



Transport Assessment

Site 5 Wrexham Industrial Estate,
Wrexham, Clwyd

Client: FI Real Estate Management



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1 INTRODUCTION

1.1 Purpose of Report

- 1.1.1 This Transport Assessment (TA) considers the highways and transportation implications associated with the development of a circa 152,000 sq/ft (14,160 sqm) B8 warehouse scheme and its associated 144 parking spaces on land to the east of Clywedog Road South on Wrexham Industrial Estate (WIE). This site is also known as Site 5 and is the site that benefits from outline planning approval for a mix of B1/B2/B8 uses obtained under application P/2018/1087.
- 1.1.2 Wrexham County Borough Council (WCBC) is the Local Highway Authority (LHA) and the Local Planning Authority (LPA). Prime Transport Planning ('Prime') has produced this TA on behalf of the applicant, FI Real Estate Management ('FIREM').
- 1.1.3 The document has been prepared in accordance with *Planning Policy Wales* and *Technical Advice Note 18: Transport* as well as a number of local policy documents. It considers the accessibility of the site and safety for all modes of travel with an emphasis on walking, cycling and public transport, while assessing the potential impact on the highway network.
- 1.1.4 The conclusions and recommendations contained herein have been drawn based on information available and obtained in advance of the planning submission to which this report relates.
- 1.1.5 Reasonable checks have been carried out on any third-party information used in the preparation of this report but, nonetheless, Prime Transport Planning accepts no liability for the accuracy or otherwise of this data.
- 1.1.6 Third-party rights are excluded for the use of information contained within this report.

1.2 Scope of Report

- 1.2.1 Prime prepared a series of Transport Assessments/Transport Statements/Travel Plans and Technical Notes to support the development of Sites 2-5 in WIE in November 2018. Prime have also recently provided documentation to support a planning application on behalf of FIREM on the Bridgeway Centre, this also being known as Site 1.
- 1.2.2 It should be noted that whilst Site 5 benefits from a planning permission for a mix of B1/B2/B8 uses, current market conditions dictate that the approved development mix is no longer commercially viable. This application therefore supports the development of a mainly B8 usage, a scheme which is understood to be more reflective of current market conditions.
- 1.2.3 Prime met with WCBC for an initial pre-application meeting on the 4th May 2018 to discuss the above sites. The scope of this report therefore follows the methodology that was adopted for the previously approved scheme on Site 5. A draft of this document has been available for comment as part of the

pre-application consultation process with no comments having been received from the highway's officers at WMBC. It has therefore been assumed that the highway's at WMBC are comfortable with the contents and findings of this TA.

1.2.4 The remainder of this report is structured as follows:

- Section 2 describes the relevant local and national transport policy and guidance;
- Section 3 describes the existing situation in terms of the site, local highway network and traffic conditions whilst also reviewing recent accident records for the local highway network;
- Section 4 details the development proposal including the access strategy and parking arrangements;
- Section 5 details access to the site by sustainable modes of travel which includes walking, cycling and public transport and provides a summary of the Travel Plan;
- Section 6 discusses the forecasting methodology and trip generation of the site. It then provides the traffic impact assessment which includes the results of a junction capacity assessment of the site accesses; and
- Section 7 concludes the findings of the Transport Assessment.

2 TRANSPORT POLICY AND GUIDANCE

2.1 Introduction

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

2.2 Planning Policy Wales

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

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

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

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

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

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

- 2.2.6 Chapter 4 also addresses the following:

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

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

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

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

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

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

2.3 Technical Advice Note 18: Transport

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

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

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

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

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

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

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

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

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

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

2.4 North Wales Joint Local Transport Plan 2015

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

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

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

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

2.5 Wrexham Unitary Development Plan (1996-2011)

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

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

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

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

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

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

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

released. As such, the Unitary Development Plan (1996-2011), as the only document available, shall be used for reference when completing this TA.

2.6 Wrexham Local Development Plan 2 (2013-2028)

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

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

2.7 Local Planning Guidance Note 16 - Parking Standards

2.7.1 This guidance note explains the parking standards the Council applies to new development. It amplifies Unitary Development Plan (UDP 1996-2011) policies and will be a material consideration in the determination of planning applications. This guidance note was revised by the Council in July 2011, subject to external consultation in September 2011 and was formally adopted for use by the Executive Board in November 2011.

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

Table 2.1 Parking Standards

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

2.8 Wrexham Connected: Our Sustainable Urban Mobility Plan 2016

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

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

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

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

2.9 Summary

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

3 EXISTING SITUATION

3.1 Site Description

- 3.1.1 The application site is currently an undeveloped plot of land, situated off Clywedog Road South. The site is bounded to the east by dense vegetation including a number of mature trees which separate the site from the residential area that can be found further to the east. To the north the site is again bounded by a line of mature trees, beyond which can be found a number of additional commercial buildings, to the south lies undeveloped land with Clywedod Road South forming the western boundary. The sites frontage to Clywedog Road South is circa 380m in length.
- 3.1.2 Wrexham Industrial Estate is circa 3.5km east of Wrexham town centre, circa 4km north of Bangor-on-Dee and approximately 6km south-west of Farndon. The location of the site in the context of WIE and the local highway network is illustrated in Image 3.1.

Image 3.1: Site Location Plan



3.2 Local Highway Network

Clywedog Road South

- 3.2.1 As mentioned above Clywedog Road South forms the western boundary of the south. It is a single carriageway road, running in a general north to south direction for circa 1200m. The northern section of Clywedog Road South meets with Clywedog Road North, and to the south the road meets with Bridge Road South at a 3-arm roundabout. Clywedog Road East meets at a priority junction with

Clywedog Road South, 250m south from the junction with Clywedog Road North. The road is circa 8m in width, subject to a 40mph speed limit with street lighting being provided.

- 3.2.2 The site is proposed to take access circa 300m north from the southern 3-arm roundabout to serve the car park located on the southern section of the development site, with a secondary access to serve the commercial vehicles located approximately a further 300m to the north of the first access.
- 3.2.3 A continuous footway begins circa 400m north from the southern section of Clywedog Road South, running through to the junction with Clywedog Road North. The footway is circa 2m in width, and alternates between the eastern and western verges.
- 3.2.4 Numerous industrial buildings take access from Clywedog Road South, with a small business park also taking access from this road. No bus stops exist along this road, with the nearest being found along Bridge Road South.

Clywedog Road East

- 3.2.5 Clywedog Road East connects Bridge Road South with Clywedog Road South, running in a general north west to south east direction, this being circa 580m in length. To the north a priority junction connects to Clywedog Road South and to the south a 3-arm roundabout connects to Bridge Road South/Bridge Road. Clywedog Road North connects into Clywedog Road East circa 250m to the south of the junction with Clywedog Road South. The road is single carriageway circa 8m in width, subject to a 40mph speed limit, with street lighting being provided.
- 3.2.6 Footways are provided along Clywedog Road East from its junction with Clywedog Road South to its junction with Clywedog Road North. Several industrial buildings take access from the road, north from the junction with Clywedog Road North.

Clywedog Road North

- 3.2.7 Clywedog Road North runs in an 'S' shape alignment, connecting to Clywedog Road East to the south, Coed Aben Road to the north, and meeting with Clywedog Road South at a priority junction midway along its length. Street lighting is provided.
- 3.2.8 Footway exists along the southern verge of the carriageway and runs continuously from the Clywedog Road East junction through to Erlas Lane, with northern verge footway beginning approximately 300m north from Clywedog Road East and running through the Abenbury Way/Coed Aben Road junction. Both footways are circa 2m in width, with the footway in the northern verge being separated from the main carriageway by a 1.5m wide grass verge. No bus stops exist along this road, with the nearest being Bridge Road South.

Bridge Road

- 3.2.9 Bridge Road has a single carriageway, running in a generally north east to south west alignment, with a circa 12m width. The road is subject to a 40mph speed limit with two 3-arm roundabouts being found in the vicinity of the site. One roundabout can be found at the junction of Clywedog Road East/Bridge Road South, the other located circa 100m south of Coed Aben Road, providing access to Spectrum Business Park.
- 3.2.10 Bridge Road is circa 530m in length, with an approximate 2m wide footway along its southern verge. A similar width footway exists along the north verge, separated from the carriageway by a section of grass verge, approximately 3m in width. Street lighting is provided on Bridge Road.
- 3.2.11 Five bus stops exist along the length of Bridge Road. A north and southbound stop exist to the south of Coed Aben Road, circa 60m from the junction. The third stop is northbound and exists circa 140m to the south of the Bridge Road/Spectrum Business Park roundabout, with the 4th and 5th existing circa 50m north from the Clywedog Road South/Bridge Road/Bridge Road South roundabout, both north and southbound.
- 3.2.12 A pelican crossing exists slightly to the south of the 3rd bus stop, with double yellow lines along both the north bound and south bound verge to prevent on street parking. Dropped kerbs and tactile paving exist along the road and at the roundabouts to aid in pedestrian movements.

Bridge Road South

- 3.2.13 Bridge Road South is a continuation from Bridge Road and extends for approximately 800m southwards towards Cefn Road. Two 3-arm roundabouts exist along this stretch of road, with the first being circa 670m south from the Bridge Road roundabout, providing a continuation of Bridge Road South and a connection to Clywedog Road South. The second 3-arm roundabout exists circa 140m further south from the above-mentioned roundabout, connecting to Cefn Road and Sesswick Way. Cefn Road provides a route through to Wrexham town centre and Sesswick Way through to the A525.
- 3.2.14 The road is single carriageway, approximately 8m in width and the majority is subject to a 30mph speed limit. Street lighting is provided and a share foot/cycleway exists along the northern verge of road, circa 3m in width, with the southern verge of footway ceasing from the southern roundabout of Bridge Road. Similarly to Bridge Road, double yellow lines exist along both the northbound and southbound verge to prevent on street parking.
- 3.2.15 The Maes Brenin/Pilgrim Way residential development takes two access points from Bridge Road South along its northern verge, with industrial units taking two access points from the southern verge. A northbound and southbound bus stop exist approximately 250m south of the roundabout with Bridge Road, called 'Pentre Maelor'.

Coed Aben Road/Abenbury Way

- 3.2.16 Coed Aben Road passes through the centre of WIE. The road is approximately 670m in length and provides a connection between Bridge Road in the south and Clywedog Road North in the north. The road is circa 9m in width, has circa 2m wide footways in both verges, the road is subject to a 40mph speed limit and street lighting is provided.
- 3.2.17 Abenbury Way is the extension westwards of Coed Aben Road. This is circa 7m in width, has a footway in the southern verge only and is subject to a 40mph speed limit.

3.3 Existing Traffic Conditions

- 3.3.1 A series of site visits to WIE have been undertaken by Prime since late 2017 with the most recent visit being on 2nd September 2021. During the site visits, traffic was observed to move freely throughout the estate with no issues noted at the majority of the key junctions. Both the Cefn Road route and the A525 towards Wrexham (via Marchwiell) were also observed and both routes appeared to be relatively lightly trafficked, with slightly more traffic on the more localised Cefn Road at the time of the site visits. From the site visits there would appear to be spare capacity for additional demand should further development, or improved attraction of existing uses be proposed. No safety concerns with the operation of the existing highway network were noted during the site visit.
- 3.3.2 As part of the aforementioned Transport Statements and Technical Note prepared in support of the other recent planning applications by FIREM, traffic surveys were undertaken at 11 key junctions following a trip distribution exercise based on 2011 Census Method of Travel to Work (MTW) data.
- 3.3.3 Classified turning counts were undertaken at a number of junctions and used in the 2018 Technical Note prepared in support of the redevelopment of a number of FIREM's other assets in WIE. The traffic surveys were undertaken by external traffic data collection specialist 360TSL Traffic Data Collection, on behalf of Prime.
- 3.3.4 The manual classified turning counts were undertaken on Tuesday 10th July 2018, between the hours of 07:00 and 10:00 and 16:00 and 19:00 to ensure that the commuter peaks were surveyed allowing the morning (AM) and evening (PM) peak hours to be determined. A survey of queue lengths on the various approaches to these junctions was also undertaken as part of the surveys, though no notably long queues were recorded.
- 3.3.5 The utilisation of the results of these surveys, in ascertaining the capacity of the site accesses is detailed in Section 6 . The raw survey data can be provided on request.

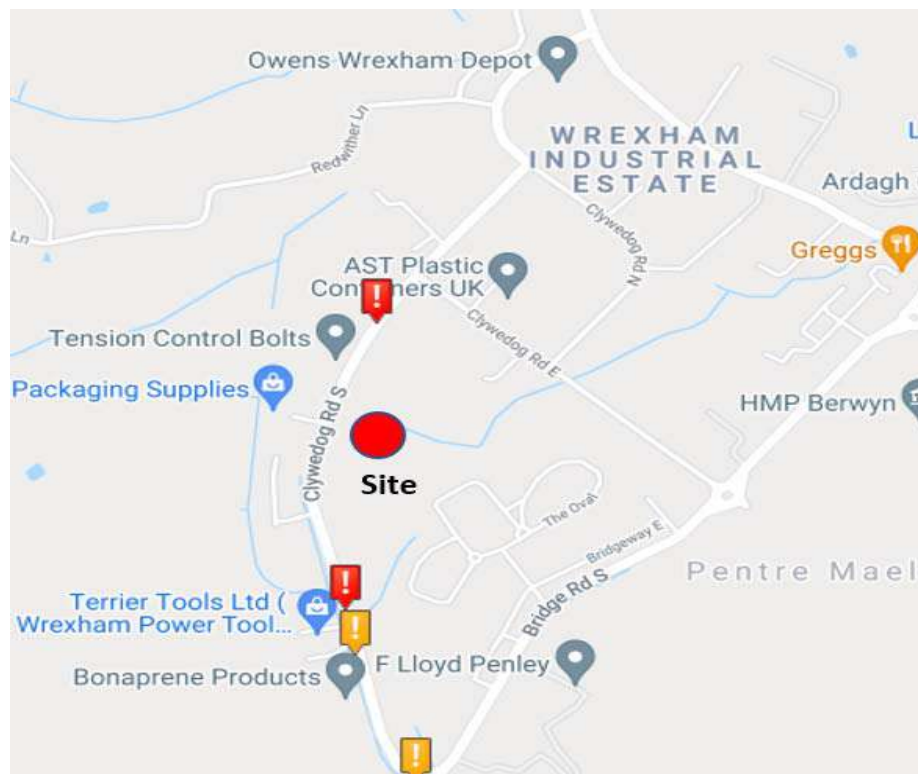
3.4 Road Safety

- 3.4.1 To allow for this road safety review to be undertaken, the highways officers at WCBC were approached to supply the required data. It should be noted that at the time of writing this TA no

response to our request for this data had been received. In the absence of this data, Crashmap has therefore been utilised to undertake the following review.

- 3.4.2 Crashmap data has been reviewed for the section of WIE comprising Clywedog Road South, Clywedog Road North, Clywedog Road East, Bridge Road and Bridge Road South. The data shows there have been four injury accidents during the five-year period between the start of 2016 and the end of 2020. All of these incidents have occurred on Clywedog Road South, between Clywedog Road East and the Bridge Road South roundabout. Image 3.2 shows the locations of these accidents. The Crashmap output is provided in Appendix A.

Image 3.2: Accident Plot



- 3.4.3 An examination of Image 3.2 shows that of those four accidents, two resulted in serious injuries being sustained and two resulted in slight injuries being sustained. The following provides some further detail with regards to these incidents.

Serious Injury Accidents

- 3.4.4 As mentioned above, two incidents have occurred on Clywedog Road South that have resulted in serious injuries being sustained, both of these incidents occurred in 2016. The first incident occurred in February of that year toward the southern end of the site frontage. This involved a cyclist being in collision with a stationary goods vehicle, with the cyclist sustaining a serious injury. The second incident occurred in March of that year toward the northern end of the site frontage. This involved a

goods vehicle being in collision with a cyclist, with the cyclist sustaining a serious injury. Both accidents occurred in daylight with dry road conditions.

Slight Injury Accidents

- 3.4.5 As mentioned above, two incidents have also occurred on Clywedog Road South that have resulted in slight injuries being sustained. The first occurred in June 2017 and involved the loss of control of a motorcycle on the approach to the Clywedog Road South/Bridge Road South roundabout, this resulted in a slight injury being sustained by the rider. It should be noted that no other vehicle was involved but the incident occurred in the rain and the road was wet. The second incident occurred in June 2019 and involved a goods vehicle in collision with a parked car. This incident occurred to the south of the southern boundary of the site, in daylight, in fine weather and road conditions were dry.

Summary

- 3.4.6 Four injury accidents in five years across quite an extensive study area is relatively low. It should be noted that these accidents have occurred in Clywedog Road South, two in the vicinity of the site frontage. On examination of the details of these accidents (including two vehicles colliding with the rear of stationary vehicles and a motorcyclist falling off in wet weather conditions) do not suggest that the road conditions in the vicinity of the site were contributory factors.
- 3.4.7 From a review of the data provided, it is therefore concluded that there are no deficiencies in the existing highway network, or existing safety issues within the vicinity of the site, that would be exacerbated by the development proposals.

4 DEVELOPMENT PROPOSAL

4.1 Development Description

- 4.1.1 As mentioned above, a planning application is to be submitted to deliver circa 152,000 sq/ft (14,160 sqm) of B8 Warehouse usage in one building on land to the east of Clywedog Road South. The scheme will also include 14 HGV docking bays and 140 parking spaces for employee/visitor parking.
- 4.1.2 It is proposed that a minimum 15m landscape buffer is to be maintained between the proposed development site and the existing residential units which can be found to the east.

4.2 Site Access

- 4.2.1 The site is proposed to take access directly from Clywedog Road South, along the site's western frontage, in the form of two priority-controlled junctions. The northern entry point will be for commercial vehicles and will facilitate access to the docking bays; the southern entry point will facilitate access into the employee and visitor car park. Both access points can also be used by pedestrians and cyclists to access the site.

Northern Access Point

- 4.2.2 As previously agreed with the highway officers at WCBC, the northern access will comprise of a 7.3m wide carriageway with 15m kerb radii. These geometric parameters being robust enough to accommodate the largest vehicles which could utilise this access i.e. 16.5m long articulated HGVs. Visibility splay of 2.4m x 120m are also to be provided in accordance with the wishes of the highway officers at WCBC and agreed as part of the approved scheme on this site, these also being TAN18/DMRB compliant for the prevailing 40mph speed limit on the adjacent highway network. The site access will further incorporate 2m wide footways, either side of the carriageway, connecting to existing footway along Clywedog Road South. The proposed access arrangements are depicted in Drawing P21065-001 contained with Appendix B.

Southern Access Point

- 4.2.3 The southern access will comprise a 5.5m wide carriageway with 6m kerb radii. These geometric parameters being robust enough to accommodate the largest vehicles which could utilise this access i.e. a large van. The geometric parameters for this access have been revised from those approved as part of the consented scheme for the site due to the fact that there will not be a need for 16.5m long articulated vehicles to utilise this access. Visibility splays for this southern access of 2.4m x 120m are also to be provided in accordance with the wishes of the highway officers at WCBC and agreed as part of the approved scheme on this site, these also being TAN18/DMRB compliant for the prevailing 40mph speed limit on the adjacent highway network. The site access will further incorporate 2m wide

footways, to provide connection to existing footway across from this access. The proposed access arrangements are depicted in Drawing P21065-002 contained with Appendix B.

Proposed Pedestrian/Cycle Access

- 4.2.4 The pedestrian access to the site will be complimented by the provision of a direct pedestrian/cycle only access onto Clywedog Road South. This will avoid the need for pedestrians/cyclist wishing to access the office element of the scheme having to walk/cycle through a service yard or car park.

4.3 Swept Path Analysis

- 4.3.1 To demonstrate that above mentioned access points will be safe to serve the site for their intended purposes, a swept path analysis using the industry approved AutoTrack software package has been undertaken for both access points. The northern access has been assessed with a 16.5m articulated HGV, this being the largest vehicle expected to regularly use this access point and the southern access has been assessed with an LGV, this being the largest vehicle expected to regularly use this access.
- 4.3.2 The swept path analysis is illustrated on Drawings P21065-003 and 004 contained in Appendix B. These drawings demonstrate that the HGV can utilise the northern access to safely access and egress the site in forward gear and that an LGV can utilise the southern access to safely access and egress the site in forward gear.

4.4 Parking Provision

- 4.4.1 Table 2.1 shows an extract of WCBC parking standards. This shows that for B8 warehouse the standards for car parking is 1 space per 100sqm and cycle parking is 1 space per 1000sqm. Based on a Gross Floor Area (GFA) of 152,000 sq/ft (14,121sqm), 141 car parking spaces should be provided together with 15 cycle parking spaces.
- 4.4.2 The proposed scheme comprises 140 car parking spaces, this being generally in line with WCBC's standards. Safe and secure cycle parking facilities are provided near to the main pedestrian access into the building, these facilities accommodating 16 spaces this also being generally in line with WCBC standards.

4.5 Summary

- 4.5.1 The development is proposed to be served by two access points. It has been demonstrated that the site is able to accommodate all likely vehicle types which will regularly access the development.
- 4.5.2 The car parking provision to be delivered as part of the scheme has been shown to be generally in line with WCBC's parking requirements and is considered appropriate for the size and layout of the proposed development. The cycle parking provision also accords with WCBC's standards.

5 ACCESS BY SUSTAINABLE MODES

5.1 Introduction

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

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

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

5.2 Access by Foot

- 5.2.1 As described in Section 3 above, the site is proposed to take access from an existing point on Clywedog Road South with a second access proposed circa 300m south from the first. The site is currently undeveloped open land. Footway provision and street lighting exist along the carriageway opposite the site. A separate pedestrian/cycle access is also to be provided onto Clywedog Road South to supplement the facilities provided at both of the main access points highlighted above.
- 5.2.2 Research has indicated that acceptable walking distances depend on several factors, including the quality of the street environment, the type of amenity offered, the surrounding area, and other local facilities. The Chartered Institution of Highways and Transportation (CIHT) document entitled *Providing for Journeys on Foot* (2000) suggests walking distances which are relevant to this application. These distances are shown in Table 5.1.

Table 5.1: Suggested Acceptable Walking Distances

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

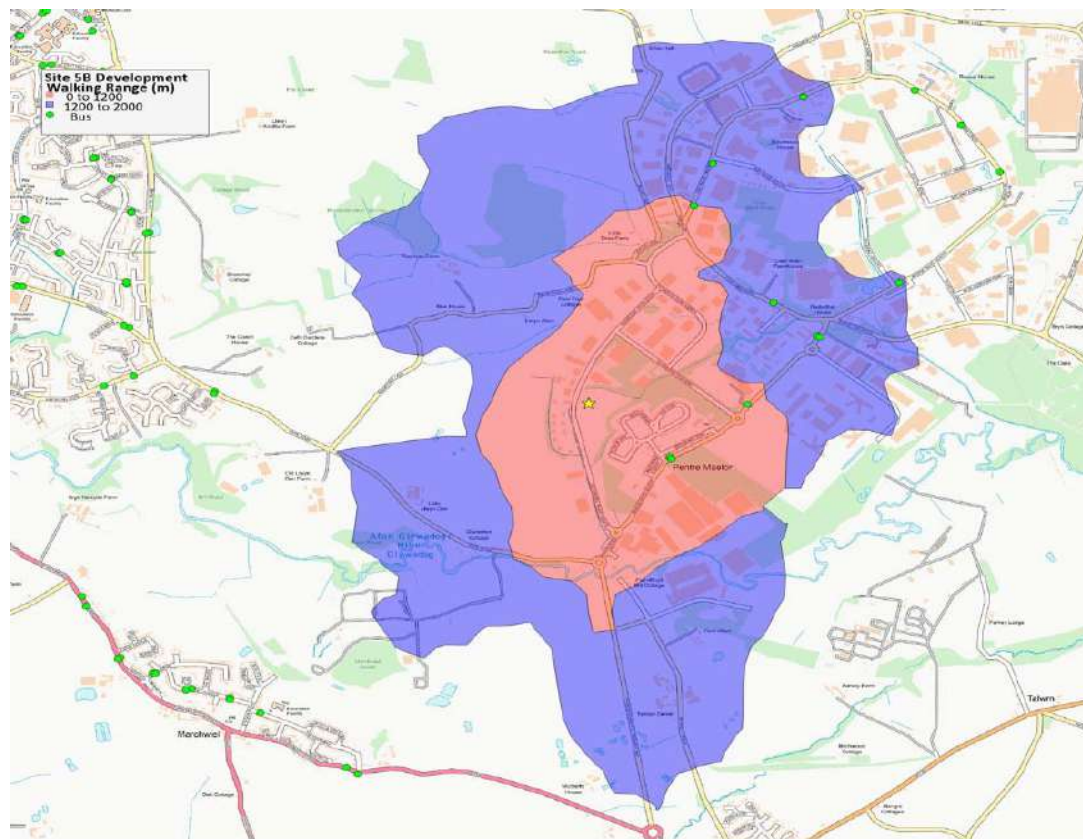
Source: CIHT Document ‘Providing for Journeys on Foot’ (2000)

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

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

5.2.4 The accessibility for pedestrians to and from the site, in relation to WIE, has been considered in the above context. In order to highlight the site's accessibility on foot, an indicative walking isochrone has been produced using the Geographic Information System (GIS) software Visography TRACC. Figure 5.1 represents the site's walking catchment with the CIHT's 'Preferred Maximum' distances of 1200m and 2000m for local service and commuting trips respectively illustrated.

Figure 5.1: Walking Isochrone – 1200m and 2000m ranges

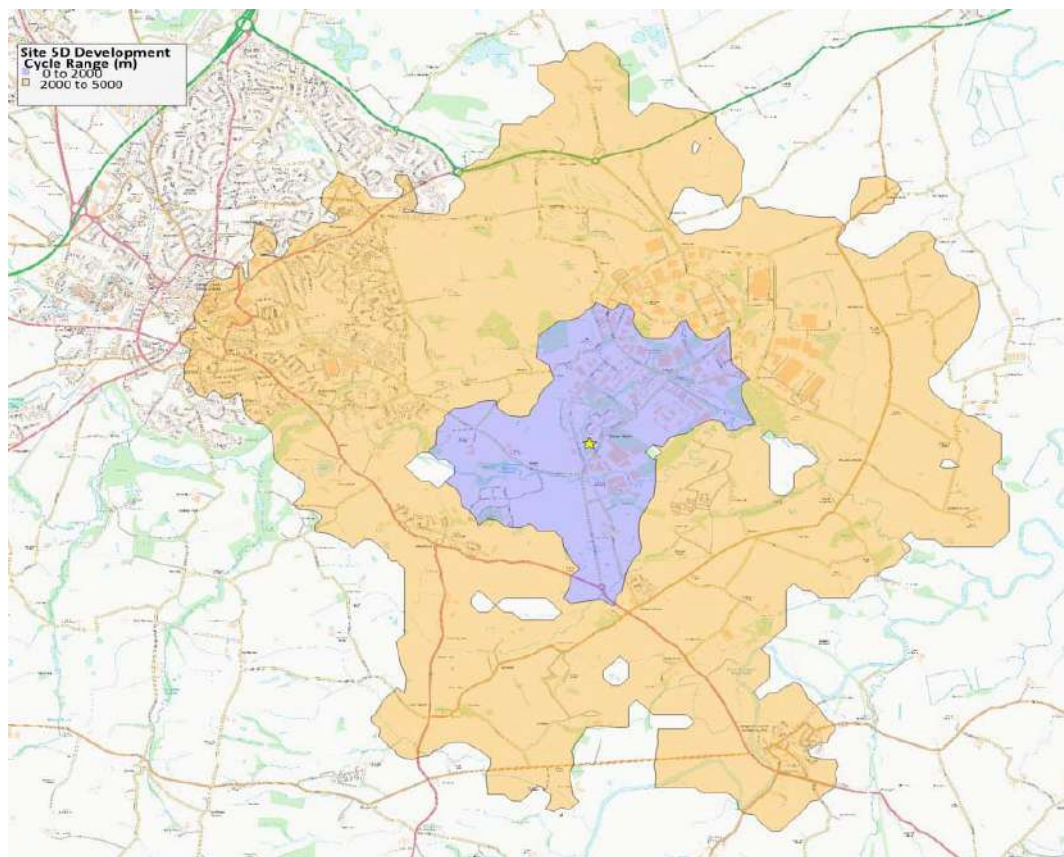


5.2.5 Seen within Figure 5.1, the site is accessible by the vast majority of WIE, with only a handful of units falling outside of the 2000m walking range, this being the preferred CIHT maximum distance. This includes the proposed and refurbished retail units on the Site 1 which are particularly important in serving the wider estate. Having such local amenities reduces the trip numbers and distances for ancillary retail use, such as lunchtime meals, tea/coffee breaks and convenience shopping, leading to higher levels of trip containment within the site, which is more sustainable than staff and visitors having to travel further distances, particularly by car, for such trip types.

