Transportation Planning : Infrastructure Design
an RSK company

Castle Green Homes Ltd

Quarry Farm, Oakenholt, Flint

Transport Assessment

230489

AUGUST 2023

SCP GENERAL NOTES

Project No.: 230489-TA (0.0)

Title: Quarry Farm, Oakenholt, Flint, Transport Assessment

Client: Castle Green Homes Ltd

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TRAFFIC FLOW FIGURES

1 INTRODUCTION

General

1.1 SCP have been instructed by Castle Green Homes Ltd to provide highway, traffic and transport advice in connection with a planning application for residential development, on land off Ffordd Pedrog, Oakenholt, Flint.

1.2 The proposed development will provide 128no. residential dwellings comprising a mix of 1, 2, 3 & 4 bed affordable flats and houses. Further information on the proposed development is provided in Chapter 3 of this report.

1.3 This TA provides an assessment of the traffic and transport implications associated with the development proposals to inform Flintshire County Council (FCC), as the local highway and planning authority, regarding the nature and magnitude of their impact.

1.4 Pre-application discussions have taken place with the Highway Officer at Flintshire County Council (FCC) regarding the scope of the Transport Assessment and internal site layout. FCC's comments in relation to the internal layout have been positively addressed through a revised site plan, with this report being consistent with the scope of the assessment agreed.

Structure of Report

1.5 The structure of this report is as follows:

- Chapter 2 – summarises relevant national and local transport policies and evaluated a Transport Implementation Strategy;
- Chapter 3 – provides an appraisal of the existing conditions of the site including an appraisal of the local highway network, existing traffic conditions and road safety record;
- Chapter 4 – provides an appraisal of the development proposals including the proposed site access arrangements, servicing arrangements and car parking;
- Chapter 5 – presents a review of the accessibility of the site by walking, cycling and public transport modes;
- Chapter 6 – describes the future baseline traffic conditions on the local highway network in relation to committed development traffic flows and traffic growth;
- Chapter 7 – presents estimates of the trip generating potential of the scheme and sets out the methodologies for estimating the distribution of site traffic through the local highway network;
- Chapter 8 – presents an assessment of the impact of the development on the operational performance of the local highway network; and,
- Chapter 9 – provides the summary and conclusions to the above chapters.

2 POLICY CONTEXT AND TRANSPORT IMPLEMENTATION STRATEGY

Introduction

2.1 Technical Advice Note 18 (TAN 18) sets out the need for all TA supporting documents in Wales to include a Transport Implementation Strategy (TIS), which should include the following information in respect of each particular development proposal:

- Details of how the development and the TIS relate to transport planning policies and strategy. TIS's are intended to incorporate all the elements of a Travel Plan (TP) and to ensure that these are integrated with design elements of the new development;
- A set of objectives and targets relating to managing travel demand for the development;
- A framework for monitoring the objectives and targets, including the future modal split of transport to the development; and
- Details of measures proposed to improve access by public transport, walking and cycling to reduce the number and impacts of motorised journeys associated with the development.

2.2 This TIS section is therefore prepared having regard to the advice from TAN 18, as outlined above. It is considered that this TIS can be taken forward and used as a framework for a future detailed Travel Plan that can be secured as part of a planning condition, if considered necessary.

Policy Context - Planning Policy Wales (PPW)

2.3 In terms of the national transport policy that is relevant to the TIS, the latest 11th edition of PPW was published in February 2021 by the Welsh Government and sets out a framework for the Welsh planning authorities to prepare their development plans. Chapter 4 of PPW sets out the approach to Transport.

2.4 Paragraph 4.1.1 of PPW states that "*The planning system should enable people to access jobs and services through shorter, more efficient and sustainable journeys, by walking, cycling and public transport. By influencing the location, scale, density, mix of uses and design of new development, the planning system can improve choice in transport and secure accessibility in a way which supports sustainable development, increases physical activity, improves health and helps to tackle the causes of climate change and airborne pollution by:*

- *Enabling More Sustainable Travel Choices – measures to increase walking, cycling and public transport, reduce dependency on the car for daily travel;*
- *Network Management – measures to make best use of the available capacity, supported by targeted new infrastructure; and,*
- *Demand Management – the application of strategies and policies to reduce travel demand, specifically that of single-occupancy private vehicles".*

2.5 Paragraph 4.1.9-4.1.10 of PPW states that "*The Welsh Government is committed to reducing reliance on the private car and supporting a modal shift to walking, cycling and public transport. The planning system has a key role to play in reducing the need to travel and supporting sustainable transport, by facilitating developments which:*

- *are sited in the right locations, where they can be easily accessed by sustainable modes of travel and without the need for a car;*
- *are designed in a way which integrates them with existing land uses and neighbourhoods; and,*
- *make it possible for all short journeys within and beyond the development to be easily made by walking and cycling."*

2.6 With reference to the Active Travel (Wales) Act 2013, Paragraph 4.1.27 of PPW states that walking and cycling should be promoted for shorter journeys, particularly everyday journeys to work and education establishments or to other local services and facilities. "*The Active Travel Act requires local authorities to produce Integrated Network Maps, identifying the walking and cycling routes required to create fully integrated networks for walking and cycling to access work, education, services and facilities."*.

2.7 In reference to supporting documentation with planning applications, paragraph 4.1.55 of PPW states that *"Transport Assessments are an important mechanism for setting out the scale of anticipated impacts of a proposed development, or redevelopment, is likely to have. They assist in helping to anticipate the impacts of development so that they can be understood and catered for appropriately."*

TIS Objectives and Targets

2.8 The objectives of a TIS should benefit both the occupiers of a development and the wider community. The objectives will be set out in the following sections and form the basis for a TP for the development. Site specific objectives that are relevant to the proposed development are as follows:

- *Increase opportunities for residents;*
- *Reduce vehicle use in and around the site;*
- *Improve the image of the local area;*
- *Reduce the transport impact of the development upon the environment;*
- *Promote more sustainable ways of travelling; and,*
- *Support government policy to manage travel demand more effectively.*

2.9 In order to achieve the objective of reducing single occupancy vehicle travel, realistic short term annual targets for mode share will be set.

2.10 The proposed development is located in the Flint Oakenholt Ward. The 2011 UK Census shows that single occupancy travel to work by car mode is, on average; lower in the Flint Oakenholt Ward (63.4%) to both Flintshire (76.2%) and Wales (71.2%). The existing local single occupancy modal share percentage of 63.4% will therefore be the initial baseline target for the residential properties on the site. The following table shows the figures obtained from the Census data:-

Table 2.1 – Mode Share from Local, Regional and National Area (2011 Census)

Travel to Work (QS701EW) Census Statistics	Flint Oakenholt	Flintshire County	Wales Country
All Usual Residents Aged 16 to 74 in Employment	2,188	74049	1363615
Work Mainly at or From Home	33	3,234	73140
Underground, Metro, Light Rail, Tram	0	45	1175
Train	19	676	27341
Bus, Minibus or Coach	63	2,951	62903
Taxi	7	343	6523
Motorcycle, Scooter or Moped	6	533	7694
Driving a Car or Van	871	53,927	918645
Passenger in a Car or Van	127	4,941	92727
Bicycle	32	1,311	19659
On Foot	242	5,676	145135
Other Method of Travel to Work	6	412	8673
Total Persons Travelling to Work	**1,373**	**70815**	**1290475**
Single Occupancy Car Journeys (%)	**63.44%**	**76.20%**	**71.20%**
Car Shares (%)	**9.25%**	**7.00%**	**7.10%**
Public Transport (%)	**5.97%**	**5.20%**	**7.10%**
Walking (%)	**17.63%**	**8.00%**	**11.20%**
Bicycle (%)	**2.33%**	**1.90%**	**1.50%**
Taxi (%)	**0.51%**	**0.50%**	**0.50%**
Motorcycle (%)	**0.44%**	**0.80%**	**0.60%**

2.11 If it is demonstrated (through surveys) that the level of single occupancy car travel from the proposed development is lower than the 63.4% local level, the initial short-term targets will be reassessed in order to try and bring levels down even further.

2.12 In addition to the single occupancy car travel targets, if it is demonstrated (through surveys) that the level of public transport travel usage to / from the site is less than the 6.0% for the ward, the initial short-term targets will be to increase the public transport travel to that level. Once public transport usage from the development is at 6.0%, the targets will be reassessed to try to increase public transport usage levels even further.

Achieving the TIS Objectives and the Monitoring Process

2.13 The objectives and monitoring of the TIS will substantially be achieved through the appointment of suitable Travel Plan Co-ordinator/s (TPC/s). The TPC role for the development would most commonly be overseen by a Management Company located on the site, although in time this role could evolve to be overseen by the residents of the site themselves. Appropriate start-up funding will be provided for the TPC/s to cover the administration costs involved.

2.14 Once appointed, the TPC/s will act as the main contact for the TIS and will be responsible for implementing the TIS measures, involving new residents, maintaining a database and monitoring the effects of implementation. A full set of duties and responsibilities of the TPC/s is set out in the sections below.

2.15 The TPC/s will inform the Local Planning Authority and the appropriate local public transport operators of their contact details. Similarly, the TPC/s will obtain the contact details of the owners and complete a 'Contact' form to provide easy reference when dealing with relevant matters.

2.16 The TPC/s will undertake an initial resident travel survey, within three months of 30% occupation of the site, to enable a resident travel database to be set up. The TPC/s will prepare and distribute a questionnaire to each resident, to collect the following details:

- *Postcode area of place of employment;*
- *Normal working hours;*
- *Mode of travel to work;*
- *Car ownership / usage;*
- *Reasons for not using public transport and other modes;*

2.17 The anticipated take-up of a car sharing scheme, the use of public transport or other non-car modes of travel to work; and,

2.18 Information relating to potential areas for sustainable travel improvement, upon which the TPC/s could act and draw up measures to improve the TIS.

2.19 On receipt of the completed questionnaires the TPC/s will set up a travel database within 3 months of completion of the travel survey.

2.20 The TPC/s will agree the annual targets with the LPA within 1 month of completion of the travel survey analysis. The initial travel survey results for the proportion of residents travelling by single occupancy vehicles should be recorded along with the agreed short-term annual targets.

