43  | 0   | 10 | 305  |
|        | G           | 19   | 9   | 17   | 21  | 17  | 7   | 0  | 90   |
|        | Tot.        | 1005 | 538 | 1373 | 670 | 995 | 484 | 42 | 5107 |

## Full Input Data And Results

### Traffic Lane Flows

| Lane                                  | Scenario 10:<br>PM With Dev<br>2036 |
|---------------------------------------|-------------------------------------|
| <b>Junction: Gresford Interchange</b> |                                     |
| 1/1<br>(short)                        | 374                                 |
| 1/2<br>(with short)                   | 749(In)<br>375(Out)                 |
| 1/3                                   | 83                                  |
| 2/1<br>(short)                        | 100                                 |
| 2/2<br>(with short)                   | 241(In)<br>141(Out)                 |
| 2/3                                   | 140                                 |
| 3/1<br>(short)                        | 648                                 |
| 3/2<br>(with short)                   | 1296(In)<br>648(Out)                |
| 3/3                                   | 649                                 |
| 4/1<br>(short)                        | 149                                 |
| 4/2<br>(with short)                   | 401(In)<br>252(Out)                 |
| 4/3                                   | 251                                 |
| 5/1<br>(short)                        | 102                                 |
| 5/2<br>(with short)                   | 502(In)<br>400(Out)                 |
| 5/3                                   | 400                                 |
| 6/1                                   | 1012                                |
| 6/2                                   | 276                                 |
| 6/3                                   | 341                                 |
| 7/1                                   | 848                                 |
| 7/2                                   | 425                                 |
| 7/3                                   | 500                                 |
| 7/4                                   | 150                                 |
| 8/1                                   | 299                                 |
| 8/2                                   | 301                                 |
| 8/3                                   | 70                                  |
| 8/4                                   | 261                                 |
| 9/1                                   | 648                                 |
| 9/2                                   | 883                                 |
| 9/3                                   | 675                                 |
| 10/1                                  | 414                                 |
| 10/2                                  | 523                                 |
| 10/3                                  | 926                                 |
| 11/1                                  | 244                                 |
| 11/2                                  | 761                                 |

## Full Input Data And Results

|                      |                     |
|----------------------|---------------------|
| 12/1                 | 538                 |
| 13/1                 | 948                 |
| 13/2                 | 425                 |
| 14/1                 | 369                 |
| 14/2                 | 301                 |
| 15/1                 | 797                 |
| 15/2                 | 198                 |
| 16/1<br>(with short) | 305(In)<br>153(Out) |
| 16/2<br>(short)      | 152                 |
| 17/1                 | 484                 |
| 18/1                 | 32                  |
| 18/2                 | 923                 |
| 18/3                 | 1326                |
| 19/1<br>(with short) | 90(In)<br>45(Out)   |
| 19/2<br>(short)      | 45                  |
| 20/1                 | 42                  |
| 21/1                 | 225                 |
| 21/2                 | 1747                |
| 21/3                 | 572                 |



## Lane Saturation Flows

| Junction: Gresford Interchange   |                                                   |          |               |               |                    |               |                   |                          |
|----------------------------------|---------------------------------------------------|----------|---------------|---------------|--------------------|---------------|-------------------|--------------------------|
| Lane                             | Lane Width (m)                                    | Gradient | Nearside Lane | Allowed Turns | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| 1/1<br>(A483 SB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/2<br>(A483 SB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/3<br>(A483 SB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 2/1<br>(B5445 Lane 1)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/2<br>(B5445 Lane 2)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/3<br>(B5445 Lane 3)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 3/1<br>(A5156 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/2<br>(A5156 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/3<br>(A5156 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/1<br>(A5152 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/2<br>(A5152 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/3<br>(A5152 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/1<br>(A483 NB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/2<br>(A483 NB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/3<br>(A483 NB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 7/1                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/2                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/3                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/4                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 8/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/4                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |

## Full Input Data And Results

|                                         |                                                   |      |      |
|-----------------------------------------|---------------------------------------------------|------|------|
| 9/3                                     | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/1                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/2                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/3                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 11/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 11/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 12/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/1<br>(Blue Bell Ln Lane 1)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/2<br>(Blue Bell Ln Lane 2)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 17/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/1<br>(Industrial Park Access Lane 1) | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/2<br>(Industrial Park Access Lane 2) | Infinite Saturation Flow                          | Inf  | Inf  |
| 20/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |

## Scenario 11: 'AM With Dev 2036 Longer Cycle' (FG9: 'AM With Dev 2036', Plan 1: 'Staging Plan No. 1')

### Traffic Flows, Desired

#### Desired Flow :

|        | Destination |     |     |      |     |     |     |    |      |
|--------|-------------|-----|-----|------|-----|-----|-----|----|------|
|        |             | A   | B   | C    | D   | E   | F   | G  | Tot. |
| Origin | A           | 0   | 6   | 872  | 183 | 0   | 138 | 22 | 1221 |
|        | B           | 150 | 0   | 161  | 55  | 130 | 27  | 4  | 527  |
|        | C           | 515 | 118 | 0    | 37  | 470 | 103 | 21 | 1264 |
|        | D           | 167 | 63  | 275  | 0   | 169 | 35  | 3  | 712  |
|        | E           | 0   | 128 | 829  | 179 | 0   | 122 | 17 | 1275 |
|        | F           | 69  | 21  | 144  | 25  | 90  | 0   | 8  | 357  |
|        | G           | 10  | 0   | 11   | 0   | 2   | 0   | 0  | 23   |
|        | Tot.        | 911 | 336 | 2292 | 479 | 861 | 425 | 75 | 5379 |

## Full Input Data And Results

### Traffic Lane Flows

| Lane                           | Scenario 11:<br>AM With Dev<br>2036 Longer<br>Cycle |
|--------------------------------|-----------------------------------------------------|
| Junction: Gresford Interchange |                                                     |
| 1/1<br>(short)                 | 530                                                 |
| 1/2<br>(with short)            | 1061(In)<br>531(Out)                                |
| 1/3                            | 160                                                 |
| 2/1<br>(short)                 | 161                                                 |
| 2/2<br>(with short)            | 344(In)<br>183(Out)                                 |
| 2/3                            | 183                                                 |
| 3/1<br>(short)                 | 421                                                 |
| 3/2<br>(with short)            | 843(In)<br>422(Out)                                 |
| 3/3                            | 421                                                 |
| 4/1<br>(short)                 | 169                                                 |
| 4/2<br>(with short)            | 441(In)<br>272(Out)                                 |
| 4/3                            | 271                                                 |
| 5/1<br>(short)                 | 139                                                 |
| 5/2<br>(with short)            | 707(In)<br>568(Out)                                 |
| 5/3                            | 568                                                 |
| 6/1                            | 1087                                                |
| 6/2                            | 502                                                 |
| 6/3                            | 296                                                 |
| 7/1                            | 1281                                                |
| 7/2                            | 850                                                 |
| 7/3                            | 387                                                 |
| 7/4                            | 252                                                 |
| 8/1                            | 219                                                 |
| 8/2                            | 223                                                 |
| 8/3                            | 174                                                 |
| 8/4                            | 389                                                 |
| 9/1                            | 558                                                 |
| 9/2                            | 761                                                 |
| 9/3                            | 471                                                 |
| 10/1                           | 353                                                 |
| 10/2                           | 546                                                 |
| 10/3                           | 742                                                 |
| 11/1                           | 243                                                 |

## Full Input Data And Results

|                      |                     |
|----------------------|---------------------|
| 11/2                 | 668                 |
| 12/1                 | 336                 |
| 13/1                 | 1442                |
| 13/2                 | 850                 |
| 14/1                 | 256                 |
| 14/2                 | 223                 |
| 15/1                 | 727                 |
| 15/2                 | 134                 |
| 16/1<br>(with short) | 357(In)<br>178(Out) |
| 16/2<br>(short)      | 179                 |
| 17/1                 | 425                 |
| 18/1                 | 67                  |
| 18/2                 | 1114                |
| 18/3                 | 1310                |
| 19/1<br>(with short) | 23(In)<br>12(Out)   |
| 19/2<br>(short)      | 11                  |
| 20/1                 | 75                  |
| 21/1                 | 233                 |
| 21/2                 | 1753                |
| 21/3                 | 787                 |

## Full Input Data And Results

## Lane Saturation Flows

| Junction: Gresford Interchange   |                                                   |          |               |               |                    |               |                   |                          |
|----------------------------------|---------------------------------------------------|----------|---------------|---------------|--------------------|---------------|-------------------|--------------------------|
| Lane                             | Lane Width (m)                                    | Gradient | Nearside Lane | Allowed Turns | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| 1/1<br>(A483 SB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/2<br>(A483 SB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 1/3<br>(A483 SB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 2/1<br>(B5445 Lane 1)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/2<br>(B5445 Lane 2)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 2/3<br>(B5445 Lane 3)            | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 3/1<br>(A5156 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/2<br>(A5156 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 3/3<br>(A5156 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/1<br>(A5152 Lane 1)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/2<br>(A5152 Lane 2)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 4/3<br>(A5152 Lane 3)            | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/1<br>(A483 NB Off-slip Lane 1) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/2<br>(A483 NB Off-slip Lane 2) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 5/3<br>(A483 NB Off-slip Lane 3) | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 6/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 7/1                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/2                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/3                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 7/4                              | Infinite Saturation Flow                          |          |               |               |                    |               | Inf               | Inf                      |
| 8/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/3                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 8/4                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/1                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |
| 9/2                              | This lane uses a directly entered Saturation Flow |          |               |               |                    |               | 1900              | 1900                     |

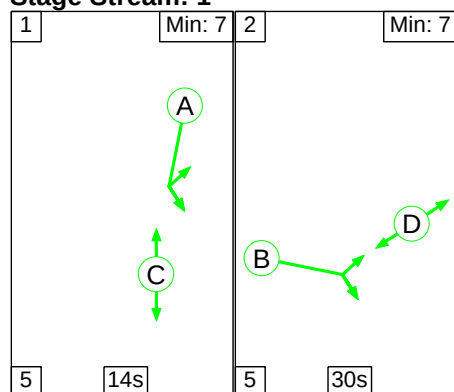
## Full Input Data And Results

|                                         |                                                   |      |      |
|-----------------------------------------|---------------------------------------------------|------|------|
| 9/3                                     | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/1                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/2                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 10/3                                    | This lane uses a directly entered Saturation Flow | 1900 | 1900 |
| 11/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 11/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 12/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 13/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 14/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 15/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/1<br>(Blue Bell Ln Lane 1)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 16/2<br>(Blue Bell Ln Lane 2)           | Infinite Saturation Flow                          | Inf  | Inf  |
| 17/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 18/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/1<br>(Industrial Park Access Lane 1) | Infinite Saturation Flow                          | Inf  | Inf  |
| 19/2<br>(Industrial Park Access Lane 2) | Infinite Saturation Flow                          | Inf  | Inf  |
| 20/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/1                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/2                                    | Infinite Saturation Flow                          | Inf  | Inf  |
| 21/3                                    | Infinite Saturation Flow                          | Inf  | Inf  |

## Scenario 1: 'AM Obs' (FG1: 'AM Obs', Plan 1: 'Staging Plan No. 1')

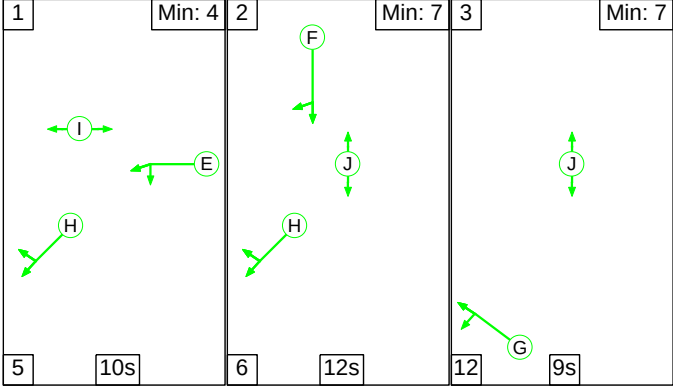
### Stage Sequence Diagram

#### Stage Stream: 1

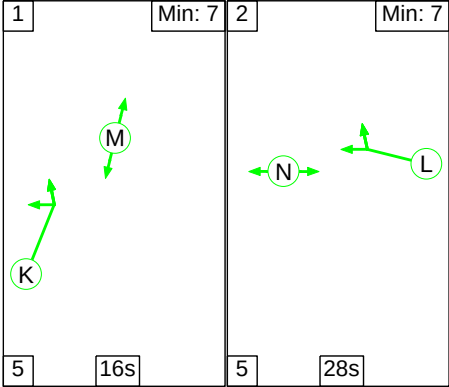


Full Input Data And Results

Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

| Stage        | 1  | 2  |
|--------------|----|----|
| Duration     | 14 | 30 |
| Change Point | 0  | 19 |

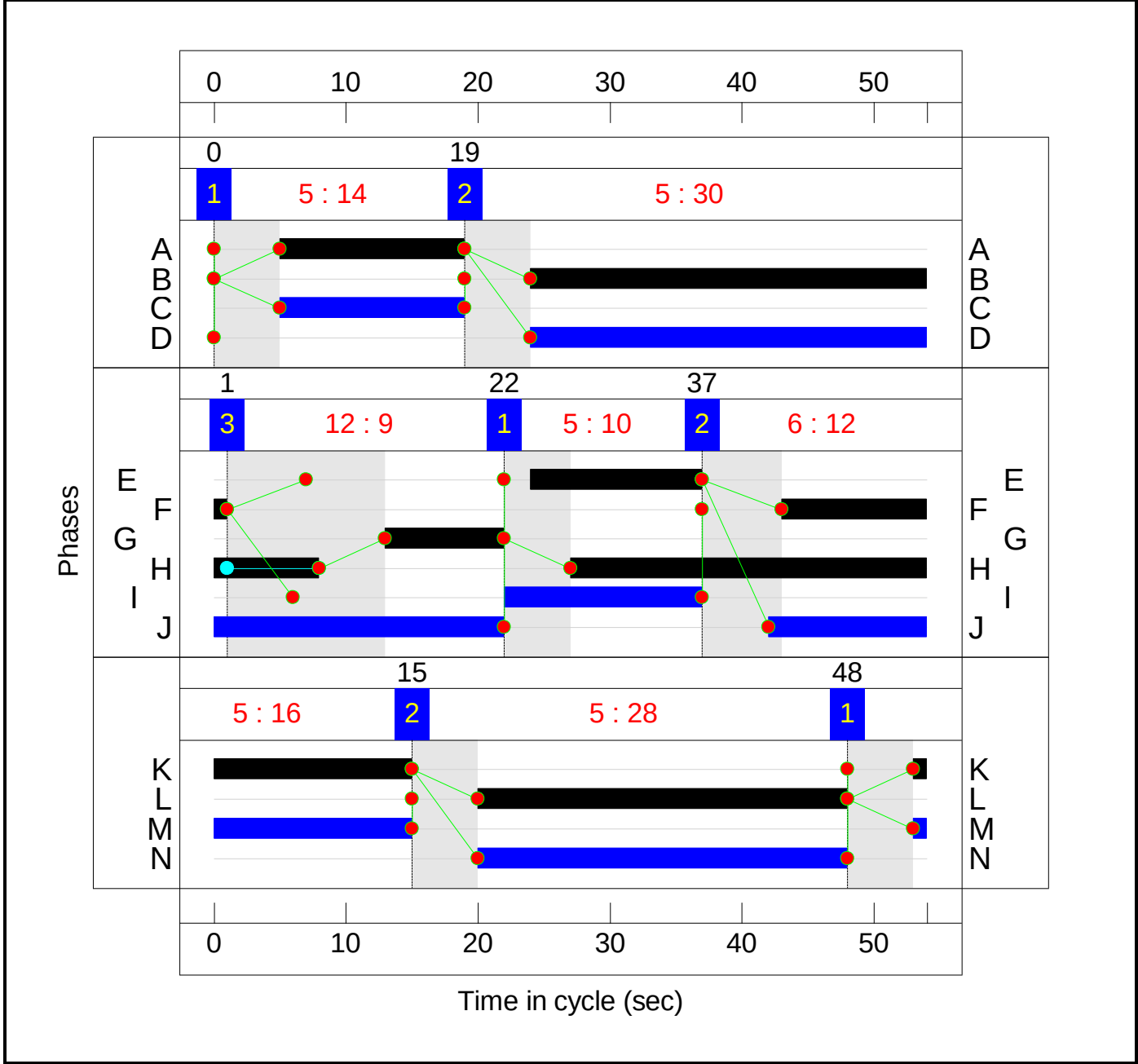
Stage Stream: 2

| Stage        | 1  | 2  | 3 |
|--------------|----|----|---|
| Duration     | 10 | 12 | 9 |
| Change Point | 22 | 37 | 1 |

Stage Stream: 3

| Stage        | 1  | 2  |
|--------------|----|----|
| Duration     | 16 | 28 |
| Change Point | 48 | 15 |

Signal Timings Diagram





## Full Input Data And Results

## Network 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 (%)  |
|-------------------------------|------------------------------|-----------|-------------------|----------------------------|------------|-------------|------------|-----------------|-----------------|-------------------|-------------------|----------------|--------------|
| Network: Gresford Interchange | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 89.6%        |
| Gresford Interchange          | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 89.6%        |
| 1/2+1/1                       | A483 SB Off-slip Left U-Turn | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 940               | 1900:1900         | 528+528        | 89.1 : 89.1% |
| 1/3                           | A483 SB Off-slip Left        | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 154               | 1900              | 528            | 29.2%        |
| 2/2+2/1                       | B5445 Ahead Left             | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 331               | Inf : Inf         | 284+284        | 61.9 : 54.5% |
| 2/3                           | B5445 Ahead                  | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 176               | Inf               | 284            | 61.9%        |
| 3/2+3/1                       | A5156 Ahead Left             | U         | 2                 | N/A                        | E          |             | 1          | 13              | -               | 708               | 1900:1900         | 493+493        | 71.9 : 71.9% |
| 3/3                           | A5156 Ahead                  | U         | 2                 | N/A                        | E          |             | 1          | 13              | -               | 354               | 1900              | 493            | 71.9%        |
| 4/2+4/1                       | A5152 Ahead Left             | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 423               | 1900:1900         | 352+218        | 74.2 : 74.2% |
| 4/3                           | A5152 Ahead                  | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 263               | 1900              | 352            | 74.7%        |
| 5/2+5/1                       | A483 NB Off-slip Left Ahead  | U         | 3                 | N/A                        | K          |             | 1          | 16              | -               | 625               | 1900:1900         | 598+163        | 82.1 : 82.1% |
| 5/3                           | A483 NB Off-slip Ahead       | U         | 3                 | N/A                        | K          |             | 1          | 16              | -               | 490               | 1900              | 598            | 81.9%        |
| 6/1                           | Right Left                   | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 977               | 1900              | 1091           | 89.6%        |
| 6/2                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 416               | 1900              | 1091           | 38.1%        |
| 6/3                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 285               | 1900              | 1091           | 26.1%        |
| 7/1                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 1123              | Inf               | Inf            | 0.0%         |
| 7/2                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 710               | Inf               | Inf            | 0.0%         |
| 7/3                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 372               | Inf               | Inf            | 0.0%         |
| 7/4                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 243               | Inf               | Inf            | 0.0%         |
| 8/1                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 12              | -               | 212               | 1900              | 457            | 46.3%        |
| 8/2                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 12              | -               | 213               | 1900              | 457            | 46.6%        |

Full Input Data And Results

|           |                                   |   |     |     |   |  |   |    |   |      |           |         |              |
|-----------|-----------------------------------|---|-----|-----|---|--|---|----|---|------|-----------|---------|--------------|
| 8/3       | Ahead                             | U | 2   | N/A | F |  | 1 | 12 | - | 167  | 1900      | 457     | 36.5%        |
| 8/4       | Ahead                             | U | 2   | N/A | F |  | 1 | 12 | - | 375  | 1900      | 457     | 82.0%        |
| 9/1       | Ahead                             | U | 2   | N/A | H |  | 1 | 35 | - | 485  | 1900      | 1267    | 38.3%        |
| 9/2       | Right Ahead                       | U | 2   | N/A | H |  | 1 | 35 | - | 681  | 1900      | 1267    | 53.8%        |
| 9/3       | Right                             | U | 2   | N/A | H |  | 1 | 35 | - | 402  | 1900      | 1267    | 31.7%        |
| 10/1      | Ahead Right                       | U | 3   | N/A | L |  | 1 | 28 | - | 325  | 1900      | 1020    | 31.9%        |
| 10/2      | Right                             | U | 3   | N/A | L |  | 1 | 28 | - | 529  | 1900      | 1020    | 51.8%        |
| 10/3      | Right                             | U | 3   | N/A | L |  | 1 | 28 | - | 665  | 1900      | 1020    | 65.2%        |
| 11/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 234  | Inf       | Inf     | 0.0%         |
| 11/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 597  | Inf       | Inf     | 0.0%         |
| 12/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 324  | Inf       | Inf     | 0.0%         |
| 13/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 1278 | Inf       | Inf     | 0.0%         |
| 13/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 710  | Inf       | Inf     | 0.0%         |
| 14/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 248  | Inf       | Inf     | 0.0%         |
| 14/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 213  | Inf       | Inf     | 0.0%         |
| 15/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 647  | Inf       | Inf     | 0.0%         |
| 15/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 88   | Inf       | Inf     | 0.0%         |
| 16/1+16/2 | Blue Bell Ln Left Ahead           | O | N/A | N/A | - |  | - | -  | - | 319  | Inf : Inf | 316+316 | 50.3 : 50.6% |
| 17/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 395  | Inf       | Inf     | 0.0%         |
| 18/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 64   | Inf       | Inf     | 0.0%         |
| 18/2      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1020 | Inf       | Inf     | 0.0%         |
| 18/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1155 | Inf       | Inf     | 0.0%         |
| 19/1+19/2 | Industrial Park Access Ahead Left | O | N/A | N/A | - |  | - | -  | - | 23   | Inf : Inf | 214+214 | 5.6 : 5.1%   |
| 20/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 72   | Inf       | Inf     | 0.0%         |
| 21/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 224  | Inf       | Inf     | 0.0%         |
| 21/2      | Right Ahead                       | U | N/A | N/A | - |  | - | -  | - | 1572 | Inf       | Inf     | 0.0%         |
| 21/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 690  | 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: Gresford Interchange</b> | -              | -             | 1522                  | 0                            | 0                           | 30.0                  | 26.4                         | 0.0                                | 56.5                | -                         | -                                | -                          | -                    |
| <b>Gresford Interchange</b>          | -              | -             | 1522                  | 0                            | 0                           | 30.0                  | 26.4                         | 0.0                                | 56.5                | -                         | -                                | -                          | -                    |
| 1/2+1/1                              | 940            | 940           | -                     | -                            | -                           | 4.9                   | 3.8                          | -                                  | 8.7                 | 33.3                      | 6.7                              | 3.8                        | 10.5                 |
| 1/3                                  | 154            | 154           | -                     | -                            | -                           | 0.7                   | 0.2                          | -                                  | 0.9                 | 20.2                      | 1.8                              | 0.2                        | 2.0                  |
| 2/2+2/1                              | 331            | 331           | 662                   | 0                            | 0                           | 0.4                   | 0.7                          | -                                  | 1.1                 | 11.5                      | 1.1                              | 0.7                        | 1.8                  |
| 2/3                                  | 176            | 176           | 176                   | 0                            | 0                           | 0.2                   | 0.8                          | -                                  | 1.0                 | 20.5                      | 1.1                              | 0.8                        | 1.9                  |
| 3/2+3/1                              | 708            | 708           | -                     | -                            | -                           | 3.6                   | 1.3                          | -                                  | 4.8                 | 24.6                      | 4.8                              | 1.3                        | 6.1                  |
| 3/3                                  | 354            | 354           | -                     | -                            | -                           | 1.8                   | 1.3                          | -                                  | 3.0                 | 31.0                      | 4.8                              | 1.3                        | 6.1                  |
| 4/2+4/1                              | 423            | 423           | -                     | -                            | -                           | 2.4                   | 1.4                          | -                                  | 3.8                 | 32.3                      | 3.7                              | 1.4                        | 5.1                  |
| 4/3                                  | 263            | 263           | -                     | -                            | -                           | 1.5                   | 1.4                          | -                                  | 3.0                 | 40.4                      | 3.7                              | 1.4                        | 5.2                  |
| 5/2+5/1                              | 625            | 625           | -                     | -                            | -                           | 2.8                   | 2.2                          | -                                  | 5.1                 | 29.1                      | 6.7                              | 2.2                        | 8.9                  |
| 5/3                                  | 490            | 490           | -                     | -                            | -                           | 2.3                   | 2.2                          | -                                  | 4.5                 | 33.1                      | 6.7                              | 2.2                        | 8.8                  |
| 6/1                                  | 977            | 977           | -                     | -                            | -                           | 2.1                   | 4.0                          | -                                  | 6.1                 | 22.4                      | 12.4                             | 4.0                        | 16.4                 |
| 6/2                                  | 416            | 416           | -                     | -                            | -                           | 0.3                   | 0.3                          | -                                  | 0.6                 | 5.3                       | 2.8                              | 0.3                        | 3.1                  |
| 6/3                                  | 285            | 285           | -                     | -                            | -                           | 0.3                   | 0.2                          | -                                  | 0.4                 | 5.5                       | 1.8                              | 0.2                        | 2.0                  |
| 7/1                                  | 1123           | 1123          | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/2                                  | 710            | 710           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/3                                  | 372            | 372           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/4                                  | 243            | 243           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 8/1                                  | 212            | 212           | -                     | -                            | -                           | 0.8                   | 0.4                          | -                                  | 1.2                 | 20.6                      | 2.8                              | 0.4                        | 3.3                  |
| 8/2                                  | 213            | 213           | -                     | -                            | -                           | 0.8                   | 0.4                          | -                                  | 1.2                 | 20.7                      | 2.8                              | 0.4                        | 3.3                  |
| 8/3                                  | 167            | 167           | -                     | -                            | -                           | 0.7                   | 0.3                          | -                                  | 1.0                 | 21.8                      | 1.9                              | 0.3                        | 2.2                  |
| 8/4                                  | 375            | 375           | -                     | -                            | -                           | 2.3                   | 2.2                          | -                                  | 4.5                 | 42.8                      | 5.3                              | 2.2                        | 7.5                  |
| 9/1                                  | 485            | 485           | -                     | -                            | -                           | 0.0                   | 0.3                          | -                                  | 0.3                 | 2.3                       | 0.0                              | 0.3                        | 0.3                  |
| 9/2                                  | 681            | 681           | -                     | -                            | -                           | 0.0                   | 0.6                          | -                                  | 0.6                 | 3.1                       | 0.0                              | 0.6                        | 0.6                  |

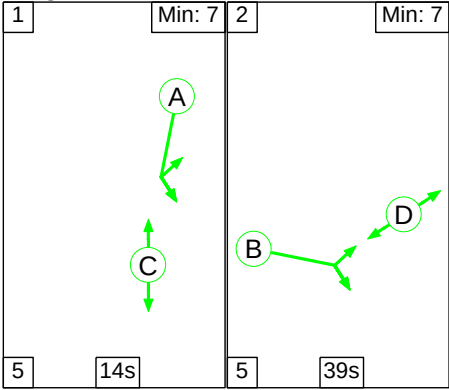
## Full Input Data And Results

|           |      |      |     |   |   |     |     |   |     |      |     |     |     |
|-----------|------|------|-----|---|---|-----|-----|---|-----|------|-----|-----|-----|
| 9/3       | 402  | 402  | -   | - | - | 0.0 | 0.2 | - | 0.2 | 2.1  | 0.0 | 0.2 | 0.2 |
| 10/1      | 325  | 325  | -   | - | - | 0.8 | 0.2 | - | 1.1 | 11.8 | 3.3 | 0.2 | 3.5 |
| 10/2      | 529  | 529  | -   | - | - | 0.6 | 0.5 | - | 1.1 | 7.8  | 3.7 | 0.5 | 4.3 |
| 10/3      | 665  | 665  | -   | - | - | 0.5 | 0.9 | - | 1.4 | 7.7  | 2.2 | 0.9 | 3.1 |
| 11/1      | 234  | 234  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 11/2      | 597  | 597  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 12/1      | 324  | 324  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/1      | 1278 | 1278 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/2      | 710  | 710  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/1      | 248  | 248  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/2      | 213  | 213  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/1      | 647  | 647  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/2      | 88   | 88   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 16/1+16/2 | 319  | 319  | 638 | 0 | 0 | 0.3 | 0.5 | - | 0.8 | 8.6  | 0.7 | 0.5 | 1.2 |
| 17/1      | 395  | 395  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/1      | 64   | 64   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/2      | 1020 | 1020 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/3      | 1155 | 1155 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 19/1+19/2 | 23   | 23   | 46  | 0 | 0 | 0.0 | 0.0 | - | 0.0 | 5.9  | 0.0 | 0.0 | 0.1 |
| 20/1      | 72   | 72   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/1      | 224  | 224  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/2      | 1572 | 1572 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/3      | 690  | 690  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |

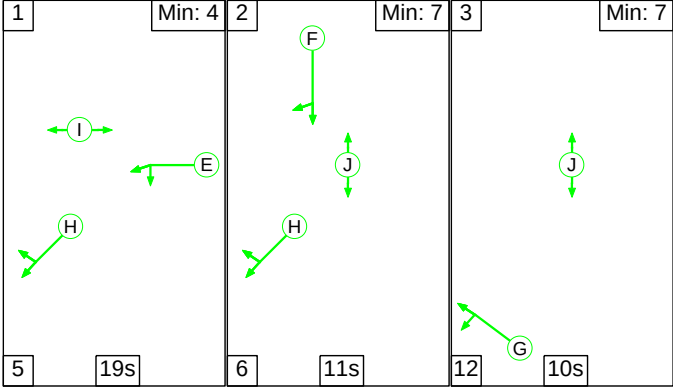
|    |           |                             |     |                                         |       |                |    |
|----|-----------|-----------------------------|-----|-----------------------------------------|-------|----------------|----|
| C1 | Stream: 1 | PRC for Signalled Lanes (%) | 0.5 | Total Delay for Signalled Lanes (pcuHr) | 16.70 | Cycle Time (s) | 54 |
| C1 | Stream: 2 | PRC for Signalled Lanes (%) | 9.8 | Total Delay for Signalled Lanes (pcuHr) | 23.69 | Cycle Time (s) | 54 |
| C1 | Stream: 3 | PRC for Signalled Lanes (%) | 9.6 | Total Delay for Signalled Lanes (pcuHr) | 13.20 | Cycle Time (s) | 54 |
|    |           | PRC Over All Lanes (%)      | 0.5 | Total Delay Over All Lanes (pcuHr)      | 56.46 |                |    |

Stage Sequence Diagram

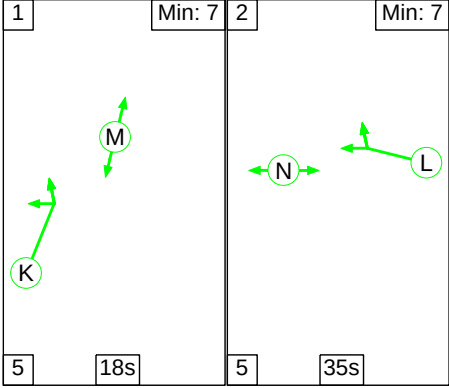
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

| Stage        | 1  | 2  |
|--------------|----|----|
| Duration     | 14 | 39 |
| Change Point | 0  | 19 |

