

## **MACBRYDE HOMES**

### **PROPOSED RESIDENTIAL DEVELOPMENT LAND OFF TOP ROAD, SUMMERHILL WREXHAM**

## **Transport Assessment**

**October 2017**

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# **1 INTRODUCTION**

## **1.1 Introduction**

1.1.1 Croft have been instructed by MacBryde Homes to advise on the traffic and transportation issues relating to proposals to develop a site for residential purposes on land off Top Road in the Summerhill area of Wrexham.

1.1.2 This report has been prepared in support of a planning application for a proposed residential development. It provides information on the traffic and transport planning aspects of the development proposals and forms supplementary information to assist in the determination of a forthcoming planning application.

## **1.2 Scope of Report**

1.2.1 This report has been prepared to consider the proposed development in transport and highways terms in order to provide the necessary reassurance that this scheme can be developed in a sustainable manner and be accommodated by the local transport network. The scope of this report has been discussed and agreed with highways officers at Wrexham County Borough Council (WCBC). The correspondence is provided within **Appendix 1**.

## **1.3 Format of Report**

1.3.1 Following this introduction, Section 2 provides a description of the existing site and the development proposals.

1.3.2 Section 3 of the report considers the aspects of national and local planning policy which are relevant to the proposals, while Section 4 considers the accessibility of the site by non-car modes, including walking, cycling and public transport.

1.3.3 Section 5 considers the trip generation and traffic impact assessment of the local highway network, while Section 6 provides an analysis of road safety in the vicinity of the site. Section 7 contains details of the Framework Travel Plan and Section 8 draws together the report's findings and conclusions.

## **2 DEVELOPMENT SITE AND PROPOSALS**

### **2.1 Introduction**

2.1.1 This section of the report will describe the site and existing highway conditions and provide details of the development proposals.

### **2.2 Development Site**

2.2.1 The development site is located around 4 kilometres north west of the centre of Wrexham. The location of the development in relation to the local area is shown in **Plan 1**.

2.2.2 The site is bordered to the north by the recent residential development of Westminster Rise/Bryn San Stefan, to the east by Top Road, to the south by existing residential properties fronting Chestnut Close and to the west by Moss Wood.

2.2.3 The predominant land use in the vicinity of the site is residential with areas of open space.

2.2.4 The site is currently occupied by Chestnut Height Stables and is used for the grazing of horses.

2.2.5 Vehicular access into the site is provided via an informal 3.0-metre-wide track which runs from the priority junction of Summerhill Road/Top Road/Bottom Road.

### **2.3 Local Highway Network**

2.3.1 Top Road runs in approximate north-south alignment along the eastern frontage of the site. In the vicinity of the existing site access, Top Road forms the minor arm of the priority junction with Summerhill Road/Bottom Road. It should be noted that Top Road runs at a very acute angle to Summerhill Road which creates a substandard junction in terms of its width, alignment and visibility.

2.3.2 Top Road is subject to a 30mph speed limit and has a carriageway width which varies between approximately 4.2 and 5.0 metres. There is no pedestrian provision along Top Road and limited street lighting along its length.



**Figure 2.1 – View along Top Road from the Junction of Summerhill Road/Top Road/Bottom Road**

2.3.3 To the south of the site, Summerhill Road continues in a north-south alignment and provides access to numerous residential access roads. Approximately 250 metres south of the site, Wheatsheaf Lane and Moss Road form the minor arms of a staggered crossroad with Summerhill Road.



**Figure 2.2 – View of Summerhill Road/Wheatsheaf Lane/Moss Road Junction**

- 2.3.4 Summerhill Road is subject to a 30mph speed limit in the vicinity of the site and has traffic calming in the form of chicanes and speed cushions at various intervals along its length, specifically at narrow points in the carriageway. Between the site and Wheatsheaf Lane, Summerhill Road has carriageway width of approximately 6.0 to 7.0 metres. No pedestrian footways are present along Summerhill Road for a distance of around 175 metres to the south of the site, however, this section of road is lightly trafficked and, from the south, traffic calming is provided on entry to this section of highway.
- 2.3.5 Wheatsheaf Lane provides a residential distributor road which links to the A541 Mold Road. Wheatsheaf Lane is traffic calmed with a carriageway width of approximately 7.5 metres with pedestrian footways on both sides of the carriageway. Wheatsheaf Lane provides the main route for vehicles travelling to and from the site to the north on the A541 Mold Road and for pedestrians travelling towards Gwersyllt urban village centre.
- 2.3.6 South of Wheatsheaf Lane, Summerhill Road continues in a southerly direction for approximately 2.0 kilometres where it forms the fourth arm of the A483/A541 Mold Road/Summerhill Roundabout. Along this length of Summerhill Road, the carriageway width and pedestrian provision varies due to topography and existing development, however, in the residential zones, the narrow points in the carriageway are controlled by traffic calming.



**Figure 2.3 – View of Summerhill Road showing Existing Traffic Calming**

## **2.4 Development Proposals**

- 2.4.1 The proposals would provide 82 residential dwellings, comprising a mix of sizes.
- 2.4.2 Car parking is provided for all dwellings, normally within the curtilage of the properties and either at the front or side of the dwelling. All properties will have a minimum of two parking spaces.
- 2.4.3 The proposed layout of the site is presented in **Plan 2** and has been designed to accord with Manual for Streets.

## **2.5 Vehicular Access**

- 2.5.1 The vehicular access into the site will be via a priority controlled junction onto a realigned Top Road. The access has been designed in accordance with residential design standards but to ensure that the route is also suitable for buses, the loop road will have a carriageway width of 7.3 metres, 2 metre footways on either side and 12 metre corner radii, to ease the movement of buses through the junction.
- 2.5.2 Alterations are proposed to the existing junction of Summerhill Road/Top Road/Bottom Road to ensure that a suitable access and will provide a significant improvement to the local highway network, as well as improving safety.
- 2.5.3 Top Road will be re-aligned so that it sits at a 90-degree angle to Summerhill/Bottom Road. The realigned road would sweep into the application site and re-join the existing Top Road to the north.
- 2.5.4 Footways of 2 metres in width will be provided along the western side of the re-aligned section of Top Road which will continue within the site, segregated from the road by a 2 metre grass verge. An additional footway of 2 metres in width is also proposed that will run adjacent to the old section of Top Road, with dropped kerb provision to connect pedestrians to the existing footway on the other side of Bottom Road.
- 2.5.5 This will provide a much improved and safer pedestrian environment, not only for residents at the development but for the wider community as well.

2.5.6 In addition, vehicular access to Ridge Mount (existing property to the south of the site) will be improved as new land will be dedicated to the property in order to provide a newly aligned driveway access onto Top Road.

2.5.7 The proposed site access and associated works are shown in **Plan 3**.

## **2.6 Servicing**

2.6.1 In order to demonstrate that the site can be adequately serviced, a swept path analysis for a refuse vehicle has been undertaken and shown in **Plan 4**.

2.6.2 The internal layout has been designed to facilitate such vehicles and allow them to enter the site, turn around and exit in a forward gear. This will ensure there is no detrimental impact to the adjoining highway or any road safety issues.

2.6.3 An additional swept path analysis has been undertaken for a bus to ensure that it can be adequately accommodated within the realigned part of Top Road and the loop road serving the site, as shown in **Plan 5**.

## **2.7 Pedestrian and Cycle Access**

2.7.1 Pedestrian and cycle access into the site will be afforded via the proposed vehicular access point into the development from Summerhill Road/Top Road as well as via a number of other connections to existing footpaths in the area.

2.7.2 The internal layout of the site will be designed to provide linkages between the site and the existing right of ways located in the vicinity of the development site and all existing rights of way will be maintained.

2.7.3 Consideration has also been given to the Active Travel Act which was passed in 2013. The Act states that *“Active travel means walking and cycling as an alternative means to motorised transport for the purpose of making everyday journeys. It’s about building a healthier, more sustainable way of getting around into our everyday lives”*.

2.7.4 The Act set out an aim to make walking and cycling the most natural and normal way of getting about for short journeys. The key provisions of the Act are:

- Ensuring that plans are in place for active travel networks that connect key places, such as schools and workplaces, to where people live.
- Setting a quality standard so the routes on the network are: safe, comfortable, continuous and direct.
- Requiring promotion of active travel and continuous improvement of the network.

2.7.5 The proposed improvements to the local road and footway network in the vicinity of the site and along the site frontage will significantly improve the current walking and cycling environment in line with the above and will allow the number of sustainable trips to and from the development to be maximised, thus contributing to a highly sustainable development.

### **3 CONSIDERATION OF PLANNING POLICY**

#### **3.1 Introduction**

3.1.1 The national policy presented in this document focuses on the Planning Policy Wales document which was published in November 2012 and sets out the Welsh Assembly's planning policies for achieving sustainable development.

3.1.2 In addition to the above, further reference has been made to the following documents;

- Technical Advice Note 18: Transport' and North Wales Regional Transport Plan;
- North Wales Regional Transport Plan, TAITH 2009; and
- North Wales Regional Transport Plan, Walking & Cycling Strategy.

3.1.3 Local planning policy is taken from the Wrexham Unitary Development Plan (UDP) which was adopted in February 2005. In future this will be replaced by the Wrexham Local Development Plan. This section will briefly outline the pertinent policies relating to the proposed development.

#### **3.2 National Policy**

##### **Planning Policy Wales**

3.2.1 The 'Planning Policy Wales' (PPW) document sets out the planning policies on the delivery of sustainable development through the planning system. With regard to transport policy it aims to extend choice in transport and secure accessibility in a way which supports sustainable development and helps to tackle the causes of climate change.

3.2.2 Within the Transport chapter of the PPW it states that land-use planning can help achieve the Welsh Government's objectives for transport through the following;

- Reducing the need to travel, especially by private car, by locating development where there is good access by public transport, walking and cycling;

- Locating development near other related uses to encourage multi-purpose trips to reduce the length of journeys;
- Improving accessibility by walking, cycling and public transport;
- Ensuring that transport is accessible to all, taking into account the needs of disabled and other less mobile people.
- Promoting walking and cycling.
- Supporting the provision of high quality public transport;
- Supporting traffic management measures;
- Promoting sustainable transport options for freight and commerce;
- Supporting sustainable travel options in rural areas;
- Supporting necessary infrastructure improvements; and
- Ensuring that, as far as possible, transport infrastructure does not contribute to land take, urban sprawl or neighbourhood severance.

#### **Transport Advice Note 18 (TAN 18) - Transport**

3.2.3 The 'TAN 18 Transport' document which was published in March 2007 provides transport guidance on how the objectives of the PPW should be achieved. In terms of guidance specifically related to the proposed development, it states that;

*"Development in rural locations should embody sustainable principles, balancing the need to support the rural economy, whilst maintaining and enhancing the environmental, social and cultural quality of rural areas".*

- 3.2.4 The site's accessibility credentials are detailed in Section 4, but in summary, the site is well placed to provide residents a choice about how they travel with good opportunities for sustainable travel. The proposed upgraded junction and new footpath links in the vicinity of the site will assist in delivering this goal and improve general walking opportunities within the local area.
- 3.2.5 TAN 18 discusses the general importance of promoting the integration between transport and land use planning, so as to contribute to the delivery of the key objective of sustainability. In order to facilitate better integration, TAN 18 discusses the importance of managing parking provision and ensuring that new development appropriately provides for pedestrians and cyclists. As already stated above, Section 4 of this TA discusses access to the proposed site via different modes of transport and details the proposed improvements to pedestrian infrastructure.
- 3.2.6 Section 6 of TAN 18 explains that it is imperative that local councils take walking and cycling into consideration when assessing planning applications. This will be addressed in Sections 4 of this Transport Assessment and the implementation of the Travel Plan will allow the use of sustainable travel modes to be encouraged and maximised, thus assisting to deliver a highly sustainable development.
- 3.2.7 Section 9 of TAN 18 confirms the need for Transport Assessments (TA) to be produced when a development is likely to result in significant trip generation. As such, the preparation of this TA to accompany the planning application is fully compliant with these requirements.

#### **North Wales Regional Transport Plan, TAITH 2009**

- 3.2.8 The North Wales Regional Transport Plan (NWRTP) was adopted in September 2009 and outlines the strategic vision for transport of six Local Authorities in the North Wales area; namely Anglesey, Conwy, Denbighshire, Gwynedd, Flintshire and Wrexham Councils.
- 3.2.9 The document outlines the local authorities' transport strategy for the next 25 years in the context of national policy as well as the social and economic aspirations of the six local authorities.

3.2.10 The overall vision of the NW RTP is summed up as follows:

*“TAITH will deliver safe, sustainable and efficient transport networks to support the economic and social activities of North Wales’ diverse communities and businesses having regard to its strategic European role”.*

3.2.11 The document includes seven main objectives, two of which are directly relevant to the proposed development and are to:

- *“Optimise accessibility to employment, education, health and services for all the diverse communities in North Wales”.* This TA demonstrates that the proposed site is suitably located for residents to access local facilities, services and areas of employment in the local area.
- *“Provide, promote and improve sustainable forms of transport and infrastructure to minimise the negative impacts of transport on the local and global environment”.* The TP submitted in conjunction with this TA helps to support this objective by actively promoting and encouraging the use of sustainable modes of transport to travel to and from the site.

#### **North Wales Regional Transport Plan, Walking & Cycling Strategy**

3.2.12 The overall aim of the strategy is to encourage more people to walk or cycle for journeys, such as the commute to work and school, trips to local shops, leisure and health facilities and for leisure activities.

3.2.13 The document discusses ‘*smarter choices*’ which are defined as ‘*imaginative ways of encouraging efficient and sustainable ways of travel*’. The Travel Plan submitted in support of this application proposes a variety of measures that may be implemented to support sustainable transport choices and, in turn, support the overall aim of the NW RTP walking and cycling strategy.

3.2.14 The document states that *“the facilitation of the needs of pedestrian and cyclists should be given priority over those of other road users for local trips and it should never be something that is just considered as an after-thought”*. Again, the Travel Plan demonstrates a commitment to promoting the use of cycle and pedestrian access to the site.

3.2.15 One of the objectives of the strategy is to *“Encourage modal shift to healthier forms of transport to contribute towards climate change targets and reduction in CO2 emissions”*. Section 4 of the TP considers a modal shift target for the proposed development.

### 3.3 Local Policy

3.3.1 Local Transport Policy for the area is contained within the Wrexham Unitary Development Plan (UDP), adopted February 2005. The following highway related policies from the UDP are considered to be relevant to the proposed development.

*“Policy T6 The design of road improvement schemes; the implementation of traffic management proposals; and the control of development adjacent to the primary and core highway network will have regard to the need to ensure the free and safe flow of traffic. Routes forming the primary and core network will take precedence over other routes and there will be limitations on access, parking, crossing and turning movements. The primary and core network is defined below.”*

*“Policy T9 Development proposals will be required to provide walking and cycling routes, where feasible and appropriate, that link with existing or proposed walking and cycling routes, and integrate with the public transport system. Opportunities for horse riding along these routes will be secured where appropriate.”*

### 3.4 Planning Policy Summary

3.4.1 The proposed development accords with national and local policy for the following reasons:

- The scheme will improve the road/highway network with an improved road junction and road width along Top Road.

- The proposals will create additional footpaths within and through the site to improve walking opportunities within the local area.
- The site is located in close proximity to a range of public transport opportunities which will facilitate non-car travel to and from the proposed development.
- Reference to national guidance has helped to establish that the site is well related to the surrounding area and will contribute towards the creation of a sustainable development.
- A Travel Plan for residents will be implemented to ensure the use of non-car modes is maximised while reducing dependence on the private car.

3.4.2 In conclusion, it is considered that the proposals conform to both National and Local transport planning policy and will assist in delivering the policies contained within.

## 4 ACCESSIBILITY BY NON CAR MODES

### 4.1 Introduction

4.1.1 The Welsh Government aims to extend choice in transport and secure accessibility in a way which supports sustainable development and helps to tackle the causes of climate change by;

*“Encouraging a more effective and efficient transport system, with greater use of the more sustainable and healthy forms of travel, and minimising the need to travel. This will be achieved through integration:*

- *within and between different types of transport;*
- *between transport measures and land use planning;*
- *between transport measures and policies to protect and improve the environment;*  
*and*
- *between transport measures and policies for education, health, social inclusion and wealth creation”.*

4.1.2 Land use planning can help to achieve the Welsh Government’s objectives for transport through:

- *reducing the need to travel, especially by private car, by locating development where there is good access by public transport, walking and cycling;*
- *locating development near other related uses to encourage multi-purpose trips and reduce the length of journeys;*
- *improving accessibility by walking, cycling and public transport;*
- *ensuring that transport is accessible to all, taking into account the needs of disabled and other less mobile people;*
- *promoting walking and cycling;*
- *supporting the provision of high quality public transport;*
- *supporting traffic management measures;*
- *promoting sustainable transport options for freight and commerce;*

- *supporting sustainable travel options in rural areas;*
- *supporting necessary infrastructure improvements; and*
- *ensuring that, as far as possible, transport infrastructure does not contribute to land take, urban sprawl or neighbourhood severance.*

4.1.3 New proposals should therefore attempt to influence the mode of travel to the development in terms of gaining a shift in modal split towards non-car modes, thus assisting in meeting the aspirations of current national and local planning policy.

4.1.4 The accessibility of the proposed site has been considered by the following modes of transport:

- Accessibility on foot.
- Accessibility by cycle.
- Accessibility by bus.
- Accessibility by rail.

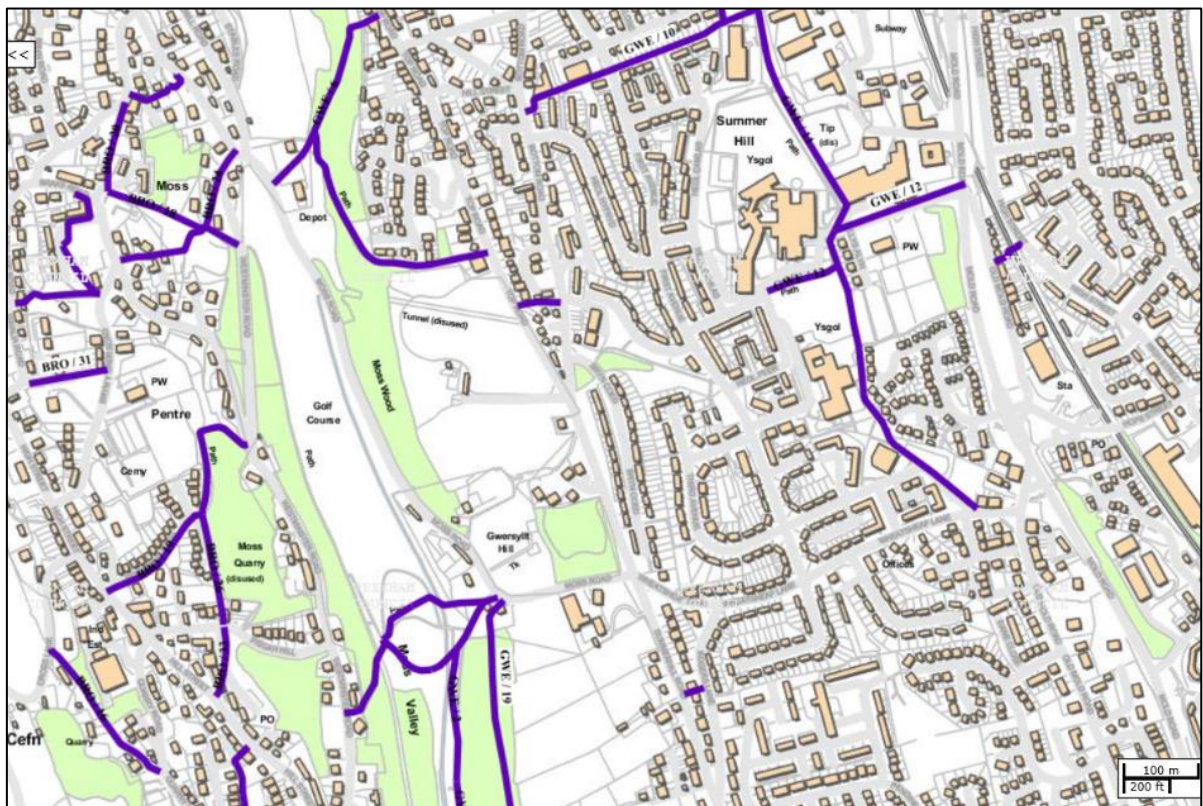
## **4.2 Access by Foot**

4.2.1 It is important to create a choice of direct, safe and attractive routes between where people live and where they need to travel in their day-to-day life. This philosophy clearly encourages the opportunity to walk whatever the journey purpose and also helps to create more active streets and a more vibrant neighbourhood.

4.2.2 It is likely that the primary pedestrian desire lines will be to the south east of the site towards Gwersyllt village centre.

4.2.3 Pedestrian provision will be significantly enhanced as part of the development proposals with new pedestrian footways/footpaths provided on Top Road and at the new Summerhill Road/Top Road/Bottom Road junction. In addition, links to existing footpaths GWE/7 and GWE/8 will be provided.

- 4.2.6 The existing footpath network is shown in **Figure 4.1** below:



### Figure 4.1 – Existing Public Rights of Way

- 4.2.7 Within the Institution of Highways and Transportation (IHT) document, entitled “Guidelines for Providing for Journeys on Foot”, a distance of 800 metres is identified as the preferred maximum distance for town centres, whilst a distance of 2 kilometres is defined as a preferred maximum for commuting.
- 4.2.8 Walking is the most important mode of travel at the local level and offers the greatest potential to replace short car journeys, particularly those under 2 kilometres. In addition, the DFT National Travel Survey of 2015 confirms that 76% of all trips less than a mile (1.6km) are carried out on foot.
- 4.2.9 **Plan 6** shows the pedestrian catchment for 800 metres and 2 kilometres from the centre of the site and provides an illustrative indication of the areas that can be reached based on a leisurely walk from the site.
- 4.2.10 In addition to the pedestrian catchment plan, a review of the proximity of local facilities such as pharmacies/doctor’s surgeries, schools (both primary and secondary) local shops/retail outlets and leisure facilities has been undertaken. The locations of such facilities in relation to the site are also shown in **Plan 6**.
- 4.2.11 The 2 kilometre pedestrian catchment shows that the entirety of Summerhill can be accessed along with areas such as Brnyteg and Gwersyllt. Many amenities are also situated within the 2 kilometre catchment including a Lidl supermarket, Home Bargains, Crown Inn Public House, Iceland Foods, WHSmith Local, Gwersyllt dental care, Pen y Maes Health Centre, Moss Valley Golf Club, Holy Trinity Church and Gwyn Evans Leisure Centre.
- 4.2.12 As illustrated, the development site benefits from being located within close proximity to a range of local amenities with the largest choice of facilities being located in Gwersyllt village centre.
- 4.2.13 **Table 4.1** below, shows the approximate walking distance from the centre of the site to the local retail stores and other nearby key amenities in the vicinity of the site:

| Local Amenity             | Distance (metres) |
|---------------------------|-------------------|
| Crown Inn Public House    | 290               |
| Pen y Maes Health Centre  | 760               |
| Gwyn Evans Leisure Centre | 890               |
| Lidl Supermarket          | 1190              |
| Gwersyllt Dental Care     | 1320              |
| Moss Valley Golf Club     | 1330              |
| Home Bargains             | 1450              |
| Holy Trinity Church       | 1580              |

**Table 4.1 - Distance from Site to Local Facilities**

4.2.14 As can be seen in the above table, the site is located within close proximity to a number of key local amenities including primary services, as well as retail and healthcare facilities.

4.2.15 It is therefore considered that the existing and proposed pedestrian infrastructure will facilitate safe and direct pedestrian linkages between the site and local destinations.

### **4.3 Access by Cycle**

4.3.1 An alternative mode of travel to the site could be achieved by bicycle.

4.3.2 A distance of 5 kilometres is generally accepted as a distance where cycling has the potential to replace short car journeys. This distance equates to a journey of around 25 minutes based on a leisurely cycle speed of 12 kilometres per hour and would encompass Gwersyllt, Gresford, New Broughton, Wrexham and Brymbo.

4.3.3 There are no formal cycle routes within the vicinity of the site, however, the surrounding roads are generally residential or rural in nature which are conducive to trips by cycle.

4.3.4 In addition, Summerhill Road is traffic calmed in the form of chicanes which also provide cycle bypass lanes.

4.3.5 The site can therefore be considered as being accessible by cycle.

## 4.4 Access by Bus

4.4.1 The nearest bus stops to the site are located on Top Road and Summerhill Road, around 210 metres from the centre of the site. The bus stops within 400 metres of the site can also be seen at Plan 6.

4.4.2 As part of the proposed highway improvements the footway within the site would be extended to provide a widened footpath to access the existing bus stop on Top Road. This would assist existing and proposed residents along with users of the existing public footpath [GWE/7] accessed from Westminster Rise/Bryn San Stefan.

4.4.3 A summary of the services available from the bus stops within 400 metres of the development site is provided in **Table 4.2** below.

| Service No | Route                                                       | Monday – Friday<br>Frequency per hour |        |         |     | Sat | Sun |
|------------|-------------------------------------------------------------|---------------------------------------|--------|---------|-----|-----|-----|
|            |                                                             | AM Peak                               | Midday | PM Peak | Eve |     |     |
| <b>21</b>  | Wrexham – Gwersyllt -<br>Summer Hill - Gwersyllt<br>Wrexham | 1                                     | 1      | 1       | 1   | 1   | 0.5 |
| <b>21A</b> | Wrexham – Summer Hill -<br>Wrexham                          | 1                                     | 1      | 1       | 0   | 1   | 0.5 |

**Table 4.2 - Existing Bus Services Operating Past the Site**

4.4.4 As can be seen from Table 4.2, the bus stops located within 400 metres of the centre of the site provide access to up to 2 services per hour to Wrexham town centre. These services also cover the evening and weekend periods as well.

4.4.5 The services operate from around 6.30am and run until around 11pm, making travel by public transport an alternative to travelling by car for residents commute journeys.

4.4.6 In order to demonstrate the level of accessibility some example journey times by bus are presented below **Table 4.3** below.

| Destination         | Duration |
|---------------------|----------|
| Wrexham town centre | 17 mins  |

**Table 4.3 - Example Bus Journey Times from the Site**

4.4.7 The above table demonstrates that Wrexham town centre is just a 17-minute bus journey from the site and onwards from Wrexham a significant number of additional services can be accessed.

4.4.8 It is therefore concluded that the proposed development site is accessible by bus.

## 4.5 Accessibility by Rail

4.5.1 Gwersyllt railway station is situated approximately 1.6 kilometres from the site, equating to a walking time of around 19 minutes.

4.5.2 Gwersyllt station is managed by Arriva Trains Wales and has 2 platforms, offering 2 services per hour to destinations such as Wrexham Central and Bidston.

4.5.3 These services increase the opportunity for residents to travel further afield by public transport, with access to Bidston station, which provides frequent services to alternative destinations such as West Kirby and Liverpool James Street.

4.5.4 A typical train journey from Gwersyllt to Wrexham Central takes approximately 12 minutes whilst a journey to Bidston takes around 1 hour calling at numerous other destinations including Caergwrle, Buckley, Shotton and Heswall.

4.5.5 In conclusion, the proposed site can be considered as being accessible in terms of travel by rail.

## **4.6 Accessibility Summary**

4.6.1 The proposals have been considered in terms of accessibility by non-car modes for the proposed residential development.

4.6.2 The following conclusions can be drawn from this section of the report:

- The site is well located to generate trips on foot and provides potential for a high degree of linked walk trips between the development and the surrounding area.
- The pedestrian infrastructure in the vicinity of the site will be significantly enhanced as part of the development proposals.
- It has been demonstrated that the site is accessible by cycle, with the surrounding roads catering for cyclists.
- The close proximity of bus stops on Top Road and Summerhill Road, offering frequent services to Wrexham, show that the proposed development can be accessed by bus.
- The site is accessible via rail with Gwersyllt train station located around 1.6 kilometres from the site.

4.6.3 In light of the above, it is considered the site is accessible by non-car modes and will cater for the needs of the development's residents and assist in promoting a choice of travel modes other than the private car.

## **5 TRAFFIC IMPACT ANALYSIS**

### **5.1 Introduction**

5.1.1 Having established that the development site is accessible by modes of transport other than the private car, the following section considers the traffic impact of the development proposals on the local highway network.

### **5.2 Assessment Criteria**

5.2.1 Given the proposed residential land use, it is assumed reasonable to consider the AM and PM weekday peak hours, as being those with the greatest impact on the local highway network.

### **5.3 Traffic Survey Data**

5.3.1 In order to establish current levels of traffic, full turning count surveys were undertaken at the following junctions as agreed with WCBC;

- Summerhill Road/Top Road/Bottom Road;
- Summerhill Road/Wheatsheaf Lane/Moss Road; and
- A483/A541 Mold Road/Summerhill Road Roundabout.

5.3.2 The full traffic survey data is contained within **Appendix 2**.

5.3.3 The peak hours were identified as 0745 to 0845 hours and 1630 to 1730 hours, for the AM and PM peaks respectively.

5.3.4 The surveyed flows for the peak hours converted into Passenger Car Units (PCU's) are shown in **Figures 1 and 2**.

## 5.4 Growthed Traffic Flows

5.4.1 For the purpose of this report, assessments have been undertaken for a five-year design horizon of 2022, which represents five years after the application registration in line with the requirements set out in the DfT guidance entitled 'Guidance on Transport Assessment'.

5.4.2 The future year traffic flows have been derived from the 2017 surveyed flows using National Traffic Model (NTM) factors adjusted by using the Trip End Model Program (TEMPro 7.2) local growth factors for Wrexham. (Wrexham MSOA 004).

5.4.3 The resultant growth factors are shown below:

- 2017 to 2022 AM Peak - 1.0743
- 2017 to 2022 PM Peak - 1.0742

5.4.4 The 2022 year of assessment is likely to be beyond when the houses on this particular application site would be built and occupied as it anticipated that, subject to planning approval, a late 2017 start date with 2.5 year build out rate is achievable on the site.

5.4.5 The growthed traffic flows are shown in **Figures 3** and **4** for the 2022 AM and PM peak periods.

## 5.5 Committed Development

5.5.1 It is understood from the agreed scoping discussions that there is one committed development in the area that would require inclusion within this report.

- P/2015/0790 – Proposed Residential Development, Boozey Field, Gwersyllt, (57 units).

5.5.2 The resultant committed development traffic flows for the Boozey Field development are shown in **Figures 5** and **6** for the AM and PM peak periods.

## 5.6 Base Flows

- 5.6.1 In order to calculate the 2022 base flows, the committed development flows in Figures 5 and 6 have been added to the 2022 growthed flows contained within Figures 3 and 4.
- 5.6.2 The resulting 2022 base flows are presented in **Figures 7 and 8** respectively for the AM and PM peak hour periods.

## 5.7 Trip Distribution

- 5.7.1 The directional distribution of the traffic associated with the proposals has been assigned to the local highway network based on information from the 2011 Census, as agreed during scoping discussions.
- 5.7.2 The site is located within the Wrexham 004 Middle Super Output Area and, therefore, travel to work data from the national census for all single occupancy commute journeys from this area have been obtained from the Office for National Statistics' Nomis website for the purposes of determining a trip distribution model.
- 5.7.3 The Nomis data is provided within **Appendix 3**, whilst the percentage distribution, across the highway network, is shown in **Figure 9**.

## 5.8 Proposed Development

- 5.8.1 As previously stated it is proposed to develop the site for 82 residential units.
- 5.8.2 To establish the level of traffic generation that the proposed residential development is likely to generate, consideration has been given to another application, namely the scheme at Boozey Field, Gwersyllt. The Gwersyllt site trip rates on a scheme at Pont Adam Crescent, Ruabon, which was considered at planning appeal. These trip rates have been agreed with WCBC as being suitable and represent a robust analysis as they consist of 85th percentile trip rates.
- 5.8.3 **Table 5.1** summarises the trip generation for the proposed development comprising 82 units.

| Peak Hour | Trip Rates |       | Trip Generation |     |
|-----------|------------|-------|-----------------|-----|
|           | Arr        | Dep   | Arr             | Dep |
| AM Peak   | 0.235      | 0.588 | 19              | 48  |
| PM Peak   | 0.556      | 0.222 | 46              | 18  |

**Table 5.1 - Forecast Trip Generation of Proposed Residential Development**

5.8.4 Table 5.1 shows that the proposed residential development could potentially generate in the region of 67 two-way trips in the AM peak and around 64 two-way trips in the PM peak hour.

5.8.5 The traffic forecast to be generated by the proposed development has been assigned to the highway network in accordance with the trip distribution shown in the Figures 9.

5.8.6 The resultant proposed residential development flows for the AM Peak are shown in **Figure 10** whilst the development flows for the PM Peak are shown in **Figure 11**.

## 5.9 Multi-Modal Trip Generation

5.9.1 The likely pedestrian, public transport and bicycle trips associated with the proposed development have been calculated by utilising the multi-modal survey data provided in the TRICS database. The output is contained within **Appendix 4**.

5.9.2 The resulting trips by non-car modes are set out in **Table 5.2** below.

| Land Use         | AM Peak   |       |                 |           | PM Peak   |       |                 |          |
|------------------|-----------|-------|-----------------|-----------|-----------|-------|-----------------|----------|
|                  | Trip Rate |       | Trip Generation |           | Trip Rate |       | Trip Generation |          |
|                  | Arr       | Dep   | Arr             | Dep       | Arr       | Dep   | Arr             | Dep      |
| Pedestrians      | 0.048     | 0.161 | 4               | 13        | 0.146     | 0.075 | 12              | 6        |
| Cyclists         | 0.002     | 0.016 | 0               | 1         | 0.017     | 0.009 | 1               | 1        |
| Public Transport | 0.002     | 0.011 | 0               | 1         | 0.011     | 0.003 | 1               | 0        |
| <b>Total</b>     | -         | -     | <b>4</b>        | <b>15</b> | -         | -     | <b>14</b>       | <b>7</b> |

**Table 5.2 - Forecast Multi Modal Trip Generation of Proposed Residential Development**

5.9.3 As demonstrated above, the residential development is forecast to generate around 19 two-way trips by non-car modes in the AM peak and 21 two-way trips in the PM peak.

5.9.4 The site is well placed to give residents a real choice about how they travel and these sustainable modes will be promoted and encouraged through the Travel Plan which will be implemented across the site.

5.9.5 The above demonstrates the proposals will assist in delivering a sustainable development in line with national and local planning guidance.

## 5.10 With Development Flows

5.10.1 In order to calculate the 2022 'With Development' flows, the development flows contained within Figures 10 and 11 have been added to the 2022 base flows contained within Figures 7 and 8.

5.10.2 The resulting 2022 'With Development' Flows are presented in **Figures 12 and 13** respectively for the AM and PM peak hour periods.

## 5.11 Net Impact

5.11.1 Prior to undertaking any capacity assessments, consideration has firstly been given to the overall net impact of the proposals.

5.11.2 **Table 5.3**, below, summarises the changes in traffic that are predicted to occur at the junctions on the local highway network during the weekday peak periods as a result of the proposed development.

|                                                                                  | 2022<br>'Without Dev' | 2022<br>'With Dev' | Change in Traffic | Percentage<br>Change |
|----------------------------------------------------------------------------------|-----------------------|--------------------|-------------------|----------------------|
| <b>Junction 1 - Summerhill Road/Top Road/Bottom Road - Priority control</b>      |                       |                    |                   |                      |
| <b>Weekday AM Peak</b>                                                           | 263                   | 329                | +66               | +25.1%               |
| <b>Weekday PM Peak</b>                                                           | 351                   | 413                | +62               | +17.7%               |
| <b>Junction 2 - Summerhill Road/Wheatsheaf Lane/Moss Road - Priority control</b> |                       |                    |                   |                      |
| <b>Weekday AM Peak</b>                                                           | 571                   | 638                | +67               | +11.7%               |
| <b>Weekday PM Peak</b>                                                           | 647                   | 708                | +61               | +9.4%                |
| <b>Junction 3 - A483/A541 Mold Road/Summerhill Road Roundabout</b>               |                       |                    |                   |                      |
| <b>Weekday AM Peak</b>                                                           | 4359                  | 4410               | +51               | +1.2%                |
| <b>Weekday PM Peak</b>                                                           | 4897                  | 4944               | +47               | +1.0%                |

**Table 5.3 – Summary of Net Impact on Local Highway Network**

5.11.3 As shown in the table, the net impact of the development is above 5% at the Summerhill Road/Top Road/Bottom Road and Summerhill Road/Wheatsheaf Lane/Moss Road junctions and, as such, capacity assessments will be undertaken at these junctions.

5.11.4 At the A483/A541 Mold Road/Summerhill Road Roundabout junction, the development is forecast to result in an increase in traffic travelling through this junction of just 51 two-way trips in the weekday AM peak and 47 two-way trips in the PM peak hour.

- 5.11.5 This equates to a percentage impact of around 1% or less than one two-way trip every minute during the busiest periods of the day. Considering the robust assessment and the large volumes of traffic utilising this section of the network, such changes in traffic will be within the daily fluctuation of traffic that occurs at the junction and, as such, the impact of the development on the operation of the A483/A541 Mold Road/Summerhill Road junction is considered minimal and no further junction analysis has been undertaken.
- 5.11.6 Furthermore, reference to the Institution of Highways and Transportation (IHT) 'Guidelines for Traffic Impact Assessment' suggests that more detailed analysis of highway impact and/or capacity improvements is only likely to be required where either:
- Traffic to/from the development exceeds 10% of existing two-way traffic on the adjoining highway; or
  - Where traffic to/from the development exceeds 5% of the existing two-way traffic flow on the adjoining highways at locations where traffic congestion exists within the assessment period or in other sensitive locations.
- 5.11.7 March 2007 Welsh Government Guidance TAN18 Annex E (para E4) provides some further advice regarding likely material increases in traffic demand, specifically occasions under which additional analysis might be required for developments affecting the Welsh Strategic Road Network.
- 5.11.8 In this case TAN18 guidance states:
- “When assessing whether or not to consult the Assembly...local planning authorities must give full consideration to the effects of a development's traffic would have at a junction, particularly in respect of the additional turning movements created. As a broad guide the Assembly Government would regard an increase in turning movements in the order of 5% as material in most cases, that is, a 5% increase of traffic using any link of the junction. Where the capacity of the junction is, or is near to, being exceeded, a smaller percentage increase on a link would normally be material”.*

- 5.11.9 It is therefore concluded that a 5% threshold represents a reasonable starting point for the assessment of the impact on the surrounding road network in the vicinity of the site and on that basis, this TA will only consider junctions where the impact exceeds the 5% threshold.

## 5.12 Capacity Assessments

- 5.12.1 In order to assess the operation of the junctions on the local highway network, capacity assessments have been undertaken at the following junctions;

- Summerhill Road/Top Road/Bottom Road;
- Summerhill Road/Wheatsheaf Lane/Moss Road; and
- A483/A541 Mold Road/Summerhill Road junction

### Summerhill Road/Top Road/Bottom Road Priority Controlled Junction

- 5.12.2 The operation of the above mentioned junction was tested using the PICADY module of the Junctions 8 program.
- 5.12.3 Assessments were undertaken using the 2022 'base' and 'with development' flows, the results of which are summarised in Table 5.4 with the full results contained within **Appendix 5**.

| Arm Name                    | 2022 Base Flows |       |      |       | 2022 With Development Flows |       |      |       |
|-----------------------------|-----------------|-------|------|-------|-----------------------------|-------|------|-------|
|                             | AM              |       | PM   |       | AM                          |       | PM   |       |
|                             | RFC             | Max Q | RFC  | Max Q | RFC                         | Max Q | RFC  | Max Q |
| Top Road                    | 0.18            | 0     | 0.08 | 0     | 0.30                        | 0     | 0.13 | 0     |
| Bottom Road<br>(Right Turn) | 0.00            | 0     | 0.00 | 0     | 0.00                        | 0     | 0.00 | 0     |

**Table 5.4 - Summary of PICADY Output for Summerhill Road/Top Road/Bottom Road Junction**

- 5.12.4 As can be seen in the above table, the 'Base' results for the AM and PM peak hours show that the junction will operate with reserve capacity with no queuing. The 2022 'With Development' results for the AM and PM peak hour show the junction will continue to operate with reserve capacity, in a similar manner to the base situation. It should also be noted that the geometric layout and design of the junction will be significantly improved as part of the development proposals to provide a safe point of access into the site.

#### Summerhill Road/Wheatsheaf Lane/Moss Road Priority Controlled Junction

- 5.12.5 The Summerhill Road/Wheatsheaf Lane/Moss Road junction is priority controlled and so has been modelled using PICADY. The results for the 'base' and 'with development' flow scenarios for 2022 are summarised within **Table 5.5** with the full results contained within **Appendix 6**.

| Arm Name            | 2022 Base Flows |       |      |       | 2022 With Development Flows |       |      |       |
|---------------------|-----------------|-------|------|-------|-----------------------------|-------|------|-------|
|                     | AM              |       | PM   |       | AM                          |       | PM   |       |
|                     | RFC             | Max Q | RFC  | Max Q | RFC                         | Max Q | RFC  | Max Q |
| Wheatsheaf Lane     | 0.30            | 0     | 0.45 | 1     | 0.32                        | 0     | 0.49 | 1     |
| Summerhill Road (N) | 0.03            | 0     | 0.03 | 0     | 0.03                        | 0     | 0.03 | 0     |
| Moss Road           | 0.45            | 1     | 0.31 | 0     | 0.46                        | 1     | 0.32 | 0     |
| Summerhill Road (S) | 0.02            | 0     | 0.01 | 0     | 0.02                        | 0     | 0.01 | 0     |

**Table 5.5 – Summary of PICADY Results for Summerhill Road/Wheatsheaf Lane/Moss Road Junction**

- 5.12.6 As can be seen in the above table, the 'Base' results for the AM and PM peak hours show that the junction will operate with reserve capacity. The 2022 'With Development' results for the AM and PM peak hour show the junction will continue to operate with reserve capacity. The proposals are also forecast to have a minimal impact on the operation of this junction.

### A483/A541 Mold Road/Summerhill Road Roundabout Junction

- 5.12.7 While the impact at the A483/A541 Mold Road/Summerhill Road junction has been calculated to be less than 5%, for completeness, and as requested by the highways officer, this junction has also been assessed. The junction model has been coded in accordance with the traffic signal timing data obtained from the Council.
- 5.12.8 The A483/A541 Mold Road/Summerhill Road junction is a signalised roundabout and so has been modelled using LINSIG. The results for the 'base' and 'with development' flow scenarios for 2022 are summarised within **Table 5.6** with the full results contained within **Appendix 6**.

| Arm Name                         | 2022 Base Flows |     |       |     | 2022 With Development Flows |     |       |     |
|----------------------------------|-----------------|-----|-------|-----|-----------------------------|-----|-------|-----|
|                                  | AM              |     | PM    |     | AM                          |     | PM    |     |
|                                  | DOS             | MMQ | DOS   | MMQ | DOS                         | MMQ | DOS   | MMQ |
| Mold Road (w) SB Left&Ahead      | 71.0            | 9   | 120.9 | 46  | 74.1                        | 10  | 120.9 | 47  |
| Mold Road (w) SB Ahead           | 71.1            | 9   | 120.9 | 46  | 74.2                        | 10  | 120.9 | 47  |
| Circ at Mold Road (w) SB Ahd&Rht | 71.2            | 8   | 43.0  | 6   | 70.0                        | 8   | 43.3  | 7   |
| Circ at Mold Road (w) SB Ahd&Rht | 73.9            | 9   | 45.6  | 6   | 73.6                        | 9   | 46.0  | 5   |
| A483 NB On Slip Ahead            | 20.5            | 0   | 20.3  | 0   | 20.8                        | 0   | 20.4  | 0   |
| A483 NB On Slip Ahead            | 12.6            | 0   | 16.9  | 0   | 13.1                        | 0   | 16.9  | 0   |
| Circ - Ahead                     | 37.6            | 0   | 24.8  | 0   | 37.9                        | 0   | 24.9  | 0   |
| Circ - Ahead                     | 46.1            | 0   | 29.7  | 0   | 46.8                        | 0   | 29.9  | 0   |
| Circ at NB Off Slip Rht&Ahd      | 60.5            | 7   | 82.7  | 15  | 64.3                        | 7   | 83.6  | 16  |
| Circ at NB Off Slip Right        | 50.1            | 6   | 58.2  | 8   | 52.7                        | 6   | 57.8  | 7   |

|                                               |             |    |               |     |             |    |               |     |
|-----------------------------------------------|-------------|----|---------------|-----|-------------|----|---------------|-----|
| <b>A483 NB Off Slip Left</b>                  | 55.4        | 7  | 68.5          | 7   | 53.5        | 6  | 68.9          | 7   |
| <b>A483 NB Off Slip Ahead&amp;Left</b>        | 63.2        | 8  | 68.7          | 7   | 60.7        | 7  | 69.0          | 7   |
| <b>Summerhill Road Left</b>                   | 51.7        | 2  | 49.5          | 2   | 61..4       | 2  | 54.5          | 2   |
| <b>A483 SB Off Slip Ahead&amp;Left</b>        | 87.4        | 10 | 64.9          | 8   | 88.0        | 11 | 68.8          | 8   |
| <b>A483 SB Off Slip Ahead&amp;Left</b>        | 81.6        | 9  | 60.5          | 7   | 82.1        | 9  | 64.3          | 8   |
| <b>Mold Road (E) NB Left</b>                  | 38.9        | 0  | 90.8          | 10  | 38.9        | 0  | 90.9          | 11  |
| <b>Mold Road (E) NB Ahead</b>                 | 64.7        | 0  | 124.6         | 119 | 65.5        | 1  | 127.9         | 129 |
| <b>Mold Road (E) NB Ahead</b>                 | 64.7        | 0  | 113.3         | 81  | 65.5        | 1  | 114.1         | 83  |
| <b>Circ at A483 SB Off Slip (Ahead)</b>       | 70.5        | 7  | 59.4          | 4   | 71.1        | 7  | 57.5          | 5   |
| <b>Circ at A483 SB Off Slip (Rht&amp;Ahd)</b> | 86.4        | 12 | 71.2          | 6   | 87.7        | 13 | 69.0          | 7   |
| <b>Circ at Mold Road (e) NB Ahead</b>         | 11.1        | 0  | 8.5           | 0   | 11.2        | 0  | 8.5           | 0   |
| <b>Circ at Mold Road (e) NB Rht&amp;Ahd</b>   | 15.3        | 0  | 21.1          | 0   | 15.7        | 0  | 21.9          | 0   |
| <b>Circ – Ahead</b>                           | 24.2        | 0  | 42.7          | 0   | 54.6        | 0  | 43.2          | 0   |
| <b>Circ – Ahead</b>                           | 20.0        | 0  | 30.1          | 0   | 20.2        | 0  | 29.8          | 0   |
| <b>A483 SB On Slip Ahead</b>                  | 25.9        | 0  | 42.8          | 0   | 26.0        | 0  | 42.8          | 0   |
| <b>A483 SB On Slip Ahead</b>                  | 11.4        | 0  | 8.7           | 0   | 11.5        | 0  | 8.8           | 0   |
| <b>PRC %</b>                                  | <b>3.0%</b> |    | <b>-38.4%</b> |     | <b>2.3%</b> |    | <b>-42.1%</b> |     |

**Table 5.6 – Summary of PICADY Results for A548/A541 Mold Road/Summerhill Road Junction**

5.12.9 As can be seen in the above table, the 'Base' results for the AM peak hours show that the junction will operate with reserve capacity on all arms of the junction.

- 5.12.10 The results which include the traffic associated with the development show that the junction will operate at a similar level to the base scenario with a slight increase in queuing.
- 5.12.11 The 2022 'With Development' results for the PM peak hour show the junction will operate above its theoretical capacity on the Mold Road (e) and Mold Road (w) approaches. However, the 'With Development' results show the impact of the development traffic will be minimal and queuing will remain at a similar level to the base flow scenario.
- 5.12.12 Notwithstanding the above, it should be noted that the junction operates on MOVA which is a traffic control strategy that is specifically designed to maximise the operational efficiency of a junction or crossing. The signal timings can be adjusted automatically using the MOVA system to operate under varying conditions i.e. when traffic flows are light or during periods of congestion. The above assessments can therefore be considered as representative of a particularly robust, if not worst-case scenario and in reality, any spare green time will be maximized to allow the junction to operate at maximum efficiency.

## **5.13 Traffic Impact Summary**

- 5.13.1 This section of the report has considered the impact of the proposal in transport terms.
- 5.13.2 The assessments have shown that the Summerhill Road/Top Road/Bottom Road priority junction and the Summerhill Road/Wheatsheaf Lane/Moss Road priority junction will operate satisfactorily in all flow scenarios.
- 5.13.3 The impact at the A483/A541 Mold Road/Summerhill Road is less than 5% but nevertheless an assessment has been undertaken, as requested by the highways officer. The results show the junction will be operating with reserve capacity in the AM peak both without and with the development traffic. The results for the PM peak hour show the junction will be operating close to its theoretical capacity on some links and over capacity of the Mold Road approaches. However, the results which include the traffic associated with the development show the actual impact will be minimal and the junction will operate at a similar level with only a slight increase in queues.

- 5.13.4 The assessments undertaken therefore demonstrate that the local highway network would remain operating well within its capacity and the development traffic can be accommodated in both peak hours, without the need for any off-site mitigation measures.
- 5.13.5 It is concluded that the development will not have a material impact on the local network and will not give rise to any highways or transportation issues.

## **6 ACCIDENT ANALYSIS**

### **6.1 Introduction**

- 6.1.1 In order to consider the potential impact of the development on road safety, a review of the Crashmap website ([www.crashmap.co.uk](http://www.crashmap.co.uk)) has been undertaken for the highway network.
- 6.1.2 In line with the agreed scope from the Council, the study area extends from the Summerhill/Top Road/Bottom Road priority junction to the Mold Road Interchange roundabout, located approximately 2.3 kilometres to the south-east.
- 6.1.3 The personal injury accident information provided on the website covered the 3-year period between 2014 and 2016, the latest data available. The accident data is provided at **Appendix 8**.

### **6.2 Accident Review**

- 6.2.1 The review of the website shows there have been no personal injury accidents on the roads in the immediate vicinity of the site over the last 3 years, including none on Top Road adjacent to the site.
- 6.2.2 However, the records show that one incident took place on Summerhill Road, approximately 90 metres to the north of the Summerhill Road/Highfield Road priority junction.
- 6.2.3 The details show that the accident that took place on Summerhill Road involved two vehicles which collided with each other but the records do not specify the cause of the incident.
- 6.2.4 The records show that it was raining and the road surface was wet/damp thus indicating that either one or both of the drivers was travelling in excess of the speed limit and either lost control or failed to react in time to a particular situation. There is no evidence to suggest that there are any particular safety problems along this section of carriageway.

- 6.2.5 The only other recorded accidents occurred at the Mold Road Interchange roundabout junction, where there have been a further 7 incidents, as identified in **Figure 6.1** below.

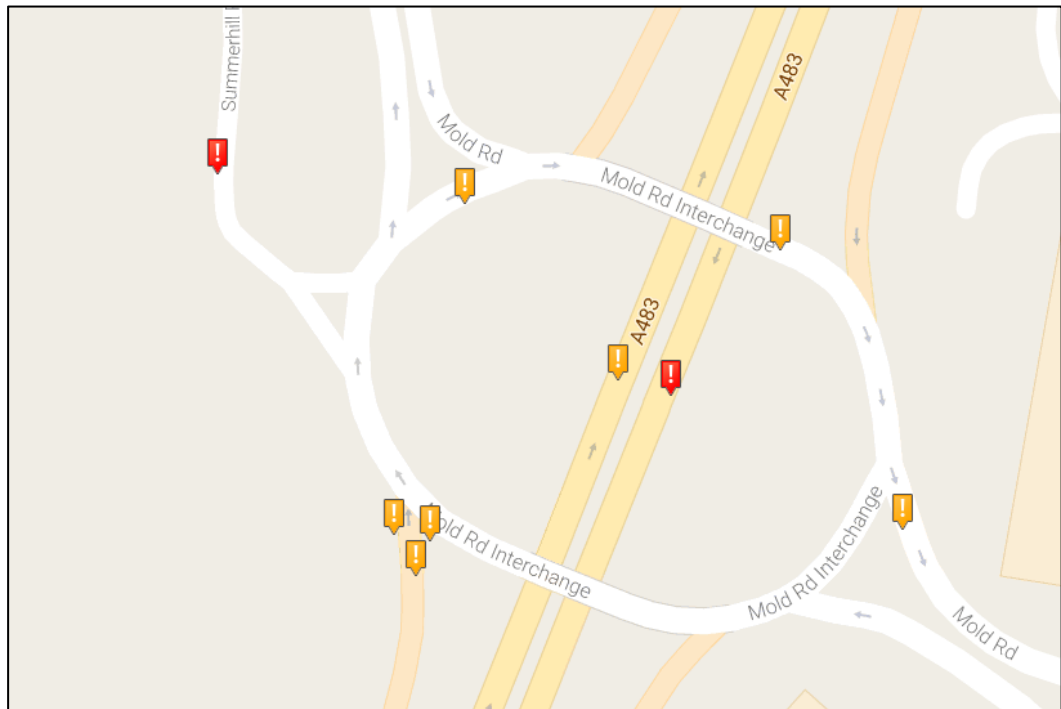


**Figure 6.1 – Location of Accidents**

- 6.2.6 It is noted from the records that none of the incidents took place at the give-way line or as vehicles were approaching the roundabout, although two accidents took place on the exit arms.
- 6.2.7 The first incident took place on the Summerhill Road exit approximately 90 metres to the north of the junction and resulted in a serious injury being sustained. The records show that only one vehicle (a car) was involved and that the car entered a ditch at the side of the road. The weather conditions and road surface was dry and so the evidence suggests that the driver was travelling in excess of the speed limit and lost control of the vehicle, rather than there being any particular engineering issues or problems with the road or junction layout.

