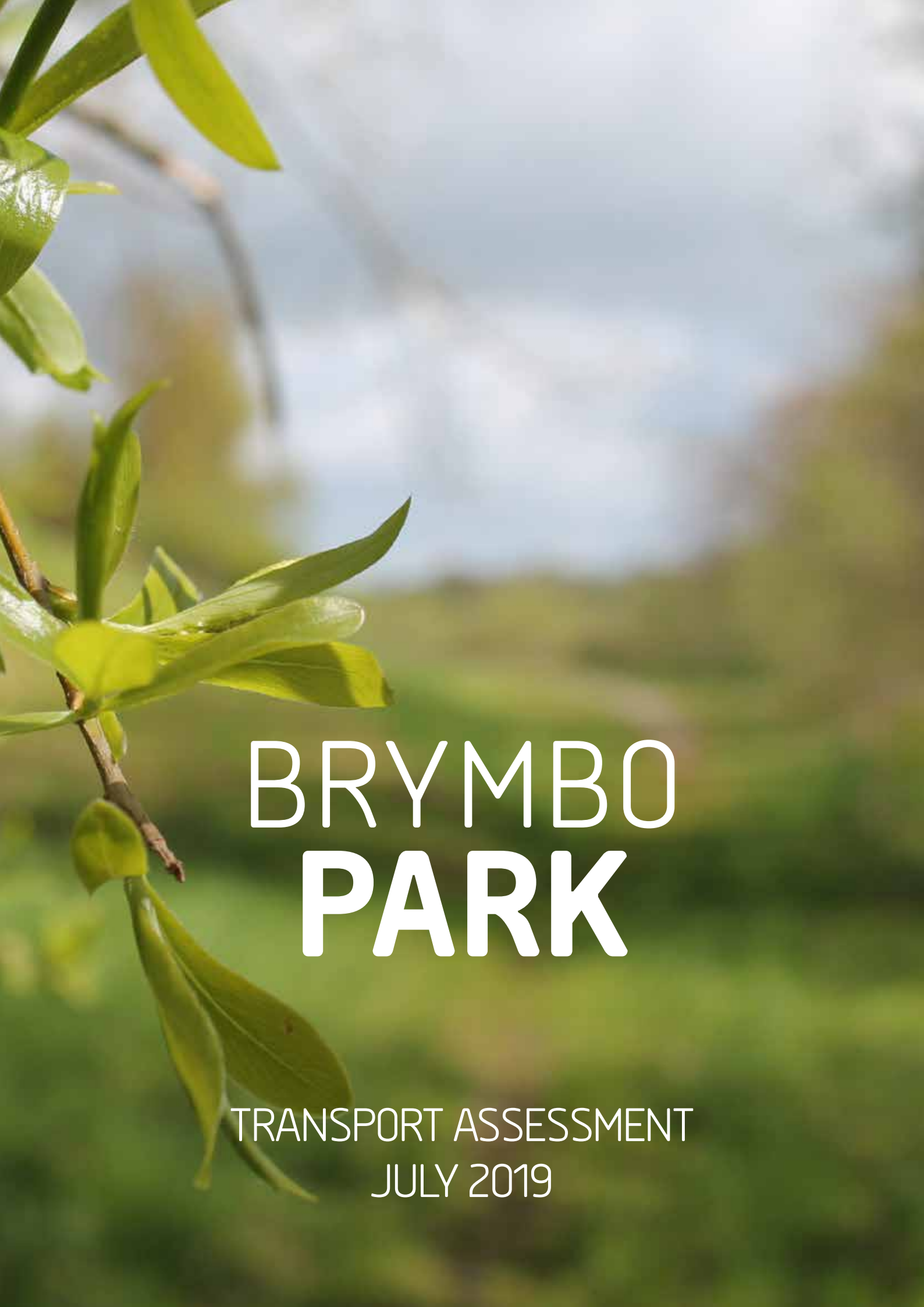




BRYMBO **PARK**

TRANSPORT ASSESSMENT
JULY 2019

Version Control and Approval

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Executive Summary

This report provides an assessment of the transport impacts of the outline planning application by Brymbo Development Ltd for development of Land at the Former Brymbo Steelworks, Brymbo. This document has been prepared following engagement with Wrexham County Borough Council (WCBC).

Outline planning permission is sought for Outline planning permission for up to 450 dwellings (Class C3 use), provision of a primary school (2-form entry), small district centre comprising up to 1,395sqm of Class A1 Retail, up to 372sqm of Class A3 Restaurant/Public House, up to 465sqm of Class D1 use, multi-functional green infrastructure, including children's play areas and informal open space, surface water attenuation, vehicle accesses, car parking, engineering works, public footpaths and hard and soft landscaping, underground services, and all ancillary and enabling works, with all matters reserved except for vehicular access from Brymbo Road.

The areas to the east of Phoenix Drive would be developed to accommodate a mix of uses; namely, residential, retail, healthcare and education. The western development parcel ('Ty Cerrig') would be developed for residential purposes.

Vehicular access to eastern development areas will be from the recently constructed spine road, Phoenix Drive, via access stubs constructed as part of the spine road. With vehicular access to the Ty Cerrig site taken from a new priority junction formed with Brymbo Road. An emergency access will also be provided from Phoenix Drive into the Ty Cerrig site.

The site has a significant planning history with the wider land having previous consent (some of which has been implemented) for various land uses. Much of the area to the south of the proposed site has been developed for residential purposes with the completion of approximately 500 dwellings in this area. The current application boundary also benefits from extant permission for the construction of food/non-food retail units and a primary school. Therefore, the principle for developing the site for some of the proposed uses set out in this report has already been tested and established.

A comprehensive review of local, regional and national transport related policy has been carried out. This review has demonstrated that the proposed development accords with relevant policy with areas for mitigation identified.

The report includes a review of existing sustainable travel provision in the surrounding area including pedestrian and cycle links and public transport provision. The existing provision is currently limited, it is however proposed to implement a full strategy for improving accessibility as follows:

- Provision of new footways;
- Provision of key local facilities within the small district centre to reduce the need to travel by car for existing and future residents;



- Improved bus service frequency and provision of new bus stops along Phoenix Drive;
- Downgrading the area of Phoenix Drive adjacent to the small district centre to create a more pedestrian/cyclist friendly environment;
- Provision of a stepped and ramped access route between the Ty Cerrig site and the small district centre area to allow Ty Cerrig residents easy access to the new facilities; and
- Provision of cycle and vehicular parking.

Some existing safety concerns were established from the analysis of highway safety data. This included multiple occurrences of collisions on Heritage Way in the vicinity of the Brymbo Sports Club. Further assessment of these however identified implementation of further measures by WCBC. Following the introduction of these measures, there have been no recorded personal injury collisions. As such, no further measures are required.

Vehicle trips generation of the development has been calculated using surveys from a nearby residential site. The TRICS database has been utilised to forecast the traffic generation of the other non-residential land uses.

There are limited nearby facilities and so existing residents are required to travel some distance to local facilities. The provision of facilities within the Brymbo Park development would reduce the need to travel for existing residents and hence reduce the impact on the surrounding highway network. In order to provide a robust assessment however, no reductions have been made for this.

Capacity of local junctions has been assessed using forecast traffic conditions for a future assessment year. The assessment accounts for background traffic growth and committed developments in accordance with national planning policy and Welsh Government guidance.

There are existing capacity issues observed at the A525/Heritage Way junction. During the PM peak hour, there are long queues associated with vehicles turning right into Heritage Way. This is forecast to worsen in future assessment years with issues also identified for vehicles turning out of Heritage Way. It is therefore proposed to provide signal control at the A525/Heritage Way junction to better manage these turning movements. The modelling of the proposed improvement scheme demonstrates a significant betterment in the operation of the junction.

Existing capacity issues have also been observed at Junction 4 of the A483, as follows:

- Queues for vehicles in both directions on the A525 with particularly long queues in an eastbound direction in the AM peak hour and a westbound direction in the PM peak hour.
- Queues on the southbound off-slip of the A483 in the AM peak hour and northbound off-slip in the PM peak hour.

The Welsh Government is currently developing schemes for various junctions along the A483. Since there are no feasible interim schemes to mitigate the impact of the proposed development at Brymbo in this



location, it is instead proposed to make a proportionate and reasonable contribution towards the wider scheme in this location.



I Introduction

I.1 Background

- 1.1.1 PJA has been appointed by Brymbo Developments Ltd (BDL) to prepare a Transport Assessment to accompany an outline planning application to develop Land at the former Brymbo Steelworks, Brymbo, Wrexham.
- 1.1.2 Outline permission is sought for a residential led mixed-use development for the Site which is located within the administrative area of Wrexham County Borough Council (WCBC).

I.2 Proposed Development

- 1.2.1 Outline planning permission is sought for up to 450 dwellings (Class C3 use), provision of a primary school (2-form entry), small district centre comprising up to 1,395sqm of Class A1 Retail, up to 372sqm of Class A3 Restaurant/Public House, up to 465sqm of Class D1 use, multi-functional green infrastructure, including children's play areas and informal open space, surface water attenuation, vehicle accesses, car parking, engineering works, public footpaths and hard and soft landscaping, underground services, and all ancillary and enabling works, with all matters reserved except for vehicular access from Brymbo Road.
- 1.2.2 The areas to the east of Phoenix Drive would be developed to accommodate a mix of uses; namely, residential, retail, healthcare and education. The western development parcel (referred to herein as the 'Ty Cerrig' Site) would be developed for residential purposes.
- 1.2.3 The indicative land use plan is provided in **Appendix A**.

I.3 Planning History

- 1.3.1 There is significant planning history associated with the Site. A summary of the planning history within the site boundary is as follows:
- P/2004/1153 – Amendment to Condition no.3 of Planning Permission P/2002/1171 relating to 1.2 hectares to be provided for a new school within the new housing area – Approved 8th November 2004. (Not implemented)
 - P/2005/1484 – Light industrial units (Phase 1) – Approved 6th March 2006. (Not implemented)
 - P/2005/1485 – Outline application for residential development (northern development area) – Approved 6th March 2006.
 - P/2005/1486 – Outline application for residential development – Refused 6th December 2010.
 - P/2005/1488 – Outline for petrol filling station and retail facility, northern area – Approved 6th March 2006. (Not implemented)



- P/2005/1489 – Commercial development phase 1 northern module – Approved 6th March 2006
- P/2009/0939 – Outline application for erection of supermarket and small retail units and associated car parking – Refused 6th December 2010. Appeal dismissed 29th November 2011.
- P/2010/0516 – Reserved matters for north spine road – Approved 3rd August 2010
- P/2012/0816 – Outline application for erection of supermarket and small retail units and associated car parking – Approved 11th July 2014 (Not implemented)
- P/2017/0105 – Outline application for the erection of new primary school – Approved 21st March 2017. (Not implemented)

1.3.2 The principle of developing the site for various land uses is therefore well established. In particular, there is extant permission for the construction of food and non-food retail provision on the site and for the construction of a new primary school. As such, the traffic impact of these uses has been deemed to be acceptable previously. This Transport Assessment therefore builds upon the previous consent on-site and considers any additional impacts of other land uses proposed as part of this outline application.

1.4 Completions

1.4.1 Approximately 500 dwellings have been constructed on the wider site, all of which are accessed from Phoenix Drive, a purpose-built spine road, connecting the B5101 (to the north) to Heritage Way (to the south).

1.5 Scoping Discussions

1.5.1 PJA has engaged with officers from Wrexham County Borough Council (WCBC) to discuss the scope and content of this Transport Assessment. In summary, the following was agreed:

- The principle of access to the various parcels and the requirement for further details to be provided within the TA was established.
- The study area for accident analysis and junction capacity assessment.
- Trip rate methodology using local donor Sites for residential development and quantifying the trip envelope for extant planning consents on the Site.
- Local committed development Sites.

1.5.2 PJA has also attempted to engage with the North and Mid Wales Trunk Road Agent (NMWTRA). NMWTRA has however not provided a response.

1.5.3 This Transport Assessment has therefore been prepared in accordance with the discussions with WCBC and in line with Planning Policy Wales, Technical Advice Note 18: Transport.



I.6 Report Format

1.6.1 Following this introduction, the Transport Assessment comprises the following sections:

- Section 2 provides a summary of relevant transport related policy;
- Section 3 sets out the existing conditions;
- Section 4 details the development proposals;
- Section 5 provides details of the forecast travel demand;
- Section 6 sets out the junction capacity assessment; and
- Section 7 summarises the report and concludes the findings.



2 Policy Context

2.1 Introduction

- 2.1.1 This chapter provides a review of relevant transport related policy at a local, regional and national level. This chapter will establish whether the proposed development accords with these policies and where the development does not accord, establish when measures may be required to ensure compliance.

2.2 Planning Policy Wales, Edition 10 (Welsh Government)

- 2.2.1 The 10th Edition of Planning Policy Wales (PPW10) was published in December 2018. The document sets out the land use planning policies of the Welsh Government and places a presumption in favour of sustainable development. The document is supported by various Technical Advice Notes (TANs).
- 2.2.2 The document sets out principles to achieve sustainable development in Section 2; part of this is to ensure wellbeing through placemaking. There are five National Sustainable Placemaking Outcomes set out, of key importance is:

“Facilitating accessible and healthy environments:

- *Accessible and high-quality green space;*
- *Accessible by means of active travel and public transport;*
- *Not car dependent;*
- *Minimises the need to travel;*
- *Provides equality of access;*
- *Feels safe and inclusive;*
- *Supports a diverse population;*
- *Good connections;*
- *Convenient access to goods and services; and*
- *Promotes physical and mental health and wellbeing.”*

- 2.2.3 PPW10 sets out objectives of good design in Section 3, the following are of relevance:

- Access and Inclusivity – PPW10 sets out that developments should be designed to meet the needs of the people accessing them. As such, proposals should meet the needs of people with sensory, learning and mobility impairments as well as older people and people with young children. Development proposals should also ensure access to essential services including education and employment by modes other than private car. Design should allow easy access by walking, cycling and public transport.



- Movement – Design of developments should avoid car-dominated environments and instead opportunities for people to make sustainable and healthy travel choices should be encouraged. This will require sites to be selected which can be made accessible by sustainable modes as well as creating suitable links within and between developments. PPW10 emphasises the importance of utilising existing infrastructure where possible. Where new infrastructure is required to mitigate development impact, this should be well integrated with current infrastructure.
- 2.2.4 Section 4 of PPW10, sets out the creation of Active and Social Places. A key theme of this is ‘*Moving within and Between Places*’. This states that “*the planning system should enable people to access jobs and services through shorter, more efficient and sustainable journeys, by walking, cycling and public transport*”.
- 2.2.5 The location, scale, density, mix of uses and design of development can improve choice in transport and secure accessibility in a way which encourages sustainable development by:
- “*Enabling more sustainable travel choices – measures to increase walking, cycling and public transport, reduce dependency on the car for daily travel;*
 - *Network management – measures to make best use of the available capacity, supported by targeted new infrastructure; and*
 - *Demand management – the application of strategies and policies to reduce travel demand, specifically that of single-occupancy private vehicles.”*
- 2.2.6 PPW10 (paragraph 4.1.8) sets out the Welsh Government’s commitment to reducing reliance on the private car and supporting a modal shift to sustainable travel modes. The planning system has a key role to play in this by facilitating developments which:
- “*Are sited in the right locations where they can be easily accessed by sustainable modes of travel and without the need for a car;*
 - *Are designed in a way which integrates them with existing land uses and neighbourhoods; and*
 - *Make it possible for short journeys within and beyond the development to be easily made by walking and cycling.”*
- 2.2.7 Development proposals must maximise opportunities for walking, cycling and public transport uses by giving priority to these users. As such, the hierarchy of users places pedestrians and cyclists at the top with less priority given to private motor vehicles.
- 2.2.8 In Section 4, PPW10 sets out the importance of Transport Assessments and their role in setting out the level of impacts of a proposed development. Further guidance is provided in TAN 18: Transport, as set out in proceeding sections.

2.3 Active Travel (Wales) Act 2013 – Design Guidance

- 2.3.1 A Design Guidance document has been published under powers granted to Welsh Minister under the Active Travel (Wales) Act 2013. The document provides guidance on the “*planning, design, construction and maintenance of active travel networks and infrastructure*”. The guidance within this document has been considered in the design of the scheme. In particular, in meeting the challenge of securing non-motorised user access between the Ty Cerrig and the main Site which are separated by a relatively steep gradient, guidance on gradients has been adopted. The guidance states an absolute maximum gradient of 1 in 12 or 8%.

2.4 Technical Advice Note 18: Transport (Welsh Government)

- 2.4.1 The Technical Advice Note 18: Transport (TAN) provides guidance on development and associated transport issues. Namely it provides advice on:

- The Integration between Land Use Planning and Transport;
- Accessible Housing Development;
- Design of Development including Street Design;
- Sustainable Modes of Transport including Walking, Cycling and Public Transport; and
- Assessing Impacts and Managing Implementation.

The Integration between Land Use Planning and Transport

- 2.4.2 The TAN states that the “*integration of land use planning and development of transport infrastructure has a key role to play in addressing the environmental aspects of sustainable development...*”

- 2.4.3 Namely, integration can help in:

- “*Ensuring new development is located where there is, or will be, good access by public transport, walking and cycling thereby minimising the need for travel and fostering social inclusion;*
- *Promoting cycling and walking;*
- *Supporting the provision of high quality, inclusive public transport; and*
- *Ensuring that transport infrastructure or service improvements necessary to serve new development allow existing transport networks to continue to perform their identified functions*”

Accessible Housing Development

- 2.4.4 In providing guidance concerning the accessibility of housing developments, the TAN outlines that developers should use the Transport Assessment to demonstrate that:



- *“The development will facilitate access by new residents to public transport stops, local shops and facilities by walking and cycling;*
- *New or existing walking and cycling routes provide direct and safe links to public transport stops, local shops and facilities;*
- *Any public transport routes through the development are suitably direct, are of a geometry to avoid obstructions and that any features that give buses priority (e.g. bus gates or bus only routes) are shown; and*
- *The walking, cycling, public transport and car routes through or adjacent to the Site are integrated in accordance with expressed principles and in the context of their relationship with parking areas and public recreation spaces.”*

Street Design

2.4.5 In providing advice relating to Street Design, the TAN states that *“transport infrastructure should contribute to a sense of place and community within a development”* and that *“the design of streets has a crucial role in this regard”*.

2.4.6 Namely the TAN states that streets should **not be:**

- *“Primarily designed to meet the needs of motor traffic;*
- *Unsafe and unwelcoming to pedestrians and cyclists; and*
- *Difficult to serve by public transport”*

2.4.7 In addition to this, the TAN outlines that *“the design of new streets should be considered in the context of the particular location”*. Namely, it states that:

- *“Carriageway widths should be appropriate to the particular context and the street character;*
- *Tracking should be used to ensure vehicles (including emergency and service vehicles) can move within streets; and*
- *New junctions must have adequate visibility.”*

Sustainable Transport

2.4.8 In providing guidance relating to **walking**, the Technical Advice Note outlines the need to:

- *“ensure that new development encourages walking as a prime means for local journeys by giving careful consideration to location, access arrangements and design;*



- *Ensure that pedestrian routes provide a safe and fully inclusive pedestrian environment, particularly for routes to primary schools;*
- *Ensure the adoption of suitable measures, such as wide pavements and road crossings; and*
- *Identify and protect existing and proposed routes suitable for the use of cyclists and walkers.”*

2.4.9 When discussing **cycling**, the note states that “*cycling has potential to act as a substitute for shorter car journeys in urban or rural areas, or form part of a longer journey when combined with public transport*”. Most notably the TAN outlines the need for development to encourage cycling by “*giving careful consideration to location, design, access arrangements, travel ‘desire lines’ through a development, and integration with existing and potential off-Site links*”.

2.4.10 Finally, in providing guidance on the provision of **public transport**, the Technical Advice Note outlines that “*new or improved public transport provision has the potential to provide alternatives to private vehicle use and to change existing travel demands*”.

2.4.11 Most notably, the note states that prior to the occupation of a development, “*reasonable public transport provision should be in place ... to ensure travel by car is not necessary at the outset*”.

Assessing Impacts and Managing Implementation

Transport Assessments

2.4.12 The TAN states that “*Transport Assessments provide the information necessary to assess the suitability of an application in terms of travel demand and impact*”. It outlines that within the Transport Assessment, a Transport Implementation Strategy (TIS) should be included. The TIS “*should set objectives and targets relating to managing travel demand for the development and set out the infrastructure, demand management measures and financial contributions necessary to achieve them*”.

2.4.13 Most notably according to the TAN, the aims of completing a Transport Assessment and creating a TIS are to:

- *“Understand the transport impacts of the development;*
- *Clearly communicate the impacts to assist the decision-making process;*
- *Demonstrate the development is Sited in a location that will produce a desired and predicted output (for example in terms of target modal split);*
- *Mitigate negative transport impacts through the design process; and*
- *Maximise the accessibility of the development by non-car modes.”*

2.4.14 The details provided in this Transport Assessment and the accompanying Outline Travel Plan meet the above aims.



2.5 North Wales Joint Local Transport Plan (Various North Wales Authorities)

2.5.1 The North Wales Joint Local Transport Plan has been produced by the six Local Authorities of North Wales (including WCBC) and covers a detailed programme from 2015 to 2020.

2.5.2 The Local Transport Plan (LTP) has several key aims. These are:

- *“To improve connections to key destinations and markets;*
- *Enhance access to employment and services;*
- *Increase levels of walking and cycling;*
- *Bring improved safety and security; and*
- *Bring benefits and minimised impacts on the environment.”*

2.5.3 In assessing transport in North Wales, the LTP outlines several key issues associated with the region. These include:

- *“Access to rail stations by car, public transport, walking or cycling can be poor;*
- *Increased congestion on strategic road network, increased journey times and reduced journey time reliability for the movement of people;*
- *People without access to a car may be excluded from accessing some job and leisure opportunities; and*
- *There is a lack of public transport for rural communities compared to the more urban areas.”*

2.5.4 These issues will be considered when determining appropriate access for the Site and in ensuring the development impact is adequately assessed and mitigated where appropriate.

2.6 Wrexham Connected (Sustainable Urban Mobility Plan) (WCBC)

2.6.1 Wrexham Connected (Sustainable Urban Mobility Plan) (SUMP) works in conjunction with the North Wales Joint Local Transport Plan.

2.6.2 The aim of the Wrexham Connected Plan *“is for Wrexham to be a place where people want to live, work and visit”*. This aim is supported by several other key goals that need to be met. Most notably this includes the use of *“the planning system to make sure sustainable travel choices are provided alongside the options to use motorised transport.”* This will be achieved by giving consideration to *“transport implications... when new developments are proposed”*.

2.6.3 As such, this Transport Assessment provides details of proposed measures to enhance sustainable travel to and from the Site and sets out the assessment of the development impact.



2.7 Local Planning Guidance Note No. 15 – Cycling (WCBC)

- 2.7.1 The Local Planning Guidance Note No.15 – Cycling, which forms a material consideration in the planning application process, outlines Wrexham County Borough Council’s policies on cycling.
- 2.7.2 The note’s aim is to increase the number of journeys made by bicycle. To do this, the note *“sets out how developers will be expected to provide facilities for cyclists in the preparation of relevant development schemes”*.
- 2.7.3 The key points contained within the note are as follows:
- *“Safe, coherent and attractive cycle routes, either on or off-road are essential to encourage cycle use”;*
 - *“New residential roads in particular should be designed with the needs of cyclists and with low traffic speeds in mind”; and*
 - *“Cycle lanes are not usually required where cyclists would use minor roads carrying fewer than 4000 vehicles per day, travelling at speeds of 20mph or less”.*
- 2.7.4 The Transport Assessment provides details of the provision for cyclists in proceeding sections.

2.8 Local Planning Guidance Note No. 16 – Parking Standards (WCBC)

- 2.8.1 The Local Planning Guidance Note No. 16 – Parking Standards, which forms a material consideration in the planning application process, details the parking standards Wrexham County Borough Council applies to new developments. Further details of the parking standards and application of these is provided in **Chapter 4**.

2.9 Summary

- 2.9.1 In summary, the proposed development meets national and local policy objectives, with regard to transport as:
- Safe and suitable access can be gained for all users;
 - The Site would be accessible by a range of sustainable travel modes;
 - The Site has been designed to accommodate both non-vehicular and vehicular travel modes; and
 - It will be ensured that any negative impacts are mitigated accordingly.



3 Existing Conditions

3.1 Site Location

- 3.1.1 The Site is located to the south of the existing settlement of Brymbo, 5km north west of Wrexham. It forms part of the wider land holding associated with the former Brymbo Steelworks, some of which has already been significantly redeveloped. The Site covers an area of approximately 32.59 hectares of former industrial land which has been remediated and regraded, formed of two distinct areas separated by a steeply sloping bank.
- 3.1.2 The uppermost area is known as Ty Cerrig, forming the western part of the Site. The eastern part of the Site is separated from the west by Phoenix Drive. This area has been regraded into a plateau which sits lower than the western parcel.
- 3.1.3 Phoenix Drive splits the site north to south and forms the main route into Brymbo as well as to Wrexham to the south east. Brymbo Road is located on the southern boundary of Ty Cerrig and links Brymbo with Bwlchgwyn to the west.
- 3.1.4 The Site location is shown on **Figure 3-1**.

Figure 3-1: Site Location Plan





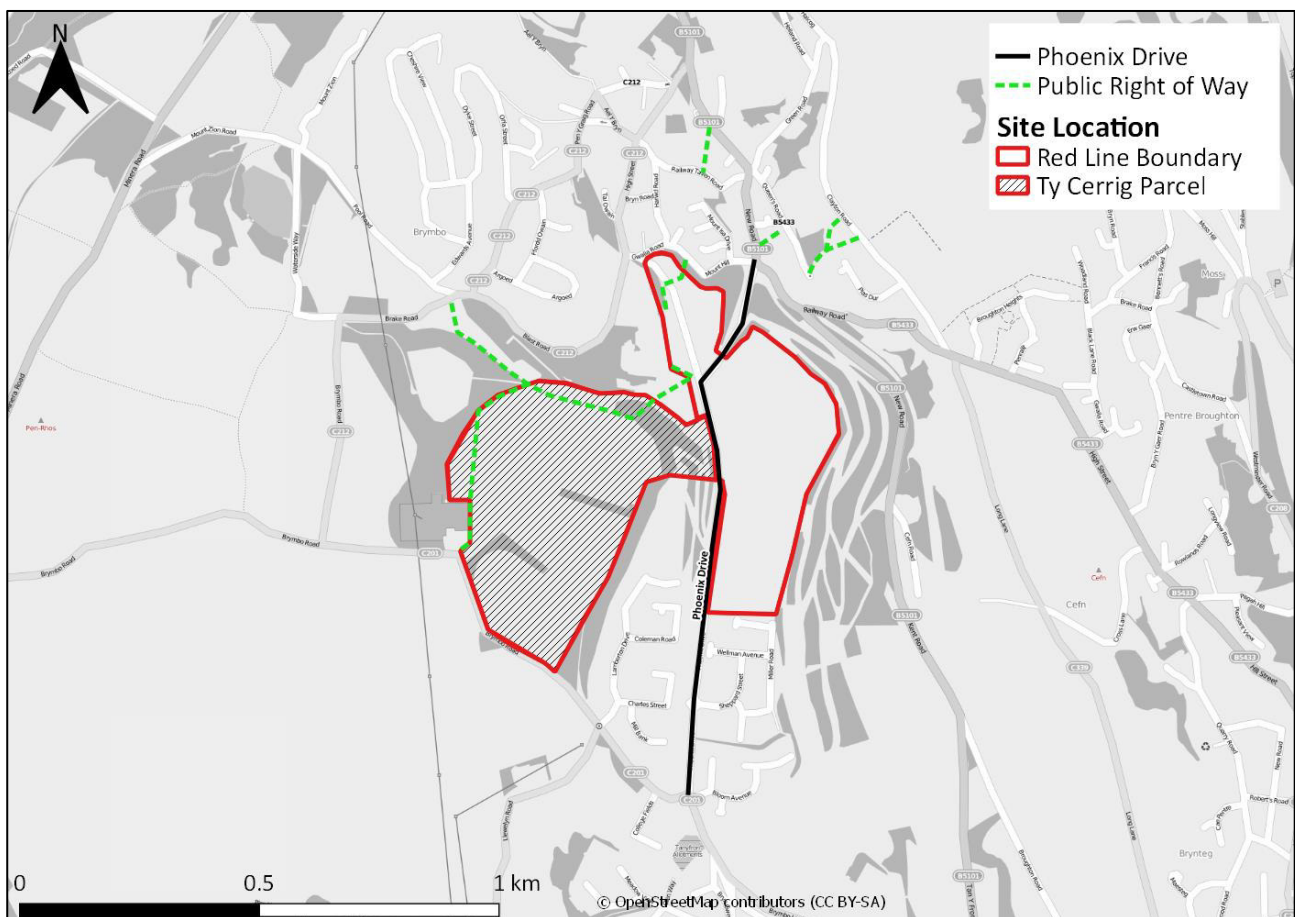
3.2 Sustainable Travel Provision

3.2.1 This section provides a review of the existing local provision supporting travel by sustainable modes.

Walking

3.2.2 There are footways and street lighting provided along Phoenix Drive, the purpose-built spine road. The footways are provided predominantly along the eastern side of Phoenix Drive at a width of at least 3m. There are pedestrian footways also linking into Brymbo to the north and Tanyfron to the south which are typically 2m in width. There are various public rights of way running through the Site and within close proximity of the Site as shown in **Figure 3-2**.

Figure 3-2: Local Public Rights of Way



3.2.3 Guidance provided by the Institution of Highways and Transport (IHT) in their publication 'Guidelines for Providing for Journeys on Foot' suggests that in terms of commuting, walking to school and recreational journeys for pedestrians without mobility impairment: walk distances of up to 2,000m can be considered as a preferred maximum, with 'desirable' and 'acceptable' distance being 500 and 1,000m respectively.



- 3.2.4 For a non-commuter journey, the Guidance suggests that walk distances of up to 1,200m can be considered as a preferred maximum, with the ‘desirable’ and ‘acceptable’ distance being 400 and 800m, respectively. In reality, longer distance journeys are often undertaken on foot.
- 3.2.5 Assuming a typical walking speed of approximately 1.4m/s as suggested in Guidelines for Providing Journeys on Foot, **Table 3-1** summarises the walking journey times that can fall under each category.

Table 3-1: Acceptable Walking Distance Thresholds

IHT Standard	Distance (m)		Walk Time (mins)	
	Commuting, Walking to School and Recreation	Other, non-commuter journeys	Commuting, Walking to School and Recreation	Other, non-commuter journeys
Desirable	500	400	6	5
Acceptable	1000	800	12	10
Preferred Maximum	2000	1200	24	14

- 3.2.6 The key local facilities surrounding the Site that are within the distance thresholds are detailed in **Table 3-2**. The areas surrounding the Site, which are within these walking distance thresholds, are displayed in the walking isochrone illustrated in **Figure 3-3**.

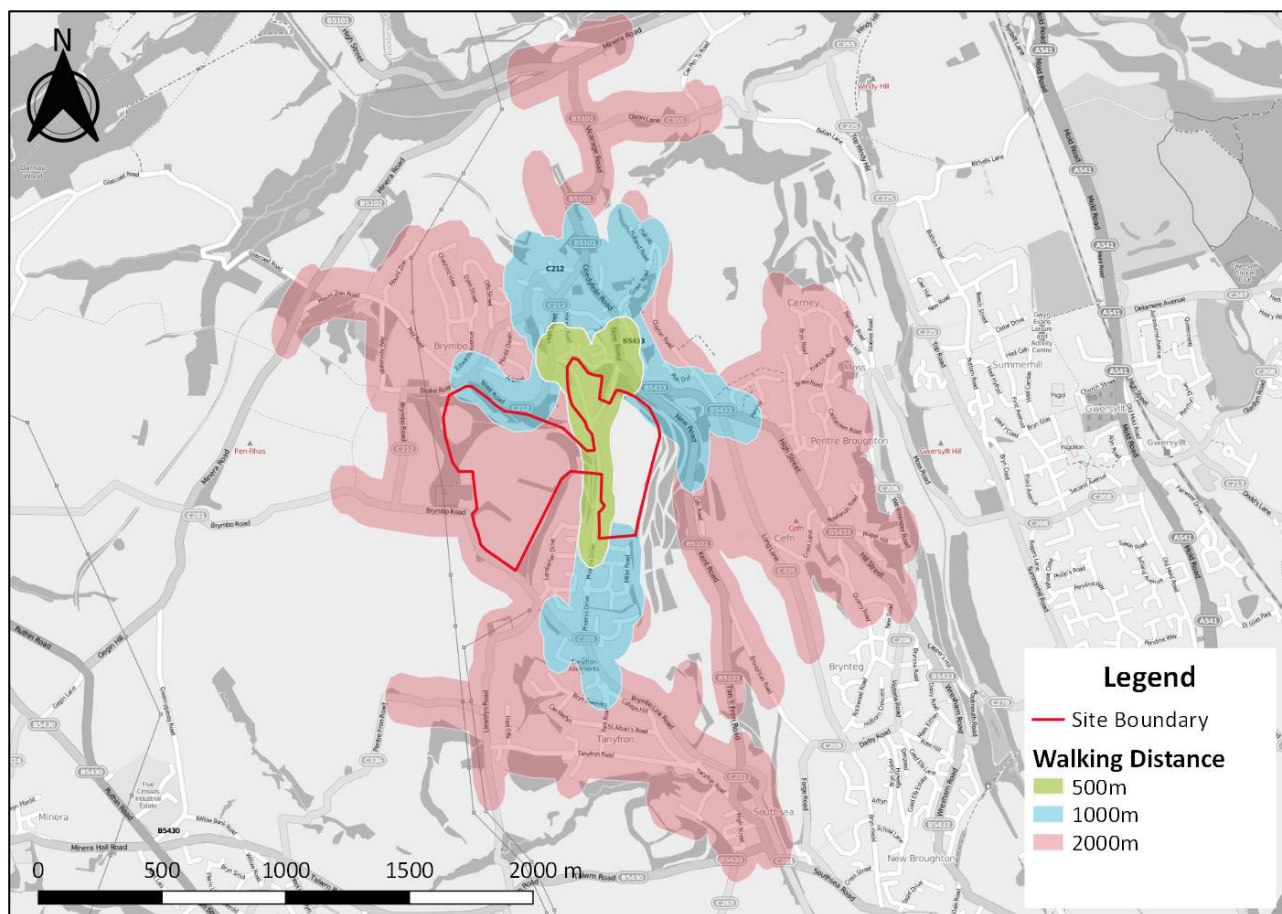
Table 3-2: Walk Journey Distance² and Time Thresholds to Key Local Facilities

Amenity	Location	Distance from Site (km)	Walking Time (mins) ¹	Within IHT Walking Standard
Well Brymbo Pharmacy	Ael- Y- Bryn	0.8	10	Acceptable
Saint Mary's VA Church in Wales Primary School	Bryn Coch	1	12	Acceptable
Black Lane County Primary School	Long Lane	1	12	Acceptable
Brymbo Library	Offa Street	1.1	13	Preferred Maximum
Premier Stores Convenience	Offa Street	1.1	13	Preferred Maximum
Ysgol Tanyfron (School)	Tanyfron Road	1.4	17	Preferred Maximum

¹ Assuming a typical walking speed of 5km/hr (1.4m/s) as suggested in Guidelines for Providing Journeys on Foot (REF: C5, para. 3.30)

² Approximate distances measured from the proposed Site access to the amenities / facility

Figure 3-3: Walking Isochrone

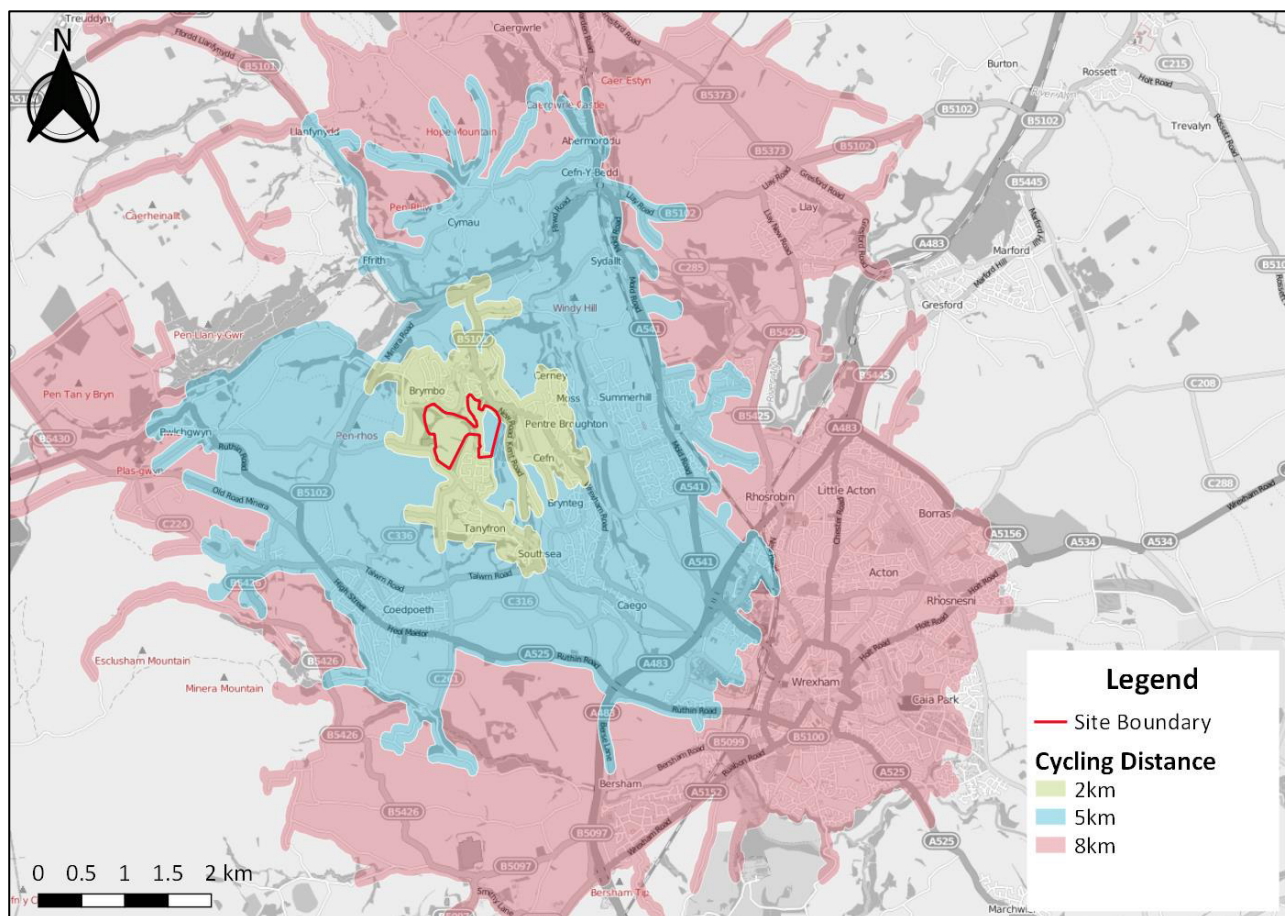


Cycling

- 3.2.7 The existing cycling provision within the vicinity of the Site is limited to sections of shared footway/cycleway located to the south of the Site around the Phoenix Drive/Brymbo Road roundabout and along Brymbo Road adjacent to the existing residential development.
- 3.2.8 Although the dedicated provision for cyclists is limited, due to the relatively quiet nature of the highway network within the residential expanses surrounding the Site, areas within the immediate vicinity of the Site can be considered accessible by bicycle.
- 3.2.9 Due to the relatively rural setting of the Site, there is a relatively limited supply of local amenities within a short distance of the Site. As such, it is currently necessary to travel to Wrexham to access a number of key amenities. There are no formal cycle routes between the Site and Wrexham and therefore it is necessary to cycle along the road network. **Figure 3-4** shows all areas within an 8km cycle of the Site.



Figure 3-4: Cycling Isochrone



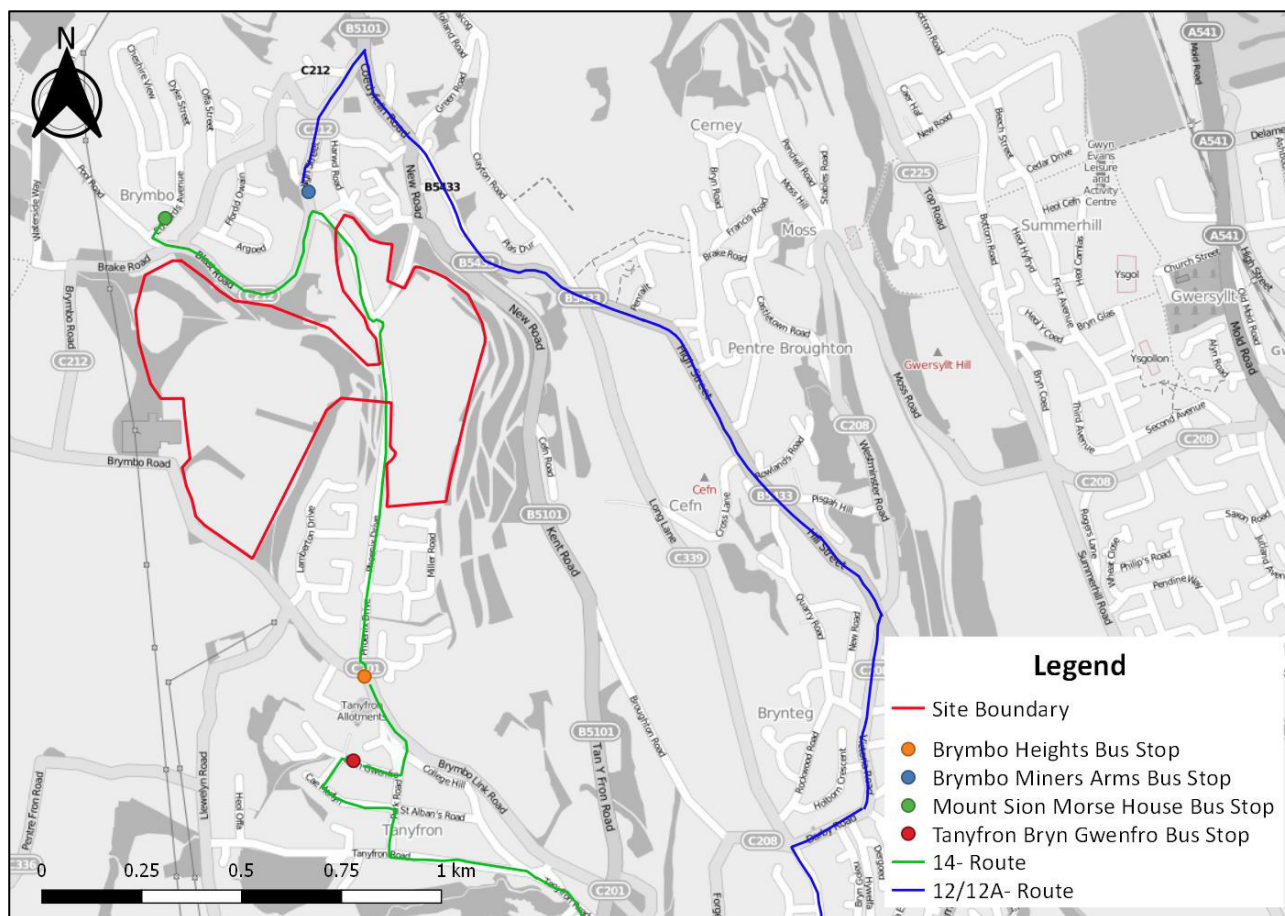
Bus Services

3.2.10 There are currently two key bus routes operating within the vicinity of the Site; the number 12/12A and the number 14. **Table 3-3** provides details of these routes including the location of the nearest stop in relation to the Site, key destinations along each of the routes and the respective service frequencies. This information is then illustrated in **Figure 3-5**.

Table 3-3: Summary of Local Bus Services

Service No.	Nearest Stop	Operator	Route	Weekday Hours of Operation	Weekday Frequency	Days of Operation
12/12A	Brymbo Miners Arms	Arriva	Brymbo Post Office- Brynteg Post Office- Caego Chapel Gardens- Wrexham Bus Station	08:01- 17:41	4 per hour (2 per hour on Sunday)	Mon-Sun
14	Tanyfron Bryn Gwenfro	Arriva	Tanyfron Primary School- Southsea Post Office- Caego Chapel Gardens-Wrexham Bus Station	08:02- 17:02	1 per hour	Mon-Sat

Figure 3-5: Surrounding Bus Service Routes and Stops



- 3.2.11 Both bus services terminate at Wrexham Bus Station which itself is surrounded by several key destinations; including Maelor Hospital, Wrexham Central Railway Station and Wrexham General Railway Station.
- 3.2.12 All of the eastern development parcel is within 400m of the existing bus route. Based on current pedestrian infrastructure, the furthest extent of the proposed development within the Ty Cerrig site is approximately 850m from the nearest bus stops, which is approximately a 10-minute walk. Improvements will be made to pedestrian links to enhance accessibility to public transport facilities as set out in proceeding chapters.

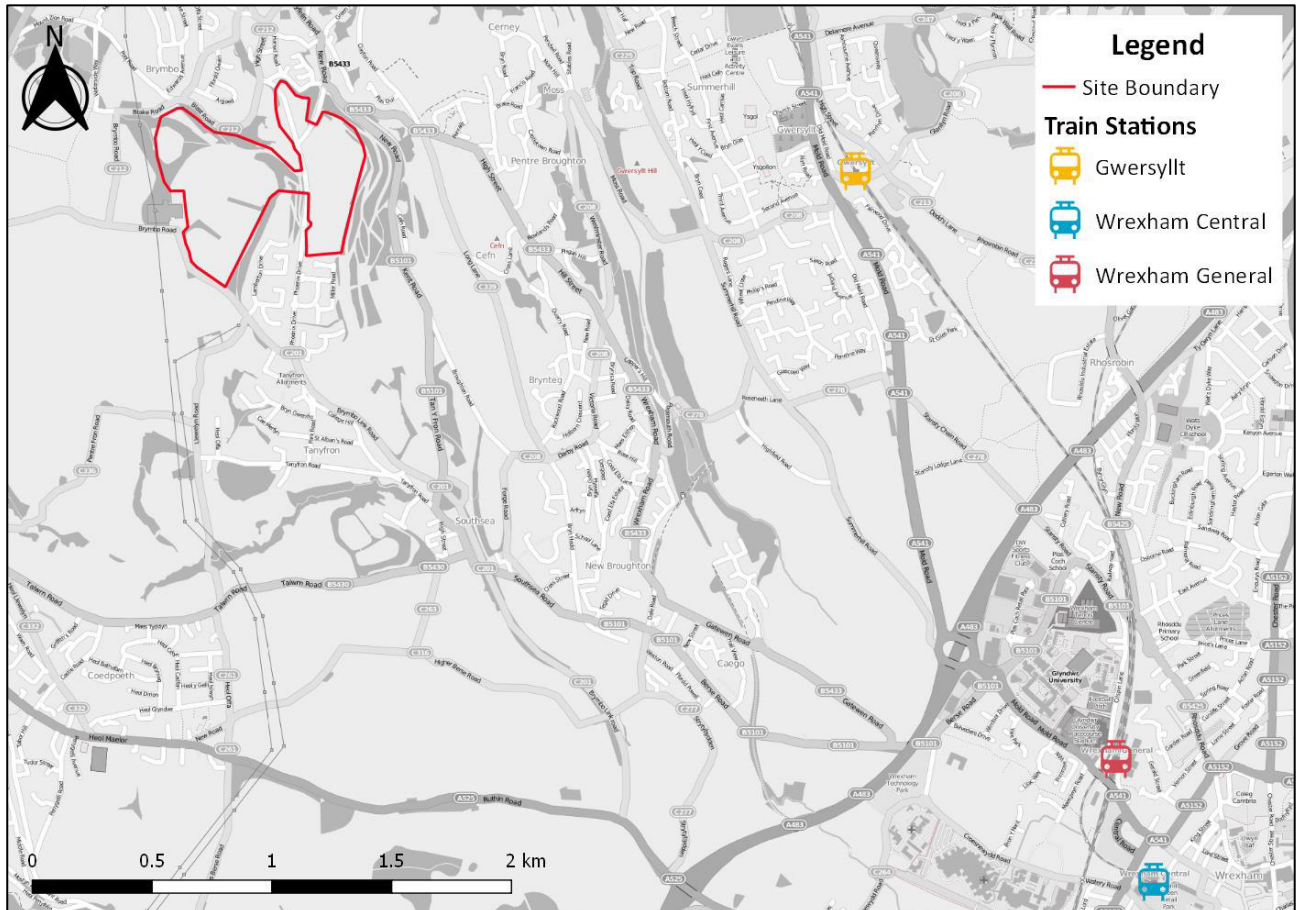
Rail Services

- 3.2.13 There are three railway stations within 8km of the Site; Wrexham General, Wrexham Central and Gwersyllt all of which can be accessed within a reasonable journey time by bicycle. Wrexham General and Wrexham Central provide 20 and eight bike storage spaces respectively to encourage multi-modal journeys.



3.2.14 Both Wrexham General and Wrexham Central can be accessed from the Site by bus. The number 12/12A and 14 services terminate at Wrexham Bus Station, with a bus journey time of approximately 15 minutes followed by just over a 10-minute walk to both railway stations.

Figure 3-6: Local Railway Stations



3.2.15 Of the three stations, Wrexham General provides the most comprehensive rail service with direct services to key strategic cities, including Cardiff and Birmingham. Wrexham Central and Gwersyllt provide access to local and regional services. **Table 3-4** summarises these rail services.

**Table 3-4: Key Railway Services**

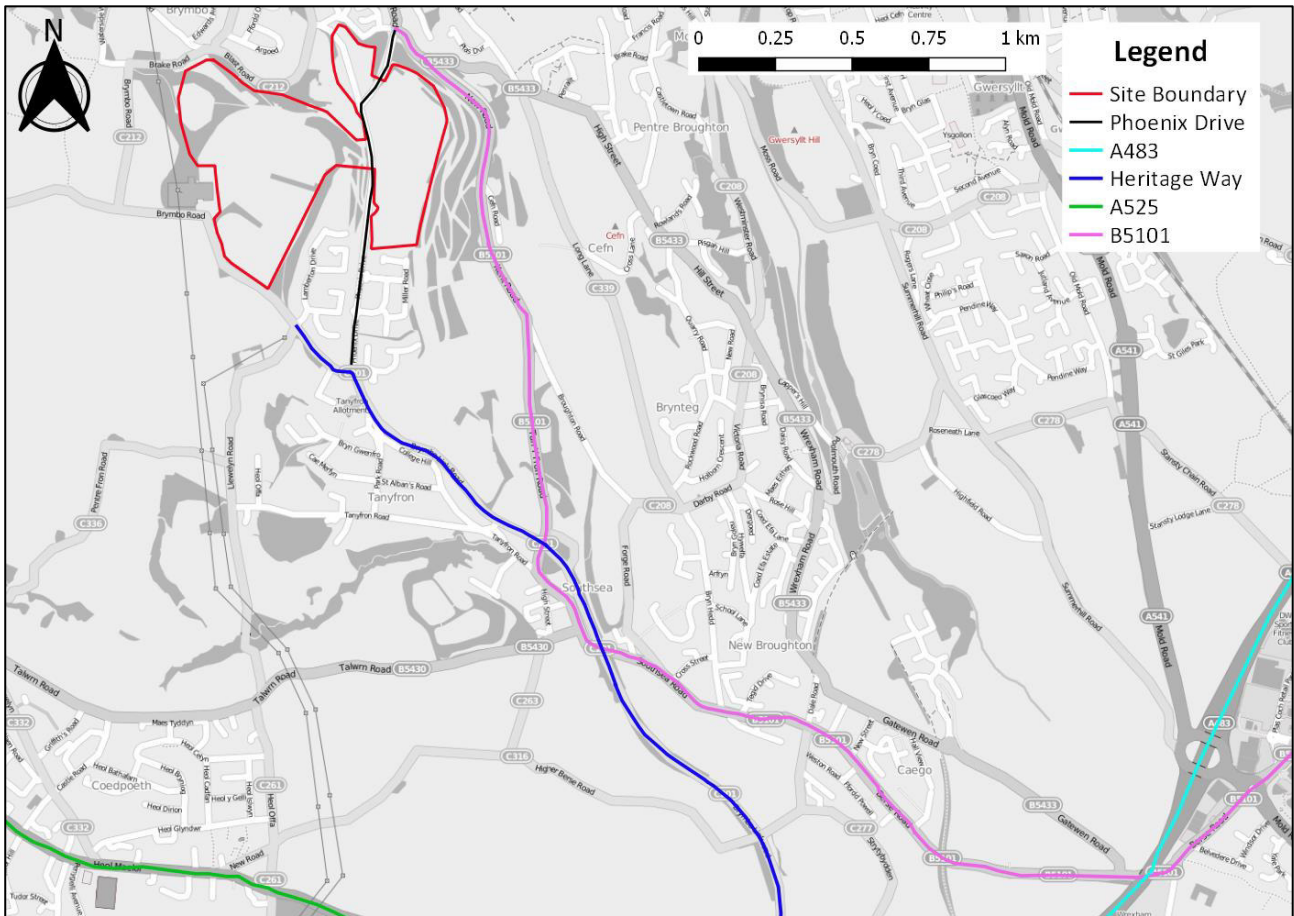
Route	Operator	Frequency (mins)			
		Mon - Fri		Saturday	Sunday
		Peak	Off-Peak		
Wrexham General- Shrewsbury- Telford- Wolverhampton- Birmingham New Street	Transport for Wales	1 per 2 hours	1 per 2 hours	1 per 2 hours	1 per 2 hours
Wrexham General- Shrewsbury- Hereford- Newport- Cardiff Central	Transport for Wales	1 per hour	1 per 2 hours	1 per 2 hours	2 services (12:44pm and 18:40pm)
Gwersyllt- Wrexham General	Transport for Wales	1 per hour	1 per hour	1 per hour	1 per 2 hours

3.3 Local Highway Network

- 3.3.1 A purpose-built spine road, Phoenix Drive, has been constructed to serve the wider development. Phoenix Drive connects to the B5101 to the north and the A525 (via Heritage Way) to the south.
- 3.3.2 The A525 provides access to the A483 at Junction 4 leading to Chester to the north and the A5 and Welshpool to the south. The A525 also provides access to Wrexham to the east. The surrounding highway network is illustrated in **Figure 3-7**.



Figure 3-7: Local Highway Network



Phoenix Drive

3.3.3 Phoenix Drive is a recently constructed single carriageway spine road connecting Heritage Way to the B5101. It is approximately 6.5m in width with footway provision and streetlighting present. The road is subject to a 30mph speed limit. Phoenix Drive was constructed to provide access to development on this wider Site.

3.3.4 Access points have been provided taking the form of roundabout and priority junctions to provide access to already developed parcels and those which were anticipated would be developed in future.

Heritage Way

3.3.5 Heritage Way, previously known as the Brymbo Link Road, is a single carriageway road providing access between the strategic road network (A483 and A525) and Brymbo. It also provides access to the settlements of New Broughton, Pentre Broughton, Lodge and Tanyfron.



- 3.3.6 Heritage Way is typically around 7.5m in width. There is footway provision between the roundabout formed with Bloom Avenue and the junction formed with Higher Berse Road. There is streetlighting provided between the roundabout formed with Bloom Avenue and the junction formed with the B5101 access.
- 3.3.7 The speed limit of the road varies with the section to the south of the roundabout formed with Bloom Avenue subject to a 40mph speed limit. On the approach to the junction formed with the A525, the road is subject to the national speed limit of 60mph.

A525

- 3.3.8 The A525 is a single carriageway road which links Coedpoeth and Wrexham. It also provides access to the strategic network of the A483 at Junction 4. It is approximately 7.5m in width and has footway provision along its northern side between Coedpoeth and Wrexham. There is also street lighting provided between the junction formed with Heritage Way and Junction 4 of the A483.
- 3.3.9 In the vicinity of Heritage Way, the road is subject to the national speed limit of 60mph, reducing to 50mph around Junction 4 of the A483.

A483

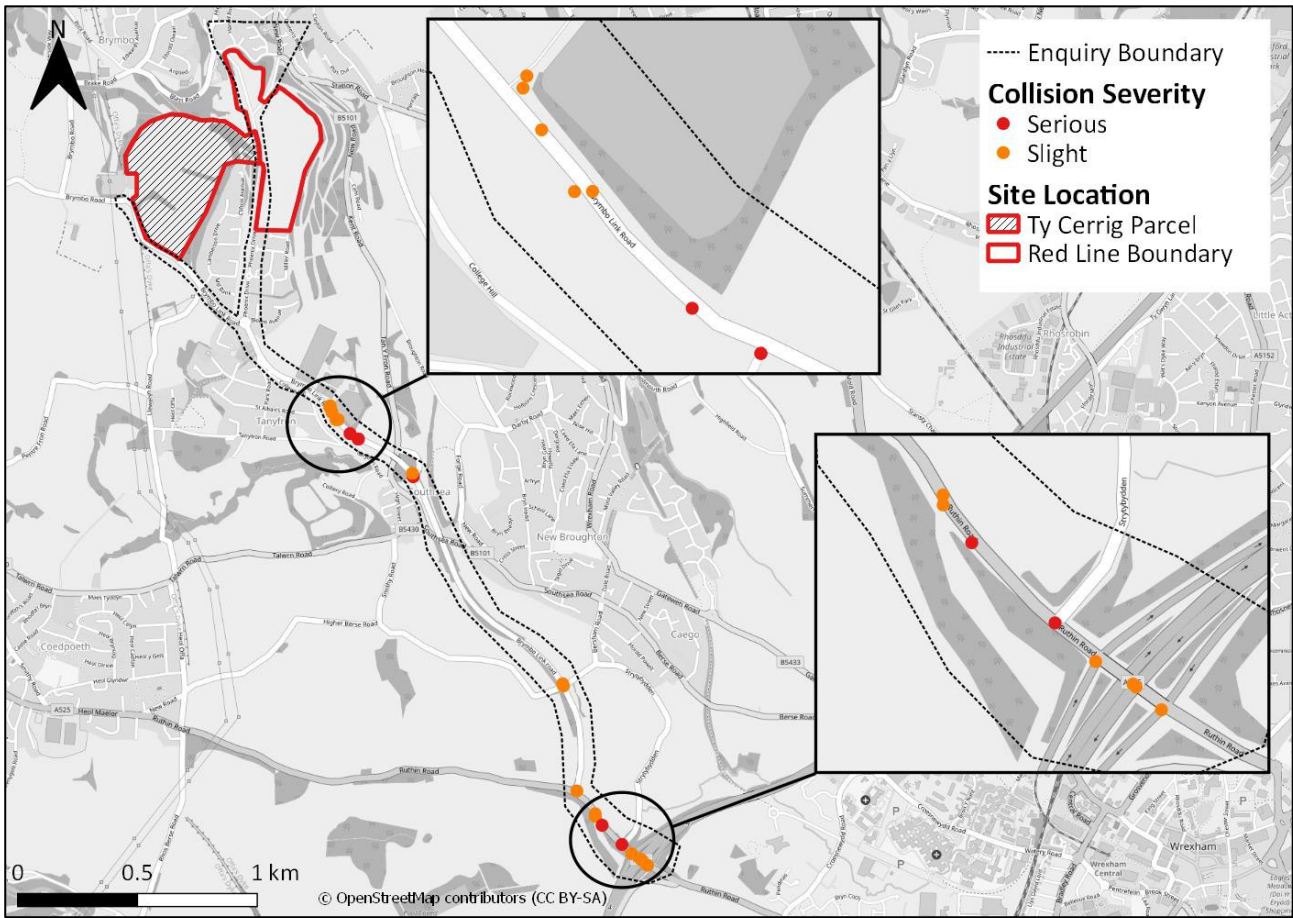
- 3.3.10 The A483 is part of the strategic road network linking Wrexham to Chester (to the north) and Oswestry (to the south). The section between Ruabon and Chester is dualled.

3.4 Personal Injury Accident Data Analysis

- 3.4.1 In order to establish whether there are any safety concerns on the local highway network that could be exacerbated by travel demand associated with the proposed development, Personal Injury Collision (PIC) data has been sourced from Wrexham County Borough Council for the most recent five-year period between 01 March 2012 and 28 February 2017. The scope of analysis and location of incidents is shown below in **Figure 3-8**. The analysis is summarised in **Table 3-5**.



Figure 3-8: Location and Severity of Personal Injury Collisions



**Table 3-5: Recorded Personal Injury Collisions³**

Link / Junction	Accident Severity			Involving Sensitive Users		
	Slight	Serious	Fatal	Pedestrian	Cycle	Motorcycle
Links						
Heritage Way between Heritage Way / Phoenix Drive / Bloom Avenue roundabout and A525 Ruthin Road	5	-	-	-	-	1
A525 Ruthin Road between Heritage Way and A483 Junction 4	2	1	-	1	-	-
Junctions						
Heritage Way / Tanyfron Road	-	2	-	-	-	-
Heritage Way / B5101	1	1	-	-	-	-
Heritage Way / Bersham Road	1	-	-	-	-	-
Heritage Way / Higher Berse Road	1	-	-	-	-	-
Heritage Way / A525 Ruthin Road	1	-	-	-	-	-
A525 Ruthin Road / A483 Junction 4	4	1	-	-	-	2
Total	15	5	-	1	-	3

Heritage Way between Heritage Way / Phoenix Drive / Bloom Avenue Roundabout and A525 Ruthin Road

- 3.4.2 A total of five collisions have occurred on Heritage Way between the Heritage Way / Phoenix Drive / Bloom Avenue roundabout and A525 Ruthin Road, all of which were classified as slight in severity. One of the five incidents involved sensitive road users; involving a motorcycle. Driver error was stated as a contributory factor in all five incidents with loss of control being a feature in four of the five collisions. In three of the five incidents, slippery road surface was also given as a contributory factor.
- 3.4.3 All five PIAs occurred in the vicinity of the access to the Brymbo Sports and Social Complex but only one involved a vehicle accessing the facility. A common causation factor relating to loss of control is present within four of the five recorded incidents in this location. It is understood, in response to the recorded PICs, that the local authority subsequently implemented mitigation measures including a reduced speed limit and advanced warning signs. The data available shows that since the implementation of these measures, no Personal Injury Collisions (PICs) have been recorded at this location.

A525 Ruthin Road between Heritage Way and A483 Junction 4

³ The table only includes locations where there has been recorded PICs.



- 3.4.4 A total of three collisions have occurred on A525 Ruthin Road between Heritage Way and A483 junction 4, with one of these incidents involving a pedestrian. Two of these were classified as slight in severity and one was classified as serious. The first slight incident was due to a vehicle's failure to stop in time and the second occurred as a result of careless / reckless driving. The serious incident involved a vehicle colliding with a pedestrian. The pedestrian was found to be impaired by alcohol and had stepped out in front of the oncoming vehicle.

Heritage Way / Tanyfron Road

- 3.4.5 A total of two collisions have occurred at the Heritage Way / Tanyfron Road junction, both of which were serious in severity and neither of which involved sensitive road users. One collision was caused by aggressive driving and loss of control on the bend on the northern approach to the junction on Heritage Way. The second collision occurred in the dark and was as a result of slippery road conditions, a poor road surface and deposit on the road (e.g. oil or mud).

Heritage Way / B5101

- 3.4.6 A total of two collisions have occurred at the Heritage Way / B5101 junction. One incident was classified as serious and the other was classified as slight in severity. Neither collision involved sensitive road users. The serious incident was caused by a driver who failed to look properly and who performed a poor turn / manoeuvre whilst exiting the junction towards Brymbo. The slight collision was caused by a vehicle that failed to slow down and collided with the rear of a vehicle slowing to turn left into the junction.

Heritage Way / Bersham Road

- 3.4.7 One collision, which did not involve sensitive road users, has occurred at the Heritage Way / Bersham Road junction and was classified as slight in severity. The collision was as a result of driver error including junction overshoot, carrying out a poor manoeuvre, failure to / misleading signal and failure to look properly. This resulted in a vehicle pulling out into the path of an oncoming vehicle.

Heritage Way / Higher Berse Road

- 3.4.8 One collision, which did not involve sensitive road users, has occurred at the Heritage Way / Higher Berse Road junction and was classified as slight in severity. The collision occurred as a result of a driver's failure to judge another person's path / speed. This led to a vehicle colliding with the rear of another vehicle waiting to turn right into the junction.

Heritage Way / A525 Ruthin Road



- 3.4.9 One collision, which did not involve sensitive road users, has occurred at the Heritage Way / A525 Ruthin Road junction and was classified as slight in severity. The incident occurred as a result of a poor manoeuvre and a driver's failure to look properly. This led to a vehicle pulling out of the junction into the path of an oncoming vehicle.

A525 Ruthin Road / A483 Junction 4

- 3.4.10 A total of five collisions have occurred at the A525 Ruthin Road / A483 (Junction 4 of the A483). Four of these were classified as slight in severity and one was classified as serious. The serious incident was caused by a driver being impaired by alcohol and took place at the junction of the A483 northbound off slip and the A525. Of the four incidents classified as slight two of these involved motorcycles with both occurring on the carriageway between the A483 northbound and southbound on / off slips. Of the two remaining incidents classified as slight, one occurred at the northbound off slip and the other at the crossroads between the southbound on and off slips.

Summary

- 3.4.11 Over the most recent five-year period, there has been a total of 20 collisions, five of which were serious and four of which involved sensitive road users. Analysis of the data revealed common occurrences of PICs on Heritage Way in the vicinity of the Brymbo Sports and Social Complex. However, the local authority has subsequently implemented mitigation measures and since this action was taken, no Personal Injury Collisions (PICs) have been recorded at this location.
- 3.4.12 As a result, it is considered that there are no inherent highway safety concerns that might be exacerbated by the proposed development.

3.5 Summary

- 3.5.1 This chapter provides a review of the baseline conditions surrounding the Site. In summary:
- The Site is located to the south of the existing area of Brymbo and north west of Wrexham.
 - The Site is intersected by Phoenix Drive, a newly constructed spine road with the purpose of serving existing and proposed development.
 - There are existing pedestrian and cycle facilities in the area surrounding the Site.
 - There are also public transport services serving local bus stops and railway stations.
 - There are limited local facilities which can be accessed using sustainable travel modes. Improvements as part of the proposed development to enhance access by sustainable travel modes are suggested in **Chapter 4** as part of a comprehensive integrated transport strategy for the Site.



- It is considered that there are no inherent highway safety concerns that might be exacerbated by the proposed development.



4 Proposed Development and Integrated Transport Strategy

4.1 Development Proposals

4.1.1 It is proposed to develop the site to accommodate the following development mix:

- 450 dwellings;
- Small district centre⁴, comprising:
 - Express style food store – 930sqm;
 - Local retail – 465sqm; and
 - Public house/restaurant – 372sqm.
 - Health centre/other non-residential use – up to 465sqm; and
- Primary School – 2FE/c. 420 pupils.

4.1.2 The facilities proposed would benefit both existing residents in the surrounding area and future residents. The facilities would reduce the need for future residents to travel and also reduce the distances travelled by existing residents to reach existing facilities. This is particularly the case for travel to food and non-food retail, healthcare and education which are also proposed to be provided on-site.

4.1.3 It is proposed that the eastern development parcel would accommodate the proposed small district centre and primary school, these would be centred around the northernmost roundabout on Phoenix Drive. This area would also include residential properties. This area of the development would be accessed from various access points from Phoenix Drive.

4.1.4 The Ty Cerrig site is proposed to be developed for residential units only. Vehicular access will be provided via a new priority junction formed with Brymbo Road.

4.1.5 Further details of the access strategy are provided in the proceeding sections.

4.2 Integrated Transport Strategy

4.2.1 The purpose of the proceeding sections is to define the strategy for accessing the development, as follows:

- Pedestrian and cycle access;
- Public transport access;
- Vehicular access;
- Parking; and

⁴ Approximately 24,000sqft or 2,230sqm Small district centre combining all uses



- Access around and through the small district centre area including proposed changes to the existing highway in this area to better accommodate all users.

Pedestrian and Cycle Access Strategy

- 4.2.2 The development infrastructure will be designed to accommodate pedestrians and cyclists. The design will ensure good connectivity between and permeability through the various development parcels and minimise conflicts with vehicular traffic. Where appropriate, pedestrians and cyclists will be placed at the top of the user hierarchy.
- 4.2.3 It will be ensured that the infrastructure for non-motorised users links well to the existing network. Footway provision, with street lighting, is already in place along Phoenix Drive which links to the existing wider pedestrian network. There are also existing public rights of way passing adjacent to the Site as shown in **Figure 3-2**. These will be maintained and enhanced, where appropriate.
- 4.2.4 Due to the local topography, there are some level differences between the Ty Cerrig Site and the rest of the development. A stepped access will provide the most direct access between these two areas with multiple wide rest points along their length. To accommodate all users however, a ramped access will also be provided at a maximum gradient of 1 in 15 to ensure access for those unable to use steps. This is within the maximum limits set out in the Active Travel Wales Guidance 2014.
- 4.2.5 Secure and convenient to use cycle parking will be provided in line with minimum standards contained in Local Planning Policy Guidance Note 16 (Wrexham County Borough Council).

Public Transport Access Strategy

- 4.2.6 The number 14 bus service (operated by Arriva), currently provides services between Brymbo and Wrexham. The service routes along Phoenix Drive and operates at an hourly frequency during the daytime between Monday and Saturday.
- 4.2.7 The maximum distance from any part of the proposed development to the existing bus route (Phoenix Drive) is approximately 650m (from the Ty Cerrig area assuming the proposed stepped access is in place). This is approximately an eight-minute walk. It is proposed to provide a bus stop in the area adjacent to the small district centre and near to the stepped/ramped access thus enhancing accessibility for those on the Ty Cerrig site.
- 4.2.8 The development proposed to the east of Phoenix Drive is all within 400m of the existing bus route. Overall, approximately 60% of the area proposed to be developed for residential properties is within 400m.



- 4.2.9 On this basis it is proposed to retain the existing rather than diverting a service into the western part of the Site which would result in a significant diversion and a reduced level of service for existing public transport users and those seeking direct access to the small district centre.
- 4.2.10 Bus stops will be provided along Phoenix Drive at locations to best serve the development parcels. The stops will be placed at appropriate intervals and consideration will also be given to increasing the service frequency.
- 4.2.11 PJA has attempted to engage with public transport officers at WCBC but no response has been provided.

Vehicular Access Strategy

- 4.2.12 Vehicular access to the proposed development will be facilitated by multiple access junctions:
- A new priority-controlled junction formed with Brymbo Road providing access to the Ty Cerrig Site;
 - Various junctions formed with Phoenix Drive (stubs are already constructed); and
 - Emergency access to the Ty Cerrig Site.
- 4.2.13 In terms of servicing and deliveries, roads will be constructed to adequate geometries to accommodate such vehicles. This will include appropriate turning and manoeuvring space where required. This will be considered further at the reserved matters stage.
- 4.2.14 **Drawings 3499-0002-A-P0 and 3499-0003 to 0004-A-P0**, included in **Appendix B**, shows the layout for the Brymbo Road site access and the area surrounding the small district centre.

Ty Cerrig Access

- 4.2.15 It is proposed to construct a new priority-controlled junction formed with Brymbo Road to provide vehicular access to the Ty Cerrig area. The access has been designed to a width of 6.5m with footway provision of 2.0m along each side of the carriageway and has been located to fit the topography of the Site. The proposed layout is shown on **Drawing 3499-0003-A-P0**.
- 4.2.16 The visibility at the site access has been informed by speed surveys undertaken on Brymbo Road. The seven day 85th percentile speeds were recorded to be 38.3mph in a northbound direction and 39.1mph in a southbound direction.
- 4.2.17 The resultant visibility requirements for 40mph of 120m are shown in both a vertical and horizontal plane on **Drawings 3499-0003 to 0004-A-P0**.



Emergency Access

- 4.2.18 It is also proposed to provide an emergency access point from Phoenix Drive into the north of the Ty Cerrig area. This is shown in **Drawing 3499-0002-A-P0**.

Residential Parking

- 4.2.19 It is proposed to provide parking in line with WCBC parking standards. A summary of the parking standards applicable to residential properties is provided in **Table 4-1**. This will be considered further at reserved matters stage.

Table 4-1: Residential Parking Standards

Number of Bedrooms	Car Parking Standard	Cycle Parking Standard
1 bedroom	1.5 spaces per dwelling	Sufficient space to provide at least 2 secure cycle parking spaces per dwelling. In the case of flats, this should be provided via safe and secure communal cycle parking areas.
2 bedrooms	2 spaces per dwelling	
3/4 bedrooms	3 spaces per dwelling	
5 or more bedrooms	4 spaces per dwelling	

Small District Centre Parking and Movement Strategy

- 4.2.20 It is proposed to provide a small district centre comprising a primary school, food and non-food retail, healthcare and a public house/restaurant. These facilities will be concentrated in the area surrounding the northernmost roundabout on Phoenix Drive.
- 4.2.21 This area is proposed to accommodate multi-modal movements with higher numbers of non-motorised users anticipated.
- 4.2.22 It will also provide a connection for non-motorised users into the Ty Cerrig area via a ramped and stepped access.
- 4.2.23 As such, it is proposed to make changes to the current highway layout to better accommodate all users. This section sets out the strategy for accommodating all users.

Non-Motorised User Access

- 4.2.24 The area surrounding the small district centre and school will be designed to ensure that pedestrians and cyclists are prioritised and conflicts with vehicular traffic is minimised. Access to the centre from the surrounding residential development will be as direct as possible for pedestrians and cyclists. It is proposed to downgrade the existing roundabout on Phoenix Drive in the vicinity of the proposed small district centre to slow vehicle speeds and better facilitate pedestrian movement to/from the development parcels.



Public Transport Access

- 4.2.25 It is intended that existing bus services would be improved to serve the development. It is likely that bus stops would be provided on Phoenix Drive adjacent to the small district centre to allow public transport access to the proposed facilities.

Phoenix Drive Roundabout Proposed Highway Improvement Works

- 4.2.26 Phoenix Drive is a recently constructed spine road serving the existing development to the south of the application boundary and it is intended that this will provide access to future phases of the development.
- 4.2.27 Phoenix Drive is currently 7.3m in width with footway provision of at least 3m wide predominantly along its eastern side. There are currently four roundabouts along the length of Phoenix Drive; the two southern roundabouts currently provide access to existing residential development via Sheppard Street and Bloom Avenue. The two northern roundabouts both have stubs provided to facilitate future access to development. There are various other access stubs provided, taking the form of priority-controlled junctions, to again provide future access to development.
- 4.2.28 It is proposed to reconfigure the northernmost roundabout on Phoenix Drive, in the area surrounding the proposed small district centre. It is proposed to provide a space which would better accommodate all users and manage potential conflicts between vehicular traffic and non-motorised users. In summary, the following principles are suggested as shown in **Drawings 3499-0002-A-P0**:
- Lower upstand kerbs to facilitate easy pedestrian movements and a vertical change in the carriageway to slow vehicle speeds and indicate a change of character on this part of the street;
 - Pedestrian crossing points on each arm of the roundabout denoted by change in surface/colour;
 - Informal pedestrian crossing points in key locations to facilitate pedestrian desire lines;
 - Level 'centre island' on the roundabout possibly using blocks to denote this; and
 - Bus stops near the small district centre.

Cycle Parking

- 4.2.29 Cycle parking will be provided in line with WCBC parking standards. A summary of the applicable parking standards is provided in **Table 4-2**.

**Table 4-2: WCBC Cycle Parking Standards**

Land Use	Parking Standard	Proposed GFA	Minimum Parking Spaces
Food Retail (>300sqm)	1 per 140sqm GFA	930sqm	7
Non-Food Retail (>300sqm)	1 per 200sqm GFA	465sqm	3

Car Parking

4.2.30 Car parking will be provided within the small district centre area, this will not however be to the detriment of non-motorised user access. This section provides an indication of the level of parking which would be provided as part of the development. The details will be discussed and agreed at reserved matters stage.

4.2.31 It is proposed to provide car parking in line with WCBC parking standards to meet the likely demand for parking whilst ensuring that the parking provision does not dominate the development. Due to the mix of land uses proposed, it is proposed to encourage shared use of the car parking.

4.2.32 Indicatively:

- The food store would have a car park which would be primarily used by its customers although this could be used for other land uses;
- There would be on-street parking bays fronting the smaller retail units primarily for the use of these units;
- The health centre would have some operational car parking;
- The public house/restaurant would have a car park which, due to the hours of operation, could also be used for school drop offs and pick-ups; and
- The car parking at the Heritage centre could also be used for school drop offs and pickups.

4.2.33 The WCBC parking standards are set out in **Table 4-3**.

Table 4-3: WCBC Car Parking Standards

Land Use	Maximum Parking Standard	Proposed GFA	Maximum Parking Spaces
Food Retail (>300sqm)	1 per 14sqm GFA	930sqm	66
Non-Food Retail (>300sqm)	1 per 20sqm GFA	465sqm	23
Pub	1 space per 4sqm of public floor space	-	-

4.2.34 It is proposed to provide 46 spaces in the area fronting the food store and 16 spaces in the area fronting the small retail units which is within the maximum standards prescribed by WCBC. Due to the envisaged local catchment of customers and since there is likely to be a relatively high turnover of parking than for a typical larger food store, this level of parking is envisaged to be sufficient.



4.2.35 To facilitate the school drop-offs and pick-ups, the shared use of other car parks is suggested. It is proposed that nearby on-street provision, parking for the Brymbo Heritage Trust facilities and parking for the other uses within the small district centre would be a relatively short walking distance to the school. Furthermore, it is unlikely that all these car parking areas would be busy during school drop off and pick up times.