- 5.2.6 The local bus stops are highlighted within Figure 5.1, with the nearest pairs of stops located on Bridge Road adjacent to the Clywedog Road East circa 800m walk from the site. The services provided by these bus stops are further detailed in Section 5.4 below.
- 5.2.7 All footways, as seen within Section 3, are of reasonable width and quality. Pedestrian dropped kerbs exist at the majority of junctions to aid in pedestrian movements.
- 5.2.8 Given the evidence presented above, walking can be considered a realistic method of travel to/from the site to access the surrounding area of WIE and vice versa.

5.3 Access by Cycle

- 5.3.1 It is widely recognised that cycling can offer an attractive alternative to short car trips, particularly those under 5km, but also as part of longer journeys by public transport.
- 5.3.2 The CIHT document Cycle Friendly Infrastructure (2004) states in paragraph 2.3 that:
- ‘Three quarters of journeys by all modes of travel are less than five miles (8km) and half under two miles (3.2km) (DoT 1993, table 2a). These are distances that can be cycled comfortably by a reasonably fit person.’*
- 5.3.3 Local Transport Note 1/20 Cycle Infrastructure Design states similar, that *‘Two out of every three personal trips are less than five miles [8km] in length – an achievable distance to cycle for most people’*.
- 5.3.4 It is noted that although no physical cycling infrastructure exists around WIE, the roads are wide, with the majority being a minimum 8m in width.
- 5.3.5 A cycling isochrone showing the site’s catchment has also been produced using TRACC and is shown as Figure 5.2. The figure illustrates 2000m and 5000m catchment ranges, which equate to 10-minute and 25-minute journey times respectively which are based on the somewhat conservative cycle speed of 12kph. Commuting cyclists are in fact more typically considered to travel at speeds between 15-20kph so a greater catchment may be more realistic.

Figure 5.2: Cycling Isochrone – 2000m and 5000m ranges

5.3.6 It is clear that the whole of WIE, eastern parts of Wrexham, Marchwiel and smaller residential areas such as Nant Clwyd Park are within the 5000m catchment. Whilst parts of Wrexham are outside of the 5000m distance, the site may still be within a reasonable cycling distances for many staff who live there given the CIHT and DfT advice.

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

5.4 Access by Public Transport

5.4.1 The nearest bus stops are known as the 'Bridge Road' stops and provide services both northbound and southbound towards Wrexham and around the industrial estate. They are located on Bridge Road adjacent to the Clywedog Road East circa 800m walk from the site.

5.4.2 The southbound stop provides a shelter, seating and timetable information, with the northbound stop being a bus stop 'flag'. A raised boarding area is provided at both stops which aid access for the mobility impaired.

5.4.3 A summary of the bus service available from these stops is provided in Table 5.2.

Table 5.2: Summary of Bus Services from ‘Bridge Road’ stop

Bus Service	Route	Weekday Period	Weekend
			Saturday
41a	Redwither Tower - Wrexham	06:06 – 18:12 Approx. 1 service/hr	06:06 – 18:12 Approx. 1 service/hr
	Wrexham – Redwither Tower	05:46 – 17:57 Approx. 1 service/hr	05:45 – 17:41 Approx. 1 service/hr

- 5.4.4 The 41a bus route shown in Table 5.2 above provides services to and from Wrexham with a frequent service of approximately one every hour on both weekdays and Saturdays and would be a viable option for commuters and visitors. Wrexham town centre can be reached in circa 20 minutes from the ‘Bridge Road’ stop, with a similar journey time from the town to Wrexham Industrial Estate.
- 5.4.5 In light of existing service times and frequencies, it is considered that existing bus services provide a realistic travel option for staff at the proposed development to travel to work during typical weekday working hours and also on a Saturday if it’s a requirement for the continual operation.
- 5.4.6 In respect of rail travel, Wrexham General train station can be reached via the abovementioned services with a short, circa 7-minute, walk from Wrexham bus station. The train station provides access to a wider range of locations, with Cardiff Central, Holyhead, Bidston, Birmingham International, Shrewsbury, Chester and Manchester all having services from this station. The station provides 20 bicycle storage spaces with 68 car parking spaces also provided¹.
- 5.4.7 The North Wales Metro project intends to enhance rail service frequencies across North Wales, with significant improvements to Wrexham’s stations being part of the plans, which should further encourage travel by rail in the area.
- 5.4.8 In summary, both bus and rail services, combined with walking/cycling as part of a multimodal commute are likely to provide a realistic travel options for commuters and visitors to the site at peak times and throughout the day.

5.5 Travel Plan

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

¹ <https://www.nationalrail.co.uk/stations/WRX/details.html> accessed 10/09/21

5.6 Summary

- 5.6.1 This section of the report has demonstrated that the site is in a reasonably sustainable location where access to public transport is available and where local amenities fall within reasonable walking and cycling distances. Ancillary facilities in WIE such as hot food takeaways and other convenience retail are available within a reasonable walking distance of the site.
- 5.6.2 The site is accessible via bicycle from the wider WIE and surrounding residential areas including Wrexham and Marchwiel.
- 5.6.3 The local bus service provide connections both locally around the site and towards Wrexham town centre at traditional working times and throughout the day, making bus travel a viable option to and from the proposed development. As such, the development proposals accord with the context and thinking as outlined in *Wrexham Connected: Our Sustainable Urban Mobility Plan* (2016) and the *Wrexham Unitary Development Plan* (1996-2011)
- 5.6.4 In light of the location of the site and the existing walking, cycling and public transport infrastructure, it is considered that there are opportunities to access to the site by sustainable modes of travel.

6 TRAFFIC IMPACT ASSESSMENT

6.1 Introduction

- 6.1.1 This section of the report details the methodology used to predict the demand associated with the development. It then provides an assessment of the impact of the development on the highway network.

6.2 Vehicular Trip Generation

- 6.2.1 The same B8 trip rates used in assessment undertaken in support of the consented development (P/2018/1087) have been used in this assessment for consistency, however no B1 or B2 elements are now proposed. These trip rates and associated trip generation were derived from a TRICS interrogation in line with best-practice advice, and have been previously agreed with WCBC. The proposed B8 trip rates (per 100m²) and resultant trip generation associated with the proposed circa 152,000 sq/ft (14,160 sqm) gross floor area (GFA) is shown in Table 6.1 with the TRICS report output included in Appendix C.

Table 6.1: Vehicular Trip Rates & Generation – Proposed Use

Time	Trip Rates			Trip Generation		
	Arrivals	Departures	Totals	Arrivals	Departures	Totals
07:00-08:00	0.296	0.125	0.421	42	18	60
08:00-09:00	0.349	0.193	0.542	49	27	76
09:00-10:00	0.217	0.200	0.417	31	28	59
10:00-11:00	0.178	0.176	0.354	25	25	50
11:00-12:00	0.188	0.183	0.371	27	26	53
12:00-13:00	0.193	0.166	0.359	27	24	51
13:00-14:00	0.195	0.195	0.390	28	28	56
14:00-15:00	0.190	0.193	0.383	27	27	54
15:00-16:00	0.181	0.241	0.422	26	34	60
16:00-17:00	0.169	0.292	0.461	24	41	65
17:00-18:00	0.089	0.277	0.366	13	39	52
18:00-19:00	0.045	0.108	0.153	6	15	21
Daily (12hr)	2.290	2.349	4.639	325	332	657
Time	HGV Trip Rates			HGV Trip Generation		
	Arrivals	Departures	Totals	Arrivals	Departures	Totals
08:00-09:00	0.077	0.080	0.157	11	11	22
16:00-17:00	0.063	0.039	0.102	9	6	15

- 6.2.2 The proposed development is therefore likely to generate in the order of 76 and 65 two-way vehicular trips in the network peak hours, which are equivalent to just over one trips per minute at the site accesses. Included in these figures are 22 and 15 HGV trips in the respective AM and PM peak hours.
- 6.2.3 It is important to note that the site has existing extant permission for two units totalling a GFA of 9,017m² across a mix of B1, B2 and B8 land uses. Whilst the previous consent was for a lesser quantum

of GFA, B1 and B2 uses typically generate more traffic than B8. A summary of the equivalent trip generation of the consented use is provided in Table 6.2.

Table 6.2: Vehicular Trip Generation and Comparison – Extant Use vs Proposed Use

Time	Extant Trip Generation			Difference - Proposed minus Extant		
	Arrivals	Departures	Totals	Arrivals	Departures	Totals
07:00-08:00	29	10	39	13	8	21
08:00-09:00	33	15	48	16	12	28
09:00-10:00	20	16	36	11	12	23
10:00-11:00	16	14	30	9	11	20
11:00-12:00	15	15	30	12	11	23
12:00-13:00	17	15	32	10	9	19
13:00-14:00	17	18	35	11	10	21
14:00-15:00	15	16	31	12	11	23
15:00-16:00	15	20	35	11	14	25
16:00-17:00	13	27	40	11	14	25
17:00-18:00	7	29	36	6	10	16
18:00-19:00	4	10	14	2	5	7
Daily (12hr)	201	205	406	124	127	251
Time	Extant HGV Trip Generation			HGV Difference - Proposed minus Extant		
	Arrivals	Departures	Totals	Arrivals	Departures	Totals
08:00-09:00	7	7	14	4	4	8
16:00-17:00	1	3	4	8	3	11

- 6.2.4 Based on the figures above, the proposed development is likely to generate an additional 28 and 25 trips in the respective AM and PM peak hours. Such an increase is equivalent to less than one new trip every two minutes at the site accesses. The impact on the junctions in the study area will be considered later in this section.

6.3 Multimodal Trip Generation

- 6.3.1 The number of non-car trips has been forecast using 2011 census Method of Travel to Work (MTW) data for the local mid layer super output (MSOA) area Wrexham 020 (W02000420) as a workplace destination. Factors have been derived by dividing the TRICS car/van trips (total vehicles minus HGVs) by the census equivalent, with these factors (0.0050 AM and 0.0046 PM) applied to the other census travel modes to forecast the site's likely modal split. As HGV (OGV) trips were calculated using TRICS and do not appear in the census data, the TRICS values have been shown, as have the TRICS values for cars/vans. A summary of these multimodal trips is shown in Table 6.3.

Table 6.3: Forecast Multimodal Person Trips

Method	Census Trips	Modal Split	AM Trips	PM Trips
Driving a car or van	10760	79.1%	54	50
Passenger in a car or van	1406	10.3%	7	7
Bus, minibus or coach	478	3.5%	2	2
On foot	414	3.0%	2	2
Bicycle	307	2.3%	2	1
Motorcycle, scooter or moped	142	1.0%	1	1
Taxi	58	0.4%	0	0
Train	44	0.3%	0	0
Total travel to work	13609	100.0%	68	63
<i>Factors</i>			<i>0.0050</i>	<i>0.0046</i>
HGVs	-	-	22	15
Total Trips	-	-	90	78

- 6.3.2 The above suggests that the proposed development will generate 90 and 78 total person trips in the respective AM and PM peak hours. Following driving a car/van as being the most popular mode, 22 and 15 will be HGV drivers, 7 trips will be as car/van passengers, 2 will be bus passengers, 2 will travel on foot, 1-2 via bicycle and 1 via motorcycle/scooter. It is hoped that the Travel Plan, produced alongside this TA, will help to increase the use of the non-car driver modes.

6.4 Traffic Growth

- 6.4.1 The 2018 observed flows (Traffic Flow Diagrams 1 and 2 in Appendix D) used in the capacity assessments in support of other recently consented FIREM developments on the wider WIE have been growthed to 2036 using TEMPro factors for the local MSOA in order to align with these assessments. 2036 aligns with WCBC's consultant Mott MacDonald (MM) request during pre-application discussions to consider the year of opening plus 10 years. We assume that much of the development will be complete by 2026 hence 2036 being 10 years after this.
- 6.4.2 As TEMPro is not strictly applicable to heavy vehicles, the DfT's Regional Traffic Forecasts (RTF) have been used to derive factors to consider HGV growth. As the level of growth for HGVs in Wales is negative with a factor of 0.9971, a factor of 1.00 has been applied instead.
- 6.4.3 It should however be noted that the current TEMPro and RTF datasets at the time of the assessment, were forecast by the DfT prior to Brexit, the 2020 recession and the Covid-19 pandemic, therefore the level of growth calculated is likely to be notably higher than what will likely occur, which further adds to the robustness of the assessment.

6.5 Committed Developments

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

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

6.5.2 We have also included traffic likely to be generated the pending application for 17,100m² of E (B1), B2 and B8 at The Oaks off Oak Road as we believe that it is close to receiving planning consent. We have also included the 11,162m² redevelopment of Site 1 (The Bridgeway Centre) off Bridge Road and Coed Aben Road which is a pending application by FIREM. As Prime worked on these applications and the other FIREM applications, we have access to the forecast traffic flows for each with the respective assessment methodologies agreed with WCBC Highways.

6.5.3 During scoping discussions regarding Site 1, WCBC's consultant MM asked that we consider the addition of a pending application for 194 additional car parking spaces at HMP Berwyn, however this application is for the formalisation of an overspill car park that is already in place and an additional car park adjacent to it. These additional parking spaces will not generate new trips, furthermore, from our onsite observations and from viewing of recent aerial photography on Google Earth, many cars park on the existing internal prison roads, and the provision of new or formalised parking areas, will simply allow such drivers to park in a parking space rather than along the internal roads rather than generating more traffic. In addition to this, many of the people who will park here will be visitors to the prison, and from viewing the prison's website, many such visiting times to not align with the peak hours of our assessment. We have therefore chosen not to include this application as a committed development.

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

6.5.5 In line with our assessments for the other FIREM and The Oaks applications, we have used the calculations in the Employment Densities Guide (3rd edition 2015). It was forecast that cumulative development of the various sites within WIE would generate more than the 784 jobs forecast in TEMPro for the local mid layer super output area (MSOA), but rather than apply negative growth, we have set the 2036 job totals to the 2018 levels, with the explicit modelling of the development trips accounting for the job growth without double-counting.

6.5.6 A summary of the TEMPro and RTF growth factors applied is shown in Table 6.4.

Table 6.4: Forecast Traffic Growth

Source	TEMPro		RTF
Peak	AM	PM	Both
Factor	1.1375	1.1372	1.0000

6.5.7 The above factors have been applied to the 2018 observed flows forming the 2036 Base flows as shown in Traffic Flow Diagrams 3 and 4 in Appendix D. We are aware that the traffic flows for the Industrial Estate Road/Abenbury Way/Ash Road North/Bryn Lane roundabout were surveyed in 2019, however for robustness and simplicity, the 2018 to 2036 growth factors have been applied.

6.5.8 The traffic associated with the committed developments is shown in Traffic Flow Diagrams 5-16, with the total committed development traffic shown in Traffic Flow Diagrams 17 and 18 added to the 2036 Base flows forming the 2036 Without Development flows shown in Traffic Flow Diagrams 19 and 20, all of which are provided in Appendix D. An adjustment to the Site 4 traffic is shown in Traffic Flow Diagrams 9 and 10 as this traffic will be reassigning from Site 1.

6.6 Trip Distribution

6.6.1 Employment based development trips have been distributed across the local highway network using census MTW data for the local MSOA and web-based route planning software (Google Maps) as per the previous FIREM developments on WIE. This distribution is shown in Traffic Flow Diagram 21 with the distributed development traffic shown in Traffic Flow Diagrams 22 and 23 in Appendix D. All HGV traffic has been assigned to the northern access given that this provides access to the loading bays whilst all other traffic has been assigned to the southern access which provides access to the main car park. The development traffic has been added to the Without Development flows forming the 2036 With Development flows shown in Traffic Flow Diagrams 24 and 25 (Appendix D). For reference, the flows associated with the consented development on Site 5 are shown in Traffic Flow Diagrams 26 and 27 (Appendix D).

6.7 Absolute and Percentage Assessment

6.7.1 The number of trips that the development is forecast to add to key local junctions in the AM and PM network peaks is summarised in absolute and percentage terms in Table 6.5.

Table 6.5: Summary of Development Trips

Junction	2036 AM Peak				2036 PM Peak			
	Without Dev	With Dev	Abs Diff	% Diff	Without Dev	With Dev	Abs Diff	% Diff
Bridge Rd S/ Clywedog Rd S	1303	1346	43	3.3%	1451	1488	37	2.5%
Sesswick Way/ Bridge Rd S/ Cefn Rd	1427	1470	43	3.0%	1559	1596	37	2.4%
Abenbury Way/ Coed Aben Rd/ Clywedog Rd N/ Ash Rd	1116	1149	33	3.0%	1017	1045	28	2.8%
Ind Est Rd/ Abenbury Way/ Ash Rd N/ Bryn Ln	2683	2716	33	1.2%	2503	2531	28	1.1%

6.7.2 The greatest increase in traffic as a result of the development is shown to be at the Bridge Rd S/ Clywedog Rd S and Sesswick Way/ Bridge Rd S/ Cefn Rd junctions with the development resulting in 43 and 37 additional two-way trips in the respective AM and PM peak hours, equivalent to percentage increases ranging from 2.4% to 3.3% and less than one new trip per minute. The increase at the other two junction is forecast to be 33 and 28 two-way trips in the respective peak hours, with the percentage impact ranging from 1.1% to 3.0%, and equivalent to around one new trip every two minutes.

6.7.3 During scoping discussions for the Site 1 redevelopment, MM requested that capacity assessments be undertaken at junctions where the increase is greater than 5%; this suggested threshold is not met or exceeded at any of the study junctions. Furthermore, it is important to acknowledge the level of traffic associate with the consented development on Site 5. A summary of the increase in traffic associated with the proposed development compared to the consented/extant at each of the study junctions is shown in Table 6.6.

Table 6.6: Development Traffic Increase Compared to Extant

Junction	AM Peak			PM Peak		
	Extant	Proposed	Abs Diff	Extant	Proposed	Abs Diff
Bridge Rd S/ Clywedog Rd S	36	43	7	27	37	10
Sesswick Way/ Bridge Rd S/ Cefn Rd	36	43	7	27	37	10
Abenbury Way/ Coed Aben Rd/ Clywedog Rd N/ Ash Rd	26	33	7	19	28	9
Ind Est Rd/ Abenbury Way/ Ash Rd N/ Bryn Ln	26	33	7	19	28	9

6.7.4 Based on the figures above in comparison with the extant permission, the proposed development is forecast to add just 7 additional trips to the four study junctions in the AM peak hour and between 9 and 10 in the PM peak hour. Clearly this level of increase, equivalent to just one new trip every six

minutes, will have a negligible impact that will be imperceptible to other road users. Junction capacity assessments at these junctions should not be required, with the conclusions drawn as part of the supporting application for the consented development remaining valid.

6.8 Site Capacity Assessments

- 6.8.1 Whilst it has been demonstrated that junction capacity assessment should not be required at any off-site junction, we have undertaken a capacity assessment of the proposed site access given that this infrastructure is proposed and will be where the development traffic is at its most concentrated. The assessment has been based on the southern access as this will be more heavily trafficked than the northern service access, however to provide a particularly robust assessment, the HGV trips have been added to the turning movements at the southern access.
- 6.8.2 In order to convert the traffic flows into PCUs, which is the requisite input flow unit required in the modelling software, a factor of 2.0 has been applied to the heavy vehicle user class which includes HGVs and buses/coaches. Cars effectively have a factor of 1.0. These factors are commonly accepted in transport modelling.
- 6.8.3 Junction geometry has been coded into the models based on a mixture of on-site measurements, OS mapping and aerial photography. Industry standard software has been used to model the access junction with the PICADY module of Junctions 9 software used.
- 6.8.4 When interpreting the Junctions results, the capacity of each arm or movement is calculated as the Ratio of Flow to Capacity (RFC) with 0.85 representing the practical capacity threshold of the arm and 1.00 representing the theoretical capacity threshold. It is above the practical capacity threshold where capacity problems begin to occur while exceeding the theoretical capacity means that arms are over capacity. Traffic flows have been input based on the 'ONE HOUR' (ODTAB) option which synthesises a 'peak within a peak' at the middle of the time period modelled and is generally seen as being the worst-case form of assessment in terms of impact.
- 6.8.5 The results of the proposed site access capacity assessment are summarised in Table 6.7 with the full results available in the model report output which is included in Appendix E.

Table 6.7: Proposed Site Access/ Clywedog Rd S

Arm	AM		PM	
	RFC	Q (PCU)	RFC	Q (PCU)
2036 With Development				
Site Access	0.09	0.1	0.09	0.1
Clywedog Rd S	0.08	0.2	0.08	0.2

6.8.6 The results show that the proposed site access, even with HGVs added which will use the northern access, will operate with a considerable level of space capacity and is therefore appropriate to serve the site.

6.8.7 Given the greater geometry of the northern access and lower traffic flows, it is logical to assume that the proposed northern access will operate with an even greater level of spare capacity.

6.9 Summary

6.9.1 It has been demonstrated that the increase in traffic as a result of the development proposals compared to the extant permission on the site is negligible. It has also been demonstrated that the proposed site accesses will have sufficient capacity to accommodate the proposed development.

7 SUMMARY AND CONCLUSION

7.1 Summary

- 7.1.1 This TA has been produced by Prime to consider the highways and transportation implications associated with a proposal by FIREM for the development of a 152,000 sq/ft (14,160sqm) B8 Warehouse on a site to the east of Clywedog Road East (Site 5).
- 7.1.2 This document has been prepared in accordance with *Planning Policy Wales* and *Technical Advice Note 18: Transport* as well as a number of local policy documents. It considers the accessibility of the site and safety for all modes of travel from the private car to more sustainable modes such as walking, cycling and public transport.
- 7.1.3 A review of personal injury accidents that have occurred on the local highway network has been undertaken for the most recent five-year period. An analysis of those accidents showed that there does not appear to be a proliferation of accidents at any one location suggesting that highway safety is not an issue that would preclude the development of the site.
- 7.1.4 The two main vehicular accesses will be provided from Clywedog Road South. The proposed footway will extend on to Clywedog Road South and connect to the existing provision along the northern verge opposite the sites northern access. A separate pedestrian/cycle only access is also to be provided onto Clywedog Road South.
- 7.1.5 Car and cycle parking are to be provided in accordance with WCBC's parking standards.
- 7.1.6 An assessment has been undertaken of the site's level of accessibility by sustainable modes, from which it can be concluded that realistic options exist for access to local residential areas and local amenities on foot, by cycle and by public transport.
- 7.1.7 An assessment of the capacity of the proposed site access has been undertaken this confirming that the access will have ample capacity to accommodate the predicted traffic flows in 2036 with the development in place.
- 7.1.8 The development traffic will also have a negligible to minor impact on the surrounding highway network.

7.2 Conclusion

- 7.2.1 This report and the associated appendices conclude that that there are no highway safety concerns that would preclude the delivery of the development proposals, the site is accessible by a variety of modes of transport, an appropriate level of car and cycle parking will be provided, and that the development would have a negligible impact on the operation of the surrounding highway network.

- 7.2.2 As the proposal complies with local and national planning policy and guidance with respect to sustainable accessibility, safety and impact on the highway network, there are no highways or transportation related reasons why planning permission should not be granted. Should the highway authority have any concerns, we are happy to consult further with them.

APPENDIX A

CRASH MAP OUTPUT

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Validated Data

Crash Date: Thursday, February 18, 2016 **Time of Crash:** 3:10:00 PM **Crash Reference:** 201660U024022

Highest Injury Severity: Serious
Highway Authority: Wrexham
Local Authority: Wrexham County Borough
Weather Description: Fine without high winds
Road Surface Description: Dry
Speed Limit: 40
Light Conditions: Daylight: regardless of presence of streetlights
Carriageway Hazards: None
Junction Detail: Not at or within 20 metres of junction
Junction Pedestrian Crossing: No physical crossing facility within 50 metres
Road Type: Single carriageway
Junction Control: Not Applicable

Road Number: U0

Number of Casualties: 1

Number of Vehicles: 2

OS Grid Reference: 337057 348884



For more information about the data please visit: www.crashmap.co.uk/home/Faq

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Validated Data

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Manoeuvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Pedal cycle	-1	Male	46 - 55	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	None
2	Goods vehicle 7.5 tonnes mgw and over	-1	Male	46 - 55	Vehicle is parked in the carriageway	Back	Journey as part of work	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Serious	Driver or rider	Male	46 - 55	Unknown or other	Unknown or other

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Validated Data

Crash Date: Tuesday, March 08, 2016 **Time of Crash:** 2:53:00 PM **Crash Reference:** 201660U033578

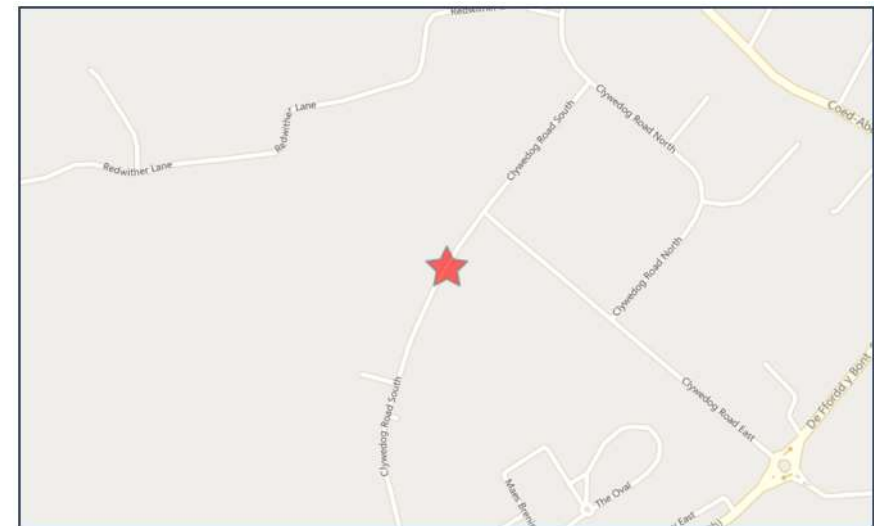
Highest Injury Severity: Serious
Highway Authority: Wrexham
Local Authority: Wrexham County Borough
Weather Description: Fine without high winds
Road Surface Description: Dry
Speed Limit: 30
Light Conditions: Daylight: regardless of presence of streetlights
Carriageway Hazards: None
Junction Detail: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

Road Number: U0

Number of Casualties: 1

Number of Vehicles: 2

OS Grid Reference: 337110 349391



For more information about the data please visit: www.crashmap.co.uk/home/Faq

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Validated Data

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Manoeuvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Goods vehicle 7.5 tonnes mgw and over	-1	Male	46 - 55	Vehicle proceeding normally along the carriageway, not on a bend	Front	Journey as part of work	None	None
2	Pedal cycle	-1	Male	Over 75	Vehicle proceeding normally along the carriageway, not on a bend	Back	Other	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Serious	Driver or rider	Male	Over 75	Unknown or other	Unknown or other