- 6.2.8 Another accident took place on the eastbound exit onto Mold Road. The data shows the accident involved a car which was changing lane and a heavy goods vehicle which was in the act of turning right, when they struck each other. The records show that the weather was dry and so it can be assumed that the incident was due to either one or both of the drivers not paying sufficient attention to other road users. It resulted in a slight injury to the car driver.
- 6.2.9 The other four record accidents took place on the circulating carriageway and all resulted in slight injuries being sustained.
- 6.2.10 The first incident related to an elderly driver who collided with a crash barrier in dry weather conditions which suggests that the driver was travelling in excess of the speed limit or was distracted, rather than there being any issues with the road layout.
- 6.2.11 The next accident refers to an accident involving two vehicles where one had moved off, likely from the traffic lights, but struck the vehicle in front. Again this suggests an error on the driver's part rather than any specific safety issues with the junction.
- 6.2.12 The records show that another accident took place involving two cars. The weather conditions and road surface were dry and the details show that one of the vehicles was proceeding normally along the carriageway and struck another vehicle which was slowing down. Again, this suggests that the driver was caused by driver error, and/or travelling in excess of the speed limit and failed to react in time.
- 6.2.13 The last accident relates to two cars, in wet or damp weather conditions where one of the vehicles was proceeding normally along the carriageway and the other vehicle was waiting to proceed normally but was held up. While the precise details are not clear, this suggests that driver error was the cause of the incident, rather than any specific engineering problems or road conditions.

## **6.3 Accident Summary**

- 6.3.1 The accident data reviewed has not identified any untypical accidents.

- 6.3.2 Having considered the accidents that have taken place over the last 3 years in the study area, it is not considered that there are specific accident or highway safety problems in the area.
- 6.3.3 The records show that the majority of incidents were general collisions caused by drivers not paying attention to other road users, or travelling in excess of the speed limit rather than being due to the characteristics or road layout.
- 6.3.4 In light of the above, it is not considered that there are specific accident or highway safety problems in the area.
- 6.3.5 It should be noted that the internal layout of the site has been focused on providing safe access for all road users, including pedestrians and cyclists.
- 6.3.6 On that basis there is no evidence to suggest that the proposed development will have an adverse effect on road safety or the number of accidents in the vicinity.

## **7 SMARTER TRAVEL CHOICES VIA TRAVEL PLANS**

### **7.1 Introduction**

- 7.1.1 In order to manage the travel by residents at the new development, the applicant wishes to offer a Travel Plan to encourage travel to the site by non-car modes.

### **7.2 Travel Planning Guidance**

- 7.2.1 The preparation and adoption of a Travel Plan is an important element of managing the demand for travel to all modern developments. The Department for Transport (DfT) have produced guidance on the preparation of Travel Plans. The document, entitled '*Good Practice Guidelines: Delivering Travel Plans through the Planning Process*' was published in August 2009.
- 7.2.2 The guidance explains how *"we often need to meet the demands of population and economic growth whilst simultaneously reducing our impact on the environment"* and identifies that *"The benefits of increases in sustainable travel, in particular cycling and walking, can extend beyond reduction in CO<sub>2</sub> emissions and climate impacts, and include tackling congestion, tackling obesity and health issues, reducing social exclusion and improving quality of life"*.
- 7.2.3 The document sets out an overview of the process and delivery of Travel Plans and states that *"A Travel Plan is a long-term management strategy for an occupier or site that seeks to deliver sustainable transport objectives through positive action and is articulated in a document that is regularly reviewed."*
- 7.2.4 The Guidance states that *"Travel Plans should involve the development of agreed explicit outcomes linked to an appropriate package of measures aimed at encouraging more sustainable travel, with an emphasis on reducing single occupancy car use..."* and;  
  
*"A Travel Plan should seek to establish clear outcomes to be achieved in relation to access and set out all the measures to be implemented in detail, including an action plan, timescales, targets and responsibilities for implementation, monitoring and review"*.

- 7.2.5 It is made clear in the document that Travel Plans should focus on achieving the lowest practical level of single occupancy vehicle trips to or from a site and widening the use of other travel modes and assist in the wider aims of encouraging sustainable travel, improving health, reducing congestion, energy consumption and pollution. The Travel Plan, it advises *“needs to address all the journeys that may be made to and from a site”*.
- 7.2.6 The guidance also specifies that *“It is important to note that Travel Planning should be developed as one of the means of delivering an area’s sustainable transport strategy. Travel Planning should feature in the policy framework and implementation programmes of Regional Spatial Strategies and Local Development Frameworks”*.
- 7.2.7 Further guidance relating specifically to residential Travel Plans is presented in the DfT document entitled *“Making Residential Travel Plans Work”* published in June 2007.
- 7.2.8 The document states that:
- “Travel Planning is one of a range of measures known as smarter choices which have been found to be effective on reducing traffic and improving accessibility in residential areas”*.
- 7.2.9 A Residential Travel Plan is a package of measures designed to reduce car use originating from new housing by supporting alternative forms of transport and reducing the need to travel in the first place. They are an important tool to help deliver accessible, sustainable communities and offer clear benefits to all the parties involved – public, private and the community. They involve meeting the access needs of residents in a new way and require partnerships between developers, local authorities, local communities and new residents.
- 7.2.10 The value of Travel Plans in reducing car use to workplaces and schools is widely recognised and many local authorities and developers have experience in their design and implementation.

- 7.2.11 However, until recently, little attention has been given to tackling the origins of journeys from people's homes. Now, forward-thinking developers and local authorities are developing packages of smarter choices to both reduce the traffic generated by new housing developments and increasing the travel choices available to residents. These smarter choices are being set out in Residential Travel Plans.

### **7.3 Residential Travel Plan**

- 7.3.1 The objective of a Residential Travel Plan is the delivery of the objectives of the NPPF, i.e. to encourage residents to travel to work by bus, on foot and by bicycle.
- 7.3.2 A Framework Residential Travel Plan has been prepared and is presented in **Appendix 9**.
- 7.3.3 The Framework Residential Travel Plan outlines physical and management measures that are designed to achieve this objective.
- 7.3.4 However, the principle measure will consist of a Residents Travel Pack containing relevant material to promote non-car modes of travel and the provision of certain physical measures.
- 7.3.5 The Travel Pack will contain information to inform residents of the existing long-term strategy for reducing the dependence of residents and visitors on travel by private car.
- 7.3.6 The site has been demonstrated to benefit from excellent non-car accessibility and it should, therefore, be expected that the adoption of a Travel Plan would be particularly effective.

## 8 CONCLUSIONS

8.1.1 This report has considered the traffic and transportation issues relating to proposals to develop a site for residential purposes on land off Top Road in the Summerhill area of Wrexham. The following conclusions have been drawn:

- The site is located close to a range of key amenities and facilities and existing and proposed pedestrian infrastructure will enable safe pedestrian movement between the development site and local services.
- The development proposals will significantly enhance the existing local highway network and pedestrian infrastructure in the vicinity of the site.
- The site benefits from being located in close proximity to the bus stops located on the Top Road and Summerhill Road which provide services that are ideally placed to cater for the needs of the residents and visitors.
- The capacity assessments undertaken show that the traffic associated with the development can be accommodated by the existing road network and will not have a material impact and the local road network will operate at a similar level to the base flow scenario.
- The proposed development will be accessed by a safe and efficient vehicular access arrangement and can be adequately serviced.
- There is no evidence to suggest that the proposals would have an adverse effect on road safety or the number of accidents in the vicinity.
- A Framework Travel Plan will be implemented to encourage the use of non-car modes to take advantage of the sustainable travel accessibility credentials of the site.

8.1.2 Based on the above it is the conclusion of this report that there are no material reasons why the proposed development should not be granted planning consent on highways or transportation grounds.

## PLANS



MACBRYDE HOMES

PROPOSED RESIDENTIAL DEVELOPMENT  
LAND OFF TOP ROAD, SUMMERHILL  
WREXHAM  
SITE LOCATION PLAN

**croft**  
Transport Solutions

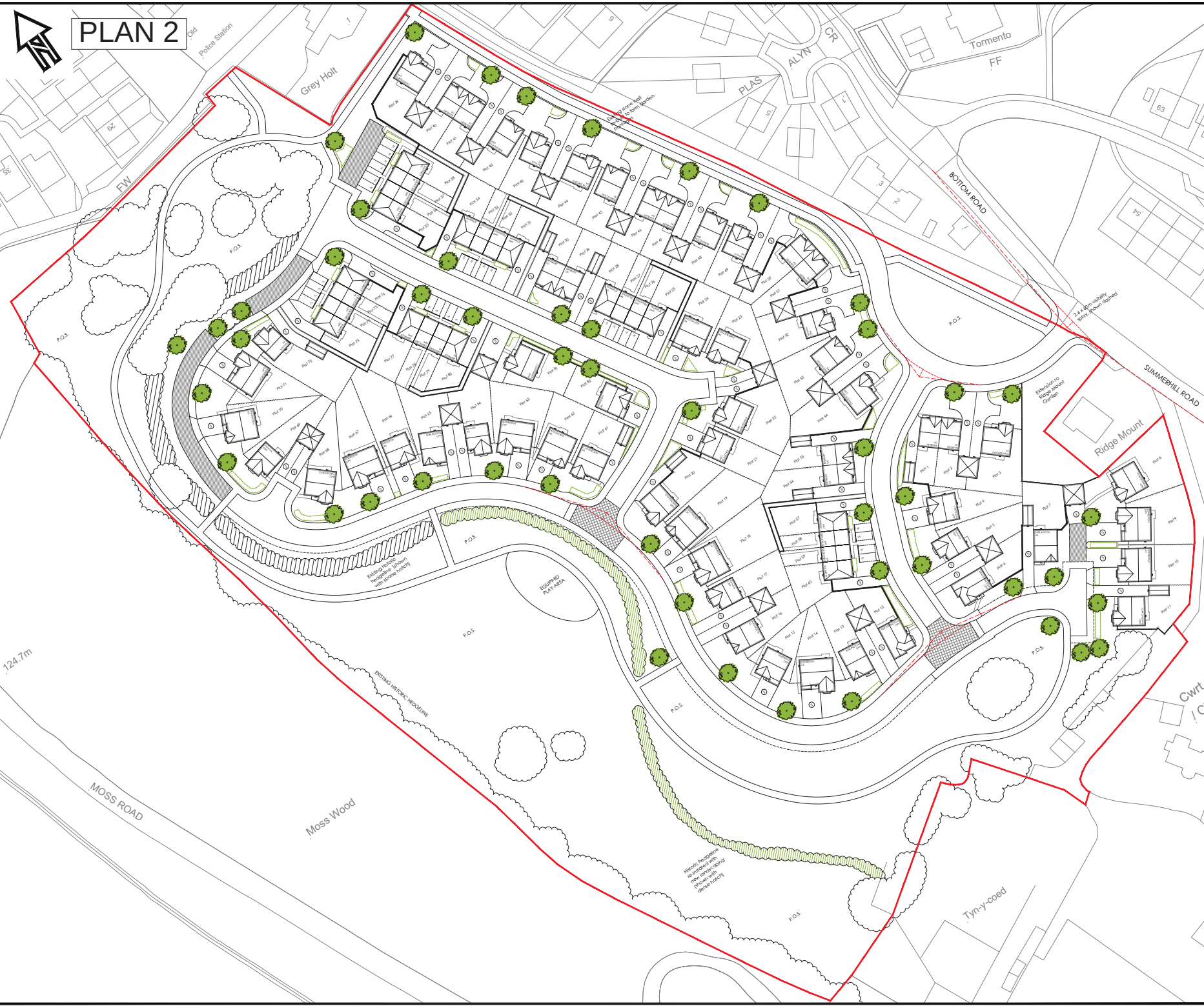
Email: [info@crofts.co.uk](mailto:info@crofts.co.uk)  
Tel: 0161 667 3746  
Web: [www.crofts.co.uk](http://www.crofts.co.uk)

9 Jordan Street,  
Manchester  
M15 4PY

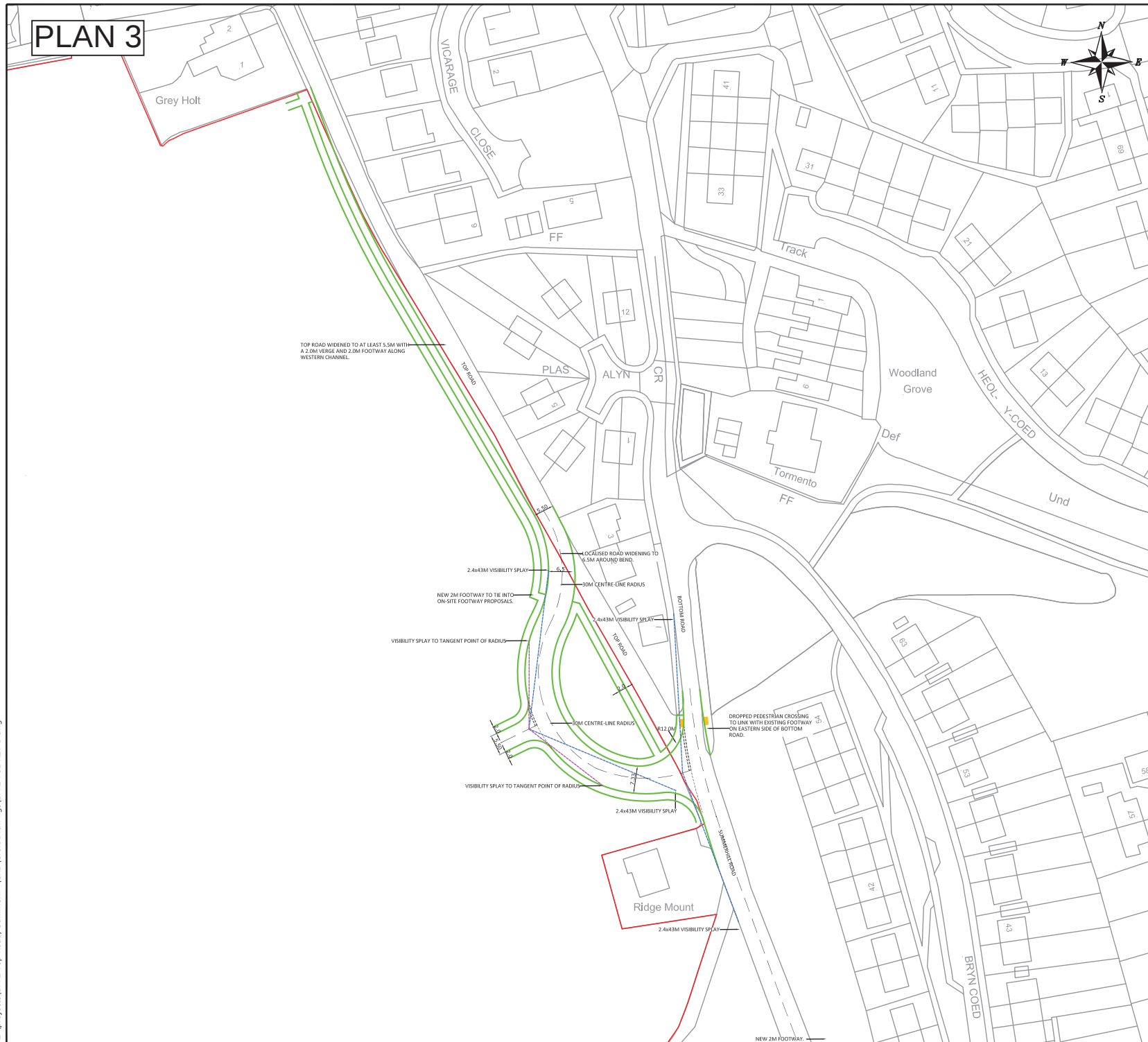
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| SM     | 30.03.17 | MTC      | 30.03.17 | N.T.S  | 1772-01         | .         |



# PLAN 2



# PLAN 3



## NOTES

THIS IS NOT A CONSTRUCTION DRAWING AND IS FOR INDICATIVE PURPOSES ONLY. IT IS SUBJECT TO FURTHER DESIGN ANALYSIS, TOPOGRAPHICAL MAPPING & HIGHWAY/THIRD PARTY LAND BOUNDARIES.

- INDICATIVE SITE BOUNDARY
- DENOTES NEW KERBS

|      |                   |       |         |        |
|------|-------------------|-------|---------|--------|
| B    | DESIGN AMENDMENTS | MTJ   | MR      | OCT 17 |
| A    | DESIGN AMENDMENTS | JC    | PJW     | SEP 17 |
| REV. | DETAILS           | DRAWN | CHECKED | DATE   |

CLIENT:  
**MACBRYDE HOMES**

PROJECT:  
**TOP ROAD, SUMMERHILL**

DRAWING TITLE:  
**POTENTIAL ACCESS ARRANGEMENT**

SCALES:  
**1:1000 @ A3**

|        |    |          |     |       |        |
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| DRAWN: | JC | CHECKED: | PJW | DATE: | MAY 17 |
|--------|----|----------|-----|-------|--------|

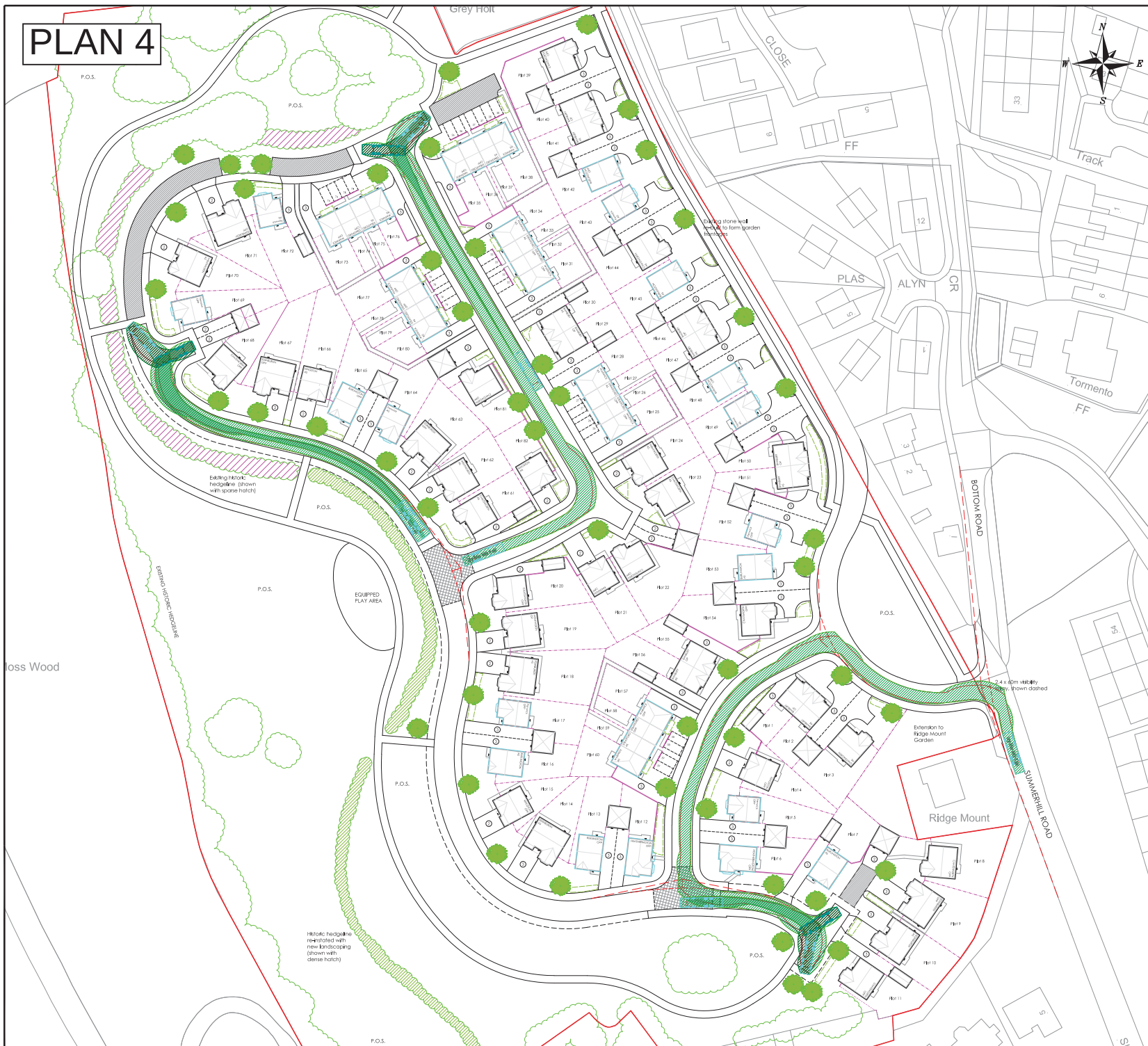
9 Jordan Street,  
Manchester,  
M15 4PY

Email: [info@crofts.co.uk](mailto:info@crofts.co.uk)  
Tel: 0161 667 3746  
Web: [www.crofts.co.uk](http://www.crofts.co.uk)

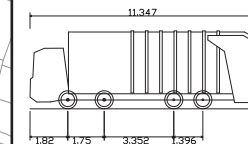
**croft**  
Transport Solutions

|                 |          |           |   |
|-----------------|----------|-----------|---|
| DRAWING NUMBER: | 1772-F01 | REVISION: | B |
|-----------------|----------|-----------|---|

# PLAN 4



## NOTES



Large Refuse Vehicle (4 axle)  
 Overall Length 11.347m  
 Overall Width 2.500m  
 Overall Body Height 3.751m  
 Min Body Ground Clearance 0.304m  
 Track Width 2.500m  
 Lock to lock time 6.00s  
 Wall to wall Turning Radius 11.330m

Large Refuse Vehicle (4 axle)

|      |                          |       |         |        |
|------|--------------------------|-------|---------|--------|
| A    | REVISED ON LATEST LAYOUT | SM    | MR      | OCT 17 |
| REV. | DETAILS                  | DRAWN | CHECKED | DATE   |

CLIENT:  
**MACBRYDE HOMES**

PROJECT:  
**TOP ROAD, SUMMERHILL**

DRAWING TITLE:  
**SWEPT PATH ANALYSIS**

SCALES:  
**1:1000 @ A3**

DRAWN: SM CHECKED: MR DATE: OCT 2017

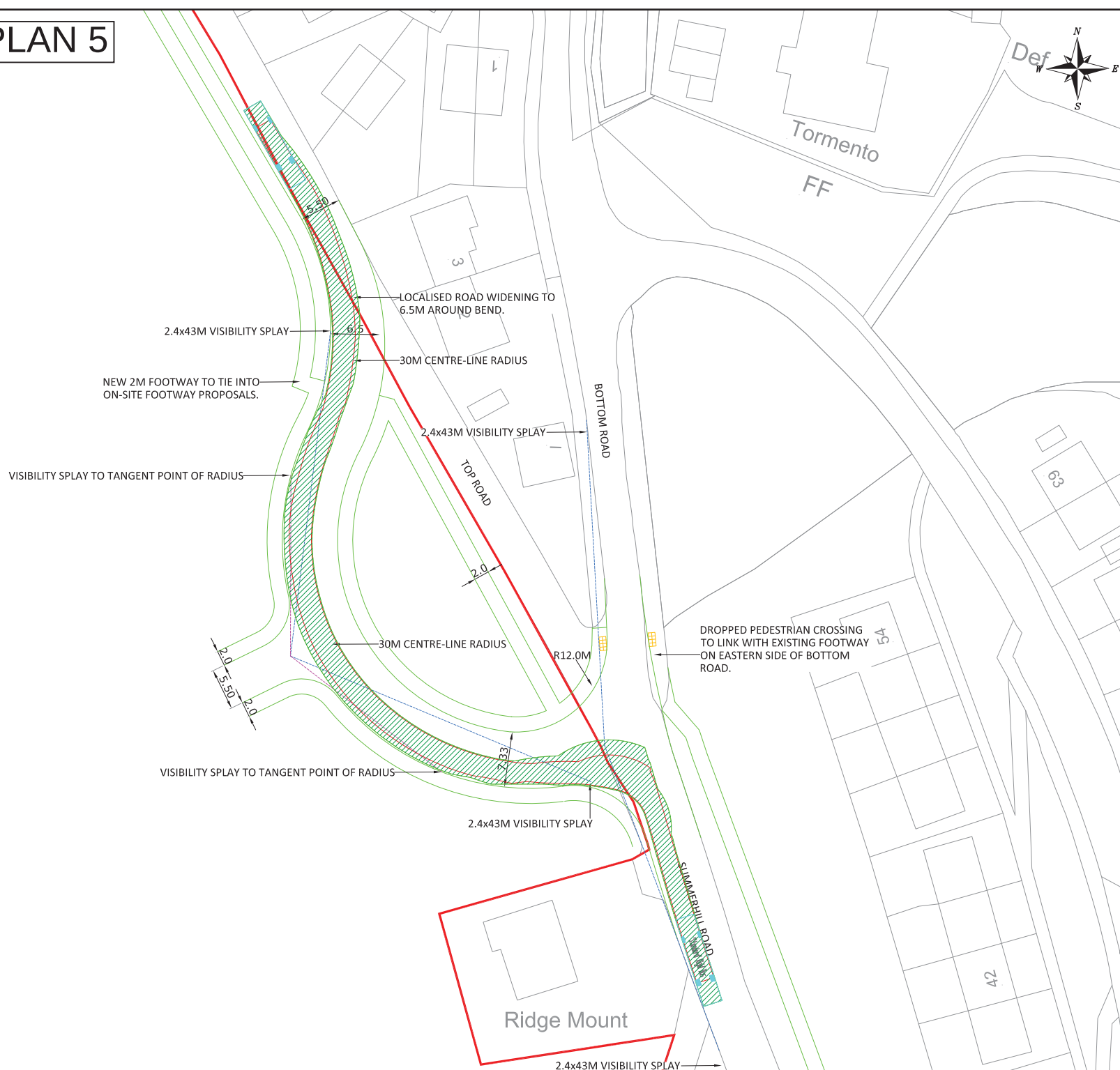
9 Jordan Street,  
 Manchester,  
 M15 4PY

Email: [info@crofts.co.uk](mailto:info@crofts.co.uk)  
 Tel: 0161 667 3746  
 Web: [www.crofts.co.uk](http://www.crofts.co.uk)

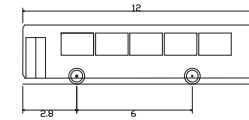
**croft**  
 Transport Solutions

DRAWING NUMBER: **1772-SP02** REVISION: **A**

# PLAN 5



## NOTES



|                             |         |
|-----------------------------|---------|
| 'Standard' Rigid Bus        | 12.000m |
| Overall Length              | 2.550m  |
| Overall Width               | 3.069m  |
| Overall Body Height         | 0.309m  |
| Min Body Ground Clearance   | 2.350m  |
| Track Width                 | 4.005m  |
| Lock to lock time           | 10.771m |
| Wall to Wall Turning Radius |         |



| REV. | DETAILS | DRAWN | CHECKED | DATE |
|------|---------|-------|---------|------|
|      |         |       |         |      |

CLIENT:

MACBRYDE HOMES

PROJECT:

TOP ROAD, SUMMERHILL

DRAWING TITLE:

SWEPT PATH ANALYSIS

SCALES:

1:500 @ A3

|        |    |          |    |       |        |
|--------|----|----------|----|-------|--------|
| DRAWN: | GM | CHECKED: | MR | DATE: | OCT 17 |
|--------|----|----------|----|-------|--------|

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Tel: 0161 667 3746  
Web: [www.crofts.co.uk](http://www.crofts.co.uk)

**croft**  
Transport Solutions

|                 |           |           |  |
|-----------------|-----------|-----------|--|
| DRAWING NUMBER: | 1772-SP04 | REVISION: |  |
|-----------------|-----------|-----------|--|



## FIGURES

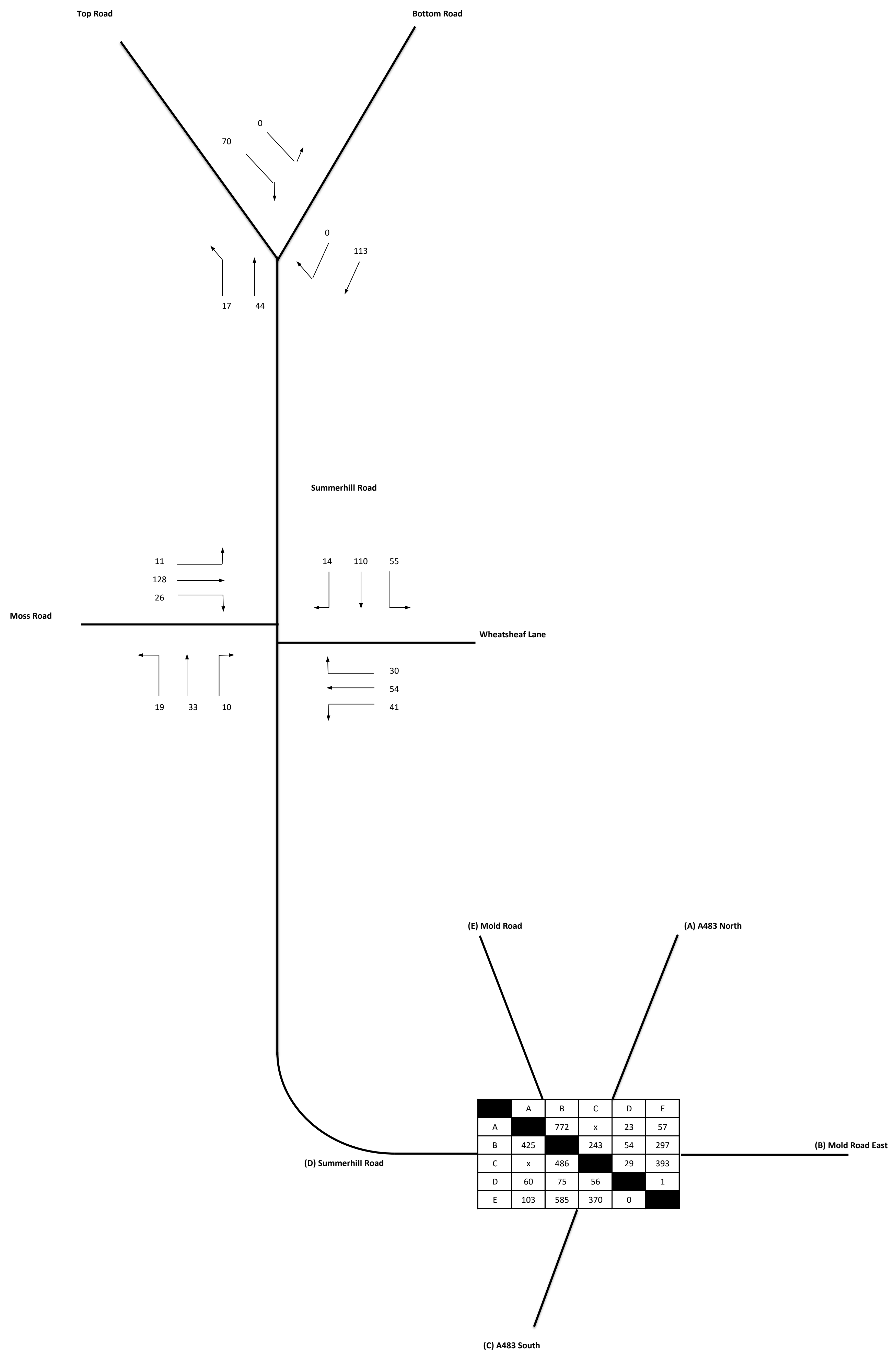


Figure 1 Weekday AM Peak  
2017 Surveyed Flows (0745-0845)

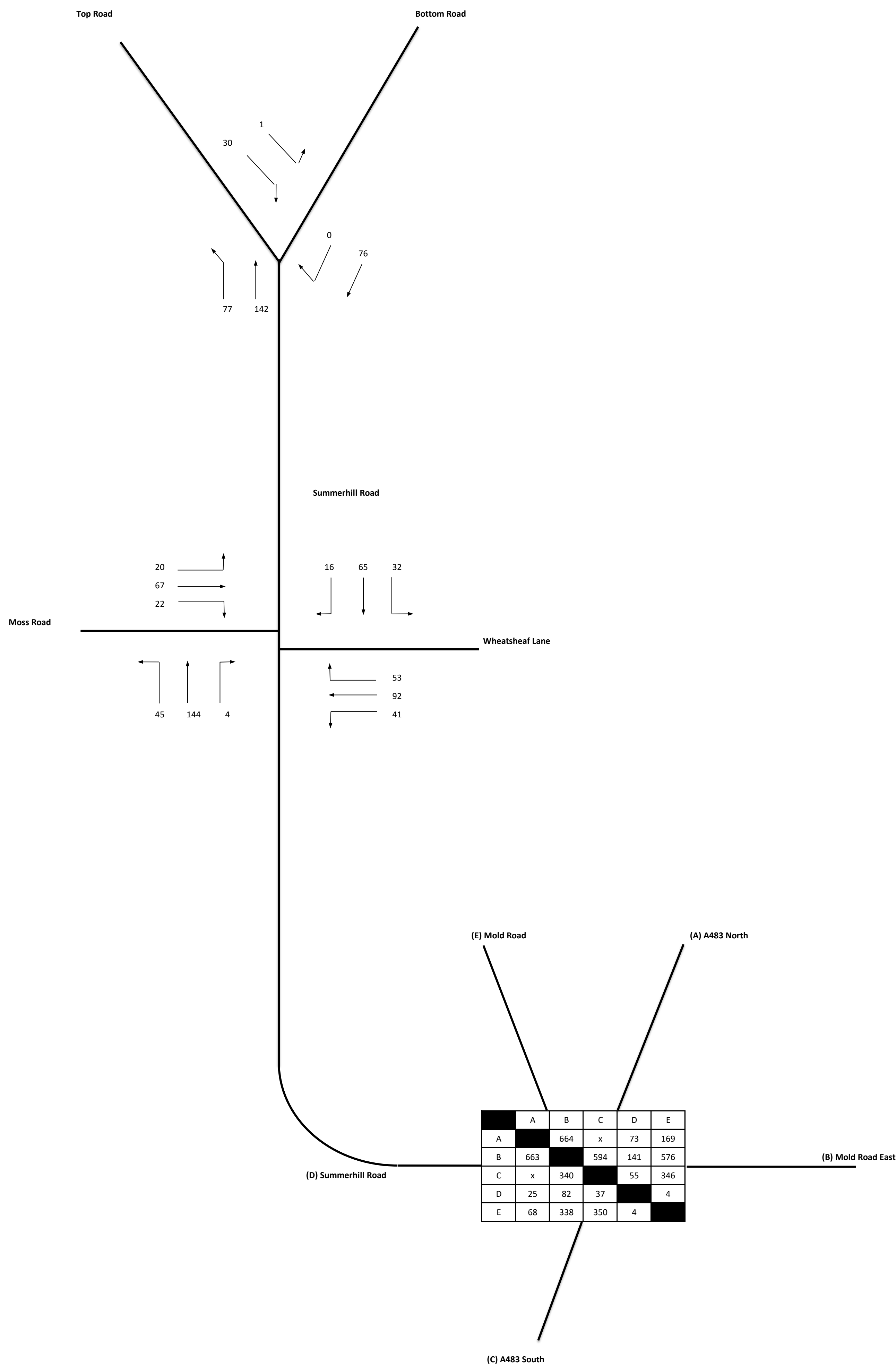
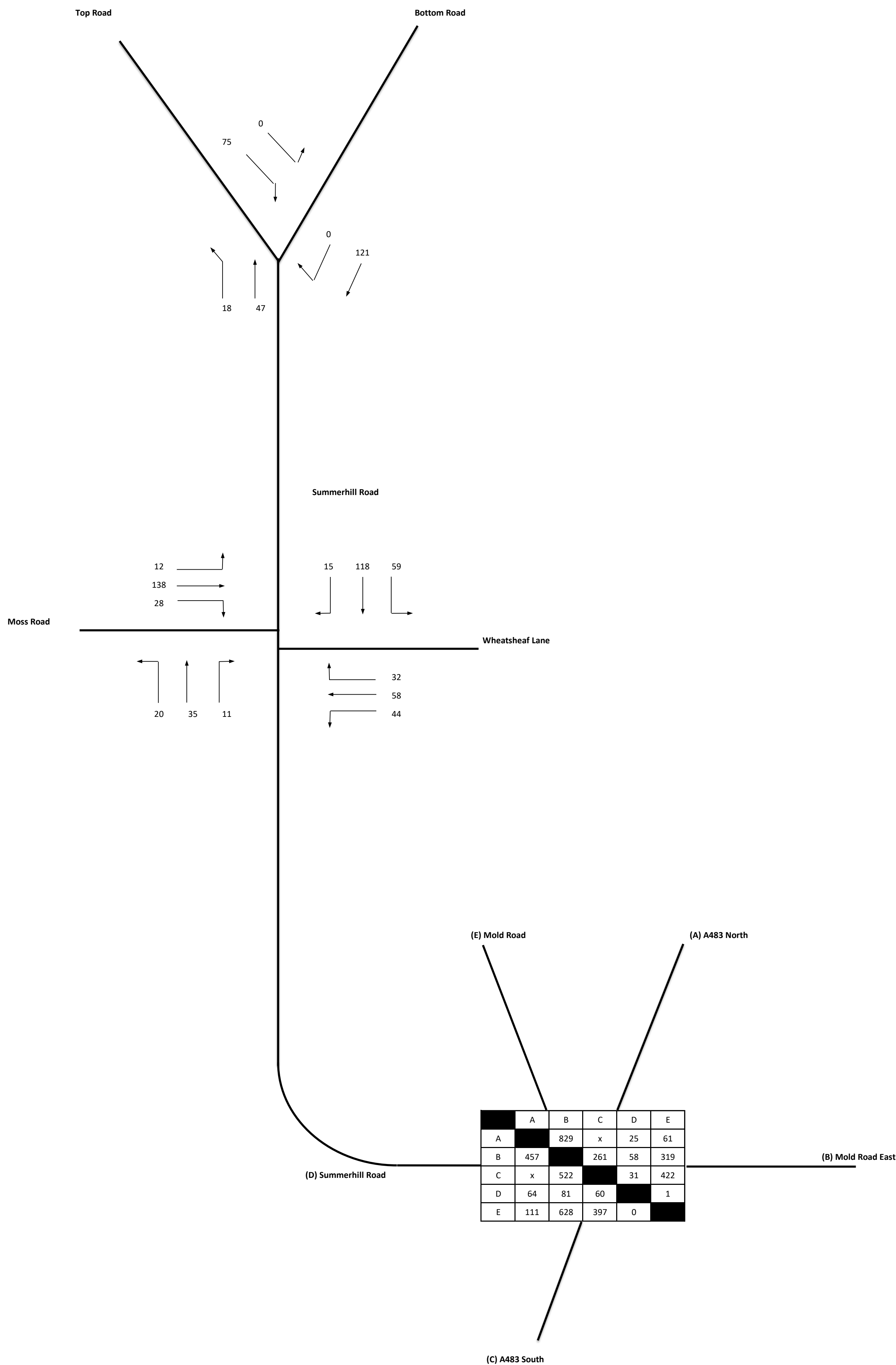


Figure 2 Weekday PM Peak  
2017 Surveyed Flows (1630-1730)

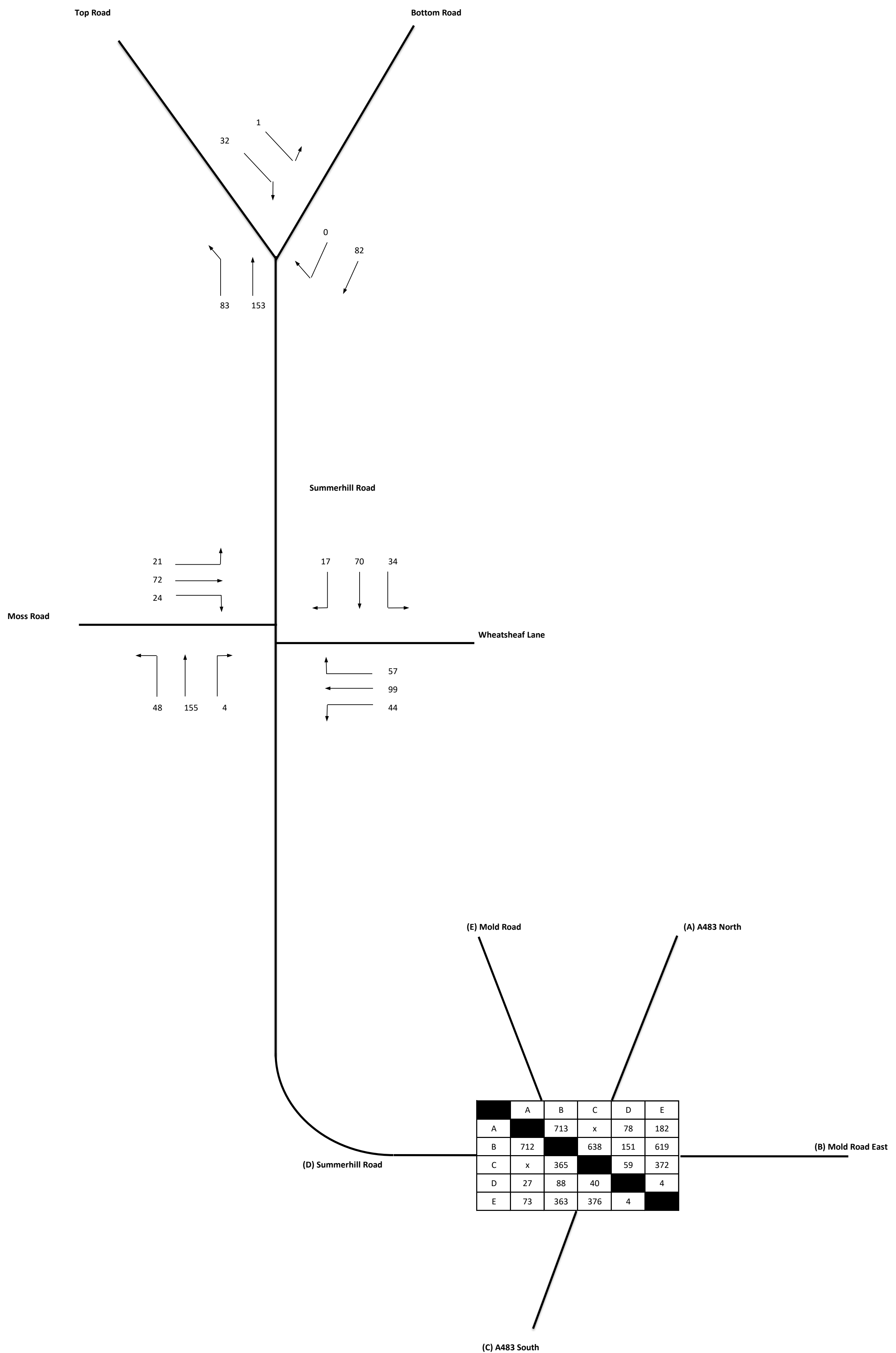


TEMPRO Adjusted NTM Factor = 1.0743

Figure 3 Weekday AM Peak  
2022 Growthed Flows (0745-0845)



9 Jordan Street, Manchester, M15 4PY  
Tel: 0161 667 3746 www.croftts.co.uk info@croftts.co.uk



TEMPRO Adjusted NTM Factor = 1.0742

Figure 4 Weekday PM Peak  
2022 Growthed Flows (1630-1730)

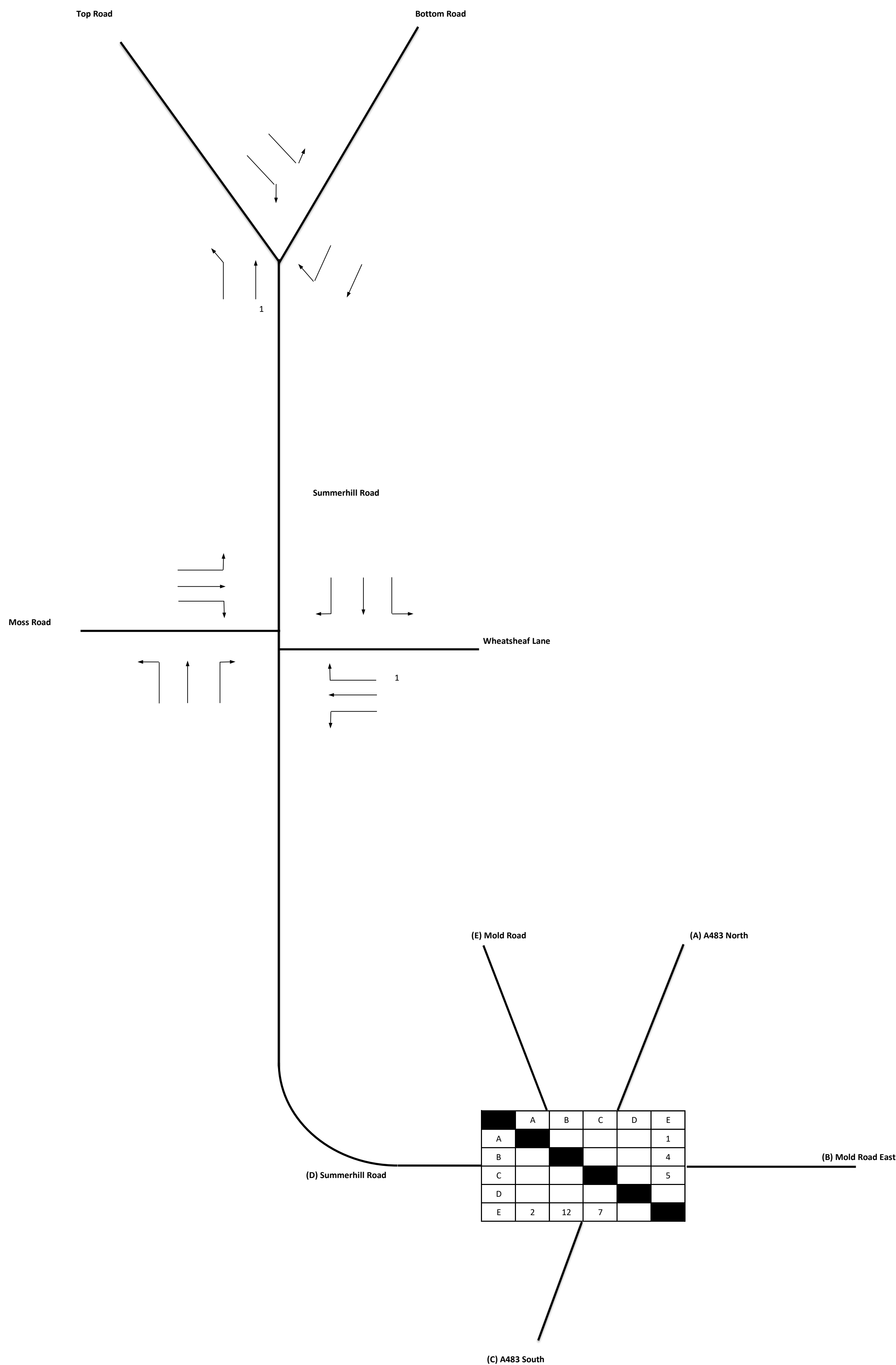


Figure 5 Weekday AM Peak  
Committed Development Flows - 57 Dwellings at Boozy Field, Gwersyllt

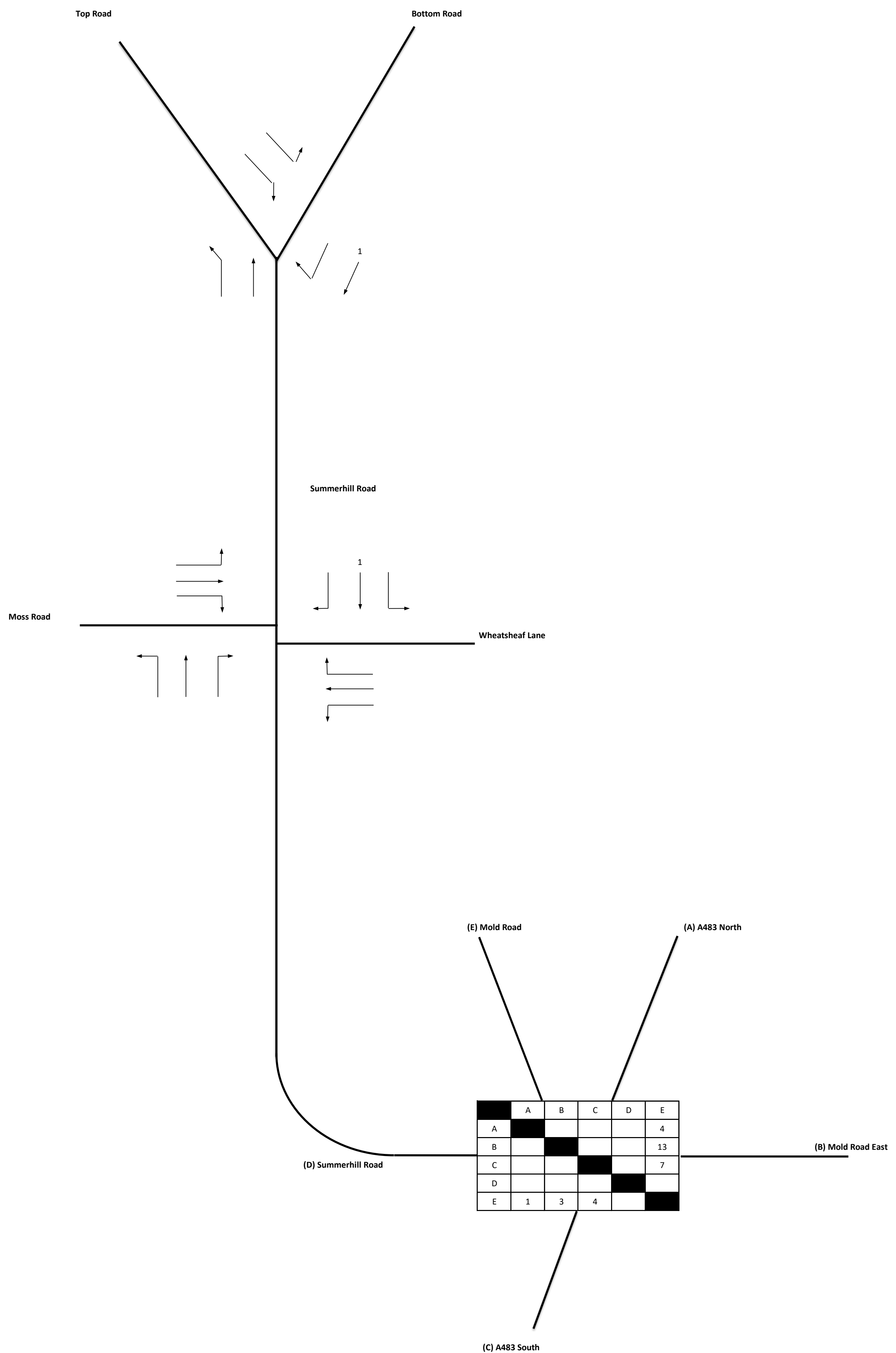


Figure 6 Weekday PM Peak  
Committed Development Flows - 57 Dwellings at Boozy Field, Gwersyllt

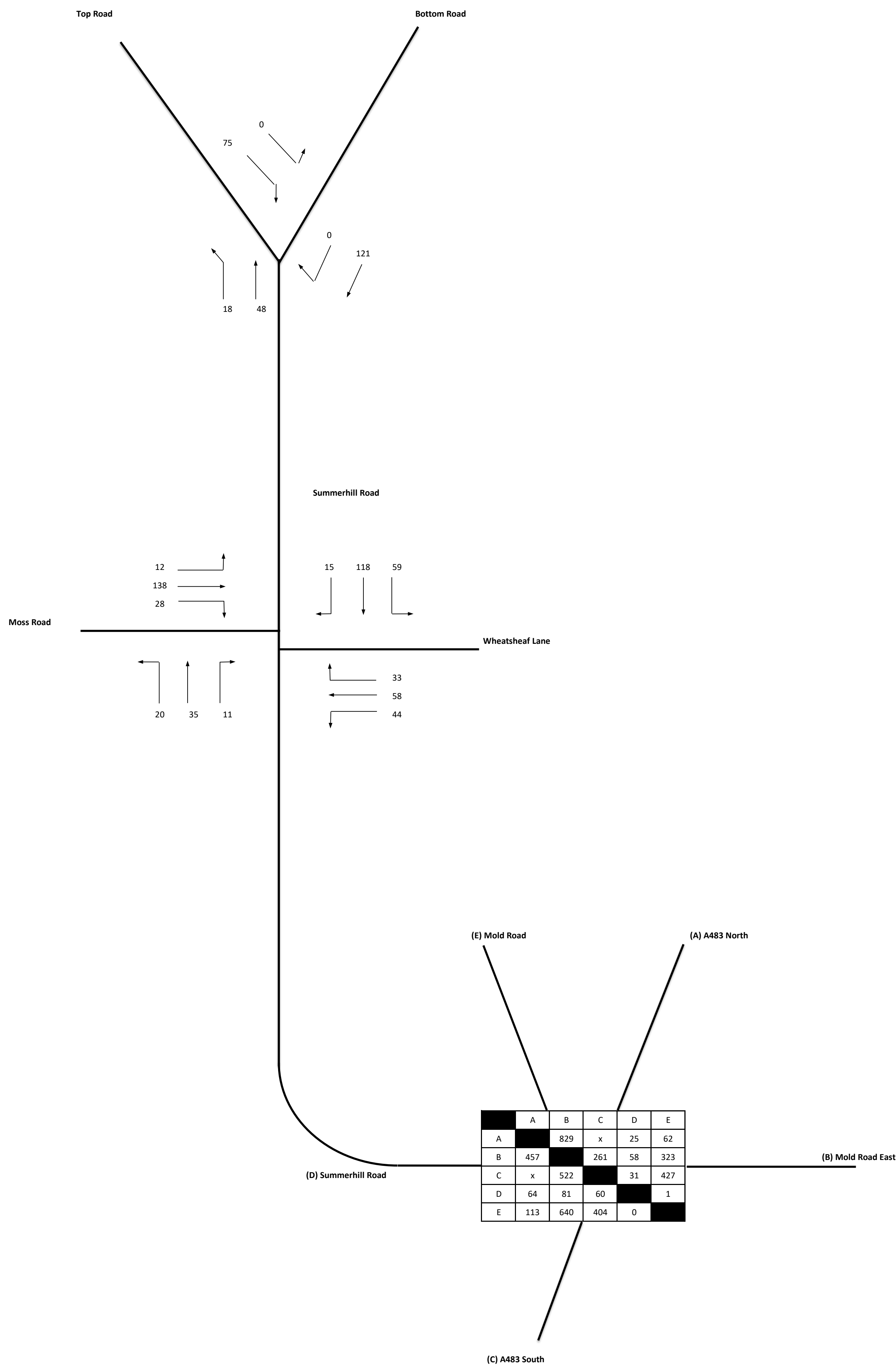


Figure 7 Weekday AM Peak  
2022 Base Flows (0745-0845)