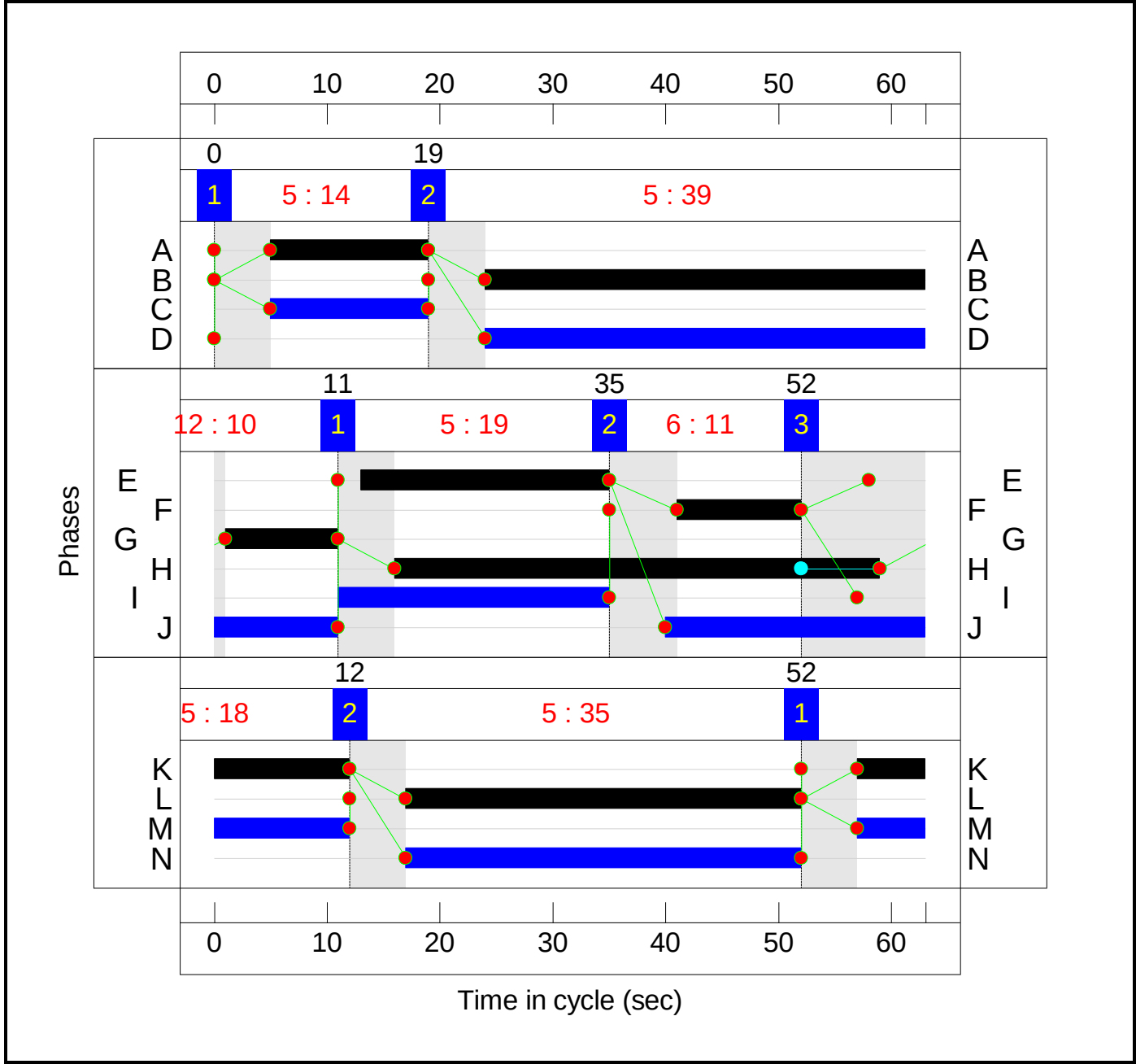
Stage Stream: 2

| Stage        | 1  | 2  | 3  |
|--------------|----|----|----|
| Duration     | 19 | 11 | 10 |
| Change Point | 11 | 35 | 52 |

Full Input Data And Results  
Stage Stream: 3

|              |    |    |
|--------------|----|----|
| Stage        | 1  | 2  |
| Duration     | 18 | 35 |
| Change Point | 52 | 12 |

Signal Timings Diagram



## Full Input Data And Results

## Network 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 (%)  |
|-------------------------------|------------------------------|-----------|-------------------|----------------------------|------------|-------------|------------|-----------------|-----------------|-------------------|-------------------|----------------|--------------|
| Network: Gresford Interchange | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 80.1%        |
| Gresford Interchange          | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 80.1%        |
| 1/2+1/1                       | A483 SB Off-slip Left U-Turn | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 659               | 1900:1900         | 452+452        | 72.9 : 72.7% |
| 1/3                           | A483 SB Off-slip Left        | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 80                | 1900              | 452            | 17.7%        |
| 2/2+2/1                       | B5445 Ahead Left             | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 232               | Inf : Inf         | 482+341        | 28.2 : 28.2% |
| 2/3                           | B5445 Ahead                  | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 135               | Inf               | 482            | 28.0%        |
| 3/2+3/1                       | A5156 Ahead Left             | U         | 2                 | N/A                        | E          |             | 1          | 22              | -               | 1096              | 1900:1900         | 694+694        | 79.0 : 79.0% |
| 3/3                           | A5156 Ahead                  | U         | 2                 | N/A                        | E          |             | 1          | 22              | -               | 547               | 1900              | 694            | 78.9%        |
| 4/2+4/1                       | A5152 Ahead Left             | U         | 2                 | N/A                        | G          |             | 1          | 10              | -               | 385               | 1900:1900         | 332+196        | 72.9 : 72.9% |
| 4/3                           | A5152 Ahead                  | U         | 2                 | N/A                        | G          |             | 1          | 10              | -               | 243               | 1900              | 332            | 73.2%        |
| 5/2+5/1                       | A483 NB Off-slip Left Ahead  | U         | 3                 | N/A                        | K          |             | 1          | 18              | -               | 443               | 1900:1900         | 573+165        | 60.0 : 60.0% |
| 5/3                           | A483 NB Off-slip Ahead       | U         | 3                 | N/A                        | K          |             | 1          | 18              | -               | 344               | 1900              | 573            | 60.0%        |
| 6/1                           | Right Left                   | U         | 1                 | N/A                        | B          |             | 1          | 39              | -               | 920               | 1900              | 1206           | 76.3%        |
| 6/2                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 39              | -               | 223               | 1900              | 1206           | 18.5%        |
| 6/3                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 39              | -               | 327               | 1900              | 1206           | 27.1%        |
| 7/1                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 731               | Inf               | Inf            | 0.0%         |
| 7/2                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 335               | Inf               | Inf            | 0.0%         |
| 7/3                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 481               | Inf               | Inf            | 0.0%         |
| 7/4                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 144               | Inf               | Inf            | 0.0%         |
| 8/1                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 11              | -               | 288               | 1900              | 362            | 79.6%        |
| 8/2                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 11              | -               | 290               | 1900              | 362            | 80.1%        |

Full Input Data And Results

|           |                                   |   |     |     |   |  |   |    |   |      |           |         |              |
|-----------|-----------------------------------|---|-----|-----|---|--|---|----|---|------|-----------|---------|--------------|
| 8/3       | Ahead                             | U | 2   | N/A | F |  | 1 | 11 | - | 67   | 1900      | 362     | 18.5%        |
| 8/4       | Ahead                             | U | 2   | N/A | F |  | 1 | 11 | - | 251  | 1900      | 362     | 69.4%        |
| 9/1       | Ahead                             | U | 2   | N/A | H |  | 1 | 43 | - | 548  | 1900      | 1327    | 41.3%        |
| 9/2       | Right Ahead                       | U | 2   | N/A | H |  | 1 | 43 | - | 774  | 1900      | 1327    | 58.3%        |
| 9/3       | Right                             | U | 2   | N/A | H |  | 1 | 43 | - | 572  | 1900      | 1327    | 43.1%        |
| 10/1      | Ahead Right                       | U | 3   | N/A | L |  | 1 | 35 | - | 368  | 1900      | 1086    | 33.9%        |
| 10/2      | Right                             | U | 3   | N/A | L |  | 1 | 35 | - | 503  | 1900      | 1086    | 46.3%        |
| 10/3      | Right                             | U | 3   | N/A | L |  | 1 | 35 | - | 815  | 1900      | 1086    | 75.1%        |
| 11/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 231  | Inf       | Inf     | 0.0%         |
| 11/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 659  | Inf       | Inf     | 0.0%         |
| 12/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 518  | Inf       | Inf     | 0.0%         |
| 13/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 827  | Inf       | Inf     | 0.0%         |
| 13/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 335  | Inf       | Inf     | 0.0%         |
| 14/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 355  | Inf       | Inf     | 0.0%         |
| 14/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 290  | Inf       | Inf     | 0.0%         |
| 15/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 691  | Inf       | Inf     | 0.0%         |
| 15/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 145  | Inf       | Inf     | 0.0%         |
| 16/1+16/2 | Blue Bell Ln Left Ahead           | O | N/A | N/A | - |  | - | -  | - | 277  | Inf : Inf | 360+360 | 38.6 : 38.3% |
| 17/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 435  | Inf       | Inf     | 0.0%         |
| 18/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 32   | Inf       | Inf     | 0.0%         |
| 18/2      | Right                             | U | N/A | N/A | - |  | - | -  | - | 847  | Inf       | Inf     | 0.0%         |
| 18/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1159 | Inf       | Inf     | 0.0%         |
| 19/1+19/2 | Industrial Park Access Ahead Left | O | N/A | N/A | - |  | - | -  | - | 87   | Inf : Inf | 268+268 | 16.1 : 16.4% |
| 20/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 42   | Inf       | Inf     | 0.0%         |
| 21/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 213  | Inf       | Inf     | 0.0%         |
| 21/2      | Right Ahead                       | U | N/A | N/A | - |  | - | -  | - | 1554 | Inf       | Inf     | 0.0%         |
| 21/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 506  | 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: Gresford Interchange</b> | -              | -             | 1327                  | 0                            | 0                           | 30.2                  | 20.5                         | 0.0                                | 50.7                | -                         | -                                | -                          | -                    |
| <b>Gresford Interchange</b>          | -              | -             | 1327                  | 0                            | 0                           | 30.2                  | 20.5                         | 0.0                                | 50.7                | -                         | -                                | -                          | -                    |
| 1/2+1/1                              | 659            | 659           | -                     | -                            | -                           | 4.1                   | 1.3                          | -                                  | 5.4                 | 29.4                      | 5.3                              | 1.3                        | 6.6                  |
| 1/3                                  | 80             | 80            | -                     | -                            | -                           | 0.4                   | 0.1                          | -                                  | 0.5                 | 23.9                      | 1.1                              | 0.1                        | 1.2                  |
| 2/2+2/1                              | 232            | 232           | 464                   | 0                            | 0                           | 0.1                   | 0.2                          | -                                  | 0.3                 | 4.6                       | 0.5                              | 0.2                        | 0.7                  |
| 2/3                                  | 135            | 135           | 135                   | 0                            | 0                           | 0.1                   | 0.2                          | -                                  | 0.3                 | 6.8                       | 0.5                              | 0.2                        | 0.7                  |
| 3/2+3/1                              | 1096           | 1096          | -                     | -                            | -                           | 5.4                   | 1.9                          | -                                  | 7.3                 | 24.0                      | 8.5                              | 1.9                        | 10.4                 |
| 3/3                                  | 547            | 547           | -                     | -                            | -                           | 2.7                   | 1.8                          | -                                  | 4.5                 | 29.8                      | 8.5                              | 1.8                        | 10.3                 |
| 4/2+4/1                              | 385            | 385           | -                     | -                            | -                           | 2.6                   | 1.3                          | -                                  | 3.9                 | 36.5                      | 4.0                              | 1.3                        | 5.3                  |
| 4/3                                  | 243            | 243           | -                     | -                            | -                           | 1.7                   | 1.3                          | -                                  | 3.0                 | 44.3                      | 4.0                              | 1.3                        | 5.3                  |
| 5/2+5/1                              | 443            | 443           | -                     | -                            | -                           | 2.2                   | 0.7                          | -                                  | 3.0                 | 24.3                      | 5.1                              | 0.7                        | 5.8                  |
| 5/3                                  | 344            | 344           | -                     | -                            | -                           | 1.8                   | 0.7                          | -                                  | 2.5                 | 26.6                      | 5.1                              | 0.7                        | 5.8                  |
| 6/1                                  | 920            | 920           | -                     | -                            | -                           | 1.8                   | 1.6                          | -                                  | 3.3                 | 13.1                      | 10.6                             | 1.6                        | 12.2                 |
| 6/2                                  | 223            | 223           | -                     | -                            | -                           | 0.2                   | 0.1                          | -                                  | 0.3                 | 4.9                       | 1.7                              | 0.1                        | 1.8                  |
| 6/3                                  | 327            | 327           | -                     | -                            | -                           | 0.5                   | 0.2                          | -                                  | 0.7                 | 7.6                       | 4.2                              | 0.2                        | 4.4                  |
| 7/1                                  | 731            | 731           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/2                                  | 335            | 335           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/3                                  | 481            | 481           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/4                                  | 144            | 144           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 8/1                                  | 288            | 288           | -                     | -                            | -                           | 1.3                   | 1.9                          | -                                  | 3.1                 | 39.0                      | 4.9                              | 1.9                        | 6.8                  |
| 8/2                                  | 290            | 290           | -                     | -                            | -                           | 1.3                   | 1.9                          | -                                  | 3.2                 | 39.7                      | 4.9                              | 1.9                        | 6.9                  |
| 8/3                                  | 67             | 67            | -                     | -                            | -                           | 0.3                   | 0.1                          | -                                  | 0.5                 | 24.7                      | 0.9                              | 0.1                        | 1.0                  |
| 8/4                                  | 251            | 251           | -                     | -                            | -                           | 1.6                   | 1.1                          | -                                  | 2.7                 | 38.7                      | 4.1                              | 1.1                        | 5.2                  |
| 9/1                                  | 548            | 548           | -                     | -                            | -                           | 0.0                   | 0.4                          | -                                  | 0.4                 | 2.3                       | 0.0                              | 0.4                        | 0.4                  |
| 9/2                                  | 774            | 774           | -                     | -                            | -                           | 0.0                   | 0.7                          | -                                  | 0.7                 | 3.3                       | 0.0                              | 0.7                        | 0.7                  |

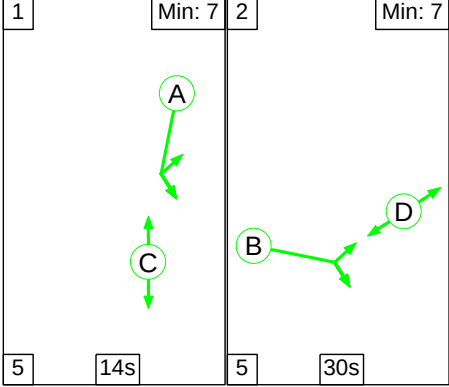
## Full Input Data And Results

|           |      |      |     |   |   |     |     |   |     |      |     |     |     |
|-----------|------|------|-----|---|---|-----|-----|---|-----|------|-----|-----|-----|
| 9/3       | 572  | 572  | -   | - | - | 0.0 | 0.4 | - | 0.4 | 2.4  | 0.0 | 0.4 | 0.4 |
| 10/1      | 368  | 368  | -   | - | - | 0.8 | 0.3 | - | 1.1 | 10.3 | 3.1 | 0.3 | 3.3 |
| 10/2      | 503  | 503  | -   | - | - | 0.6 | 0.4 | - | 1.0 | 7.5  | 4.0 | 0.4 | 4.4 |
| 10/3      | 815  | 815  | -   | - | - | 0.6 | 1.5 | - | 2.1 | 9.3  | 4.9 | 1.5 | 6.4 |
| 11/1      | 231  | 231  | -   | - | - | 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      | 518  | 518  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/1      | 827  | 827  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/2      | 335  | 335  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/1      | 355  | 355  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/2      | 290  | 290  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/1      | 691  | 691  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/2      | 145  | 145  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 16/1+16/2 | 277  | 277  | 554 | 0 | 0 | 0.1 | 0.3 | - | 0.5 | 5.9  | 1.0 | 0.3 | 1.3 |
| 17/1      | 435  | 435  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/1      | 32   | 32   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/2      | 847  | 847  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/3      | 1159 | 1159 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 19/1+19/2 | 87   | 87   | 174 | 0 | 0 | 0.0 | 0.1 | - | 0.1 | 5.0  | 0.1 | 0.1 | 0.2 |
| 20/1      | 42   | 42   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/1      | 213  | 213  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/2      | 1554 | 1554 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/3      | 506  | 506  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |

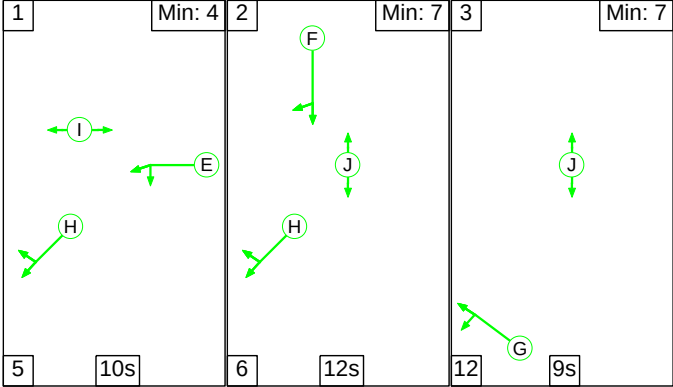
|    |           |                             |      |                                         |       |                |    |
|----|-----------|-----------------------------|------|-----------------------------------------|-------|----------------|----|
| C1 | Stream: 1 | PRC for Signalled Lanes (%) | 18.0 | Total Delay for Signalled Lanes (pcuHr) | 10.24 | Cycle Time (s) | 63 |
| C1 | Stream: 2 | PRC for Signalled Lanes (%) | 12.3 | Total Delay for Signalled Lanes (pcuHr) | 29.63 | Cycle Time (s) | 63 |
| C1 | Stream: 3 | PRC for Signalled Lanes (%) | 19.9 | Total Delay for Signalled Lanes (pcuHr) | 9.73  | Cycle Time (s) | 63 |
|    |           | PRC Over All Lanes (%)      | 12.3 | Total Delay Over All Lanes (pcuHr)      | 50.72 |                |    |

Stage Sequence Diagram

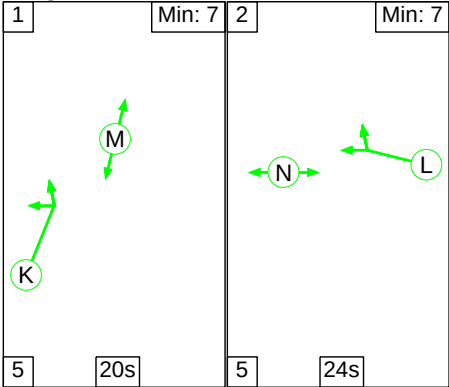
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

| Stage        | 1  | 2  |
|--------------|----|----|
| Duration     | 14 | 30 |
| Change Point | 0  | 19 |

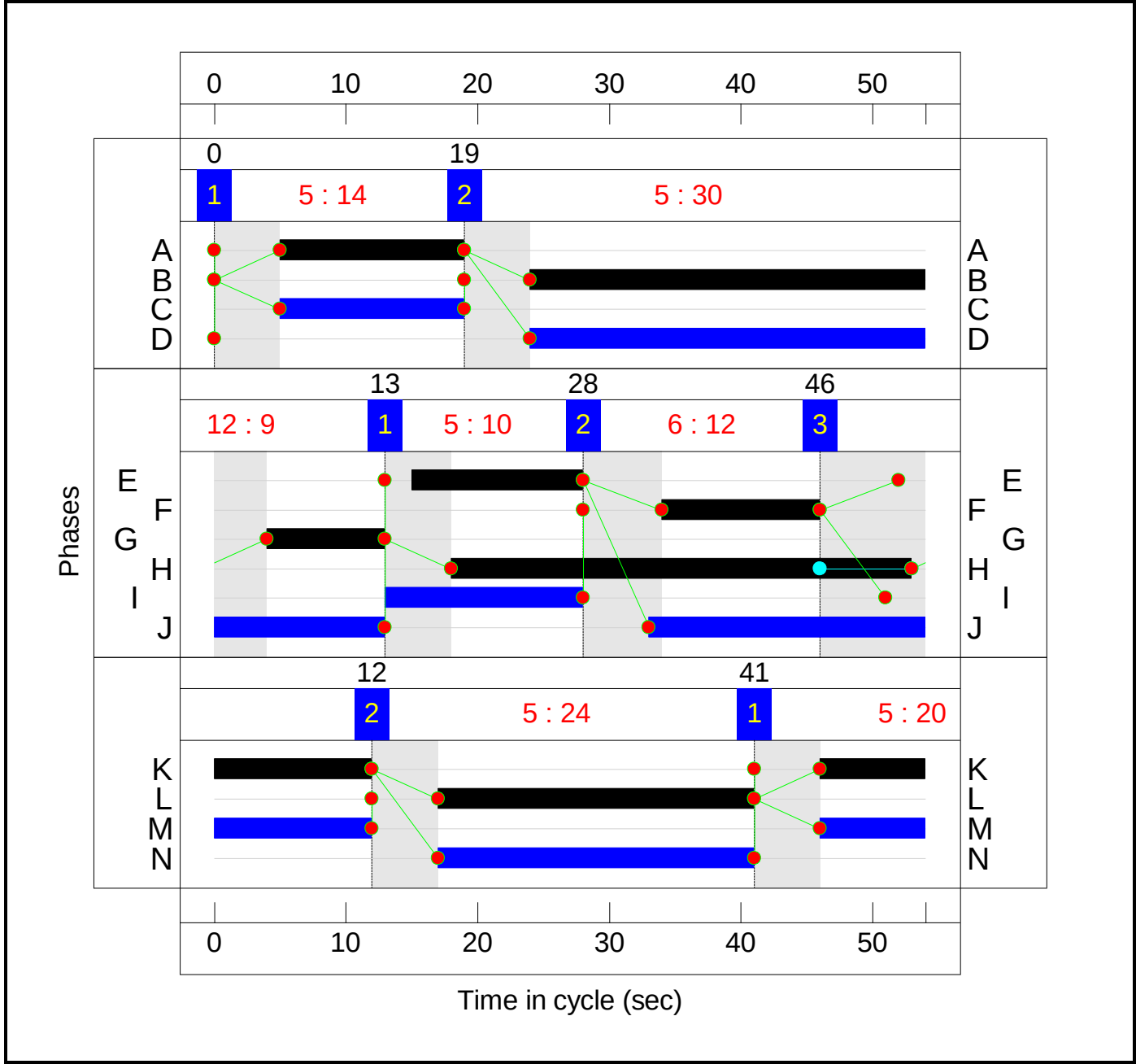
Stage Stream: 2

| Stage        | 1  | 2  | 3  |
|--------------|----|----|----|
| Duration     | 10 | 12 | 9  |
| Change Point | 13 | 28 | 46 |

Full Input Data And Results  
Stage Stream: 3

|              |    |    |
|--------------|----|----|
| Stage        | 1  | 2  |
| Duration     | 20 | 24 |
| Change Point | 41 | 12 |

Signal Timings Diagram



## Full Input Data And Results

## Network 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 (%)  |
|-------------------------------|------------------------------|-----------|-------------------|----------------------------|------------|-------------|------------|-----------------|-----------------|-------------------|-------------------|----------------|--------------|
| Network: Gresford Interchange | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 95.9%        |
| Gresford Interchange          | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 95.9%        |
| 1/2+1/1                       | A483 SB Off-slip Left U-Turn | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 1011              | 1900:1900         | 528+528        | 95.9 : 95.7% |
| 1/3                           | A483 SB Off-slip Left        | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 157               | 1900              | 528            | 29.7%        |
| 2/2+2/1                       | B5445 Ahead Left             | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 338               | Inf : Inf         | 261+261        | 69.0 : 60.6% |
| 2/3                           | B5445 Ahead                  | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 180               | Inf               | 261            | 69.0%        |
| 3/2+3/1                       | A5156 Ahead Left             | U         | 2                 | N/A                        | E          |             | 1          | 13              | -               | 786               | 1900:1900         | 493+493        | 79.8 : 79.8% |
| 3/3                           | A5156 Ahead                  | U         | 2                 | N/A                        | E          |             | 1          | 13              | -               | 393               | 1900              | 493            | 79.8%        |
| 4/2+4/1                       | A5152 Ahead Left             | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 432               | 1900:1900         | 352+220        | 75.6 : 75.6% |
| 4/3                           | A5152 Ahead                  | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 268               | 1900              | 352            | 76.2%        |
| 5/2+5/1                       | A483 NB Off-slip Left Ahead  | U         | 3                 | N/A                        | K          |             | 1          | 20              | -               | 673               | 1900:1900         | 739+187        | 72.7 : 72.7% |
| 5/3                           | A483 NB Off-slip Ahead       | U         | 3                 | N/A                        | K          |             | 1          | 20              | -               | 538               | 1900              | 739            | 72.8%        |
| 6/1                           | Right Left                   | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 1042              | 1900              | 1091           | 95.5%        |
| 6/2                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 468               | 1900              | 1091           | 42.9%        |
| 6/3                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 292               | 1900              | 1091           | 26.8%        |
| 7/1                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 1217              | Inf               | Inf            | 0.0%         |
| 7/2                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 794               | Inf               | Inf            | 0.0%         |
| 7/3                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 381               | Inf               | Inf            | 0.0%         |
| 7/4                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 248               | Inf               | Inf            | 0.0%         |
| 8/1                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 12              | -               | 217               | 1900              | 457            | 47.4%        |
| 8/2                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 12              | -               | 218               | 1900              | 457            | 47.7%        |

Full Input Data And Results

|           |                                   |   |     |     |   |  |   |    |   |      |           |         |              |
|-----------|-----------------------------------|---|-----|-----|---|--|---|----|---|------|-----------|---------|--------------|
| 8/3       | Ahead                             | U | 2   | N/A | F |  | 1 | 12 | - | 171  | 1900      | 457     | 37.4%        |
| 8/4       | Ahead                             | U | 2   | N/A | F |  | 1 | 12 | - | 383  | 1900      | 457     | 83.7%        |
| 9/1       | Ahead                             | U | 2   | N/A | H |  | 1 | 35 | - | 527  | 1900      | 1267    | 41.6%        |
| 9/2       | Right Ahead                       | U | 2   | N/A | H |  | 1 | 35 | - | 727  | 1900      | 1267    | 57.4%        |
| 9/3       | Right                             | U | 2   | N/A | H |  | 1 | 35 | - | 442  | 1900      | 1267    | 34.9%        |
| 10/1      | Ahead Right                       | U | 3   | N/A | L |  | 1 | 24 | - | 340  | 1900      | 880     | 38.7%        |
| 10/2      | Right                             | U | 3   | N/A | L |  | 1 | 24 | - | 532  | 1900      | 880     | 60.5%        |
| 10/3      | Right                             | U | 3   | N/A | L |  | 1 | 24 | - | 710  | 1900      | 880     | 80.7%        |
| 11/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 237  | Inf       | Inf     | 0.0%         |
| 11/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 635  | Inf       | Inf     | 0.0%         |
| 12/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 330  | Inf       | Inf     | 0.0%         |
| 13/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 1375 | Inf       | Inf     | 0.0%         |
| 13/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 794  | Inf       | Inf     | 0.0%         |
| 14/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 254  | Inf       | Inf     | 0.0%         |
| 14/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 218  | Inf       | Inf     | 0.0%         |
| 15/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 693  | Inf       | Inf     | 0.0%         |
| 15/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 121  | Inf       | Inf     | 0.0%         |
| 16/1+16/2 | Blue Bell Ln Left Ahead           | O | N/A | N/A | - |  | - | -  | - | 342  | Inf : Inf | 284+284 | 60.3 : 60.3% |
| 17/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 412  | Inf       | Inf     | 0.0%         |
| 18/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 64   | Inf       | Inf     | 0.0%         |
| 18/2      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1069 | Inf       | Inf     | 0.0%         |
| 18/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1248 | Inf       | Inf     | 0.0%         |
| 19/1+19/2 | Industrial Park Access Ahead Left | O | N/A | N/A | - |  | - | -  | - | 23   | Inf : Inf | 171+171 | 7.0 : 6.4%   |
| 20/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 72   | Inf       | Inf     | 0.0%         |
| 21/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 227  | Inf       | Inf     | 0.0%         |
| 21/2      | Right Ahead                       | U | N/A | N/A | - |  | - | -  | - | 1675 | Inf       | Inf     | 0.0%         |
| 21/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 749  | 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: Gresford Interchange</b> | -              | -             | 1586                  | 0                            | 0                           | 33.3                  | 37.4                         | 0.0                                | 70.8                | -                         | -                                | -                          | -                    |
| <b>Gresford Interchange</b>          | -              | -             | 1586                  | 0                            | 0                           | 33.3                  | 37.4                         | 0.0                                | 70.8                | -                         | -                                | -                          | -                    |
| 1/2+1/1                              | 1011           | 1011          | -                     | -                            | -                           | 5.4                   | 8.3                          | -                                  | 13.7                | 48.7                      | 7.4                              | 8.3                        | 15.7                 |
| 1/3                                  | 157            | 157           | -                     | -                            | -                           | 0.7                   | 0.2                          | -                                  | 0.9                 | 20.2                      | 1.8                              | 0.2                        | 2.0                  |
| 2/2+2/1                              | 338            | 338           | 676                   | 0                            | 0                           | 0.5                   | 0.9                          | -                                  | 1.4                 | 14.6                      | 2.1                              | 0.9                        | 3.1                  |
| 2/3                                  | 180            | 180           | 180                   | 0                            | 0                           | 0.3                   | 1.1                          | -                                  | 1.3                 | 27.0                      | 2.1                              | 1.1                        | 3.2                  |
| 3/2+3/1                              | 786            | 786           | -                     | -                            | -                           | 4.1                   | 1.9                          | -                                  | 6.0                 | 27.6                      | 5.5                              | 1.9                        | 7.4                  |
| 3/3                                  | 393            | 393           | -                     | -                            | -                           | 2.0                   | 1.9                          | -                                  | 3.9                 | 36.1                      | 5.5                              | 1.9                        | 7.4                  |
| 4/2+4/1                              | 432            | 432           | -                     | -                            | -                           | 2.4                   | 1.5                          | -                                  | 4.0                 | 33.0                      | 3.8                              | 1.5                        | 5.3                  |
| 4/3                                  | 268            | 268           | -                     | -                            | -                           | 1.6                   | 1.5                          | -                                  | 3.1                 | 41.6                      | 3.8                              | 1.5                        | 5.3                  |
| 5/2+5/1                              | 673            | 673           | -                     | -                            | -                           | 2.5                   | 1.3                          | -                                  | 3.8                 | 20.5                      | 6.9                              | 1.3                        | 8.2                  |
| 5/3                                  | 538            | 538           | -                     | -                            | -                           | 2.1                   | 1.3                          | -                                  | 3.4                 | 22.9                      | 6.9                              | 1.3                        | 8.2                  |
| 6/1                                  | 1042           | 1042          | -                     | -                            | -                           | 3.0                   | 8.0                          | -                                  | 11.0                | 38.0                      | 14.9                             | 8.0                        | 23.0                 |
| 6/2                                  | 468            | 468           | -                     | -                            | -                           | 0.7                   | 0.4                          | -                                  | 1.1                 | 8.4                       | 5.0                              | 0.4                        | 5.3                  |
| 6/3                                  | 292            | 292           | -                     | -                            | -                           | 0.5                   | 0.2                          | -                                  | 0.6                 | 7.9                       | 2.9                              | 0.2                        | 3.1                  |
| 7/1                                  | 1217           | 1217          | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/2                                  | 794            | 794           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/3                                  | 381            | 381           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/4                                  | 248            | 248           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 8/1                                  | 217            | 217           | -                     | -                            | -                           | 0.6                   | 0.4                          | -                                  | 1.0                 | 17.0                      | 2.2                              | 0.4                        | 2.7                  |
| 8/2                                  | 218            | 218           | -                     | -                            | -                           | 0.6                   | 0.5                          | -                                  | 1.0                 | 17.1                      | 2.2                              | 0.5                        | 2.7                  |
| 8/3                                  | 171            | 171           | -                     | -                            | -                           | 0.9                   | 0.3                          | -                                  | 1.2                 | 24.7                      | 2.2                              | 0.3                        | 2.5                  |
| 8/4                                  | 383            | 383           | -                     | -                            | -                           | 2.2                   | 2.4                          | -                                  | 4.6                 | 43.2                      | 5.6                              | 2.4                        | 8.1                  |
| 9/1                                  | 527            | 527           | -                     | -                            | -                           | 0.0                   | 0.4                          | -                                  | 0.4                 | 2.5                       | 0.0                              | 0.4                        | 0.4                  |
| 9/2                                  | 727            | 727           | -                     | -                            | -                           | 0.0                   | 0.7                          | -                                  | 0.7                 | 3.4                       | 0.0                              | 0.7                        | 0.7                  |

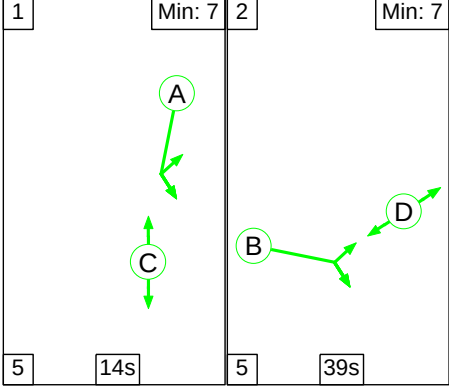
## Full Input Data And Results

|                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |      |     |   |   |     |     |   |     |      |     |     |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----|---|---|-----|-----|---|-----|------|-----|-----|-----|
| 9/3                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 442  | 442  | -   | - | - | 0.0 | 0.3 | - | 0.3 | 2.2  | 0.0 | 0.3 | 0.3 |
| 10/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 340  | 340  | -   | - | - | 1.1 | 0.3 | - | 1.4 | 15.2 | 3.6 | 0.3 | 3.9 |
| 10/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 532  | 532  | -   | - | - | 1.1 | 0.8 | - | 1.8 | 12.3 | 5.2 | 0.8 | 5.9 |
| 10/3                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 710  | 710  | -   | - | - | 0.9 | 2.0 | - | 2.9 | 14.8 | 5.1 | 2.0 | 7.1 |
| 11/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 237  | 237  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 11/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 635  | 635  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 12/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 330  | 330  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1375 | 1375 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 794  | 794  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 254  | 254  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 218  | 218  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 693  | 693  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 121  | 121  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 16/1+16/2                                                                                                                                                                                                                                                                                                                                                                                                                                             | 342  | 342  | 684 | 0 | 0 | 0.4 | 0.8 | - | 1.1 | 11.9 | 1.1 | 0.8 | 1.8 |
| 17/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 412  | 412  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 64   | 64   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1069 | 1069 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/3                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1248 | 1248 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 19/1+19/2                                                                                                                                                                                                                                                                                                                                                                                                                                             | 23   | 23   | 46  | 0 | 0 | 0.0 | 0.0 | - | 0.0 | 7.4  | 0.0 | 0.0 | 0.1 |
| 20/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 72   | 72   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 227  | 227  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1675 | 1675 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/3                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 749  | 749  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| C1 Stream: 1 PRC for Signalled Lanes (%): -6.5<br>C1 Stream: 2 PRC for Signalled Lanes (%): 7.5<br>C1 Stream: 3 PRC for Signalled Lanes (%): 11.5<br>PRC Over All Lanes (%): -6.5<br>Total Delay for Signalled Lanes (pcuHr): 27.29<br>Total Delay for Signalled Lanes (pcuHr): 26.16<br>Total Delay for Signalled Lanes (pcuHr): 13.43<br>Total Delay Over All Lanes(pcuHr): 70.78<br>Cycle Time (s): 54<br>Cycle Time (s): 54<br>Cycle Time (s): 54 |      |      |     |   |   |     |     |   |     |      |     |     |     |