2.21 The TPC/s will ensure that any changes to the TIS or any relevant information is passed on to residents on a biannual / annual basis in the form of leaflets.

2.22 The TPC/s will ensure that residents are provided with information to allow ease of use of the local public transport by providing up-to-date public transport route maps and timetable information in residential 'welcome packs', and updating by leaflet drop, as necessary. Contact details for local taxi firms will also be provided by the TPC/s.

2.23 The TPC/s will liaise regularly with local public transport operators to ensure that information remains valid. The TPC/s will provide details of the websites and telephone advice services, such as http://www.traveline.info/ to enable residents to obtain details on their individual journey requirements.

2.24 The TPC/s will also liaise with the local public transport operators and release survey data to the operators to identify travel demands and allow appropriate services to be provided. The TPC/s will check regularly to ensure that the information supplied to residents remains valid.

2.25 The TPC/s will encourage walking as a mode of travel to the site by implementing the following initiatives:

- *Raise awareness of the health benefits of walking through promotional material;*
- *Provide a map showing walking routes, indicating distances and times to the most common destinations near to the site; and,*
- *Ensure that footways on site are well maintained and lit and any defects reported to the highways authority on an annual/biannual basis.*

2.26 In conjunction with the pedestrian initiatives, the TPC/s will investigate the potential to set up a bicycle user group (BUG) to encourage residents to cycle to work.

2.27 The TPC/s will set up a car sharing scheme, utilising the online website www.liftshare.com, within 3 months of receiving the initial residents travel surveys. Residents will be contacted by the TPC/s to allow potential car sharers to register an interest and provide details of their journey to and from work along with their contact phone number and work location. The TPC/s will then identify suitable matches for residents that may be able to share their journeys to and from work or for shopping trips.

2.28 The TPC/s will make the new residents aware of the existence of the TIS by providing them with a copy of the TIS as part of a welcome pack as they move into their properties. The existence of the TIS would also be highlighted in promotional literature and advertising for the new dwellings.

2.29 The TPC/s will monitor travel patterns on an annual basis for the first five years of the occupation of the sites and then at suitable intervals as agreed by the Local Planning Authority. The monitoring of the plan is important for the following reasons:

- It will ensure that the Local Planning Authority can see that the aims and objectives of the TIS are being achieved;
- It justifies the commitment of the TPC/s and of other resources;
- It maintains support for the plan by reporting successes;
- It identifies any measures that are not working or problems with the approach of the Plan;
- It can be shared with other organisations to refine the development of the Plan.

2.30 Surveys will be used to monitor travel to and from the site. The surveys can be used to monitor the number of residents walking, cycling, using cars and using public transport. The results can then be compared with the mode share targets identified earlier in this framework TIS.

2.31 The TPC/s will develop the monitoring programme in conjunction with the Local Planning Authority to ensure that the monitoring procedures are appropriate. The TPC/s will maintain a monitoring table of progress to key TIS targets based on the results of the monitoring travel surveys. This table will be published and distributed by leaflet to residents on the site.

2.32 The TPC/s will make information on mode share available to the Local Planning Authority as part of the continuous monitoring process, subject to the provisions of the Data Protection Act.

2.33 The TPC/s will undertake an annual review of the TIS in conjunction with the Local Planning Authority. This review will be important in assessing the effectiveness of the measures implemented and to identify areas where modification may be necessary. In particular the following will be assessed:

- The level of car/non-car usage at the site;
- Comments received from residents.

2.34 When reviewing the effectiveness of the TIS, the following questions will be asked:

- Which areas offer the greatest potential for change/improvement?
- Was the initiative implemented by the target date?
- How well used is each scheme/initiative?
- How much did it cost to introduce?

2.35 The TPC/s will compare the mode share statistics obtained from the annual monitoring to the targets set for the development. The TPC/s will set revised realistic targets for modal shifts to non-car travel modes and investigate the effectiveness of the TIS initiatives being promoted in conjunction with the Local Planning Authority.

2.36 In light of the data collected from the monitoring process, the TPC/s will adapt the TIS to enable the revised agreed targets to be achieved and submit a review report to be agreed with the Local Planning Authority.

2.37 It is considered that the delivery of the TIS / TP can be secured by planning condition, as appropriate.

3 EXISTING CONDITIONS

General

3.1 This Chapter provides a detailed description of the location of the site and composition, local highway network and road safety record.

Site Location and Composition

3.2 The application site is irregular in shape and has an area of approximately 10.6ac.

3.3 The site is located approximately 1.9km walking distance to the south-east of Flint town centre, to the south of the A548 Chester Road and west of Leadbrook Drive.

3.4 The location of the site in relation to the wider highway network is shown on **Figure 3.1** below and the site boundary in relation to the local highway network shown on **Figure 3.2** overleaf.

Figure 3.1 – Site Location – Wider Highway Network

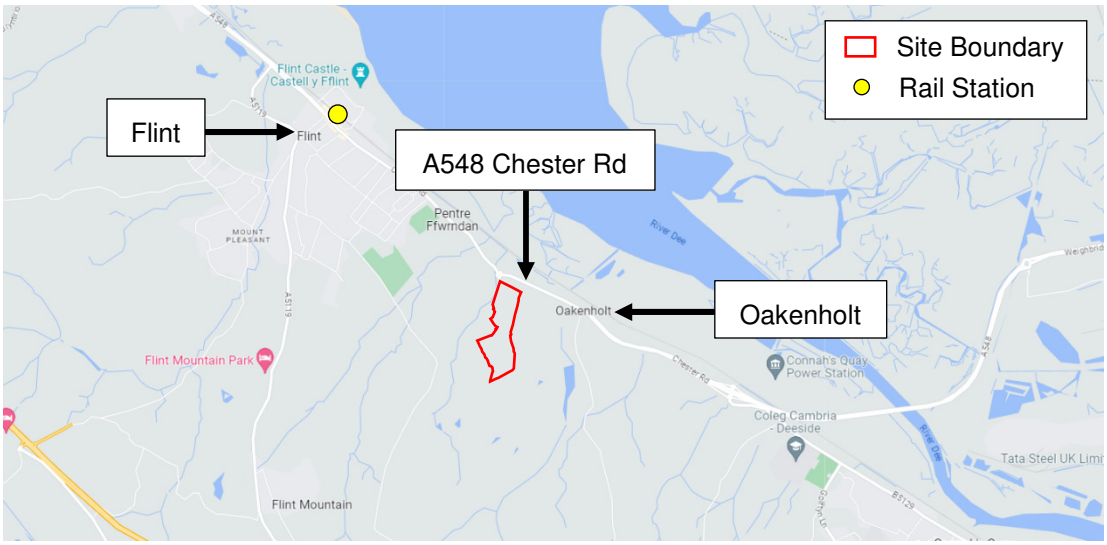


Figure 3.2 – Site Location – Local Highway Network

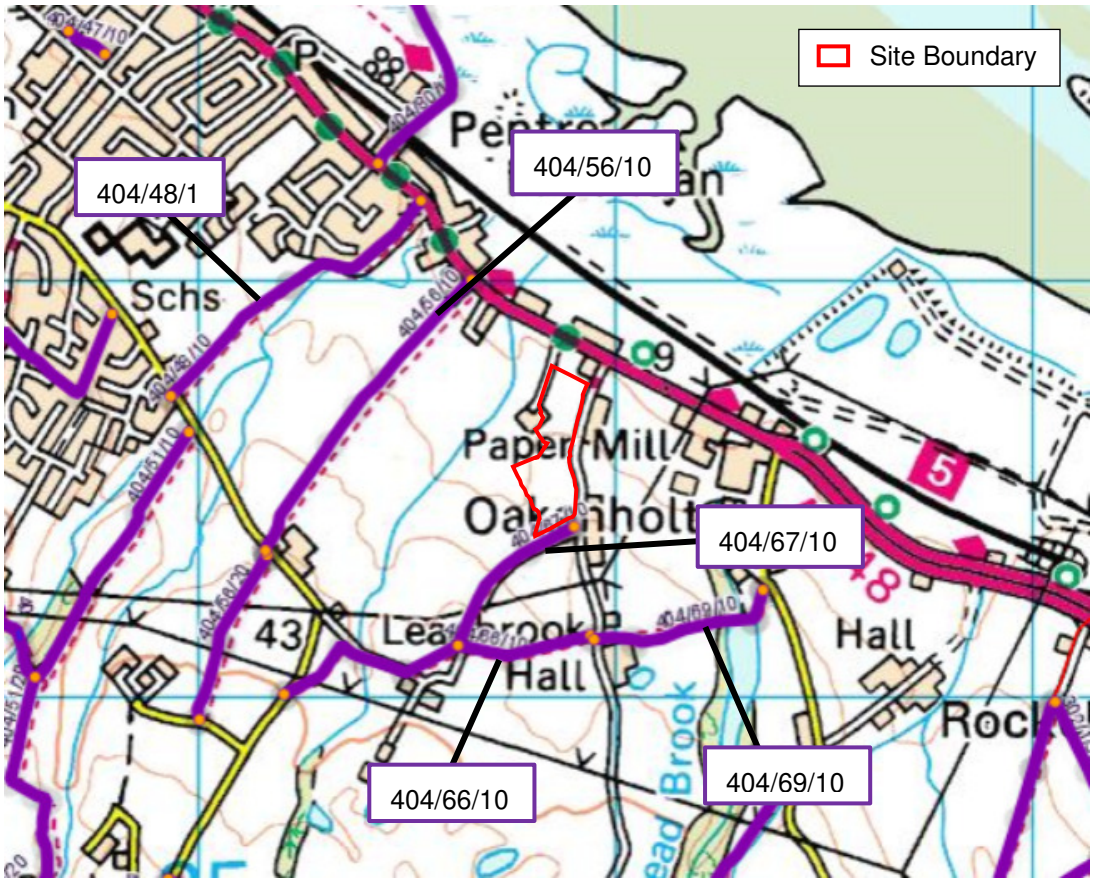
3.5 The site is currently accessed from a gated, agricultural access off Leadbrook Drive, as shown on **Figure 3.3** below.