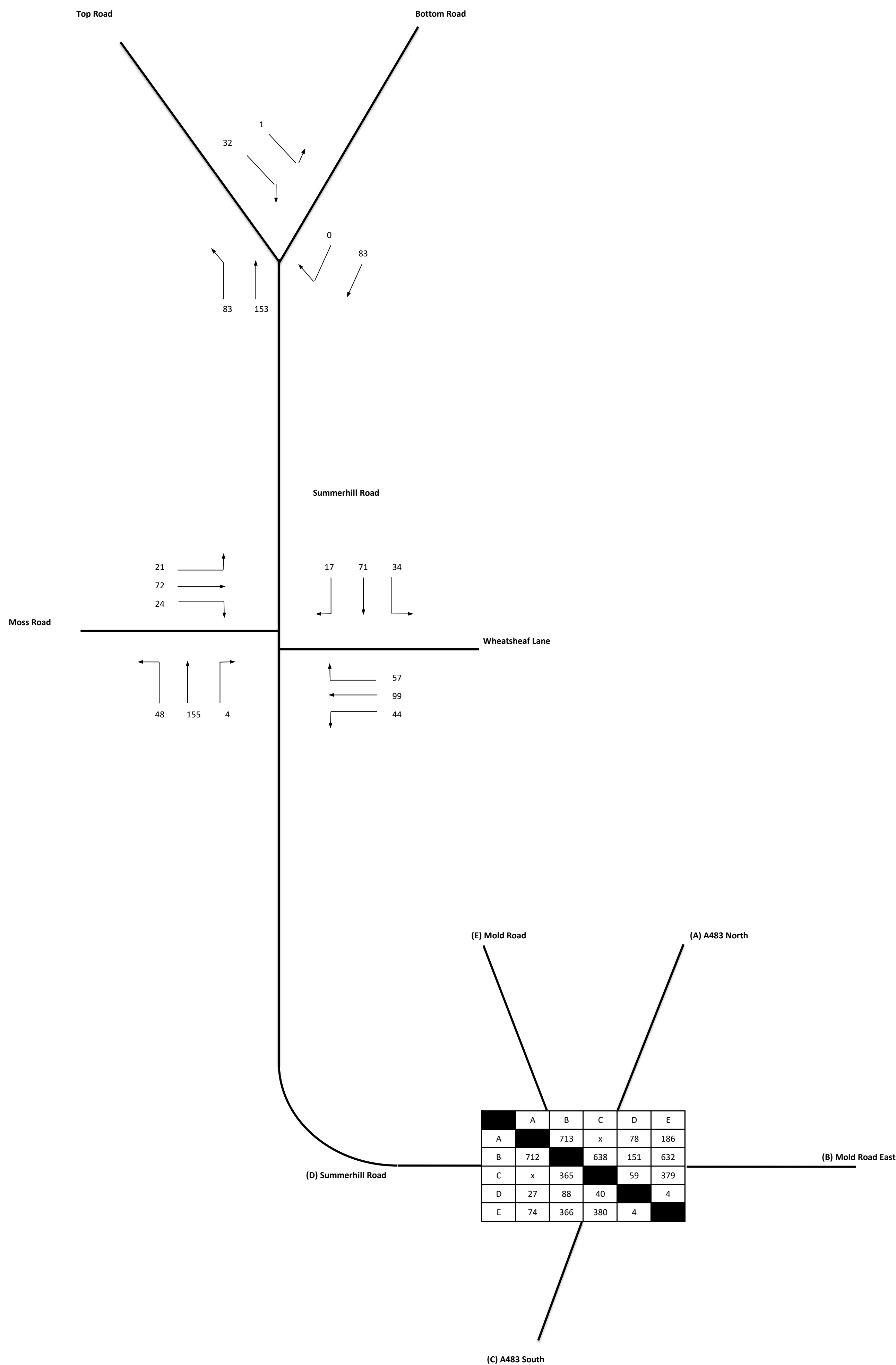


**Figure 8** Weekday PM Peak  
2022 Base Flows (1630-1730)

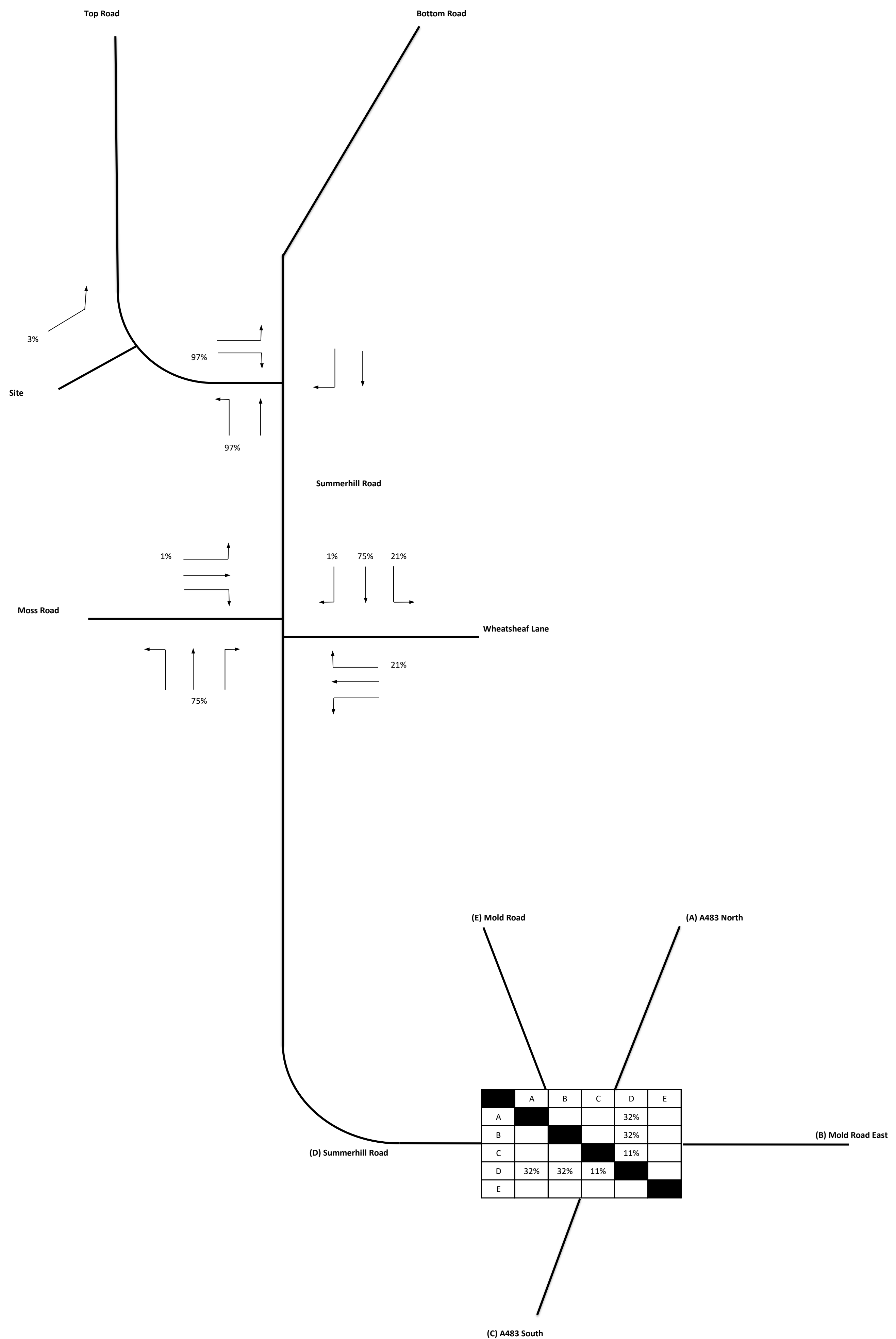


Figure 9 Proposed Trip Distribution

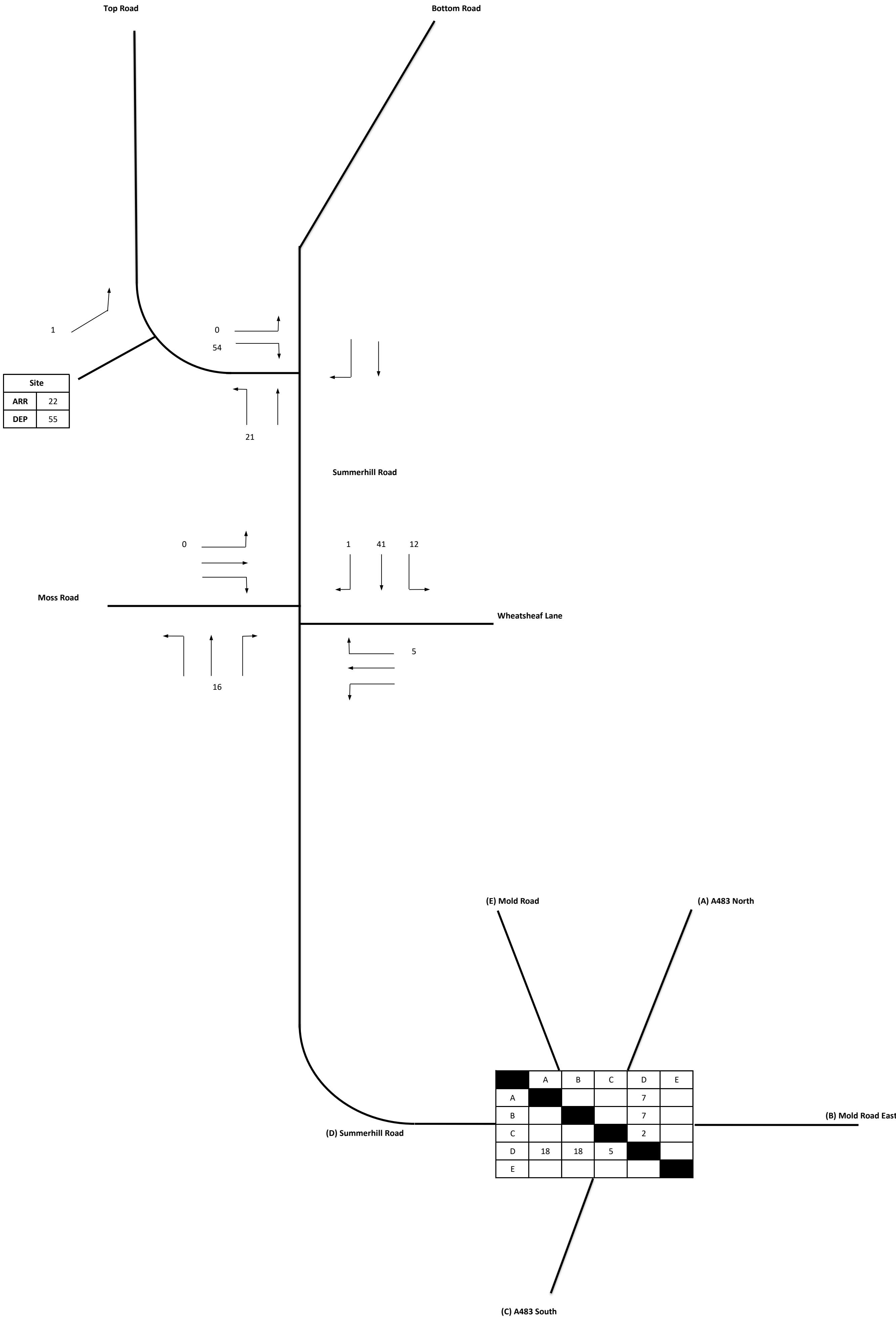


Figure 10 Weekday AM Peak  
Proposed Development Flows (0745-0845)

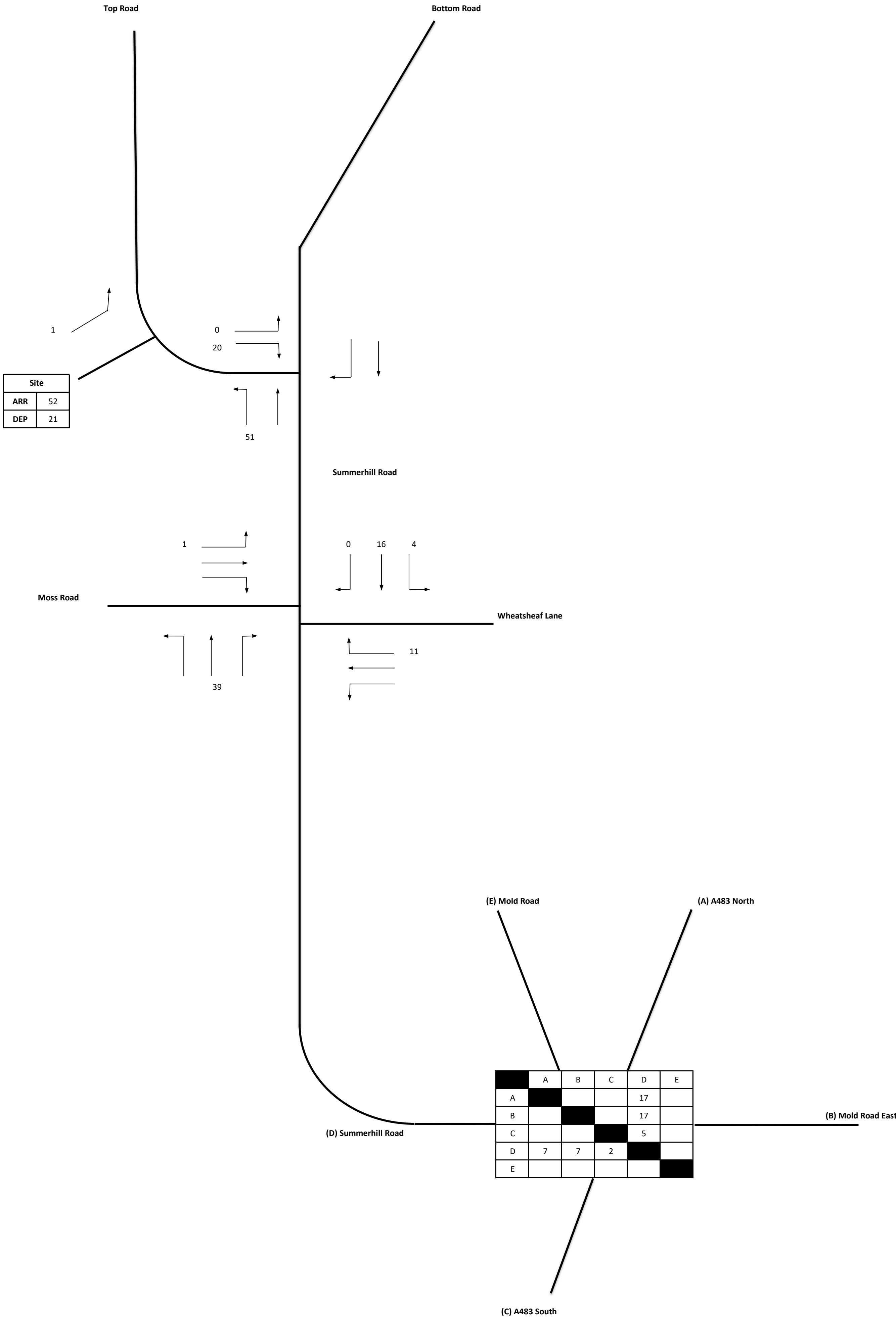


Figure 11 Weekday PM Peak  
Proposed Development Flows (1630-1730)

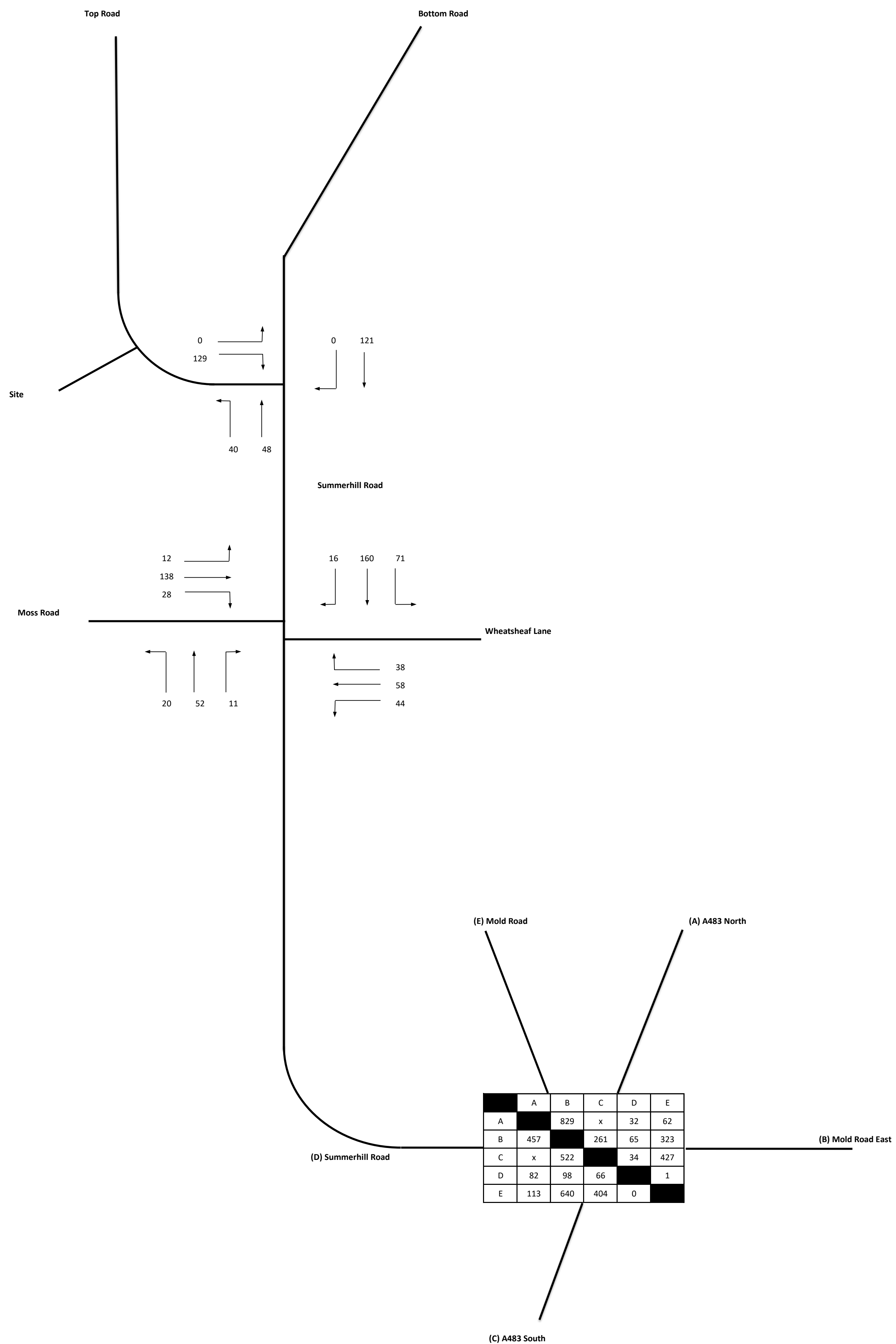


**Figure 12 Weekday AM Peak  
2022 With Development Flows (0745-0845)**

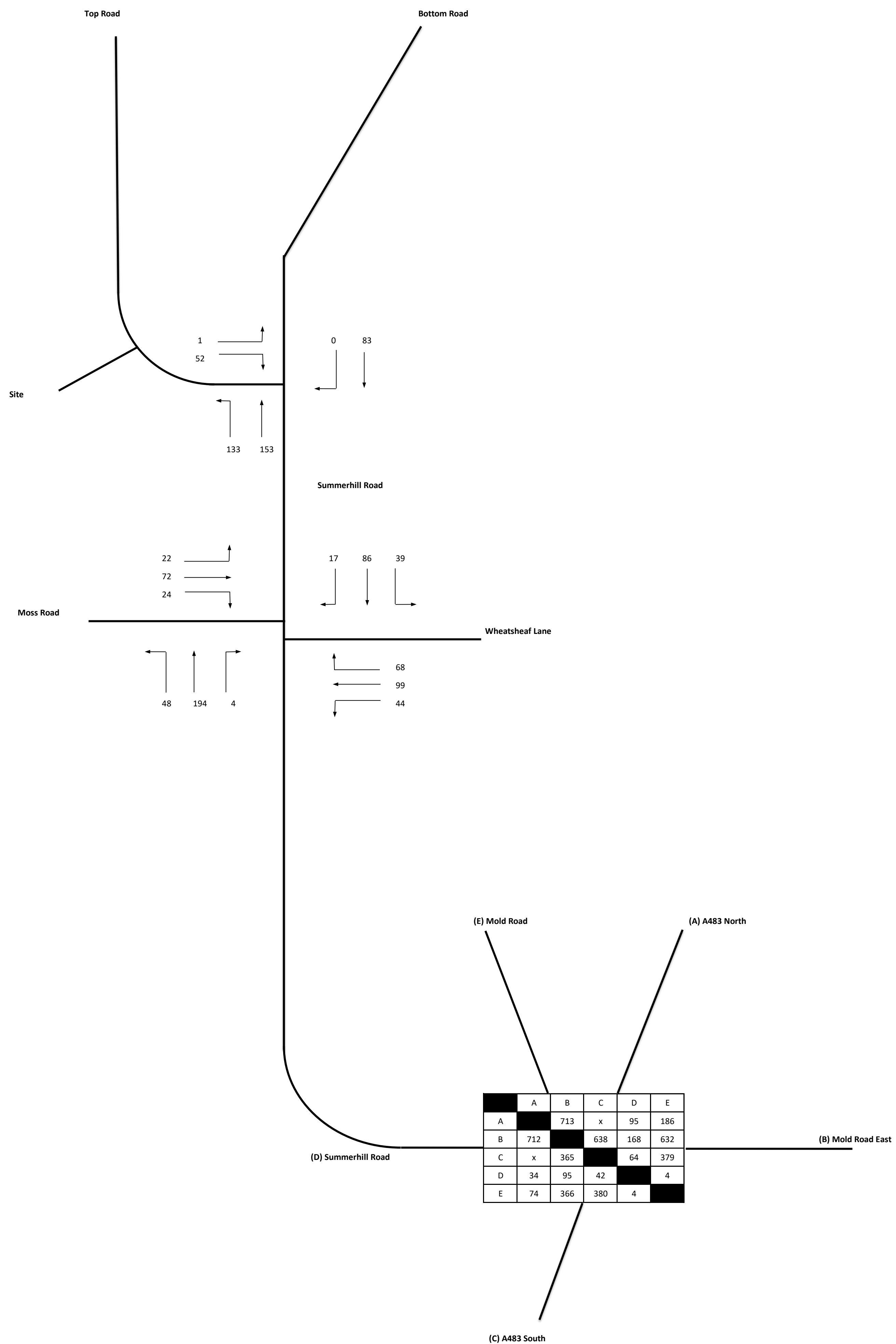


Figure 13 Weekday PM Peak  
2022 With Development Flows (1630-1730)

## APPENDICES

## **APPENDIX 1**

### **Correspondence with WCBC**

**Sam McLoughlin**

---

**Subject:** FW: Summerhill

---

**From:** Peter Douthwaite [<mailto:Peter.Douthwaite@wrexham.gov.uk>]  
**Sent:** 06 February 2017 11:25  
**To:** Phil Wooliscroft <[phil@crofts.co.uk](mailto:phil@crofts.co.uk)>  
**Subject:** Summerhill

Phil

Just to confirm that we still need you to look at access to the Mold Road roundabout along Summerhill Road.

cheers

Pete Douthwaite  
Senior Development Control Engineer Uwch Beiriannydd Rheoli Datblygu  
01978 729689



Cyngor Bwrdeistref Sirol Wrecsam, Adran Amgylchedd a Chynllunio, De Ffordd yr Abaty, Ystad Ddiwydiannol Wrecsam, Wrecsam LL13 9PW

Wrexham County Borough Council, Environment and Planning Department, Abbey Road South, Wrexham Industrial Estate, Wrexham LL13 9PW

[wrecsam.gov.uk](http://wrecsam.gov.uk) | [wrexham.gov.uk](http://wrexham.gov.uk)

[twitter.com/cbswrecsam](https://twitter.com/cbswrecsam) | [twitter.com/wrexhamcbc](https://twitter.com/wrexhamcbc)

[facebook.com/cyngorwrecsam](https://facebook.com/cyngorwrecsam) | [facebook.com/wrexhamcouncil](https://facebook.com/wrexhamcouncil)

Rydym yn croesawu gohebiaeth yn Gymraeg. Byddwn yn ymateb i unrhyw ohebiaeth yn Gymraeg ac ni fydd hyn yn arwain at unrhyw oedi.

Ewch i weld - mi fedrwch chi dalu, rhoi gwybod, gwneud cais, dweud eich dweud, a dod o hyd i wybodaeth ar-lein yn [www.wrecsam.gov.uk](http://www.wrecsam.gov.uk). Arbedwch bapur - meddyliwch cyn argraffu!

Mae'r neges e-bost hon ac unrhyw atodiadau wedi eu bwriadu ar gyfer yr unigolyn neu'r sefydliad y?i cyfeirir atynt yn unig. Am yr amodau llawn yngl?n ? chynnwys a defnyddio'r neges e-bost hon, ac unrhyw atodiadau, cyfeiriwch at [www.wrecsam.gov.uk/top\\_navigation/disclaimersw.htm](http://www.wrecsam.gov.uk/top_navigation/disclaimersw.htm)

We welcome correspondence in Welsh. We will respond to any correspondence in Welsh and this will not lead to any delay.

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No virus found in this message.

Checked by AVG - [www.avg.com](http://www.avg.com)

Version: 2016.0.7998 / Virus Database: 4756/13897 - Release Date: 02/05/17

---

No virus found in this message.

Checked by AVG - [www.avg.com](http://www.avg.com)

Version: 2016.0.8007 / Virus Database: 4767/14189 - Release Date: 03/27/17

Internal Virus Database is out of date.

## **APPENDIX 2**

### **Traffic Survey Data**

**SURVEY CONTROL**

**Client:** Croft Transport Solutions

**Client Contact:** Phil Wooliscroft

**Survey Location:** Gwersyllt

**Date(s) of Survey:** Tuesday 14 February 2017

**Notes:**

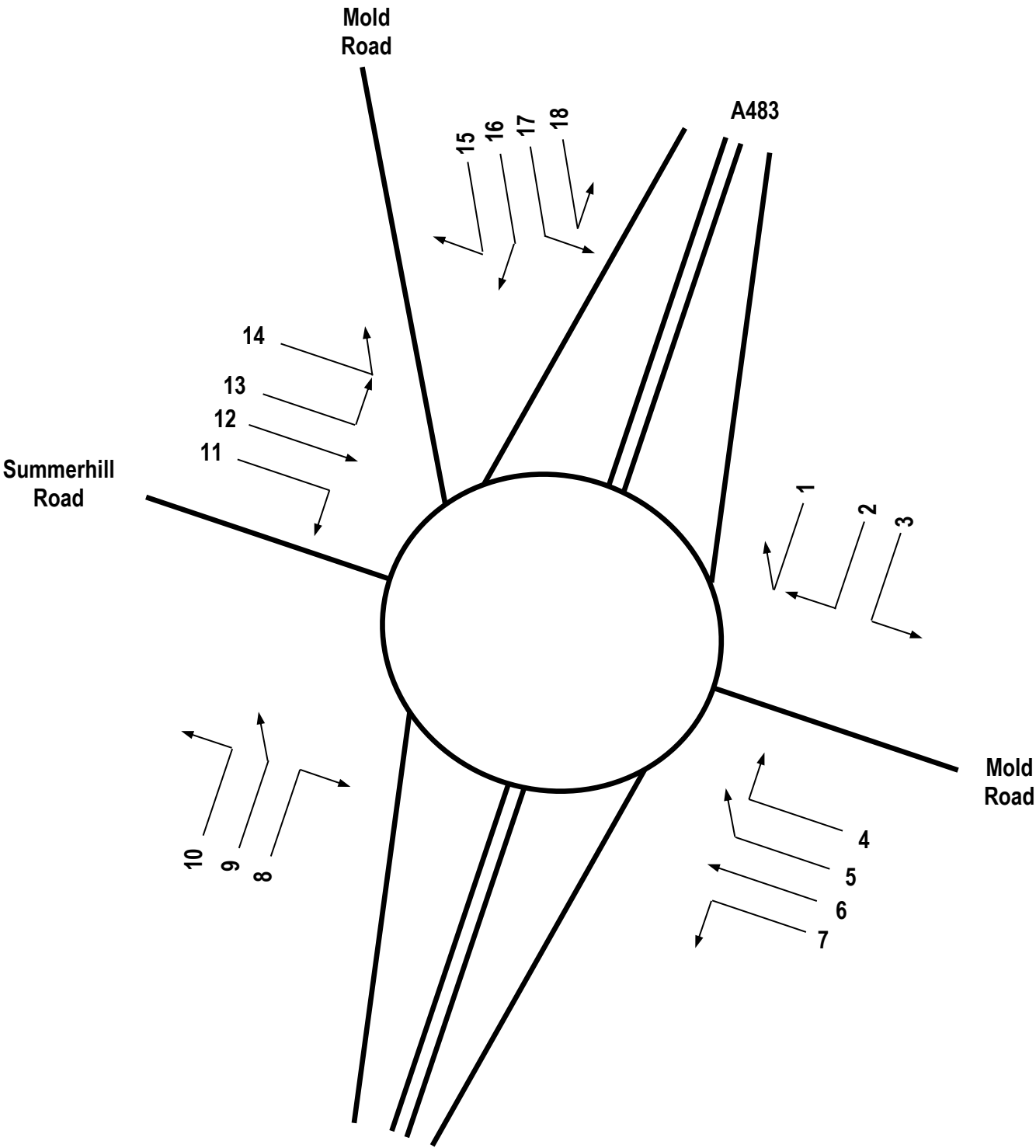
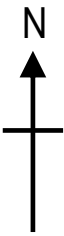
**On Site Supervisor:** Neil Harley

**Data Checking:** David Cheng

**Survey Reference:** 2017.028 Gwersyllt

**Status:** Final

**Date of Issue:** 20 February 2017



DRAWING TITLE

TRAFFIC MOVEMENT REFERENCE

JOB TITLE

2017.028 GWERSYLLT

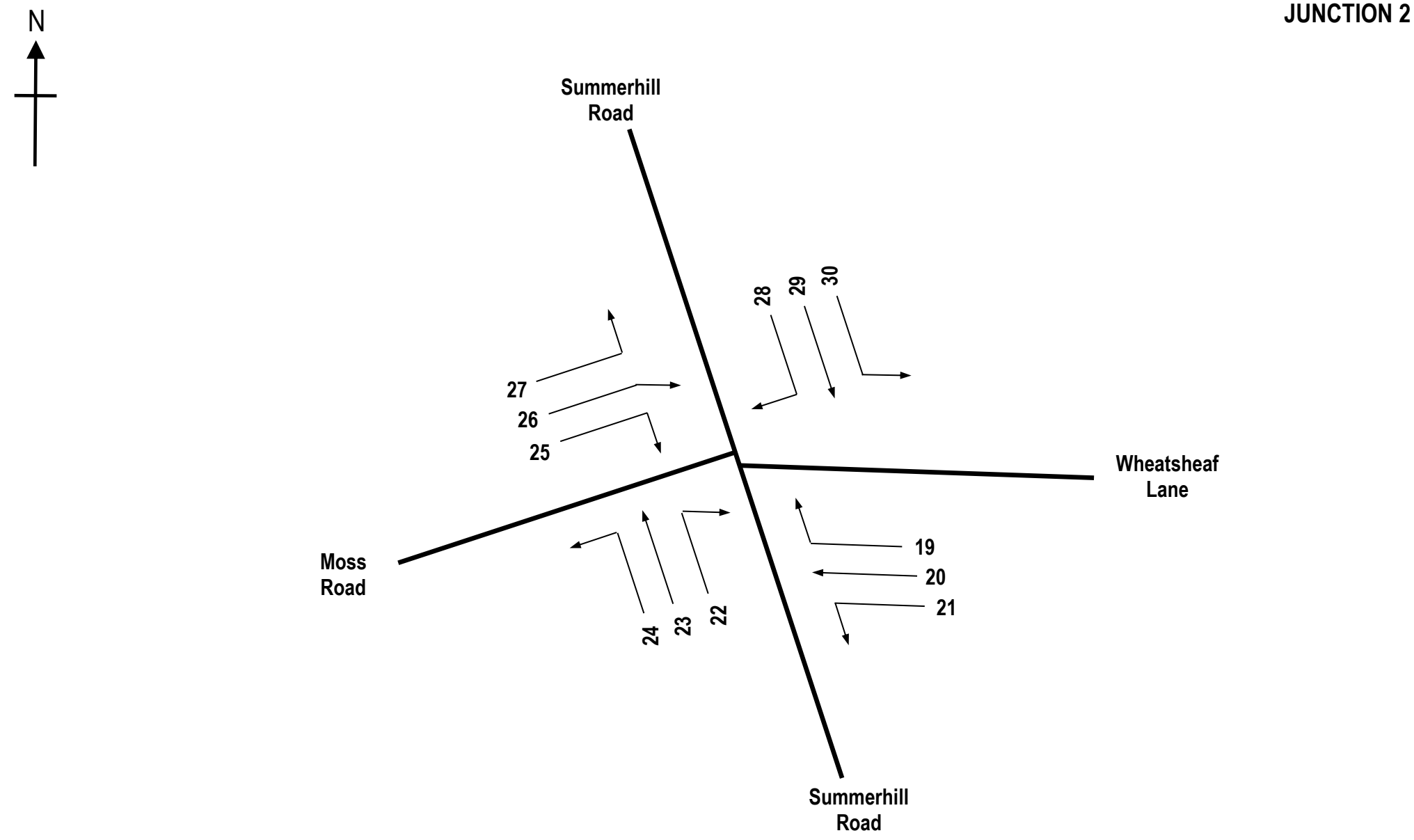
DRAWN BY  
DC

DATE  
FEB 2017

SCALE  
NTS

REF  
FIGURE 1

**signal surveys**  
Traffic Counts and Car Park Surveys  
Parkway House, Palatine Road, Northenden, Manchester,  
M22 4DB  
Tel 0161 998 4226 Fax 0161 998 1189



signal surveys

| Time Beginning | A483/Mold Road/Summerhill Road - Tuesday 14 February 2017 |    |    |    |     |    |     |    |     |    |    |    |     |    |     |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |     |    |     |    |    |    |
|----------------|-----------------------------------------------------------|----|----|----|-----|----|-----|----|-----|----|----|----|-----|----|-----|----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|----|-----|----|----|----|
|                | 1                                                         |    | 2  |    | 3   |    | 4   |    | 5   |    | 6  |    | 7   |    | 8   |    | 9   |    | 10 |    | 11 |    | 12 |    | 13 |    | 14 |    | 15 |    | 16  |    | 17  |    | 18 |    |
|                | LV                                                        | HV | LV | HV | LV  | HV | LV  | HV | LV  | HV | LV | HV | LV  | HV | LV  | HV | LV  | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV  | HV | LV  | HV | LV | HV |
| 0730           | 8                                                         | 1  | 1  | 0  | 114 | 7  | 108 | 1  | 63  | 1  | 16 | 0  | 49  | 1  | 57  | 4  | 94  | 2  | 7  | 0  | 11 | 0  | 24 | 2  | 25 | 0  | 1  | 0  | 0  | 0  | 74  | 1  | 92  | 0  | 37 | 0  |
| 0745           | 5                                                         | 1  | 8  | 0  | 168 | 2  | 122 | 3  | 68  | 1  | 7  | 2  | 65  | 1  | 71  | 4  | 96  | 2  | 7  | 1  | 15 | 0  | 23 | 0  | 33 | 0  | 1  | 0  | 0  | 0  | 101 | 1  | 118 | 5  | 31 | 0  |
| 0800           | 14                                                        | 0  | 3  | 0  | 185 | 2  | 103 | 0  | 76  | 3  | 15 | 1  | 52  | 1  | 110 | 5  | 101 | 7  | 6  | 0  | 24 | 0  | 15 | 1  | 10 | 0  | 0  | 0  | 0  | 0  | 83  | 2  | 148 | 3  | 27 | 0  |
| 0815           | 15                                                        | 1  | 4  | 0  | 185 | 2  | 97  | 3  | 72  | 6  | 14 | 1  | 51  | 0  | 121 | 3  | 91  | 2  | 7  | 0  | 12 | 0  | 17 | 0  | 8  | 0  | 0  | 0  | 0  | 0  | 89  | 4  | 147 | 0  | 24 | 2  |
| 0830           | 19                                                        | 0  | 8  | 0  | 216 | 3  | 85  | 3  | 57  | 2  | 10 | 0  | 71  | 0  | 154 | 3  | 79  | 2  | 7  | 0  | 5  | 0  | 18 | 0  | 9  | 0  | 0  | 0  | 0  | 0  | 79  | 2  | 148 | 4  | 17 | 0  |
| 0845           | 9                                                         | 0  | 13 | 0  | 219 | 5  | 66  | 1  | 36  | 1  | 13 | 2  | 64  | 2  | 116 | 3  | 69  | 1  | 7  | 0  | 8  | 0  | 9  | 0  | 7  | 0  | 0  | 0  | 0  | 0  | 49  | 4  | 179 | 0  | 20 | 0  |
| 0900           | 13                                                        | 2  | 9  | 0  | 200 | 0  | 70  | 0  | 60  | 1  | 13 | 0  | 61  | 3  | 119 | 2  | 41  | 2  | 4  | 1  | 6  | 0  | 14 | 1  | 11 | 0  | 1  | 0  | 0  | 0  | 61  | 4  | 142 | 1  | 11 | 1  |
| 0915           | 12                                                        | 1  | 5  | 0  | 154 | 2  | 80  | 1  | 55  | 0  | 14 | 1  | 60  | 4  | 101 | 6  | 45  | 4  | 7  | 0  | 5  | 0  | 7  | 0  | 11 | 0  | 2  | 0  | 0  | 0  | 42  | 0  | 131 | 1  | 18 | 1  |
| Time Beginning | A483/Mold Road/Summerhill Road - Tuesday 14 February 2017 |    |    |    |     |    |     |    |     |    |    |    |     |    |     |    |     |    |    |    |    |    |    |    |    |    |    |    |    |    |     |    |     |    |    |    |
|                | 1                                                         |    | 2  |    | 3   |    | 4   |    | 5   |    | 6  |    | 7   |    | 8   |    | 9   |    | 10 |    | 11 |    | 12 |    | 13 |    | 14 |    | 15 |    | 16  |    | 17  |    | 18 |    |
|                | LV                                                        | HV | LV | HV | LV  | HV | LV  | HV | LV  | HV | LV | HV | LV  | HV | LV  | HV | LV  | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV  | HV | LV  | HV | LV | HV |
| 1630           | 40                                                        | 2  | 18 | 0  | 157 | 0  | 159 | 3  | 145 | 1  | 34 | 0  | 144 | 5  | 77  | 3  | 89  | 2  | 12 | 1  | 8  | 0  | 20 | 1  | 11 | 1  | 1  | 0  | 2  | 0  | 79  | 3  | 81  | 1  | 14 | 0  |
| 1645           | 42                                                        | 1  | 17 | 0  | 141 | 0  | 160 | 4  | 124 | 2  | 39 | 0  | 156 | 1  | 92  | 5  | 88  | 3  | 9  | 1  | 10 | 0  | 10 | 0  | 1  | 0  | 1  | 0  | 1  | 0  | 76  | 3  | 76  | 0  | 20 | 0  |
| 1700           | 33                                                        | 1  | 16 | 0  | 168 | 1  | 179 | 2  | 143 | 0  | 42 | 0  | 151 | 2  | 81  | 2  | 84  | 0  | 11 | 1  | 12 | 0  | 15 | 1  | 7  | 0  | 0  | 0  | 0  | 0  | 76  | 2  | 100 | 0  | 19 | 0  |
| 1715           | 46                                                        | 0  | 22 | 0  | 194 | 1  | 145 | 1  | 158 | 0  | 26 | 0  | 127 | 0  | 68  | 1  | 75  | 0  | 17 | 0  | 7  | 0  | 33 | 0  | 4  | 0  | 2  | 0  | 1  | 0  | 99  | 2  | 79  | 0  | 13 | 1  |
| 1730           | 31                                                        | 0  | 13 | 0  | 157 | 1  | 141 | 2  | 148 | 1  | 37 | 1  | 135 | 1  | 92  | 0  | 68  | 0  | 13 | 0  | 4  | 0  | 15 | 0  | 15 | 0  | 0  | 0  | 1  | 0  | 64  | 1  | 95  | 0  | 16 | 0  |
| 1745           | 23                                                        | 0  | 10 | 0  | 205 | 1  | 133 | 2  | 133 | 0  | 40 | 0  | 141 | 1  | 97  | 1  | 70  | 0  | 8  | 0  | 6  | 0  | 25 | 0  | 13 | 0  | 1  | 0  | 2  | 0  | 71  | 0  | 102 | 0  | 23 | 0  |
| 1800           | 42                                                        | 0  | 14 | 0  | 167 | 0  | 130 | 0  | 119 | 0  | 28 | 0  | 115 | 1  | 74  | 1  | 60  | 0  | 5  | 0  | 8  | 0  | 17 | 1  | 12 | 0  | 1  | 0  | 1  | 0  | 70  | 0  | 88  | 0  | 14 | 0  |
| 1815           | 19                                                        | 0  | 8  | 0  | 106 | 0  | 119 | 0  | 108 | 0  | 28 | 1  | 118 | 0  | 60  | 1  | 72  | 0  | 14 | 0  | 5  | 0  | 20 | 1  | 6  | 0  | 0  | 0  | 0  | 0  | 32  | 0  | 101 | 0  | 10 | 0  |

signal surveys

| Time Beginning | Summerhill Road/Moss Road/Wheatsheaf Lane - Tuesday 14 February 2017 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----------------|----------------------------------------------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                | 19                                                                   |    | 20 |    | 21 |    | 22 |    | 23 |    | 24 |    | 25 |    | 26 |    | 27 |    | 28 |    | 29 |    | 30 |    |
|                | LV                                                                   | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV |
| 0730           | 4                                                                    | 0  | 4  | 0  | 7  | 0  | 1  | 0  | 7  | 0  | 1  | 0  | 7  | 0  | 19 | 0  | 1  | 0  | 1  | 0  | 21 | 0  | 13 | 0  |
| 0745           | 4                                                                    | 1  | 6  | 1  | 9  | 0  | 2  | 0  | 7  | 0  | 3  | 0  | 11 | 0  | 16 | 1  | 1  | 0  | 1  | 0  | 41 | 0  | 12 | 0  |
| 0800           | 4                                                                    | 1  | 10 | 1  | 7  | 0  | 2  | 0  | 8  | 0  | 6  | 0  | 7  | 0  | 30 | 0  | 1  | 1  | 5  | 0  | 21 | 0  | 7  | 0  |
| 0815           | 6                                                                    | 1  | 12 | 1  | 7  | 1  | 1  | 1  | 8  | 1  | 7  | 0  | 3  | 0  | 41 | 2  | 0  | 1  | 6  | 0  | 22 | 0  | 16 | 1  |
| 0830           | 10                                                                   | 0  | 18 | 1  | 14 | 1  | 3  | 0  | 8  | 0  | 3  | 0  | 5  | 0  | 31 | 2  | 5  | 0  | 2  | 0  | 24 | 1  | 18 | 0  |
| 0845           | 13                                                                   | 1  | 23 | 2  | 3  | 0  | 1  | 0  | 14 | 0  | 6  | 0  | 3  | 0  | 22 | 1  | 1  | 1  | 6  | 0  | 18 | 0  | 13 | 0  |
| 0900           | 16                                                                   | 0  | 16 | 2  | 6  | 0  | 1  | 0  | 9  | 0  | 4  | 0  | 2  | 0  | 18 | 1  | 4  | 0  | 2  | 1  | 17 | 0  | 12 | 0  |
| 0915           | 14                                                                   | 0  | 15 | 1  | 5  | 0  | 2  | 0  | 8  | 0  | 4  | 0  | 3  | 0  | 17 | 1  | 2  | 0  | 3  | 0  | 16 | 0  | 12 | 0  |

| Time Beginning | Summerhill Road/Moss Road/Wheatsheaf Lane - Tuesday 14 February 2017 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----------------|----------------------------------------------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                | 19                                                                   |    | 20 |    | 21 |    | 22 |    | 23 |    | 24 |    | 25 |    | 26 |    | 27 |    | 28 |    | 29 |    | 30 |    |
|                | LV                                                                   | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV |
| 1630           | 14                                                                   | 0  | 23 | 0  | 10 | 1  | 2  | 0  | 30 | 1  | 10 | 0  | 6  | 0  | 12 | 0  | 4  | 0  | 4  | 0  | 15 | 0  | 6  | 0  |
| 1645           | 14                                                                   | 1  | 21 | 1  | 6  | 0  | 0  | 0  | 34 | 0  | 11 | 0  | 8  | 0  | 14 | 0  | 7  | 0  | 4  | 1  | 13 | 0  | 7  | 0  |
| 1700           | 12                                                                   | 0  | 16 | 0  | 9  | 0  | 0  | 0  | 38 | 0  | 7  | 0  | 6  | 0  | 24 | 0  | 3  | 0  | 1  | 0  | 22 | 0  | 11 | 0  |
| 1715           | 11                                                                   | 0  | 30 | 0  | 14 | 0  | 2  | 0  | 40 | 0  | 17 | 0  | 2  | 0  | 17 | 0  | 6  | 0  | 5  | 0  | 15 | 0  | 8  | 0  |
| 1730           | 14                                                                   | 1  | 15 | 0  | 7  | 0  | 0  | 0  | 34 | 0  | 10 | 0  | 1  | 0  | 10 | 0  | 1  | 0  | 3  | 0  | 17 | 0  | 3  | 0  |
| 1745           | 19                                                                   | 1  | 18 | 0  | 8  | 0  | 0  | 0  | 24 | 0  | 6  | 0  | 5  | 0  | 15 | 0  | 4  | 0  | 2  | 0  | 18 | 0  | 16 | 0  |
| 1800           | 13                                                                   | 0  | 12 | 0  | 5  | 0  | 2  | 0  | 21 | 0  | 6  | 0  | 6  | 0  | 14 | 0  | 5  | 0  | 2  | 0  | 18 | 0  | 10 | 0  |
| 1815           | 21                                                                   | 0  | 24 | 0  | 8  | 0  | 1  | 0  | 30 | 0  | 7  | 0  | 3  | 0  | 14 | 0  | 0  | 0  | 6  | 0  | 11 | 0  | 8  | 0  |

| Time Beginning | Summerhill Road/Top Road/Bolton Road - Tuesday 14 February 2017 |    |    |    |    |    |    |    |    |    |    |    |
|----------------|-----------------------------------------------------------------|----|----|----|----|----|----|----|----|----|----|----|
|                | 31                                                              |    | 32 |    | 33 |    | 34 |    | 35 |    | 36 |    |
|                | LV                                                              | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV |
| 0730           | 0                                                               | 0  | 23 | 0  | 6  | 0  | 1  | 1  | 11 | 0  | 1  | 0  |
| 0745           | 0                                                               | 0  | 33 | 0  | 6  | 0  | 3  | 1  | 20 | 0  | 0  | 0  |
| 0800           | 0                                                               | 0  | 20 | 0  | 9  | 0  | 2  | 0  | 15 | 0  | 0  | 0  |
| 0815           | 0                                                               | 0  | 30 | 0  | 10 | 2  | 3  | 1  | 18 | 0  | 0  | 0  |
| 0830           | 0                                                               | 0  | 28 | 1  | 12 | 0  | 5  | 0  | 17 | 0  | 0  | 0  |
| 0845           | 0                                                               | 0  | 28 | 0  | 10 | 0  | 18 | 1  | 11 | 0  | 0  | 0  |
| 0900           | 0                                                               | 0  | 21 | 1  | 17 | 0  | 13 | 0  | 8  | 0  | 0  | 0  |
| 0915           | 0                                                               | 0  | 18 | 1  | 13 | 0  | 8  | 1  | 6  | 0  | 0  | 0  |
| Time Beginning | Summerhill Road/Top Road/Bolton Road - Tuesday 14 February 2017 |    |    |    |    |    |    |    |    |    |    |    |
|                | 31                                                              |    | 32 |    | 33 |    | 34 |    | 35 |    | 36 |    |
|                | LV                                                              | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV |
| 1630           | 0                                                               | 0  | 23 | 0  | 34 | 0  | 20 | 0  | 5  | 0  | 1  | 0  |
| 1645           | 0                                                               | 0  | 19 | 0  | 41 | 0  | 15 | 1  | 1  | 0  | 0  | 0  |
| 1700           | 0                                                               | 0  | 22 | 0  | 28 | 0  | 21 | 0  | 10 | 0  | 0  | 0  |
| 1715           | 0                                                               | 0  | 12 | 0  | 39 | 0  | 19 | 0  | 14 | 0  | 0  | 0  |
| 1730           | 0                                                               | 0  | 13 | 0  | 30 | 0  | 15 | 1  | 6  | 0  | 0  | 0  |
| 1745           | 0                                                               | 0  | 23 | 0  | 27 | 0  | 23 | 1  | 12 | 0  | 0  | 0  |
| 1800           | 0                                                               | 0  | 17 | 0  | 19 | 0  | 19 | 0  | 10 | 0  | 0  | 0  |
| 1815           | 1                                                               | 0  | 16 | 0  | 28 | 0  | 22 | 0  | 8  | 0  | 0  | 0  |

## **APPENDIX 3**

### **NOMIS Data**

WU03EW - Location of usual residence and place of work by method of travel to work (MSOA level)

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population

units

date

method of travel to work

All usual residents aged 16 and over in employment the week before the census

Persons

2011

Driving a car or van

| place of work : 2011 super output area - middle layer | usual residence         | Percentage of Toal Trips | Assigned Route |
|-------------------------------------------------------|-------------------------|--------------------------|----------------|
|                                                       | W02000081 : Wrexham 004 |                          |                |
| E02001504 : Wirral 038                                | 3                       | 0.2%                     | D              |
| E02002251 : Calderdale 008                            | 3                       | 0.2%                     | D              |
| E02003794 : Cheshire West and Chester 022             | 3                       | 0.2%                     | D              |
| E02003795 : Cheshire West and Chester 025             | 3                       | 0.2%                     | C              |
| E02003797 : Cheshire West and Chester 028             | 9                       | 0.5%                     | D              |
| E02003802 : Cheshire West and Chester 033             | 18                      | 1.1%                     | D              |
| E02003803 : Cheshire West and Chester 034             | 55                      | 3.2%                     | D              |
| E02003805 : Cheshire West and Chester 039             | 4                       | 0.2%                     | D              |
| E02003807 : Cheshire West and Chester 043             | 6                       | 0.4%                     | D              |
| E02003809 : Cheshire West and Chester 046             | 42                      | 2.5%                     | D              |
| E02003810 : Cheshire West and Chester 047             | 8                       | 0.5%                     | D              |
| E02003837 : Cheshire East 049                         | 3                       | 0.2%                     | D              |
| E02003849 : Cheshire West and Chester 011             | 8                       | 0.5%                     | D              |
| E02005778 : Harrogate 018                             | 6                       | 0.4%                     | D              |
| E02006017 : Shropshire 004                            | 6                       | 0.4%                     | F              |
| E02006023 : Shropshire 003                            | 9                       | 0.5%                     | F              |
| E02006024 : Shropshire 006                            | 6                       | 0.4%                     | F              |
| E02006025 : Shropshire 007                            | 8                       | 0.5%                     | F              |
| W02000030 : Conwy 004                                 | 3                       | 0.2%                     | C              |
| W02000037 : Conwy 011                                 | 4                       | 0.2%                     | C              |
| W02000050 : Denbighshire 009                          | 10                      | 0.6%                     | C              |
| W02000051 : Denbighshire 010                          | 3                       | 0.2%                     | C              |
| W02000054 : Denbighshire 013                          | 3                       | 0.2%                     | A              |
| W02000055 : Denbighshire 014                          | 4                       | 0.2%                     | A              |
| W02000057 : Denbighshire 016                          | 9                       | 0.5%                     | F              |
| W02000060 : Flintshire 003                            | 7                       | 0.4%                     | C              |
| W02000061 : Flintshire 004                            | 6                       | 0.4%                     | C              |
| W02000063 : Flintshire 006                            | 5                       | 0.3%                     | C              |
| W02000064 : Flintshire 007                            | 9                       | 0.5%                     | C              |
| W02000066 : Flintshire 009                            | 32                      | 1.9%                     | C              |
| W02000068 : Flintshire 011                            | 20                      | 1.2%                     | C              |
| W02000069 : Flintshire 012                            | 11                      | 0.6%                     | C              |
| W02000070 : Flintshire 013                            | 10                      | 0.6%                     | C              |
| W02000072 : Flintshire 015                            | 51                      | 3.0%                     | C              |
| W02000073 : Flintshire 016                            | 33                      | 1.9%                     | C              |
| W02000074 : Flintshire 017                            | 8                       | 0.5%                     | C              |
| W02000075 : Flintshire 018                            | 5                       | 0.3%                     | C              |
| W02000076 : Flintshire 019                            | 6                       | 0.4%                     | C              |
| W02000077 : Flintshire 020                            | 21                      | 1.2%                     | C              |
| W02000080 : Wrexham 003                               | 56                      | 3.3%                     | C              |
| W02000081 : Wrexham 004                               | 63                      | 3.7%                     | C              |
| W02000082 : Wrexham 005                               | 15                      | 0.9%                     | G              |
| W02000083 : Wrexham 006                               | 19                      | 1.1%                     | A              |
| W02000084 : Wrexham 007                               | 9                       | 0.5%                     | D              |
| W02000085 : Wrexham 008                               | 172                     | 10.1%                    | E              |
| W02000086 : Wrexham 009                               | 40                      | 2.4%                     | E              |
| W02000087 : Wrexham 010                               | 9                       | 0.5%                     | E              |
| W02000088 : Wrexham 011                               | 250                     | 14.7%                    | E              |
| W02000089 : Wrexham 012                               | 71                      | 4.2%                     | E              |
| W02000090 : Wrexham 013                               | 16                      | 0.9%                     | A              |
| W02000091 : Wrexham 014                               | 26                      | 1.5%                     | F              |
| W02000092 : Wrexham 015                               | 22                      | 1.3%                     | F              |
| W02000093 : Wrexham 016                               | 46                      | 2.7%                     | F              |
| W02000094 : Wrexham 017                               | 16                      | 0.9%                     | F              |
| W02000095 : Wrexham 018                               | 15                      | 0.9%                     | F              |
| W02000096 : Wrexham 019                               | 23                      | 1.4%                     | F              |
| W02000420 : Wrexham 020                               | 367                     | 21.7%                    | D              |
|                                                       | 1,695                   | 100.0%                   |                |

| Route |                 | %      |
|-------|-----------------|--------|
| A     | Top Road        | 2.5%   |
| B     | Bottom Road     |        |
| C     | Wheatsheaf Lane | 21.6%  |
| D     | A483 North      | 32.1%  |
| E     | Mold Road East  | 32.0%  |
| F     | A483 South      | 11.0%  |
| G     | Moss Road       | 0.9%   |
|       |                 | 100.0% |