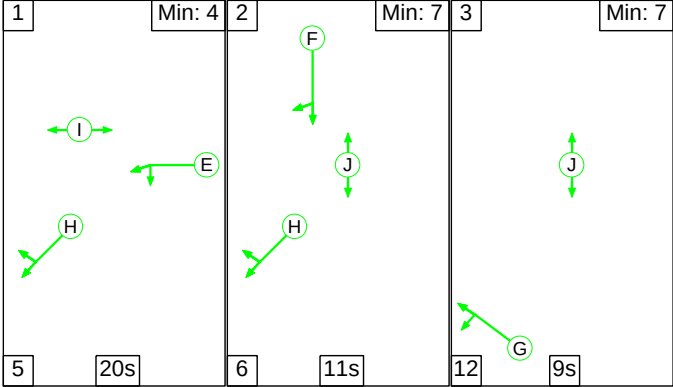


Stage Sequence Diagram

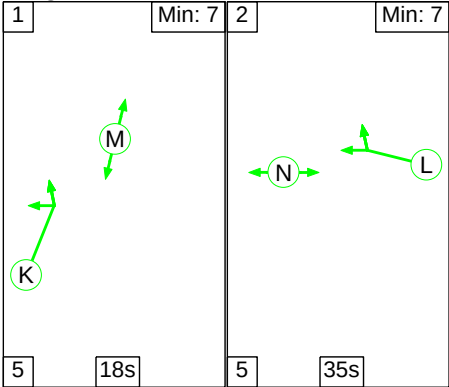
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

| Stage        | 1  | 2  |
|--------------|----|----|
| Duration     | 14 | 39 |
| Change Point | 0  | 19 |

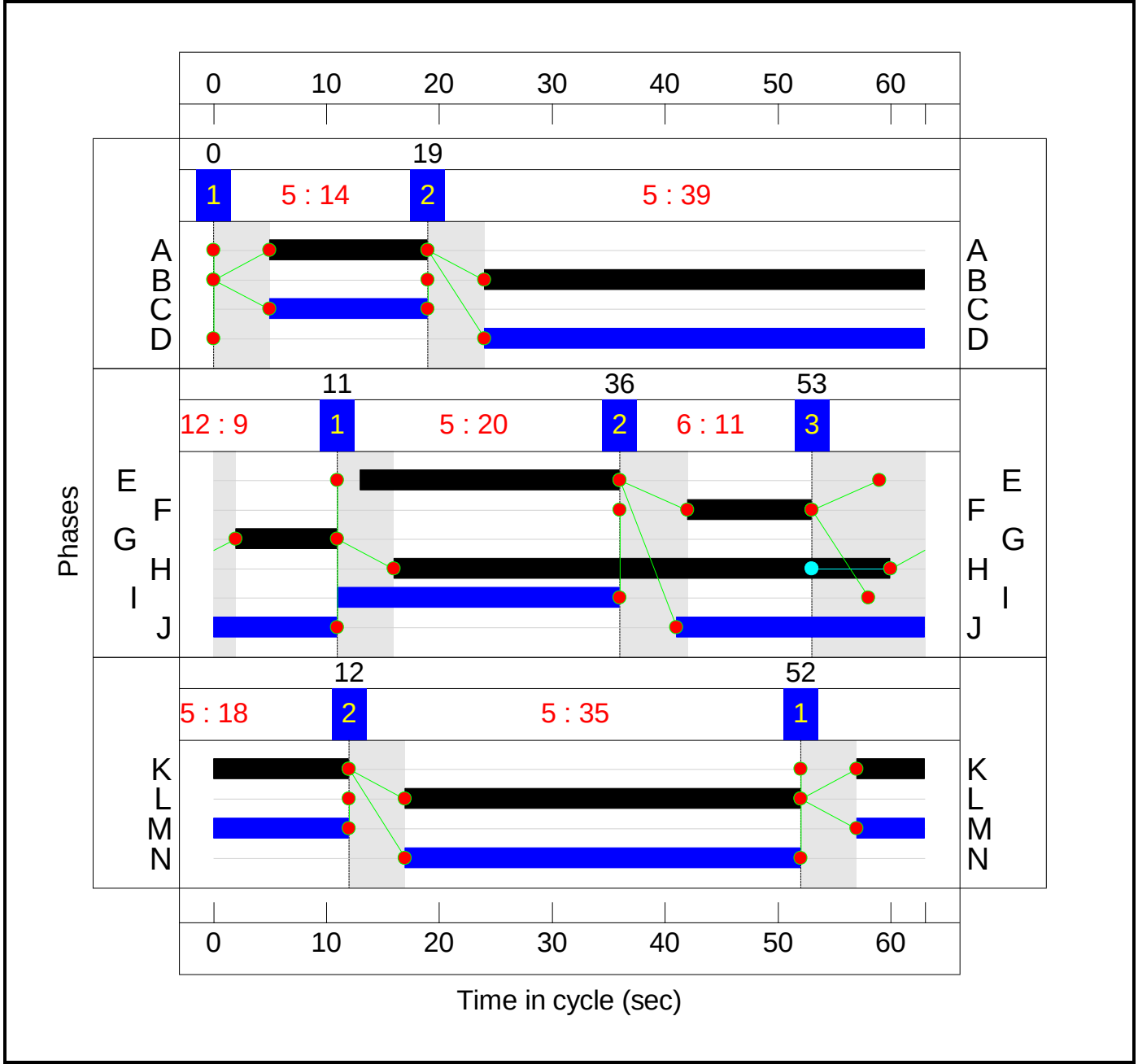
Stage Stream: 2

| Stage        | 1  | 2  | 3  |
|--------------|----|----|----|
| Duration     | 20 | 11 | 9  |
| Change Point | 11 | 36 | 53 |

Full Input Data And Results  
Stage Stream: 3

|              |    |    |
|--------------|----|----|
| Stage        | 1  | 2  |
| Duration     | 18 | 35 |
| Change Point | 52 | 12 |

Signal Timings Diagram



## Full Input Data And Results

## Network 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 (%)  |
|-------------------------------|------------------------------|-----------|-------------------|----------------------------|------------|-------------|------------|-----------------|-----------------|-------------------|-------------------|----------------|--------------|
| Network: Gresford Interchange | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 83.7%        |
| Gresford Interchange          | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 83.7%        |
| 1/2+1/1                       | A483 SB Off-slip Left U-Turn | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 708               | 1900:1900         | 452+452        | 78.3 : 78.3% |
| 1/3                           | A483 SB Off-slip Left        | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 82                | 1900              | 452            | 18.1%        |
| 2/2+2/1                       | B5445 Ahead Left             | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 237               | Inf : Inf         | 452+319        | 30.7 : 30.7% |
| 2/3                           | B5445 Ahead                  | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 139               | Inf               | 452            | 30.7%        |
| 3/2+3/1                       | A5156 Ahead Left             | U         | 2                 | N/A                        | E          |             | 1          | 23              | -               | 1211              | 1900:1900         | 724+724        | 83.6 : 83.7% |
| 3/3                           | A5156 Ahead                  | U         | 2                 | N/A                        | E          |             | 1          | 23              | -               | 606               | 1900              | 724            | 83.7%        |
| 4/2+4/1                       | A5152 Ahead Left             | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 393               | 1900:1900         | 302+178        | 81.9 : 81.9% |
| 4/3                           | A5152 Ahead                  | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 248               | 1900              | 302            | 82.2%        |
| 5/2+5/1                       | A483 NB Off-slip Left Ahead  | U         | 3                 | N/A                        | K          |             | 1          | 18              | -               | 473               | 1900:1900         | 573+156        | 64.9 : 64.9% |
| 5/3                           | A483 NB Off-slip Ahead       | U         | 3                 | N/A                        | K          |             | 1          | 18              | -               | 372               | 1900              | 573            | 64.9%        |
| 6/1                           | Right Left                   | U         | 1                 | N/A                        | B          |             | 1          | 39              | -               | 966               | 1900              | 1206           | 80.1%        |
| 6/2                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 39              | -               | 252               | 1900              | 1206           | 20.9%        |
| 6/3                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 39              | -               | 333               | 1900              | 1206           | 27.6%        |
| 7/1                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 791               | Inf               | Inf            | 0.0%         |
| 7/2                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 383               | Inf               | Inf            | 0.0%         |
| 7/3                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 491               | Inf               | Inf            | 0.0%         |
| 7/4                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 147               | Inf               | Inf            | 0.0%         |
| 8/1                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 11              | -               | 294               | 1900              | 362            | 81.2%        |
| 8/2                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 11              | -               | 296               | 1900              | 362            | 81.8%        |

Full Input Data And Results

|           |                                   |   |     |     |   |  |   |    |   |      |           |         |              |
|-----------|-----------------------------------|---|-----|-----|---|--|---|----|---|------|-----------|---------|--------------|
| 8/3       | Ahead                             | U | 2   | N/A | F |  | 1 | 11 | - | 69   | 1900      | 362     | 19.1%        |
| 8/4       | Ahead                             | U | 2   | N/A | F |  | 1 | 11 | - | 257  | 1900      | 362     | 71.0%        |
| 9/1       | Ahead                             | U | 2   | N/A | H |  | 1 | 44 | - | 606  | 1900      | 1357    | 44.7%        |
| 9/2       | Right Ahead                       | U | 2   | N/A | H |  | 1 | 44 | - | 837  | 1900      | 1357    | 61.7%        |
| 9/3       | Right                             | U | 2   | N/A | H |  | 1 | 44 | - | 631  | 1900      | 1357    | 46.5%        |
| 10/1      | Ahead Right                       | U | 3   | N/A | L |  | 1 | 35 | - | 396  | 1900      | 1086    | 36.5%        |
| 10/2      | Right                             | U | 3   | N/A | L |  | 1 | 35 | - | 512  | 1900      | 1086    | 47.2%        |
| 10/3      | Right                             | U | 3   | N/A | L |  | 1 | 35 | - | 879  | 1900      | 1086    | 81.0%        |
| 11/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 238  | Inf       | Inf     | 0.0%         |
| 11/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 715  | Inf       | Inf     | 0.0%         |
| 12/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 529  | Inf       | Inf     | 0.0%         |
| 13/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 889  | Inf       | Inf     | 0.0%         |
| 13/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 383  | Inf       | Inf     | 0.0%         |
| 14/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 363  | Inf       | Inf     | 0.0%         |
| 14/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 296  | Inf       | Inf     | 0.0%         |
| 15/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 752  | Inf       | Inf     | 0.0%         |
| 15/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 176  | Inf       | Inf     | 0.0%         |
| 16/1+16/2 | Blue Bell Ln Left Ahead           | O | N/A | N/A | - |  | - | -  | - | 292  | Inf : Inf | 323+323 | 45.2 : 45.2% |
| 17/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 465  | Inf       | Inf     | 0.0%         |
| 18/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 32   | Inf       | Inf     | 0.0%         |
| 18/2      | Right                             | U | N/A | N/A | - |  | - | -  | - | 884  | Inf       | Inf     | 0.0%         |
| 18/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1251 | Inf       | Inf     | 0.0%         |
| 19/1+19/2 | Industrial Park Access Ahead Left | O | N/A | N/A | - |  | - | -  | - | 87   | Inf : Inf | 225+225 | 19.1 : 19.5% |
| 20/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 42   | Inf       | Inf     | 0.0%         |
| 21/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 220  | Inf       | Inf     | 0.0%         |
| 21/2      | Right Ahead                       | U | N/A | N/A | - |  | - | -  | - | 1656 | Inf       | Inf     | 0.0%         |
| 21/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 541  | Inf       | Inf     | 0.0%         |

## Full Input Data And Results

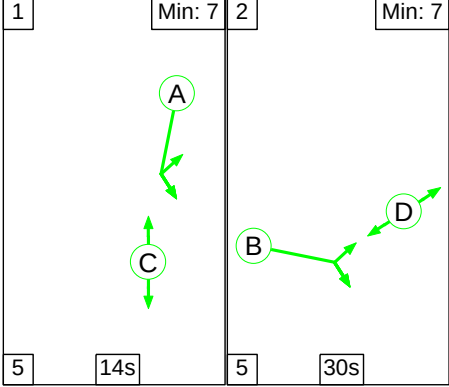
| Item                                 | Arriving (pcu) | Leaving (pcu) | Turners In Gaps (pcu) | Turners When Unopposed (pcu) | Turners In Intergreen (pcu) | Uniform Delay (pcuHr) | Rand + Oversat Delay (pcuHr) | Storage Area Uniform Delay (pcuHr) | Total Delay (pcuHr) | Av. Delay Per PCU (s/pcu) | Max. Back of Uniform Queue (pcu) | Rand + Oversat Queue (pcu) | Mean Max Queue (pcu) |
|--------------------------------------|----------------|---------------|-----------------------|------------------------------|-----------------------------|-----------------------|------------------------------|------------------------------------|---------------------|---------------------------|----------------------------------|----------------------------|----------------------|
| <b>Network: Gresford Interchange</b> | -              | -             | 1371                  | 0                            | 0                           | 32.6                  | 26.2                         | 0.0                                | 58.8                | -                         | -                                | -                          | -                    |
| <b>Gresford Interchange</b>          | -              | -             | 1371                  | 0                            | 0                           | 32.6                  | 26.2                         | 0.0                                | 58.8                | -                         | -                                | -                          | -                    |
| 1/2+1/1                              | 708            | 708           | -                     | -                            | -                           | 4.4                   | 1.8                          | -                                  | 6.2                 | 31.5                      | 5.7                              | 1.8                        | 7.5                  |
| 1/3                                  | 82             | 82            | -                     | -                            | -                           | 0.4                   | 0.1                          | -                                  | 0.5                 | 24.0                      | 1.1                              | 0.1                        | 1.2                  |
| 2/2+2/1                              | 237            | 237           | 474                   | 0                            | 0                           | 0.1                   | 0.2                          | -                                  | 0.3                 | 5.2                       | 0.5                              | 0.2                        | 0.8                  |
| 2/3                                  | 139            | 139           | 139                   | 0                            | 0                           | 0.1                   | 0.2                          | -                                  | 0.3                 | 7.7                       | 0.5                              | 0.2                        | 0.8                  |
| 3/2+3/1                              | 1211           | 1211          | -                     | -                            | -                           | 6.0                   | 2.5                          | -                                  | 8.5                 | 25.2                      | 9.6                              | 2.5                        | 12.1                 |
| 3/3                                  | 606            | 606           | -                     | -                            | -                           | 3.0                   | 2.5                          | -                                  | 5.5                 | 32.4                      | 9.6                              | 2.5                        | 12.1                 |
| 4/2+4/1                              | 393            | 393           | -                     | -                            | -                           | 2.7                   | 2.2                          | -                                  | 4.9                 | 44.8                      | 4.1                              | 2.2                        | 6.3                  |
| 4/3                                  | 248            | 248           | -                     | -                            | -                           | 1.8                   | 2.1                          | -                                  | 3.9                 | 56.7                      | 4.1                              | 2.1                        | 6.3                  |
| 5/2+5/1                              | 473            | 473           | -                     | -                            | -                           | 2.4                   | 0.9                          | -                                  | 3.3                 | 25.5                      | 5.6                              | 0.9                        | 6.5                  |
| 5/3                                  | 372            | 372           | -                     | -                            | -                           | 2.0                   | 0.9                          | -                                  | 2.9                 | 28.0                      | 5.6                              | 0.9                        | 6.5                  |
| 6/1                                  | 966            | 966           | -                     | -                            | -                           | 2.1                   | 2.0                          | -                                  | 4.1                 | 15.1                      | 12.8                             | 2.0                        | 14.7                 |
| 6/2                                  | 252            | 252           | -                     | -                            | -                           | 0.2                   | 0.1                          | -                                  | 0.4                 | 5.1                       | 2.1                              | 0.1                        | 2.3                  |
| 6/3                                  | 333            | 333           | -                     | -                            | -                           | 0.5                   | 0.2                          | -                                  | 0.7                 | 7.6                       | 4.3                              | 0.2                        | 4.5                  |
| 7/1                                  | 791            | 791           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/2                                  | 383            | 383           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/3                                  | 491            | 491           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/4                                  | 147            | 147           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 8/1                                  | 294            | 294           | -                     | -                            | -                           | 1.3                   | 2.0                          | -                                  | 3.4                 | 41.2                      | 5.0                              | 2.0                        | 7.1                  |
| 8/2                                  | 296            | 296           | -                     | -                            | -                           | 1.3                   | 2.1                          | -                                  | 3.5                 | 42.0                      | 5.1                              | 2.1                        | 7.2                  |
| 8/3                                  | 69             | 69            | -                     | -                            | -                           | 0.3                   | 0.1                          | -                                  | 0.5                 | 24.3                      | 0.9                              | 0.1                        | 1.0                  |
| 8/4                                  | 257            | 257           | -                     | -                            | -                           | 1.6                   | 1.2                          | -                                  | 2.8                 | 39.7                      | 4.3                              | 1.2                        | 5.5                  |
| 9/1                                  | 606            | 606           | -                     | -                            | -                           | 0.0                   | 0.4                          | -                                  | 0.4                 | 2.4                       | 0.0                              | 0.4                        | 0.4                  |
| 9/2                                  | 837            | 837           | -                     | -                            | -                           | 0.0                   | 0.8                          | -                                  | 0.8                 | 3.5                       | 0.0                              | 0.8                        | 0.8                  |

## Full Input Data And Results

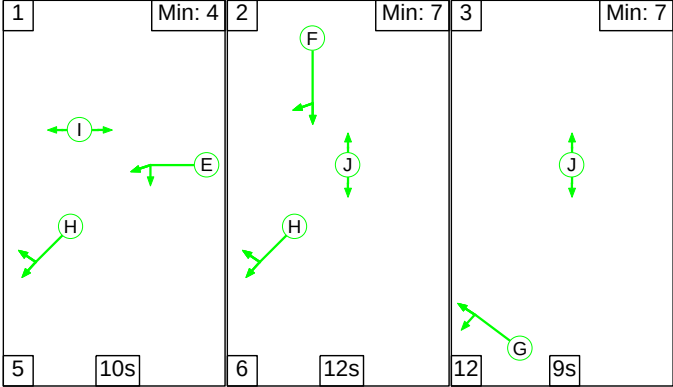
|                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |      |     |   |   |     |     |   |     |      |     |     |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----|---|---|-----|-----|---|-----|------|-----|-----|-----|
| 9/3                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 631  | 631  | -   | - | - | 0.0 | 0.4 | - | 0.4 | 2.5  | 0.0 | 0.4 | 0.4 |
| 10/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 396  | 396  | -   | - | - | 0.8 | 0.3 | - | 1.1 | 9.8  | 3.2 | 0.3 | 3.5 |
| 10/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 512  | 512  | -   | - | - | 0.6 | 0.4 | - | 1.0 | 7.3  | 4.1 | 0.4 | 4.6 |
| 10/3                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 879  | 879  | -   | - | - | 0.6 | 2.1 | - | 2.7 | 11.0 | 5.3 | 2.1 | 7.4 |
| 11/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 238  | 238  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 11/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 715  | 715  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 12/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 529  | 529  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 889  | 889  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 383  | 383  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 363  | 363  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 296  | 296  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 752  | 752  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 176  | 176  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 16/1+16/2                                                                                                                                                                                                                                                                                                                                                                                                                                            | 292  | 292  | 584 | 0 | 0 | 0.2 | 0.4 | - | 0.6 | 7.8  | 1.2 | 0.4 | 1.6 |
| 17/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 465  | 465  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 32   | 32   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 884  | 884  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/3                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1251 | 1251 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 19/1+19/2                                                                                                                                                                                                                                                                                                                                                                                                                                            | 87   | 87   | 174 | 0 | 0 | 0.0 | 0.1 | - | 0.1 | 6.2  | 0.1 | 0.1 | 0.2 |
| 20/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 42   | 42   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 220  | 220  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1656 | 1656 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/3                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 541  | 541  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| C1 Stream: 1 PRC for Signalled Lanes (%): 12.4<br>C1 Stream: 2 PRC for Signalled Lanes (%): 7.5<br>C1 Stream: 3 PRC for Signalled Lanes (%): 11.2<br>PRC Over All Lanes (%): 7.5<br>Total Delay for Signalled Lanes (pcuHr): 11.85<br>Total Delay for Signalled Lanes (pcuHr): 34.49<br>Total Delay for Signalled Lanes (pcuHr): 11.04<br>Total Delay Over All Lanes(pcuHr): 58.81<br>Cycle Time (s): 63<br>Cycle Time (s): 63<br>Cycle Time (s): 63 |      |      |     |   |   |     |     |   |     |      |     |     |     |

Stage Sequence Diagram

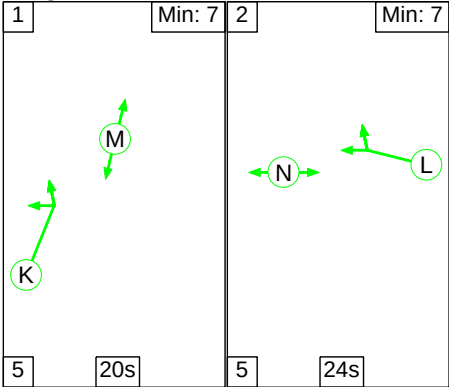
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

| Stage        | 1  | 2  |
|--------------|----|----|
| Duration     | 14 | 30 |
| Change Point | 0  | 19 |

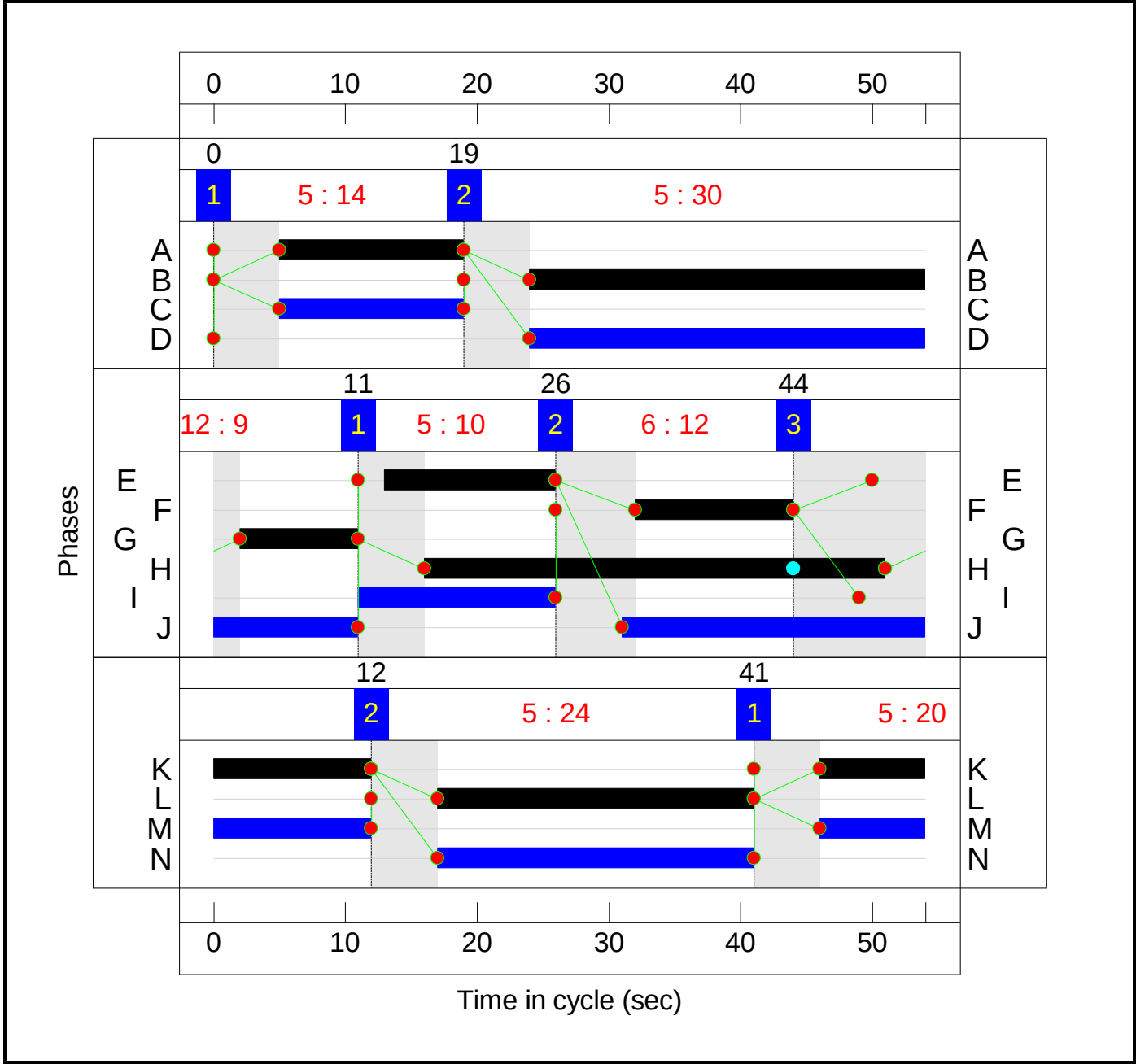
Stage Stream: 2

| Stage        | 1  | 2  | 3  |
|--------------|----|----|----|
| Duration     | 10 | 12 | 9  |
| Change Point | 11 | 26 | 44 |

Full Input Data And Results  
Stage Stream: 3

|              |    |    |
|--------------|----|----|
| Stage        | 1  | 2  |
| Duration     | 20 | 24 |
| Change Point | 41 | 12 |

Signal Timings Diagram





## Full Input Data And Results

## Network 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 (%)  |
|-------------------------------|------------------------------|-----------|-------------------|----------------------------|------------|-------------|------------|-----------------|-----------------|-------------------|-------------------|----------------|--------------|
| Network: Gresford Interchange | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 97.8%        |
| Gresford Interchange          | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 97.8%        |
| 1/2+1/1                       | A483 SB Off-slip Left U-Turn | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 1032              | 1900:1900         | 528+528        | 97.8 : 97.8% |
| 1/3                           | A483 SB Off-slip Left        | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 160               | 1900              | 528            | 30.3%        |
| 2/2+2/1                       | B5445 Ahead Left             | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 344               | Inf : Inf         | 255+255        | 71.9 : 63.2% |
| 2/3                           | B5445 Ahead                  | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 183               | Inf               | 255            | 71.9%        |
| 3/2+3/1                       | A5156 Ahead Left             | U         | 2                 | N/A                        | E          |             | 1          | 13              | -               | 801               | 1900:1900         | 493+493        | 81.2 : 81.4% |
| 3/3                           | A5156 Ahead                  | U         | 2                 | N/A                        | E          |             | 1          | 13              | -               | 401               | 1900              | 493            | 81.4%        |
| 4/2+4/1                       | A5152 Ahead Left             | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 441               | 1900:1900         | 352+219        | 77.3 : 77.3% |
| 4/3                           | A5152 Ahead                  | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 271               | 1900              | 352            | 77.0%        |
| 5/2+5/1                       | A483 NB Off-slip Left Ahead  | U         | 3                 | N/A                        | K          |             | 1          | 20              | -               | 687               | 1900:1900         | 739+187        | 74.2 : 74.2% |
| 5/3                           | A483 NB Off-slip Ahead       | U         | 3                 | N/A                        | K          |             | 1          | 20              | -               | 548               | 1900              | 739            | 74.2%        |
| 6/1                           | Right Left                   | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 1062              | 1900              | 1091           | 97.4%        |
| 6/2                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 477               | 1900              | 1091           | 43.7%        |
| 6/3                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 296               | 1900              | 1091           | 27.1%        |
| 7/1                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 1242              | Inf               | Inf            | 0.0%         |
| 7/2                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 810               | Inf               | Inf            | 0.0%         |
| 7/3                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 387               | Inf               | Inf            | 0.0%         |
| 7/4                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 252               | Inf               | Inf            | 0.0%         |
| 8/1                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 12              | -               | 219               | 1900              | 457            | 47.9%        |
| 8/2                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 12              | -               | 223               | 1900              | 457            | 48.8%        |

Full Input Data And Results

|           |                                   |   |     |     |   |  |   |    |   |      |           |         |              |
|-----------|-----------------------------------|---|-----|-----|---|--|---|----|---|------|-----------|---------|--------------|
| 8/3       | Ahead                             | U | 2   | N/A | F |  | 1 | 12 | - | 174  | 1900      | 457     | 38.0%        |
| 8/4       | Ahead                             | U | 2   | N/A | F |  | 1 | 12 | - | 389  | 1900      | 457     | 85.0%        |
| 9/1       | Ahead                             | U | 2   | N/A | H |  | 1 | 35 | - | 538  | 1900      | 1267    | 42.5%        |
| 9/2       | Right Ahead                       | U | 2   | N/A | H |  | 1 | 35 | - | 739  | 1900      | 1267    | 58.3%        |
| 9/3       | Right                             | U | 2   | N/A | H |  | 1 | 35 | - | 451  | 1900      | 1267    | 35.6%        |
| 10/1      | Ahead Right                       | U | 3   | N/A | L |  | 1 | 24 | - | 346  | 1900      | 880     | 39.3%        |
| 10/2      | Right                             | U | 3   | N/A | L |  | 1 | 24 | - | 545  | 1900      | 880     | 62.0%        |
| 10/3      | Right                             | U | 3   | N/A | L |  | 1 | 24 | - | 722  | 1900      | 880     | 82.1%        |
| 11/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 242  | Inf       | Inf     | 0.0%         |
| 11/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 648  | Inf       | Inf     | 0.0%         |
| 12/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 336  | Inf       | Inf     | 0.0%         |
| 13/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 1403 | Inf       | Inf     | 0.0%         |
| 13/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 810  | Inf       | Inf     | 0.0%         |
| 14/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 256  | Inf       | Inf     | 0.0%         |
| 14/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 223  | Inf       | Inf     | 0.0%         |
| 15/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 707  | Inf       | Inf     | 0.0%         |
| 15/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 120  | Inf       | Inf     | 0.0%         |
| 16/1+16/2 | Blue Bell Ln Left Ahead           | O | N/A | N/A | - |  | - | -  | - | 347  | Inf : Inf | 272+272 | 63.7 : 64.1% |
| 17/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 418  | Inf       | Inf     | 0.0%         |
| 18/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 67   | Inf       | Inf     | 0.0%         |
| 18/2      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1093 | Inf       | Inf     | 0.0%         |
| 18/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1270 | Inf       | Inf     | 0.0%         |
| 19/1+19/2 | Industrial Park Access Ahead Left | O | N/A | N/A | - |  | - | -  | - | 23   | Inf : Inf | 158+158 | 7.6 : 6.9%   |
| 20/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 75   | Inf       | Inf     | 0.0%         |
| 21/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 232  | Inf       | Inf     | 0.0%         |
| 21/2      | Right Ahead                       | U | N/A | N/A | - |  | - | -  | - | 1708 | Inf       | Inf     | 0.0%         |
| 21/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 762  | 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: Gresford Interchange</b> | -              | -             | 1611                  | 0                            | 0                           | 34.5                  | 44.7                         | 0.0                                | 79.2                | -                         | -                                | -                          | -                    |
| <b>Gresford Interchange</b>          | -              | -             | 1611                  | 0                            | 0                           | 34.5                  | 44.7                         | 0.0                                | 79.2                | -                         | -                                | -                          | -                    |
| 1/2+1/1                              | 1032           | 1032          | -                     | -                            | -                           | 5.5                   | 11.2                         | -                                  | 16.8                | 58.5                      | 7.6                              | 11.2                       | 18.8                 |
| 1/3                                  | 160            | 160           | -                     | -                            | -                           | 0.7                   | 0.2                          | -                                  | 0.9                 | 20.3                      | 1.9                              | 0.2                        | 2.1                  |
| 2/2+2/1                              | 344            | 344           | 688                   | 0                            | 0                           | 0.5                   | 1.0                          | -                                  | 1.6                 | 16.5                      | 2.3                              | 1.0                        | 3.4                  |
| 2/3                                  | 183            | 183           | 183                   | 0                            | 0                           | 0.3                   | 1.2                          | -                                  | 1.6                 | 30.7                      | 2.3                              | 1.2                        | 3.6                  |
| 3/2+3/1                              | 801            | 801           | -                     | -                            | -                           | 4.2                   | 2.1                          | -                                  | 6.3                 | 28.3                      | 5.6                              | 2.1                        | 7.7                  |
| 3/3                                  | 401            | 401           | -                     | -                            | -                           | 2.1                   | 2.1                          | -                                  | 4.2                 | 37.6                      | 5.6                              | 2.1                        | 7.7                  |
| 4/2+4/1                              | 441            | 441           | -                     | -                            | -                           | 2.5                   | 1.7                          | -                                  | 4.2                 | 34.0                      | 3.9                              | 1.7                        | 5.5                  |
| 4/3                                  | 271            | 271           | -                     | -                            | -                           | 1.6                   | 1.6                          | -                                  | 3.2                 | 42.3                      | 3.8                              | 1.6                        | 5.5                  |
| 5/2+5/1                              | 687            | 687           | -                     | -                            | -                           | 2.6                   | 1.4                          | -                                  | 4.0                 | 20.9                      | 7.0                              | 1.4                        | 8.4                  |
| 5/3                                  | 548            | 548           | -                     | -                            | -                           | 2.2                   | 1.4                          | -                                  | 3.6                 | 23.5                      | 7.0                              | 1.4                        | 8.4                  |
| 6/1                                  | 1062           | 1062          | -                     | -                            | -                           | 3.1                   | 10.6                         | -                                  | 13.7                | 46.4                      | 15.5                             | 10.6                       | 26.1                 |
| 6/2                                  | 477            | 477           | -                     | -                            | -                           | 0.8                   | 0.4                          | -                                  | 1.1                 | 8.6                       | 5.1                              | 0.4                        | 5.5                  |
| 6/3                                  | 296            | 296           | -                     | -                            | -                           | 0.5                   | 0.2                          | -                                  | 0.7                 | 8.5                       | 3.2                              | 0.2                        | 3.4                  |
| 7/1                                  | 1242           | 1242          | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/2                                  | 810            | 810           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/3                                  | 387            | 387           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/4                                  | 252            | 252           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 8/1                                  | 219            | 219           | -                     | -                            | -                           | 0.6                   | 0.5                          | -                                  | 1.1                 | 17.5                      | 2.0                              | 0.5                        | 2.5                  |
| 8/2                                  | 223            | 223           | -                     | -                            | -                           | 0.6                   | 0.5                          | -                                  | 1.1                 | 17.7                      | 2.1                              | 0.5                        | 2.6                  |
| 8/3                                  | 174            | 174           | -                     | -                            | -                           | 0.9                   | 0.3                          | -                                  | 1.2                 | 24.0                      | 1.9                              | 0.3                        | 2.2                  |
| 8/4                                  | 389            | 389           | -                     | -                            | -                           | 2.1                   | 2.6                          | -                                  | 4.7                 | 43.6                      | 5.7                              | 2.6                        | 8.4                  |
| 9/1                                  | 538            | 538           | -                     | -                            | -                           | 0.0                   | 0.4                          | -                                  | 0.4                 | 2.5                       | 0.0                              | 0.4                        | 0.4                  |
| 9/2                                  | 739            | 739           | -                     | -                            | -                           | 0.0                   | 0.7                          | -                                  | 0.7                 | 3.5                       | 0.0                              | 0.7                        | 0.7                  |