4.2.36 The precise strategy would be determined at reserved matters stage.

4.3 Summary

4.3.1 This chapter has set out the strategy for multi-modal access:

- Access would be provided to the various development areas for pedestrians, cyclists and vehicles. Public transport access will also be ensured.
- Pedestrian access would be provided between the development areas.
- Vehicular access would be provided from Phoenix Drive and Brymbo Road.
- It is proposed to implement changes to the highway in the vicinity of the northernmost Phoenix Drive roundabout to tie in with the development, and to better serve the proposed small district centre area. This forms part of a wider strategy for accommodating a pedestrians, cyclists, public transport and vehicles.



5 Travel Demand

5.1 Introduction

5.1.1 For the purposes of the assessment of travel demand, the following development mix has been assumed

- 450 dwellings;
- Small district centre, comprising:
 - Express style food store – 930sqm;
 - Small retail units – 465sqm; and
 - Public house/restaurant – 372sqm.
 - Health centre/other non-residential use – up to 465sqm; and
- Primary School – 2FE/c. 420 pupils.

5.1.2 The primary school already has outline consent and so has been treated as committed development. There is also extant permission for a 1,700sqm 'express' style food store and six no. non-food retail units (93sqm each) (ref: P/2012/0816) which have been used to determine the net trip generation.

5.2 Extant Development Trip Generation

Retail

5.2.1 To forecast the likely traffic generation of the extant retail uses as part of application P/2012/0816 (and in the absence of a supporting Transport Assessment), trip rates have been extracted from the TRICS database (outputs are included at **Appendix C**), as follows:

- Sites selected from 01 – Retail, I – Local Shops category;
- Sites surveyed on a weekday have been included;
- Sites located in a suburban/neighbourhood centre location have been included; and
- Sites which include convenience retail/small food store have been included.

5.2.2 The above provides an approximation of trip rates for the combined retail offering (small food store/convenience store and retail units). The corresponding average vehicle trip rates and resultant traffic generation is provided in **Table 5-1**.

Table 5-1: Retail Vehicle Trip Rates and Traffic Generation

Time Period ⁵	Trip Rates (per 100sqm)			Trip Generation (2,258sqm)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
AM Peak Hour	4.376	3.859	8.235	99	87	186
PM Peak Hour	5.426	6.012	11.438	123	136	258

5.3 Committed Development Trip Generation

- 5.3.1 WCBC, during scoping meetings, requested consideration was given to the Tomlinson Dairies Site in terms of committed development. It is understood that the expansion and car park/access reconfiguration has already been completed and would have been operational at the time of the base traffic surveys. As such, no further consideration has been given to this.
- 5.3.2 Since the primary school already has outline planning consent, traffic generated by this has been included in the committed development scenario, as set out below.
- 5.3.3 There is already outline consent for the exhibition area in the former machine shop. It is however assumed that the vehicular trip generation during the peak hours considered in this assessment would be minimal. As such, no further consideration has been given to this.
- 5.3.4 PJA is not aware of any further committed developments which would impact on the local highway network and therefore any other growth in traffic levels has been adequately accounted for using TEMPro growth factors.

Primary School

- 5.3.5 A planning application was submitted and approved in 2017 (ref 2017/0105). As such, the school will be treated in trip generation terms as committed development.
- 5.3.6 To account for the traffic likely to be generated by the consented primary school, trip rates have been extracted from the TRICS database (outputs are included at **Appendix C**), as follows:
- Sites selected from 04 – Education, A – Primary;
 - Sites surveyed on a weekday have been included;
 - Sites located in a suburban/neighbourhood centre location have been included; and
 - Sites with more than 250 pupils have been included.
- 5.3.7 The corresponding average vehicle trip rates and resultant traffic generation is provided in **Table 5-2**.

Table 5-2: Primary School Vehicle Trip Rates and Traffic Generation

⁵ AM Peak Hour of 08:00 to 09:00 and PM Peak Hour of 17:00 to 18:00 is assumed throughout.



Time Period	Trip Rates (per pupil)			Trip Generation (420 pupils)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
AM Peak Hour	0.266	0.187	0.453	112	79	191
PM Peak Hour ⁶	0.022	0.028	0.050	9	12	21

5.3.8 It is assumed that the departures during the AM peak hour are associated with pupil drop offs and the arrivals during the PM peak hour are associated with out of hours pupil pickups. On this basis, a breakdown of staff and pupil associated vehicle trips is provided in **Table 5-3**.

Table 5-3: Primary School Traffic Generation by Staff/Pupils

Time Period	Staff			Pupils		
	Arrivals	Departures	Total	Arrivals	Departures	Total
AM Peak Hour	33	0	33	79	79	158
PM Peak Hour	0	3	3	9	9	18

5.4 Proposed Development Trip Generation

Residential

5.4.1 Trip rates have been calculated for the proposed residential element utilising local traffic count data. A traffic count was undertaken at the Bloom Avenue/Brymbo Road/Phoenix Drive junction. A summary of the surveyed traffic flows is provided in **Table 5-4** using traffic volumes on the Bloom Avenue arm of the roundabout.

Table 5-4: AM and PM Peak Hour Traffic Survey Summary – Bloom Avenue

	To Bloom Avenue	From Bloom Avenue	Total
AM Peak Hour	19	44	63
PM Peak Hour	40	19	59

5.4.2 A total of 103 dwellings are accessed from Bloom Avenue, as follows:

- Bloom Avenue – 46 dwellings;
- Ingot Close – 31 dwellings; and
- Chariot Drive – 26 dwellings.

5.4.3 The corresponding calculated trip rates and resultant trip generation for the proposed residential development are provided in **Table 5-5**.

Table 5-5: Calculated Residential Trip Rates and Traffic Generation

⁶ This is the network PM peak hour of 17:00 to 18:00 which is being assessed, not the school PM peak hour.

Time Period	Trip Rates (per dwelling)			Traffic Generation (450 dwellings)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
AM Peak Hour	0.184	0.427	0.612	83	192	275
PM Peak Hour	0.388	0.184	0.573	175	83	258

5.4.4 The above trip rates provide a robust indication of residential traffic generation since the existing residential development is located some distance away from local facilities. The provision of local facilities within the development will reduce the need to travel by car, particularly to retail, healthcare and educational facilities.

5.4.5 Not only would this mean that the above forecast of traffic generation is likely to be high, the volume of traffic generated by the existing surrounding residential development could also reduce due to the reduced need to travel longer distances to everyday amenities.

Retail

5.4.6 The trip rates extracted for the extant retail use have been used to forecast the traffic likely to be generated by the proposed retail element. The corresponding average trip rates and resultant traffic generation is provided in **Table 5-6**.

Table 5-6: Retail Trip Rates and Traffic Generation

Time Period	Trip Rates (per 100sqm)			Trip Generation (1,394sqm)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
AM Peak Hour	4.376	3.859	8.235	61	54	115
PM Peak Hour	5.426	6.012	11.438	76	84	160

Public House/Restaurant

5.4.7 Trip rates have been extracted from the TRICS database to forecast the traffic likely to be generated by the proposed public house, (outputs are included at **Appendix C**), as follows:

- Sites selected from 06 – Hotel, Food & Drink, C – Pub/Restaurant;
- Sites surveyed on a weekday have been included;
- Sites located in a suburban/neighbourhood centre location have been included; and
- Sites occupying up to 1000sqm have been included.

5.4.8 The corresponding average trip rates and resultant traffic generation is provided in **Table 5-7**.

Table 5-7: Public House/Restaurant Trip Rates and Traffic Generation



Time Period	Trip Rates (per 100sqm)			Trip Generation (372sqm)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
AM Peak Hour	0	0	0	0	0	0
PM Peak Hour	2.745	2.297	5.042	10	9	19

Health Centre

5.4.9 Trip rates have been extracted from the TRICS database to forecast the traffic likely to be generated by the proposed healthcare element (outputs are included at **Appendix C**), as follows:

- Sites selected from 05 – Health, G – GP Surgeries;
- Sites surveyed on a weekday have been included;
- Sites located in a suburban/neighbourhood centre location have been included; and
- Sites occupying between 300 sqm and 700 sqm have been included.

5.4.10 The corresponding average trip rates and resultant traffic generation is provided in **Table 5-8**.

Table 5-8: Health Centre Trip Rates and Traffic Generation

Time Period	Trip Rates (per 100sqm)			Trip Generation (465sqm)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
AM Peak Hour	2.667	1.497	4.164	12	7	19
PM Peak Hour	2.041	3.021	5.062	9	14	23

Net Trip Generation

5.4.11 The Site already benefits from a range of previous planning consents. This includes extant outline permission for retail uses. A summary of the net trip generation is provided in **Table 5-9**.

Table 5-9: Net Trip Generation

Development	AM Peak Hour			PM Peak Hour		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Proposed New Development (excl. Primary School)	156	253	409	270	189	459
<i>Extant Permission – Retail Uses</i>	99	87	186	123	136	258
Net Development	57	166	223	147	53	200

5.4.12 The proposed development is forecast to generate 223 and 200 total trips in the AM and PM peak hours respectively, net of trips forecast to be generated by extant permissions. This therefore forms the basis of the assessment.

5.4.13 It should however be noted that the provision of local facilities on the site is likely to reduce the need to travel for existing residents in the adjoining areas for retail, healthcare and education

journey purposes. This has not been accounted for within this assessment and so provides a robust assessment of the impact of the proposals.

5.5 Trip Distribution and Assignment

5.5.1 Gravity models have been developed to appropriately distribute the traffic associated with the proposed development, as follows:

- Eastern Parcel – Residential and School;
- Eastern Parcel – Retail; and
- Western Parcel – Residential.

5.5.2 A Technical Note is provided in **Appendix D** which sets out the methodology used and also includes the traffic flow and distribution diagrams.

5.5.3 Since no Transport Assessment is available to directly inform the distribution of the extant retail uses, the 'Eastern Parcel – Retail' gravity model has been utilised. The distribution of traffic is in line with the catchment area identified by RPS in the Retail Study submitted with the planning application for the extant use.

5.6 Travel Demand Management

5.6.1 An overarching Travel Plan has been prepared to support the planning application. This provides a framework for the preparation of the final Travel Plan and covers the mix of uses proposed on-Site. To provide a robust assessment of development impact however, no reductions have been applied to the trip generation to account for the Travel Plan.



6 Development Impact

6.1 Network Study Area

6.1.1 Based on the assignment of development traffic the following junctions have been considered as part of the assessment along with the Ty Cerrig Site Access/Brymbo Road junction:

- Bloom Avenue/Brymbo Road/Phoenix Drive;
- A525/Heritage Way; and
- A525/A483 (Junction 4 of A483).

6.1.2 PJA commissioned traffic surveys at the above junctions on Thursday 28 June 2018 between 07:00 and 10:00 hours in the AM period and between 16:00 and 19:00 hours in the PM period.

6.1.3 The impact of the proposed development has been assessed for the above junctions using standalone junction capacity modelling software (Junctions 9 or LinSig, as appropriate). Proportionate and reasonable mitigation has been considered where required and feasible.

6.1.4 Consideration has also been given to the 'Wrexham Strategic Road Network Capacity and Improvement Study' prepared by CAPITA with respect to Junction 4 of the A483.

6.2 Assessment Periods

6.2.1 The following peak hour time periods have been assessed in line with the peak hours for development traffic generation:

- AM: 08:00 to 09:00 hours; and
- PM: 17:00 to 18:00 hours.

6.2.2 The following scenarios have been assessed:

- 2018 Base;
- Future Year Base;
- Future Year Base + Committed Development; and
- Future Year Base + Committed Development + Proposed Development.

6.2.3 A future year of 2024 for the local network and 2029 for the strategic network (i.e. Junction 4 of the A483) have been assessed. The appropriate factors to growth traffic data from the base year of 2018 to the future years of 2024 and 2029 have been obtained from the TEMPro database, as set out in **Table 6-1**.

Table 6-1: TEMPro Growth Factors

	AM Peak	PM Peak
2018 to 2024	1.0751	1.0750
2018 to 2029	1.1280	1.1290

6.3 Development Impact in Brymbo

- 6.3.1 In the area to the north of the Site, traffic has been distributed either towards Gwalia Road (via the unnamed road from the roundabout on Phoenix Drive) or towards the B5101 (via Phoenix Drive). Traffic forecast to travel to/from Brymbo centre, has been distributed along the unnamed road and traffic forecast to travel to/from areas to the east of the Site has been distributed along Phoenix Drive.
- 6.3.2 Approximately 30% of traffic has been distributed to the north of the Site following the gravity modelling. No capacity issues have been noted in this area and therefore further assessment of junction capacity has not been undertaken for this area.

6.4 Junction Capacity Assessments

- 6.4.1 Junction capacity assessments have been undertaken using standalone junction models. The modelling outputs are provided in **Appendix E**.

Ty Cerrig Site Access/Brymbo Road Junction

- 6.4.2 It is proposed to provide access to the Ty Cerrig area through the construction of a new priority junction formed with Brymbo Road. The junction has been modelled using Junctions 9. The results are presented in **Table 6-2**.

Table 6-2: Ty Cerrig Site Access/Brymbo Road Junction – 2024 Base + Committed Development + Net Development

Arm/Turning Movement	AM Peak			PM Peak		
	RFC	Queue	Delay	RFC	Queue	Delay
Site Access – Left turn	0.19	1	6	0.08	1	5
Site Access – right turn	0.00	1	8	0.00	1	0
Brymbo Road (E) – Right turn/ahead	0.10	1	6	0.21	1	7

- 6.4.3 The junction is forecast to operate well within acceptable thresholds of capacity in the future year Base + Development scenario. The junction therefore provides a suitable form of access in terms of capacity.



Phoenix Drive/Bloom Avenue/Heritage Way/Brymbo Road Roundabout

6.4.4 The Phoenix Drive/Bloom Avenue/Heritage Way/Brymbo Road junction takes the form of a four-arm roundabout. The junction has been modelled using Junctions 9. The results are presented in **Tables 6-3 to 6-6**.

Table 6-3: Phoenix Drive/Bloom Avenue/Heritage Way/Brymbo Road Roundabout – 2018 Base Results

Arm	AM Peak			PM Peak		
	RFC	Queue	Delay	RFC	Queue	Delay
Phoenix Drive	0.17	1	3	0.11	1	3
Bloom Avenue	0.06	1	4	0.02	1	4
Heritage Way	0.11	1	3	0.24	1	3
Brymbo Road	0.14	1	3	0.07	1	3

Table 6-4: Phoenix Drive/Bloom Avenue/Heritage Way/Brymbo Road Roundabout – 2024 Base Results

Link Name	AM Peak			PM Peak		
	RFC	Queue	Delay	RFC	Queue	Delay
Phoenix Drive	0.18	1	3	0.12	1	3
Bloom Avenue	0.06	1	4	0.02	1	4
Heritage Way	0.12	1	3	0.25	1	3
Brymbo Road	0.15	1	3	0.08	1	3

Table 6-5: Phoenix Drive/Bloom Avenue/Heritage Way/Brymbo Road Roundabout – 2024 Base + Committed Development Results

Link Name	AM Peak			PM Peak		
	RFC	Queue	Delay	RFC	Queue	Delay
Phoenix Drive	0.22	1	4	0.13	1	3
Bloom Avenue	0.06	1	5	0.02	1	4
Heritage Way	0.14	1	3	0.26	1	3
Brymbo Road	0.17	1	3	0.08	1	3

Table 6-6: Phoenix Drive/Bloom Avenue/Heritage Way/Brymbo Road Roundabout – 2024 Base + Committed Development + Net Development Results

Link Name	AM Peak			PM Peak		
	RFC	Queue	Delay	RFC	Queue	Delay
Phoenix Drive	0.28	1	4	0.16	1	3
Bloom Avenue	0.07	1	5	0.02	1	4
Heritage Way	0.18	1	3	0.34	1	4
Brymbo Road	0.27	1	4	0.13	1	3

6.4.5 The Phoenix Drive/Bloom Avenue/Heritage Way/Brymbo Road roundabout is forecast to operate well within acceptable thresholds of capacity in all the scenarios modelled.

A525/Heritage Way Junction

6.4.6 The A525/Heritage Way junction takes the form of a priority junction. The minor arm is formed by Heritage Way and the major arms are formed by the A525. The junction has been modelled using Junctions 9. The results are presented in **Tables 6-7 to 6-10**, below.

Table 6-7: A525/Heritage Way Junction – 2018 Base Results

Link Name	AM Peak			PM Peak		
	RFC	Queue	Delay	RFC	Queue	Delay
Heritage Way – Left turn	0.64	2	17	0.49	1	12
Heritage Way – Right turn	0.03	0	17	0.07	1	35
A525 (E) – Ahead/Right turn	0.59	2	17	1.02	30	116

Table 6-8: A525/Heritage Way Junction – 2024 Base Results

Link Name	AM Peak			PM Peak		
	RFC	Queue	Delay	RFC	Queue	Delay
Heritage Way – Left turn	0.70	2	19	0.55	1	13
Heritage Way – Right turn	0.03	0	15	0.15	0	74
A525 (E) – Ahead/Right turn	0.64	2	18	1.11	74	359

Table 6-9: A525/Heritage Way Junction – 2024 Base + Committed Development Results

Link Name	AM Peak			PM Peak		
	RFC	Queue	Delay	RFC	Queue	Delay
Heritage Way – Left turn	0.70	2	19	0.56	1	13
Heritage Way – Right turn	0.03	0	15	0.18	0	78
A525 (E) – Ahead/Right turn	0.65	2	19	1.11	76	359

**Table 6-10: A525/Heritage Way Junction – 2024 Base + Committed Development + Net Development Results**

Link Name	AM Peak			PM Peak		
	RFC	Queue	Delay	RFC	Queue	Delay
Heritage Way – Left turn	0.84	5	32	0.78	3	30
Heritage Way – Right turn	0.04	0	16	*	3	916
A525 (E) – Ahead/Right turn	0.73	3	24	1.22	143	669

* Has exceeded reporting limits major road traffic flows result in the capacity of the Heritage Way right turn being 0.

- 6.4.7 The A525/Heritage Way junction currently operates within capacity in the AM peak hour and outside acceptable thresholds of capacity during the PM peak hour. The junction continues to operate outside acceptable capacity thresholds in the PM peak hour in the future year and with development scenarios.
- 6.4.8 It is therefore clear that a scheme would be required in this location to mitigate the development impact. The predominant traffic movements are left out of Heritage Way and right in to Heritage Way during the peak periods.
- 6.4.9 In order to better facilitate these movements, it is proposed to control traffic using traffic signals. Since the dominant movements are not in conflict, these could operate concurrently. Furthermore, signal control of the junction would also assist vehicles turning right out of Heritage Way which the modelling demonstrates would be difficult in the future year with development scenario.
- 6.4.10 The proposed mitigation layout is shown on **Drawing 3499-0001-A-P0** included at **Appendix F**. The proposed scheme has been modelled in Linsig V3 and the results are provided in **Table 6-11** and **Appendix G**.

Table 6-11: A525/Heritage Way – Proposed Mitigation Layout – 2024 Base + Committed Development + Net Development

Link No.	Link Name	AM Peak			PM Peak		
		DoS	Ave. Delay (s/PCU)	MMQ (PCU)	DoS	Ave. Delay (s/PCU)	MMQ (PCU)
1/1+1/2	Heritage Way Left Right	52%	18	8	32%	11	4
2/1+2/2	A525 (E) Right Ahead	66%	14	8	97%	37	28
3/1	A525 (W) Left Ahead	67%	31	11	94%	78	17
PRC (Cycle Time)		35% (90s)			-8% (90s)		

- 6.4.11 The proposed junction improvement scheme more than mitigates the forecast development impact. In the AM peak hour, the junction is forecast to operate within acceptable capacity thresholds with the junction forecast to operate marginally above capacity in the PM peak hour this however mitigates the impact of the proposed development since queues and delays are no worse than the without development scenario for the current layout.

A483 Junction 4

- 6.4.12 Junction 4 of the A483 is signal controlled. The junction comprises two signal-controlled junctions formed with the A525.
- 6.4.13 One providing access to the A483 northbound on-slip and egress from the A483 northbound off slip. The other junction provides access to the A483 southbound on-slip and egress from the A483 southbound off slip. The junction has been modelled in LinSig V3 and the results are presented in **Tables 6-12 to 6-15**.

**Table 6-12: A483 Junction 4 - 2018 Base Results**

Link No.	Link Name	AM Peak			PM Peak		
		DoS	Ave. Delay (s/PCU)	MMQ (PCU)	DoS	Ave. Delay (s/PCU)	MMQ (PCU)
1/2+1/1	A525 West (Eastbound) Ahead Left	102.8%	133	31	95.5%	81	15
1/3	A525 West (Eastbound) Ahead	44.4%	37	5	55.4%	46	5
2/1	A483 Northbound Off-Slip Left	49.8%	32	6	100.4%	113	26
2/2	A483 Northbound Off-Slip Right	56.3%	33	7	37.2%	29	4
3/1	A525 West (Westbound) Ahead	71.8%	40	7	88.5%	29	13
3/2	A525 West (Westbound) Right	30.9%	5	2	23.0%	4	1
4/1	A525 East (Eastbound) Ahead	76.7%	16	9	54.6%	22	9
4/2	A525 East (Eastbound) Right	26.0%	3	2	22.4%	22	2
5/1	A483 Southbound Off-Slip Left	88.8%	57	15	28.5%	33	3
5/2	A483 Southbound Off-Slip Right	43.3%	31	5	87.3%	62	12
6/1	A525 East (Westbound) Left	45.9%	50	3	42.4%	47	3
6/2+6/3	A525 East (Westbound) Ahead	87.2%	66	9	104.5%	174	24
PRC (Cycle Time)		-14.2% (90s)			-16.1% (90s)		

6.4.14 In line with observations, the junction operates outside acceptable thresholds of capacity in both peak hours in the base year scenario. In the AM peak hour, the highest queues and delays are seen on the A525 (West) approach to the junction.

6.4.15 In the PM peak hour, the A525 (West) approach is again forecast to operate outside acceptable thresholds of capacity with higher associated queues and delays. The highest queues and delays

are however observed on the A525 (East) approach with queues of 53 PCUs observed on this approach in the PM peak hour.

- 6.4.16 In the future year scenarios, the junction performance has been optimised to minimise queuing between the junctions and to minimise the impact of queuing on the A483 off-slips on the A483 mainline.

Table 6-13: A483 Junction 4 - 2029 Base Results

Link No.	Link Name	AM Peak			PM Peak		
		DoS	Ave. Delay (s/PCU)	MMQ (PCU)	DoS	Ave. Delay (s/PCU)	MMQ (PCU)
1/2+1/1	A525 West (Eastbound) Ahead Left	137%	573	129	197%	953	165
1/3	A525 West (Eastbound) Ahead	66%	50	6	125%	468	30
2/1	A483 Northbound Off-Slip Left	56%	33	7	96%	73	23
2/2	A483 Northbound Off-Slip Right	64%	36	8	36%	25	4
3/1	A525 West (Westbound) Ahead	58%	20	4	88%	19	10
3/2	A525 West (Westbound) Right	25%	4	2	23%	6	4
4/1	A525 East (Eastbound) Ahead	70%	10	9	46%	23	5
4/2	A525 East (Eastbound) Right	27%	3	3	21%	44	4
5/1	A483 Southbound Off-Slip Left	97%	82	21	29%	32	3
5/2	A483 Southbound Off-Slip Right	47%	31	6	90%	65	14
6/1	A525 East (Westbound) Left	78%	88	5	48%	49	3
6/2+6/3	A525 East (Westbound) Ahead	147%	538	66	118%	350	51
PRC (Cycle Time)		-64% (90s)			-119% (90s)		



6.4.17 In the future year base, the operation is forecast to worsen with the growth in the base year traffic.

Table 6-14: A483 Junction 4 - 2029 Base + Committed Development

Link No.	Link Name	AM Peak			PM Peak		
		DoS	Ave. Delay (s/PCU)	MMQ (PCU)	DoS	Ave. Delay (s/PCU)	MMQ (PCU)
1/2+1/1	A525 West (Eastbound) Ahead Left	137%	579	131	197%	955	165
1/3	A525 West (Eastbound) Ahead	66%	50	6	125%	468	30
2/1	A483 Northbound Off-Slip Left	56%	33	7	96%	73	23
2/2	A483 Northbound Off-Slip Right	64%	36	8	36%	25	4
3/1	A525 West (Westbound) Ahead	59%	20	4	88%	19	10
3/2	A525 West (Westbound) Right	25%	4	2	23%	6	4
4/1	A525 East (Eastbound) Ahead	70%	10	9	46%	23	5
4/2	A525 East (Eastbound) Right	27%	3	3	21%	44	4
5/1	A483 Southbound Off-Slip Left	97%	82	21	29%	32	3
5/2	A483 Southbound Off-Slip Right	48%	31	6	91%	66	14
6/1	A525 East (Westbound) Left	78%	88	5	48%	49	3
6/2+6/3	A525 East (Westbound) Ahead	147%	538	66	118%	354	52
PRC (Cycle Time)		-64% (90s)			-119% (90s)		

6.4.18 The addition of committed development traffic does not impact on the operation of the junction since the number of committed development trips on this part of the network is minimal.

Table 6-15: A483 Junction 4 - 2029 Base + Committed Development + Net Development Results

Link No.	Link Name	AM Peak			PM Peak		
		DoS	Ave. Delay (s/PCU)	MMQ (PCU)	DoS	Ave. Delay (s/PCU)	MMQ (PCU)
1/2+1/1	A525 West (Eastbound) Ahead Left	146%	660	163	211%	1005	184
1/3	A525 West (Eastbound) Ahead	66%	50	6	125%	467	30
2/1	A483 Northbound Off-Slip Left	56%	33	7	96%	73	23
2/2	A483 Northbound Off-Slip Right	64%	36	8	36%	25	4
3/1	A525 West (Westbound) Ahead	61%	20	4	89%	21	11
3/2	A525 West (Westbound) Right	25%	4	2	18%	7	3
4/1	A525 East (Eastbound) Ahead	72%	10	10	46%	23	5
4/2	A525 East (Eastbound) Right	27%	3	3	21%	43	4
5/1	A483 Southbound Off-Slip Left	97%	82	21	29%	32	3
5/2	A483 Southbound Off-Slip Right	50%	32	6	93%	75	16
6/1	A525 East (Westbound) Left	78%	88	5	48%	49	3
6/2+6/3	A525 East (Westbound) Ahead	165%	642	85	134%	534	84
PRC (Cycle Time)		-83% (90s)			-134% (90s)		

6.4.19 With the addition of development traffic, the operation of the junction is forecast to worsen when compared to the base traffic scenario.

6.4.20 On those movements which were already operating at or beyond capacity (a degree of saturation of 90% or more), queuing has increased in line with the number of additional vehicles forecast to be generated by the development.



- 6.4.21 PJA has been provided with a study undertaken by CAPITA considering the capacity and potential improvements at junctions along the A483 corridor; this study included Junction 4 of the A483. The findings of the baseline modelling of the junction are consistent with the findings of the above modelling which demonstrated issues with capacity on the A525 (West) in the AM peak and on the A525 (East) and A483 northbound off-slip in the PM peak.
- 6.4.22 As part of the study, two options were considered to improve the junction performance in the future year scenario with the addition of traffic generated by wider development and growth aspirations for the area. One option comprised the construction of a new link road linking the A525/Heritage Way junction with Croesnewydd Road to by-pass Junction 4 of the A483. The second option comprised the provision of a grade separated roundabout at Junction 4 of the A483. The report concluded that the provision of a grade separated junction provided the greatest benefit in terms of junction performance with the junction forecast to operate within acceptable thresholds of capacity in the future year with development and growth aspirations scenario.
- 6.4.23 PJA has contacted the Welsh Government Project Manager for this scheme to determine the timescales and progress with implementing a scheme in this location. PJA has been advised that the Welsh Government is currently undertaking a WelTAG⁷ Stage 2 study into the improvements that can be made to ease congestion and improve journey time reliability between Junctions 3 and 6 on the A483. Outline Business Case (Stage 2) is due to be completed by December 2019 which involves outline infrastructure solutions that will have been modelled and shortlisted to take forward to Full Business Case (Stage 3). The timescales for implementation of a scheme in this location is not yet known.
- 6.4.24 Potential options have been considered to mitigate the development impact. It is not possible to provide additional traffic lanes due to the available highway boundary and the constraints of the overbridge over the A483. Changes to staging of the traffic signals has also been considered. This includes consideration of allowing vehicles turning right on to the A483 on-slips to run opposed to oncoming movements (this would require right turning vehicles to give way). Due to the number of lanes right turning traffic would be opposed to, this is not deemed to be an option. Since there are no feasible interim schemes to mitigate the impact of the proposed development at Brymbo in this location, it is instead proposed to make a proportionate and reasonable contribution towards the wider scheme in this location.
- 6.4.25 It is likely that a scheme would have been implemented prior to the full occupation/completion of the Brymbo Park development. If not, it is likely that the impact resulting from full build out would be temporary prior to the implementation of a scheme in this location.

⁷ Welsh Transport Appraisal Guidance

- 6.4.26 There is currently extant permission for food/non-food retail and education uses on-site. These did not require the delivery of improvements at Junction 4 of the A483 as it was deemed the impact was not severe. Furthermore, the provision of food/non-food retail on-site, would likely reduce the number of vehicle movements (associated with existing adjoining residential areas) to/from Wrexham for shopping trips. This would reduce the number of vehicles passing through Junction 4 of the A483.

6.5 Summary

6.5.1 In summary:

- The proposed Ty Cerrig access junction formed with Brymbo Road is forecast to operate within acceptable thresholds of capacity.
- The Phoenix Drive/Bloom Avenue/Heritage Way/Brymbo Road roundabout is forecast to operate within acceptable thresholds of capacity including with the inclusion of development traffic.
- The A525/Heritage Way junction currently operates within capacity in the AM peak hour and outside acceptable thresholds of capacity during the PM peak hour. The junction continues to operate outside acceptable capacity thresholds in the PM peak hour in the future year and with development scenarios. It is therefore proposed to implement a junction improvement scheme at this location taking the form of a signal-controlled junction which has been shown to mitigate the development impact.
- Junction 4 of the A483 currently operates outside acceptable thresholds of capacity in both peak hours. This operation is forecast to worsen in the future year and with the inclusion of development traffic. There are no feasible measures to solely mitigate the development impact and therefore it is proposed that a fair and proportionate contribution is made towards a wider improvement scheme in this location.



7 Summary and Conclusions

- 7.1.1 PJA has been commissioned to prepare a Transport Assessment to accompany the proposed development of land at the former Brymbo Steelworks site for a residential led mixed-use development.
- 7.1.2 The Transport Assessment has been prepared in accordance with discussions with WCBC highways officers and in line with Planning Policy Wales, Technical Advice Note 18: Transport.
- 7.1.3 Over the most recent five-year period, there has been a total of 20 collisions, five of which were serious and four of which involved sensitive road users. Analysis of the data revealed common occurrences of PICs on Heritage Way in the vicinity of the Brymbo Sports and Social Complex. However, the local authority has subsequently implemented mitigation measures and since this action was taken, no Personal Injury Collisions (PICs) have been recorded at this location. As a result, it is considered that there are no inherent highway safety concerns that might be exacerbated by the proposed development.
- 7.1.4 It is proposed to develop the Site for 450 dwellings, a primary school and a small district centre comprising retail, a public house/restaurant and health centre/other non-residential use. The provision of local facilities will benefit future residents by reducing the need to travel as well as improving accessibility for existing residents of adjoining areas to retail, healthcare and educational facilities, again reducing the need to travel.
- 7.1.5 The development will be designed to adequately accommodate pedestrians, cyclists, public transport services and other vehicular traffic. Vehicular access is proposed to be facilitated from Phoenix Drive and via a newly constructed access from Brymbo Road.
- 7.1.6 It is proposed to provide cycle and car parking facilities in line with WCBC parking standards.
- 7.1.7 Trip generation has been calculated using traffic surveys for the residential development. Thus, provide a robust indication of traffic generation as existing residents are required to travel some distance to access local amenities whereas a future residents would have access to key facilities within walking distance. The trip generation for the other uses has been estimated using data extracted from the TRICS database). Gravity modes have been developed to appropriately distribute and assign traffic to the highway network.
- 7.1.8 In terms of the forecast impact in Brymbo to the north of the Site, approximately 30% of traffic is forecast to route in this direction. No capacity issues have been noted in this area and therefore further assessment of junction capacity has not been undertaken.
- 7.1.9 The following junctions have been considered as part of the capacity assessment along with the Ty Cerrig Site Access/Brymbo Road junction:



- Bloom Avenue/Brymbo Road/Phoenix Drive;
- A525/Heritage Way; and
- A525/A483 (Junction 4 of A483).

- 7.1.10 The impact of the proposed development has been assessed for the above junctions using standalone junction capacity modelling software (Junctions or LinSig, as appropriate).
- 7.1.11 The proposed Ty Cerrig site access junction formed with Brymbo Road is forecast to operate within acceptable thresholds of capacity and therefore provides a suitable form of access in capacity terms.
- 7.1.12 The Phoenix Drive/Bloom Avenue/Heritage Way/Brymbo Road roundabout is forecast to operate within acceptable thresholds of capacity in its current form with the inclusion of development traffic.
- 7.1.13 The A525/Heritage Way junction currently operates within capacity in the AM peak hour and outside acceptable capacity thresholds in the PM peak hour. The operation is forecast to worsen in the future year base and with the addition of traffic forecast to be generated by the proposed development. It is therefore proposed to implement a junction improvement scheme in this location.
- 7.1.14 Junction 4 of the A483 currently operates outside acceptable thresholds of capacity in both peak hours. This operation is forecast to worsen in the future year and within the inclusion of development traffic. There are no feasible measures to solely mitigate the development impact and therefore it is proposed that a fair and proportionate contribution is made towards a wider improvement scheme in this location. It is likely that a scheme would have been implemented prior to the full occupation/completion of the Brymbo Park development. If not, it is likely that the impact resulting from full build out would be temporary prior to the implementation of a scheme.

7.2 Conclusion

- 7.2.1 From the assessment undertaken, it has been demonstrated that the residual cumulative impacts of the development are not severe. Therefore, the proposed development should not be prevented or refused on highways grounds.



Appendix A Indicative Land Use Plan



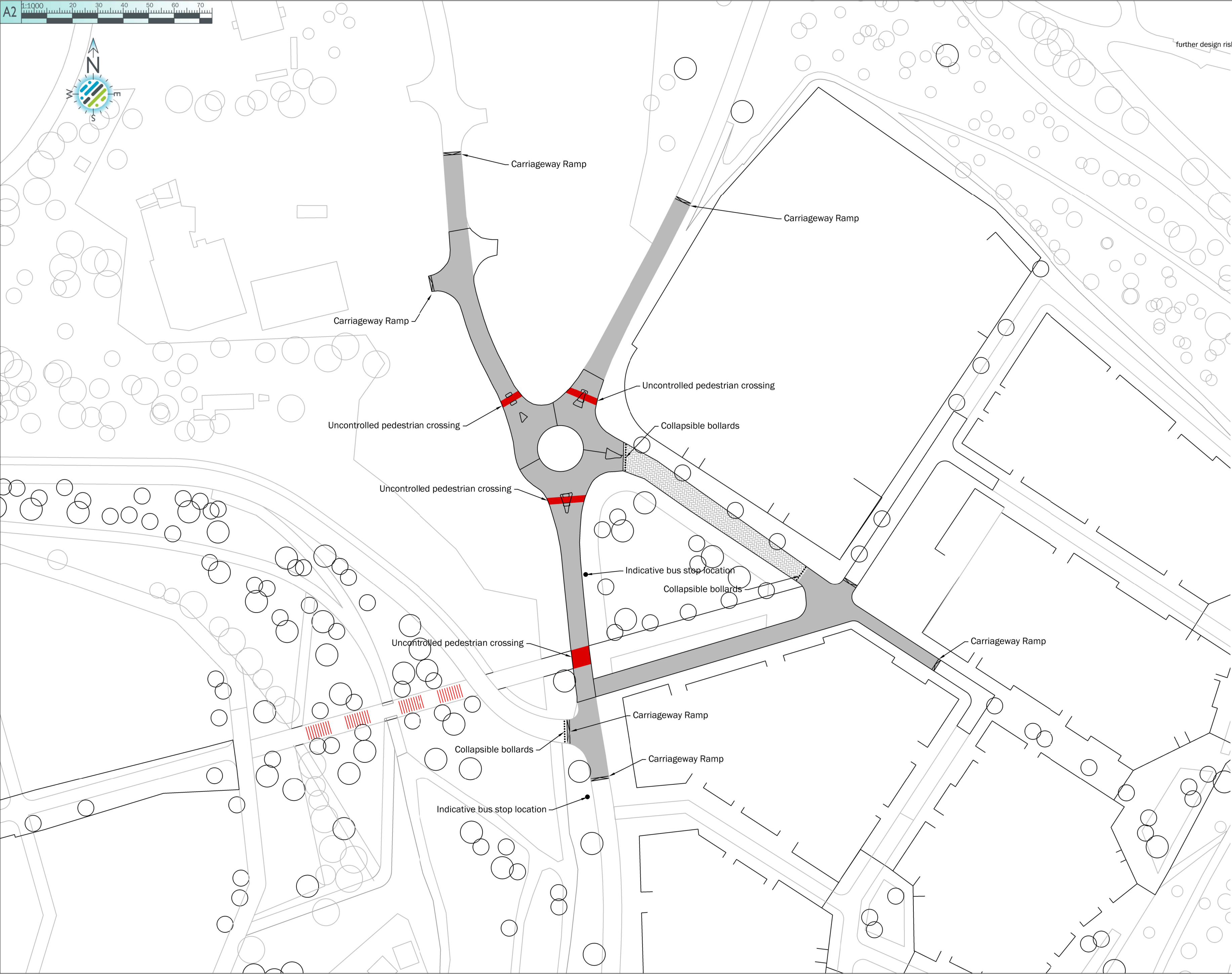
Planning • Master Planning & Urban Design • Architecture •
Landscape Planning & Design • Environmental Planning • Graphic
Communication • Public Engagement • Development Economics

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Appendix B Preliminary Access Drawings



NOTES
These drawings have been produced with reference to the CDM Regulations 2015. Please note that these are pre-construction phase drawings and should be subject to further design risk management as required in accordance with Regulation 9

- Key**
- Kerb upstand along the carriageway to be between 25mm and 50mm
 - Kerb upstand along pedestrian and emergency access to be between 25mm and 50mm
 - Change of surface for pedestrian crossing

REV	DATE	REVISION NOTE	BY



Seven House - High Street
Longbridge - Birmingham
B31 2UQ - Tel: 0121 475 0234

London - Birmingham
Bristol - Reading - Exeter
www.pja.co.uk

CLIENT
Brymbo Developments Ltd

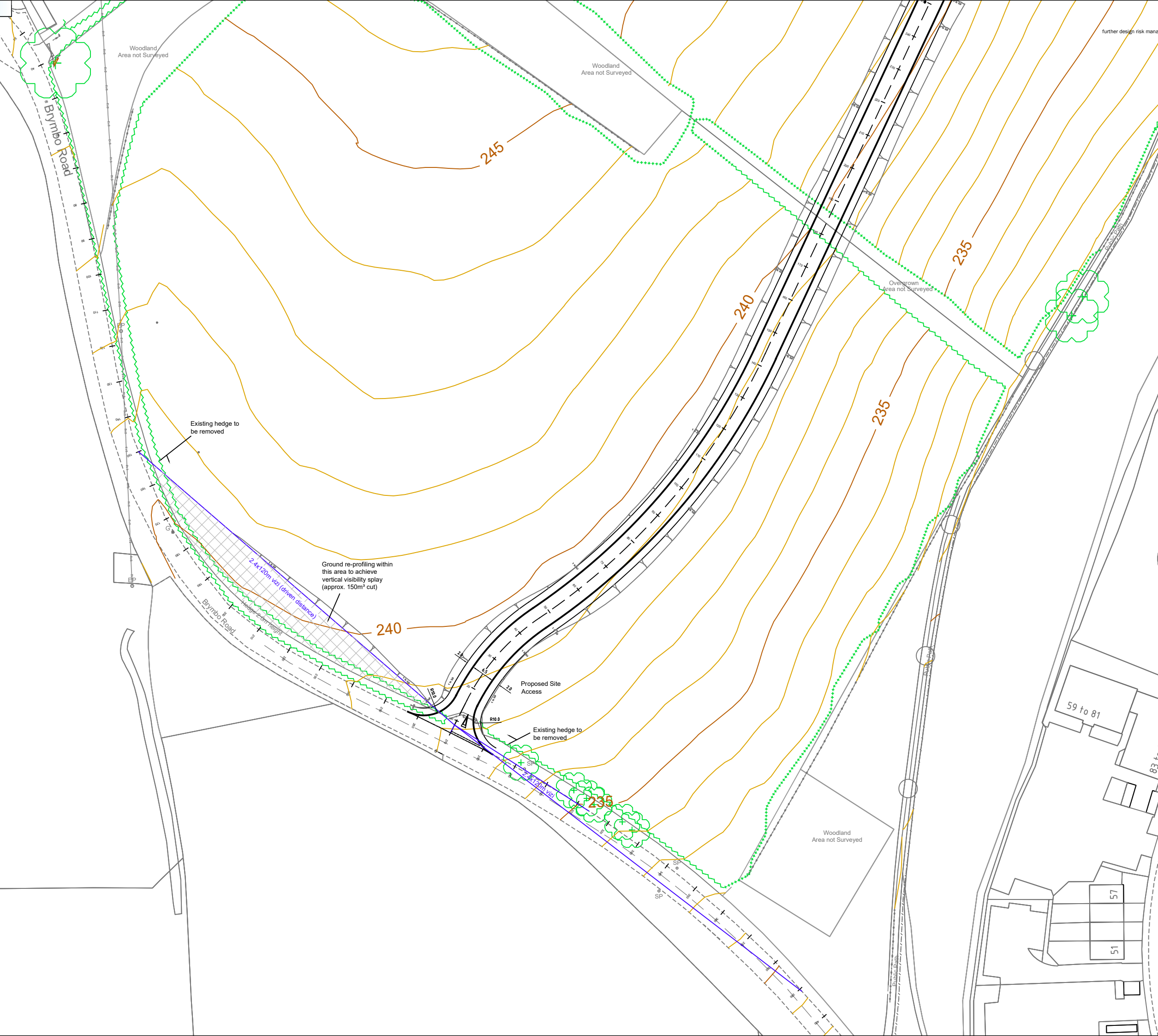
PROJECT
**Brymbo Park
Brymbo**

DRAWING TITLE
**Proposed Local Centre
Indicative Highway
Improvement Scheme**

DRAWING ISSUE STATUS

INFORMATION

JOB CODE	SUB-CODE	DRAWING NO.	REVISION
03499	- A	- 002	-
Revision Letter : P - Prelim / T - Tender / C - Construction			
A2@ 1:1000	ARP	KN	21.03.19
SCALE	DRAWN	REVIEWED	DATE



NOTES
These drawings have been produced with reference to the CDM Regulations 2015. Please note that these are pre-construction phase drawings and should be subject to further design risk management in accordance with Regulation 9

REV	DATE	REVISION NOTE	BY

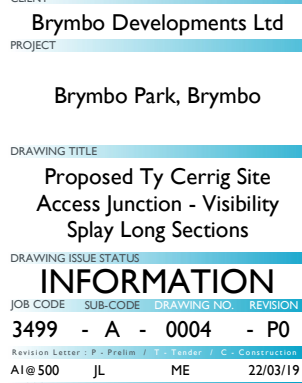
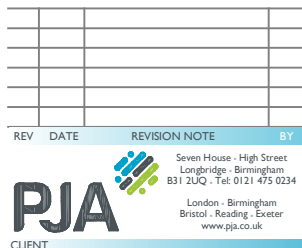
PJA
CLIENT
Seven House - High Street
Longbridge - Birmingham
B31 2UQ - Tel: 0121 475 0234
London - Birmingham
Bristol - Reading - Exeter
www.pja.co.uk

PROJECT
Brymbo Developments Ltd

DRAWING TITLE
Brymbo Park, Brymbo, Wrexham

DRAWING ISSUE STATUS
INFORMATION
JOB CODE SUB-CODE DRAWING NO REVISION
3499 - A - 0003 - P0

Revision Letter : P - Prelim / T - Tender / C - Construction
Revision : 1
SCALE DRAWN REVIEWED DATE
A1@ 500 JLM ME 22/03/19





Appendix C TRICS Outputs

Phil Jones Associates The Innovation Centre Longbridge Technology Park

Licence No: 231601

Filtering Summary

Land Use	01/I	RETAIL/SHOPPING CENTRE - LOCAL SHOPS
Selected Trip Rate Calculation Parameter Range	500-2000 sqm GFA	
Actual Trip Rate Calculation Parameter Range	525-1840 sqm GFA	
Date Range	Minimum: 01/01/10	Maximum: 22/09/15
Days of the week selected	Monday	3
	Tuesday	1
	Wednesday	1
	Thursday	1
	Friday	1
Main Location Types selected	Suburban Area (PPS6 Out of Centre)	2
	Neighbourhood Centre (PPS6 Local Centre)	5
Population <1 Mile ranges selected	5,001 to 10,000	1
	15,001 to 20,000	1
	20,001 to 25,000	2
	25,001 to 50,000	2
	50,001 to 100,000	1
Population <5 Mile ranges selected	125,001 to 250,000	3
	250,001 to 500,000	4
Car Ownership <5 Mile ranges selected	0.6 to 1.0	2
	1.1 to 1.5	5
PTAL Rating	No PTAL Present	7

Calculation Reference: AUDIT-231601-181008-1013

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

VEHICLESSelected regions and areas:

03	SOUTH WEST	
	BR BRISTOL CITY	1 days
	GS GLOUCESTERSHIRE	1 days
08	NORTH WEST	
	LC LANCASHIRE	1 days
09	NORTH	
	TV TEES VALLEY	2 days
	TW TYNE & WEAR	1 days
11	SCOTLAND	
	EB CITY OF EDINBURGH	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: Gross floor area
 Actual Range: 525 to 1840 (units: sqm)
 Range Selected by User: 500 to 2000 (units: sqm)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/10 to 22/09/15

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

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

Selected survey types:

Manual count	7 days
Directional ATC Count	0 days

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

Selected Locations:

Suburban Area (PPS6 Out of Centre)	2
Neighbourhood Centre (PPS6 Local Centre)	5

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

Selected Location Sub Categories:

Residential Zone	7
------------------	---

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

Secondary Filtering selection:Use Class:

A1	5 days
----	--------

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

Population within 1 mile:

5,001 to 10,000	1 days
15,001 to 20,000	1 days
20,001 to 25,000	2 days
25,001 to 50,000	2 days
50,001 to 100,000	1 days

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

Population within 5 miles:

125,001 to 250,000	3 days
250,001 to 500,000	4 days

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

Car ownership within 5 miles:

0.6 to 1.0	2 days
1.1 to 1.5	5 days

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

Petrol filling station:

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

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

Travel Plan:

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

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

PTAL Rating:

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

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

LIST OF SITES relevant to selection parameters

Site(1):	BR-01-I-01	Gross floor area:	770 sqm
Development Name:	LOCAL SHOPS	Retail floor area:	635 sqm
Location:	BRISTOL		
Postcode:	BS14 0EW	Number of Employees:	49
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	22/09/15
Sub-Location Type:	Residential Zone	Survey Day:	Tuesday
PTAL:	n/a	Parking Spaces:	22
Site(2):	EB-01-I-01	Gross floor area:	825 sqm
Development Name:	LOCAL SHOPS	Retail floor area:	650 sqm
Location:	EDINBURGH		
Postcode:	EH14 1BY	Number of Employees:	21
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	28/10/10
Sub-Location Type:	Residential Zone	Survey Day:	Thursday
PTAL:	n/a	Parking Spaces:	14
Site(3):	GS-01-I-01	Gross floor area:	525 sqm
Development Name:	LOCAL SHOPS	Retail floor area:	335 sqm
Location:	CHELTENHAM		
Postcode:	GL51 3GA	Number of Employees:	26
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	26/04/10
Sub-Location Type:	Residential Zone	Survey Day:	Monday
PTAL:	n/a	Parking Spaces:	
Site(4):	LC-01-I-01	Gross floor area:	720 sqm
Development Name:	LOCAL SHOPS	Retail floor area:	555 sqm
Location:	NEAR CHORLEY		
Postcode:	PR7 6HS	Number of Employees:	50
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	17/10/11
Sub-Location Type:	Residential Zone	Survey Day:	Monday
PTAL:	n/a	Parking Spaces:	19
Site(5):	TV-01-I-03	Gross floor area:	1840 sqm
Development Name:	LOCAL SHOPS	Retail floor area:	1185 sqm
Location:	MIDDLESBROUGH		
Postcode:	TS5 7BP	Number of Employees:	108
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	04/10/13
Sub-Location Type:	Residential Zone	Survey Day:	Friday
PTAL:	n/a	Parking Spaces:	62
Site(6):	TV-01-I-04	Gross floor area:	585 sqm
Development Name:	LOCAL SHOPS	Retail floor area:	354 sqm
Location:	MIDDLESBROUGH		
Postcode:	TS3 0PL	Number of Employees:	21
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	07/10/13
Sub-Location Type:	Residential Zone	Survey Day:	Monday
PTAL:	n/a	Parking Spaces:	13
Site(7):	TW-01-I-02	Gross floor area:	540 sqm
Development Name:	LOCAL SHOPS	Retail floor area:	410 sqm
Location:	SUNDERLAND		
Postcode:	SR3 4BX	Number of Employees:	34
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	21/11/12
Sub-Location Type:	Residential Zone	Survey Day:	Wednesday
PTAL:	n/a	Parking Spaces:	16

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

VEHICLES**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	1.296	1	540	1.296	1	540	2.592
07:00 - 08:00	7	829	4.496	7	829	4.048	7	829	8.544
08:00 - 09:00	7	829	4.376	7	829	3.859	7	829	8.235
09:00 - 10:00	7	829	6.081	7	829	5.099	7	829	11.180
10:00 - 11:00	7	829	5.185	7	829	4.841	7	829	10.026
11:00 - 12:00	7	829	5.392	7	829	5.409	7	829	10.801
12:00 - 13:00	7	829	6.512	7	829	6.408	7	829	12.920
13:00 - 14:00	7	829	5.840	7	829	5.891	7	829	11.731
14:00 - 15:00	7	829	5.168	7	829	5.754	7	829	10.922
15:00 - 16:00	7	829	4.410	7	829	4.789	7	829	9.199
16:00 - 17:00	7	829	5.151	7	829	4.169	7	829	9.320
17:00 - 18:00	7	829	5.426	7	829	6.012	7	829	11.438
18:00 - 19:00	7	829	5.909	7	829	6.288	7	829	12.197
19:00 - 20:00	7	829	5.340	7	829	5.685	7	829	11.025
20:00 - 21:00	7	829	3.618	7	829	4.152	7	829	7.770
21:00 - 22:00	5	852	3.638	5	852	3.779	5	852	7.417
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			77.838			77.479			155.317

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

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

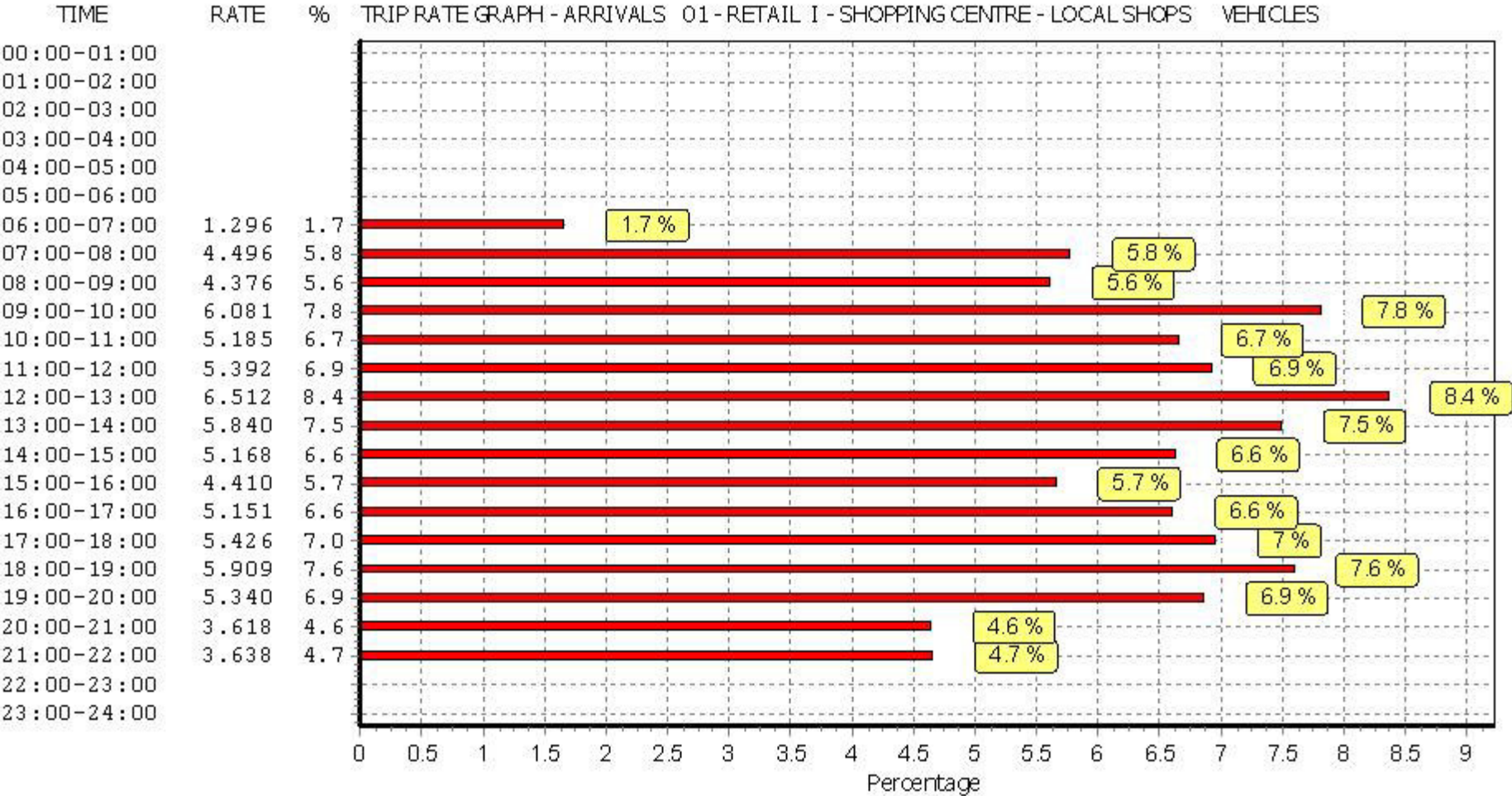
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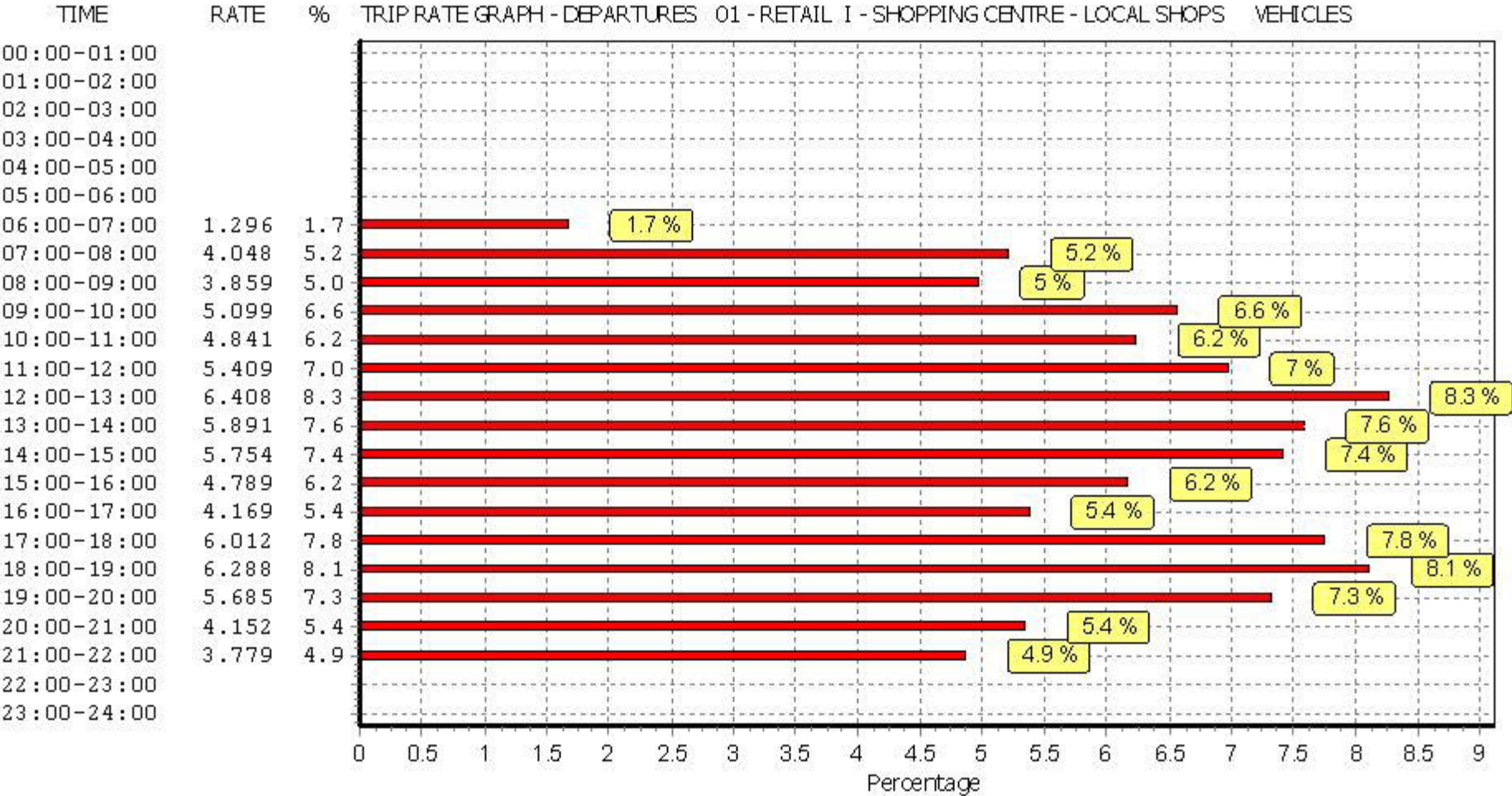
Parameter summary

Trip rate parameter range selected:	525 - 1840 (units: sqm)
Survey date range:	01/01/10 - 22/09/15
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

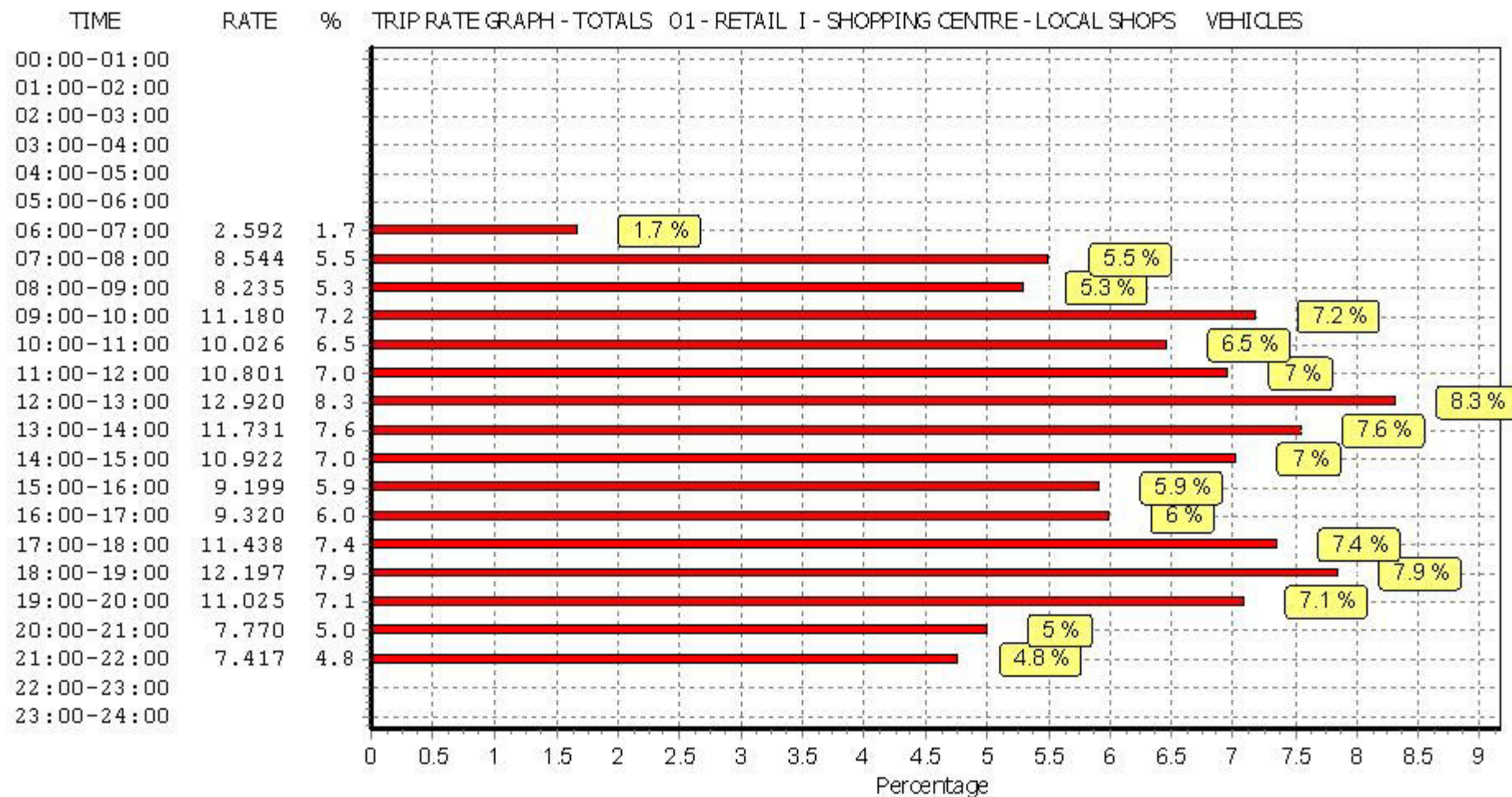
This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected 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.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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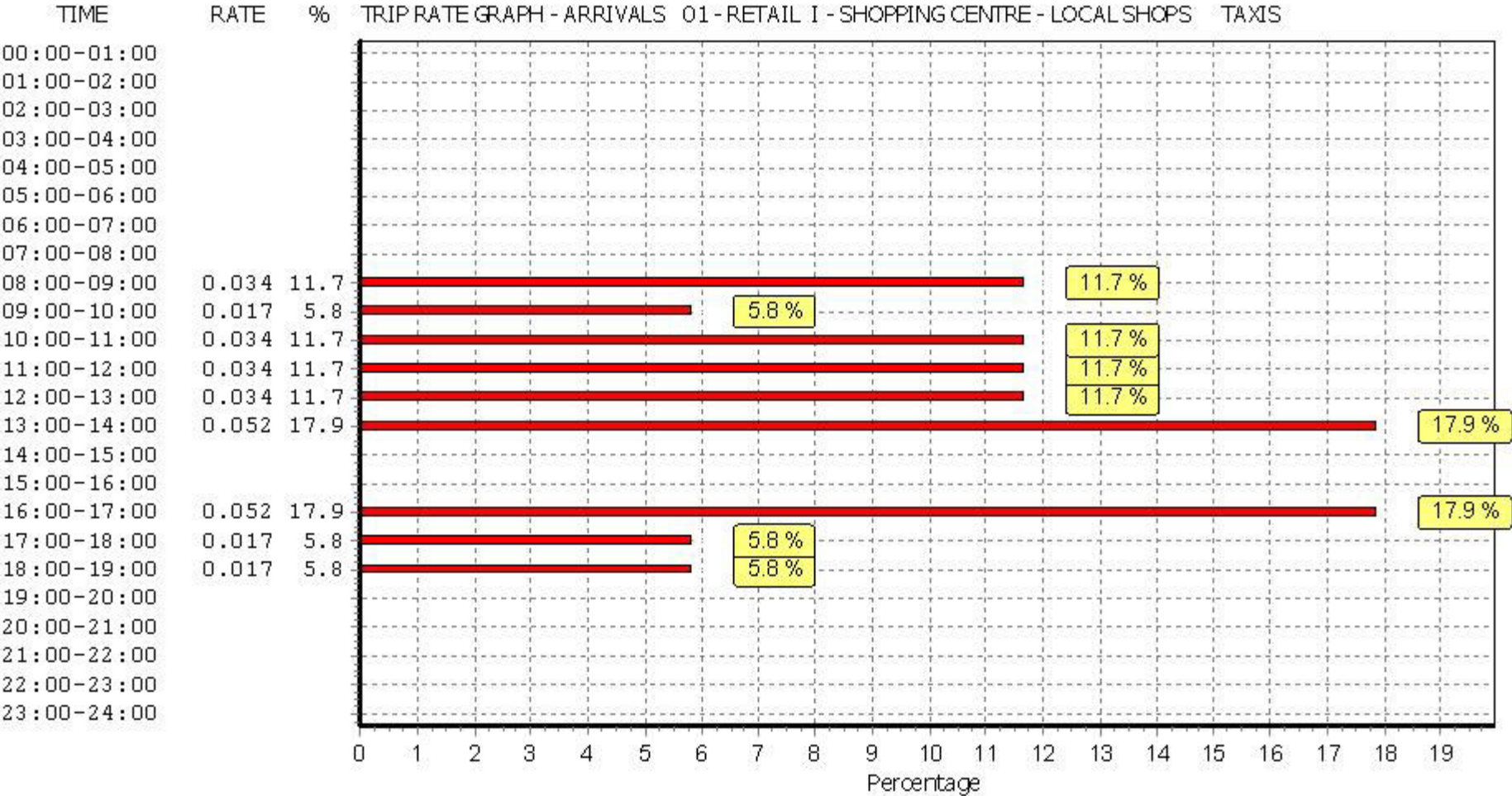
TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS

TAXIS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

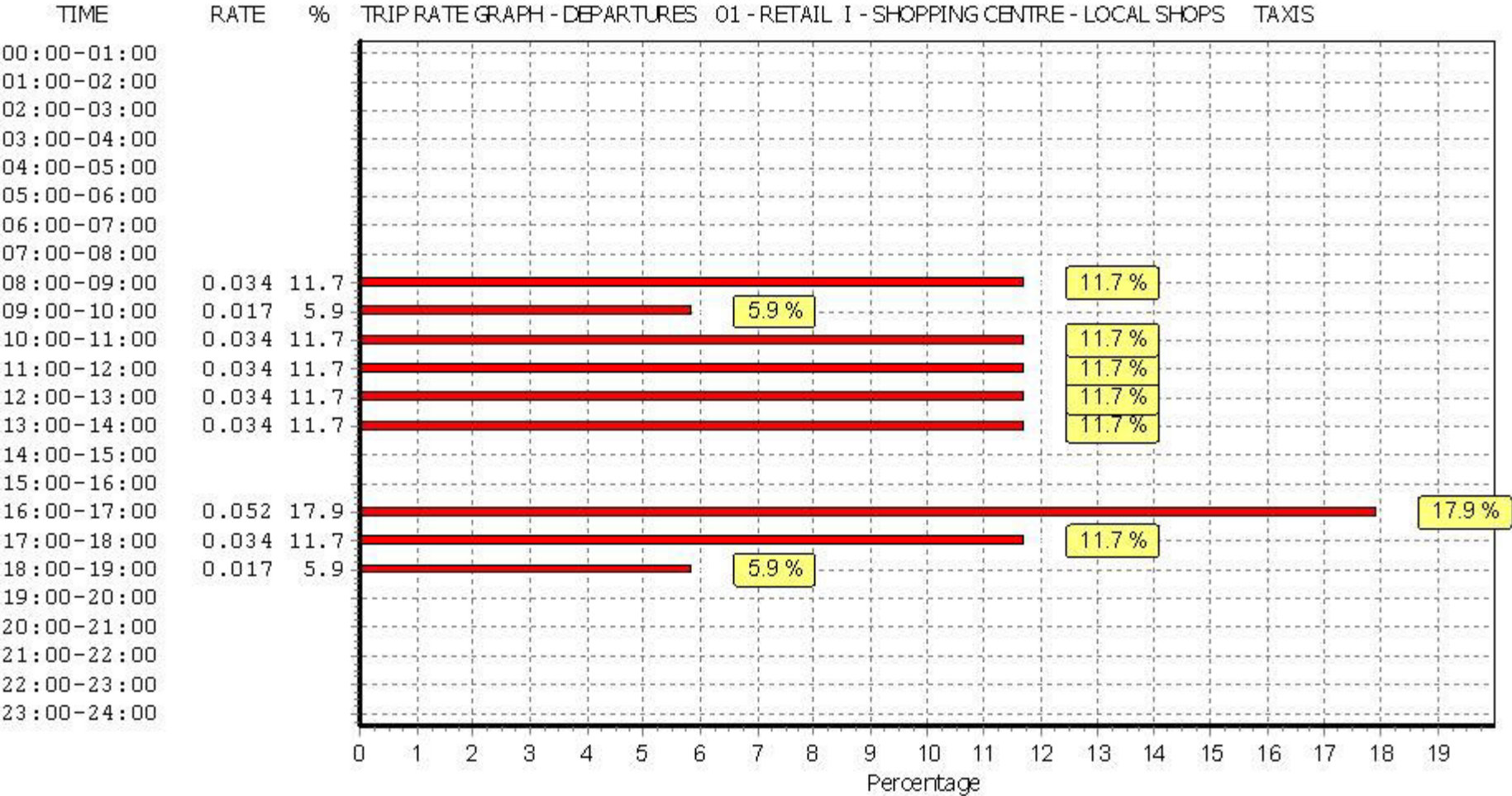
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	0.000	1	540	0.000	1	540	0.000
07:00 - 08:00	7	829	0.000	7	829	0.000	7	829	0.000
08:00 - 09:00	7	829	0.034	7	829	0.034	7	829	0.068
09:00 - 10:00	7	829	0.017	7	829	0.017	7	829	0.034
10:00 - 11:00	7	829	0.034	7	829	0.034	7	829	0.068
11:00 - 12:00	7	829	0.034	7	829	0.034	7	829	0.068
12:00 - 13:00	7	829	0.034	7	829	0.034	7	829	0.068
13:00 - 14:00	7	829	0.052	7	829	0.034	7	829	0.086
14:00 - 15:00	7	829	0.000	7	829	0.000	7	829	0.000
15:00 - 16:00	7	829	0.000	7	829	0.000	7	829	0.000
16:00 - 17:00	7	829	0.052	7	829	0.052	7	829	0.104
17:00 - 18:00	7	829	0.017	7	829	0.034	7	829	0.051
18:00 - 19:00	7	829	0.017	7	829	0.017	7	829	0.034
19:00 - 20:00	7	829	0.000	7	829	0.000	7	829	0.000
20:00 - 21:00	7	829	0.000	7	829	0.000	7	829	0.000
21:00 - 22:00	5	852	0.000	5	852	0.000	5	852	0.000
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.291			0.290			0.581

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.

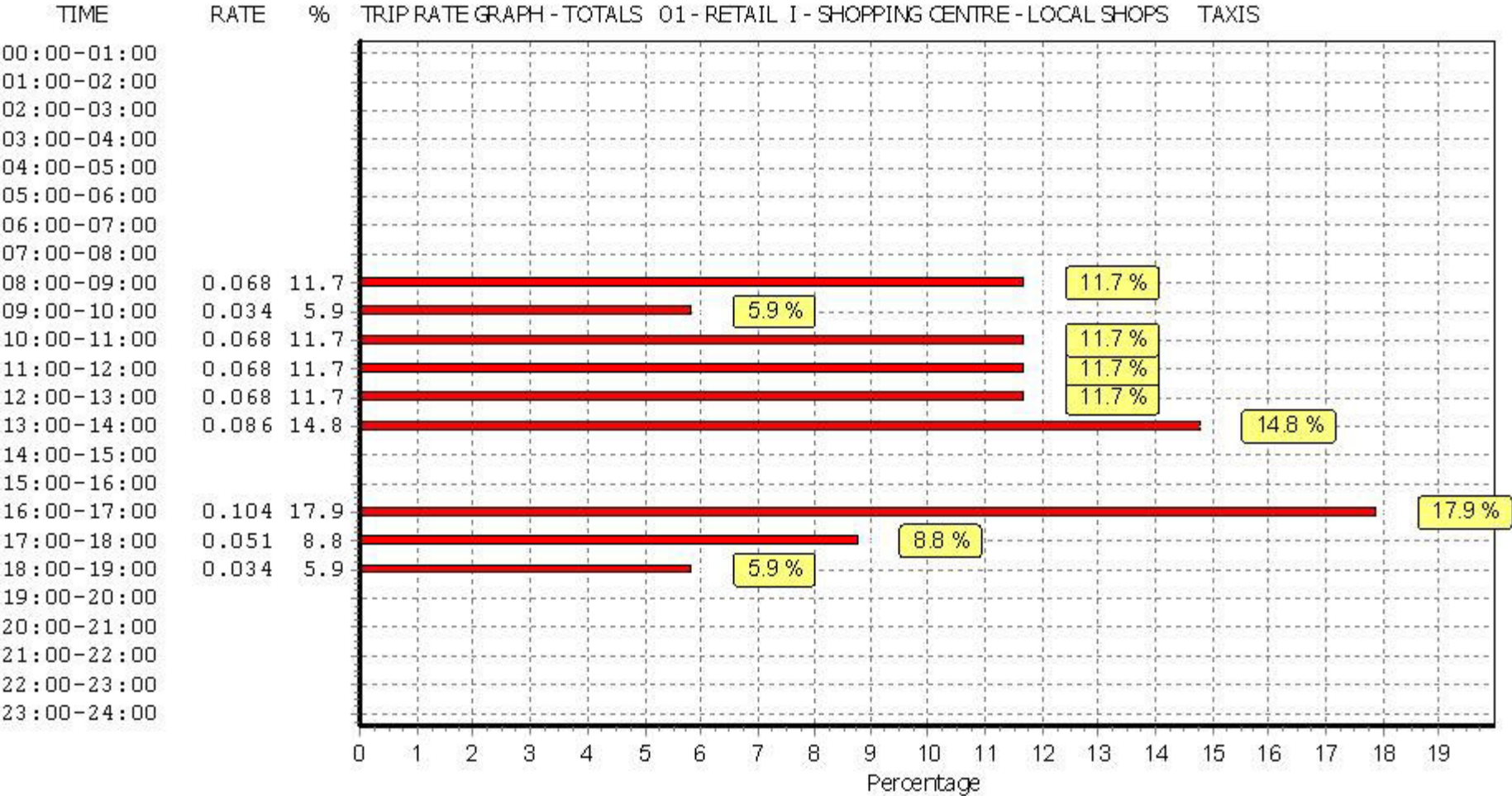
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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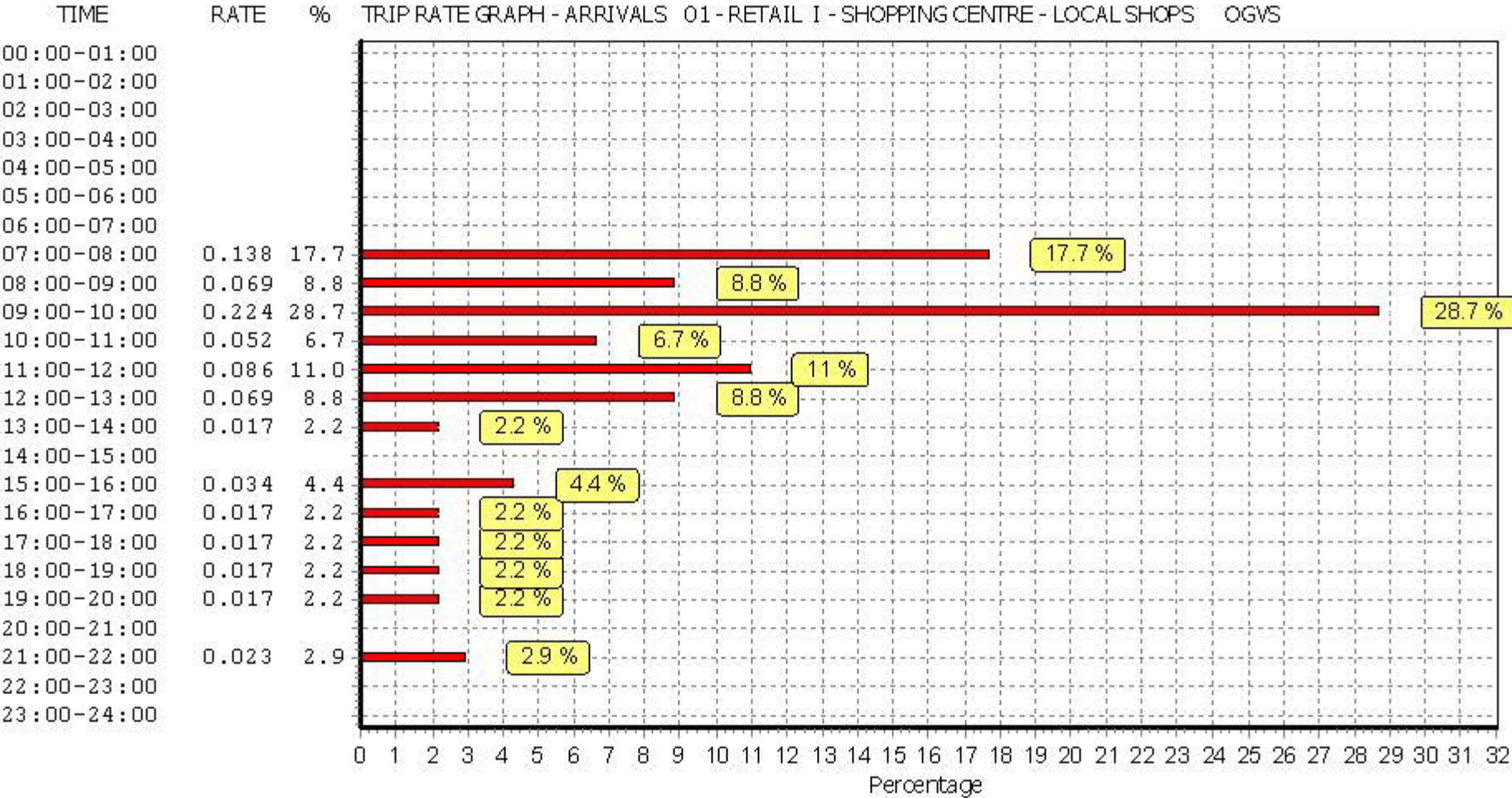
TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS

OGVS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

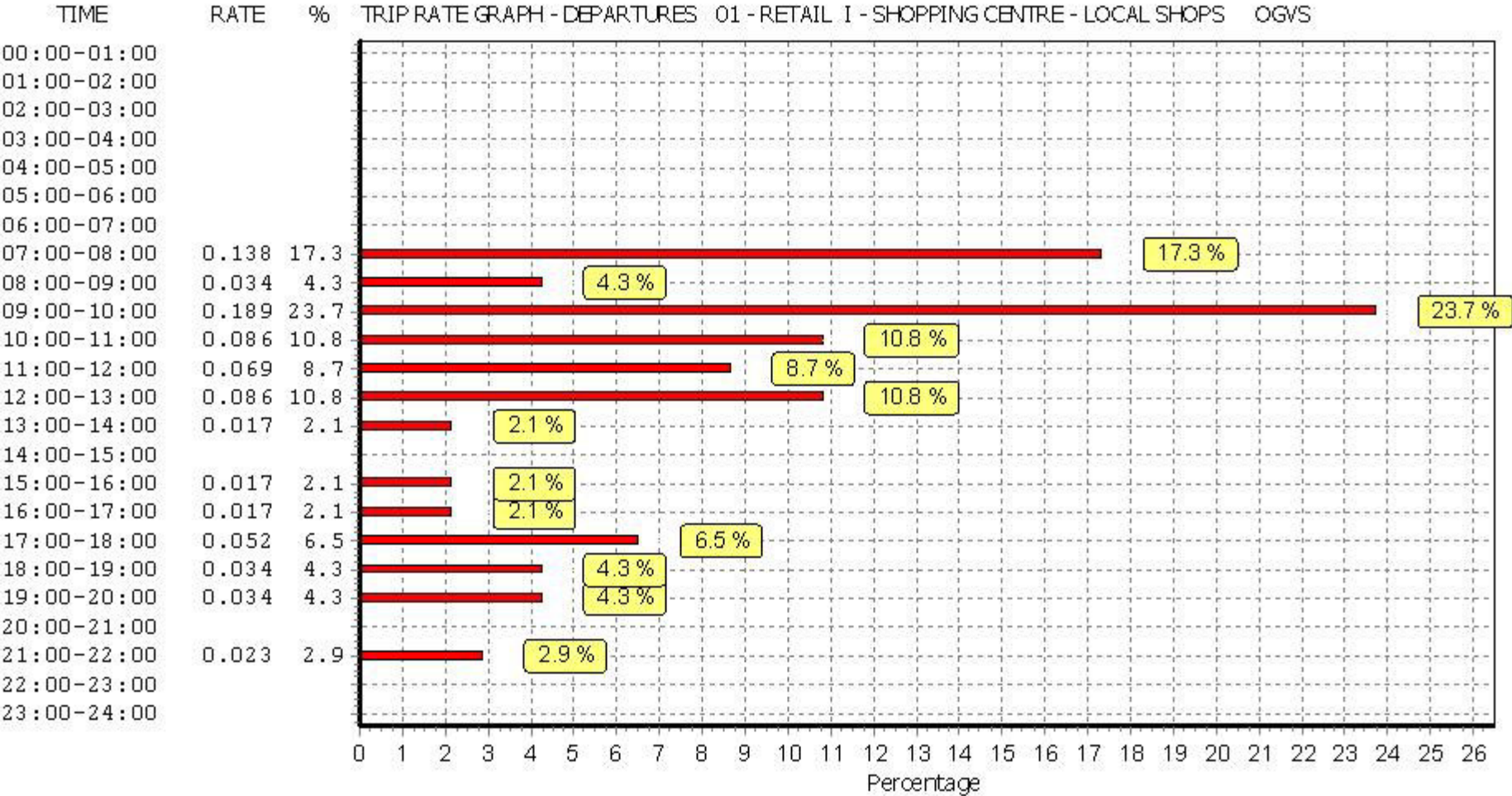
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	0.000	1	540	0.000	1	540	0.000
07:00 - 08:00	7	829	0.138	7	829	0.138	7	829	0.276
08:00 - 09:00	7	829	0.069	7	829	0.034	7	829	0.103
09:00 - 10:00	7	829	0.224	7	829	0.189	7	829	0.413
10:00 - 11:00	7	829	0.052	7	829	0.086	7	829	0.138
11:00 - 12:00	7	829	0.086	7	829	0.069	7	829	0.155
12:00 - 13:00	7	829	0.069	7	829	0.086	7	829	0.155
13:00 - 14:00	7	829	0.017	7	829	0.017	7	829	0.034
14:00 - 15:00	7	829	0.000	7	829	0.000	7	829	0.000
15:00 - 16:00	7	829	0.034	7	829	0.017	7	829	0.051
16:00 - 17:00	7	829	0.017	7	829	0.017	7	829	0.034
17:00 - 18:00	7	829	0.017	7	829	0.052	7	829	0.069
18:00 - 19:00	7	829	0.017	7	829	0.034	7	829	0.051
19:00 - 20:00	7	829	0.017	7	829	0.034	7	829	0.051
20:00 - 21:00	7	829	0.000	7	829	0.000	7	829	0.000
21:00 - 22:00	5	852	0.023	5	852	0.023	5	852	0.046
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.780			0.796			1.576

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.