## **APPENDIX 4**

### **TRICS Output for Residential Use – Multi Modal**

Calculation Reference: AUDIT-851401-170106-0102

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL  
Category : A - HOUSES PRIVATELY OWNED  
**MULTI-MODAL CYCLISTS**

Selected regions and areas:

|    |                                |        |
|----|--------------------------------|--------|
| 02 | SOUTH EAST                     |        |
|    | ES EAST SUSSEX                 | 1 days |
|    | EX ESSEX                       | 1 days |
|    | HC HAMPSHIRE                   | 1 days |
|    | SC SURREY                      | 1 days |
|    | WS WEST SUSSEX                 | 2 days |
| 03 | SOUTH WEST                     |        |
|    | DV DEVON                       | 3 days |
|    | SM SOMERSET                    | 1 days |
| 04 | EAST ANGLIA                    |        |
|    | NF NORFOLK                     | 3 days |
|    | SF SUFFOLK                     | 2 days |
| 05 | EAST MIDLANDS                  |        |
|    | LN LINCOLNSHIRE                | 1 days |
| 06 | WEST MIDLANDS                  |        |
|    | SH SHROPSHIRE                  | 4 days |
|    | ST STAFFORDSHIRE               | 1 days |
|    | WK WARWICKSHIRE                | 2 days |
| 07 | YORKSHIRE & NORTH LINCOLNSHIRE |        |
|    | NE NORTH EAST LINCOLNSHIRE     | 1 days |
|    | NY NORTH YORKSHIRE             | 5 days |
|    | SY SOUTH YORKSHIRE             | 1 days |
| 08 | NORTH WEST                     |        |
|    | CH CHESHIRE                    | 4 days |
|    | GM GREATER MANCHESTER          | 1 days |
|    | MS MERSEYSIDE                  | 1 days |
| 09 | NORTH                          |        |
|    | CB CUMBRIA                     | 2 days |
|    | TW TYNE & WEAR                 | 1 days |
| 10 | WALES                          |        |
|    | PS POWYS                       | 1 days |
| 11 | SCOTLAND                       |        |
|    | AG ANGUS                       | 1 days |
|    | EA EAST AYRSHIRE               | 1 days |
|    | FA FALKIRK                     | 2 days |
|    | HI HIGHLAND                    | 1 days |
|    | PK PERTH & KINROSS             | 1 days |

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

## Secondary Filtering selection:

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

Parameter: Number of dwellings  
Actual Range: 6 to 432 (units: )  
Range Selected by User: 6 to 491 (units: )

## Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/08 to 12/11/15

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

## Selected survey days:

|           |         |
|-----------|---------|
| Monday    | 8 days  |
| Tuesday   | 9 days  |
| Wednesday | 10 days |
| Thursday  | 12 days |
| Friday    | 7 days  |

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

## Selected survey types:

|                       |         |
|-----------------------|---------|
| Manual count          | 46 days |
| Directional ATC Count | 0 days  |

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

## Selected Locations:

|                                    |    |
|------------------------------------|----|
| Suburban Area (PPS6 Out of Centre) | 25 |
| Edge of Town                       | 21 |

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

## Selected Location Sub Categories:

|                  |    |
|------------------|----|
| Residential Zone | 40 |
| No Sub Category  | 6  |

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

## Secondary Filtering selection:

## Use Class:

|    |         |
|----|---------|
| C3 | 46 days |
|----|---------|

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

Secondary Filtering selection (Cont.):

Population within 1 mile:

|                  |         |
|------------------|---------|
| 1,001 to 5,000   | 4 days  |
| 5,001 to 10,000  | 11 days |
| 10,001 to 15,000 | 12 days |
| 15,001 to 20,000 | 9 days  |
| 20,001 to 25,000 | 6 days  |
| 25,001 to 50,000 | 4 days  |

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

Population within 5 miles:

|                    |         |
|--------------------|---------|
| 5,001 to 25,000    | 5 days  |
| 25,001 to 50,000   | 7 days  |
| 50,001 to 75,000   | 4 days  |
| 75,001 to 100,000  | 14 days |
| 100,001 to 125,000 | 5 days  |
| 125,001 to 250,000 | 6 days  |
| 250,001 to 500,000 | 4 days  |
| 500,001 or More    | 1 days  |

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

Car ownership within 5 miles:

|            |         |
|------------|---------|
| 0.6 to 1.0 | 16 days |
| 1.1 to 1.5 | 30 days |

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

Travel Plan:

|     |         |
|-----|---------|
| Yes | 4 days  |
| No  | 42 days |

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

PTAL Rating:

|                 |         |
|-----------------|---------|
| No PTAL Present | 46 days |
|-----------------|---------|

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

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

MULTI-MODAL PEDESTRIANS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

| Time Range    | ARRIVALS |             |           | DEPARTURES |             |           | TOTALS   |             |           |
|---------------|----------|-------------|-----------|------------|-------------|-----------|----------|-------------|-----------|
|               | No. Days | Ave. DWELLS | Trip Rate | No. Days   | Ave. DWELLS | Trip Rate | No. Days | Ave. DWELLS | Trip Rate |
| 00:00 - 01:00 |          |             |           |            |             |           |          |             |           |
| 01:00 - 02:00 |          |             |           |            |             |           |          |             |           |
| 02:00 - 03:00 |          |             |           |            |             |           |          |             |           |
| 03:00 - 04:00 |          |             |           |            |             |           |          |             |           |
| 04:00 - 05:00 |          |             |           |            |             |           |          |             |           |
| 05:00 - 06:00 |          |             |           |            |             |           |          |             |           |
| 06:00 - 07:00 |          |             |           |            |             |           |          |             |           |
| 07:00 - 08:00 | 46       | 59          | 0.026     | 46         | 59          | 0.063     | 46       | 59          | 0.089     |
| 08:00 - 09:00 | 46       | 59          | 0.048     | 46         | 59          | 0.161     | 46       | 59          | 0.209     |
| 09:00 - 10:00 | 46       | 59          | 0.048     | 46         | 59          | 0.061     | 46       | 59          | 0.109     |
| 10:00 - 11:00 | 46       | 59          | 0.046     | 46         | 59          | 0.055     | 46       | 59          | 0.101     |
| 11:00 - 12:00 | 46       | 59          | 0.038     | 46         | 59          | 0.032     | 46       | 59          | 0.070     |
| 12:00 - 13:00 | 46       | 59          | 0.044     | 46         | 59          | 0.032     | 46       | 59          | 0.076     |
| 13:00 - 14:00 | 46       | 59          | 0.036     | 46         | 59          | 0.045     | 46       | 59          | 0.081     |
| 14:00 - 15:00 | 46       | 59          | 0.048     | 46         | 59          | 0.057     | 46       | 59          | 0.105     |
| 15:00 - 16:00 | 46       | 59          | 0.146     | 46         | 59          | 0.075     | 46       | 59          | 0.221     |
| 16:00 - 17:00 | 46       | 59          | 0.093     | 46         | 59          | 0.054     | 46       | 59          | 0.147     |
| 17:00 - 18:00 | 46       | 59          | 0.081     | 46         | 59          | 0.042     | 46       | 59          | 0.123     |
| 18:00 - 19:00 | 46       | 59          | 0.059     | 46         | 59          | 0.044     | 46       | 59          | 0.103     |
| 19:00 - 20:00 |          |             |           |            |             |           |          |             |           |
| 20:00 - 21:00 |          |             |           |            |             |           |          |             |           |
| 21:00 - 22:00 |          |             |           |            |             |           |          |             |           |
| 22:00 - 23:00 |          |             |           |            |             |           |          |             |           |
| 23:00 - 24:00 |          |             |           |            |             |           |          |             |           |
| Total Rates:  |          |             | 0.713     |            |             | 0.721     |          |             | 1.434     |

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

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

#### Parameter summary

Trip rate parameter range selected: 6 - 432 (units: )  
 Survey date range: 01/01/08 - 12/11/15  
 Number of weekdays (Monday-Friday): 46  
 Number of Saturdays: 0  
 Number of Sundays: 0  
 Surveys automatically removed from selection: 1  
 Surveys manually removed from selection: 0

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

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

MULTI-MODAL CYCLISTS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

| Time Range    | ARRIVALS |             |           | DEPARTURES |             |           | TOTALS   |             |           |
|---------------|----------|-------------|-----------|------------|-------------|-----------|----------|-------------|-----------|
|               | No. Days | Ave. DWELLS | Trip Rate | No. Days   | Ave. DWELLS | Trip Rate | No. Days | Ave. DWELLS | Trip Rate |
| 00:00 - 01:00 |          |             |           |            |             |           |          |             |           |
| 01:00 - 02:00 |          |             |           |            |             |           |          |             |           |
| 02:00 - 03:00 |          |             |           |            |             |           |          |             |           |
| 03:00 - 04:00 |          |             |           |            |             |           |          |             |           |
| 04:00 - 05:00 |          |             |           |            |             |           |          |             |           |
| 05:00 - 06:00 |          |             |           |            |             |           |          |             |           |
| 06:00 - 07:00 |          |             |           |            |             |           |          |             |           |
| 07:00 - 08:00 | 46       | 59          | 0.004     | 46         | 59          | 0.014     | 46       | 59          | 0.018     |
| 08:00 - 09:00 | 46       | 59          | 0.002     | 46         | 59          | 0.016     | 46       | 59          | 0.018     |
| 09:00 - 10:00 | 46       | 59          | 0.001     | 46         | 59          | 0.005     | 46       | 59          | 0.006     |
| 10:00 - 11:00 | 46       | 59          | 0.003     | 46         | 59          | 0.009     | 46       | 59          | 0.012     |
| 11:00 - 12:00 | 46       | 59          | 0.003     | 46         | 59          | 0.002     | 46       | 59          | 0.005     |
| 12:00 - 13:00 | 46       | 59          | 0.006     | 46         | 59          | 0.005     | 46       | 59          | 0.011     |
| 13:00 - 14:00 | 46       | 59          | 0.005     | 46         | 59          | 0.003     | 46       | 59          | 0.008     |
| 14:00 - 15:00 | 46       | 59          | 0.004     | 46         | 59          | 0.004     | 46       | 59          | 0.008     |
| 15:00 - 16:00 | 46       | 59          | 0.013     | 46         | 59          | 0.004     | 46       | 59          | 0.017     |
| 16:00 - 17:00 | 46       | 59          | 0.013     | 46         | 59          | 0.004     | 46       | 59          | 0.017     |
| 17:00 - 18:00 | 46       | 59          | 0.017     | 46         | 59          | 0.009     | 46       | 59          | 0.026     |
| 18:00 - 19:00 | 46       | 59          | 0.009     | 46         | 59          | 0.005     | 46       | 59          | 0.014     |
| 19:00 - 20:00 | 1        | 7           | 0.000     | 1          | 7           | 0.000     | 1        | 7           | 0.000     |
| 20:00 - 21:00 | 1        | 7           | 0.000     | 1          | 7           | 0.000     | 1        | 7           | 0.000     |
| 21:00 - 22:00 | 1        | 7           | 0.000     | 1          | 7           | 0.000     | 1        | 7           | 0.000     |
| 22:00 - 23:00 |          |             |           |            |             |           |          |             |           |
| 23:00 - 24:00 |          |             |           |            |             |           |          |             |           |
| Total Rates:  |          |             | 0.080     |            |             | 0.080     |          |             | 0.160     |

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

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

#### Parameter summary

Trip rate parameter range selected: 6 - 432 (units: )  
 Survey date range: 01/01/08 - 12/11/15  
 Number of weekdays (Monday-Friday): 46  
 Number of Saturdays: 0  
 Number of Sundays: 0  
 Surveys automatically removed from selection: 1  
 Surveys manually removed from selection: 0

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

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED  
MULTI-MODAL PUBLIC TRANSPORT USERS  
Calculation factor: 1 DWELLS  
BOLD print indicates peak (busiest) period

| Time Range    | ARRIVALS |             |           | DEPARTURES |             |           | TOTALS   |             |           |
|---------------|----------|-------------|-----------|------------|-------------|-----------|----------|-------------|-----------|
|               | No. Days | Ave. DWELLS | Trip Rate | No. Days   | Ave. DWELLS | Trip Rate | No. Days | Ave. DWELLS | Trip Rate |
| 00:00 - 01:00 |          |             |           |            |             |           |          |             |           |
| 01:00 - 02:00 |          |             |           |            |             |           |          |             |           |
| 02:00 - 03:00 |          |             |           |            |             |           |          |             |           |
| 03:00 - 04:00 |          |             |           |            |             |           |          |             |           |
| 04:00 - 05:00 |          |             |           |            |             |           |          |             |           |
| 05:00 - 06:00 |          |             |           |            |             |           |          |             |           |
| 06:00 - 07:00 |          |             |           |            |             |           |          |             |           |
| 07:00 - 08:00 | 46       | 59          | 0.000     | 46         | 59          | 0.012     | 46       | 59          | 0.012     |
| 08:00 - 09:00 | 46       | 59          | 0.002     | 46         | 59          | 0.011     | 46       | 59          | 0.013     |
| 09:00 - 10:00 | 46       | 59          | 0.001     | 46         | 59          | 0.007     | 46       | 59          | 0.008     |
| 10:00 - 11:00 | 46       | 59          | 0.003     | 46         | 59          | 0.005     | 46       | 59          | 0.008     |
| 11:00 - 12:00 | 46       | 59          | 0.005     | 46         | 59          | 0.005     | 46       | 59          | 0.010     |
| 12:00 - 13:00 | 46       | 59          | 0.006     | 46         | 59          | 0.007     | 46       | 59          | 0.013     |
| 13:00 - 14:00 | 46       | 59          | 0.005     | 46         | 59          | 0.001     | 46       | 59          | 0.006     |
| 14:00 - 15:00 | 46       | 59          | 0.005     | 46         | 59          | 0.004     | 46       | 59          | 0.009     |
| 15:00 - 16:00 | 46       | 59          | 0.006     | 46         | 59          | 0.005     | 46       | 59          | 0.011     |
| 16:00 - 17:00 | 46       | 59          | 0.009     | 46         | 59          | 0.004     | 46       | 59          | 0.013     |
| 17:00 - 18:00 | 46       | 59          | 0.011     | 46         | 59          | 0.003     | 46       | 59          | 0.014     |
| 18:00 - 19:00 | 46       | 59          | 0.009     | 46         | 59          | 0.000     | 46       | 59          | 0.009     |
| 19:00 - 20:00 |          |             |           |            |             |           |          |             |           |
| 20:00 - 21:00 |          |             |           |            |             |           |          |             |           |
| 21:00 - 22:00 |          |             |           |            |             |           |          |             |           |
| 22:00 - 23:00 |          |             |           |            |             |           |          |             |           |
| 23:00 - 24:00 |          |             |           |            |             |           |          |             |           |
| Total Rates:  |          |             | 0.062     |            |             | 0.064     |          |             | 0.126     |

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

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#### Parameter summary

Trip rate parameter range selected: 6 - 432 (units: )  
Survey date range: 01/01/08 - 12/11/15  
Number of weekdays (Monday-Friday): 46  
Number of Saturdays: 0  
Number of Sundays: 0  
Surveys automatically removed from selection: 1  
Surveys manually removed from selection: 0

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

## **APPENDIX 5**

### **PICADY Output for Summerhill Road/Top Road/Bottom Road**

| Junctions 8                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PICADY 8 - Priority Intersection Module                                                                                                                                     |
| Version: 8.0.6.541 [19821,26/11/2015]<br>© Copyright TRL Limited, 2017                                                                                                      |
| For sales and distribution information, program advice and maintenance, contact TRL:<br>Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://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: Summerhill Road\_Top Road\_Bottom Road - Existing.arc8

Path: Z:\projects\1772 Top Road, Summerhill\Picady

Report generation date: 31/03/2017 15:15:10

## Summary of junction performance

|                                   | AM          |           |      |     | PM          |           |      |     |
|-----------------------------------|-------------|-----------|------|-----|-------------|-----------|------|-----|
|                                   | Queue (PCU) | Delay (s) | RFC  | LOS | Queue (PCU) | Delay (s) | RFC  | LOS |
| Existing Layout - 2022 Base Flows |             |           |      |     |             |           |      |     |
| Stream B-AC                       | 0.21        | 9.35      | 0.18 | A   | 0.09        | 8.83      | 0.08 | A   |
| Stream C-AB                       | 0.00        | 0.00      | 0.00 | A   | 0.00        | 0.00      | 0.00 | A   |
| Stream C-A                        | -           | -         | -    | -   | -           | -         | -    | -   |
| Stream A-B                        | -           | -         | -    | -   | -           | -         | -    | -   |
| Stream A-C                        | -           | -         | -    | -   | -           | -         | -    | -   |

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

"D1 - 2022 Base Flows, AM " model duration: 07:30 - 09:00

"D2 - 2022 Base Flows, PM" model duration: 16:15 - 17:45

Run using Junctions 8.0.6.541 at 31/03/2017 15:15:09

## File summary

|             |                                      |
|-------------|--------------------------------------|
| Title       | Summerhill Road/Top Road/Bottom Road |
| Location    | Summerhill                           |
| Site Number |                                      |
| Date        | 31/03/2017                           |
| Version     |                                      |
| Status      | TIA                                  |
| Identifier  |                                      |
| Client      |                                      |
| Jobnumber   | 1772                                 |
| Enumerator  | Mark Cleary                          |
| Description |                                      |

## Analysis Options

| Vehicle Length (m) | Do Queue Variations | Calculate Residual Capacity | Residual Capacity Criteria Type | RFC Threshold | Average Delay Threshold (s) | Queue Threshold (PCU) |
|--------------------|---------------------|-----------------------------|---------------------------------|---------------|-----------------------------|-----------------------|
| 5.75               |                     |                             | N/A                             | 0.85          | 36.00                       | 20.00                 |

## 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              |

# Existing Layout - 2022 Base Flows, AM

## Data Errors and Warnings

No errors or warnings

## Analysis Set Details

| Name            | Roundabout Capacity Model | Description | Include In Report | Use Specific Demand Set(s) | Specific Demand Set(s) | Locked | Network Flow Scaling Factor (%) | Network Capacity Scaling Factor (%) | Reason For Scaling Factors |
|-----------------|---------------------------|-------------|-------------------|----------------------------|------------------------|--------|---------------------------------|-------------------------------------|----------------------------|
| Existing Layout | N/A                       |             | ✓                 |                            |                        |        | 100.000                         | 100.000                             |                            |

## Demand Set Details

| Name                | Scenario Name   | Time Period Name | Description | Traffic Profile Type | Model Start Time (HH:mm) | Model Finish Time (HH:mm) | Model Time Period Length (min) | Time Segment Length (min) | Results For Central Hour Only | Single Time Segment Only | Locked | Run Automatically | Use Relationship | Relationship |
|---------------------|-----------------|------------------|-------------|----------------------|--------------------------|---------------------------|--------------------------------|---------------------------|-------------------------------|--------------------------|--------|-------------------|------------------|--------------|
| 2022 Base Flows, AM | 2022 Base Flows | AM               |             | ONE HOUR             | 07:30                    | 09:00                     | 90                             | 15                        |                               |                          |        | ✓                 |                  |              |

# Junction Network

## Junctions

| Junction | Name                                 | Junction Type | Major Road Direction | Arm Order | Do Geometric Delay | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------|--------------------|--------------------|--------------|
| 1        | Summerhill Road/Top Road/Bottom Road | T-Junction    | Two-way              | A,B,C     |                    | 9.35               | A            |

## Junction Network Options

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

# Arms

## Arms

| Arm | Arm | Name            | Description | Arm Type |
|-----|-----|-----------------|-------------|----------|
| A   | A   | Summerhill Road |             | Major    |
| B   | B   | Top Road        |             | Minor    |
| C   | C   | Bottom Road     |             | Major    |

## Major Arm Geometry

| Arm | Width of carriageway (m) | Has kerbed central reserve | Width of kerbed central reserve (m) | Has right turn bay | Width For Right Turn (m) | Visibility For Right Turn (m) | Blocks? | Blocking Queue (PCU) |
|-----|--------------------------|----------------------------|-------------------------------------|--------------------|--------------------------|-------------------------------|---------|----------------------|
| C   | 6.00                     |                            | 0.00                                |                    | 2.20                     | 250.00                        | ✓       | 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) | Lane Width (Left) (m) | Lane Width (Right) (m) | 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   | One lane       | 2.70           |                       |                        |                       |                 |                  |                  |                  |                       |                    | 14                     | 70                      |

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

| Junction | Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for C-A | Slope for C-B |
|----------|--------|--------------------|---------------|---------------|---------------|---------------|
| 1        | B-A    | 500.816            | 0.091         | 0.231         | 0.145         | 0.329         |
| 1        | B-C    | 647.940            | 0.099         | 0.251         | -             | -             |
| 1        | C-B    | 718.741            | 0.278         | 0.278         | -             | -             |

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 Flows

## Demand Set Data Options

| Default Vehicle Mix | Vehicle Mix Varies Over Time | Vehicle Mix Varies Over Turn | Vehicle Mix Varies Over Entry | Vehicle Mix Source | PCU Factor for a HV (PCU) | Default Turning Proportions | Estimate from entry/exit counts | Turning Proportions Vary Over Time | Turning Proportions Vary Over Turn | Turning Proportions Vary Over Entry |
|---------------------|------------------------------|------------------------------|-------------------------------|--------------------|---------------------------|-----------------------------|---------------------------------|------------------------------------|------------------------------------|-------------------------------------|
|                     |                              | ✓                            | ✓                             | HV Percentages     | 2.00                      |                             |                                 |                                    | ✓                                  | ✓                                   |

# Entry Flows

## General Flows Data

| Arm | Profile Type | Use Turning Counts | Average Demand Flow (PCU/hr) | Flow Scaling Factor (%) |
|-----|--------------|--------------------|------------------------------|-------------------------|
| A   | ONE HOUR     | ✓                  | 66.00                        | 100.000                 |
| B   | ONE HOUR     | ✓                  | 75.00                        | 100.000                 |
| C   | ONE HOUR     | ✓                  | 121.00                       | 100.000                 |

# Turning Proportions

## Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

|      | To |         |        |        |
|------|----|---------|--------|--------|
|      |    | A       | B      | C      |
| From | A  | 0.000   | 18.000 | 48.000 |
|      | B  | 75.000  | 0.000  | 0.000  |
|      | C  | 121.000 | 0.000  | 0.000  |

## Turning Proportions (PCU) - Junction 1 (for whole period)

|      | To |      |      |      |
|------|----|------|------|------|
|      |    | A    | B    | C    |
| From | A  | 0.00 | 0.27 | 0.73 |
|      | B  | 1.00 | 0.00 | 0.00 |
|      | C  | 1.00 | 0.00 | 0.00 |

# Vehicle Mix

## Average PCU Per Vehicle - Junction 1 (for whole period)

|      | To |       |       |       |
|------|----|-------|-------|-------|
|      |    | A     | B     | C     |
| From | A  | 1.000 | 1.000 | 1.000 |
|      | B  | 1.000 | 1.000 | 1.000 |
|      | C  | 1.000 | 1.000 | 1.000 |

## Heavy Vehicle Percentages - Junction 1 (for whole period)

|      | To |     |     |     |
|------|----|-----|-----|-----|
|      |    | A   | B   | C   |
| From | A  | 0.0 | 0.0 | 0.0 |
|      | B  | 0.0 | 0.0 | 0.0 |
|      | C  | 0.0 | 0.0 | 0.0 |

# Results

## Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) | Total Queueing Delay (PCU-min) | Average Queueing Delay (s) | Rate Of Queueing Delay (PCU-min/min) | Inclusive Total Queueing Delay (PCU-min) | Inclusive Average Queueing Delay (s) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|--------------------------------|----------------------------|--------------------------------------|------------------------------------------|--------------------------------------|
| B-AC   | 0.18    | 9.35          | 0.21            | A       | 68.82                   | 103.23                        | 15.27                          | 8.87                       | 0.17                                 | 15.27                                    | 8.87                                 |
| C-AB   | 0.00    | 0.00          | 0.00            | A       | 0.00                    | 0.00                          | 0.00                           | 0.00                       | 0.00                                 | 0.00                                     | 0.00                                 |
| C-A    | -       | -             | -               | -       | 111.03                  | 166.55                        | -                              | -                          | -                                    | -                                        | -                                    |
| A-B    | -       | -             | -               | -       | 16.52                   | 24.78                         | -                              | -                          | -                                    | -                                        | -                                    |
| A-C    | -       | -             | -               | -       | 44.05                   | 66.07                         | -                              | -                          | -                                    | -                                        | -                                    |

## Main Results for each time segment

**Main results: (07:30-07:45)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 56.46                 | 14.12                   | 55.93               | 0.00                       | 478.03            | 0.118 | 0.00              | 0.13            | 8.519     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 704.90            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 91.10                 | 22.77                   | 91.10               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 13.55                 | 3.39                    | 13.55               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 36.14                 | 9.03                    | 36.14               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (07:45-08:00)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 67.42                 | 16.86                   | 67.30               | 0.00                       | 473.61            | 0.142 | 0.13              | 0.16            | 8.857     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 702.22            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 108.78                | 27.19                   | 108.78              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 16.18                 | 4.05                    | 16.18               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 43.15                 | 10.79                   | 43.15               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (08:00-08:15)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 82.58                 | 20.64                   | 82.39               | 0.00                       | 467.50            | 0.177 | 0.16              | 0.21            | 9.342     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 698.50            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 133.22                | 33.31                   | 133.22              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 19.82                 | 4.95                    | 19.82               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 52.85                 | 13.21                   | 52.85               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (08:15-08:30)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 82.58                 | 20.64                   | 82.57               | 0.00                       | 467.50            | 0.177 | 0.21              | 0.21            | 9.352     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 698.50            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 133.22                | 33.31                   | 133.22              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 19.82                 | 4.95                    | 19.82               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 52.85                 | 13.21                   | 52.85               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (08:30-08:45)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 67.42                 | 16.86                   | 67.61               | 0.00                       | 473.61            | 0.142 | 0.21              | 0.17            | 8.870     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 702.22            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 108.78                | 27.19                   | 108.78              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 16.18                 | 4.05                    | 16.18               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 43.15                 | 10.79                   | 43.15               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (08:45-09:00)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 56.46                 | 14.12                   | 56.59               | 0.00                       | 478.03            | 0.118 | 0.17              | 0.14            | 8.546     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 704.90            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 91.10                 | 22.77                   | 91.10               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 13.55                 | 3.39                    | 13.55               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 36.14                 | 9.03                    | 36.14               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Queueing Delay Results for each time segment****Queueing Delay results: (07:30-07:45)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 1.91                           | 0.13                                 | 8.519                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (07:45-08:00)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 2.41                           | 0.16                                 | 8.857                                  | A                             | A                           |



| Junction | Name                                 | Junction Type | Major Road Direction | Arm Order | Do Geometric Delay | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------|--------------------|--------------------|--------------|
| 1        | Summerhill Road/Top Road/Bottom Road | T-Junction    | Two-way              | A,B,C     |                    | 8.83               | A            |

## Junction Network Options

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

# Arms

## Arms

| Arm | Arm | Name            | Description | Arm Type |
|-----|-----|-----------------|-------------|----------|
| A   | A   | Summerhill Road |             | Major    |
| B   | B   | Top Road        |             | Minor    |
| C   | C   | Bottom Road     |             | Major    |

## Major Arm Geometry

| Arm | Width of carriageway (m) | Has kerbed central reserve | Width of kerbed central reserve (m) | Has right turn bay | Width For Right Turn (m) | Visibility For Right Turn (m) | Blocks? | Blocking Queue (PCU) |
|-----|--------------------------|----------------------------|-------------------------------------|--------------------|--------------------------|-------------------------------|---------|----------------------|
| C   | 6.00                     |                            | 0.00                                |                    | 2.20                     | 250.00                        | ✓       | 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) | Lane Width (Left) (m) | Lane Width (Right) (m) | 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   | One lane       | 2.70           |                       |                        |                       |                 |                  |                  |                  |                       |                    | 14                     | 70                      |

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

| Junction | Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for C-A | Slope for C-B |
|----------|--------|--------------------|---------------|---------------|---------------|---------------|
| 1        | B-A    | 500.816            | 0.091         | 0.231         | 0.145         | 0.329         |
| 1        | B-C    | 647.940            | 0.099         | 0.251         | -             | -             |
| 1        | C-B    | 718.741            | 0.278         | 0.278         | -             | -             |

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 Flows

## Demand Set Data Options

| Default Vehicle Mix | Vehicle Mix Varies Over Time | Vehicle Mix Varies Over Turn | Vehicle Mix Varies Over Entry | Vehicle Mix Source | PCU Factor for a HV (PCU) | Default Turning Proportions | Estimate from entry/exit counts | Turning Proportions Vary Over Time | Turning Proportions Vary Over Turn | Turning Proportions Vary Over Entry |
|---------------------|------------------------------|------------------------------|-------------------------------|--------------------|---------------------------|-----------------------------|---------------------------------|------------------------------------|------------------------------------|-------------------------------------|
|                     |                              | ✓                            | ✓                             | HV Percentages     | 2.00                      |                             |                                 |                                    | ✓                                  | ✓                                   |

# Entry Flows

## General Flows Data

| Arm | Profile Type | Use Turning Counts | Average Demand Flow (PCU/hr) | Flow Scaling Factor (%) |
|-----|--------------|--------------------|------------------------------|-------------------------|
| A   | ONE HOUR     | ✓                  | 236.00                       | 100.000                 |
| B   | ONE HOUR     | ✓                  | 33.00                        | 100.000                 |
| C   | ONE HOUR     | ✓                  | 83.00                        | 100.000                 |

# Turning Proportions

**Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)**

|      | To |        |        |         |
|------|----|--------|--------|---------|
|      |    | A      | B      | C       |
|      | A  | 0.000  | 83.000 | 153.000 |
|      | B  | 32.000 | 0.000  | 1.000   |
| From | C  | 83.000 | 0.000  | 0.000   |

**Turning Proportions (PCU) - Junction 1 (for whole period)**

|      | To |      |      |      |
|------|----|------|------|------|
|      |    | A    | B    | C    |
|      | A  | 0.00 | 0.35 | 0.65 |
|      | B  | 0.97 | 0.00 | 0.03 |
| From | C  | 1.00 | 0.00 | 0.00 |

# Vehicle Mix

**Average PCU Per Vehicle - Junction 1 (for whole period)**

|      | To |       |       |       |
|------|----|-------|-------|-------|
|      |    | A     | B     | C     |
|      | A  | 1.000 | 1.000 | 1.000 |
|      | B  | 1.000 | 1.000 | 1.000 |
| From | C  | 1.000 | 1.000 | 1.000 |

**Heavy Vehicle Percentages - Junction 1 (for whole period)**

|      | To |     |     |     |
|------|----|-----|-----|-----|
|      |    | A   | B   | C   |
|      | A  | 0.0 | 0.0 | 0.0 |
|      | B  | 0.0 | 0.0 | 0.0 |
| From | C  | 0.0 | 0.0 | 0.0 |

# Results

**Results Summary for whole modelled period**

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) | Total Queueing Delay (PCU-min) | Average Queueing Delay (s) | Rate Of Queueing Delay (PCU-min/min) | Inclusive Total Queueing Delay (PCU-min) | Inclusive Average Queueing Delay (s) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|--------------------------------|----------------------------|--------------------------------------|------------------------------------------|--------------------------------------|
| B-AC   | 0.08    | 8.83          | 0.09            | A       | 30.28                   | 45.42                         | 6.41                           | 8.46                       | 0.07                                 | 6.41                                     | 8.46                                 |
| C-AB   | 0.00    | 0.00          | 0.00            | A       | 0.00                    | 0.00                          | 0.00                           | 0.00                       | 0.00                                 | 0.00                                     | 0.00                                 |
| C-A    | -       | -             | -               | -       | 76.16                   | 114.24                        | -                              | -                          | -                                    | -                                        | -                                    |
| A-B    | -       | -             | -               | -       | 76.16                   | 114.24                        | -                              | -                          | -                                    | -                                        | -                                    |
| A-C    | -       | -             | -               | -       | 140.40                  | 210.59                        | -                              | -                          | -                                    | -                                        | -                                    |

**Main Results for each time segment****Main results: (16:15-16:30)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 24.84                 | 6.21                    | 24.62               | 0.00                       | 463.01            | 0.054 | 0.00              | 0.06            | 8.207     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 669.26            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 62.49                 | 15.62                   | 62.49               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 62.49                 | 15.62                   | 62.49               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 115.19                | 28.80                   | 115.19              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (16:30-16:45)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 29.67                 | 7.42                    | 29.61               | 0.00                       | 454.99            | 0.065 | 0.06              | 0.07            | 8.462     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 659.66            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 74.62                 | 18.65                   | 74.62               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 74.62                 | 18.65                   | 74.62               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

|     |        |       |        |      |   |   |   |   |   |   |
|-----|--------|-------|--------|------|---|---|---|---|---|---|
| A-C | 137.54 | 34.39 | 137.54 | 0.00 | - | - | - | - | - | - |
|-----|--------|-------|--------|------|---|---|---|---|---|---|

**Main results: (16:45-17:00)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 36.33                 | 9.08                    | 36.26               | 0.00                       | 443.91            | 0.082 | 0.07              | 0.09            | 8.831     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 646.38            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 91.38                 | 22.85                   | 91.38               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 91.38                 | 22.85                   | 91.38               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 168.46                | 42.11                   | 168.46              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (17:00-17:15)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 36.33                 | 9.08                    | 36.33               | 0.00                       | 443.91            | 0.082 | 0.09              | 0.09            | 8.832     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 646.38            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 91.38                 | 22.85                   | 91.38               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 91.38                 | 22.85                   | 91.38               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 168.46                | 42.11                   | 168.46              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (17:15-17:30)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 29.67                 | 7.42                    | 29.74               | 0.00                       | 454.99            | 0.065 | 0.09              | 0.07            | 8.468     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 659.66            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 74.62                 | 18.65                   | 74.62               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 74.62                 | 18.65                   | 74.62               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 137.54                | 34.39                   | 137.54              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (17:30-17:45)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 24.84                 | 6.21                    | 24.90               | 0.00                       | 463.01            | 0.054 | 0.07              | 0.06            | 8.219     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 669.26            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 62.49                 | 15.62                   | 62.49               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 62.49                 | 15.62                   | 62.49               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 115.19                | 28.80                   | 115.19              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Queueing Delay Results for each time segment****Queueing Delay results: (16:15-16:30)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 0.81                           | 0.05                                 | 8.207                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (16:30-16:45)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 1.01                           | 0.07                                 | 8.462                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (16:45-17:00)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 1.29                           | 0.09                                 | 8.831                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (17:00-17:15)**

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  |  |  |  |  |
|--|--|--|--|--|--|

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 1.33                           | 0.09                                 | 8.832                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

#### Queueing Delay results: (17:15-17:30)

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 1.08                           | 0.07                                 | 8.468                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

#### Queueing Delay results: (17:30-17:45)

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 0.88                           | 0.06                                 | 8.219                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

| Junctions 8                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PICADY 8 - Priority Intersection Module                                                                                                                                     |
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Filename: Summerhill Road\_Top Road\_Bottom Road - Proposed.arc8

Path: Z:\projects\1772 Top Road, Summerhill\Picady

Report generation date: 31/03/2017 15:13:07

## Summary of junction performance

|                                       | AM          |           |      |     | PM          |           |      |     |
|---------------------------------------|-------------|-----------|------|-----|-------------|-----------|------|-----|
|                                       | Queue (PCU) | Delay (s) | RFC  | LOS | Queue (PCU) | Delay (s) | RFC  | LOS |
| Proposed Layout - 2022 With Dev Flows |             |           |      |     |             |           |      |     |
| Stream B-AC                           | 0.45        | 11.58     | 0.31 | B   | 0.16        | 9.80      | 0.14 | A   |
| Stream C-AB                           | 0.00        | 0.00      | 0.00 | A   | 0.00        | 0.00      | 0.00 | A   |
| Stream C-A                            | -           | -         | -    | -   | -           | -         | -    | -   |
| Stream A-B                            | -           | -         | -    | -   | -           | -         | -    | -   |
| Stream A-C                            | -           | -         | -    | -   | -           | -         | -    | -   |

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

"D1 - 2022 With Dev Flows, AM " model duration: 07:30 - 09:00

"D2 - 2022 With Dev Flows, PM" model duration: 16:15 - 17:45

Run using Junctions 8.0.6.541 at 31/03/2017 15:13:06

## File summary

|             |                                      |
|-------------|--------------------------------------|
| Title       | Summerhill Road/Top Road/Bottom Road |
| Location    | Summerhill                           |
| Site Number |                                      |
| Date        | 31/03/2017                           |
| Version     |                                      |
| Status      | TIA                                  |
| Identifier  |                                      |
| Client      |                                      |
| Jobnumber   | 1772                                 |
| Enumerator  | Mark Cleary                          |
| Description |                                      |

## Analysis Options

| Vehicle Length (m) | Do Queue Variations | Calculate Residual Capacity | Residual Capacity Criteria Type | RFC Threshold | Average Delay Threshold (s) | Queue Threshold (PCU) |
|--------------------|---------------------|-----------------------------|---------------------------------|---------------|-----------------------------|-----------------------|
| 5.75               |                     |                             | N/A                             | 0.85          | 36.00                       | 20.00                 |

## 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              |

# Proposed Layout - 2022 With Dev Flows, AM

## Data Errors and Warnings

No errors or warnings

## Analysis Set Details

| Name     | Roundabout Capacity Model | Description | Include In Report | Use Specific Demand Set(s) | Specific Demand Set (s) | Locked | Network Flow Scaling Factor (%) | Network Capacity Scaling Factor (%) | Reason For Scaling Factors |
|----------|---------------------------|-------------|-------------------|----------------------------|-------------------------|--------|---------------------------------|-------------------------------------|----------------------------|
| Proposed |                           |             |                   |                            |                         |        |                                 |                                     |                            |

|        |     |  |   |  |  |  |         |         |  |
|--------|-----|--|---|--|--|--|---------|---------|--|
| Layout | N/A |  | ✓ |  |  |  | 100.000 | 100.000 |  |
|--------|-----|--|---|--|--|--|---------|---------|--|

## Demand Set Details

| Name                    | Scenario Name       | Time Period Name | Description | Traffic Profile Type | Model Start Time (HH:mm) | Model Finish Time (HH:mm) | Model Time Period Length (min) | Time Segment Length (min) | Results For Central Hour Only | Single Time Segment Only | Locked | Run Automatically | Use Relationship | Relationship |
|-------------------------|---------------------|------------------|-------------|----------------------|--------------------------|---------------------------|--------------------------------|---------------------------|-------------------------------|--------------------------|--------|-------------------|------------------|--------------|
| 2022 With Dev Flows, AM | 2022 With Dev Flows | AM               |             | ONE HOUR             | 07:30                    | 09:00                     | 90                             | 15                        |                               |                          |        | ✓                 |                  |              |

# Junction Network

## Junctions

| Junction | Name                                 | Junction Type | Major Road Direction | Arm Order | Do Geometric Delay | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------|--------------------|--------------------|--------------|
| 1        | Summerhill Road/Top Road/Bottom Road | T-Junction    | Two-way              | A,B,C     |                    | 11.58              | B            |

## Junction Network Options

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

# Arms

## Arms

| Arm | Arm | Name            | Description | Arm Type |
|-----|-----|-----------------|-------------|----------|
| A   | A   | Summerhill Road |             | Major    |
| B   | B   | Top Road        |             | Minor    |
| C   | C   | Bottom Road     |             | Major    |

## Major Arm Geometry

| Arm | Width of carriageway (m) | Has kerbed central reserve | Width of kerbed central reserve (m) | Has right turn bay | Width For Right Turn (m) | Visibility For Right Turn (m) | Blocks? | Blocking Queue (PCU) |
|-----|--------------------------|----------------------------|-------------------------------------|--------------------|--------------------------|-------------------------------|---------|----------------------|
| C   | 6.00                     |                            | 0.00                                |                    | 2.20                     | 250.00                        | ✓       | 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) | Lane Width (Left) (m) | Lane Width (Right) (m) | 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   | One lane       | 2.75           |                       |                        |                       |                 |                  |                  |                  |                       |                    | 34                     | 23                      |

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

| Junction | Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for C-A | Slope for C-B |
|----------|--------|--------------------|---------------|---------------|---------------|---------------|
| 1        | B-A    | 487.390            | 0.089         | 0.224         | 0.141         | 0.321         |
| 1        | B-C    | 622.437            | 0.095         | 0.241         | -             | -             |
| 1        | C-B    | 718.741            | 0.278         | 0.278         | -             | -             |

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 Flows

## Demand Set Data Options

| Default Vehicle | Vehicle Mix Varies | Vehicle Mix Varies | Vehicle Mix Varies | Vehicle Mix | PCU Factor for | Default Turning | Estimate from | Turning Proportions | Turning Proportions | Turning Proportions |
|-----------------|--------------------|--------------------|--------------------|-------------|----------------|-----------------|---------------|---------------------|---------------------|---------------------|
|-----------------|--------------------|--------------------|--------------------|-------------|----------------|-----------------|---------------|---------------------|---------------------|---------------------|

| Mix | Over Time | Over Turn | Over Entry | Source         | a HV (PCU) | Proportions | entry/exit counts | Vary Over Time | Vary Over Turn | Vary Over Entry |
|-----|-----------|-----------|------------|----------------|------------|-------------|-------------------|----------------|----------------|-----------------|
|     |           | ✓         | ✓          | HV Percentages | 2.00       |             |                   |                | ✓              | ✓               |

## Entry Flows

### General Flows Data

| Arm | Profile Type | Use Turning Counts | Average Demand Flow (PCU/hr) | Flow Scaling Factor (%) |
|-----|--------------|--------------------|------------------------------|-------------------------|
| A   | ONE HOUR     | ✓                  | 88.00                        | 100.000                 |
| B   | ONE HOUR     | ✓                  | 129.00                       | 100.000                 |
| C   | ONE HOUR     | ✓                  | 121.00                       | 100.000                 |

## Turning Proportions

### Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

|      | To |         |        |        |
|------|----|---------|--------|--------|
|      |    | A       | B      | C      |
| From | A  | 0.000   | 40.000 | 48.000 |
|      | B  | 129.000 | 0.000  | 0.000  |
|      | C  | 121.000 | 0.000  | 0.000  |

### Turning Proportions (PCU) - Junction 1 (for whole period)

|      | To |      |      |      |
|------|----|------|------|------|
|      |    | A    | B    | C    |
| From | A  | 0.00 | 0.45 | 0.55 |
|      | B  | 1.00 | 0.00 | 0.00 |
|      | C  | 1.00 | 0.00 | 0.00 |

## Vehicle Mix

### Average PCU Per Vehicle - Junction 1 (for whole period)

|      | To |       |       |       |
|------|----|-------|-------|-------|
|      |    | A     | B     | C     |
| From | A  | 1.000 | 1.000 | 1.000 |
|      | B  | 1.000 | 1.000 | 1.000 |
|      | C  | 1.000 | 1.000 | 1.000 |

### Heavy Vehicle Percentages - Junction 1 (for whole period)

|      | To |     |     |     |
|------|----|-----|-----|-----|
|      |    | A   | B   | C   |
| From | A  | 0.0 | 0.0 | 0.0 |
|      | B  | 0.0 | 0.0 | 0.0 |
|      | C  | 0.0 | 0.0 | 0.0 |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) | Total Queueing Delay (PCU-min) | Average Queueing Delay (s) | Rate Of Queueing Delay (PCU-min/min) | Inclusive Total Queueing Delay (PCU-min) | Inclusive Average Queueing Delay (s) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|--------------------------------|----------------------------|--------------------------------------|------------------------------------------|--------------------------------------|
| B-AC   | 0.31    | 11.58         | 0.45            | B       | 118.37                  | 177.56                        | 31.33                          | 10.59                      | 0.35                                 | 31.33                                    | 10.59                                |
| C-AB   | 0.00    | 0.00          | 0.00            | A       | 0.00                    | 0.00                          | 0.00                           | 0.00                       | 0.00                                 | 0.00                                     | 0.00                                 |
| C-A    | -       | -             | -               | -       | 111.03                  | 166.55                        | -                              | -                          | -                                    | -                                        | -                                    |
| A-B    | -       | -             | -               | -       | 36.70                   | 55.06                         | -                              | -                          | -                                    | -                                        | -                                    |
| A-C    | -       | -             | -               | -       | 44.05                   | 66.07                         | -                              | -                          | -                                    | -                                        | -                                    |

## Main Results for each time segment

### Main results: (07:30-07:45)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 97.12                 | 24.28                   | 96.07               | 0.00                       | 463.75            | 0.209 | 0.00              | 0.26            | 9.764     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 700.29            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 91.10                 | 22.77                   | 91.10               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 30.11                 | 7.53                    | 30.11               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 36.14                 | 9.03                    | 36.14               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

### Main results: (07:45-08:00)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 115.97                | 28.99                   | 115.68              | 0.00                       | 459.16            | 0.253 | 0.26              | 0.33            | 10.472    | B   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 696.71            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 108.78                | 27.19                   | 108.78              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 35.96                 | 8.99                    | 35.96               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 43.15                 | 10.79                   | 43.15               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

### Main results: (08:00-08:15)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 142.03                | 35.51                   | 141.57              | 0.00                       | 452.82            | 0.314 | 0.33              | 0.45            | 11.549    | B   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 691.76            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 133.22                | 33.31                   | 133.22              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 44.04                 | 11.01                   | 44.04               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 52.85                 | 13.21                   | 52.85               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

### Main results: (08:15-08:30)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 142.03                | 35.51                   | 142.02              | 0.00                       | 452.82            | 0.314 | 0.45              | 0.45            | 11.580    | B   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 691.76            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 133.22                | 33.31                   | 133.22              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 44.04                 | 11.01                   | 44.04               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 52.85                 | 13.21                   | 52.85               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

### Main results: (08:30-08:45)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 115.97                | 28.99                   | 116.41              | 0.00                       | 459.16            | 0.253 | 0.45              | 0.34            | 10.518    | B   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 696.71            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 108.78                | 27.19                   | 108.78              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 35.96                 | 8.99                    | 35.96               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 43.15                 | 10.79                   | 43.15               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

### Main results: (08:45-09:00)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 97.12                 | 24.28                   | 97.42               | 0.00                       | 463.75            | 0.209 | 0.34              | 0.27            | 9.834     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 700.29            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 91.10                 | 22.77                   | 91.10               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 30.11                 | 7.53                    | 30.11               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 36.14                 | 9.03                    | 36.14               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

## Queueing Delay Results for each time segment

### Queueing Delay results: (07:30-07:45)

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 3.74                           | 0.25                                 | 9.764                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (07:45-08:00)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 4.85                           | 0.32                                 | 10.472                                 | B                             | B                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (08:00-08:15)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 6.50                           | 0.43                                 | 11.549                                 | B                             | B                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (08:15-08:30)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 6.77                           | 0.45                                 | 11.580                                 | B                             | B                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (08:30-08:45)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 5.31                           | 0.35                                 | 10.518                                 | B                             | B                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (08:45-09:00)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 4.14                           | 0.28                                 | 9.834                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

# Proposed Layout - 2022 With Dev Flows, PM

**Data Errors and Warnings**

No errors or warnings

**Analysis Set Details**

| Name            | Roundabout Capacity Model | Description | Include In Report | Use Specific Demand Set(s) | Specific Demand Set (s) | Locked | Network Flow Scaling Factor (%) | Network Capacity Scaling Factor (%) | Reason For Scaling Factors |
|-----------------|---------------------------|-------------|-------------------|----------------------------|-------------------------|--------|---------------------------------|-------------------------------------|----------------------------|
| Proposed Layout | N/A                       |             | ✓                 |                            |                         |        | 100.000                         | 100.000                             |                            |

**Demand Set Details**

| Name                    | Scenario Name       | Time Period Name | Description | Traffic Profile Type | Model Start Time (HH:mm) | Model Finish Time (HH:mm) | Model Time Period Length (min) | Time Segment Length (min) | Results For Central Hour Only | Single Time Segment Only | Locked | Run Automatically | Use Relationship | Relationship |
|-------------------------|---------------------|------------------|-------------|----------------------|--------------------------|---------------------------|--------------------------------|---------------------------|-------------------------------|--------------------------|--------|-------------------|------------------|--------------|
| 2022 With Dev Flows, PM | 2022 With Dev Flows | PM               |             | ONE HOUR             | 16:15                    | 17:45                     | 90                             | 15                        |                               |                          |        | ✓                 |                  |              |

# Junction Network

## Junctions

| Junction | Name                                 | Junction Type | Major Road Direction | Arm Order | Do Geometric Delay | Junction Delay (s) | Junction LOS |
|----------|--------------------------------------|---------------|----------------------|-----------|--------------------|--------------------|--------------|
| 1        | Summerhill Road/Top Road/Bottom Road | T-Junction    | Two-way              | A,B,C     |                    | 9.80               | A            |

## Junction Network Options

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

# Arms

## Arms

| Arm | Arm | Name            | Description | Arm Type |
|-----|-----|-----------------|-------------|----------|
| A   | A   | Summerhill Road |             | Major    |
| B   | B   | Top Road        |             | Minor    |
| C   | C   | Bottom Road     |             | Major    |

## Major Arm Geometry

| Arm | Width of carriageway (m) | Has kerbed central reserve | Width of kerbed central reserve (m) | Has right turn bay | Width For Right Turn (m) | Visibility For Right Turn (m) | Blocks? | Blocking Queue (PCU) |
|-----|--------------------------|----------------------------|-------------------------------------|--------------------|--------------------------|-------------------------------|---------|----------------------|
| C   | 6.00                     |                            | 0.00                                |                    | 2.20                     | 250.00                        | ✓       | 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) | Lane Width (Left) (m) | Lane Width (Right) (m) | 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   | One lane       | 2.75           |                       |                        |                       |                 |                  |                  |                  |                       |                    | 34                     | 23                      |

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

| Junction | Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for C-A | Slope for C-B |
|----------|--------|--------------------|---------------|---------------|---------------|---------------|
| 1        | B-A    | 487.390            | 0.089         | 0.224         | 0.141         | 0.321         |
| 1        | B-C    | 622.437            | 0.095         | 0.241         | -             | -             |
| 1        | C-B    | 718.741            | 0.278         | 0.278         | -             | -             |

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 Flows

## Demand Set Data Options

| Default Vehicle Mix | Vehicle Mix Varies Over Time | Vehicle Mix Varies Over Turn | Vehicle Mix Varies Over Entry | Vehicle Mix Source | PCU Factor for a HV (PCU) | Default Turning Proportions | Estimate from entry/exit counts | Turning Proportions Vary Over Time | Turning Proportions Vary Over Turn | Turning Proportions Vary Over Entry |
|---------------------|------------------------------|------------------------------|-------------------------------|--------------------|---------------------------|-----------------------------|---------------------------------|------------------------------------|------------------------------------|-------------------------------------|
|                     |                              | ✓                            | ✓                             | HV Percentages     | 2.00                      |                             |                                 |                                    | ✓                                  | ✓                                   |

# Entry Flows

## General Flows Data

| Arm | Profile Type | Use Turning Counts | Average Demand Flow (PCU/hr) | Flow Scaling Factor (%) |
|-----|--------------|--------------------|------------------------------|-------------------------|
| A   | ONE HOUR     | ✓                  | 286.00                       | 100.000                 |

|          |          |   |       |         |
|----------|----------|---|-------|---------|
| <b>B</b> | ONE HOUR | ✓ | 53.00 | 100.000 |
| <b>C</b> | ONE HOUR | ✓ | 83.00 | 100.000 |

## Turning Proportions

### Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

|      | To       |        |         |         |
|------|----------|--------|---------|---------|
|      |          | A      | B       | C       |
| From | <b>A</b> | 0.000  | 133.000 | 153.000 |
|      | <b>B</b> | 52.000 | 0.000   | 1.000   |
|      | <b>C</b> | 83.000 | 0.000   | 0.000   |

### Turning Proportions (PCU) - Junction 1 (for whole period)

|      | To       |      |      |      |
|------|----------|------|------|------|
|      |          | A    | B    | C    |
| From | <b>A</b> | 0.00 | 0.47 | 0.53 |
|      | <b>B</b> | 0.98 | 0.00 | 0.02 |
|      | <b>C</b> | 1.00 | 0.00 | 0.00 |

## Vehicle Mix

### Average PCU Per Vehicle - Junction 1 (for whole period)

|      | To       |       |       |       |
|------|----------|-------|-------|-------|
|      |          | A     | B     | C     |
| From | <b>A</b> | 1.000 | 1.000 | 1.000 |
|      | <b>B</b> | 1.000 | 1.000 | 1.000 |
|      | <b>C</b> | 1.000 | 1.000 | 1.000 |

### Heavy Vehicle Percentages - Junction 1 (for whole period)

|      | To       |     |     |     |
|------|----------|-----|-----|-----|
|      |          | A   | B   | C   |
| From | <b>A</b> | 0.0 | 0.0 | 0.0 |
|      | <b>B</b> | 0.0 | 0.0 | 0.0 |
|      | <b>C</b> | 0.0 | 0.0 | 0.0 |