## Full Input Data And Results

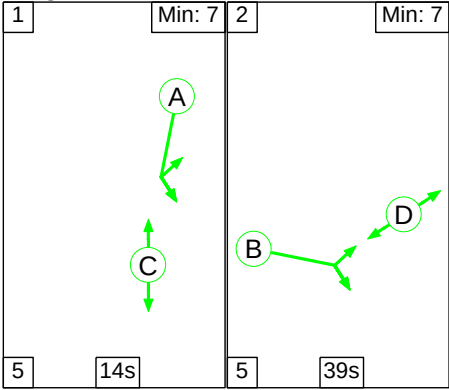
|           |      |      |     |   |   |     |     |   |     |      |     |     |     |
|-----------|------|------|-----|---|---|-----|-----|---|-----|------|-----|-----|-----|
| 9/3       | 451  | 451  | -   | - | - | 0.0 | 0.3 | - | 0.3 | 2.2  | 0.0 | 0.3 | 0.3 |
| 10/1      | 346  | 346  | -   | - | - | 1.2 | 0.3 | - | 1.5 | 15.8 | 3.5 | 0.3 | 3.9 |
| 10/2      | 545  | 545  | -   | - | - | 1.1 | 0.8 | - | 2.0 | 12.9 | 5.3 | 0.8 | 6.1 |
| 10/3      | 722  | 722  | -   | - | - | 0.9 | 2.2 | - | 3.1 | 15.7 | 5.5 | 2.2 | 7.7 |
| 11/1      | 242  | 242  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 11/2      | 648  | 648  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 12/1      | 336  | 336  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/1      | 1403 | 1403 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/2      | 810  | 810  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/1      | 256  | 256  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/2      | 223  | 223  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/1      | 707  | 707  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/2      | 120  | 120  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 16/1+16/2 | 347  | 347  | 694 | 0 | 0 | 0.5 | 0.9 | - | 1.4 | 14.7 | 1.2 | 0.9 | 2.0 |
| 17/1      | 418  | 418  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/1      | 67   | 67   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/2      | 1093 | 1093 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/3      | 1270 | 1270 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 19/1+19/2 | 23   | 23   | 46  | 0 | 0 | 0.0 | 0.0 | - | 0.1 | 8.2  | 0.0 | 0.0 | 0.1 |
| 20/1      | 75   | 75   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/1      | 232  | 232  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/2      | 1708 | 1708 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/3      | 762  | 762  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |

|    |           |                             |      |                                         |       |                |    |
|----|-----------|-----------------------------|------|-----------------------------------------|-------|----------------|----|
| C1 | Stream: 1 | PRC for Signalled Lanes (%) | -8.6 | Total Delay for Signalled Lanes (pcuHr) | 33.20 | Cycle Time (s) | 54 |
| C1 | Stream: 2 | PRC for Signalled Lanes (%) | 5.8  | Total Delay for Signalled Lanes (pcuHr) | 27.24 | Cycle Time (s) | 54 |
| C1 | Stream: 3 | PRC for Signalled Lanes (%) | 9.6  | Total Delay for Signalled Lanes (pcuHr) | 14.19 | Cycle Time (s) | 54 |
|    |           | PRC Over All Lanes (%)      | -8.6 | Total Delay Over All Lanes (pcuHr)      | 79.24 |                |    |

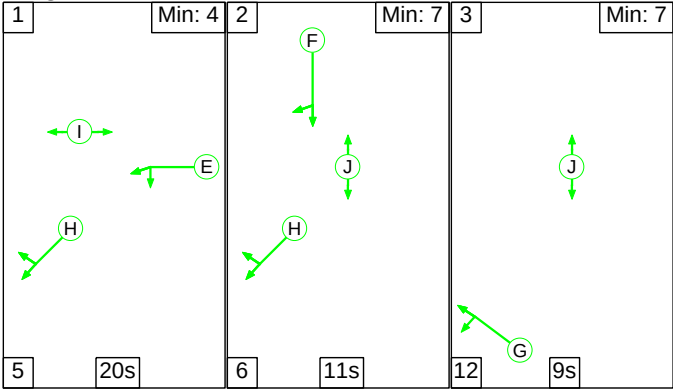
Full Input Data And Results  
**Scenario 6: 'PM Without 2036'** (FG6: 'PM Without 2036', Plan 1: 'Staging Plan No. 1')

**Stage Sequence Diagram**

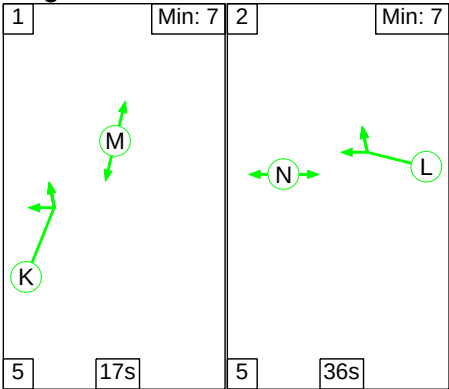
**Stage Stream: 1**



**Stage Stream: 2**



**Stage Stream: 3**



**Stage Timings**

**Stage Stream: 1**

| Stage        | 1  | 2  |
|--------------|----|----|
| Duration     | 14 | 39 |
| Change Point | 0  | 19 |

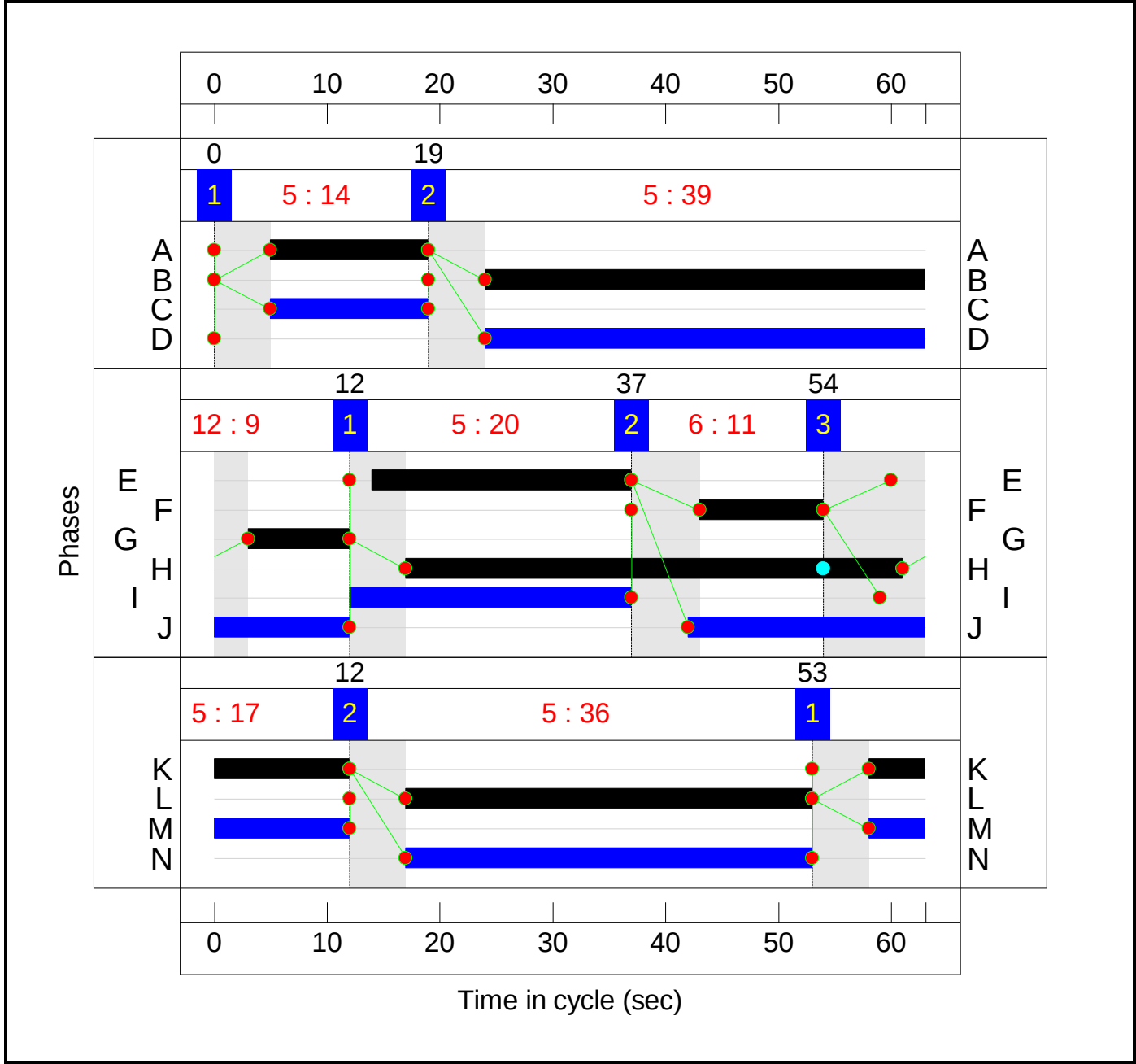
**Stage Stream: 2**

| Stage        | 1  | 2  | 3  |
|--------------|----|----|----|
| Duration     | 20 | 11 | 9  |
| Change Point | 12 | 37 | 54 |

Full Input Data And Results  
Stage Stream: 3

|              |    |    |
|--------------|----|----|
| Stage        | 1  | 2  |
| Duration     | 17 | 36 |
| Change Point | 53 | 12 |

Signal Timings Diagram



## Full Input Data And Results

## Network 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 (%)  |
|-------------------------------|------------------------------|-----------|-------------------|----------------------------|------------|-------------|------------|-----------------|-----------------|-------------------|-------------------|----------------|--------------|
| Network: Gresford Interchange | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 85.4%        |
| Gresford Interchange          | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 85.4%        |
| 1/2+1/1                       | A483 SB Off-slip Left U-Turn | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 720               | 1900:1900         | 452+452        | 79.6 : 79.6% |
| 1/3                           | A483 SB Off-slip Left        | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 83                | 1900              | 452            | 18.3%        |
| 2/2+2/1                       | B5445 Ahead Left             | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 241               | Inf : Inf         | 438+310        | 32.2 : 32.2% |
| 2/3                           | B5445 Ahead                  | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 140               | Inf               | 438            | 32.0%        |
| 3/2+3/1                       | A5156 Ahead Left             | U         | 2                 | N/A                        | E          |             | 1          | 23              | -               | 1235              | 1900:1900         | 724+724        | 85.4 : 85.2% |
| 3/3                           | A5156 Ahead                  | U         | 2                 | N/A                        | E          |             | 1          | 23              | -               | 616               | 1900              | 724            | 85.1%        |
| 4/2+4/1                       | A5152 Ahead Left             | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 401               | 1900:1900         | 302+178        | 83.6 : 83.6% |
| 4/3                           | A5152 Ahead                  | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 251               | 1900              | 302            | 83.2%        |
| 5/2+5/1                       | A483 NB Off-slip Left Ahead  | U         | 3                 | N/A                        | K          |             | 1          | 17              | -               | 482               | 1900:1900         | 543+146        | 70.0 : 70.0% |
| 5/3                           | A483 NB Off-slip Ahead       | U         | 3                 | N/A                        | K          |             | 1          | 17              | -               | 380               | 1900              | 543            | 70.0%        |
| 6/1                           | Right Left                   | U         | 1                 | N/A                        | B          |             | 1          | 39              | -               | 986               | 1900              | 1206           | 81.7%        |
| 6/2                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 39              | -               | 254               | 1900              | 1206           | 21.1%        |
| 6/3                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 39              | -               | 341               | 1900              | 1206           | 28.3%        |
| 7/1                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 808               | Inf               | Inf            | 0.0%         |
| 7/2                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 388               | Inf               | Inf            | 0.0%         |
| 7/3                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 500               | Inf               | Inf            | 0.0%         |
| 7/4                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 150               | Inf               | Inf            | 0.0%         |
| 8/1                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 11              | -               | 299               | 1900              | 362            | 82.6%        |
| 8/2                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 11              | -               | 301               | 1900              | 362            | 83.2%        |

Full Input Data And Results

|           |                                   |   |     |     |   |  |   |    |   |      |           |         |              |
|-----------|-----------------------------------|---|-----|-----|---|--|---|----|---|------|-----------|---------|--------------|
| 8/3       | Ahead                             | U | 2   | N/A | F |  | 1 | 11 | - | 70   | 1900      | 362     | 19.3%        |
| 8/4       | Ahead                             | U | 2   | N/A | F |  | 1 | 11 | - | 261  | 1900      | 362     | 72.1%        |
| 9/1       | Ahead                             | U | 2   | N/A | H |  | 1 | 44 | - | 617  | 1900      | 1357    | 45.5%        |
| 9/2       | Right Ahead                       | U | 2   | N/A | H |  | 1 | 44 | - | 853  | 1900      | 1357    | 62.9%        |
| 9/3       | Right                             | U | 2   | N/A | H |  | 1 | 44 | - | 642  | 1900      | 1357    | 47.3%        |
| 10/1      | Ahead Right                       | U | 3   | N/A | L |  | 1 | 36 | - | 401  | 1900      | 1116    | 35.9%        |
| 10/2      | Right                             | U | 3   | N/A | L |  | 1 | 36 | - | 523  | 1900      | 1116    | 46.9%        |
| 10/3      | Right                             | U | 3   | N/A | L |  | 1 | 36 | - | 893  | 1900      | 1116    | 80.0%        |
| 11/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 243  | Inf       | Inf     | 0.0%         |
| 11/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 729  | Inf       | Inf     | 0.0%         |
| 12/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 538  | Inf       | Inf     | 0.0%         |
| 13/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 908  | Inf       | Inf     | 0.0%         |
| 13/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 388  | Inf       | Inf     | 0.0%         |
| 14/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 369  | Inf       | Inf     | 0.0%         |
| 14/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 301  | Inf       | Inf     | 0.0%         |
| 15/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 766  | Inf       | Inf     | 0.0%         |
| 15/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 181  | Inf       | Inf     | 0.0%         |
| 16/1+16/2 | Blue Bell Ln Left Ahead           | O | N/A | N/A | - |  | - | -  | - | 297  | Inf : Inf | 312+312 | 47.8 : 47.5% |
| 17/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 471  | Inf       | Inf     | 0.0%         |
| 18/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 32   | Inf       | Inf     | 0.0%         |
| 18/2      | Right                             | U | N/A | N/A | - |  | - | -  | - | 903  | Inf       | Inf     | 0.0%         |
| 18/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1273 | Inf       | Inf     | 0.0%         |
| 19/1+19/2 | Industrial Park Access Ahead Left | O | N/A | N/A | - |  | - | -  | - | 90   | Inf : Inf | 212+212 | 21.2 : 21.2% |
| 20/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 42   | Inf       | Inf     | 0.0%         |
| 21/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 224  | Inf       | Inf     | 0.0%         |
| 21/2      | Right Ahead                       | U | N/A | N/A | - |  | - | -  | - | 1689 | Inf       | Inf     | 0.0%         |
| 21/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 550  | Inf       | Inf     | 0.0%         |



## Full Input Data And Results

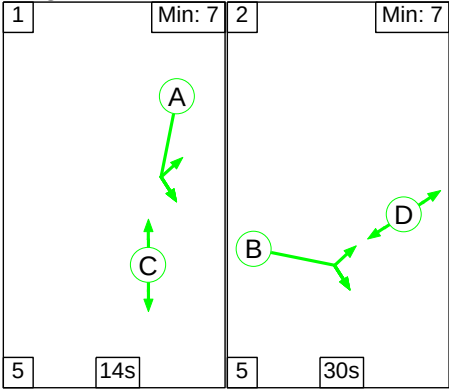
| Item                                 | Arriving (pcu) | Leaving (pcu) | Turners In Gaps (pcu) | Turners When Unopposed (pcu) | Turners In Intergreen (pcu) | Uniform Delay (pcuHr) | Rand + Oversat Delay (pcuHr) | Storage Area Uniform Delay (pcuHr) | Total Delay (pcuHr) | Av. Delay Per PCU (s/pcu) | Max. Back of Uniform Queue (pcu) | Rand + Oversat Queue (pcu) | Mean Max Queue (pcu) |
|--------------------------------------|----------------|---------------|-----------------------|------------------------------|-----------------------------|-----------------------|------------------------------|------------------------------------|---------------------|---------------------------|----------------------------------|----------------------------|----------------------|
| <b>Network: Gresford Interchange</b> | -              | -             | 1396                  | 0                            | 0                           | 33.4                  | 28.4                         | 0.0                                | 61.8                | -                         | -                                | -                          | -                    |
| <b>Gresford Interchange</b>          | -              | -             | 1396                  | 0                            | 0                           | 33.4                  | 28.4                         | 0.0                                | 61.8                | -                         | -                                | -                          | -                    |
| 1/2+1/1                              | 720            | 720           | -                     | -                            | -                           | 4.5                   | 1.9                          | -                                  | 6.4                 | 32.1                      | 5.9                              | 1.9                        | 7.8                  |
| 1/3                                  | 83             | 83            | -                     | -                            | -                           | 0.4                   | 0.1                          | -                                  | 0.6                 | 24.0                      | 1.2                              | 0.1                        | 1.3                  |
| 2/2+2/1                              | 241            | 241           | 482                   | 0                            | 0                           | 0.1                   | 0.2                          | -                                  | 0.4                 | 5.5                       | 0.5                              | 0.2                        | 0.8                  |
| 2/3                                  | 140            | 140           | 140                   | 0                            | 0                           | 0.1                   | 0.2                          | -                                  | 0.3                 | 8.1                       | 0.5                              | 0.2                        | 0.8                  |
| 3/2+3/1                              | 1235           | 1235          | -                     | -                            | -                           | 6.1                   | 2.8                          | -                                  | 9.0                 | 26.1                      | 9.8                              | 2.8                        | 12.6                 |
| 3/3                                  | 616            | 616           | -                     | -                            | -                           | 3.1                   | 2.7                          | -                                  | 5.8                 | 33.8                      | 9.8                              | 2.7                        | 12.5                 |
| 4/2+4/1                              | 401            | 401           | -                     | -                            | -                           | 2.8                   | 2.4                          | -                                  | 5.2                 | 46.7                      | 4.3                              | 2.4                        | 6.7                  |
| 4/3                                  | 251            | 251           | -                     | -                            | -                           | 1.8                   | 2.3                          | -                                  | 4.1                 | 58.3                      | 4.3                              | 2.3                        | 6.5                  |
| 5/2+5/1                              | 482            | 482           | -                     | -                            | -                           | 2.6                   | 1.2                          | -                                  | 3.8                 | 28.1                      | 5.9                              | 1.2                        | 7.1                  |
| 5/3                                  | 380            | 380           | -                     | -                            | -                           | 2.1                   | 1.2                          | -                                  | 3.3                 | 31.0                      | 5.9                              | 1.2                        | 7.1                  |
| 6/1                                  | 986            | 986           | -                     | -                            | -                           | 2.2                   | 2.2                          | -                                  | 4.4                 | 15.9                      | 13.8                             | 2.2                        | 16.0                 |
| 6/2                                  | 254            | 254           | -                     | -                            | -                           | 0.2                   | 0.1                          | -                                  | 0.3                 | 4.6                       | 1.9                              | 0.1                        | 2.0                  |
| 6/3                                  | 341            | 341           | -                     | -                            | -                           | 0.4                   | 0.2                          | -                                  | 0.6                 | 6.8                       | 4.2                              | 0.2                        | 4.4                  |
| 7/1                                  | 808            | 808           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/2                                  | 388            | 388           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/3                                  | 500            | 500           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/4                                  | 150            | 150           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 8/1                                  | 299            | 299           | -                     | -                            | -                           | 1.4                   | 2.2                          | -                                  | 3.6                 | 43.8                      | 5.1                              | 2.2                        | 7.3                  |
| 8/2                                  | 301            | 301           | -                     | -                            | -                           | 1.4                   | 2.3                          | -                                  | 3.7                 | 44.6                      | 5.2                              | 2.3                        | 7.5                  |
| 8/3                                  | 70             | 70            | -                     | -                            | -                           | 0.4                   | 0.1                          | -                                  | 0.5                 | 24.9                      | 0.9                              | 0.1                        | 1.1                  |
| 8/4                                  | 261            | 261           | -                     | -                            | -                           | 1.7                   | 1.3                          | -                                  | 3.0                 | 40.8                      | 4.4                              | 1.3                        | 5.6                  |
| 9/1                                  | 617            | 617           | -                     | -                            | -                           | 0.0                   | 0.4                          | -                                  | 0.4                 | 2.4                       | 0.0                              | 0.4                        | 0.4                  |
| 9/2                                  | 853            | 853           | -                     | -                            | -                           | 0.0                   | 0.8                          | -                                  | 0.9                 | 3.6                       | 0.0                              | 0.8                        | 0.9                  |

## Full Input Data And Results

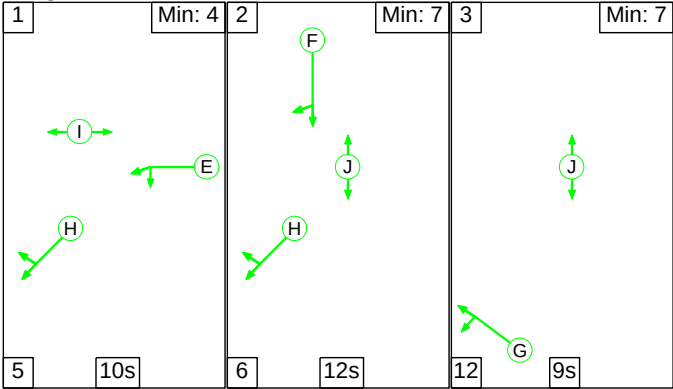
|                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |      |     |   |   |     |     |   |     |      |     |     |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----|---|---|-----|-----|---|-----|------|-----|-----|-----|
| 9/3                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 642  | 642  | -   | - | - | 0.0 | 0.4 | - | 0.4 | 2.5  | 0.0 | 0.4 | 0.5 |
| 10/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 401  | 401  | -   | - | - | 0.8 | 0.3 | - | 1.0 | 9.3  | 3.2 | 0.3 | 3.5 |
| 10/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 523  | 523  | -   | - | - | 0.5 | 0.4 | - | 1.0 | 6.7  | 4.1 | 0.4 | 4.6 |
| 10/3                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 893  | 893  | -   | - | - | 0.5 | 2.0 | - | 2.5 | 10.1 | 4.9 | 2.0 | 6.9 |
| 11/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 243  | 243  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 11/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 729  | 729  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 12/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 538  | 538  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 908  | 908  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 388  | 388  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 369  | 369  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 301  | 301  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 766  | 766  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 181  | 181  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 16/1+16/2                                                                                                                                                                                                                                                                                                                                                                                                                                            | 297  | 297  | 594 | 0 | 0 | 0.2 | 0.5 | - | 0.6 | 7.6  | 0.6 | 0.5 | 1.0 |
| 17/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 471  | 471  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 32   | 32   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 903  | 903  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/3                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1273 | 1273 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 19/1+19/2                                                                                                                                                                                                                                                                                                                                                                                                                                            | 90   | 90   | 180 | 0 | 0 | 0.0 | 0.1 | - | 0.2 | 6.6  | 0.1 | 0.1 | 0.3 |
| 20/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 42   | 42   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/1                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 224  | 224  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/2                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1689 | 1689 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/3                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 550  | 550  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| C1 Stream: 1 PRC for Signalled Lanes (%): 10.1<br>C1 Stream: 2 PRC for Signalled Lanes (%): 5.4<br>C1 Stream: 3 PRC for Signalled Lanes (%): 12.5<br>PRC Over All Lanes (%): 5.4<br>Total Delay for Signalled Lanes (pcuHr): 12.31<br>Total Delay for Signalled Lanes (pcuHr): 36.53<br>Total Delay for Signalled Lanes (pcuHr): 11.53<br>Total Delay Over All Lanes(pcuHr): 61.85<br>Cycle Time (s): 63<br>Cycle Time (s): 63<br>Cycle Time (s): 63 |      |      |     |   |   |     |     |   |     |      |     |     |     |

Stage Sequence Diagram

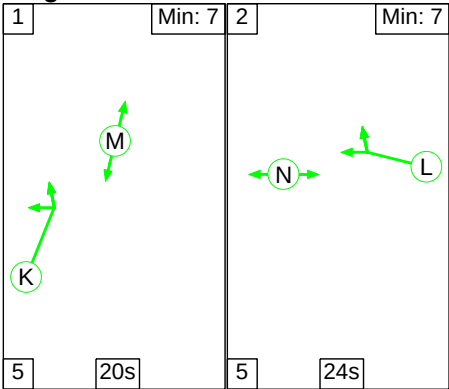
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

| Stage        | 1  | 2  |
|--------------|----|----|
| Duration     | 14 | 30 |
| Change Point | 0  | 19 |

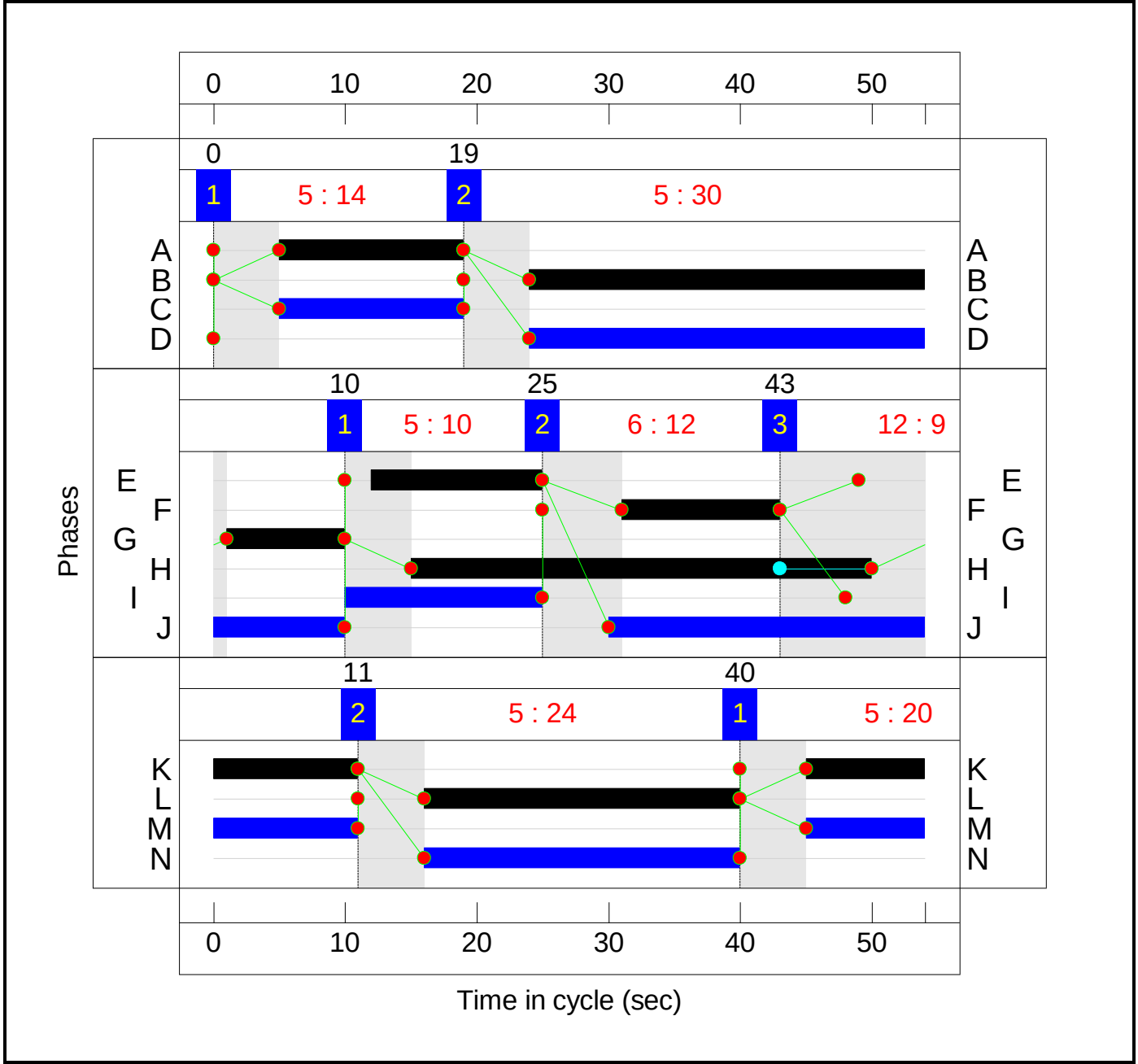
Stage Stream: 2

| Stage        | 1  | 2  | 3  |
|--------------|----|----|----|
| Duration     | 10 | 12 | 9  |
| Change Point | 10 | 25 | 43 |

Full Input Data And Results  
Stage Stream: 3

|              |    |    |
|--------------|----|----|
| Stage        | 1  | 2  |
| Duration     | 20 | 24 |
| Change Point | 40 | 11 |

Signal Timings Diagram



## Full Input Data And Results

## Network 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 (%)  |
|-------------------------------|------------------------------|-----------|-------------------|----------------------------|------------|-------------|------------|-----------------|-----------------|-------------------|-------------------|----------------|--------------|
| Network: Gresford Interchange | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 98.5%        |
| Gresford Interchange          | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 98.5%        |
| 1/2+1/1                       | A483 SB Off-slip Left U-Turn | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 1040              | 1900:1900         | 528+528        | 98.5 : 98.5% |
| 1/3                           | A483 SB Off-slip Left        | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 157               | 1900              | 528            | 29.7%        |
| 2/2+2/1                       | B5445 Ahead Left             | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 338               | Inf : Inf         | 251+251        | 71.8 : 63.1% |
| 2/3                           | B5445 Ahead                  | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 180               | Inf               | 251            | 71.8%        |
| 3/2+3/1                       | A5156 Ahead Left             | U         | 2                 | N/A                        | E          |             | 1          | 13              | -               | 827               | 1900:1900         | 493+493        | 84.0 : 83.8% |
| 3/3                           | A5156 Ahead                  | U         | 2                 | N/A                        | E          |             | 1          | 13              | -               | 413               | 1900              | 493            | 83.8%        |
| 4/2+4/1                       | A5152 Ahead Left             | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 432               | 1900:1900         | 352+220        | 75.6 : 75.6% |
| 4/3                           | A5152 Ahead                  | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 268               | 1900              | 352            | 76.2%        |
| 5/2+5/1                       | A483 NB Off-slip Left Ahead  | U         | 3                 | N/A                        | K          |             | 1          | 20              | -               | 694               | 1900:1900         | 739+180        | 75.5 : 75.5% |
| 5/3                           | A483 NB Off-slip Ahead       | U         | 3                 | N/A                        | K          |             | 1          | 20              | -               | 557               | 1900              | 739            | 75.4%        |
| 6/1                           | Right Left                   | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 1068              | 1900              | 1091           | 97.9%        |
| 6/2                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 492               | 1900              | 1091           | 45.1%        |
| 6/3                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 292               | 1900              | 1091           | 26.8%        |
| 7/1                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 1258              | Inf               | Inf            | 0.0%         |
| 7/2                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 832               | Inf               | Inf            | 0.0%         |
| 7/3                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 381               | Inf               | Inf            | 0.0%         |
| 7/4                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 248               | Inf               | Inf            | 0.0%         |
| 8/1                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 12              | -               | 217               | 1900              | 457            | 47.4%        |
| 8/2                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 12              | -               | 218               | 1900              | 457            | 47.7%        |