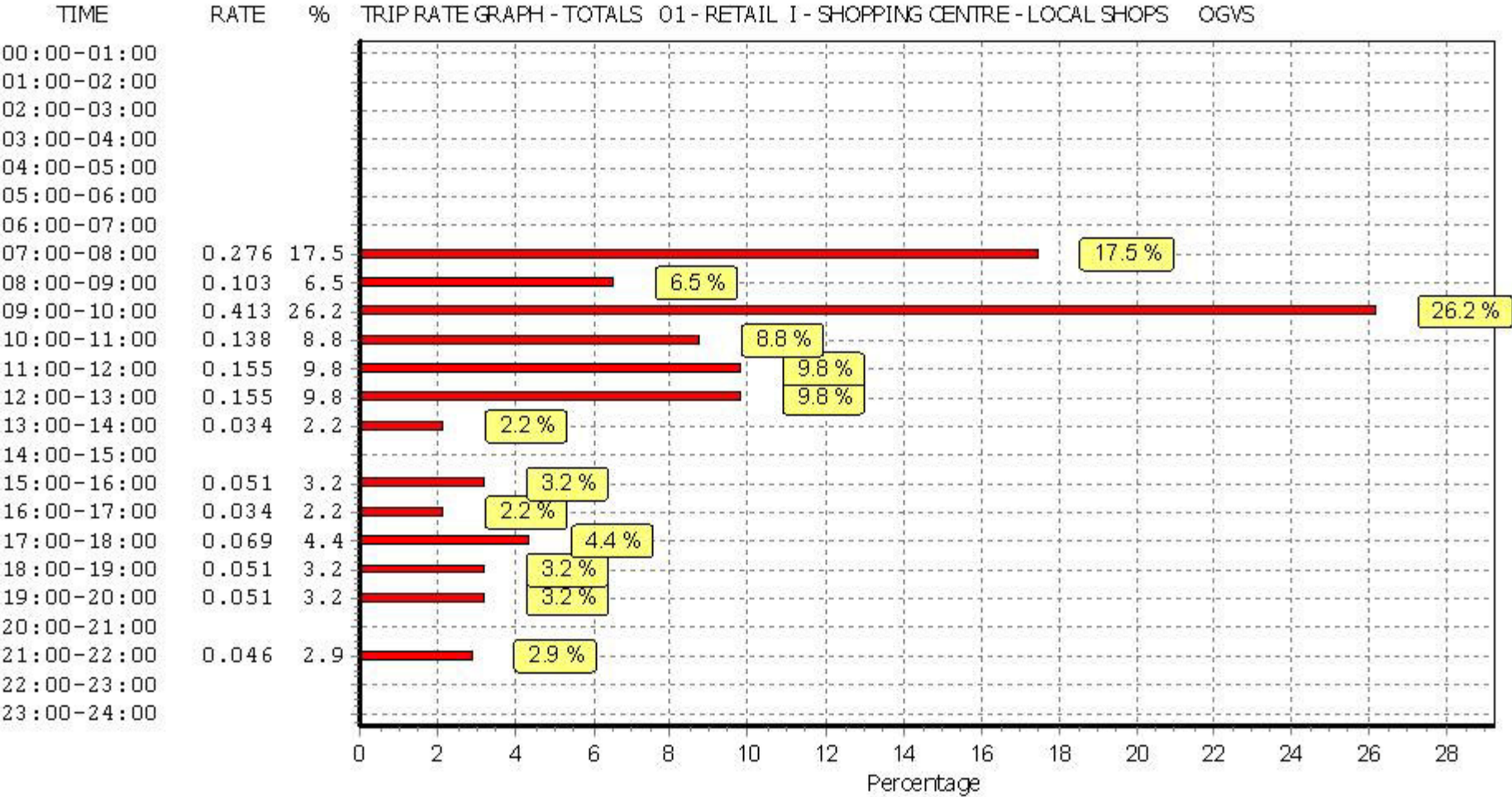
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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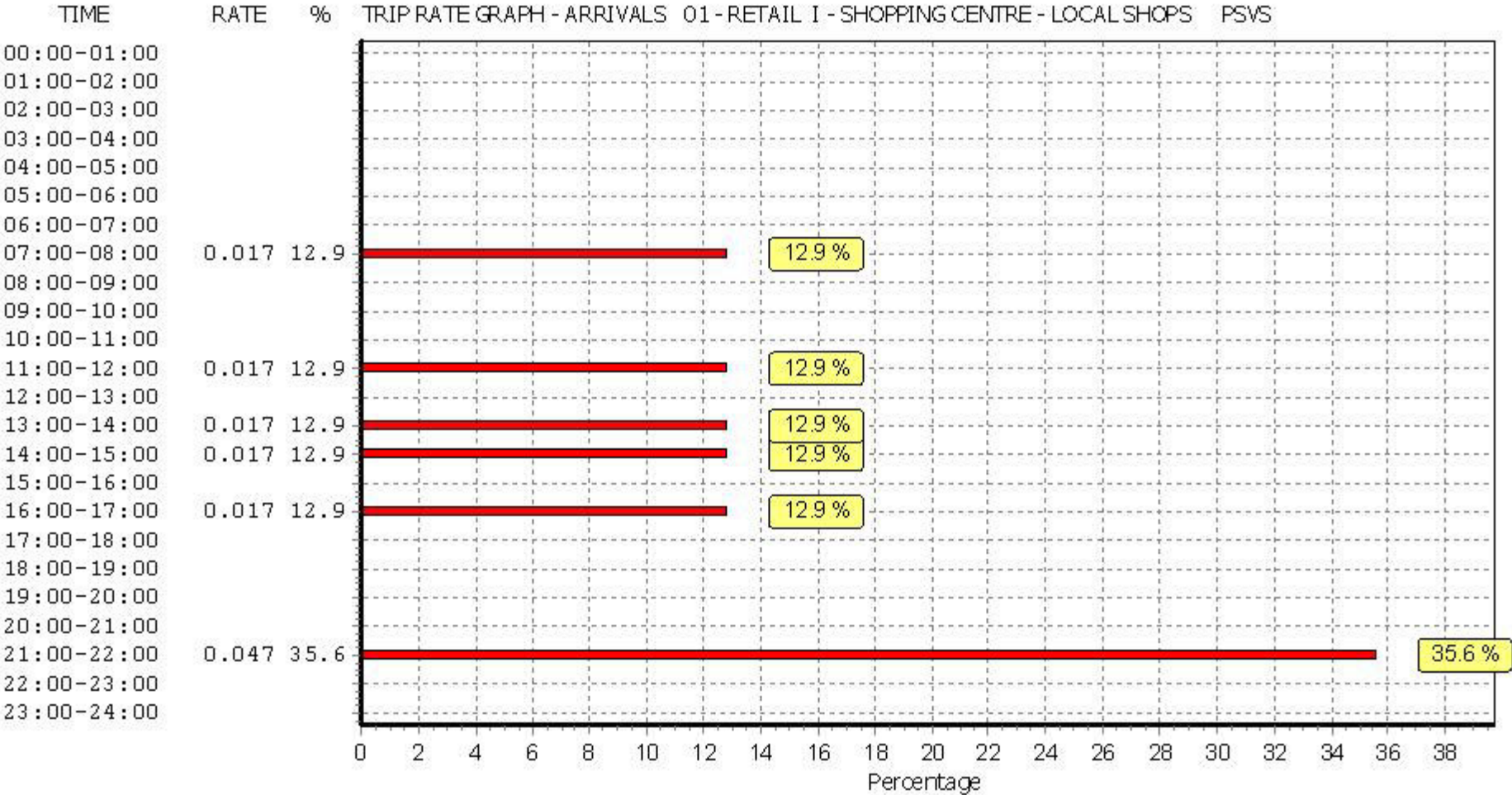
TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS

PSVS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

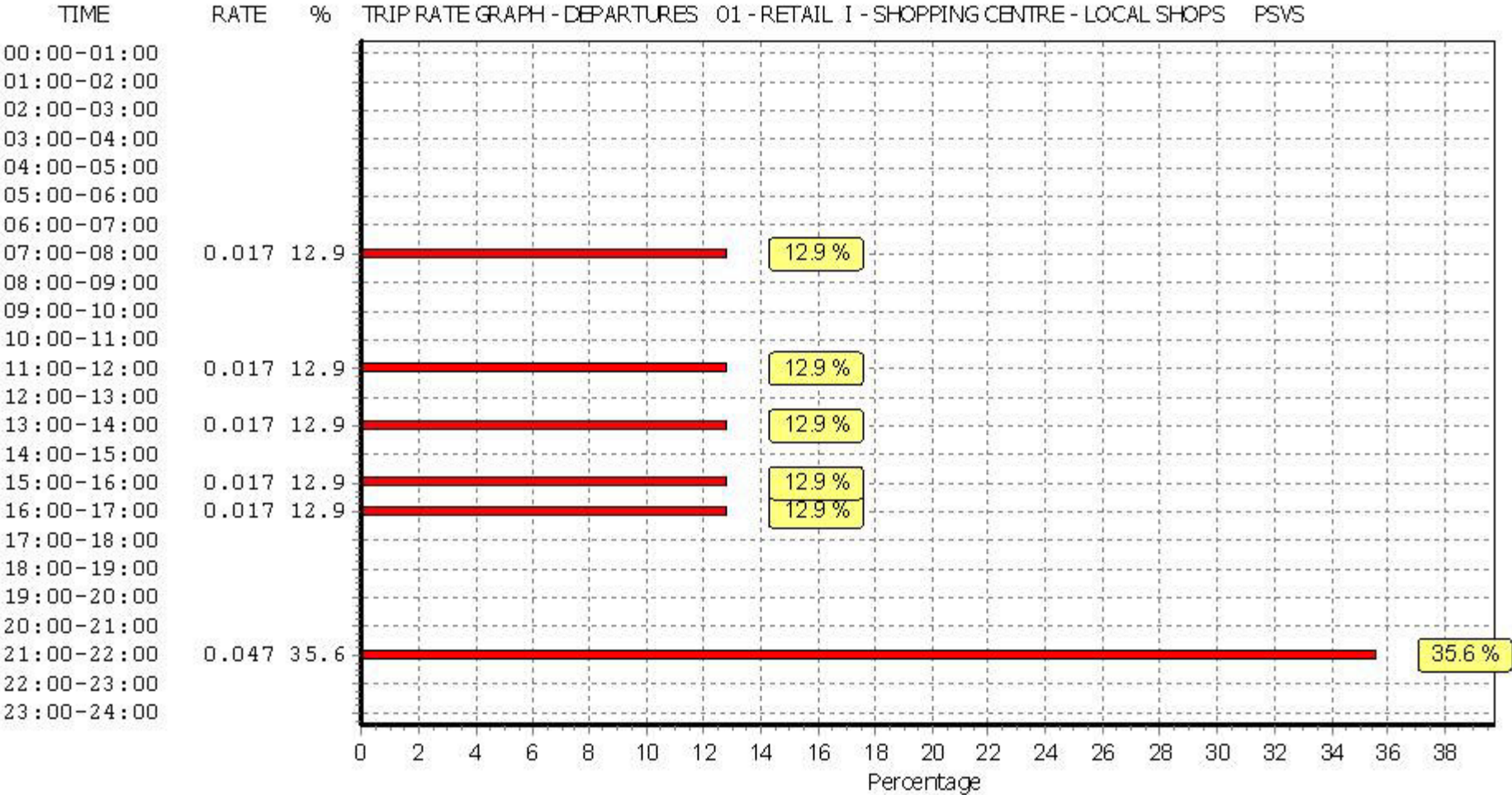
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	0.000	1	540	0.000	1	540	0.000
07:00 - 08:00	7	829	0.017	7	829	0.017	7	829	0.034
08:00 - 09:00	7	829	0.000	7	829	0.000	7	829	0.000
09:00 - 10:00	7	829	0.000	7	829	0.000	7	829	0.000
10:00 - 11:00	7	829	0.000	7	829	0.000	7	829	0.000
11:00 - 12:00	7	829	0.017	7	829	0.017	7	829	0.034
12:00 - 13:00	7	829	0.000	7	829	0.000	7	829	0.000
13:00 - 14:00	7	829	0.017	7	829	0.017	7	829	0.034
14:00 - 15:00	7	829	0.017	7	829	0.000	7	829	0.017
15:00 - 16:00	7	829	0.000	7	829	0.017	7	829	0.017
16:00 - 17:00	7	829	0.017	7	829	0.017	7	829	0.034
17:00 - 18:00	7	829	0.000	7	829	0.000	7	829	0.000
18:00 - 19:00	7	829	0.000	7	829	0.000	7	829	0.000
19:00 - 20:00	7	829	0.000	7	829	0.000	7	829	0.000
20:00 - 21:00	7	829	0.000	7	829	0.000	7	829	0.000
21:00 - 22:00	5	852	0.047	5	852	0.047	5	852	0.094
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.132			0.132			0.264

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.

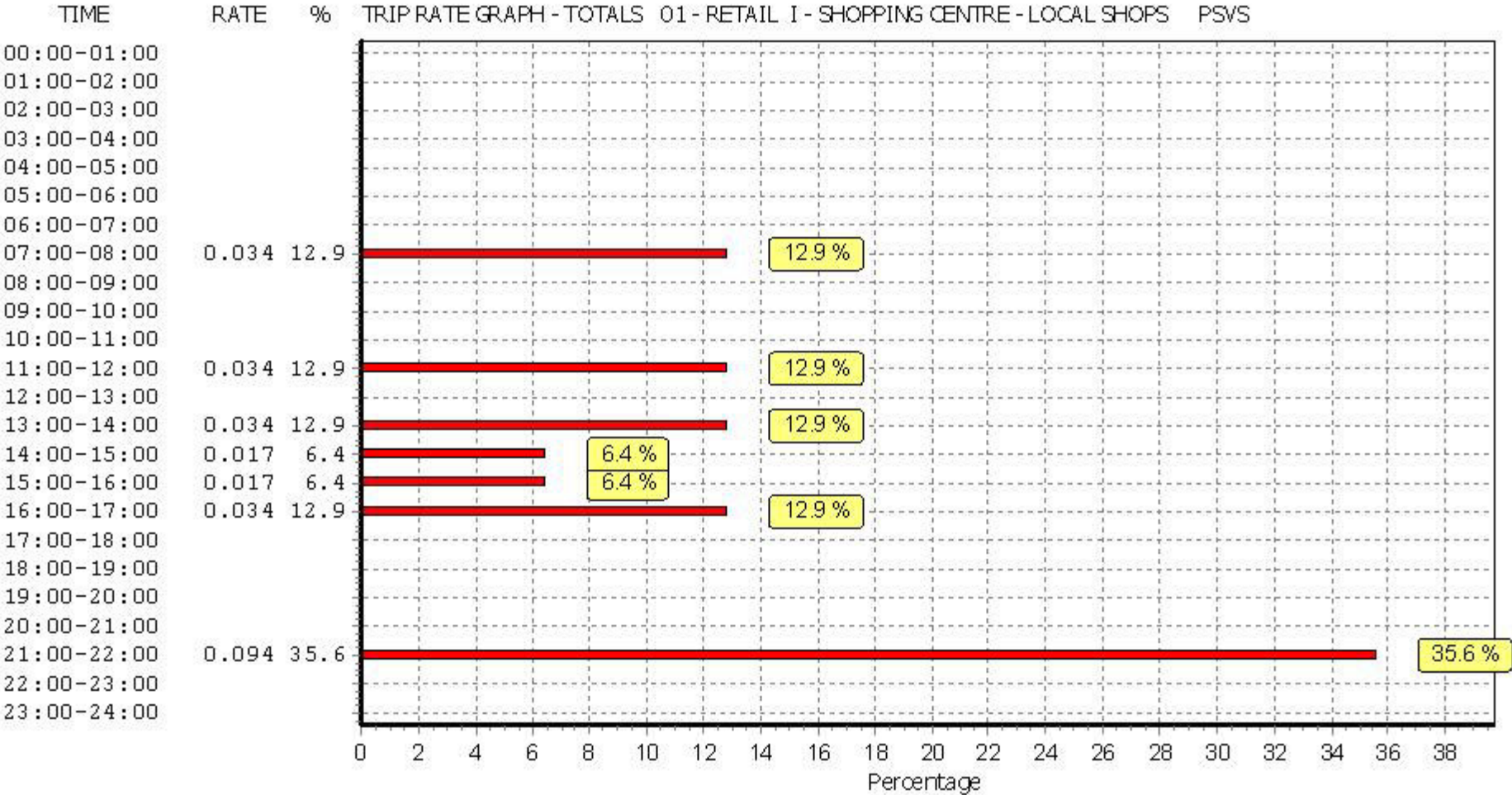
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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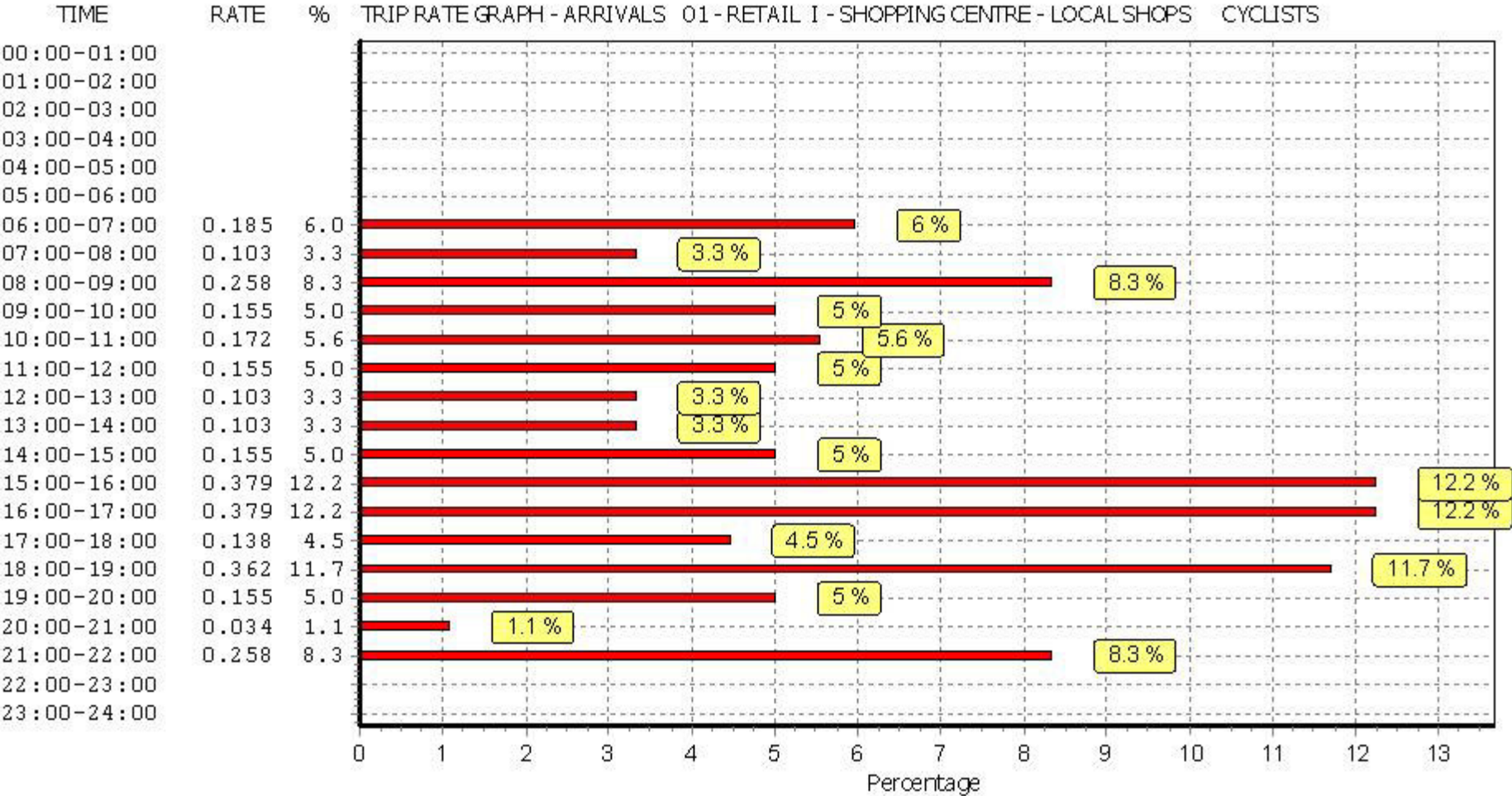
TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS

CYCLISTS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

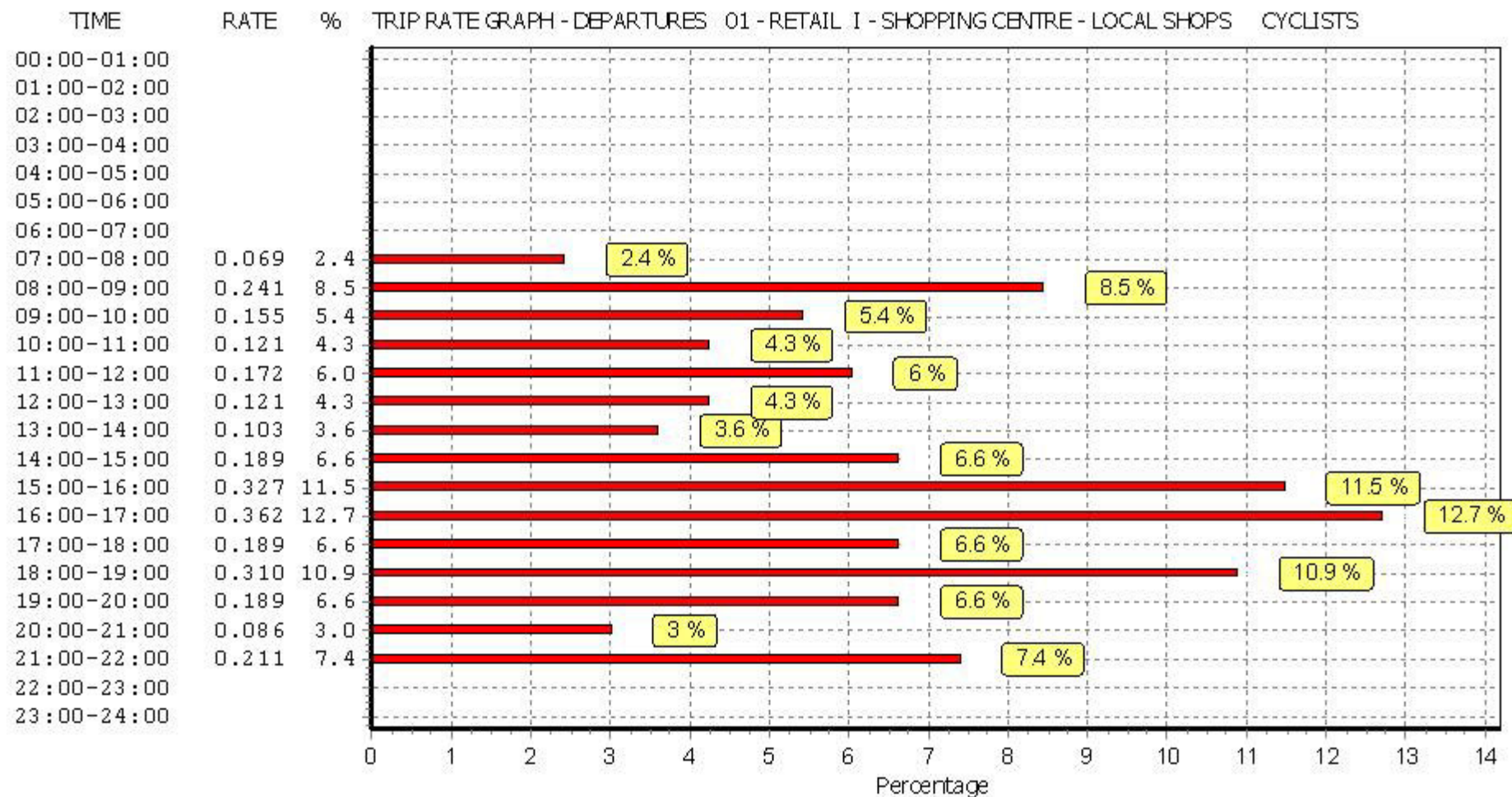
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	1	540	0.185	1	540	0.000	1	540	0.185
07:00 - 08:00	7	829	0.103	7	829	0.069	7	829	0.172
08:00 - 09:00	7	829	0.258	7	829	0.241	7	829	0.499
09:00 - 10:00	7	829	0.155	7	829	0.155	7	829	0.310
10:00 - 11:00	7	829	0.172	7	829	0.121	7	829	0.293
11:00 - 12:00	7	829	0.155	7	829	0.172	7	829	0.327
12:00 - 13:00	7	829	0.103	7	829	0.121	7	829	0.224
13:00 - 14:00	7	829	0.103	7	829	0.103	7	829	0.206
14:00 - 15:00	7	829	0.155	7	829	0.189	7	829	0.344
15:00 - 16:00	7	829	0.379	7	829	0.327	7	829	0.706
16:00 - 17:00	7	829	0.379	7	829	0.362	7	829	0.741
17:00 - 18:00	7	829	0.138	7	829	0.189	7	829	0.327
18:00 - 19:00	7	829	0.362	7	829	0.310	7	829	0.672
19:00 - 20:00	7	829	0.155	7	829	0.189	7	829	0.344
20:00 - 21:00	7	829	0.034	7	829	0.086	7	829	0.120
21:00 - 22:00	5	852	0.258	5	852	0.211	5	852	0.469
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.094			2.845			5.939

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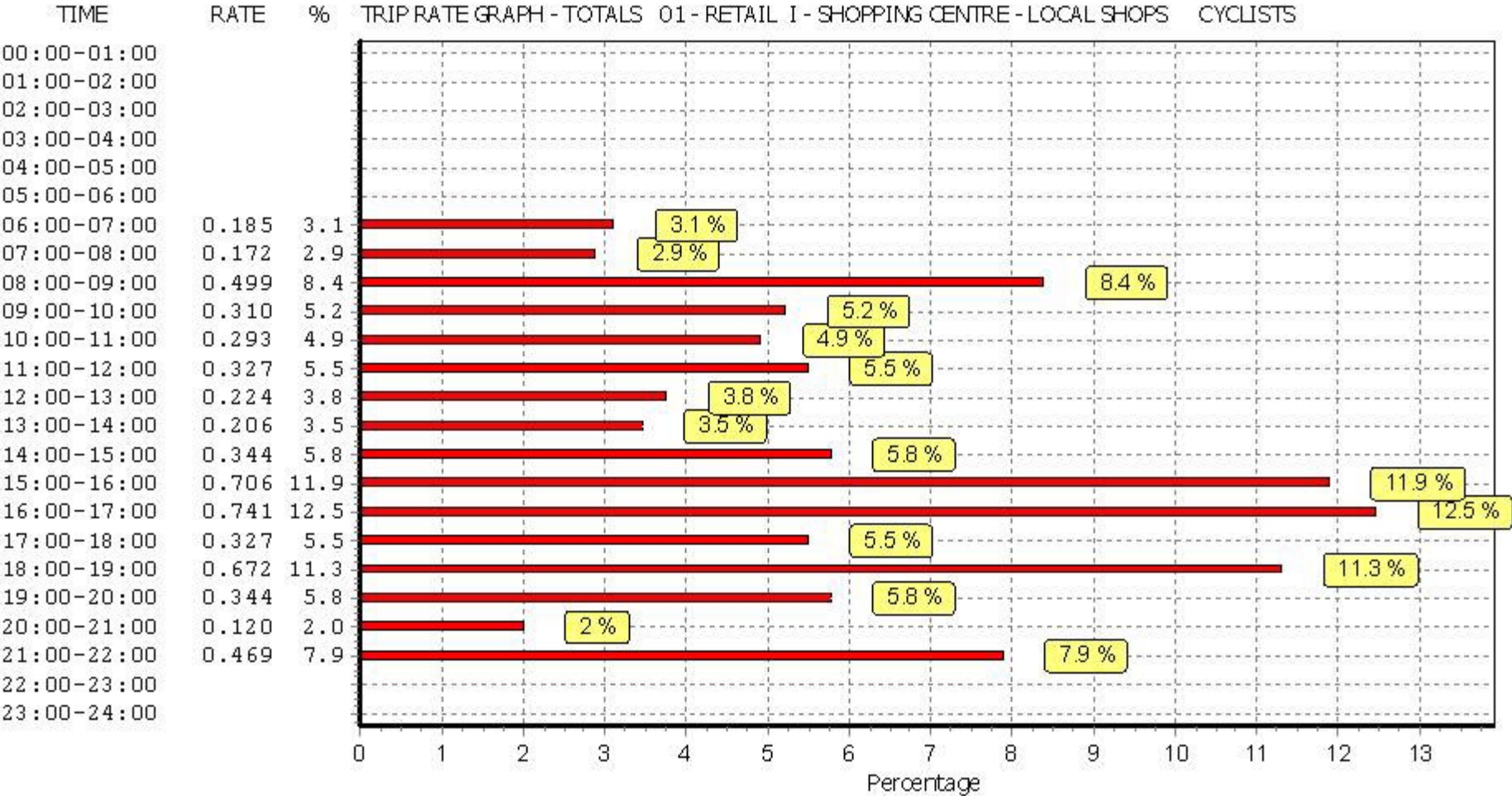
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Phil Jones Associates The Innovation Centre Longbridge Technology Park

Licence No: 231601

Filtering Summary

Land Use	04/A	EDUCATION/PRIMARY
Selected Trip Rate Calculation Parameter Range	250-657	PUPILS
Actual Trip Rate Calculation Parameter Range	260-621	PUPILS
Date Range	Minimum: 01/01/10	Maximum: 28/09/16
Days of the week selected	Monday	3
	Tuesday	1
	Wednesday	3
	Thursday	4
Main Location Types selected	Suburban Area (PPS6 Out of Centre)	7
	Neighbourhood Centre (PPS6 Local Centre)	4
Population <1 Mile ranges selected	1,001 to 5,000	1
	5,001 to 10,000	3
	10,001 to 15,000	3
	25,001 to 50,000	3
	50,001 to 100,000	1
Population <5 Mile ranges selected	50,001 to 75,000	1
	75,001 to 100,000	2
	125,001 to 250,000	2
	250,001 to 500,000	4
	500,001 or More	2
Car Ownership <5 Mile ranges selected	0.6 to 1.0	7
	1.1 to 1.5	4
PTAL Rating	No PTAL Present	11

Calculation Reference: AUDIT-231601-181008-1009

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 04 - EDUCATION

Category : A - PRIMARY

VEHICLESSelected regions and areas:

02	SOUTH EAST	
	SC SURREY	1 days
05	EAST MIDLANDS	
	LN LINCOLNSHIRE	1 days
	NR NORTHAMPTONSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	WY WEST YORKSHIRE	2 days
08	NORTH WEST	
	LC LANCASHIRE	2 days
	MS MERSEYSIDE	1 days
09	NORTH	
	TW TYNE & WEAR	1 days
11	SCOTLAND	
	DU DUNDEE CITY	1 days
	FI FIFE	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 pupils
 Actual Range: 260 to 621 (units:)
 Range Selected by User: 250 to 657 (units:)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/10 to 28/09/16

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	3 days
Tuesday	1 days
Wednesday	3 days
Thursday	4 days

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

Selected survey types:

Manual count	11 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)	7
Neighbourhood Centre (PPS6 Local Centre)	4

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	8
Village	2
No Sub Category	1

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

Secondary Filtering selection:Use Class:

D1	11 days
----	---------

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

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	3 days
10,001 to 15,000	3 days
25,001 to 50,000	3 days
50,001 to 100,000	1 days

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

Population within 5 miles:

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

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

Car ownership within 5 miles:

0.6 to 1.0	7 days
1.1 to 1.5	4 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	2 days
No	9 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	11 days
-----------------	---------

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

LIST OF SITES relevant to selection parameters

Site(1):	DU-04-A-01	Gross floor area:	3288 sqm
Development Name:	PRIMARY SCHOOL	Number of pupils:	412
Location:	DUNDEE		
Postcode:	DD5 3SQ	Number of Employees:	32
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	21/05/12
Sub-Location Type:	Residential Zone	Survey Day:	Monday
PTAL:	n/a	Parking Spaces:	25
Site(2):	FI-04-A-01	Gross floor area:	1975 sqm
Development Name:	PRIMARY SCHOOL	Number of pupils:	285
Location:	NEAR DUNFERMLINE		
Postcode:	KY12 8RN	Number of Employees:	36
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	27/05/15
Sub-Location Type:	Village	Survey Day:	Wednesday
PTAL:	n/a	Parking Spaces:	26
Site(3):	LC-04-A-05	Gross floor area:	3359 sqm
Development Name:	PRIMARY SCHOOL	Number of pupils:	472
Location:	BLACKBURN		
Postcode:	BB1 1NE	Number of Employees:	75
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	28/09/16
Sub-Location Type:	No Sub Category	Survey Day:	Wednesday
PTAL:	n/a	Parking Spaces:	23
Site(4):	LC-04-A-06	Gross floor area:	4520 sqm
Development Name:	PRIMARY SCHOOL	Number of pupils:	449
Location:	BLACKPOOL		
Postcode:	FY4 1EE	Number of Employees:	90
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	27/09/16
Sub-Location Type:	Residential Zone	Survey Day:	Tuesday
PTAL:	n/a	Parking Spaces:	5
Site(5):	LN-04-A-01	Gross floor area:	1990 sqm
Development Name:	PRIMARY SCHOOL	Number of pupils:	312
Location:	GRANTHAM		
Postcode:	NG31 8HQ	Number of Employees:	39
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	12/06/13
Sub-Location Type:	Residential Zone	Survey Day:	Wednesday
PTAL:	n/a	Parking Spaces:	17
Site(6):	MS-04-A-02	Gross floor area:	2500 sqm
Development Name:	PRIMARY SCHOOL	Number of pupils:	264
Location:	LIVERPOOL		
Postcode:	L18 9SB	Number of Employees:	31
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	13/06/13
Sub-Location Type:	Residential Zone	Survey Day:	Thursday
PTAL:	n/a	Parking Spaces:	16
Site(7):	NR-04-A-03	Gross floor area:	2635 sqm
Development Name:	PRIMARY SCHOOL	Number of pupils:	400
Location:	NORTHAMPTON		
Postcode:	NN3 6JQ	Number of Employees:	121
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	24/03/16
Sub-Location Type:	Residential Zone	Survey Day:	Thursday
PTAL:	n/a	Parking Spaces:	47
Site(8):	SC-04-A-01	Gross floor area:	2175 sqm
Development Name:	PRIMARY SCHOOL	Number of pupils:	414
Location:	NEAR WOKING		
Postcode:	GU24 0JN	Number of Employees:	55
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	22/11/12
Sub-Location Type:	Village	Survey Day:	Thursday
PTAL:	n/a	Parking Spaces:	36
Site(9):	TW-04-A-01	Gross floor area:	2900 sqm
Development Name:	PRIMARY SCHOOL	Number of pupils:	260
Location:	GATESHEAD		
Postcode:	NE9 5SY	Number of Employees:	40
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	07/10/13
Sub-Location Type:	Residential Zone	Survey Day:	Monday
PTAL:	n/a	Parking Spaces:	35
Site(10):	WY-04-A-01	Gross floor area:	3756 sqm
Development Name:	PRIMARY SCHOOL	Number of pupils:	370
Location:	LEEDS		
Postcode:	LS9 7HP	Number of Employees:	82
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	19/09/13
Sub-Location Type:	Residential Zone	Survey Day:	Thursday
PTAL:	n/a	Parking Spaces:	36

LIST OF SITES relevant to selection parameters (Cont.)

Site(11):	WY-04-A-02	Gross floor area:	3150 sqm
Development Name:	PRIMARY SCHOOL	Number of pupils:	621
Location:	LEEDS		
Postcode:	LS11 8PN	Number of Employees:	80
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	19/10/15
Sub-Location Type:	Residential Zone	Survey Day:	Monday
PTAL:	n/a	Parking Spaces:	40

TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY

VEHICLES**Calculation factor: 1 PUPILS****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	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	1	312	0.000	1	312	0.000	1	312	0.000
06:00 - 07:00	1	312	0.013	1	312	0.003	1	312	0.016
07:00 - 08:00	11	387	0.053	11	387	0.022	11	387	0.075
08:00 - 09:00	11	387	0.266	11	387	0.187	11	387	0.453
09:00 - 10:00	11	387	0.036	11	387	0.050	11	387	0.086
10:00 - 11:00	11	387	0.013	11	387	0.011	11	387	0.024
11:00 - 12:00	11	387	0.019	11	387	0.012	11	387	0.031
12:00 - 13:00	11	387	0.017	11	387	0.020	11	387	0.037
13:00 - 14:00	11	387	0.013	11	387	0.023	11	387	0.036
14:00 - 15:00	11	387	0.051	11	387	0.019	11	387	0.070
15:00 - 16:00	11	387	0.170	11	387	0.224	11	387	0.394
16:00 - 17:00	11	387	0.043	11	387	0.094	11	387	0.137
17:00 - 18:00	11	387	0.022	11	387	0.028	11	387	0.050
18:00 - 19:00	11	387	0.014	11	387	0.018	11	387	0.032
19:00 - 20:00	1	312	0.000	1	312	0.000	1	312	0.000
20:00 - 21:00	1	312	0.000	1	312	0.032	1	312	0.032
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:		0.730			0.743			1.473	

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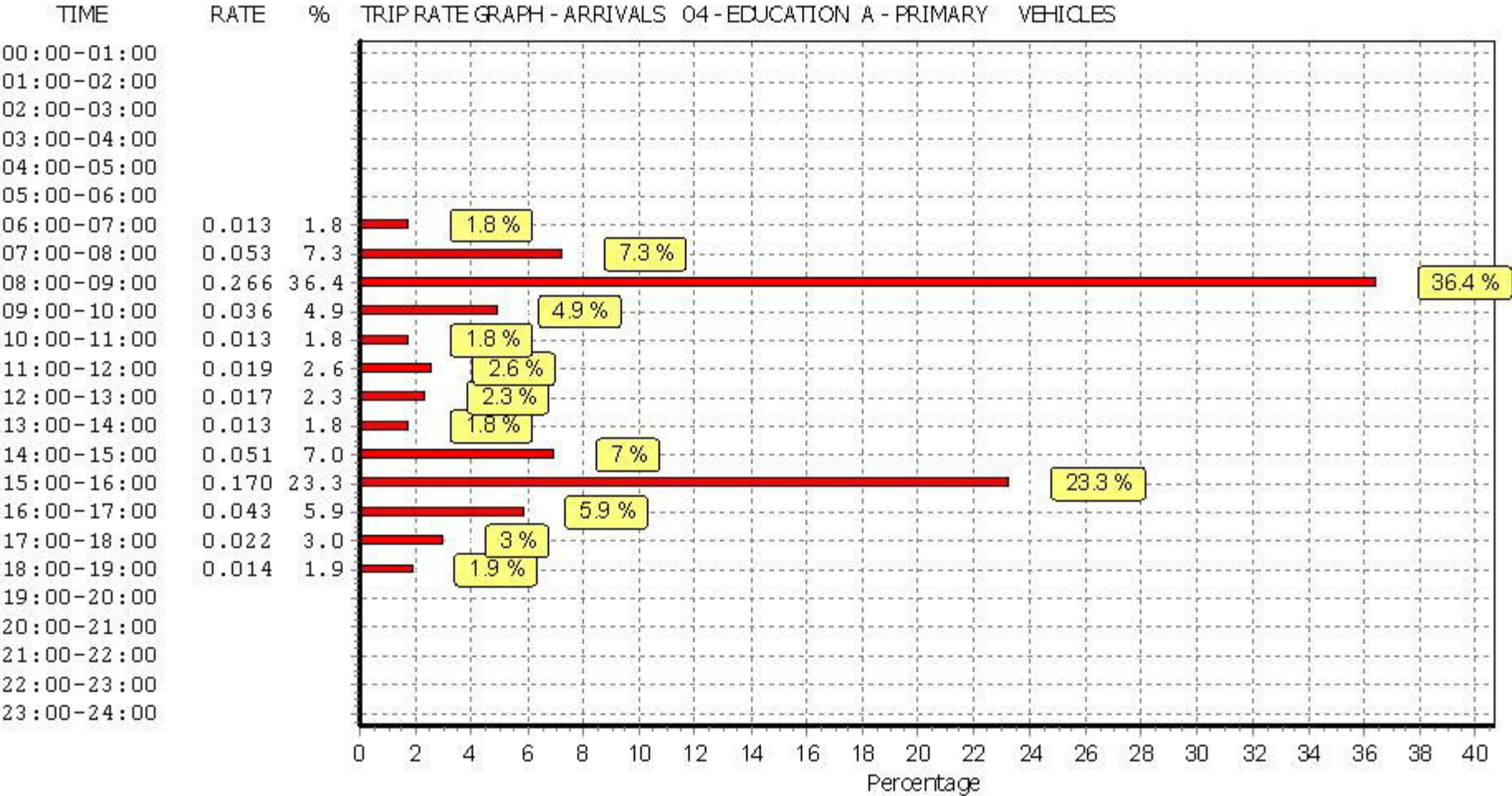
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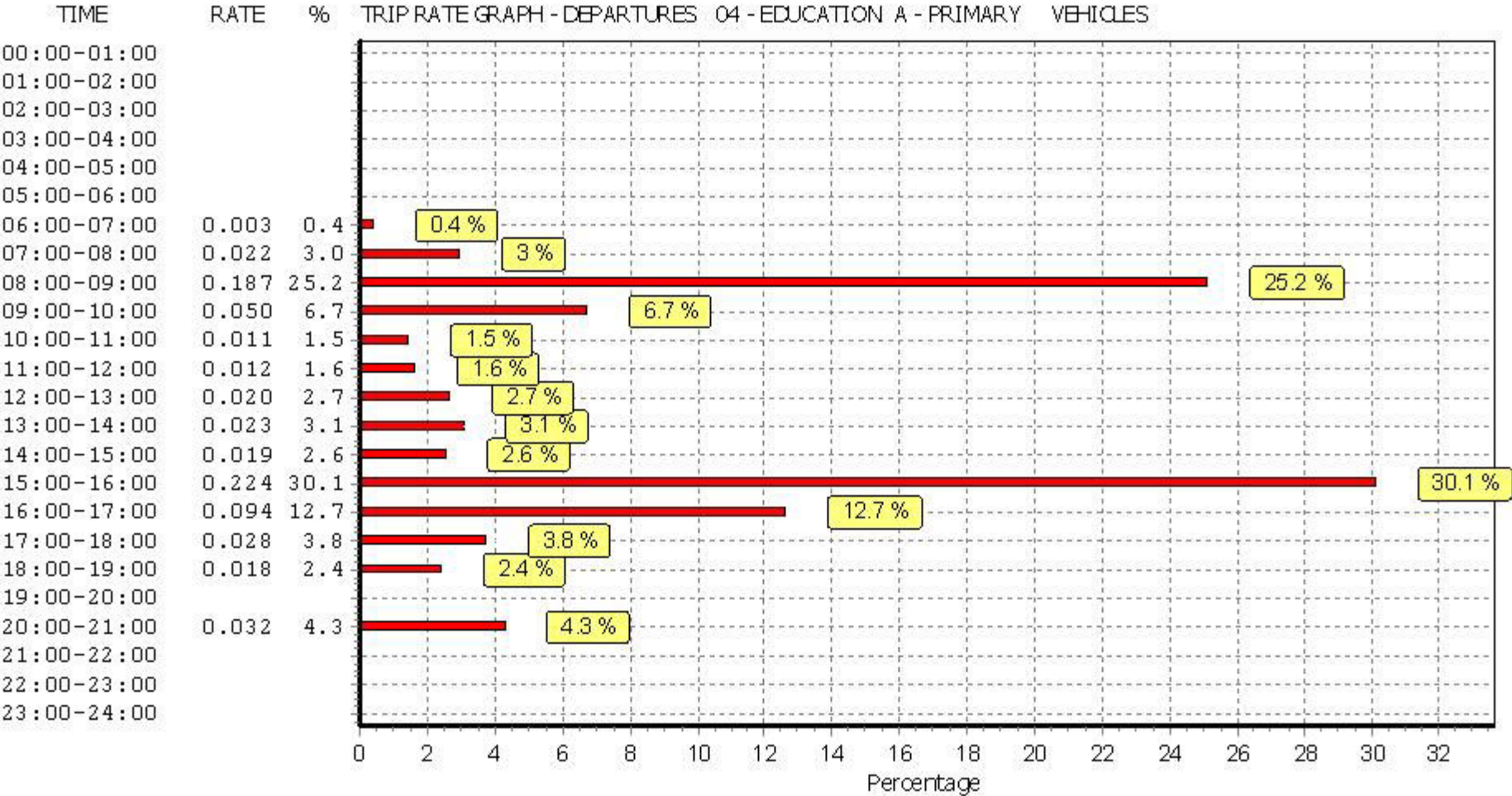
Parameter summary

Trip rate parameter range selected:	260 - 621 (units:)
Survey date date range:	01/01/10 - 28/09/16
Number of weekdays (Monday-Friday):	11
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

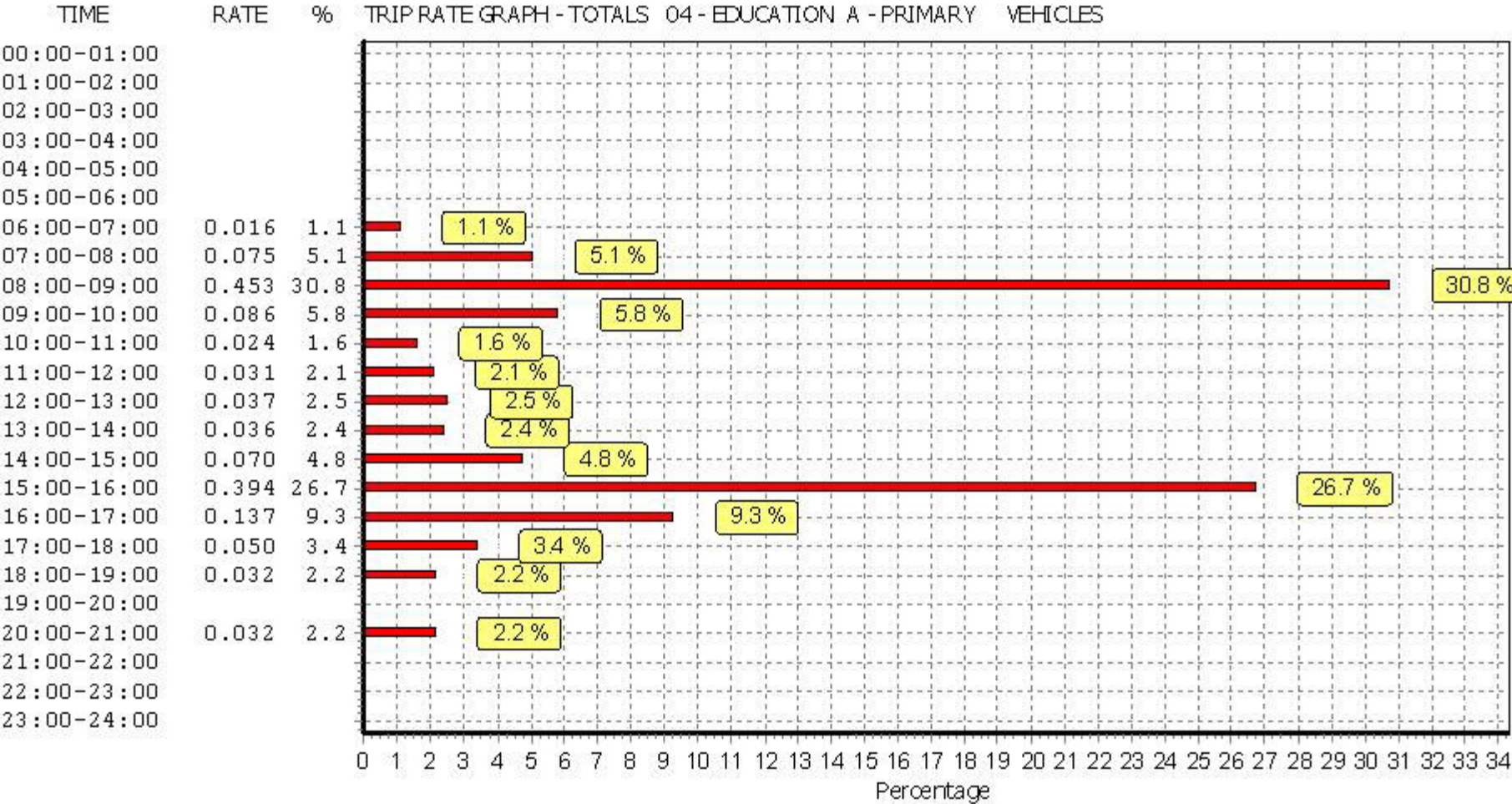
This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected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



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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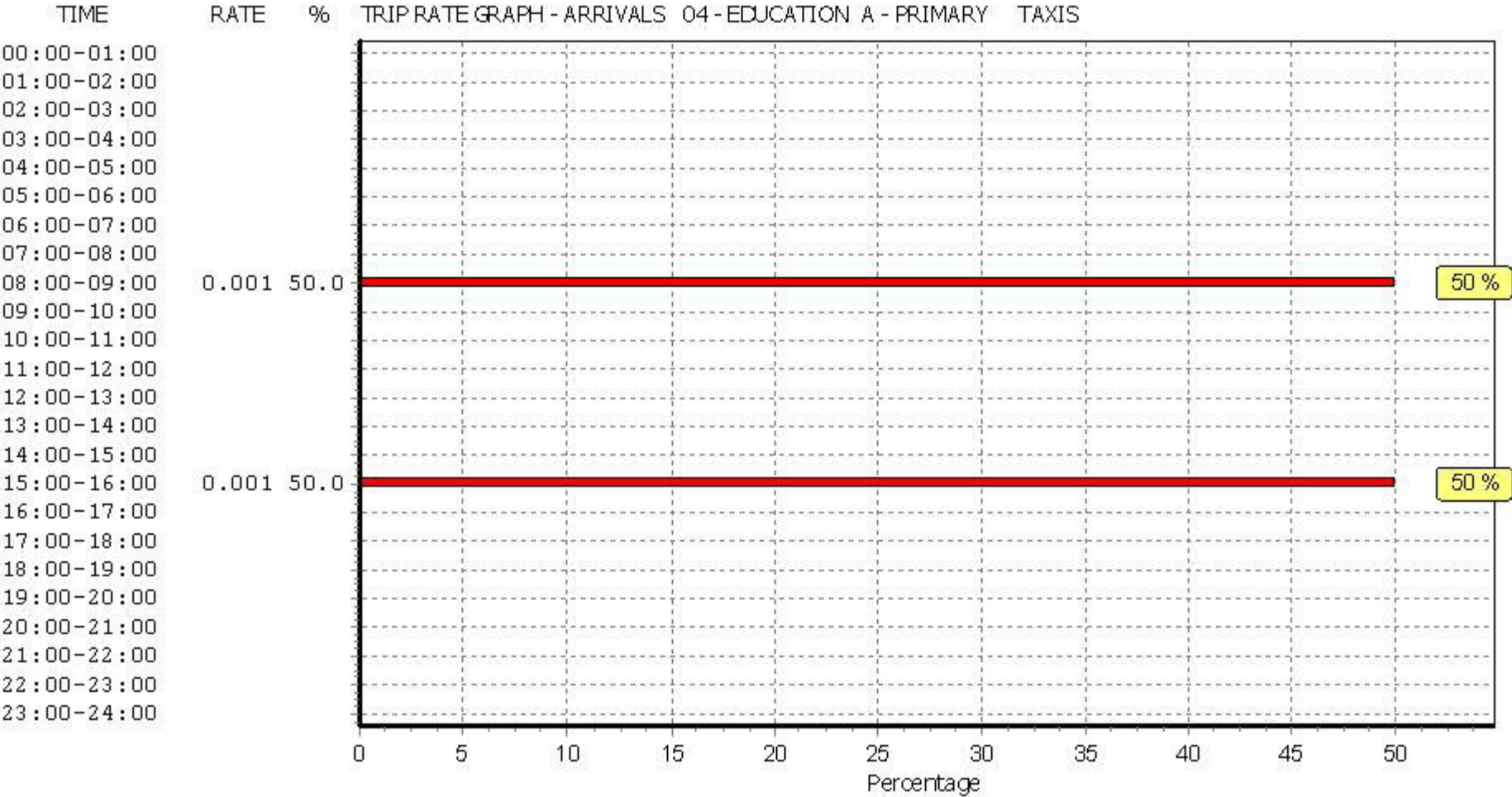
TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY

TAXIS**Calculation factor: 1 PUPILS****BOLD print indicates peak (busiest) period**

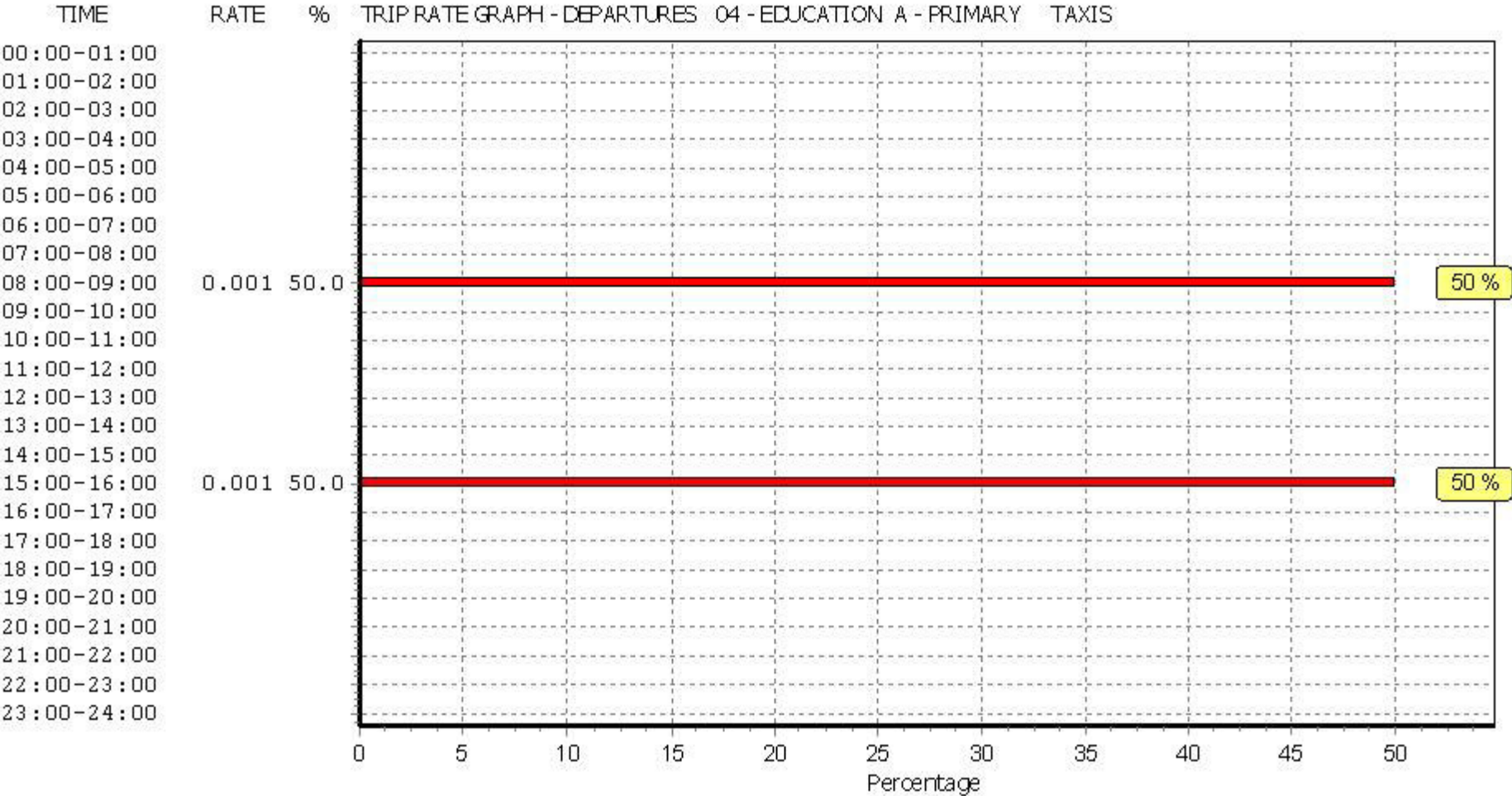
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	1	312	0.000	1	312	0.000	1	312	0.000
06:00 - 07:00	1	312	0.000	1	312	0.000	1	312	0.000
07:00 - 08:00	11	387	0.000	11	387	0.000	11	387	0.000
08:00 - 09:00	11	387	0.001	11	387	0.001	11	387	0.002
09:00 - 10:00	11	387	0.000	11	387	0.000	11	387	0.000
10:00 - 11:00	11	387	0.000	11	387	0.000	11	387	0.000
11:00 - 12:00	11	387	0.000	11	387	0.000	11	387	0.000
12:00 - 13:00	11	387	0.000	11	387	0.000	11	387	0.000
13:00 - 14:00	11	387	0.000	11	387	0.000	11	387	0.000
14:00 - 15:00	11	387	0.000	11	387	0.000	11	387	0.000
15:00 - 16:00	11	387	0.001	11	387	0.001	11	387	0.002
16:00 - 17:00	11	387	0.000	11	387	0.000	11	387	0.000
17:00 - 18:00	11	387	0.000	11	387	0.000	11	387	0.000
18:00 - 19:00	11	387	0.000	11	387	0.000	11	387	0.000
19:00 - 20:00	1	312	0.000	1	312	0.000	1	312	0.000
20:00 - 21:00	1	312	0.000	1	312	0.000	1	312	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.002			0.002			0.004

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.

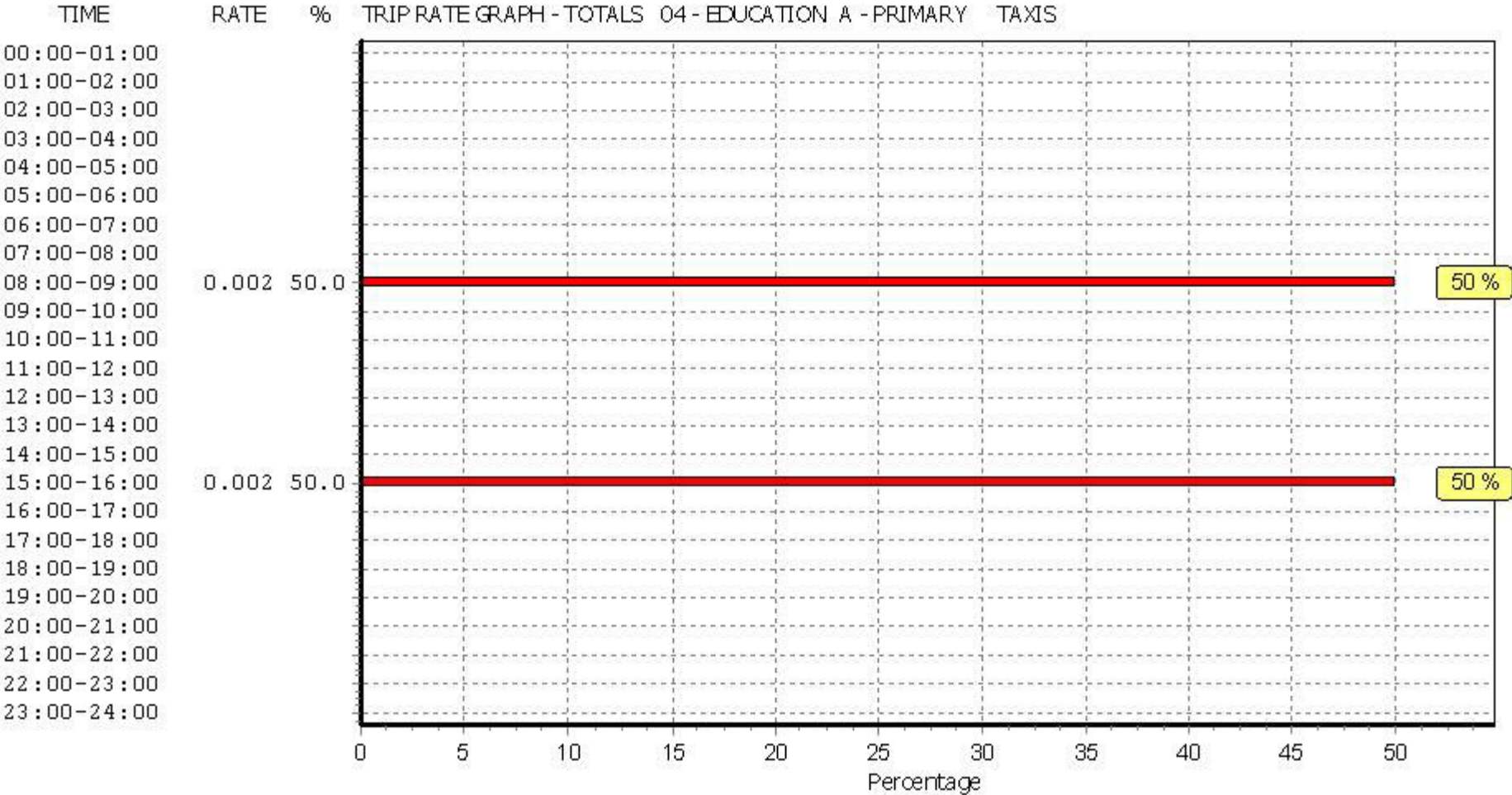
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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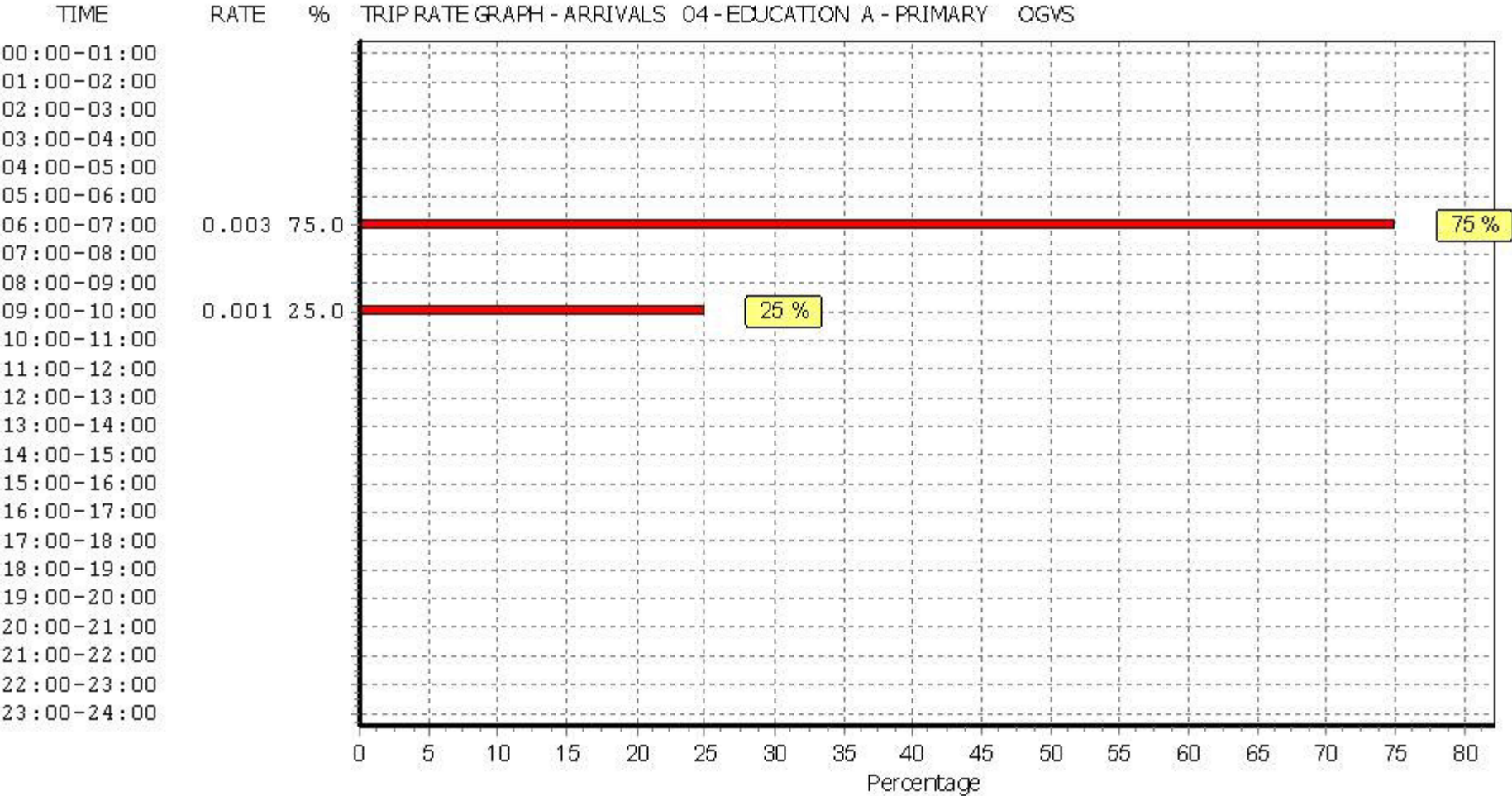
TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY

OGVS**Calculation factor: 1 PUPILS****BOLD print indicates peak (busiest) period**

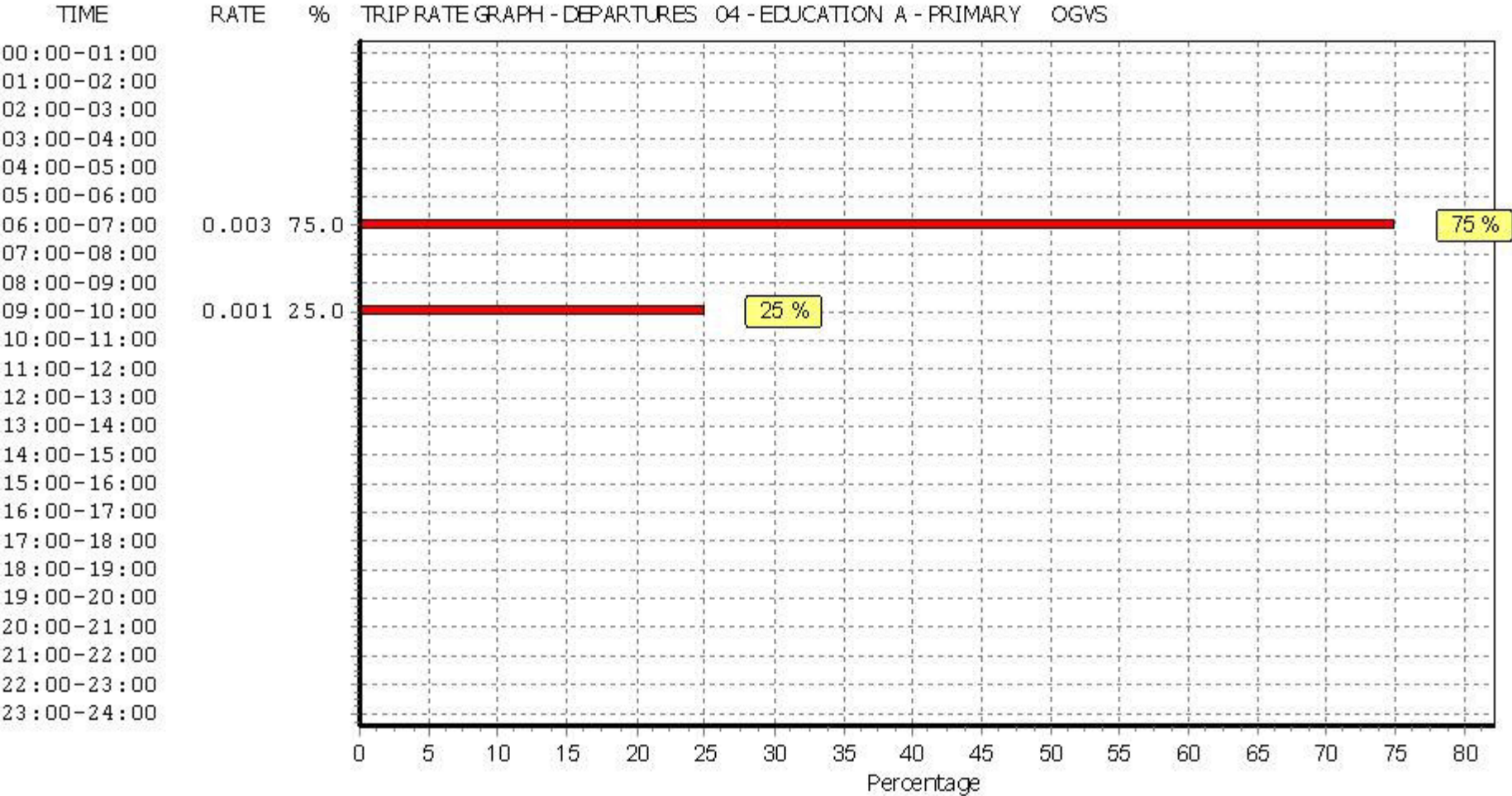
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	1	312	0.000	1	312	0.000	1	312	0.000
06:00 - 07:00	1	312	0.003	1	312	0.003	1	312	0.006
07:00 - 08:00	11	387	0.000	11	387	0.000	11	387	0.000
08:00 - 09:00	11	387	0.000	11	387	0.000	11	387	0.000
09:00 - 10:00	11	387	0.001	11	387	0.001	11	387	0.002
10:00 - 11:00	11	387	0.000	11	387	0.000	11	387	0.000
11:00 - 12:00	11	387	0.000	11	387	0.000	11	387	0.000
12:00 - 13:00	11	387	0.000	11	387	0.000	11	387	0.000
13:00 - 14:00	11	387	0.000	11	387	0.000	11	387	0.000
14:00 - 15:00	11	387	0.000	11	387	0.000	11	387	0.000
15:00 - 16:00	11	387	0.000	11	387	0.000	11	387	0.000
16:00 - 17:00	11	387	0.000	11	387	0.000	11	387	0.000
17:00 - 18:00	11	387	0.000	11	387	0.000	11	387	0.000
18:00 - 19:00	11	387	0.000	11	387	0.000	11	387	0.000
19:00 - 20:00	1	312	0.000	1	312	0.000	1	312	0.000
20:00 - 21:00	1	312	0.000	1	312	0.000	1	312	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.004			0.004			0.008

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.