## Results

### Results Summary for whole modelled period

| Stream      | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) | Total Queueing Delay (PCU-min) | Average Queueing Delay (s) | Rate Of Queueing Delay (PCU-min/min) | Inclusive Total Queueing Delay (PCU-min) | Inclusive Average Queueing Delay (s) |
|-------------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|--------------------------------|----------------------------|--------------------------------------|------------------------------------------|--------------------------------------|
| <b>B-AC</b> | 0.14    | 9.80          | 0.16            | A       | 48.63                   | 72.95                         | 11.26                          | 9.26                       | 0.13                                 | 11.26                                    | 9.26                                 |
| <b>C-AB</b> | 0.00    | 0.00          | 0.00            | A       | 0.00                    | 0.00                          | 0.00                           | 0.00                       | 0.00                                 | 0.00                                     | 0.00                                 |
| <b>C-A</b>  | -       | -             | -               | -       | 76.16                   | 114.24                        | -                              | -                          | -                                    | -                                        | -                                    |
| <b>A-B</b>  | -       | -             | -               | -       | 122.04                  | 183.06                        | -                              | -                          | -                                    | -                                        | -                                    |
| <b>A-C</b>  | -       | -             | -               | -       | 140.40                  | 210.59                        | -                              | -                          | -                                    | -                                        | -                                    |

### Main Results for each time segment

#### Main results: (16:15-16:30)

| Stream      | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|-------------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| <b>B-AC</b> | 39.90                 | 9.98                    | 39.51               | 0.00                       | 445.87            | 0.089 | 0.00              | 0.10            | 8.851     | A   |
| <b>C-AB</b> | 0.00                  | 0.00                    | 0.00                | 0.00                       | 658.78            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| <b>C-A</b>  | 62.49                 | 15.62                   | 62.49               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| <b>A-B</b>  | 100.13                | 25.03                   | 100.13              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| <b>A-C</b>  | 115.19                | 28.80                   | 115.19              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (16:30-16:45)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 47.65                 | 11.91                   | 47.55               | 0.00                       | 437.42            | 0.109 | 0.10              | 0.12            | 9.232     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 647.14            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 74.62                 | 18.65                   | 74.62               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 119.56                | 29.89                   | 119.56              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 137.54                | 34.39                   | 137.54              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (16:45-17:00)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 58.35                 | 14.59                   | 58.21               | 0.00                       | 425.73            | 0.137 | 0.12              | 0.16            | 9.791     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 631.05            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 91.38                 | 22.85                   | 91.38               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 146.44                | 36.61                   | 146.44              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 168.46                | 42.11                   | 168.46              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (17:00-17:15)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 58.35                 | 14.59                   | 58.35               | 0.00                       | 425.73            | 0.137 | 0.16              | 0.16            | 9.798     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 631.05            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 91.38                 | 22.85                   | 91.38               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 146.44                | 36.61                   | 146.44              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 168.46                | 42.11                   | 168.46              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (17:15-17:30)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 47.65                 | 11.91                   | 47.78               | 0.00                       | 437.42            | 0.109 | 0.16              | 0.12            | 9.244     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 647.14            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 74.62                 | 18.65                   | 74.62               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 119.56                | 29.89                   | 119.56              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 137.54                | 34.39                   | 137.54              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (17:30-17:45)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-AC   | 39.90                 | 9.98                    | 40.00               | 0.00                       | 445.87            | 0.089 | 0.12              | 0.10            | 8.871     | A   |
| C-AB   | 0.00                  | 0.00                    | 0.00                | 0.00                       | 658.78            | 0.000 | 0.00              | 0.00            | 0.000     | A   |
| C-A    | 62.49                 | 15.62                   | 62.49               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-B    | 100.13                | 25.03                   | 100.13              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 115.19                | 28.80                   | 115.19              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Queueing Delay Results for each time segment****Queueing Delay results: (16:15-16:30)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 1.40                           | 0.09                                 | 8.851                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (16:30-16:45)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 1.77                           | 0.12                                 | 9.232                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (16:45-17:00)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 2.29                           | 0.15                                 | 9.791                                  | A                             | A                           |

|      |      |      |       |   |   |
|------|------|------|-------|---|---|
| C-AB | 0.00 | 0.00 | 0.000 | A | A |
| C-A  | -    | -    | -     | - | - |
| A-B  | -    | -    | -     | - | - |
| A-C  | -    | -    | -     | - | - |

**Queueing Delay results: (17:00-17:15)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 2.36                           | 0.16                                 | 9.798                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (17:15-17:30)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 1.90                           | 0.13                                 | 9.244                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (17:30-17:45)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-AC   | 1.53                           | 0.10                                 | 8.871                                  | A                             | A                           |
| C-AB   | 0.00                           | 0.00                                 | 0.000                                  | A                             | A                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |

## **APPENDIX 6**

### **PICADY Output for Summerhill Road/Wheatsheaf Lane/Moss Road**

| Junctions 8                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PICADY 8 - Priority Intersection Module                                                                                                                                     |
| Version: 8.0.6.541 [19821,26/11/2015]<br>© Copyright TRL Limited, 2017                                                                                                      |
| For sales and distribution information, program advice and maintenance, contact TRL:<br>Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://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: Summerhill Road\_Wheatsheaf Lane\_Moss Road.arc8

Path: Z:\projects\1772 Top Road, Summerhill\Picady

Report generation date: 31/03/2017 16:50:57

## Summary of junction performance

|                                              | AM          |           |      |     | PM          |           |      |     |
|----------------------------------------------|-------------|-----------|------|-----|-------------|-----------|------|-----|
|                                              | Queue (PCU) | Delay (s) | RFC  | LOS | Queue (PCU) | Delay (s) | RFC  | LOS |
| <b>Existing Layout - 2022 Base Flows</b>     |             |           |      |     |             |           |      |     |
| Stream B-ACD                                 | 0.43        | 10.39     | 0.30 | B   | 0.82        | 13.56     | 0.45 | B   |
| Stream A-BCD                                 | 0.03        | 4.76      | 0.03 | A   | 0.04        | 5.44      | 0.03 | A   |
| Stream A-B                                   | -           | -         | -    | -   | -           | -         | -    | -   |
| Stream A-C                                   | -           | -         | -    | -   | -           | -         | -    | -   |
| Stream D-ABC                                 | 0.79        | 14.76     | 0.45 | B   | 0.44        | 12.35     | 0.31 | B   |
| Stream C-ABD                                 | 0.02        | 5.63      | 0.02 | A   | 0.01        | 4.69      | 0.01 | A   |
| Stream C-D                                   | -           | -         | -    | -   | -           | -         | -    | -   |
| Stream C-A                                   | -           | -         | -    | -   | -           | -         | -    | -   |
| <b>Existing Layout - 2022 With Dev Flows</b> |             |           |      |     |             |           |      |     |
| Stream B-ACD                                 | 0.47        | 11.10     | 0.32 | B   | 0.86        | 14.19     | 0.47 | B   |
| Stream A-BCD                                 | 0.04        | 4.65      | 0.03 | A   | 0.05        | 5.42      | 0.03 | A   |
| Stream A-B                                   | -           | -         | -    | -   | -           | -         | -    | -   |
| Stream A-C                                   | -           | -         | -    | -   | -           | -         | -    | -   |
| Stream D-ABC                                 | 0.84        | 15.66     | 0.46 | C   | 0.46        | 13.01     | 0.32 | B   |
| Stream C-ABD                                 | 0.03        | 5.67      | 0.02 | A   | 0.01        | 4.61      | 0.01 | A   |
| Stream C-D                                   | -           | -         | -    | -   | -           | -         | -    | -   |
| Stream C-A                                   | -           | -         | -    | -   | -           | -         | -    | -   |

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

"D1 - 2022 Base Flows, AM" model duration: 07:30 - 09:00

"D2 - 2022 Base Flows, PM" model duration: 16:15 - 17:45

"D3 - 2022 With Dev Flows, AM" model duration: 07:30 - 09:00

"D4 - 2022 With Dev Flows, PM" model duration: 16:15 - 17:45

Run using Junctions 8.0.6.541 at 31/03/2017 16:50:54

## File summary

|             |                                           |
|-------------|-------------------------------------------|
| Title       | Summerhill Road/Wheatsheaf Lane/Moss Road |
| Location    | Summerhill                                |
| Site Number |                                           |
| Date        | 31/03/2017                                |
| Version     |                                           |
| Status      | TIA                                       |
| Identifier  |                                           |
| Client      |                                           |
| Jobnumber   | 1772                                      |
| Enumerator  | Mark Cleary                               |
| Description |                                           |

## Analysis Options

| Vehicle Length (m) | Do Queue Variations | Calculate Residual Capacity | Residual Capacity Criteria Type | RFC Threshold | Average Delay Threshold (s) | Queue Threshold (PCU) |
|--------------------|---------------------|-----------------------------|---------------------------------|---------------|-----------------------------|-----------------------|
| 5.75               |                     |                             | N/A                             | 0.85          | 36.00                       | 20.00                 |

## Units

| Distance Units | Speed Units | Traffic Units Input | Traffic Units Results | Flow Units | Average Delay Units | Total Delay Units | Rate Of Delay Units |
|----------------|-------------|---------------------|-----------------------|------------|---------------------|-------------------|---------------------|
|----------------|-------------|---------------------|-----------------------|------------|---------------------|-------------------|---------------------|



| Junction | Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for A-D | Slope for B-A | Slope for B-D | Slope for C-A | Slope for C-B | Slope for C-D | Slope for D-B | Slope for D-C |
|----------|--------|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1        | A-D    | 718.741            | -             | -             | -             | 0.278         | 0.278         | 0.278         | -             | 0.278         | -             | -             |
| 1        | B-AD   | 527.854            | 0.096         | 0.243         | -             | -             | -             | 0.153         | 0.347         | 0.153         | 0.096         | 0.243         |
| 1        | B-C    | 673.679            | 0.103         | 0.261         | -             | -             | -             | -             | -             | -             | 0.103         | 0.261         |
| 1        | C-B    | 718.741            | 0.278         | 0.278         | -             | -             | -             | -             | -             | -             | 0.278         | 0.278         |
| 1        | D-A    | 624.278            | -             | -             | -             | 0.242         | 0.096         | 0.242         | -             | 0.096         | -             | -             |
| 1        | D-BC   | 489.147            | 0.142         | 0.142         | 0.322         | 0.225         | 0.089         | 0.225         | -             | 0.089         | -             | -             |

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 Flows

### Demand Set Data Options

| Default Vehicle Mix | Vehicle Mix Varies Over Time | Vehicle Mix Varies Over Turn | Vehicle Mix Varies Over Entry | Vehicle Mix Source | PCU Factor for a HV (PCU) | Default Turning Proportions | Estimate from entry/exit counts | Turning Proportions Vary Over Time | Turning Proportions Vary Over Turn | Turning Proportions Vary Over Entry |
|---------------------|------------------------------|------------------------------|-------------------------------|--------------------|---------------------------|-----------------------------|---------------------------------|------------------------------------|------------------------------------|-------------------------------------|
|                     |                              | ✓                            | ✓                             | HV Percentages     | 2.00                      |                             |                                 |                                    | ✓                                  | ✓                                   |

## Entry Flows

### General Flows Data

| Arm | Profile Type | Use Turning Counts | Average Demand Flow (PCU/hr) | Flow Scaling Factor (%) |
|-----|--------------|--------------------|------------------------------|-------------------------|
| A   | ONE HOUR     | ✓                  | 192.00                       | 100.000                 |
| B   | ONE HOUR     | ✓                  | 135.00                       | 100.000                 |
| C   | ONE HOUR     | ✓                  | 66.00                        | 100.000                 |
| D   | ONE HOUR     | ✓                  | 178.00                       | 100.000                 |

## Turning Proportions

### Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

|      | To |        |         |         |        |
|------|----|--------|---------|---------|--------|
| From |    | A      | B       | C       | D      |
|      | A  | 0.000  | 59.000  | 118.000 | 15.000 |
|      | B  | 33.000 | 0.000   | 44.000  | 58.000 |
|      | C  | 35.000 | 11.000  | 0.000   | 20.000 |
|      | D  | 12.000 | 138.000 | 28.000  | 0.000  |

### Turning Proportions (PCU) - Junction 1 (for whole period)

|      | To |      |      |      |      |
|------|----|------|------|------|------|
| From |    | A    | B    | C    | D    |
|      | A  | 0.00 | 0.31 | 0.61 | 0.08 |
|      | B  | 0.24 | 0.00 | 0.33 | 0.43 |
|      | C  | 0.53 | 0.17 | 0.00 | 0.30 |
|      | D  | 0.07 | 0.78 | 0.16 | 0.00 |

## Vehicle Mix

### Average PCU Per Vehicle - Junction 1 (for whole period)

|      | To |       |       |       |       |
|------|----|-------|-------|-------|-------|
| From |    | A     | B     | C     | D     |
|      | A  | 1.000 | 1.000 | 1.000 | 1.000 |
|      | B  | 1.000 | 1.000 | 1.000 | 1.000 |
|      | C  | 1.000 | 1.000 | 1.000 | 1.000 |
|      | D  | 1.000 | 1.000 | 1.000 | 1.000 |

## Heavy Vehicle Percentages - Junction 1 (for whole period)

|      | To |     |     |     |     |
|------|----|-----|-----|-----|-----|
|      | A  | B   | C   | D   |     |
|      | A  | 0.0 | 0.0 | 0.0 | 0.0 |
|      | B  | 0.0 | 0.0 | 0.0 | 0.0 |
|      | C  | 0.0 | 0.0 | 0.0 | 0.0 |
| From | D  | 0.0 | 0.0 | 0.0 | 0.0 |

# Results

## Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) | Total Queueing Delay (PCU-min) | Average Queueing Delay (s) | Rate Of Queueing Delay (PCU-min/min) | Inclusive Total Queueing Delay (PCU-min) | Inclusive Average Queueing Delay (s) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|--------------------------------|----------------------------|--------------------------------------|------------------------------------------|--------------------------------------|
| B-ACD  | 0.30    | 10.39         | 0.43            | B       | 123.88                  | 185.82                        | 29.19                          | 9.43                       | 0.32                                 | 29.19                                    | 9.43                                 |
| A-BCD  | 0.03    | 4.76          | 0.03            | A       | 17.33                   | 26.00                         | 2.45                           | 5.66                       | 0.03                                 | 2.45                                     | 5.66                                 |
| A-B    | -       | -             | -               | -       | 52.95                   | 79.42                         | -                              | -                          | -                                    | -                                        | -                                    |
| A-C    | -       | -             | -               | -       | 105.90                  | 158.85                        | -                              | -                          | -                                    | -                                        | -                                    |
| D-ABC  | 0.45    | 14.76         | 0.79            | B       | 163.34                  | 245.00                        | 51.95                          | 12.72                      | 0.58                                 | 51.96                                    | 12.73                                |
| C-ABD  | 0.02    | 5.63          | 0.02            | A       | 10.95                   | 16.42                         | 1.74                           | 6.37                       | 0.02                                 | 1.74                                     | 6.37                                 |
| C-D    | -       | -             | -               | -       | 18.04                   | 27.06                         | -                              | -                          | -                                    | -                                        | -                                    |
| C-A    | -       | -             | -               | -       | 31.57                   | 47.36                         | -                              | -                          | -                                    | -                                        | -                                    |

## Main Results for each time segment

## Main results: (07:30-07:45)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 101.64                | 25.41                   | 100.67              | 0.00                       | 518.47            | 0.196 | 0.00              | 0.24            | 8.597     | A   |
| A-BCD  | 13.57                 | 3.39                    | 13.49               | 0.00                       | 770.03            | 0.018 | 0.00              | 0.02            | 4.758     | A   |
| A-B    | 43.66                 | 10.91                   | 43.66               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 87.32                 | 21.83                   | 87.32               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 134.01                | 33.50                   | 132.38              | 0.00                       | 457.84            | 0.293 | 0.00              | 0.41            | 11.007    | B   |
| C-ABD  | 8.82                  | 2.20                    | 8.76                | 0.00                       | 673.34            | 0.013 | 0.00              | 0.01            | 5.416     | A   |
| C-D    | 14.86                 | 3.72                    | 14.86               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 26.01                 | 6.50                    | 26.01               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

## Main results: (07:45-08:00)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 121.36                | 30.34                   | 121.09              | 0.00                       | 508.64            | 0.239 | 0.24              | 0.31            | 9.282     | A   |
| A-BCD  | 16.81                 | 4.20                    | 16.78               | 0.00                       | 780.14            | 0.022 | 0.02              | 0.03            | 4.715     | A   |
| A-B    | 51.93                 | 12.98                   | 51.93               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 103.87                | 25.97                   | 103.87              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 160.02                | 40.00                   | 159.48              | 0.00                       | 450.22            | 0.355 | 0.41              | 0.54            | 12.358    | B   |
| C-ABD  | 10.68                 | 2.67                    | 10.66               | 0.00                       | 664.50            | 0.016 | 0.01              | 0.02            | 5.505     | A   |
| C-D    | 17.69                 | 4.42                    | 17.69               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 30.96                 | 7.74                    | 30.96               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

## Main results: (08:00-08:15)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 148.64                | 37.16                   | 148.19              | 0.00                       | 495.24            | 0.300 | 0.31              | 0.42            | 10.359    | B   |
| A-BCD  | 21.61                 | 5.40                    | 21.57               | 0.00                       | 794.41            | 0.027 | 0.03              | 0.03            | 4.657     | A   |
| A-B    | 63.26                 | 15.82                   | 63.26               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 126.53                | 31.63                   | 126.53              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 195.98                | 49.00                   | 195.02              | 0.00                       | 439.81            | 0.446 | 0.54              | 0.78            | 14.645    | B   |
| C-ABD  | 13.34                 | 3.34                    | 13.32               | 0.00                       | 652.90            | 0.020 | 0.02              | 0.02            | 5.628     | A   |
| C-D    | 21.57                 | 5.39                    | 21.57               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 37.75                 | 9.44                    | 37.75               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

## Main results: (08:15-08:30)

|  | Total Demand | Junction Arrivals | Entry Flow | Pedestrian Demand | Capacity |  | Start Queue | End Queue | Delay |  |
|--|--------------|-------------------|------------|-------------------|----------|--|-------------|-----------|-------|--|
|--|--------------|-------------------|------------|-------------------|----------|--|-------------|-----------|-------|--|

| Stream | (PCU/hr) | (PCU) | (PCU/hr) | (Ped/hr) | (PCU/hr) | RFC   | (PCU) | (PCU) | (s)    | LOS |
|--------|----------|-------|----------|----------|----------|-------|-------|-------|--------|-----|
| B-ACD  | 148.64   | 37.16 | 148.62   | 0.00     | 495.12   | 0.300 | 0.42  | 0.43  | 10.389 | B   |
| A-BCD  | 21.61    | 5.40  | 21.61    | 0.00     | 794.35   | 0.027 | 0.03  | 0.03  | 4.658  | A   |
| A-B    | 63.26    | 15.82 | 63.26    | 0.00     | -        | -     | -     | -     | -      | -   |
| A-C    | 126.52   | 31.63 | 126.52   | 0.00     | -        | -     | -     | -     | -      | -   |
| D-ABC  | 195.98   | 49.00 | 195.94   | 0.00     | 439.76   | 0.446 | 0.78  | 0.79  | 14.757 | B   |
| C-ABD  | 13.34    | 3.34  | 13.34    | 0.00     | 652.66   | 0.020 | 0.02  | 0.02  | 5.632  | A   |
| C-D    | 21.57    | 5.39  | 21.57    | 0.00     | -        | -     | -     | -     | -      | -   |
| C-A    | 37.75    | 9.44  | 37.75    | 0.00     | -        | -     | -     | -     | -      | -   |

**Main results: (08:30-08:45)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 121.36                | 30.34                   | 121.79              | 0.00                       | 508.44            | 0.239 | 0.43              | 0.32            | 9.322     | A   |
| A-BCD  | 16.82                 | 4.20                    | 16.85               | 0.00                       | 780.03            | 0.022 | 0.03              | 0.03            | 4.718     | A   |
| A-B    | 51.93                 | 12.98                   | 51.93               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 103.86                | 25.96                   | 103.86              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 160.02                | 40.00                   | 160.94              | 0.00                       | 450.14            | 0.355 | 0.79              | 0.56            | 12.487    | B   |
| C-ABD  | 10.68                 | 2.67                    | 10.71               | 0.00                       | 664.10            | 0.016 | 0.02              | 0.02            | 5.511     | A   |
| C-D    | 17.69                 | 4.42                    | 17.69               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 30.96                 | 7.74                    | 30.96               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (08:45-09:00)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 101.64                | 25.41                   | 101.92              | 0.00                       | 518.18            | 0.196 | 0.32              | 0.25            | 8.655     | A   |
| A-BCD  | 13.59                 | 3.40                    | 13.61               | 0.00                       | 769.82            | 0.018 | 0.03              | 0.02            | 4.760     | A   |
| A-B    | 43.65                 | 10.91                   | 43.65               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 87.30                 | 21.83                   | 87.30               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 134.01                | 33.50                   | 134.58              | 0.00                       | 457.69            | 0.293 | 0.56              | 0.42            | 11.163    | B   |
| C-ABD  | 8.82                  | 2.21                    | 8.84                | 0.00                       | 672.77            | 0.013 | 0.02              | 0.01            | 5.421     | A   |
| C-D    | 14.86                 | 3.71                    | 14.86               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 26.00                 | 6.50                    | 26.00               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Queueing Delay Results for each time segment****Queueing Delay results: (07:30-07:45)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 3.47                           | 0.23                                 | 8.597                                  | A                             | A                           |
| A-BCD  | 0.31                           | 0.02                                 | 4.758                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 5.78                           | 0.39                                 | 11.007                                 | B                             | B                           |
| C-ABD  | 0.22                           | 0.01                                 | 5.416                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (07:45-08:00)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 4.52                           | 0.30                                 | 9.282                                  | A                             | A                           |
| A-BCD  | 0.39                           | 0.03                                 | 4.715                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 7.82                           | 0.52                                 | 12.358                                 | B                             | B                           |
| C-ABD  | 0.28                           | 0.02                                 | 5.505                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (08:00-08:15)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 6.13                           | 0.41                                 | 10.359                                 | B                             | B                           |
| A-BCD  | 0.52                           | 0.03                                 | 4.657                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 11.17                          | 0.75                                 | 14.645                                 | B                             | B                           |
| C-ABD  | 0.37                           | 0.02                                 | 5.628                                  | A                             | A                           |
|        |                                |                                      |                                        |                               |                             |

|     |   |   |   |   |   |
|-----|---|---|---|---|---|
| C-D | - | - | - | - | - |
| C-A | - | - | - | - | - |

**Queueing Delay results: (08:15-08:30)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 6.36                           | 0.42                                 | 10.389                                 | B                             | B                           |
| A-BCD  | 0.52                           | 0.03                                 | 4.658                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 11.83                          | 0.79                                 | 14.757                                 | B                             | B                           |
| C-ABD  | 0.37                           | 0.02                                 | 5.632                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (08:30-08:45)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 4.91                           | 0.33                                 | 9.322                                  | A                             | A                           |
| A-BCD  | 0.40                           | 0.03                                 | 4.718                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 8.81                           | 0.59                                 | 12.487                                 | B                             | B                           |
| C-ABD  | 0.28                           | 0.02                                 | 5.511                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (08:45-09:00)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 3.80                           | 0.25                                 | 8.655                                  | A                             | A                           |
| A-BCD  | 0.31                           | 0.02                                 | 4.760                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 6.54                           | 0.44                                 | 11.163                                 | B                             | B                           |
| C-ABD  | 0.22                           | 0.01                                 | 5.421                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

# Existing Layout - 2022 Base Flows, PM

**Data Errors and Warnings***No errors or warnings***Analysis Set Details**

| Name            | Roundabout Capacity Model | Description | Include In Report | Use Specific Demand Set(s) | Specific Demand Set(s) | Locked | Network Flow Scaling Factor (%) | Network Capacity Scaling Factor (%) | Reason For Scaling Factors |
|-----------------|---------------------------|-------------|-------------------|----------------------------|------------------------|--------|---------------------------------|-------------------------------------|----------------------------|
| Existing Layout | N/A                       |             | ✓                 |                            |                        |        | 100.000                         | 100.000                             |                            |

**Demand Set Details**

| Name                | Scenario Name   | Time Period Name | Description | Traffic Profile Type | Model Start Time (HH:mm) | Model Finish Time (HH:mm) | Model Time Period Length (min) | Time Segment Length (min) | Results For Central Hour Only | Single Time Segment Only | Locked | Run Automatically | Use Relationship | Relationship |
|---------------------|-----------------|------------------|-------------|----------------------|--------------------------|---------------------------|--------------------------------|---------------------------|-------------------------------|--------------------------|--------|-------------------|------------------|--------------|
| 2022 Base Flows, PM | 2022 Base Flows | PM               |             | ONE HOUR             | 16:15                    | 17:45                     | 90                             | 15                        |                               |                          |        | ✓                 |                  |              |

# Junction Network

**Junctions**

| Junction | Name | Junction Type | Major Road Direction | Arm Order | Do Geometric Delay | Junction Delay (s) | Junction LOS |
|----------|------|---------------|----------------------|-----------|--------------------|--------------------|--------------|
|          |      |               |                      |           |                    |                    |              |

|   |                                           |                               |         |         |  |       |   |
|---|-------------------------------------------|-------------------------------|---------|---------|--|-------|---|
| 1 | Summerhill Road/Wheatsheaf Lane/Moss Road | OS-NS Stagger (UK RL Stagger) | Two-way | A,B,C,D |  | 12.54 | B |
|---|-------------------------------------------|-------------------------------|---------|---------|--|-------|---|

## Junction Network Options

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

# Arms

## Arms

| Arm | Arm | Name                | Description | Arm Type |
|-----|-----|---------------------|-------------|----------|
| A   | A   | Summerhill Road (N) |             | Major    |
| B   | B   | Wheatsheaf Lane     |             | Minor    |
| C   | C   | Summerhill Road (S) |             | Major    |
| D   | D   | Moss Road           |             | Minor    |

## Major Arm Geometry

| Arm | Width of carriageway (m) | Has kerbed central reserve | Width of kerbed central reserve (m) | Has right turn bay | Width For Right Turn (m) | Visibility For Right Turn (m) | Blocks? | Blocking Queue (PCU) |
|-----|--------------------------|----------------------------|-------------------------------------|--------------------|--------------------------|-------------------------------|---------|----------------------|
| A   | 6.00                     |                            | 0.00                                |                    | 2.20                     | 250.00                        | ✓       | 0.00                 |
| C   | 6.00                     |                            | 0.00                                |                    | 2.20                     | 250.00                        | ✓       | 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) | Lane Width (Left) (m) | Lane Width (Right) (m) | 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   | One lane       | 3.50           |                       |                        |                       |                 |                  |                  |                  |                       |                    | 35                     | 28                      |
| D   | One lane       | 2.75           |                       |                        |                       |                 |                  |                  |                  |                       |                    | 35                     | 26                      |

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

| Junction | Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for A-D | Slope for B-A | Slope for B-D | Slope for C-A | Slope for C-B | Slope for C-D | Slope for D-B | Slope for D-C |
|----------|--------|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1        | A-D    | 718.741            | -             | -             | -             | 0.278         | 0.278         | 0.278         | -             | 0.278         | -             | -             |
| 1        | B-AD   | 527.854            | 0.096         | 0.243         | -             | -             | -             | 0.153         | 0.347         | 0.153         | 0.096         | 0.243         |
| 1        | B-C    | 673.679            | 0.103         | 0.261         | -             | -             | -             | -             | -             | -             | 0.103         | 0.261         |
| 1        | C-B    | 718.741            | 0.278         | 0.278         | -             | -             | -             | -             | -             | -             | 0.278         | 0.278         |
| 1        | D-A    | 624.278            | -             | -             | -             | 0.242         | 0.096         | 0.242         | -             | 0.096         | -             | -             |
| 1        | D-BC   | 489.147            | 0.142         | 0.142         | 0.322         | 0.225         | 0.089         | 0.225         | -             | 0.089         | -             | -             |

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 Flows

## Demand Set Data Options

| Default Vehicle Mix | Vehicle Mix Varies Over Time | Vehicle Mix Varies Over Turn | Vehicle Mix Varies Over Entry | Vehicle Mix Source | PCU Factor for a HV (PCU) | Default Turning Proportions | Estimate from entry/exit counts | Turning Proportions Vary Over Time | Turning Proportions Vary Over Turn | Turning Proportions Vary Over Entry |
|---------------------|------------------------------|------------------------------|-------------------------------|--------------------|---------------------------|-----------------------------|---------------------------------|------------------------------------|------------------------------------|-------------------------------------|
|                     |                              | ✓                            | ✓                             | HV Percentages     | 2.00                      |                             |                                 |                                    | ✓                                  | ✓                                   |

# Entry Flows

## General Flows Data

| Arm | Profile Type | Use Turning Counts | Average Demand Flow (PCU/hr) | Flow Scaling Factor (%) |
|-----|--------------|--------------------|------------------------------|-------------------------|
| A   | ONE HOUR     | ✓                  | 122.00                       | 100.000                 |

|          |          |   |        |         |
|----------|----------|---|--------|---------|
| <b>B</b> | ONE HOUR | ✓ | 200.00 | 100.000 |
| <b>C</b> | ONE HOUR | ✓ | 207.00 | 100.000 |
| <b>D</b> | ONE HOUR | ✓ | 117.00 | 100.000 |

## Turning Proportions

### Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

|      | To |         |        |        |        |
|------|----|---------|--------|--------|--------|
| From |    | A       | B      | C      | D      |
|      | A  | 0.000   | 34.000 | 71.000 | 17.000 |
|      | B  | 57.000  | 0.000  | 44.000 | 99.000 |
|      | C  | 155.000 | 4.000  | 0.000  | 48.000 |
|      | D  | 21.000  | 72.000 | 24.000 | 0.000  |

### Turning Proportions (PCU) - Junction 1 (for whole period)

|      | To |      |      |      |      |
|------|----|------|------|------|------|
| From |    | A    | B    | C    | D    |
|      | A  | 0.00 | 0.28 | 0.58 | 0.14 |
|      | B  | 0.29 | 0.00 | 0.22 | 0.50 |
|      | C  | 0.75 | 0.02 | 0.00 | 0.23 |
|      | D  | 0.18 | 0.62 | 0.21 | 0.00 |

## Vehicle Mix

### Average PCU Per Vehicle - Junction 1 (for whole period)

|      | To |       |       |       |       |
|------|----|-------|-------|-------|-------|
| From |    | A     | B     | C     | D     |
|      | A  | 1.000 | 1.000 | 1.000 | 1.000 |
|      | B  | 1.000 | 1.000 | 1.000 | 1.000 |
|      | C  | 1.000 | 1.000 | 1.000 | 1.000 |
|      | D  | 1.000 | 1.000 | 1.000 | 1.000 |

### Heavy Vehicle Percentages - Junction 1 (for whole period)

|      | To |     |     |     |     |
|------|----|-----|-----|-----|-----|
| From |    | A   | B   | C   | D   |
|      | A  | 0.0 | 0.0 | 0.0 | 0.0 |
|      | B  | 0.0 | 0.0 | 0.0 | 0.0 |
|      | C  | 0.0 | 0.0 | 0.0 | 0.0 |
|      | D  | 0.0 | 0.0 | 0.0 | 0.0 |

## Results

### Results Summary for whole modelled period

| Stream       | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) | Total Queueing Delay (PCU-min) | Average Queueing Delay (s) | Rate Of Queueing Delay (PCU-min/min) | Inclusive Total Queueing Delay (PCU-min) | Inclusive Average Queueing Delay (s) |
|--------------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|--------------------------------|----------------------------|--------------------------------------|------------------------------------------|--------------------------------------|
| <b>B-ACD</b> | 0.45    | 13.56         | 0.82            | B       | 183.52                  | 275.29                        | 53.40                          | 11.64                      | 0.59                                 | 53.41                                    | 11.64                                |
| <b>A-BCD</b> | 0.03    | 5.44          | 0.04            | A       | 18.18                   | 27.27                         | 3.04                           | 6.68                       | 0.03                                 | 3.04                                     | 6.68                                 |
| <b>A-B</b>   | -       | -             | -               | -       | 30.36                   | 45.55                         | -                              | -                          | -                                    | -                                        | -                                    |
| <b>A-C</b>   | -       | -             | -               | -       | 63.41                   | 95.11                         | -                              | -                          | -                                    | -                                        | -                                    |
| <b>D-ABC</b> | 0.31    | 12.35         | 0.44            | B       | 107.36                  | 161.04                        | 29.65                          | 11.05                      | 0.33                                 | 29.65                                    | 11.05                                |
| <b>C-ABD</b> | 0.01    | 4.69          | 0.01            | A       | 4.79                    | 7.19                          | 0.58                           | 4.87                       | 0.01                                 | 0.58                                     | 4.87                                 |
| <b>C-D</b>   | -       | -             | -               | -       | 43.78                   | 65.67                         | -                              | -                          | -                                    | -                                        | -                                    |
| <b>C-A</b>   | -       | -             | -               | -       | 141.37                  | 212.06                        | -                              | -                          | -                                    | -                                        | -                                    |

### Main Results for each time segment

**Main results: (16:15-16:30)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 150.57                | 37.64                   | 148.91              | 0.00                       | 507.46            | 0.297 | 0.00              | 0.42            | 9.996     | A   |
| A-BCD  | 14.41                 | 3.60                    | 14.31               | 0.00                       | 694.17            | 0.021 | 0.00              | 0.02            | 5.295     | A   |
| A-B    | 25.07                 | 6.27                    | 25.07               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 52.36                 | 13.09                   | 52.36               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 88.08                 | 22.02                   | 87.12               | 0.00                       | 448.62            | 0.196 | 0.00              | 0.24            | 9.933     | A   |
| C-ABD  | 3.72                  | 0.93                    | 3.70                | 0.00                       | 771.35            | 0.005 | 0.00              | 0.01            | 4.689     | A   |
| C-D    | 35.97                 | 8.99                    | 35.97               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 116.15                | 29.04                   | 116.15              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (16:30-16:45)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 179.80                | 44.95                   | 179.24              | 0.00                       | 498.20            | 0.361 | 0.42              | 0.55            | 11.266    | B   |
| A-BCD  | 17.67                 | 4.42                    | 17.64               | 0.00                       | 689.79            | 0.026 | 0.02              | 0.03            | 5.355     | A   |
| A-B    | 29.79                 | 7.45                    | 29.79               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 62.22                 | 15.55                   | 62.22               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 105.18                | 26.30                   | 104.89              | 0.00                       | 436.67            | 0.241 | 0.24              | 0.31            | 10.840    | B   |
| C-ABD  | 4.64                  | 1.16                    | 4.63                | 0.00                       | 781.89            | 0.006 | 0.01              | 0.01            | 4.631     | A   |
| C-D    | 42.90                 | 10.73                   | 42.90               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 138.55                | 34.64                   | 138.55              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (16:45-17:00)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 220.20                | 55.05                   | 219.19              | 0.00                       | 485.48            | 0.454 | 0.55              | 0.81            | 13.454    | B   |
| A-BCD  | 22.44                 | 5.61                    | 22.39               | 0.00                       | 684.45            | 0.033 | 0.03              | 0.04            | 5.437     | A   |
| A-B    | 36.23                 | 9.06                    | 36.23               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 75.66                 | 18.91                   | 75.66               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 128.82                | 32.20                   | 128.33              | 0.00                       | 420.34            | 0.306 | 0.31              | 0.43            | 12.307    | B   |
| C-ABD  | 6.01                  | 1.50                    | 6.01                | 0.00                       | 796.85            | 0.008 | 0.01              | 0.01            | 4.551     | A   |
| C-D    | 52.47                 | 13.12                   | 52.47               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 169.43                | 42.36                   | 169.43              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (17:00-17:15)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 220.20                | 55.05                   | 220.16              | 0.00                       | 485.43            | 0.454 | 0.81              | 0.82            | 13.564    | B   |
| A-BCD  | 22.45                 | 5.61                    | 22.45               | 0.00                       | 684.25            | 0.033 | 0.04              | 0.04            | 5.439     | A   |
| A-B    | 36.23                 | 9.06                    | 36.23               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 75.65                 | 18.91                   | 75.65               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 128.82                | 32.20                   | 128.80              | 0.00                       | 420.21            | 0.307 | 0.43              | 0.44            | 12.351    | B   |
| C-ABD  | 6.02                  | 1.50                    | 6.02                | 0.00                       | 796.76            | 0.008 | 0.01              | 0.01            | 4.554     | A   |
| C-D    | 52.47                 | 13.12                   | 52.47               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 169.43                | 42.36                   | 169.43              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (17:15-17:30)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 179.80                | 44.95                   | 180.77              | 0.00                       | 498.10            | 0.361 | 0.82              | 0.58            | 11.381    | B   |
| A-BCD  | 17.68                 | 4.42                    | 17.72               | 0.00                       | 689.46            | 0.026 | 0.04              | 0.03            | 5.359     | A   |
| A-B    | 29.79                 | 7.45                    | 29.79               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 62.21                 | 15.55                   | 62.21               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 105.18                | 26.30                   | 105.64              | 0.00                       | 436.47            | 0.241 | 0.44              | 0.32            | 10.896    | B   |
| C-ABD  | 4.64                  | 1.16                    | 4.65                | 0.00                       | 781.72            | 0.006 | 0.01              | 0.01            | 4.632     | A   |
| C-D    | 42.90                 | 10.73                   | 42.90               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 138.54                | 34.64                   | 138.54              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (17:30-17:45)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 150.57                | 37.64                   | 151.16              | 0.00                       | 507.30            | 0.297 | 0.58              | 0.43            | 10.124    | B   |
| A-BCD  | 14.43                 | 3.61                    | 14.46               | 0.00                       | 693.70            | 0.021 | 0.03              | 0.03            | 5.299     | A   |
| A-B    | 25.07                 | 6.27                    | 25.07               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 52.35                 | 13.09                   | 52.35               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 88.08                 | 22.02                   | 88.38               | 0.00                       | 448.33            | 0.196 | 0.32              | 0.25            | 10.011    | B   |
| C-ABD  | 3.73                  | 0.93                    | 3.73                | 0.00                       | 771.08            | 0.005 | 0.01              | 0.01            | 4.692     | A   |
| C-D    | 35.97                 | 8.99                    | 35.97               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

|     |        |       |        |      |   |   |   |   |   |   |
|-----|--------|-------|--------|------|---|---|---|---|---|---|
| C-A | 116.14 | 29.04 | 116.14 | 0.00 | - | - | - | - | - | - |
|-----|--------|-------|--------|------|---|---|---|---|---|---|

## Queueing Delay Results for each time segment

### Queueing Delay results: (16:15-16:30)

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 5.92                           | 0.39                                 | 9.996                                  | A                             | A                           |
| A-BCD  | 0.37                           | 0.02                                 | 5.295                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 3.45                           | 0.23                                 | 9.933                                  | A                             | A                           |
| C-ABD  | 0.08                           | 0.01                                 | 4.689                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

### Queueing Delay results: (16:30-16:45)

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 8.03                           | 0.54                                 | 11.266                                 | B                             | B                           |
| A-BCD  | 0.48                           | 0.03                                 | 5.355                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 4.55                           | 0.30                                 | 10.840                                 | B                             | B                           |
| C-ABD  | 0.09                           | 0.01                                 | 4.631                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

### Queueing Delay results: (16:45-17:00)

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 11.58                          | 0.77                                 | 13.454                                 | B                             | B                           |
| A-BCD  | 0.66                           | 0.04                                 | 5.437                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 6.27                           | 0.42                                 | 12.307                                 | B                             | B                           |
| C-ABD  | 0.12                           | 0.01                                 | 4.551                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

### Queueing Delay results: (17:00-17:15)

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 12.23                          | 0.82                                 | 13.564                                 | B                             | B                           |
| A-BCD  | 0.66                           | 0.04                                 | 5.439                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 6.54                           | 0.44                                 | 12.351                                 | B                             | B                           |
| C-ABD  | 0.12                           | 0.01                                 | 4.554                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

### Queueing Delay results: (17:15-17:30)

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 9.00                           | 0.60                                 | 11.381                                 | B                             | B                           |
| A-BCD  | 0.49                           | 0.03                                 | 5.359                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 5.00                           | 0.33                                 | 10.896                                 | B                             | B                           |
| C-ABD  | 0.09                           | 0.01                                 | 4.632                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

### Queueing Delay results: (17:30-17:45)

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 6.65                           | 0.44                                 | 10.124                                 | B                             | B                           |
| A-BCD  | 0.38                           | 0.03                                 | 5.299                                  | A                             | A                           |

|       |      |      |        |   |   |
|-------|------|------|--------|---|---|
| A-B   | -    | -    | -      | - | - |
| A-C   | -    | -    | -      | - | - |
| D-ABC | 3.83 | 0.26 | 10.011 | B | B |
| C-ABD | 0.08 | 0.01 | 4.692  | A | A |
| C-D   | -    | -    | -      | - | - |
| C-A   | -    | -    | -      | - | - |

## Existing Layout - 2022 With Dev Flows, AM

### Data Errors and Warnings

No errors or warnings

### Analysis Set Details

| Name            | Roundabout Capacity Model | Description | Include In Report | Use Specific Demand Set(s) | Specific Demand Set(s) | Locked | Network Flow Scaling Factor (%) | Network Capacity Scaling Factor (%) | Reason For Scaling Factors |
|-----------------|---------------------------|-------------|-------------------|----------------------------|------------------------|--------|---------------------------------|-------------------------------------|----------------------------|
| Existing Layout | N/A                       |             | ✓                 |                            |                        |        | 100.000                         | 100.000                             |                            |

### Demand Set Details

| Name                    | Scenario Name       | Time Period Name | Description | Traffic Profile Type | Model Start Time (HH:mm) | Model Finish Time (HH:mm) | Model Time Period Length (min) | Time Segment Length (min) | Results For Central Hour Only | Single Time Segment Only | Locked | Run Automatically | Use Relationship | Relationship |
|-------------------------|---------------------|------------------|-------------|----------------------|--------------------------|---------------------------|--------------------------------|---------------------------|-------------------------------|--------------------------|--------|-------------------|------------------|--------------|
| 2022 With Dev Flows, AM | 2022 With Dev Flows | AM               |             | ONE HOUR             | 07:30                    | 09:00                     | 90                             | 15                        |                               |                          |        | ✓                 |                  |              |

## Junction Network

### Junctions

| Junction | Name                                      | Junction Type                 | Major Road Direction | Arm Order | Do Geometric Delay | Junction Delay (s) | Junction LOS |
|----------|-------------------------------------------|-------------------------------|----------------------|-----------|--------------------|--------------------|--------------|
| 1        | Summerhill Road/Wheatsheaf Lane/Moss Road | OS-NS Stagger (UK RL Stagger) | Two-way              | A,B,C,D   |                    | 12.82              | B            |

### Junction Network Options

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

## Arms

### Arms

| Arm | Arm | Name                | Description | Arm Type |
|-----|-----|---------------------|-------------|----------|
| A   | A   | Summerhill Road (N) |             | Major    |
| B   | B   | Wheatsheaf Lane     |             | Minor    |
| C   | C   | Summerhill Road (S) |             | Major    |
| D   | D   | Moss Road           |             | Minor    |

### Major Arm Geometry

| Arm | Width of carriageway (m) | Has kerbed central reserve | Width of kerbed central reserve (m) | Has right turn bay | Width For Right Turn (m) | Visibility For Right Turn (m) | Blocks? | Blocking Queue (PCU) |
|-----|--------------------------|----------------------------|-------------------------------------|--------------------|--------------------------|-------------------------------|---------|----------------------|
| A   | 6.00                     |                            | 0.00                                |                    | 2.20                     | 250.00                        | ✓       | 0.00                 |
| C   | 6.00                     |                            | 0.00                                |                    | 2.20                     | 250.00                        | ✓       | 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) | Lane Width (Left) (m) | Lane Width (Right) (m) | 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   | One lane       | 3.50           |                       |                        |                       |                 |                  |                  |                  |                       |                    | 35                     | 28                      |

|   |          |      |  |  |  |  |  |  |  |  |  |    |    |
|---|----------|------|--|--|--|--|--|--|--|--|--|----|----|
| D | One lane | 2.75 |  |  |  |  |  |  |  |  |  | 35 | 26 |
|---|----------|------|--|--|--|--|--|--|--|--|--|----|----|

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

| Junction | Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for A-D | Slope for B-A | Slope for B-D | Slope for C-A | Slope for C-B | Slope for C-D | Slope for D-B | Slope for D-C |
|----------|--------|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1        | A-D    | 718.741            | -             | -             | -             | 0.278         | 0.278         | 0.278         | -             | 0.278         | -             | -             |
| 1        | B-AD   | 527.854            | 0.096         | 0.243         | -             | -             | -             | 0.153         | 0.347         | 0.153         | 0.096         | 0.243         |
| 1        | B-C    | 673.679            | 0.103         | 0.261         | -             | -             | -             | -             | -             | -             | 0.103         | 0.261         |
| 1        | C-B    | 718.741            | 0.278         | 0.278         | -             | -             | -             | -             | -             | -             | 0.278         | 0.278         |
| 1        | D-A    | 624.278            | -             | -             | -             | 0.242         | 0.096         | 0.242         | -             | 0.096         | -             | -             |
| 1        | D-BC   | 489.147            | 0.142         | 0.142         | 0.322         | 0.225         | 0.089         | 0.225         | -             | 0.089         | -             | -             |

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 Flows

### Demand Set Data Options

| Default Vehicle Mix | Vehicle Mix Varies Over Time | Vehicle Mix Varies Over Turn | Vehicle Mix Varies Over Entry | Vehicle Mix Source | PCU Factor for a HV (PCU) | Default Turning Proportions | Estimate from entry/exit counts | Turning Proportions Vary Over Time | Turning Proportions Vary Over Turn | Turning Proportions Vary Over Entry |
|---------------------|------------------------------|------------------------------|-------------------------------|--------------------|---------------------------|-----------------------------|---------------------------------|------------------------------------|------------------------------------|-------------------------------------|
|                     |                              | ✓                            | ✓                             | HV Percentages     | 2.00                      |                             |                                 |                                    | ✓                                  | ✓                                   |

## Entry Flows

### General Flows Data

| Arm | Profile Type | Use Turning Counts | Average Demand Flow (PCU/hr) | Flow Scaling Factor (%) |
|-----|--------------|--------------------|------------------------------|-------------------------|
| A   | ONE HOUR     | ✓                  | 247.00                       | 100.000                 |
| B   | ONE HOUR     | ✓                  | 140.00                       | 100.000                 |
| C   | ONE HOUR     | ✓                  | 83.00                        | 100.000                 |
| D   | ONE HOUR     | ✓                  | 178.00                       | 100.000                 |

## Turning Proportions

### Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

|      | To |        |         |         |        |
|------|----|--------|---------|---------|--------|
| From |    | A      | B       | C       | D      |
|      | A  | 0.000  | 71.000  | 160.000 | 16.000 |
|      | B  | 38.000 | 0.000   | 44.000  | 58.000 |
|      | C  | 52.000 | 11.000  | 0.000   | 20.000 |
|      | D  | 12.000 | 138.000 | 28.000  | 0.000  |

### Turning Proportions (PCU) - Junction 1 (for whole period)

|      | To |      |      |      |      |
|------|----|------|------|------|------|
| From |    | A    | B    | C    | D    |
|      | A  | 0.00 | 0.29 | 0.65 | 0.06 |
|      | B  | 0.27 | 0.00 | 0.31 | 0.41 |
|      | C  | 0.63 | 0.13 | 0.00 | 0.24 |
|      | D  | 0.07 | 0.78 | 0.16 | 0.00 |

## Vehicle Mix

### Average PCU Per Vehicle - Junction 1 (for whole period)

| To |  |  |  |  |
|----|--|--|--|--|
|    |  |  |  |  |

| From |   | A     | B     | C     | D     |
|------|---|-------|-------|-------|-------|
|      | A | 1.000 | 1.000 | 1.000 | 1.000 |
|      | B | 1.000 | 1.000 | 1.000 | 1.000 |
|      | C | 1.000 | 1.000 | 1.000 | 1.000 |
|      | D | 1.000 | 1.000 | 1.000 | 1.000 |

### Heavy Vehicle Percentages - Junction 1 (for whole period)

| From |   | To  |     |     |     |
|------|---|-----|-----|-----|-----|
|      |   | A   | B   | C   | D   |
|      | A | 0.0 | 0.0 | 0.0 | 0.0 |
|      | B | 0.0 | 0.0 | 0.0 | 0.0 |
|      | C | 0.0 | 0.0 | 0.0 | 0.0 |
|      | D | 0.0 | 0.0 | 0.0 | 0.0 |

## Results

### Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) | Total Queueing Delay (PCU-min) | Average Queueing Delay (s) | Rate Of Queueing Delay (PCU-min/min) | Inclusive Total Queueing Delay (PCU-min) | Inclusive Average Queueing Delay (s) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|--------------------------------|----------------------------|--------------------------------------|------------------------------------------|--------------------------------------|
| B-ACD  | 0.32    | 11.10         | 0.47            | B       | 128.47                  | 192.70                        | 31.92                          | 9.94                       | 0.35                                 | 31.92                                    | 9.94                                 |
| A-BCD  | 0.03    | 4.65          | 0.04            | A       | 19.76                   | 29.65                         | 2.76                           | 5.59                       | 0.03                                 | 2.76                                     | 5.59                                 |
| A-B    | -       | -             | -               | -       | 63.59                   | 95.38                         | -                              | -                          | -                                    | -                                        | -                                    |
| A-C    | -       | -             | -               | -       | 143.30                  | 214.95                        | -                              | -                          | -                                    | -                                        | -                                    |
| D-ABC  | 0.46    | 15.66         | 0.84            | C       | 163.34                  | 245.00                        | 54.34                          | 13.31                      | 0.60                                 | 54.35                                    | 13.31                                |
| C-ABD  | 0.02    | 5.67          | 0.03            | A       | 11.25                   | 16.87                         | 1.81                           | 6.44                       | 0.02                                 | 1.81                                     | 6.44                                 |
| C-D    | -       | -             | -               | -       | 18.03                   | 27.05                         | -                              | -                          | -                                    | -                                        | -                                    |
| C-A    | -       | -             | -               | -       | 46.88                   | 70.33                         | -                              | -                          | -                                    | -                                        | -                                    |

### Main Results for each time segment

#### Main results: (07:30-07:45)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 105.40                | 26.35                   | 104.36              | 0.00                       | 506.51            | 0.208 | 0.00              | 0.26            | 8.928     | A   |
| A-BCD  | 15.28                 | 3.82                    | 15.18               | 0.00                       | 790.48            | 0.019 | 0.00              | 0.02            | 4.643     | A   |
| A-B    | 52.46                 | 13.11                   | 52.46               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 118.22                | 29.55                   | 118.22              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 134.01                | 33.50                   | 132.33              | 0.00                       | 448.28            | 0.299 | 0.00              | 0.42            | 11.335    | B   |
| C-ABD  | 9.00                  | 2.25                    | 8.94                | 0.00                       | 670.55            | 0.013 | 0.00              | 0.02            | 5.441     | A   |
| C-D    | 14.86                 | 3.71                    | 14.86               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 38.63                 | 9.66                    | 38.63               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

#### Main results: (07:45-08:00)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 125.86                | 31.46                   | 125.55              | 0.00                       | 494.63            | 0.254 | 0.26              | 0.34            | 9.746     | A   |
| A-BCD  | 19.10                 | 4.78                    | 19.08               | 0.00                       | 804.59            | 0.024 | 0.02              | 0.03            | 4.582     | A   |
| A-B    | 62.38                 | 15.59                   | 62.38               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 140.57                | 35.14                   | 140.57              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 160.02                | 40.00                   | 159.45              | 0.00                       | 438.79            | 0.365 | 0.42              | 0.56            | 12.860    | B   |
| C-ABD  | 10.95                 | 2.74                    | 10.94               | 0.00                       | 661.33            | 0.017 | 0.02              | 0.02            | 5.534     | A   |
| C-D    | 17.68                 | 4.42                    | 17.68               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 45.98                 | 11.49                   | 45.98               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

#### Main results: (08:00-08:15)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 154.14                | 38.54                   | 153.62              | 0.00                       | 478.40            | 0.322 | 0.34              | 0.47            | 11.066    | B   |
| A-BCD  | 24.88                 | 6.22                    | 24.84               | 0.00                       | 824.33            | 0.030 | 0.03              | 0.04            | 4.502     | A   |
| A-B    | 75.94                 | 18.98                   | 75.94               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 171.13                | 42.78                   | 171.13              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 195.98                | 49.00                   | 194.92              | 0.00                       | 425.78            | 0.460 | 0.56              | 0.83            | 15.518    | C   |

|       |       |       |       |      |        |       |      |      |       |   |
|-------|-------|-------|-------|------|--------|-------|------|------|-------|---|
| C-ABD | 13.78 | 3.44  | 13.75 | 0.00 | 649.34 | 0.021 | 0.02 | 0.03 | 5.663 | A |
| C-D   | 21.56 | 5.39  | 21.56 | 0.00 | -      | -     | -    | -    | -     | - |
| C-A   | 56.05 | 14.01 | 56.05 | 0.00 | -      | -     | -    | -    | -     | - |