Full Input Data And Results

|           |                                   |   |     |     |   |  |   |    |   |      |           |         |              |
|-----------|-----------------------------------|---|-----|-----|---|--|---|----|---|------|-----------|---------|--------------|
| 8/3       | Ahead                             | U | 2   | N/A | F |  | 1 | 12 | - | 171  | 1900      | 457     | 37.4%        |
| 8/4       | Ahead                             | U | 2   | N/A | F |  | 1 | 12 | - | 383  | 1900      | 457     | 83.7%        |
| 9/1       | Ahead                             | U | 2   | N/A | H |  | 1 | 35 | - | 547  | 1900      | 1267    | 43.2%        |
| 9/2       | Right Ahead                       | U | 2   | N/A | H |  | 1 | 35 | - | 748  | 1900      | 1267    | 59.1%        |
| 9/3       | Right                             | U | 2   | N/A | H |  | 1 | 35 | - | 462  | 1900      | 1267    | 36.5%        |
| 10/1      | Ahead Right                       | U | 3   | N/A | L |  | 1 | 24 | - | 347  | 1900      | 880     | 39.4%        |
| 10/2      | Right                             | U | 3   | N/A | L |  | 1 | 24 | - | 533  | 1900      | 880     | 60.6%        |
| 10/3      | Right                             | U | 3   | N/A | L |  | 1 | 24 | - | 730  | 1900      | 880     | 83.0%        |
| 11/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 238  | Inf       | Inf     | 0.0%         |
| 11/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 655  | Inf       | Inf     | 0.0%         |
| 12/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 330  | Inf       | Inf     | 0.0%         |
| 13/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 1416 | Inf       | Inf     | 0.0%         |
| 13/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 832  | Inf       | Inf     | 0.0%         |
| 14/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 254  | Inf       | Inf     | 0.0%         |
| 14/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 218  | Inf       | Inf     | 0.0%         |
| 15/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 713  | Inf       | Inf     | 0.0%         |
| 15/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 134  | Inf       | Inf     | 0.0%         |
| 16/1+16/2 | Blue Bell Ln Left Ahead           | O | N/A | N/A | - |  | - | -  | - | 352  | Inf : Inf | 268+268 | 65.8 : 65.8% |
| 17/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 419  | Inf       | Inf     | 0.0%         |
| 18/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 64   | Inf       | Inf     | 0.0%         |
| 18/2      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1091 | Inf       | Inf     | 0.0%         |
| 18/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1287 | Inf       | Inf     | 0.0%         |
| 19/1+19/2 | Industrial Park Access Ahead Left | O | N/A | N/A | - |  | - | -  | - | 23   | Inf : Inf | 152+152 | 7.9 : 7.2%   |
| 20/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 72   | Inf       | Inf     | 0.0%         |
| 21/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 228  | Inf       | Inf     | 0.0%         |
| 21/2      | Right Ahead                       | U | N/A | N/A | - |  | - | -  | - | 1721 | Inf       | Inf     | 0.0%         |
| 21/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 773  | 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: Gresford Interchange | -              | -             | 1606                  | 0                            | 0                           | 35.0                  | 47.9                         | 0.0                                | 82.9                | -                         | -                                | -                          | -                    |
| Gresford Interchange          | -              | -             | 1606                  | 0                            | 0                           | 35.0                  | 47.9                         | 0.0                                | 82.9                | -                         | -                                | -                          | -                    |
| 1/2+1/1                       | 1040           | 1040          | -                     | -                            | -                           | 5.6                   | 12.7                         | -                                  | 18.3                | 63.3                      | 7.7                              | 12.7                       | 20.4                 |
| 1/3                           | 157            | 157           | -                     | -                            | -                           | 0.7                   | 0.2                          | -                                  | 0.9                 | 20.2                      | 1.8                              | 0.2                        | 2.0                  |
| 2/2+2/1                       | 338            | 338           | 676                   | 0                            | 0                           | 0.6                   | 1.0                          | -                                  | 1.6                 | 16.9                      | 2.3                              | 1.0                        | 3.3                  |
| 2/3                           | 180            | 180           | 180                   | 0                            | 0                           | 0.3                   | 1.2                          | -                                  | 1.6                 | 31.4                      | 2.3                              | 1.2                        | 3.5                  |
| 3/2+3/1                       | 827            | 827           | -                     | -                            | -                           | 4.4                   | 2.5                          | -                                  | 6.9                 | 30.0                      | 5.9                              | 2.5                        | 8.4                  |
| 3/3                           | 413            | 413           | -                     | -                            | -                           | 2.2                   | 2.4                          | -                                  | 4.6                 | 40.2                      | 5.9                              | 2.4                        | 8.3                  |
| 4/2+4/1                       | 432            | 432           | -                     | -                            | -                           | 2.4                   | 1.5                          | -                                  | 4.0                 | 33.0                      | 3.8                              | 1.5                        | 5.3                  |
| 4/3                           | 268            | 268           | -                     | -                            | -                           | 1.6                   | 1.5                          | -                                  | 3.1                 | 41.6                      | 3.8                              | 1.5                        | 5.3                  |
| 5/2+5/1                       | 694            | 694           | -                     | -                            | -                           | 2.6                   | 1.5                          | -                                  | 4.1                 | 21.5                      | 7.1                              | 1.5                        | 8.7                  |
| 5/3                           | 557            | 557           | -                     | -                            | -                           | 2.2                   | 1.5                          | -                                  | 3.7                 | 24.0                      | 7.1                              | 1.5                        | 8.6                  |
| 6/1                           | 1068           | 1068          | -                     | -                            | -                           | 3.2                   | 11.6                         | -                                  | 14.8                | 50.0                      | 15.6                             | 11.6                       | 27.2                 |
| 6/2                           | 492            | 492           | -                     | -                            | -                           | 0.9                   | 0.4                          | -                                  | 1.3                 | 9.4                       | 5.5                              | 0.4                        | 5.9                  |
| 6/3                           | 292            | 292           | -                     | -                            | -                           | 0.5                   | 0.2                          | -                                  | 0.7                 | 8.9                       | 3.2                              | 0.2                        | 3.4                  |
| 7/1                           | 1258           | 1258          | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/2                           | 832            | 832           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/3                           | 381            | 381           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/4                           | 248            | 248           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 8/1                           | 217            | 217           | -                     | -                            | -                           | 0.6                   | 0.4                          | -                                  | 1.1                 | 17.6                      | 2.0                              | 0.4                        | 2.4                  |
| 8/2                           | 218            | 218           | -                     | -                            | -                           | 0.6                   | 0.5                          | -                                  | 1.1                 | 17.7                      | 2.0                              | 0.5                        | 2.5                  |
| 8/3                           | 171            | 171           | -                     | -                            | -                           | 0.8                   | 0.3                          | -                                  | 1.1                 | 23.5                      | 1.8                              | 0.3                        | 2.1                  |
| 8/4                           | 383            | 383           | -                     | -                            | -                           | 2.0                   | 2.4                          | -                                  | 4.4                 | 41.1                      | 5.6                              | 2.4                        | 8.0                  |
| 9/1                           | 547            | 547           | -                     | -                            | -                           | 0.0                   | 0.4                          | -                                  | 0.4                 | 2.5                       | 0.0                              | 0.4                        | 0.4                  |
| 9/2                           | 748            | 748           | -                     | -                            | -                           | 0.0                   | 0.7                          | -                                  | 0.7                 | 3.5                       | 0.0                              | 0.7                        | 0.8                  |

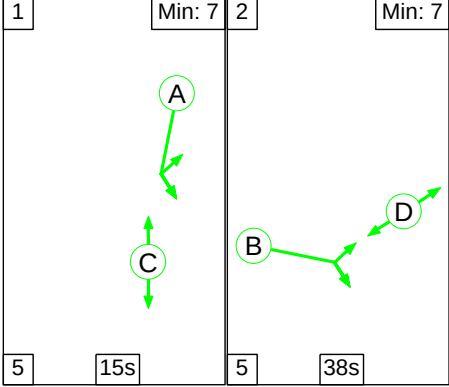
## Full Input Data And Results

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |      |     |   |   |     |     |   |     |      |     |     |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----|---|---|-----|-----|---|-----|------|-----|-----|-----|
| 9/3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 462  | 462  | -   | - | - | 0.0 | 0.3 | - | 0.3 | 2.2  | 0.0 | 0.3 | 0.3 |
| 10/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 347  | 347  | -   | - | - | 1.2 | 0.3 | - | 1.5 | 15.7 | 3.5 | 0.3 | 3.8 |
| 10/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 533  | 533  | -   | - | - | 1.1 | 0.8 | - | 1.9 | 12.8 | 5.1 | 0.8 | 5.9 |
| 10/3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 730  | 730  | -   | - | - | 0.9 | 2.4 | - | 3.3 | 16.2 | 5.5 | 2.4 | 7.8 |
| 11/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 238  | 238  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 11/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 655  | 655  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 12/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 330  | 330  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1416 | 1416 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 832  | 832  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 254  | 254  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 218  | 218  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 713  | 713  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 134  | 134  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 16/1+16/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 352  | 352  | 704 | 0 | 0 | 0.5 | 1.0 | - | 1.5 | 15.3 | 1.2 | 1.0 | 2.1 |
| 17/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 419  | 419  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 64   | 64   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1091 | 1091 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1287 | 1287 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 19/1+19/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 23   | 23   | 46  | 0 | 0 | 0.0 | 0.0 | - | 0.1 | 8.5  | 0.0 | 0.0 | 0.1 |
| 20/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 72   | 72   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 228  | 228  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1721 | 1721 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 773  | 773  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| <div><div><div>C1</div><div>Stream: 1</div><div>PRC for Signalled Lanes (%)</div><div>-9.5</div></div><div><div>C1</div><div>Stream: 2</div><div>PRC for Signalled Lanes (%)</div><div>7.1</div></div><div><div>C1</div><div>Stream: 3</div><div>PRC for Signalled Lanes (%)</div><div>8.4</div></div><div><div></div><div></div><div>PRC Over All Lanes (%)</div><div>-9.5</div></div></div> <div><div>Total Delay for Signalled Lanes (pcuHr)</div><div>36.02</div></div> <div><div>Cycle Time (s)</div><div>54</div></div> <div><div>Total Delay for Signalled Lanes (pcuHr)</div><div>27.58</div></div> <div><div>Cycle Time (s)</div><div>54</div></div> <div><div>Total Delay for Signalled Lanes (pcuHr)</div><div>14.56</div></div> <div><div>Cycle Time (s)</div><div>54</div></div> <div><div>Total Delay Over All Lanes(pcuHr)</div><div>82.87</div></div> |      |      |     |   |   |     |     |   |     |      |     |     |     |

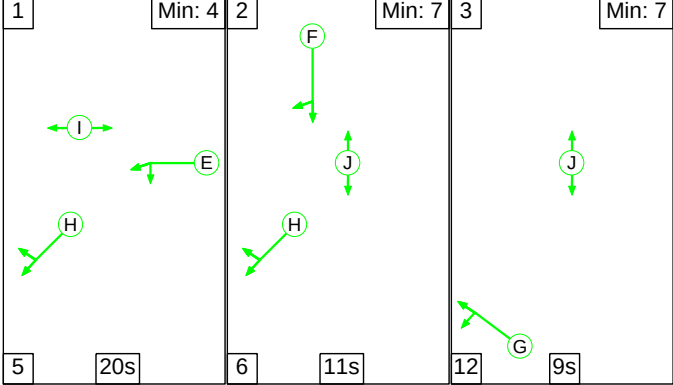


Stage Sequence Diagram

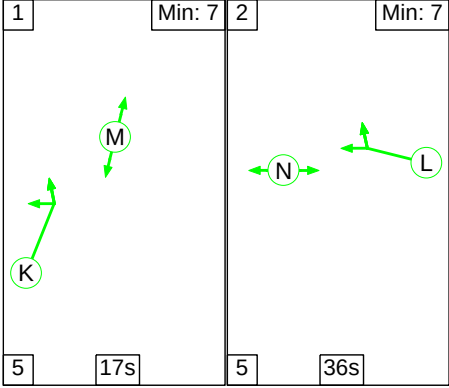
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

| Stage        | 1  | 2  |
|--------------|----|----|
| Duration     | 15 | 38 |
| Change Point | 0  | 20 |

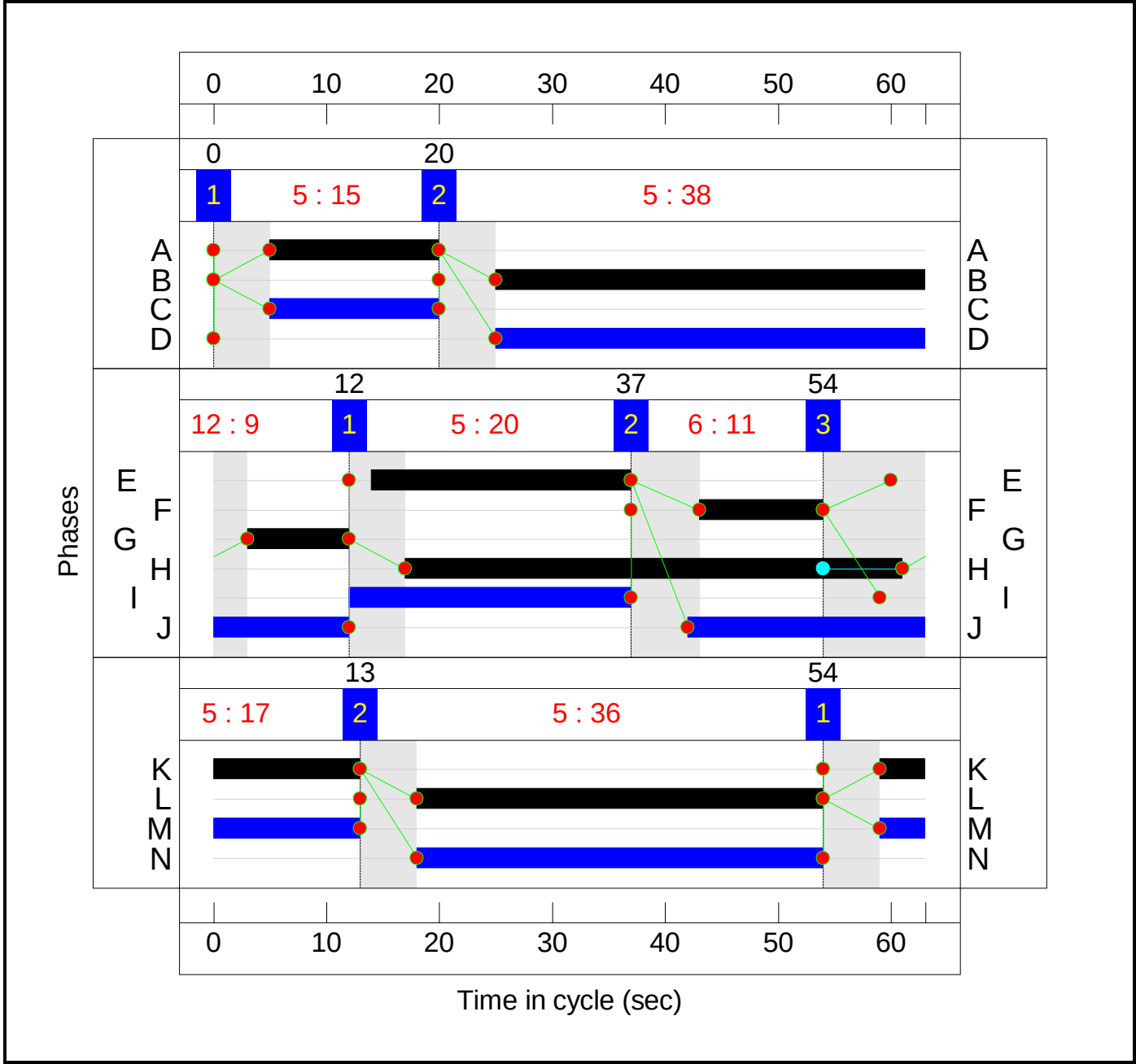
Stage Stream: 2

| Stage        | 1  | 2  | 3  |
|--------------|----|----|----|
| Duration     | 20 | 11 | 9  |
| Change Point | 12 | 37 | 54 |

Full Input Data And Results  
Stage Stream: 3

|              |    |    |
|--------------|----|----|
| Stage        | 1  | 2  |
| Duration     | 17 | 36 |
| Change Point | 54 | 13 |

Signal Timings Diagram



## Full Input Data And Results

## Network 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 (%)  |
|-------------------------------|------------------------------|-----------|-------------------|----------------------------|------------|-------------|------------|-----------------|-----------------|-------------------|-------------------|----------------|--------------|
| Network: Gresford Interchange | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 88.1%        |
| Gresford Interchange          | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 88.1%        |
| 1/2+1/1                       | A483 SB Off-slip Left U-Turn | U         | 1                 | N/A                        | A          |             | 1          | 15              | -               | 738               | 1900:1900         | 483+483        | 76.5 : 76.5% |
| 1/3                           | A483 SB Off-slip Left        | U         | 1                 | N/A                        | A          |             | 1          | 15              | -               | 82                | 1900              | 483            | 17.0%        |
| 2/2+2/1                       | B5445 Ahead Left             | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 237               | Inf : Inf         | 427+301        | 32.6 : 32.6% |
| 2/3                           | B5445 Ahead                  | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 139               | Inf               | 427            | 32.6%        |
| 3/2+3/1                       | A5156 Ahead Left             | U         | 2                 | N/A                        | E          |             | 1          | 23              | -               | 1274              | 1900:1900         | 724+724        | 88.0 : 88.0% |
| 3/3                           | A5156 Ahead                  | U         | 2                 | N/A                        | E          |             | 1          | 23              | -               | 638               | 1900              | 724            | 88.1%        |
| 4/2+4/1                       | A5152 Ahead Left             | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 393               | 1900:1900         | 302+178        | 81.9 : 81.9% |
| 4/3                           | A5152 Ahead                  | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 248               | 1900              | 302            | 82.2%        |
| 5/2+5/1                       | A483 NB Off-slip Left Ahead  | U         | 3                 | N/A                        | K          |             | 1          | 17              | -               | 493               | 1900:1900         | 543+140        | 72.2 : 72.2% |
| 5/3                           | A483 NB Off-slip Ahead       | U         | 3                 | N/A                        | K          |             | 1          | 17              | -               | 392               | 1900              | 543            | 72.2%        |
| 6/1                           | Right Left                   | U         | 1                 | N/A                        | B          |             | 1          | 38              | -               | 992               | 1900              | 1176           | 84.3%        |
| 6/2                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 38              | -               | 274               | 1900              | 1176           | 23.3%        |
| 6/3                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 38              | -               | 333               | 1900              | 1176           | 28.3%        |
| 7/1                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 832               | Inf               | Inf            | 0.0%         |
| 7/2                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 420               | Inf               | Inf            | 0.0%         |
| 7/3                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 491               | Inf               | Inf            | 0.0%         |
| 7/4                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 147               | Inf               | Inf            | 0.0%         |
| 8/1                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 11              | -               | 295               | 1900              | 362            | 81.5%        |
| 8/2                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 11              | -               | 295               | 1900              | 362            | 81.5%        |

Full Input Data And Results

|           |                                   |   |     |     |   |  |   |    |   |      |           |         |              |
|-----------|-----------------------------------|---|-----|-----|---|--|---|----|---|------|-----------|---------|--------------|
| 8/3       | Ahead                             | U | 2   | N/A | F |  | 1 | 11 | - | 69   | 1900      | 362     | 19.1%        |
| 8/4       | Ahead                             | U | 2   | N/A | F |  | 1 | 11 | - | 257  | 1900      | 362     | 71.0%        |
| 9/1       | Ahead                             | U | 2   | N/A | H |  | 1 | 44 | - | 637  | 1900      | 1357    | 46.9%        |
| 9/2       | Right Ahead                       | U | 2   | N/A | H |  | 1 | 44 | - | 869  | 1900      | 1357    | 64.0%        |
| 9/3       | Right                             | U | 2   | N/A | H |  | 1 | 44 | - | 663  | 1900      | 1357    | 48.9%        |
| 10/1      | Ahead Right                       | U | 3   | N/A | L |  | 1 | 36 | - | 409  | 1900      | 1116    | 36.7%        |
| 10/2      | Right                             | U | 3   | N/A | L |  | 1 | 36 | - | 514  | 1900      | 1116    | 46.1%        |
| 10/3      | Right                             | U | 3   | N/A | L |  | 1 | 36 | - | 911  | 1900      | 1116    | 81.6%        |
| 11/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 240  | Inf       | Inf     | 0.0%         |
| 11/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 747  | Inf       | Inf     | 0.0%         |
| 12/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 529  | Inf       | Inf     | 0.0%         |
| 13/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 930  | Inf       | Inf     | 0.0%         |
| 13/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 420  | Inf       | Inf     | 0.0%         |
| 14/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 364  | Inf       | Inf     | 0.0%         |
| 14/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 295  | Inf       | Inf     | 0.0%         |
| 15/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 783  | Inf       | Inf     | 0.0%         |
| 15/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 193  | Inf       | Inf     | 0.0%         |
| 16/1+16/2 | Blue Bell Ln Left Ahead           | O | N/A | N/A | - |  | - | -  | - | 300  | Inf : Inf | 303+303 | 49.6 : 49.6% |
| 17/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 478  | Inf       | Inf     | 0.0%         |
| 18/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 32   | Inf       | Inf     | 0.0%         |
| 18/2      | Right                             | U | N/A | N/A | - |  | - | -  | - | 906  | Inf       | Inf     | 0.0%         |
| 18/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1303 | Inf       | Inf     | 0.0%         |
| 19/1+19/2 | Industrial Park Access Ahead Left | O | N/A | N/A | - |  | - | -  | - | 87   | Inf : Inf | 202+202 | 21.3 : 21.8% |
| 20/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 42   | Inf       | Inf     | 0.0%         |
| 21/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 222  | Inf       | Inf     | 0.0%         |
| 21/2      | Right Ahead                       | U | N/A | N/A | - |  | - | -  | - | 1714 | Inf       | Inf     | 0.0%         |
| 21/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 563  | Inf       | Inf     | 0.0%         |

## Full Input Data And Results

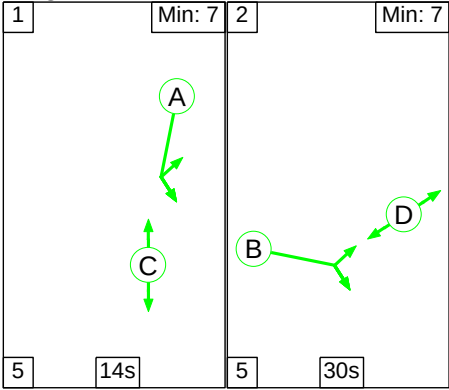
| Item                                 | Arriving (pcu) | Leaving (pcu) | Turners In Gaps (pcu) | Turners When Unopposed (pcu) | Turners In Intergreen (pcu) | Uniform Delay (pcuHr) | Rand + Oversat Delay (pcuHr) | Storage Area Uniform Delay (pcuHr) | Total Delay (pcuHr) | Av. Delay Per PCU (s/pcu) | Max. Back of Uniform Queue (pcu) | Rand + Oversat Queue (pcu) | Mean Max Queue (pcu) |
|--------------------------------------|----------------|---------------|-----------------------|------------------------------|-----------------------------|-----------------------|------------------------------|------------------------------------|---------------------|---------------------------|----------------------------------|----------------------------|----------------------|
| <b>Network: Gresford Interchange</b> | -              | -             | 1387                  | 0                            | 0                           | 34.1                  | 29.8                         | 0.0                                | 63.9                | -                         | -                                | -                          | -                    |
| <b>Gresford Interchange</b>          | -              | -             | 1387                  | 0                            | 0                           | 34.1                  | 29.8                         | 0.0                                | 63.9                | -                         | -                                | -                          | -                    |
| 1/2+1/1                              | 738            | 738           | -                     | -                            | -                           | 4.5                   | 1.6                          | -                                  | 6.1                 | 29.6                      | 5.9                              | 1.6                        | 7.5                  |
| 1/3                                  | 82             | 82            | -                     | -                            | -                           | 0.4                   | 0.1                          | -                                  | 0.5                 | 22.8                      | 1.1                              | 0.1                        | 1.2                  |
| 2/2+2/1                              | 237            | 237           | 474                   | 0                            | 0                           | 0.1                   | 0.2                          | -                                  | 0.4                 | 5.7                       | 0.6                              | 0.2                        | 0.8                  |
| 2/3                                  | 139            | 139           | 139                   | 0                            | 0                           | 0.1                   | 0.2                          | -                                  | 0.3                 | 8.4                       | 0.6                              | 0.2                        | 0.8                  |
| 3/2+3/1                              | 1274           | 1274          | -                     | -                            | -                           | 6.4                   | 3.5                          | -                                  | 10.0                | 28.1                      | 10.3                             | 3.5                        | 13.8                 |
| 3/3                                  | 638            | 638           | -                     | -                            | -                           | 3.2                   | 3.4                          | -                                  | 6.7                 | 37.6                      | 10.3                             | 3.4                        | 13.7                 |
| 4/2+4/1                              | 393            | 393           | -                     | -                            | -                           | 2.7                   | 2.2                          | -                                  | 4.9                 | 44.8                      | 4.1                              | 2.2                        | 6.3                  |
| 4/3                                  | 248            | 248           | -                     | -                            | -                           | 1.8                   | 2.1                          | -                                  | 3.9                 | 56.7                      | 4.1                              | 2.1                        | 6.3                  |
| 5/2+5/1                              | 493            | 493           | -                     | -                            | -                           | 2.7                   | 1.3                          | -                                  | 4.0                 | 29.0                      | 6.1                              | 1.3                        | 7.4                  |
| 5/3                                  | 392            | 392           | -                     | -                            | -                           | 2.2                   | 1.3                          | -                                  | 3.5                 | 32.0                      | 6.1                              | 1.3                        | 7.4                  |
| 6/1                                  | 992            | 992           | -                     | -                            | -                           | 2.4                   | 2.6                          | -                                  | 5.0                 | 18.1                      | 14.4                             | 2.6                        | 17.0                 |
| 6/2                                  | 274            | 274           | -                     | -                            | -                           | 0.2                   | 0.2                          | -                                  | 0.4                 | 5.0                       | 2.3                              | 0.2                        | 2.4                  |
| 6/3                                  | 333            | 333           | -                     | -                            | -                           | 0.5                   | 0.2                          | -                                  | 0.7                 | 7.1                       | 4.0                              | 0.2                        | 4.2                  |
| 7/1                                  | 832            | 832           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/2                                  | 420            | 420           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/3                                  | 491            | 491           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/4                                  | 147            | 147           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 8/1                                  | 295            | 295           | -                     | -                            | -                           | 1.4                   | 2.1                          | -                                  | 3.4                 | 41.9                      | 5.0                              | 2.1                        | 7.1                  |
| 8/2                                  | 295            | 295           | -                     | -                            | -                           | 1.4                   | 2.1                          | -                                  | 3.4                 | 41.9                      | 5.0                              | 2.1                        | 7.1                  |
| 8/3                                  | 69             | 69            | -                     | -                            | -                           | 0.3                   | 0.1                          | -                                  | 0.5                 | 24.3                      | 0.9                              | 0.1                        | 1.0                  |
| 8/4                                  | 257            | 257           | -                     | -                            | -                           | 1.7                   | 1.2                          | -                                  | 2.9                 | 39.9                      | 4.2                              | 1.2                        | 5.4                  |
| 9/1                                  | 637            | 637           | -                     | -                            | -                           | 0.0                   | 0.4                          | -                                  | 0.4                 | 2.5                       | 0.0                              | 0.4                        | 0.4                  |
| 9/2                                  | 869            | 869           | -                     | -                            | -                           | 0.0                   | 0.9                          | -                                  | 0.9                 | 3.7                       | 0.0                              | 0.9                        | 0.9                  |

## Full Input Data And Results

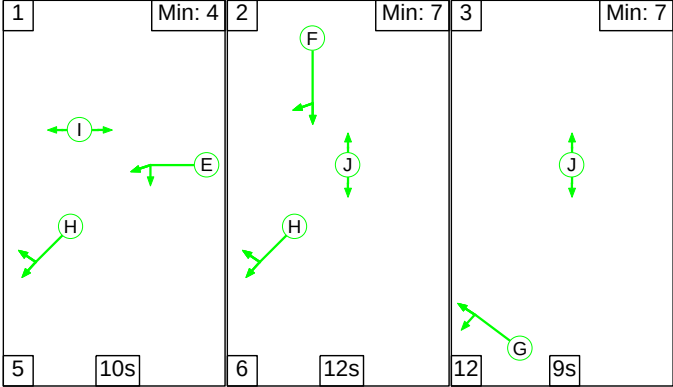
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     |      |      |     |   |   |     |     |   |     |      |     |     |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----|---|---|-----|-----|---|-----|------|-----|-----|-----|
| 9/3                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 663  | 663  | -   | - | - | 0.0 | 0.5 | - | 0.5 | 2.6  | 0.0 | 0.5 | 0.5 |
| 10/1                                                                                                                                                                                                                                                                                                                                                                                                                                                | 409  | 409  | -   | - | - | 0.8 | 0.3 | - | 1.1 | 9.5  | 3.1 | 0.3 | 3.4 |
| 10/2                                                                                                                                                                                                                                                                                                                                                                                                                                                | 514  | 514  | -   | - | - | 0.6 | 0.4 | - | 1.0 | 7.0  | 4.1 | 0.4 | 4.5 |
| 10/3                                                                                                                                                                                                                                                                                                                                                                                                                                                | 911  | 911  | -   | - | - | 0.6 | 2.2 | - | 2.7 | 10.9 | 5.3 | 2.2 | 7.5 |
| 11/1                                                                                                                                                                                                                                                                                                                                                                                                                                                | 240  | 240  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 11/2                                                                                                                                                                                                                                                                                                                                                                                                                                                | 747  | 747  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 12/1                                                                                                                                                                                                                                                                                                                                                                                                                                                | 529  | 529  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/1                                                                                                                                                                                                                                                                                                                                                                                                                                                | 930  | 930  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/2                                                                                                                                                                                                                                                                                                                                                                                                                                                | 420  | 420  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/1                                                                                                                                                                                                                                                                                                                                                                                                                                                | 364  | 364  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/2                                                                                                                                                                                                                                                                                                                                                                                                                                                | 295  | 295  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/1                                                                                                                                                                                                                                                                                                                                                                                                                                                | 783  | 783  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/2                                                                                                                                                                                                                                                                                                                                                                                                                                                | 193  | 193  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 16/1+16/2                                                                                                                                                                                                                                                                                                                                                                                                                                           | 300  | 300  | 600 | 0 | 0 | 0.2 | 0.5 | - | 0.7 | 8.8  | 1.3 | 0.5 | 1.7 |
| 17/1                                                                                                                                                                                                                                                                                                                                                                                                                                                | 478  | 478  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/1                                                                                                                                                                                                                                                                                                                                                                                                                                                | 32   | 32   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/2                                                                                                                                                                                                                                                                                                                                                                                                                                                | 906  | 906  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/3                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1303 | 1303 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 19/1+19/2                                                                                                                                                                                                                                                                                                                                                                                                                                           | 87   | 87   | 174 | 0 | 0 | 0.0 | 0.1 | - | 0.2 | 7.1  | 0.1 | 0.1 | 0.3 |
| 20/1                                                                                                                                                                                                                                                                                                                                                                                                                                                | 42   | 42   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/1                                                                                                                                                                                                                                                                                                                                                                                                                                                | 222  | 222  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/2                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1714 | 1714 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/3                                                                                                                                                                                                                                                                                                                                                                                                                                                | 563  | 563  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| C1 Stream: 1 PRC for Signalled Lanes (%): 6.7<br>C1 Stream: 2 PRC for Signalled Lanes (%): 2.1<br>C1 Stream: 3 PRC for Signalled Lanes (%): 10.2<br>PRC Over All Lanes (%): 2.1<br>Total Delay for Signalled Lanes (pcuHr): 12.60<br>Total Delay for Signalled Lanes (pcuHr): 37.41<br>Total Delay for Signalled Lanes (pcuHr): 12.28<br>Total Delay Over All Lanes(pcuHr): 63.89<br>Cycle Time (s): 63<br>Cycle Time (s): 63<br>Cycle Time (s): 63 |      |      |     |   |   |     |     |   |     |      |     |     |     |