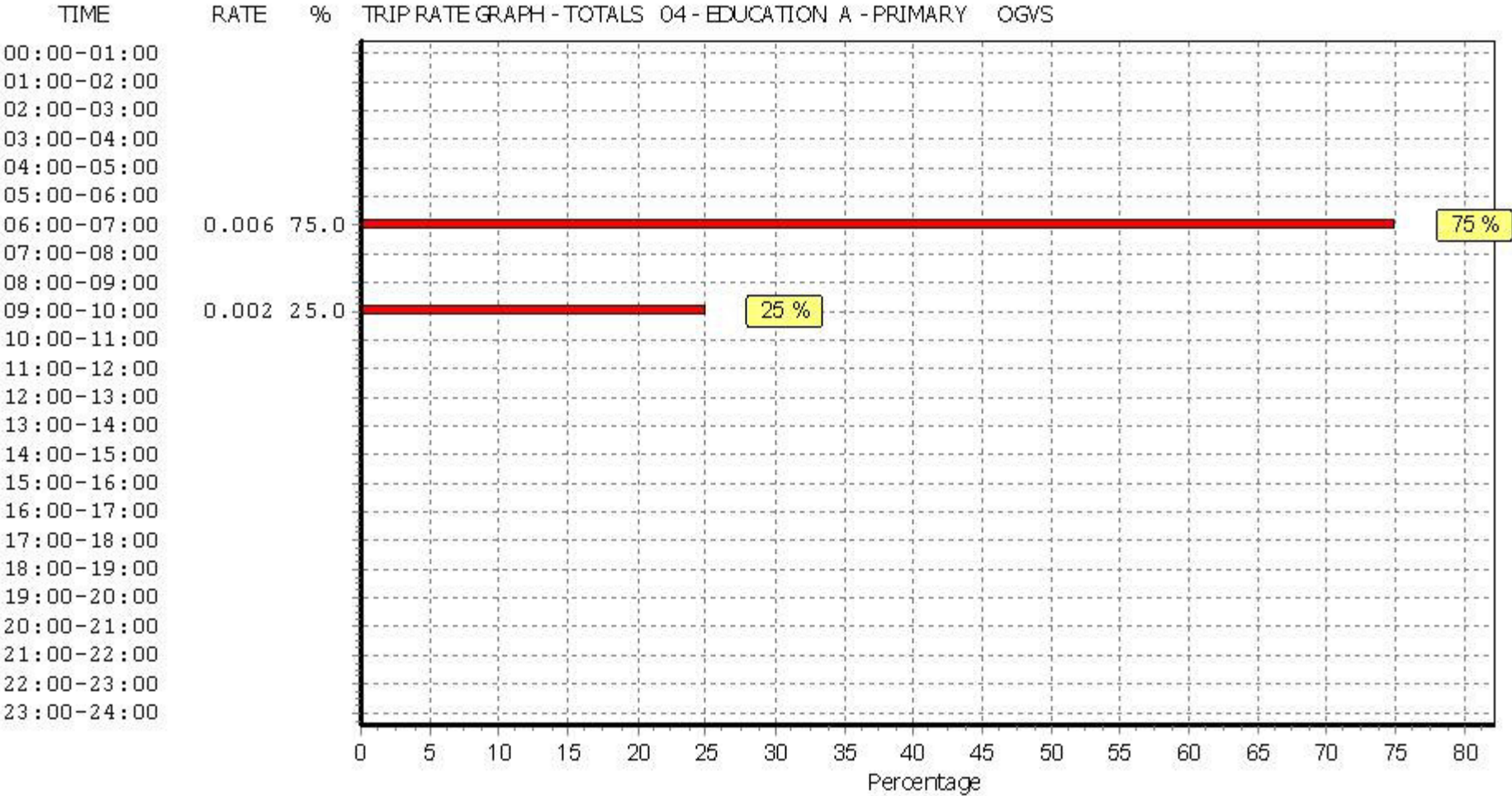
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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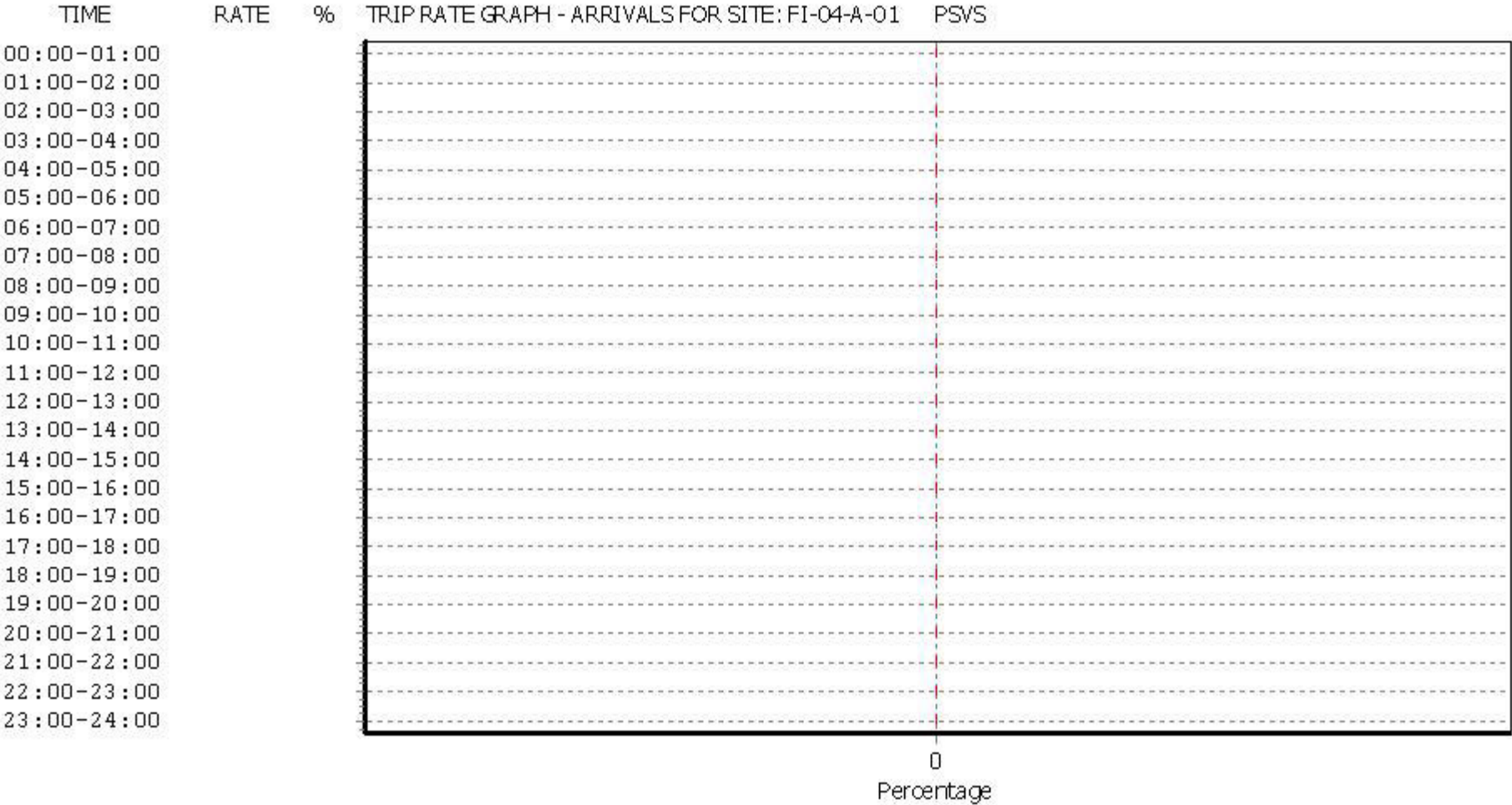
TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY

PSVS**Calculation factor: 1 PUPILS****BOLD print indicates peak (busiest) period**

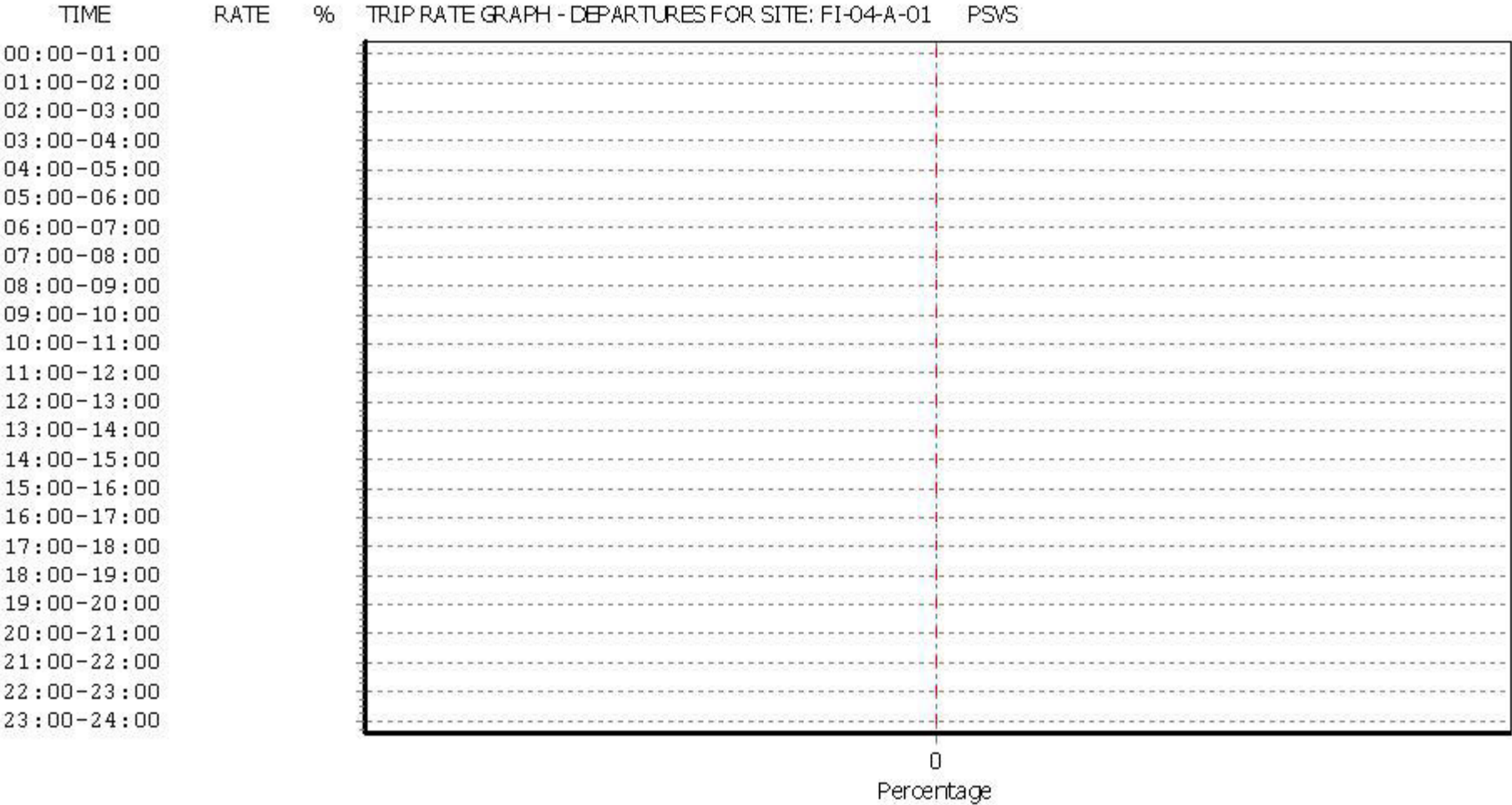
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	1	312	0.000	1	312	0.000	1	312	0.000
06:00 - 07:00	1	312	0.000	1	312	0.000	1	312	0.000
07:00 - 08:00	11	387	0.000	11	387	0.000	11	387	0.000
08:00 - 09:00	11	387	0.000	11	387	0.000	11	387	0.000
09:00 - 10:00	11	387	0.000	11	387	0.000	11	387	0.000
10:00 - 11:00	11	387	0.000	11	387	0.000	11	387	0.000
11:00 - 12:00	11	387	0.000	11	387	0.000	11	387	0.000
12:00 - 13:00	11	387	0.000	11	387	0.000	11	387	0.000
13:00 - 14:00	11	387	0.000	11	387	0.000	11	387	0.000
14:00 - 15:00	11	387	0.000	11	387	0.000	11	387	0.000
15:00 - 16:00	11	387	0.000	11	387	0.000	11	387	0.000
16:00 - 17:00	11	387	0.000	11	387	0.000	11	387	0.000
17:00 - 18:00	11	387	0.000	11	387	0.000	11	387	0.000
18:00 - 19:00	11	387	0.000	11	387	0.000	11	387	0.000
19:00 - 20:00	1	312	0.000	1	312	0.000	1	312	0.000
20:00 - 21:00	1	312	0.000	1	312	0.000	1	312	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:		0.000			0.000			0.000	

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

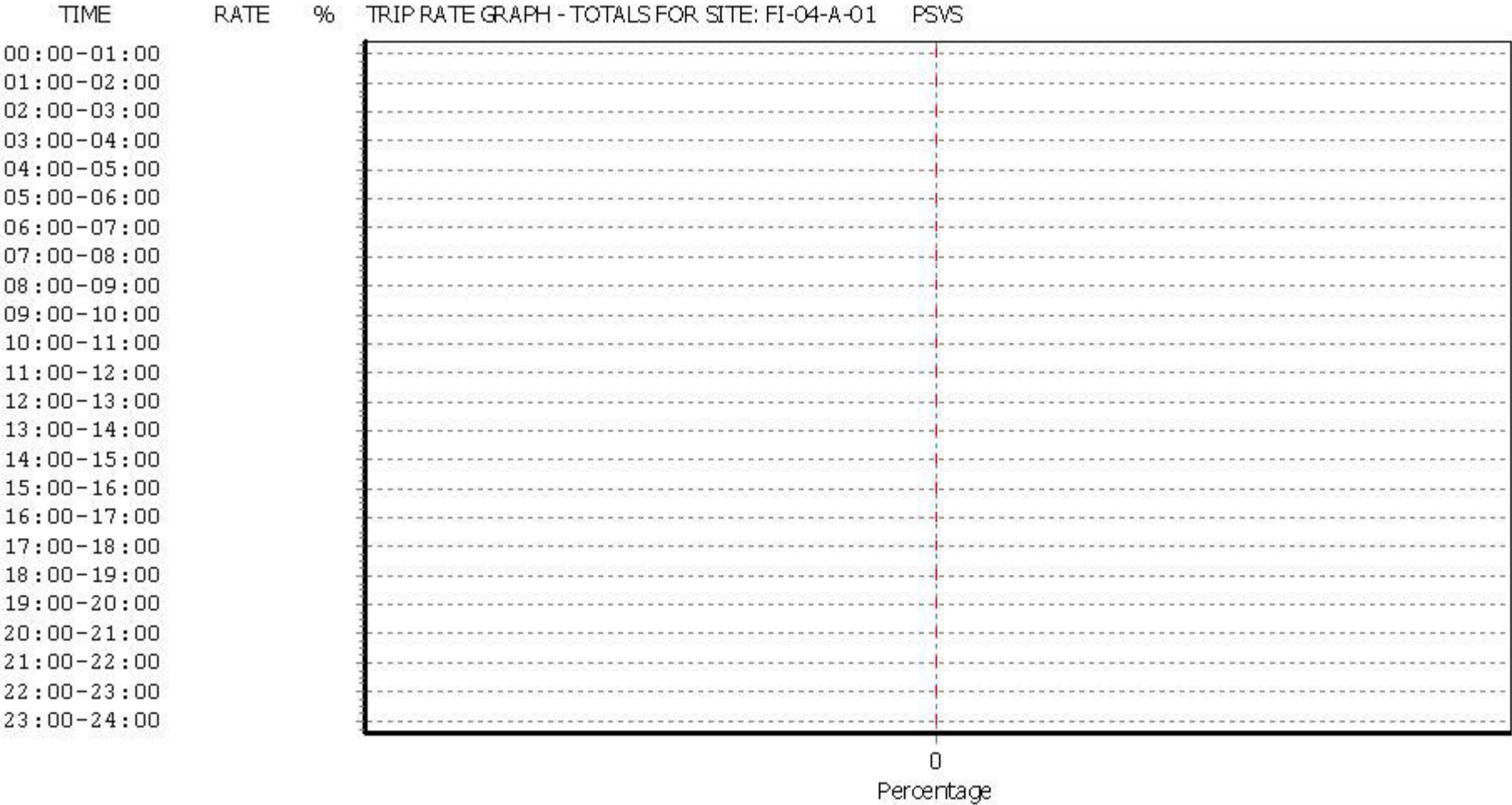
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected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



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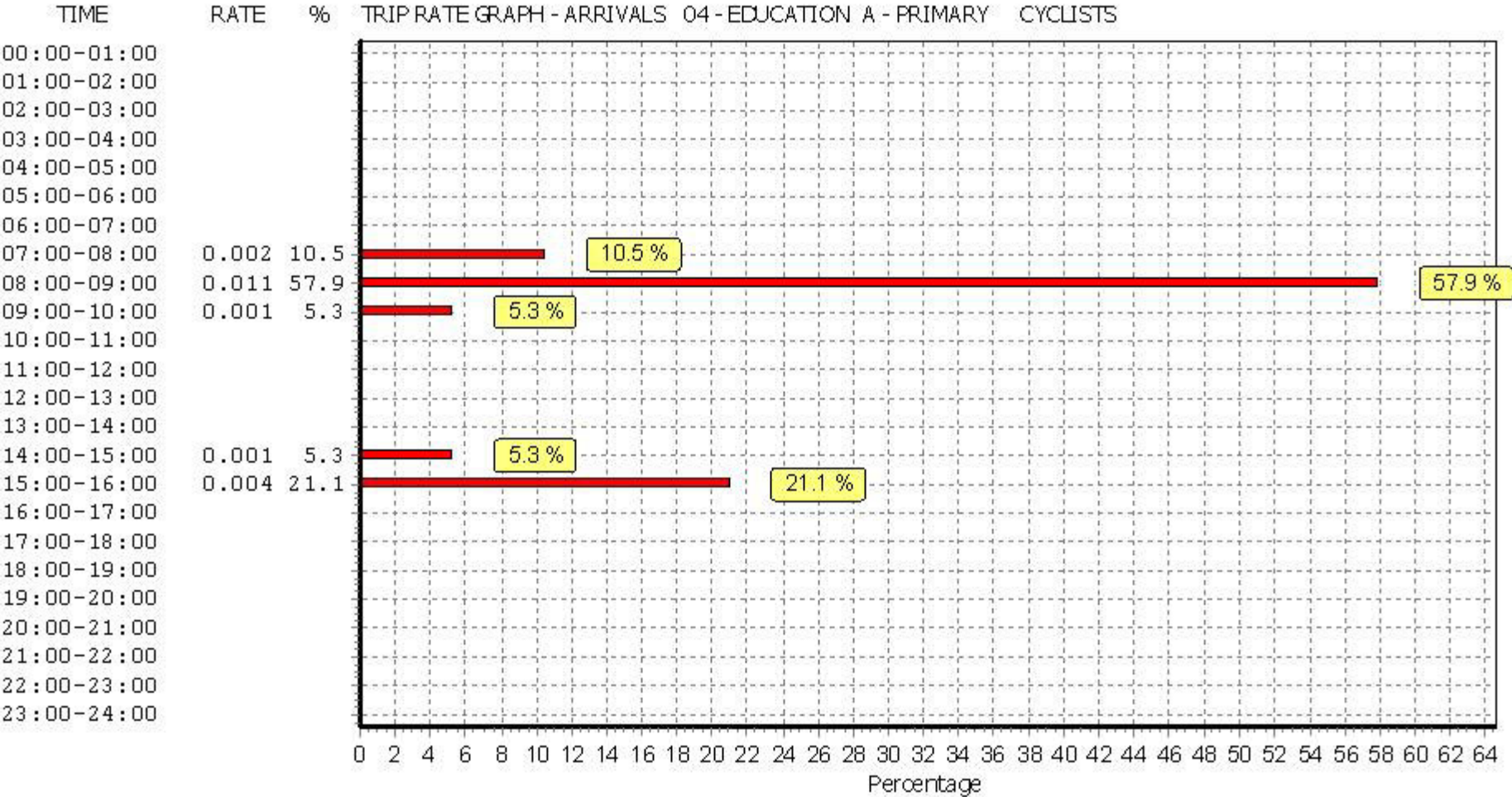
TRIP RATE for Land Use 04 - EDUCATION/A - PRIMARY

CYCLISTS**Calculation factor: 1 PUPILS****BOLD print indicates peak (busiest) period**

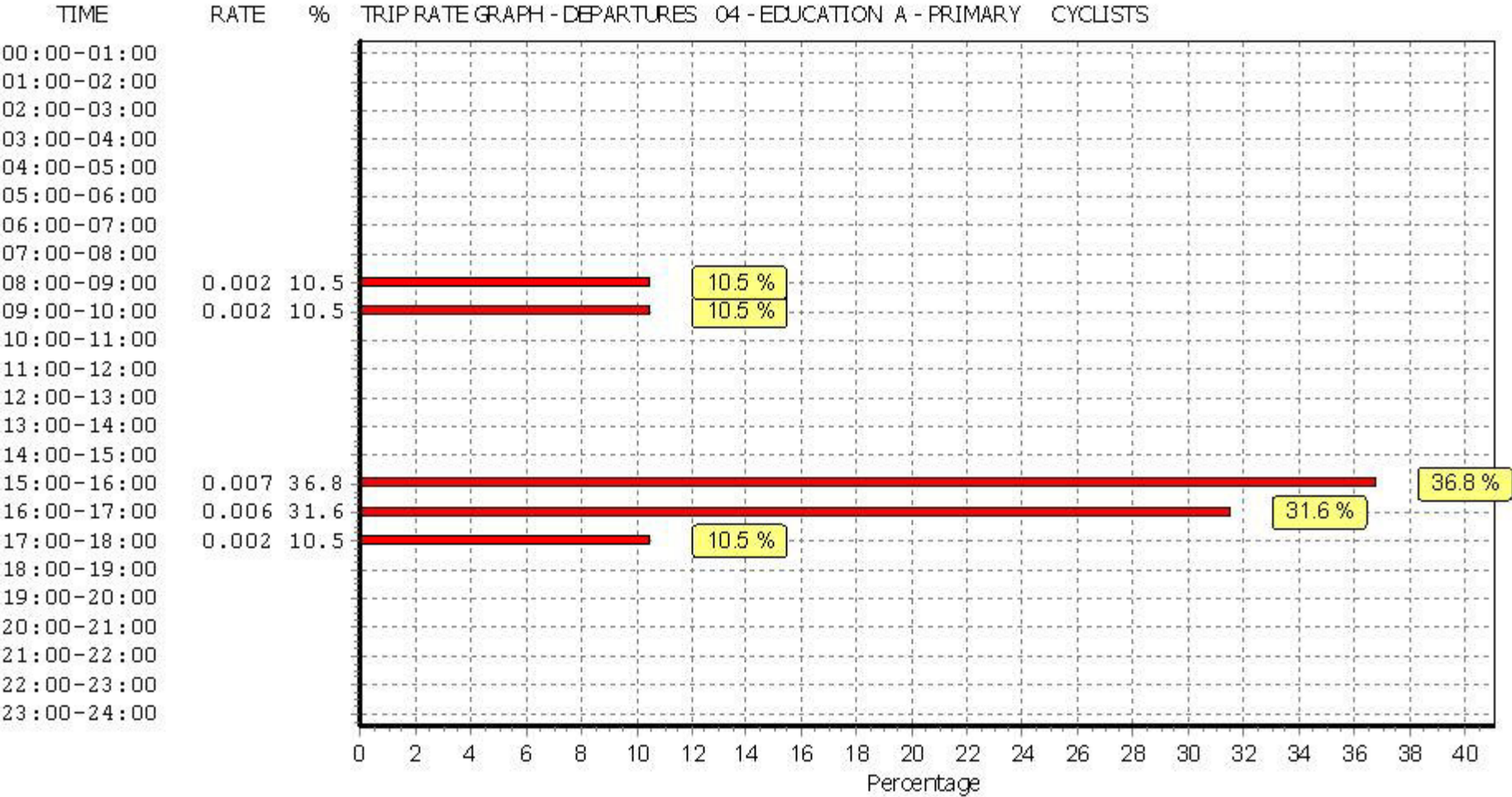
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	1	312	0.000	1	312	0.000	1	312	0.000
06:00 - 07:00	1	312	0.000	1	312	0.000	1	312	0.000
07:00 - 08:00	11	387	0.002	11	387	0.000	11	387	0.002
08:00 - 09:00	11	387	0.011	11	387	0.002	11	387	0.013
09:00 - 10:00	11	387	0.001	11	387	0.002	11	387	0.003
10:00 - 11:00	11	387	0.000	11	387	0.000	11	387	0.000
11:00 - 12:00	11	387	0.000	11	387	0.000	11	387	0.000
12:00 - 13:00	11	387	0.000	11	387	0.000	11	387	0.000
13:00 - 14:00	11	387	0.000	11	387	0.000	11	387	0.000
14:00 - 15:00	11	387	0.001	11	387	0.000	11	387	0.001
15:00 - 16:00	11	387	0.004	11	387	0.007	11	387	0.011
16:00 - 17:00	11	387	0.000	11	387	0.006	11	387	0.006
17:00 - 18:00	11	387	0.000	11	387	0.002	11	387	0.002
18:00 - 19:00	11	387	0.000	11	387	0.000	11	387	0.000
19:00 - 20:00	1	312	0.000	1	312	0.000	1	312	0.000
20:00 - 21:00	1	312	0.000	1	312	0.000	1	312	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.019			0.019			0.038

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.

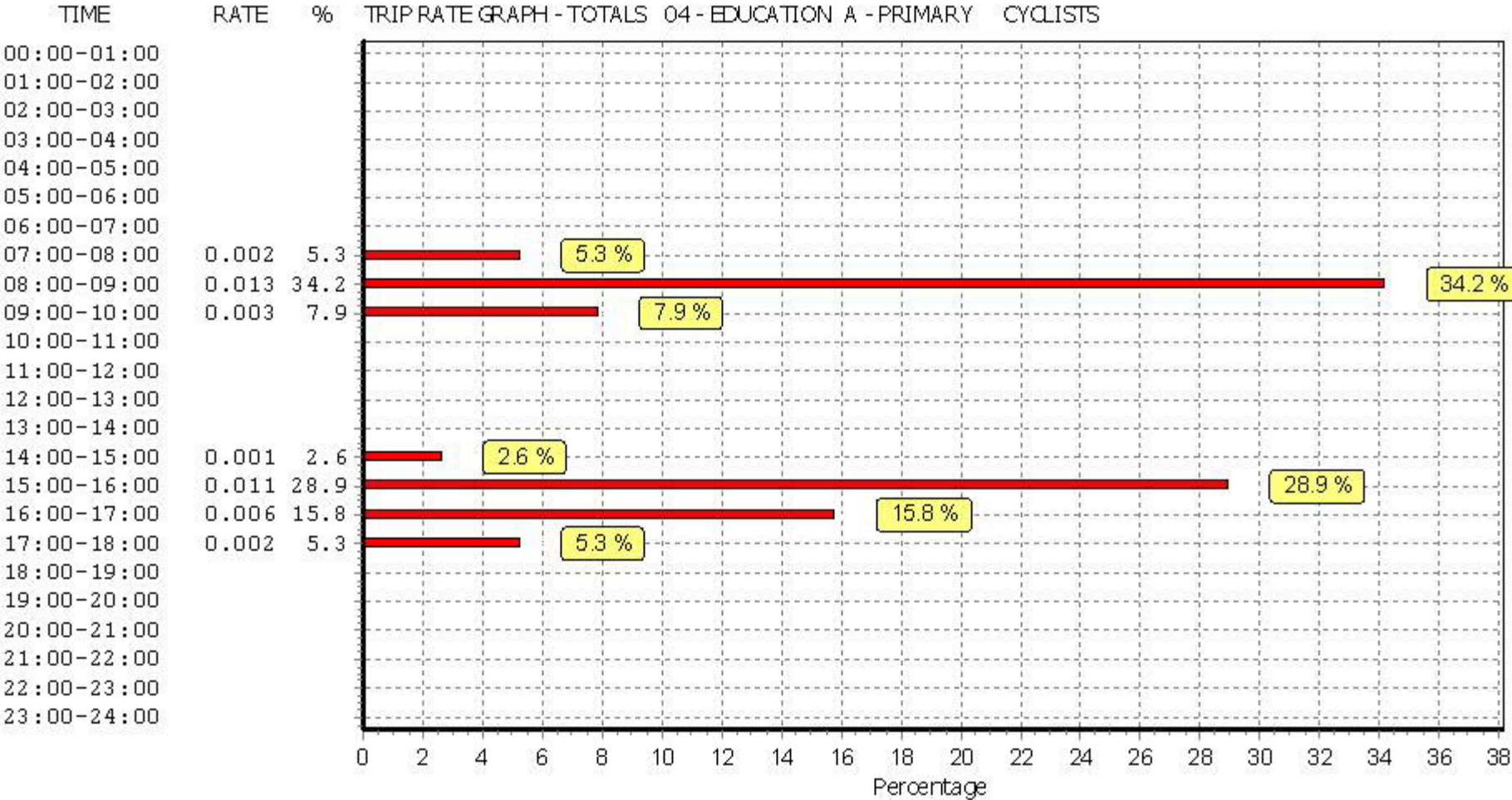
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Phil Jones Associates The Innovation Centre Longbridge Technology Park

Licence No: 231601

Filtering Summary

Land Use	05/G	HEALTH/GP SURGERIES
Selected Trip Rate Calculation Parameter Range	300-700 sqm GFA	
Actual Trip Rate Calculation Parameter Range	300-601 sqm GFA	
Date Range	Minimum: 01/01/10	Maximum: 21/11/17
Days of the week selected	Monday	1
	Tuesday	3
	Wednesday	1
	Friday	3
Main Location Types selected	Suburban Area (PPS6 Out of Centre)	3
	Neighbourhood Centre (PPS6 Local Centre)	5
Population <1 Mile ranges selected	1,000 or Less	1
	1,001 to 5,000	1
	10,001 to 15,000	1
	15,001 to 20,000	1
	20,001 to 25,000	1
	25,001 to 50,000	3
Population <5 Mile ranges selected	5,001 to 25,000	1
	100,001 to 125,000	2
	125,001 to 250,000	2
	250,001 to 500,000	3
Car Ownership <5 Mile ranges selected	0.5 or Less	1
	0.6 to 1.0	2
	1.1 to 1.5	5
PTAL Rating	No PTAL Present	8

Calculation Reference: AUDIT-231601-181008-1051

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 05 - HEALTH
 Category : G - GP SURGERIES

VEHICLESSelected regions and areas:

02	SOUTH EAST	
	BU BUCKINGHAMSHIRE	1 days
03	SOUTH WEST	
	WL WILTSHIRE	1 days
05	EAST MIDLANDS	
	LE LEICESTERSHIRE	1 days
	NT NOTTINGHAMSHIRE	1 days
06	WEST MIDLANDS	
	WM WEST MIDLANDS	1 days
09	NORTH	
	TW TYNE & WEAR	1 days
11	SCOTLAND	
	FI FIFE	2 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: Gross floor area
 Actual Range: 300 to 601 (units: sqm)
 Range Selected by User: 300 to 700 (units: sqm)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/10 to 21/11/17

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

Selected survey days:

Monday	1 days
Tuesday	3 days
Wednesday	1 days
Friday	3 days

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

Selected survey types:

Manual count	8 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)	3
Neighbourhood Centre (PPS6 Local Centre)	5

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

Selected Location Sub Categories:

Residential Zone	6
Village	2

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:

D1	7 days
Sui Generis	1 days

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

Population within 1 mile:

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

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

Population within 5 miles:

5,001 to 25,000	1 days
100,001 to 125,000	2 days
125,001 to 250,000	2 days
250,001 to 500,000	3 days

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

Car ownership within 5 miles:

0.5 or Less	1 days
0.6 to 1.0	2 days
1.1 to 1.5	5 days

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

Travel Plan:

No	8 days
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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	8 days
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This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

Site(1):	BU-05-G-02	Gross floor area:	601 sqm
Development Name:	GP SURGERY	Number of doctors:	5
Location:	MILTON KEYNES		
Postcode:	MK7 7PB	Number of Employees:	30
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	19/10/10
Sub-Location Type:	Residential Zone	Survey Day:	Tuesday
PTAL:	n/a	Parking Spaces:	25
Site(2):	FI-05-G-02	Gross floor area:	325 sqm
Development Name:	GP SURGERY	Number of doctors:	2
Location:	NEAR DUNFERMLINE		
Postcode:	KY11 3ED	Number of Employees:	14
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	29/05/15
Sub-Location Type:	Village	Survey Day:	Friday
PTAL:	n/a	Parking Spaces:	20
Site(3):	FI-05-G-03	Gross floor area:	425 sqm
Development Name:	GP SURGERY	Number of doctors:	6
Location:	DUNFERMLINE		
Postcode:	KY11 3BA	Number of Employees:	15
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	21/03/16
Sub-Location Type:	Residential Zone	Survey Day:	Monday
PTAL:	n/a	Parking Spaces:	12
Site(4):	LE-05-G-02	Gross floor area:	363 sqm
Development Name:	GP SURGERY	Number of doctors:	7
Location:	NEAR MELTON MOWBRAY		
Postcode:	LE14 4PA	Number of Employees:	22
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	29/11/16
Sub-Location Type:	Village	Survey Day:	Tuesday
PTAL:	n/a	Parking Spaces:	
Site(5):	NT-05-G-01	Gross floor area:	460 sqm
Development Name:	GP SURGERY	Number of doctors:	2
Location:	NOTTINGHAM		
Postcode:	NG5 2EJ	Number of Employees:	11
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	24/06/15
Sub-Location Type:	Residential Zone	Survey Day:	Wednesday
PTAL:	n/a	Parking Spaces:	10
Site(6):	TW-05-G-01	Gross floor area:	600 sqm
Development Name:	GP SURGERY	Number of doctors:	2
Location:	SUNDERLAND		
Postcode:	SR3 4BY	Number of Employees:	16
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Date:	30/11/12
Sub-Location Type:	Residential Zone	Survey Day:	Friday
PTAL:	n/a	Parking Spaces:	16
Site(7):	WL-05-G-01	Gross floor area:	300 sqm
Development Name:	GP SURGERY	Number of doctors:	4
Location:	SWINDON BOROUGH C.		
Postcode:	SN2 7BG	Number of Employees:	27
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	23/09/16
Sub-Location Type:	Residential Zone	Survey Day:	Friday
PTAL:	n/a	Parking Spaces:	11
Site(8):	WM-05-G-04	Gross floor area:	600 sqm
Development Name:	GP SURGERY	Number of doctors:	4
Location:	DUDLEY		
Postcode:	DY1 2ER	Number of Employees:	21
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Date:	21/11/17
Sub-Location Type:	Residential Zone	Survey Day:	Tuesday
PTAL:	n/a	Parking Spaces:	27

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

VEHICLES**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	459	0.933	7	459	0.062	7	459	0.995
08:00 - 09:00	8	459	2.667	8	459	1.497	8	459	4.164
09:00 - 10:00	8	459	3.674	8	459	3.021	8	459	6.695
10:00 - 11:00	8	459	5.008	8	459	4.437	8	459	9.445
11:00 - 12:00	8	459	4.273	8	459	4.219	8	459	8.492
12:00 - 13:00	8	459	3.348	8	459	4.464	8	459	7.812
13:00 - 14:00	8	459	2.858	8	459	2.858	8	459	5.716
14:00 - 15:00	8	459	2.994	8	459	2.803	8	459	5.797
15:00 - 16:00	8	459	2.994	8	459	2.858	8	459	5.852
16:00 - 17:00	8	459	3.566	8	459	3.375	8	459	6.941
17:00 - 18:00	8	459	2.041	8	459	3.021	8	459	5.062
18:00 - 19:00	8	459	0.435	8	459	1.551	8	459	1.986
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			34.791			34.166			68.957

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

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

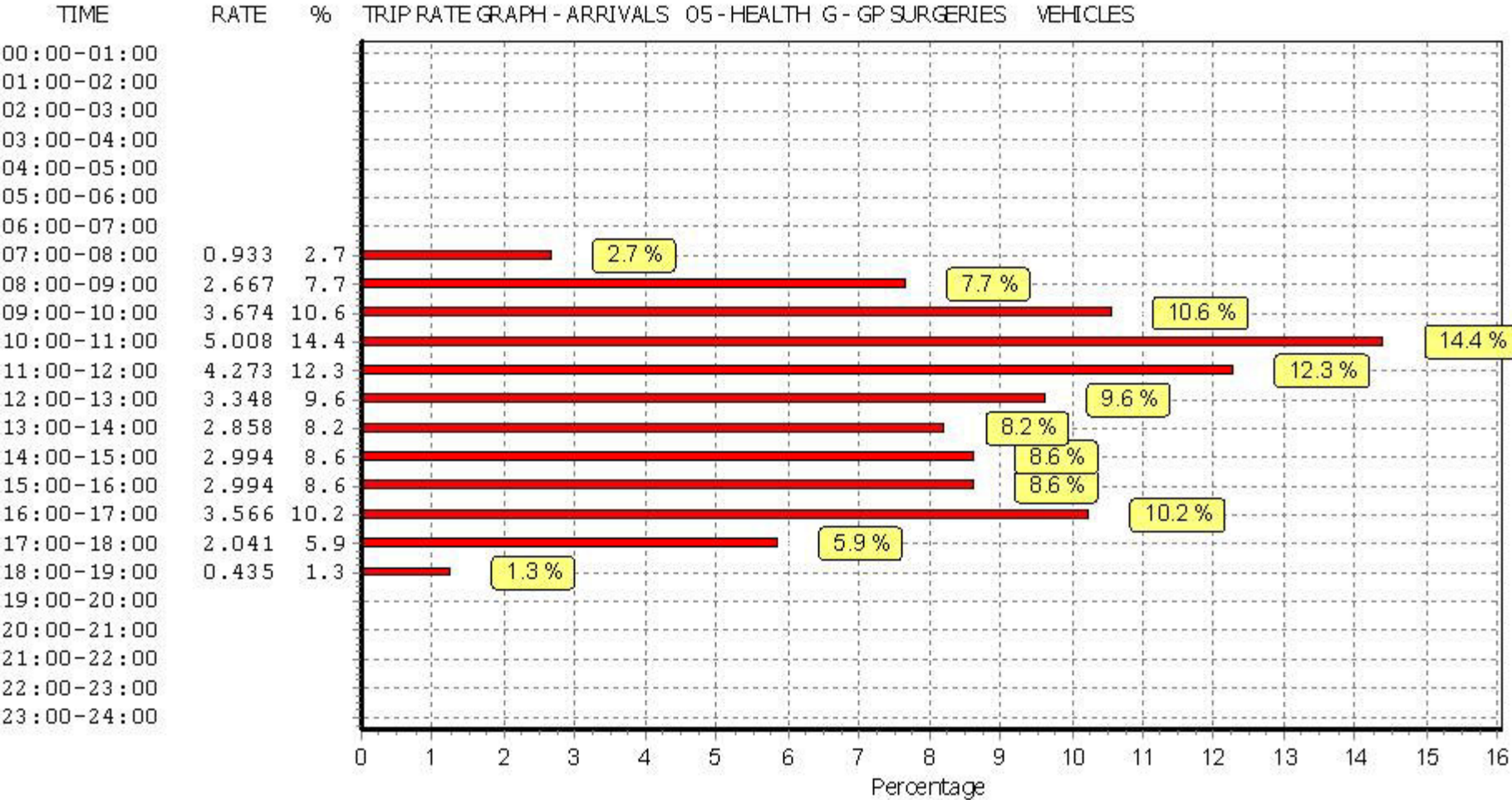
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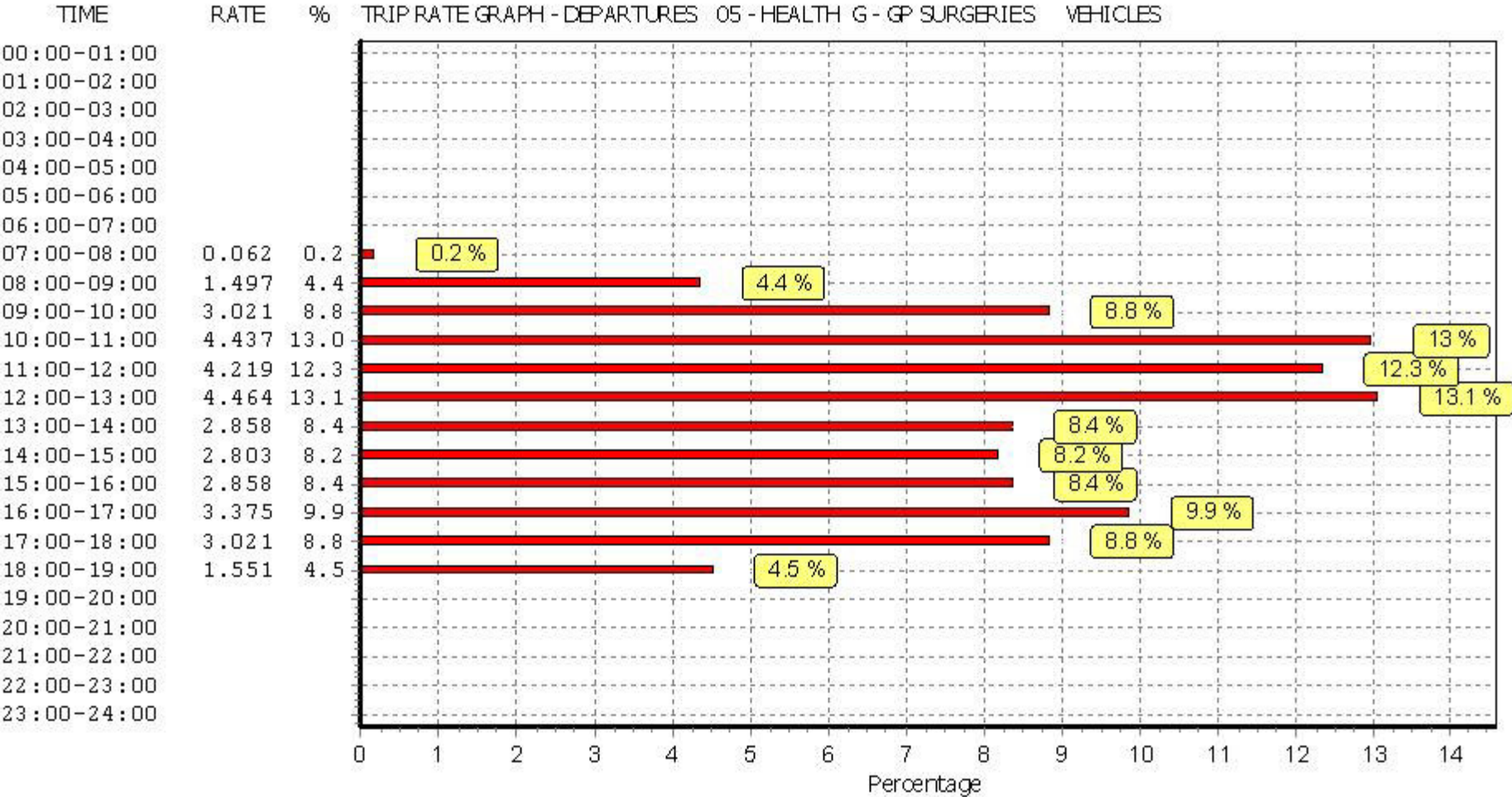
Parameter summary

Trip rate parameter range selected:	300 - 601 (units: sqm)
Survey date date range:	01/01/10 - 21/11/17
Number of weekdays (Monday-Friday):	8
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

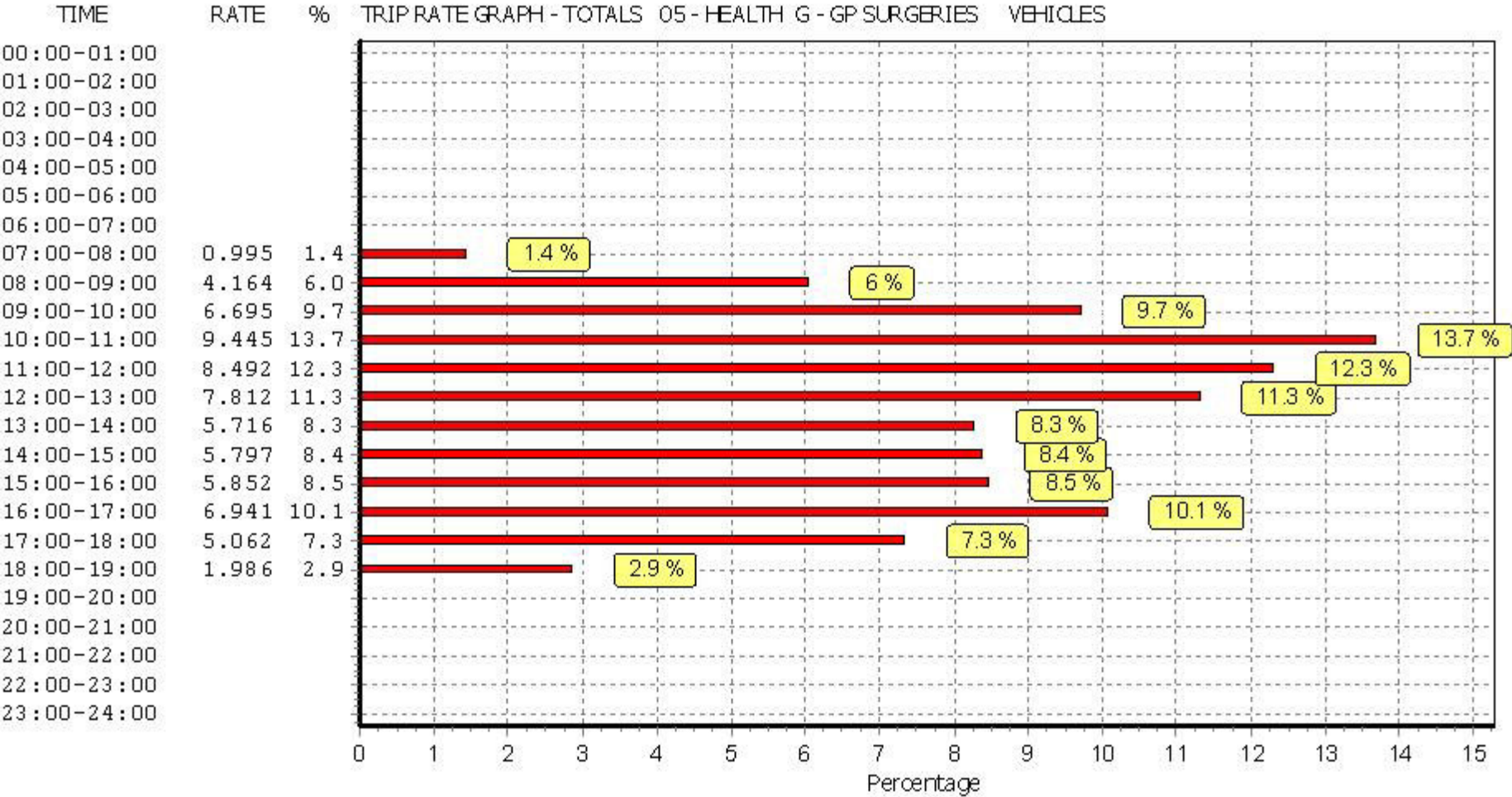
This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected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



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

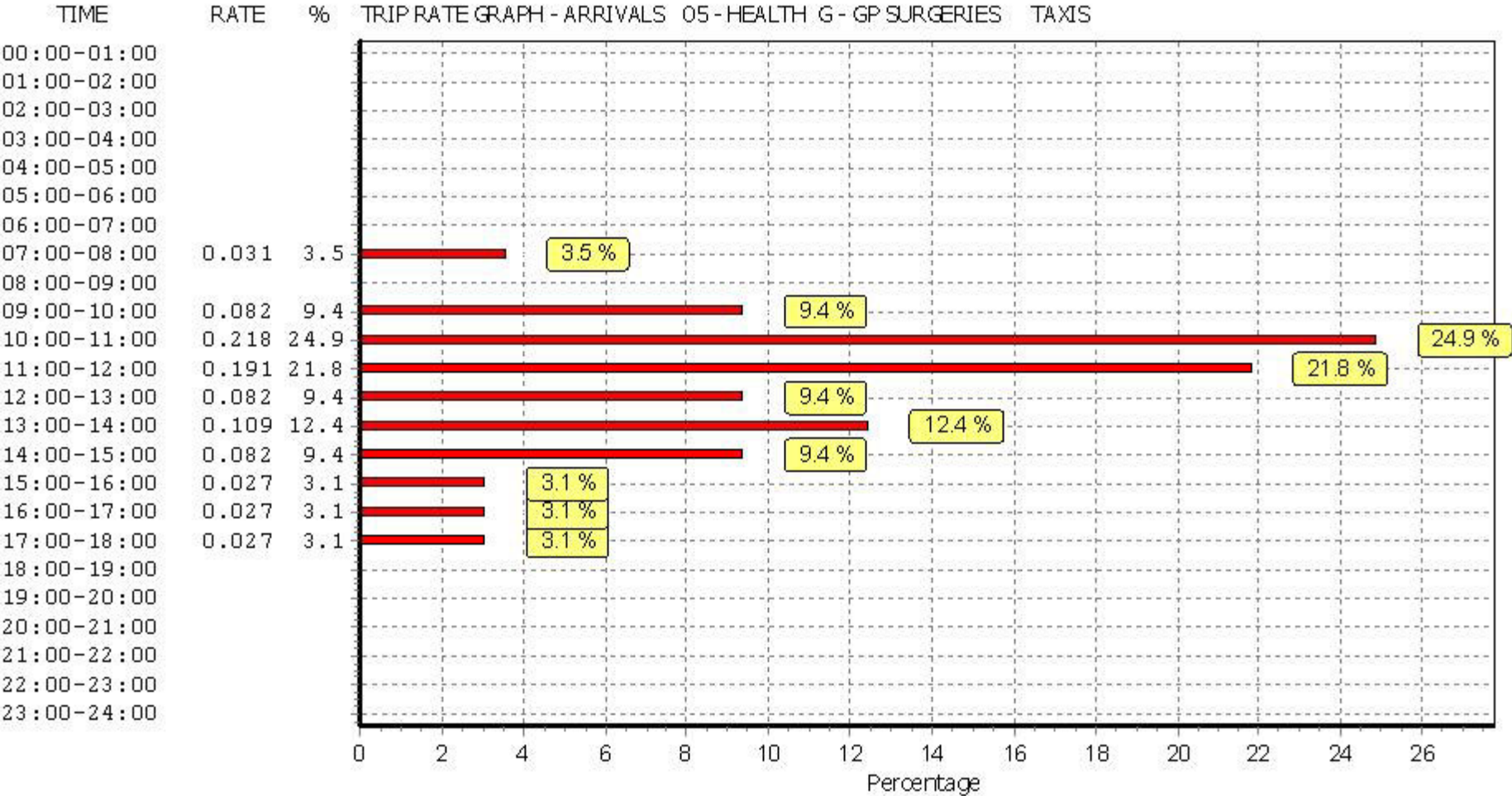
TRIP RATE for Land Use 05 - HEALTH/G - GP SURGERIES

TAXIS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

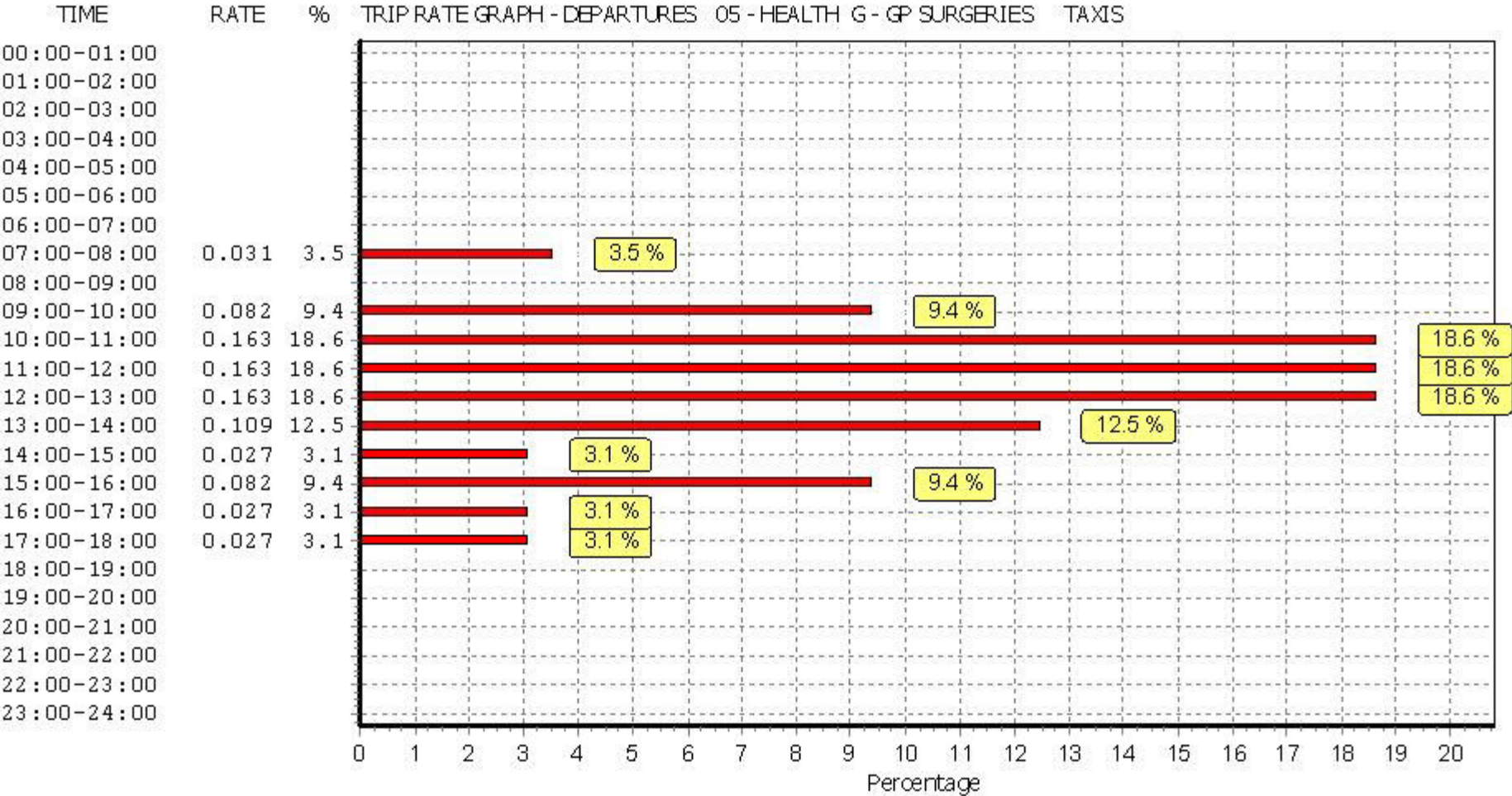
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	459	0.031	7	459	0.031	7	459	0.062
08:00 - 09:00	8	459	0.000	8	459	0.000	8	459	0.000
09:00 - 10:00	8	459	0.082	8	459	0.082	8	459	0.164
10:00 - 11:00	8	459	0.218	8	459	0.163	8	459	0.381
11:00 - 12:00	8	459	0.191	8	459	0.163	8	459	0.354
12:00 - 13:00	8	459	0.082	8	459	0.163	8	459	0.245
13:00 - 14:00	8	459	0.109	8	459	0.109	8	459	0.218
14:00 - 15:00	8	459	0.082	8	459	0.027	8	459	0.109
15:00 - 16:00	8	459	0.027	8	459	0.082	8	459	0.109
16:00 - 17:00	8	459	0.027	8	459	0.027	8	459	0.054
17:00 - 18:00	8	459	0.027	8	459	0.027	8	459	0.054
18:00 - 19:00	8	459	0.000	8	459	0.000	8	459	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.876			0.874			1.750

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.

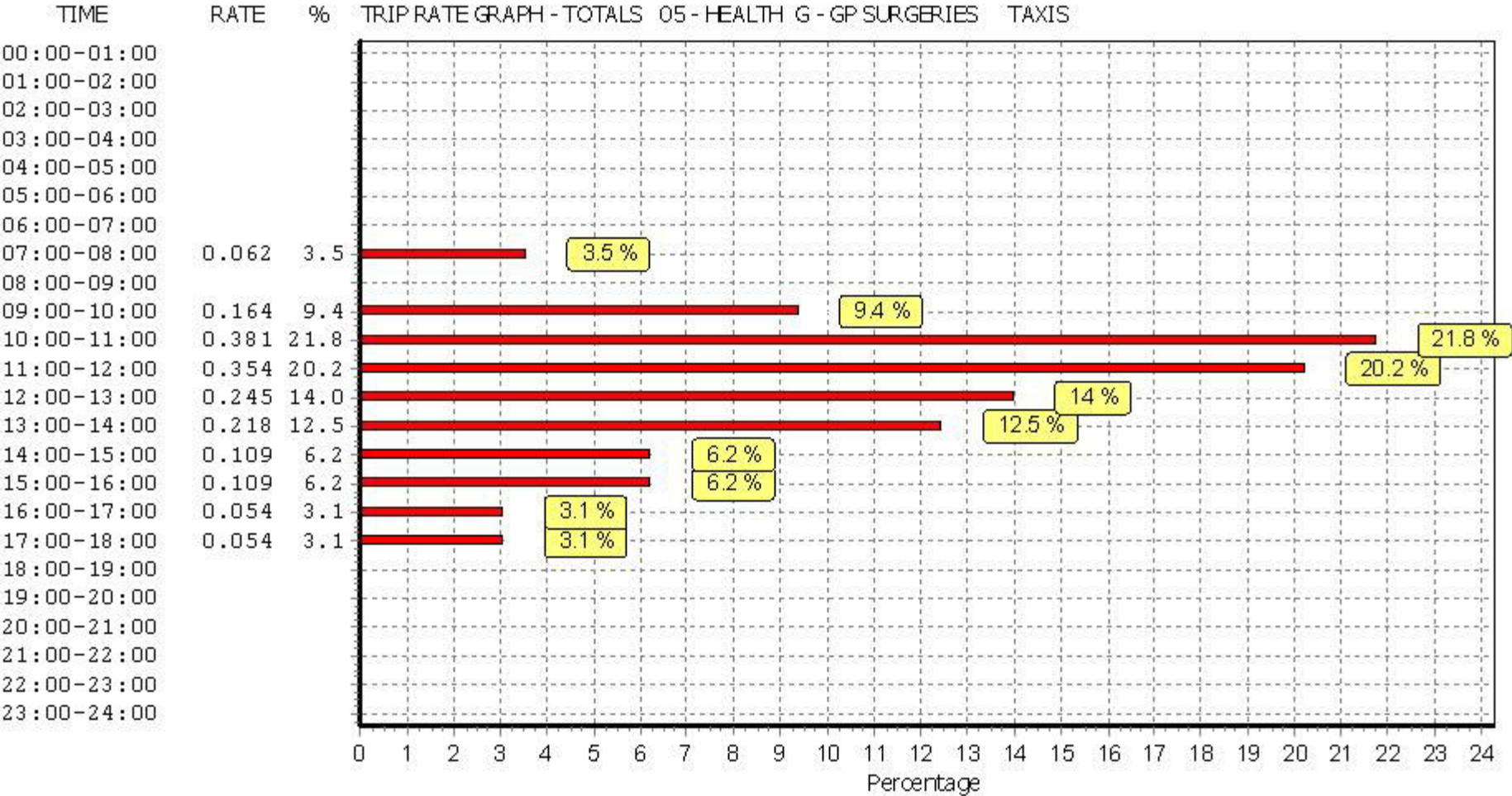
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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

OGVS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

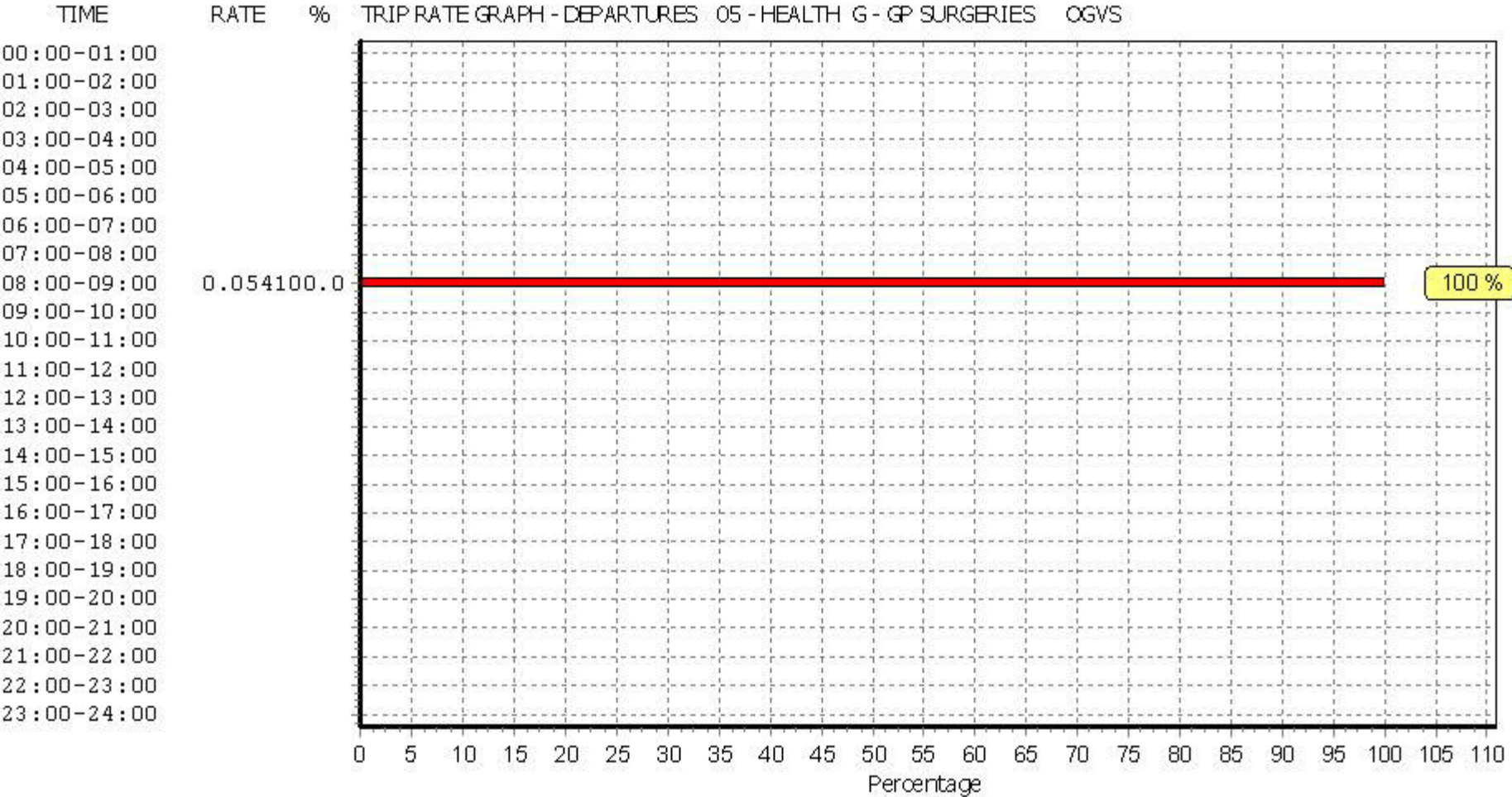
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	459	0.000	7	459	0.000	7	459	0.000
08:00 - 09:00	8	459	0.054	8	459	0.054	8	459	0.108
09:00 - 10:00	8	459	0.000	8	459	0.000	8	459	0.000
10:00 - 11:00	8	459	0.000	8	459	0.000	8	459	0.000
11:00 - 12:00	8	459	0.000	8	459	0.000	8	459	0.000
12:00 - 13:00	8	459	0.000	8	459	0.000	8	459	0.000
13:00 - 14:00	8	459	0.000	8	459	0.000	8	459	0.000
14:00 - 15:00	8	459	0.000	8	459	0.000	8	459	0.000
15:00 - 16:00	8	459	0.000	8	459	0.000	8	459	0.000
16:00 - 17:00	8	459	0.000	8	459	0.000	8	459	0.000
17:00 - 18:00	8	459	0.000	8	459	0.000	8	459	0.000
18:00 - 19:00	8	459	0.000	8	459	0.000	8	459	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.054			0.054			0.108

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

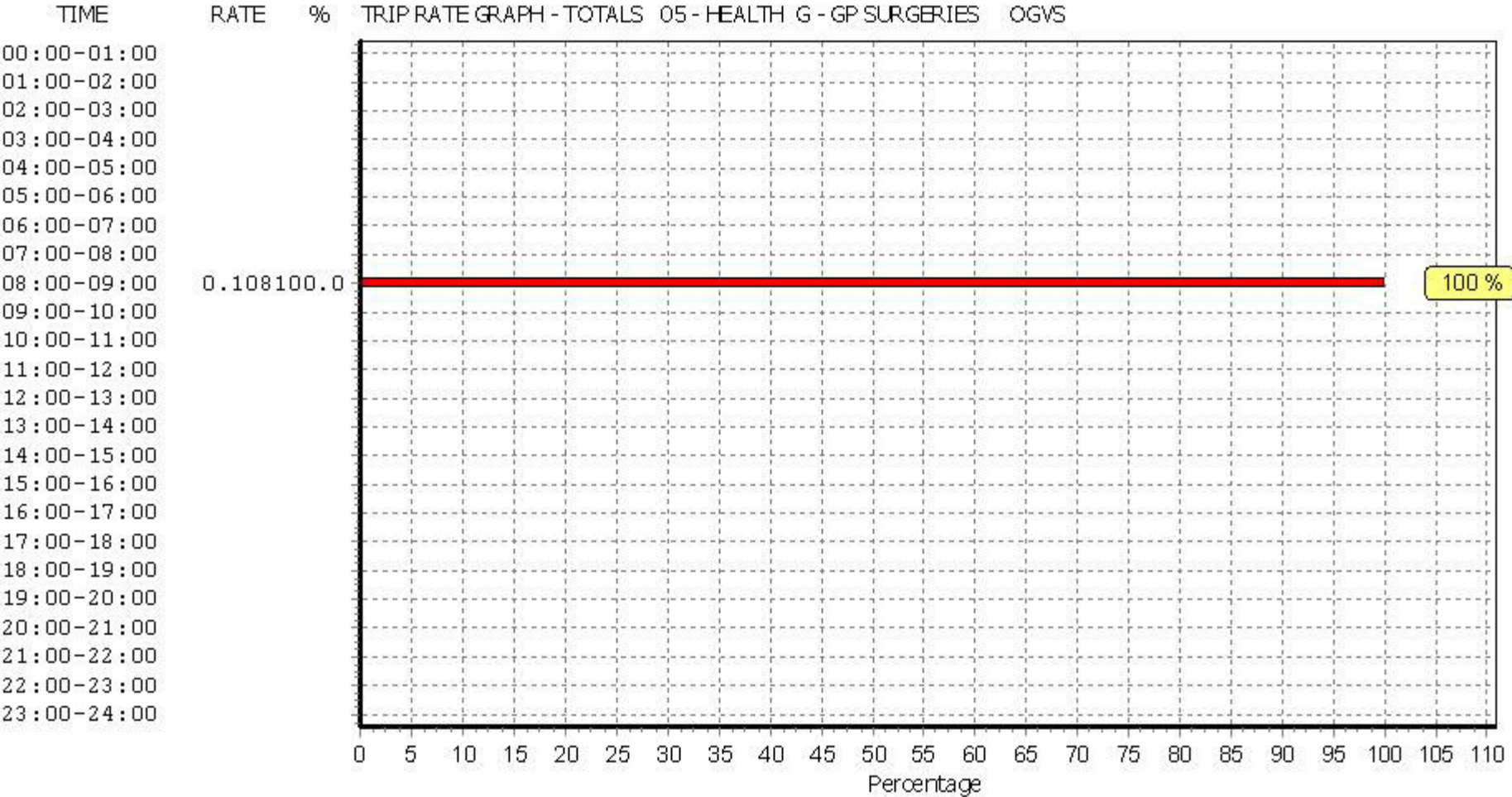
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected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



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This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

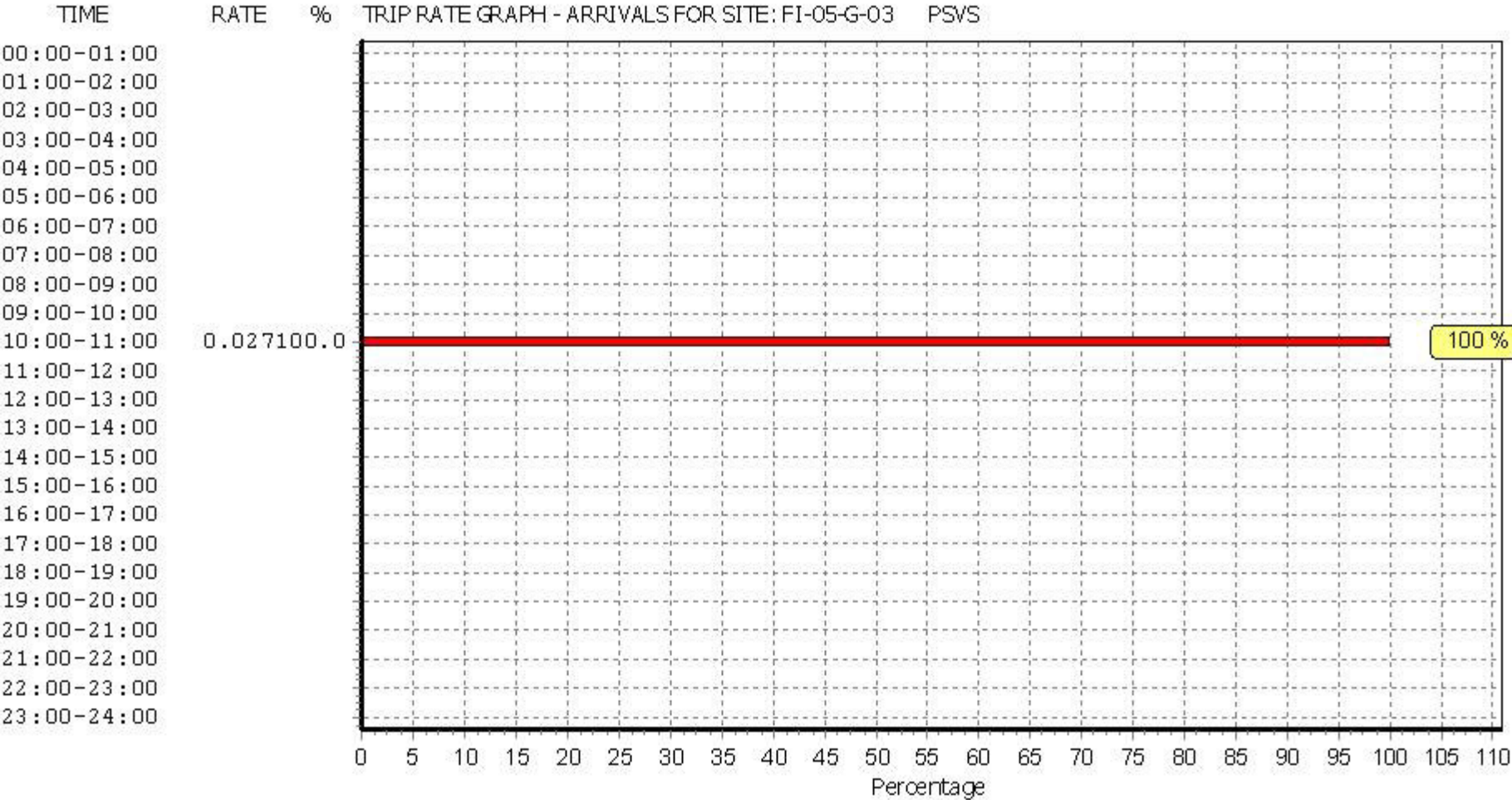
TRIP RATE for Land Use 05 - HEALTH/G - GP SURGERIES

PSVS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

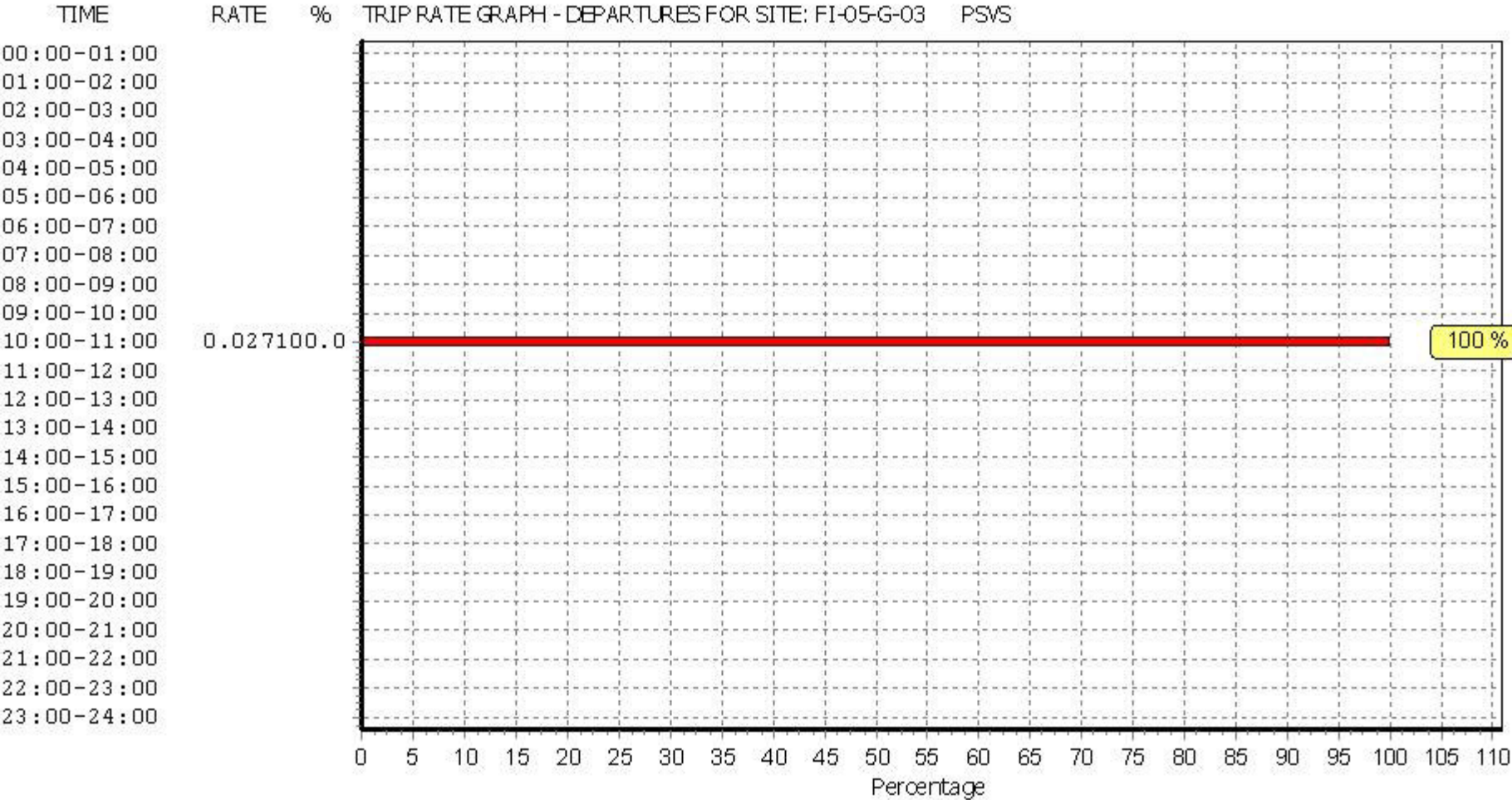
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	459	0.000	7	459	0.000	7	459	0.000
08:00 - 09:00	8	459	0.000	8	459	0.000	8	459	0.000
09:00 - 10:00	8	459	0.000	8	459	0.000	8	459	0.000
10:00 - 11:00	8	459	0.027	8	459	0.027	8	459	0.054
11:00 - 12:00	8	459	0.000	8	459	0.000	8	459	0.000
12:00 - 13:00	8	459	0.000	8	459	0.000	8	459	0.000
13:00 - 14:00	8	459	0.000	8	459	0.000	8	459	0.000
14:00 - 15:00	8	459	0.000	8	459	0.000	8	459	0.000
15:00 - 16:00	8	459	0.000	8	459	0.000	8	459	0.000
16:00 - 17:00	8	459	0.000	8	459	0.000	8	459	0.000
17:00 - 18:00	8	459	0.000	8	459	0.000	8	459	0.000
18:00 - 19:00	8	459	0.000	8	459	0.000	8	459	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.027			0.027			0.054

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.