**Main results: (08:15-08:30)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 154.14                | 38.54                   | 154.13              | 0.00                       | 478.27            | 0.322 | 0.47              | 0.47            | 11.104    | B   |
| A-BCD  | 24.90                 | 6.22                    | 24.89               | 0.00                       | 824.25            | 0.030 | 0.04              | 0.04            | 4.503     | A   |
| A-B    | 75.94                 | 18.98                   | 75.94               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 171.12                | 42.78                   | 171.12              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 195.98                | 49.00                   | 195.93              | 0.00                       | 425.72            | 0.460 | 0.83              | 0.84            | 15.657    | C   |
| C-ABD  | 13.78                 | 3.44                    | 13.78               | 0.00                       | 649.07            | 0.021 | 0.03              | 0.03            | 5.666     | A   |
| C-D    | 21.56                 | 5.39                    | 21.56               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 56.05                 | 14.01                   | 56.05               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (08:30-08:45)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 125.86                | 31.46                   | 126.36              | 0.00                       | 494.41            | 0.255 | 0.47              | 0.35            | 9.794     | A   |
| A-BCD  | 19.12                 | 4.78                    | 19.16               | 0.00                       | 804.46            | 0.024 | 0.04              | 0.03            | 4.584     | A   |
| A-B    | 62.37                 | 15.59                   | 62.37               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 140.56                | 35.14                   | 140.56              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 160.02                | 40.00                   | 161.03              | 0.00                       | 438.68            | 0.365 | 0.84              | 0.59            | 13.015    | B   |
| C-ABD  | 10.96                 | 2.74                    | 10.98               | 0.00                       | 660.91            | 0.017 | 0.03              | 0.02            | 5.541     | A   |
| C-D    | 17.68                 | 4.42                    | 17.68               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 45.98                 | 11.49                   | 45.98               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (08:45-09:00)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 105.40                | 26.35                   | 105.72              | 0.00                       | 506.21            | 0.208 | 0.35              | 0.27            | 8.997     | A   |
| A-BCD  | 15.30                 | 3.83                    | 15.33               | 0.00                       | 790.26            | 0.019 | 0.03              | 0.02            | 4.647     | A   |
| A-B    | 52.45                 | 13.11                   | 52.45               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 118.20                | 29.55                   | 118.20              | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 134.01                | 33.50                   | 134.62              | 0.00                       | 448.11            | 0.299 | 0.59              | 0.43            | 11.505    | B   |
| C-ABD  | 9.01                  | 2.25                    | 9.02                | 0.00                       | 669.95            | 0.013 | 0.02              | 0.02            | 5.446     | A   |
| C-D    | 14.86                 | 3.71                    | 14.86               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 38.62                 | 9.66                    | 38.62               | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Queueing Delay Results for each time segment****Queueing Delay results: (07:30-07:45)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 3.73                           | 0.25                                 | 8.928                                  | A                             | A                           |
| A-BCD  | 0.34                           | 0.02                                 | 4.643                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 5.95                           | 0.40                                 | 11.335                                 | B                             | B                           |
| C-ABD  | 0.23                           | 0.02                                 | 5.441                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (07:45-08:00)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 4.91                           | 0.33                                 | 9.746                                  | A                             | A                           |
| A-BCD  | 0.44                           | 0.03                                 | 4.582                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 8.11                           | 0.54                                 | 12.860                                 | B                             | B                           |
| C-ABD  | 0.29                           | 0.02                                 | 5.534                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (08:00-08:15)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
|        |                                |                                      |                                        |                               |                             |

|       |       |      |        |   |   |
|-------|-------|------|--------|---|---|
| B-ACD | 6.76  | 0.45 | 11.066 | B | B |
| A-BCD | 0.59  | 0.04 | 4.502  | A | A |
| A-B   | -     | -    | -      | - | - |
| A-C   | -     | -    | -      | - | - |
| D-ABC | 11.79 | 0.79 | 15.518 | C | B |
| C-ABD | 0.39  | 0.03 | 5.663  | A | A |
| C-D   | -     | -    | -      | - | - |
| C-A   | -     | -    | -      | - | - |

#### Queueing Delay results: (08:15-08:30)

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 7.05                           | 0.47                                 | 11.104                                 | B                             | B                           |
| A-BCD  | 0.59                           | 0.04                                 | 4.503                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 12.53                          | 0.84                                 | 15.657                                 | C                             | B                           |
| C-ABD  | 0.39                           | 0.03                                 | 5.666                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

#### Queueing Delay results: (08:30-08:45)

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 5.37                           | 0.36                                 | 9.794                                  | A                             | A                           |
| A-BCD  | 0.45                           | 0.03                                 | 4.584                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 9.20                           | 0.61                                 | 13.015                                 | B                             | B                           |
| C-ABD  | 0.29                           | 0.02                                 | 5.541                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

#### Queueing Delay results: (08:45-09:00)

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 4.11                           | 0.27                                 | 8.997                                  | A                             | A                           |
| A-BCD  | 0.35                           | 0.02                                 | 4.647                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 6.75                           | 0.45                                 | 11.505                                 | B                             | B                           |
| C-ABD  | 0.23                           | 0.02                                 | 5.446                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

## Existing Layout - 2022 With Dev Flows, PM

### Data Errors and Warnings

No errors or warnings

### Analysis Set Details

| Name            | Roundabout Capacity Model | Description | Include In Report | Use Specific Demand Set(s) | Specific Demand Set(s) | Locked | Network Flow Scaling Factor (%) | Network Capacity Scaling Factor (%) | Reason For Scaling Factors |
|-----------------|---------------------------|-------------|-------------------|----------------------------|------------------------|--------|---------------------------------|-------------------------------------|----------------------------|
| Existing Layout | N/A                       |             | ✓                 |                            |                        |        | 100.000                         | 100.000                             |                            |

### Demand Set Details

| Name                    | Scenario Name       | Time Period Name | Description | Traffic Profile Type | Model Start Time (HH:mm) | Model Finish Time (HH:mm) | Model Time Period Length (min) | Time Segment Length (min) | Results For Central Hour Only | Single Time Segment Only | Locked | Run Automatically | Use Relationship | Relationship |
|-------------------------|---------------------|------------------|-------------|----------------------|--------------------------|---------------------------|--------------------------------|---------------------------|-------------------------------|--------------------------|--------|-------------------|------------------|--------------|
| 2022 With Dev Flows, PM | 2022 With Dev Flows | PM               |             | ONE HOUR             | 16:15                    | 17:45                     | 90                             | 15                        |                               |                          |        | ✓                 |                  |              |

# Junction Network

## Junctions

| Junction | Name                                      | Junction Type                 | Major Road Direction | Arm Order | Do Geometric Delay | Junction Delay (s) | Junction LOS |
|----------|-------------------------------------------|-------------------------------|----------------------|-----------|--------------------|--------------------|--------------|
| 1        | Summerhill Road/Wheatsheaf Lane/Moss Road | OS-NS Stagger (UK RL Stagger) | Two-way              | A,B,C,D   |                    | 13.12              | B            |

## Junction Network Options

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

# Arms

## Arms

| Arm | Arm | Name                | Description | Arm Type |
|-----|-----|---------------------|-------------|----------|
| A   | A   | Summerhill Road (N) |             | Major    |
| B   | B   | Wheatsheaf Lane     |             | Minor    |
| C   | C   | Summerhill Road (S) |             | Major    |
| D   | D   | Moss Road           |             | Minor    |

## Major Arm Geometry

| Arm | Width of carriageway (m) | Has kerbed central reserve | Width of kerbed central reserve (m) | Has right turn bay | Width For Right Turn (m) | Visibility For Right Turn (m) | Blocks? | Blocking Queue (PCU) |
|-----|--------------------------|----------------------------|-------------------------------------|--------------------|--------------------------|-------------------------------|---------|----------------------|
| A   | 6.00                     |                            | 0.00                                |                    | 2.20                     | 250.00                        | ✓       | 0.00                 |
| C   | 6.00                     |                            | 0.00                                |                    | 2.20                     | 250.00                        | ✓       | 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) | Lane Width (Left) (m) | Lane Width (Right) (m) | 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   | One lane       | 3.50           |                       |                        |                       |                 |                  |                  |                  |                       |                    | 35                     | 28                      |
| D   | One lane       | 2.75           |                       |                        |                       |                 |                  |                  |                  |                       |                    | 35                     | 26                      |

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

| Junction | Stream | Intercept (PCU/hr) | Slope for A-B | Slope for A-C | Slope for A-D | Slope for B-A | Slope for B-D | Slope for C-A | Slope for C-B | Slope for C-D | Slope for D-B | Slope for D-C |
|----------|--------|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1        | A-D    | 718.741            | -             | -             | -             | 0.278         | 0.278         | 0.278         | -             | 0.278         | -             | -             |
| 1        | B-AD   | 527.854            | 0.096         | 0.243         | -             | -             | -             | 0.153         | 0.347         | 0.153         | 0.096         | 0.243         |
| 1        | B-C    | 673.679            | 0.103         | 0.261         | -             | -             | -             | -             | -             | -             | 0.103         | 0.261         |
| 1        | C-B    | 718.741            | 0.278         | 0.278         | -             | -             | -             | -             | -             | -             | 0.278         | 0.278         |
| 1        | D-A    | 624.278            | -             | -             | -             | 0.242         | 0.096         | 0.242         | -             | 0.096         | -             | -             |
| 1        | D-BC   | 489.147            | 0.142         | 0.142         | 0.322         | 0.225         | 0.089         | 0.225         | -             | 0.089         | -             | -             |

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 Flows

## Demand Set Data Options

| Default Vehicle Mix | Vehicle Mix Varies Over Time | Vehicle Mix Varies Over Turn | Vehicle Mix Varies Over Entry | Vehicle Mix Source | PCU Factor for a HV (PCU) | Default Turning Proportions | Estimate from entry/exit counts | Turning Proportions Vary Over Time | Turning Proportions Vary Over Turn | Turning Proportions Vary Over Entry |
|---------------------|------------------------------|------------------------------|-------------------------------|--------------------|---------------------------|-----------------------------|---------------------------------|------------------------------------|------------------------------------|-------------------------------------|
|                     |                              | ✓                            | ✓                             | HV Percentages     | 2.00                      |                             |                                 |                                    | ✓                                  | ✓                                   |

# Entry Flows

## General Flows Data

| Arm | Profile Type | Use Turning Counts | Average Demand Flow (PCU/hr) | Flow Scaling Factor (%) |
|-----|--------------|--------------------|------------------------------|-------------------------|
| A   | ONE HOUR     | ✓                  | 142.00                       | 100.000                 |
| B   | ONE HOUR     | ✓                  | 201.00                       | 100.000                 |
| C   | ONE HOUR     | ✓                  | 246.00                       | 100.000                 |
| D   | ONE HOUR     | ✓                  | 118.00                       | 100.000                 |

# Turning Proportions

## Turning Counts / Proportions (PCU/hr) - Junction 1 (for whole period)

|      | To |         |        |        |
|------|----|---------|--------|--------|
|      | A  | B       | C      | D      |
| From | A  | 0.000   | 39.000 | 86.000 |
|      | B  | 68.000  | 0.000  | 44.000 |
|      | C  | 194.000 | 4.000  | 0.000  |
|      | D  | 22.000  | 72.000 | 24.000 |

## Turning Proportions (PCU) - Junction 1 (for whole period)

|      | To |      |      |      |
|------|----|------|------|------|
|      | A  | B    | C    | D    |
| From | A  | 0.00 | 0.27 | 0.61 |
|      | B  | 0.34 | 0.00 | 0.22 |
|      | C  | 0.79 | 0.02 | 0.00 |
|      | D  | 0.19 | 0.61 | 0.20 |

# Vehicle Mix

## Average PCU Per Vehicle - Junction 1 (for whole period)

|      | To |       |       |       |
|------|----|-------|-------|-------|
|      | A  | B     | C     | D     |
| From | A  | 1.000 | 1.000 | 1.000 |
|      | B  | 1.000 | 1.000 | 1.000 |
|      | C  | 1.000 | 1.000 | 1.000 |
|      | D  | 1.000 | 1.000 | 1.000 |

## Heavy Vehicle Percentages - Junction 1 (for whole period)

|      | To |     |     |     |
|------|----|-----|-----|-----|
|      | A  | B   | C   | D   |
| From | A  | 0.0 | 0.0 | 0.0 |
|      | B  | 0.0 | 0.0 | 0.0 |
|      | C  | 0.0 | 0.0 | 0.0 |
|      | D  | 0.0 | 0.0 | 0.0 |

# Results

## Results Summary for whole modelled period

| Stream | Max RFC | Max Delay (s) | Max Queue (PCU) | Max LOS | Average Demand (PCU/hr) | Total Junction Arrivals (PCU) | Total Queueing Delay (PCU-min) | Average Queueing Delay (s) | Rate Of Queueing Delay (PCU-min/min) | Inclusive Total Queueing Delay (PCU-min) | Inclusive Average Queueing Delay (s) |
|--------|---------|---------------|-----------------|---------|-------------------------|-------------------------------|--------------------------------|----------------------------|--------------------------------------|------------------------------------------|--------------------------------------|
| B-ACD  | 0.47    | 14.19         | 0.86            | B       | 184.44                  | 276.66                        | 55.54                          | 12.05                      | 0.62                                 | 55.55                                    | 12.05                                |
| A-BCD  | 0.03    | 5.42          | 0.05            | A       | 18.74                   | 28.12                         | 3.14                           | 6.70                       | 0.03                                 | 3.14                                     | 6.70                                 |
| A-B    | -       | -             | -               | -       | 34.81                   | 52.21                         | -                              | -                          | -                                    | -                                        | -                                    |
| A-C    | -       | -             | -               | -       | 76.75                   | 115.13                        | -                              | -                          | -                                    | -                                        | -                                    |
| D-ABC  | 0.32    | 13.01         | 0.46            | B       | 108.28                  | 162.42                        | 31.13                          | 11.50                      | 0.35                                 | 31.13                                    | 11.50                                |
| C-ABD  | 0.01    | 4.61          | 0.01            | A       | 5.03                    | 7.55                          | 0.60                           | 4.77                       | 0.01                                 | 0.60                                     | 4.77                                 |

|     |   |   |   |   |        |        |   |   |   |   |   |
|-----|---|---|---|---|--------|--------|---|---|---|---|---|
| C-D | - | - | - | - | 43.78  | 65.66  | - | - | - | - | - |
| C-A | - | - | - | - | 176.92 | 265.39 | - | - | - | - | - |

## Main Results for each time segment

### Main results: (16:15-16:30)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 151.32                | 37.83                   | 149.62              | 0.00                       | 500.17            | 0.303 | 0.00              | 0.43            | 10.222    | B   |
| A-BCD  | 14.76                 | 3.69                    | 14.65               | 0.00                       | 695.83            | 0.021 | 0.00              | 0.03            | 5.285     | A   |
| A-B    | 28.75                 | 7.19                    | 28.75               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 63.40                 | 15.85                   | 63.40               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 88.84                 | 22.21                   | 87.84               | 0.00                       | 439.58            | 0.202 | 0.00              | 0.25            | 10.207    | B   |
| C-ABD  | 3.87                  | 0.97                    | 3.85                | 0.00                       | 785.49            | 0.005 | 0.00              | 0.01            | 4.605     | A   |
| C-D    | 35.97                 | 8.99                    | 35.97               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 145.36                | 36.34                   | 145.36              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

### Main results: (16:30-16:45)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 180.69                | 45.17                   | 180.11              | 0.00                       | 489.50            | 0.369 | 0.43              | 0.57            | 11.611    | B   |
| A-BCD  | 18.18                 | 4.55                    | 18.15               | 0.00                       | 691.98            | 0.026 | 0.03              | 0.03            | 5.342     | A   |
| A-B    | 34.16                 | 8.54                    | 34.16               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 75.32                 | 18.83                   | 75.32               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 106.08                | 26.52                   | 105.77              | 0.00                       | 425.69            | 0.249 | 0.25              | 0.33            | 11.241    | B   |
| C-ABD  | 4.86                  | 1.22                    | 4.86                | 0.00                       | 798.82            | 0.006 | 0.01              | 0.01            | 4.533     | A   |
| C-D    | 42.90                 | 10.73                   | 42.90               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 173.39                | 43.35                   | 173.39              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

### Main results: (16:45-17:00)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 221.31                | 55.33                   | 220.20              | 0.00                       | 474.82            | 0.466 | 0.57              | 0.85            | 14.074    | B   |
| A-BCD  | 23.27                 | 5.82                    | 23.22               | 0.00                       | 687.48            | 0.034 | 0.03              | 0.05            | 5.419     | A   |
| A-B    | 41.52                 | 10.38                   | 41.52               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 91.55                 | 22.89                   | 91.55               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 129.92                | 32.48                   | 129.39              | 0.00                       | 406.68            | 0.319 | 0.33              | 0.46            | 12.956    | B   |
| C-ABD  | 6.36                  | 1.59                    | 6.35                | 0.00                       | 817.63            | 0.008 | 0.01              | 0.01            | 4.437     | A   |
| C-D    | 52.46                 | 13.12                   | 52.46               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 212.03                | 53.01                   | 212.03              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

### Main results: (17:00-17:15)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 221.31                | 55.33                   | 221.26              | 0.00                       | 474.76            | 0.466 | 0.85              | 0.86            | 14.194    | B   |
| A-BCD  | 23.28                 | 5.82                    | 23.28               | 0.00                       | 687.27            | 0.034 | 0.05              | 0.05            | 5.423     | A   |
| A-B    | 41.52                 | 10.38                   | 41.52               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 91.55                 | 22.89                   | 91.55               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 129.92                | 32.48                   | 129.90              | 0.00                       | 406.53            | 0.320 | 0.46              | 0.46            | 13.011    | B   |
| C-ABD  | 6.36                  | 1.59                    | 6.36                | 0.00                       | 817.52            | 0.008 | 0.01              | 0.01            | 4.439     | A   |
| C-D    | 52.46                 | 13.12                   | 52.46               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 212.03                | 53.01                   | 212.03              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

### Main results: (17:15-17:30)

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 180.69                | 45.17                   | 181.75              | 0.00                       | 489.40            | 0.369 | 0.86              | 0.60            | 11.741    | B   |
| A-BCD  | 18.20                 | 4.55                    | 18.24               | 0.00                       | 691.64            | 0.026 | 0.05              | 0.03            | 5.346     | A   |
| A-B    | 34.15                 | 8.54                    | 34.15               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 75.31                 | 18.83                   | 75.31               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 106.08                | 26.52                   | 106.59              | 0.00                       | 425.46            | 0.249 | 0.46              | 0.34            | 11.309    | B   |
| C-ABD  | 4.86                  | 1.22                    | 4.87                | 0.00                       | 798.64            | 0.006 | 0.01              | 0.01            | 4.536     | A   |
| C-D    | 42.90                 | 10.72                   | 42.90               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 173.39                | 43.35                   | 173.39              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Main results: (17:30-17:45)**

| Stream | Total Demand (PCU/hr) | Junction Arrivals (PCU) | Entry Flow (PCU/hr) | Pedestrian Demand (Ped/hr) | Capacity (PCU/hr) | RFC   | Start Queue (PCU) | End Queue (PCU) | Delay (s) | LOS |
|--------|-----------------------|-------------------------|---------------------|----------------------------|-------------------|-------|-------------------|-----------------|-----------|-----|
| B-ACD  | 151.32                | 37.83                   | 151.95              | 0.00                       | 500.01            | 0.303 | 0.60              | 0.44            | 10.363    | B   |
| A-BCD  | 14.77                 | 3.69                    | 14.81               | 0.00                       | 695.35            | 0.021 | 0.03              | 0.03            | 5.289     | A   |
| A-B    | 28.74                 | 7.19                    | 28.74               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| A-C    | 63.39                 | 15.85                   | 63.39               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| D-ABC  | 88.84                 | 22.21                   | 89.16               | 0.00                       | 439.26            | 0.202 | 0.34              | 0.26            | 10.291    | B   |
| C-ABD  | 3.88                  | 0.97                    | 3.88                | 0.00                       | 785.21            | 0.005 | 0.01              | 0.01            | 4.609     | A   |
| C-D    | 35.96                 | 8.99                    | 35.96               | 0.00                       | -                 | -     | -                 | -               | -         | -   |
| C-A    | 145.36                | 36.34                   | 145.36              | 0.00                       | -                 | -     | -                 | -               | -         | -   |

**Queueing Delay Results for each time segment****Queueing Delay results: (16:15-16:30)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 6.08                           | 0.41                                 | 10.222                                 | B                             | B                           |
| A-BCD  | 0.38                           | 0.03                                 | 5.285                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 3.57                           | 0.24                                 | 10.207                                 | B                             | B                           |
| C-ABD  | 0.08                           | 0.01                                 | 4.605                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (16:30-16:45)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 8.30                           | 0.55                                 | 11.611                                 | B                             | B                           |
| A-BCD  | 0.50                           | 0.03                                 | 5.342                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 4.75                           | 0.32                                 | 11.241                                 | B                             | B                           |
| C-ABD  | 0.10                           | 0.01                                 | 4.533                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (16:45-17:00)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 12.12                          | 0.81                                 | 14.074                                 | B                             | B                           |
| A-BCD  | 0.68                           | 0.05                                 | 5.419                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 6.64                           | 0.44                                 | 12.956                                 | B                             | B                           |
| C-ABD  | 0.13                           | 0.01                                 | 4.437                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (17:00-17:15)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 12.84                          | 0.86                                 | 14.194                                 | B                             | B                           |
| A-BCD  | 0.69                           | 0.05                                 | 5.423                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 6.94                           | 0.46                                 | 13.011                                 | B                             | B                           |
| C-ABD  | 0.13                           | 0.01                                 | 4.439                                  | A                             | A                           |
| C-D    | -                              | -                                    | -                                      | -                             | -                           |
| C-A    | -                              | -                                    | -                                      | -                             | -                           |

**Queueing Delay results: (17:15-17:30)**

| Stream | Queueing Total Delay (PCU-min) | Queueing Rate Of Delay (PCU-min/min) | Average Delay Per Arriving Vehicle (s) | Unsignalised Level Of Service | Signalised Level Of Service |
|--------|--------------------------------|--------------------------------------|----------------------------------------|-------------------------------|-----------------------------|
| B-ACD  | 9.35                           | 0.62                                 | 11.741                                 | B                             | B                           |
| A-BCD  | 0.50                           | 0.03                                 | 5.346                                  | A                             | A                           |
| A-B    | -                              | -                                    | -                                      | -                             | -                           |
| A-C    | -                              | -                                    | -                                      | -                             | -                           |
| D-ABC  | 5.25                           | 0.35                                 | 11.309                                 | B                             | B                           |

|              |      |      |       |   |   |
|--------------|------|------|-------|---|---|
| <b>C-ABD</b> | 0.10 | 0.01 | 4.536 | A | A |
| <b>C-D</b>   | -    | -    | -     | - | - |
| <b>C-A</b>   | -    | -    | -     | - | - |

**Queueing Delay results: (17:30-17:45)**

| <b>Stream</b> | <b>Queueing Total Delay (PCU-min)</b> | <b>Queueing Rate Of Delay (PCU-min/min)</b> | <b>Average Delay Per Arriving Vehicle (s)</b> | <b>Unsignalised Level Of Service</b> | <b>Signalised Level Of Service</b> |
|---------------|---------------------------------------|---------------------------------------------|-----------------------------------------------|--------------------------------------|------------------------------------|
| <b>B-ACD</b>  | 6.85                                  | 0.46                                        | 10.363                                        | B                                    | B                                  |
| <b>A-BCD</b>  | 0.39                                  | 0.03                                        | 5.289                                         | A                                    | A                                  |
| <b>A-B</b>    | -                                     | -                                           | -                                             | -                                    | -                                  |
| <b>A-C</b>    | -                                     | -                                           | -                                             | -                                    | -                                  |
| <b>D-ABC</b>  | 3.98                                  | 0.27                                        | 10.291                                        | B                                    | B                                  |
| <b>C-ABD</b>  | 0.08                                  | 0.01                                        | 4.609                                         | A                                    | A                                  |
| <b>C-D</b>    | -                                     | -                                           | -                                             | -                                    | -                                  |
| <b>C-A</b>    | -                                     | -                                           | -                                             | -                                    | -                                  |

## **APPENDIX 7**

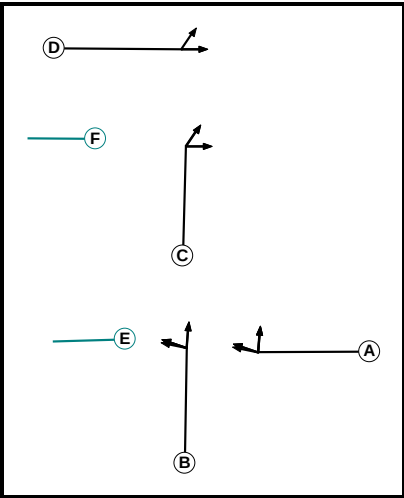
### **LINSIG Output for A483/A541 Mold Road/Summerhill Road Roundabout**

**User and Project Details**

|            |                                              |
|------------|----------------------------------------------|
| Project:   | Proposed Residential Development, Summerhill |
| Title:     | Network Model                                |
| Location:  |                                              |
| File name: | A483 J5 v2 Final.lsg3x                       |
| Author:    |                                              |
| Company:   | CROFT                                        |
| Address:   |                                              |
| Notes:     |                                              |



C1  
Phase Diagram



Phase Input Data

| Phase Name | Phase Type | Stage Stream | Assoc. Phase | Street Min | Cont Min |
|------------|------------|--------------|--------------|------------|----------|
| A          | Traffic    | 1            |              | -9999      | 7        |
| B          | Traffic    | 1            |              | -9999      | 7        |
| C          | Traffic    | 2            |              | -9999      | 7        |
| D          | Traffic    | 2            |              | -9999      | 7        |
| E          | Dummy      | 1            |              | -9999      | 3        |
| F          | Dummy      | 2            |              | -9999      | 3        |

Phase Intergreens Matrix

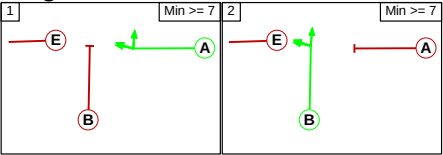
|                      |                |   |   |   |   |   |   |
|----------------------|----------------|---|---|---|---|---|---|
| Terminating<br>Phase | Starting Phase |   |   |   |   |   |   |
|                      |                | A | B | C | D | E | F |
|                      | A              |   | 7 | - | - | 3 | - |
|                      | B              | 7 |   | - | - | 3 | - |
|                      | C              | - | - |   | 7 | - | 3 |
|                      | D              | - | - | 7 |   | - | 3 |
|                      | E              | 2 | 2 | - | - |   | - |
|                      | F              | - | - | 2 | 2 | - |   |

Phases in Stage

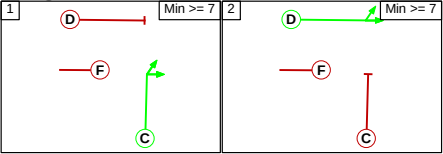
| Stream | Stage No. | Phases in Stage |
|--------|-----------|-----------------|
| 1      | 1         | A               |
| 1      | 2         | B               |
| 2      | 1         | C               |
| 2      | 2         | D               |

Stage Diagram

Stage Stream: 1



Stage Stream: 2



Phase Delays

Stage Stream: 1

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

Stage Stream: 2

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

Prohibited Stage Change

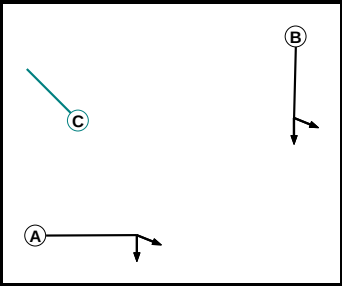
Stage Stream: 1

|            |          |   |   |
|------------|----------|---|---|
|            | To Stage |   |   |
| From Stage |          | 1 | 2 |
|            | 1        |   | 7 |
|            | 2        | 7 |   |

Stage Stream: 2

|            |          |   |   |
|------------|----------|---|---|
|            | To Stage |   |   |
| From Stage |          | 1 | 2 |
|            | 1        |   | 7 |
|            | 2        | 7 |   |

C2  
Phase Diagram



Phase Input Data

| Phase Name | Phase Type | Stage Stream | Assoc. Phase | Street Min | Cont Min |
|------------|------------|--------------|--------------|------------|----------|
| A          | Traffic    | 1            |              | -9999      | 7        |
| B          | Traffic    | 1            |              | -9999      | 7        |
| C          | Dummy      | 1            |              | -9999      | 3        |

Phase Intergreens Matrix

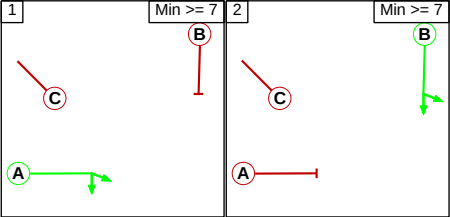
|                   |                |   |   |   |
|-------------------|----------------|---|---|---|
|                   | Starting Phase |   |   |   |
| Terminating Phase |                | A | B | C |
|                   | A              |   | 7 | 3 |
|                   | B              | 7 |   | 3 |
|                   | C              | 2 | 2 |   |

Phases in Stage

| Stream | Stage No. | Phases in Stage |
|--------|-----------|-----------------|
| 1      | 1         | A               |
| 1      | 2         | B               |

Stage Diagram

Stage Stream: 1



**Phase Delays****Stage Stream: 1**

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

**Prohibited Stage Change****Stage Stream: 1**

|            |          |   |
|------------|----------|---|
|            | To Stage |   |
| From Stage | 1        | 2 |
|            | 1        | 7 |
|            | 2        | 7 |

**Give-Way Lane Input Data**

| Junction: J1: A483 J5        |                    |                                   |                                   |               |                  |                                     |                          |                            |     |                        |                               |
|------------------------------|--------------------|-----------------------------------|-----------------------------------|---------------|------------------|-------------------------------------|--------------------------|----------------------------|-----|------------------------|-------------------------------|
| Lane                         | Movement           | Max Flow when Giving Way (PCU/Hr) | Min Flow when Giving Way (PCU/Hr) | Opposing Lane | Opp. Lane Coeff. | Opp. Mvmnts.                        | Right Turn Storage (PCU) | Non-Blocking Storage (PCU) | RTF | Right Turn Move up (s) | Max Turns in Intergreen (PCU) |
| J1:10/1<br>(Summerhill Road) | J1:2/1 (Left)      | 750                               | 0                                 | J1:7/1        | 0.22             | To J1:4/1 (Ahead) To J1:4/2 (Ahead) | -                        | -                          | -   | -                      | -                             |
|                              |                    |                                   |                                   | J1:8/1        | 0.22             | To J1:4/1 (Left) To J1:4/2 (Left)   |                          |                            |     |                        |                               |
|                              |                    |                                   |                                   | J1:8/2        | 0.22             | To J1:2/1 (Ahead)                   |                          |                            |     |                        |                               |
|                              | J1:2/2 (Left)      | 750                               | 0                                 | J1:7/1        | 0.22             | All                                 |                          |                            |     |                        |                               |
|                              |                    |                                   |                                   | J1:7/2        | 0.22             | All                                 |                          |                            |     |                        |                               |
|                              |                    |                                   |                                   | J1:8/1        | 0.22             | All                                 |                          |                            |     |                        |                               |
|                              |                    |                                   |                                   | J1:8/2        | 0.22             | All                                 |                          |                            |     |                        |                               |
|                              | J1:4/1<br>(U-Turn) | 750                               | 0                                 | J1:7/1        | 0.22             | To J1:4/1 (Ahead)                   |                          |                            |     |                        |                               |
|                              |                    |                                   |                                   | J1:8/1        | 0.22             | To J1:4/1 (Left)                    |                          |                            |     |                        |                               |

| Junction: J2: A483 J5           |                   |                                               |                                               |                  |                        |                                        |                                |                                  |     |                              |                                        |
|---------------------------------|-------------------|-----------------------------------------------|-----------------------------------------------|------------------|------------------------|----------------------------------------|--------------------------------|----------------------------------|-----|------------------------------|----------------------------------------|
| Lane                            | Movement          | Max Flow<br>when<br>Giving<br>Way<br>(PCU/Hr) | Min Flow<br>when<br>Giving<br>Way<br>(PCU/Hr) | Opposing<br>Lane | Opp.<br>Lane<br>Coeff. | Opp.<br>Mvmnts.                        | Right Turn<br>Storage<br>(PCU) | Non-Blocking<br>Storage<br>(PCU) | RTF | Right Turn<br>Move up<br>(s) | Max Turns<br>in<br>Intergreen<br>(PCU) |
| J2:2/1<br>(Mold Road (e)<br>NB) | J2:6/1 (Left)     | 802                                           | 0                                             | J2:4/1           | 0.28                   | All                                    | -                              | -                                | -   | -                            | -                                      |
|                                 |                   |                                               |                                               | J2:4/2           | 0.28                   | To J2:6/2 (Ahead)                      |                                |                                  |     |                              |                                        |
| J2:2/2<br>(Mold Road (e)<br>NB) | J2:5/1<br>(Ahead) | 802                                           | 0                                             | J2:4/1           | 0.28                   | All                                    | -                              | -                                | -   | -                            | -                                      |
|                                 |                   |                                               |                                               | J2:4/2           | 0.28                   | To J2:5/1 (Right) To J2:6/2<br>(Ahead) |                                |                                  |     |                              |                                        |
| J2:2/3<br>(Mold Road (e)<br>NB) | J2:5/2<br>(Ahead) | 802                                           | 0                                             | J2:4/1           | 0.28                   | All                                    | -                              | -                                | -   | -                            | -                                      |
|                                 |                   |                                               |                                               | J2:4/2           | 0.28                   | All                                    |                                |                                  |     |                              |                                        |

**Lane Input Data**

| Junction: J1: A483 J5                |           |        |             |           |                       |               |                                   |                |          |               |                |                    |
|--------------------------------------|-----------|--------|-------------|-----------|-----------------------|---------------|-----------------------------------|----------------|----------|---------------|----------------|--------------------|
| Lane                                 | Lane Type | Phases | Start Disp. | End Disp. | Physical Length (PCU) | Sat Flow Type | Def User Saturation Flow (PCU/Hr) | Lane Width (m) | Gradient | Nearside Lane | Turns          | Turning Radius (m) |
| J1:1/1<br>(Mold Road (w) SB)         | U         | D      | 2           | 3         | 60.0                  | Geom          | -                                 | 4.20           | 0.00     | Y             | Arm J1:3 Left  | Inf                |
|                                      |           |        |             |           |                       |               |                                   |                |          |               | Arm J1:5 Ahead | Inf                |
| J1:1/2<br>(Mold Road (w) SB)         | U         | D      | 2           | 3         | 60.0                  | Geom          | -                                 | 4.20           | 0.00     | Y             | Arm J1:5 Ahead | Inf                |
| J1:2/1<br>(Circ at Mold Road (w) SB) | U         | C      | 2           | 3         | 12.2                  | Geom          | -                                 | 4.25           | 0.00     | Y             | Arm J1:3 Ahead | Inf                |
|                                      |           |        |             |           |                       |               |                                   |                |          |               | Arm J1:5 Right | Inf                |
| J1:2/2<br>(Circ at Mold Road (w) SB) | U         | C      | 2           | 3         | 12.2                  | Geom          | -                                 | 4.25           | 0.00     | Y             | Arm J1:3 Ahead | Inf                |
|                                      |           |        |             |           |                       |               |                                   |                |          |               | Arm J1:5 Right | Inf                |
| J1:3/1<br>(A483 NB On Slip)          | U         |        | 2           | 3         | 12.2                  | Geom          | -                                 | 3.00           | 0.00     | Y             | Arm J1:6 Ahead | Inf                |
| J1:3/2<br>(A483 NB On Slip)          | U         |        | 2           | 3         | 2.8                   | Geom          | -                                 | 3.00           | 0.00     | Y             | Arm J1:6 Ahead | Inf                |
| J1:4/1                               | U         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -              | -                  |
| J1:4/2                               | U         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -              | -                  |
| J1:5/1                               | U         |        | 2           | 3         | 60.0                  | Geom          | -                                 | 4.25           | 0.00     | Y             | Arm J2:3 Ahead | Inf                |
| J1:5/2                               | U         |        | 2           | 3         | 60.0                  | Geom          | -                                 | 4.25           | 0.00     | Y             | Arm J2:3 Ahead | Inf                |
| J1:6/1                               | U         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -              | -                  |
| J1:6/2                               | U         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -              | -                  |
| J1:7/1<br>(Circ at NB Off Slip)      | U         | A      | 2           | 3         | 13.9                  | Geom          | -                                 | 4.75           | 0.00     | Y             | Arm J1:2 Right | Inf                |
|                                      |           |        |             |           |                       |               |                                   |                |          |               | Arm J1:4 Ahead | Inf                |
|                                      |           |        |             |           |                       |               |                                   |                |          |               | Arm J1:9 Ahead | Inf                |
| J1:7/2<br>(Circ at NB Off Slip)      | U         | A      | 2           | 3         | 13.9                  | Geom          | -                                 | 4.75           | 0.00     | Y             | Arm J1:2 Right | Inf                |
| J1:8/1                               | U         | B      | 2           | 3         | 60.0                  | Geom          | -                                 | 4.50           | 0.00     | Y             | Arm J1:4 Left  | Inf                |

## Full Input Data And Results

|                              |   |   |   |   |      |      |   |      |      |   |                 |     |
|------------------------------|---|---|---|---|------|------|---|------|------|---|-----------------|-----|
| (A483 NB Off-Slip)           |   |   |   |   |      |      |   |      |      |   | Arm J1:9 Left   | Inf |
| J1:8/2<br>(A483 NB Off-Slip) | U | B | 2 | 3 | 60.0 | Geom | - | 4.50 | 0.00 | Y | Arm J1:2 Ahead  | Inf |
|                              |   |   |   |   |      |      |   |      |      |   | Arm J1:4 Left   | Inf |
| J1:9/1                       | U |   | 2 | 3 | 60.0 | Inf  | - | -    | -    | - | -               | -   |
| J1:10/1<br>(Summerhill Road) | O |   | 2 | 3 | 60.0 | Geom | - | 5.00 | 0.00 | Y | Arm J1:2 Left   | Inf |
|                              |   |   |   |   |      |      |   |      |      |   | Arm J1:4 U-Turn | Inf |

| Junction: J2: A483 J5                |           |        |             |           |                       |               |                                   |                |          |               |                |                    |
|--------------------------------------|-----------|--------|-------------|-----------|-----------------------|---------------|-----------------------------------|----------------|----------|---------------|----------------|--------------------|
| Lane                                 | Lane Type | Phases | Start Disp. | End Disp. | Physical Length (PCU) | Sat Flow Type | Def User Saturation Flow (PCU/Hr) | Lane Width (m) | Gradient | Nearside Lane | Turns          | Turning Radius (m) |
| J2:1/1<br>(A438 SB Off Slip)         | U         | B      | 2           | 3         | 60.0                  | Geom          | -                                 | 3.50           | 0.00     | Y             | Arm J2:4 Ahead | Inf                |
| J2:1/2<br>(A438 SB Off Slip)         | U         | B      | 2           | 3         | 60.0                  | Geom          | -                                 | 3.50           | 0.00     | N             | Arm J2:7 Left  | Inf                |
|                                      |           |        |             |           |                       |               |                                   |                |          |               | Arm J2:4 Ahead | Inf                |
|                                      |           |        |             |           |                       |               |                                   |                |          |               | Arm J2:7 Left  | Inf                |
| J2:2/1<br>(Mold Road (e) NB)         | O         |        | 2           | 3         | 60.0                  | Geom          | -                                 | 3.50           | 0.00     | Y             | Arm J2:6 Left  | Inf                |
| J2:2/2<br>(Mold Road (e) NB)         | O         |        | 2           | 3         | 60.0                  | Geom          | -                                 | 3.50           | 0.00     | N             | Arm J2:5 Ahead | Inf                |
| J2:2/3<br>(Mold Road (e) NB)         | O         |        | 2           | 3         | 60.0                  | Geom          | -                                 | 3.50           | 0.00     | N             | Arm J2:5 Ahead | Inf                |
| J2:3/1<br>(Circ at A543 SB Off Slip) | U         | A      | 2           | 3         | 12.2                  | Geom          | -                                 | 4.25           | 0.00     | Y             | Arm J2:7 Ahead | Inf                |
| J2:3/2<br>(Circ at A543 SB Off Slip) | U         | A      | 2           | 3         | 12.2                  | Geom          | -                                 | 4.25           | 0.00     | Y             | Arm J2:4 Right | Inf                |
|                                      |           |        |             |           |                       |               |                                   |                |          |               | Arm J2:7 Ahead | Inf                |
| J2:4/1<br>(Circ at Mold Road (e) NB) | U         |        | 2           | 3         | 7.8                   | Geom          | -                                 | 4.75           | 0.00     | Y             | Arm J2:6 Ahead | Inf                |
| J2:4/2<br>(Circ at Mold Road (e) NB) | U         |        | 2           | 3         | 60.0                  | Geom          | -                                 | 4.75           | 0.00     | Y             | Arm J2:5 Right | Inf                |
|                                      |           |        |             |           |                       |               |                                   |                |          |               | Arm J2:6 Ahead | Inf                |
| J2:5/1                               | U         |        | 2           | 3         | 60.0                  | Geom          | -                                 | 4.75           | 0.00     | Y             | Arm J1:7 Ahead | Inf                |
| J2:5/2                               | U         |        | 2           | 3         | 60.0                  | Geom          | -                                 | 4.75           | 0.00     | Y             | Arm J1:7 Ahead | Inf                |
| J2:6/1<br>(A483 SB On Slip)          | U         |        | 2           | 3         | 60.0                  | Geom          | -                                 | 2.90           | 0.00     | Y             | Arm J2:8 Ahead | Inf                |
| J2:6/2<br>(A483 SB On Slip)          | U         |        | 2           | 3         | 60.0                  | Geom          | -                                 | 2.80           | 0.00     | N             | Arm J2:8 Ahead | Inf                |
| J2:7/1                               | U         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -              | -                  |
| J2:7/2                               | U         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -              | -                  |
| J2:8/1                               | U         |        | 2           | 3         | 60.0                  | Inf           | -                                 | -              | -        | -             | -              | -                  |

## Full Input Data And Results

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|        |   |  |   |   |      |     |   |   |   |   |   |   |
|--------|---|--|---|---|------|-----|---|---|---|---|---|---|
| J2:8/2 | U |  | 2 | 3 | 60.0 | Inf | - | - | - | - | - | - |
|--------|---|--|---|---|------|-----|---|---|---|---|---|---|

## Traffic Flow Groups

| Flow Group                    | Start Time | End Time | Duration | Formula |
|-------------------------------|------------|----------|----------|---------|
| 1: 'AM Peak 2022 without Dev' | 07:45      | 08:45    | 01:00    |         |
| 2: 'PM Peak 2022 without Dev' | 16:30      | 17:30    | 01:00    |         |
| 3: 'AM Peak 2022 with Dev'    | 07:45      | 08:45    | 01:00    |         |
| 4: 'PM Peak 2022 with Dev'    | 16:30      | 17:30    | 01:00    |         |

**Scenario 1: 'AM Peak 2022 Base'** (FG1: 'AM Peak 2022 without Dev',  
**Traffic Flows, Desired**  
**Desired Flow :**

|        | Destination |     |      |     |     |     |      |
|--------|-------------|-----|------|-----|-----|-----|------|
|        |             | A   | B    | C   | D   | E   | Tot. |
| Origin | A           | 0   | 829  | 0   | 25  | 62  | 916  |
|        | B           | 457 | 0    | 261 | 58  | 323 | 1099 |
|        | C           | 0   | 522  | 0   | 31  | 427 | 980  |
|        | D           | 64  | 81   | 60  | 0   | 1   | 206  |
|        | E           | 113 | 640  | 404 | 0   | 0   | 1157 |
|        | Tot.        | 634 | 2072 | 725 | 114 | 813 | 4358 |

**Traffic Lane Flows**

| Lane                         | Scenario 1:<br>AM Peak<br>2022 Base |
|------------------------------|-------------------------------------|
| <b>Junction: J1: A483 J5</b> |                                     |
| J1:1/1                       | 578                                 |
| J1:1/2                       | 579                                 |
| J1:2/1                       | 581                                 |
| J1:2/2                       | 603                                 |
| J1:3/1                       | 392                                 |
| J1:3/2                       | 242                                 |
| J1:4/1                       | 406                                 |
| J1:4/2                       | 407                                 |
| J1:5/1                       | 767                                 |
| J1:5/2                       | 940                                 |
| J1:6/1                       | 392                                 |
| J1:6/2                       | 242                                 |
| J1:7/1                       | 506                                 |
| J1:7/2                       | 419                                 |
| J1:8/1                       | 458                                 |
| J1:8/2                       | 522                                 |
| J1:9/1                       | 114                                 |
| J1:10/1                      | 206                                 |
| <b>Junction: J2: A483 J5</b> |                                     |
| J2:1/1                       | 458                                 |
| J2:1/2                       | 458                                 |
| J2:2/1                       | 261                                 |
| J2:2/2                       | 419                                 |
| J2:2/3                       | 419                                 |
| J2:3/1                       | 767                                 |

## Full Input Data And Results

|        |      |
|--------|------|
| J2:3/2 | 940  |
| J2:4/1 | 232  |
| J2:4/2 | 319  |
| J2:5/1 | 506  |
| J2:5/2 | 419  |
| J2:6/1 | 493  |
| J2:6/2 | 232  |
| J2:7/1 | 1225 |
| J2:7/2 | 847  |
| J2:8/1 | 493  |
| J2:8/2 | 232  |

**Lane Saturation Flows**

| Junction: J1: A483 J5                |                          |          |               |                |                    |               |                   |                          |
|--------------------------------------|--------------------------|----------|---------------|----------------|--------------------|---------------|-------------------|--------------------------|
| Lane                                 | Lane Width (m)           | Gradient | Nearside Lane | Allowed Turns  | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| J1:1/1<br>(Mold Road (w) SB)         | 4.20                     | 0.00     | Y             | Arm J1:3 Left  | Inf                | 19.6 %        | 2035              | 2035                     |
|                                      |                          |          |               | Arm J1:5 Ahead | Inf                | 80.4 %        |                   |                          |
| J1:1/2<br>(Mold Road (w) SB)         | 4.20                     | 0.00     | Y             | Arm J1:5 Ahead | Inf                | 100.0 %       | 2035              | 2035                     |
| J1:2/1<br>(Circ at Mold Road (w) SB) | 4.25                     | 0.00     | Y             | Arm J1:3 Ahead | Inf                | 48.0 %        | 2040              | 2040                     |
|                                      |                          |          |               | Arm J1:5 Right | Inf                | 52.0 %        |                   |                          |
| J1:2/2<br>(Circ at Mold Road (w) SB) | 4.25                     | 0.00     | Y             | Arm J1:3 Ahead | Inf                | 40.1 %        | 2040              | 2040                     |
|                                      |                          |          |               | Arm J1:5 Right | Inf                | 59.9 %        |                   |                          |
| J1:3/1<br>(A483 NB On Slip)          | 3.00                     | 0.00     | Y             | Arm J1:6 Ahead | Inf                | 100.0 %       | 1915              | 1915                     |
| J1:3/2<br>(A483 NB On Slip)          | 3.00                     | 0.00     | Y             | Arm J1:6 Ahead | Inf                | 100.0 %       | 1915              | 1915                     |
| J1:4/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:4/2                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:5/1                               | 4.25                     | 0.00     | Y             | Arm J2:3 Ahead | Inf                | 100.0 %       | 2040              | 2040                     |
| J1:5/2                               | 4.25                     | 0.00     | Y             | Arm J2:3 Ahead | Inf                | 100.0 %       | 2040              | 2040                     |
| J1:6/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:6/2                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:7/1<br>(Circ at NB Off Slip)      | 4.75                     | 0.00     | Y             | Arm J1:2 Right | Inf                | 7.5 %         | 2090              | 2090                     |
|                                      |                          |          |               | Arm J1:4 Ahead | Inf                | 76.1 %        |                   |                          |
|                                      |                          |          |               | Arm J1:9 Ahead | Inf                | 16.4 %        |                   |                          |
| J1:7/2<br>(Circ at NB Off Slip)      | 4.75                     | 0.00     | Y             | Arm J1:2 Right | Inf                | 100.0 %       | 2090              | 2090                     |
| J1:8/1<br>(A483 NB Off-Slip)         | 4.50                     | 0.00     | Y             | Arm J1:4 Left  | Inf                | 93.2 %        | 2065              | 2065                     |
|                                      |                          |          |               | Arm J1:9 Left  | Inf                | 6.8 %         |                   |                          |

## Full Input Data And Results

|                              |                          |      |   |                 |     |         |      |      |
|------------------------------|--------------------------|------|---|-----------------|-----|---------|------|------|
| J1:8/2<br>(A483 NB Off-Slip) | 4.50                     | 0.00 | Y | Arm J1:2 Ahead  | Inf | 100.0 % | 2065 | 2065 |
|                              |                          |      |   | Arm J1:4 Left   | Inf | 0.0 %   |      |      |
| J1:9/1                       | Infinite Saturation Flow |      |   |                 |     |         | Inf  | Inf  |
| J1:10/1<br>(Summerhill Road) | 5.00                     | 0.00 | Y | Arm J1:2 Left   | Inf | 99.5 %  | 2115 | 2115 |
|                              |                          |      |   | Arm J1:4 U-Turn | Inf | 0.5 %   |      |      |

| Junction: J2: A483 J5                |                          |          |               |                |                    |               |                   |                          |
|--------------------------------------|--------------------------|----------|---------------|----------------|--------------------|---------------|-------------------|--------------------------|
| Lane                                 | Lane Width (m)           | Gradient | Nearside Lane | Allowed Turns  | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| J2:1/1<br>(A438 SB Off Slip)         | 3.50                     | 0.00     | Y             | Arm J2:4 Ahead | Inf                | 0.0 %         | 1965              | 1965                     |
|                                      |                          |          |               | Arm J2:7 Left  | Inf                | 100.0 %       |                   |                          |
| J2:1/2<br>(A438 SB Off Slip)         | 3.50                     | 0.00     | N             | Arm J2:4 Ahead | Inf                | 19.0 %        | 2105              | 2105                     |
|                                      |                          |          |               | Arm J2:7 Left  | Inf                | 81.0 %        |                   |                          |
| J2:2/1<br>(Mold Road (e) NB)         | 3.50                     | 0.00     | Y             | Arm J2:6 Left  | Inf                | 100.0 %       | 1965              | 1965                     |
| J2:2/2<br>(Mold Road (e) NB)         | 3.50                     | 0.00     | N             | Arm J2:5 Ahead | Inf                | 100.0 %       | 2105              | 2105                     |
| J2:2/3<br>(Mold Road (e) NB)         | 3.50                     | 0.00     | N             | Arm J2:5 Ahead | Inf                | 100.0 %       | 2105              | 2105                     |
| J2:3/1<br>(Circ at A543 SB Off Slip) | 4.25                     | 0.00     | Y             | Arm J2:7 Ahead | Inf                | 100.0 %       | 2040              | 2040                     |
| J2:3/2<br>(Circ at A543 SB Off Slip) | 4.25                     | 0.00     | Y             | Arm J2:4 Right | Inf                | 49.4 %        | 2040              | 2040                     |
|                                      |                          |          |               | Arm J2:7 Ahead | Inf                | 50.6 %        |                   |                          |
| J2:4/1<br>(Circ at Mold Road (e) NB) | 4.75                     | 0.00     | Y             | Arm J2:6 Ahead | Inf                | 100.0 %       | 2090              | 2090                     |
| J2:4/2<br>(Circ at Mold Road (e) NB) | 4.75                     | 0.00     | Y             | Arm J2:5 Right | Inf                | 27.3 %        | 2090              | 2090                     |
|                                      |                          |          |               | Arm J2:6 Ahead | Inf                | 72.7 %        |                   |                          |
| J2:5/1                               | 4.75                     | 0.00     | Y             | Arm J1:7 Ahead | Inf                | 100.0 %       | 2090              | 2090                     |
| J2:5/2                               | 4.75                     | 0.00     | Y             | Arm J1:7 Ahead | Inf                | 100.0 %       | 2090              | 2090                     |
| J2:6/1<br>(A483 SB On Slip)          | 2.90                     | 0.00     | Y             | Arm J2:8 Ahead | Inf                | 100.0 %       | 1905              | 1905                     |
| J2:6/2<br>(A483 SB On Slip)          | 2.80                     | 0.00     | N             | Arm J2:8 Ahead | Inf                | 100.0 %       | 2035              | 2035                     |
| J2:7/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J2:7/2                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J2:8/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |

|        |                          |     |     |
|--------|--------------------------|-----|-----|
| J2:8/2 | Infinite Saturation Flow | Inf | Inf |
|--------|--------------------------|-----|-----|

**Scenario 2: 'PM Peak 2022 Base' (FG2: 'PM Peak 2022 without Dev')**
**Traffic Flows, Desired**
**Desired Flow :**

|        | Destination |     |      |      |     |      |      |
|--------|-------------|-----|------|------|-----|------|------|
|        |             | A   | B    | C    | D   | E    | Tot. |
| Origin | A           | 0   | 713  | 0    | 78  | 186  | 977  |
|        | B           | 712 | 0    | 638  | 151 | 632  | 2133 |
|        | C           | 0   | 365  | 0    | 59  | 379  | 803  |
|        | D           | 27  | 88   | 40   | 0   | 4    | 159  |
|        | E           | 74  | 366  | 380  | 0   | 0    | 820  |
|        | Tot.        | 813 | 1532 | 1058 | 288 | 1201 | 4892 |

**Traffic Lane Flows**

| Lane                         | Scenario 2:<br>PM Peak<br>2022 Base |
|------------------------------|-------------------------------------|
| <b>Junction: J1: A483 J5</b> |                                     |
| J1:1/1                       | 410                                 |
| J1:1/2                       | 410                                 |
| J1:2/1                       | 597                                 |
| J1:2/2                       | 635                                 |
| J1:3/1                       | 444                                 |
| J1:3/2                       | 369                                 |
| J1:4/1                       | 621                                 |
| J1:4/2                       | 580                                 |
| J1:5/1                       | 563                                 |
| J1:5/2                       | 676                                 |
| J1:6/1                       | 444                                 |
| J1:6/2                       | 369                                 |
| J1:7/1                       | 1047                                |
| J1:7/2                       | 712                                 |
| J1:8/1                       | 401                                 |
| J1:8/2                       | 402                                 |
| J1:9/1                       | 288                                 |
| J1:10/1                      | 159                                 |
| <b>Junction: J2: A483 J5</b> |                                     |
| J2:1/1                       | 489                                 |
| J2:1/2                       | 488                                 |
| J2:2/1                       | 638                                 |
| J2:2/2                       | 783                                 |
| J2:2/3                       | 712                                 |
| J2:3/1                       | 563                                 |

## Full Input Data And Results

|        |      |
|--------|------|
| J2:3/2 | 676  |
| J2:4/1 | 210  |
| J2:4/2 | 474  |
| J2:5/1 | 1047 |
| J2:5/2 | 712  |
| J2:6/1 | 848  |
| J2:6/2 | 210  |
| J2:7/1 | 1052 |
| J2:7/2 | 480  |
| J2:8/1 | 848  |
| J2:8/2 | 210  |