Stage Sequence Diagram

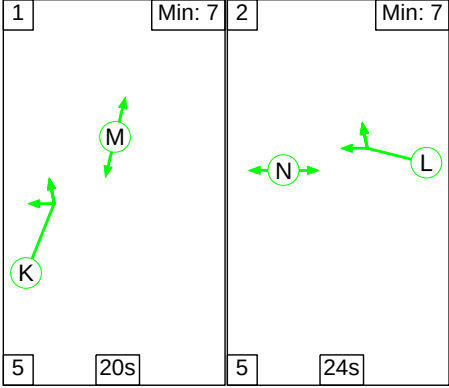
Stage Stream: 1



Stage Stream: 2



Stage Stream: 3



Stage Timings

Stage Stream: 1

| Stage        | 1  | 2  |
|--------------|----|----|
| Duration     | 14 | 30 |
| Change Point | 0  | 19 |

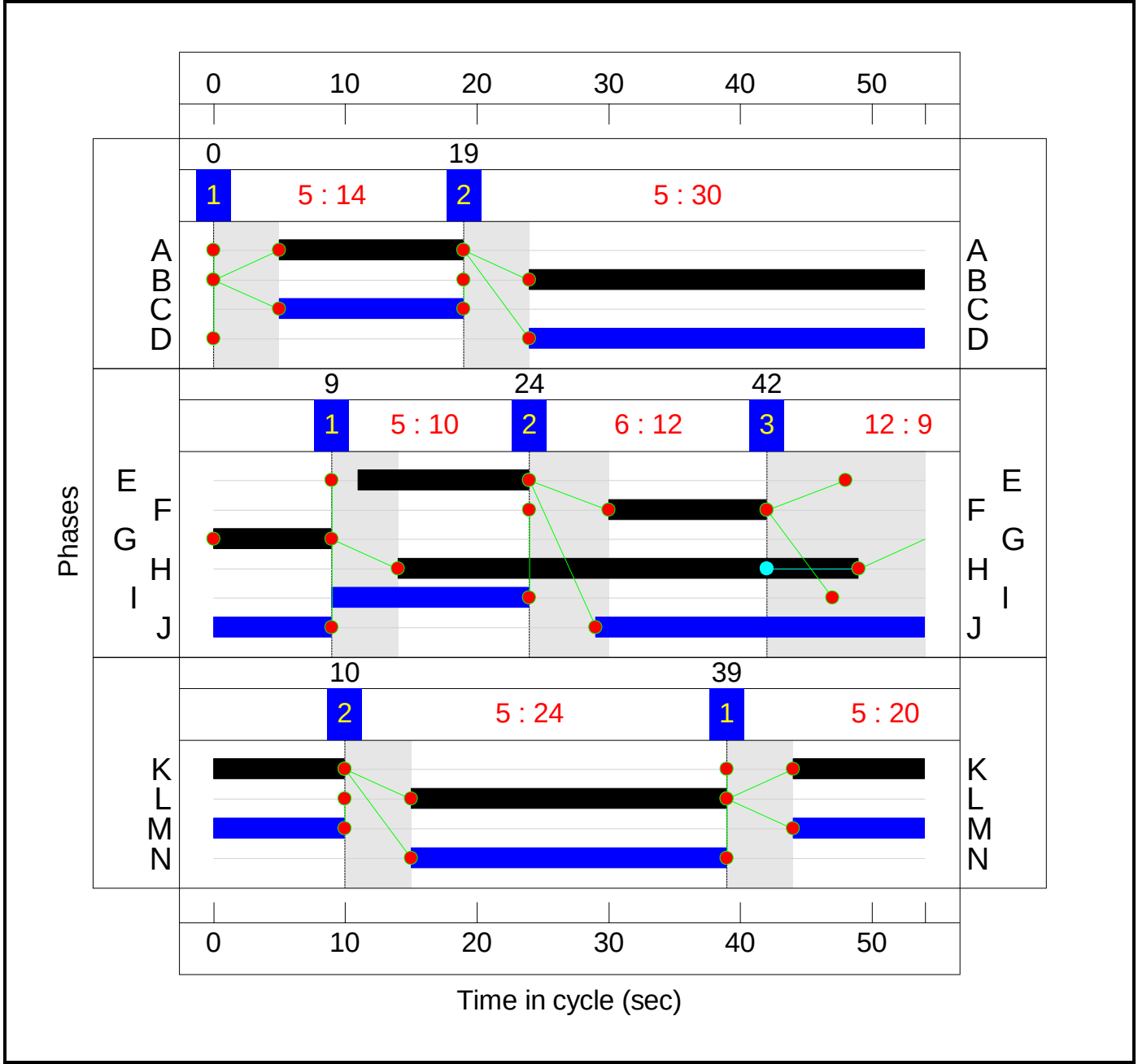
Stage Stream: 2

| Stage        | 1  | 2  | 3  |
|--------------|----|----|----|
| Duration     | 10 | 12 | 9  |
| Change Point | 9  | 24 | 42 |

Full Input Data And Results  
Stage Stream: 3

|              |    |    |
|--------------|----|----|
| Stage        | 1  | 2  |
| Duration     | 20 | 24 |
| Change Point | 39 | 10 |

Signal Timings Diagram





## Full Input Data And Results

## Network 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 (%)    |
|-------------------------------|------------------------------|-----------|-------------------|----------------------------|------------|-------------|------------|-----------------|-----------------|-------------------|-------------------|----------------|----------------|
| Network: Gresford Interchange | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 100.6%         |
| Gresford Interchange          | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 100.6%         |
| 1/2+1/1                       | A483 SB Off-slip Left U-Turn | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 1061              | 1900:1900         | 528+528        | 100.6 : 100.4% |
| 1/3                           | A483 SB Off-slip Left        | U         | 1                 | N/A                        | A          |             | 1          | 14              | -               | 160               | 1900              | 528            | 30.3%          |
| 2/2+2/1                       | B5445 Ahead Left             | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 344               | Inf : Inf         | 245+245        | 74.7 : 65.7%   |
| 2/3                           | B5445 Ahead                  | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 183               | Inf               | 245            | 74.7%          |
| 3/2+3/1                       | A5156 Ahead Left             | U         | 2                 | N/A                        | E          |             | 1          | 13              | -               | 843               | 1900:1900         | 493+493        | 85.7 : 85.5%   |
| 3/3                           | A5156 Ahead                  | U         | 2                 | N/A                        | E          |             | 1          | 13              | -               | 421               | 1900              | 493            | 85.5%          |
| 4/2+4/1                       | A5152 Ahead Left             | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 441               | 1900:1900         | 352+219        | 77.3 : 77.3%   |
| 4/3                           | A5152 Ahead                  | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 271               | 1900              | 352            | 77.0%          |
| 5/2+5/1                       | A483 NB Off-slip Left Ahead  | U         | 3                 | N/A                        | K          |             | 1          | 20              | -               | 707               | 1900:1900         | 739+181        | 76.9 : 76.9%   |
| 5/3                           | A483 NB Off-slip Ahead       | U         | 3                 | N/A                        | K          |             | 1          | 20              | -               | 568               | 1900              | 739            | 76.9%          |
| 6/1                           | Right Left                   | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 1087              | 1900              | 1091           | 99.7%          |
| 6/2                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 502               | 1900              | 1091           | 46.0%          |
| 6/3                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 30              | -               | 296               | 1900              | 1091           | 27.1%          |
| 7/1                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 1281              | Inf               | Inf            | 0.0%           |
| 7/2                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 850               | Inf               | Inf            | 0.0%           |
| 7/3                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 387               | Inf               | Inf            | 0.0%           |
| 7/4                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 252               | Inf               | Inf            | 0.0%           |
| 8/1                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 12              | -               | 219               | 1900              | 457            | 47.8%          |
| 8/2                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 12              | -               | 223               | 1900              | 457            | 48.6%          |

Full Input Data And Results

|           |                                   |   |     |     |   |  |   |    |   |      |           |         |              |
|-----------|-----------------------------------|---|-----|-----|---|--|---|----|---|------|-----------|---------|--------------|
| 8/3       | Ahead                             | U | 2   | N/A | F |  | 1 | 12 | - | 174  | 1900      | 457     | 38.0%        |
| 8/4       | Ahead                             | U | 2   | N/A | F |  | 1 | 12 | - | 389  | 1900      | 457     | 85.0%        |
| 9/1       | Ahead                             | U | 2   | N/A | H |  | 1 | 35 | - | 558  | 1900      | 1267    | 44.1%        |
| 9/2       | Right Ahead                       | U | 2   | N/A | H |  | 1 | 35 | - | 761  | 1900      | 1267    | 60.1%        |
| 9/3       | Right                             | U | 2   | N/A | H |  | 1 | 35 | - | 471  | 1900      | 1267    | 37.2%        |
| 10/1      | Ahead Right                       | U | 3   | N/A | L |  | 1 | 24 | - | 353  | 1900      | 880     | 40.1%        |
| 10/2      | Right                             | U | 3   | N/A | L |  | 1 | 24 | - | 546  | 1900      | 880     | 62.1%        |
| 10/3      | Right                             | U | 3   | N/A | L |  | 1 | 24 | - | 742  | 1900      | 880     | 84.4%        |
| 11/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 243  | Inf       | Inf     | 0.0%         |
| 11/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 668  | Inf       | Inf     | 0.0%         |
| 12/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 336  | Inf       | Inf     | 0.0%         |
| 13/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 1442 | Inf       | Inf     | 0.0%         |
| 13/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 850  | Inf       | Inf     | 0.0%         |
| 14/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 256  | Inf       | Inf     | 0.0%         |
| 14/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 223  | Inf       | Inf     | 0.0%         |
| 15/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 727  | Inf       | Inf     | 0.0%         |
| 15/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 134  | Inf       | Inf     | 0.0%         |
| 16/1+16/2 | Blue Bell Ln Left Ahead           | O | N/A | N/A | - |  | - | -  | - | 357  | Inf : Inf | 256+256 | 69.7 : 70.0% |
| 17/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 425  | Inf       | Inf     | 0.0%         |
| 18/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 67   | Inf       | Inf     | 0.0%         |
| 18/2      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1114 | Inf       | Inf     | 0.0%         |
| 18/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1310 | Inf       | Inf     | 0.0%         |
| 19/1+19/2 | Industrial Park Access Ahead Left | O | N/A | N/A | - |  | - | -  | - | 23   | Inf : Inf | 140+140 | 8.6 : 7.9%   |
| 20/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 75   | Inf       | Inf     | 0.0%         |
| 21/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 233  | Inf       | Inf     | 0.0%         |
| 21/2      | Right Ahead                       | U | N/A | N/A | - |  | - | -  | - | 1753 | Inf       | Inf     | 0.0%         |
| 21/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 787  | Inf       | Inf     | 0.0%         |

## Full Input Data And Results

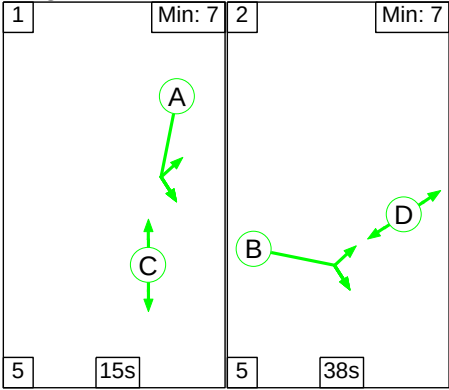
| Item                                 | Arriving (pcu) | Leaving (pcu) | Turners In Gaps (pcu) | Turners When Unopposed (pcu) | Turners In Intergreen (pcu) | Uniform Delay (pcuHr) | Rand + Oversat Delay (pcuHr) | Storage Area Uniform Delay (pcuHr) | Total Delay (pcuHr) | Av. Delay Per PCU (s/pcu) | Max. Back of Uniform Queue (pcu) | Rand + Oversat Queue (pcu) | Mean Max Queue (pcu) |
|--------------------------------------|----------------|---------------|-----------------------|------------------------------|-----------------------------|-----------------------|------------------------------|------------------------------------|---------------------|---------------------------|----------------------------------|----------------------------|----------------------|
| <b>Network: Gresford Interchange</b> | -              | -             | 1631                  | 0                            | 0                           | 36.5                  | 59.0                         | 0.0                                | 95.5                | -                         | -                                | -                          | -                    |
| <b>Gresford Interchange</b>          | -              | -             | 1631                  | 0                            | 0                           | 36.5                  | 59.0                         | 0.0                                | 95.5                | -                         | -                                | -                          | -                    |
| 1/2+1/1                              | 1061           | 1056          | -                     | -                            | -                           | 5.9                   | 17.7                         | -                                  | 23.6                | 80.1                      | 8.0                              | 17.7                       | 25.7                 |
| 1/3                                  | 160            | 160           | -                     | -                            | -                           | 0.7                   | 0.2                          | -                                  | 0.9                 | 20.3                      | 1.9                              | 0.2                        | 2.1                  |
| 2/2+2/1                              | 344            | 344           | 688                   | 0                            | 0                           | 0.7                   | 1.2                          | -                                  | 1.8                 | 19.0                      | 2.4                              | 1.2                        | 3.5                  |
| 2/3                                  | 183            | 183           | 183                   | 0                            | 0                           | 0.4                   | 1.4                          | -                                  | 1.8                 | 35.3                      | 2.4                              | 1.4                        | 3.8                  |
| 3/2+3/1                              | 843            | 843           | -                     | -                            | -                           | 4.5                   | 2.9                          | -                                  | 7.3                 | 31.2                      | 6.0                              | 2.9                        | 8.8                  |
| 3/3                                  | 421            | 421           | -                     | -                            | -                           | 2.2                   | 2.7                          | -                                  | 5.0                 | 42.4                      | 6.0                              | 2.7                        | 8.7                  |
| 4/2+4/1                              | 441            | 441           | -                     | -                            | -                           | 2.5                   | 1.7                          | -                                  | 4.2                 | 34.0                      | 3.9                              | 1.7                        | 5.5                  |
| 4/3                                  | 271            | 271           | -                     | -                            | -                           | 1.6                   | 1.6                          | -                                  | 3.2                 | 42.3                      | 3.8                              | 1.6                        | 5.5                  |
| 5/2+5/1                              | 707            | 707           | -                     | -                            | -                           | 2.7                   | 1.6                          | -                                  | 4.3                 | 22.0                      | 7.4                              | 1.6                        | 9.1                  |
| 5/3                                  | 568            | 568           | -                     | -                            | -                           | 2.3                   | 1.6                          | -                                  | 3.9                 | 24.7                      | 7.4                              | 1.6                        | 9.0                  |
| 6/1                                  | 1087           | 1087          | -                     | -                            | -                           | 3.5                   | 15.6                         | -                                  | 19.0                | 63.1                      | 16.1                             | 15.6                       | 31.7                 |
| 6/2                                  | 502            | 502           | -                     | -                            | -                           | 1.0                   | 0.4                          | -                                  | 1.4                 | 10.1                      | 5.7                              | 0.4                        | 6.1                  |
| 6/3                                  | 296            | 296           | -                     | -                            | -                           | 0.6                   | 0.2                          | -                                  | 0.8                 | 9.5                       | 3.4                              | 0.2                        | 3.6                  |
| 7/1                                  | 1279           | 1279          | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/2                                  | 848            | 848           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/3                                  | 386            | 386           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/4                                  | 252            | 252           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 8/1                                  | 218            | 218           | -                     | -                            | -                           | 0.7                   | 0.5                          | -                                  | 1.1                 | 18.4                      | 2.0                              | 0.5                        | 2.5                  |
| 8/2                                  | 222            | 222           | -                     | -                            | -                           | 0.7                   | 0.5                          | -                                  | 1.1                 | 18.6                      | 2.1                              | 0.5                        | 2.6                  |
| 8/3                                  | 174            | 174           | -                     | -                            | -                           | 0.8                   | 0.3                          | -                                  | 1.1                 | 23.5                      | 1.7                              | 0.3                        | 2.0                  |
| 8/4                                  | 389            | 389           | -                     | -                            | -                           | 1.9                   | 2.6                          | -                                  | 4.6                 | 42.2                      | 5.7                              | 2.6                        | 8.3                  |
| 9/1                                  | 558            | 558           | -                     | -                            | -                           | 0.0                   | 0.4                          | -                                  | 0.4                 | 2.6                       | 0.0                              | 0.4                        | 0.4                  |
| 9/2                                  | 761            | 761           | -                     | -                            | -                           | 0.0                   | 0.8                          | -                                  | 0.8                 | 3.6                       | 0.0                              | 0.8                        | 0.8                  |

## Full Input Data And Results

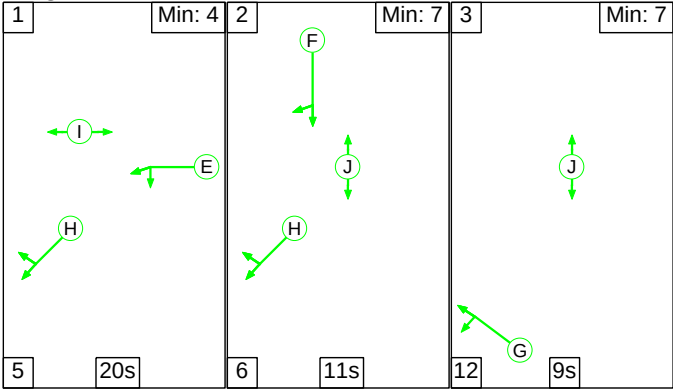
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |      |      |     |   |   |     |     |   |     |      |     |     |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----|---|---|-----|-----|---|-----|------|-----|-----|-----|
| 9/3                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 471  | 471  | -   | - | - | 0.0 | 0.3 | - | 0.3 | 2.3  | 0.0 | 0.3 | 0.3 |
| 10/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 353  | 353  | -   | - | - | 1.2 | 0.3 | - | 1.5 | 15.6 | 3.6 | 0.3 | 3.9 |
| 10/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 546  | 546  | -   | - | - | 1.2 | 0.8 | - | 2.0 | 13.1 | 5.3 | 0.8 | 6.1 |
| 10/3                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 742  | 742  | -   | - | - | 1.0 | 2.6 | - | 3.6 | 17.2 | 5.8 | 2.6 | 8.4 |
| 11/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 243  | 243  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 11/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 668  | 668  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 12/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 336  | 336  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1440 | 1440 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 848  | 848  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 255  | 255  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 222  | 222  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 727  | 727  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 134  | 134  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 16/1+16/2                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 357  | 357  | 714 | 0 | 0 | 0.6 | 1.1 | - | 1.8 | 17.7 | 1.2 | 1.1 | 2.4 |
| 17/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 425  | 425  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 67   | 67   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1114 | 1114 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/3                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1310 | 1310 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 19/1+19/2                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 23   | 23   | 46  | 0 | 0 | 0.0 | 0.0 | - | 0.1 | 9.3  | 0.0 | 0.0 | 0.1 |
| 20/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 75   | 75   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/1                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 233  | 233  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/2                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1753 | 1753 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/3                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 787  | 787  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| C1 Stream: 1 PRC for Signalled Lanes (%): -11.8      Total Delay for Signalled Lanes (pcuHr): 45.73      Cycle Time (s): 54<br>C1 Stream: 2 PRC for Signalled Lanes (%): 5.1      Total Delay for Signalled Lanes (pcuHr): 29.05      Cycle Time (s): 54<br>C1 Stream: 3 PRC for Signalled Lanes (%): 6.7      Total Delay for Signalled Lanes (pcuHr): 15.30      Cycle Time (s): 54<br>PRC Over All Lanes (%): -11.8      Total Delay Over All Lanes(pcuHr): 95.50 |      |      |     |   |   |     |     |   |     |      |     |     |     |

**Stage Sequence Diagram**

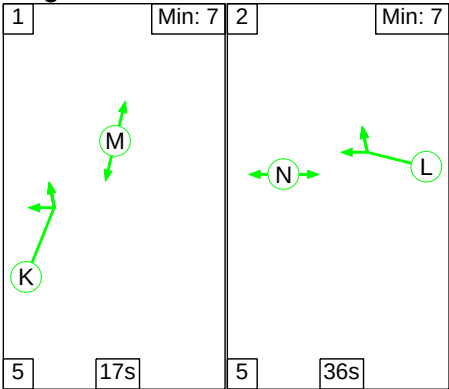
**Stage Stream: 1**



**Stage Stream: 2**



**Stage Stream: 3**



**Stage Timings**

**Stage Stream: 1**

| Stage        | 1  | 2  |
|--------------|----|----|
| Duration     | 15 | 38 |
| Change Point | 0  | 20 |

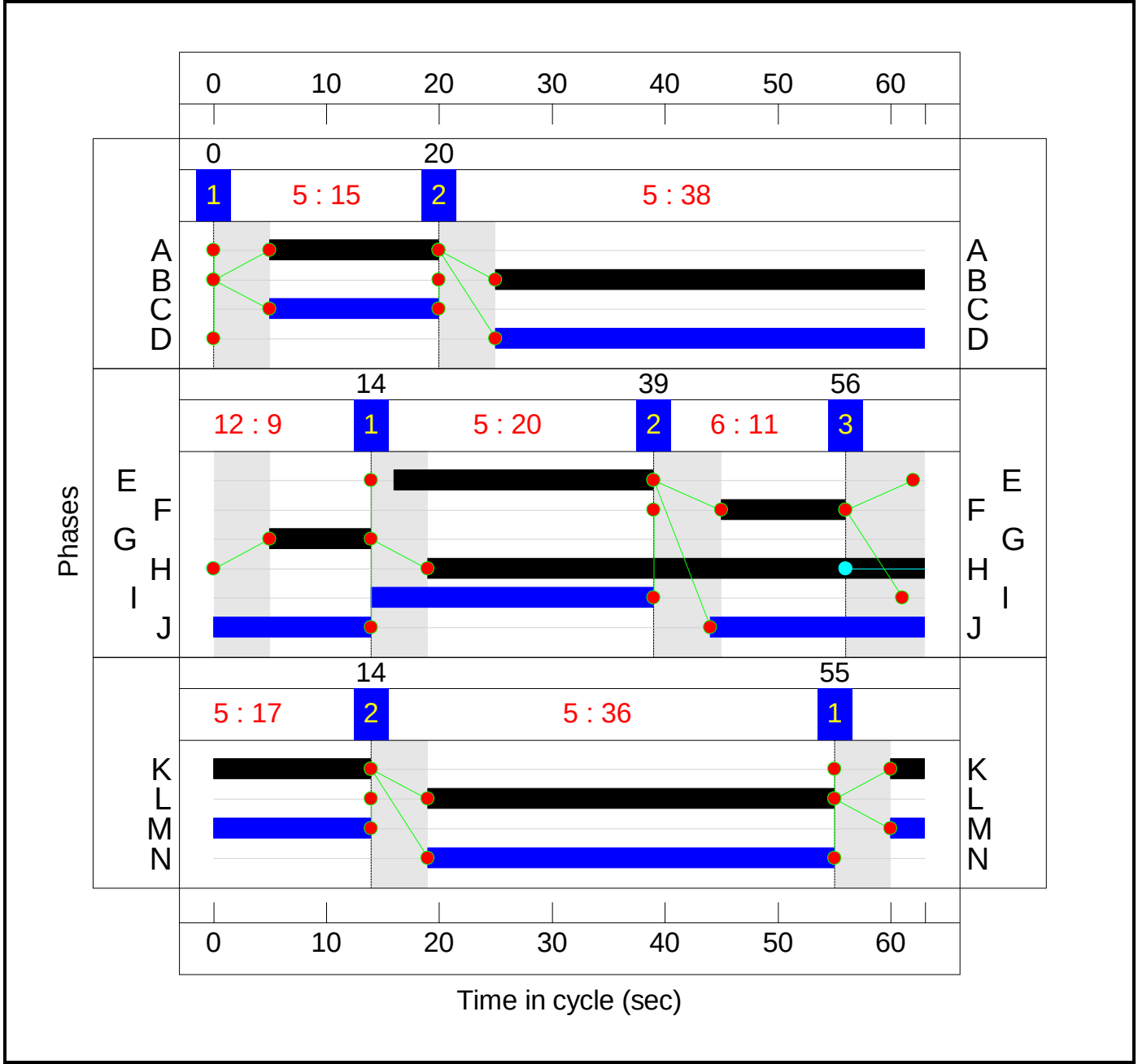
**Stage Stream: 2**

| Stage        | 1  | 2  | 3  |
|--------------|----|----|----|
| Duration     | 20 | 11 | 9  |
| Change Point | 14 | 39 | 56 |

Full Input Data And Results  
Stage Stream: 3

|              |    |    |
|--------------|----|----|
| Stage        | 1  | 2  |
| Duration     | 17 | 36 |
| Change Point | 55 | 14 |

Signal Timings Diagram



## Full Input Data And Results

## Network 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 (%)  |
|-------------------------------|------------------------------|-----------|-------------------|----------------------------|------------|-------------|------------|-----------------|-----------------|-------------------|-------------------|----------------|--------------|
| Network: Gresford Interchange | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 89.7%        |
| Gresford Interchange          | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 89.7%        |
| 1/2+1/1                       | A483 SB Off-slip Left U-Turn | U         | 1                 | N/A                        | A          |             | 1          | 15              | -               | 749               | 1900:1900         | 483+483        | 77.7 : 77.5% |
| 1/3                           | A483 SB Off-slip Left        | U         | 1                 | N/A                        | A          |             | 1          | 15              | -               | 83                | 1900              | 483            | 17.2%        |
| 2/2+2/1                       | B5445 Ahead Left             | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 241               | Inf : Inf         | 413+293        | 34.2 : 34.2% |
| 2/3                           | B5445 Ahead                  | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 140               | Inf               | 413            | 33.9%        |
| 3/2+3/1                       | A5156 Ahead Left             | U         | 2                 | N/A                        | E          |             | 1          | 23              | -               | 1296              | 1900:1900         | 724+724        | 89.5 : 89.5% |
| 3/3                           | A5156 Ahead                  | U         | 2                 | N/A                        | E          |             | 1          | 23              | -               | 649               | 1900              | 724            | 89.7%        |
| 4/2+4/1                       | A5152 Ahead Left             | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 401               | 1900:1900         | 302+178        | 83.6 : 83.6% |
| 4/3                           | A5152 Ahead                  | U         | 2                 | N/A                        | G          |             | 1          | 9               | -               | 251               | 1900              | 302            | 83.2%        |
| 5/2+5/1                       | A483 NB Off-slip Left Ahead  | U         | 3                 | N/A                        | K          |             | 1          | 17              | -               | 502               | 1900:1900         | 543+138        | 73.7 : 73.7% |
| 5/3                           | A483 NB Off-slip Ahead       | U         | 3                 | N/A                        | K          |             | 1          | 17              | -               | 400               | 1900              | 543            | 73.7%        |
| 6/1                           | Right Left                   | U         | 1                 | N/A                        | B          |             | 1          | 38              | -               | 1012              | 1900              | 1176           | 86.0%        |
| 6/2                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 38              | -               | 276               | 1900              | 1176           | 23.5%        |
| 6/3                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 38              | -               | 341               | 1900              | 1176           | 29.0%        |
| 7/1                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 848               | Inf               | Inf            | 0.0%         |
| 7/2                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 425               | Inf               | Inf            | 0.0%         |
| 7/3                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 500               | Inf               | Inf            | 0.0%         |
| 7/4                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 150               | Inf               | Inf            | 0.0%         |
| 8/1                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 11              | -               | 299               | 1900              | 362            | 82.6%        |
| 8/2                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 11              | -               | 301               | 1900              | 362            | 83.2%        |

Full Input Data And Results

|           |                                   |   |     |     |   |  |   |    |   |      |           |         |              |
|-----------|-----------------------------------|---|-----|-----|---|--|---|----|---|------|-----------|---------|--------------|
| 8/3       | Ahead                             | U | 2   | N/A | F |  | 1 | 11 | - | 70   | 1900      | 362     | 19.3%        |
| 8/4       | Ahead                             | U | 2   | N/A | F |  | 1 | 11 | - | 261  | 1900      | 362     | 72.1%        |
| 9/1       | Ahead                             | U | 2   | N/A | H |  | 1 | 44 | - | 648  | 1900      | 1357    | 47.7%        |
| 9/2       | Right Ahead                       | U | 2   | N/A | H |  | 1 | 44 | - | 883  | 1900      | 1357    | 65.1%        |
| 9/3       | Right                             | U | 2   | N/A | H |  | 1 | 44 | - | 675  | 1900      | 1357    | 49.7%        |
| 10/1      | Ahead Right                       | U | 3   | N/A | L |  | 1 | 36 | - | 414  | 1900      | 1116    | 37.1%        |
| 10/2      | Right                             | U | 3   | N/A | L |  | 1 | 36 | - | 523  | 1900      | 1116    | 46.9%        |
| 10/3      | Right                             | U | 3   | N/A | L |  | 1 | 36 | - | 926  | 1900      | 1116    | 83.0%        |
| 11/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 244  | Inf       | Inf     | 0.0%         |
| 11/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 761  | Inf       | Inf     | 0.0%         |
| 12/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 538  | Inf       | Inf     | 0.0%         |
| 13/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 948  | Inf       | Inf     | 0.0%         |
| 13/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 425  | Inf       | Inf     | 0.0%         |
| 14/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 369  | Inf       | Inf     | 0.0%         |
| 14/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 301  | Inf       | Inf     | 0.0%         |
| 15/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 797  | Inf       | Inf     | 0.0%         |
| 15/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 198  | Inf       | Inf     | 0.0%         |
| 16/1+16/2 | Blue Bell Ln Left Ahead           | O | N/A | N/A | - |  | - | -  | - | 305  | Inf : Inf | 292+292 | 52.4 : 52.1% |
| 17/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 484  | Inf       | Inf     | 0.0%         |
| 18/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 32   | Inf       | Inf     | 0.0%         |
| 18/2      | Right                             | U | N/A | N/A | - |  | - | -  | - | 923  | Inf       | Inf     | 0.0%         |
| 18/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1326 | Inf       | Inf     | 0.0%         |
| 19/1+19/2 | Industrial Park Access Ahead Left | O | N/A | N/A | - |  | - | -  | - | 90   | Inf : Inf | 189+189 | 23.8 : 23.8% |
| 20/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 42   | Inf       | Inf     | 0.0%         |
| 21/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 225  | Inf       | Inf     | 0.0%         |
| 21/2      | Right Ahead                       | U | N/A | N/A | - |  | - | -  | - | 1747 | Inf       | Inf     | 0.0%         |
| 21/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 572  | Inf       | Inf     | 0.0%         |