Figure 3.3 – Existing Vehicular Access along Leadbrook Drive

3.6 There are a number of Pubic Right of Way (PRoW) within the vicinity of the site which are shown on **Figure 3.4** and summarised below:-

- PRoW 404/67/10 is located along the southern boundary of the site and provides a link between Leadbrook Drive in the east and Leadbrook Hall access road in the south-west. PRoW 404/67/10 joins onto 404/67/10 and 404/67/10 which provide a link between All Goch Lane in the south-west and Paper Mill Lane in the north-east, via Leadbrook Drive; and
- PRoW 404/56/10 and 404/48/10 are both located to the north-west of the site and provide a link between the A548 in the north-east and Coenn Onn Road in the south-west.

Figure 3.4 – PRoW Plan



Source: www.flintshire.gov.uk

Local Highway Network

A548 Chester Road

3.7 The A548 Chester Road is located to the north of the site provides a route between the A494/A550 in Deeside in the south-east with the A55 in Abergele in the north-west, via Rhyl. In the immediate vicinity of the site, the A548 provides access to a number of residential properties with marked on-road parking bays provided on the northern side of the road.

3.8 In the vicinity of the site, the A548 Chester Road the A548 is street lit and is subject to a mandatory 30mph speed limit from a point approximately 50m to the east of the junction with Leadbrook Road. Past this point the A548 Chester Road is subject to a 40mph speed limit.

3.9 The A548 Chester Road benefits from a shared footway / cycleway on the southern side of the road, which forms part of national cycle route 5, and a footway on the northern side of the road.

3.10 Pedestrian crossing points are provided on either side of the junction with Leadbrook Drive which benefit from tactile paving, dropped kerbs and pedestrian refuges.

3.11 Bus stops are provided on the A548 Chester Road immediately to the north of the site, which are provided within laybys. Further details on public transport are provided later in this report.

Ffordd Pedrog / Ffordd Hywyn

3.12 Ffordd Pedrog / Ffordd Hywn are located to the west of the site and are access roads constructed as part of a relatively recently constructed housing development. Ffordd Hywyn provides a connection to Ffordd Dewi in the north, at a three-arm roundabout, and beyond to the main A548 Chester Road / Ffordd Dewi roundabout.

3.13 Ffordd Pedrog / Ffordd Hywn are constructed to relatively standard residential standards having a circa 6m wide carriageway and 1.8m wide footways and street lighting on both sides of the road. An access stub is provided from Ffordd Pedrog up to the application site boundary, which is designed to similar residential standards.

Leadbrook Drive

3.14 Leadbrook Drive is located along the eastern boundary of the site and is a cul-de-sac which serves approximately 17no. residential dwellings and agricultural uses at its southern end.

3.15 In the vicinity of the site, Leadbrook Drive has a carriageway width which varies between approximately 4.8m-6.0m. A footway is provided on the eastern side of Leadbrook Drive outside of the residential properties, which does not extend up to the A548 Chester Road.

3.16 Within the vicinity of the site, Leadbrook Drive is subject to a mandatory speed limit of 30mph.

A548 Chester Road / Ffordd Dewi Roundabout

3.17 The A548 Chester Road / Ffordd Dewi roundabout is located to the northwest of the site and takes the form of a four arm roundabout. All arms of the roundabout are under priority control with the A548 Chester Road and Ffordd Dewi arms all being of single lane approach which flare out to provide two lanes on entry. The northern are serves a residential service road and provides a single lane entry.

3.18 Pedestrian / cycle crossing facilities are provided over the Ffordd Dewi arm of the roundabout which take the form of dropped kerbs, tactile paving and an appropriately sized splitter island, which allows this arm of the junction to be crossed in two phases.

Traffic Survey Data

3.19 The study area for this TA has been agreed with the Highway Officer at FCC and includes the A548 Chester Road / Ffordd Dewi roundabout.

3.20 The surveys were undertaken on Wednesday 14th June 2023 in a neutral traffic month and are presented in **Appendix A**, with the peak hour traffic flows shown diagrammatically on **Traffic Flow Figure 1**.

3.21 The peak hours for junction have been calculated as being between 07:30 to 08:30 and 17:00 to 18:00.

Road Safety

3.22 In order to identify critical locations on the network with a poor accident record, the personal injury accident data has been obtained from the online resource CrashMap for the most recently available 5-year period (approx.), ending 31st December 2021.

3.23 The data analysis demonstrates that no accidents have occurred along Ffordd Pedrog, Ffordd Dewi, or within 200m of the A548 Chester Road / Ffordd Dewi roundabout over the 5-year period.

3.24 On this basis, the existing accident record does not represent a material concern in the context of the proposed development and no further analysis of the accident record is required.

4 PROPOSED DEVELOPMENT

General

4.1 The proposed development will provide 128no. affordable residential dwellings comprising the following mix of accommodation:-

- 20no. 1-bed flats;
- 4no. 2-bed flats;
- 54no. 2-bed houses;
- 42no. 3-bed houses; and
- 8no. 4-bed houses.

4.2 The proposed site layout plan is provided in **Appendix B**.

Proposed Access Arrangements

4.3 Vehicular access to the site will be provided via an extension to Ffordd Pedrog, as shown on Drawing SCP/230489/ATR01 provided in **Appendix C**. The proposed extension will feature a carriageway width of 5.5m and footways with widths of 2.0m both sides of the road.

4.4 The existing geometries of Ffordd Pedrog / Ffordd Hywn (carriageway widths in excess of 5.5m) are of typical residential standard and adequate to serve the scale and nature of traffic generated by the proposed development. It has also been demonstrated that the surrounding highway network is operating safely.

4.5 Pedestrian and cycle access into the site will be provided at the same location as the vehicular access. In addition and in response to FCC's pre-application comments over the number of units served from a single point of access, a separate 3.7m wide emergency access / cycleway will be provided onto Leadbrook Drive to the east of the site, which will be controlled by removable bollards.

Internal Site Layout, Servicing and Parking

4.6 The internal site layout has been designed to typical residential standards with the main access road providing a 5.5m wide carriageway and 2m wide footways on both sides of the road. The main access road serves a number of cul-de-sacs, which provide a 4.8m wide carriageway, and private driveways.

4.7 Based on FCC's comments at pre-application stage, the following amendments have been made to the layout from that submitted as part of the pre-application discussions to ensure that parking spaces are no longer on junction radii or at the end of private driveways to avoid lengthy reversing distances. Where parking spaces are at the end of private drives a turning area has been provided. The layout has also been amended to ensure that the shared surface cul-de-sacs serve less than 25 dwellings in accordance with FCC's standards.

4.8 Appropriately located turning heads are provided at the end of the internal cul-de-sacs which have been designed to accommodate the movements of a large refuse vehicle, as shown on the swept path analysis drawings presented in **Appendix C**.

4.9 Local parking standards are set out in FCC's Local Planning Guidance Note 11. This specifies the following standards:-

- 1 bedroom properties – 1.5 spaces per dwelling
- 2 or 3 bedroom properties – 2 spaces per dwelling
- 4 or more bedrooms - maximum of 3 spaces per dwelling

4.10 As shown on the site layout plan presented in **Appendix B**, the scheme provided a level of parking broadly in line with FCC's maximum parking standards.

5 ACCESIBILITY

General

5.1 This Chapter presents a review of the accessibility of the site by walking, cycling and public transport modes.

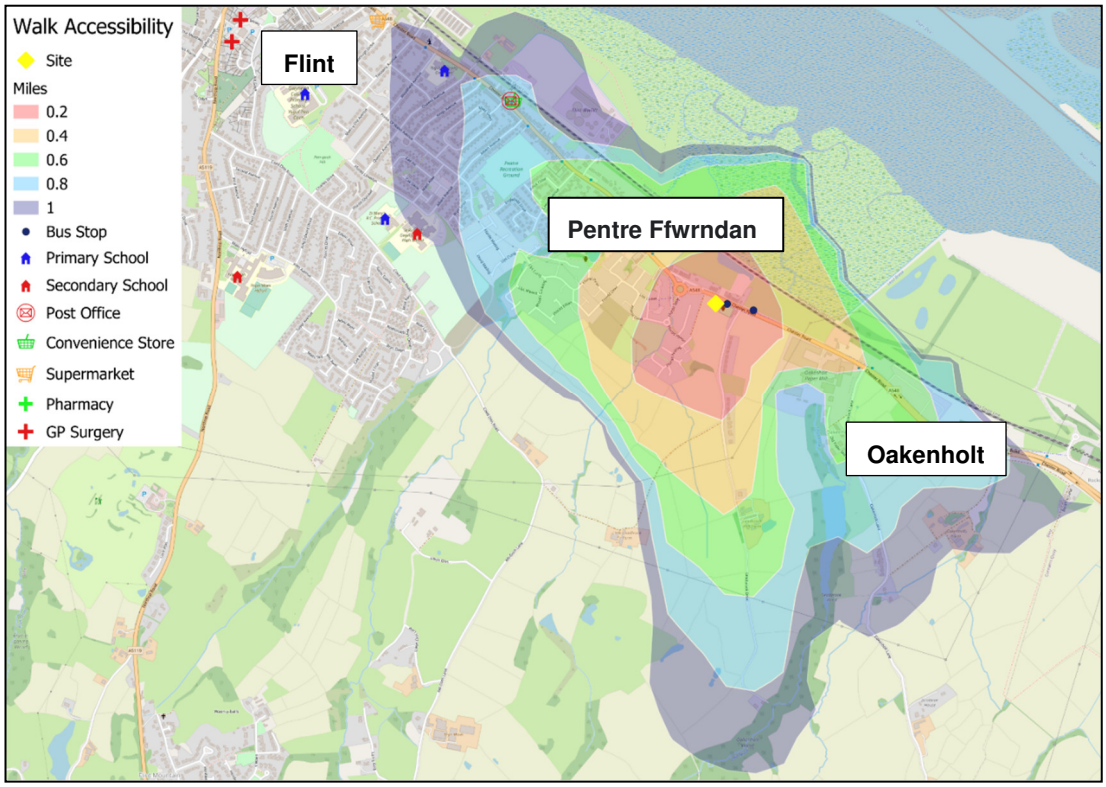
5.2 It should be noted that a large residential development has relatively recently been approved and constructed to the west of the application site. The principle of residential development and accessibility of this area must therefore be deemed acceptable to FCC.