**Lane Saturation Flows**

| Junction: J1: A483 J5                |                          |          |               |                |                    |               |                   |                          |
|--------------------------------------|--------------------------|----------|---------------|----------------|--------------------|---------------|-------------------|--------------------------|
| Lane                                 | Lane Width (m)           | Gradient | Nearside Lane | Allowed Turns  | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| J1:1/1<br>(Mold Road (w) SB)         | 4.20                     | 0.00     | Y             | Arm J1:3 Left  | Inf                | 18.0 %        | 2035              | 2035                     |
|                                      |                          |          |               | Arm J1:5 Ahead | Inf                | 82.0 %        |                   |                          |
| J1:1/2<br>(Mold Road (w) SB)         | 4.20                     | 0.00     | Y             | Arm J1:5 Ahead | Inf                | 100.0 %       | 2035              | 2035                     |
| J1:2/1<br>(Circ at Mold Road (w) SB) | 4.25                     | 0.00     | Y             | Arm J1:3 Ahead | Inf                | 62.0 %        | 2040              | 2040                     |
|                                      |                          |          |               | Arm J1:5 Right | Inf                | 38.0 %        |                   |                          |
| J1:2/2<br>(Circ at Mold Road (w) SB) | 4.25                     | 0.00     | Y             | Arm J1:3 Ahead | Inf                | 58.1 %        | 2040              | 2040                     |
|                                      |                          |          |               | Arm J1:5 Right | Inf                | 41.9 %        |                   |                          |
| J1:3/1<br>(A483 NB On Slip)          | 3.00                     | 0.00     | Y             | Arm J1:6 Ahead | Inf                | 100.0 %       | 1915              | 1915                     |
| J1:3/2<br>(A483 NB On Slip)          | 3.00                     | 0.00     | Y             | Arm J1:6 Ahead | Inf                | 100.0 %       | 1915              | 1915                     |
| J1:4/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:4/2                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:5/1                               | 4.25                     | 0.00     | Y             | Arm J2:3 Ahead | Inf                | 100.0 %       | 2040              | 2040                     |
| J1:5/2                               | 4.25                     | 0.00     | Y             | Arm J2:3 Ahead | Inf                | 100.0 %       | 2040              | 2040                     |
| J1:6/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:6/2                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:7/1<br>(Circ at NB Off Slip)      | 4.75                     | 0.00     | Y             | Arm J1:2 Right | Inf                | 0.0 %         | 2090              | 2090                     |
|                                      |                          |          |               | Arm J1:4 Ahead | Inf                | 78.1 %        |                   |                          |
|                                      |                          |          |               | Arm J1:9 Ahead | Inf                | 21.9 %        |                   |                          |
| J1:7/2<br>(Circ at NB Off Slip)      | 4.75                     | 0.00     | Y             | Arm J1:2 Right | Inf                | 100.0 %       | 2090              | 2090                     |
| J1:8/1<br>(A483 NB Off-Slip)         | 4.50                     | 0.00     | Y             | Arm J1:4 Left  | Inf                | 85.3 %        | 2065              | 2065                     |
|                                      |                          |          |               | Arm J1:9 Left  | Inf                | 14.7 %        |                   |                          |

## Full Input Data And Results

|                              |                          |      |   |                 |     |        |      |      |
|------------------------------|--------------------------|------|---|-----------------|-----|--------|------|------|
| J1:8/2<br>(A483 NB Off-Slip) | 4.50                     | 0.00 | Y | Arm J1:2 Ahead  | Inf | 90.8 % | 2065 | 2065 |
|                              |                          |      |   | Arm J1:4 Left   | Inf | 9.2 %  |      |      |
| J1:9/1                       | Infinite Saturation Flow |      |   |                 |     |        | Inf  | Inf  |
| J1:10/1<br>(Summerhill Road) | 5.00                     | 0.00 | Y | Arm J1:2 Left   | Inf | 97.5 % | 2115 | 2115 |
|                              |                          |      |   | Arm J1:4 U-Turn | Inf | 2.5 %  |      |      |

| Junction: J2: A483 J5                |                          |          |               |                |                    |               |                   |                          |
|--------------------------------------|--------------------------|----------|---------------|----------------|--------------------|---------------|-------------------|--------------------------|
| Lane                                 | Lane Width (m)           | Gradient | Nearside Lane | Allowed Turns  | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| J2:1/1<br>(A438 SB Off Slip)         | 3.50                     | 0.00     | Y             | Arm J2:4 Ahead | Inf                | 0.0 %         | 1965              | 1965                     |
|                                      |                          |          |               | Arm J2:7 Left  | Inf                | 100.0 %       |                   |                          |
| J2:1/2<br>(A438 SB Off Slip)         | 3.50                     | 0.00     | N             | Arm J2:4 Ahead | Inf                | 54.1 %        | 2105              | 2105                     |
|                                      |                          |          |               | Arm J2:7 Left  | Inf                | 45.9 %        |                   |                          |
| J2:2/1<br>(Mold Road (e) NB)         | 3.50                     | 0.00     | Y             | Arm J2:6 Left  | Inf                | 100.0 %       | 1965              | 1965                     |
| J2:2/2<br>(Mold Road (e) NB)         | 3.50                     | 0.00     | N             | Arm J2:5 Ahead | Inf                | 100.0 %       | 2105              | 2105                     |
| J2:2/3<br>(Mold Road (e) NB)         | 3.50                     | 0.00     | N             | Arm J2:5 Ahead | Inf                | 100.0 %       | 2105              | 2105                     |
| J2:3/1<br>(Circ at A543 SB Off Slip) | 4.25                     | 0.00     | Y             | Arm J2:7 Ahead | Inf                | 100.0 %       | 2040              | 2040                     |
| J2:3/2<br>(Circ at A543 SB Off Slip) | 4.25                     | 0.00     | Y             | Arm J2:4 Right | Inf                | 62.1 %        | 2040              | 2040                     |
|                                      |                          |          |               | Arm J2:7 Ahead | Inf                | 37.9 %        |                   |                          |
| J2:4/1<br>(Circ at Mold Road (e) NB) | 4.75                     | 0.00     | Y             | Arm J2:6 Ahead | Inf                | 100.0 %       | 2090              | 2090                     |
| J2:4/2<br>(Circ at Mold Road (e) NB) | 4.75                     | 0.00     | Y             | Arm J2:5 Right | Inf                | 55.7 %        | 2090              | 2090                     |
|                                      |                          |          |               | Arm J2:6 Ahead | Inf                | 44.3 %        |                   |                          |
| J2:5/1                               | 4.75                     | 0.00     | Y             | Arm J1:7 Ahead | Inf                | 100.0 %       | 2090              | 2090                     |
| J2:5/2                               | 4.75                     | 0.00     | Y             | Arm J1:7 Ahead | Inf                | 100.0 %       | 2090              | 2090                     |
| J2:6/1<br>(A483 SB On Slip)          | 2.90                     | 0.00     | Y             | Arm J2:8 Ahead | Inf                | 100.0 %       | 1905              | 1905                     |
| J2:6/2<br>(A483 SB On Slip)          | 2.80                     | 0.00     | N             | Arm J2:8 Ahead | Inf                | 100.0 %       | 2035              | 2035                     |
| J2:7/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J2:7/2                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J2:8/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |

|        |                          |     |     |
|--------|--------------------------|-----|-----|
| J2:8/2 | Infinite Saturation Flow | Inf | Inf |
|--------|--------------------------|-----|-----|

**Scenario 3: 'AM Peak 2022 Ass' (FG3: 'AM Peak 2022 with Dev'  
Traffic Flows, Desired**

**Desired Flow :**

|        | Destination |     |      |     |     |     |      |
|--------|-------------|-----|------|-----|-----|-----|------|
|        |             | A   | B    | C   | D   | E   | Tot. |
| Origin | A           | 0   | 829  | 0   | 31  | 62  | 922  |
|        | B           | 457 | 0    | 261 | 64  | 323 | 1105 |
|        | C           | 0   | 522  | 0   | 33  | 427 | 982  |
|        | D           | 80  | 96   | 66  | 0   | 1   | 243  |
|        | E           | 113 | 640  | 404 | 0   | 0   | 1157 |
|        | Tot.        | 650 | 2087 | 731 | 128 | 813 | 4409 |

**Traffic Lane Flows**

| Lane                         | Scenario 3:<br>AM Peak<br>2022 Ass |
|------------------------------|------------------------------------|
| <b>Junction: J1: A483 J5</b> |                                    |
| J1:1/1                       | 578                                |
| J1:1/2                       | 579                                |
| J1:2/1                       | 595                                |
| J1:2/2                       | 626                                |
| J1:3/1                       | 399                                |
| J1:3/2                       | 251                                |
| J1:4/1                       | 406                                |
| J1:4/2                       | 407                                |
| J1:5/1                       | 774                                |
| J1:5/2                       | 954                                |
| J1:6/1                       | 399                                |
| J1:6/2                       | 251                                |
| J1:7/1                       | 515                                |
| J1:7/2                       | 422                                |
| J1:8/1                       | 460                                |
| J1:8/2                       | 522                                |
| J1:9/1                       | 128                                |
| J1:10/1                      | 243                                |
| <b>Junction: J2: A483 J5</b> |                                    |
| J2:1/1                       | 461                                |
| J2:1/2                       | 461                                |
| J2:2/1                       | 261                                |
| J2:2/2                       | 422                                |
| J2:2/3                       | 422                                |
| J2:3/1                       | 774                                |

## Full Input Data And Results

|        |      |
|--------|------|
| J2:3/2 | 954  |
| J2:4/1 | 235  |
| J2:4/2 | 328  |
| J2:5/1 | 515  |
| J2:5/2 | 422  |
| J2:6/1 | 496  |
| J2:6/2 | 235  |
| J2:7/1 | 1235 |
| J2:7/2 | 852  |
| J2:8/1 | 496  |
| J2:8/2 | 235  |

**Lane Saturation Flows**

| Junction: J1: A483 J5                |                          |          |               |                |                    |               |                   |                          |
|--------------------------------------|--------------------------|----------|---------------|----------------|--------------------|---------------|-------------------|--------------------------|
| Lane                                 | Lane Width (m)           | Gradient | Nearside Lane | Allowed Turns  | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| J1:1/1<br>(Mold Road (w) SB)         | 4.20                     | 0.00     | Y             | Arm J1:3 Left  | Inf                | 19.6 %        | 2035              | 2035                     |
|                                      |                          |          |               | Arm J1:5 Ahead | Inf                | 80.4 %        |                   |                          |
| J1:1/2<br>(Mold Road (w) SB)         | 4.20                     | 0.00     | Y             | Arm J1:5 Ahead | Inf                | 100.0 %       | 2035              | 2035                     |
| J1:2/1<br>(Circ at Mold Road (w) SB) | 4.25                     | 0.00     | Y             | Arm J1:3 Ahead | Inf                | 48.1 %        | 2040              | 2040                     |
|                                      |                          |          |               | Arm J1:5 Right | Inf                | 51.9 %        |                   |                          |
| J1:2/2<br>(Circ at Mold Road (w) SB) | 4.25                     | 0.00     | Y             | Arm J1:3 Ahead | Inf                | 40.1 %        | 2040              | 2040                     |
|                                      |                          |          |               | Arm J1:5 Right | Inf                | 59.9 %        |                   |                          |
| J1:3/1<br>(A483 NB On Slip)          | 3.00                     | 0.00     | Y             | Arm J1:6 Ahead | Inf                | 100.0 %       | 1915              | 1915                     |
| J1:3/2<br>(A483 NB On Slip)          | 3.00                     | 0.00     | Y             | Arm J1:6 Ahead | Inf                | 100.0 %       | 1915              | 1915                     |
| J1:4/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:4/2                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:5/1                               | 4.25                     | 0.00     | Y             | Arm J2:3 Ahead | Inf                | 100.0 %       | 2040              | 2040                     |
| J1:5/2                               | 4.25                     | 0.00     | Y             | Arm J2:3 Ahead | Inf                | 100.0 %       | 2040              | 2040                     |
| J1:6/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:6/2                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:7/1<br>(Circ at NB Off Slip)      | 4.75                     | 0.00     | Y             | Arm J1:2 Right | Inf                | 6.8 %         | 2090              | 2090                     |
|                                      |                          |          |               | Arm J1:4 Ahead | Inf                | 74.8 %        |                   |                          |
|                                      |                          |          |               | Arm J1:9 Ahead | Inf                | 18.4 %        |                   |                          |
| J1:7/2<br>(Circ at NB Off Slip)      | 4.75                     | 0.00     | Y             | Arm J1:2 Right | Inf                | 100.0 %       | 2090              | 2090                     |
| J1:8/1<br>(A483 NB Off-Slip)         | 4.50                     | 0.00     | Y             | Arm J1:4 Left  | Inf                | 92.8 %        | 2065              | 2065                     |
|                                      |                          |          |               | Arm J1:9 Left  | Inf                | 7.2 %         |                   |                          |

## Full Input Data And Results

|                              |                          |      |   |                 |     |         |      |      |
|------------------------------|--------------------------|------|---|-----------------|-----|---------|------|------|
| J1:8/2<br>(A483 NB Off-Slip) | 4.50                     | 0.00 | Y | Arm J1:2 Ahead  | Inf | 100.0 % | 2065 | 2065 |
|                              |                          |      |   | Arm J1:4 Left   | Inf | 0.0 %   |      |      |
| J1:9/1                       | Infinite Saturation Flow |      |   |                 |     |         | Inf  | Inf  |
| J1:10/1<br>(Summerhill Road) | 5.00                     | 0.00 | Y | Arm J1:2 Left   | Inf | 99.6 %  | 2115 | 2115 |
|                              |                          |      |   | Arm J1:4 U-Turn | Inf | 0.4 %   |      |      |

| Junction: J2: A483 J5                |                          |          |               |                |                    |               |                   |                          |
|--------------------------------------|--------------------------|----------|---------------|----------------|--------------------|---------------|-------------------|--------------------------|
| Lane                                 | Lane Width (m)           | Gradient | Nearside Lane | Allowed Turns  | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| J2:1/1<br>(A438 SB Off Slip)         | 3.50                     | 0.00     | Y             | Arm J2:4 Ahead | Inf                | 0.0 %         | 1965              | 1965                     |
|                                      |                          |          |               | Arm J2:7 Left  | Inf                | 100.0 %       |                   |                          |
| J2:1/2<br>(A438 SB Off Slip)         | 3.50                     | 0.00     | N             | Arm J2:4 Ahead | Inf                | 20.2 %        | 2105              | 2105                     |
|                                      |                          |          |               | Arm J2:7 Left  | Inf                | 79.8 %        |                   |                          |
| J2:2/1<br>(Mold Road (e) NB)         | 3.50                     | 0.00     | Y             | Arm J2:6 Left  | Inf                | 100.0 %       | 1965              | 1965                     |
| J2:2/2<br>(Mold Road (e) NB)         | 3.50                     | 0.00     | N             | Arm J2:5 Ahead | Inf                | 100.0 %       | 2105              | 2105                     |
| J2:2/3<br>(Mold Road (e) NB)         | 3.50                     | 0.00     | N             | Arm J2:5 Ahead | Inf                | 100.0 %       | 2105              | 2105                     |
| J2:3/1<br>(Circ at A543 SB Off Slip) | 4.25                     | 0.00     | Y             | Arm J2:7 Ahead | Inf                | 100.0 %       | 2040              | 2040                     |
| J2:3/2<br>(Circ at A543 SB Off Slip) | 4.25                     | 0.00     | Y             | Arm J2:4 Right | Inf                | 49.3 %        | 2040              | 2040                     |
|                                      |                          |          |               | Arm J2:7 Ahead | Inf                | 50.7 %        |                   |                          |
| J2:4/1<br>(Circ at Mold Road (e) NB) | 4.75                     | 0.00     | Y             | Arm J2:6 Ahead | Inf                | 100.0 %       | 2090              | 2090                     |
| J2:4/2<br>(Circ at Mold Road (e) NB) | 4.75                     | 0.00     | Y             | Arm J2:5 Right | Inf                | 28.4 %        | 2090              | 2090                     |
|                                      |                          |          |               | Arm J2:6 Ahead | Inf                | 71.6 %        |                   |                          |
| J2:5/1                               | 4.75                     | 0.00     | Y             | Arm J1:7 Ahead | Inf                | 100.0 %       | 2090              | 2090                     |
| J2:5/2                               | 4.75                     | 0.00     | Y             | Arm J1:7 Ahead | Inf                | 100.0 %       | 2090              | 2090                     |
| J2:6/1<br>(A483 SB On Slip)          | 2.90                     | 0.00     | Y             | Arm J2:8 Ahead | Inf                | 100.0 %       | 1905              | 1905                     |
| J2:6/2<br>(A483 SB On Slip)          | 2.80                     | 0.00     | N             | Arm J2:8 Ahead | Inf                | 100.0 %       | 2035              | 2035                     |
| J2:7/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J2:7/2                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J2:8/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |

|        |                          |     |     |
|--------|--------------------------|-----|-----|
| J2:8/2 | Infinite Saturation Flow | Inf | Inf |
|--------|--------------------------|-----|-----|

**Scenario 4: 'PM Peak 2022 Ass' (FG4: 'PM Peak 2022 with Dev'****Traffic Flows, Desired****Desired Flow :**

| Origin | Destination |     |      |      |     |      |      |
|--------|-------------|-----|------|------|-----|------|------|
|        |             | A   | B    | C    | D   | E    | Tot. |
|        | A           | 0   | 713  | 0    | 93  | 186  | 992  |
|        | B           | 712 | 0    | 638  | 166 | 632  | 2148 |
|        | C           | 0   | 365  | 0    | 63  | 379  | 807  |
|        | D           | 33  | 94   | 42   | 0   | 4    | 173  |
|        | E           | 74  | 366  | 380  | 0   | 0    | 820  |
|        | Tot.        | 819 | 1538 | 1060 | 322 | 1201 | 4940 |
|        |             |     |      |      |     |      |      |

**Traffic Lane Flows**

| Lane                         | Scenario 4:<br>PM Peak<br>2022 Ass |
|------------------------------|------------------------------------|
| <b>Junction: J1: A483 J5</b> |                                    |
| J1:1/1                       | 410                                |
| J1:1/2                       | 410                                |
| J1:2/1                       | 603                                |
| J1:2/2                       | 643                                |
| J1:3/1                       | 447                                |
| J1:3/2                       | 372                                |
| J1:4/1                       | 622                                |
| J1:4/2                       | 579                                |
| J1:5/1                       | 566                                |
| J1:5/2                       | 681                                |
| J1:6/1                       | 447                                |
| J1:6/2                       | 372                                |
| J1:7/1                       | 1077                               |
| J1:7/2                       | 712                                |
| J1:8/1                       | 403                                |
| J1:8/2                       | 404                                |
| J1:9/1                       | 322                                |
| J1:10/1                      | 173                                |
| <b>Junction: J2: A483 J5</b> |                                    |
| J2:1/1                       | 496                                |
| J2:1/2                       | 496                                |
| J2:2/1                       | 638                                |
| J2:2/2                       | 798                                |
| J2:2/3                       | 712                                |
| J2:3/1                       | 566                                |

## Full Input Data And Results

|        |      |
|--------|------|
| J2:3/2 | 681  |
| J2:4/1 | 211  |
| J2:4/2 | 490  |
| J2:5/1 | 1077 |
| J2:5/2 | 712  |
| J2:6/1 | 849  |
| J2:6/2 | 211  |
| J2:7/1 | 1062 |
| J2:7/2 | 476  |
| J2:8/1 | 849  |
| J2:8/2 | 211  |

**Lane Saturation Flows**

| Junction: J1: A483 J5                |                          |          |               |                |                    |               |                   |                          |
|--------------------------------------|--------------------------|----------|---------------|----------------|--------------------|---------------|-------------------|--------------------------|
| Lane                                 | Lane Width (m)           | Gradient | Nearside Lane | Allowed Turns  | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| J1:1/1<br>(Mold Road (w) SB)         | 4.20                     | 0.00     | Y             | Arm J1:3 Left  | Inf                | 18.0 %        | 2035              | 2035                     |
|                                      |                          |          |               | Arm J1:5 Ahead | Inf                | 82.0 %        |                   |                          |
| J1:1/2<br>(Mold Road (w) SB)         | 4.20                     | 0.00     | Y             | Arm J1:5 Ahead | Inf                | 100.0 %       | 2035              | 2035                     |
| J1:2/1<br>(Circ at Mold Road (w) SB) | 4.25                     | 0.00     | Y             | Arm J1:3 Ahead | Inf                | 61.9 %        | 2040              | 2040                     |
|                                      |                          |          |               | Arm J1:5 Right | Inf                | 38.1 %        |                   |                          |
| J1:2/2<br>(Circ at Mold Road (w) SB) | 4.25                     | 0.00     | Y             | Arm J1:3 Ahead | Inf                | 57.9 %        | 2040              | 2040                     |
|                                      |                          |          |               | Arm J1:5 Right | Inf                | 42.1 %        |                   |                          |
| J1:3/1<br>(A483 NB On Slip)          | 3.00                     | 0.00     | Y             | Arm J1:6 Ahead | Inf                | 100.0 %       | 1915              | 1915                     |
| J1:3/2<br>(A483 NB On Slip)          | 3.00                     | 0.00     | Y             | Arm J1:6 Ahead | Inf                | 100.0 %       | 1915              | 1915                     |
| J1:4/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:4/2                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:5/1                               | 4.25                     | 0.00     | Y             | Arm J2:3 Ahead | Inf                | 100.0 %       | 2040              | 2040                     |
| J1:5/2                               | 4.25                     | 0.00     | Y             | Arm J2:3 Ahead | Inf                | 100.0 %       | 2040              | 2040                     |
| J1:6/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:6/2                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J1:7/1<br>(Circ at NB Off Slip)      | 4.75                     | 0.00     | Y             | Arm J1:2 Right | Inf                | 0.0 %         | 2090              | 2090                     |
|                                      |                          |          |               | Arm J1:4 Ahead | Inf                | 76.0 %        |                   |                          |
|                                      |                          |          |               | Arm J1:9 Ahead | Inf                | 24.0 %        |                   |                          |
| J1:7/2<br>(Circ at NB Off Slip)      | 4.75                     | 0.00     | Y             | Arm J1:2 Right | Inf                | 100.0 %       | 2090              | 2090                     |
| J1:8/1<br>(A483 NB Off-Slip)         | 4.50                     | 0.00     | Y             | Arm J1:4 Left  | Inf                | 84.4 %        | 2065              | 2065                     |
|                                      |                          |          |               | Arm J1:9 Left  | Inf                | 15.6 %        |                   |                          |

## Full Input Data And Results

|                              |                          |      |   |                 |     |        |      |      |
|------------------------------|--------------------------|------|---|-----------------|-----|--------|------|------|
| J1:8/2<br>(A483 NB Off-Slip) | 4.50                     | 0.00 | Y | Arm J1:2 Ahead  | Inf | 90.3 % | 2065 | 2065 |
|                              |                          |      |   | Arm J1:4 Left   | Inf | 9.7 %  |      |      |
| J1:9/1                       | Infinite Saturation Flow |      |   |                 |     |        | Inf  | Inf  |
| J1:10/1<br>(Summerhill Road) | 5.00                     | 0.00 | Y | Arm J1:2 Left   | Inf | 97.7 % | 2115 | 2115 |
|                              |                          |      |   | Arm J1:4 U-Turn | Inf | 2.3 %  |      |      |

| Junction: J2: A483 J5                |                          |          |               |                |                    |               |                   |                          |
|--------------------------------------|--------------------------|----------|---------------|----------------|--------------------|---------------|-------------------|--------------------------|
| Lane                                 | Lane Width (m)           | Gradient | Nearside Lane | Allowed Turns  | Turning Radius (m) | Turning Prop. | Sat Flow (PCU/Hr) | Flared Sat Flow (PCU/Hr) |
| J2:1/1<br>(A438 SB Off Slip)         | 3.50                     | 0.00     | Y             | Arm J2:4 Ahead | Inf                | 0.0 %         | 1965              | 1965                     |
|                                      |                          |          |               | Arm J2:7 Left  | Inf                | 100.0 %       |                   |                          |
| J2:1/2<br>(A438 SB Off Slip)         | 3.50                     | 0.00     | N             | Arm J2:4 Ahead | Inf                | 56.3 %        | 2105              | 2105                     |
|                                      |                          |          |               | Arm J2:7 Left  | Inf                | 43.8 %        |                   |                          |
| J2:2/1<br>(Mold Road (e) NB)         | 3.50                     | 0.00     | Y             | Arm J2:6 Left  | Inf                | 100.0 %       | 1965              | 1965                     |
| J2:2/2<br>(Mold Road (e) NB)         | 3.50                     | 0.00     | N             | Arm J2:5 Ahead | Inf                | 100.0 %       | 2105              | 2105                     |
| J2:2/3<br>(Mold Road (e) NB)         | 3.50                     | 0.00     | N             | Arm J2:5 Ahead | Inf                | 100.0 %       | 2105              | 2105                     |
| J2:3/1<br>(Circ at A543 SB Off Slip) | 4.25                     | 0.00     | Y             | Arm J2:7 Ahead | Inf                | 100.0 %       | 2040              | 2040                     |
| J2:3/2<br>(Circ at A543 SB Off Slip) | 4.25                     | 0.00     | Y             | Arm J2:4 Right | Inf                | 62.0 %        | 2040              | 2040                     |
|                                      |                          |          |               | Arm J2:7 Ahead | Inf                | 38.0 %        |                   |                          |
| J2:4/1<br>(Circ at Mold Road (e) NB) | 4.75                     | 0.00     | Y             | Arm J2:6 Ahead | Inf                | 100.0 %       | 2090              | 2090                     |
| J2:4/2<br>(Circ at Mold Road (e) NB) | 4.75                     | 0.00     | Y             | Arm J2:5 Right | Inf                | 56.9 %        | 2090              | 2090                     |
|                                      |                          |          |               | Arm J2:6 Ahead | Inf                | 43.1 %        |                   |                          |
| J2:5/1                               | 4.75                     | 0.00     | Y             | Arm J1:7 Ahead | Inf                | 100.0 %       | 2090              | 2090                     |
| J2:5/2                               | 4.75                     | 0.00     | Y             | Arm J1:7 Ahead | Inf                | 100.0 %       | 2090              | 2090                     |
| J2:6/1<br>(A483 SB On Slip)          | 2.90                     | 0.00     | Y             | Arm J2:8 Ahead | Inf                | 100.0 %       | 1905              | 1905                     |
| J2:6/2<br>(A483 SB On Slip)          | 2.80                     | 0.00     | N             | Arm J2:8 Ahead | Inf                | 100.0 %       | 2035              | 2035                     |
| J2:7/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J2:7/2                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |
| J2:8/1                               | Infinite Saturation Flow |          |               |                |                    |               | Inf               | Inf                      |

|        |                          |     |     |
|--------|--------------------------|-----|-----|
| J2:8/2 | Infinite Saturation Flow | Inf | Inf |
|--------|--------------------------|-----|-----|

**Network Results 'AM Peak 2022 Base'**

| Item                          | Lane Description                       | Full Phase | Demand Flow (pcu) | Sat Flow (pcu/Hr) | Capacity (pcu) | Deg Sat (%)  | Uniform Delay (pcuHr) | Rand + Oversat 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: Network Model</b> | -                                      | -          | -                 | -                 | -              | <b>87.4%</b> | <b>24.7</b>           | <b>21.6</b>                  | <b>46.2</b>         | -                         | -                                | -                          | -                    |
| <b>J1: A483 J5</b>            | -                                      | -          | -                 | -                 | -              | <b>73.9%</b> | <b>16.6</b>           | <b>9.3</b>                   | <b>25.8</b>         | -                         | -                                | -                          | -                    |
| 1/1                           | Mold Road (w) SB Left Ahead            | C1:D       | 578               | 2035              | 814            | 71.0%        | 2.4                   | 1.2                          | 3.6                 | 22.6                      | 8.0                              | 1.2                        | 9.2                  |
| 1/2                           | Mold Road (w) SB Ahead                 | C1:D       | 579               | 2035              | 814            | 71.1%        | 2.4                   | 1.2                          | 3.6                 | 22.7                      | 8.0                              | 1.2                        | 9.3                  |
| 2/1                           | Circ at Mold Road (w) SB Ahead Right   | C1:C       | 581               | 2040              | 816            | 71.2%        | 2.4                   | 1.2                          | 3.6                 | 22.3                      | 7.0                              | 1.2                        | 8.2                  |
| 2/2                           | Circ at Mold Road (w) SB Ahead Right   | C1:C       | 603               | 2040              | 816            | 73.9%        | 2.1                   | 1.4                          | 3.5                 | 21.0                      | 7.1                              | 1.4                        | 8.5                  |
| 3/1                           | A483 NB On Slip Ahead                  | -          | 392               | 1915              | 1915           | 20.5%        | 0.0                   | 0.1                          | 0.1                 | 1.2                       | 0.0                              | 0.1                        | 0.1                  |
| 3/2                           | A483 NB On Slip Ahead                  | -          | 242               | 1915              | 1915           | 12.6%        | 0.0                   | 0.1                          | 0.1                 | 1.1                       | 0.0                              | 0.1                        | 0.1                  |
| 5/1                           | Ahead                                  | -          | 767               | 2040              | 2040           | 37.6%        | 0.0                   | 0.3                          | 0.3                 | 1.4                       | 0.0                              | 0.3                        | 0.3                  |
| 5/2                           | Ahead                                  | -          | 940               | 2040              | 2040           | 46.1%        | 0.0                   | 0.4                          | 0.4                 | 1.6                       | 0.0                              | 0.4                        | 0.4                  |
| 7/1                           | Circ at NB Off Slip Right Ahead Ahead2 | C1:A       | 506               | 2090              | 836            | 60.5%        | 1.6                   | 0.8                          | 2.4                 | 17.1                      | 6.0                              | 0.8                        | 6.8                  |
| 7/2                           | Circ at NB Off Slip Right              | C1:A       | 419               | 2090              | 836            | 50.1%        | 1.6                   | 0.5                          | 2.1                 | 17.8                      | 5.2                              | 0.5                        | 5.7                  |
| 8/1                           | A483 NB Off-Slip Left Left2            | C1:B       | 458               | 2065              | 826            | 55.4%        | 1.8                   | 0.6                          | 2.4                 | 18.8                      | 5.9                              | 0.6                        | 6.5                  |
| 8/2                           | A483 NB Off-Slip Ahead Left            | C1:B       | 522               | 2065              | 826            | 63.2%        | 2.1                   | 0.9                          | 3.0                 | 20.3                      | 7.0                              | 0.9                        | 7.8                  |
| 10/1                          | Summerhill Road Left U-Turn            | -          | 206               | 2115              | 399            | 51.7%        | 0.2                   | 0.5                          | 0.7                 | 12.3                      | 1.0                              | 0.5                        | 1.6                  |
| <b>J2: A483 J5</b>            | -                                      | -          | -                 | -                 | -              | <b>87.4%</b> | <b>8.1</b>            | <b>12.3</b>                  | <b>20.4</b>         | -                         | -                                | -                          | -                    |
| 1/1                           | A438 SB Off Slip Ahead Left            | C2:B       | 458               | 1965              | 524            | 87.4%        | 2.7                   | 3.2                          | 5.8                 | 45.9                      | 7.3                              | 3.2                        | 10.4                 |
| 1/2                           | A438 SB Off Slip Ahead Left            | C2:B       | 458               | 2105              | 561            | 81.6%        | 2.6                   | 2.1                          | 4.8                 | 37.4                      | 7.1                              | 2.1                        | 9.3                  |

|     |                                      |      |                                        |      |      |       |                                          |     |     |       |                 |     |      |    |
|-----|--------------------------------------|------|----------------------------------------|------|------|-------|------------------------------------------|-----|-----|-------|-----------------|-----|------|----|
| 2/1 | Mold Road (e) NB Left                | -    | 261                                    | 1965 | 672  | 38.9% | 0.0                                      | 0.3 | 0.3 | 4.4   | 0.0             | 0.3 | 0.3  |    |
| 2/2 | Mold Road (e) NB Ahead               | -    | 419                                    | 2105 | 647  | 64.7% | 0.0                                      | 0.9 | 0.9 | 7.8   | 0.0             | 0.9 | 0.9  |    |
| 2/3 | Mold Road (e) NB Ahead               | -    | 419                                    | 2105 | 647  | 64.7% | 0.0                                      | 0.9 | 0.9 | 7.8   | 0.0             | 0.9 | 0.9  |    |
| 3/1 | Circ at A543 SB Off Slip Ahead       | C2:A | 767                                    | 2040 | 1088 | 70.5% | 1.2                                      | 1.2 | 2.4 | 11.1  | 5.7             | 1.2 | 6.9  |    |
| 3/2 | Circ at A543 SB Off Slip Right Ahead | C2:A | 940                                    | 2040 | 1088 | 86.4% | 1.6                                      | 3.0 | 4.6 | 17.8  | 8.5             | 3.0 | 11.6 |    |
| 4/1 | Circ at Mold Road (e) NB Ahead       | -    | 232                                    | 2090 | 2090 | 11.1% | 0.0                                      | 0.1 | 0.1 | 1.0   | 0.0             | 0.1 | 0.1  |    |
| 4/2 | Circ at Mold Road (e) NB Right Ahead | -    | 319                                    | 2090 | 2090 | 15.3% | 0.0                                      | 0.1 | 0.1 | 1.0   | 0.0             | 0.1 | 0.1  |    |
| 5/1 | Ahead                                | -    | 506                                    | 2090 | 2090 | 24.2% | 0.0                                      | 0.2 | 0.2 | 1.1   | 0.0             | 0.2 | 0.2  |    |
| 5/2 | Ahead                                | -    | 419                                    | 2090 | 2090 | 20.0% | 0.0                                      | 0.1 | 0.1 | 1.1   | 0.0             | 0.1 | 0.1  |    |
| 6/1 | A483 SB On Slip Ahead                | -    | 493                                    | 1905 | 1905 | 25.9% | 0.0                                      | 0.2 | 0.2 | 1.3   | 0.0             | 0.2 | 0.2  |    |
| 6/2 | A483 SB On Slip Ahead                | -    | 232                                    | 2035 | 2035 | 11.4% | 0.0                                      | 0.1 | 0.1 | 1.0   | 0.0             | 0.1 | 0.1  |    |
|     |                                      | C1   | Stream: 1 PRC for Signalled Lanes (%): |      |      | 42.4  | Total Delay for Signalled Lanes (pcuHr): |     |     | 9.81  | Cycle Time (s): |     |      | 60 |
|     |                                      | C1   | Stream: 2 PRC for Signalled Lanes (%): |      |      | 21.8  | Total Delay for Signalled Lanes (pcuHr): |     |     | 14.40 | Cycle Time (s): |     |      | 60 |
|     |                                      | C2   | Stream: 1 PRC for Signalled Lanes (%): |      |      | 3.0   | Total Delay for Signalled Lanes (pcuHr): |     |     | 17.59 | Cycle Time (s): |     |      | 60 |
|     |                                      |      | PRC Over All Lanes (%):                |      |      | 3.0   | Total Delay Over All Lanes(pcuHr):       |     |     | 46.25 |                 |     |      |    |

## Network Results 'PM Peak 2022 Base'

| Item                          | Lane Description                       | Full Phase | Demand Flow (pcu) | Sat Flow (pcu/Hr) | Capacity (pcu) | Deg Sat (%)   | Uniform Delay (pcuHr) | Rand + Oversat 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: Network Model</b> | -                                      | -          | -                 | -                 | -              | <b>124.6%</b> | <b>35.6</b>           | <b>217.7</b>                 | <b>253.3</b>        | -                         | -                                | -                          | -                    |
| <b>J1: A483 J5</b>            | -                                      | -          | -                 | -                 | -              | <b>120.9%</b> | <b>19.2</b>           | <b>83.3</b>                  | <b>102.5</b>        | -                         | -                                | -                          | -                    |
| 1/1                           | Mold Road (w) SB Left Ahead            | C1:D       | 410               | 2035              | 339            | 120.9%        | 4.5                   | 38.1                         | 42.6                | 373.7                     | 8.0                              | 38.1                       | 46.1                 |
| 1/2                           | Mold Road (w) SB Ahead                 | C1:D       | 410               | 2035              | 339            | 120.9%        | 4.5                   | 38.1                         | 42.6                | 373.7                     | 8.0                              | 38.1                       | 46.1                 |
| 2/1                           | Circ at Mold Road (w) SB Ahead Right   | C1:C       | 597               | 2040              | 1292           | 43.0%         | 1.1                   | 0.4                          | 1.5                 | 9.8                       | 5.5                              | 0.4                        | 5.9                  |
| 2/2                           | Circ at Mold Road (w) SB Ahead Right   | C1:C       | 635               | 2040              | 1292           | 45.6%         | 0.9                   | 0.4                          | 1.3                 | 7.8                       | 5.3                              | 0.4                        | 5.7                  |
| 3/1                           | A483 NB On Slip Ahead                  | -          | 444               | 1915              | 1915           | 20.3%         | 0.0                   | 0.1                          | 0.1                 | 1.2                       | 0.0                              | 0.1                        | 0.1                  |
| 3/2                           | A483 NB On Slip Ahead                  | -          | 369               | 1915              | 1915           | 16.9%         | 0.0                   | 0.1                          | 0.1                 | 1.1                       | 0.0                              | 0.1                        | 0.1                  |
| 5/1                           | Ahead                                  | -          | 563               | 2040              | 2040           | 24.8%         | 0.0                   | 0.2                          | 0.2                 | 1.2                       | 0.0                              | 0.2                        | 0.2                  |
| 5/2                           | Ahead                                  | -          | 676               | 2040              | 2040           | 29.7%         | 0.0                   | 0.2                          | 0.2                 | 1.3                       | 0.0                              | 0.2                        | 0.2                  |
| 7/1                           | Circ at NB Off Slip Right Ahead Ahead2 | C1:A       | 1047              | 2090              | 1080           | 82.7%         | 2.1                   | 2.3                          | 4.5                 | 18.0                      | 12.4                             | 2.3                        | 14.7                 |
| 7/2                           | Circ at NB Off Slip Right              | C1:A       | 712               | 2090              | 1080           | 58.2%         | 1.7                   | 0.7                          | 2.4                 | 13.6                      | 6.8                              | 0.7                        | 7.5                  |
| 8/1                           | A483 NB Off-Slip Left Left2            | C1:B       | 401               | 2065              | 585            | 68.5%         | 2.1                   | 1.1                          | 3.2                 | 28.8                      | 5.9                              | 1.1                        | 7.0                  |
| 8/2                           | A483 NB Off-Slip Ahead Left            | C1:B       | 402               | 2065              | 585            | 68.7%         | 2.1                   | 1.1                          | 3.2                 | 28.9                      | 5.9                              | 1.1                        | 7.0                  |
| 10/1                          | Summerhill Road Left U-Turn            | -          | 159               | 2115              | 321            | 49.5%         | 0.2                   | 0.5                          | 0.7                 | 15.5                      | 1.1                              | 0.5                        | 1.6                  |
| <b>J2: A483 J5</b>            | -                                      | -          | -                 | -                 | -              | <b>124.6%</b> | <b>16.4</b>           | <b>134.5</b>                 | <b>150.8</b>        | -                         | -                                | -                          | -                    |
| 1/1                           | A438 SB Off Slip Ahead Left            | C2:B       | 489               | 1965              | 753            | 64.9%         | 2.1                   | 0.9                          | 3.0                 | 22.0                      | 6.7                              | 0.9                        | 7.6                  |
| 1/2                           | A438 SB Off Slip Ahead Left            | C2:B       | 488               | 2105              | 807            | 60.5%         | 2.0                   | 0.8                          | 2.8                 | 20.5                      | 6.5                              | 0.8                        | 7.3                  |

|     |                                      |      |                                                                                                                                                                 |                               |      |                                                                                                                                                                        |                                  |      |                                                       |                |      |      |       |
|-----|--------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------|-------------------------------------------------------|----------------|------|------|-------|
| 2/1 | Mold Road (e) NB Left                | -    | 638                                                                                                                                                             | 1965                          | 703  | 90.8%                                                                                                                                                                  | 0.2                              | 4.4  | 4.6                                                   | 25.8           | 5.8  | 4.4  | 10.2  |
| 2/2 | Mold Road (e) NB Ahead               | -    | 783                                                                                                                                                             | 2105                          | 629  | 124.6%                                                                                                                                                                 | 6.7                              | 79.7 | 86.4                                                  | 397.1          | 39.2 | 79.7 | 118.8 |
| 2/3 | Mold Road (e) NB Ahead               | -    | 712                                                                                                                                                             | 2105                          | 629  | 113.3%                                                                                                                                                                 | 3.7                              | 45.6 | 49.4                                                  | 249.5          | 35.6 | 45.6 | 81.2  |
| 3/1 | Circ at A543 SB Off Slip Ahead       | C2:A | 563                                                                                                                                                             | 2040                          | 850  | 59.4%                                                                                                                                                                  | 0.7                              | 0.7  | 1.4                                                   | 10.1           | 3.5  | 0.7  | 4.2   |
| 3/2 | Circ at A543 SB Off Slip Right Ahead | C2:A | 676                                                                                                                                                             | 2040                          | 850  | 71.2%                                                                                                                                                                  | 0.9                              | 1.2  | 2.2                                                   | 12.9           | 4.6  | 1.2  | 5.9   |
| 4/1 | Circ at Mold Road (e) NB Ahead       | -    | 210                                                                                                                                                             | 2090                          | 2090 | 8.5%                                                                                                                                                                   | 0.0                              | 0.0  | 0.0                                                   | 0.9            | 0.0  | 0.0  | 0.0   |
| 4/2 | Circ at Mold Road (e) NB Right Ahead | -    | 474                                                                                                                                                             | 2090                          | 2090 | 21.1%                                                                                                                                                                  | 0.0                              | 0.1  | 0.1                                                   | 1.1            | 0.0  | 0.1  | 0.1   |
| 5/1 | Ahead                                | -    | 1047                                                                                                                                                            | 2090                          | 2090 | 42.7%                                                                                                                                                                  | 0.0                              | 0.4  | 0.4                                                   | 1.5            | 0.0  | 0.4  | 0.4   |
| 5/2 | Ahead                                | -    | 712                                                                                                                                                             | 2090                          | 2090 | 30.1%                                                                                                                                                                  | 0.0                              | 0.2  | 0.2                                                   | 1.2            | 0.0  | 0.2  | 0.2   |
| 6/1 | A483 SB On Slip Ahead                | -    | 848                                                                                                                                                             | 1905                          | 1905 | 42.8%                                                                                                                                                                  | 0.0                              | 0.4  | 0.4                                                   | 1.7            | 0.0  | 0.4  | 0.4   |
| 6/2 | A483 SB On Slip Ahead                | -    | 210                                                                                                                                                             | 2035                          | 2035 | 8.7%                                                                                                                                                                   | 0.0                              | 0.0  | 0.0                                                   | 1.0            | 0.0  | 0.0  | 0.0   |
|     |                                      |      | C1 Stream: 1 PRC for Signalled Lanes (%):<br>C1 Stream: 2 PRC for Signalled Lanes (%):<br>C2 Stream: 1 PRC for Signalled Lanes (%):<br>PRC Over All Lanes (%) : | 8.9<br>-34.3<br>26.4<br>-38.4 |      | Total Delay for Signalled Lanes (pcuHr):<br>Total Delay for Signalled Lanes (pcuHr):<br>Total Delay for Signalled Lanes (pcuHr):<br>Total Delay Over All Lanes(pcuHr): | 13.26<br>87.91<br>9.35<br>253.29 |      | Cycle Time (s):<br>Cycle Time (s):<br>Cycle Time (s): | 60<br>60<br>60 |      |      |       |

**Network Results 'AM Peak 2022 Ass'**

| Item                          | Lane Description                       | Full Phase | Demand Flow (pcu) | Sat Flow (pcu/Hr) | Capacity (pcu) | Deg Sat (%)  | Uniform Delay (pcuHr) | Rand + Oversat 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: Network Model</b> | -                                      | -          | -                 | -                 | -              | <b>88.0%</b> | <b>25.1</b>           | <b>22.9</b>                  | <b>48.0</b>         | -                         | -                                | -                          | -                    |
| <b>J1: A483 J5</b>            | -                                      | -          | -                 | -                 | -              | <b>74.2%</b> | <b>16.9</b>           | <b>9.9</b>                   | <b>26.8</b>         | -                         | -                                | -                          | -                    |
| 1/1                           | Mold Road (w) SB Left Ahead            | C1:D       | 578               | 2035              | 780            | 74.1%        | 2.6                   | 1.4                          | 4.0                 | 24.7                      | 8.2                              | 1.4                        | 9.6                  |
| 1/2                           | Mold Road (w) SB Ahead                 | C1:D       | 579               | 2035              | 780            | 74.2%        | 2.6                   | 1.4                          | 4.0                 | 24.8                      | 8.2                              | 1.4                        | 9.6                  |
| 2/1                           | Circ at Mold Road (w) SB Ahead Right   | C1:C       | 595               | 2040              | 850            | 70.0%        | 2.3                   | 1.2                          | 3.5                 | 21.2                      | 7.1                              | 1.2                        | 8.2                  |
| 2/2                           | Circ at Mold Road (w) SB Ahead Right   | C1:C       | 626               | 2040              | 850            | 73.6%        | 2.1                   | 1.4                          | 3.5                 | 20.1                      | 7.6                              | 1.4                        | 9.0                  |
| 3/1                           | A483 NB On Slip Ahead                  | -          | 399               | 1915              | 1915           | 20.8%        | 0.0                   | 0.1                          | 0.1                 | 1.2                       | 0.0                              | 0.1                        | 0.1                  |
| 3/2                           | A483 NB On Slip Ahead                  | -          | 251               | 1915              | 1915           | 13.1%        | 0.0                   | 0.1                          | 0.1                 | 1.1                       | 0.0                              | 0.1                        | 0.1                  |
| 5/1                           | Ahead                                  | -          | 774               | 2040              | 2040           | 37.9%        | 0.0                   | 0.3                          | 0.3                 | 1.4                       | 0.0                              | 0.3                        | 0.3                  |
| 5/2                           | Ahead                                  | -          | 954               | 2040              | 2040           | 46.8%        | 0.0                   | 0.4                          | 0.4                 | 1.7                       | 0.0                              | 0.4                        | 0.4                  |
| 7/1                           | Circ at NB Off Slip Right Ahead Ahead2 | C1:A       | 515               | 2090              | 801            | 64.3%        | 1.8                   | 0.9                          | 2.7                 | 18.5                      | 6.4                              | 0.9                        | 7.3                  |
| 7/2                           | Circ at NB Off Slip Right              | C1:A       | 422               | 2090              | 801            | 52.7%        | 1.7                   | 0.6                          | 2.2                 | 19.0                      | 5.4                              | 0.6                        | 5.9                  |
| 8/1                           | A483 NB Off-Slip Left Left2            | C1:B       | 460               | 2065              | 860            | 53.5%        | 1.7                   | 0.6                          | 2.3                 | 17.6                      | 5.8                              | 0.6                        | 6.3                  |
| 8/2                           | A483 NB Off-Slip Ahead Left            | C1:B       | 522               | 2065              | 860            | 60.7%        | 2.0                   | 0.8                          | 2.7                 | 19.0                      | 6.7                              | 0.8                        | 7.4                  |
| 10/1                          | Summerhill Road Left U-Turn            | -          | 243               | 2115              | 396            | 61.4%        | 0.2                   | 0.8                          | 1.0                 | 15.1                      | 1.3                              | 0.8                        | 2.1                  |
| <b>J2: A483 J5</b>            | -                                      | -          | -                 | -                 | -              | <b>88.0%</b> | <b>8.2</b>            | <b>13.0</b>                  | <b>21.2</b>         | -                         | -                                | -                          | -                    |
| 1/1                           | A438 SB Off Slip Ahead Left            | C2:B       | 461               | 1965              | 524            | 88.0%        | 2.7                   | 3.3                          | 6.0                 | 46.9                      | 7.3                              | 3.3                        | 10.6                 |
| 1/2                           | A438 SB Off Slip Ahead Left            | C2:B       | 461               | 2105              | 561            | 82.1%        | 2.6                   | 2.2                          | 4.8                 | 37.9                      | 7.2                              | 2.2                        | 9.4                  |

|     |                                      |      |                                        |      |      |       |                                          |     |     |       |                 |     |      |    |
|-----|--------------------------------------|------|----------------------------------------|------|------|-------|------------------------------------------|-----|-----|-------|-----------------|-----|------|----|
| 2/1 | Mold Road (e) NB Left                | -    | 261                                    | 1965 | 670  | 38.9% | 0.0                                      | 0.3 | 0.3 | 4.4   | 0.0             | 0.3 | 0.3  |    |
| 2/2 | Mold Road (e) NB Ahead               | -    | 422                                    | 2105 | 644  | 65.5% | 0.0                                      | 0.9 | 0.9 | 8.0   | 0.1             | 0.9 | 1.1  |    |
| 2/3 | Mold Road (e) NB Ahead               | -    | 422                                    | 2105 | 644  | 65.5% | 0.0                                      | 0.9 | 0.9 | 8.0   | 0.1             | 0.9 | 1.1  |    |
| 3/1 | Circ at A543 SB Off Slip Ahead       | C2:A | 774                                    | 2040 | 1088 | 71.1% | 1.2                                      | 1.2 | 2.4 | 11.2  | 5.7             | 1.2 | 6.9  |    |
| 3/2 | Circ at A543 SB Off Slip Right Ahead | C2:A | 954                                    | 2040 | 1088 | 87.7% | 1.6                                      | 3.4 | 5.0 | 19.0  | 9.1             | 3.4 | 12.5 |    |
| 4/1 | Circ at Mold Road (e) NB Ahead       | -    | 235                                    | 2090 | 2090 | 11.2% | 0.0                                      | 0.1 | 0.1 | 1.0   | 0.0             | 0.1 | 0.1  |    |
| 4/2 | Circ at Mold Road (e) NB Right Ahead | -    | 328                                    | 2090 | 2090 | 15.7% | 0.0                                      | 0.1 | 0.1 | 1.0   | 0.0             | 0.1 | 0.1  |    |
| 5/1 | Ahead                                | -    | 515                                    | 2090 | 2090 | 24.6% | 0.0                                      | 0.2 | 0.2 | 1.1   | 0.0             | 0.2 | 0.2  |    |
| 5/2 | Ahead                                | -    | 422                                    | 2090 | 2090 | 20.2% | 0.0                                      | 0.1 | 0.1 | 1.1   | 0.0             | 0.1 | 0.1  |    |
| 6/1 | A483 SB On Slip Ahead                | -    | 496                                    | 1905 | 1905 | 26.0% | 0.0                                      | 0.2 | 0.2 | 1.3   | 0.0             | 0.2 | 0.2  |    |
| 6/2 | A483 SB On Slip Ahead                | -    | 235                                    | 2035 | 2035 | 11.5% | 0.0                                      | 0.1 | 0.1 | 1.0   | 0.0             | 0.1 | 0.1  |    |
|     |                                      | C1   | Stream: 1 PRC for Signalled Lanes (%): |      |      | 40.0  | Total Delay for Signalled Lanes (pcuHr): |     |     | 9.89  | Cycle Time (s): |     |      | 60 |
|     |                                      | C1   | Stream: 2 PRC for Signalled Lanes (%): |      |      | 21.3  | Total Delay for Signalled Lanes (pcuHr): |     |     | 14.96 | Cycle Time (s): |     |      | 60 |
|     |                                      | C2   | Stream: 1 PRC for Signalled Lanes (%): |      |      | 2.3   | Total Delay for Signalled Lanes (pcuHr): |     |     | 18.31 | Cycle Time (s): |     |      | 60 |
|     |                                      |      | PRC Over All Lanes (%):                |      |      | 2.3   | Total Delay Over All Lanes(pcuHr):       |     |     | 48.01 |                 |     |      |    |