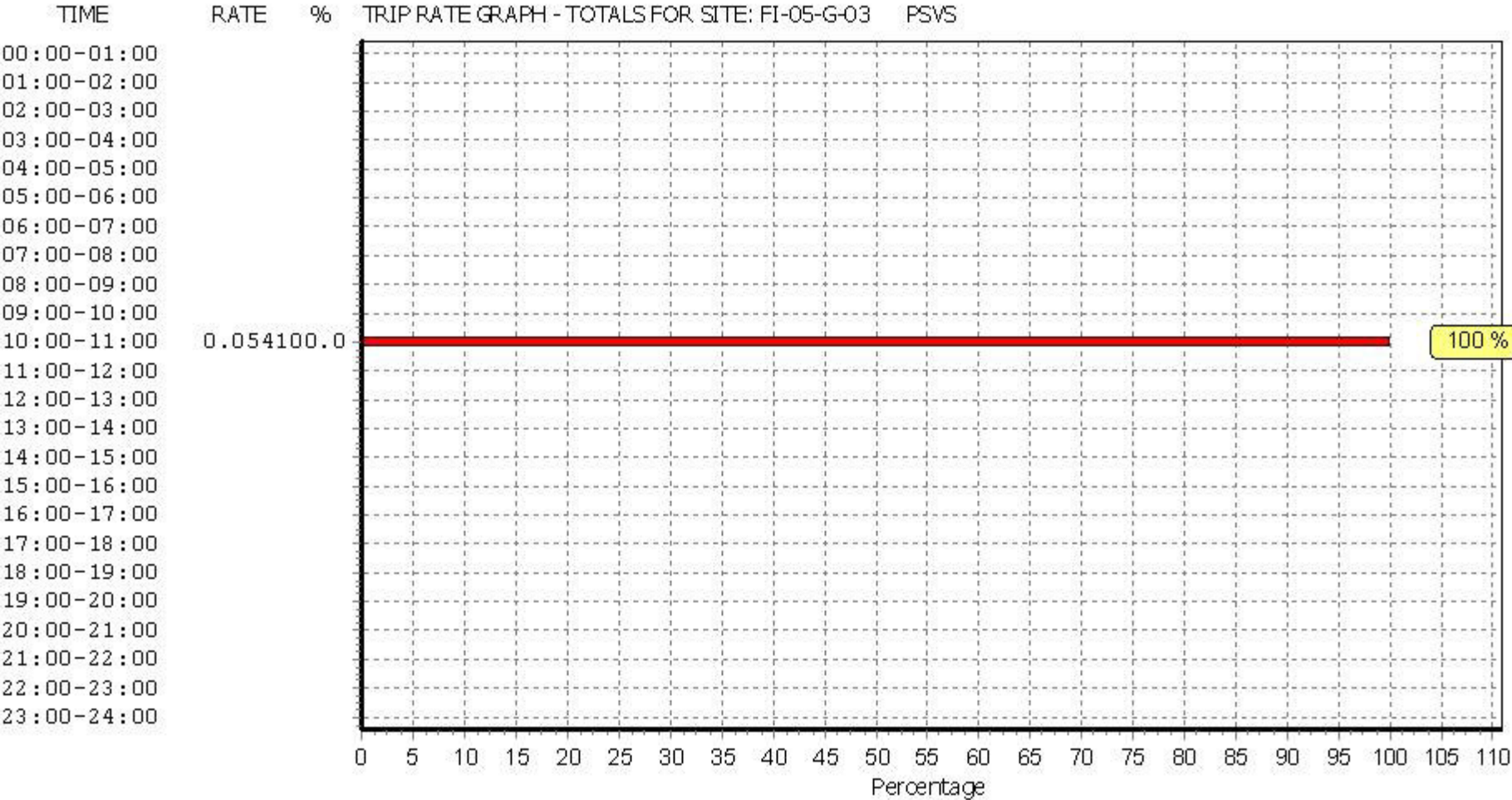
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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

CYCLISTS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

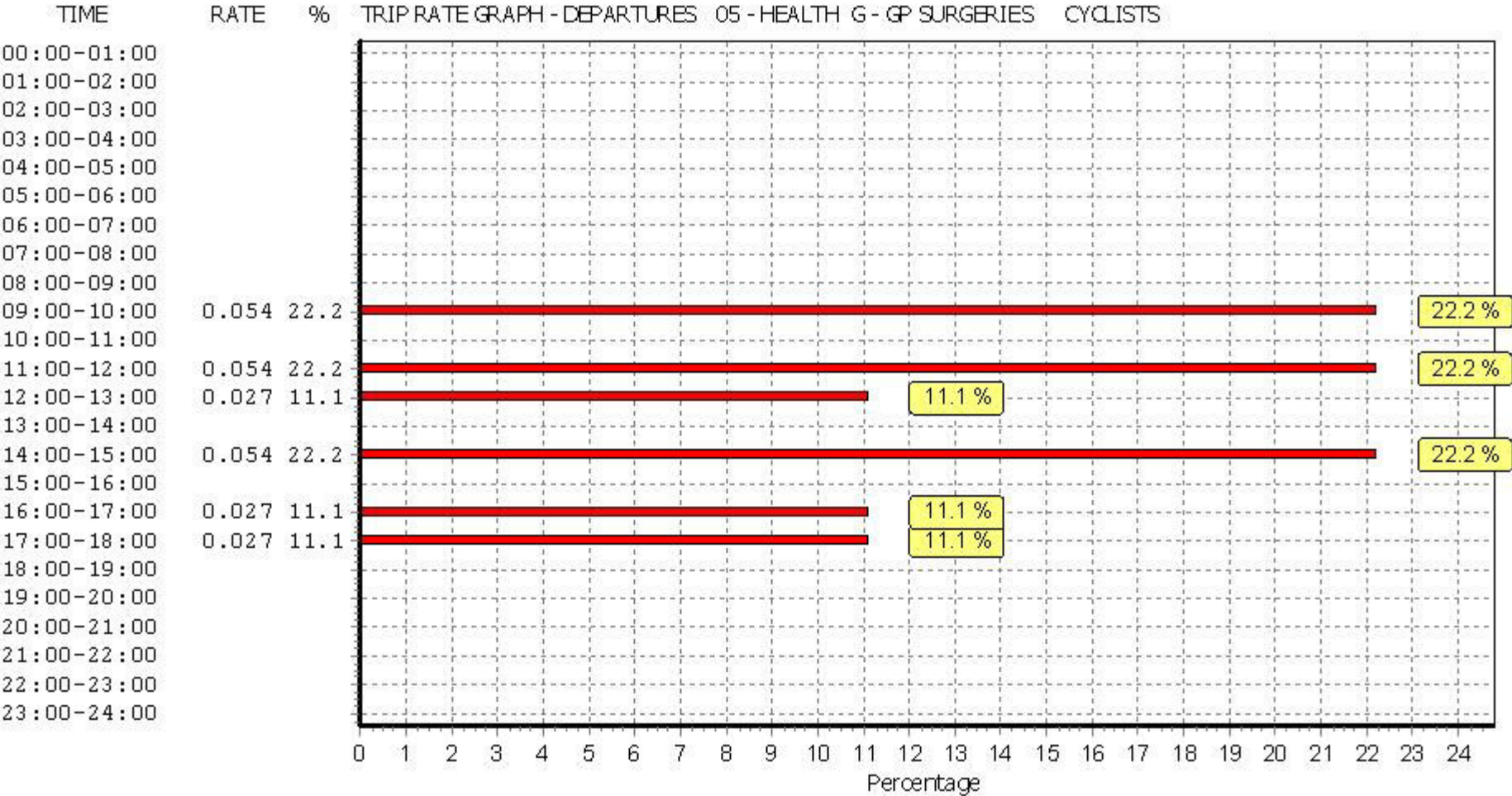
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	459	0.000	7	459	0.000	7	459	0.000
08:00 - 09:00	8	459	0.027	8	459	0.000	8	459	0.027
09:00 - 10:00	8	459	0.082	8	459	0.054	8	459	0.136
10:00 - 11:00	8	459	0.000	8	459	0.000	8	459	0.000
11:00 - 12:00	8	459	0.000	8	459	0.054	8	459	0.054
12:00 - 13:00	8	459	0.027	8	459	0.027	8	459	0.054
13:00 - 14:00	8	459	0.000	8	459	0.000	8	459	0.000
14:00 - 15:00	8	459	0.054	8	459	0.054	8	459	0.108
15:00 - 16:00	8	459	0.000	8	459	0.000	8	459	0.000
16:00 - 17:00	8	459	0.054	8	459	0.027	8	459	0.081
17:00 - 18:00	8	459	0.000	8	459	0.027	8	459	0.027
18:00 - 19:00	8	459	0.000	8	459	0.000	8	459	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.244			0.243			0.487

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

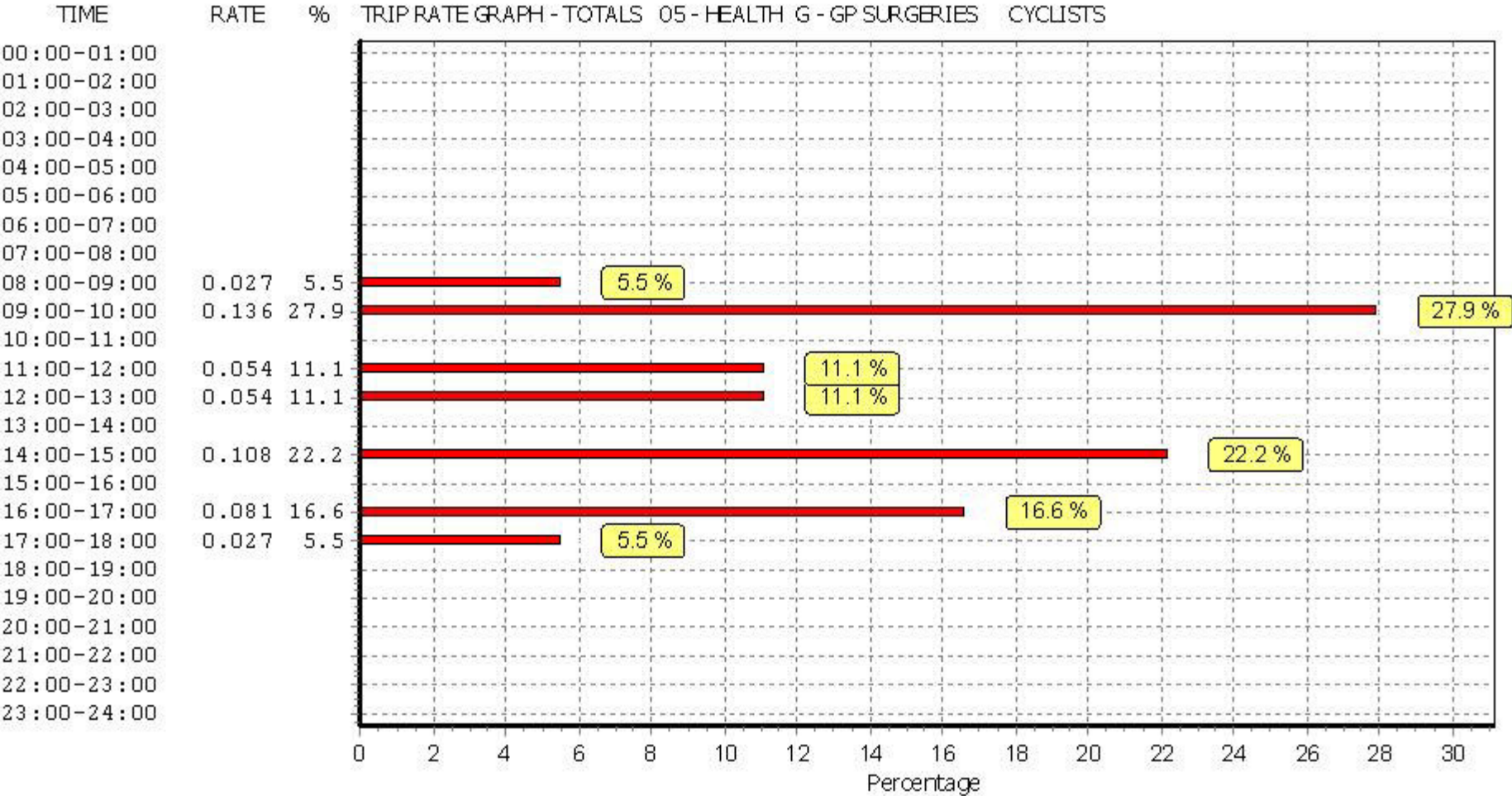
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected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



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Phil Jones Associates The Innovation Centre Longbridge Technology Park

Licence No: 231601

Filtering Summary

Land Use	06/C	HOTEL, FOOD & DRINK/PUB/RESTAURANT
Selected Trip Rate Calculation Parameter Range	112-1000 sqm GFA	
Actual Trip Rate Calculation Parameter Range	450-875 sqm GFA	
Date Range	Minimum: 01/01/10	Maximum: 10/11/17
Days of the week selected	Tuesday	1
	Friday	2
Main Location Types selected	Suburban Area (PPS6 Out of Centre)	1
	Neighbourhood Centre (PPS6 Local Centre)	2
Population <1 Mile ranges selected	10,001 to 15,000	1
	25,001 to 50,000	1
	50,001 to 100,000	1
Population <5 Mile ranges selected	125,001 to 250,000	1
	250,001 to 500,000	2
Car Ownership <5 Mile ranges selected	1.1 to 1.5	3
PTAL Rating	No PTAL Present	3

Calculation Reference: AUDIT-231601-181008-1024

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 06 - HOTEL, FOOD & DRINK
 Category : C - PUB/RESTAURANT

VEHICLESSelected regions and areas:

02 SOUTH EAST	
ES EAST SUSSEX	1 days
04 EAST ANGLIA	
SF SUFFOLK	1 days
05 EAST MIDLANDS	
NT NOTTINGHAMSHIRE	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: Gross floor area
 Actual Range: 450 to 875 (units: sqm)
 Range Selected by User: 112 to 1000 (units: sqm)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/10 to 10/11/17

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

Selected survey days:

Tuesday 1 days
 Friday 2 days

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

Selected survey types:

Manual count 3 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) 1
 Neighbourhood Centre (PPS6 Local Centre) 2

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

Selected Location Sub Categories:

Industrial Zone 1
 Residential Zone 2

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:

A4 3 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:

10,001 to 15,000	1 days
25,001 to 50,000	1 days
50,001 to 100,000	1 days

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

Population within 5 miles:

125,001 to 250,000	1 days
250,001 to 500,000	2 days

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

Car ownership within 5 miles:

1.1 to 1.5	3 days
------------	--------

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

Travel Plan:

No	3 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	3 days
-----------------	--------

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

LIST OF SITES relevant to selection parameters

Site(1):	ES-06-C-02	Gross floor area:	460 sqm
Development Name:	PUB/RESTAURANT	Parking spaces:	4
Location:	BRIGHTON	Number of Employees:	9
Postcode:	BN3 2DH	Survey Date:	22/09/17
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Day:	Friday
Sub-Location Type:	Residential Zone		
PTAL:	n/a		
Site(2):	NT-06-C-03	Gross floor area:	450 sqm
Development Name:	HARVESTER	Parking spaces:	72
Location:	NOTTINGHAM	Number of Employees:	25
Postcode:	NG11 7AT	Survey Date:	18/06/13
Main Location Type:	Neighbourhood Centre (PPS6 Local Centre)	Survey Day:	Tuesday
Sub-Location Type:	Residential Zone		
PTAL:	n/a		
Site(3):	SF-06-C-02	Gross floor area:	875 sqm
Development Name:	PUB/RESTAURANT	Parking spaces:	32
Location:	IPSWICH	Number of Employees:	21
Postcode:	IP3 0AT	Survey Date:	18/09/15
Main Location Type:	Suburban Area (PPS6 Out of Centre)	Survey Day:	Friday
Sub-Location Type:	Industrial Zone		
PTAL:	n/a		

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/C - PUB/RESTAURANT

VEHICLES**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00									
08:00 - 09:00									
09:00 - 10:00									
10:00 - 11:00	3	595	0.504	3	595	0.392	3	595	0.896
11:00 - 12:00	3	595	0.952	3	595	0.392	3	595	1.344
12:00 - 13:00	3	595	1.905	3	595	1.064	3	595	2.969
13:00 - 14:00	3	595	1.457	3	595	1.345	3	595	2.802
14:00 - 15:00	3	595	0.784	3	595	1.176	3	595	1.960
15:00 - 16:00	3	595	0.168	3	595	0.560	3	595	0.728
16:00 - 17:00	3	595	1.961	3	595	0.840	3	595	2.801
17:00 - 18:00	3	595	2.745	3	595	2.297	3	595	5.042
18:00 - 19:00	3	595	2.521	3	595	2.185	3	595	4.706
19:00 - 20:00	3	595	2.801	3	595	3.081	3	595	5.882
20:00 - 21:00	3	595	1.849	3	595	2.353	3	595	4.202
21:00 - 22:00	3	595	0.728	3	595	1.849	3	595	2.577
22:00 - 23:00	3	595	1.008	3	595	2.241	3	595	3.249
23:00 - 24:00	3	595	0.336	3	595	0.672	3	595	1.008
Total Rates:			19.719			20.447			40.166

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

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

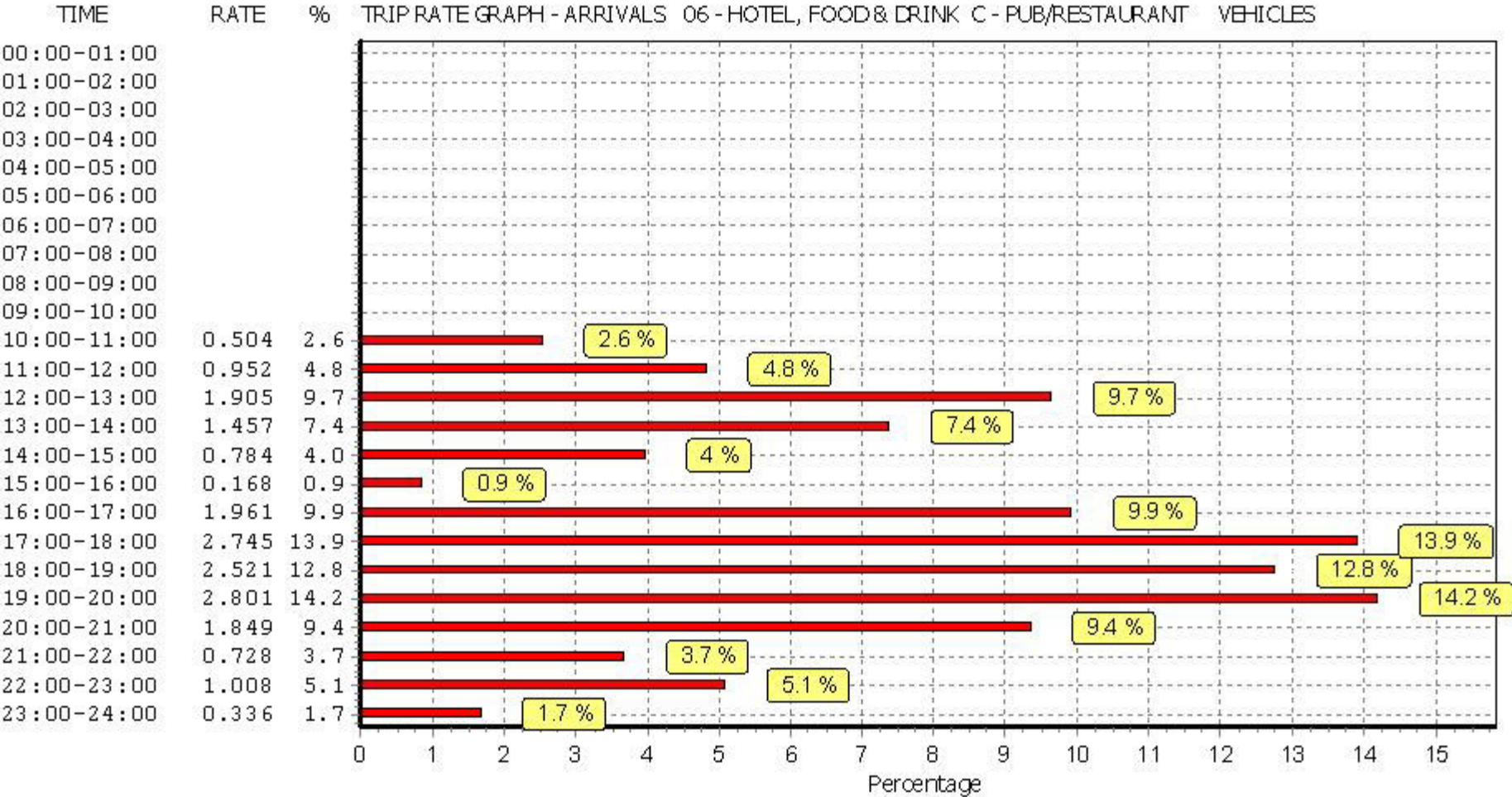
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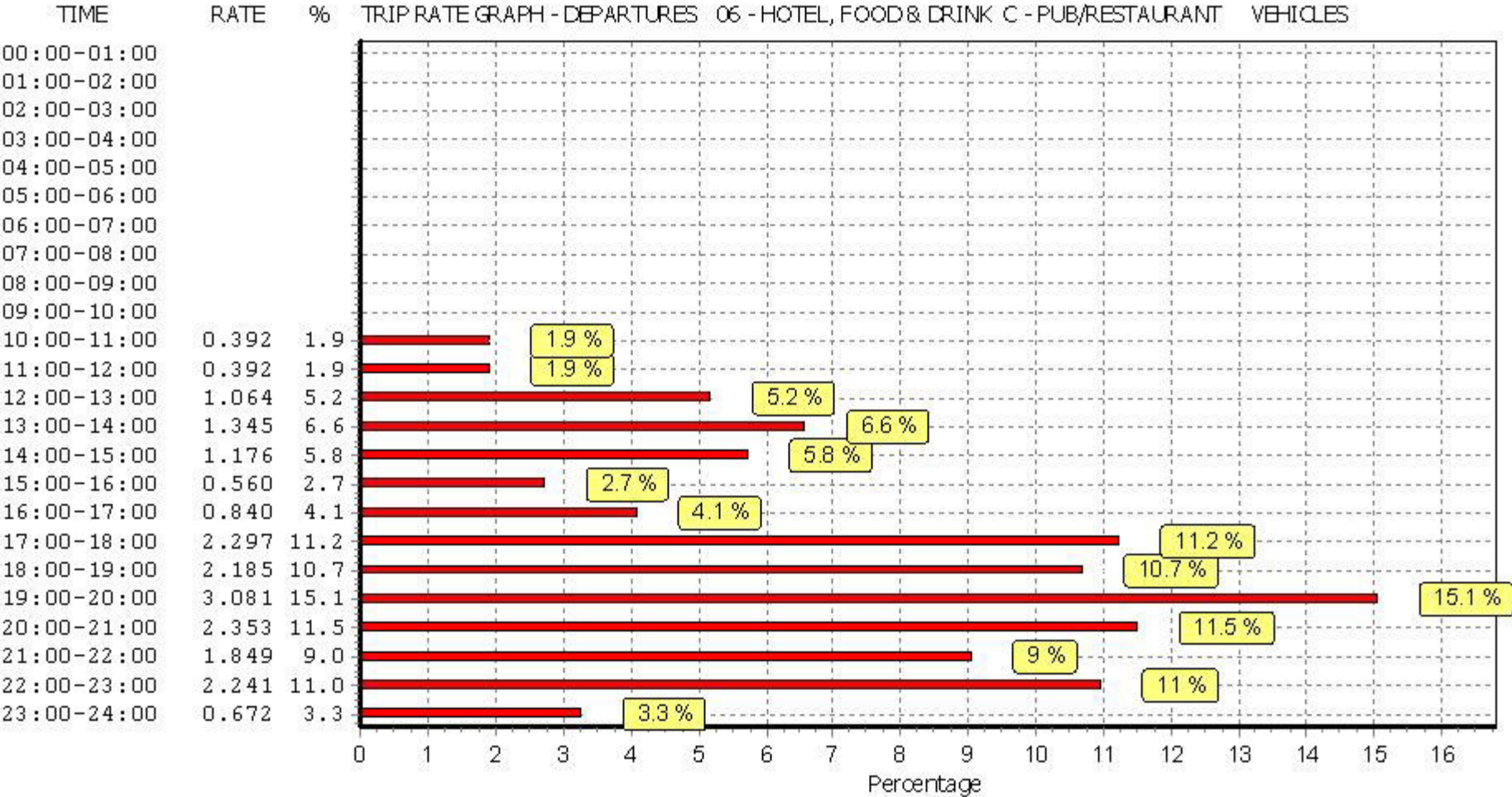
Parameter summary

Trip rate parameter range selected:	450 - 875 (units: sqm)
Survey date range:	01/01/10 - 10/11/17
Number of weekdays (Monday-Friday):	3
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

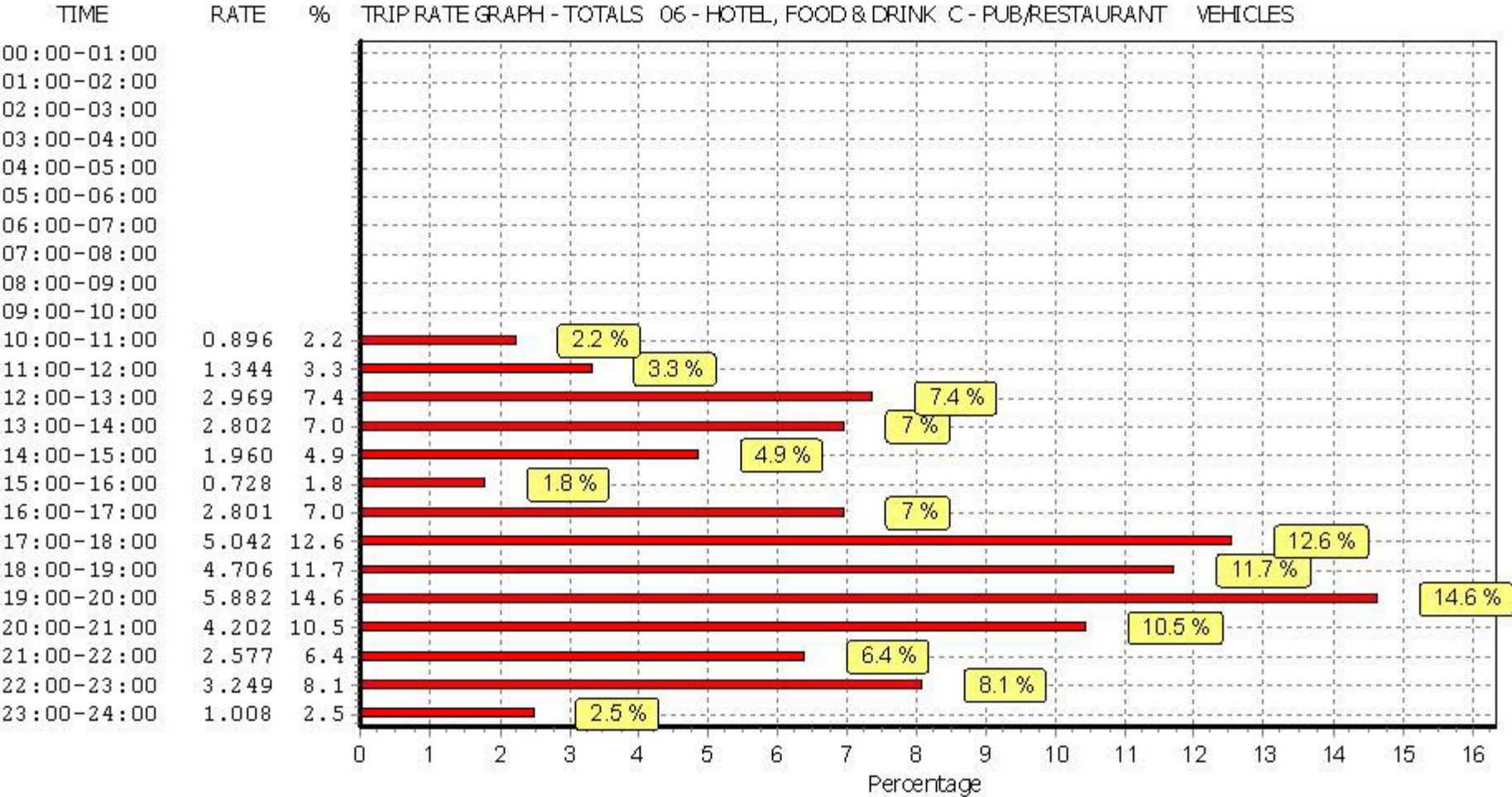
This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected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



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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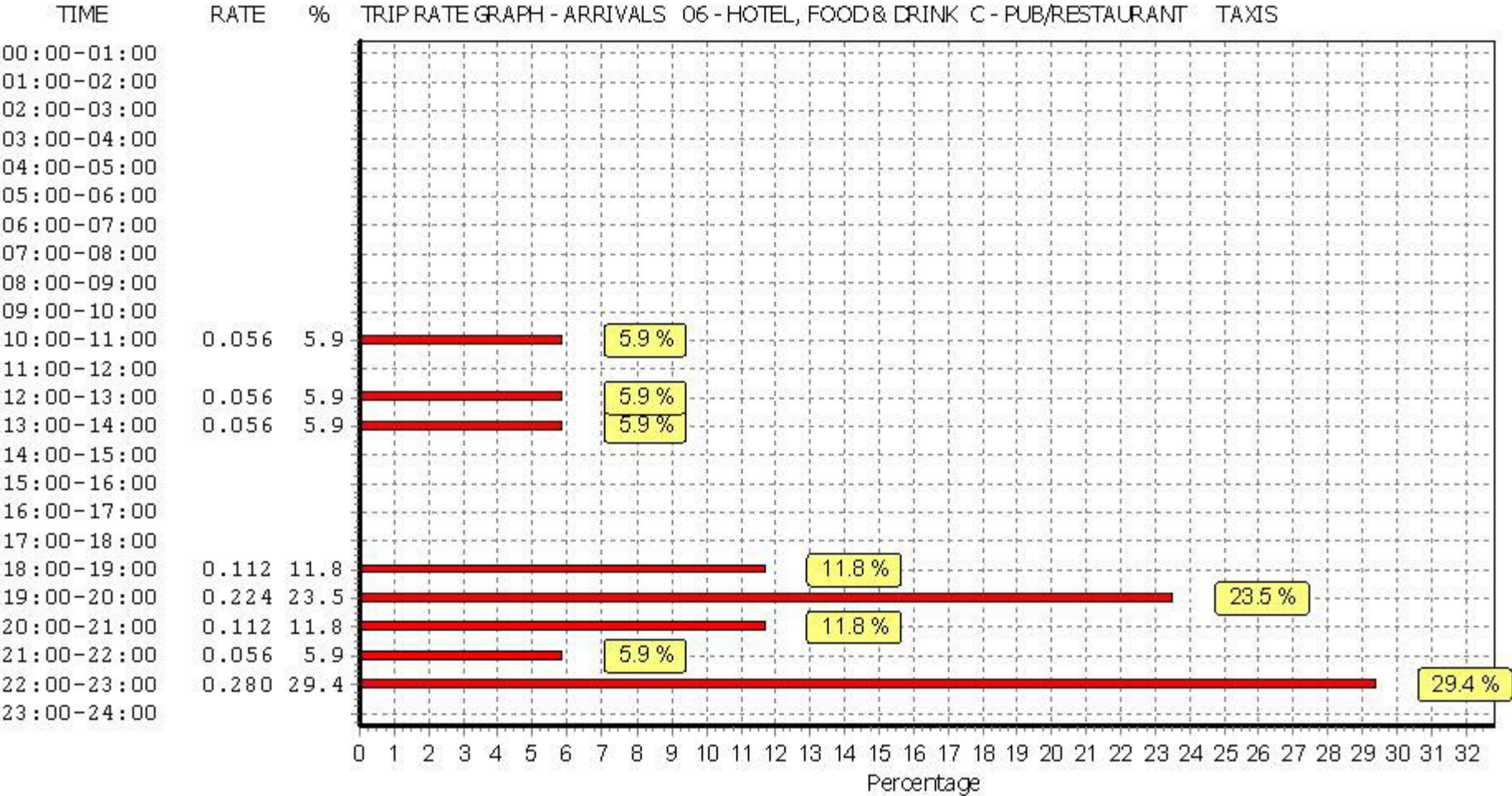
TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/C - PUB/RESTAURANT

TAXIS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

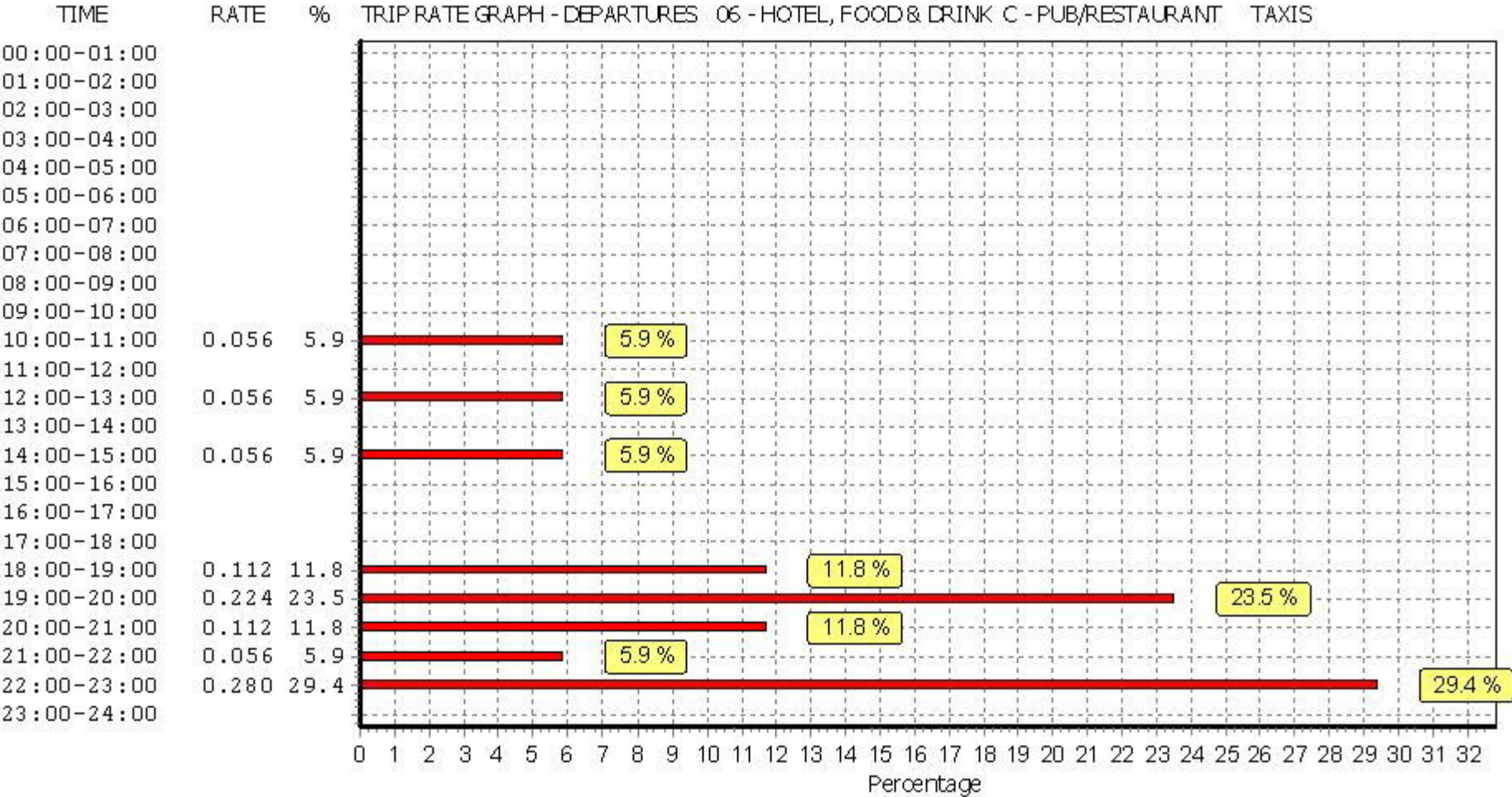
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00									
08:00 - 09:00									
09:00 - 10:00									
10:00 - 11:00	3	595	0.056	3	595	0.056	3	595	0.112
11:00 - 12:00	3	595	0.000	3	595	0.000	3	595	0.000
12:00 - 13:00	3	595	0.056	3	595	0.056	3	595	0.112
13:00 - 14:00	3	595	0.056	3	595	0.000	3	595	0.056
14:00 - 15:00	3	595	0.000	3	595	0.056	3	595	0.056
15:00 - 16:00	3	595	0.000	3	595	0.000	3	595	0.000
16:00 - 17:00	3	595	0.000	3	595	0.000	3	595	0.000
17:00 - 18:00	3	595	0.000	3	595	0.000	3	595	0.000
18:00 - 19:00	3	595	0.112	3	595	0.112	3	595	0.224
19:00 - 20:00	3	595	0.224	3	595	0.224	3	595	0.448
20:00 - 21:00	3	595	0.112	3	595	0.112	3	595	0.224
21:00 - 22:00	3	595	0.056	3	595	0.056	3	595	0.112
22:00 - 23:00	3	595	0.280	3	595	0.280	3	595	0.560
23:00 - 24:00	3	595	0.000	3	595	0.000	3	595	0.000
Total Rates:			0.952			0.952			1.904

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.

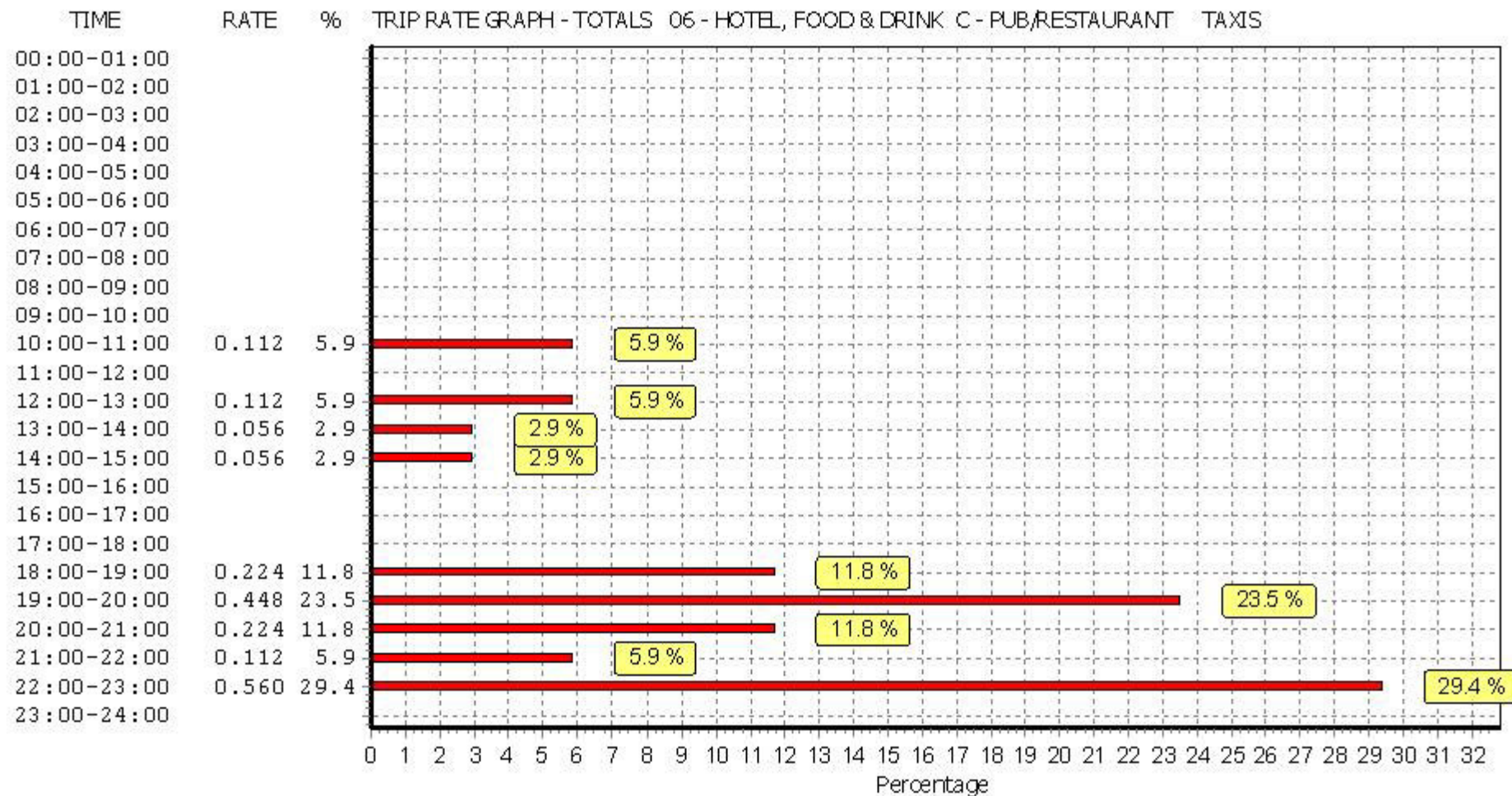
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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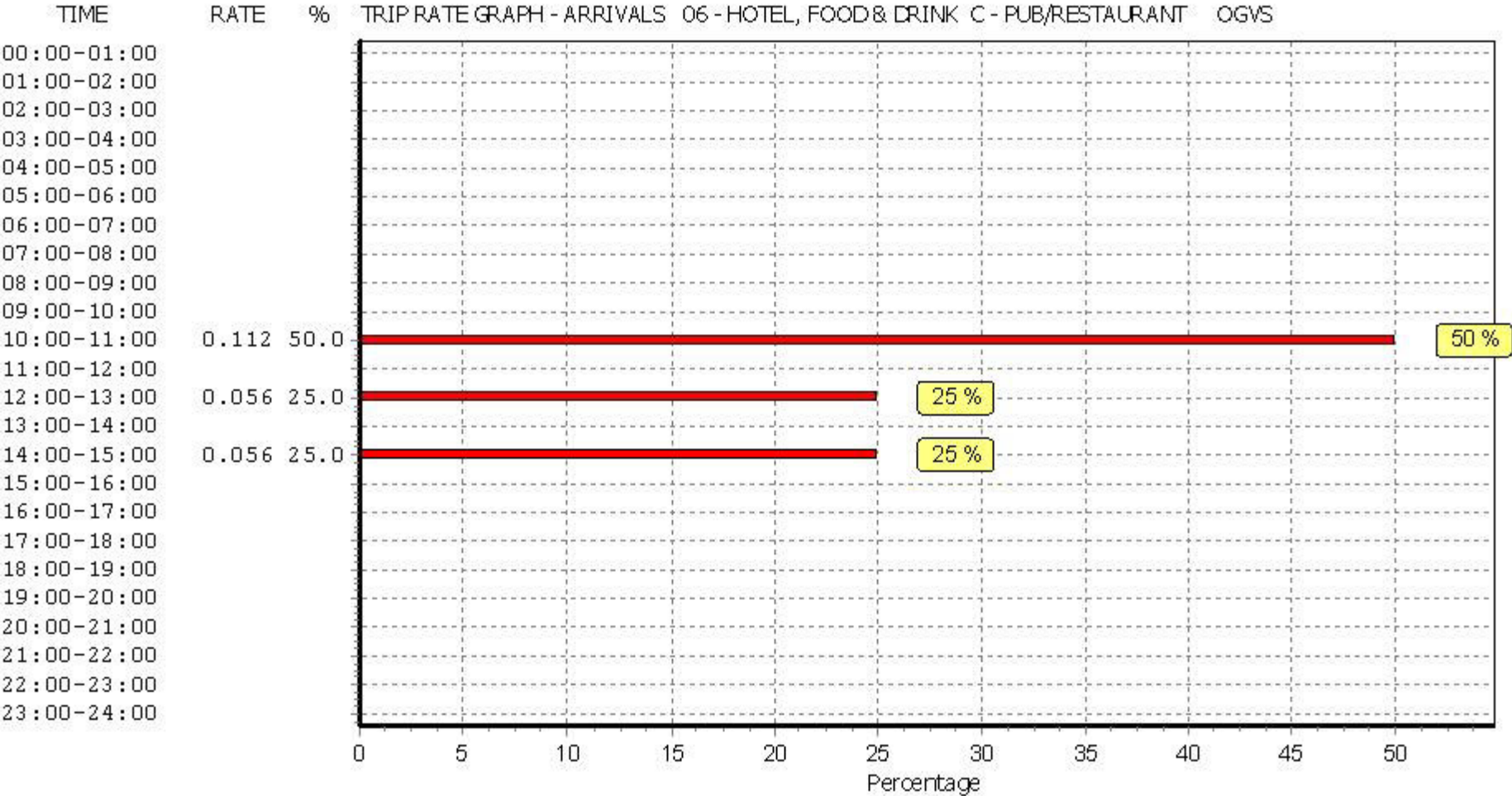
TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/C - PUB/RESTAURANT

OGVS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

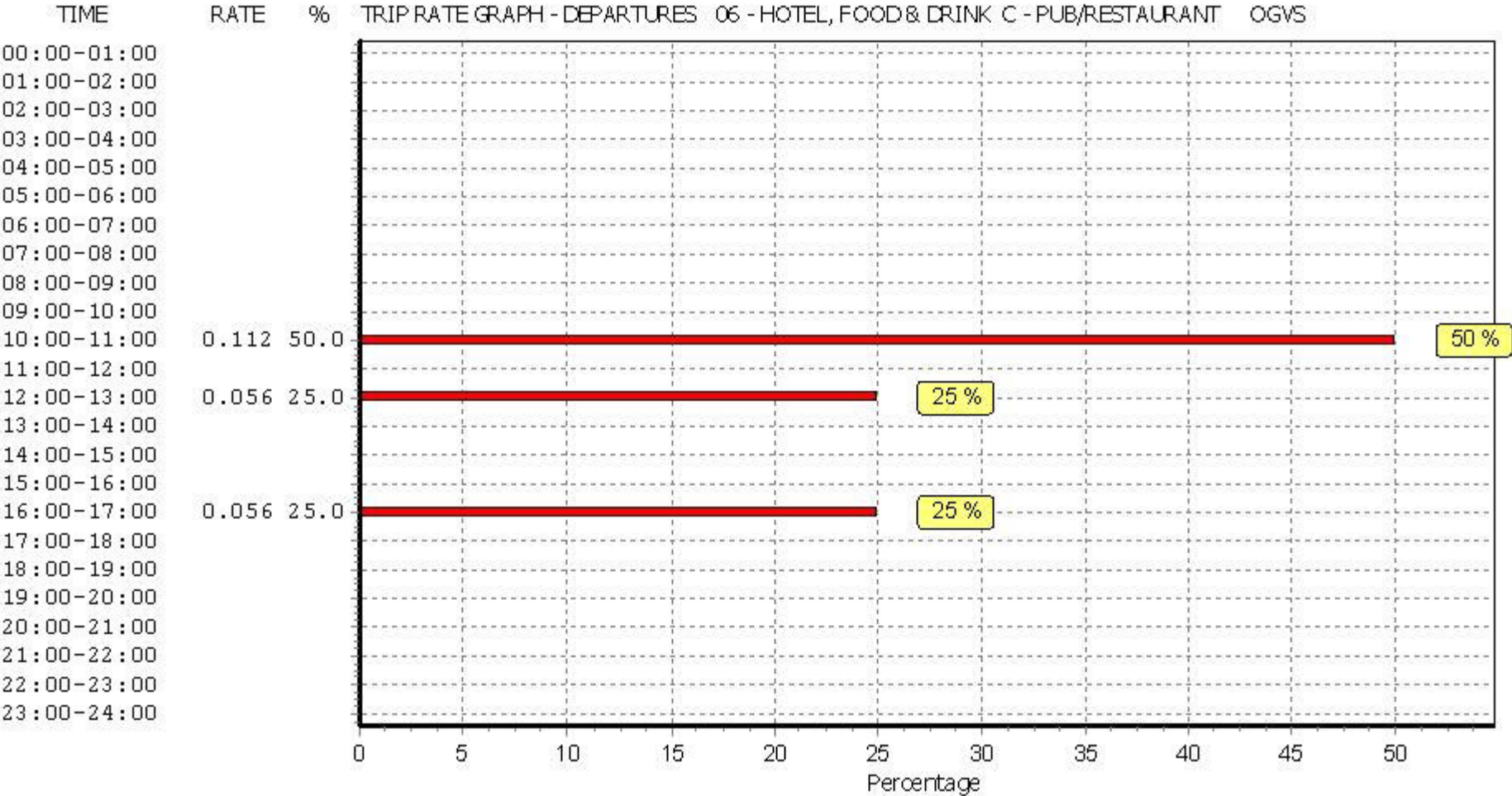
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00									
08:00 - 09:00									
09:00 - 10:00									
10:00 - 11:00	3	595	0.112	3	595	0.112	3	595	0.224
11:00 - 12:00	3	595	0.000	3	595	0.000	3	595	0.000
12:00 - 13:00	3	595	0.056	3	595	0.056	3	595	0.112
13:00 - 14:00	3	595	0.000	3	595	0.000	3	595	0.000
14:00 - 15:00	3	595	0.056	3	595	0.000	3	595	0.056
15:00 - 16:00	3	595	0.000	3	595	0.000	3	595	0.000
16:00 - 17:00	3	595	0.000	3	595	0.056	3	595	0.056
17:00 - 18:00	3	595	0.000	3	595	0.000	3	595	0.000
18:00 - 19:00	3	595	0.000	3	595	0.000	3	595	0.000
19:00 - 20:00	3	595	0.000	3	595	0.000	3	595	0.000
20:00 - 21:00	3	595	0.000	3	595	0.000	3	595	0.000
21:00 - 22:00	3	595	0.000	3	595	0.000	3	595	0.000
22:00 - 23:00	3	595	0.000	3	595	0.000	3	595	0.000
23:00 - 24:00	3	595	0.000	3	595	0.000	3	595	0.000
Total Rates:			0.224			0.224			0.448

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.

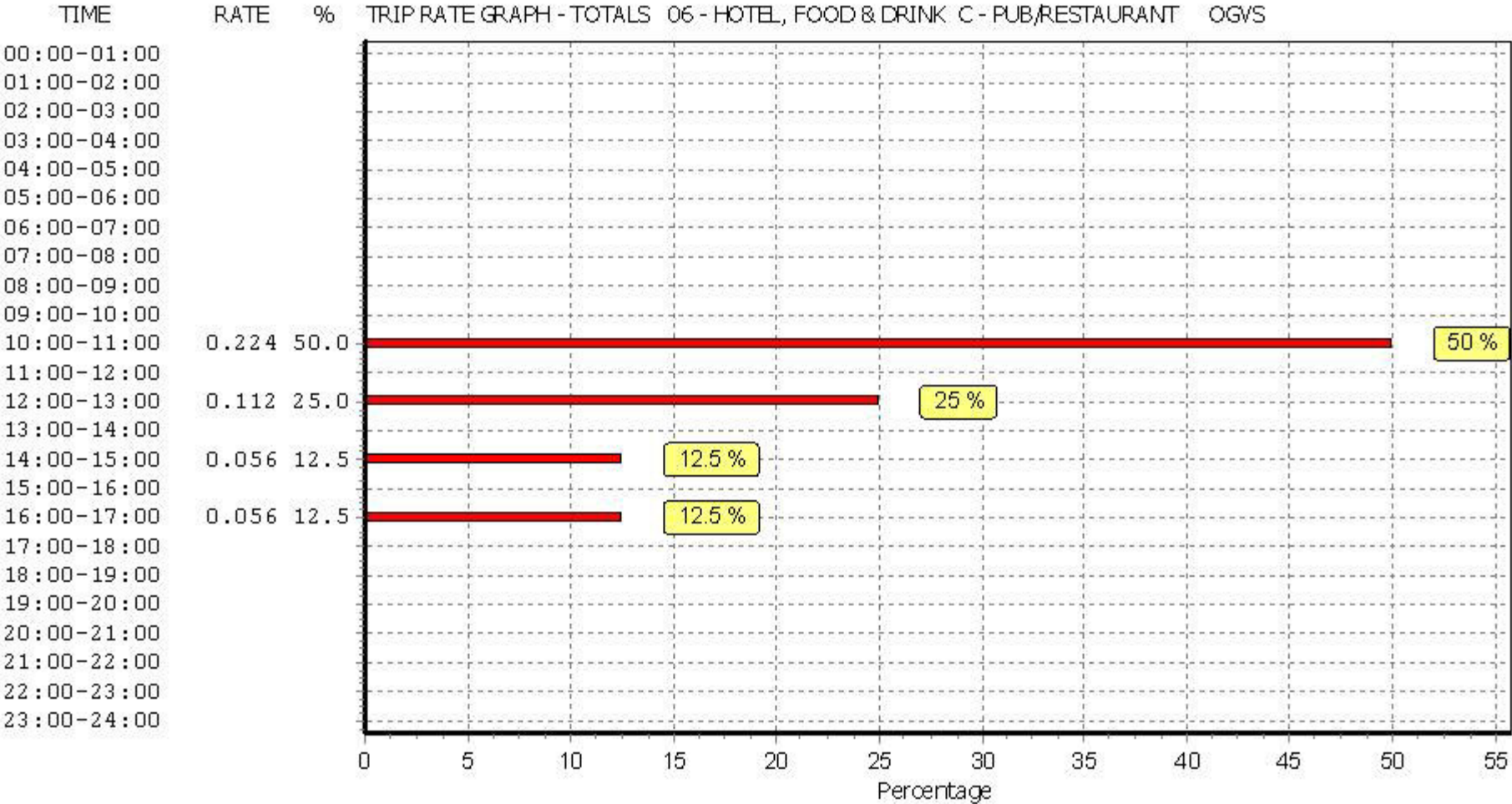
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

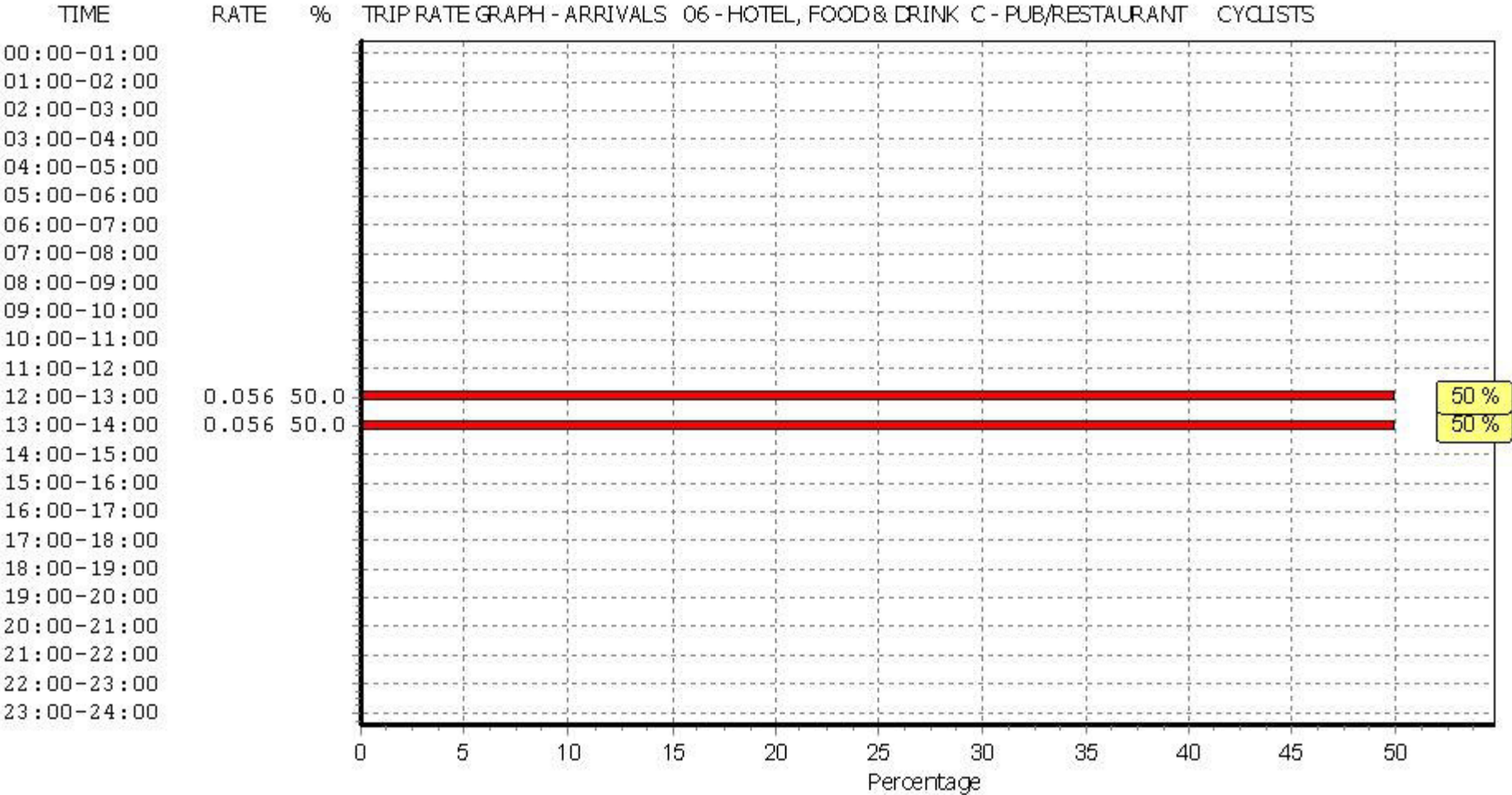
TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/C - PUB/RESTAURANT

CYCLISTS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

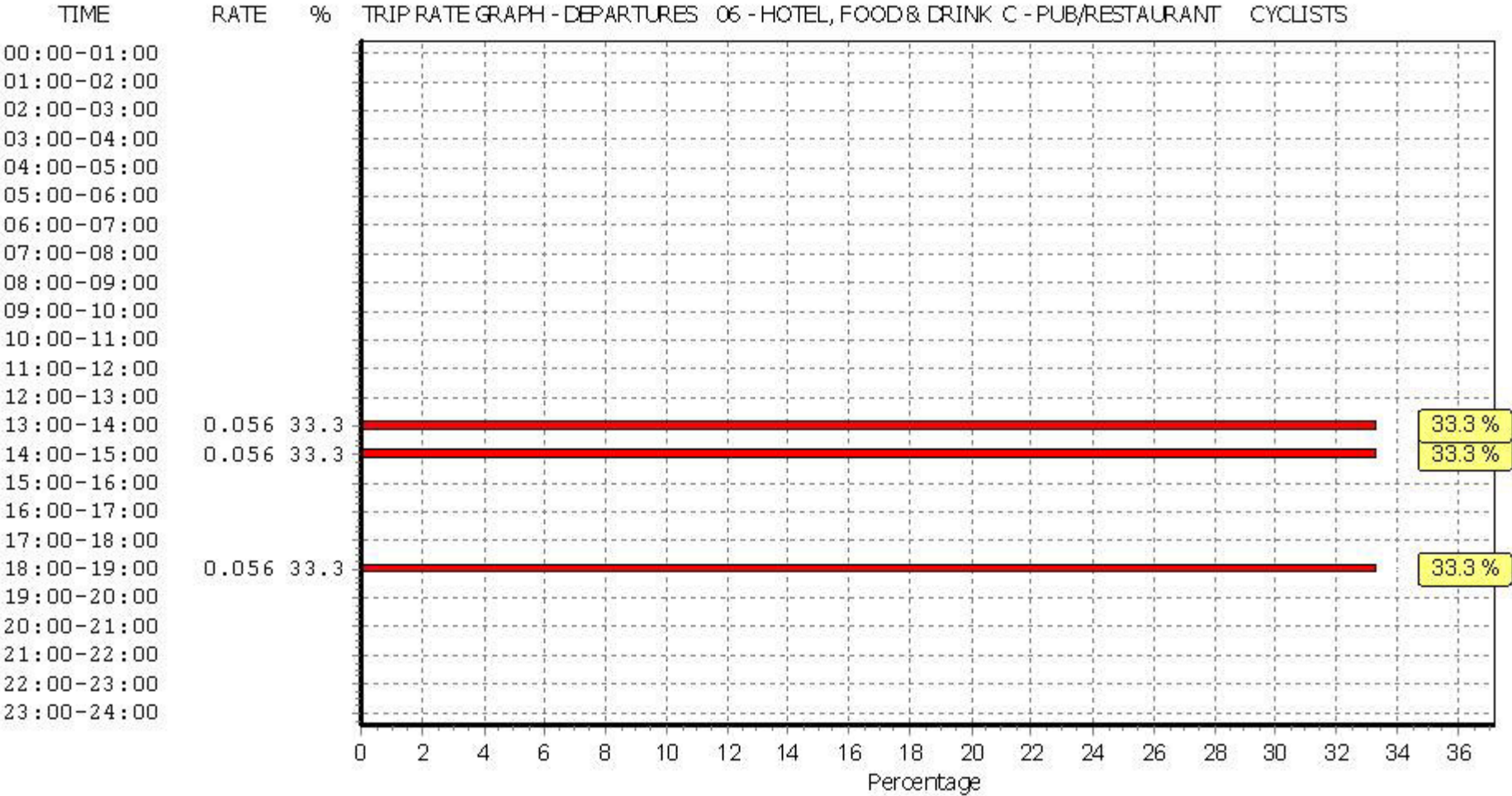
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00									
08:00 - 09:00									
09:00 - 10:00									
10:00 - 11:00	3	595	0.000	3	595	0.000	3	595	0.000
11:00 - 12:00	3	595	0.000	3	595	0.000	3	595	0.000
12:00 - 13:00	3	595	0.056	3	595	0.000	3	595	0.056
13:00 - 14:00	3	595	0.056	3	595	0.056	3	595	0.112
14:00 - 15:00	3	595	0.000	3	595	0.056	3	595	0.056
15:00 - 16:00	3	595	0.000	3	595	0.000	3	595	0.000
16:00 - 17:00	3	595	0.000	3	595	0.000	3	595	0.000
17:00 - 18:00	3	595	0.000	3	595	0.000	3	595	0.000
18:00 - 19:00	3	595	0.000	3	595	0.056	3	595	0.056
19:00 - 20:00	3	595	0.000	3	595	0.000	3	595	0.000
20:00 - 21:00	3	595	0.000	3	595	0.000	3	595	0.000
21:00 - 22:00	3	595	0.000	3	595	0.000	3	595	0.000
22:00 - 23:00	3	595	0.000	3	595	0.000	3	595	0.000
23:00 - 24:00	3	595	0.000	3	595	0.000	3	595	0.000
Total Rates:			0.112			0.168			0.280

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.

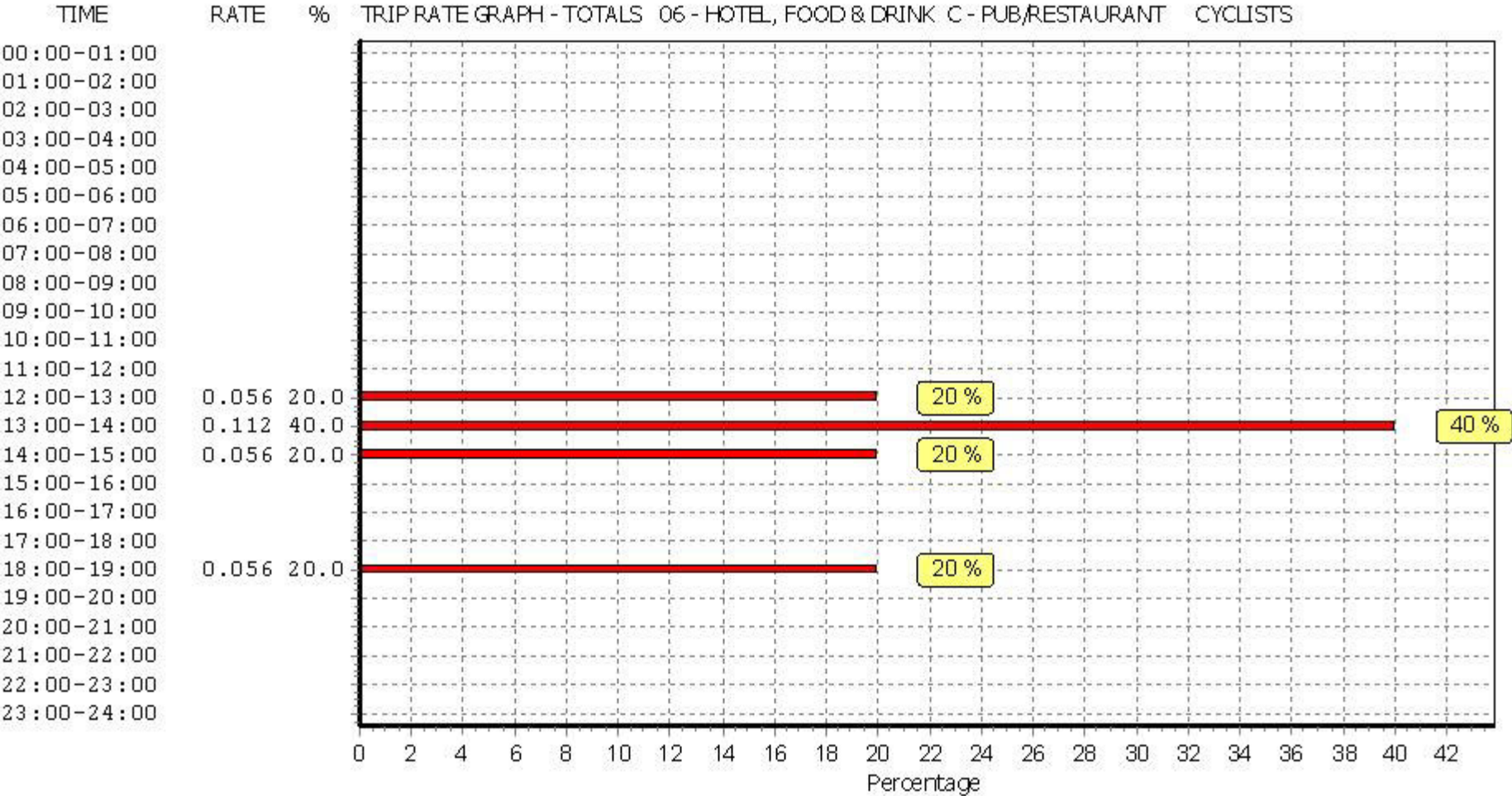
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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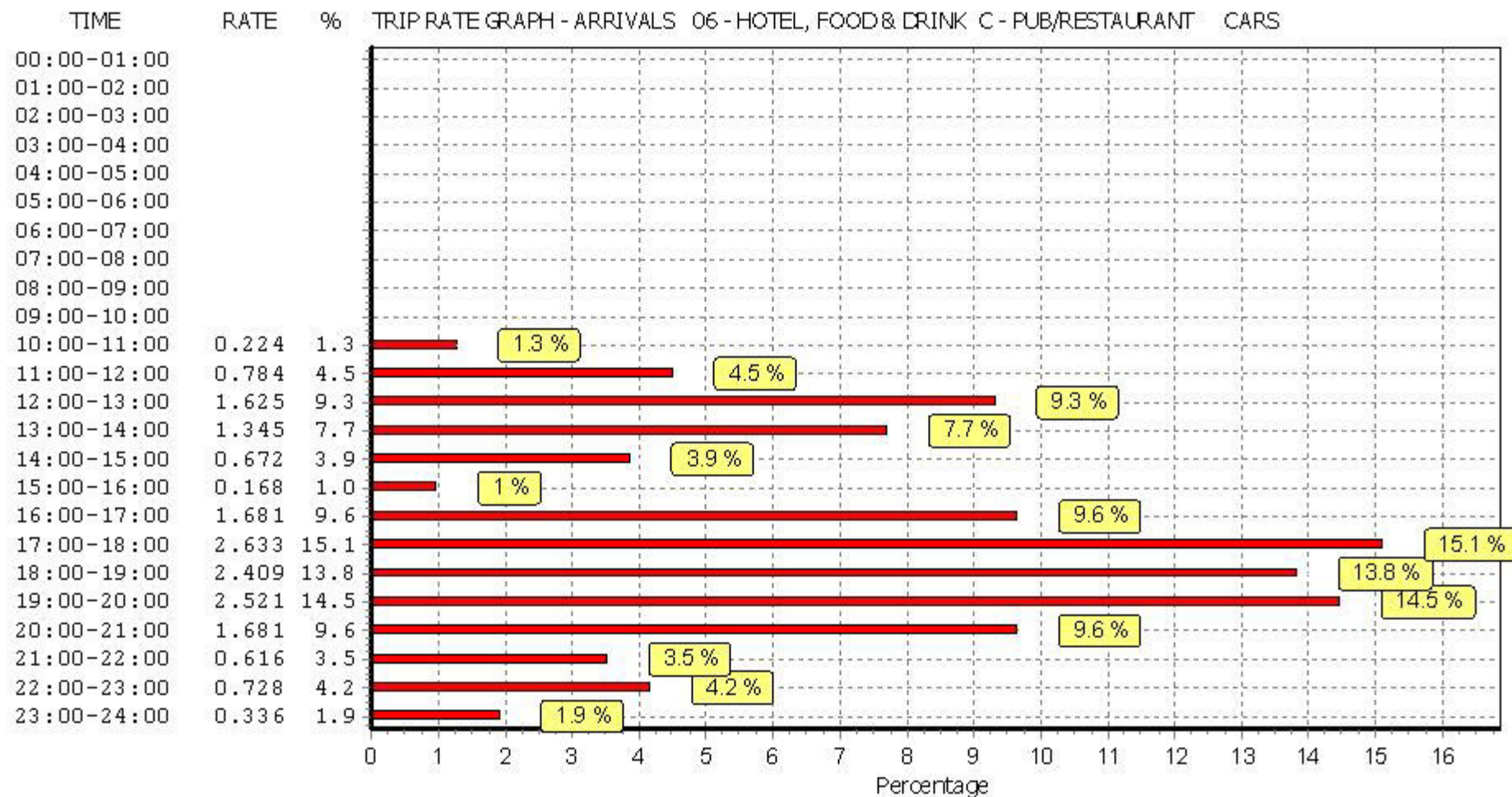
TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/C - PUB/RESTAURANT

CARS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

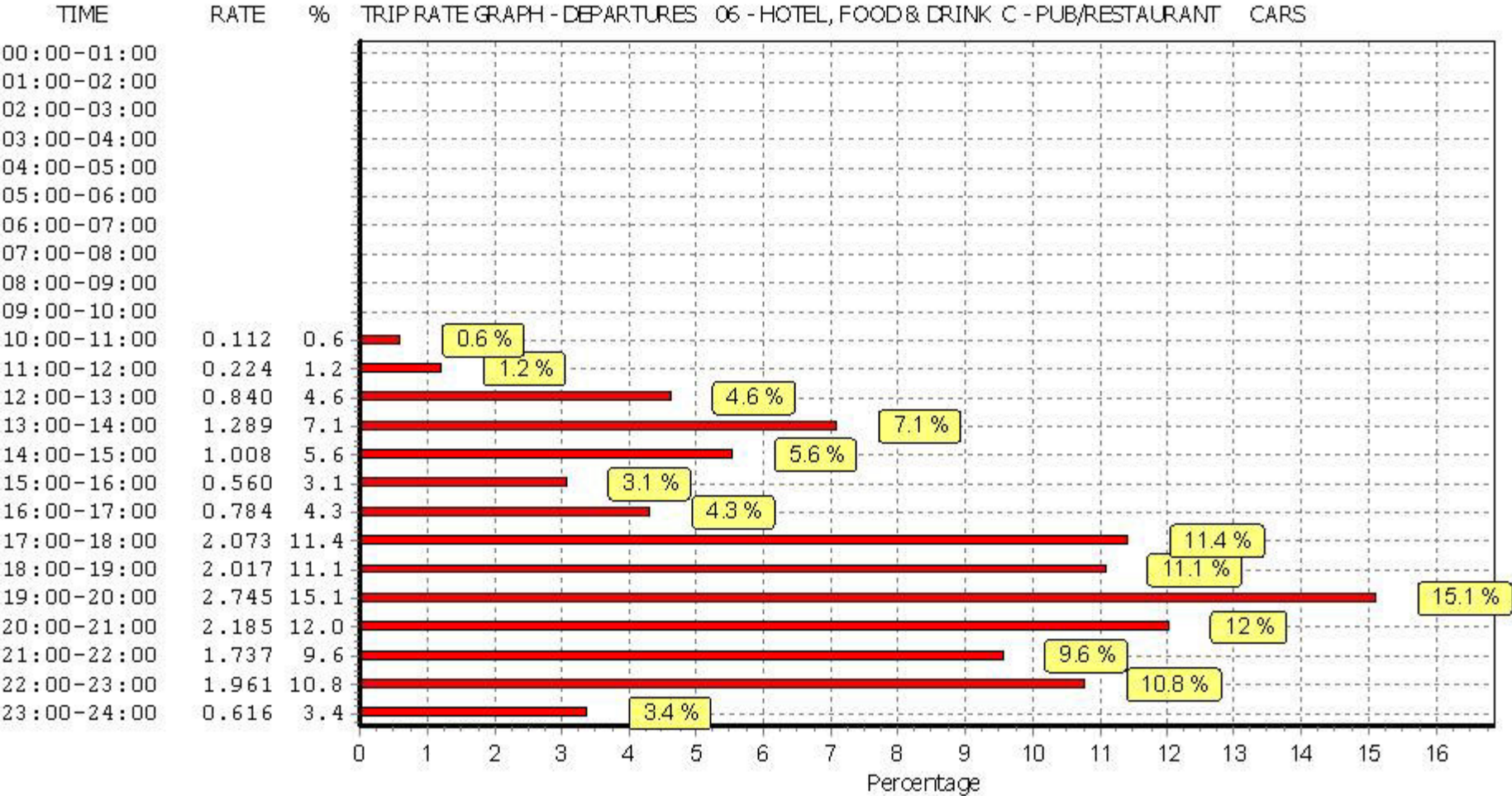
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00									
08:00 - 09:00									
09:00 - 10:00									
10:00 - 11:00	3	595	0.224	3	595	0.112	3	595	0.336
11:00 - 12:00	3	595	0.784	3	595	0.224	3	595	1.008
12:00 - 13:00	3	595	1.625	3	595	0.840	3	595	2.465
13:00 - 14:00	3	595	1.345	3	595	1.289	3	595	2.634
14:00 - 15:00	3	595	0.672	3	595	1.008	3	595	1.680
15:00 - 16:00	3	595	0.168	3	595	0.560	3	595	0.728
16:00 - 17:00	3	595	1.681	3	595	0.784	3	595	2.465
17:00 - 18:00	3	595	2.633	3	595	2.073	3	595	4.706
18:00 - 19:00	3	595	2.409	3	595	2.017	3	595	4.426
19:00 - 20:00	3	595	2.521	3	595	2.745	3	595	5.266
20:00 - 21:00	3	595	1.681	3	595	2.185	3	595	3.866
21:00 - 22:00	3	595	0.616	3	595	1.737	3	595	2.353
22:00 - 23:00	3	595	0.728	3	595	1.961	3	595	2.689
23:00 - 24:00	3	595	0.336	3	595	0.616	3	595	0.952
Total Rates:			17.423			18.151			35.574

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.