Pedestrian Accessibility

5.3 Reference has been made to the Walking and Cycling Strategy for Wales, dated December 2003, which indicates that the practical distance for journeys on foot are up to 1 mile.

5.4 Industry standard GIS TRACC software has been used to assess the accessibility of the development by foot for a 1 mile walk distance from the site, as shown on **Figure 5.1** below.

Figure 5.1 – Walking Accessibility 1 mile Isochrone



5.5 As can be seen from the above, the proposed development is within walking distance of the southeastern areas of Flint. **Table 5.1** below demonstrates a selection of local facilities that are within a 1-mile walking distance from the proposed development.

Table 5.1 – Nearby Facilities

Amenity	Location	Approx. Distance
Bus Stop	Leadbrook Drive, Oakenholt, Flint	<150ft
Bus Stop	Leadbrook Drive, Oakenholt, Flint	440ft
Convenience Store	SPAR Flint, 211 Chester Rd, Flint	0.7 miles
Primary School	Ysgol Croes Atti Primary School, Chester Rd, Flint	0.8 miles
Secondary School	St. Richard Gwyn Catholic High School, Albert Ave, Flint	0.9 miles
Primary School	St Mary's Catholic Primary School, Ffordd Llewelyn, Flint	1 mile
Supermarket	Farmfoods Ltd, 44 Chester St, Flint CH6 5DT	1 mile
Employment Areas	Range of employment units to east of site off A548	Approx 1 mile

5.6 In addition to the above, Flintshire retail park is located around 1.5 miles to the northwest of the site and whilst outside of the typical 1 mile walk threshold, it still provides a viable option for residents travelling on foot. This retail park provides a range of food and non-food retail outlets, along with employment opportunities for prospective residents of the site.

5.7 Heinzel Park is located around 1.7 mile to the northwest of the site which is a large employment park providing a range of employment opportunities for prospective residents of the site. Again, whilst this is outside of the typical 1 mile walk threshold, it still provides a viable option for residents travelling on foot

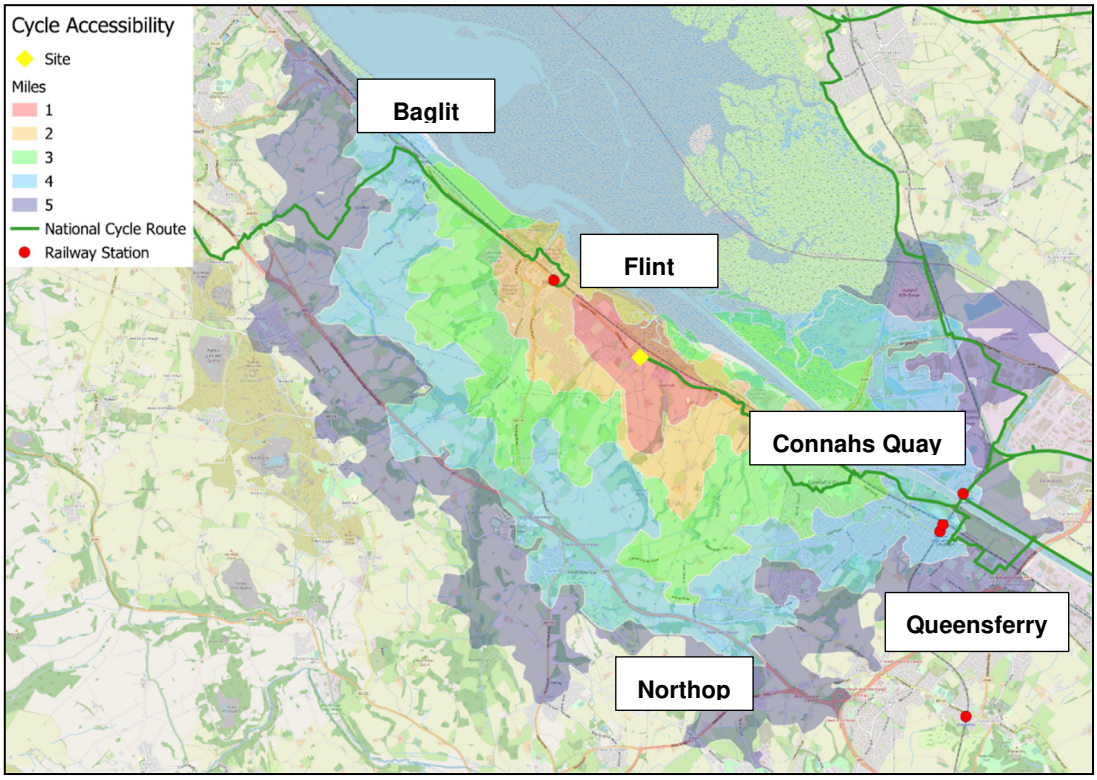
5.8 The pedestrian facilities in the vicinity of the site are good with continuous and lit footways on the roads that surround the site. Pedestrian crossing points are provided on the A548 Chester Road, either side of the Leadbrook Drive junction, and across the Ffordd Dewi arm of the A548 / Ffordd Dewi roundabout. These crossings take the form of dropped kerbs, tactile paving and an appropriately sized pedestrian refuge / splitter island, which allow pedestrians to cross these roads in two phases.

Cycle Accessibility

5.9 Transport policy identifies that cycling represents a realistic and healthy option to use instead of the private car for making journeys up to 5 miles as a whole journey or as part of a longer journey by public transport.

5.10 GIS TRACC software has again been used to assess the accessibility of the site by bicycle, for a 5km cycle distance and is shown on **Figure 5.2** below.

Figure 5.2 - Cycle Accessibility 5 mile Isochrone



5.11 The plan demonstrates that the nearby areas of Northop, Connah's Quay and Baglit, amongst others, are all located within the 5-mile catchment area from the development site. These locations provide a wide range of facilities and employment opportunities.

5.12 As detailed earlier, the A548 Chester Road benefits from a shared footway / cycleway on the southern side of the road, which forms part of National cycle route 5 which is the north Wales coastal route. This is shown on **Figure 5.2** earlier and provides a high-quality pedestrian route to Baglit in the northwest and Connah's Quay / Queensferry in the southwest, within the 5 mile cycling distance. Beyond this, National cycle route 5 provides wider connections to the main conurbations along the north Wales coast line and beyond to Anglesey.

5.13 As the application site is within an acceptable cycle distance of a range of areas and directly on National cycle route 5, cycling is considered to be a viable alternative to private car use for prospective residents.

Public Transport

5.14 In terms of bus services, the Chartered Institute of Highways & Transportation's (CIHT's) *"Guidelines for Planning for Public Transport in Developments"* document identifies, at section 6.20, that *"Bus stops are located to minimise passengers' walking distance to their final destination. The maximum walking distance to a bus stop should not exceed 400m and preferably be no more than 300m."*

5.15 The closest bus stops to the site are located on both sides of Turf Hill Road, approximately 500m south-west of the site and are therefore within the recommended walk distance. These bus stops are served by bus services numbers R7 and R9 and R10 and a summary of these services is provided in **Table 5.2** below.

Table 5.2 – Local Bus Services

Service Number	Route	Core Frequency of Service
10A	Chester Bus Interchange - Connah's Quay	Mon – Fri: every 30 mins
		Sat: every 30 mins
		Sun: -
11	Chester Bus Interchange, Stand F - Holywell Bus Station	Mon – Fri: every 30 mins
		Sat: every 30 mins
		Sun: approx. every 2 hours
D1	Flint - Deeside Industrial Park	Mon – Fri: approx. every hour
		Sat: approx. every hour
		Sun: approx. every 2 hours
D2	Connah's Quay - Deeside Industrial Park	M–on Fri: approx. every hour
		Sat: - No Service
		Sun: - No Service
D3	Flint - Deeside Industrial Park	Mon – Fri: approx. every hour
		Sat: - No Service
		Sun: - No Service

5.16 The 10A is a regular service that runs Monday to Saturday at a frequent rate. Prospective residents can access a range of other frequent services from Chester Interchange to destinations such as; Crewe, Warrington, Liverpool and Ellesmere Port. Chester Bus Interchange is a short 10 minute (0.5m mile) walk away from Chester Railway Station, which provides links to Manchester, Liverpool, Holyhead, Crewe, Birmingham and London.

5.17 Similarly, to the 10A, the number 11 service runs from Chester Bus Interchange to Holywell Bus Station, frequently through Monday to Saturday. Holywell Bus Station connects prospective residents with services running to Prestatyn, Rhyl and Mold.