For more information about the data please visit: www.crashmap.co.uk/home/Faq

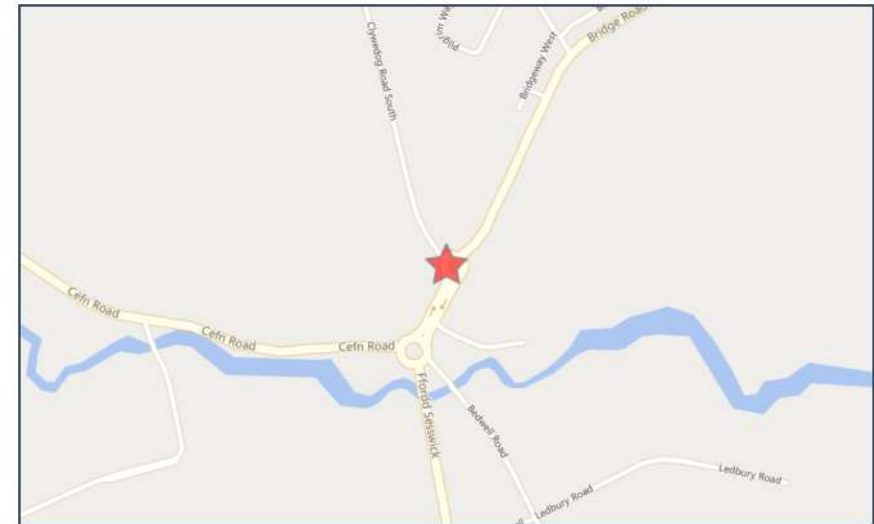
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Validated Data

Crash Date:	Friday, June 02, 2017	Time of Crash:	6:00:00 PM	Crash Reference:	201760V080595
Highest Injury Severity:	Slight	Road Number:	U0	Number of Casualties:	1
Highway Authority:	Wrexham			Number of Vehicles:	1
Local Authority:	Wrexham County Borough			OS Grid Reference:	337157 348573
Weather Description:	Raining without high winds				
Road Surface Description:	Wet or Damp				
Speed Limit:	30				
Light Conditions:	Daylight: regardless of presence of streetlights				
Carriageway Hazards:	None				
Junction Detail:	Roundabout				
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres				
Road Type:	Single carriageway				
Junction Control:	Give way or uncontrolled				



For more information about the data please visit: www.crashmap.co.uk/home/Faq
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Validated Data

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Manoeuvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Motorcycle over 50cc and up to 125cc	-1	Male	36 - 45	Vehicle proceeding normally along the carriageway, on a right hand bend	Offside	Commuting to/from work	None	None

Casualties

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

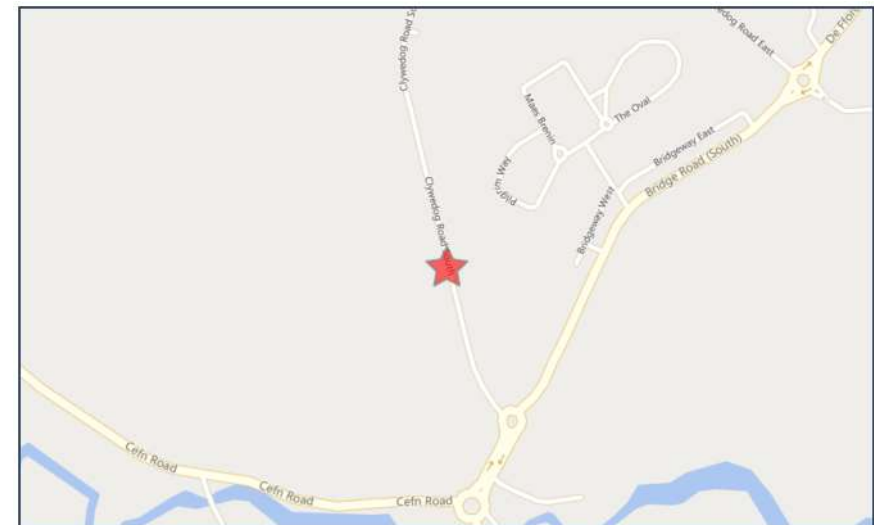
For more information about the data please visit: www.crashmap.co.uk/home/Faq

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Validated Data

Crash Date:	Tuesday, June 25, 2019	Time of Crash:	1:30:00 PM	Crash Reference:	201960X088129
Highest Injury Severity:	Slight	Road Number:	U0	Number of Casualties:	2
Highway Authority:	Wrexham			Number of Vehicles:	2
Local Authority:	Wrexham County Borough			OS Grid Reference:	337073 348803
Weather Description:	Fine without high winds				
Road Surface Description:	Dry				
Speed Limit:	40				
Light Conditions:	Daylight: regardless of presence of streetlights				
Carriageway Hazards:	None				
Junction Detail:	Not at or within 20 metres of junction				
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres				
Road Type:	Single carriageway				
Junction Control:	Not Applicable				



For more information about the data please visit: www.crashmap.co.uk/home/Faq

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Validated Data

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Manoeuvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Good vehicles of unknown weight	-1	Male	36 - 45	Vehicle proceeding normally along the carriageway, not on a bend	Front	Journey as part of work	Parked vehicle	None
2	Car (excluding private hire)	-1	Female	16 - 20	Vehicle is parked in the carriageway	Back	Journey as part of work	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Slight	Driver or rider	Female	16 - 20	Unknown or other	Unknown or other
2	2	Slight	Vehicle or pillion passenger	Male	36 - 45	Unknown or other	Unknown or other

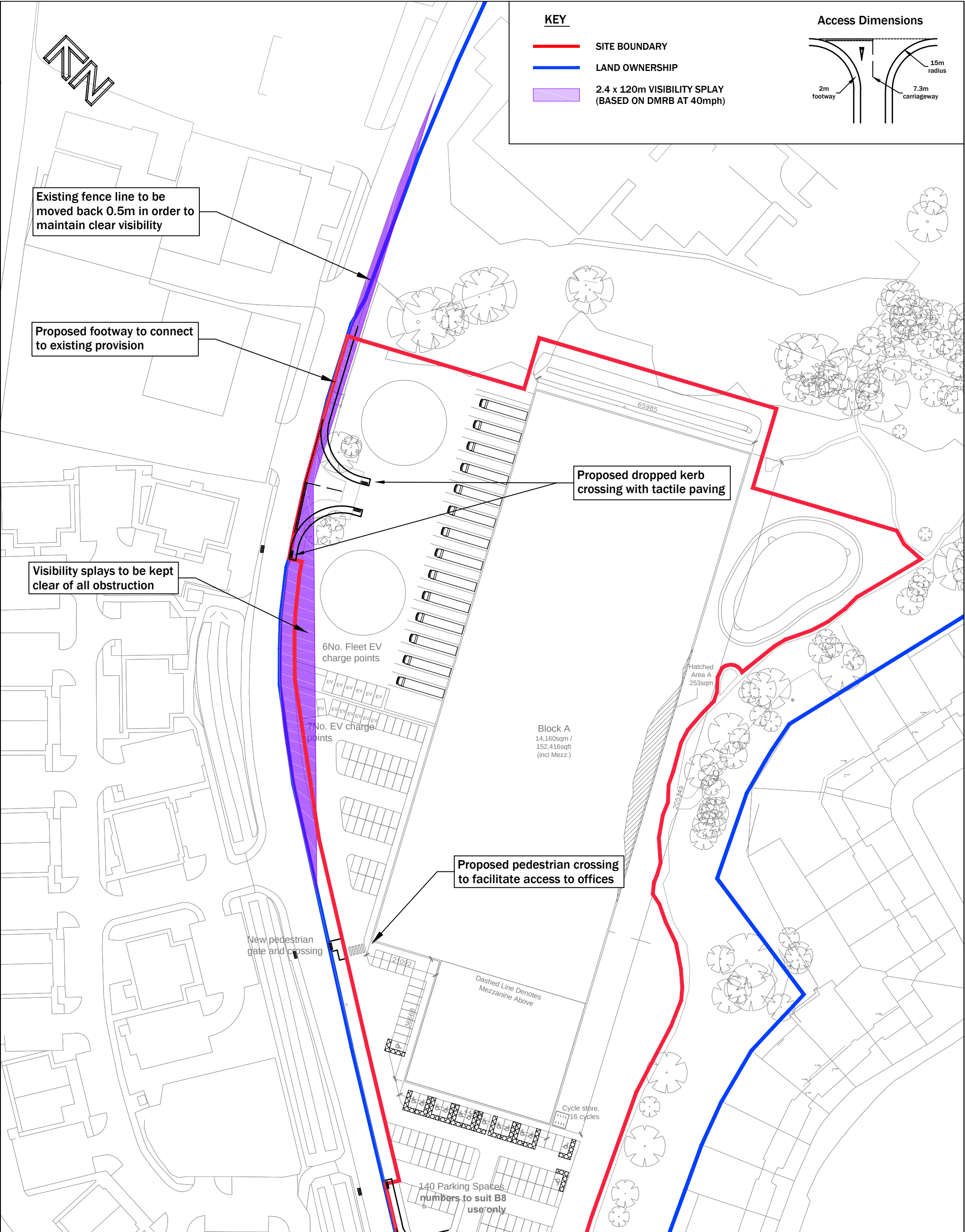
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APPENDIX B

TECHNICAL DRAWINGS

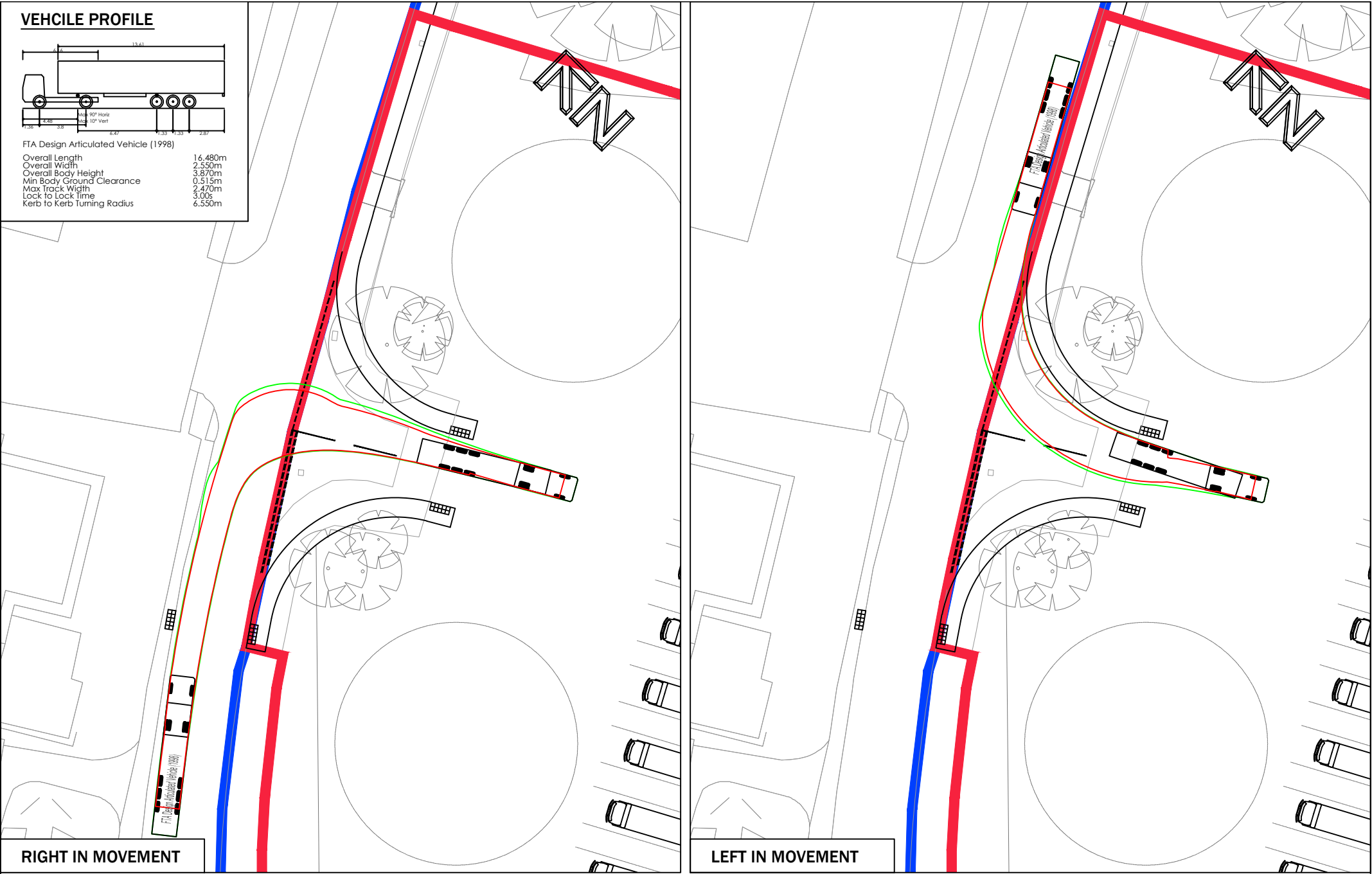
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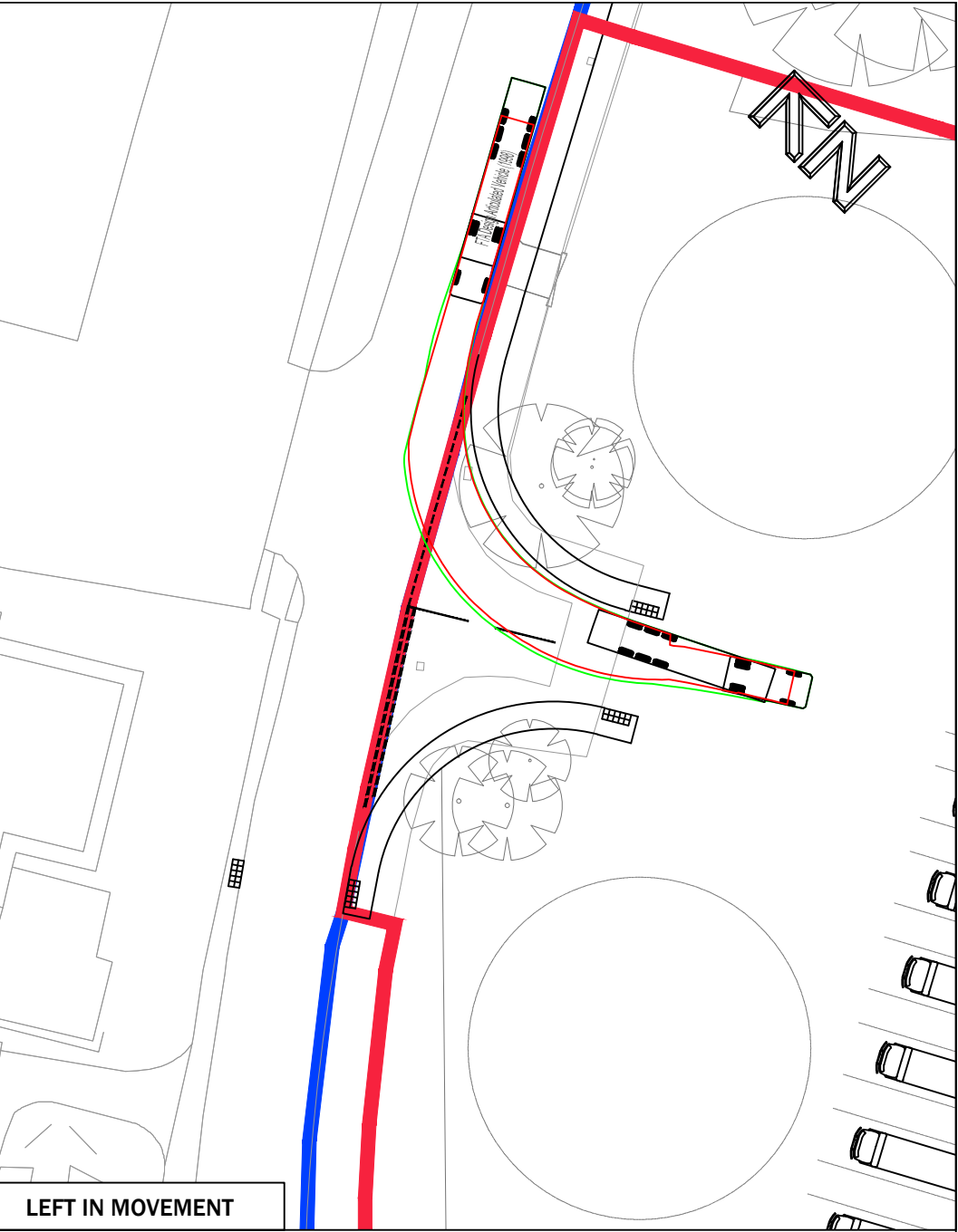


 9 Hurricane Court Liverpool International Business Park Estuary Boulevard Liverpool L24 8RL www.primetp.co.uk 0151 728 1860					Project	WREXHAM INDUSTRIAL ESTATE - SITE 5	Drawn by VB	Issue date 16 DEC 2021
	*	*	*	*			Scale(s) 1:1000 @ A3	
	Rev	Date	By	Revision notes				
	Status				Title	PROPOSED ACCESS STRATEGY - NORTHERN ACCESS		Drawing No P21065-001
	FINAL							

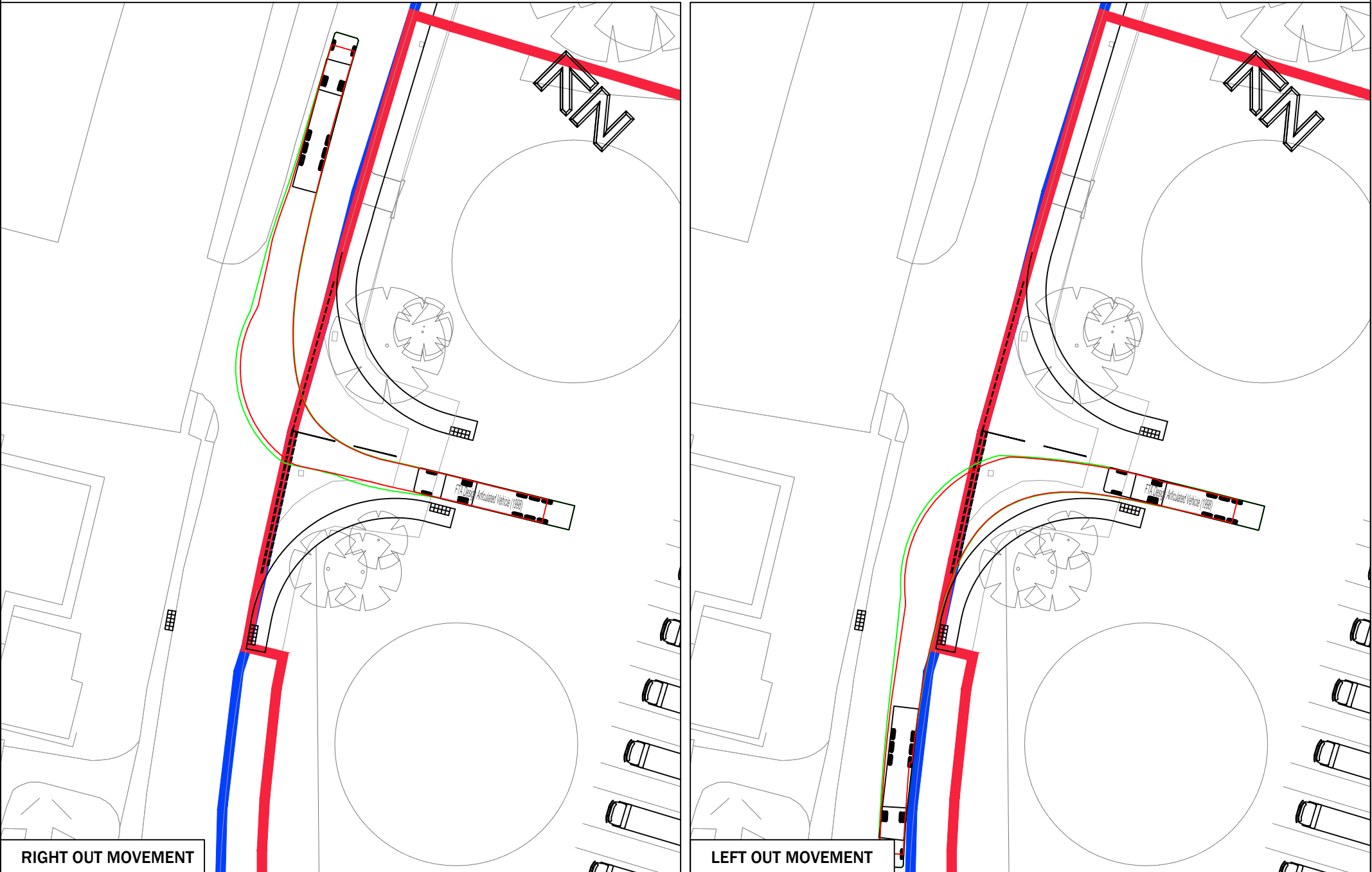
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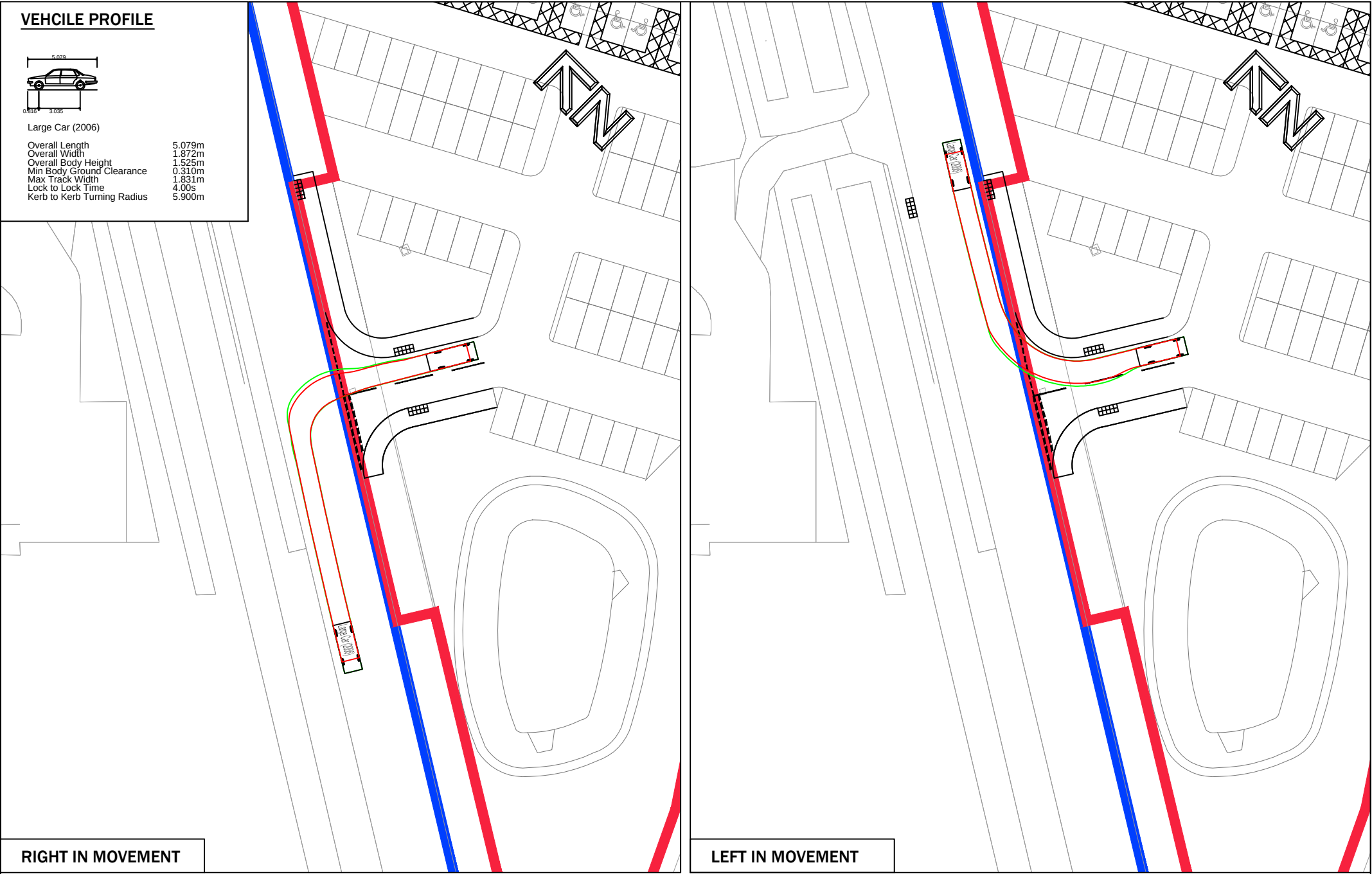


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 9 Hurricane Court Liverpool International Business Park Estuary Boulevard Liverpool L24 8RL www.primetp.co.uk 0151 728 1860					Project WREXHAM INDUSTRIAL ESTATE - SITE 5	Drawn by VB	Issue date 16 DEC 2021
	*	*	*	*		Scale(s) 1:500 @ A3	
	Rev	Date	By	Revision notes	Title SWEPT PATH ANALYSIS - NORTHERN ACCESS		Drawing No P21065-003
	Status FOR INFORMATION						

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APPENDIX C

TRICS REPORT OUTPUTS

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Calculation Reference: AUDIT-753001-180518-0557

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
 Category : F - WAREHOUSING (COMMERCIAL)
 VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	HC HAMPSHIRE	1 days
	KC KENT	1 days
	SC SURREY	1 days
03	SOUTH WEST	
	CW CORNWALL	1 days
04	EAST ANGLIA	
	SF SUFFOLK	1 days
05	EAST MIDLANDS	
	DS DERBYSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	WY WEST YORKSHIRE	1 days
08	NORTH WEST	
	LC LANCASHIRE	1 days
09	NORTH	
	CB CUMBRIA	1 days
	TV TEES VALLEY	1 days
10	WALES	
	BG BRIDGEND	1 days
11	SCOTLAND	
	ML MIDLOTHIAN	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: 634 to 11200 (units: sqm)
 Range Selected by User: 634 to 13000 (units: sqm)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/07 to 22/09/17

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	2 days
Tuesday	5 days
Wednesday	2 days
Friday	3 days

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

Selected survey types:

Manual count	12 days
Directional ATC Count	0 days

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

Selected Locations:

Edge of Town Centre	2
Suburban Area (PPS6 Out of Centre)	2
Edge of Town	8

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	7
Commercial Zone	1
Residential Zone	1
Built-Up Zone	1
No Sub Category	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:

B8 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:

1,000 or Less	1 days
1,001 to 5,000	2 days
5,001 to 10,000	4 days
10,001 to 15,000	3 days
15,001 to 20,000	1 days
25,001 to 50,000	1 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	2 days
25,001 to 50,000	1 days
50,001 to 75,000	1 days
75,001 to 100,000	2 days
125,001 to 250,000	4 days
250,001 to 500,000	2 days

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

Car ownership within 5 miles:

0.6 to 1.0	5 days
1.1 to 1.5	7 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 12 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 12 days

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

LIST OF SITES relevant to selection parameters

1	BG-02-F-01	LOGISTICS COMPANY	BRIDGEND
	PARC CRESCENT		
	WATERTON IND. EST.		
	BRIDGEND		
	Edge of Town		
	Industrial Zone		
	Total Gross floor area:	3050 sqm	
	Survey date: MONDAY	13/10/14	Survey Type: MANUAL
2	CB-02-F-01	DOMINO'S PIZZA	CUMBRIA
	COWPER ROAD		
	GILWILLY IND. ESTATE		
	PENRITH		
	Edge of Town		
	Industrial Zone		
	Total Gross floor area:	2950 sqm	
	Survey date: TUESDAY	10/06/14	Survey Type: MANUAL
3	CW-02-F-01	WAREHOUSING	CORNWALL
	A390		
	THREEMILESTONE		
	NEAR TRURO		
	Edge of Town		
	No Sub Category		
	Total Gross floor area:	5150 sqm	
	Survey date: TUESDAY	18/09/07	Survey Type: MANUAL
4	DS-02-F-01	ARMADILLO S. STORAGE	DERBYSHIRE
	FORRESTERS BUSINESS P..		
	SINFIN LANE		
	DERBY		
	Edge of Town Centre		
	Commercial Zone		
	Total Gross floor area:	1900 sqm	
	Survey date: TUESDAY	05/07/11	Survey Type: MANUAL
5	HC-02-F-01	WAREHOUSING	HAMPSHIRE
	MAURETANIA ROAD		
	NURSLING INDUSTRIAL ESTATE		
	SOUTHAMPTON		
	Edge of Town		
	Industrial Zone		
	Total Gross floor area:	4000 sqm	
	Survey date: WEDNESDAY	21/11/07	Survey Type: MANUAL
6	KC-02-F-02	COMMERCIAL WAREHOUSING	KENT
	MILLS ROAD		
	QUARRY WOOD		
	AYLESFORD		
	Edge of Town		
	Industrial Zone		
	Total Gross floor area:	11200 sqm	
	Survey date: FRIDAY	22/09/17	Survey Type: MANUAL
7	LC-02-F-02	WAREHOUSING	LANCASHIRE
	CHORLEY ROAD		
	WALTON-LE-DALE		
	PRESTON		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total Gross floor area:	1200 sqm	
	Survey date: FRIDAY	22/06/07	Survey Type: MANUAL
8	ML-02-F-01	WINDOWS	MIDLOTHIAN
	UNIT 53		
	MAYFIELD IND. ESTATE		
	DALKEITH		
	Edge of Town		
	Industrial Zone		
	Total Gross floor area:	750 sqm	
	Survey date: WEDNESDAY	04/05/11	Survey Type: MANUAL
9	SC-02-F-04	WAREHOUSING	SURREY
	PRETORIA ROAD		
	CHERTSEY		
	Edge of Town		
	No Sub Category		
	Total Gross floor area:	4460 sqm	
	Survey date: TUESDAY	27/11/07	Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

10	SF-02-F-03	ROAD HAULAGE	SUFFOLK
	CENTRAL AVENUE		
	WARREN HEATH		
	IPSWICH		
	Edge of Town		
	Industrial Zone		
	Total Gross floor area:	4700 sqm	
	Survey date: FRIDAY	18/09/15	Survey Type: MANUAL
11	TV-02-F-03	ELECTRICAL COMPONENTS	TEES VALLEY
	UNIT 8,NAVIGATOR COURT		
	STOCKTON-ON-TEES		
	Suburban Area (PPS6 Out of Centre)		
	Industrial Zone		
	Total Gross floor area:	634 sqm	
	Survey date: TUESDAY	28/06/11	Survey Type: MANUAL
12	WY-02-F-01	ELECTRONICS DISTRIBUTION	WEST YORKSHIRE
	MORTIMER STREET		
	CLECKHEATON		
	Edge of Town Centre		
	Built-Up Zone		
	Total Gross floor area:	1507 sqm	
	Survey date: MONDAY	19/09/16	Survey Type: MANUAL

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

TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)

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	1	2950	0.102	1	2950	0.000	1	2950	0.102
06:00 - 07:00	1	2950	0.136	1	2950	0.034	1	2950	0.170
07:00 - 08:00	12	3458	0.296	12	3458	0.125	12	3458	0.421
08:00 - 09:00	12	3458	0.349	12	3458	0.193	12	3458	0.542
09:00 - 10:00	12	3458	0.217	12	3458	0.200	12	3458	0.417
10:00 - 11:00	12	3458	0.178	12	3458	0.176	12	3458	0.354
11:00 - 12:00	12	3458	0.188	12	3458	0.183	12	3458	0.371
12:00 - 13:00	12	3458	0.193	12	3458	0.166	12	3458	0.359
13:00 - 14:00	12	3458	0.195	12	3458	0.195	12	3458	0.390
14:00 - 15:00	12	3458	0.190	12	3458	0.193	12	3458	0.383
15:00 - 16:00	12	3458	0.181	12	3458	0.241	12	3458	0.422
16:00 - 17:00	12	3458	0.169	12	3458	0.292	12	3458	0.461
17:00 - 18:00	12	3458	0.089	12	3458	0.277	12	3458	0.366
18:00 - 19:00	11	3636	0.045	11	3636	0.108	11	3636	0.153
19:00 - 20:00	1	2950	0.203	1	2950	0.203	1	2950	0.406
20:00 - 21:00	1	2950	0.102	1	2950	0.136	1	2950	0.238
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.833			2.722			5.555

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.