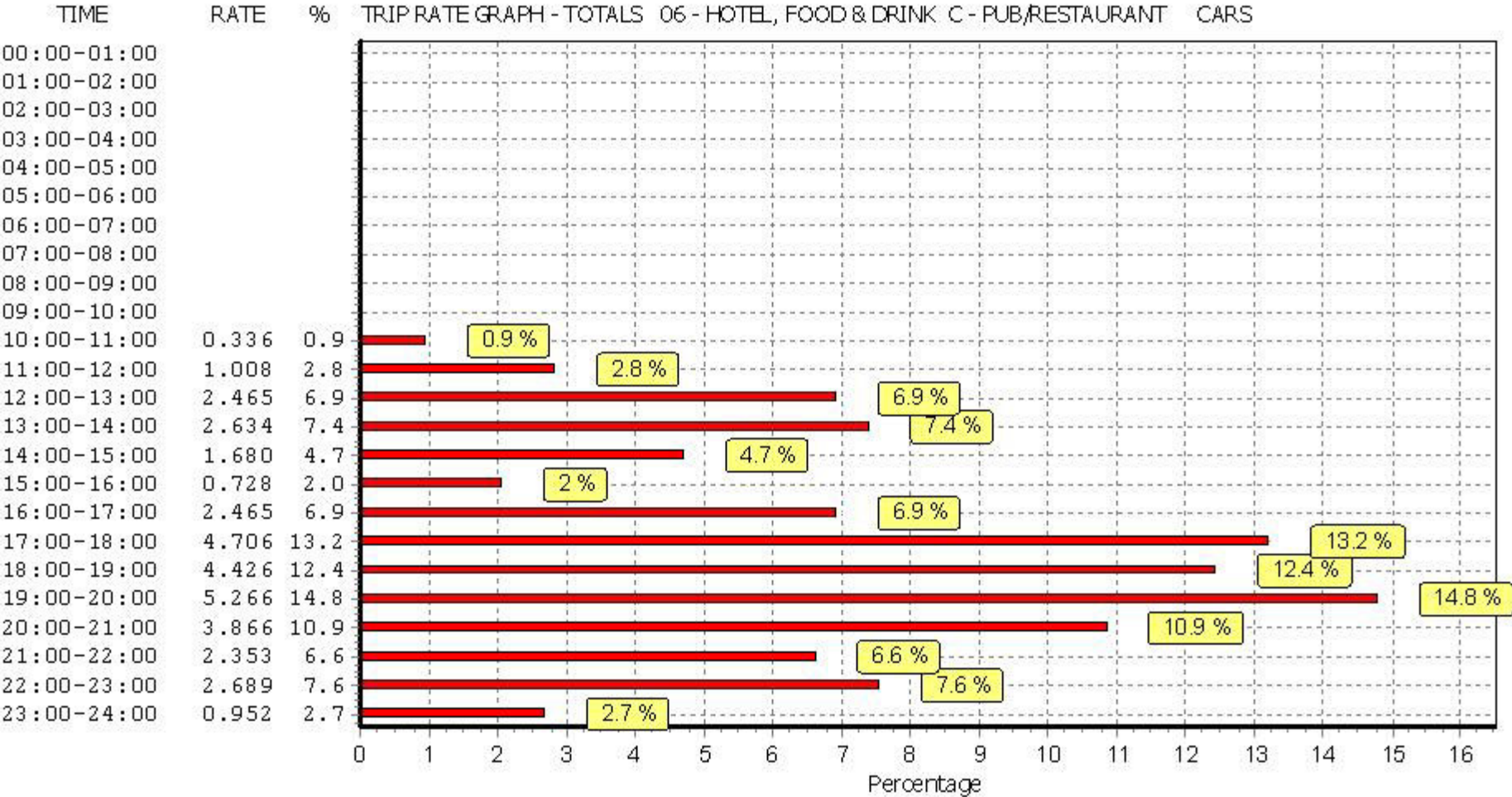
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



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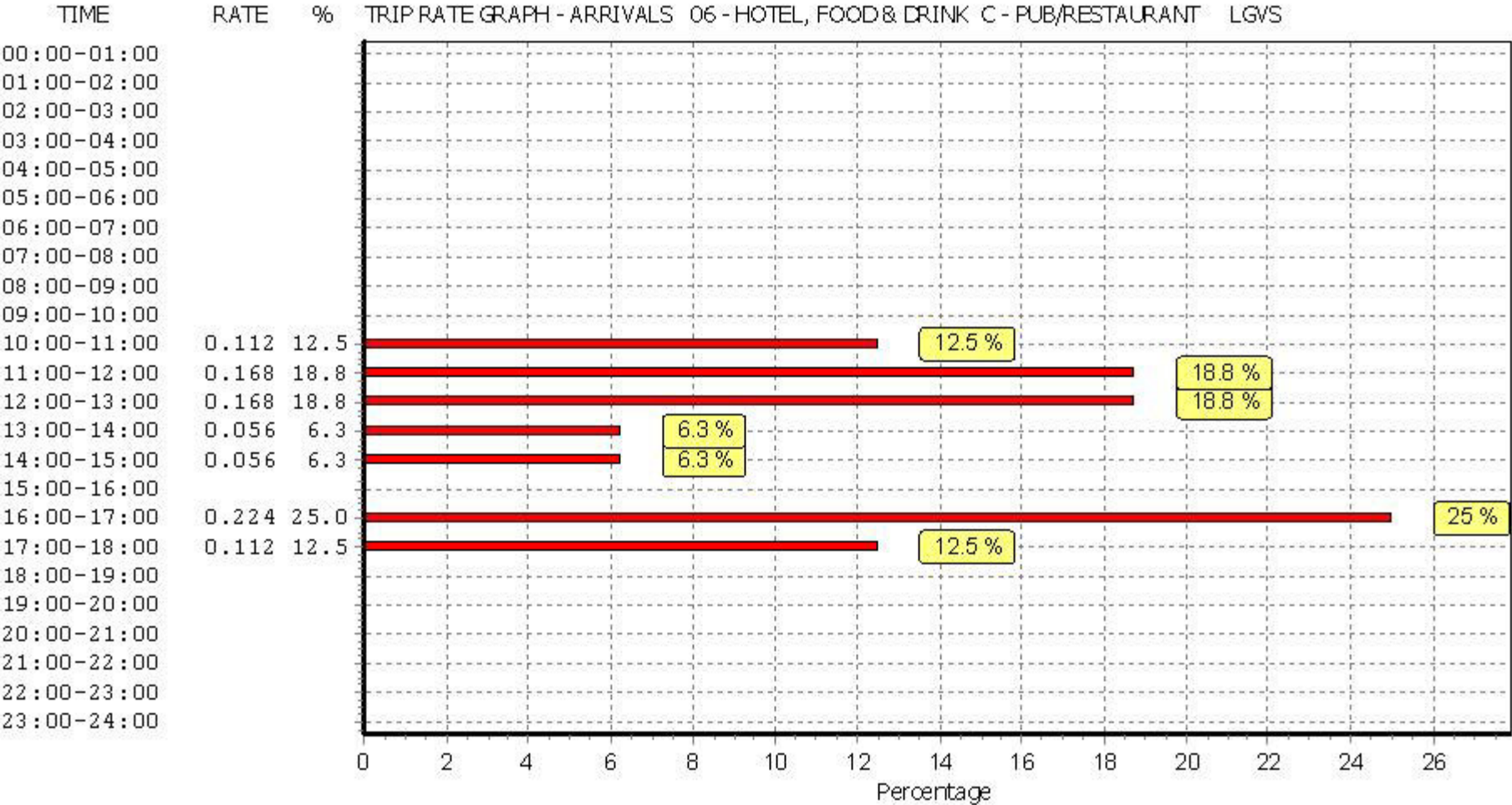
TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/C - PUB/RESTAURANT

LGVS**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

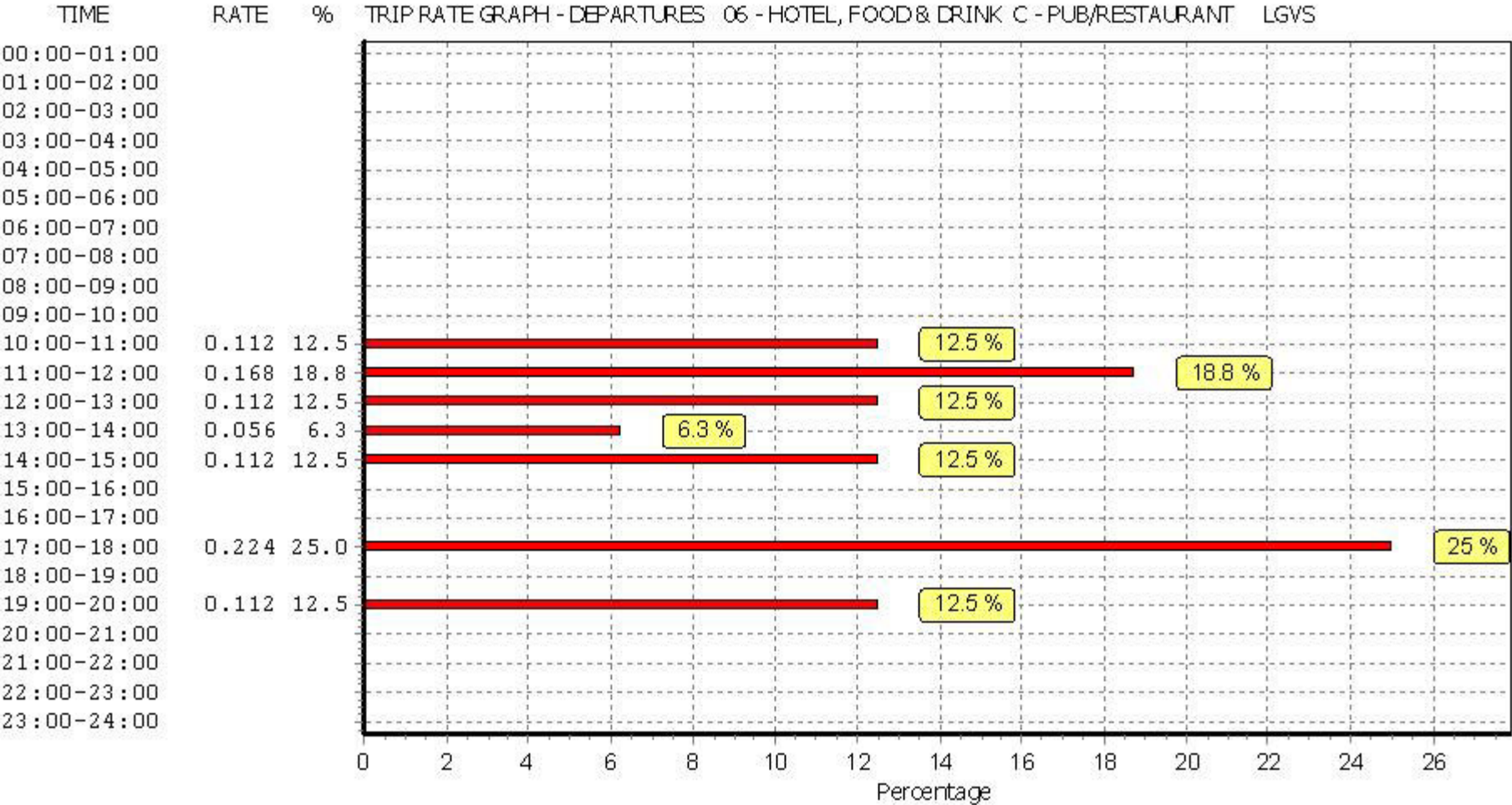
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00									
08:00 - 09:00									
09:00 - 10:00									
10:00 - 11:00	3	595	0.112	3	595	0.112	3	595	0.224
11:00 - 12:00	3	595	0.168	3	595	0.168	3	595	0.336
12:00 - 13:00	3	595	0.168	3	595	0.112	3	595	0.280
13:00 - 14:00	3	595	0.056	3	595	0.056	3	595	0.112
14:00 - 15:00	3	595	0.056	3	595	0.112	3	595	0.168
15:00 - 16:00	3	595	0.000	3	595	0.000	3	595	0.000
16:00 - 17:00	3	595	0.224	3	595	0.000	3	595	0.224
17:00 - 18:00	3	595	0.112	3	595	0.224	3	595	0.336
18:00 - 19:00	3	595	0.000	3	595	0.000	3	595	0.000
19:00 - 20:00	3	595	0.000	3	595	0.112	3	595	0.112
20:00 - 21:00	3	595	0.000	3	595	0.000	3	595	0.000
21:00 - 22:00	3	595	0.000	3	595	0.000	3	595	0.000
22:00 - 23:00	3	595	0.000	3	595	0.000	3	595	0.000
23:00 - 24:00	3	595	0.000	3	595	0.000	3	595	0.000
Total Rates:			0.896			0.896			1.792

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

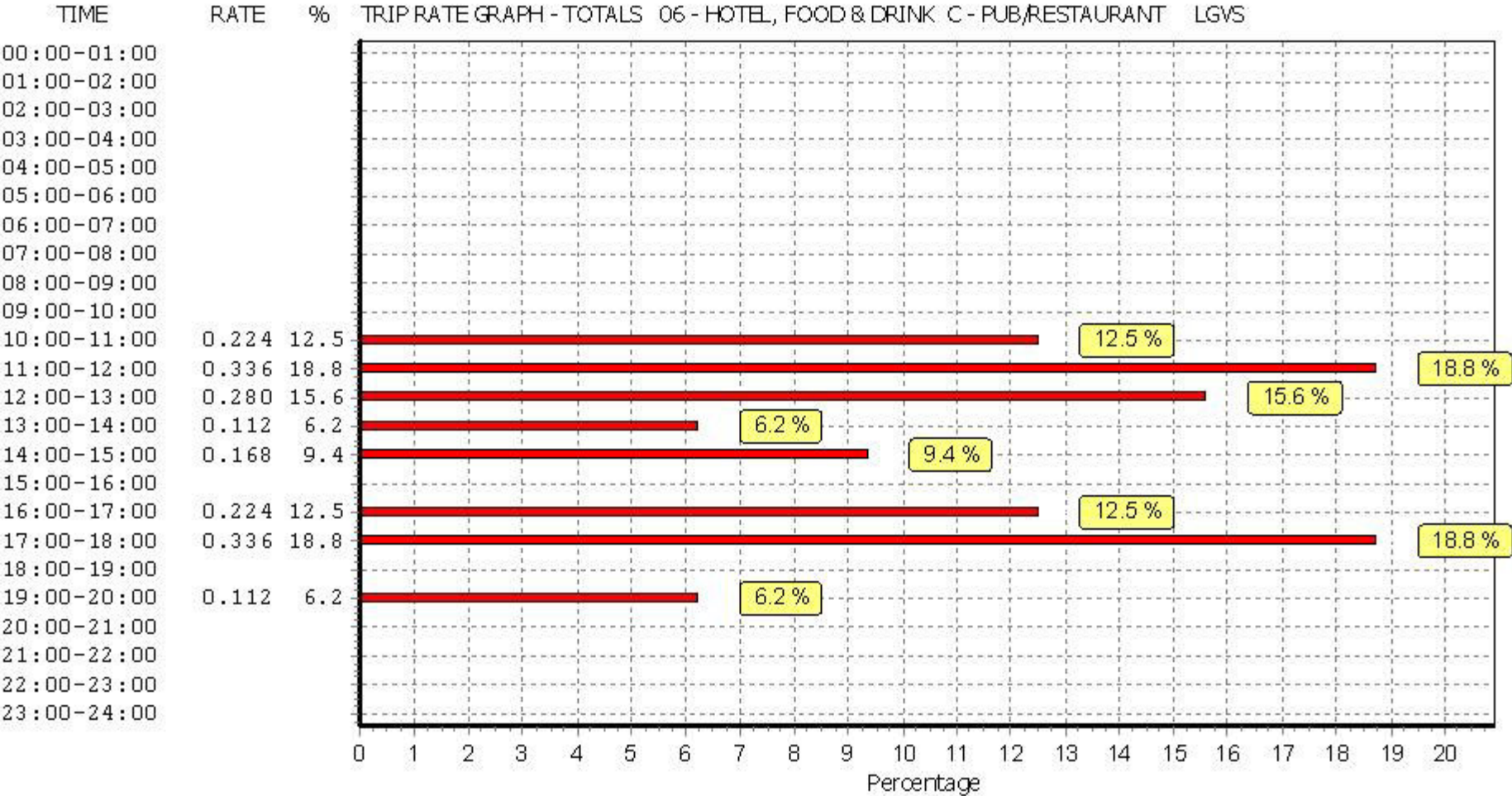
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected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



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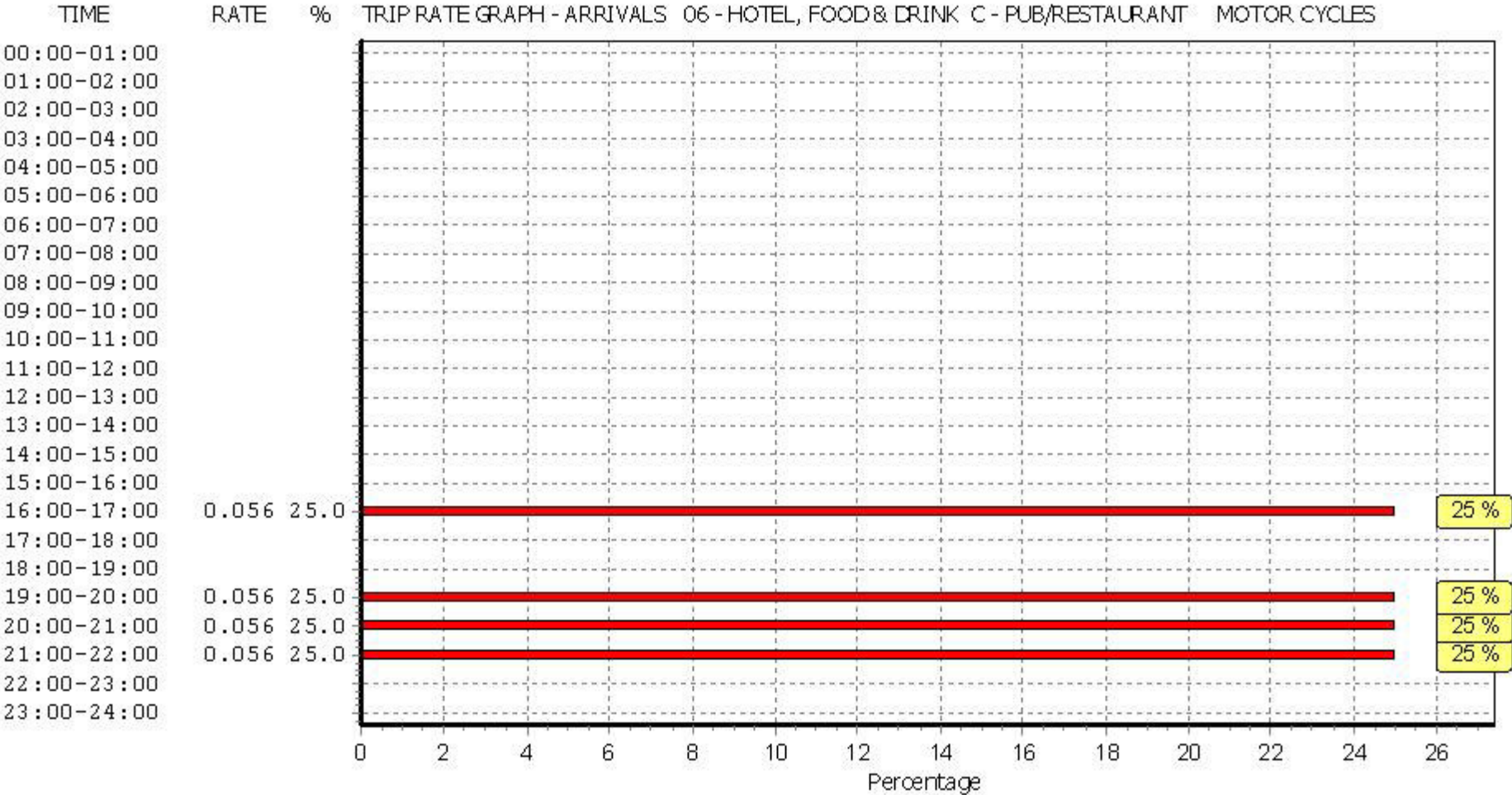
TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/C - PUB/RESTAURANT

MOTOR CYCLES**Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

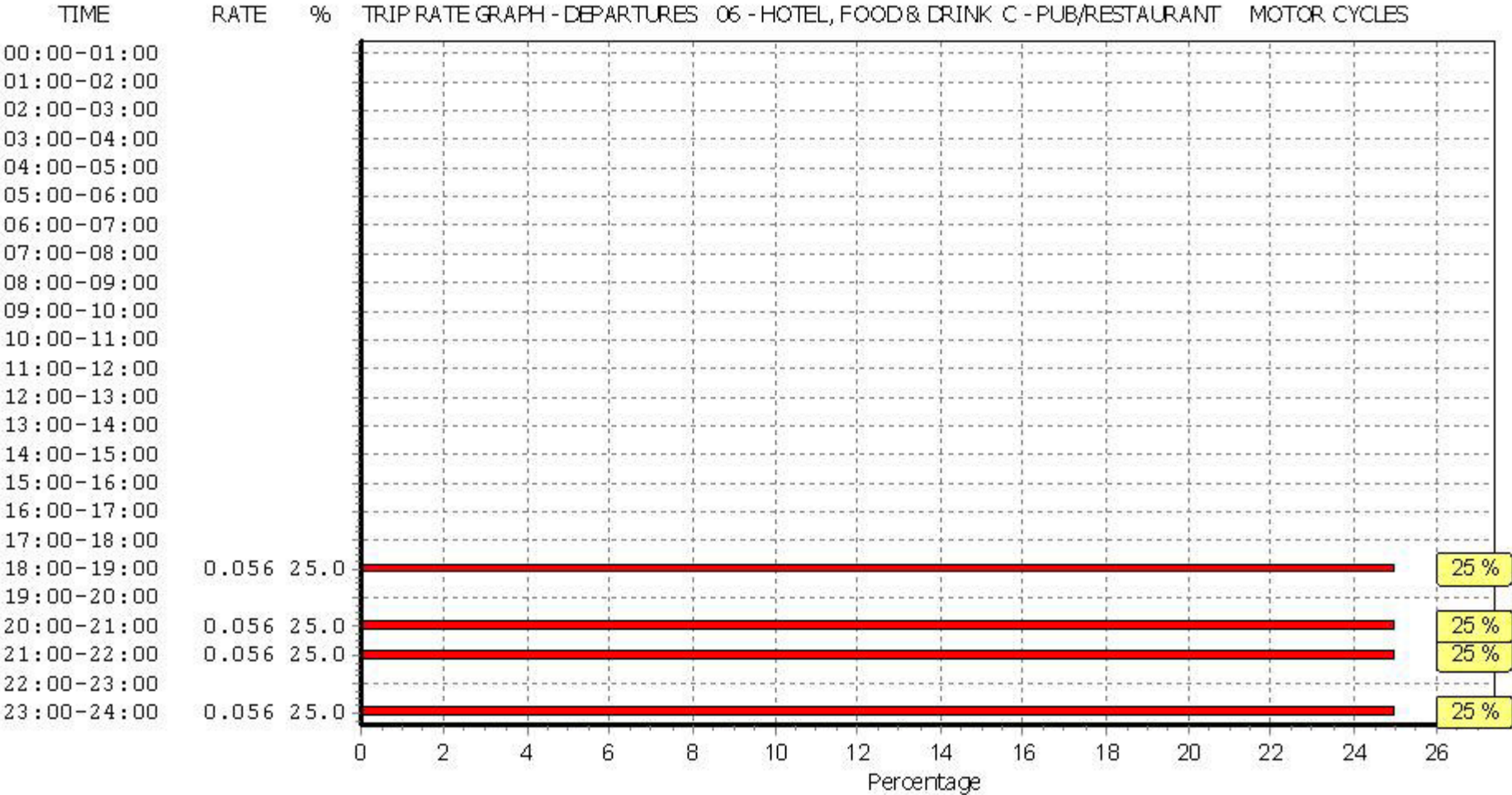
Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00									
08:00 - 09:00									
09:00 - 10:00									
10:00 - 11:00	3	595	0.000	3	595	0.000	3	595	0.000
11:00 - 12:00	3	595	0.000	3	595	0.000	3	595	0.000
12:00 - 13:00	3	595	0.000	3	595	0.000	3	595	0.000
13:00 - 14:00	3	595	0.000	3	595	0.000	3	595	0.000
14:00 - 15:00	3	595	0.000	3	595	0.000	3	595	0.000
15:00 - 16:00	3	595	0.000	3	595	0.000	3	595	0.000
16:00 - 17:00	3	595	0.056	3	595	0.000	3	595	0.056
17:00 - 18:00	3	595	0.000	3	595	0.000	3	595	0.000
18:00 - 19:00	3	595	0.000	3	595	0.056	3	595	0.056
19:00 - 20:00	3	595	0.056	3	595	0.000	3	595	0.056
20:00 - 21:00	3	595	0.056	3	595	0.056	3	595	0.112
21:00 - 22:00	3	595	0.056	3	595	0.056	3	595	0.112
22:00 - 23:00	3	595	0.000	3	595	0.000	3	595	0.000
23:00 - 24:00	3	595	0.000	3	595	0.056	3	595	0.056
Total Rates:			0.224			0.224			0.448

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.

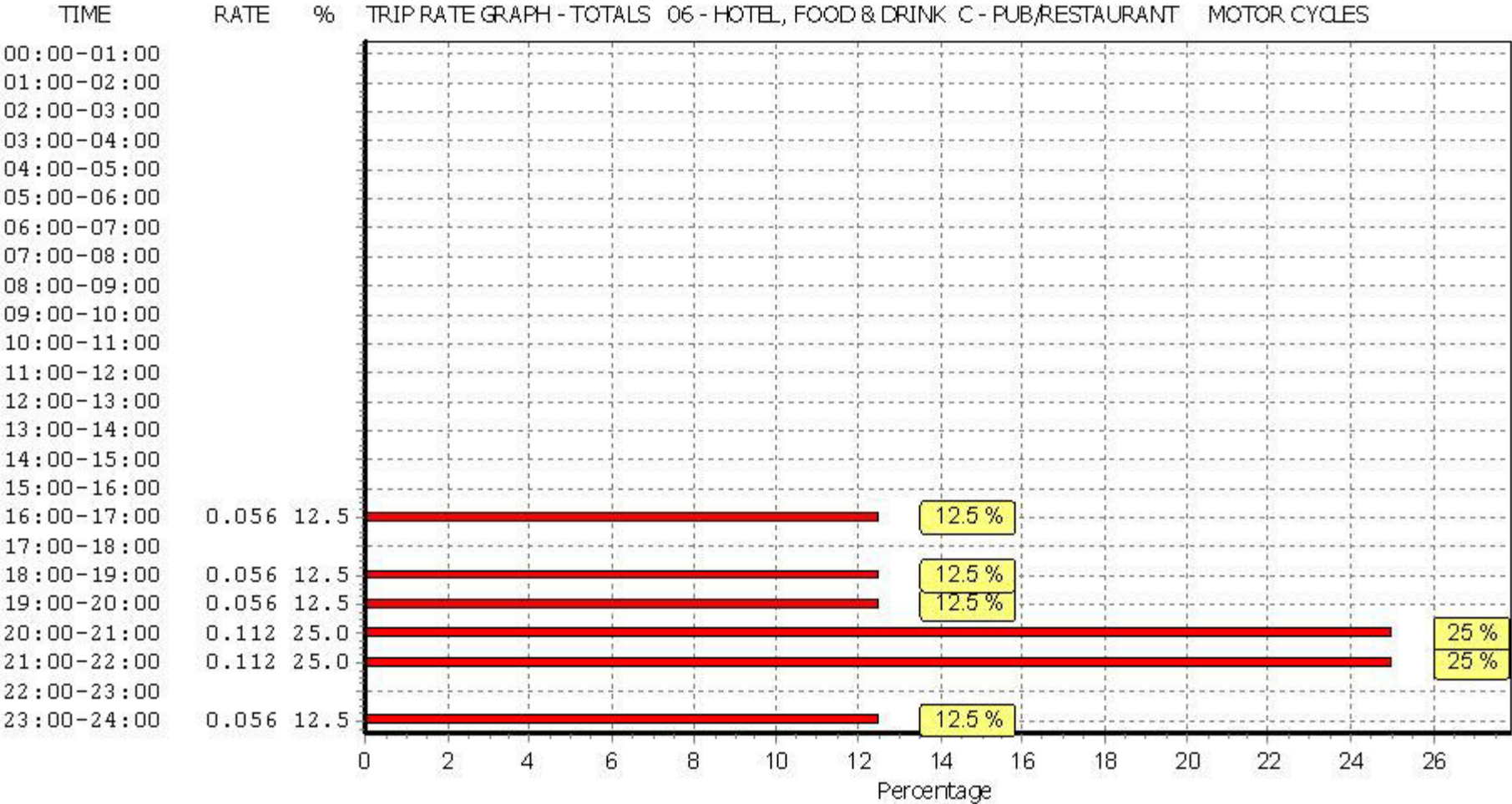
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Appendix D Vehicular Trip Distribution and Assignment Methodology Technical Note

Technical Note

Project: Brymbo, Wrexham

Subject: Gravity Modelling Methodology

Client:	Brymbo Developments Ltd	Version:	A
Project No:	3499	Author:	BL
Date:	9th November 2018	Approved:	CS

I Introduction

I.1 Overview

- 1.1.1 This note sets out the methodology used for the preparation of the gravity models relating to the Brymbo Park site to distribute the traffic forecast to be generated by the proposed development onto the local network.
- 1.1.2 For the purposes of this assessment the development has been split into two parcels, hereafter known as 'East' (that is parcels at the eastern extent of the site, primarily to the east of the spine road) and 'West' (that is the parcel of land at the western extent of the site also known as the 'Ty Cerrig' site). For each parcel the following development quantum has been assumed:

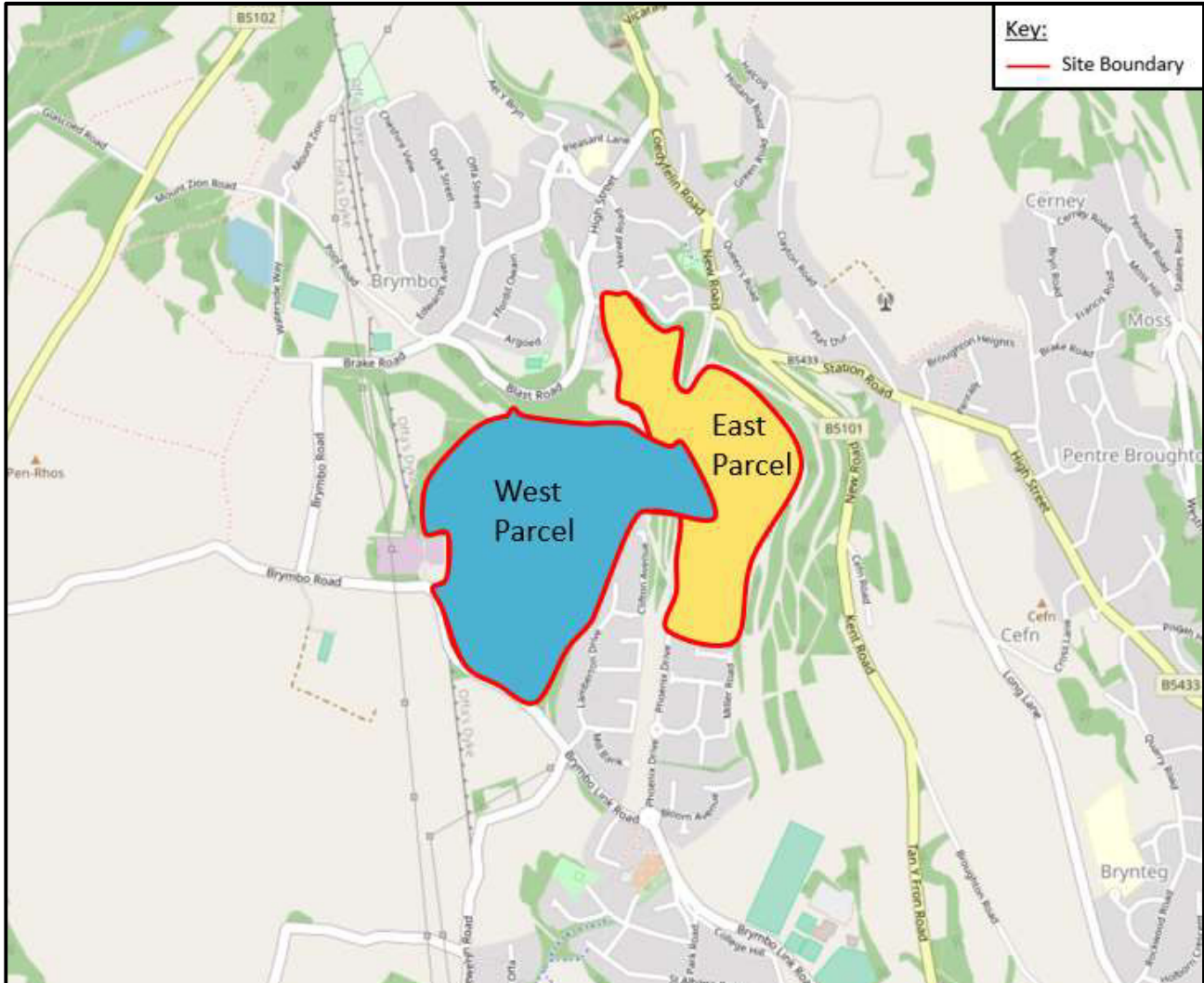
East Parcel

- 200 Dwellings;
- 930sqm Food Retail;
- 464sqm Non-Food Retail;
- 372sqm Public House;
- 2FE Primary School (420 pupils); and
- 465sqm Healthcare Facility.

West Parcel

- 250 Dwellings only.

Figure 1-1: Development Site



1.1.3 In order to identify the likely trip distribution for the proposed development, three gravity models have been developed, comprising;

- West Parcel - Residential Gravity Model;
- East Parcel - Residential & School Gravity Model; and
- East Parcel - Retail Gravity Model.

1.2 Document Structure

1.2.1 The remainder of this note is structured as follows:

- Section 2: West Parcel - Residential Gravity Model;

- Section 3: East Parcel – Residential and School Gravity Model;
- Section 4: East Parcel - Retail Gravity Model;
- Section 5: Whole Site Distribution; and
- Section 6: Route Assignment.

2 West Parcel - Residential Gravity Model

2.1 Travel Demand

Vehicle Trip Generation

- 2.1.1 Residential trip generation has been derived from a donor site survey. Full details of the trip rates are contained within the Transport Assessment.
- 2.1.2 Table 2-1 identifies the resultant trip rates and associated trip generation for the West development parcel.

Table 2-1: West Parcel - Trip Rates and Generation

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Trip Rate (per dwelling)	0.184	0.427	0.612	0.388	0.184	0.573
Trip Generation (250 dwellings)	46	107	153	97	46	143

Vehicle Trip Generation – By Journey Purpose

- 2.1.3 TEMPRO data has been collected for the local 'Wrexham 006' super output area – middle layer (MSOA) in order to determine the modal split of travel for the site and the journey purpose.
- 2.1.4 The TEMPRO journey purposes have been aggregated into the 'Employment', 'Education' and 'Retail' categories as follows:
- **Employment** – 'Work', 'Employers Business', 'Personal Business';
 - **Education** - 'Education'; and
 - **Retail** – 'Shopping', 'Recreation', 'Visit', 'Holiday'.

Table 2-2: Journey Purpose by Mode – Wrexham 006 MSOA

Mode of Travel	Employment	Education	Retail	Total
AM Peak Hour				
Walk	4%	14%	3%	22%
Cycle	1%	0%	0%	1%
Car Driver	29%	5%	9%	43%
Car Passenger	6%	13%	5%	24%
Bus	2%	5%	1%	8%
Rail	1%	0%	0%	2%
Total	44%	38%	19%	100%
PM Peak Hour				
Walk	5%	3%	8%	16%
Cycle	1%	0%	1%	2%
Car Driver	25%	2%	22%	49%
Car Passenger	6%	3%	17%	26%
Bus	2%	1%	2%	5%
Rail	1%	0%	0%	1%
Total	40%	10%	50%	100%

2.1.5 The forecast traffic generation has been split by journey purpose using the above splits for ‘car driver’ trips as shown in Table 2-3.

Table 2-3: Car Journey Purpose

Peak Period	Employment	Education	Retail	Total
AM Peak Hour	67%	11%	22%	100%
PM Peak Hour	51%	5%	44%	100%

2.1.6 The residential trip generation according to journey purpose has been calculated using this and is summarised below.

Table 2-4: West Parcel - Residential Trip Generation

AM Peak Hour			PM Peak Hour		
Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Employment					
31	71	102	50	24	74
Education					
5	12	18	5	2	7
Retail					
10	23	33	42	20	63
Total					
46	107	153	97	46	143

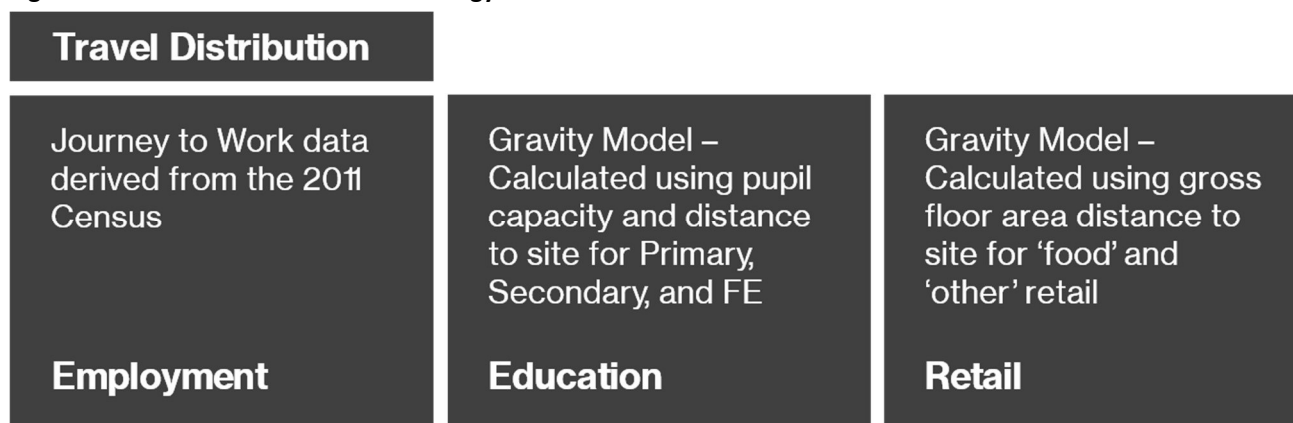
Internalisation

- 2.1.7 For the purpose of this assessment, the eastern and western development parcels have been treated as separate sites. It is anticipated that the West development parcel will comprise residential dwellings only. Therefore, there is not considered to be any opportunity for the internalisation of trips.

2.2 Travel Distribution

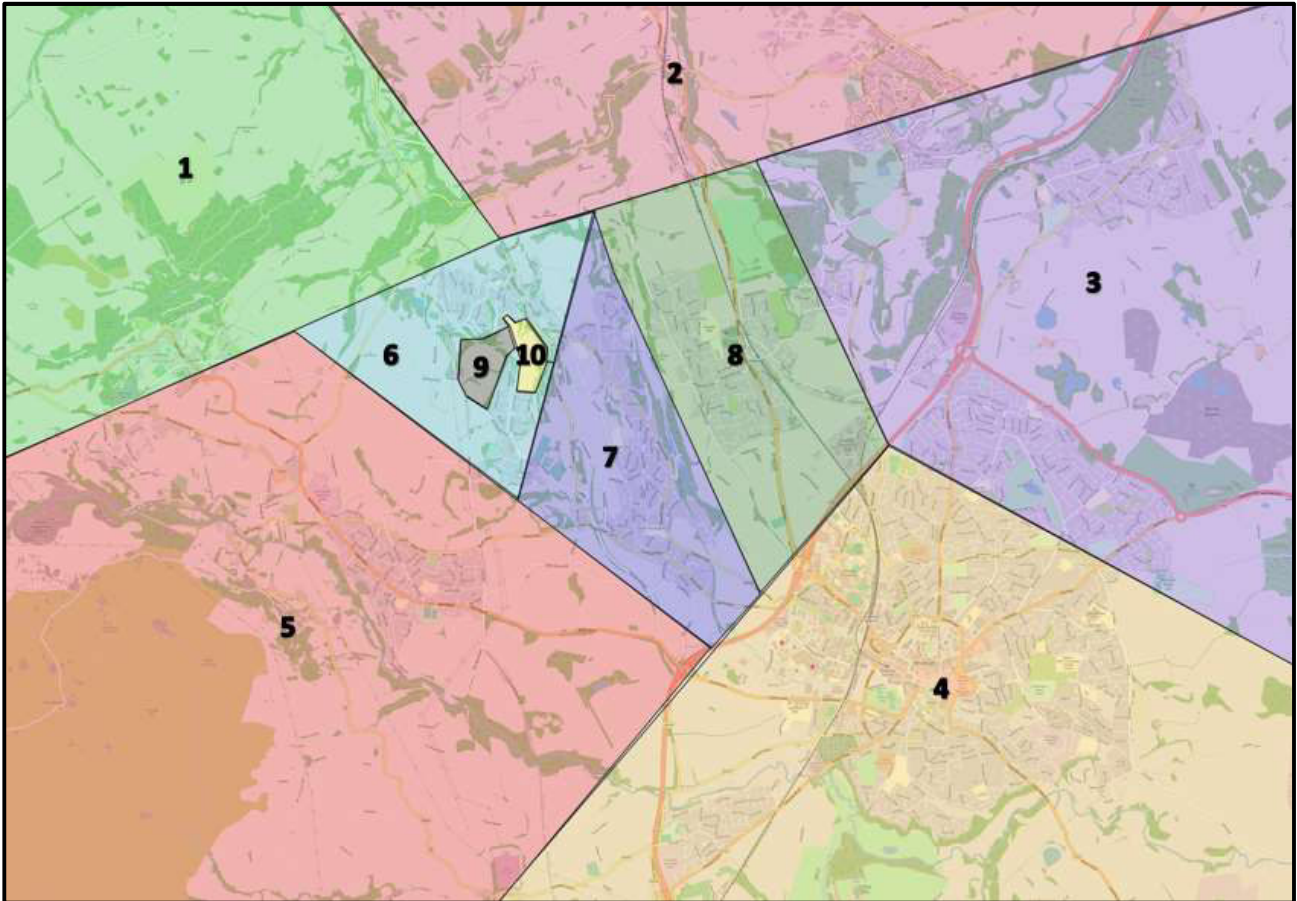
- 2.2.1 A manual approach to traffic distribution has been carried out for each journey purpose as indicated in Figure 2-1.

Figure 2-1: Travel Distribution Methodology



- 2.2.2 A zone system has been identified to ensure that there is a common basis for the distribution of trips by each journey purpose, as shown in Figure 2-2.

Figure 2-2: Zone Plan



Journey Purpose – Employment

- 2.2.3 The employment trip distribution has been calculated using ‘Journey to Work’ data derived from the 2011 Census. The trip distribution of vehicular employment trips for those whose ‘usual residence’ was ‘Wrexham 006’ MSOA has been used as a proxy for trips generated by the residential development.
- 2.2.4 Figure 2-3 provides a plan showing the distribution of trips to employment from those residing on the West development parcel.

Figure 2-3: West Parcel Trip Distribution - Employment Journey Purpose

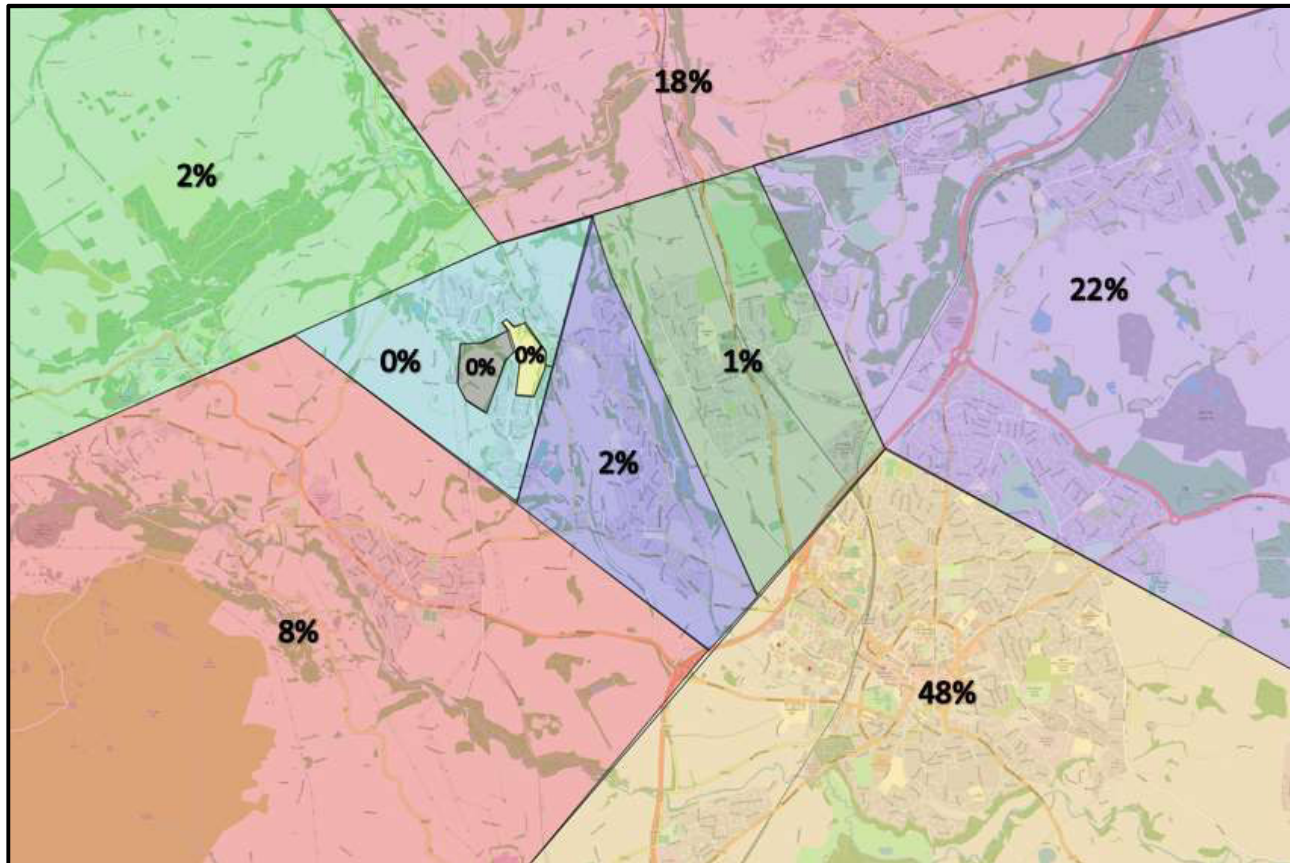


Table 2-5: West Parcel - Employment Journey Purpose Trips

Zone	Distribution	AM Peak Hour		PM Peak Hour	
		Arrivals	Departures	Arrivals	Departures
1	2%	1	2	1	1
2	18%	5	13	9	4
3	22%	7	16	11	5
4	48%	15	34	24	11
5	8%	2	5	4	2
6	0%	0	0	0	0
7	2%	0	1	1	0
8	1%	0	1	0	0
9	0%	0	0	0	0
10	0%	0	0	0	0
Total	100%	31	71	50	24

Journey Purpose – Education

- 2.2.5 The trip generation for education journeys at the proposed development has been distributed using a gravity model for ‘Primary’, ‘Secondary’, and ‘Further Education’ (FE) elements individually.
- 2.2.6 For the purposes of this assessment, expected pupil yields from the development have been calculated based on the age structure of the Wrexham 006 MSOA, from 2011 census data. The proposed development is estimated to have the following:
- 45 primary aged pupils (aged 5-11);
 - 32 secondary aged pupils (aged 11-16); and
 - 12 further education pupils (aged 16-18).
- 2.2.7 When considered in conjunction with the development proposals it is possible to calculate the number of education journeys to and from the site.
- 2.2.8 Given that the education provision on site is proposed as part of the East development parcel, it has been assumed that no education provision will be provided on the West parcel. The resultant education journeys are summarised below.

Table 2-6: West Parcel - Education Trip Breakdown

Stage of Education	Pupils on site	On-Site Provision	Pupil Trips off Site	External Pupil Trips to Site
Primary School (5 to 11)	45	0	45	0
Secondary School (11 to 16)	32	0	32	0
Further Education (17 to 18)	12	0	12	0
Total	90	0	90	0

- 2.2.9 It has been assumed that all primary school aged pupils would attend the new school on the eastern parcel. For secondary and further education, demand has been determined based on the capacity of and distance from the site of the education establishment. Further to this, a factor has been applied to the model which weights establishments in favour of distance over population. This assumes that pupils are more likely to go to and be accepted at their nearest establishment.

Table 2-7: West Parcel - Pupil Trips off Site

School / College	Pupil Capacity ¹	Distance to Site (KM) ²	Weighted Distribution	Zone
Primary School				
On Site Provision – East Parcel	420	1.2	100%	10
Secondary School				
Ysgol Clywedog	700	4.6	63%	4
Ysgol Bryn Alyn	696	6.0	37%	8
Total	-	-	100%	-
Further Education				
Castell Alun High School/Sixth Form	310	7.7	100%	2
Total	-	-	100%	-

2.2.10 The full education trip generation and distribution breakdown by zone is as follows.

Table 2-8: West Parcel - Education Journey Purpose Trips

Zone	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
1	0	0	0	0
2	1	2	1	0
3	0	0	0	0
4	1	3	1	1
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	1	2	1	0
9	0	0	0	0
10	3	6	2	1
Total	5	12	5	2

Journey Purpose – Retail

2.2.11 The forecast vehicular trips for retail journeys from the West development parcel have been distributed using a gravity model that considers ‘food’ and ‘other’ retail trips individually.

2.2.12 The retail gravity model determines demand based on the ‘size’ (measured in gross floor area) of the retail element and ‘distance to the site’. A factor has been applied that weights retail elements in favour of distance over size.

¹ Pupil capacity has been sourced from <http://mylocalschool.gov.wales/?lang=en>, with the exception of the proposed on-site provision.

² Distance calculated as driving distance from proposed site access point on Brymbo Road.

2.2.13 'Food' retail journeys are based upon food stores located within a 7km³ catchment area of the site, and 'other' retail journeys are based on several major shopping areas and centres in the vicinity of the site. Table 2-9 indicates the distribution model for retail trips.

Table 2-9: West Parcel - Retail Trips Model

Store	Store Size (sqm) ⁴	Distance to Site (km)	Weighted Distribution	Zone
Food Retail				
On Site Provision – East Parcel	930	1.2	50%	10
Iceland, Ruthin Road	350	6.9	1%	8
Lidl, Old Mold Road	1,500	5.9	3%	8
Aldi, Plas Coch Retail Park	1,300	5.2	4%	4
Sainsbury's, Plas Coch Retail Park	7,000	5.5	18%	4
Morrisons, Ruthin Road	5,500	4.9	18%	4
Aldi, Ruthin Road	1,800	4.7	6%	4
Total	-	-	100%	-
Other Retail				
On Site Provision – East Parcel	464	1.2	2%	10
Dodds Lane Retail Park	13,000	6.8	2%	8
Plas Coch Retail Park	97,000	5.0	27%	4
Wrexham Town Centre	360,000	6.0	69%	4
Total	-	-	100%	-

2.2.14 In order to determine whether a retail journey is associated with 'food' retail or 'other' retail a split of travel has been estimated based on the ratio of average two-way peak trips rates for the most relevant TRICS subcategories, 'Retail / A - Food Superstore' and 'Retail / I - Shopping Centre - Local Shops'. This forecasts that 42% of trips will be 'Food' associated and 58% will be 'Other' retail trips.

2.2.15 The trip generation and distribution for retail journeys from the site is presented as follows. Figure 2-4 provides a plan showing the distribution of retail trips.

³ Considered to be the average travel distance for shopping trips in the UK (National Travel Survey, NTS0405)

⁴ Store size has been estimated based on Google Maps Aerial view.

Figure 2-4: West Parcel Trip Distribution - Retail Journey Purpose

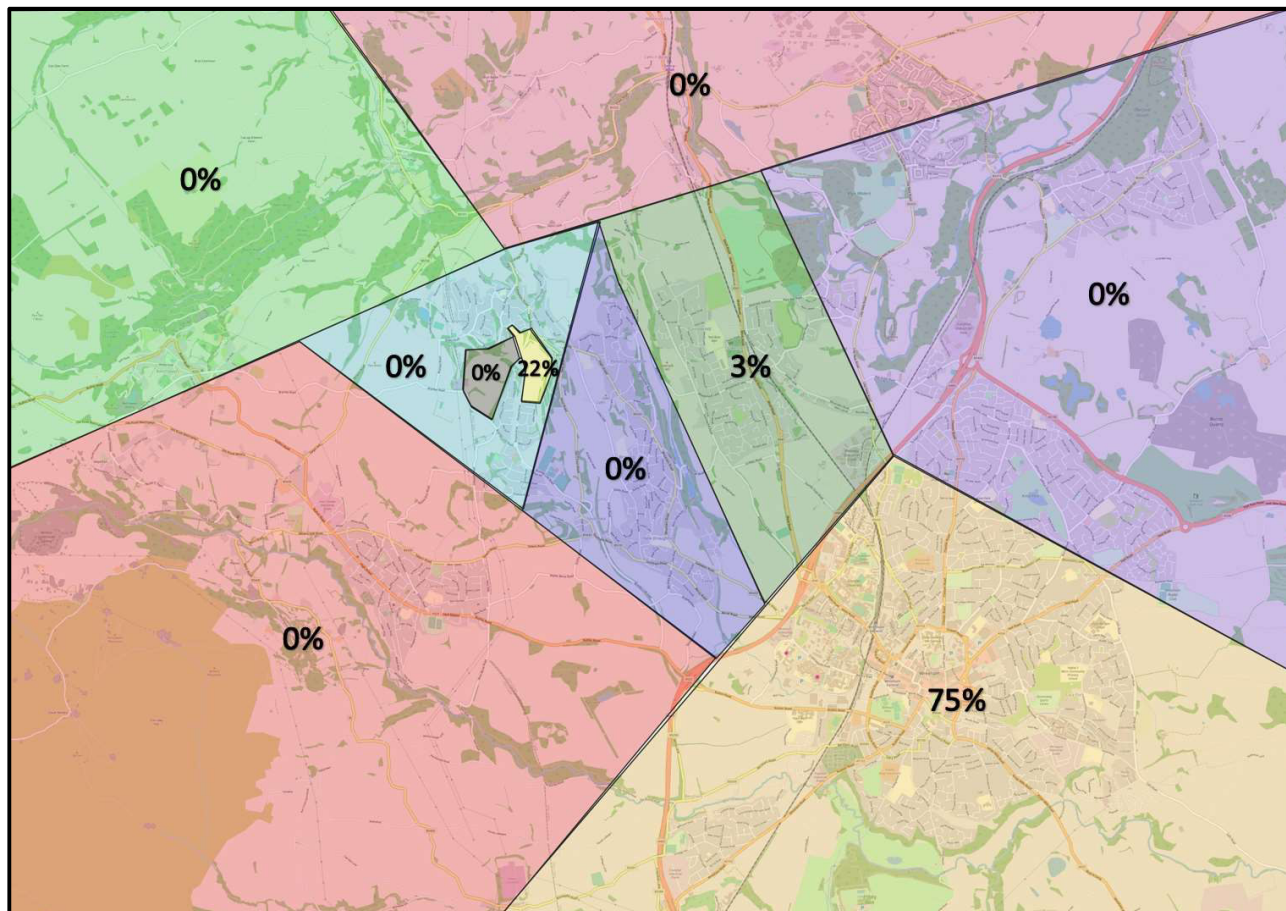


Table 2-10: West Parcel – Retail Journey Purpose Trips

Zone	Distribution	AM Peak Hour		PM Peak Hour	
		Arrivals	Departures	Arrivals	Departures
1	0%	0	0	0	0
2	0%	0	0	0	0
3	0%	0	0	0	0
4	75%	7	17	32	15
5	0%	0	0	0	0
6	0%	0	0	0	0
7	0%	0	0	0	0
8	3%	0	1	1	1
9	0%	0	0	0	0
10	22%	2	5	10	5
Total	100%	10	23	42	20

West Parcel – Total Distribution

2.2.16 The total trip generation and zone distribution associated with the West development parcel is provided in Table 2-11 as follows.

Table 2-11: West Parcel – Total Trip Distribution

Zone	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
1	1	2	1	1
2	6	14	9	5
3	7	16	11	5
4	23	54	57	27
5	2	5	4	2
6	0	0	0	0
7	1	3	1	1
8	1	3	2	1
9	0	0	0	0
10	4	9	11	5
Total	46	107	97	46

3 East Parcel – Residential & School Gravity Model

3.1 Residential - Travel Demand

Vehicle Trip Generation

3.1.1 Consistent with the approach taken for the West development parcel, Table 3-1 identifies the resultant vehicular trip rates and associated trip generation for the residential element of the East development parcel.

Table 3-1: East Parcel - Trip Rates and Generation

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Trip Rate (per dwelling)	0.184	0.427	0.612	0.388	0.184	0.573
Trip Generation (200 dwellings)	37	85	122	78	37	115

Vehicle Trip Generation – By Journey Purpose

3.1.2 Using the TEMPRO modal split for travel to the site identified in Tables 2-2 and 2-3, the residential vehicular trip generation according to journey purpose has been calculated and is summarised below.

Table 3-2: East Parcel - Residential Trip Generation

AM Peak Hour			PM Peak Hour		
Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Employment					
25	57	82	40	19	59
Education					
4	10	14	4	2	6
Retail					
8	19	27	34	16	50
Total					
37	85	122	78	37	115

Internalisation

Employment Journey Purpose

- 3.1.3 It is considered that some residents will work within the development on site. Therefore, some trips to/from the residential element can be considered to be internal.
- 3.1.4 In order to estimate the level of internal trips generated by the residential element, Journey to Work data for the 'Wrexham 006' MSOA has been used to calculate the proportion of residents who both live and work within the same area. This indicates that out of 2735 residents, a total of 101 also work within the 'Wrexham 006' MSOA resulting in an internalisation factor of 4% of the total trips generated.

Table 3-3: Internal/External Residential Trip Generation – Employment Journey Purpose

	AM Peak Hour (0800 to 0900)			PM Peak Hour (1700 to 1800)		
	Arrivals	Departures	Two-Way	Arrivals	Departures	Two-Way
Internal Trips	1	2	3	1	1	2
External Trips	24	55	79	38	18	57

Education Journey Purpose

- 3.1.5 As part of development, it is proposed to provide one 2 form entry (2FE) primary school. It is considered that all primary aged pupils residing on site will attend this school, and therefore these trips can be considered to be internal. The degree of internalisation within the East development parcel is detailed in Section 3.2 below.

3.2 School - Travel Demand

Pupil Trips

- 3.2.1 It is proposed to provide one 2FE primary school onsite, which would be able to accommodate 420 pupils. Details of the internal and external breakdown of pupil trips has been detailed within Section 3.3 below.

Staff Trips

- 3.2.2 Staff trip generation has been derived using TRICS trip rates. Full details of the trip rates are contained within the Transport Assessment.
- 3.2.3 Table 3-4 identifies the resultant trip generation associated with the staff of the proposed on-site education provision.

Table 3-4: Trip Generation – School Staff Trips

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Primary School Staff Trips	33	0	33	0	3	3

Internalisation

- 3.2.4 In order to estimate the percentage of staff both living and working onsite, and subsequently the number of internal trips, the same internalisation factor as for the residential employment journey purpose (4%) has been used.

Table 3-5: School Staff Trips - Internal/External Split

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Internal Trips	1	0	1	0	0	0
External Trips	32	0	32	0	3	3

3.3 East Parcel Travel Distribution

- 3.3.1 Consistent with the approach undertaken for the West Parcel, a manual approach to traffic distribution has been carried out for each journey purpose as indicated in Figure 2-1.

Journey Purpose – Employment

3.3.2 Employment trip distribution has been calculated using ‘Journey to Work’ data derived from the 2011 Census. Figure 3-1 provides a plan showing the distribution of trips to employment from those residing on the East development parcel.

Figure 3-1: East Parcel Trip Distribution - Employment Journey Purpose

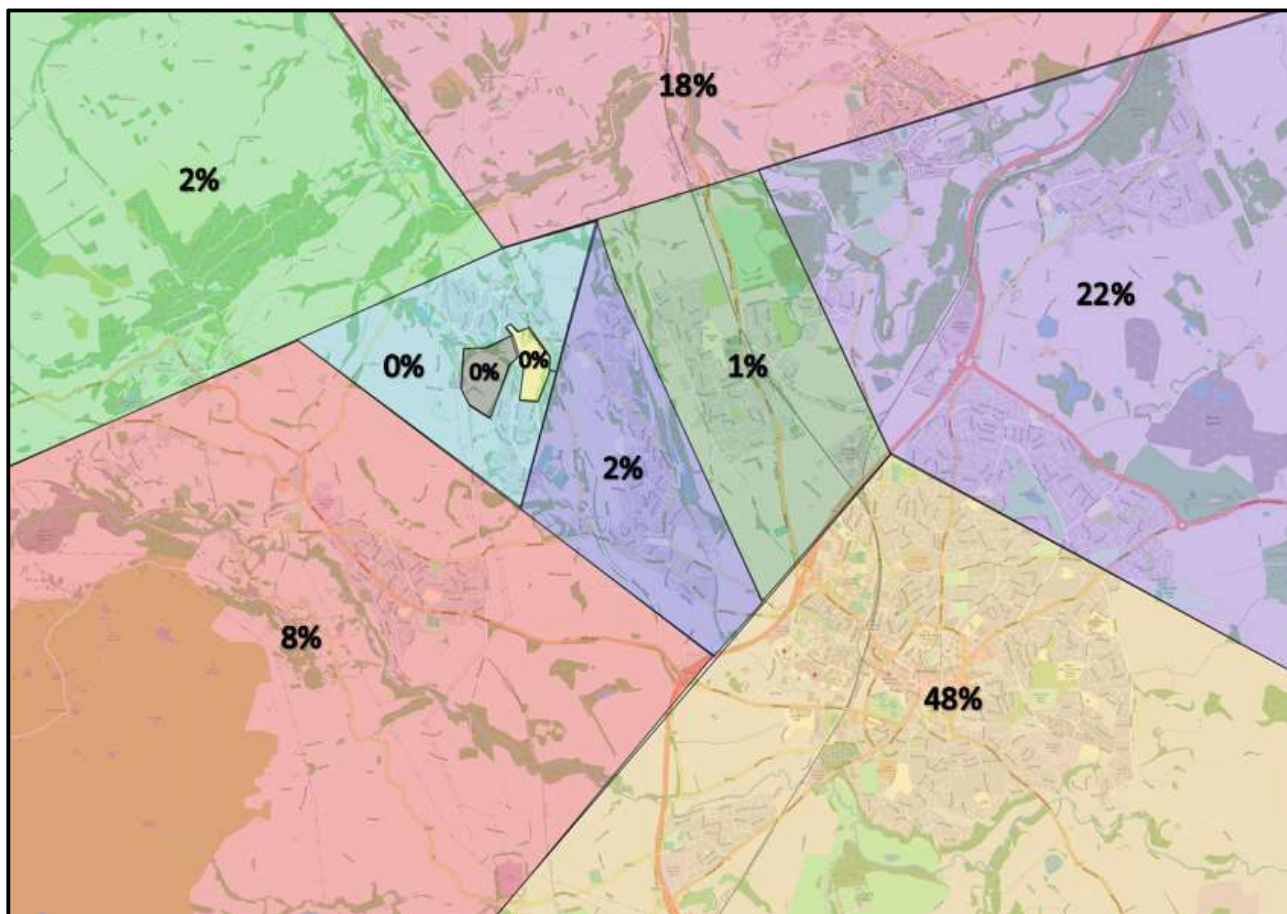


Table 3-6: East Parcel - Employment Journey Purpose Trips

Zone	Distribution	AM Peak Hour		PM Peak Hour	
		Arrivals	Departures	Arrivals	Departures
1	2%	1	1	1	0
2	18%	4	10	7	3
3	22%	5	12	8	4
4	48%	11	26	18	9
5	8%	2	4	3	1
6	0%	0	0	0	0
7	2%	0	1	1	0
8	1%	0	1	0	0
9	0%	0	0	0	0
10	0%	0	0	0	0
Total	100%	24	55	38	18

Journey Purpose – Education

Pupil Trips

- 3.3.3 The vehicle trips for education journeys at the proposed development have been distributed using a gravity model for 'Primary', 'Secondary', and 'Further Education' (FE) elements individually.
- 3.3.4 Consistent with the West parcel approach, the proposed East development parcel is estimated to generate the following:
- 36 primary aged pupils (aged 5-11);
 - 26 secondary aged pupils (aged 11-16); and
 - 10 further education pupils (aged 16-18).
- 3.3.5 For the purposes of this assessment, it has been assumed that a one 2FE primary school will be provided on site, with capacity for 420 pupils. The resultant education journeys are summarised below.

Table 3-7: East Parcel - Education Trip Breakdown

Stage of Education	Pupils on site	On-Site Provision	Pupil Trips off Site	External Pupil Trips to Site
Primary School (5 to 11)	36	420	0	384
Secondary School (11 to 16)	26	0	26	0
Further Education (17 to 18)	10	0	10	0
Total	72	420	36	384

3.3.6 The vehicle trips generated are distributed individually for internal pupils travelling off site, and external pupils travelling to the site.

3.3.7 In the case of pupils travelling off site for education purposes, demand has been determined based on the capacity and distance from the site of the education establishment.

Table 3-8: East Parcel - Pupil Trips Off Site Distribution

School / College	Pupil Capacity ⁵	Distance to Site (KM) ⁶	Weighted Distribution	Zone
Secondary School				
Ysgol Clywedog	700	5.0	40%	4
Ysgol Bryn Alyn	696	4.1	60%	8
Total	-	-	100%	-
Further Education				
Castell Alun High School/Sixth Form	310	6.3	100%	2
Total	-	-	100%	-

3.3.8 In the case of pupils travelling to the site for education purposes, demand has been determined based on the 'associated school age population'⁷ within adjacent lower super output areas (LSOA) at the site, and 'distance to the site' of those areas. A weighting factor has been applied to the model which weights establishments in favour of distance over population.

⁵ Pupil capacity has been sourced from <http://mylocalschool.gov.wales/?lang=en>, with the exception of the proposed on-site provision.

⁶ Distance calculated as driving distance from proposed site access point on Phoenix Drive.

⁷ Primary School – LSOA Population for 5 to 11 year olds / Secondary School – LSOA Population for 11 to 16 year olds / FE – LSOA Population for 16 to 18 year olds

Table 3-9: East Parcel - External Pupil Trips to Site Distribution

LSOA	LSOA Education Age Population	Distance to Site (KM)	Weighted Distribution	Zone
Primary School				
Onsite Residential – West Parcel	45	1.2	6%	9
Wrexham 004A	101	2.9	2%	8
Wrexham 004B	138	3.7	2%	8
Wrexham 004C	104	3.7	2%	8
Wrexham 004D	82	3.1	2%	8
Wrexham 005A	136	1.0	27%	7
Wrexham 005B	150	2.6	4%	7
Wrexham 005C	112	2.1	5%	7
Wrexham 005D	150	3.7	2%	7
Wrexham 006A	188	1.3	22%	6
Wrexham 006B	142	1.2	20%	6
Wrexham 006C	121	3.7	2%	5
Wrexham 006D	100	4.4	1%	5
Wrexham 006E	115	4.4	1%	5
Wrexham 013A	85	4.7	1%	5
Wrexham 013B	71	4.4	1%	1
Total	-	-	100%	-

3.3.9 The trip distribution associated with school pupils is shown below, broken down by zone.

Table 3-10: East Parcel - Education Journey Purpose Trips – External Pupil Trips

Zone	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
1	1	1	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	4	3	0	0
6	32	31	3	3
7	30	29	3	3
8	6	6	1	1
9	5	5	0	1
10	0	0	0	0
Total	76	74	7	8

Staff Trips

- 3.3.10 The distribution of staff trips associated with the proposed primary school has been calculated using 'Journey from Work' data derived from the 2011 Census. Figure 3-2 provides a plan showing the distribution of trips to home from those employed on the East development parcel.

Figure 3-2: East Parcel – Staff Trip Distribution – Journey from Work 2011 Census

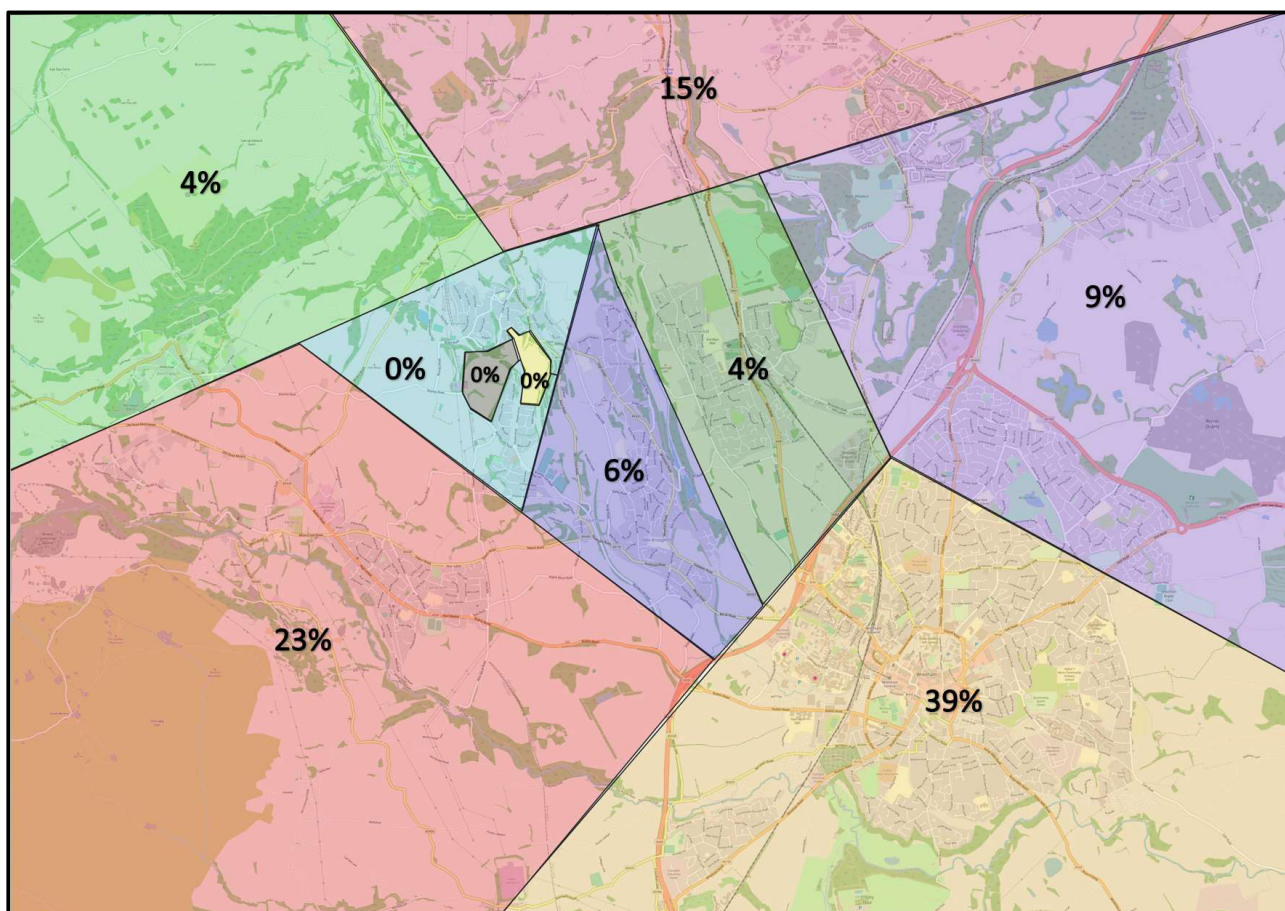


Table 3-11: East Parcel – Education Trips – External Staff Trips

Zone	Distribution	AM Peak Hour		PM Peak Hour	
		Arrivals	Departures	Arrivals	Departures
1	4%	1	0	0	0
2	15%	5	0	0	0
3	9%	3	0	0	0
4	39%	13	0	0	1
5	23%	7	0	0	1
6	0%	0	0	0	0
7	6%	2	0	0	0
8	4%	1	0	0	0
9	0%	0	0	0	0
10	0%	0	0	0	0
Total	100%	32	0	0	2

Whole Site – Residential Trips (Education Journey Purpose) and School Trips

3.3.11 The full education trip generation and distribution breakdown by zone is as follows.

Table 3-12: East Parcel - Education Journey Purpose External Trips (Pupils & Staff)

Zone	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
1	2	1	0	0
2	5	0	0	0
3	3	0	0	0
4	13	0	0	1
5	11	3	0	1
6	32	31	3	3
7	32	29	3	3
8	7	6	1	1
9	5	5	0	1
10	0	0	0	0
Total	108	74	7	11

Journey Purpose – Retail

3.3.12 The vehicles trips for retail journeys at the East development parcel have been distributed using a gravity model that considers ‘food’ and ‘other’ retail trips individually. Table 3-13 indicates the distribution model for retail trips.

Table 3-13: East Parcel - Retail Trips

Store	Store Size (sqm) ⁸	Distance to Site (km)	Weighted Distribution	Zone
Food Retail				
On Site Provision – East Parcel	930	0.3	94%	10
Iceland, Ruthin Road	350	4.6	0%	8
Lidl, Old Mold Road	1,500	4.2	1%	8
Aldi, Plas Coch Retail Park	1,300	5.5	0%	4
Sainsbury's, Plas Coch Retail Park	7,000	5.7	2%	4
Morrisons, Ruthin Road	5,500	5.1	2%	4
Aldi, Ruthin Road	1,800	5.3	1%	4
Total	-	-	100%	-
Other Retail				
On Site Provision – East Parcel	464	0.3	30%	10
Dodds Lane Retail Park	13,000	7.0	2%	8
Plas Coch Retail Park	97,000	5.5	18%	4
Wrexham Town Centre	360,000	6.4	50%	4
Total	-	-	100%	-

3.3.13 The trip generation and distribution for retail journeys from the site is presented as follows. Figure 3-3 provides a plan showing the distribution of retail trips.

⁸ Store size has been calculated by aerial on google maps.

Figure 3-3: East Parcel Trip Distribution - Retail Journey Purpose

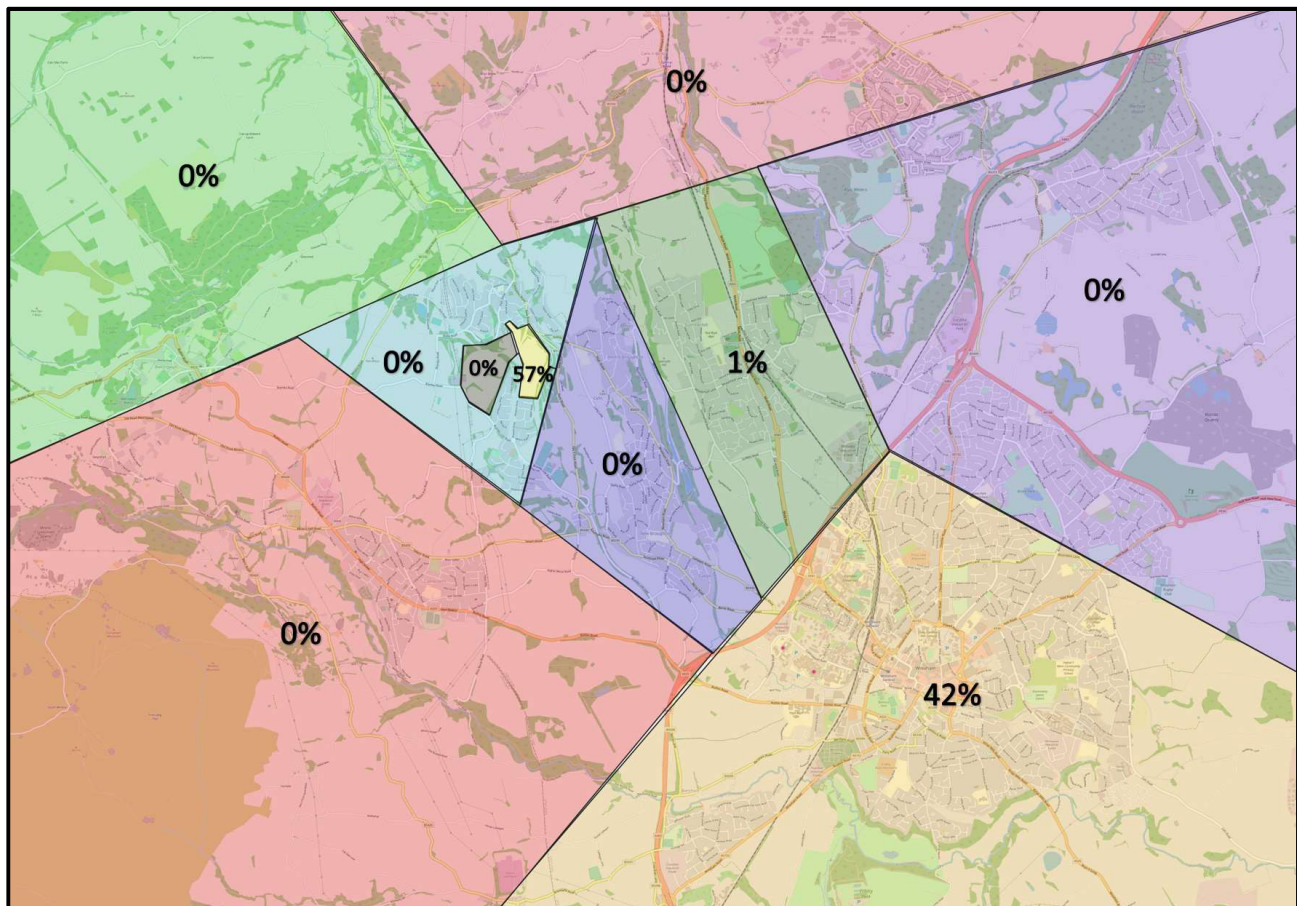


Table 3-14: East Parcel – Retail Journey Purpose Trips

Zone	Distribution	AM Peak Hour		PM Peak Hour	
		Arrivals	Departures	Arrivals	Departures
1	0%	0	0	0	0
2	0%	0	0	0	0
3	0%	0	0	0	0
4	42%	3	8	14	7
5	0%	0	0	0	0
6	0%	0	0	0	0
7	0%	0	0	0	0
8	1%	0	0	0	0
9	0%	0	0	0	0
10	57%	5	11	19	9
Total	100%	8	19	34	16

3.3.14 Given that the distribution above includes internal trips (to Zone 10, the eastern development parcel), the distribution has been manually adjusted to include external trips only. As a result, trips to zone 10 have been removed. Table 3-15 identifies the external trip breakdown by zone.

Table 3-15: East Parcel – Retail Journey Purpose – External Trips

Zone	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	3	8	14	7
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
Total	3	8	15	7

East Parcel – Total Residential & School Distribution

3.3.15 The total trip generation and zone distribution associated with the residential and school elements of the East development parcel is provided in Table 3-16 as follows.

Table 3-16: East Parcel – Total Residential & School External Trip Distribution

Zone	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
1	2	2	1	1
2	10	11	7	4
3	8	12	8	4
4	28	35	33	17
5	10	7	4	2
6	9	22	8	4
7	11	21	8	4
8	4	7	3	2
9	1	3	1	1
10	0	0	0	0
Total	84	120	75	38

4 Retail Gravity Model – East Parcel

4.1 Travel Demand

- 4.1.1 Vehicle trip generation for the proposed retail land uses has been derived from TRICS trip rates. The proposed trip generation outlined in Table 4-1 below, includes trips associated with the proposed Retail uses, Public House and Healthcare facility.

Table 4-1: East Parcel – Retail/Leisure/Healthcare Trip Generation

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Retail/Leisure/Healthcare Trip Generation	73	61	134	95	106	202

- 4.1.2 Retail journey purpose from residential element on east parcel identified a total of 15 and 28 internal trips in the AM and PM peaks respectively. The resultant internal/external split is as follows.