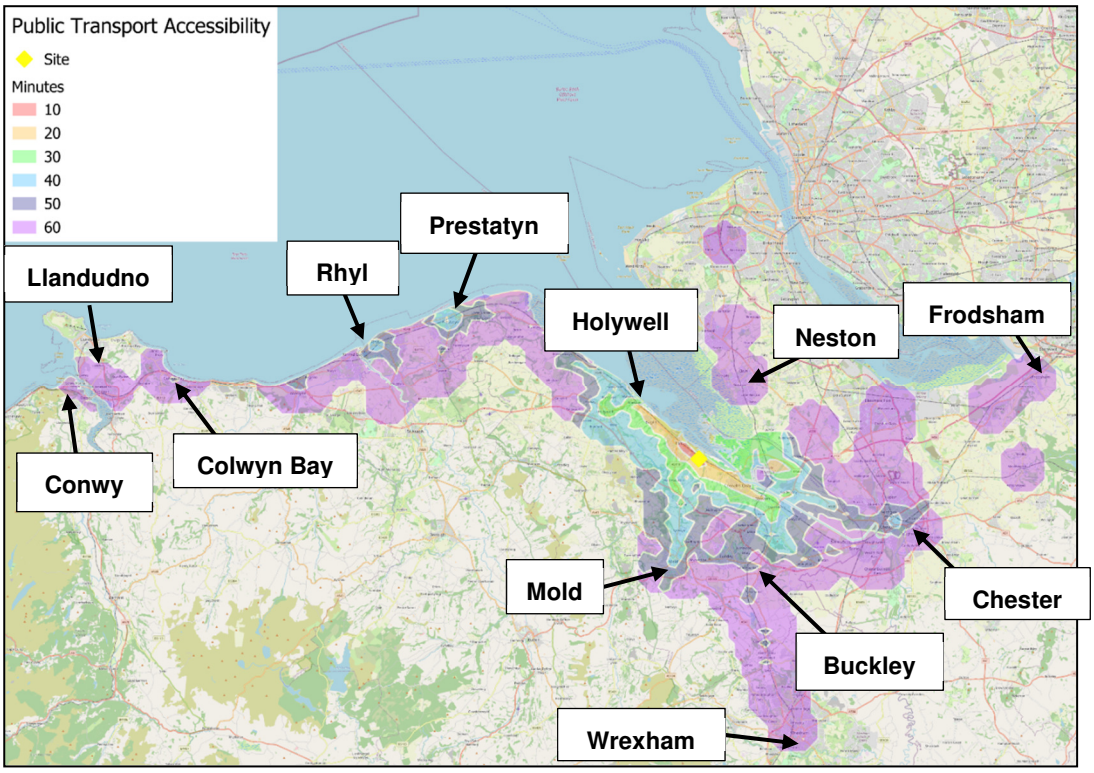
5.18 The D1, D2 and D3 all provide services to Deeside Industrial Park, which is approximately 3 services an hour to the industrial park and therefore allows prospective residents of the site to access potential employment.

5.19 All bus services that serve the proposed development site pass by Flint Railway Station, which has regular services to Cardiff, Holyhead, Rhyl, Bangor, Llandudno, Chester, Warrington and Manchester.

5.20 Having regard to the above, prospective residents of the site will have access to bus services stopping within an easy walk distance from the site which provide access to key destinations at a good frequency.

5.21 The level of accessibility by public transport has been analysed using GIS TRACC software to assess the accessibility of the site and is shown on **Figure 5.3** below. The figure illustrates the distance that can be travelled within 60 minutes by public transport to and from the site, which includes the time taken to walk to the bus stops.

Figure 5.3 – Public Transport Accessibility



5.22 The figure shows that key areas of Llandudno, Rhyl, Wrexham, Chester and Frodsham, amongst others, are all within an acceptable 60-minute commute time.

Summary

5.23 Having regard to the above, it is considered that the site benefits from a good level of accessibility by sustainable modes. Access to the site on foot and by cycle is of a good standard and there are good quality bus services within close proximity providing access to a range of local destinations. These findings demonstrate that prospective residents will not be wholly reliant on the private car.

6 FUTURE BASELINE TRAFFIC CONDITIONS

Introduction

6.1 This Chapter describes the future baseline traffic conditions on the local highway network in relation to traffic growth and committed development traffic flows.

Traffic Growth

6.2 As agreed with the Highway Officer at FCC, capacity assessments in this TA are undertaken in the assessment year which is 5-years post submission. An anticipated opening year of 2023 has been adopted and therefore the future assessment will be 2028.

6.3 In order to quantify the level of background traffic growth that could occur on the local network between the date of the traffic surveys and the assessment years, National Traffic Model (NTM) growth factors, modified by TEMPRO local growth factors, have been used and summarised in **Table 6.1** below:-

Table 6.1 – Traffic Growth Factors

Period	AM Peak	PM Peak
2023 to 2028	1.0372	1.0375

6.4 The above growth factors are applied to the surveyed traffic flow to obtain the 2028 growthed surveyed traffic flows, as shown on **Traffic Flow Figure 2**.

Committed Developments

6.5 A review of the committed developments in the vicinity of the site have been undertaken, with the following two committed developments have been identified for inclusion in this TA:-

- The following application was approved in April 2023 under LPA Ref FUL/000776/22:-

  "New, two storey 240 FTE Place Welsh Medium Primary School building and 30 Place PTE Nursery. New, partial two storey wrap around childcare, Welsh Immersion and Community building. Project associated external works, inclusive of boundary treatments, new pedestrian access points, new car parking arrangements and extended vehicular access off Ffordd Dewi."

  The trip generation has been extracted from the supporting TA and is shown on **Traffic Flow Figure 3**. Whilst it is acknowledged that some of the associated trips will route via the recently built link between Prince of Wales Ave and Ffordd Madog and be generated from the recently constructed residential development to the west of the site, in order to provide a robust assessment all trips have been assigned through the A548 Chester Road / Ffordd Dewi priority roundabout.

- The following application was approved in July 2006 under LPA Ref 035575:-

  "Outline - mixed use development including residential, open space, infrastructure, landscaping, education and community facilities"

  A large majority of this development has already been built and it is considered that trips associated with the development are already on the local highway network and recorded in the traffic surveys.

7 TRIP GENERATION, DISTRIBUTION AND ASSIGNMENT

Overview

7.1 This chapter provides an estimate of the vehicular, pedestrian, public transport and cycle trips likely to be generated by the proposed development.

Trip Generation

7.2 In order to estimate the trip generating potential of the proposed residential use, average trip rates from the industry-standard TRICS Database have been obtained. The selection criteria for the TRICS based trip rates is as follows:-

- Residential;
- Affordable Houses;
- Multi modal surveys;
- Sites in Greater London excluded;
- Selection by number of units; and
- Weekday surveys only.

7.3 The multi modal TRICS outputs for the existing industrial use are presented in **Appendix D** and are summarised in **Table 7.1** below:-

Table 7.1 - Estimated Trip Rates (Per Dwelling) Associated with the Proposed Development

Mode	Weekday AM Peak Hour		Weekday PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Vehicles	0.102	0.203	0.217	0.147
Cycles	0.002	0.011	0.016	0.013
Pedestrians	0.052	0.253	0.142	0.122
Pub. Trans.	0.000	0.047	0.014	0.004

7.4 When applied to the proposed 128 dwellings at the application site, this results in the following estimated level of trip generation:-

Table 7.2 – Estimated Trip Generation – 128 Dwellings				
Mode	**Weekday AM Peak Hour**		**Weekday PM Peak Hour**	
	Arrivals	**Departures**	**Arrivals**	**Departures**
Vehicles	13	26	28	19
Cycles	0	1	2	2
Pedestrians	7	32	18	16
Pub. Trans.	0	6	2	1

7.5 It should be noted that the above trip rates are for privately owned houses. Given that the proposed development comprises 24no. apartments which typically have lower car ownership and therefore lower trip generation, the above trip generation analysis is considered robust.

Trip Distribution

7.6 The trips generated by the proposed development have been distributed on the local highway network based on observed turning proportions at the A548 Chester Road / Ffordd Dewi priority roundabout. This is considered appropriate given that Ffordd Dewi serves a recently constructed residential development and will therefore have a similar trip distribution to that of the proposed development.

7.7 The proposed development distribution percentages and routes are shown diagrammatically on the **Traffic Flow Figure 4.**

7.8 The traffic assignment of the proposed scheme has been obtained by applying the relevant estimated trip distribution proportions to the relevant estimated traffic generation figures. The traffic assignment for the scheme is presented diagrammatically on **Traffic Flow Figure 5**.

8 ANTICIPATED HIGHWAY IMPACT

Overview

8.1 This Chapter describes the impact of the additional trips generated by the proposed development on the operation of the local highway network.

8.2 As detailed earlier, the study area has been agreed with the Highway Officer at FCC and includes the A548 Chester Road / Ffordd Dewi priority roundabout. Assessments of the roundabout have been undertaken using Junctions 9 (ARCADY) software. With the Junctions 9 models the results generated provide a Ratio to Flow capacity (RFC) along with an estimate of the likely traffic queues. RFC values between 0.00 and 0.85 are generally accepted as representing stable and acceptable operating conditions. Values between 0.85 and one and represents variable operation (i.e. possible queues building up at the junction during the period under consideration and increases in vehicular delay moving through the junction). RFC values in excess of one represents overloaded conditions (i.e. congested conditions).

8.3 The 2028 'without development' baseline traffic flows are the sum of the growthed traffic flows and the committed development traffic flows, as shown on **Traffic Flow Figure 6**.

8.4 The 2028 'with development' assessment traffic flows are the sum of the baseline traffic flows and the proposed development traffic flows, as shown on **Traffic Flow Figure 7**.

A548 Chester Road / Ffordd Dewi Priority Roundabout

8.5 Junctions 9 ARCADY software has been used in the assessment of the A548 Chester Road / Ffordd Dewi priority roundabout. The ARCADY results are presented in **Appendix E** with the results summarised in **Table 8.1** below.

Table 8.1 – A548 Chester Road / Ffordd Dewi Priority Roundabout – 2028 'With Development' ARCADY Results

Movement	AM		PM	
	RFC	Queue (PCU)	RFC	Queue (PCU)
A548 Chester Rd (E)	0.36	0.6	0.54	1.2
Ffordd Dewi	0.27	0.4	0.15	0.2
A548 Chester Rd (W)	0.61	1.6	0.52	1.1
Residential Access Rd	0.00	0.0	0.00	0.0

8.6 The above results clearly show that the A548 Chester Road / Ffordd Dewi roundabout will continue to operate well within its practical capacity in the future assessment year of 2028 with the proposed development in place, with minimal queuing and delay.

9 SUMMARY AND CONCLUSIONS

9.1 SCP have been instructed by Castle Green Homes Ltd to provide highway, traffic and transport advice in connection with a planning application for residential development, located to the west of Leadbrook Drive, Oakenholt.

9.2 The proposed development provides 128no. residential dwellings comprising a mix of 1, 2, 3 & 4 bed affordable flats and houses.

9.3 The existing geometries of Ffordd Pedrog / Ffordd Hywn (carriageway widths in excess of 5.5m) are of typical residential standard and adequate to serve the scale and nature of traffic generated by the proposed development.