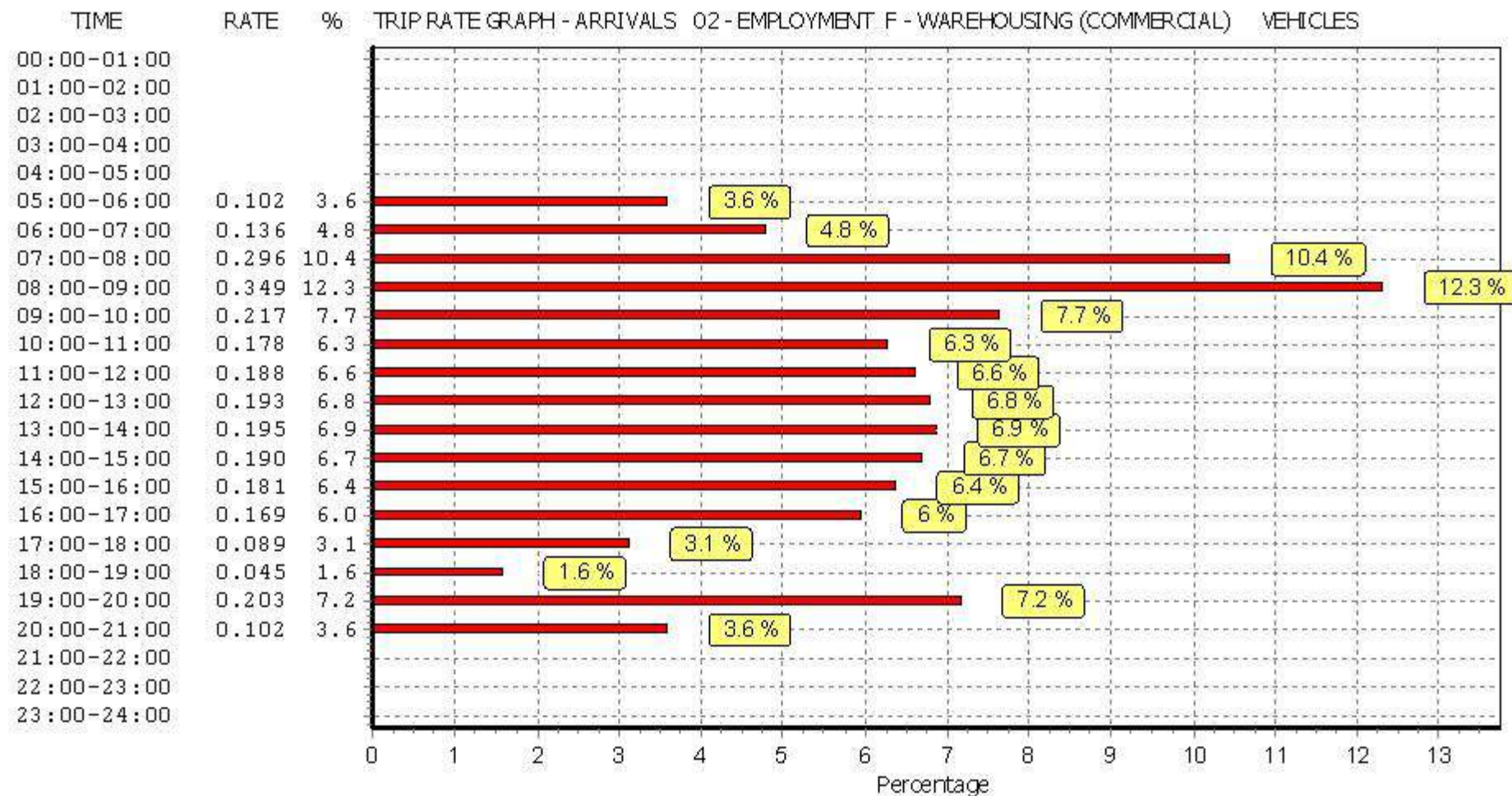
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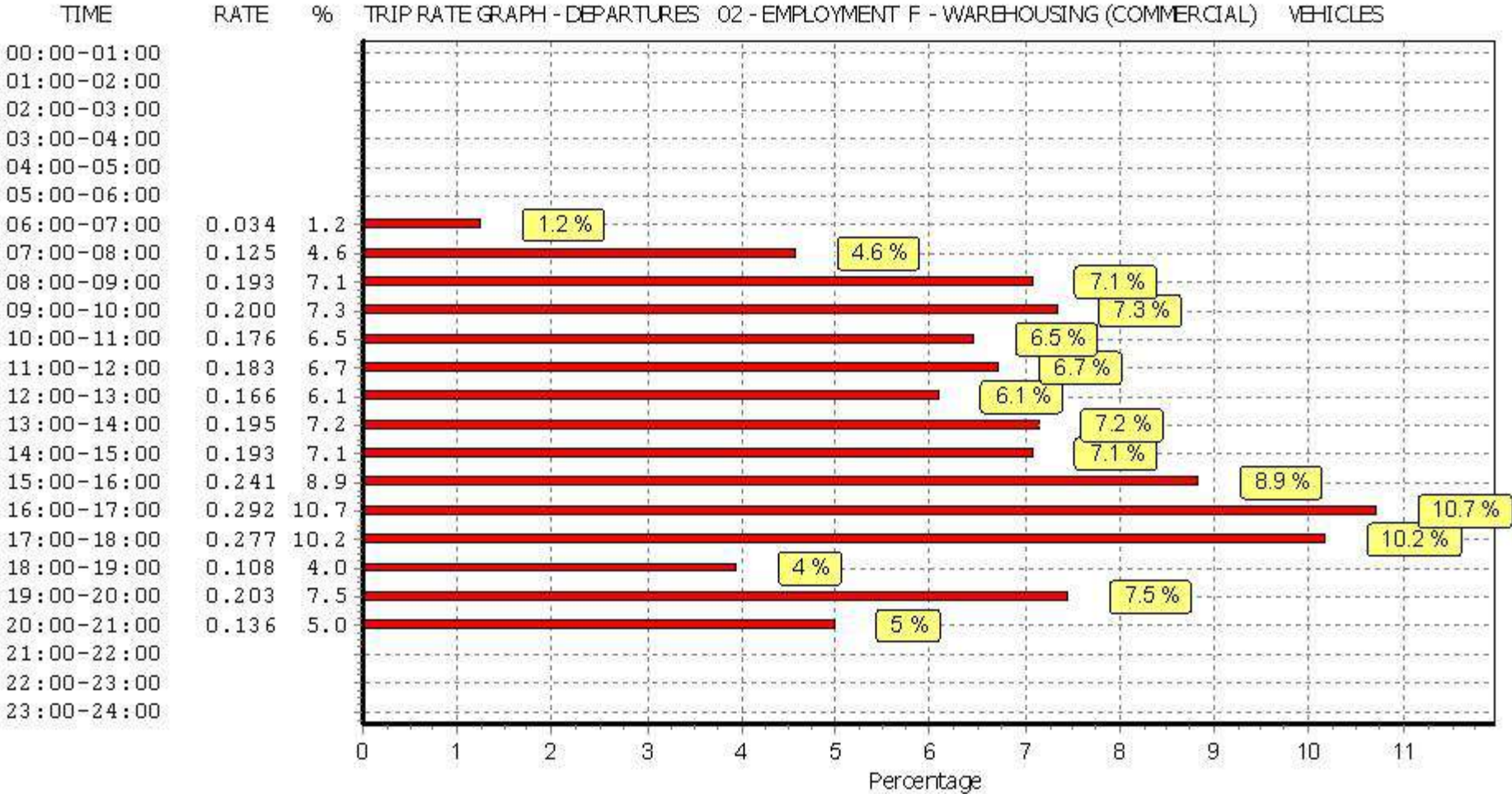
Parameter summary

Trip rate parameter range selected:	634 - 11200 (units: sqm)
Survey date date range:	01/01/07 - 22/09/17
Number of weekdays (Monday-Friday):	12
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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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 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)

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	1	2950	0.000	1	2950	0.000	1	2950	0.000
06:00 - 07:00	1	2950	0.000	1	2950	0.000	1	2950	0.000
07:00 - 08:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
08:00 - 09:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
09:00 - 10:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
10:00 - 11:00	12	3458	0.002	12	3458	0.002	12	3458	0.004
11:00 - 12:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
12:00 - 13:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
13:00 - 14:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
14:00 - 15:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
15:00 - 16:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
16:00 - 17:00	12	3458	0.005	12	3458	0.005	12	3458	0.010
17:00 - 18:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
18:00 - 19:00	11	3636	0.000	11	3636	0.000	11	3636	0.000
19:00 - 20:00	1	2950	0.000	1	2950	0.000	1	2950	0.000
20:00 - 21:00	1	2950	0.000	1	2950	0.000	1	2950	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.007			0.007			0.014

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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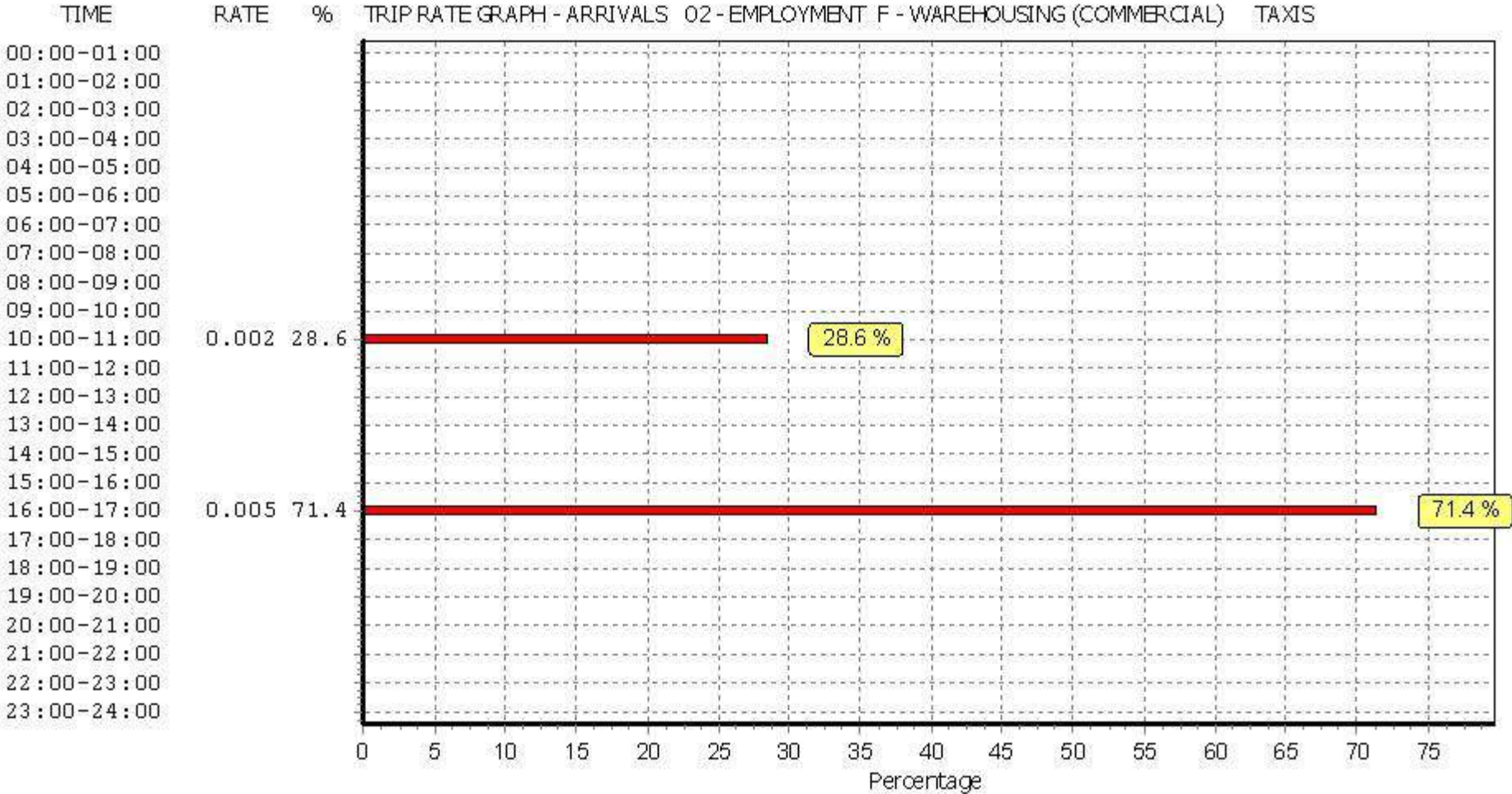
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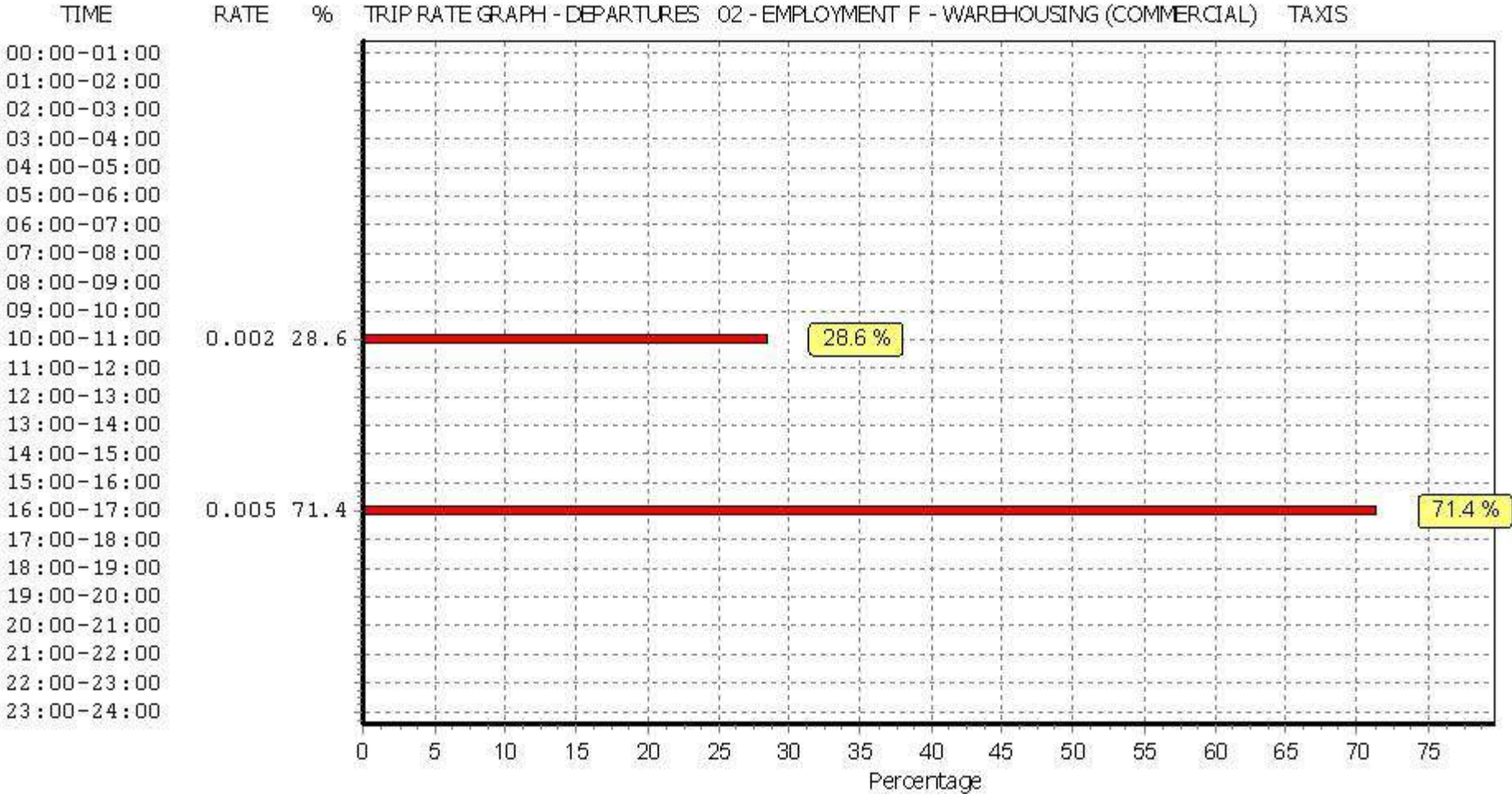
Parameter summary

Trip rate parameter range selected:	634 - 11200 (units: sqm)
Survey date range:	01/01/07 - 22/09/17
Number of weekdays (Monday-Friday):	12
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

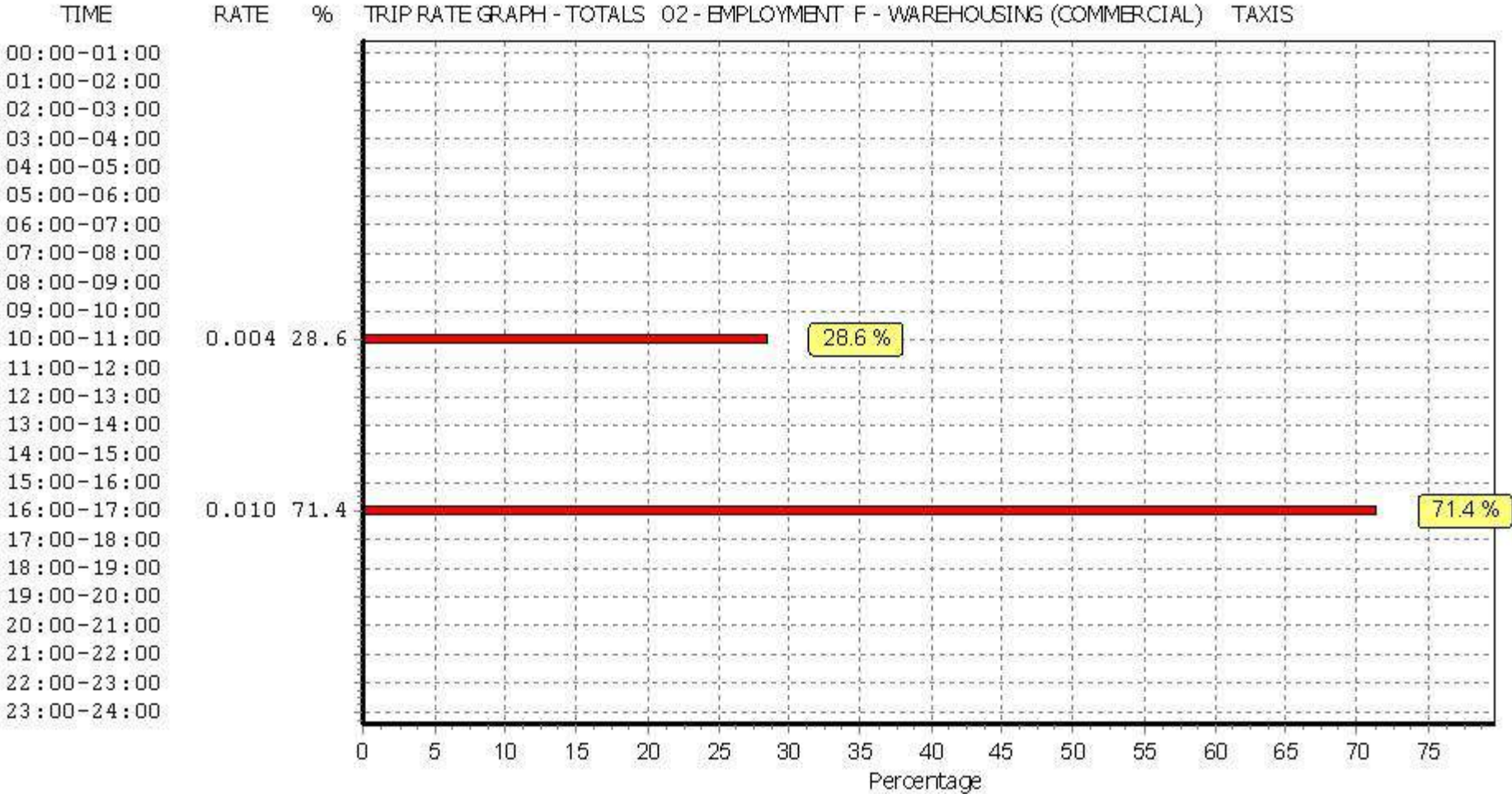
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TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)

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	1	2950	0.000	1	2950	0.000	1	2950	0.000
06:00 - 07:00	1	2950	0.068	1	2950	0.000	1	2950	0.068
07:00 - 08:00	12	3458	0.031	12	3458	0.065	12	3458	0.096
08:00 - 09:00	12	3458	0.077	12	3458	0.080	12	3458	0.157
09:00 - 10:00	12	3458	0.058	12	3458	0.072	12	3458	0.130
10:00 - 11:00	12	3458	0.051	12	3458	0.041	12	3458	0.092
11:00 - 12:00	12	3458	0.075	12	3458	0.075	12	3458	0.150
12:00 - 13:00	12	3458	0.063	12	3458	0.039	12	3458	0.102
13:00 - 14:00	12	3458	0.077	12	3458	0.058	12	3458	0.135
14:00 - 15:00	12	3458	0.089	12	3458	0.039	12	3458	0.128
15:00 - 16:00	12	3458	0.080	12	3458	0.058	12	3458	0.138
16:00 - 17:00	12	3458	0.063	12	3458	0.039	12	3458	0.102
17:00 - 18:00	12	3458	0.019	12	3458	0.029	12	3458	0.048
18:00 - 19:00	11	3636	0.015	11	3636	0.035	11	3636	0.050
19:00 - 20:00	1	2950	0.000	1	2950	0.203	1	2950	0.203
20:00 - 21:00	1	2950	0.000	1	2950	0.102	1	2950	0.102
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.766			0.935			1.701

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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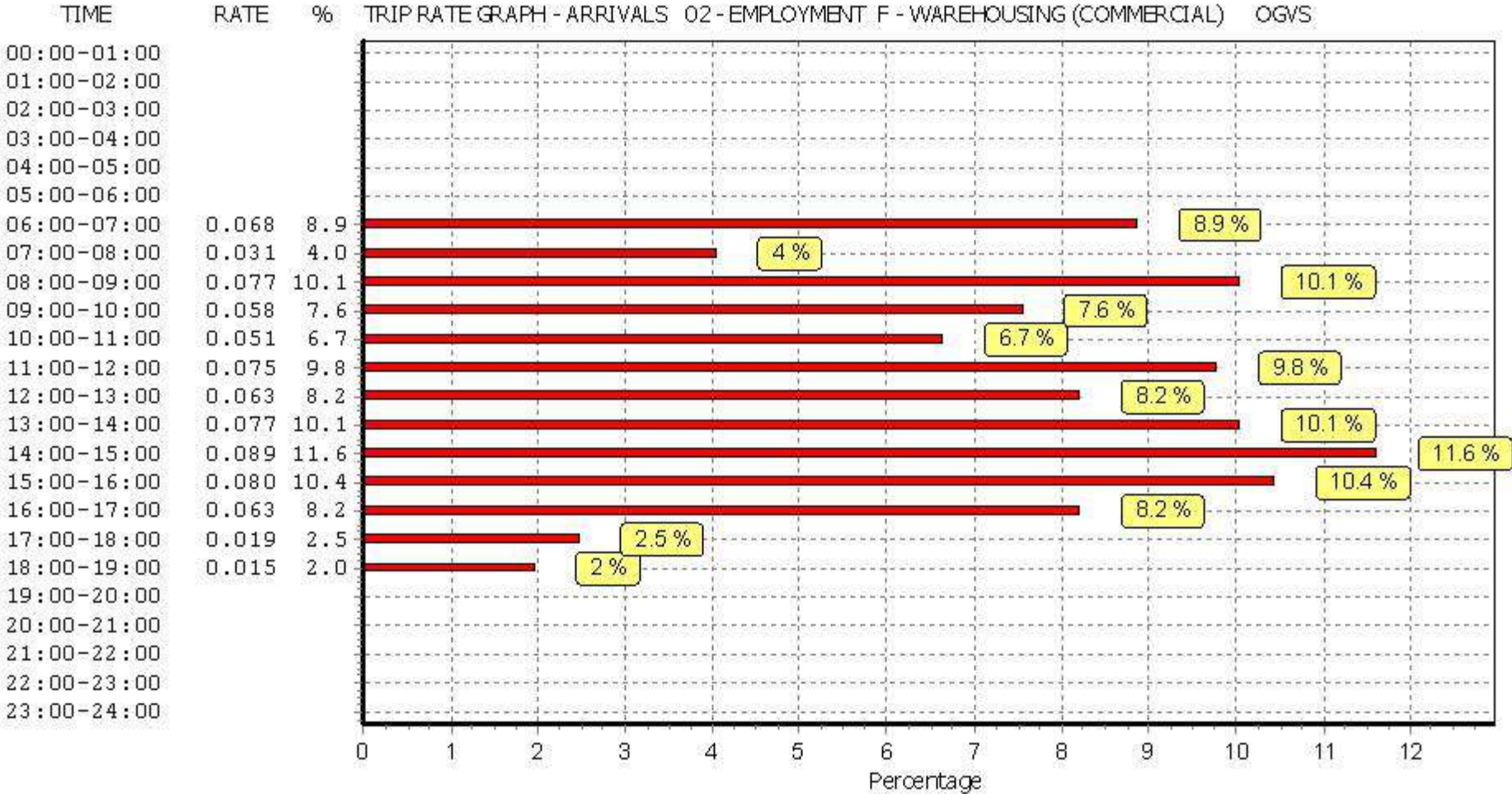
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Parameter summary