Table 4-2: East Parcel – Retail/Leisure Trips - Internal/External Split

	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Internal Trips	5	11	15	19	9	28
External Trips	69	50	119	76	97	173

4.2 Trip Distribution

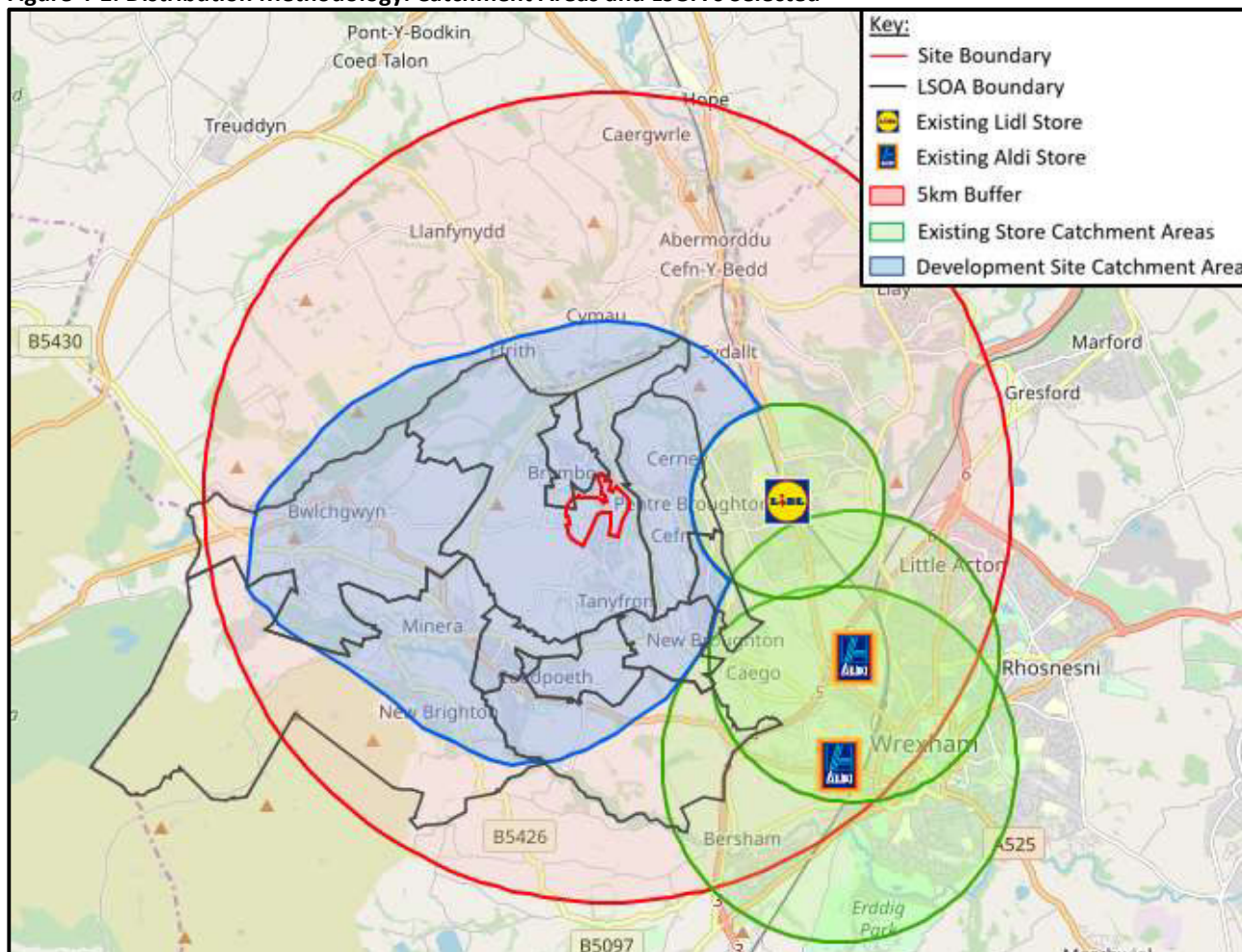
- 4.2.1 Following the identification of the likely travel demand associated with the proposed facilities, the following method has been followed to identify the trip distribution.
- Lower Super Output Areas (LSOA's) within a 5km catchment of the site have been identified;
 - Nearby food stores within the catchment area have been identified. Where two stores are located adjacent to each other, only one has been used. This resulted in the identification of three main stores, including:
 - Lidl, Old Mold Road, Gwesyllt;
 - Aldi, Plas Coch Retail Park, Wrexham; and
 - Aldi, Ruthin Road, Wrexham.
 - A buffer around each store has been plotted to a point equidistant between the existing store and proposed on-site store. This has defined the likely catchment areas for each existing store;

- The catchment has been manually extended to include the villages of Bwlchgwyn, Minera, New Brighton and Coedpoeth. Each of these stores is located closer to the proposed site than the existing stores. It is therefore considered that the on-site provision would likely be their preferred store;
- LSOA's within the proposed store catchment area have been identified; and
- A distribution proportion has been calculated based on population within the identified catchment LSOA's and the proposed West development parcel⁹.

4.2.2 Figures 4-1 and 4-2 illustrate the identified LSOAs and the catchment areas used and the resultant distribution.

⁹ The likely population of the West development parcel has been calculated using 2011 census data to identify a resident to household proportion for the Wrexham 006 MSOA. This has then been applied to the proposed number of dwellings on-site.

Figure 4-1: Distribution Methodology: Catchment Areas and LSOA's Selected ¹⁰



¹⁰ LSOA's selected: Wrexham 005A, 005B, 005D, 006A, 006B, 006C, 006D, 006E, 013A, and 013B.

Figure 4-2: Retail Distribution by LSOA

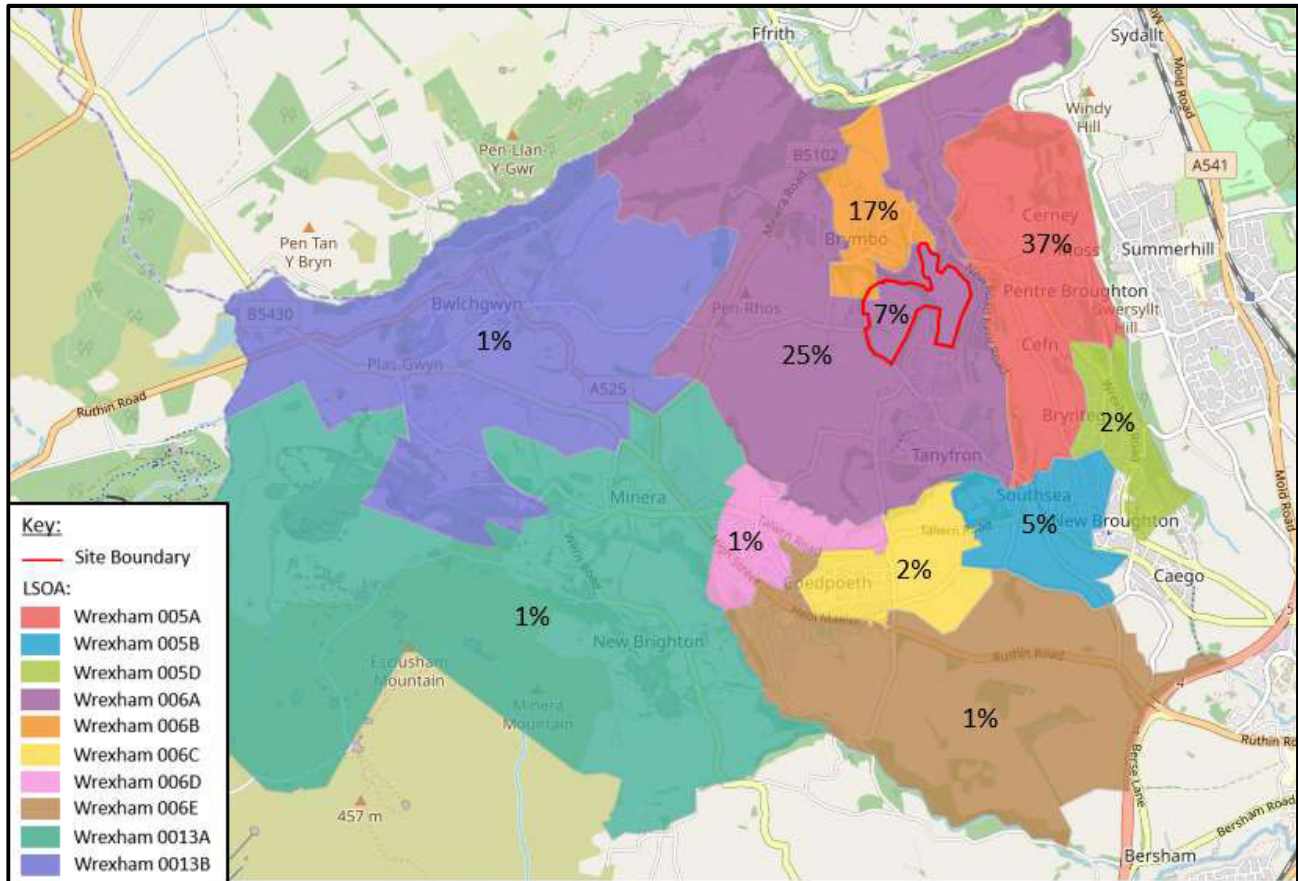


Table 4-3: East Parcel – Retail Development Trip Distribution

Zone	Distribution	AM Peak Hour		PM Peak Hour	
		Arrivals	Departures	Arrivals	Departures
1	1%	1	1	1	1
2	0%	0	0	0	0
3	0%	0	0	0	0
4	0%	0	0	0	0
5	6%	4	3	4	6
6	43%	29	21	32	41
7	44%	30	22	33	43
8	0%	0	0	0	0
9	7%	5	4	5	7
10	0%	0	0	0	0
Total	100%	69	50	76	97

5 Whole Site Distribution

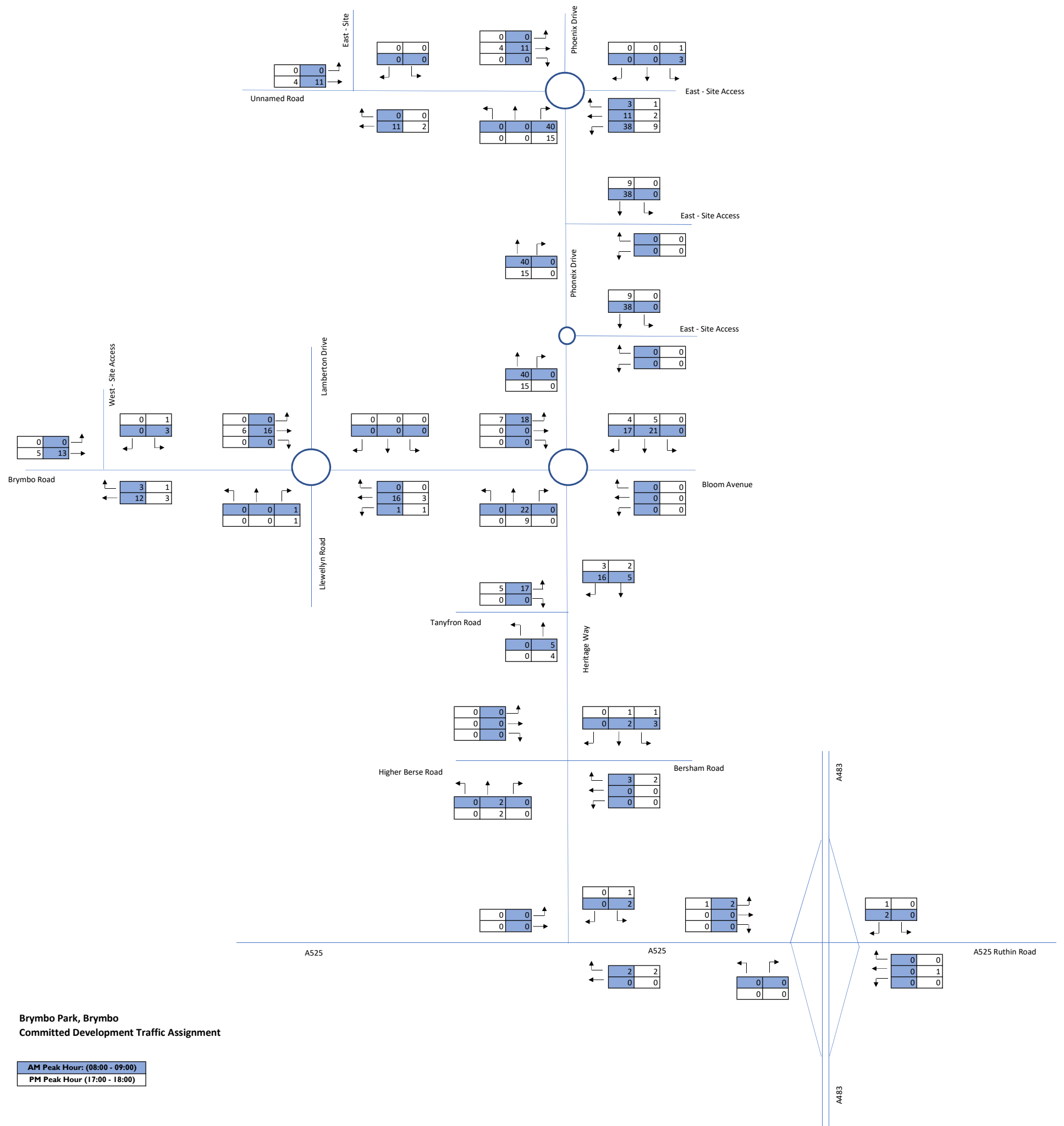
5.1.1 The total trip generation and zone distribution associated with the whole site is provided in Table 5-1 as follows.

Table 5-1: Total Site Trip Distribution

Zone	AM Peak Hour			PM Peak Hour		
	Arrivals	Departures	Total	Arrivals	Departures	Total
1	4	4	8	3	2	5
2	16	25	41	17	8	25
3	15	28	43	19	9	29
4	51	90	141	90	44	133
5	19	16	35	11	10	21
6	61	52	113	35	45	80
7	63	53	115	38	47	84
8	10	11	21	4	3	7
9	10	8	18	6	7	13
10	22	44	66	56	27	82
Total	269	332	601	279	201	481

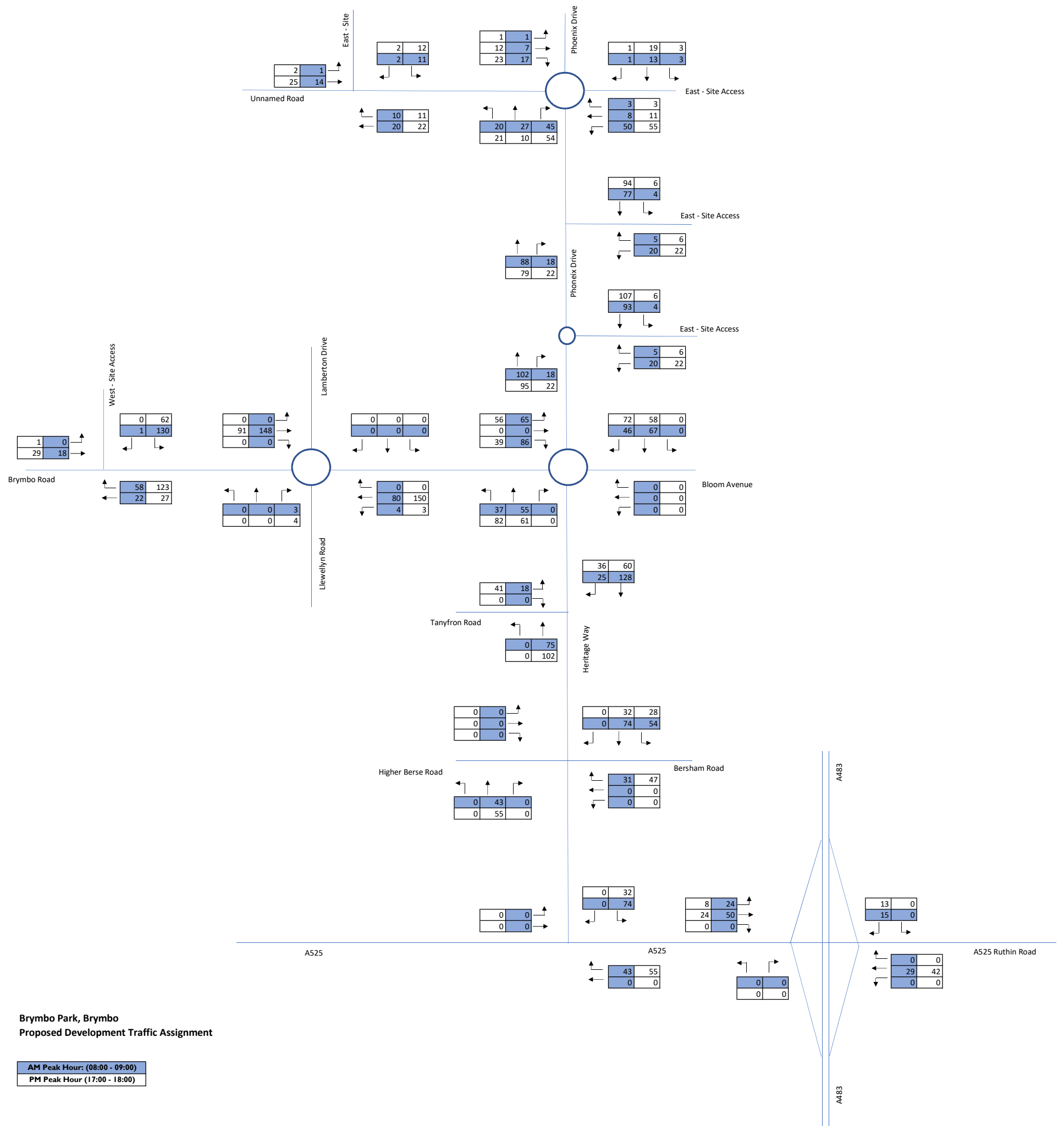
6 Route Assignment

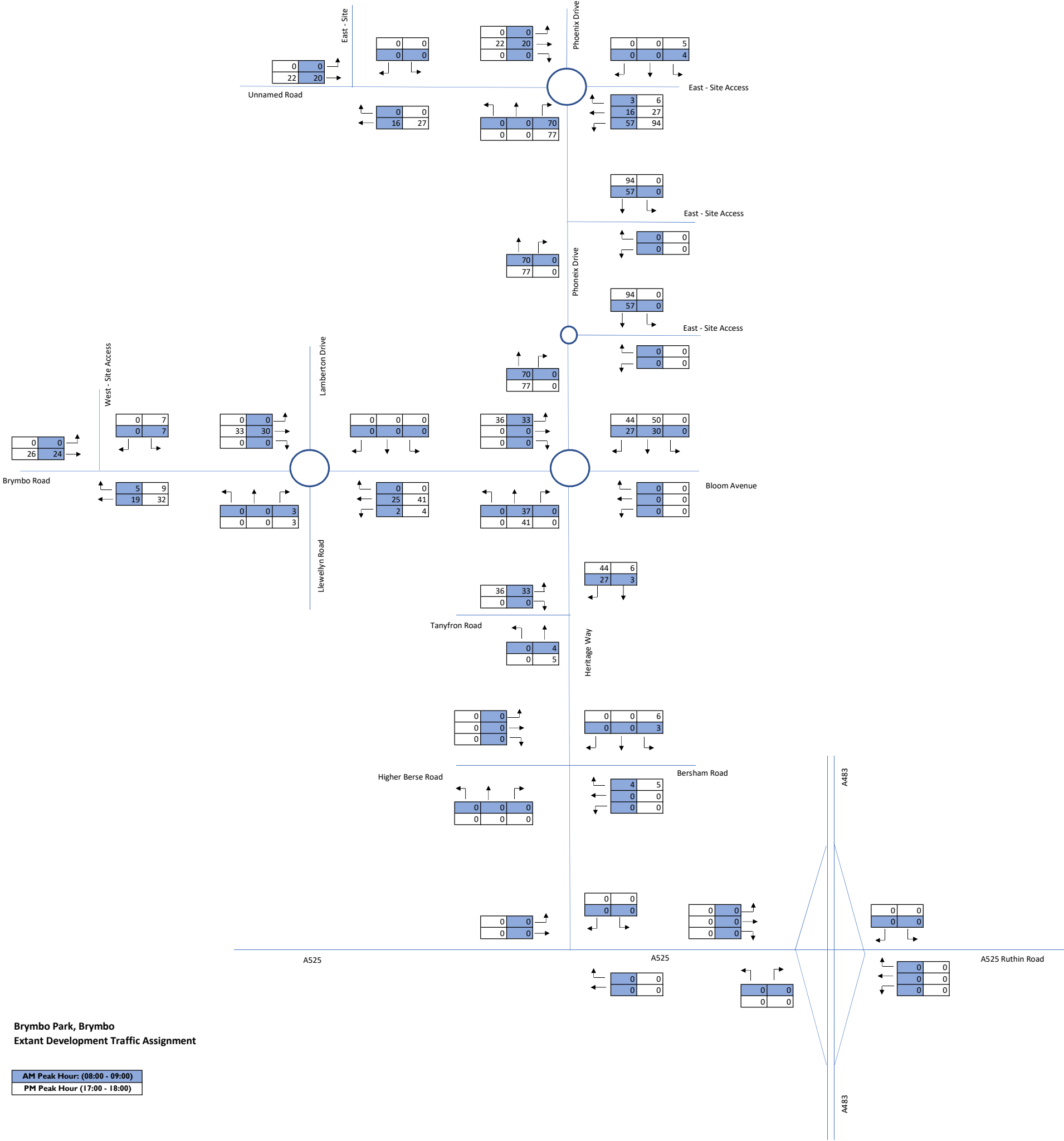
- 6.1.1 The vehicle trips for each development parcel have been assigned to the local highway network based upon the above distribution and the logical routes to and from these areas. Possible routing has been derived from Google Maps from the site access points to each zone.
- 6.1.2 The model has been developed to account for route choice, and where multiple routes were identified by Google Maps, trips have been proportionally split between each route.
- 6.1.3 A full route assignment diagram for each development parcel has been included within **Appendix A**.

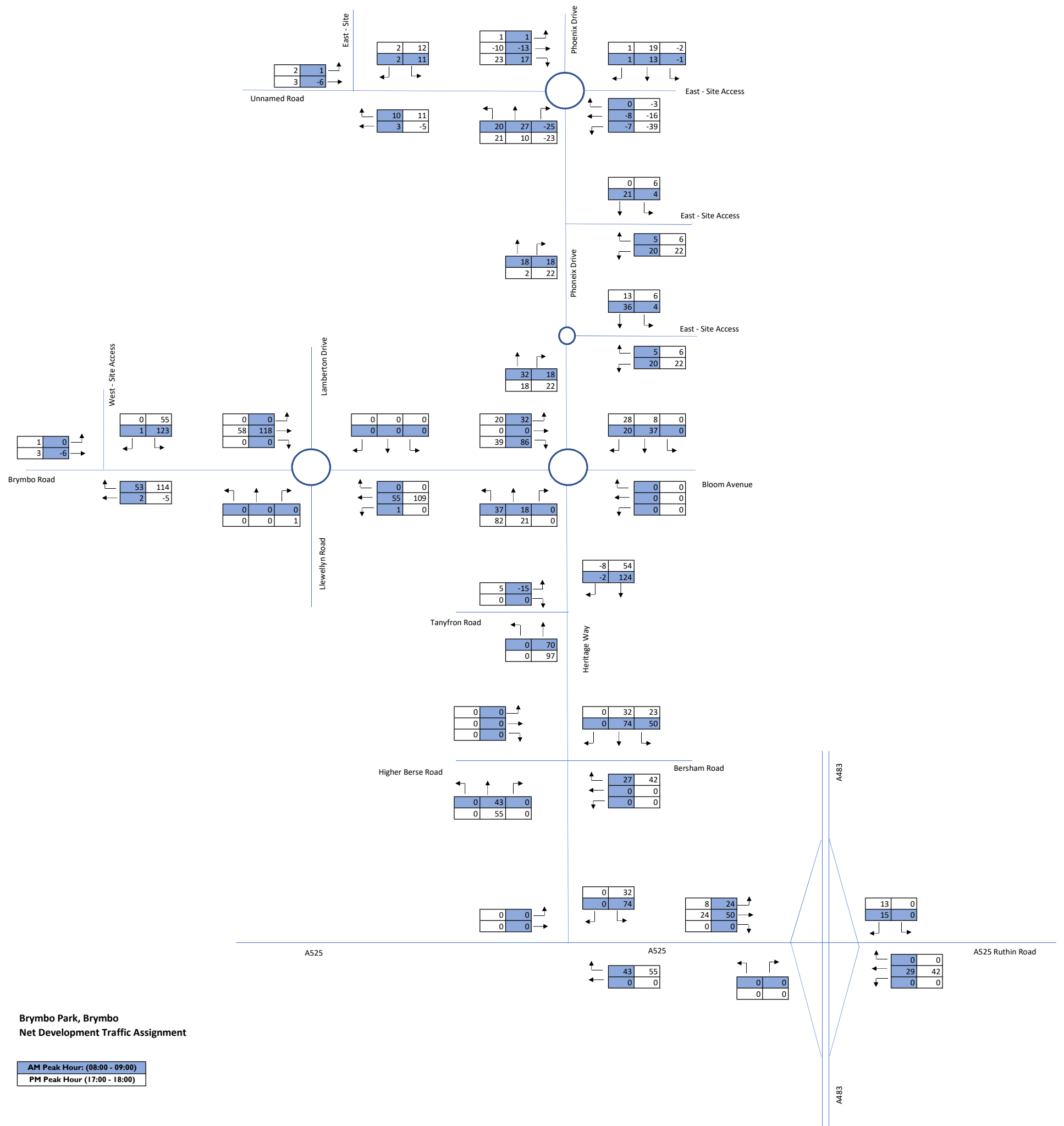


Brymbo Park, Brymbo
Committed Development Traffic Assignment

AM Peak Hour: (08:00 - 09:00)
PM Peak Hour (17:00 - 18:00)



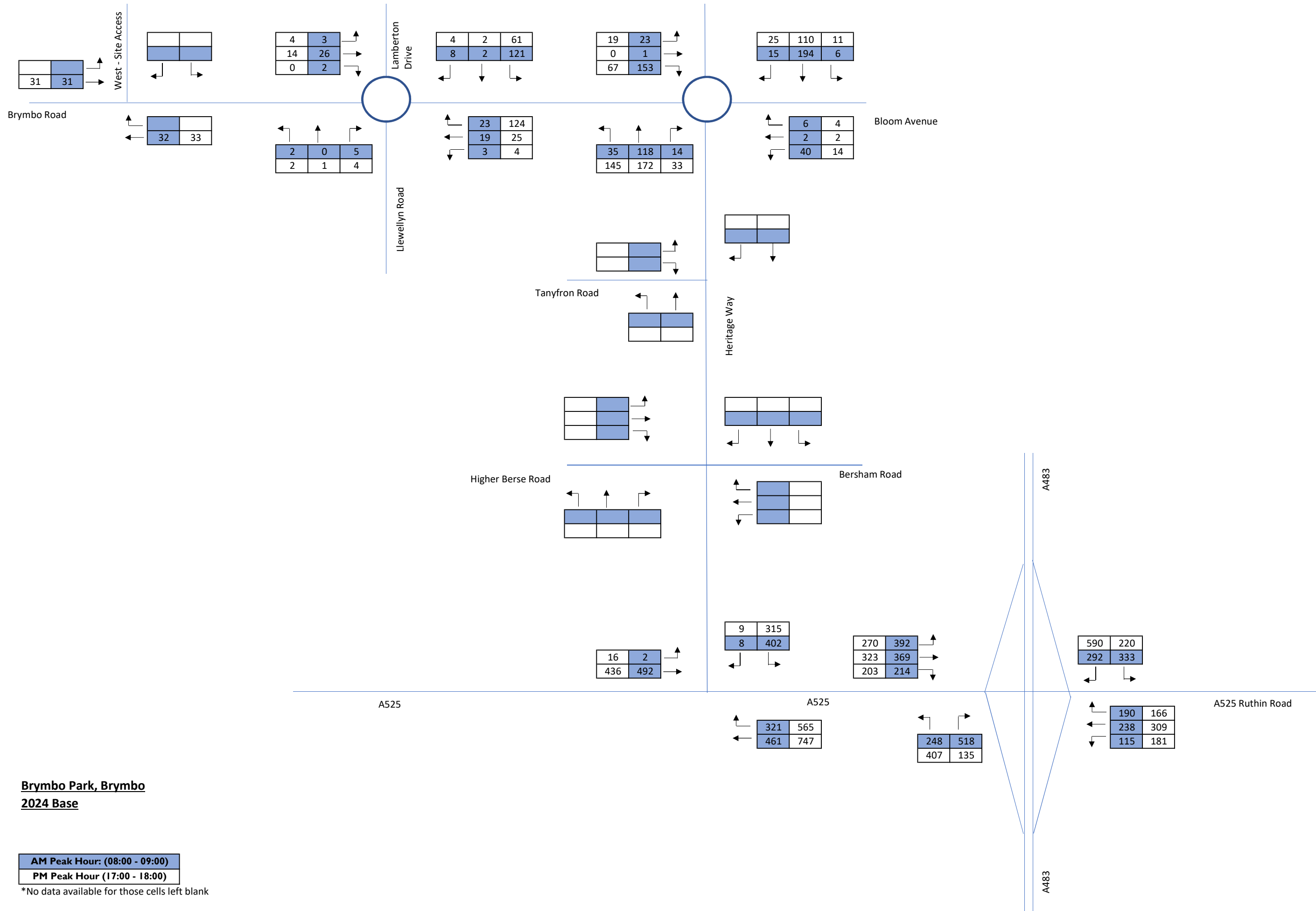




Brymbo Park, Brymbo

Net Development Traffic Assignment

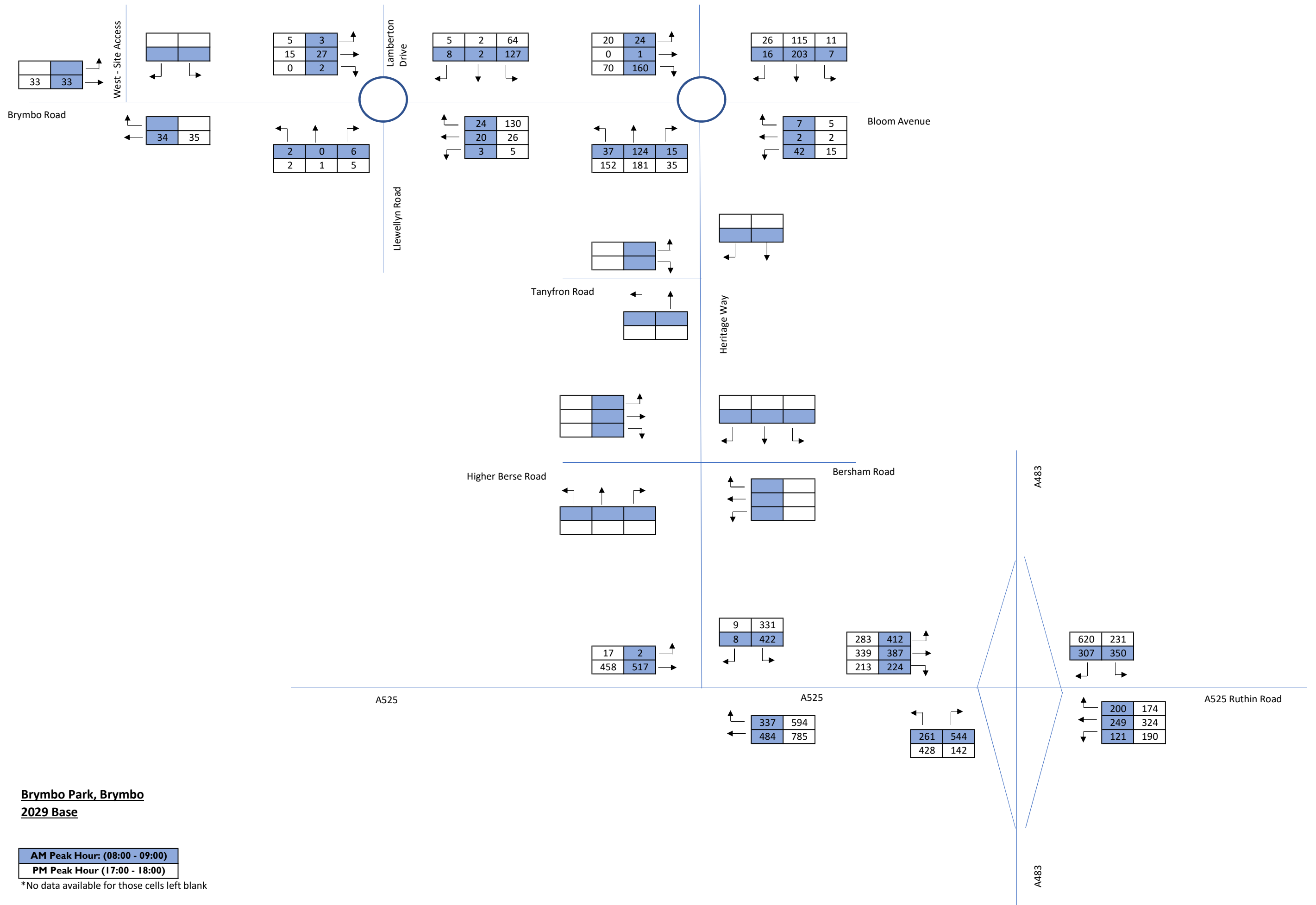
AM Peak Hour: (08:00 - 09:00)
PM Peak Hour (17:00 - 18:00)

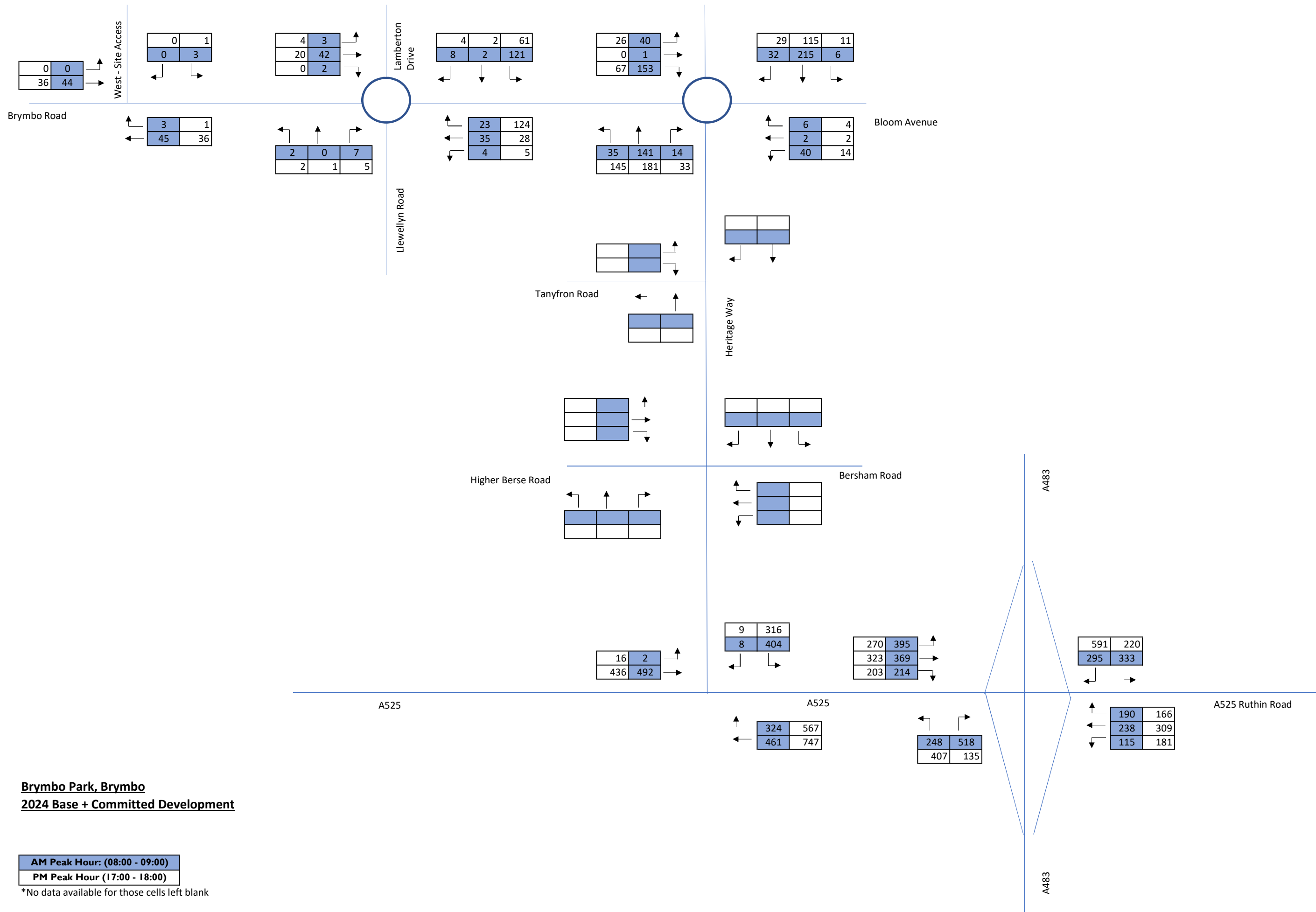


Brymbo Park, Brymbo
2024 Base

AM Peak Hour: (08:00 - 09:00)
PM Peak Hour: (17:00 - 18:00)

*No data available for those cells left blank

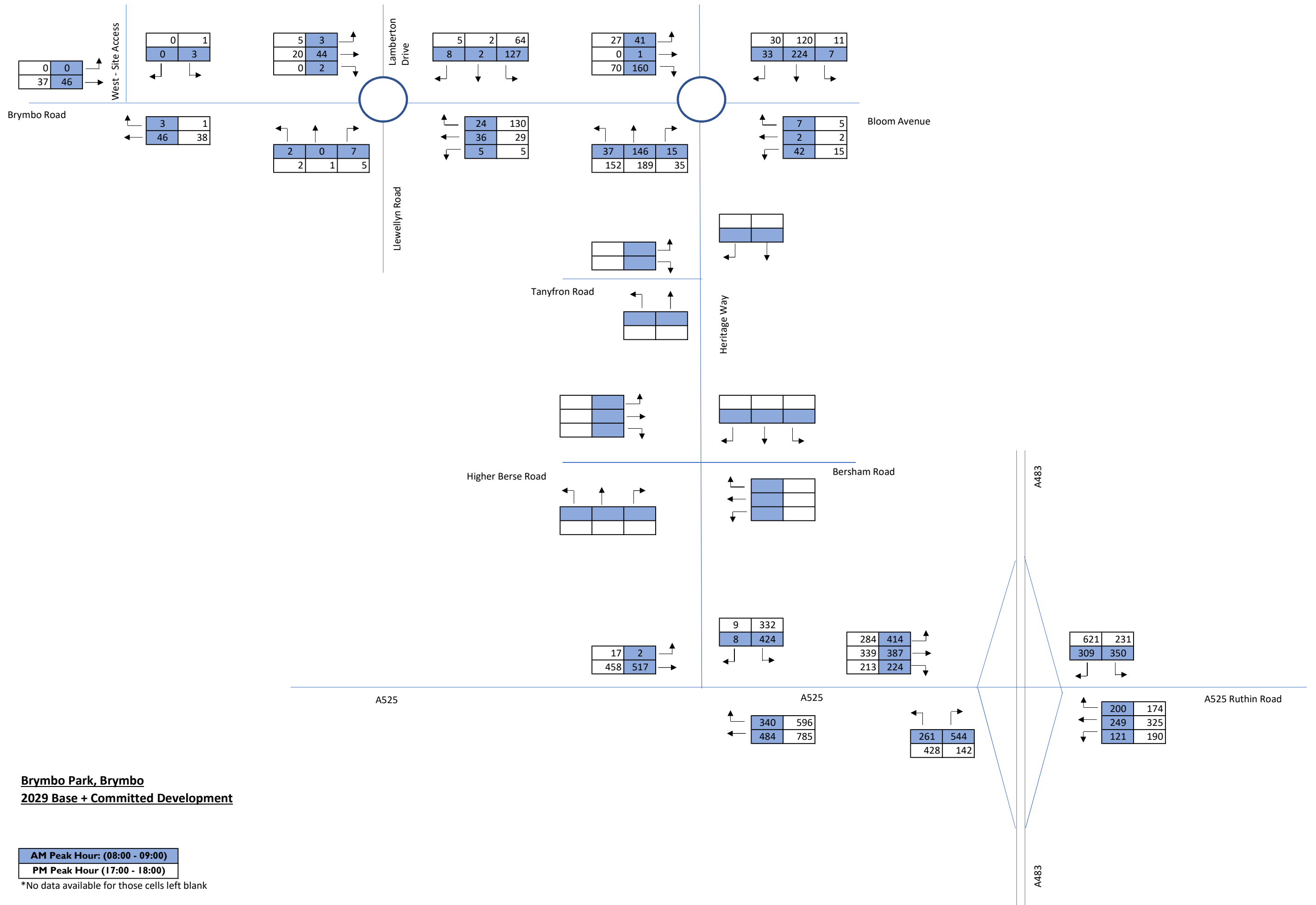


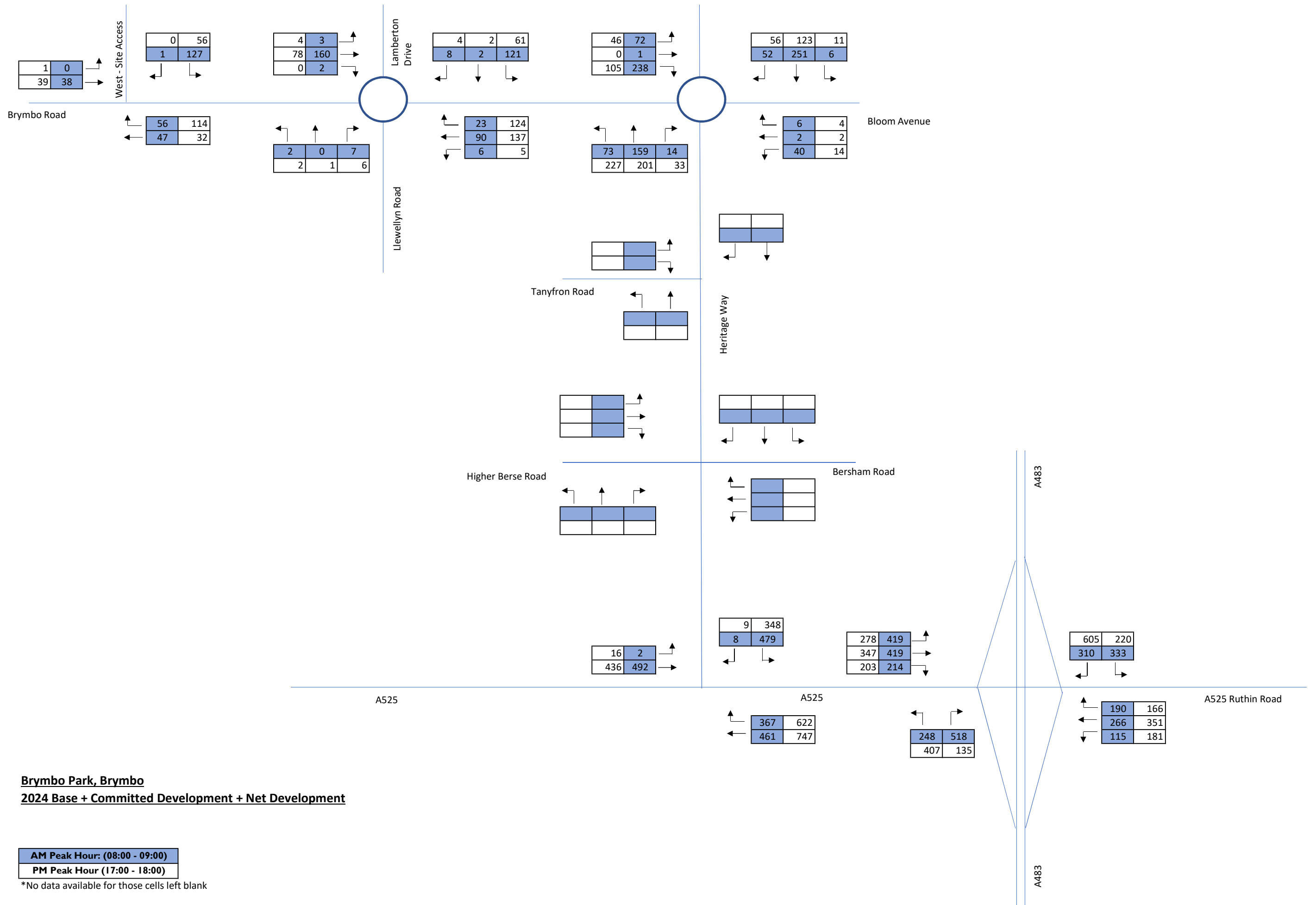


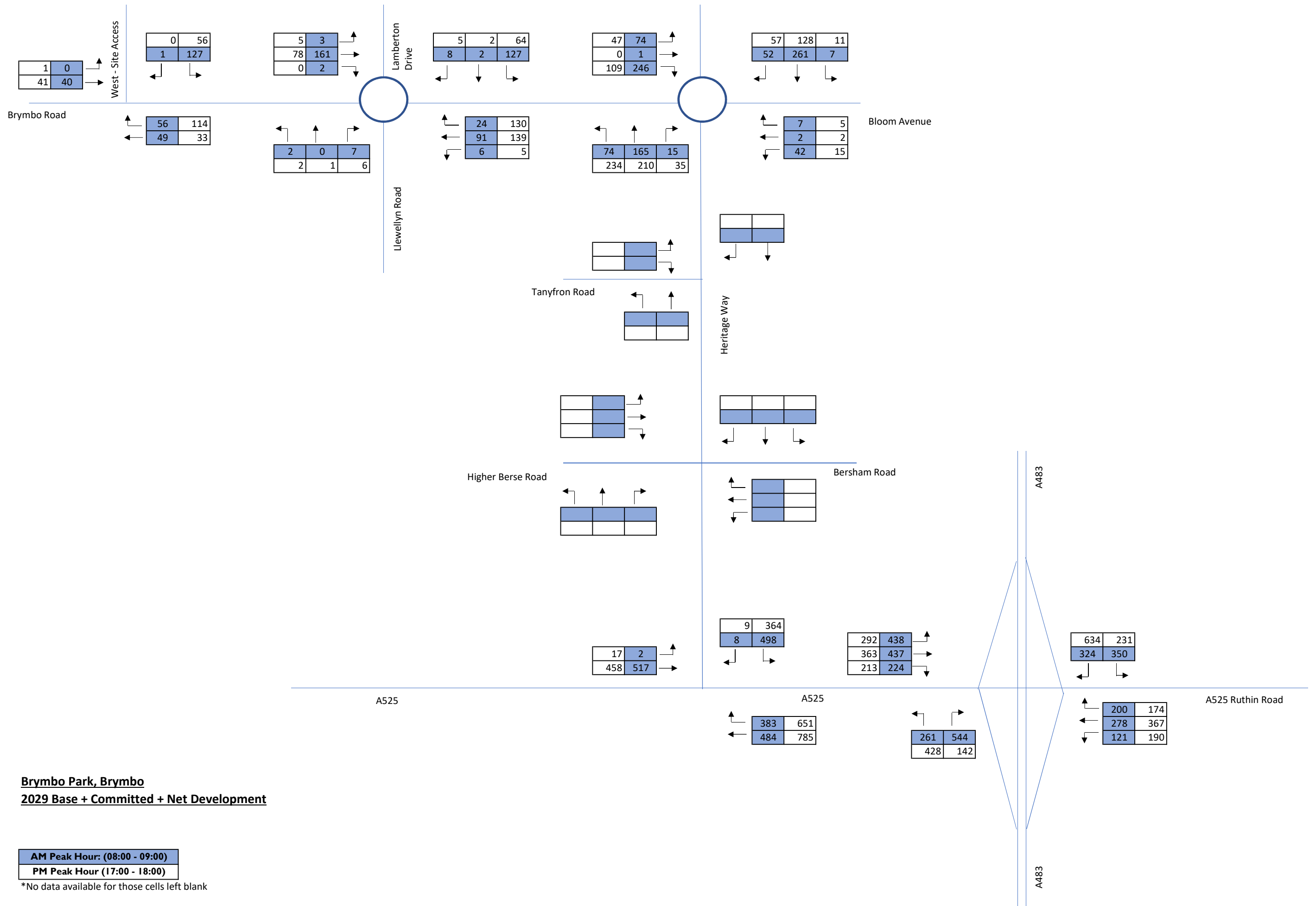
Brymbo Park, Brymbo
2024 Base + Committed Development

AM Peak Hour: (08:00 - 09:00)
PM Peak Hour (17:00 - 18:00)

*No data available for those cells left blank









Appendix E Junction Capacity Modelling Outputs

Junctions 9				
PICADY 9 - Priority Intersection Module				
Version: 9.5.0.6896 © Copyright TRL Limited, 2018				
For sales and distribution information, program advice and maintenance, contact TRL: +44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk				
The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution				

Filename: Brymbo Road Site Access.j9

Path: T:\Projects Current\#3400\03499 Brymbo, Wrexham\3. Technical\3.2 Modelling\Brymbo Road Site Access

Report generation date: 21/03/2019 14:42:10

»Proposed Layout - 2024 B+C+D, AM

»Proposed Layout - 2024 B+C+D, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
Proposed Layout - 2024 B+C+D								
Stream B-C	0.2	6.04	0.19	A	0.1	5.34	0.08	A
Stream B-A	0.0	7.66	0.00	A	0.0	0.00	0.00	A
Stream C-AB	0.1	6.11	0.10	A	0.3	7.04	0.21	A

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

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

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	27/11/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	PJA\Jack Hanly
Description	

Units

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2024 B+C+D	AM	ONE HOUR	08:00	09:30	15
D2	2024 B+C+D	PM	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Proposed Layout	100.000

Proposed Layout - 2024 B+C+D, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.25	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	untitled	Brymbo Road West	Major
B	untitled	Site Access	Minor
C	untitled	Brymbo Road East	Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.30			100.0	✓	0.00

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

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	4.50	3.20	3.20	3.20	✓	1.00	24	108

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	512	0.092	0.233	0.146	0.333
1	B-C	748	0.113	0.286	-	-
1	C-B	632	0.242	0.242	-	-

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

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

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2024 B+C+D	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	38	100.000
B		✓	128	100.000
C		✓	103	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A	B	C
	A	0	0	38
	B	1	0	127
	C	47	56	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A	B	C
	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.19	6.04	0.2	A
B-A	0.00	7.66	0.0	A
C-AB	0.10	6.11	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	96	740	0.129	95	0.1	5.579	A
B-A	0.75	485	0.002	0.75	0.0	7.426	A
C-AB	45	648	0.069	44	0.1	5.960	A
C-A	33			33			
A-B	0			0			
A-C	29			29			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	114	738	0.155	114	0.2	5.766	A
B-A	0.90	480	0.002	0.90	0.0	7.520	A
C-AB	54	651	0.083	54	0.1	6.025	A
C-A	39			39			
A-B	0			0			
A-C	34			34			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	140	736	0.190	140	0.2	6.037	A
B-A	1	471	0.002	1	0.0	7.658	A
C-AB	67	656	0.102	67	0.1	6.114	A
C-A	46			46			
A-B	0			0			
A-C	42			42			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	140	736	0.190	140	0.2	6.039	A
B-A	1	471	0.002	1	0.0	7.659	A
C-AB	67	656	0.102	67	0.1	6.115	A
C-A	46			46			
A-B	0			0			
A-C	42			42			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	114	738	0.155	114	0.2	5.772	A
B-A	0.90	479	0.002	0.90	0.0	7.524	A
C-AB	54	651	0.083	54	0.1	6.030	A
C-A	39			39			
A-B	0			0			
A-C	34			34			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	96	740	0.129	96	0.1	5.592	A
B-A	0.75	485	0.002	0.75	0.0	7.429	A
C-AB	45	648	0.069	45	0.1	5.966	A
C-A	33			33			
A-B	0			0			
A-C	29			29			

Proposed Layout - 2024 B+C+D, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Minor arm flare	Arm B - Minor arm geometry	Is flare very short? Estimated flare length is zero but has been increased to 1 because a zero flare length is not allowed.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.72	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2024 B+C+D	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	40	100.000
B		✓	56	100.000
C		✓	146	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
From		A	B	C
	A	0	1	39
	B	0	0	56
	C	32	114	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
From		A	B	C
	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.08	5.34	0.1	A
B-A	0.00	0.00	0.0	A
C-AB	0.21	7.04	0.3	A
C-A				
A-B				
A-C				

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	42	740	0.057	42	0.1	5.154	A
B-A	0	472	0.000	0	0.0	0.000	A
C-AB	89	640	0.139	89	0.2	6.518	A
C-A	21			21			
A-B	0.75			0.75			
A-C	29			29			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	50	739	0.068	50	0.1	5.230	A
B-A	0	465	0.000	0	0.0	0.000	A
C-AB	107	642	0.167	107	0.2	6.729	A
C-A	24			24			
A-B	0.90			0.90			
A-C	35			35			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	62	736	0.084	62	0.1	5.335	A
B-A	0	454	0.000	0	0.0	0.000	A
C-AB	133	644	0.206	133	0.3	7.031	A
C-A	28			28			
A-B	1			1			
A-C	43			43			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	62	736	0.084	62	0.1	5.335	A
B-A	0	454	0.000	0	0.0	0.000	A
C-AB	133	644	0.206	133	0.3	7.040	A
C-A	28			28			
A-B	1			1			
A-C	43			43			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	50	739	0.068	50	0.1	5.231	A
B-A	0	465	0.000	0	0.0	0.000	A
C-AB	107	642	0.167	108	0.2	6.738	A
C-A	24			24			
A-B	0.90			0.90			
A-C	35			35			

18:15 - 18:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	42	740	0.057	42	0.1	5.157	A
B-A	0	472	0.000	0	0.0	0.000	A
C-AB	89	640	0.139	89	0.2	6.538	A
C-A	21			21			
A-B	0.75			0.75			
A-C	29			29			

Junctions 9			
ARCADY 9 - Roundabout Module			
Version: 9.5.0.6896 © Copyright TRL Limited, 2018			
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Filename: Phoenix Drive_ Bloom Ave_ Brymbo Road.j9

Path: T:\Projects Current\#3400\03499 Brymbo, Wrexham\3. Technical\3.2 Modelling\Phoenix Way_Brymbo Road

Report generation date: 21/03/2019 15:40:53

- »Existing Layout - 2018, AM
- »Existing Layout - 2018, PM
- »Existing Layout - 2024 Base , AM
- »Existing Layout - 2024 Base , PM
- »Existing Layout - 2024 Base + Committed, AM
- »Existing Layout - 2024 Base + Committed, PM
- »Existing Layout - 2024 Base + Committed + Net , AM
- »Existing Layout - 2024 Base + Committed + Net, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
Existing Layout - 2018								
Arm 1	0.2	3.37	0.17	A	0.1	3.05	0.11	A
Arm 2	0.1	4.38	0.06	A	0.0	3.85	0.02	A
Arm 3	0.1	2.67	0.11	A	0.3	3.11	0.24	A
Arm 4	0.2	3.18	0.14	A	0.1	3.05	0.07	A
Existing Layout - 2024 Base								
Arm 1	0.2	3.45	0.18	A	0.1	3.09	0.12	A
Arm 2	0.1	4.47	0.06	A	0.0	3.89	0.02	A
Arm 3	0.1	2.69	0.12	A	0.3	3.19	0.25	A
Arm 4	0.2	3.24	0.15	A	0.1	3.09	0.08	A
Existing Layout - 2024 Base + Committed								
Arm 1	0.3	3.59	0.22	A	0.1	3.12	0.13	A
Arm 2	0.1	4.60	0.06	A	0.0	3.92	0.02	A
Arm 3	0.2	2.77	0.14	A	0.4	3.22	0.26	A
Arm 4	0.2	3.34	0.17	A	0.1	3.13	0.08	A
Existing Layout - 2024 Base + Committed + Net								
Arm 1	0.4	4.07	0.28	A	0.2	3.30	0.16	A
Arm 2	0.1	5.11	0.07	A	0.0	4.10	0.02	A
Arm 3	0.2	2.94	0.18	A	0.5	3.65	0.34	A
Arm 4	0.4	3.84	0.27	A	0.2	3.35	0.13	A

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

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

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	22/11/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	PJA\Jack Hanly
Description	

Units

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2018	AM	ONE HOUR	08:00	09:30	15
D2	2018	PM	ONE HOUR	17:00	18:30	15
D3	2024 Base	AM	ONE HOUR	08:00	09:30	15
D4	2024 Base	PM	ONE HOUR	17:00	18:30	15
D5	2024 Base + Committed	AM	ONE HOUR	08:00	09:30	15
D6	2024 Base + Committed	PM	ONE HOUR	17:00	18:30	15
D7	2024 Base + Committed + Net	AM	ONE HOUR	08:00	09:30	15
D8	2024 Base + Committed + Net	PM	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Existing Layout	100.000

Existing Layout - 2018, AM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	3.20	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	3.70	6.10	4.3	34.0	32.0	34.0	
2	2.80	4.50	6.5	15.7	32.0	44.0	
3	3.70	4.90	13.2	37.6	32.0	9.0	
4	3.00	5.70	9.9	23.9	32.0	21.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.595	1391
2	0.506	1059
3	0.652	1537
4	0.606	1399

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2018	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	200	100.000
2		✓	45	100.000
3		✓	156	100.000
4		✓	164	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
	1	2	3	4	
From	1	0	6	180	14
	2	6	0	37	2
	3	110	13	0	33
	4	21	1	142	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
	1	2	3	4	
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.17	3.37	0.2	A
2	0.06	4.38	0.1	A
3	0.11	2.67	0.1	A
4	0.14	3.18	0.2	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	151	117	1321	0.114	150	0.1	3.072	A
2	34	252	931	0.036	34	0.0	4.011	A
3	117	17	1526	0.077	117	0.1	2.554	A
4	123	97	1340	0.092	123	0.1	2.958	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	180	140	1307	0.138	180	0.2	3.191	A
2	40	302	906	0.045	40	0.0	4.158	A
3	140	20	1524	0.092	140	0.1	2.600	A
4	147	116	1328	0.111	147	0.1	3.047	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	220	172	1289	0.171	220	0.2	3.368	A
2	50	370	872	0.057	49	0.1	4.377	A
3	172	24	1521	0.113	172	0.1	2.667	A
4	181	142	1313	0.138	180	0.2	3.179	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	220	172	1289	0.171	220	0.2	3.368	A
2	50	370	872	0.057	50	0.1	4.378	A
3	172	24	1521	0.113	172	0.1	2.667	A
4	181	142	1313	0.138	181	0.2	3.179	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	180	140	1307	0.138	180	0.2	3.193	A
2	40	302	906	0.045	41	0.0	4.161	A
3	140	20	1524	0.092	140	0.1	2.601	A
4	147	116	1328	0.111	148	0.1	3.051	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	151	118	1321	0.114	151	0.1	3.076	A
2	34	253	931	0.036	34	0.0	4.013	A
3	117	17	1526	0.077	118	0.1	2.557	A
4	123	97	1340	0.092	124	0.1	2.959	A

Existing Layout - 2018, PM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	3.11	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2018	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	135	100.000
2		✓	19	100.000
3		✓	326	100.000
4		✓	80	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
	1	2	3	4	
From	1	0	10	102	23
	2	4	0	13	2
	3	160	31	0	135
	4	18	0	62	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
		1	2	3	4
	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
From	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.11	3.05	0.1	A
2	0.02	3.85	0.0	A
3	0.24	3.11	0.3	A
4	0.07	3.05	0.1	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	102	70	1349	0.075	101	0.1	2.884	A
2	14	140	988	0.014	14	0.0	3.696	A
3	245	22	1523	0.161	245	0.2	2.815	A
4	60	146	1310	0.046	60	0.0	2.880	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	121	84	1341	0.091	121	0.1	2.950	A
2	17	168	974	0.018	17	0.0	3.761	A
3	293	26	1520	0.193	293	0.2	2.933	A
4	72	175	1292	0.056	72	0.1	2.949	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	149	102	1330	0.112	149	0.1	3.046	A
2	21	206	955	0.022	21	0.0	3.854	A
3	359	32	1516	0.237	359	0.3	3.109	A
4	88	215	1269	0.069	88	0.1	3.048	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	149	102	1330	0.112	149	0.1	3.046	A
2	21	206	955	0.022	21	0.0	3.854	A
3	359	32	1516	0.237	359	0.3	3.109	A
4	88	215	1268	0.069	88	0.1	3.049	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	121	84	1341	0.091	121	0.1	2.953	A
2	17	168	974	0.018	17	0.0	3.762	A
3	293	26	1520	0.193	293	0.2	2.934	A
4	72	175	1292	0.056	72	0.1	2.952	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	102	70	1349	0.075	102	0.1	2.887	A
2	14	141	988	0.014	14	0.0	3.697	A
3	245	22	1523	0.161	246	0.2	2.820	A
4	60	147	1310	0.046	60	0.0	2.883	A

Existing Layout - 2024 Base , AM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	3.26	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2024 Base	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	215	100.000
2		✓	48	100.000
3		✓	167	100.000
4		✓	177	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
	1	2	3	4	
From	1	0	6	194	15
	2	6	0	40	2
	3	118	14	0	35
	4	23	1	153	0

Vehicle Mix

Heavy Vehicle Percentages

From	To				
		1	2	3	4
	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.18	3.45	0.2	A
2	0.06	4.47	0.1	A
3	0.12	2.69	0.1	A
4	0.15	3.24	0.2	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	162	126	1316	0.123	161	0.1	3.116	A
2	36	272	921	0.039	36	0.0	4.065	A
3	126	17	1526	0.082	125	0.1	2.570	A
4	133	104	1336	0.100	133	0.1	2.992	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	193	151	1301	0.149	193	0.2	3.249	A
2	43	325	894	0.048	43	0.1	4.228	A
3	150	21	1524	0.099	150	0.1	2.620	A
4	159	124	1323	0.120	159	0.1	3.091	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	237	185	1281	0.185	237	0.2	3.446	A
2	53	398	857	0.062	53	0.1	4.473	A
3	184	25	1521	0.121	184	0.1	2.692	A
4	195	152	1307	0.149	195	0.2	3.237	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	237	185	1281	0.185	237	0.2	3.447	A
2	53	399	857	0.062	53	0.1	4.474	A
3	184	25	1521	0.121	184	0.1	2.692	A
4	195	152	1306	0.149	195	0.2	3.237	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	193	151	1301	0.149	193	0.2	3.250	A
2	43	326	894	0.048	43	0.1	4.232	A
3	150	21	1524	0.099	150	0.1	2.623	A
4	159	124	1323	0.120	159	0.1	3.092	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	162	127	1316	0.123	162	0.1	3.120	A
2	36	273	921	0.039	36	0.0	4.070	A
3	126	17	1526	0.082	126	0.1	2.571	A
4	133	104	1336	0.100	133	0.1	2.994	A

Existing Layout - 2024 Base , PM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	3.17	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2024 Base	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	146	100.000
2		✓	20	100.000
3		✓	350	100.000
4		✓	86	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
	1	2	3	4	
From	1	0	11	110	25
	2	4	0	14	2
	3	172	33	0	145
	4	19	0	67	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
		1	2	3	4
	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
From	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.12	3.09	0.1	A
2	0.02	3.89	0.0	A
3	0.25	3.19	0.3	A
4	0.08	3.09	0.1	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	110	75	1346	0.082	110	0.1	2.911	A
2	15	152	982	0.015	15	0.0	3.721	A
3	263	23	1522	0.173	263	0.2	2.857	A
4	65	157	1304	0.050	65	0.1	2.905	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	131	90	1337	0.098	131	0.1	2.984	A
2	18	181	967	0.019	18	0.0	3.792	A
3	315	28	1519	0.207	314	0.3	2.988	A
4	77	188	1285	0.060	77	0.1	2.980	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	161	110	1325	0.121	161	0.1	3.090	A
2	22	222	946	0.023	22	0.0	3.894	A
3	385	34	1515	0.254	385	0.3	3.186	A
4	95	230	1259	0.075	95	0.1	3.090	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	161	110	1325	0.121	161	0.1	3.090	A
2	22	222	946	0.023	22	0.0	3.894	A
3	385	34	1515	0.254	385	0.3	3.186	A
4	95	230	1259	0.075	95	0.1	3.091	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	131	90	1337	0.098	131	0.1	2.987	A
2	18	182	967	0.019	18	0.0	3.795	A
3	315	28	1519	0.207	315	0.3	2.990	A
4	77	188	1285	0.060	77	0.1	2.983	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	110	75	1346	0.082	110	0.1	2.912	A
2	15	152	982	0.015	15	0.0	3.722	A
3	263	23	1522	0.173	264	0.2	2.861	A
4	65	157	1303	0.050	65	0.1	2.906	A

Existing Layout - 2024 Base + Committed, AM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	3.36	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2024 Base + Committed	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	253	100.000
2		✓	48	100.000
3		✓	190	100.000
4		✓	194	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
	1	2	3	4	
From	1	0	6	215	32
	2	6	0	40	2
	3	141	14	0	35
	4	40	1	153	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
		1	2	3	4
	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
From	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.22	3.59	0.3	A
2	0.06	4.60	0.1	A
3	0.14	2.77	0.2	A
4	0.17	3.34	0.2	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	190	126	1316	0.145	190	0.2	3.195	A
2	36	300	907	0.040	36	0.0	4.133	A
3	143	30	1518	0.094	143	0.1	2.618	A
4	146	121	1325	0.110	146	0.1	3.049	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	227	151	1301	0.175	227	0.2	3.352	A
2	43	359	877	0.049	43	0.1	4.316	A
3	171	36	1514	0.113	171	0.1	2.680	A
4	174	145	1311	0.133	174	0.2	3.166	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	279	185	1281	0.217	278	0.3	3.590	A
2	53	440	836	0.063	53	0.1	4.594	A
3	209	44	1508	0.139	209	0.2	2.770	A
4	214	177	1291	0.165	213	0.2	3.339	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	279	185	1281	0.217	279	0.3	3.591	A
2	53	440	836	0.063	53	0.1	4.595	A
3	209	44	1508	0.139	209	0.2	2.770	A
4	214	177	1291	0.165	214	0.2	3.340	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	227	151	1301	0.175	228	0.2	3.357	A
2	43	360	877	0.049	43	0.1	4.320	A
3	171	36	1514	0.113	171	0.1	2.683	A
4	174	145	1311	0.133	175	0.2	3.168	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	190	127	1316	0.145	191	0.2	3.200	A
2	36	301	906	0.040	36	0.0	4.136	A
3	143	30	1517	0.094	143	0.1	2.619	A
4	146	121	1325	0.110	146	0.1	3.053	A

Existing Layout - 2024 Base + Committed, PM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	3.20	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2024 Base + Committed	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	155	100.000
2		✓	20	100.000
3		✓	359	100.000
4		✓	93	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
	1	2	3	4	
From	1	0	11	115	29
	2	4	0	14	2
	3	181	33	0	145
	4	26	0	67	0

Vehicle Mix

Heavy Vehicle Percentages

From	To				
		1	2	3	4
	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.13	3.12	0.1	A
2	0.02	3.92	0.0	A
3	0.26	3.22	0.4	A
4	0.08	3.13	0.1	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	117	75	1346	0.087	116	0.1	2.927	A
2	15	158	979	0.015	15	0.0	3.734	A
3	270	26	1520	0.178	269	0.2	2.877	A
4	70	164	1299	0.054	70	0.1	2.927	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	139	90	1337	0.104	139	0.1	3.004	A
2	18	190	963	0.019	18	0.0	3.808	A
3	323	31	1517	0.213	323	0.3	3.014	A
4	84	196	1280	0.065	84	0.1	3.008	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	171	110	1325	0.129	171	0.1	3.117	A
2	22	232	941	0.023	22	0.0	3.915	A
3	395	39	1512	0.261	395	0.4	3.222	A
4	102	240	1253	0.082	102	0.1	3.127	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	171	110	1325	0.129	171	0.1	3.117	A
2	22	232	941	0.023	22	0.0	3.915	A
3	395	39	1512	0.261	395	0.4	3.223	A
4	102	240	1253	0.082	102	0.1	3.127	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	139	90	1337	0.104	139	0.1	3.007	A
2	18	190	963	0.019	18	0.0	3.812	A
3	323	31	1517	0.213	323	0.3	3.018	A
4	84	196	1280	0.065	84	0.1	3.009	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	117	75	1346	0.087	117	0.1	2.928	A
2	15	159	978	0.015	15	0.0	3.735	A
3	270	26	1520	0.178	270	0.2	2.883	A
4	70	164	1299	0.054	70	0.1	2.928	A

Existing Layout - 2024 Base + Committed + Net , AM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	3.74	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D7	2024 Base + Committed + Net	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	309	100.000
2		✓	48	100.000
3		✓	246	100.000
4		✓	311	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
	1	2	3	4	
From	1	0	6	251	52
	2	6	0	40	2
	3	159	14	0	73
	4	72	1	238	0

Vehicle Mix

Heavy Vehicle Percentages

From	To				
		1	2	3	4
	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.28	4.07	0.4	A
2	0.07	5.11	0.1	A
3	0.18	2.94	0.2	A
4	0.27	3.84	0.4	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	233	190	1278	0.182	232	0.2	3.437	A
2	36	406	854	0.042	36	0.0	4.401	A
3	185	45	1508	0.123	185	0.1	2.719	A
4	234	134	1317	0.178	233	0.2	3.316	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	278	227	1256	0.221	278	0.3	3.680	A
2	43	486	813	0.053	43	0.1	4.675	A
3	221	54	1502	0.147	221	0.2	2.810	A
4	280	161	1301	0.215	279	0.3	3.523	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	340	278	1225	0.278	340	0.4	4.063	A
2	53	595	758	0.070	53	0.1	5.105	A
3	271	66	1494	0.181	271	0.2	2.942	A
4	342	197	1279	0.268	342	0.4	3.838	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	340	279	1225	0.278	340	0.4	4.067	A
2	53	596	758	0.070	53	0.1	5.107	A
3	271	66	1494	0.181	271	0.2	2.942	A
4	342	197	1279	0.268	342	0.4	3.843	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	278	228	1255	0.221	278	0.3	3.684	A
2	43	487	813	0.053	43	0.1	4.679	A
3	221	54	1502	0.147	221	0.2	2.813	A
4	280	161	1301	0.215	280	0.3	3.526	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	233	191	1277	0.182	233	0.2	3.446	A
2	36	408	853	0.042	36	0.0	4.410	A
3	185	45	1508	0.123	185	0.1	2.724	A
4	234	135	1317	0.178	234	0.2	3.328	A

Existing Layout - 2024 Base + Committed + Net, PM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	3.53	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D8	2024 Base + Committed + Net	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	190	100.000
2		✓	20	100.000
3		✓	461	100.000
4		✓	151	100.000

Origin-Destination Data

Demand (PCU/hr)

	To				
	1	2	3	4	
From	1	0	11	123	56
	2	4	0	14	2
	3	201	33	0	227
	4	46	0	105	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
		1	2	3	4
	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
From	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.16	3.30	0.2	A
2	0.02	4.10	0.0	A
3	0.34	3.65	0.5	A
4	0.13	3.35	0.2	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	143	104	1329	0.108	143	0.1	3.031	A
2	15	213	951	0.016	15	0.0	3.845	A
3	347	47	1507	0.230	346	0.3	3.098	A
4	114	179	1290	0.088	113	0.1	3.058	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	171	124	1317	0.130	171	0.1	3.139	A
2	18	255	930	0.019	18	0.0	3.947	A
3	414	56	1501	0.276	414	0.4	3.313	A
4	136	214	1269	0.107	136	0.1	3.175	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	209	152	1301	0.161	209	0.2	3.298	A
2	22	312	901	0.024	22	0.0	4.096	A
3	508	68	1493	0.340	507	0.5	3.650	A
4	166	262	1240	0.134	166	0.2	3.352	A

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	209	152	1300	0.161	209	0.2	3.298	A
2	22	313	901	0.024	22	0.0	4.096	A
3	508	68	1493	0.340	508	0.5	3.653	A
4	166	262	1240	0.134	166	0.2	3.352	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	171	124	1317	0.130	171	0.1	3.143	A
2	18	256	930	0.019	18	0.0	3.950	A
3	414	56	1501	0.276	415	0.4	3.319	A
4	136	214	1269	0.107	136	0.1	3.179	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	143	104	1329	0.108	143	0.1	3.035	A
2	15	214	951	0.016	15	0.0	3.847	A
3	347	47	1507	0.230	347	0.3	3.108	A
4	114	179	1290	0.088	114	0.1	3.060	A

Junctions 9			
PICADY 9 - Priority Intersection Module			
Version: 9.5.0.6896 © Copyright TRL Limited, 2018			
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Filename: J1 _ Heritage Way _ A524.j9

Path: T:\Projects Current\#3400\03499 Brymbo, Wrexham\3. Technical\3.2 Modelling\A525_Heritage Way

Report generation date: 21/03/2019 15:00:26

- »2018 Base, AM
- »2018 Base, PM
- »2024 Base , AM
- »2024 Base , PM
- »2024 Base + Committed, AM
- »2024 Base + Committed, PM
- »2024 Base + Committed + Net , AM
- »2024 Base + Committed + Net , PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
2018 Base								
Stream B-C	1.9	16.98	0.64	C	1.1	12.02	0.49	B
Stream B-A	0.0	14.34	0.03	B	0.1	35.46	0.07	E
Stream C-AB	1.5	17.25	0.59	C	30.2	116.05	1.02	F
2024 Base								
Stream B-C	2.3	18.92	0.70	C	1.2	12.91	0.55	B
Stream B-A	0.0	14.60	0.03	B	0.2	74.14	0.17	F
Stream C-AB	1.8	18.38	0.64	C	74.1	359.23	1.11	F
2024 Base + Committed								
Stream B-C	2.3	19.14	0.70	C	1.2	13.02	0.56	B
Stream B-A	0.0	14.69	0.03	B	0.2	77.74	0.18	F
Stream C-AB	1.8	18.69	0.65	C	76.3	370.67	1.11	F
2024 Base + Committed + Net								
Stream B-C	4.6	33.20	0.84	D	3.1	29.97	0.78	D
Stream B-A	0.0	16.11	0.04	C	2.7	915.51	999999999.00	F
Stream C-AB	2.7	24.46	0.74	C	143.3	668.65	1.22	F

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

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

File summary

File Description

Title	A525 / Heritage Way
Location	
Site number	
Date	19/10/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	PJA\Joe Platt
Description	

Units

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2018 Base	AM	ONE HOUR	07:45	09:15	15
D2	2018 Base	PM	ONE HOUR	16:45	18:15	15
D3	2024 Base	AM	ONE HOUR	07:45	09:15	15
D4	2024 Base	PM	ONE HOUR	16:45	18:15	15
D5	2024 Base + Committed	AM	ONE HOUR	07:45	09:15	15
D6	2024 Base + Committed	PM	ONE HOUR	16:45	18:15	15
D7	2024 Base + Committed + Net	AM	ONE HOUR	07:45	09:15	15
D8	2024 Base + Committed + Net	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2018 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A525 / Heritage Way	T-Junction	Two-way		7.40	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	A525 West		Major
B	Heritage Way		Minor
C	A525 East		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.60		✓	3.00	105.0	✓	15.00

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 (Left) (m)	Lane Width (Right) (m)	Visibility to left (m)	Visibility to right (m)
B	Two lanes	3.60	3.00	230	210

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	667	0.118	0.299	0.188	0.427
1	B-C	802	0.120	0.302	-	-
1	C-B	690	0.260	0.260	-	-

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

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

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2018 Base	AM	ONE HOUR	07:45	09:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	460	100.000
B		✓	381	100.000
C		✓	728	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	2	458
	B	7	0	374
	C	429	299	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.64	16.98	1.9	C
B-A	0.03	14.34	0.0	B
C-AB	0.59	17.25	1.5	C
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	282	695	0.405	279	0.7	9.450	A
B-A	5	407	0.013	5	0.0	9.861	A
C-AB	225	600	0.375	223	0.6	10.425	B
C-A	323			323			
A-B	2			2			
A-C	345			345			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	336	674	0.499	335	1.1	11.636	B
B-A	6	355	0.018	6	0.0	11.351	B
C-AB	269	582	0.462	268	0.9	12.539	B
C-A	386			386			
A-B	2			2			
A-C	412			412			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	412	644	0.639	409	1.9	16.573	C
B-A	8	285	0.027	8	0.0	14.286	B
C-AB	329	559	0.590	327	1.5	16.926	C
C-A	472			472			
A-B	2			2			
A-C	504			504			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	412	644	0.639	412	1.9	16.983	C
B-A	8	284	0.027	8	0.0	14.341	B
C-AB	329	559	0.590	329	1.5	17.248	C
C-A	472			472			
A-B	2			2			
A-C	504			504			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	336	674	0.499	339	1.1	11.950	B
B-A	6	354	0.018	6	0.0	11.406	B
C-AB	269	582	0.462	271	1.0	12.818	B
C-A	386			386			
A-B	2			2			
A-C	412			412			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	282	695	0.405	283	0.8	9.650	A
B-A	5	405	0.013	5	0.0	9.905	A
C-AB	225	600	0.375	226	0.7	10.635	B
C-A	323			323			
A-B	2			2			
A-C	345			345			

2018 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A525 / Heritage Way	T-Junction	Two-way		50.51	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2018 Base	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	421	100.000
B		✓	301	100.000
C		✓	1221	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A	B	C
	A	0	15	406
	B	8	0	293
	C	695	526	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A	B	C
	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.49	12.02	1.1	B
B-A	0.07	35.46	0.1	E
C-AB	1.02	116.05	30.2	F
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	221	704	0.313	219	0.5	8.121	A
B-A	6	307	0.020	6	0.0	13.168	B
C-AB	397	609	0.652	389	2.0	17.454	C
C-A	522			522			
A-B	11			11			
A-C	306			306			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	263	684	0.385	263	0.7	9.377	A
B-A	7	233	0.031	7	0.0	17.503	C
C-AB	496	621	0.799	489	3.9	28.416	D
C-A	601			601			
A-B	13			13			
A-C	365			365			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	323	653	0.494	321	1.0	11.868	B
B-A	9	133	0.066	9	0.1	31.686	D
C-AB	1344	1322	1.017	1293	16.8	48.936	E
C-A	0			0			
A-B	17			17			
A-C	447			447			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	323	652	0.495	323	1.1	12.020	B
B-A	9	120	0.073	9	0.1	35.456	E
C-AB	1344	1322	1.017	1291	30.2	79.332	F
C-A	0			0			
A-B	17			17			
A-C	447			447			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	263	683	0.386	265	0.7	9.499	A
B-A	7	201	0.036	7	0.0	20.416	C
C-AB	496	621	0.799	593	6.2	116.052	F
C-A	601			601			
A-B	13			13			
A-C	365			365			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	221	704	0.313	221	0.5	8.218	A
B-A	6	296	0.020	6	0.0	13.651	B
C-AB	397	609	0.652	413	2.2	21.645	C
C-A	522			522			
A-B	11			11			
A-C	306			306			