9.4 Pedestrian and cycle access into the site will be provided at the same location as the vehicular access. In addition and in response to FCC's pre-application comments over the number of units served from a single point of access, a separate 3.7m wide emergency access / cycleway will be provided onto Leadbrook Drive to the east of the site, which will be controlled by removable bollards.

9.5 The site layout has been designed in accordance with FCC's requirements and allows the movements of service and refuse vehicles to be accommodated without allowing their requirements to dominate the layout of the site. The scheme also provides a level of parking broadly in line with FCC's maximum parking standards.

9.6 The most recently available five-year road safety record of the local highway network surrounding the site has been examined and does not represent a material concern in the context of the development.

9.7 The accessibility of the site has been assessed by walk, cycle, and bus and train modes. Overall, the site benefits from a good level of accessibility by sustainable modes. Access to the site on foot and by cycle is of a good standard and there are good quality bus services within close proximity providing access to a range of local destinations. These findings demonstrate that prospective residents will not be wholly reliant on the private car.

9.8 The impact of the traffic arising from the scheme has been tested in detail at the A548 Chester Road / Ffordd Dewi priority roundabout, as agreed with FCC. The assessments show that the roundabout has sufficient spare capacity to accommodate the proposed development.

9.9 Having regard to the above, it is concluded that there is no highway or transport related reason to withhold planning permission for the scheme and the proposed development is therefore recommended for approval.

S|C|P

APPENDIX A

Manual Classified Turning Counts, Oakenholt

DATE: TUESDAY 4th JULY 2023

LOCATION: A548 / FFORDD DEWI / RESIDENTIAL

ARM: A548 EAST

TIME / CLASS	LEFT TO FFORDD DEWI								STRAIGHT TO A548 WEST								RIGHT TO RESIDENTIAL								U TURN								TOTAL MOVEMENT FROM ARM
	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	
7:30 - 7:45	0	0	8	2	1	0	0	11	1	1	72	25	2	6	1	108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	119
7:45 - 8:00	0	0	5	3	0	1	0	9	0	1	96	35	3	6	1	142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	151
8:00 - 8:15	0	0	7	3	0	0	0	10	3	0	70	25	3	4	1	106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	116
8:15 - 8:30	0	0	10	0	1	0	0	11	0	0	88	28	5	6	1	128	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	140
HOURLY TOTAL	0	0	30	8	2	1	0	41	4	2	326	113	13	22	4	484	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	526
8:30 - 8:45	0	0	7	4	1	0	0	12	2	1	16	22	2	2	5	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62
8:45 - 9:00	0	0	1	0	0	0	0	1	0	0	62	25	1	9	2	99	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	102
9:00 - 9:15	0	0	13	5	0	0	0	18	0	0	81	23	2	3	2	111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	129
9:15 - 9:30	0	0	6	1	0	0	0	7	0	0	74	18	1	2	1	96	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	103
HOURLY TOTAL	0	0	27	10	1	0	0	38	2	1	233	88	6	16	10	356	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	396
PERIOD TOTAL	0	0	57	18	3	1	0	79	6	3	559	201	19	38	14	840	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	922
16:00 - 16:15	0	0	17	3	0	0	0	20	0	1	127	41	2	9	3	183	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	3	206
16:15 - 16:30	0	1	13	1	0	0	0	15	0	2	131	39	2	3	4	181	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	196
16:30 - 16:45	0	0	12	4	0	0	0	16	0	1	159	37	1	2	1	201	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	218
16:45 - 17:00	0	0	19	6	1	0	0	26	0	1	164	26	2	0	2	195	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	222
HOURLY TOTAL	0	1	61	14	1	0	0	77	0	5	581	143	7	14	10	760	0	0	1	0	0	0	0	1	0	0	2	2	0	0	0	4	842
17:00 - 17:15	0	0	20	7	0	0	0	27	0	1	160	29	1	3	3	197	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	226
17:15 - 17:30	0	0	27	3	0	0	0	30	1	0	177	30	1	3	1	213	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	243
17:30 - 17:45	0	0	24	5	0	0	0	29	0	1	181	25	2	1	2	212	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	242
17:45 - 18:00	0	0	16	2	0	0	0	18	0	0	154	20	1	1	1	177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	195
HOURLY TOTAL	0	0	87	17	0	0	0	104	1	2	672	104	5	8	7	799	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	3	906
PERIOD TOTAL	0	1	148	31	1	0	0	181	1	7	1253	247	12	22	17	1559	0	0	1	0	0	0	0	1	0	0	3	4	0	0	0	7	1748

Manual Classified Turning Counts, Oakenholt

DATE: TUESDAY 4th JULY 2023

LOCATION: A548 / FFORDD DEWI / RESIDENTIAL

ARM: FFORDD DEWI

TIME / CLASS	LEFT TO A548 WEST								STRAIGHT TO RESIDENTIAL								RIGHT TO A548 EAST								TOTAL MOVEMENT FROM ARM
	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	
7:30 - 7:45	0	0	14	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	38	3	0	0	0	41	55
7:45 - 8:00	0	0	18	4	0	0	0	22	0	0	0	0	0	0	0	0	0	0	38	5	1	0	0	44	66
8:00 - 8:15	0	0	20	3	0	0	0	23	0	0	0	0	0	0	0	0	0	0	31	4	0	0	0	35	58
8:15 - 8:30	0	0	27	1	0	0	0	28	0	0	0	0	0	0	0	0	0	0	19	6	1	1	0	27	55
HOURLY TOTAL	0	0	79	8	0	0	0	87	0	0	0	0	0	0	0	0	0	0	126	18	2	1	0	147	234
8:30 - 8:45	0	0	43	6	0	0	0	49	0	0	0	0	0	0	0	0	0	0	33	6	1	0	0	40	89
8:45 - 9:00	0	0	28	1	0	0	0	29	0	0	0	0	0	0	0	0	0	0	9	3	0	0	0	12	41
9:00 - 9:15	0	0	10	2	0	0	0	12	0	0	0	0	0	0	0	0	0	1	8	2	0	0	0	11	23
9:15 - 9:30	0	0	6	1	0	0	0	7	0	0	0	0	0	0	0	0	0	0	5	2	0	0	0	7	14
HOURLY TOTAL	0	0	87	10	0	0	0	97	0	0	0	0	0	0	0	0	0	1	55	13	1	0	0	70	167
PERIOD TOTAL	0	0	166	18	0	0	0	184	0	0	0	0	0	0	0	0	0	1	181	31	3	1	0	217	401
16:00 - 16:15	0	0	13	1	0	0	0	14	0	0	0	0	0	0	0	0	0	0	12	1	0	0	0	13	27
16:15 - 16:30	0	0	25	1	0	0	0	26	0	0	0	0	0	0	0	0	0	0	7	2	0	0	0	9	35
16:30 - 16:45	0	0	11	2	0	1	0	14	0	0	0	0	0	0	0	0	0	0	12	1	0	0	0	13	27
16:45 - 17:00	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	1	9	3	0	0	0	13	15
HOURLY TOTAL	0	0	49	6	0	1	0	56	0	0	0	0	0	0	0	0	0	1	40	7	0	0	0	48	104
17:00 - 17:15	0	0	13	1	0	0	0	14	0	0	0	0	0	0	0	0	0	0	15	4	0	0	0	19	33
17:15 - 17:30	0	0	14	4	0	0	0	18	0	0	0	0	0	0	0	0	0	0	9	1	0	0	0	10	28
17:30 - 17:45	0	0	29	4	0	0	0	33	0	0	0	0	0	0	0	0	0	0	16	2	0	0	0	18	51
17:45 - 18:00	0	0	20	2	0	0	0	22	0	0	0	0	0	0	0	0	0	0	11	1	0	0	0	12	34
HOURLY TOTAL	0	0	76	11	0	0	0	87	0	0	0	0	0	0	0	0	0	0	51	8	0	0	0	59	146
PERIOD TOTAL	0	0	125	17	0	1	0	143	0	0	0	0	0	0	0	0	0	1	91	15	0	0	0	107	250