Trip rate parameter range selected:	634 - 11200 (units: sqm)
Survey date date range:	01/01/07 - 22/09/17
Number of weekdays (Monday-Friday):	12
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

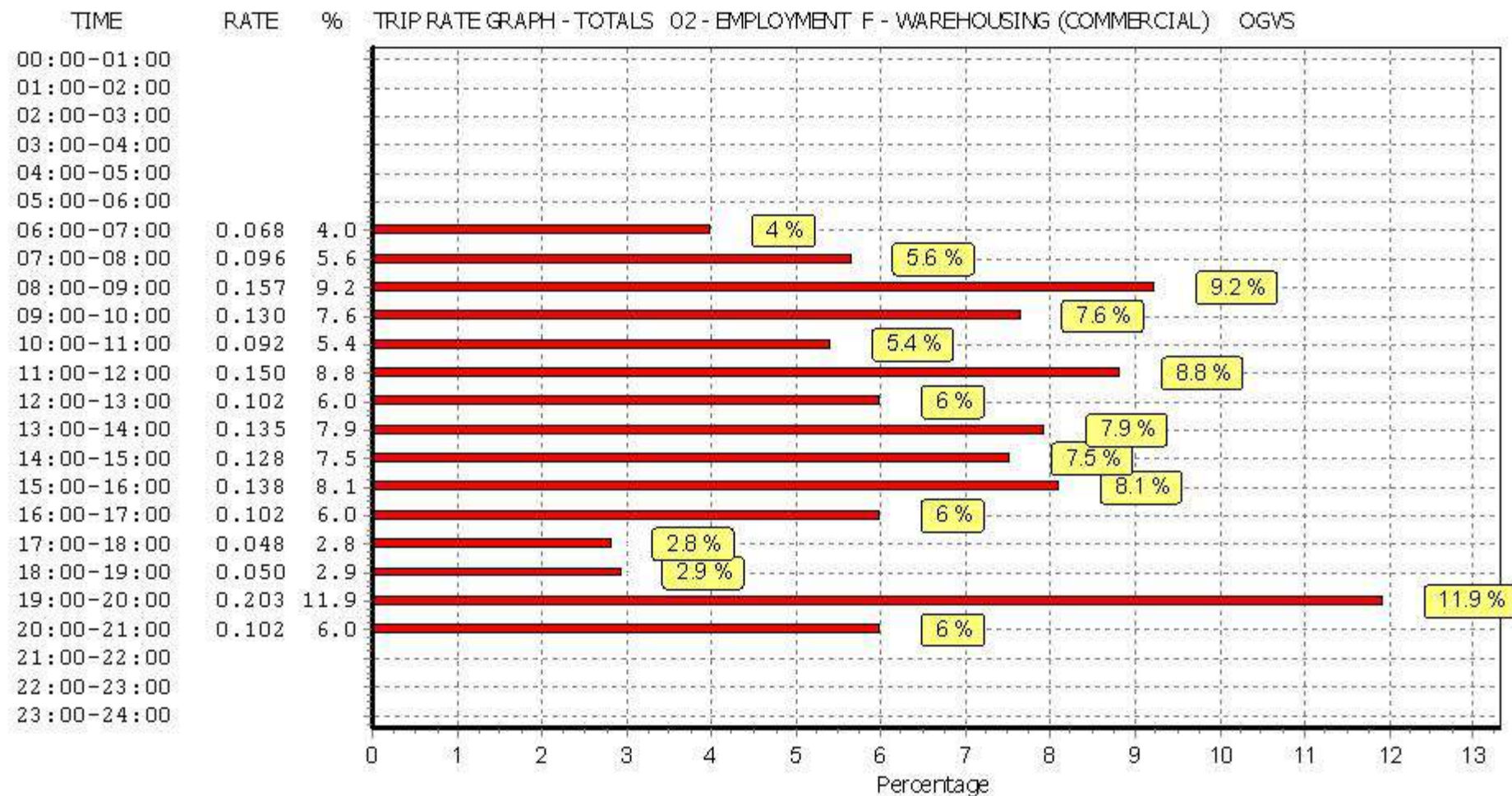
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TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)

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	1	2950	0.000	1	2950	0.000	1	2950	0.000
06:00 - 07:00	1	2950	0.000	1	2950	0.000	1	2950	0.000
07:00 - 08:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
08:00 - 09:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
09:00 - 10:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
10:00 - 11:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
11:00 - 12:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
12:00 - 13:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
13:00 - 14:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
14:00 - 15:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
15:00 - 16:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
16:00 - 17:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
17:00 - 18:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
18:00 - 19:00	11	3636	0.000	11	3636	0.000	11	3636	0.000
19:00 - 20:00	1	2950	0.000	1	2950	0.000	1	2950	0.000
20:00 - 21:00	1	2950	0.000	1	2950	0.000	1	2950	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.

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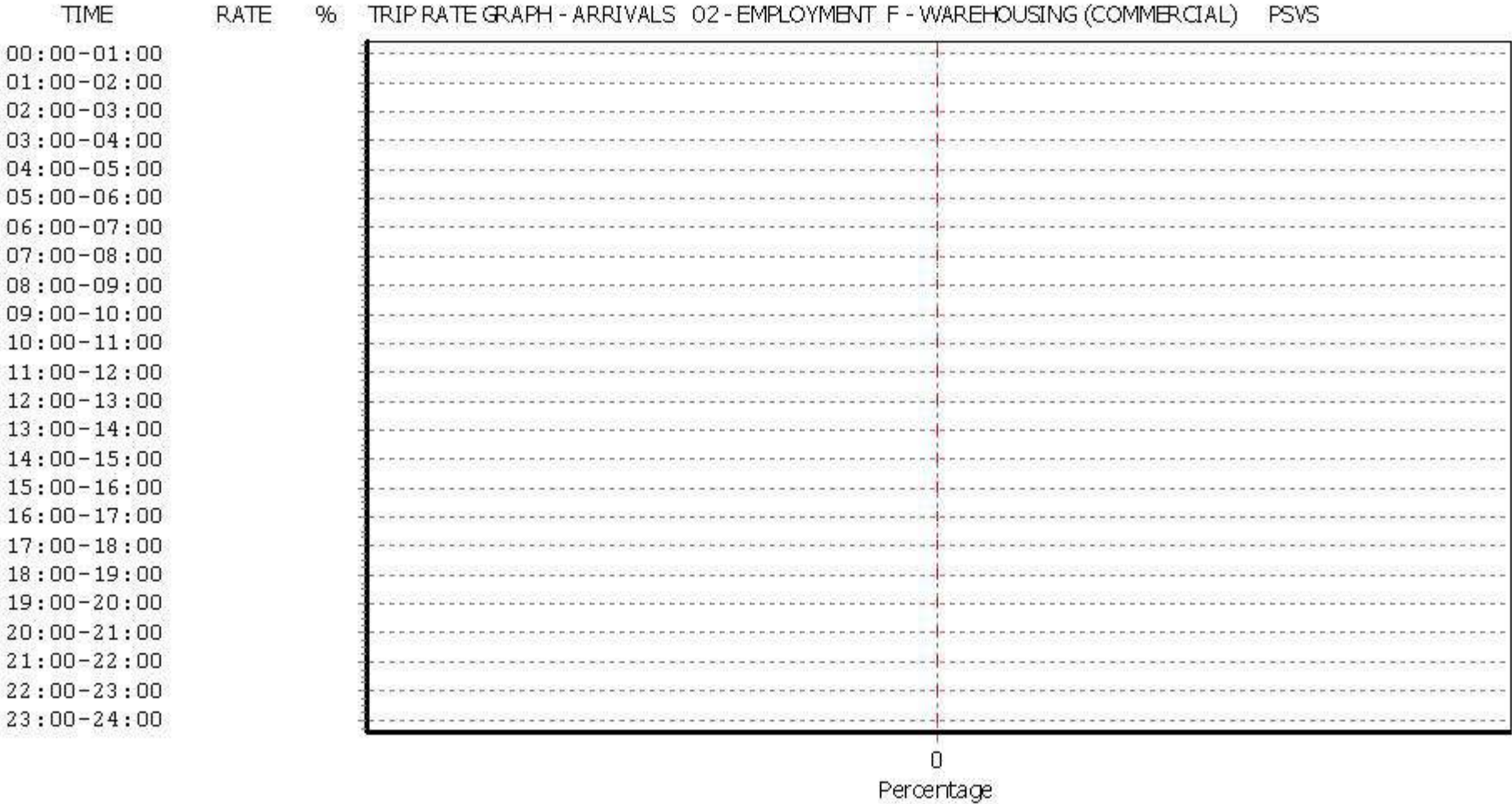
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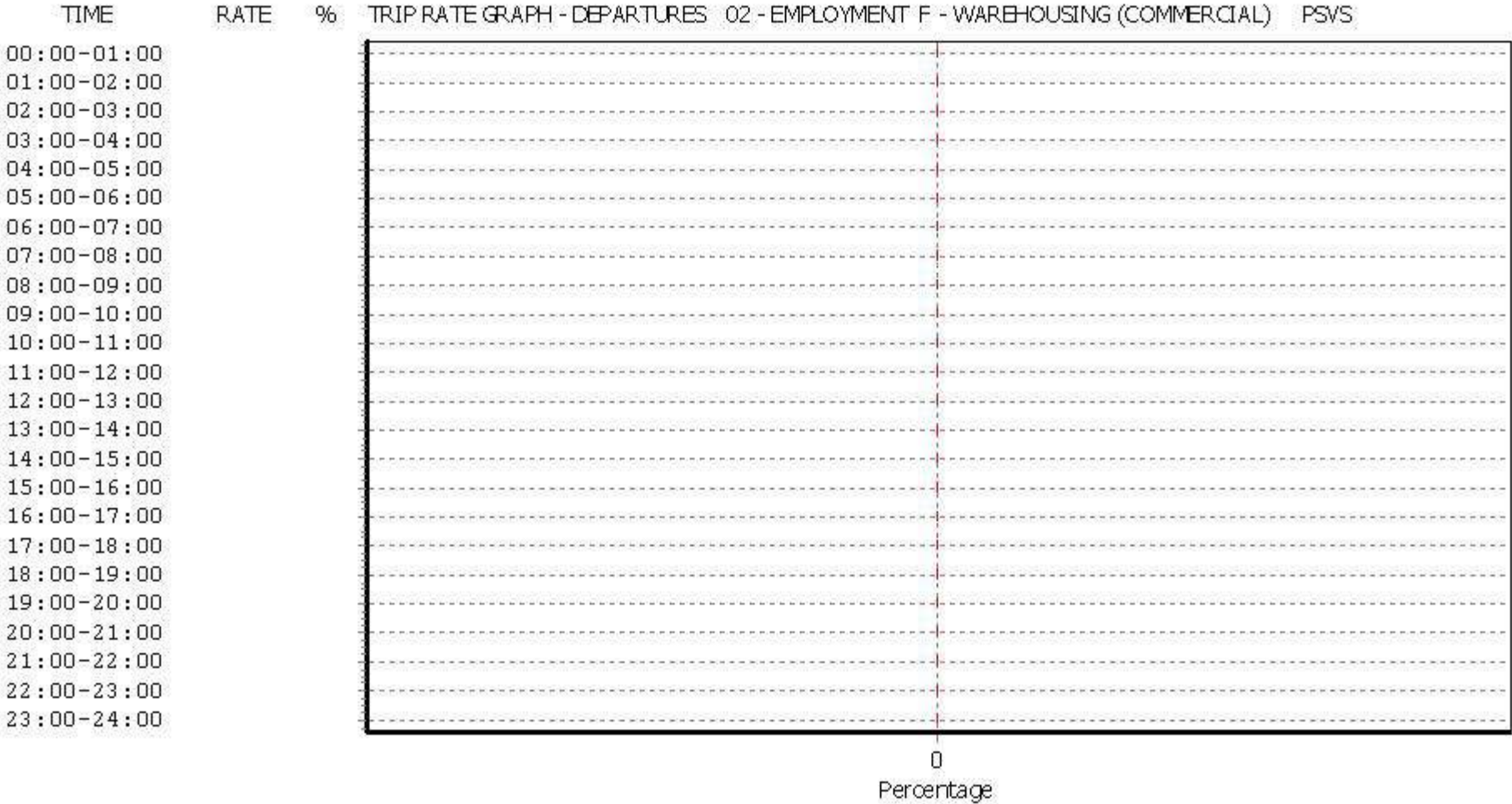
Parameter summary

Trip rate parameter range selected:	634 - 11200 (units: sqm)
Survey date range:	01/01/07 - 22/09/17
Number of weekdays (Monday-Friday):	12
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

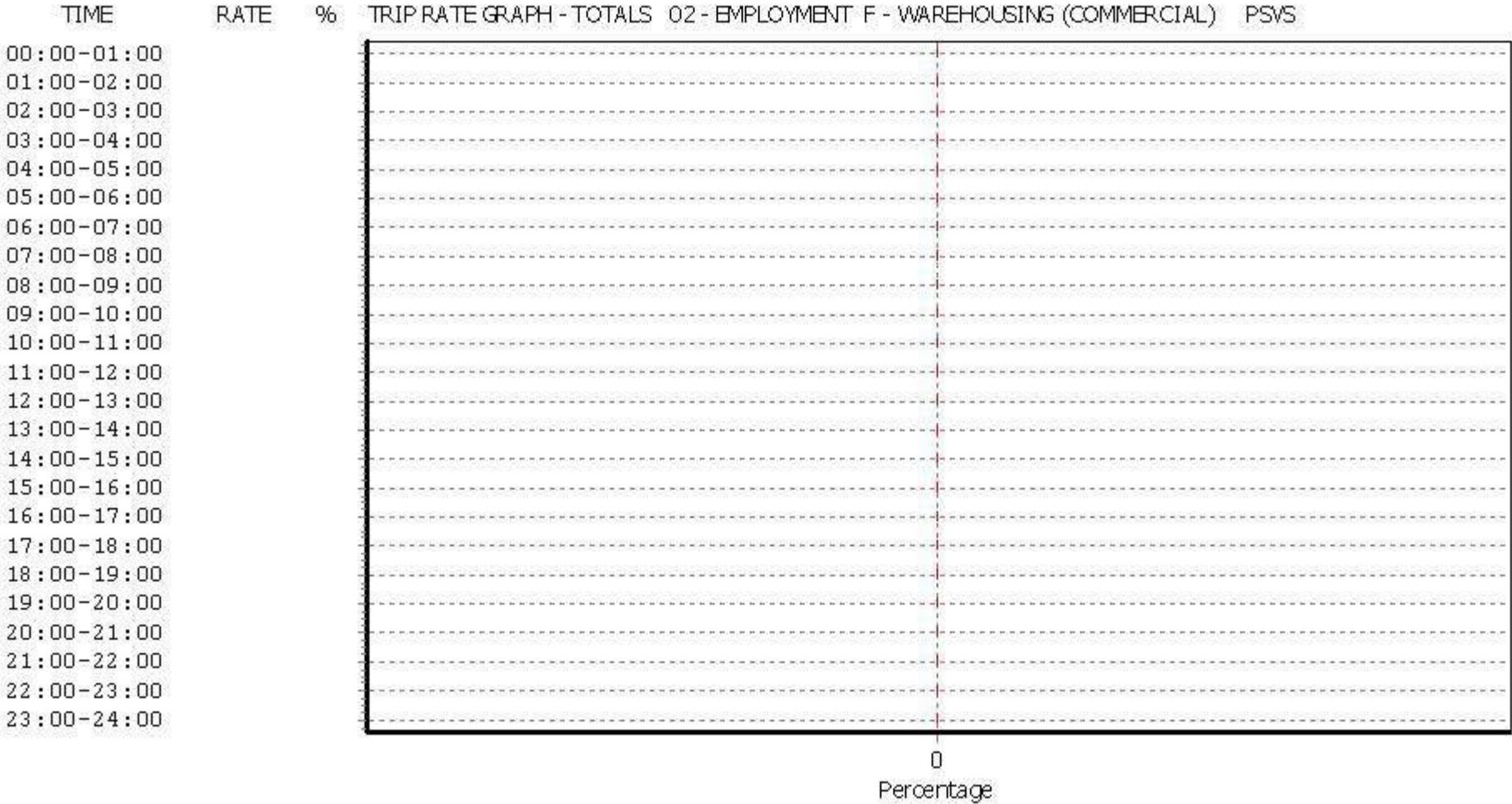
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TRIP RATE for Land Use 02 - EMPLOYMENT/F - WAREHOUSING (COMMERCIAL)

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	1	2950	0.000	1	2950	0.000	1	2950	0.000
06:00 - 07:00	1	2950	0.034	1	2950	0.000	1	2950	0.034
07:00 - 08:00	12	3458	0.005	12	3458	0.000	12	3458	0.005
08:00 - 09:00	12	3458	0.014	12	3458	0.000	12	3458	0.014
09:00 - 10:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
10:00 - 11:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
11:00 - 12:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
12:00 - 13:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
13:00 - 14:00	12	3458	0.002	12	3458	0.002	12	3458	0.004
14:00 - 15:00	12	3458	0.000	12	3458	0.002	12	3458	0.002
15:00 - 16:00	12	3458	0.000	12	3458	0.007	12	3458	0.007
16:00 - 17:00	12	3458	0.000	12	3458	0.000	12	3458	0.000
17:00 - 18:00	12	3458	0.000	12	3458	0.010	12	3458	0.010
18:00 - 19:00	11	3636	0.000	11	3636	0.003	11	3636	0.003
19:00 - 20:00	1	2950	0.000	1	2950	0.000	1	2950	0.000
20:00 - 21:00	1	2950	0.000	1	2950	0.000	1	2950	0.000
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.055			0.024			0.079

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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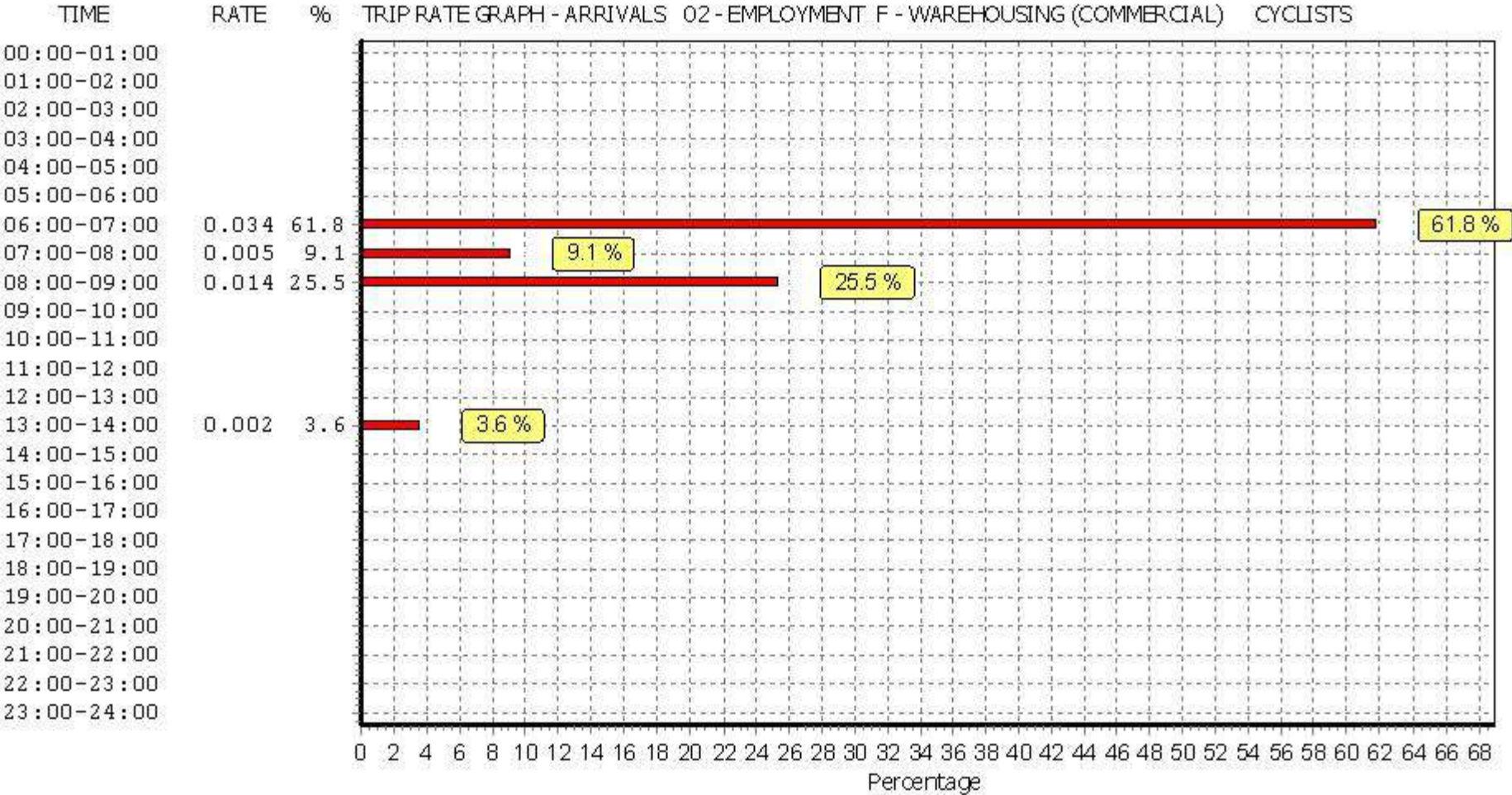
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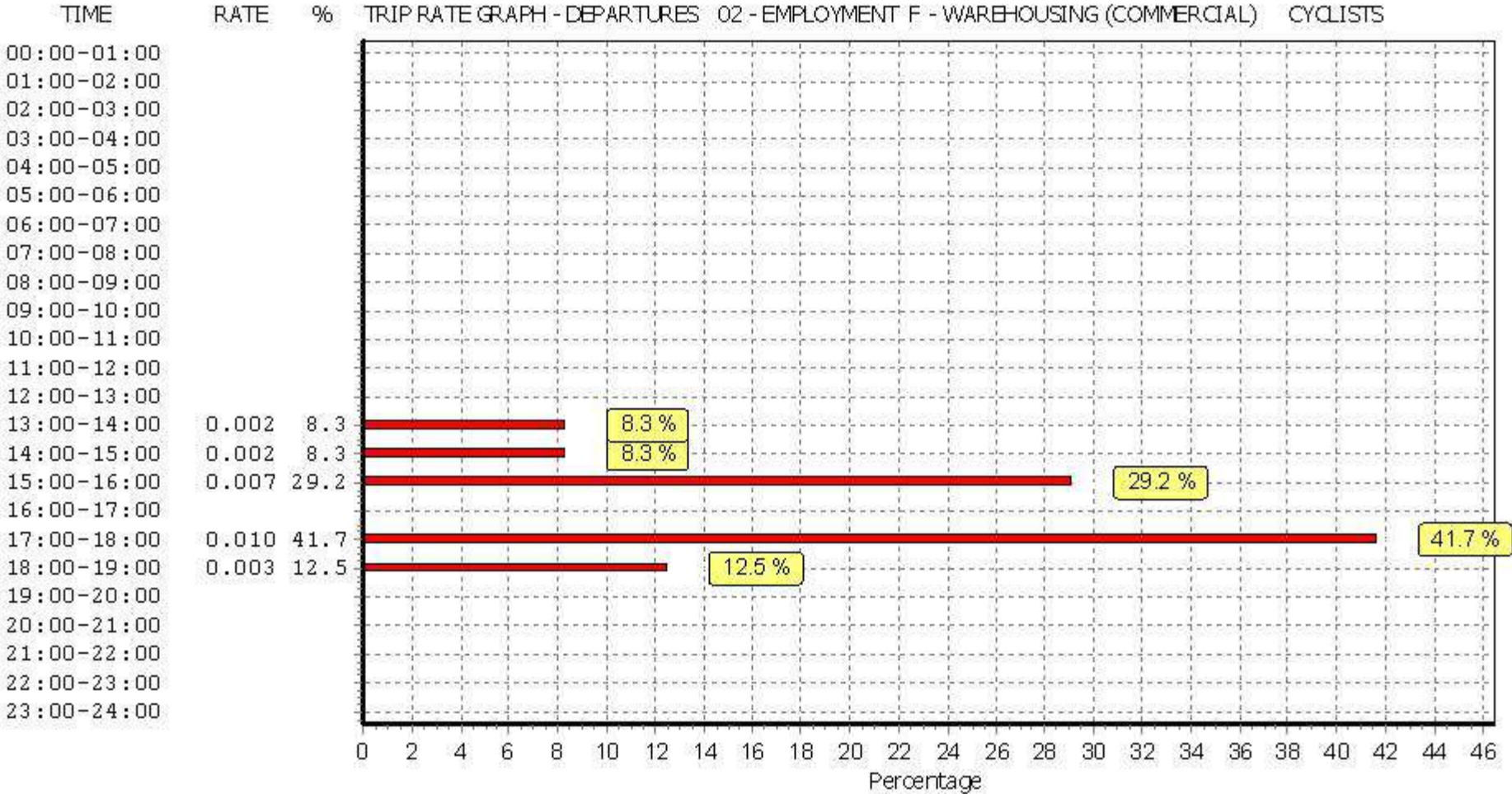
Parameter summary

Trip rate parameter range selected:	634 - 11200 (units: sqm)
Survey date range:	01/01/07 - 22/09/17
Number of weekdays (Monday-Friday):	12
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