## Full Input Data And Results

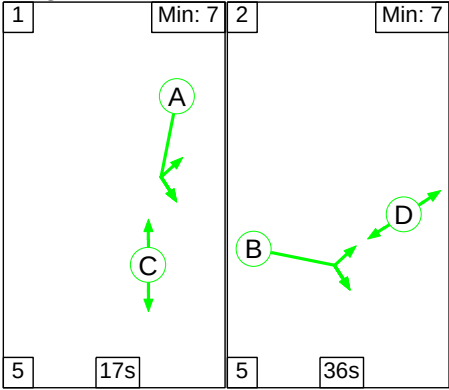
| Item                                 | Arriving (pcu) | Leaving (pcu) | Turners In Gaps (pcu) | Turners When Unopposed (pcu) | Turners In Intergreen (pcu) | Uniform Delay (pcuHr) | Rand + Oversat Delay (pcuHr) | Storage Area Uniform Delay (pcuHr) | Total Delay (pcuHr) | Av. Delay Per PCU (s/pcu) | Max. Back of Uniform Queue (pcu) | Rand + Oversat Queue (pcu) | Mean Max Queue (pcu) |
|--------------------------------------|----------------|---------------|-----------------------|------------------------------|-----------------------------|-----------------------|------------------------------|------------------------------------|---------------------|---------------------------|----------------------------------|----------------------------|----------------------|
| <b>Network: Gresford Interchange</b> | -              | -             | 1412                  | 0                            | 0                           | 35.0                  | 32.7                         | 0.0                                | 67.6                | -                         | -                                | -                          | -                    |
| <b>Gresford Interchange</b>          | -              | -             | 1412                  | 0                            | 0                           | 35.0                  | 32.7                         | 0.0                                | 67.6                | -                         | -                                | -                          | -                    |
| 1/2+1/1                              | 749            | 749           | -                     | -                            | -                           | 4.5                   | 1.7                          | -                                  | 6.3                 | 30.0                      | 6.0                              | 1.7                        | 7.7                  |
| 1/3                                  | 83             | 83            | -                     | -                            | -                           | 0.4                   | 0.1                          | -                                  | 0.5                 | 22.9                      | 1.1                              | 0.1                        | 1.2                  |
| 2/2+2/1                              | 241            | 241           | 482                   | 0                            | 0                           | 0.1                   | 0.3                          | -                                  | 0.4                 | 5.8                       | 0.6                              | 0.3                        | 0.8                  |
| 2/3                                  | 140            | 140           | 140                   | 0                            | 0                           | 0.1                   | 0.3                          | -                                  | 0.3                 | 8.6                       | 0.6                              | 0.3                        | 0.8                  |
| 3/2+3/1                              | 1296           | 1296          | -                     | -                            | -                           | 6.6                   | 4.1                          | -                                  | 10.7                | 29.6                      | 10.6                             | 4.1                        | 14.7                 |
| 3/3                                  | 649            | 649           | -                     | -                            | -                           | 3.3                   | 3.9                          | -                                  | 7.2                 | 40.1                      | 10.6                             | 3.9                        | 14.6                 |
| 4/2+4/1                              | 401            | 401           | -                     | -                            | -                           | 2.8                   | 2.4                          | -                                  | 5.2                 | 46.7                      | 4.3                              | 2.4                        | 6.7                  |
| 4/3                                  | 251            | 251           | -                     | -                            | -                           | 1.8                   | 2.3                          | -                                  | 4.1                 | 58.3                      | 4.3                              | 2.3                        | 6.5                  |
| 5/2+5/1                              | 502            | 502           | -                     | -                            | -                           | 2.7                   | 1.4                          | -                                  | 4.1                 | 29.6                      | 6.2                              | 1.4                        | 7.6                  |
| 5/3                                  | 400            | 400           | -                     | -                            | -                           | 2.3                   | 1.4                          | -                                  | 3.6                 | 32.7                      | 6.2                              | 1.4                        | 7.6                  |
| 6/1                                  | 1012           | 1012          | -                     | -                            | -                           | 2.5                   | 3.0                          | -                                  | 5.5                 | 19.5                      | 15.0                             | 3.0                        | 18.0                 |
| 6/2                                  | 276            | 276           | -                     | -                            | -                           | 0.2                   | 0.2                          | -                                  | 0.3                 | 4.4                       | 2.0                              | 0.2                        | 2.1                  |
| 6/3                                  | 341            | 341           | -                     | -                            | -                           | 0.4                   | 0.2                          | -                                  | 0.6                 | 6.4                       | 3.8                              | 0.2                        | 4.0                  |
| 7/1                                  | 848            | 848           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/2                                  | 425            | 425           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/3                                  | 500            | 500           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/4                                  | 150            | 150           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 8/1                                  | 299            | 299           | -                     | -                            | -                           | 1.5                   | 2.2                          | -                                  | 3.7                 | 44.6                      | 5.1                              | 2.2                        | 7.3                  |
| 8/2                                  | 301            | 301           | -                     | -                            | -                           | 1.5                   | 2.3                          | -                                  | 3.8                 | 45.4                      | 5.2                              | 2.3                        | 7.5                  |
| 8/3                                  | 70             | 70            | -                     | -                            | -                           | 0.4                   | 0.1                          | -                                  | 0.5                 | 24.7                      | 0.9                              | 0.1                        | 1.1                  |
| 8/4                                  | 261            | 261           | -                     | -                            | -                           | 1.7                   | 1.3                          | -                                  | 3.0                 | 41.3                      | 4.4                              | 1.3                        | 5.6                  |
| 9/1                                  | 648            | 648           | -                     | -                            | -                           | 0.0                   | 0.5                          | -                                  | 0.5                 | 2.5                       | 0.0                              | 0.5                        | 0.5                  |
| 9/2                                  | 883            | 883           | -                     | -                            | -                           | 0.0                   | 0.9                          | -                                  | 0.9                 | 3.8                       | 0.0                              | 0.9                        | 1.0                  |

## Full Input Data And Results

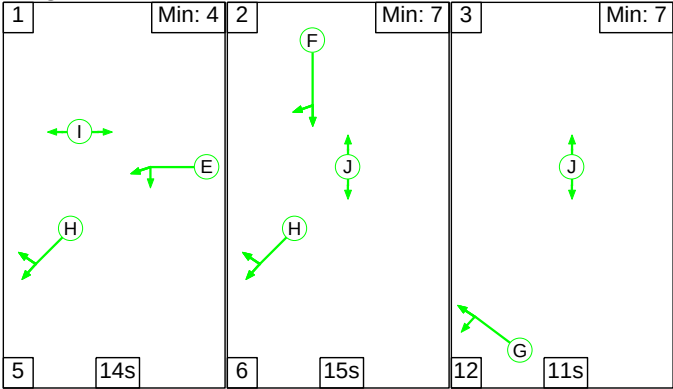
|                                                                                                                                                                                                                                                                                                                                                                                                                                                    |      |      |     |   |   |     |     |   |     |      |     |     |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----|---|---|-----|-----|---|-----|------|-----|-----|-----|
| 9/3                                                                                                                                                                                                                                                                                                                                                                                                                                                | 675  | 675  | -   | - | - | 0.0 | 0.5 | - | 0.5 | 2.6  | 0.0 | 0.5 | 0.5 |
| 10/1                                                                                                                                                                                                                                                                                                                                                                                                                                               | 414  | 414  | -   | - | - | 0.8 | 0.3 | - | 1.1 | 9.2  | 3.2 | 0.3 | 3.5 |
| 10/2                                                                                                                                                                                                                                                                                                                                                                                                                                               | 523  | 523  | -   | - | - | 0.5 | 0.4 | - | 1.0 | 6.8  | 4.1 | 0.4 | 4.6 |
| 10/3                                                                                                                                                                                                                                                                                                                                                                                                                                               | 926  | 926  | -   | - | - | 0.6 | 2.4 | - | 2.9 | 11.4 | 5.0 | 2.4 | 7.4 |
| 11/1                                                                                                                                                                                                                                                                                                                                                                                                                                               | 244  | 244  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 11/2                                                                                                                                                                                                                                                                                                                                                                                                                                               | 761  | 761  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 12/1                                                                                                                                                                                                                                                                                                                                                                                                                                               | 538  | 538  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/1                                                                                                                                                                                                                                                                                                                                                                                                                                               | 948  | 948  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/2                                                                                                                                                                                                                                                                                                                                                                                                                                               | 425  | 425  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/1                                                                                                                                                                                                                                                                                                                                                                                                                                               | 369  | 369  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/2                                                                                                                                                                                                                                                                                                                                                                                                                                               | 301  | 301  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/1                                                                                                                                                                                                                                                                                                                                                                                                                                               | 797  | 797  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/2                                                                                                                                                                                                                                                                                                                                                                                                                                               | 198  | 198  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 16/1+16/2                                                                                                                                                                                                                                                                                                                                                                                                                                          | 305  | 305  | 610 | 0 | 0 | 0.2 | 0.5 | - | 0.7 | 8.8  | 0.6 | 0.5 | 1.2 |
| 17/1                                                                                                                                                                                                                                                                                                                                                                                                                                               | 484  | 484  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/1                                                                                                                                                                                                                                                                                                                                                                                                                                               | 32   | 32   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/2                                                                                                                                                                                                                                                                                                                                                                                                                                               | 923  | 923  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/3                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1326 | 1326 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 19/1+19/2                                                                                                                                                                                                                                                                                                                                                                                                                                          | 90   | 90   | 180 | 0 | 0 | 0.0 | 0.2 | - | 0.2 | 7.6  | 0.2 | 0.2 | 0.3 |
| 20/1                                                                                                                                                                                                                                                                                                                                                                                                                                               | 42   | 42   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/1                                                                                                                                                                                                                                                                                                                                                                                                                                               | 225  | 225  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/2                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1747 | 1747 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/3                                                                                                                                                                                                                                                                                                                                                                                                                                               | 572  | 572  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| C1 Stream: 1 PRC for Signalled Lanes (%): 4.6<br>C1 Stream: 2 PRC for Signalled Lanes (%): 0.4<br>C1 Stream: 3 PRC for Signalled Lanes (%): 8.5<br>PRC Over All Lanes (%): 0.4<br>Total Delay for Signalled Lanes (pcuHr): 13.20<br>Total Delay for Signalled Lanes (pcuHr): 40.01<br>Total Delay for Signalled Lanes (pcuHr): 12.73<br>Total Delay Over All Lanes(pcuHr): 67.61<br>Cycle Time (s): 63<br>Cycle Time (s): 63<br>Cycle Time (s): 63 |      |      |     |   |   |     |     |   |     |      |     |     |     |

**Stage Sequence Diagram**

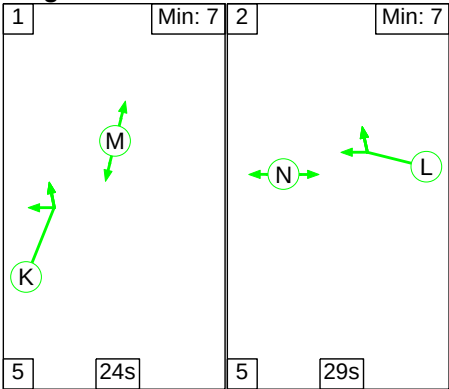
**Stage Stream: 1**



**Stage Stream: 2**



**Stage Stream: 3**



**Stage Timings**

**Stage Stream: 1**

| Stage        | 1  | 2  |
|--------------|----|----|
| Duration     | 17 | 36 |
| Change Point | 0  | 22 |

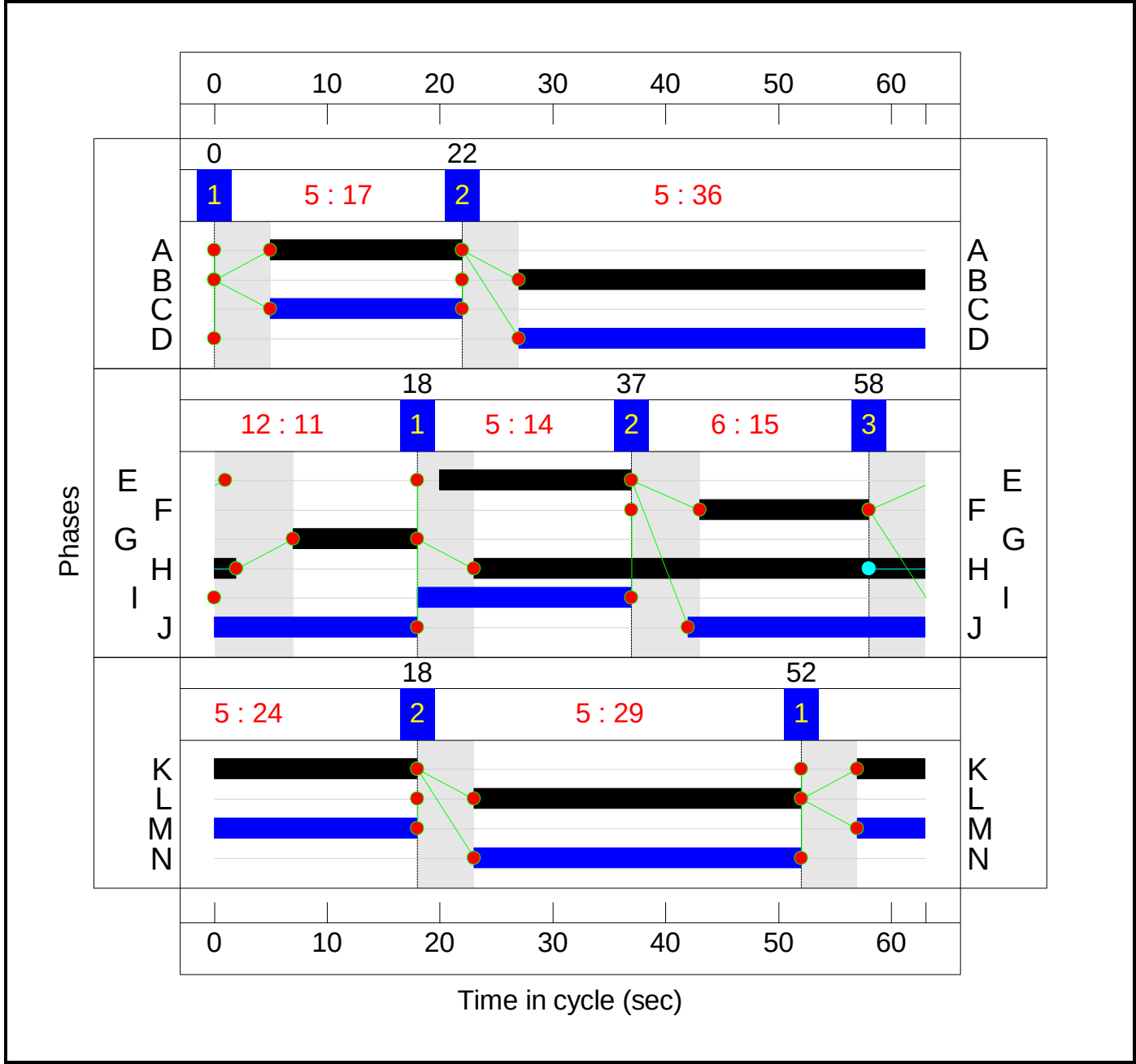
**Stage Stream: 2**

| Stage        | 1  | 2  | 3  |
|--------------|----|----|----|
| Duration     | 14 | 15 | 11 |
| Change Point | 18 | 37 | 58 |

Full Input Data And Results  
Stage Stream: 3

|              |    |    |
|--------------|----|----|
| Stage        | 1  | 2  |
| Duration     | 24 | 29 |
| Change Point | 52 | 18 |

Signal Timings Diagram



## Full Input Data And Results

## Network 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 (%)  |
|-------------------------------|------------------------------|-----------|-------------------|----------------------------|------------|-------------|------------|-----------------|-----------------|-------------------|-------------------|----------------|--------------|
| Network: Gresford Interchange | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 97.8%        |
| Gresford Interchange          | -                            | -         | N/A               | -                          | -          |             | -          | -               | -               | -                 | -                 | -              | 97.8%        |
| 1/2+1/1                       | A483 SB Off-slip Left U-Turn | U         | 1                 | N/A                        | A          |             | 1          | 17              | -               | 1061              | 1900:1900         | 543+543        | 97.8 : 97.6% |
| 1/3                           | A483 SB Off-slip Left        | U         | 1                 | N/A                        | A          |             | 1          | 17              | -               | 160               | 1900              | 543            | 29.5%        |
| 2/2+2/1                       | B5445 Ahead Left             | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 344               | Inf : Inf         | 242+242        | 75.5 : 66.4% |
| 2/3                           | B5445 Ahead                  | O         | N/A               | N/A                        | -          |             | -          | -               | -               | 183               | Inf               | 242            | 75.5%        |
| 3/2+3/1                       | A5156 Ahead Left             | U         | 2                 | N/A                        | E          |             | 1          | 17              | -               | 843               | 1900:1900         | 543+543        | 77.7 : 77.6% |
| 3/3                           | A5156 Ahead                  | U         | 2                 | N/A                        | E          |             | 1          | 17              | -               | 421               | 1900              | 543            | 77.6%        |
| 4/2+4/1                       | A5152 Ahead Left             | U         | 2                 | N/A                        | G          |             | 1          | 11              | -               | 441               | 1900:1900         | 362+225        | 75.2 : 75.2% |
| 4/3                           | A5152 Ahead                  | U         | 2                 | N/A                        | G          |             | 1          | 11              | -               | 271               | 1900              | 362            | 74.9%        |
| 5/2+5/1                       | A483 NB Off-slip Left Ahead  | U         | 3                 | N/A                        | K          |             | 1          | 24              | -               | 707               | 1900:1900         | 732+179        | 77.6 : 77.6% |
| 5/3                           | A483 NB Off-slip Ahead       | U         | 3                 | N/A                        | K          |             | 1          | 24              | -               | 568               | 1900              | 754            | 75.3%        |
| 6/1                           | Right Left                   | U         | 1                 | N/A                        | B          |             | 1          | 36              | -               | 1087              | 1900              | 1116           | 97.4%        |
| 6/2                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 36              | -               | 502               | 1900              | 1116           | 45.0%        |
| 6/3                           | Right                        | U         | 1                 | N/A                        | B          |             | 1          | 36              | -               | 296               | 1900              | 1116           | 26.5%        |
| 7/1                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 1281              | Inf               | Inf            | 0.0%         |
| 7/2                           | Ahead                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 850               | Inf               | Inf            | 0.0%         |
| 7/3                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 387               | Inf               | Inf            | 0.0%         |
| 7/4                           | Right                        | U         | N/A               | N/A                        | -          |             | -          | -               | -               | 252               | Inf               | Inf            | 0.0%         |
| 8/1                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 15              | -               | 219               | 1900              | 483            | 45.4%        |
| 8/2                           | Ahead                        | U         | 2                 | N/A                        | F          |             | 1          | 15              | -               | 223               | 1900              | 483            | 46.2%        |

Full Input Data And Results

|           |                                   |   |     |     |   |  |   |    |   |      |           |         |              |
|-----------|-----------------------------------|---|-----|-----|---|--|---|----|---|------|-----------|---------|--------------|
| 8/3       | Ahead                             | U | 2   | N/A | F |  | 1 | 15 | - | 174  | 1900      | 483     | 36.1%        |
| 8/4       | Ahead                             | U | 2   | N/A | F |  | 1 | 15 | - | 389  | 1900      | 483     | 80.6%        |
| 9/1       | Ahead                             | U | 2   | N/A | H |  | 1 | 42 | - | 558  | 1900      | 1297    | 43.0%        |
| 9/2       | Right Ahead                       | U | 2   | N/A | H |  | 1 | 42 | - | 761  | 1900      | 1297    | 58.7%        |
| 9/3       | Right                             | U | 2   | N/A | H |  | 1 | 42 | - | 471  | 1900      | 1297    | 36.3%        |
| 10/1      | Ahead Right                       | U | 3   | N/A | L |  | 1 | 29 | - | 353  | 1900      | 905     | 39.0%        |
| 10/2      | Right                             | U | 3   | N/A | L |  | 1 | 29 | - | 546  | 1900      | 905     | 60.3%        |
| 10/3      | Right                             | U | 3   | N/A | L |  | 1 | 29 | - | 742  | 1900      | 905     | 82.0%        |
| 11/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 243  | Inf       | Inf     | 0.0%         |
| 11/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 668  | Inf       | Inf     | 0.0%         |
| 12/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 336  | Inf       | Inf     | 0.0%         |
| 13/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 1442 | Inf       | Inf     | 0.0%         |
| 13/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 850  | Inf       | Inf     | 0.0%         |
| 14/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 256  | Inf       | Inf     | 0.0%         |
| 14/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 223  | Inf       | Inf     | 0.0%         |
| 15/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 727  | Inf       | Inf     | 0.0%         |
| 15/2      |                                   | U | N/A | N/A | - |  | - | -  | - | 134  | Inf       | Inf     | 0.0%         |
| 16/1+16/2 | Blue Bell Ln Left Ahead           | O | N/A | N/A | - |  | - | -  | - | 357  | Inf : Inf | 261+261 | 68.3 : 68.7% |
| 17/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 425  | Inf       | Inf     | 0.0%         |
| 18/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 67   | Inf       | Inf     | 0.0%         |
| 18/2      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1114 | Inf       | Inf     | 0.0%         |
| 18/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 1310 | Inf       | Inf     | 0.0%         |
| 19/1+19/2 | Industrial Park Access Ahead Left | O | N/A | N/A | - |  | - | -  | - | 23   | Inf : Inf | 146+146 | 8.2 : 7.5%   |
| 20/1      |                                   | U | N/A | N/A | - |  | - | -  | - | 75   | Inf       | Inf     | 0.0%         |
| 21/1      | Ahead                             | U | N/A | N/A | - |  | - | -  | - | 233  | Inf       | Inf     | 0.0%         |
| 21/2      | Right Ahead                       | U | N/A | N/A | - |  | - | -  | - | 1753 | Inf       | Inf     | 0.0%         |
| 21/3      | Right                             | U | N/A | N/A | - |  | - | -  | - | 787  | 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: Gresford Interchange</b> | -              | -             | 1631                  | 0                            | 0                           | 41.0                  | 43.9                         | 0.0                                | 84.9                | -                         | -                                | -                          | -                    |
| <b>Gresford Interchange</b>          | -              | -             | 1631                  | 0                            | 0                           | 41.0                  | 43.9                         | 0.0                                | 84.9                | -                         | -                                | -                          | -                    |
| 1/2+1/1                              | 1061           | 1061          | -                     | -                            | -                           | 6.6                   | 11.2                         | -                                  | 17.8                | 60.4                      | 9.1                              | 11.2                       | 20.4                 |
| 1/3                                  | 160            | 160           | -                     | -                            | -                           | 0.8                   | 0.2                          | -                                  | 1.0                 | 22.3                      | 2.2                              | 0.2                        | 2.4                  |
| 2/2+2/1                              | 344            | 344           | 688                   | 0                            | 0                           | 0.8                   | 1.2                          | -                                  | 2.0                 | 21.0                      | 2.8                              | 1.2                        | 4.0                  |
| 2/3                                  | 183            | 183           | 183                   | 0                            | 0                           | 0.5                   | 1.5                          | -                                  | 1.9                 | 38.2                      | 2.8                              | 1.5                        | 4.3                  |
| 3/2+3/1                              | 843            | 843           | -                     | -                            | -                           | 4.8                   | 1.7                          | -                                  | 6.5                 | 28.0                      | 6.7                              | 1.7                        | 8.4                  |
| 3/3                                  | 421            | 421           | -                     | -                            | -                           | 2.4                   | 1.7                          | -                                  | 4.1                 | 35.0                      | 6.7                              | 1.7                        | 8.3                  |
| 4/2+4/1                              | 441            | 441           | -                     | -                            | -                           | 2.9                   | 1.5                          | -                                  | 4.4                 | 35.7                      | 4.5                              | 1.5                        | 5.9                  |
| 4/3                                  | 271            | 271           | -                     | -                            | -                           | 1.8                   | 1.4                          | -                                  | 3.3                 | 43.3                      | 4.4                              | 1.4                        | 5.9                  |
| 5/2+5/1                              | 707            | 707           | -                     | -                            | -                           | 3.1                   | 1.7                          | -                                  | 4.8                 | 24.2                      | 8.5                              | 1.7                        | 10.2                 |
| 5/3                                  | 568            | 568           | -                     | -                            | -                           | 2.6                   | 1.5                          | -                                  | 4.1                 | 25.9                      | 8.5                              | 1.5                        | 10.0                 |
| 6/1                                  | 1087           | 1087          | -                     | -                            | -                           | 3.5                   | 10.8                         | -                                  | 14.3                | 47.4                      | 18.6                             | 10.8                       | 29.4                 |
| 6/2                                  | 502            | 502           | -                     | -                            | -                           | 0.9                   | 0.4                          | -                                  | 1.3                 | 9.1                       | 6.4                              | 0.4                        | 6.8                  |
| 6/3                                  | 296            | 296           | -                     | -                            | -                           | 0.6                   | 0.2                          | -                                  | 0.7                 | 8.9                       | 3.5                              | 0.2                        | 3.7                  |
| 7/1                                  | 1281           | 1281          | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/2                                  | 850            | 850           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/3                                  | 387            | 387           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 7/4                                  | 252            | 252           | -                     | -                            | -                           | 0.0                   | 0.0                          | -                                  | 0.0                 | 0.0                       | 0.0                              | 0.0                        | 0.0                  |
| 8/1                                  | 219            | 219           | -                     | -                            | -                           | 0.8                   | 0.4                          | -                                  | 1.2                 | 19.4                      | 3.4                              | 0.4                        | 3.8                  |
| 8/2                                  | 223            | 223           | -                     | -                            | -                           | 0.8                   | 0.4                          | -                                  | 1.2                 | 19.6                      | 3.5                              | 0.4                        | 3.9                  |
| 8/3                                  | 174            | 174           | -                     | -                            | -                           | 1.0                   | 0.3                          | -                                  | 1.3                 | 26.6                      | 2.5                              | 0.3                        | 2.8                  |
| 8/4                                  | 389            | 389           | -                     | -                            | -                           | 2.8                   | 2.0                          | -                                  | 4.8                 | 44.6                      | 6.5                              | 2.0                        | 8.5                  |
| 9/1                                  | 558            | 558           | -                     | -                            | -                           | 0.0                   | 0.4                          | -                                  | 0.4                 | 2.5                       | 0.0                              | 0.4                        | 0.4                  |
| 9/2                                  | 761            | 761           | -                     | -                            | -                           | 0.0                   | 0.7                          | -                                  | 0.7                 | 3.4                       | 0.0                              | 0.7                        | 0.7                  |

## Full Input Data And Results

|                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |      |     |   |   |     |     |   |     |      |     |     |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----|---|---|-----|-----|---|-----|------|-----|-----|-----|
| 9/3                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 471  | 471  | -   | - | - | 0.0 | 0.3 | - | 0.3 | 2.2  | 0.0 | 0.3 | 0.3 |
| 10/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 353  | 353  | -   | - | - | 1.4 | 0.3 | - | 1.7 | 17.6 | 4.1 | 0.3 | 4.4 |
| 10/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 546  | 546  | -   | - | - | 1.3 | 0.8 | - | 2.0 | 13.4 | 6.1 | 0.8 | 6.8 |
| 10/3                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 742  | 742  | -   | - | - | 1.0 | 2.2 | - | 3.2 | 15.6 | 6.9 | 2.2 | 9.1 |
| 11/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 243  | 243  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 11/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 668  | 668  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 12/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 336  | 336  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1442 | 1442 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 13/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 850  | 850  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 256  | 256  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 14/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 223  | 223  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 727  | 727  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 15/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 134  | 134  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 16/1+16/2                                                                                                                                                                                                                                                                                                                                                                                                                                             | 357  | 357  | 714 | 0 | 0 | 0.7 | 1.1 | - | 1.8 | 18.2 | 1.4 | 1.1 | 2.5 |
| 17/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 425  | 425  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 67   | 67   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1114 | 1114 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 18/3                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1310 | 1310 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 19/1+19/2                                                                                                                                                                                                                                                                                                                                                                                                                                             | 23   | 23   | 46  | 0 | 0 | 0.0 | 0.0 | - | 0.1 | 9.6  | 0.1 | 0.0 | 0.1 |
| 20/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 75   | 75   | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/1                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 233  | 233  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1753 | 1753 | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| 21/3                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 787  | 787  | -   | - | - | 0.0 | 0.0 | - | 0.0 | 0.0  | 0.0 | 0.0 | 0.0 |
| C1 Stream: 1 PRC for Signalled Lanes (%): -8.7<br>C1 Stream: 2 PRC for Signalled Lanes (%): 11.6<br>C1 Stream: 3 PRC for Signalled Lanes (%): 9.7<br>PRC Over All Lanes (%): -8.7<br>Total Delay for Signalled Lanes (pcuHr): 35.11<br>Total Delay for Signalled Lanes (pcuHr): 28.16<br>Total Delay for Signalled Lanes (pcuHr): 15.82<br>Total Delay Over All Lanes(pcuHr): 84.91<br>Cycle Time (s): 63<br>Cycle Time (s): 63<br>Cycle Time (s): 63 |      |      |     |   |   |     |     |   |     |      |     |     |     |



| Junctions 9                                                                                                                                                      |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| PICADY 9 - Priority Intersection Module                                                                                                                          |  |
| Version: 9.5.1.7462<br>© Copyright TRL Limited, 2019                                                                                                             |  |
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| The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution |  |

Filename: Bryn-Oak.j9

Path: N:\Projects 2021\P21066 - Kingmoor, Wrexham Industrial Estate\6.Technical\Models

Report generation date: 21/03/2023 16:08:54

- »Observed 2022, AM
- »Observed 2022, PM
- »Without Dev 2027, AM
- »Without Dev 2027, PM
- »Without Dev 2036, AM
- »Without Dev 2036, PM
- »With Dev 2027, AM
- »With Dev 2027, PM
- »With Dev 2036, AM
- »With Dev 2036, PM

## File summary

### File Description

|             |                        |
|-------------|------------------------|
| Title       | Bryn Lane/Oak Road     |
| Location    | Wrexham                |
| Site number |                        |
| Date        | 21/03/2023             |
| Version     |                        |
| Status      | Final                  |
| Identifier  |                        |
| Client      | FIREM                  |
| Jobnumber   | P21066                 |
| Enumerator  | GHC\b.gaze             |
| Description | Checked by D. Stoddart |

## Units

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

## Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------|-----------------------------|-----------------------|
| 5.75               |                             |                                   |                             | 0.85          | 36.00                       | 20.00                 |

## Demand Set Summary

| ID  | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|-----|------------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D1  | Observed 2022    | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |
| D2  | Observed 2022    | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |
| D3  | Without Dev 2027 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |
| D4  | Without Dev 2027 | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |
| D5  | Without Dev 2036 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |
| D6  | Without Dev 2036 | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |
| D7  | With Dev 2027    | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |
| D8  | With Dev 2027    | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |
| D9  | With Dev 2036    | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |
| D10 | With Dev 2036    | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |

## Analysis Set Details

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

# Observed 2022, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name               | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/Oak Road | T-Junction    | Two-way              |                       | 3.98               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Arms

### Arms

| Arm | Name                   | Description | Arm type |
|-----|------------------------|-------------|----------|
| A   | Oak Road (Western Arm) |             | Major    |
| B   | Bryn Lane              |             | Minor    |
| C   | Oak Road (Eastern Arm) |             | Major    |

### Major Arm Geometry

| Arm                        | Width of carriageway (m) | Has kerbed central reserve | Has right turn bay | Width for right turn (m) | Visibility for right turn (m) | Blocks? | Blocking queue (PCU) |
|----------------------------|--------------------------|----------------------------|--------------------|--------------------------|-------------------------------|---------|----------------------|
| C - Oak Road (Eastern Arm) | 7.00                     |                            | ✓                  | 3.50                     | 150.0                         | ✓       | 8.00                 |

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

### Minor Arm Geometry

| Arm           | Minor arm type      | Width at give-way (m) | Width at 5m (m) | Width at 10m (m) | Width at 15m (m) | Width at 20m (m) | Estimate flare length | Flare length (PCU) | Visibility to left (m) | Visibility to right (m) |
|---------------|---------------------|-----------------------|-----------------|------------------|------------------|------------------|-----------------------|--------------------|------------------------|-------------------------|
| B - Bryn Lane | One lane plus flare | 10.00                 | 9.60            | 5.80             | 3.60             | 3.20             | ✓                     | 2.00               | 40                     | 16                      |

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

| Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for C-A | Slope for C-B |
|--------|--------------------|---------------|---------------|---------------|---------------|
| B-A    | 559                | 0.097         | 0.246         | 0.155         | 0.352         |
| B-C    | 713                | 0.105         | 0.264         | -             | -             |
| C-B    | 754                | 0.280         | 0.280         | -             | -             |

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D1 | Observed 2022 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                        | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Oak Road (Western Arm) |            | ONE HOUR     | ✓            | 148                     | 100.000            |
| B - Bryn Lane              |            | ONE HOUR     | ✓            | 145                     | 100.000            |
| C - Oak Road (Eastern Arm) |            | ONE HOUR     | ✓            | 90                      | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|  | To                         |                            |               |                            |
|--|----------------------------|----------------------------|---------------|----------------------------|
|  |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
|  | From                       |                            |               |                            |
|  | A - Oak Road (Western Arm) | 0                          | 88            | 60                         |
|  | B - Bryn Lane              | 72                         | 0             | 73                         |
|  | C - Oak Road (Eastern Arm) | 40                         | 50            | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|  | To                         |                            |               |                            |
|--|----------------------------|----------------------------|---------------|----------------------------|
|  |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
|  | From                       |                            |               |                            |
|  | A - Oak Road (Western Arm) | 0                          | 19            | 10                         |
|  | B - Bryn Lane              | 22                         | 0             | 4                          |
|  | C - Oak Road (Eastern Arm) | 9                          | 12            | 0                          |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.12    | 6.51          | 0.1             | A       | 67                      | 100                           |
| B-A    | 0.16    | 10.28         | 0.2             | B       | 66                      | 99                            |
| C-AB   | 0.08    | 6.16          | 0.1             | A       | 46                      | 69                            |
| C-A    |         |               |                 |         | 37                      | 55                            |
| A-B    |         |               |                 |         | 81                      | 121                           |
| A-C    |         |               |                 |         | 55                      | 83                            |

# Observed 2022, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name               | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/Oak Road | T-Junction    | Two-way              |                       | 3.68               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D2 | Observed 2022 | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                        | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Oak Road (Western Arm) |            | ONE HOUR     | ✓            | 173                     | 100.000            |
| B - Bryn Lane              |            | ONE HOUR     | ✓            | 138                     | 100.000            |
| C - Oak Road (Eastern Arm) |            | ONE HOUR     | ✓            | 127                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                            |               |                            |
|------|----------------------------|----------------------------|---------------|----------------------------|
|      |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
| From |                            |                            |               |                            |
|      | A - Oak Road (Western Arm) | 0                          | 128           | 45                         |
|      | B - Bryn Lane              | 78                         | 0             | 60                         |
|      | C - Oak Road (Eastern Arm) | 54                         | 73            | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |                            |               |                            |
|------|----------------------------|----------------------------|---------------|----------------------------|
|      |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
| From |                            |                            |               |                            |
|      | A - Oak Road (Western Arm) | 0                          | 8             | 14                         |
|      | B - Bryn Lane              | 16                         | 0             | 5                          |
|      | C - Oak Road (Eastern Arm) | 6                          | 4             | 0                          |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.10    | 6.58          | 0.1             | A       | 55                      | 83                            |
| B-A    | 0.17    | 9.96          | 0.2             | A       | 72                      | 107                           |
| C-AB   | 0.11    | 6.05          | 0.1             | A       | 67                      | 100                           |
| C-A    |         |               |                 |         | 50                      | 74                            |
| A-B    |         |               |                 |         | 117                     | 176                           |
| A-C    |         |               |                 |         | 41                      | 62                            |