Manual Classified Turning Counts, Oakenholt

DATE: TUESDAY 4th JULY 2023

LOCATION: A548 / FFORDD DEWI / RESIDENTIAL

ARM: A548 WEST

TIME / CLASS	LEFT TO RESIDENTIAL								STRAIGHT TO A548 EAST								RIGHT TO FFORDD DEWI								U TURN								TOTAL MOVEMENT FROM ARM
	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	
7:30 - 7:45	0	0	2	0	0	0	0	2	0	3	142	32	1	4	4	186	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	189
7:45 - 8:00	0	0	0	0	0	0	0	0	1	1	116	29	1	4	2	154	0	0	5	5	0	0	0	10	0	0	0	1	0	0	0	1	165
8:00 - 8:15	0	0	0	0	0	0	0	0	0	0	120	30	0	3	2	155	0	0	4	3	0	0	0	7	0	0	1	0	0	0	0	1	163
8:15 - 8:30	0	0	0	0	0	0	0	0	0	2	111	22	2	3	2	142	0	0	13	3	0	0	0	16	0	0	1	0	0	0	0	1	159
HOURLY TOTAL	0	0	2	0	0	0	0	2	1	6	489	113	4	14	10	637	0	0	22	12	0	0	0	34	0	0	2	1	0	0	0	3	676
8:30 - 8:45	0	0	0	0	0	0	0	0	0	0	104	21	1	4	4	134	0	0	9	2	0	0	0	11	0	0	6	0	0	0	0	6	151
8:45 - 9:00	0	0	0	0	0	0	0	0	1	1	95	19	5	4	2	127	0	0	22	1	0	0	0	23	0	0	1	0	0	0	0	1	151
9:00 - 9:15	0	0	0	0	0	0	0	0	0	0	89	27	3	6	2	127	0	0	19	5	0	0	0	24	0	0	2	1	0	0	0	3	154
9:15 - 9:30	0	0	0	0	0	0	0	0	0	1	92	18	2	5	2	120	0	0	16	2	0	0	0	18	0	0	2	0	0	0	0	2	140
HOURLY TOTAL	0	0	0	0	0	0	0	0	1	2	380	85	11	19	10	508	0	0	66	10	0	0	0	76	0	0	11	1	0	0	0	12	596
PERIOD TOTAL	0	0	2	0	0	0	0	2	2	8	869	198	15	33	20	1145	0	0	88	22	0	0	0	110	0	0	13	2	0	0	0	15	1272
16:00 - 16:15	0	0	2	0	0	0	0	2	0	0	98	15	3	3	0	119	0	0	20	3	0	0	0	23	0	0	0	0	0	0	0	0	144
16:15 - 16:30	0	0	0	0	0	0	0	0	0	0	83	13	4	2	2	104	0	0	16	2	0	0	0	18	0	0	0	1	0	0	0	1	123
16:30 - 16:45	0	0	1	0	0	0	0	1	0	2	83	17	2	1	1	106	0	0	16	0	0	0	0	16	0	0	0	0	0	0	0	0	123
16:45 - 17:00	0	0	0	0	0	0	0	0	1	1	97	15	0	3	3	120	0	0	20	2	0	0	0	22	0	0	0	0	0	0	0	0	142
HOURLY TOTAL	0	0	3	0	0	0	0	3	1	3	361	60	9	9	6	449	0	0	72	7	0	0	0	79	0	0	0	1	0	0	0	1	532
17:00 - 17:15	0	0	0	0	0	0	0	0	0	0	118	18	1	1	0	138	0	2	19	6	0	0	0	27	0	0	0	1	0	0	0	1	166
17:15 - 17:30	0	0	0	0	0	0	0	0	0	1	104	18	0	2	1	126	0	0	32	4	0	0	0	36	0	0	0	0	0	0	0	0	162
17:30 - 17:45	0	0	0	1	0	0	0	1	1	0	118	11	1	7	3	141	0	0	25	1	0	0	0	26	0	0	0	2	1	0	0	3	171
17:45 - 18:00	0	0	0	0	0	0	0	0	0	0	110	14	0	4	1	129	0	0	19	2	0	0	0	21	0	0	0	0	0	0	0	0	150
HOURLY TOTAL	0	0	0	1	0	0	0	1	1	1	450	61	2	14	5	534	0	2	95	13	0	0	0	110	0	0	0	3	1	0	0	4	649
PERIOD TOTAL	0	0	3	1	0	0	0	4	2	4	811	121	11	23	11	983	0	2	167	20	0	0	0	189	0	0	0	4	1	0	0	5	1181

Manual Classified Turning Counts, Oakenholt

DATE: TUESDAY 4th JULY 2023

LOCATION: A548 / FFORDD DEWI / RESIDENTIAL

ARM: RESIDENTIAL

TIME / CLASS	LEFT TO A548 EAST								STRAIGHT TO FFORDD DEWI								RIGHT TO A548 WEST								TOTAL MOVEMENT FROM ARM
	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	PEDAL CYCLE	MOTOR CYCLE	CAR TAXI	LGV	OGV 1	OGV 2	BUS COACH	TOTAL	
7:30 - 7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 - 8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 - 8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 - 8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HOURLY TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 - 8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 - 9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 - 9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 - 9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HOURLY TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERIOD TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00 - 16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15 - 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30 - 16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45 - 17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HOURLY TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00 - 17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15 - 17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30 - 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45 - 18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HOURLY TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PERIOD TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

S|C|P

APPENDIX B

SCHEDULE OF ACCOMMODATION

HOUSETYPE	DESCRIPTION	SQFT	NUMBER	PERCENTAGE
2P1B (Affordable)	1 Bed, Walk up flat - Ground Floor	578 SQFT	10	7.81
2P1B (Affordable)	1 Bed, Walk up flat - First Floor	646 SQFT	10	7.81
3P2B (Affordable)	2 Bed, Walk up flat - Ground Floor	705 SQFT	2	1.56
3P2B (Affordable)	2 Bed, Walk up flat - First Floor	791 SQFT	2	1.56
4P2B (Affordable)	2 Bed, 2 Storey, End/Mid-Terrace	895 SQFT	54	42.19
5P3B (Affordable)	3 Bed, 2 Storey, End-Terrace	1015 SQFT	34	26.56
5P3B Corner (Affordable)	3 Bed, 2 Storey, End-Terrace	1015 SQFT	8	6.25
6P4B (Affordable)	4 Bed, 2 Storey, Semi-Detached	1192 SQFT	8	6.25
TOTAL		116474 SQFT	128	

Gross Site Area	12.04 Acres	4.87	Hectares
Amenity POS	0.47 Acres	0.19	Hectares
Undevelopable Site Access & SSR	0.29 Acres	0.12	Hectares
POS / CADV/Designation	2.93 Acres	1.19	Hectares
Landscape Buffer & Existing Landscape	1.16 Acres	0.47	Hectares
NETT SITE AREA	7.19 ACRES	2.91	HECTARES
Gross Density:	10.63 Units/Acre	26.27	Units/Hectare
NETT DENSITY:	17.80 UNITS/ACRE	43.99	UNITS/HECTARE
Gross Footage:	9607.48 SQFT/Acre	2205.55	SQM/Hectare
NETT FOOTAGE:	16088.18 SQFT/ACRE	3693.39	SQM/HECTARE

Key:

- Site Boundary
- 1.8m high boundary fence
- 1.8m high screen wall / fence
- Private Drive
- Indicative Landscaping. Refer to landscaping design for exact details
- Number of parking spaces proposed to Semi-Detached and Detached Dwellings in accordance with LPA Parking Standards
- Parking space allocation to Frontage Parking Dwellings
- * Affordable Housing
- Existing retained hedges/landscaping
- Location of low Pressure Gas Main

Rev:	Description:	Date:
A	Mix adjusted slightly	23.11.22
B	Amended in line with Highways officer	01.08.23

Castle Green,
Unit 20,
St. Asaph Business Park,
St Asaph,
Denbighshire. LL17 0LJ.
Tel. 01745 536677

Site: Quarry Farm, Oakenholt

Title: Proposed Site Plan

Scale: 1:500@A0

Date: 10.05.22

Ref: QRY-OAK-SP01

Rev: B

S|C|P

APPENDIX C

1:1000

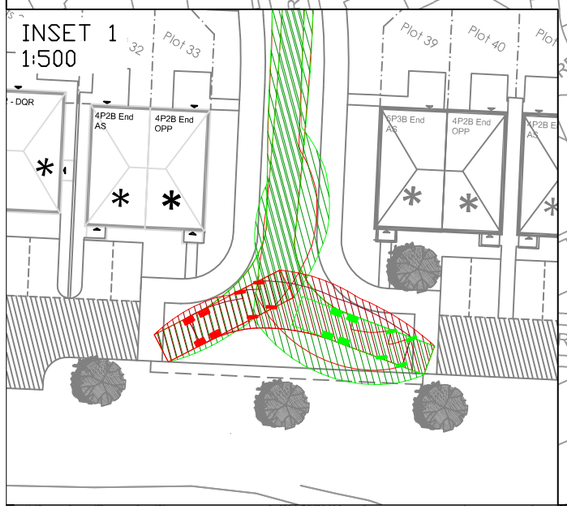
2.4m x 25m
VISIBILITY SPLAY

2.4m x 25m
VISIBILITY SPLAY

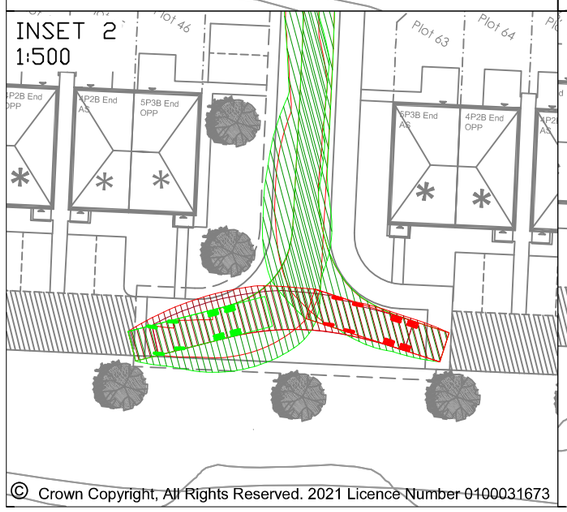
2.4m x TANGENTIAL
VISIBILITY SPLAY

2.4m x 25m
VISIBILITY SPLAY

INSET 1
1:500

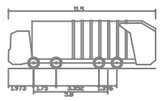


INSET 2
1:500



INSET 3
1:500

NOTES



Mercedes Econic Euro 5 (Based on Large Refuse Vehicle)

Overall Length	11.500m
Overall Width	2.500m
Overall Body Height	3.781m
Min Body Ground Clearance	0.457m
Track Width	2.500m
Lock to lock time	6.00s
Wall to Wall Turning Radius	11.330m

REVISIONS

REV	DESCRIPTION	DATE	BY
A	NEW SITE LAYOUT UNDERLAID	02.08.23	LD

S|C|P
Transportation Planning : Infrastructure Design
Colwyn Chambers, 19 York Street, Manchester, M2 3BA, Tel 0161 832 4400, www.scptransport.co.uk, Email info@scptransport.co.uk

Client Name:
CASTLE GREEN HOMES LTD

Project Title:
QUARRY FARM,
OAKENHOLT, FLINT

Drawing Title:
VISIBILITY SPLAYS & INTERNAL SWEPT PATH ANALYSIS

Drawn By: LD	Date: 24/07/23
Checked: PT	Scale: AS STATED @ A3
Status: PLANNING	Approved/Unapproved: -
Drawing No. SCP/230489/ATR01	Rev. A

S|C|P

APPENDIX D

Calculation Reference: AUDIT-726001-230719-0736

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : B - AFFORDABLE/LOCAL AUTHORITY HOUSES

MULTI-MODAL TOTAL VEHICLES

Selected regions and areas:

02	**SOUTH EAST**		
	ES	EAST SUSSEX	1 days
03	**SOUTH WEST**		
	DV	DEVON	1 days
04	**EAST ANGLIA**		
	SF	SUFFOLK	1 days
05	**EAST MIDLANDS**		
	LR	LEICESTER	1 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	KS	KIRKLEES	1 days
	LS	LEEDS	1 days
	NY	NORTH YORKSHIRE	1 days
08	**NORTH WEST**		
	MS	MERSEYSIDE	1 days
15	**GREATER DUBLIN**		
	DL	DUBLIN	1 days