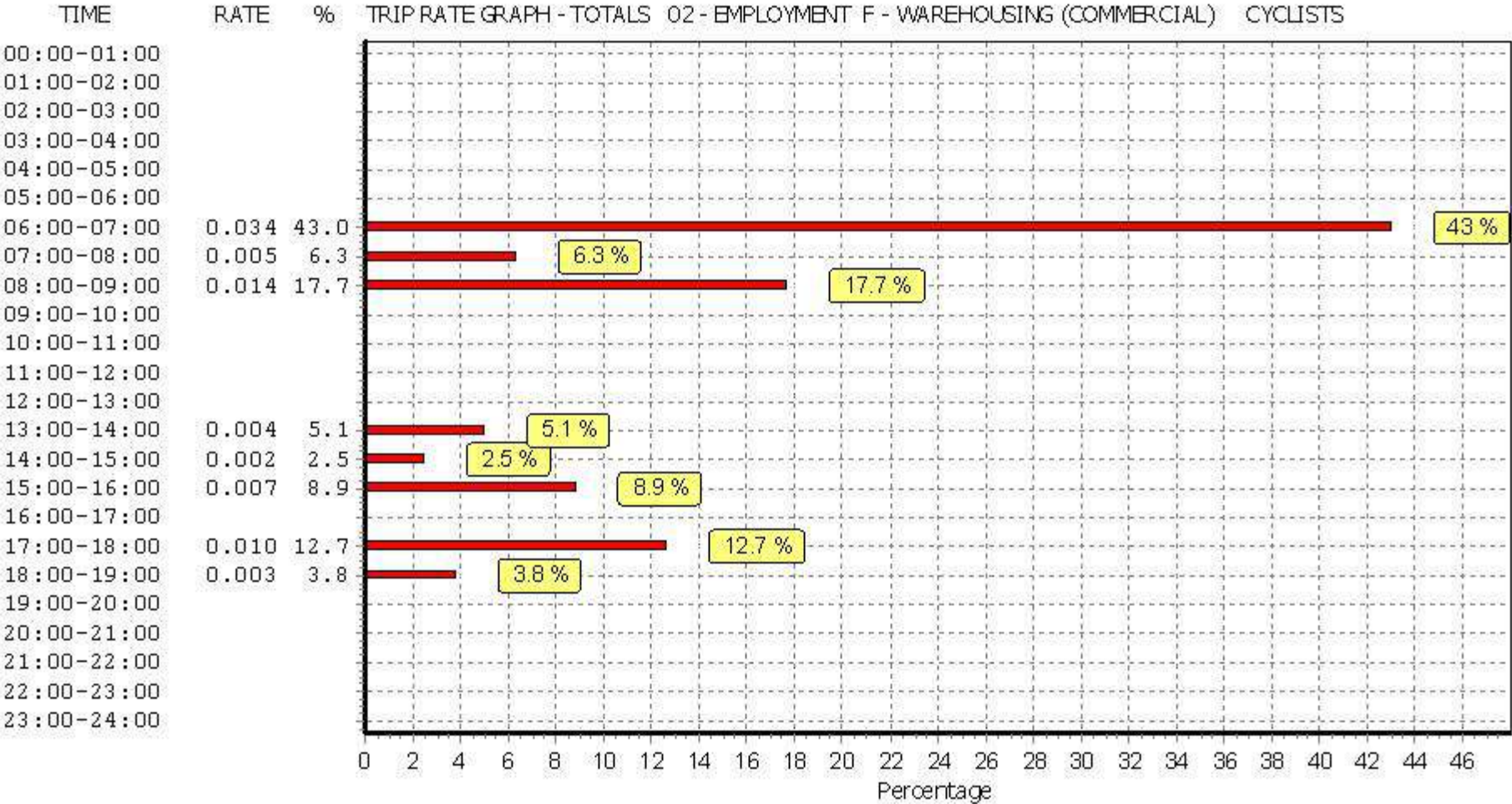
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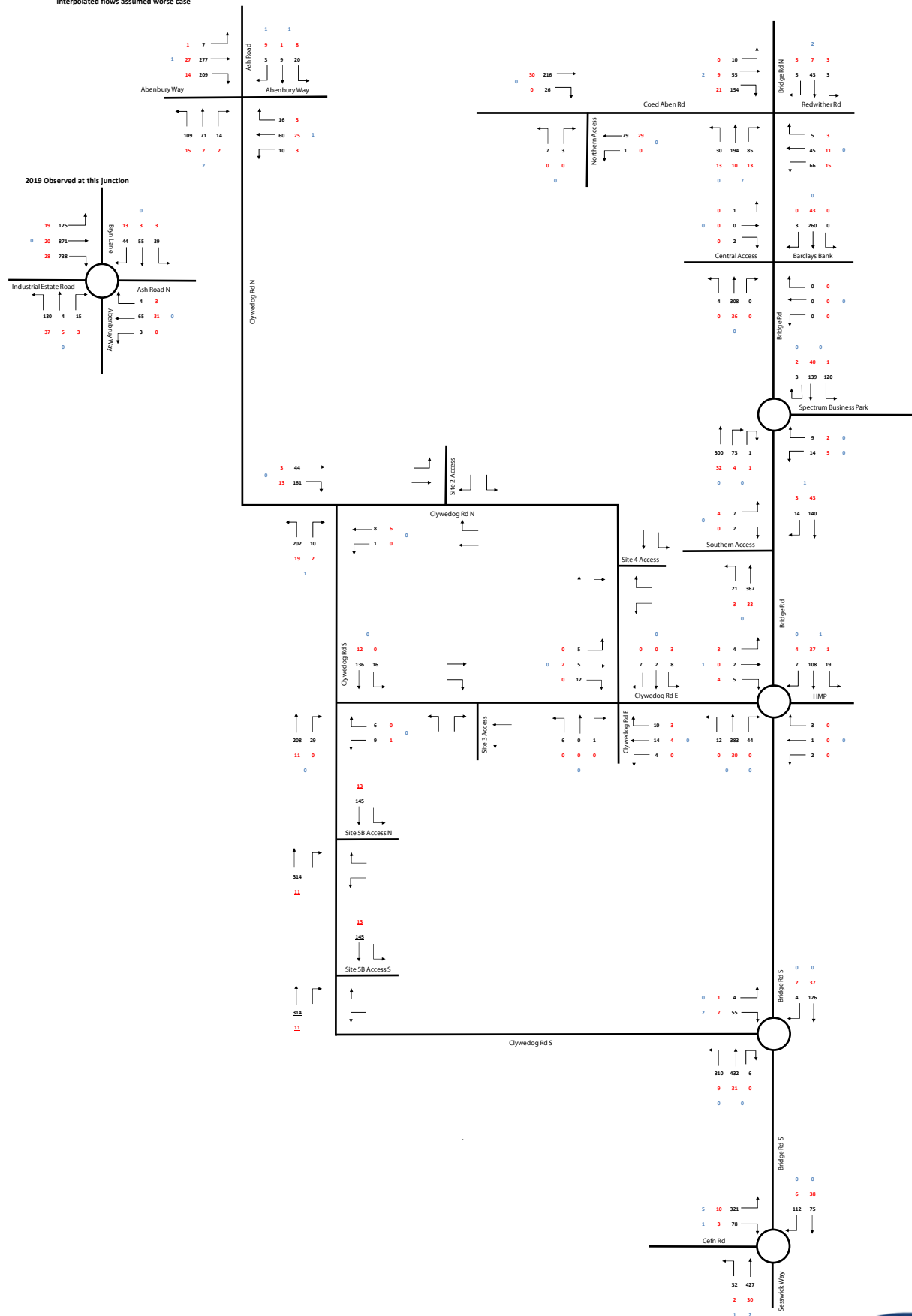
APPENDIX D

TRAFFIC FLOW DIAGRAMS

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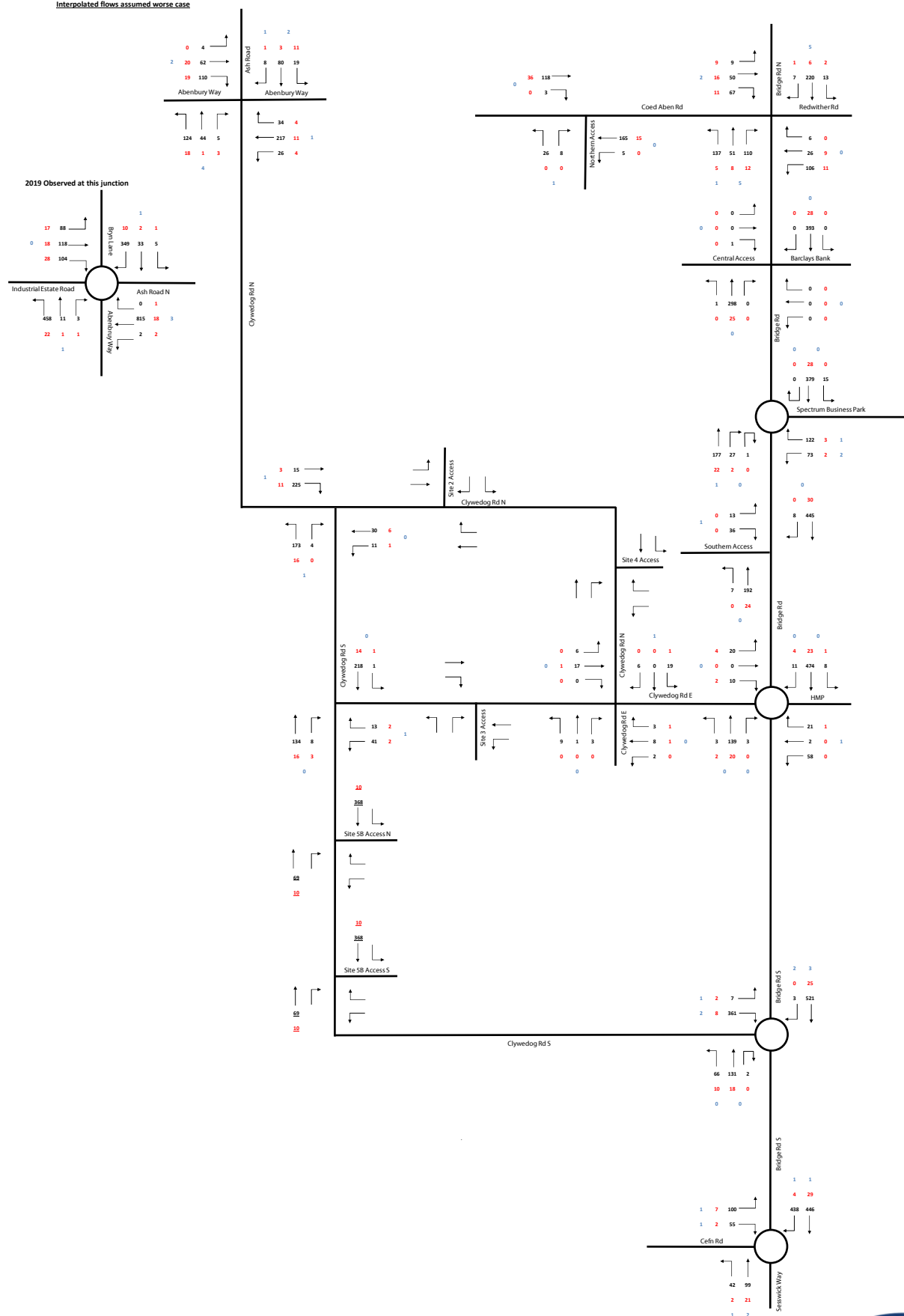
Traffic Flow Diagrams			
Reference	Scenario	Peak	Derivation
1	Traffic Flow Diagram 1 - 2018 Observed Flows	AM (0745-0845)	Raw Data
2	Traffic Flow Diagram 2 - 2018 Observed Flows	PM (1615-1715)	Raw Data
3	Traffic Flow Diagram 3 - 2036 Base	AM (0745-0845)	1*TEMPro
4	Traffic Flow Diagram 4 - 2036 Base	PM (1615-1715)	2*TEMPro
5	Traffic Flow Diagram 5 - Site 2 Generated Traffic	AM (0745-0845)	Consented app
6	Traffic Flow Diagram 6 - Site 2 Generated Traffic	PM (1615-1715)	Consented app
7	Traffic Flow Diagram 7 - Site 3 Generated Traffic	AM (0745-0845)	Consented app
8	Traffic Flow Diagram 8 - Site 3 Generated Traffic	PM (1615-1715)	Consented app
9	Traffic Flow Diagram 9 - Site 4 Generated Traffic	AM (0745-0845)	Consented app
10	Traffic Flow Diagram 10 - Site 4 Generated Traffic	PM (1615-1715)	Consented app
11	Traffic Flow Diagram 11 - The Oaks Generated Traffic	AM (0745-0845)	Pending app
12	Traffic Flow Diagram 12 - The Oaks Generated Traffic	PM (1615-1715)	Pending app
13	Traffic Flow Diagram 13 - The Bridgeway: Employment Trips	AM (0745-0845)	Pending app
14	Traffic Flow Diagram 14 - The Bridgeway: Employment Trips	PM (1615-1715)	Pending app
15	Traffic Flow Diagram 15 - The Bridgeway: New Retail	AM (0745-0845)	Pending app
16	Traffic Flow Diagram 16 - The Bridgeway: New Retail	PM (1615-1715)	Pending app
17	Traffic Flow Diagram 17 - Total Committed Development	AM (0745-0845)	5+7+9+11+13+15
18	Traffic Flow Diagram 18 - Total Committed Development	PM (1615-1715)	6+8+10+12+14+18
19	Traffic Flow Diagram 19 - 2036 Without Development	AM (0745-0845)	3+17
20	Traffic Flow Diagram 20 - 2036 Without Development	PM (1615-1715)	4+18
21	Traffic Flow Diagram 21 - Distribution	Both	Census MTW
22	Traffic Flow Diagram 22 - Site 5 Development Traffic	AM (0745-0845)	TRICS * 21
23	Traffic Flow Diagram 23 - Site 5 Development Traffic	PM (1615-1715)	TRICS * 21
24	Traffic Flow Diagram 24 - 2036 With Development	AM (0745-0845)	19+22
25	Traffic Flow Diagram 25 - 2036 With Development	PM (1615-1715)	20+23
26	Traffic Flow Diagram 26 - Site 5 Consented Development Traffic	AM (0745-0845)	Consented app
27	Traffic Flow Diagram 27 - Site 5 Consented Development Traffic	PM (1615-1715)	Consented app

Project: Site 5, Wrexham Industrial Estate
Scenario: Traffic Flow Diagram 1 - 2018 Observed Flows
Peak: AM (0745-0845)
Notes: All flows are in vehicles
 Light Vehicles (cars & LGVs) in black
 Heavy Vehicles (HGVs & buses) in red
 Observed queues in blue
 Interpolated flows assumed worse case

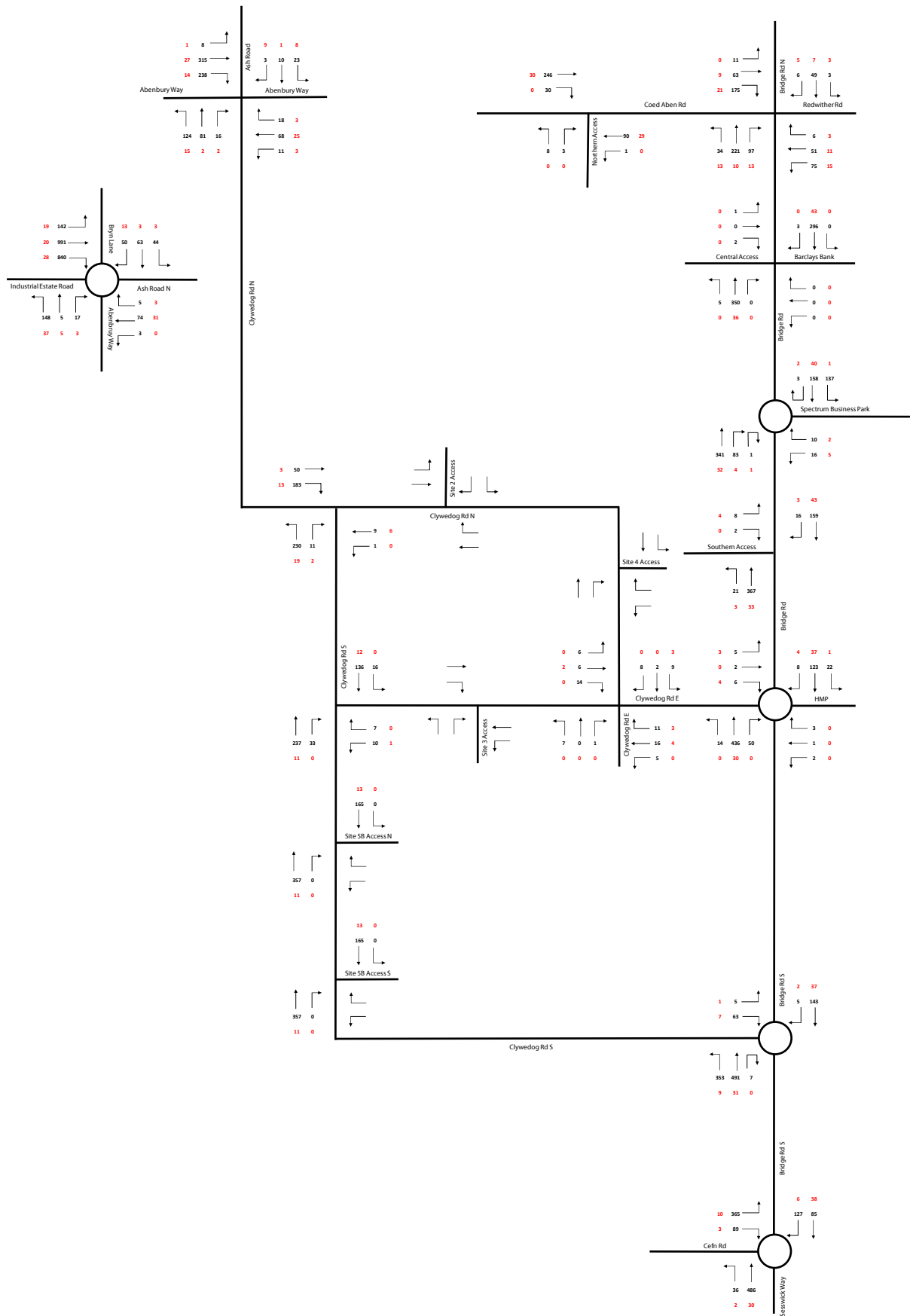


Notes:

- All flows are in vehicles
- Light Vehicles (cars & LGVs) in black
- Heavy Vehicles (HGVs & buses) in red
- Observed queues in blue
- Interpolated flows assumed worse case



Project: Site 5, Wrexham Industrial Estate
Scenario: Traffic Flow Diagram 3 - 2036 Base
Peak: AM (0745-0845)
Notes: All flows are in vehicles
 Light Vehicles (cars & LGVs) in black
 Heavy Vehicles (HGVs & buses) in red



Heavy Vehicles (HGVs & buses) in red



Project: The Bridgeway Centre, Wrexham Industrial Estate

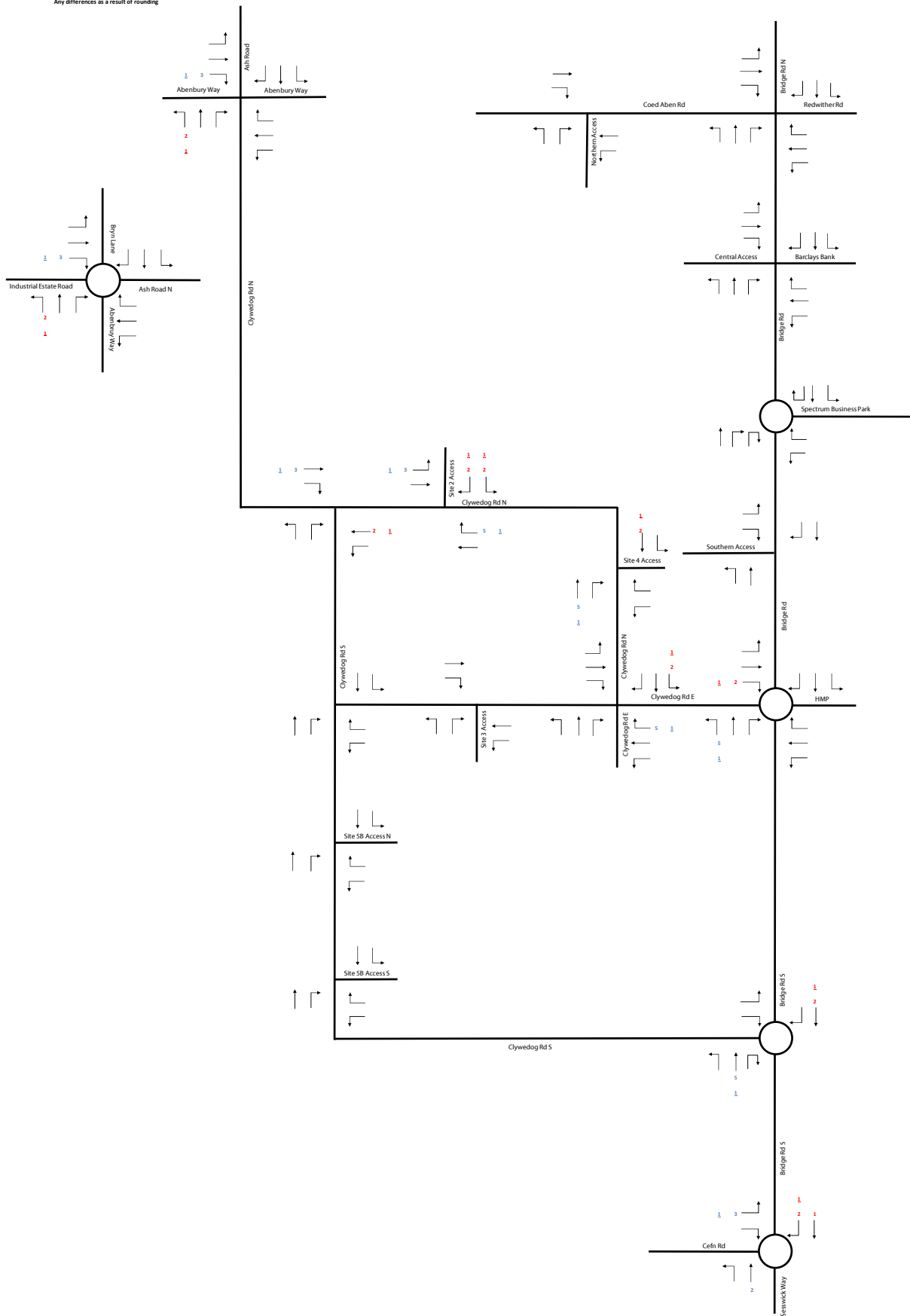
Scenario: Traffic Flow Diagram 5 - Site 2 Generated Traffic

Peak: AM (0745-0845)

Notes: Normal = Light Vehs
Underline = Heavy Vehs

Arrivals	8	2
Departures	4	2

Any differences as a result of rounding



Any differences as a result of rounding



Any differences as a result of rounding



Any differences as a result of rounding



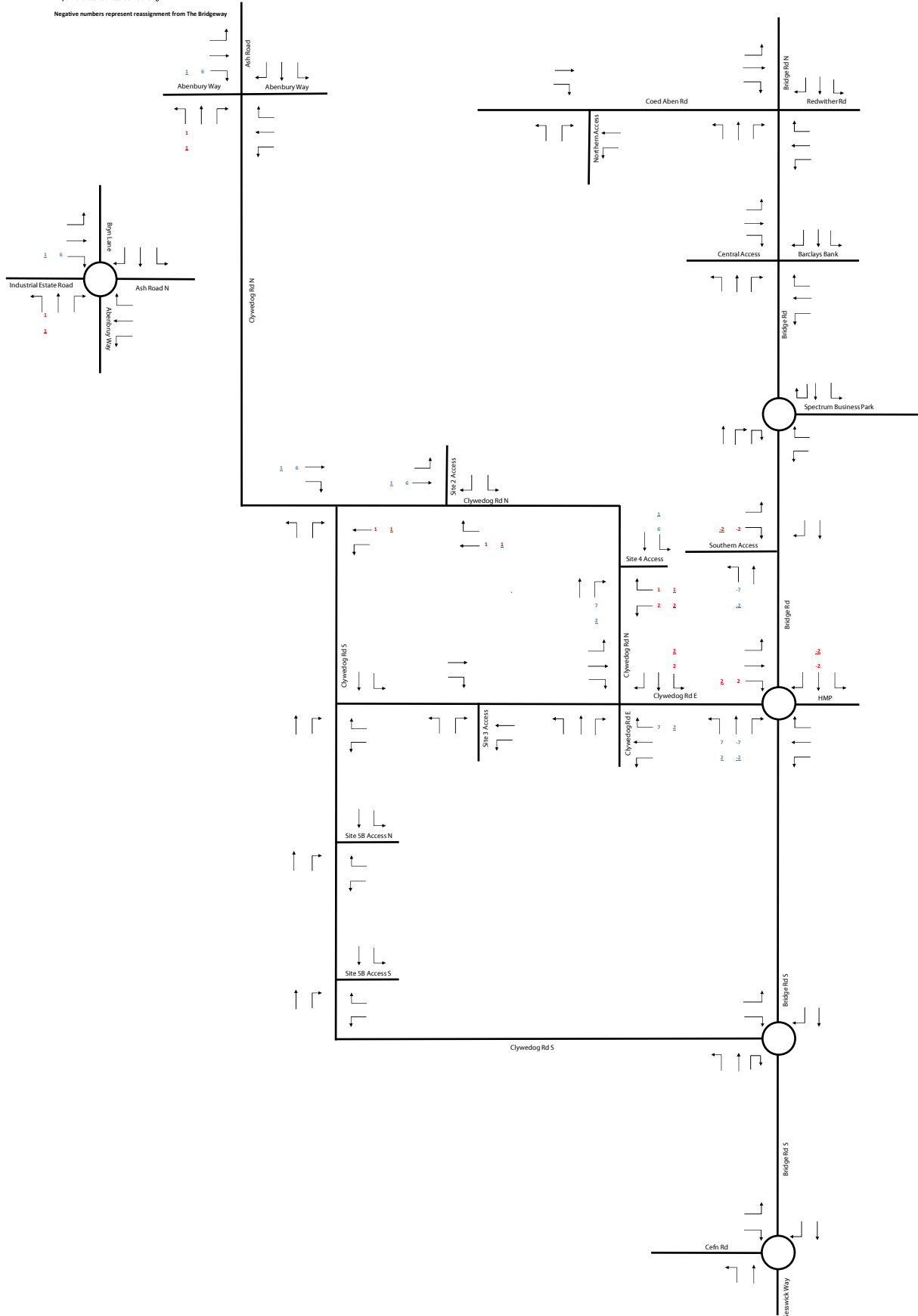
Project: The Bridgeway Centre, Wrexham Industrial Estate
 Scenario: Traffic Flow Diagram 9 - Site 4 Generated Traffic
 Peak AM (0745-0845)
 Notes: Normal = Light Vehs
 Underline = Heavy Vehs

Arrivals 13 3

Departures 3 3

Any differences as a result of rounding

Negative numbers represent reassignment from The Bridgeway



Notes:

Underline = Heavy Vehs

Arrivals	2	1
----------	---	---

Arrivals	14	1
Departures	14	1

Departures 11 11

Any differences as a result of rounding



17,100sqm scheme (pending)

Any differences as a result of rounding

Diagram illustrating a proposed 17,100sqm scheme (pending) for a road layout. The scheme shows a roundabout and a T-junction.