2024 Base , AM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A525 / Heritage Way	T-Junction	Two-way		8.08	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2024 Base	AM	ONE HOUR	07:45	09:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	494	100.000
B		✓	410	100.000
C		✓	782	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	2	492
	B	8	0	402
	C	461	321	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.70	18.92	2.3	C
B-A	0.03	14.60	0.0	B
C-AB	0.64	18.38	1.8	C
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	303	687	0.441	300	0.8	9.229	A
B-A	6	387	0.016	6	0.0	9.435	A
C-AB	242	593	0.407	239	0.7	10.085	B
C-A	347			347			
A-B	2			2			
A-C	370			370			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	361	664	0.544	360	1.2	11.775	B
B-A	7	332	0.022	7	0.0	11.080	B
C-AB	289	574	0.502	287	1.0	12.483	B
C-A	414			414			
A-B	2			2			
A-C	442			442			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	443	632	0.700	438	2.2	18.218	C
B-A	9	257	0.034	9	0.0	14.524	B
C-AB	354	549	0.644	351	1.7	17.893	C
C-A	507			507			
A-B	2			2			
A-C	542			542			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	443	632	0.700	442	2.3	18.922	C
B-A	9	255	0.035	9	0.0	14.604	B
C-AB	354	549	0.644	354	1.8	18.379	C
C-A	507			507			
A-B	2			2			
A-C	542			542			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	361	664	0.544	366	1.2	12.229	B
B-A	7	330	0.022	7	0.0	11.147	B
C-AB	289	574	0.502	291	1.0	12.853	B
C-A	414			414			
A-B	2			2			
A-C	442			442			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	303	687	0.441	304	0.8	9.460	A
B-A	6	386	0.016	6	0.0	9.482	A
C-AB	242	593	0.407	243	0.7	10.319	B
C-A	347			347			
A-B	2			2			
A-C	370			370			

2024 Base , PM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A525 / Heritage Way	T-Junction	Two-way		155.48	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2024 Base	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	452	100.000
B		✓	324	100.000
C		✓	1312	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A	B	C
	A	0	16	436
	B	9	0	315
	C	747	565	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A	B	C
	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.55	12.91	1.2	B
B-A	0.17	74.14	0.2	F
C-AB	1.11	359.23	74.1	F
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	237	697	0.340	235	0.5	7.767	A
B-A	7	280	0.024	7	0.0	13.174	B
C-AB	428	605	0.707	419	2.3	18.564	C
C-A	560			560			
A-B	12			12			
A-C	328			328			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	283	674	0.420	282	0.7	9.165	A
B-A	8	201	0.040	8	0.0	18.660	C
C-AB	579	667	0.869	567	5.4	32.836	D
C-A	600			600			
A-B	14			14			
A-C	392			392			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	347	636	0.545	345	1.2	12.199	B
B-A	10	92	0.107	10	0.1	43.448	E
C-AB	1445	1301	1.110	1319	36.9	82.397	F
C-A	0			0			
A-B	18			18			
A-C	480			480			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	347	625	0.555	347	1.2	12.915	B
B-A	10	58	0.171	10	0.2	74.138	F
C-AB	1445	1301	1.110	1296	74.1	183.412	F
C-A	0			0			
A-B	18			18			
A-C	480			480			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	283	669	0.424	285	0.7	9.434	A
B-A	8	119	0.068	9	0.1	32.860	D
C-AB	579	667	0.869	757	29.8	359.226	F
C-A	600			600			
A-B	14			14			
A-C	392			392			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	237	696	0.341	238	0.5	7.886	A
B-A	7	233	0.029	7	0.0	15.973	C
C-AB	428	605	0.707	535	2.8	83.484	F
C-A	560			560			
A-B	12			12			
A-C	328			328			

2024 Base + Committed, AM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A525 / Heritage Way	T-Junction	Two-way		8.23	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2024 Base + Committed	AM	ONE HOUR	07:45	09:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	494	100.000
B		✓	412	100.000
C		✓	785	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A	B	C
	A	0	2	492
	B	8	0	404
	C	461	324	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A	B	C
	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.70	19.14	2.3	C
B-A	0.03	14.69	0.0	B
C-AB	0.65	18.69	1.8	C
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	304	687	0.443	301	0.8	9.264	A
B-A	6	387	0.016	6	0.0	9.459	A
C-AB	244	593	0.411	241	0.7	10.151	B
C-A	347			347			
A-B	2			2			
A-C	370			370			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	363	664	0.547	362	1.2	11.844	B
B-A	7	331	0.022	7	0.0	11.120	B
C-AB	291	574	0.507	290	1.0	12.599	B
C-A	414			414			
A-B	2			2			
A-C	442			442			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	445	632	0.704	441	2.2	18.411	C
B-A	9	255	0.035	9	0.0	14.609	B
C-AB	357	549	0.650	354	1.8	18.170	C
C-A	507			507			
A-B	2			2			
A-C	542			542			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	445	632	0.704	445	2.3	19.143	C
B-A	9	254	0.035	9	0.0	14.693	B
C-AB	357	549	0.650	357	1.8	18.686	C
C-A	507			507			
A-B	2			2			
A-C	542			542			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	363	664	0.547	367	1.2	12.309	B
B-A	7	329	0.022	7	0.0	11.192	B
C-AB	291	574	0.507	294	1.1	12.987	B
C-A	414			414			
A-B	2			2			
A-C	442			442			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	304	687	0.443	306	0.8	9.497	A
B-A	6	385	0.016	6	0.0	9.507	A
C-AB	244	593	0.411	245	0.7	10.388	B
C-A	347			347			
A-B	2			2			
A-C	370			370			

2024 Base + Committed, PM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A525 / Heritage Way	T-Junction	Two-way		160.80	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2024 Base + Committed	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	452	100.000
B		✓	325	100.000
C		✓	1314	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	16	436
	B	9	0	316
	C	747	567	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
	A	B	C	
From	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.56	13.02	1.2	B
B-A	0.18	77.74	0.2	F
C-AB	1.11	370.67	76.3	F
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	238	697	0.342	236	0.5	7.780	A
B-A	7	279	0.024	7	0.0	13.205	B
C-AB	429	605	0.710	420	2.3	18.689	C
C-A	560			560			
A-B	12			12			
A-C	328			328			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	284	674	0.421	283	0.7	9.186	A
B-A	8	200	0.040	8	0.0	18.739	C
C-AB	585	671	0.872	572	5.6	33.118	D
C-A	596			596			
A-B	14			14			
A-C	392			392			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	348	636	0.547	346	1.2	12.332	B
B-A	10	91	0.109	10	0.1	44.023	E
C-AB	1447	1299	1.114	1317	38.1	84.214	F
C-A	0			0			
A-B	18			18			
A-C	480			480			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	348	624	0.558	348	1.2	13.021	B
B-A	10	56	0.178	10	0.2	77.744	F
C-AB	1447	1299	1.114	1294	76.3	189.222	F
C-A	0			0			
A-B	18			18			
A-C	480			480			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	284	668	0.425	286	0.8	9.468	A
B-A	8	115	0.070	9	0.1	33.949	D
C-AB	585	671	0.872	758	33.1	370.670	F
C-A	596			596			
A-B	14			14			
A-C	392			392			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	238	695	0.342	239	0.5	7.902	A
B-A	7	227	0.030	7	0.0	16.398	C
C-AB	429	605	0.710	550	2.9	99.565	F
C-A	560			560			
A-B	12			12			
A-C	328			328			

2024 Base + Committed + Net , AM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A525 / Heritage Way	T-Junction	Two-way		13.84	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D7	2024 Base + Committed + Net	AM	ONE HOUR	07:45	09:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	494	100.000
B		✓	487	100.000
C		✓	828	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A	B	C
	A	0	2	492
	B	8	0	479
	C	461	367	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A	B	C
	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.84	33.20	4.6	D
B-A	0.04	16.11	0.0	C
C-AB	0.74	24.46	2.7	C
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	361	687	0.525	356	1.1	10.765	B
B-A	6	373	0.016	6	0.0	9.816	A
C-AB	276	593	0.466	273	0.9	11.126	B
C-A	347			347			
A-B	2			2			
A-C	370			370			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	431	664	0.649	428	1.8	15.081	C
B-A	7	314	0.023	7	0.0	11.729	B
C-AB	330	575	0.574	328	1.3	14.503	B
C-A	414			414			
A-B	2			2			
A-C	442			442			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	527	631	0.835	517	4.3	29.278	D
B-A	9	234	0.038	9	0.0	15.952	C
C-AB	408	554	0.737	403	2.6	23.118	C
C-A	504			504			
A-B	2			2			
A-C	542			542			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	527	631	0.835	526	4.6	33.198	D
B-A	9	232	0.038	9	0.0	16.113	C
C-AB	408	554	0.737	407	2.7	24.457	C
C-A	504			504			
A-B	2			2			
A-C	542			542			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	431	664	0.649	441	1.9	16.887	C
B-A	7	311	0.023	7	0.0	11.853	B
C-AB	330	575	0.574	335	1.4	15.343	C
C-A	414			414			
A-B	2			2			
A-C	442			442			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	361	686	0.525	364	1.1	11.263	B
B-A	6	370	0.016	6	0.0	9.884	A
C-AB	276	593	0.466	278	0.9	11.507	B
C-A	347			347			
A-B	2			2			
A-C	370			370			

2024 Base + Committed + Net , PM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	A525 / Heritage Way	T-Junction	Two-way		329.52	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D8	2024 Base + Committed + Net	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	452	100.000
B		✓	357	100.000
C		✓	1369	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
		A	B	C
	A	0	16	436
	B	9	0	348
	C	747	622	0

Vehicle Mix

Heavy Vehicle Percentages

	To			
		A	B	C
	A	0	0	0
	B	0	0	0
	C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.78	29.97	3.1	D
B-A	999999999.00	915.51	2.7	F
C-AB	1.22	668.65	143.3	F
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	262	696	0.376	260	0.6	8.201	A
B-A	7	262	0.026	7	0.0	14.119	B
C-AB	479	615	0.779	466	3.2	22.641	C
C-A	552			552			
A-B	12			12			
A-C	328			328			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	313	673	0.465	312	0.9	9.926	A
B-A	8	177	0.046	8	0.0	21.233	C
C-AB	892	932	0.957	864	10.2	40.116	E
C-A	339			339			
A-B	14			14			
A-C	392			392			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	383	627	0.611	381	1.5	14.455	B
B-A	10	60	0.164	9	0.2	70.036	F
C-AB	1507	1234	1.222	1250	74.5	141.715	F
C-A	0			0			
A-B	18			18			
A-C	480			480			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	383	491	0.781	377	3.1	29.969	D
B-A	10	0	999999999.000	0	2.7	161.959	F
C-AB	1507	1234	1.222	1232	143.3	350.786	F
C-A	0			0			
A-B	18			18			
A-C	480			480			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	313	511	0.612	319	1.7	19.246	C
B-A	8	13	0.634	9	2.5	915.515	F
C-AB	892	932	0.957	947	129.5	622.650	F
C-A	339			339			
A-B	14			14			
A-C	392			392			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	262	667	0.393	266	0.7	9.061	A
B-A	7	86	0.078	16	0.1	57.155	F
C-AB	479	615	0.779	612	96.2	668.649	F
C-A	552			552			
A-B	12			12			
A-C	328			328			

Basic Results Summary

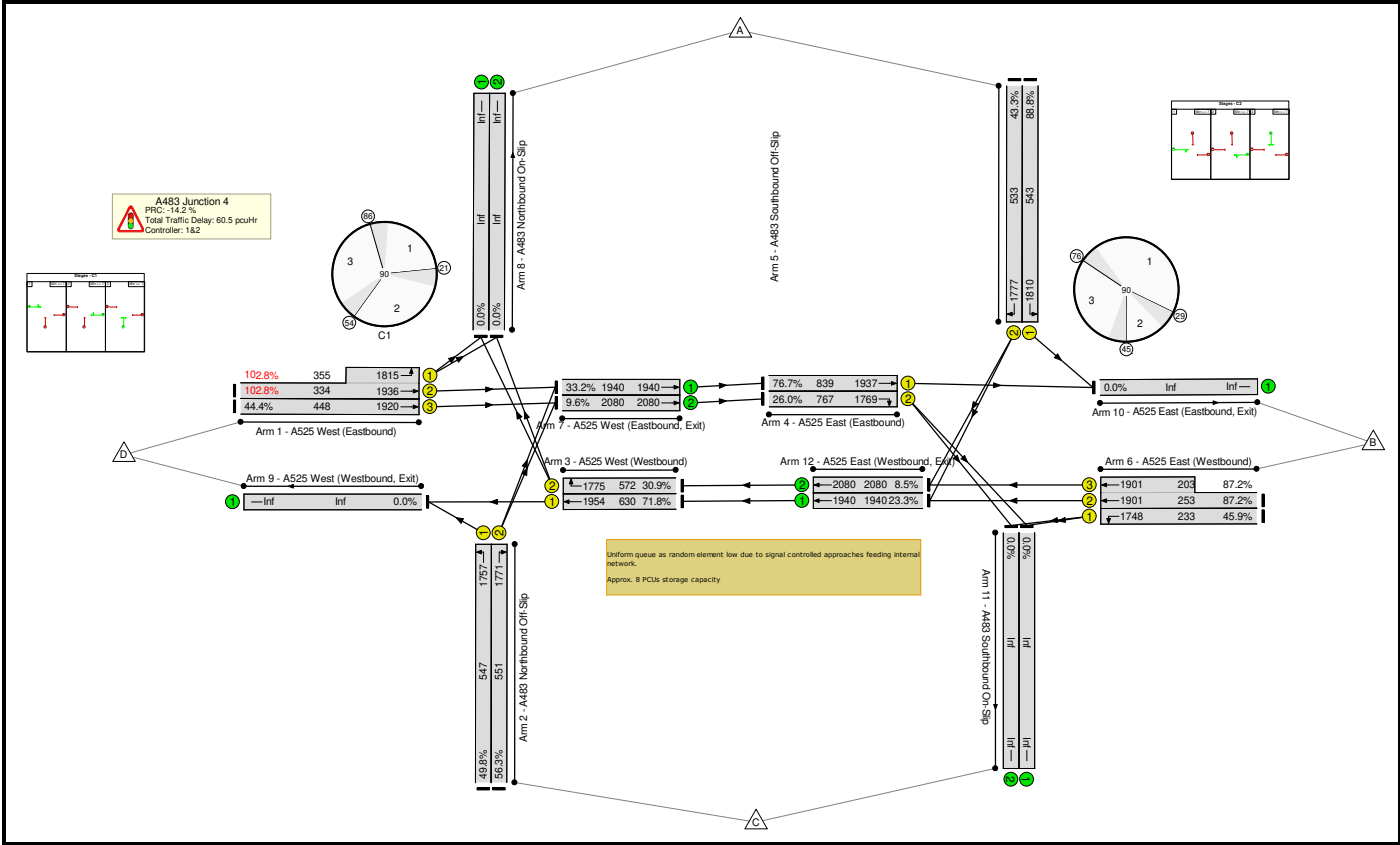
Basic Results Summary

User and Project Details

Project:	Brymbo Park, Brymbo
Title:	
Location:	
Client:	Brymbo Development Ltd
Additional detail:	
File name:	J2 _ A483 Junction 4 - Base Model.lsg3x
Author:	
Company:	
Address:	

Scenario 1: '2018 Base AM' (FG1: '2018 Base AM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	102.8%	0	0	0	60.5	-	-
A483 Junction 4	-	-	-		-	-	-	-	-	-	102.8%	0	0	0	60.5	-	-
1/2+1/1	A525 West (Eastbound) Ahead Left	U	C1:A		1	20	-	708	1936:1815	334+355	102.8 : 102.8%	-	-	-	26.2	133.2	31.0
1/3	A525 West (Eastbound) Ahead	U	C1:A		1	20	-	199	1920	448	44.4%	-	-	-	2.0	36.7	4.6
2/1	A483 Northbound Off-Slip Left	U	C1:C		1	27	-	272	1757	547	49.8%	-	-	-	2.4	31.8	6.0
2/2	A483 Northbound Off-Slip Right	U	C1:C		1	27	-	310	1771	551	56.3%	-	-	-	2.9	33.3	7.1
3/1	A525 West (Westbound) Ahead	U	C1:B		1	28	-	452	1954	630	71.8%	-	-	-	5.0	39.5	7.1
3/2	A525 West (Westbound) Right	U	C1:B		1	28	-	177	1775	572	30.9%	-	-	-	0.2	4.8	1.8
4/1	A525 East (Eastbound) Ahead	U	C2:A		1	38	-	653	1937	839	76.7%	-	-	-	2.8	15.9	9.4
4/2	A525 East (Eastbound) Right	U	C2:A		1	38	-	199	1769	767	26.0%	-	-	-	0.2	3.4	1.7
5/1	A483 Southbound Off-Slip Left	U	C2:B		1	26	-	482	1810	543	88.8%	-	-	-	7.6	56.5	14.9
5/2	A483 Southbound Off-Slip Right	U	C2:B		1	26	-	231	1777	533	43.3%	-	-	-	2.0	31.3	5.0
6/1	A525 East (Westbound) Left	U	C2:C		1	11	-	107	1748	233	45.9%	-	-	-	1.5	50.2	2.9

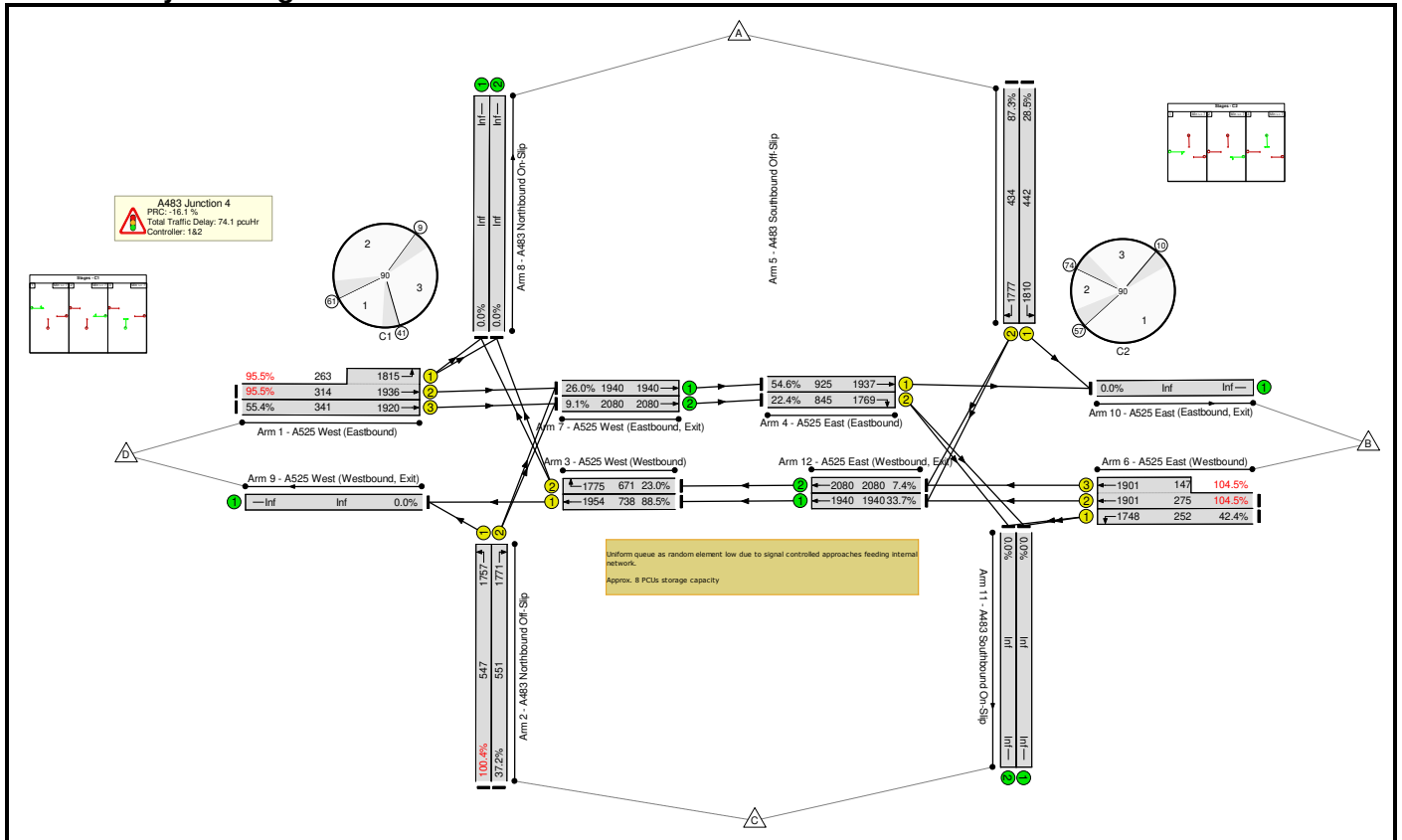
Basic Results Summary

6/2+6/3	A525 East (Westbound) Ahead	U	C2:C		1	11	-	398	1901:1901	253+203	87.2 : 87.2%	-	-	-	7.3	65.7	8.5
7/1	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	653	1940	1940	33.2%	-	-	-	0.2	1.4	0.2
7/2	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	199	2080	2080	9.6%	-	-	-	0.1	1.0	0.1
12/1	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	452	1940	1940	23.3%	-	-	-	0.2	1.2	0.2
12/2	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	177	2080	2080	8.5%	-	-	-	0.0	0.9	0.0
			C1	PRC for Signalled Lanes (%):		-14.2		Total Delay for Signalled Lanes (pcuHr):				38.69		Cycle Time (s):		90	
			C2	PRC for Signalled Lanes (%):		1.4		Total Delay for Signalled Lanes (pcuHr):				21.36		Cycle Time (s):		90	
				PRC Over All Lanes (%):		-14.2		Total Delay Over All Lanes(pcuHr):				60.54					

Basic Results Summary

Scenario 2: '2018 Base PM' (FG2: '2018 Base PM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	104.5%	0	0	0	74.1	-	-
A483 Junction 4	-	-	-		-	-	-	-	-	-	104.5%	0	0	0	74.1	-	-
1/2+1/1	A525 West (Eastbound) Ahead Left	U	C1:A		1	15	-	551	1936:1815	314+263	95.5 : 95.5%	-	-	-	12.4	81.0	14.7
1/3	A525 West (Eastbound) Ahead	U	C1:A		1	15	-	189	1920	341	55.4%	-	-	-	2.4	45.5	4.9
2/1	A483 Northbound Off-Slip Left	U	C1:C		1	27	-	549	1757	547	100.4%	-	-	-	17.2	112.5	26.1
2/2	A483 Northbound Off-Slip Right	U	C1:C		1	27	-	205	1771	551	37.2%	-	-	-	1.7	29.3	4.3
3/1	A525 West (Westbound) Ahead	U	C1:B		1	33	-	666	1954	738	88.5%	-	-	-	5.2	28.6	12.6
3/2	A525 West (Westbound) Right	U	C1:B		1	33	-	154	1775	671	23.0%	-	-	-	0.1	3.5	1.1
4/1	A525 East (Eastbound) Ahead	U	C2:A		1	42	-	505	1937	925	54.6%	-	-	-	3.1	22.4	9.3
4/2	A525 East (Eastbound) Right	U	C2:A		1	42	-	189	1769	845	22.4%	-	-	-	1.1	21.8	2.1
5/1	A483 Southbound Off-Slip Left	U	C2:B		1	21	-	126	1810	442	28.5%	-	-	-	1.2	33.3	2.8
5/2	A483 Southbound Off-Slip Right	U	C2:B		1	21	-	379	1777	434	87.3%	-	-	-	6.5	61.9	12.1
6/1	A525 East (Westbound) Left	U	C2:C		1	12	-	107	1748	252	42.4%	-	-	-	1.4	47.4	2.8

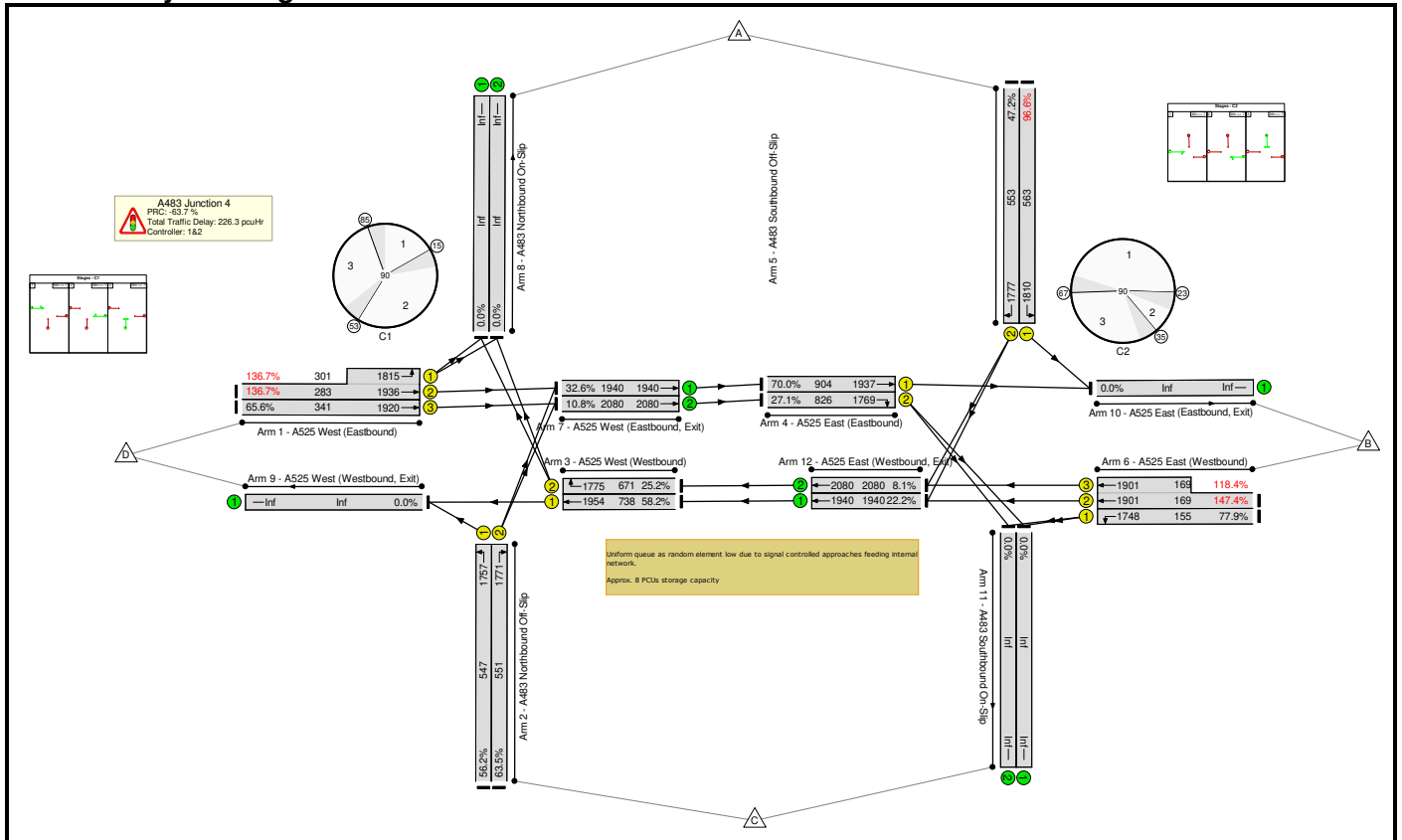
Basic Results Summary

6/2+6/3	A525 East (Westbound) Ahead	U	C2:C		1	12	-	441	1901:1901	275+147	104.5 : 104.5%	-	-	-	21.3	173.7	23.8
7/1	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	505	1940	1940	26.0%	-	-	-	0.2	1.3	0.2
7/2	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	189	2080	2080	9.1%	-	-	-	0.0	1.0	0.0
12/1	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	666	1940	1940	33.7%	-	-	-	0.3	1.4	0.3
12/2	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	154	2080	2080	7.4%	-	-	-	0.0	0.9	0.0
			C1	PRC for Signalled Lanes (%):		-11.6		Total Delay for Signalled Lanes (pcuHr):				38.94		Cycle Time (s):		90	
			C2	PRC for Signalled Lanes (%):		-16.1		Total Delay for Signalled Lanes (pcuHr):				34.66		Cycle Time (s):		90	
				PRC Over All Lanes (%):		-16.1		Total Delay Over All Lanes(pcuHr):				74.12					

Basic Results Summary

Scenario 3: '2029 Base AM' (FG3: '2029 Base AM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	147.4%	0	0	0	226.3	-	-
A483 Junction 4	-	-	-		-	-	-	-	-	-	147.4%	0	0	0	226.3	-	-
1/2+1/1	A525 West (Eastbound) Ahead Left	U	C1:A		1	15	-	799	1936:1815	283+301	136.7 : 136.7%	-	-	-	127.1	572.7	129.4
1/3	A525 West (Eastbound) Ahead	U	C1:A		1	15	-	224	1920	341	65.6%	-	-	-	3.1	49.5	6.1
2/1	A483 Northbound Off-Slip Left	U	C1:C		1	27	-	307	1757	547	56.2%	-	-	-	2.8	33.4	7.0
2/2	A483 Northbound Off-Slip Right	U	C1:C		1	27	-	350	1771	551	63.5%	-	-	-	3.5	35.5	8.3
3/1	A525 West (Westbound) Ahead	U	C1:B		1	33	-	510	1954	738	58.2%	-	-	-	2.4	20.1	3.6
3/2	A525 West (Westbound) Right	U	C1:B		1	33	-	200	1775	671	25.2%	-	-	-	0.2	3.6	1.7
4/1	A525 East (Eastbound) Ahead	U	C2:A		1	41	-	737	1937	904	70.0%	-	-	-	1.8	10.2	9.4
4/2	A525 East (Eastbound) Right	U	C2:A		1	41	-	224	1769	826	27.1%	-	-	-	0.2	3.3	3.1
5/1	A483 Southbound Off-Slip Left	U	C2:B		1	27	-	544	1810	563	96.6%	-	-	-	12.4	82.3	21.1
5/2	A483 Southbound Off-Slip Right	U	C2:B		1	27	-	261	1777	553	47.2%	-	-	-	2.3	31.2	5.7
6/1	A525 East (Westbound) Left	U	C2:C		1	7	-	121	1748	155	77.9%	-	-	-	3.0	88.0	4.6

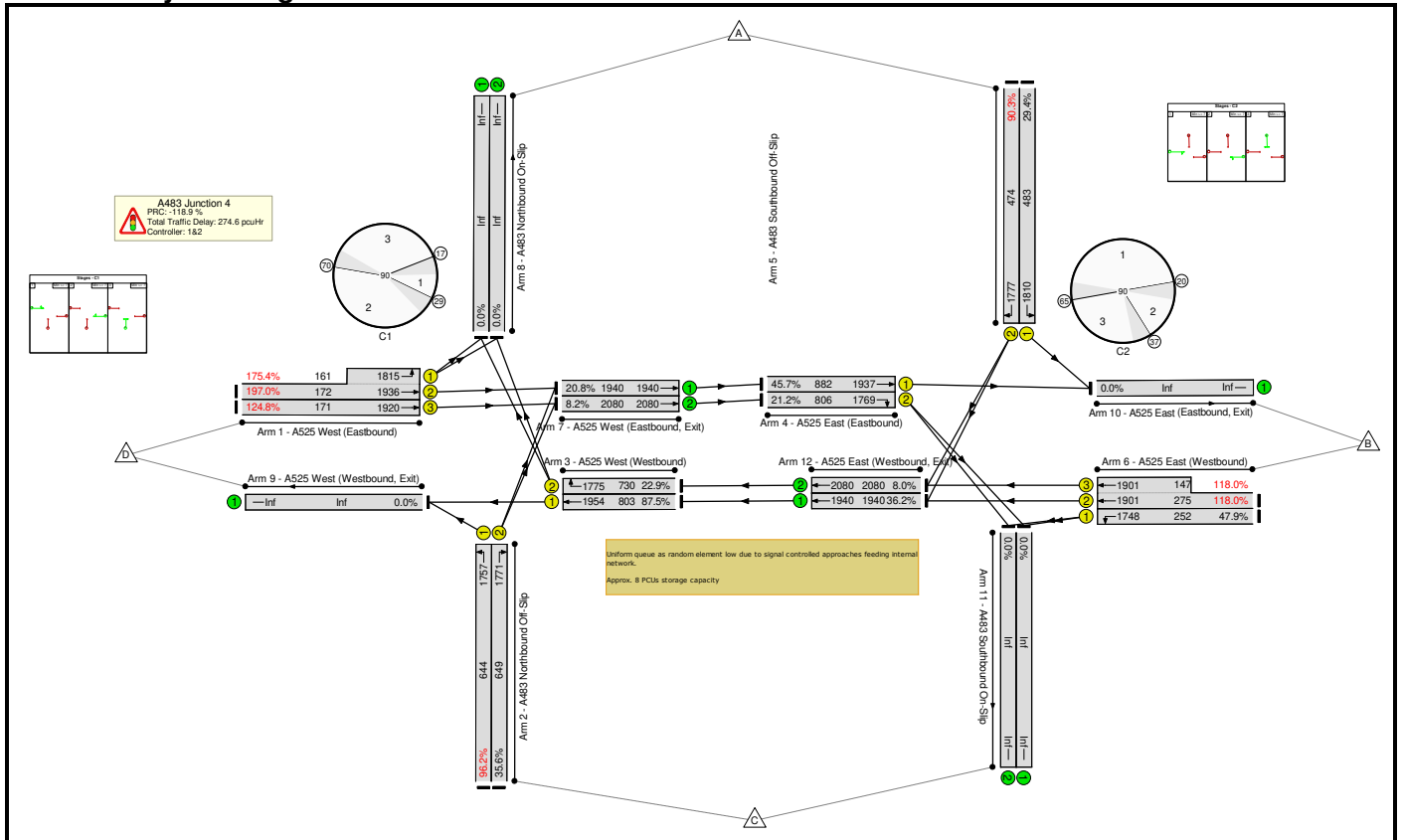
Basic Results Summary

6/2+6/3	A525 East (Westbound) Ahead	U	C2:C		1	7	-	449	1901:1901	169+169	147.4 : 118.4%	-	-	-	67.1	538.1	65.7
7/1	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	737	1940	1940	32.6%	-	-	-	0.2	1.4	0.2
7/2	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	224	2080	2080	10.8%	-	-	-	0.1	1.0	0.1
12/1	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	510	1940	1940	22.2%	-	-	-	0.1	1.2	0.1
12/2	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	200	2080	2080	8.1%	-	-	-	0.0	0.9	0.0
			C1	PRC for Signalled Lanes (%):		-51.9		Total Delay for Signalled Lanes (pcuHr):				139.07		Cycle Time (s):		90	
			C2	PRC for Signalled Lanes (%):		-63.7		Total Delay for Signalled Lanes (pcuHr):				86.76		Cycle Time (s):		90	
				PRC Over All Lanes (%):		-63.7		Total Delay Over All Lanes(pcuHr):				226.32					

Basic Results Summary

Scenario 4: '2029 Base PM' (FG4: '2029 Base PM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	197.0%	0	0	0	274.6	-	-
A483 Junction 4	-	-	-		-	-	-	-	-	-	197.0%	0	0	0	274.6	-	-
1/2+1/1	A525 West (Eastbound) Ahead Left	U	C1:A		1	7	-	622	1936:1815	172+161	197.0 : 175.4%	-	-	-	164.7	953.1	164.8
1/3	A525 West (Eastbound) Ahead	U	C1:A		1	7	-	213	1920	171	124.8%	-	-	-	27.7	467.5	29.8
2/1	A483 Northbound Off-Slip Left	U	C1:C		1	32	-	620	1757	644	96.2%	-	-	-	12.6	73.1	22.9
2/2	A483 Northbound Off-Slip Right	U	C1:C		1	32	-	231	1771	649	35.6%	-	-	-	1.6	25.1	4.4
3/1	A525 West (Westbound) Ahead	U	C1:B		1	36	-	752	1954	803	87.5%	-	-	-	3.7	18.8	10.4
3/2	A525 West (Westbound) Right	U	C1:B		1	36	-	174	1775	730	22.9%	-	-	-	0.3	5.7	4.2
4/1	A525 East (Eastbound) Ahead	U	C2:A		1	40	-	570	1937	882	45.7%	-	-	-	2.5	22.7	5.0
4/2	A525 East (Eastbound) Right	U	C2:A		1	40	-	213	1769	806	21.2%	-	-	-	2.1	44.4	4.4
5/1	A483 Southbound Off-Slip Left	U	C2:B		1	23	-	142	1810	483	29.4%	-	-	-	1.2	31.6	3.0
5/2	A483 Southbound Off-Slip Right	U	C2:B		1	23	-	428	1777	474	90.3%	-	-	-	7.8	65.3	14.2
6/1	A525 East (Westbound) Left	U	C2:C		1	12	-	121	1748	252	47.9%	-	-	-	1.6	49.0	3.2

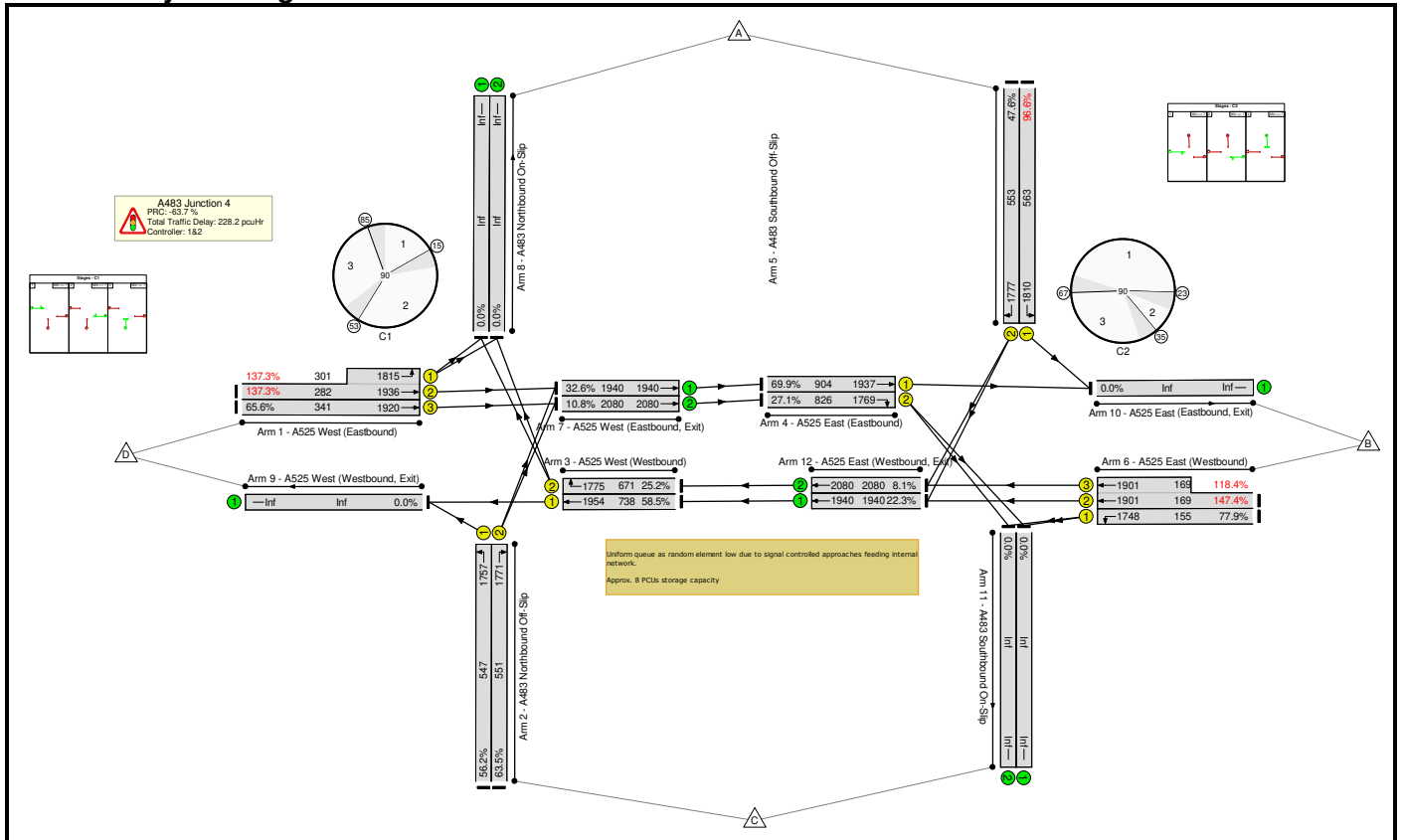
Basic Results Summary

6/2+6/3	A525 East (Westbound) Ahead	U	C2:C		1	12	-	498	1901:1901	275+147	118.0 : 118.0%	-	-	-	48.3	349.5	51.4	
7/1	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	570	1940	1940	20.8%	-	-	-	0.1	1.2	0.1	
7/2	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	213	2080	2080	8.2%	-	-	-	0.0	0.9	0.0	
12/1	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	752	1940	1940	36.2%	-	-	-	0.3	1.5	0.3	
12/2	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	174	2080	2080	8.0%	-	-	-	0.0	0.9	0.0	
			C1	PRC for Signalled Lanes (%):				-118.9	Total Delay for Signalled Lanes (pcuHr):			210.46	Cycle Time (s):		90			
			C2	PRC for Signalled Lanes (%):				-31.1	Total Delay for Signalled Lanes (pcuHr):			63.65	Cycle Time (s):		90			
				PRC Over All Lanes (%):				-118.9	Total Delay Over All Lanes(pcuHr):			274.61						

Basic Results Summary

Scenario 5: '2029 Base + Com AM' (FG9: '2029 AM Base + Com', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	147.4%	0	0	0	228.2	-	-
A483 Junction 4	-	-	-		-	-	-	-	-	-	147.4%	0	0	0	228.2	-	-
1/2+1/1	A525 West (Eastbound) Ahead Left	U	C1:A		1	15	-	801	1936:1815	282+301	137.3 : 137.3%	-	-	-	128.9	579.4	131.2
1/3	A525 West (Eastbound) Ahead	U	C1:A		1	15	-	224	1920	341	65.6%	-	-	-	3.1	49.5	6.1
2/1	A483 Northbound Off-Slip Left	U	C1:C		1	27	-	307	1757	547	56.2%	-	-	-	2.8	33.4	7.0
2/2	A483 Northbound Off-Slip Right	U	C1:C		1	27	-	350	1771	551	63.5%	-	-	-	3.5	35.5	8.3
3/1	A525 West (Westbound) Ahead	U	C1:B		1	33	-	512	1954	738	58.5%	-	-	-	2.4	20.4	3.7
3/2	A525 West (Westbound) Right	U	C1:B		1	33	-	200	1775	671	25.2%	-	-	-	0.2	3.6	1.7
4/1	A525 East (Eastbound) Ahead	U	C2:A		1	41	-	737	1937	904	69.9%	-	-	-	1.8	10.2	9.4
4/2	A525 East (Eastbound) Right	U	C2:A		1	41	-	224	1769	826	27.1%	-	-	-	0.2	3.3	3.1
5/1	A483 Southbound Off-Slip Left	U	C2:B		1	27	-	544	1810	563	96.6%	-	-	-	12.4	82.3	21.1
5/2	A483 Southbound Off-Slip Right	U	C2:B		1	27	-	263	1777	553	47.6%	-	-	-	2.3	31.3	5.7
6/1	A525 East (Westbound) Left	U	C2:C		1	7	-	121	1748	155	77.9%	-	-	-	3.0	88.0	4.6

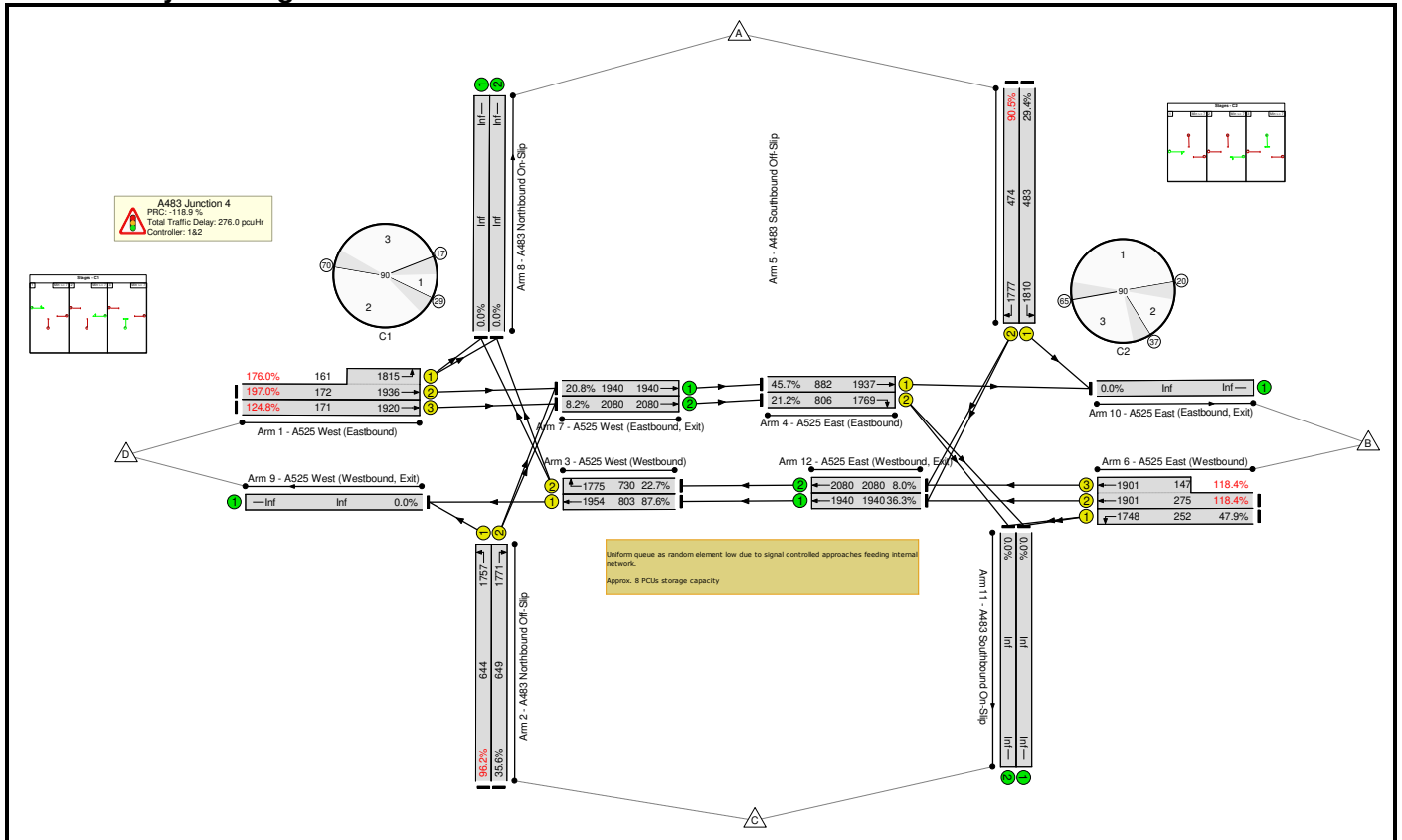
Basic Results Summary

6/2+6/3	A525 East (Westbound) Ahead	U	C2:C		1	7	-	449	1901:1901	169+169	147.4 : 118.4%	-	-	-	67.1	538.1	65.7	
7/1	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	737	1940	1940	32.6%	-	-	-	0.2	1.4	0.2	
7/2	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	224	2080	2080	10.8%	-	-	-	0.1	1.0	0.1	
12/1	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	512	1940	1940	22.3%	-	-	-	0.1	1.2	0.1	
12/2	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	200	2080	2080	8.1%	-	-	-	0.0	0.9	0.0	
			C1	PRC for Signalled Lanes (%):				-52.6	Total Delay for Signalled Lanes (pcuHr):			140.90	Cycle Time (s):		90			
			C2	PRC for Signalled Lanes (%):				-63.7	Total Delay for Signalled Lanes (pcuHr):			86.77	Cycle Time (s):		90			
				PRC Over All Lanes (%):				-63.7	Total Delay Over All Lanes(pcuHr):			228.16						

Basic Results Summary

Scenario 6: '2029 Base + Com PM' (FG10: '2029 PM Base + Com', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	197.0%	0	0	0	276.0	-	-
A483 Junction 4	-	-	-		-	-	-	-	-	-	197.0%	0	0	0	276.0	-	-
1/2+1/1	A525 West (Eastbound) Ahead Left	U	C1:A		1	7	-	623	1936:1815	172+161	197.0 : 176.0%	-	-	-	165.2	954.7	165.4
1/3	A525 West (Eastbound) Ahead	U	C1:A		1	7	-	213	1920	171	124.8%	-	-	-	27.7	467.5	29.8
2/1	A483 Northbound Off-Slip Left	U	C1:C		1	32	-	620	1757	644	96.2%	-	-	-	12.6	73.1	22.9
2/2	A483 Northbound Off-Slip Right	U	C1:C		1	32	-	231	1771	649	35.6%	-	-	-	1.6	25.1	4.4
3/1	A525 West (Westbound) Ahead	U	C1:B		1	36	-	754	1954	803	87.6%	-	-	-	3.7	19.0	10.4
3/2	A525 West (Westbound) Right	U	C1:B		1	36	-	174	1775	730	22.7%	-	-	-	0.3	5.7	4.2
4/1	A525 East (Eastbound) Ahead	U	C2:A		1	40	-	570	1937	882	45.7%	-	-	-	2.5	22.7	5.0
4/2	A525 East (Eastbound) Right	U	C2:A		1	40	-	213	1769	806	21.2%	-	-	-	2.1	44.4	4.4
5/1	A483 Southbound Off-Slip Left	U	C2:B		1	23	-	142	1810	483	29.4%	-	-	-	1.2	31.6	3.0
5/2	A483 Southbound Off-Slip Right	U	C2:B		1	23	-	429	1777	474	90.5%	-	-	-	7.9	65.9	14.4
6/1	A525 East (Westbound) Left	U	C2:C		1	12	-	121	1748	252	47.9%	-	-	-	1.6	49.0	3.2

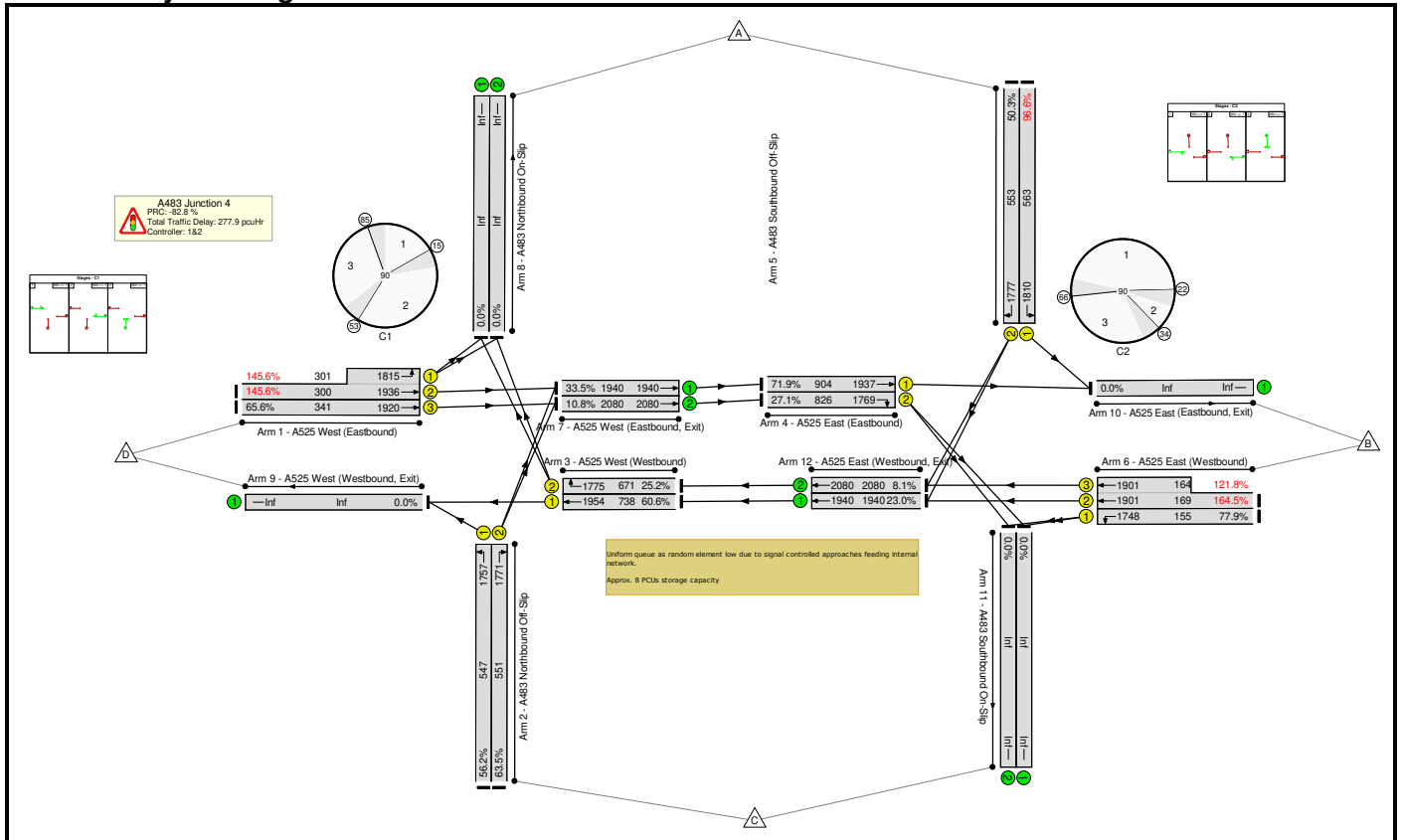
Basic Results Summary

6/2+6/3	A525 East (Westbound) Ahead	U	C2:C		1	12	-	499	1901:1901	275+147	118.4 : 118.4%	-	-	-	49.1	354.2	52.2
7/1	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	570	1940	1940	20.8%	-	-	-	0.1	1.2	0.1
7/2	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	213	2080	2080	8.2%	-	-	-	0.0	0.9	0.0
12/1	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	754	1940	1940	36.3%	-	-	-	0.3	1.5	0.3
12/2	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	174	2080	2080	8.0%	-	-	-	0.0	0.9	0.0
			C1	PRC for Signalled Lanes (%):		-118.9		Total Delay for Signalled Lanes (pcuHr):				211.04		Cycle Time (s):		90	
			C2	PRC for Signalled Lanes (%):		-31.5		Total Delay for Signalled Lanes (pcuHr):				64.49		Cycle Time (s):		90	
				PRC Over All Lanes (%):		-118.9		Total Delay Over All Lanes(pcuHr):				276.04					

Basic Results Summary

Scenario 7: '2029 Base + Com + Dev AM' (FG11: '2029 AM Base + Com + Dev', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

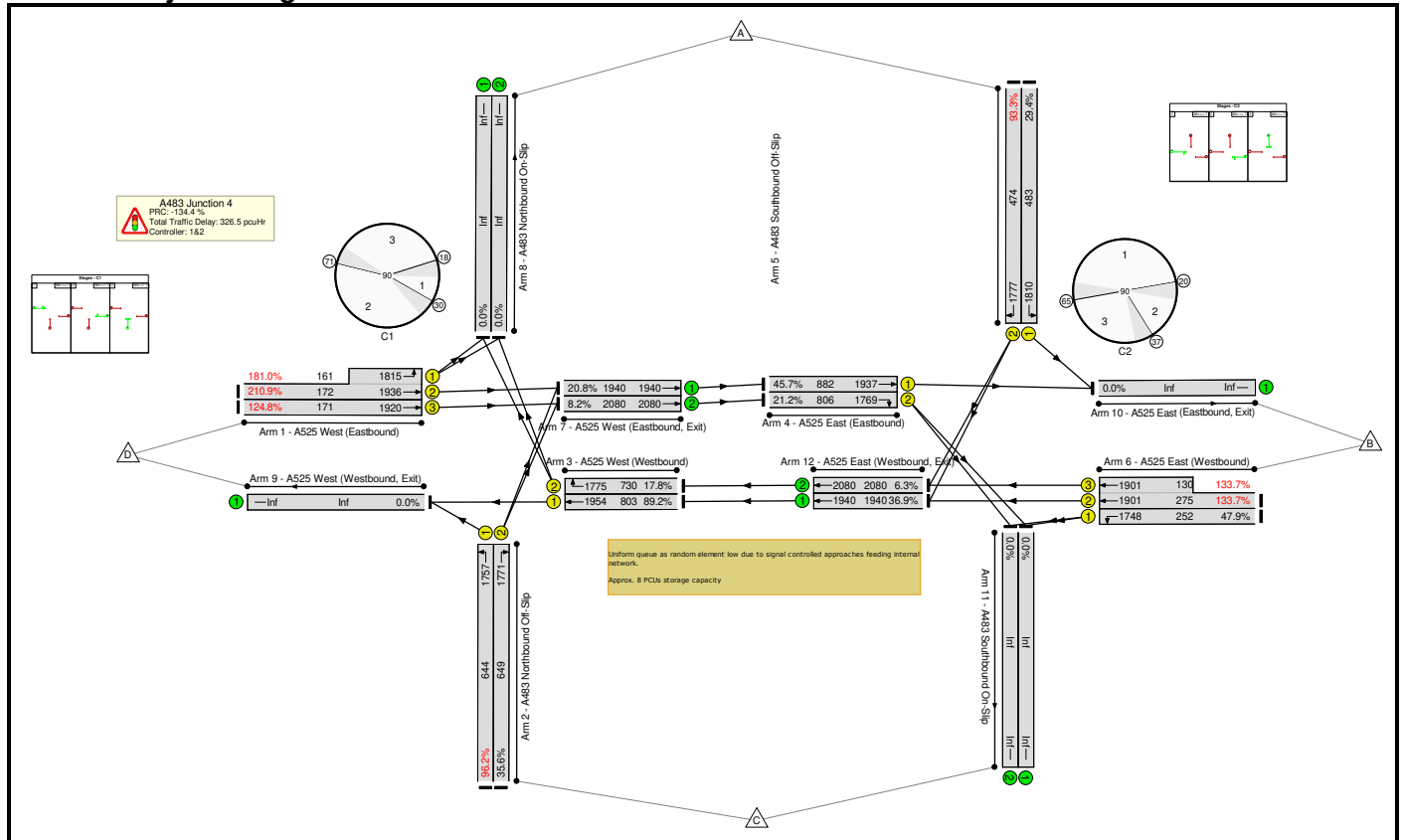
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	164.5%	0	0	0	277.9	-	-
A483 Junction 4	-	-	-		-	-	-	-	-	-	164.5%	0	0	0	277.9	-	-
1/2+1/1	A525 West (Eastbound) Ahead Left	U	C1:A		1	15	-	875	1936:1815	300+301	145.6 : 145.6%	-	-	-	160.3	659.5	163.0
1/3	A525 West (Eastbound) Ahead	U	C1:A		1	15	-	224	1920	341	65.6%	-	-	-	3.1	49.5	6.1
2/1	A483 Northbound Off-Slip Left	U	C1:C		1	27	-	307	1757	547	56.2%	-	-	-	2.8	33.4	7.0
2/2	A483 Northbound Off-Slip Right	U	C1:C		1	27	-	350	1771	551	63.5%	-	-	-	3.5	35.5	8.3
3/1	A525 West (Westbound) Ahead	U	C1:B		1	33	-	556	1954	738	60.6%	-	-	-	2.4	19.6	3.6
3/2	A525 West (Westbound) Right	U	C1:B		1	33	-	200	1775	671	25.2%	-	-	-	0.2	3.6	1.7
4/1	A525 East (Eastbound) Ahead	U	C2:A		1	41	-	787	1937	904	71.9%	-	-	-	1.9	10.3	9.5
4/2	A525 East (Eastbound) Right	U	C2:A		1	41	-	224	1769	826	27.1%	-	-	-	0.2	3.4	3.1
5/1	A483 Southbound Off-Slip Left	U	C2:B		1	27	-	544	1810	563	96.6%	-	-	-	12.4	82.3	21.1
5/2	A483 Southbound Off-Slip Right	U	C2:B		1	27	-	278	1777	553	50.3%	-	-	-	2.5	31.8	6.1
6/1	A525 East (Westbound) Left	U	C2:C		1	7	-	121	1748	155	77.9%	-	-	-	3.0	88.0	4.6

Basic Results Summary

6/2+6/3	A525 East (Westbound) Ahead	U	C2:C		1	7	-	478	1901:1901	169+164	164.5 : 121.8%	-	-	-	85.2	641.8	85.3
7/1	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	787	1940	1940	33.5%	-	-	-	0.3	1.4	0.3
7/2	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	224	2080	2080	10.8%	-	-	-	0.1	1.0	0.1
12/1	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	556	1940	1940	23.0%	-	-	-	0.1	1.2	0.1
12/2	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	200	2080	2080	8.1%	-	-	-	0.0	0.9	0.0
			C1	PRC for Signalled Lanes (%):		-61.8		Total Delay for Signalled Lanes (pcuHr):				172.28		Cycle Time (s):		90	
			C2	PRC for Signalled Lanes (%):		-82.8		Total Delay for Signalled Lanes (pcuHr):				105.16		Cycle Time (s):		90	
				PRC Over All Lanes (%):		-82.8		Total Delay Over All Lanes(pcuHr):				277.95					

Network Layout Diagram



Basic Results Summary

Network Results

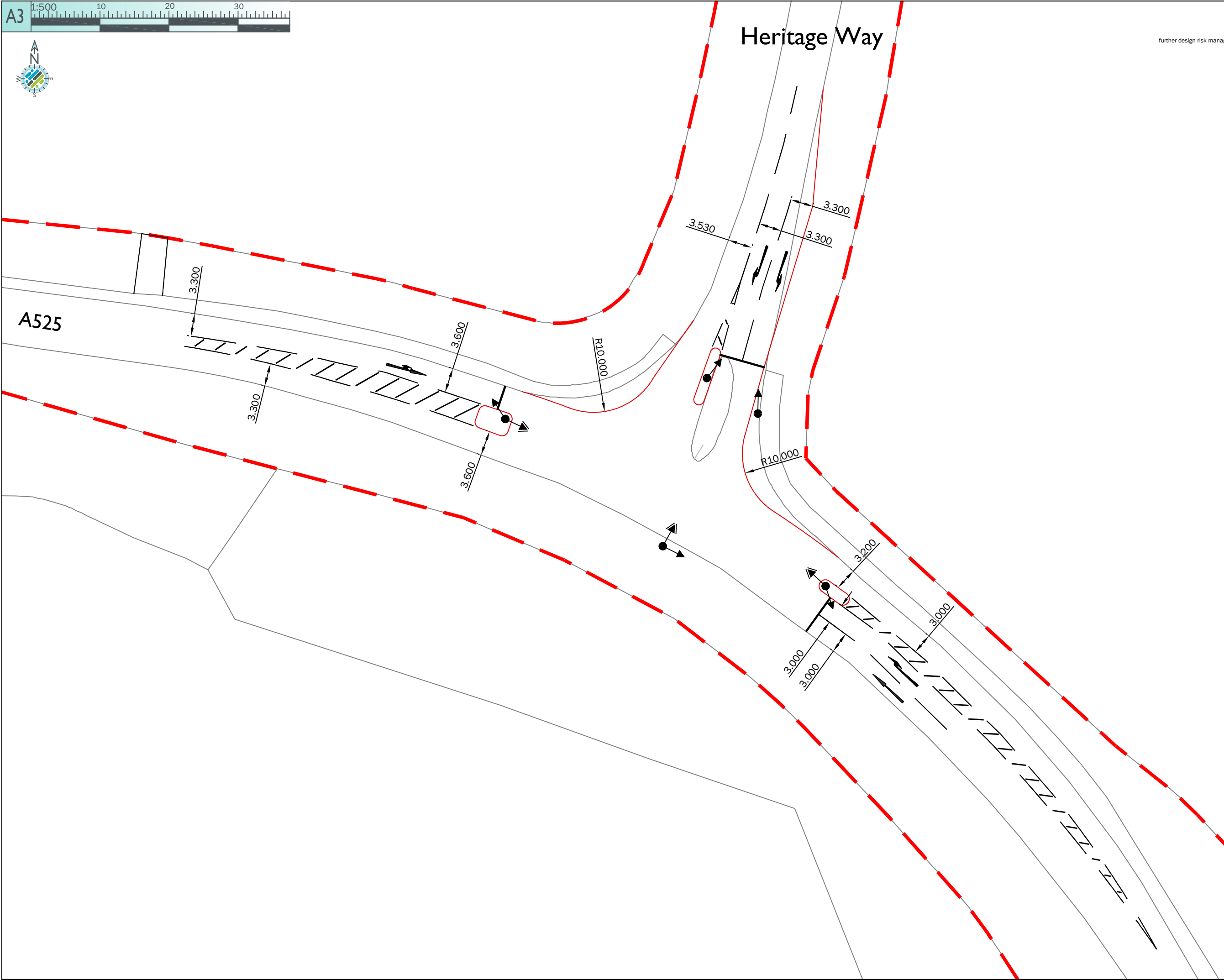
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	210.9%	0	0	0	326.5	-	-
A483 Junction 4	-	-	-		-	-	-	-	-	-	210.9%	0	0	0	326.5	-	-
1/2+1/1	A525 West (Eastbound) Ahead Left	U	C1:A		1	7	-	655	1936:1815	172+161	210.9 : 181.0%	-	-	-	182.8	1004.7	183.8
1/3	A525 West (Eastbound) Ahead	U	C1:A		1	7	-	213	1920	171	124.8%	-	-	-	27.6	467.3	29.8
2/1	A483 Northbound Off-Slip Left	U	C1:C		1	32	-	620	1757	644	96.2%	-	-	-	12.6	73.1	22.9
2/2	A483 Northbound Off-Slip Right	U	C1:C		1	32	-	231	1771	649	35.6%	-	-	-	1.6	25.1	4.4
3/1	A525 West (Westbound) Ahead	U	C1:B		1	36	-	809	1954	803	89.2%	-	-	-	4.2	21.1	11.0
3/2	A525 West (Westbound) Right	U	C1:B		1	36	-	174	1775	730	17.8%	-	-	-	0.2	6.5	3.3
4/1	A525 East (Eastbound) Ahead	U	C2:A		1	40	-	594	1937	882	45.7%	-	-	-	2.5	22.6	5.0
4/2	A525 East (Eastbound) Right	U	C2:A		1	40	-	213	1769	806	21.2%	-	-	-	2.1	43.4	4.4
5/1	A483 Southbound Off-Slip Left	U	C2:B		1	23	-	142	1810	483	29.4%	-	-	-	1.2	31.6	3.0
5/2	A483 Southbound Off-Slip Right	U	C2:B		1	23	-	442	1777	474	93.3%	-	-	-	9.2	74.8	15.9
6/1	A525 East (Westbound) Left	U	C2:C		1	12	-	121	1748	252	47.9%	-	-	-	1.6	49.0	3.2

Basic Results Summary

6/2+6/3	A525 East (Westbound) Ahead	U	C2:C		1	12	-	541	1901:1901	275+130	133.7 : 133.7%	-	-	-	80.3	534.0	83.9
7/1	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	594	1940	1940	20.8%	-	-	-	0.1	1.2	0.1
7/2	A525 West (Eastbound, Exit) Ahead	U	-		-	-	-	213	2080	2080	8.2%	-	-	-	0.0	0.9	0.0
12/1	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	809	1940	1940	36.9%	-	-	-	0.3	1.5	0.3
12/2	A525 East (Westbound, Exit) Ahead	U	-		-	-	-	174	2080	2080	6.3%	-	-	-	0.0	0.9	0.0
			C1	PRC for Signalled Lanes (%):		-134.4		Total Delay for Signalled Lanes (pcuHr):				229.08		Cycle Time (s):		90	
			C2	PRC for Signalled Lanes (%):		-48.5		Total Delay for Signalled Lanes (pcuHr):				96.91		Cycle Time (s):		90	
				PRC Over All Lanes (%):		-134.4		Total Delay Over All Lanes(pcuHr):				326.50					



Appendix F Junction Mitigation Drawings



NOTES

These drawings have been produced with reference to the CDM Regulations 2015. Please note that these are pre-construction phase drawings and should be subject to further design risk management as required in accordance with Regulation 9

KEY

- Highway Boundary
- Proposed Kerbline
- Proposed Traffic Signal

REV	DATE	REVISION NOTE	BY

CLIENT

PJA

Seven House - High Street
Longbridge - Birmingham
B31 2UQ - Tel: 0121 475 0234

London - Birmingham
Bristol - Reading - Exeter
www.pja.co.uk

PROJECT

Brymbo Developments Limited

Brymbo Park, Brymbo Wrexham

DRAWING TITLE

Proposed Junction Improvement Scheme A525/Heritage Way

DRAWING ISSUE STATUS

PLANNING

JOB CODE	SUB-CODE	DRAWING NO.	REVISION
03499	- A	- 001	- P0

Revision Letter: P - Prelim / T - Tender / C - Construction

SCALE	DRAWN	REVIEWED	DATE
A3@ 1:500	AF	KN	04.12.18

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Appendix G Junction Capacity Modelling Outputs - Mitigation

Basic Results Summary

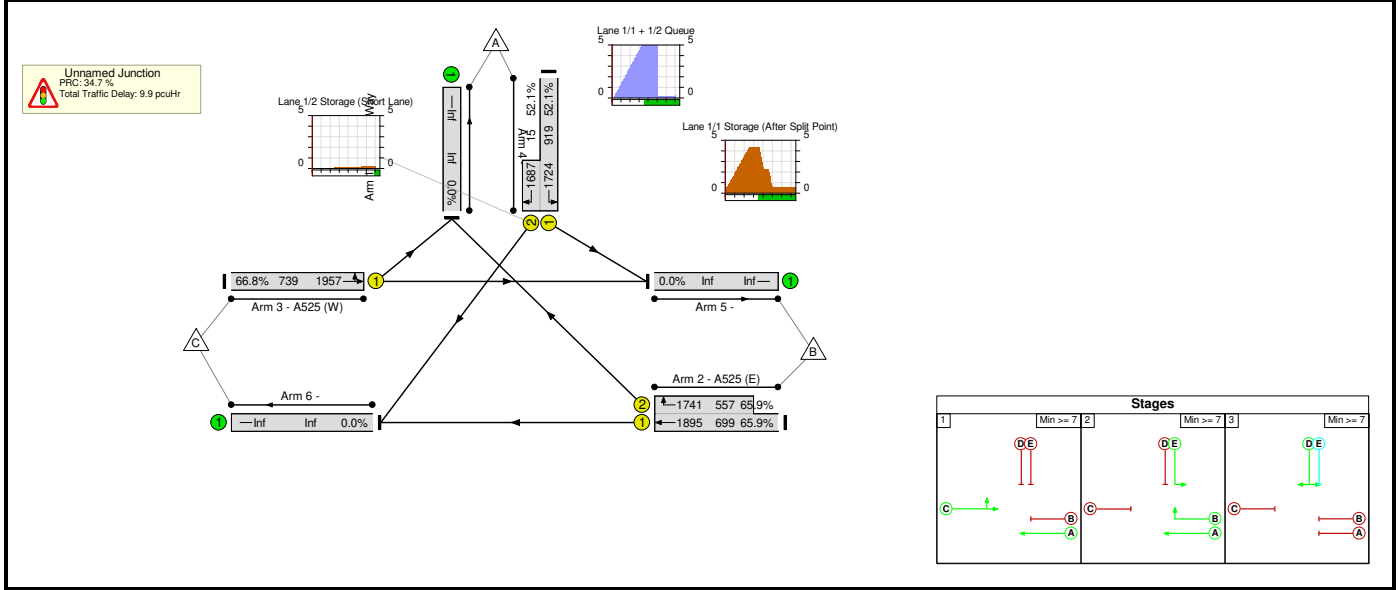
Basic Results Summary

User and Project Details

Project:	Brymbo Park, Brymbo
Title:	
Location:	
Client:	Brymbo Development Ltd
Additional detail:	
File name:	A525_Heritage Way - Proposed Mitigation.lsg3x
Author:	
Company:	
Address:	

Scenario 1: '2023 AM Base + Com + Net Dev' (FG1: '2024 AM Base + Com + Net Dev', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



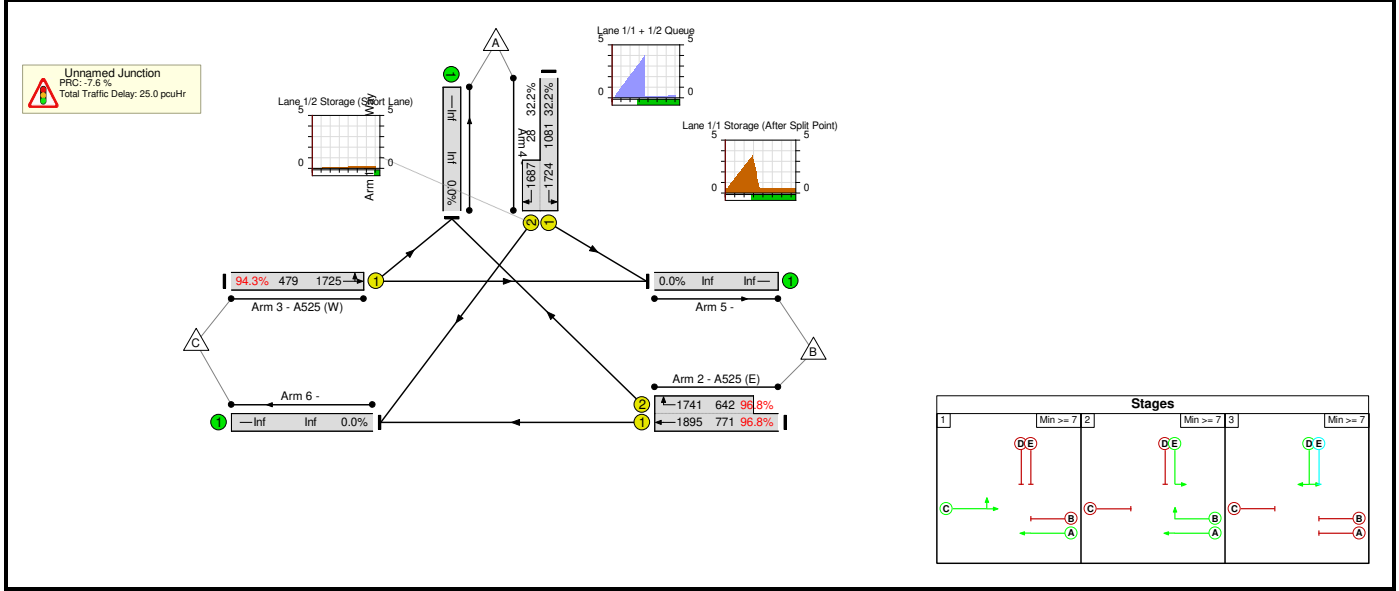
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	66.8%	0	0	0	9.9	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	66.8%	0	0	0	9.9	-	-
1/1+1/2	Heritage Way Left Right	U	D	E	1	47:7	40	487	1724:1687	919+15	52.1 : 52.1%	-	-	-	2.4	18.0	8.3
2/1+2/2	A525 (E) Right Ahead	U	A B		1	73:35	-	828	1895:1741	699+557	65.9 : 65.9%	-	-	-	3.3	14.3	7.9
3/1	A525 (W) Left Ahead	U	C		1	33	-	494	1957	739	66.8%	-	-	-	4.2	30.6	11.2
			C1	PRC for Signalled Lanes (%):			34.7	Total Delay for Signalled Lanes (pcuHr):			9.93	Cycle Time (s):			90		
				PRC Over All Lanes (%):			34.7	Total Delay Over All Lanes(pcuHr):			9.93						

Basic Results Summary

Scenario 2: '2023 PM Base + Com + Net Dev' (FG2: '2024 PM Base + Com + Net Dev', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	
Network	-	-	-		-	-	-	-	-	-	96.8%	0	0	0	25.0	-	-	
Unnamed Junction	-	-	-		-	-	-	-	-	-	96.8%	0	0	0	25.0	-	-	
1/1+1/2	Heritage Way Left Right	U	D	E	1	56:7	49	357	1724:1687	1081+28	32.2 : 32.2%	-	-	-	1.1	10.7	4.2	
2/1+2/2	A525 (E) Right Ahead	U	A B		1	73:44	-	1369	1895:1741	771+642	96.8 : 96.8%	-	-	-	14.1	37.0	28.3	
3/1	A525 (W) Left Ahead	U	C		1	24	-	452	1725	479	94.3%	-	-	-	9.8	78.2	16.9	
			C1	PRC for Signalled Lanes (%):			-7.6	Total Delay for Signalled Lanes (pcuHr):			24.96	Cycle Time (s):			90			
				PRC Over All Lanes (%):			-7.6	Total Delay Over All Lanes(pcuHr):			24.96							