# Without Dev 2027, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name               | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/Oak Road | T-Junction    | Two-way              |                       | 4.53               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D3 | Without Dev 2027 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                        | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Oak Road (Western Arm) |            | ONE HOUR     | ✓            | 175                     | 100.000            |
| B - Bryn Lane              |            | ONE HOUR     | ✓            | 187                     | 100.000            |
| C - Oak Road (Eastern Arm) |            | ONE HOUR     | ✓            | 94                      | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                            |               |                            |
|------|----------------------------|----------------------------|---------------|----------------------------|
|      |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
| From |                            |                            |               |                            |
|      | A - Oak Road (Western Arm) | 0                          | 114           | 61                         |
|      | B - Bryn Lane              | 112                        | 0             | 75                         |
|      | C - Oak Road (Eastern Arm) | 41                         | 53            | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |                            |               |                            |
|------|----------------------------|----------------------------|---------------|----------------------------|
|      |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
| From |                            |                            |               |                            |
|      | A - Oak Road (Western Arm) | 0                          | 19            | 9                          |
|      | B - Bryn Lane              | 18                         | 0             | 4                          |
|      | C - Oak Road (Eastern Arm) | 8                          | 11            | 0                          |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.13    | 6.94          | 0.2             | A       | 69                      | 103                           |
| B-A    | 0.24    | 10.87         | 0.4             | B       | 103                     | 154                           |
| C-AB   | 0.08    | 6.23          | 0.1             | A       | 49                      | 73                            |
| C-A    |         |               |                 |         | 38                      | 56                            |
| A-B    |         |               |                 |         | 105                     | 157                           |
| A-C    |         |               |                 |         | 56                      | 84                            |



# Without Dev 2027, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name               | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/Oak Road | T-Junction    | Two-way              |                       | 3.97               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D4 | Without Dev 2027 | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                        | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Oak Road (Western Arm) |            | ONE HOUR     | ✓            | 208                     | 100.000            |
| B - Bryn Lane              |            | ONE HOUR     | ✓            | 168                     | 100.000            |
| C - Oak Road (Eastern Arm) |            | ONE HOUR     | ✓            | 130                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|  | To                         |                            |               |                            |
|--|----------------------------|----------------------------|---------------|----------------------------|
|  |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
|  | From                       |                            |               |                            |
|  | A - Oak Road (Western Arm) | 0                          | 162           | 46                         |
|  | B - Bryn Lane              | 104                        | 0             | 64                         |
|  | C - Oak Road (Eastern Arm) | 55                         | 75            | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|  | To                         |                            |               |                            |
|--|----------------------------|----------------------------|---------------|----------------------------|
|  |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
|  | From                       |                            |               |                            |
|  | A - Oak Road (Western Arm) | 0                          | 8             | 13                         |
|  | B - Bryn Lane              | 15                         | 0             | 5                          |
|  | C - Oak Road (Eastern Arm) | 6                          | 4             | 0                          |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.11    | 6.85          | 0.1             | A       | 59                      | 88                            |
| B-A    | 0.23    | 10.66         | 0.3             | B       | 95                      | 143                           |
| C-AB   | 0.12    | 6.18          | 0.1             | A       | 69                      | 103                           |
| C-A    |         |               |                 |         | 50                      | 76                            |
| A-B    |         |               |                 |         | 149                     | 223                           |
| A-C    |         |               |                 |         | 42                      | 63                            |

# Without Dev 2036, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name               | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/Oak Road | T-Junction    | Two-way              |                       | 4.54               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D5 | Without Dev 2036 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                        | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Oak Road (Western Arm) |            | ONE HOUR     | ✓            | 179                     | 100.000            |
| B - Bryn Lane              |            | ONE HOUR     | ✓            | 190                     | 100.000            |
| C - Oak Road (Eastern Arm) |            | ONE HOUR     | ✓            | 95                      | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                            |               |                            |
|------|----------------------------|----------------------------|---------------|----------------------------|
|      |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
| From |                            |                            |               |                            |
|      | A - Oak Road (Western Arm) | 0                          | 117           | 62                         |
|      | B - Bryn Lane              | 113                        | 0             | 77                         |
|      | C - Oak Road (Eastern Arm) | 41                         | 54            | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |                            |               |                            |
|------|----------------------------|----------------------------|---------------|----------------------------|
|      |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
| From |                            |                            |               |                            |
|      | A - Oak Road (Western Arm) | 0                          | 20            | 9                          |
|      | B - Bryn Lane              | 18                         | 0             | 4                          |
|      | C - Oak Road (Eastern Arm) | 8                          | 11            | 0                          |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.14    | 6.97          | 0.2             | A       | 71                      | 106                           |
| B-A    | 0.24    | 10.92         | 0.4             | B       | 104                     | 156                           |
| C-AB   | 0.09    | 6.24          | 0.1             | A       | 50                      | 74                            |
| C-A    |         |               |                 |         | 38                      | 56                            |
| A-B    |         |               |                 |         | 107                     | 161                           |
| A-C    |         |               |                 |         | 57                      | 85                            |

# Without Dev 2036, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name               | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/Oak Road | T-Junction    | Two-way              |                       | 3.99               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name    | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|------------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D6 | Without Dev 2036 | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                        | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Oak Road (Western Arm) |            | ONE HOUR     | ✓            | 210                     | 100.000            |
| B - Bryn Lane              |            | ONE HOUR     | ✓            | 170                     | 100.000            |
| C - Oak Road (Eastern Arm) |            | ONE HOUR     | ✓            | 133                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|  | To                         |                            |               |                            |
|--|----------------------------|----------------------------|---------------|----------------------------|
|  |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
|  | From                       |                            |               |                            |
|  | A - Oak Road (Western Arm) | 0                          | 164           | 46                         |
|  | B - Bryn Lane              | 105                        | 0             | 65                         |
|  | C - Oak Road (Eastern Arm) | 56                         | 77            | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|  | To                         |                            |               |                            |
|--|----------------------------|----------------------------|---------------|----------------------------|
|  |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
|  | From                       |                            |               |                            |
|  | A - Oak Road (Western Arm) | 0                          | 8             | 13                         |
|  | B - Bryn Lane              | 15                         | 0             | 5                          |
|  | C - Oak Road (Eastern Arm) | 6                          | 4             | 0                          |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.12    | 6.86          | 0.1             | A       | 60                      | 89                            |
| B-A    | 0.23    | 10.71         | 0.3             | B       | 96                      | 145                           |
| C-AB   | 0.12    | 6.20          | 0.1             | A       | 71                      | 106                           |
| C-A    |         |               |                 |         | 51                      | 77                            |
| A-B    |         |               |                 |         | 150                     | 226                           |
| A-C    |         |               |                 |         | 42                      | 63                            |

# With Dev 2027, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name               | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/Oak Road | T-Junction    | Two-way              |                       | 4.61               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D7 | With Dev 2027 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                        | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Oak Road (Western Arm) |            | ONE HOUR     | ✓            | 184                     | 100.000            |
| B - Bryn Lane              |            | ONE HOUR     | ✓            | 196                     | 100.000            |
| C - Oak Road (Eastern Arm) |            | ONE HOUR     | ✓            | 98                      | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|  | To                         |                            |               |                            |
|--|----------------------------|----------------------------|---------------|----------------------------|
|  |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
|  | From                       |                            |               |                            |
|  | A - Oak Road (Western Arm) | 0                          | 123           | 61                         |
|  | B - Bryn Lane              | 118                        | 0             | 78                         |
|  | C - Oak Road (Eastern Arm) | 41                         | 57            | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|  | To                         |                            |               |                            |
|--|----------------------------|----------------------------|---------------|----------------------------|
|  |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
|  | From                       |                            |               |                            |
|  | A - Oak Road (Western Arm) | 0                          | 18            | 9                          |
|  | B - Bryn Lane              | 17                         | 0             | 4                          |
|  | C - Oak Road (Eastern Arm) | 8                          | 10            | 0                          |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.14    | 7.02          | 0.2             | A       | 72                      | 107                           |
| B-A    | 0.25    | 11.01         | 0.4             | B       | 108                     | 162                           |
| C-AB   | 0.09    | 6.25          | 0.1             | A       | 52                      | 78                            |
| C-A    |         |               |                 |         | 38                      | 56                            |
| A-B    |         |               |                 |         | 113                     | 169                           |
| A-C    |         |               |                 |         | 56                      | 84                            |



# With Dev 2027, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name               | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/Oak Road | T-Junction    | Two-way              |                       | 4.34               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D8 | With Dev 2027 | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                        | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Oak Road (Western Arm) |            | ONE HOUR     | ✓            | 215                     | 100.000            |
| B - Bryn Lane              |            | ONE HOUR     | ✓            | 186                     | 100.000            |
| C - Oak Road (Eastern Arm) |            | ONE HOUR     | ✓            | 134                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|  | To                         |                            |               |                            |
|--|----------------------------|----------------------------|---------------|----------------------------|
|  |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
|  | From                       |                            |               |                            |
|  | A - Oak Road (Western Arm) | 0                          | 169           | 46                         |
|  | B - Bryn Lane              | 116                        | 0             | 70                         |
|  | C - Oak Road (Eastern Arm) | 55                         | 79            | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|  | To                         |                            |               |                            |
|--|----------------------------|----------------------------|---------------|----------------------------|
|  |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
|  | From                       |                            |               |                            |
|  | A - Oak Road (Western Arm) | 0                          | 8             | 13                         |
|  | B - Bryn Lane              | 14                         | 0             | 5                          |
|  | C - Oak Road (Eastern Arm) | 6                          | 4             | 0                          |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.13    | 7.01          | 0.1             | A       | 64                      | 96                            |
| B-A    | 0.26    | 11.53         | 0.4             | B       | 106                     | 160                           |
| C-AB   | 0.13    | 6.23          | 0.1             | A       | 72                      | 109                           |
| C-A    |         |               |                 |         | 50                      | 76                            |
| A-B    |         |               |                 |         | 155                     | 233                           |
| A-C    |         |               |                 |         | 42                      | 63                            |

# With Dev 2036, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name               | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/Oak Road | T-Junction    | Two-way              |                       | 4.62               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D9 | With Dev 2036 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                        | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Oak Road (Western Arm) |            | ONE HOUR     | ✓            | 188                     | 100.000            |
| B - Bryn Lane              |            | ONE HOUR     | ✓            | 199                     | 100.000            |
| C - Oak Road (Eastern Arm) |            | ONE HOUR     | ✓            | 99                      | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|  | To                         |                            |               |                            |
|--|----------------------------|----------------------------|---------------|----------------------------|
|  |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
|  | From                       |                            |               |                            |
|  | A - Oak Road (Western Arm) | 0                          | 126           | 62                         |
|  | B - Bryn Lane              | 119                        | 0             | 80                         |
|  | C - Oak Road (Eastern Arm) | 41                         | 58            | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|  | To                         |                            |               |                            |
|--|----------------------------|----------------------------|---------------|----------------------------|
|  |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
|  | From                       |                            |               |                            |
|  | A - Oak Road (Western Arm) | 0                          | 18            | 9                          |
|  | B - Bryn Lane              | 17                         | 0             | 4                          |
|  | C - Oak Road (Eastern Arm) | 8                          | 10            | 0                          |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.14    | 7.05          | 0.2             | A       | 73                      | 110                           |
| B-A    | 0.26    | 11.07         | 0.4             | B       | 109                     | 164                           |
| C-AB   | 0.09    | 6.26          | 0.1             | A       | 53                      | 80                            |
| C-A    |         |               |                 |         | 38                      | 56                            |
| A-B    |         |               |                 |         | 116                     | 173                           |
| A-C    |         |               |                 |         | 57                      | 85                            |

# With Dev 2036, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name               | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|--------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | Bryn Lane/Oak Road | T-Junction    | Two-way              |                       | 4.36               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID  | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|-----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D10 | With Dev 2036 | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                        | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - Oak Road (Western Arm) |            | ONE HOUR     | ✓            | 217                     | 100.000            |
| B - Bryn Lane              |            | ONE HOUR     | ✓            | 188                     | 100.000            |
| C - Oak Road (Eastern Arm) |            | ONE HOUR     | ✓            | 137                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                         |                            |               |                            |
|------|----------------------------|----------------------------|---------------|----------------------------|
|      |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
| From |                            |                            |               |                            |
|      | A - Oak Road (Western Arm) | 0                          | 171           | 46                         |
|      | B - Bryn Lane              | 117                        | 0             | 71                         |
|      | C - Oak Road (Eastern Arm) | 56                         | 81            | 0                          |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                         |                            |               |                            |
|------|----------------------------|----------------------------|---------------|----------------------------|
|      |                            | A - Oak Road (Western Arm) | B - Bryn Lane | C - Oak Road (Eastern Arm) |
| From |                            |                            |               |                            |
|      | A - Oak Road (Western Arm) | 0                          | 8             | 13                         |
|      | B - Bryn Lane              | 13                         | 0             | 5                          |
|      | C - Oak Road (Eastern Arm) | 6                          | 4             | 0                          |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-C    | 0.13    | 7.03          | 0.2             | A       | 65                      | 98                            |
| B-A    | 0.27    | 11.59         | 0.4             | B       | 107                     | 161                           |
| C-AB   | 0.13    | 6.25          | 0.2             | A       | 74                      | 111                           |
| C-A    |         |               |                 |         | 51                      | 77                            |
| A-B    |         |               |                 |         | 157                     | 235                           |
| A-C    |         |               |                 |         | 42                      | 63                            |

| Junctions 9                                                                                                                                                      |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| PICADY 9 - Priority Intersection Module                                                                                                                          |  |
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Filename: VG Access Road-Proposed Site Access.j9

Path: N:\Projects 2021\P21066 - Kingmoor, Wrexham Industrial Estate\6.Technical\Models

Report generation date: 21/03/2023 13:54:23

- »With Dev 2027, AM
- »With Dev 2027, PM
- »With Dev 2036, AM
- »With Dev 2036, PM

## File summary

### File Description

|             |                                                 |
|-------------|-------------------------------------------------|
| Title       | The Very Group Access Road/Proposed Site Access |
| Location    | Wrexham                                         |
| Site number |                                                 |
| Date        | 21/03/2023                                      |
| Version     |                                                 |
| Status      | Final                                           |
| Identifier  |                                                 |
| Client      | FI Real Estate Management                       |
| Jobnumber   | P21066                                          |
| Enumerator  | GHC\b.gaze                                      |
| Description | Checked by D. Stoddart                          |

## Units

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

## Analysis Options

| Vehicle length (m) | Calculate Queue Percentiles | Calculate detailed queueing delay | Calculate residual capacity | RFC Threshold | Average Delay threshold (s) | Queue threshold (PCU) |
|--------------------|-----------------------------|-----------------------------------|-----------------------------|---------------|-----------------------------|-----------------------|
| 5.75               |                             |                                   |                             | 0.85          | 36.00                       | 20.00                 |

## Demand Set Summary

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D1 | With Dev 2027 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |
| D2 | With Dev 2027 | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |
| D3 | With Dev 2036 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |
| D4 | With Dev 2036 | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |

## Analysis Set Details

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





# With Dev 2027, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                            | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|-------------------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | The Very Group Access Road/Proposed Site Access | T-Junction    | Two-way              |                       | 2.29               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Arms

### Arms

| Arm | Name                                     | Description | Arm type |
|-----|------------------------------------------|-------------|----------|
| A   | The Very Group Access Road (Western Arm) |             | Major    |
| B   | Proposed Site Access                     |             | Minor    |
| C   | The Very Group Access Road (Eastern Arm) |             | Major    |

### Major Arm Geometry

| Arm                                          | Width of carriageway (m) | Has kerbed central reserve | Has right turn bay | Visibility for right turn (m) | Blocks? | Blocking queue (PCU) |
|----------------------------------------------|--------------------------|----------------------------|--------------------|-------------------------------|---------|----------------------|
| C - The Very Group Access Road (Eastern Arm) | 7.50                     |                            |                    | 50.0                          | ✓       | 0.00                 |

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

### Minor Arm Geometry

| Arm                      | Minor arm type | Lane width (m) | Visibility to left (m) | Visibility to right (m) |
|--------------------------|----------------|----------------|------------------------|-------------------------|
| B - Proposed Site Access | One lane       | 3.60           | 20                     | 20                      |

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

| Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for C-A | Slope for C-B |
|--------|--------------------|---------------|---------------|---------------|---------------|
| B-A    | 524                | 0.089         | 0.225         | 0.142         | 0.322         |
| B-C    | 675                | 0.097         | 0.244         | -             | -             |
| C-B    | 603                | 0.218         | 0.218         | -             | -             |

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D1 | With Dev 2027 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                                          | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - The Very Group Access Road (Western Arm) |            | ONE HOUR     | ✓            | 267                     | 100.000            |
| B - Proposed Site Access                     |            | ONE HOUR     | ✓            | 88                      | 100.000            |
| C - The Very Group Access Road (Eastern Arm) |            | ONE HOUR     | ✓            | 120                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                                           |                                              |                          |                                              |
|------|----------------------------------------------|----------------------------------------------|--------------------------|----------------------------------------------|
| From |                                              | A - The Very Group Access Road (Western Arm) | B - Proposed Site Access | C - The Very Group Access Road (Eastern Arm) |
|      | A - The Very Group Access Road (Western Arm) | 0                                            | 115                      | 152                                          |
|      | B - Proposed Site Access                     | 88                                           | 0                        | 0                                            |
|      | C - The Very Group Access Road (Eastern Arm) | 120                                          | 0                        | 0                                            |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                                           |                                              |                          |                                              |
|------|----------------------------------------------|----------------------------------------------|--------------------------|----------------------------------------------|
| From |                                              | A - The Very Group Access Road (Western Arm) | B - Proposed Site Access | C - The Very Group Access Road (Eastern Arm) |
|      | A - The Very Group Access Road (Western Arm) | 0                                            | 18                       | 23                                           |
|      | B - Proposed Site Access                     | 23                                           | 0                        | 4                                            |
|      | C - The Very Group Access Road (Eastern Arm) | 30                                           | 10                       | 0                                            |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-AC   | 0.21    | 12.34         | 0.3             | B       | 81                      | 121                           |
| C-AB   | 0.00    | 0.00          | 0.0             | A       | 0                       | 0                             |
| C-A    |         |               |                 |         | 110                     | 165                           |
| A-B    |         |               |                 |         | 106                     | 158                           |
| A-C    |         |               |                 |         | 139                     | 209                           |

# With Dev 2027, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                            | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|-------------------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | The Very Group Access Road/Proposed Site Access | T-Junction    | Two-way              |                       | 3.38               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D2 | With Dev 2027 | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                                          | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - The Very Group Access Road (Western Arm) |            | ONE HOUR     | ✓            | 231                     | 100.000            |
| B - Proposed Site Access                     |            | ONE HOUR     | ✓            | 138                     | 100.000            |
| C - The Very Group Access Road (Eastern Arm) |            | ONE HOUR     | ✓            | 189                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                                           |                                              |                          |                                              |
|------|----------------------------------------------|----------------------------------------------|--------------------------|----------------------------------------------|
|      |                                              | A - The Very Group Access Road (Western Arm) | B - Proposed Site Access | C - The Very Group Access Road (Eastern Arm) |
| From | A - The Very Group Access Road (Western Arm) | 0                                            | 105                      | 126                                          |
|      | B - Proposed Site Access                     | 138                                          | 0                        | 0                                            |
|      | C - The Very Group Access Road (Eastern Arm) | 189                                          | 0                        | 0                                            |
|      |                                              |                                              |                          |                                              |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                                           |                                              |                          |                                              |
|------|----------------------------------------------|----------------------------------------------|--------------------------|----------------------------------------------|
|      |                                              | A - The Very Group Access Road (Western Arm) | B - Proposed Site Access | C - The Very Group Access Road (Eastern Arm) |
| From | A - The Very Group Access Road (Western Arm) | 0                                            | 23                       | 28                                           |
|      | B - Proposed Site Access                     | 14                                           | 0                        | 5                                            |
|      | C - The Very Group Access Road (Eastern Arm) | 16                                           | 4                        | 0                                            |
|      |                                              |                                              |                          |                                              |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-AC   | 0.34    | 13.65         | 0.6             | B       | 127                     | 190                           |
| C-AB   | 0.00    | 0.00          | 0.0             | A       | 0                       | 0                             |
| C-A    |         |               |                 |         | 173                     | 260                           |
| A-B    |         |               |                 |         | 96                      | 145                           |
| A-C    |         |               |                 |         | 116                     | 173                           |

# With Dev 2036, AM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                            | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|-------------------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | The Very Group Access Road/Proposed Site Access | T-Junction    | Two-way              |                       | 2.29               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D3 | With Dev 2036 | AM               | ONE HOUR             | 07:15              | 08:45               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                                          | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - The Very Group Access Road (Western Arm) |            | ONE HOUR     | ✓            | 267                     | 100.000            |
| B - Proposed Site Access                     |            | ONE HOUR     | ✓            | 88                      | 100.000            |
| C - The Very Group Access Road (Eastern Arm) |            | ONE HOUR     | ✓            | 120                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                                           |                                              |                          |                                              |
|------|----------------------------------------------|----------------------------------------------|--------------------------|----------------------------------------------|
| From |                                              | A - The Very Group Access Road (Western Arm) | B - Proposed Site Access | C - The Very Group Access Road (Eastern Arm) |
|      | A - The Very Group Access Road (Western Arm) | 0                                            | 115                      | 152                                          |
|      | B - Proposed Site Access                     | 88                                           | 0                        | 0                                            |
|      | C - The Very Group Access Road (Eastern Arm) | 120                                          | 0                        | 0                                            |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                                           |                                              |                          |                                              |
|------|----------------------------------------------|----------------------------------------------|--------------------------|----------------------------------------------|
| From |                                              | A - The Very Group Access Road (Western Arm) | B - Proposed Site Access | C - The Very Group Access Road (Eastern Arm) |
|      | A - The Very Group Access Road (Western Arm) | 0                                            | 18                       | 23                                           |
|      | B - Proposed Site Access                     | 23                                           | 0                        | 4                                            |
|      | C - The Very Group Access Road (Eastern Arm) | 30                                           | 10                       | 0                                            |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-AC   | 0.21    | 12.34         | 0.3             | B       | 81                      | 121                           |
| C-AB   | 0.00    | 0.00          | 0.0             | A       | 0                       | 0                             |
| C-A    |         |               |                 |         | 110                     | 165                           |
| A-B    |         |               |                 |         | 106                     | 158                           |
| A-C    |         |               |                 |         | 139                     | 209                           |

# With Dev 2036, PM

## Data Errors and Warnings

No errors or warnings

## Junction Network

### Junctions

| Junction | Name                                            | Junction type | Major road direction | Use circulating lanes | Junction Delay (s) | Junction LOS |
|----------|-------------------------------------------------|---------------|----------------------|-----------------------|--------------------|--------------|
| 1        | The Very Group Access Road/Proposed Site Access | T-Junction    | Two-way              |                       | 3.38               | A            |

### Junction Network Options

| Driving side | Lighting       |
|--------------|----------------|
| Left         | Normal/unknown |

## Traffic Demand

### Demand Set Details

| ID | Scenario name | Time Period name | Traffic profile type | Start time (HH:mm) | Finish time (HH:mm) | Time segment length (min) | Run automatically |
|----|---------------|------------------|----------------------|--------------------|---------------------|---------------------------|-------------------|
| D4 | With Dev 2036 | PM               | ONE HOUR             | 16:00              | 17:30               | 15                        | ✓                 |

| Vehicle mix varies over turn | Vehicle mix varies over entry | Vehicle mix source | PCU Factor for a HV (PCU) |
|------------------------------|-------------------------------|--------------------|---------------------------|
| ✓                            | ✓                             | HV Percentages     | 2.00                      |

### Demand overview (Traffic)

| Arm                                          | Linked arm | Profile type | Use O-D data | Average Demand (PCU/hr) | Scaling Factor (%) |
|----------------------------------------------|------------|--------------|--------------|-------------------------|--------------------|
| A - The Very Group Access Road (Western Arm) |            | ONE HOUR     | ✓            | 231                     | 100.000            |
| B - Proposed Site Access                     |            | ONE HOUR     | ✓            | 138                     | 100.000            |
| C - The Very Group Access Road (Eastern Arm) |            | ONE HOUR     | ✓            | 189                     | 100.000            |

## Origin-Destination Data

### Demand (PCU/hr)

|      | To                                           |                                              |                          |                                              |
|------|----------------------------------------------|----------------------------------------------|--------------------------|----------------------------------------------|
|      |                                              | A - The Very Group Access Road (Western Arm) | B - Proposed Site Access | C - The Very Group Access Road (Eastern Arm) |
| From | A - The Very Group Access Road (Western Arm) | 0                                            | 105                      | 126                                          |
|      | B - Proposed Site Access                     | 138                                          | 0                        | 0                                            |
|      | C - The Very Group Access Road (Eastern Arm) | 189                                          | 0                        | 0                                            |
|      |                                              |                                              |                          |                                              |

## Vehicle Mix

### Heavy Vehicle Percentages

|      | To                                           |                                              |                          |                                              |
|------|----------------------------------------------|----------------------------------------------|--------------------------|----------------------------------------------|
|      |                                              | A - The Very Group Access Road (Western Arm) | B - Proposed Site Access | C - The Very Group Access Road (Eastern Arm) |
| From | A - The Very Group Access Road (Western Arm) | 0                                            | 23                       | 28                                           |
|      | B - Proposed Site Access                     | 14                                           | 0                        | 4                                            |
|      | C - The Very Group Access Road (Eastern Arm) | 16                                           | 4                        | 0                                            |
|      |                                              |                                              |                          |                                              |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|
| B-AC   | 0.34    | 13.65         | 0.6             | B       | 127                     | 190                           |
| C-AB   | 0.00    | 0.00          | 0.0             | A       | 0                       | 0                             |
| C-A    |         |               |                 |         | 173                     | 260                           |
| A-B    |         |               |                 |         | 96                      | 145                           |
| A-C    |         |               |                 |         | 116                     | 173                           |



## APPENDIX F

### GRESFORD INTERCHANGE CYCLETIMES

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## GRESFORD INTERCHANGE OBSERVED CYCLETIMES 28TH JUNE 2022

| AM Peak   |          |            | PM Peak   |          |            |
|-----------|----------|------------|-----------|----------|------------|
| Cycle No. | 07:44:58 | Cycle Time | Cycle No. | 16:30:03 | Cycle Time |
| 1         | 07:45:49 | 00:00:51   | 1         | 16:31:16 | 00:01:13   |
| 2         | 07:46:42 | 00:00:53   | 2         | 16:32:24 | 00:01:08   |
| 3         | 07:47:36 | 00:00:54   | 3         | 16:33:33 | 00:01:09   |
| 4         | 07:48:33 | 00:00:57   | 4         | 16:34:47 | 00:01:14   |
| 5         | 07:49:22 | 00:00:49   | 5         | 16:35:45 | 00:00:58   |
| 6         | 07:50:20 | 00:00:58   | 6         | 16:36:53 | 00:01:08   |
| 7         | 07:51:11 | 00:00:51   | 7         | 16:37:56 | 00:01:03   |
| 8         | 07:52:05 | 00:00:54   | 8         | 16:38:51 | 00:00:55   |
| 9         | 07:52:59 | 00:00:54   | 9         | 16:39:49 | 00:00:58   |
| 10        | 07:53:53 | 00:00:54   | 10        | 16:40:45 | 00:00:56   |
| 11        | 07:54:44 | 00:00:51   | 11        | 16:41:55 | 00:01:10   |
| 12        | 07:55:31 | 00:00:47   | 12        | 16:42:58 | 00:01:03   |
| 13        | 07:56:19 | 00:00:48   | 13        | 16:44:13 | 00:01:15   |
| 14        | 07:57:10 | 00:00:51   | 14        | 16:45:22 | 00:01:09   |
| 15        | 07:57:58 | 00:00:48   | 15        | 16:46:36 | 00:01:14   |
| 16        | 07:58:48 | 00:00:50   | 16        | 16:47:39 | 00:01:03   |
| 17        | 07:59:40 | 00:00:52   | 17        | 16:48:37 | 00:00:58   |
| 18        | 08:00:30 | 00:00:50   | 18        | 16:49:35 | 00:00:58   |
| 19        | 08:01:18 | 00:00:48   | 19        | 16:50:40 | 00:01:05   |
| 20        | 08:02:05 | 00:00:47   | 20        | 16:51:35 | 00:00:55   |
| 21        | 08:02:55 | 00:00:50   | 21        | 16:52:35 | 00:01:00   |
| 22        | 08:03:49 | 00:00:54   | 22        | 16:53:37 | 00:01:02   |
| 23        | 08:04:37 | 00:00:48   | 23        | 16:54:34 | 00:00:57   |
| 24        | 08:05:27 | 00:00:50   | 24        | 16:55:39 | 00:01:05   |
| 25        | 08:06:21 | 00:00:54   | 25        | 16:56:37 | 00:00:58   |
| 26        | 08:07:14 | 00:00:53   | 26        | 16:57:49 | 00:01:12   |
| 27        | 08:08:02 | 00:00:48   | 27        | 16:58:46 | 00:00:57   |
| 28        | 08:08:51 | 00:00:49   | 28        | 16:59:46 | 00:01:00   |
| 29        | 08:09:41 | 00:00:50   | 29        | 17:00:55 | 00:01:09   |
| 30        | 08:10:35 | 00:00:54   | 30        | 17:01:58 | 00:01:03   |
| 31        | 08:11:29 | 00:00:54   | 31        | 17:02:55 | 00:00:57   |
| 32        | 08:12:19 | 00:00:50   | 32        | 17:03:55 | 00:01:00   |
| 33        | 08:13:07 | 00:00:48   | 33        | 17:04:55 | 00:01:00   |
| 34        | 08:14:04 | 00:00:57   | 34        | 17:05:53 | 00:00:58   |
| 35        | 08:14:59 | 00:00:55   | 35        | 17:06:55 | 00:01:02   |
| 36        | 08:15:55 | 00:00:56   | 36        | 17:08:08 | 00:01:13   |
| 37        | 08:16:54 | 00:00:59   | 37        | 17:09:21 | 00:01:13   |
| 38        | 08:17:50 | 00:00:56   | 38        | 17:10:18 | 00:00:57   |
| 39        | 08:18:41 | 00:00:51   | 39        | 17:11:14 | 00:00:56   |
| 40        | 08:19:33 | 00:00:52   | 40        | 17:12:16 | 00:01:02   |
| 41        | 08:20:25 | 00:00:52   | 41        | 17:13:17 | 00:01:01   |
| 42        | 08:21:13 | 00:00:48   | 42        | 17:14:22 | 00:01:05   |
| 43        | 08:22:01 | 00:00:48   | 43        | 17:15:23 | 00:01:01   |
| 44        | 08:22:50 | 00:00:49   | 44        | 17:16:24 | 00:01:01   |
| 45        | 08:23:47 | 00:00:57   | 45        | 17:17:23 | 00:00:59   |
| 46        | 08:24:43 | 00:00:56   | 46        | 17:18:24 | 00:01:01   |
| 47        | 08:25:33 | 00:00:50   | 47        | 17:19:38 | 00:01:14   |
| 48        | 08:26:37 | 00:01:04   | 48        | 17:20:49 | 00:01:11   |
| 49        | 08:27:43 | 00:01:06   | 49        | 17:22:03 | 00:01:14   |
| 50        | 08:28:48 | 00:01:05   | 50        | 17:23:03 | 00:01:00   |
| 51        | 08:29:41 | 00:00:53   | 51        | 17:24:05 | 00:01:02   |
| 52        | 08:30:45 | 00:01:04   | 52        | 17:25:07 | 00:01:02   |
| 53        | 08:31:38 | 00:00:53   | 53        | 17:26:05 | 00:00:58   |
| 54        | 08:32:24 | 00:00:46   | 54        | 17:26:51 | 00:00:46   |
| 55        | 08:33:30 | 00:01:06   | 55        | 17:27:59 | 00:01:08   |
| 56        | 08:34:22 | 00:00:52   | 56        | 17:29:08 | 00:01:09   |
| 57        | 08:35:26 | 00:01:04   | 57        | 17:30:20 | 00:01:12   |
| 58        | 08:36:19 | 00:00:53   |           |          |            |
| 59        | 08:37:21 | 00:01:02   |           |          |            |
| 60        | 08:38:26 | 00:01:05   |           |          |            |
| 61        | 08:39:31 | 00:01:05   |           |          |            |
| 62        | 08:40:22 | 00:00:51   |           |          |            |
| 63        | 08:41:18 | 00:00:56   |           |          |            |
| 64        | 08:42:16 | 00:00:58   |           |          |            |
| 65        | 08:43:11 | 00:00:55   |           |          |            |
| 66        | 08:44:08 | 00:00:57   |           |          |            |
| 67        | 08:45:02 | 00:00:54   |           |          |            |
| Ave Cyc   |          | 00:00:54   | Ave Cyc   |          | 00:01:03   |
| Min Cyc   |          | 00:00:46   | Min Cyc   |          | 00:00:46   |
| Max Cyc   |          | 00:01:06   | Max Cyc   |          | 00:01:15   |

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