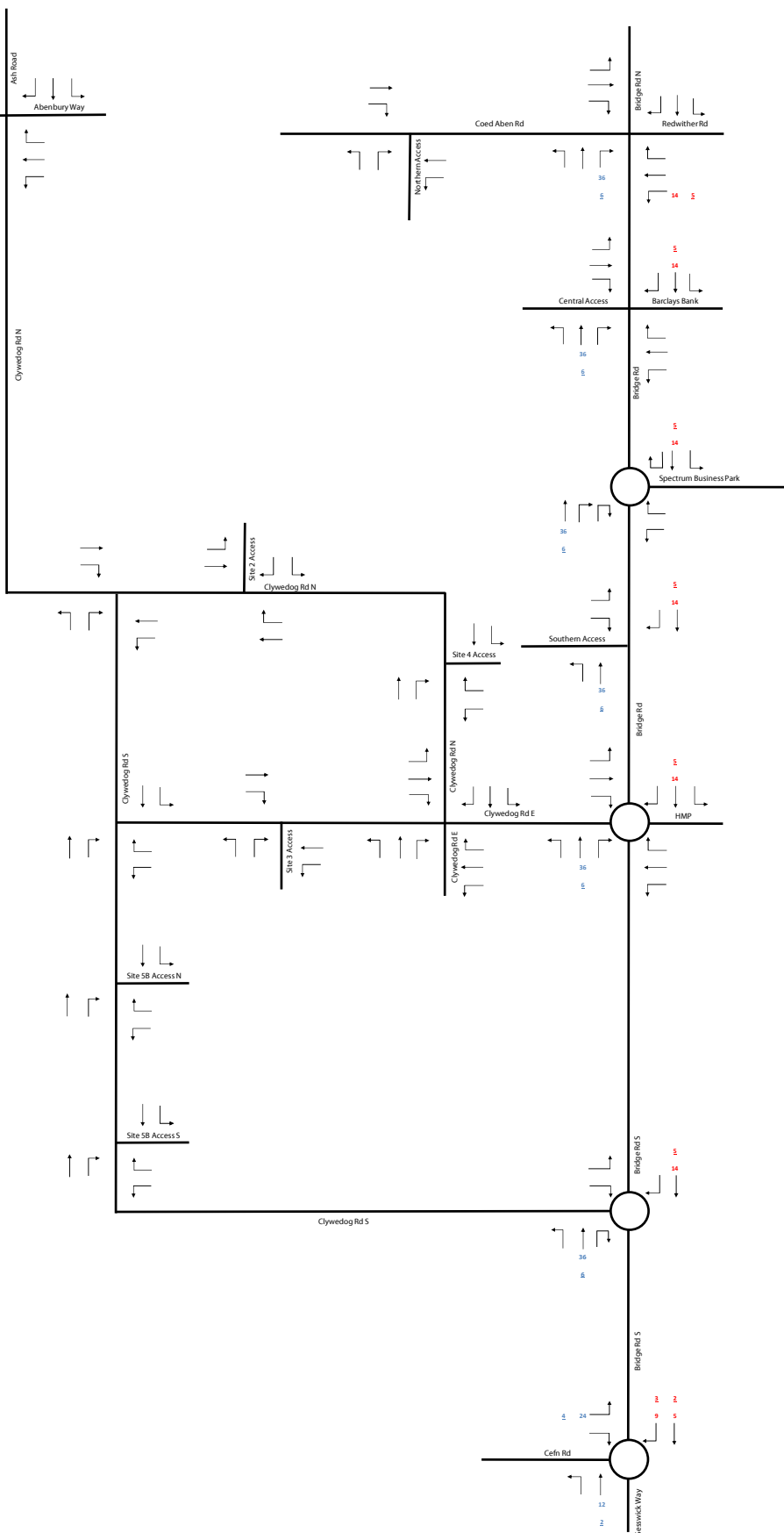
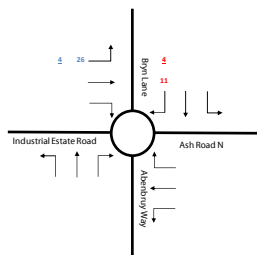
Roundabout Approaches:

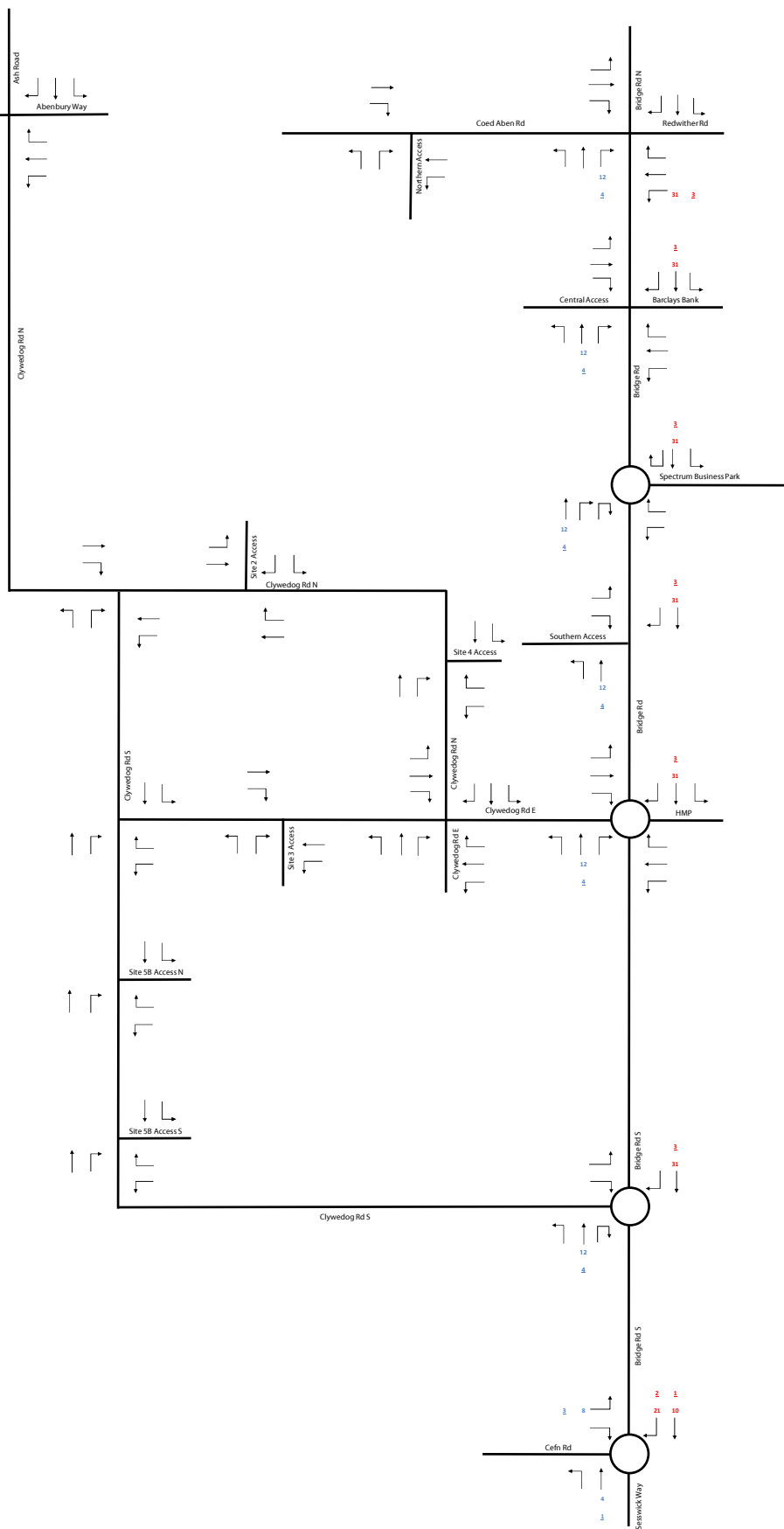
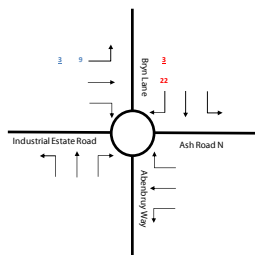
- Bogn Lane (Top):** 4 (red) and 26 (blue) vehicles per hour.
- Ash Road N (Right):** 11 (red) vehicles per hour.
- Abernethy Way (Bottom):** Approach to the roundabout.
- Industrial Estate Road (Left):** Approach to the roundabout.

T-junction on Abernethy Way:

- Ash Road:** Branching off to the right.
- Ash Road Way:** Branching off to the right.

Arrows indicate the direction of traffic flow for each approach.





Project: The Bridgeway Centre, Wrexham Industrial Estate
 Scenario: Traffic Flow Diagram 13 - The Bridgeway: Employment Trips
 Peak AM (0745-0845)
 Notes: Normal = Light Vehs
 Underline = Heavy Vehs

Northern Half:

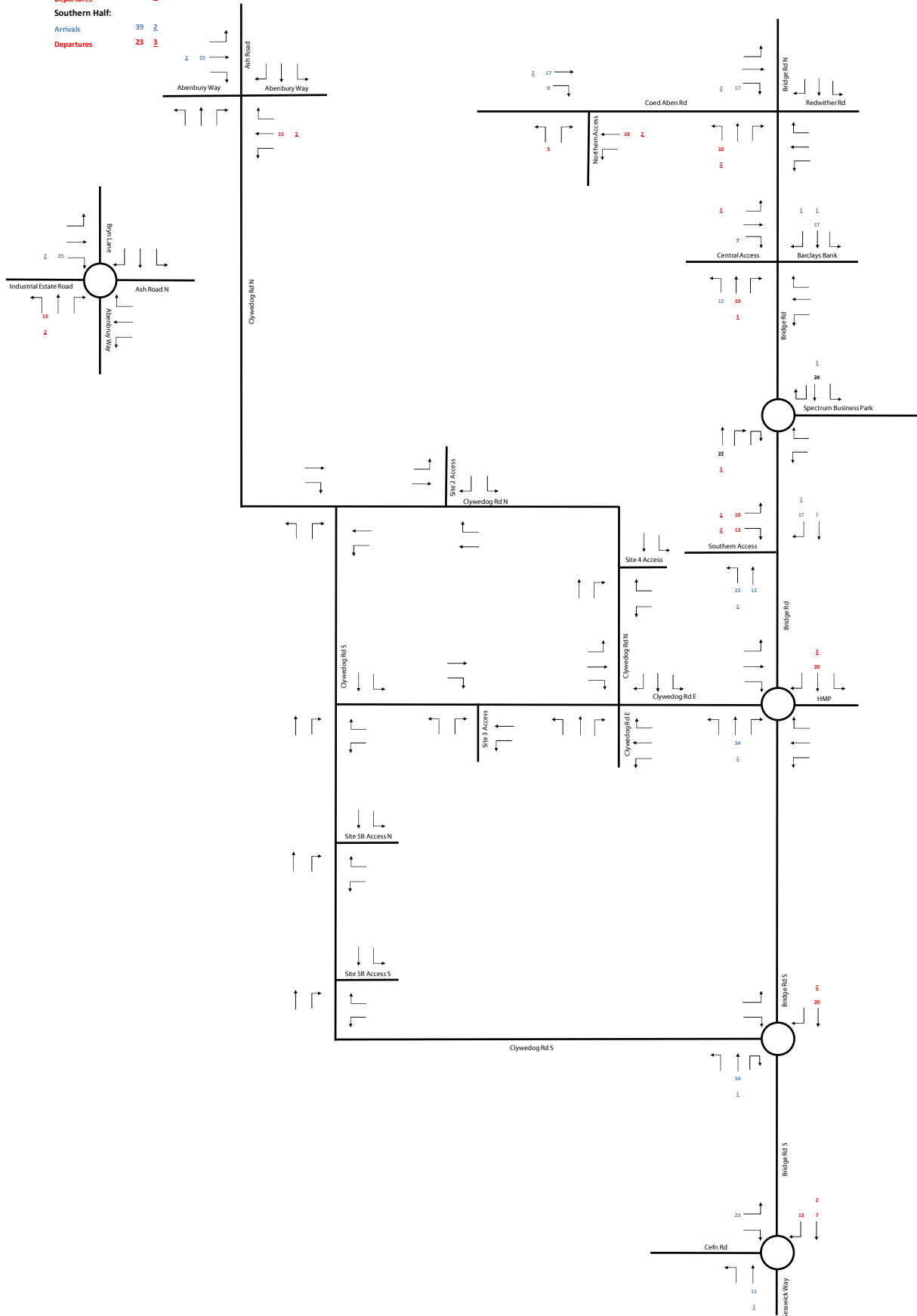
Arrivals 20 1

Departures 12 1

Southern Half:

Arrivals 39 2

Departures 23 3



Project: The Bridgeway Centre, Wrexham Industrial Estate
 Scenario: Traffic Flow Diagram 14 - The Bridgeway: Employment Trips
 Peak PM (1615-1715)
 Notes: Normal = Light Vehs
 Underline = Heavy Vehs

Northern Half:

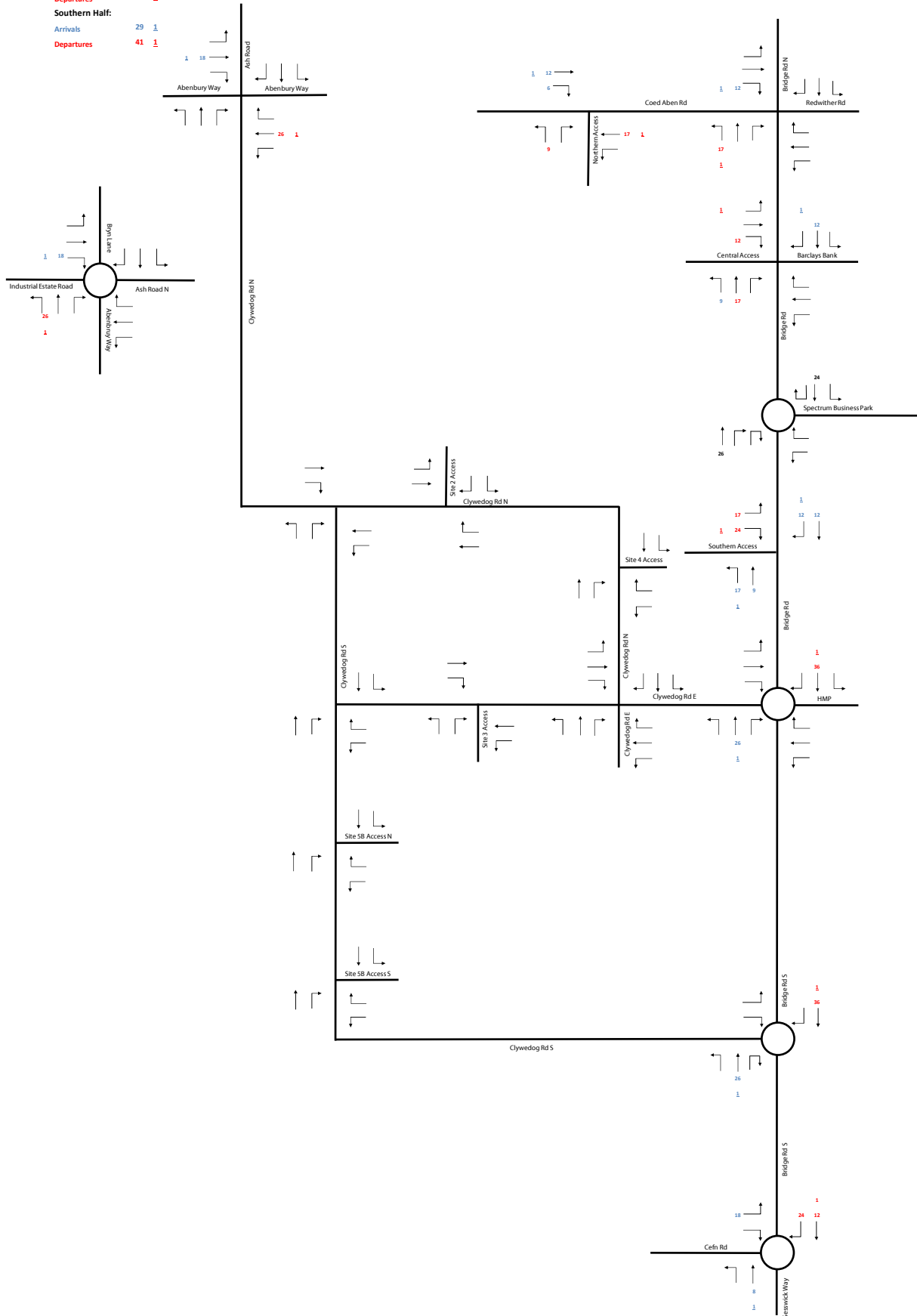
Arrivals 15 1

Departures 21 1

Southern Half:

Arrivals 29 1

Departures 41 1



Departures 14



Project: The Bridgeway Centre, Wrexham Industrial Estate
 Scenario: Traffic Flow Diagram 16 - The Bridgeway: New Retail
 Peak PM (1615-1715)

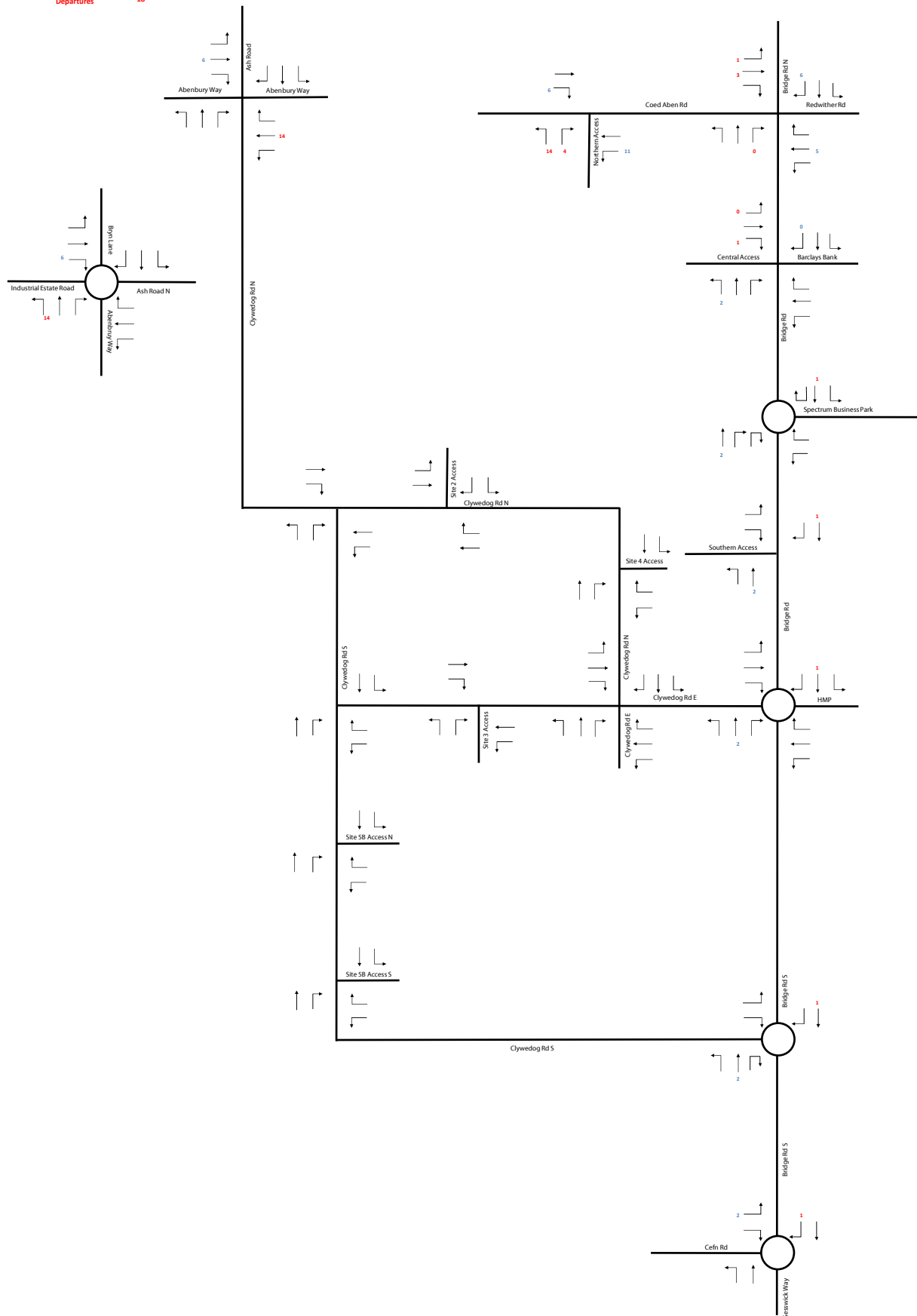
Notes: Normal = Light Vehs

Modelled as 100% new trips but likely to be a mix of pass-by, diverted and linked trips

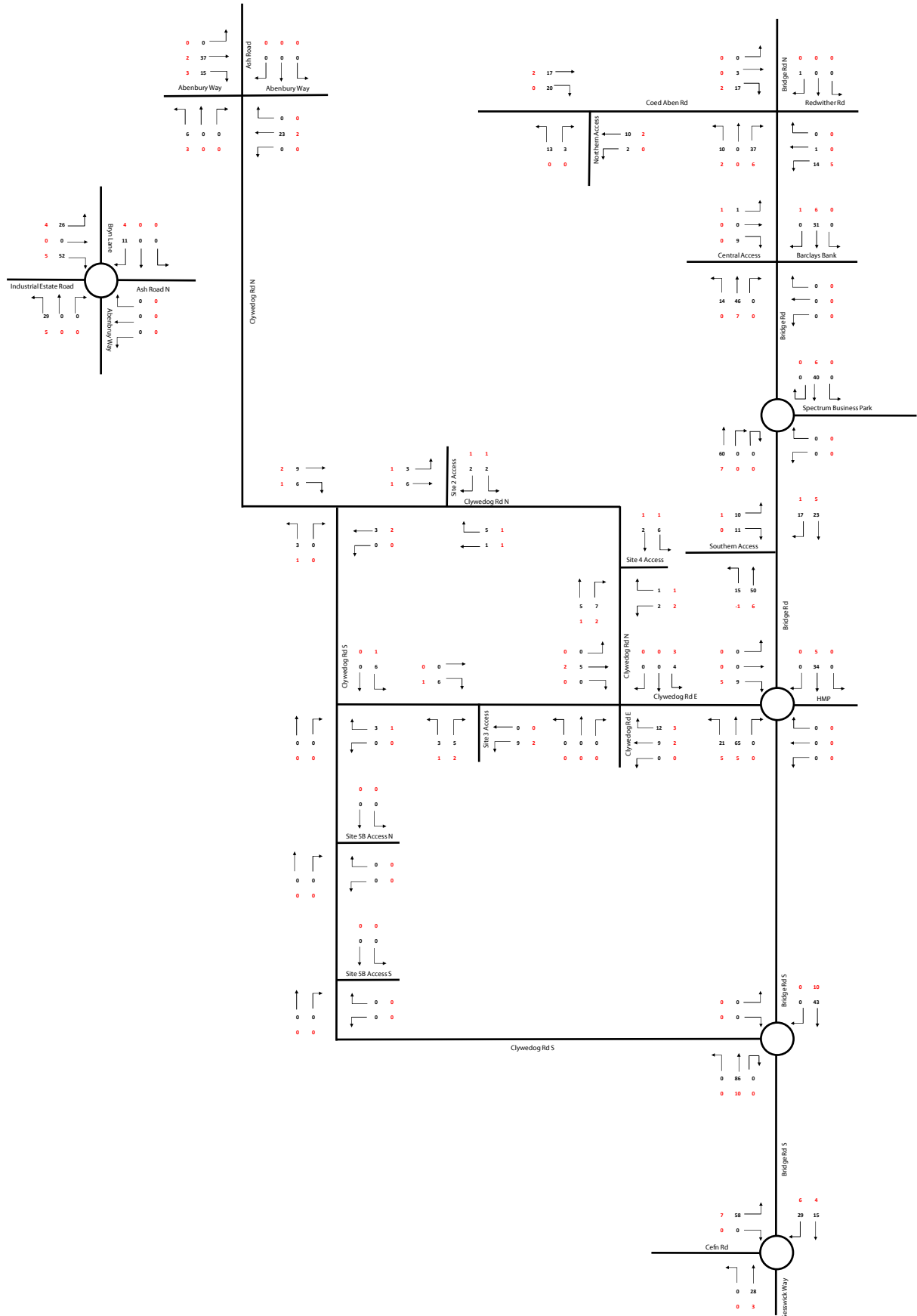
Distribution based on observed at northern and central accesses i.e. existing retail

Arrivals 19

Departures 18



Project: Site 5, Wrexham Industrial Estate
Scenario: Traffic Flow Diagram 17 - Total Committed Development
Peak: AM (0745-0845)
Notes: All flows are in vehicles
 Light Vehicles (cars & LGVs) in black
 Heavy Vehicles (HGVs & buses) in red
 Any differences as a result of rounding



Any differences as a result of rounding



Any differences as a result of rounding

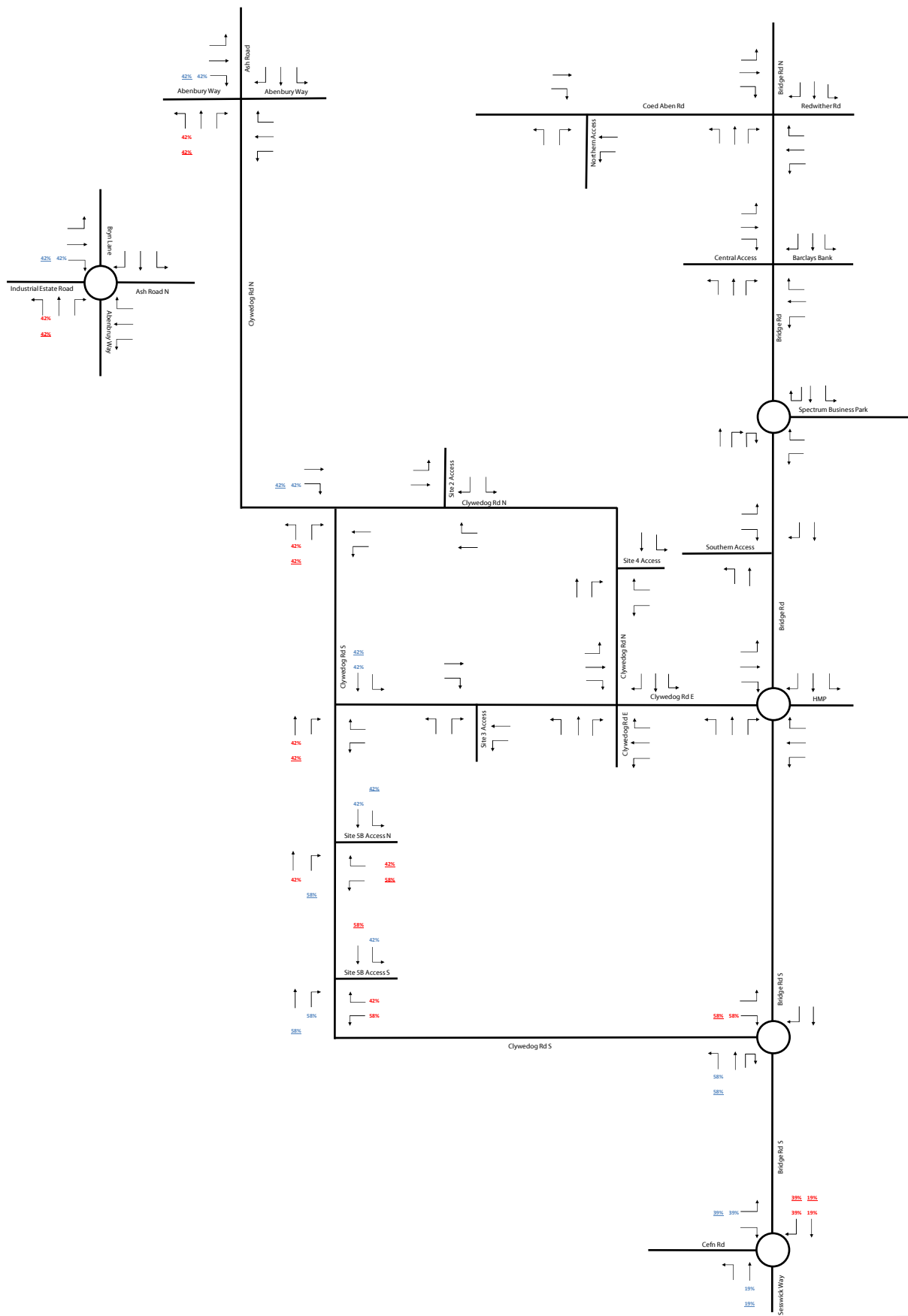


Any differences as a result of rounding



Project: Site 5, Wrexham Industrial Estate
Scenario: Traffic Flow Diagram 21 - Distribution
Peak Both
Notes: Distribution based on Census MTW as per other FIREM sites

Lights	Heavies
<u>Arrivals</u>	<u>Arrivals</u>
<u>Departures</u>	<u>Departures</u>