## Network Results 'PM Peak 2022 Ass'

| Item                          | Lane Description                       | Full Phase | Demand Flow (pcu) | Sat Flow (pcu/Hr) | Capacity (pcu) | Deg Sat (%)   | Uniform Delay (pcuHr) | Rand + Oversat 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: Network Model</b> | -                                      | -          | -                 | -                 | -              | <b>127.9%</b> | <b>37.5</b>           | <b>230.1</b>                 | <b>267.6</b>        | -                         | -                                | -                          | -                    |
| <b>J1: A483 J5</b>            | -                                      | -          | -                 | -                 | -              | <b>120.9%</b> | <b>20.8</b>           | <b>83.6</b>                  | <b>104.4</b>        | -                         | -                                | -                          | -                    |
| 1/1                           | Mold Road (w) SB Left Ahead            | C1:D       | 410               | 2035              | 339            | 120.9%        | 5.2                   | 38.1                         | 43.3                | 380.1                     | 8.4                              | 38.1                       | 46.5                 |
| 1/2                           | Mold Road (w) SB Ahead                 | C1:D       | 410               | 2035              | 339            | 120.9%        | 5.2                   | 38.1                         | 43.3                | 380.1                     | 8.4                              | 38.1                       | 46.5                 |
| 2/1                           | Circ at Mold Road (w) SB Ahead Right   | C1:C       | 603               | 2040              | 1292           | 43.3%         | 0.9                   | 0.4                          | 1.3                 | 8.1                       | 6.3                              | 0.4                        | 6.7                  |
| 2/2                           | Circ at Mold Road (w) SB Ahead Right   | C1:C       | 643               | 2040              | 1292           | 46.0%         | 0.9                   | 0.4                          | 1.3                 | 7.8                       | 4.3                              | 0.4                        | 4.7                  |
| 3/1                           | A483 NB On Slip Ahead                  | -          | 447               | 1915              | 1915           | 20.4%         | 0.0                   | 0.1                          | 0.1                 | 1.2                       | 0.0                              | 0.1                        | 0.1                  |
| 3/2                           | A483 NB On Slip Ahead                  | -          | 372               | 1915              | 1915           | 16.9%         | 0.0                   | 0.1                          | 0.1                 | 1.1                       | 0.0                              | 0.1                        | 0.1                  |
| 5/1                           | Ahead                                  | -          | 566               | 2040              | 2040           | 24.9%         | 0.0                   | 0.2                          | 0.2                 | 1.2                       | 0.0                              | 0.2                        | 0.2                  |
| 5/2                           | Ahead                                  | -          | 681               | 2040              | 2040           | 29.9%         | 0.0                   | 0.2                          | 0.2                 | 1.3                       | 0.0                              | 0.2                        | 0.2                  |
| 7/1                           | Circ at NB Off Slip Right Ahead Ahead2 | C1:A       | 1077              | 2090              | 1080           | 83.6%         | 2.5                   | 2.5                          | 5.0                 | 20.1                      | 13.7                             | 2.5                        | 16.2                 |
| 7/2                           | Circ at NB Off Slip Right              | C1:A       | 712               | 2090              | 1080           | 57.8%         | 1.6                   | 0.7                          | 2.3                 | 13.2                      | 6.8                              | 0.7                        | 7.4                  |
| 8/1                           | A483 NB Off-Slip Left Left2            | C1:B       | 403               | 2065              | 585            | 68.9%         | 2.1                   | 1.1                          | 3.2                 | 28.9                      | 5.9                              | 1.1                        | 7.0                  |
| 8/2                           | A483 NB Off-Slip Ahead Left            | C1:B       | 404               | 2065              | 585            | 69.0%         | 2.2                   | 1.1                          | 3.3                 | 29.0                      | 5.9                              | 1.1                        | 7.0                  |
| 10/1                          | Summerhill Road Left U-Turn            | -          | 173               | 2115              | 317            | 54.5%         | 0.2                   | 0.6                          | 0.8                 | 17.5                      | 1.4                              | 0.6                        | 2.0                  |
| <b>J2: A483 J5</b>            | -                                      | -          | -                 | -                 | -              | <b>127.9%</b> | <b>16.8</b>           | <b>146.5</b>                 | <b>163.3</b>        | -                         | -                                | -                          | -                    |
| 1/1                           | A438 SB Off Slip Ahead Left            | C2:B       | 496               | 1965              | 721            | 68.8%         | 2.2                   | 1.1                          | 3.3                 | 24.0                      | 6.9                              | 1.1                        | 8.0                  |
| 1/2                           | A438 SB Off Slip Ahead Left            | C2:B       | 496               | 2105              | 772            | 64.3%         | 2.2                   | 0.9                          | 3.1                 | 22.2                      | 6.8                              | 0.9                        | 7.6                  |

|     |                                      |      |      |      |      |        |     |      |      |       |      |      |       |
|-----|--------------------------------------|------|------|------|------|--------|-----|------|------|-------|------|------|-------|
| 2/1 | Mold Road (e) NB Left                | -    | 638  | 1965 | 702  | 90.9%  | 0.3 | 4.4  | 4.6  | 26.2  | 6.2  | 4.4  | 10.6  |
| 2/2 | Mold Road (e) NB Ahead               | -    | 798  | 2105 | 624  | 127.9% | 7.4 | 89.3 | 96.7 | 436.4 | 39.9 | 89.3 | 129.2 |
| 2/3 | Mold Road (e) NB Ahead               | -    | 712  | 2105 | 624  | 114.1% | 3.8 | 47.8 | 51.6 | 261.0 | 35.6 | 47.8 | 83.4  |
| 3/1 | Circ at A543 SB Off Slip Ahead       | C2:A | 566  | 2040 | 884  | 57.5%  | 0.3 | 0.7  | 1.0  | 7.0   | 4.3  | 0.7  | 4.9   |
| 3/2 | Circ at A543 SB Off Slip Right Ahead | C2:A | 681  | 2040 | 884  | 69.0%  | 0.6 | 1.1  | 1.7  | 10.0  | 6.3  | 1.1  | 7.4   |
| 4/1 | Circ at Mold Road (e) NB Ahead       | -    | 211  | 2090 | 2090 | 8.5%   | 0.0 | 0.0  | 0.0  | 0.9   | 0.0  | 0.0  | 0.0   |
| 4/2 | Circ at Mold Road (e) NB Right Ahead | -    | 490  | 2090 | 2090 | 21.9%  | 0.0 | 0.1  | 0.1  | 1.1   | 0.0  | 0.1  | 0.1   |
| 5/1 | Ahead                                | -    | 1077 | 2090 | 2090 | 43.2%  | 0.0 | 0.4  | 0.4  | 1.5   | 0.0  | 0.4  | 0.4   |
| 5/2 | Ahead                                | -    | 712  | 2090 | 2090 | 29.8%  | 0.0 | 0.2  | 0.2  | 1.2   | 0.0  | 0.2  | 0.2   |
| 6/1 | A483 SB On Slip Ahead                | -    | 849  | 1905 | 1905 | 42.8%  | 0.0 | 0.4  | 0.4  | 1.7   | 0.0  | 0.4  | 0.4   |
| 6/2 | A483 SB On Slip Ahead                | -    | 211  | 2035 | 2035 | 8.8%   | 0.0 | 0.0  | 0.0  | 1.0   | 0.0  | 0.0  | 0.0   |

|    |                                        |       |                                          |        |                 |    |
|----|----------------------------------------|-------|------------------------------------------|--------|-----------------|----|
| C1 | Stream: 1 PRC for Signalled Lanes (%): | 7.6   | Total Delay for Signalled Lanes (pcuHr): | 13.81  | Cycle Time (s): | 60 |
| C1 | Stream: 2 PRC for Signalled Lanes (%): | -34.3 | Total Delay for Signalled Lanes (pcuHr): | 89.10  | Cycle Time (s): | 60 |
| C2 | Stream: 1 PRC for Signalled Lanes (%): | 30.4  | Total Delay for Signalled Lanes (pcuHr): | 9.06   | Cycle Time (s): | 60 |
|    | PRC Over All Lanes (%):                | -42.1 | Total Delay Over All Lanes (pcuHr):      | 267.62 |                 |    |

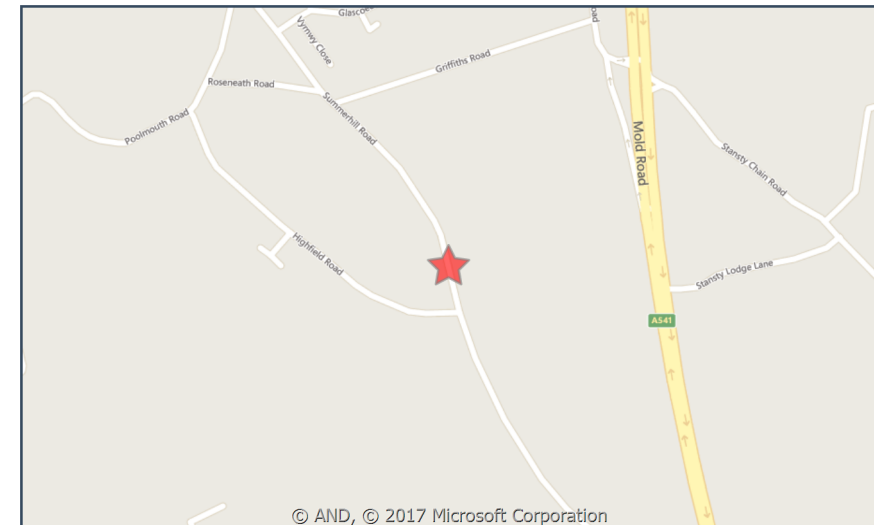
## **APPENDIX 8**

### **Accident Data**



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|                                      |                                                  |                       |            |                              |               |
|--------------------------------------|--------------------------------------------------|-----------------------|------------|------------------------------|---------------|
| <b>Crash Date:</b>                   | Monday, March 09, 2015                           | <b>Time of Crash:</b> | 2:00:00 PM | <b>Crash Reference:</b>      | 201560S033348 |
| <b>Highest Injury Severity:</b>      | Slight                                           | <b>Road Number:</b>   | U0         | <b>Number of Casualties:</b> | 2             |
| <b>Highway Authority:</b>            | Wrexham                                          |                       |            | <b>Number of Vehicles:</b>   | 2             |
| <b>Local Authority:</b>              | Wrexham                                          |                       |            | <b>OS Grid Reference:</b>    | 331790 352110 |
| <b>Weather Description:</b>          | Raining without high winds                       |                       |            |                              |               |
| <b>Road Surface Description:</b>     | Wet or Damp                                      |                       |            |                              |               |
| <b>Speed Limit:</b>                  | 60                                               |                       |            |                              |               |
| <b>Light Conditions:</b>             | Daylight: regardless of presence of streetlights |                       |            |                              |               |
| <b>Carriageway Hazards:</b>          | None                                             |                       |            |                              |               |
| <b>Junction Detail:</b>              | Not at or within 20 metres of junction           |                       |            |                              |               |
| <b>Junction Pedestrian Crossing:</b> | No physical crossing facility within 50 metres   |                       |            |                              |               |
| <b>Road Type:</b>                    | Single carriageway                               |                       |            |                              |               |
| <b>Junction Control:</b>             | Not Applicable                                   |                       |            |                              |               |



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



## 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        | 26 - 35         | Vehicle proceeding normally along the carriageway, on a right hand bend | Front                 | Other           | None                        | None                         |
| 2           | Car (excluding private hire) | -1          | Male          | 46 - 55         | Vehicle proceeding normally along the carriageway, on a left hand bend  | Front                 | Other           | 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 | 26 - 35  | Unknown or other    | Unknown or other    |
| 2           | 2            | Slight          | Driver or rider | Male   | 46 - 55  | Unknown or other    | Unknown or other    |

## Accident Description:

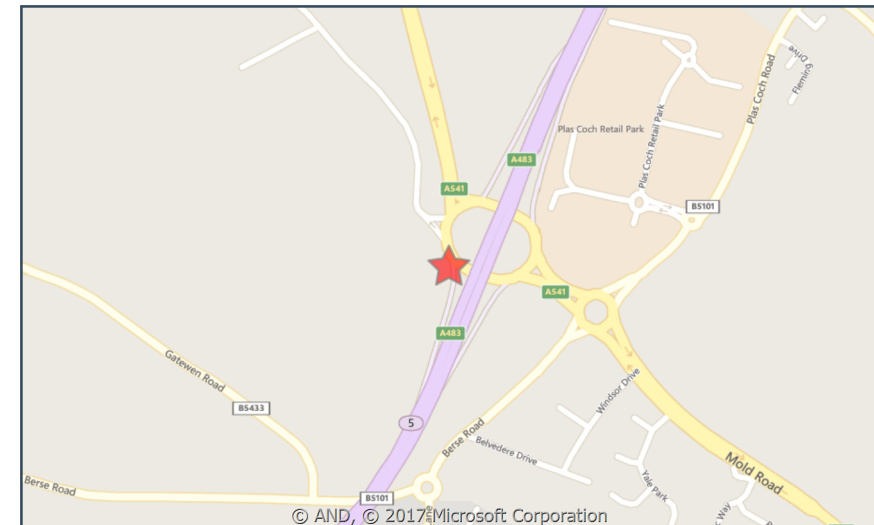
Accident description text currently unavailable for this highway authority / police force

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



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|                                      |                                                  |                       |            |                              |               |
|--------------------------------------|--------------------------------------------------|-----------------------|------------|------------------------------|---------------|
| <b>Crash Date:</b>                   | Tuesday, February 04, 2014                       | <b>Time of Crash:</b> | 8:30:00 AM | <b>Crash Reference:</b>      | 201460R016656 |
| <b>Highest Injury Severity:</b>      | Slight                                           | <b>Road Number:</b>   | A483       | <b>Number of Casualties:</b> | 1             |
| <b>Highway Authority:</b>            | Wrexham                                          |                       |            | <b>Number of Vehicles:</b>   | 2             |
| <b>Local Authority:</b>              | Wrexham                                          |                       |            | <b>OS Grid Reference:</b>    | 332246 351288 |
| <b>Weather Description:</b>          | Fine without high winds                          |                       |            |                              |               |
| <b>Road Surface Description:</b>     | Wet or Damp                                      |                       |            |                              |               |
| <b>Speed Limit:</b>                  | 30                                               |                       |            |                              |               |
| <b>Light Conditions:</b>             | Daylight: regardless of presence of streetlights |                       |            |                              |               |
| <b>Carriageway Hazards:</b>          | None                                             |                       |            |                              |               |
| <b>Junction Detail:</b>              | Slip road                                        |                       |            |                              |               |
| <b>Junction Pedestrian Crossing:</b> | No physical crossing facility within 50 metres   |                       |            |                              |               |
| <b>Road Type:</b>                    | Slip Road                                        |                       |            |                              |               |
| <b>Junction Control:</b>             | Auto traffic signal                              |                       |            |                              |               |



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



## 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          | Female        | Unknown         | Vehicle proceeding normally along the carriageway, not on a bend | Front                 | Other           | None                        | None                         |
| 2           | Car (excluding private hire) | -1          | Female        | 36 - 45         | Vehicle is waiting to proceed normally but is held up            | Back                  | Other           | None                        | None                         |

## Casualties

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

## Accident Description:

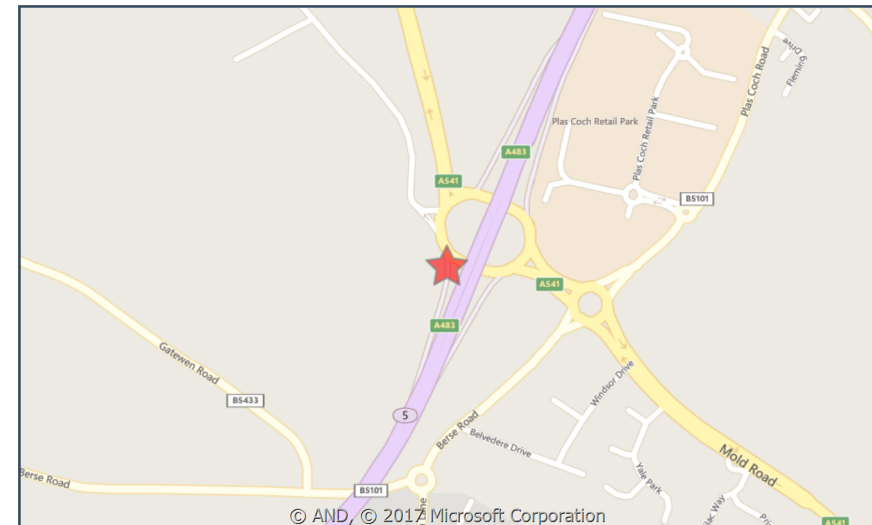
Accident description text currently unavailable for this highway authority / police force

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



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|                                      |                                                |                       |            |                              |               |
|--------------------------------------|------------------------------------------------|-----------------------|------------|------------------------------|---------------|
| <b>Crash Date:</b>                   | Wednesday, September 16, 2015                  | <b>Time of Crash:</b> | 9:41:00 PM | <b>Crash Reference:</b>      | 201560S142196 |
| <b>Highest Injury Severity:</b>      | Slight                                         | <b>Road Number:</b>   | A483       | <b>Number of Casualties:</b> | 1             |
| <b>Highway Authority:</b>            | Wrexham                                        |                       |            | <b>Number of Vehicles:</b>   | 2             |
| <b>Local Authority:</b>              | Wrexham                                        |                       |            | <b>OS Grid Reference:</b>    | 332250 351275 |
| <b>Weather Description:</b>          | Fine without high winds                        |                       |            |                              |               |
| <b>Road Surface Description:</b>     | Dry                                            |                       |            |                              |               |
| <b>Speed Limit:</b>                  | 30                                             |                       |            |                              |               |
| <b>Light Conditions:</b>             | Darkness: street lights present and lit        |                       |            |                              |               |
| <b>Carriageway Hazards:</b>          | None                                           |                       |            |                              |               |
| <b>Junction Detail:</b>              | Slip road                                      |                       |            |                              |               |
| <b>Junction Pedestrian Crossing:</b> | No physical crossing facility within 50 metres |                       |            |                              |               |
| <b>Road Type:</b>                    | Single carriageway                             |                       |            |                              |               |
| <b>Junction Control:</b>             | Give way or uncontrolled                       |                       |            |                              |               |



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



### 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          | 21 - 25         | Vehicle is slowing down or stopping                              | Did not impact        | Other                   | None                        | None                         |
| 2           | Car (excluding private hire) | -1          | Unknown       | Unknown         | Vehicle proceeding normally along the carriageway, not on a bend | Did not impact        | Journey as part of work | None                        | None                         |

### Casualties

| Vehicle Ref | Casualty Ref | Injury Severity | Casualty Class               | Gender | Age Band | Pedestrian Location | Pedestrian Movement |
|-------------|--------------|-----------------|------------------------------|--------|----------|---------------------|---------------------|
| 2           | 1            | Slight          | Vehicle or pillion passenger | Male   | 0 - 5    | Unknown or other    | Unknown or other    |

### Accident Description:

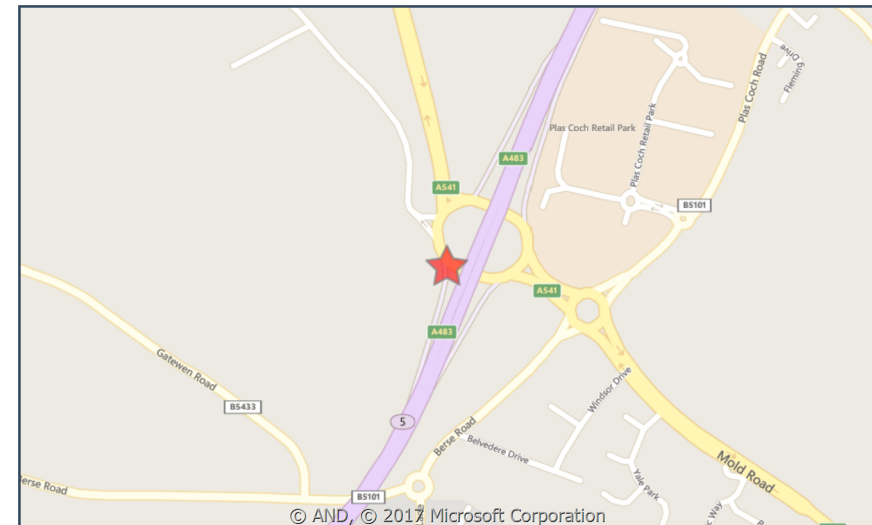
Accident description text currently unavailable for this highway authority / police force

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



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|                                      |                                                  |                       |            |                              |               |
|--------------------------------------|--------------------------------------------------|-----------------------|------------|------------------------------|---------------|
| <b>Crash Date:</b>                   | Friday, September 05, 2014                       | <b>Time of Crash:</b> | 4:15:00 PM | <b>Crash Reference:</b>      | 201460R140045 |
| <b>Highest Injury Severity:</b>      | Slight                                           | <b>Road Number:</b>   | A541       | <b>Number of Casualties:</b> | 1             |
| <b>Highway Authority:</b>            | Wrexham                                          |                       |            | <b>Number of Vehicles:</b>   | 2             |
| <b>Local Authority:</b>              | Wrexham                                          |                       |            | <b>OS Grid Reference:</b>    | 332256 351286 |
| <b>Weather Description:</b>          | Fine without high winds                          |                       |            |                              |               |
| <b>Road Surface Description:</b>     | Dry                                              |                       |            |                              |               |
| <b>Speed Limit:</b>                  | 30                                               |                       |            |                              |               |
| <b>Light Conditions:</b>             | Daylight: regardless of presence of streetlights |                       |            |                              |               |
| <b>Carriageway Hazards:</b>          | None                                             |                       |            |                              |               |
| <b>Junction Detail:</b>              | Slip road                                        |                       |            |                              |               |
| <b>Junction Pedestrian Crossing:</b> | No physical crossing facility within 50 metres   |                       |            |                              |               |
| <b>Road Type:</b>                    | Roundabout                                       |                       |            |                              |               |
| <b>Junction Control:</b>             | Give way or uncontrolled                         |                       |            |                              |               |



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



## 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          | Unknown         | Vehicle proceeding normally along the carriageway, not on a bend | Front                 | Other           | None                        | None                         |
| 2           | Car (excluding private hire) | -1          | Male          | 26 - 35         | Vehicle is moving off                                            | Back                  | Other           | 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   | 26 - 35  | Unknown or other    | Unknown or other    |

## Accident Description:

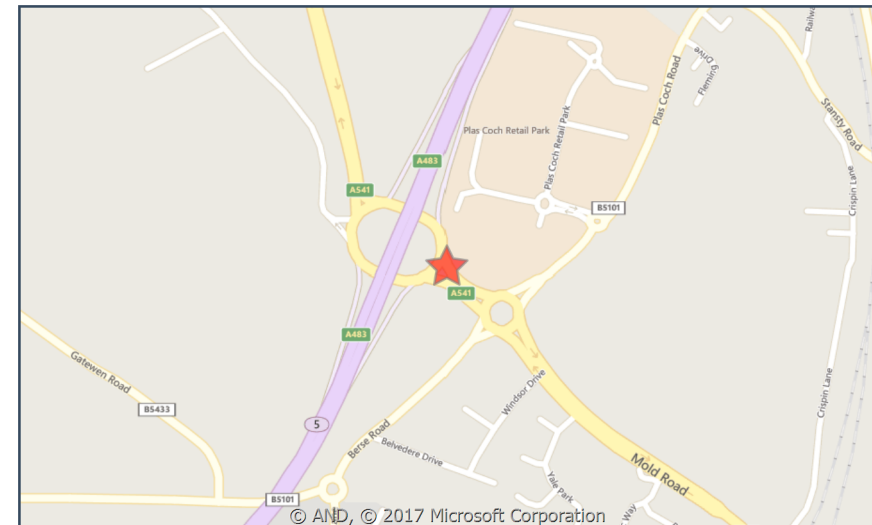
Accident description text currently unavailable for this highway authority / police force

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



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|                                      |                                                  |                       |            |                              |               |
|--------------------------------------|--------------------------------------------------|-----------------------|------------|------------------------------|---------------|
| <b>Crash Date:</b>                   | Friday, February 20, 2015                        | <b>Time of Crash:</b> | 7:20:00 AM | <b>Crash Reference:</b>      | 201560S024353 |
| <b>Highest Injury Severity:</b>      | Slight                                           | <b>Road Number:</b>   | A483       | <b>Number of Casualties:</b> | 1             |
| <b>Highway Authority:</b>            | Wrexham                                          |                       |            | <b>Number of Vehicles:</b>   | 2             |
| <b>Local Authority:</b>              | Wrexham                                          |                       |            | <b>OS Grid Reference:</b>    | 332386 351286 |
| <b>Weather Description:</b>          | Fine without high winds                          |                       |            |                              |               |
| <b>Road Surface Description:</b>     | Dry                                              |                       |            |                              |               |
| <b>Speed Limit:</b>                  | 60                                               |                       |            |                              |               |
| <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>                    | Roundabout                                       |                       |            |                              |               |
| <b>Junction Control:</b>             | Give way or uncontrolled                         |                       |            |                              |               |



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



## 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          | Female        | 21 - 25         | Vehicle is changing lane to the left  | Nearside              | Journey as part of work | None                        | None                         |
| 2           | Goods vehicle 7.5 tonnes mgw and over | -1          | Male          | 26 - 35         | Vehicle is in the act of turning left | Offside               | 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 | 21 - 25  | Unknown or other    | Unknown or other    |

## Accident Description:

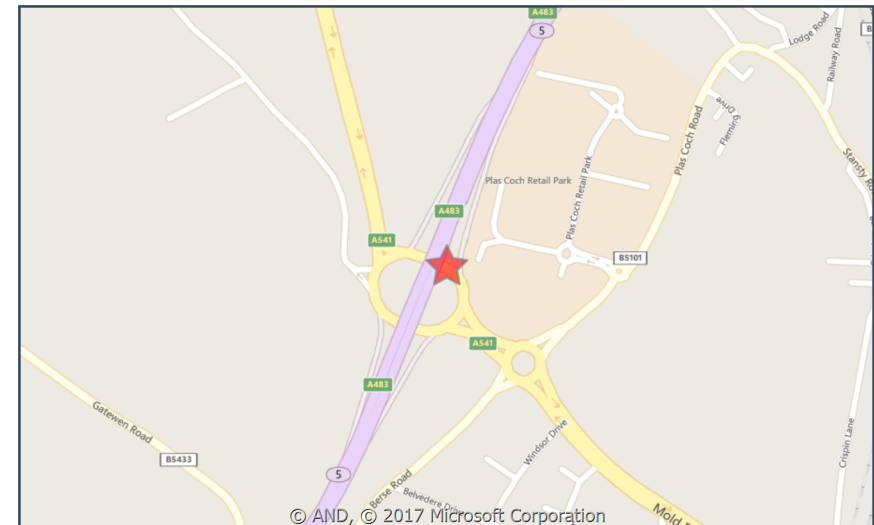
Accident description text currently unavailable for this highway authority / police force

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



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|                                      |                                                  |                       |            |                              |               |
|--------------------------------------|--------------------------------------------------|-----------------------|------------|------------------------------|---------------|
| <b>Crash Date:</b>                   | Thursday, May 07, 2015                           | <b>Time of Crash:</b> | 2:05:00 PM | <b>Crash Reference:</b>      | 201560S064922 |
| <b>Highest Injury Severity:</b>      | Slight                                           | <b>Road Number:</b>   | A541       | <b>Number of Casualties:</b> | 1             |
| <b>Highway Authority:</b>            | Wrexham                                          |                       |            | <b>Number of Vehicles:</b>   | 2             |
| <b>Local Authority:</b>              | Wrexham                                          |                       |            | <b>OS Grid Reference:</b>    | 332353 351364 |
| <b>Weather Description:</b>          | Fine without high winds                          |                       |            |                              |               |
| <b>Road Surface Description:</b>     | Dry                                              |                       |            |                              |               |
| <b>Speed Limit:</b>                  | 30                                               |                       |            |                              |               |
| <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>                    | Roundabout                                       |                       |            |                              |               |
| <b>Junction Control:</b>             | Give way or uncontrolled                         |                       |            |                              |               |



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



## 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          | Female        | 56 - 65         | Vehicle is changing lane to the left | Front                 | Other           | None                        | None                         |
| 2           | Car (excluding private hire) | -1          | Male          | 46 - 55         | Vehicle is moving off                | Back                  | Other           | 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    |

## Accident Description:

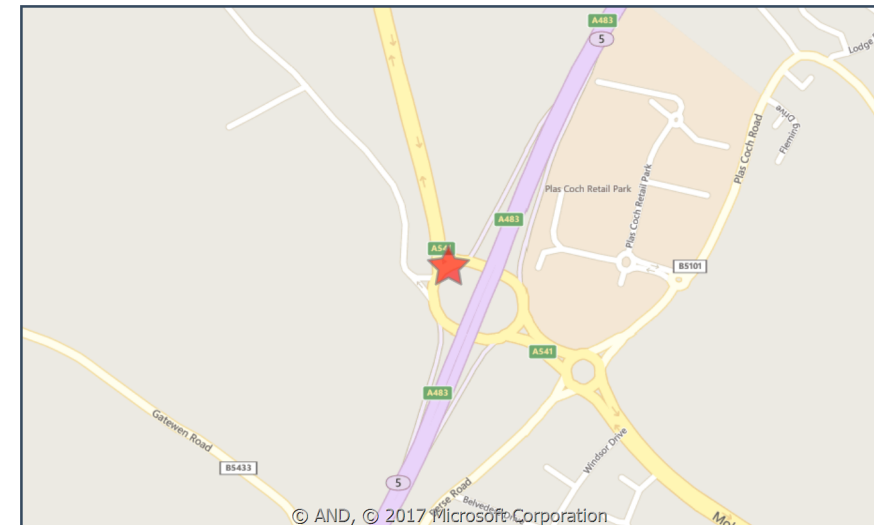
Accident description text currently unavailable for this highway authority / police force

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



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|                                      |                                                  |                       |            |                              |               |
|--------------------------------------|--------------------------------------------------|-----------------------|------------|------------------------------|---------------|
| <b>Crash Date:</b>                   | Monday, October 20, 2014                         | <b>Time of Crash:</b> | 3:10:00 PM | <b>Crash Reference:</b>      | 201460R165468 |
| <b>Highest Injury Severity:</b>      | Slight                                           | <b>Road Number:</b>   | A541       | <b>Number of Casualties:</b> | 1             |
| <b>Highway Authority:</b>            | Wrexham                                          |                       |            | <b>Number of Vehicles:</b>   | 1             |
| <b>Local Authority:</b>              | Wrexham                                          |                       |            | <b>OS Grid Reference:</b>    | 332267 351380 |
| <b>Weather Description:</b>          | Fine without high winds                          |                       |            |                              |               |
| <b>Road Surface Description:</b>     | Dry                                              |                       |            |                              |               |
| <b>Speed Limit:</b>                  | 60                                               |                       |            |                              |               |
| <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>                    | Roundabout                                       |                       |            |                              |               |
| <b>Junction Control:</b>             | Auto traffic signal                              |                       |            |                              |               |



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



## 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          | Female        | Over 75         | Vehicle proceeding normally along the carriageway, not on a bend | Front                 | Other           | None                        | Nearside or offside crash barrier |

## Casualties

| Vehicle Ref | Casualty Ref | Injury Severity | Casualty Class  | Gender | Age Band | Pedestrian Location | Pedestrian Movement |
|-------------|--------------|-----------------|-----------------|--------|----------|---------------------|---------------------|
| 1           | 1            | Slight          | Driver or rider | Female | Over 75  | Unknown or other    | Unknown or other    |

## Accident Description:

Accident description text currently unavailable for this highway authority / police force

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



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**Crash Date:** Thursday, February 20, 2014 **Time of Crash:** 8:43:00 PM **Crash Reference:** 201460R026214

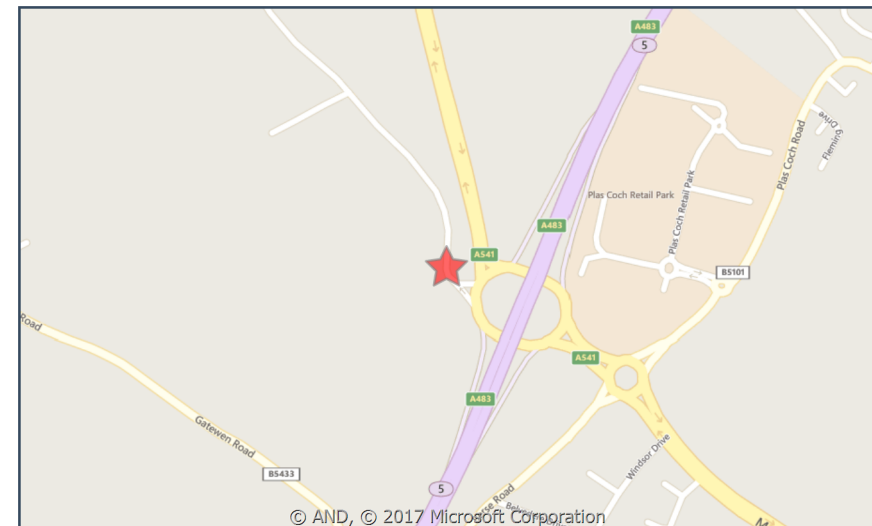
**Highest Injury Severity:** Serious  
**Highway Authority:** Wrexham  
**Local Authority:** Wrexham  
**Weather Description:** Fine without high winds  
**Road Surface Description:** Dry  
**Speed Limit:** 60  
**Light Conditions:** Darkness: street lights present and lit  
**Carriageway Hazards:** None  
**Junction Detail:** Roundabout  
**Junction Pedestrian Crossing:** No physical crossing facility within 50 metres  
**Road Type:** Roundabout  
**Junction Control:** Give way or uncontrolled

**Road Number:** U0

**Number of Casualties:** 1

**Number of Vehicles:** 1

**OS Grid Reference:** 332198 351389



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



## 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 is in the act of turning right | Front                 | Other           | Kerb                        | Entered ditch                |

## Casualties

| Vehicle Ref | Casualty Ref | Injury Severity | Casualty Class  | Gender | Age Band | Pedestrian Location | Pedestrian Movement |
|-------------|--------------|-----------------|-----------------|--------|----------|---------------------|---------------------|
| 1           | 1            | Serious         | Driver or rider | Male   | 26 - 35  | Unknown or other    | Unknown or other    |

## Accident Description:

Accident description text currently unavailable for this highway authority / police force

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

## **APPENDIX 9**

### **Framework Travel Plan**

## **MACBRYDE HOMES**

### **PROPOSED RESIDENTIAL DEVELOPMENT LAND OFF TOP ROAD, SUMMERHILL WREXHAM**

### **Travel Plan Framework**

**October 2017**

## REPORT CONTROL

**Document:** Travel Plan Framework

**Project:** Proposed Residential Development, Land off Top Road, Summerhill, Wrexham

**Client:** MacBryde Homes

**Job Number:** 1772

**File Origin:** Z:\projects\1772 Top Road, Summerhill\Docs\Reports\1772tp.1.docx

### Document Checking:

|                       |     |                    |
|-----------------------|-----|--------------------|
| <b>Primary Author</b> | MTC | <b>Initialled:</b> |
|-----------------------|-----|--------------------|

|                    |    |                    |
|--------------------|----|--------------------|
| <b>Contributor</b> | SM | <b>Initialled:</b> |
|--------------------|----|--------------------|

|                  |     |                    |
|------------------|-----|--------------------|
| <b>Review By</b> | MTC | <b>Initialled:</b> |
|------------------|-----|--------------------|

| Issue | Date     | Status | Checked for Issue |
|-------|----------|--------|-------------------|
| 1     | 23/10/17 | Final  |                   |
| 2     |          |        |                   |
| 3     |          |        |                   |
| 4     |          |        |                   |

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# **1 INTRODUCTION**

## **1.1 Introduction**

1.1.1 Croft have been instructed by MacBryde Homes to advise on the traffic and transportation issues relating to proposals to develop a site for residential purposes on land off Top Road in the Summerhill area of Wrexham.

1.1.2 This document will set out the principle strategies that will be put in place once the development is open and residents are occupying the dwellings, to encourage sustainable travel to the development.

1.1.3 The Department for Transport has issued two separate guides on the preparation of travel plans which are of relevance to this proposed development, these documents are as follows;

- Making Residential Travel Plans Work - Published in September 2005;
- Good Practice Guidelines: Delivering Travel Plans through the Planning Process – Published in April 2009.

## **1.2 Development Site**

1.2.1 The development site is located around 4 kilometres north west of the centre of Wrexham. The location of the development in relation to the local area is shown in **Plan 1** of the accompanying Transport Assessment.

1.2.2 The site is bordered to the north by the recent residential development of Westminster Rise/Bryn San Stefan, to the east by Top Road, to the south by existing residential properties fronting Chestnut Close and to the west by Moss Wood.

1.2.3 Vehicular access into the site is provided via an informal 3.0-metre-wide track which runs from the priority junction of Summerhill Road/Top Road/Bottom Road.

### **1.3 Development Proposals**

- 1.3.1 The proposals would provide 82 residential dwellings, comprising a mix of sizes.
- 1.3.2 The vehicular access into the site will be via a priority controlled junction onto a realigned Top Road, as detailed in the TA.
- 1.3.3 Alterations are proposed to the existing junction of Summerhill Road/Top Road/Bottom Road to ensure that a suitable access, designed in accordance with the residential design standards, is provided. This scheme will provide a significant improvement to the local highway network.

### **1.4 The Travel Plan**

- 1.4.1 The aims of the Travel Plans are as follows:
  - To encourage residents and visitors to use alternatives to the private car,
  - To increase the awareness of the advantages and potential for travel by more environmentally friendly modes, and
  - To introduce a package of management measures that will facilitate travel by modes of transport other than the private car.

### **1.5 Resident's Travel Pack**

- 1.5.1 The principle measure will consist of a Resident's Travel Pack containing relevant material to promote non-car modes of travel and the provision of certain physical measures. This will be discussed further in Section 3.

## 2 ACCESSIBILITY BY NON-CAR MODES

### 2.1 Introduction

2.1.1 The Welsh Government aims to extend choice in transport and secure accessibility in a way which supports sustainable development and helps to tackle the causes of climate change by;

*“Encouraging a more effective and efficient transport system, with greater use of the more sustainable and healthy forms of travel, and minimising the need to travel. This will be achieved through integration:*

- *within and between different types of transport;*
- *between transport measures and land use planning;*
- *between transport measures and policies to protect and improve the environment;*  
*and*
- *between transport measures and policies for education, health, social inclusion and wealth creation”.*

2.1.2 Land use planning can help to achieve the Welsh Government’s objectives for transport through:

- *reducing the need to travel, especially by private car, by locating development where there is good access by public transport, walking and cycling;*
- *locating development near other related uses to encourage multi-purpose trips and reduce the length of journeys;*
- *improving accessibility by walking, cycling and public transport;*
- *ensuring that transport is accessible to all, taking into account the needs of disabled and other less mobile people;*
- *promoting walking and cycling;*
- *supporting the provision of high quality public transport;*
- *supporting traffic management measures;*
- *promoting sustainable transport options for freight and commerce;*

- *supporting sustainable travel options in rural areas;*
- *supporting necessary infrastructure improvements; and*
- *ensuring that, as far as possible, transport infrastructure does not contribute to land take, urban sprawl or neighbourhood severance.*

2.1.3 New proposals should therefore attempt to influence the mode of travel to the development in terms of gaining a shift in modal split towards non-car modes, thus assisting in meeting the aspirations of current national and local planning policy.

2.1.4 The accessibility of the proposed site has been considered by the following modes of transport:

- Accessibility on foot.
- Accessibility by cycle.
- Accessibility by bus.
- Accessibility by rail.

## **2.2 Access by Foot**

2.2.1 It is important to create a choice of direct, safe and attractive routes between where people live and where they need to travel in their day-to-day life. This philosophy clearly encourages the opportunity to walk whatever the journey purpose and also helps to create more active streets and a more vibrant neighbourhood.

2.2.2 It is likely that the primary pedestrian desire lines will be to the south east of the site towards Gwersyllt village centre.

2.2.3 Pedestrian provision will be significantly enhanced as part of the development proposals with new pedestrian footways/footpaths provided on Top Road and at the new Summerhill Road/Top Road/Bottom Road junction. In addition, links to existing footpaths GWE/7 and GWE/8 will be provided.

- 2.2.4 Footpath GWE/7 runs to the north the site between Top Road to the east, and the Golf Club within Moss Valley to the west. The footpath also links with existing housing estate of Westminster Rise/Bryn San Stfan. The scheme proposes a new opening within the boundary wall along the northern edge of the site to provide a link from the application site to this footpath GWE/7. This opening of the site allows a greater permeability through the site into the wider area.
- 2.2.5 The existing Footpath GWE/8 runs to the east of the site between Top Road (to the west) and Bottom Road (to the east). The footpath lies between the Vicarage Close and Plas Alyn Crescent housing developments. The scheme proposes a safe crossing point from the development to this footpath. This would provide new residents and existing local residents with a direct route to the centre of the settlement and local schools as well as towards Gwersyllt village centre.
- 2.2.6 The existing footpath network is shown in Figure 2.1 below:

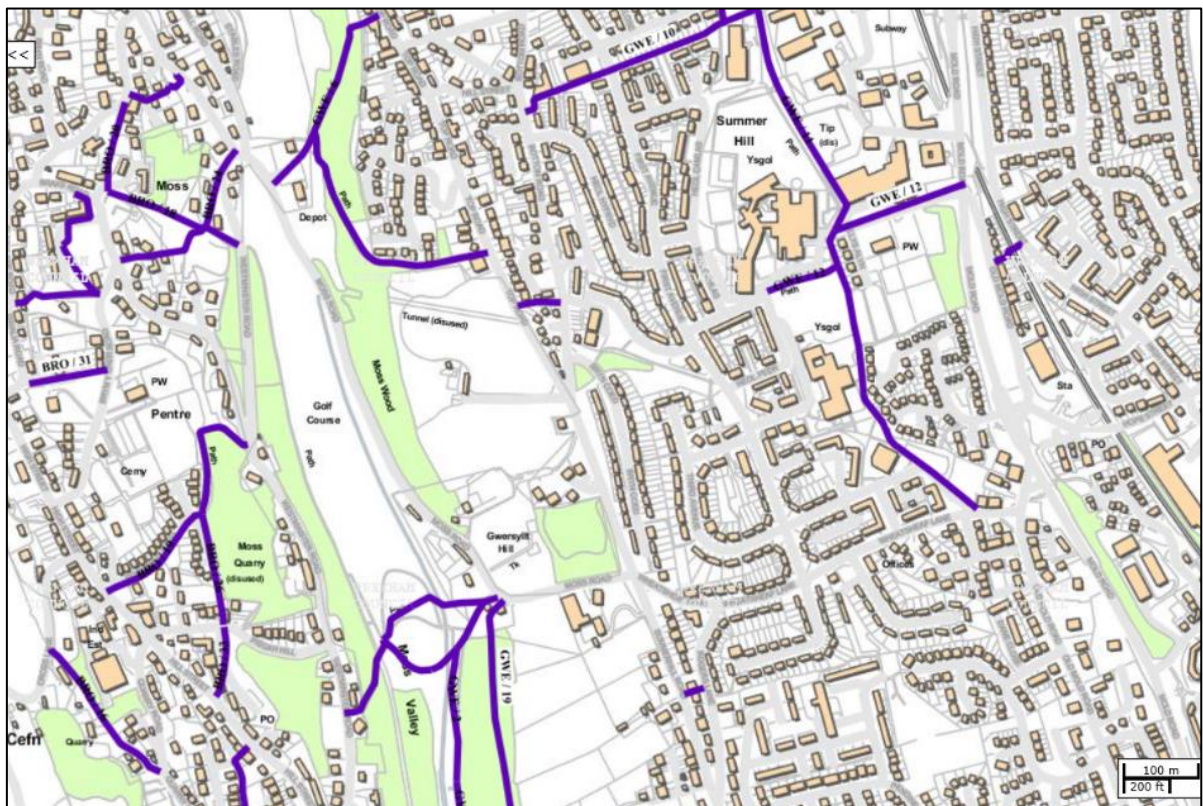


**Figure 2.1 – Existing Public Rights of Way**

- 2.2.7 Within the Institution of Highways and Transportation (IHT) document, entitled “Guidelines for Providing for Journeys on Foot”, a distance of 800 metres is identified as the preferred maximum distance for town centres, whilst a distance of 2 kilometres is defined as a preferred maximum for commuting.
  
- 2.2.8 Walking is the most important mode of travel at the local level and offers the greatest potential to replace short car journeys, particularly those under 2 kilometres. In addition, the DFT National Travel Survey of 2015 confirms that 76% of all trips less than a mile (1.6km) are carried out on foot.
  
- 2.2.9 **Plan 4** of the accompanying Transport Assessment shows the pedestrian catchment for 800 metres and 2 kilometres from the centre of the site and provides an illustrative indication of the areas that can be reached based on a leisurely walk from the site.
  
- 2.2.10 In addition to the pedestrian catchment plan, a review of the proximity of local facilities such as pharmacies/doctor’s surgeries, schools (both primary and secondary) local shops/retail outlets and leisure facilities has been undertaken. The locations of such facilities in relation to the site are also shown in **Plan 4**.
  
- 2.2.11 The 2 kilometre pedestrian catchment shows that the entirety of Summerhill can be accessed along with areas such as Brnyteg and Gwersyllt. Many amenities are also situated within the 2 kilometre catchment including a Lidl supermarket, Home Bargains, Crown Inn Public House, Iceland Foods, WHSmith Local, Gwersyllt dental care, Pen y maes Health Centre, Moss Valley Golf Club, Holy Trinity Church and Gwyn Evans Leisure Centre.
  
- 2.2.12 As illustrated, the development site benefits from being located within close proximity to a range of local amenities with the largest choice of facilities being located in Gwersyllt village centre.
  
- 2.2.13 **Table 2.1** below, shows the approximate walking distance from the centre of the site to the local retail stores and other nearby key amenities in the vicinity of the site:

| Local Amenity             | Distance (metres) |
|---------------------------|-------------------|
| Crown Inn Public House    | 290               |
| Pen y maes Health Centre  | 760               |
| Gwyn Evans Leisure Centre | 890               |
| Lidl Supermarket          | 1190              |
| Gwersyllt Dental Care     | 1320              |
| Moss Valley Golf Club     | 1330              |
| Home Bargains             | 1450              |
| Holy Trinity Church       | 1580              |

**Table 2.1 - Distance from Site to Local Facilities**

2.2.14 As can be seen in the above table, the site is located within close proximity to a number of key local amenities including primary services, as well as retail and healthcare facilities.

2.2.15 It is therefore considered that the existing and proposed pedestrian infrastructure will facilitate safe and direct pedestrian linkages between the site and local destinations.

## 2.3 Access by Cycle

2.3.1 An alternative mode of travel to the site could be achieved by bicycle.

2.3.2 A distance of 5 kilometres is generally accepted as a distance where cycling has the potential to replace short car journeys. This distance equates to a journey of around 25 minutes based on a leisurely cycle speed of 12 kilometres per hour and would encompass Gwersyllt, Gresford, New Broughton, Wrexham and Brymbo.

2.3.3 There are no formal cycle routes within the vicinity of the site, however, the surrounding roads are generally residential or rural in nature which are conducive to trips by cycle.

2.3.4 In addition, Summerhill Road is traffic calmed in the form of chicanes which also provide cycle bypass lanes.

2.3.5 The site can therefore be considered as being accessible by cycle.

## 2.4 Access by Bus

2.4.1 The nearest bus stops to the site are located on Top Road and Summerhill Road, around 210 metres from the centre of the site. The bus stops within 400 metres of the site can also be seen at Plan 4.

2.4.2 As part of the proposed highway improvements the footway within the site would be extended to provide a widened footpath to access the existing bus stop on Top Road. This would assist existing and proposed residents along with users of the existing public footpath [GWE/7] accessed from Westminster Rise/Bryn San Stefan.

2.4.3 A summary of the services available from the bus stops within 400 metres of the development site is provided in **Table 2.2** below.

| Service No | Route                                                       | Monday – Friday<br>Frequency per hour |        |         |     | Sat | Sun |
|------------|-------------------------------------------------------------|---------------------------------------|--------|---------|-----|-----|-----|
|            |                                                             | AM Peak                               | Midday | PM Peak | Eve |     |     |
| <b>21</b>  | Wrexham – Gwersyllt -<br>Summer Hill - Gwersyllt<br>Wrexham | 1                                     | 1      | 1       | 1   | 1   | 0.5 |
| <b>21A</b> | Wrexham – Summer Hill -<br>Wrexham                          | 1                                     | 1      | 1       | 0   | 1   | 0.5 |

**Table 2.2 - Existing Bus Services Operating Past the Site**

2.4.4 As can be seen from Table 2.2, the bus stops located within 400 metres of the centre of the site provide access to up to 2 services per hour to Wrexham town centre. These services also cover the evening and weekend periods as well.

2.4.5 The services operate from around 6.30am and run until around 11pm, making travel by public transport an alternative to travelling by car for residents commute journeys.

2.4.6 In order to demonstrate the level of accessibility some example journey times by bus are presented below **Table 2.3** below.

| Destination         | Duration |
|---------------------|----------|
| Wrexham town centre | 17 mins  |

**Table 2.3 - Example Bus Journey Times from the Site**

2.4.7 The above table demonstrates that Wrexham town centre is just a 17-minute bus journey from the site and onwards from Wrexham a significant number of additional services can be accessed.

2.4.8 It is therefore concluded that the proposed development site is accessible by bus.

## 2.5 Accessibility by Rail

2.5.1 Gwersyllt railway station is situated approximately 1.6 kilometres from the site, equating to a walking time of around 19 minutes.

2.5.2 Gwersyllt station is managed by Arriva Trains Wales and has 2 platforms, offering 2 services per hour to destinations such as Wrexham Central and Bidston.

2.5.3 These services increase the opportunity for residents to travel further afield by public transport, with access to Bidston station, which provides frequent services to alternative destinations such as West Kirby and Liverpool James Street.

2.5.4 A typical train journey from Gwersyllt to Wrexham Central takes approximately 12 minutes whilst a journey to Bidston takes around 1 hour calling at numerous other destinations including Caergwrle, Buckley, Shotton and Heswall.

2.5.5 In conclusion, the proposed site can be considered as being accessible in terms of travel by rail.

## **2.6 Accessibility Summary**

2.6.1 The proposals have been considered in terms of accessibility by non-car modes for the proposed residential development.

2.6.2 The following conclusions can be drawn from this section of the report:

- The site is well located to generate trips on foot and provides potential for a high degree of linked walk trips between the development and the surrounding area.
- The pedestrian infrastructure in the vicinity of the site will be significantly enhanced as part of the development proposals.
- It has been demonstrated that the site is accessible by cycle, with the surrounding roads catering for cyclists.
- The close proximity of bus stops on Top Road and Summerhill Road, offering frequent services to Wrexham, show that the proposed development can be accessed by bus.
- The site is accessible via rail with Gwersyllt train station located around 1.6 kilometres from the site.

2.6.3 In light of the above, it is considered the site is accessible by non-car modes and will cater for the needs of the development's residents and assist in promoting a choice of travel modes other than the private car.

## **3 MANAGEMENT MEASURES**

### **3.1 Introduction**

3.1.1 The following Travel Plan measures will be considered:

- i) Resident's Travel Pack,
- ii) Travel awareness and Information,
- iii) Promotion of Lift Share Scheme, and
- iv) Encouraging Walking/Cycling.

### **3.2 Resident's Travel Pack**

3.2.1 It is an important and emerging principle in residential developments that where appropriate the implementation of travel plan type measures can establish a pattern of travel behaviour favouring sustainable modes from the inception of the development.

3.2.2 The proposed development is well placed for encouraging access on foot or by cycle to a wide range of facilities. Similarly the existence of a local bus service will encourage choice of public transport as a primary means of travel for the development.

3.2.3 However, in order to build on these locational advantages it is recommended that a Residents' Travel Pack is provided for the occupants of each new residential unit.

3.2.4 The contents of such a travel pack would include information relating to walking and cycling routes in the area and the provision of up to date bus and rail timetable information as well as identification of the location of nearby amenity facilities as part of the information supplied to prospective purchasers.

3.2.5 The adoption of such travel packs is recognised as being an important element in ensuring that access by non-car modes is promoted from the earliest occupation of a residential development.

- 3.2.6 It is also proposed that the Travel Plan Co-ordinator will investigate the potential to provide discounted season tickets for new residents.
- 3.2.7 Within the Resident's Welcome Pack, residents will be encouraged to consider ways in which to reduce their need to travel such as home delivery for shopping and working from home. The first issue of the Resident's Travel Pack will be the responsibility of the house builder.
- 3.2.8 The provision of a Resident's Travel Pack will form part of the terms of the sale or occupancy of the dwellings and therefore they are aware in advance of what is required of them within the Travel Plan framework.

### **3.3 Travel Awareness and Information**

- 3.3.1 Residents will be made aware of the existence of the Travel Plan and a copy of the plan will be made available to residents on purchasing a property.
- 3.3.2 As mentioned previously, Resident's Travel Packs will be issued for new residents moving into the development and prospective buyers will be made aware of the travel plan when viewing properties.

### **3.4 Promotion of Car Share Scheme**

- 3.4.1 The Travel Plan Co-ordinator will promote the use of car sharing via registering on the Liftshare website. It allows users to register their details, where they are travelling to, if they are offering a lift or need a lift to their destination.
- 3.4.2 The website can be found at the following location [www.liftshare.com](http://www.liftshare.com).
- 3.4.3 Travel Plan Co-ordinator will also investigate the viability of establishing a Car Sharing Club for the residential development, however, it is likely that the promotion of the lift share scheme will be more beneficial to local residents.

### **3.5 Encouraging Walking/Cycling**

- 3.5.1 Residents will be provided with information and advice concerning safe pedestrian and cycle routes to the site through the WalkBUDi/BikeBUDi schemes. Information on these schemes is available on the following websites [www.walkbudi.com](http://www.walkbudi.com)/[www.bikebudi.com](http://www.bikebudi.com).
- 3.5.2 The WalkBUDi/BikeBUDi schemes are part of the National Lift Share Network and are simple and free to use. They simply match individuals with others walking or cycling the same way so they can walk or cycle together. The matches are displayed in both table and map format, allowing the user to easily find the most suitable people.
- 3.5.3 The WalkBUDi/BikeBUDi schemes aim to help individuals to meet others wanting to travel the same way. They can be used for regular trips such as walking or cycling to the office or going to the station as well as making a journey safer.
- 3.5.4 As part of these schemes the provision of walking/cycling signage will be investigated by the Travel Plan Co-ordinator, this signage could provide details on the routes and distances to and from local services and amenities in the area.

## **4 TRAVEL PLAN TARGETS**

### **4.1 Introduction**

- 4.1.1 This section of the Travel Plan will provide details of the targets against which the success of the Plan in achieving its objectives will be measured.
- 4.1.2 The targets are designed to be quantifiable, be relevant to both measures and objectives identified in the Plan and to include timescale.
- 4.1.3 In order to set the targets further information (e.g. through a travel survey) may have to be obtained in order to establish against which to set the targets. This information will be related to existing patterns of movement (i.e. the proportion of residents who travel to their workplace by non-car mode) and may be obtained from sources such as the National Travel Survey and the National Census.
- 4.1.4 Suitable targets for reducing the need to travel by private car will be set and agreed with Wrexham County Borough Council and included in the final Travel Plan for the development.

### **4.2 Potential Targets**

- 4.2.1 Targets which according to the DfT may potentially be included in the Travel Plan include the following:
- Car trips per household - targets set on the basis of predicted trip rates for the development.
  - Uptake of alternatives - Targets for bus patronage, membership and use of car clubs, registration and participation in car share scheme, cycle counts and pedestrian counts.
  - Car ownership and mode of travel - trip based targets may be supplemented by targets related to car ownership, travel to work by mode and travel to school by mode.

- Travel Plan awareness targets - for example, a target can be established to ensure a significant percentage of residents are aware of the travel plan and its purpose.

## **4.3 Plan Monitoring and Assessment**

4.3.1 DfT best practice guidelines state that monitoring of the travel plan should normally take place on the following basis:

- Early on in the occupation period of the site - for example, triggered by 75% occupancy to provide the information base for the review of the plan;
- Annually or at least every two years thereafter to provide ongoing information on the impact of the plan. Monitoring should take place over a wide range of time periods to reflect the different pattern of journeys that can be generated by residential development.

4.3.2 The monitoring could include items such as:

- Full residential surveys to be completed on a regular basis;
- Feedback from bus operators to establish demand for local bus services.

4.3.3 Consideration will be given on how best to monitor and measure the success of the Travel Plan measures when preparing the final Travel Plan for the development. Appropriate monitoring arrangements will be discussed and agreed with Wrexham County Borough Council.



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