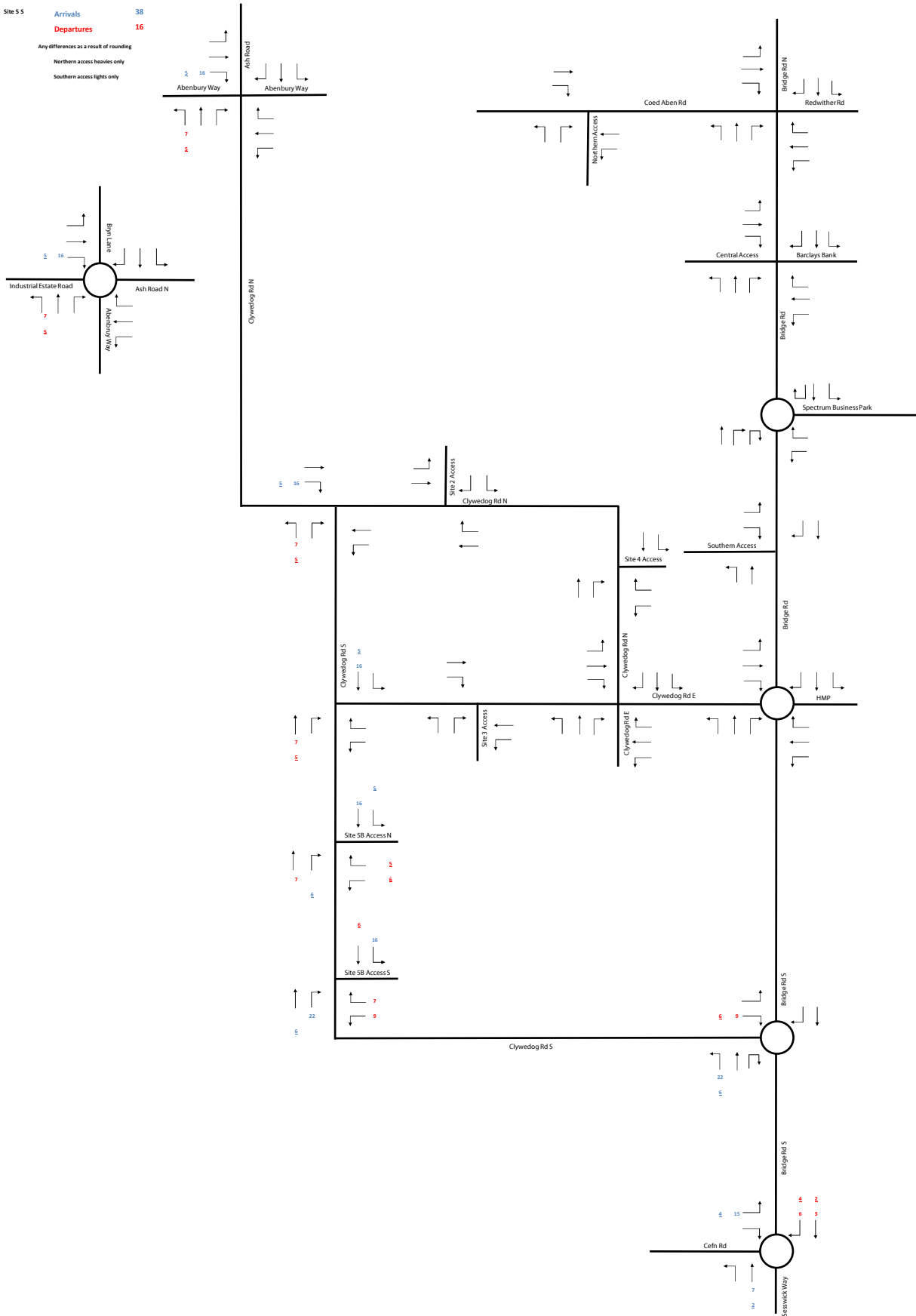


Project: The Bridgeway Centre, Wrexham Industrial Estate
 Scenario: Traffic Flow Diagram 22 - Site 5 Development Traffic
 Peak AM (0745-0845)
 Notes: Normal = Light Vehs
 Underline = Heavy Vehs

Site 5 N Arrivals 11
 Departures 11

Site 5 S Arrivals 38
 Departures 16

Any differences as a result of rounding
 Northern access heavies only
 Southern access lights only

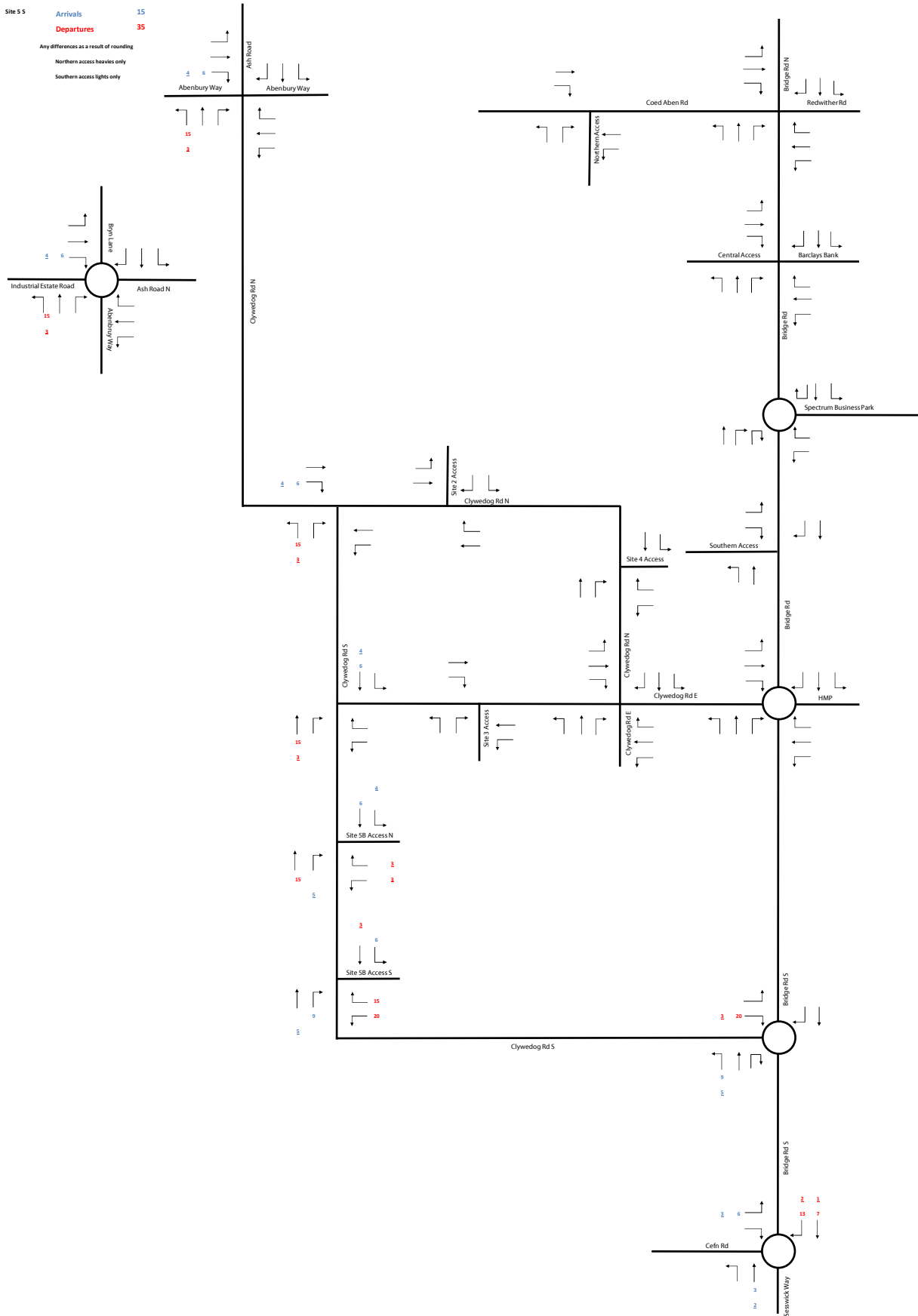


Project: The Bridgeway Centre, Wrexham Industrial Estate
 Scenario: Traffic Flow Diagram 23 - Site 5 Development Traffic
 Peak PM (1615-1715)
 Notes: Normal = Light Vehs
 Underline = Heavy Vehs

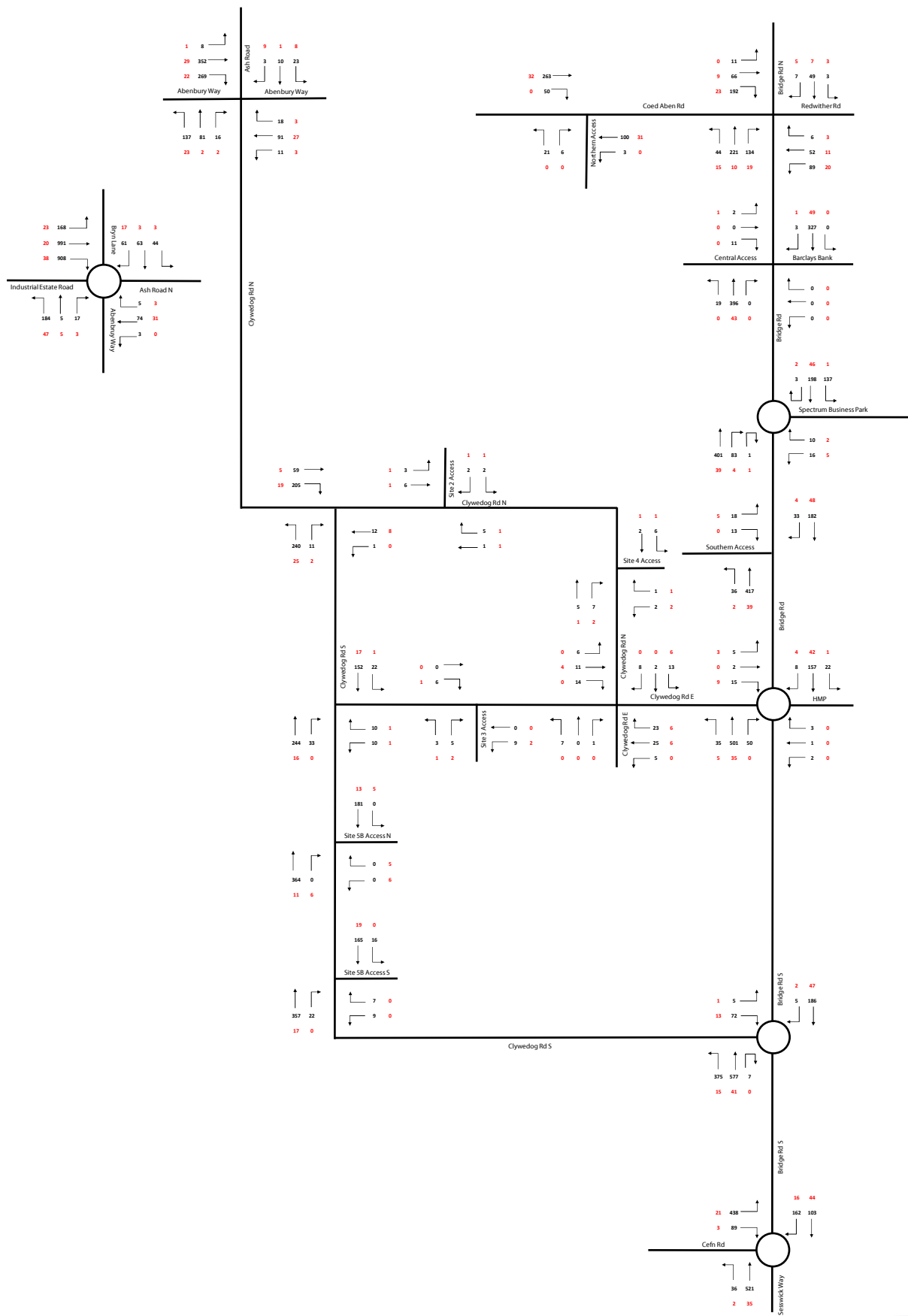
Site 5 N Arrivals 2
 Departures 6

Site 5 S Arrivals 15
 Departures 35

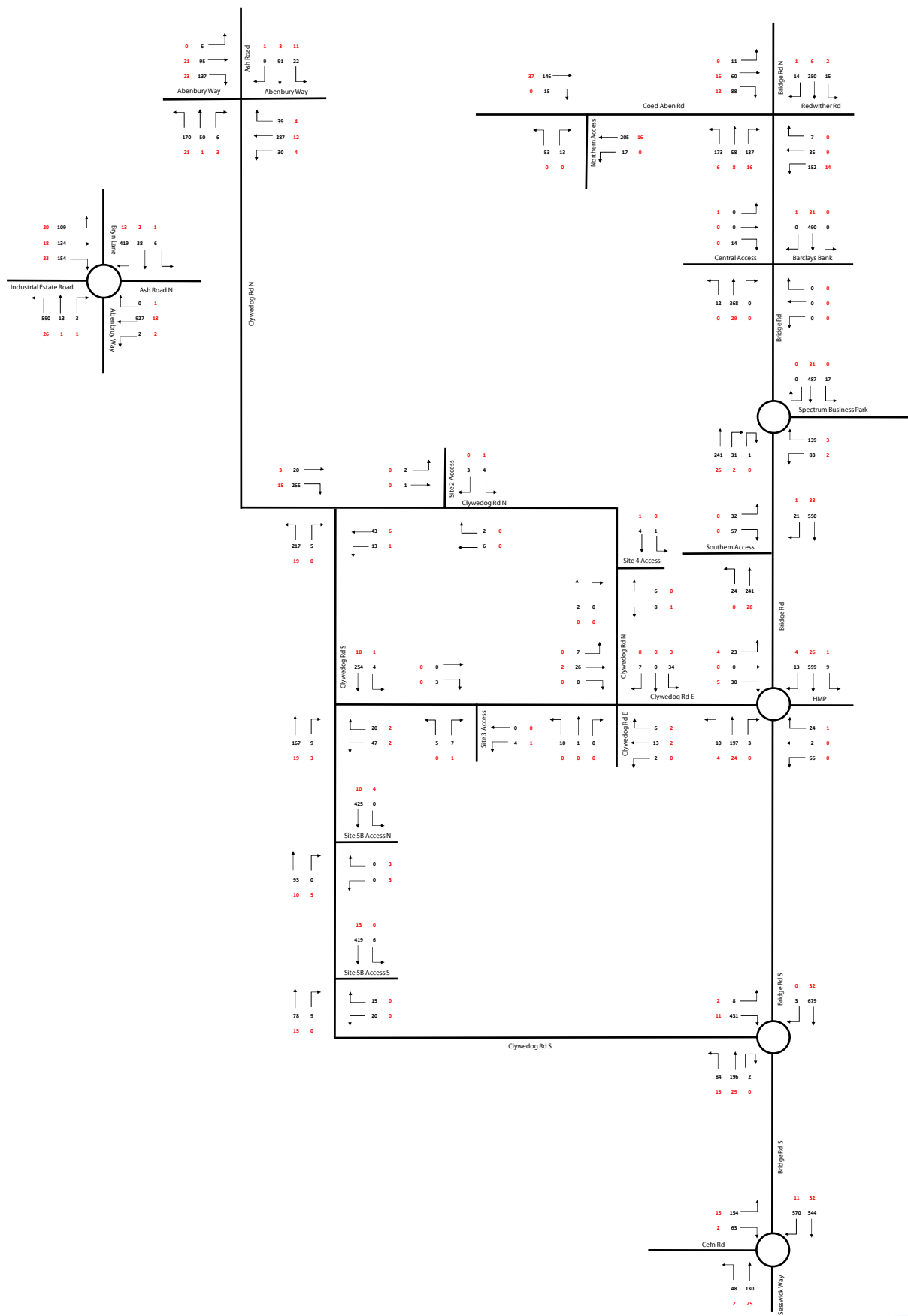
Any differences as a result of rounding
 Northern access heavies only
 Southern access lights only



Project: Site 5, Wrexham Industrial Estate
Scenario: Traffic Flow Diagram 24 - 2036 With Development
Peak AM (0745-0845)
Notes: All flows are in vehicles
 Light Vehicles (cars & LGVs) in black
 Heavy Vehicles (HGVs & buses) in red
 Any differences as a result of rounding



Project: Site 5, Wrexham Industrial Estate
Scenario: Traffic Flow Diagram 25 - 2036 With Development
Peak PM (1615-1715)
Notes: All flows are in vehicles
 Light Vehicles (cars & LGVs) in black
 Heavy Vehicles (HGVs & buses) in red
Any differences as a result of rounding

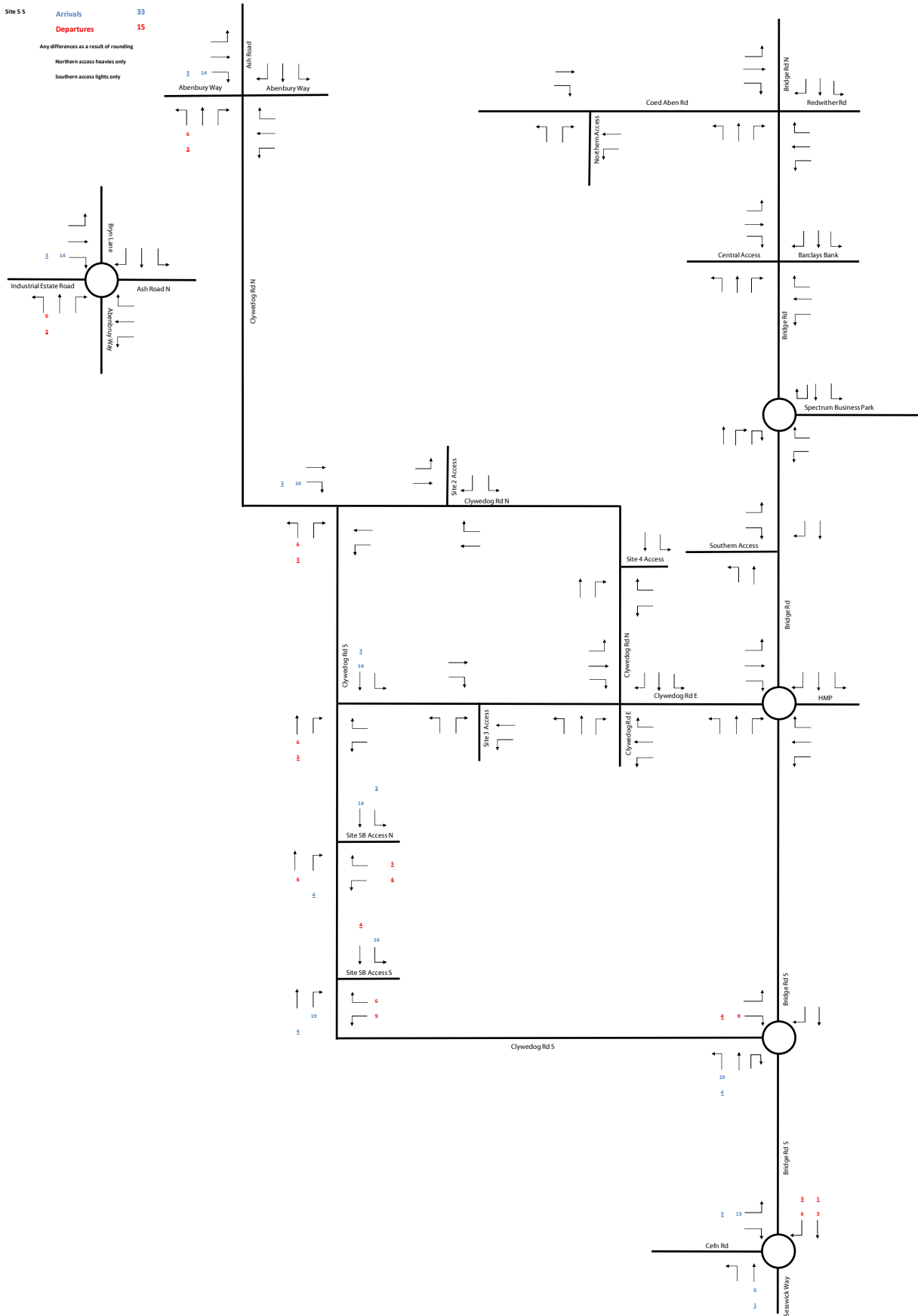


Project: The Bridgeway Centre, Wrexham Industrial Estate
 Scenario: Traffic Flow Diagram 26 - Site 5 Consented Development Traffic
 Peak AM (0745-0845)
 Notes: Normal = Light Vehs
 Underline = Heavy Vehs

Site 5 N Arrivals 2
 Departures 2

Site 5 S Arrivals 33
 Departures 15

Any differences as a result of rounding
 Northern access heavies only
 Southern access lights only

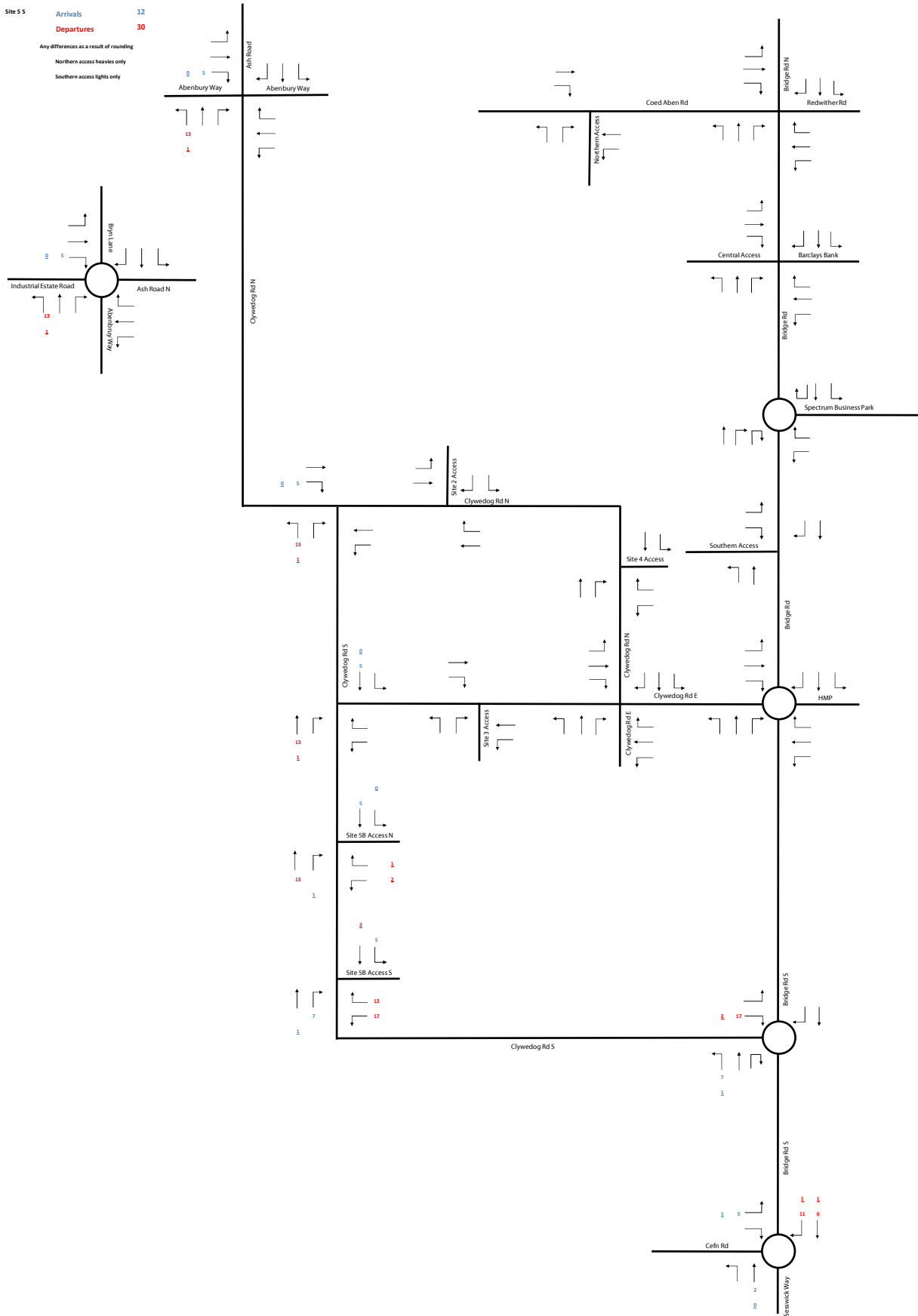


Project: The Bridgeway Centre, Wrexham Industrial Estate
 Scenario: Traffic Flow Diagram 27 - Site 5 Consented Development Traffic
 Peak PM (1615-1715)
 Notes: Normal = Light Vehs
 Underline = Heavy Vehs

Site 5 N
 Arrivals 1
 Departures 2

Site 5 S
 Arrivals 12
 Departures 30

Any differences as a result of rounding
 Northern access heavies only
 Southern access lights only



APPENDIX E

CAPACITY ASSESSMENT REPORT OUTPUTS

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Junctions 9	
PICADY 9 - Priority Intersection Module	
Version: 9.5.1.7462 © Copyright TRL Limited, 2019	
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: Site Access 5 (S).j9

Path: N:\Projects 2021\P21065 - Site 5 Wrexham Industrial Estate\6.Technical\Models

Report generation date: 30/11/2021 13:22:59

»With Development 2036, AM

»With Development 2036, PM

File summary

File Description

Title	Site 5 Southern Access/Clywedog Road S
Location	Wrexham
Site number	
Date	30/11/2021
Version	
Status	Final
Identifier	
Client	FI Real Estate
Jobnumber	P21065
Enumerator	D.Stoddart
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

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

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	With Development 2036	AM	ONE HOUR	07:30	09:00	15	✓
D2	With Development 2036	PM	ONE HOUR	16:00	17:30	15	✓

Analysis Set Details

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

With Development 2036, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access (S)/Clywedog Road S	T-Junction	Two-way		1.12	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Clywedog Road S (Northern Arm)		Major
B	Site Access 5B (S)		Minor
C	Clywedog Road S (Southern Arm)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Clywedog Road S (Southern Arm)	7.40			180.0	✓	0.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Site Access 5B (S)	One lane	3.20	18	18

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	502	0.086	0.217	0.137	0.310
B-C	648	0.093	0.236	-	-
C-B	678	0.247	0.247	-	-

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

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

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	With Development 2036	AM	ONE HOUR	07:30	09:00	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Clywedog Road S (Northern Arm)		ONE HOUR	✓	217	100.000
B - Site Access 5B (S)		ONE HOUR	✓	38	100.000
C - Clywedog Road S (Southern Arm)		ONE HOUR	✓	413	100.000

Origin-Destination Data

Demand (PCU/hr)

From	To			
		A - Clywedog Road S (Northern Arm)	B - Site Access 5B (S)	C - Clywedog Road S (Southern Arm)
	A - Clywedog Road S (Northern Arm)	0	26	191
	B - Site Access 5B (S)	17	0	21
	C - Clywedog Road S (Southern Arm)	379	34	0

Vehicle Mix

Heavy Vehicle Percentages

From	To			
		A - Clywedog Road S (Northern Arm)	B - Site Access 5B (S)	C - Clywedog Road S (Southern Arm)
	A - Clywedog Road S (Northern Arm)	0	24	7
	B - Site Access 5B (S)	42	0	40
	C - Clywedog Road S (Southern Arm)	3	21	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.09	11.60	0.1	B	35	52
C-AB	0.08	5.25	0.2	A	54	80
C-A					325	488
A-B					24	36
A-C					175	263

With Development 2036, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Site Access (S)/Clywedog Road S	T-Junction	Two-way		1.12	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	With Development 2036	PM	ONE HOUR	16:00	17:30	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Clywedog Road S (Northern Arm)		ONE HOUR	✓	217	100.000
B - Site Access 5B (S)		ONE HOUR	✓	38	100.000
C - Clywedog Road S (Southern Arm)		ONE HOUR	✓	413	100.000

Origin-Destination Data

Demand (PCU/hr)

From	To			
		A - Clywedog Road S (Northern Arm)	B - Site Access 5B (S)	C - Clywedog Road S (Southern Arm)
	A - Clywedog Road S (Northern Arm)	0	26	191
	B - Site Access 5B (S)	17	0	21
	C - Clywedog Road S (Southern Arm)	379	34	0

Vehicle Mix

Heavy Vehicle Percentages

From	To			
		A - Clywedog Road S (Northern Arm)	B - Site Access 5B (S)	C - Clywedog Road S (Southern Arm)
	A - Clywedog Road S (Northern Arm)	0	24	7
	B - Site Access 5B (S)	42	0	40
	C - Clywedog Road S (Southern Arm)	3	21	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.09	11.60	0.1	B	35	52
C-AB	0.08	5.25	0.2	A	54	80
C-A					325	488
A-B					24	36
A-C					175	263

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