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

Primary Filtering selection:

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

Parameter: No of Dwellings
Actual Range: 14 to 280 (units:)
Range Selected by User: 14 to 280 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/00 to 22/10/21

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

Selected survey days:

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

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

Selected survey types:

Manual count	9 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 undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	6
Edge of Town	3

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

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

Inclusion of Servicing Vehicles Counts:

Servicing vehicles Included	X days - Selected
Servicing vehicles Excluded	10 days - Selected

Secondary Filtering selection:

Use Class:

C3	9 days

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

Population within 500m Range:
All Surveys Included

Population within 1 mile:

1,001 to 5,000	2 days
10,001 to 15,000	4 days
15,001 to 20,000	1 days
25,001 to 50,000	1 days
50,001 to 100,000	1 days

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

Population within 5 miles:

5,001 to 25,000	2 days
50,001 to 75,000	1 days
75,001 to 100,000	3 days
250,001 to 500,000	3 days

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

Car ownership within 5 miles:

0.6 to 1.0	6 days
1.1 to 1.5	2 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	9 days

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

PTAL Rating:

No PTAL Present	9 days

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

LIST OF SITES relevant to selection parameters

1 **DL-03-B-01** **TERRACED** **DUBLIN**
ROCK ROAD
DUBLIN
BOOTERSTOWN
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 45
Survey date: WEDNESDAY *20/11/02* *Survey Type: MANUAL*

2 **DV-03-B-01** **TERRACED** **DEVON**
HAM DRIVE
PLYMOUTH

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 35
Survey date: WEDNESDAY *06/07/05* *Survey Type: MANUAL*

3 **ES-03-B-01** **BUNGALOWS** **EAST SUSSEX**
BOWLEY ROAD
HAILSHAM

Edge of Town
Residential Zone
Total No of Dwellings: 14
Survey date: THURSDAY *03/07/03* *Survey Type: MANUAL*

4 **KS-03-B-01** **MIXED HOUSES** **KIRKLEES**
WHITEACRE STREET
HUDDERSFIELD
DEIGHTON
Edge of Town
Residential Zone
Total No of Dwellings: 54
Survey date: TUESDAY *17/09/13* *Survey Type: MANUAL*

5 **LR-03-B-01** **SEMI-DETACHED & TERRACED** **LEICESTER**
COLEMAN ROAD
LEICESTER

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 38
Survey date: FRIDAY *22/10/21* *Survey Type: MANUAL*

6 **LS-03-B-02** **TERRACED HOUSES** **LEEDS**
LINCOLN GREEN ROAD
LEEDS

Suburban Area (PPS6 Out of Centre)
Built-Up Zone
Total No of Dwellings: 29
Survey date: THURSDAY *19/09/13* *Survey Type: MANUAL*

7 **MS-03-B-01** **TERRACED** **MERSEYSIDE**
TARBOCK ROAD
LIVERPOOL
SPEKE
Edge of Town
Residential Zone
Total No of Dwellings: 16
Survey date: TUESDAY *18/06/13* *Survey Type: MANUAL*

8 **NY-03-B-01** **TERRACED HOUSING** **NORTH YORKSHIRE**
NORTHALLERTON ROAD
THIRSK
NORBY
Suburban Area (PPS6 Out of Centre)
No Sub Category
Total No of Dwellings: 280
Survey date: THURSDAY *20/09/07* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

9 SF-03-B-01 SEMI D./TERRACED SUFFOLK
A1144 ST PETERS STREET
LOWESTOFT

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total No of Dwellings: 46
Survey date: TUESDAY *20/09/05* *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 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES

MULTI-MODAL TOTAL VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Total People to Total Vehicles ratio (all time periods and directions): 2.32

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	9	62	0.041	9	62	0.131	9	62	0.172
08:00 - 09:00	9	62	0.102	**9**	**62**	**0.203**	9	62	0.305
09:00 - 10:00	9	62	0.122	9	62	0.131	9	62	0.253
10:00 - 11:00	9	62	0.124	9	62	0.126	9	62	0.250
11:00 - 12:00	9	62	0.145	9	62	0.115	9	62	0.260
12:00 - 13:00	9	62	0.120	9	62	0.138	9	62	0.258
13:00 - 14:00	9	62	0.133	9	62	0.102	9	62	0.235
14:00 - 15:00	9	62	0.122	9	62	0.145	9	62	0.267
15:00 - 16:00	9	62	0.158	9	62	0.118	9	62	0.276
16:00 - 17:00	9	62	0.140	9	62	0.133	9	62	0.273
17:00 - 18:00	**9**	**62**	**0.217**	9	62	0.147	**9**	**62**	**0.364**
18:00 - 19:00	9	62	0.126	9	62	0.083	9	62	0.209
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.550			1.572			3.122

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

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

Parameter summary

Trip rate parameter range selected:	14 - 280 (units:)
Survey date date range:	01/01/00 - 22/10/21
Number of weekdays (Monday-Friday):	9
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

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

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES

MULTI-MODAL CYCLISTS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	9	62	0.009	9	62	0.007	9	62	0.016
08:00 - 09:00	9	62	0.002	9	62	0.011	9	62	0.013
09:00 - 10:00	9	62	0.005	**9**	**62**	**0.014**	9	62	0.019
10:00 - 11:00	9	62	0.005	9	62	0.000	9	62	0.005
11:00 - 12:00	9	62	0.005	9	62	0.011	9	62	0.016
12:00 - 13:00	9	62	0.009	9	62	0.004	9	62	0.013
13:00 - 14:00	9	62	0.005	9	62	0.004	9	62	0.009
14:00 - 15:00	9	62	0.004	9	62	0.007	9	62	0.011
15:00 - 16:00	**9**	**62**	**0.020**	9	62	0.004	9	62	0.024
16:00 - 17:00	9	62	0.013	9	62	0.014	9	62	0.027
17:00 - 18:00	9	62	0.016	9	62	0.013	**9**	**62**	**0.029**
18:00 - 19:00	9	62	0.013	9	62	0.014	9	62	0.027
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.106			0.103			0.209

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.*

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES

MULTI-MODAL PEDESTRIANS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	9	62	0.016	9	62	0.048	9	62	0.064
08:00 - 09:00	9	62	0.052	**9**	**62**	**0.253**	9	62	0.305
09:00 - 10:00	9	62	0.097	9	62	0.084	9	62	0.181
10:00 - 11:00	9	62	0.074	9	62	0.127	9	62	0.201
11:00 - 12:00	9	62	0.095	9	62	0.101	9	62	0.196
12:00 - 13:00	9	62	0.122	9	62	0.092	9	62	0.214
13:00 - 14:00	9	62	0.061	9	62	0.052	9	62	0.113
14:00 - 15:00	9	62	0.083	9	62	0.084	9	62	0.167
15:00 - 16:00	**9**	**62**	**0.206**	9	62	0.131	**9**	**62**	**0.337**
16:00 - 17:00	9	62	0.131	9	62	0.079	9	62	0.210
17:00 - 18:00	9	62	0.142	9	62	0.122	9	62	0.264
18:00 - 19:00	9	62	0.079	9	62	0.068	9	62	0.147
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.158			1.241			2.399

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.*

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES

MULTI-MODAL PUBLIC TRANSPORT USERS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	9	62	0.000	9	62	0.013	9	62	0.013
08:00 - 09:00	9	62	0.000	**9**	**62**	**0.047**	**9**	**62**	**0.047**
09:00 - 10:00	9	62	0.009	9	62	0.029	9	62	0.038
10:00 - 11:00	9	62	0.004	9	62	0.004	9	62	0.008
11:00 - 12:00	9	62	0.011	9	62	0.013	9	62	0.024
12:00 - 13:00	9	62	0.016	9	62	0.009	9	62	0.025
13:00 - 14:00	9	62	0.029	9	62	0.014	9	62	0.043
14:00 - 15:00	9	62	0.016	9	62	0.009	9	62	0.025
15:00 - 16:00	**9**	**62**	**0.031**	9	62	0.007	9	62	0.038
16:00 - 17:00	9	62	0.011	9	62	0.005	9	62	0.016
17:00 - 18:00	9	62	0.014	9	62	0.004	9	62	0.018
18:00 - 19:00	9	62	0.013	9	62	0.000	9	62	0.013
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.154			0.154			0.308

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.*

S|C|P

APPENDIX E

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Chester Rd W_ Chester Rd East_ Ffordd Dewi.j9
Path: Z:\Job Library\2023\230489 - Quarry Farm, Oakenholt, Flint\Traffic Data\ARCADY
Report generation date: 02/08/2023 12:08:58

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	Assess 2028									
Arm 1	D1	0.6	2.81	0.36	A	D2	1.2	3.98	0.54	A
Arm 2		0.4	3.33	0.27	A		0.2	3.41	0.15	A
Arm 3		1.6	6.64	0.61	A		1.1	4.92	0.52	A
Arm 4		0.0	0.00	0.00	A		0.0	0.00	0.00	A

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

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

File summary

File Description

Title	Chester Rd W/ Chester Rd East/ Ffordd Dewi
Location	
Site number	
Date	02/08/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	SCP\gis
Description	

Units

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

Analysis Options

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

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	Assess 2028	AM	ONE HOUR	07:15	08:45	15
D2	Assess 2028	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Assess 2028, AM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Chester Rd W/ Chester Rd East/ Ffordd Dewi	Standard Roundabout		1, 2, 3, 4	4.58	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Chester Road E	
2	Ffordd Dewi	
3	Chester Rd West	
4	Residential	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.00	7.40	28.0	149.0	38.0	24.0	
2	4.00	7.00	26.0	51.0	38.0	37.0	
3	3.00	7.00	17.0	14.0	38.0	31.5	
4	5.00	5.00	0.0	20.8	38.0	25.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.741	2077
2	0.685	1886
3	0.610	1559
4	0.621	1544

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	Assess 2028	AM	ONE HOUR	07:15	08:45	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	654	100.000
2		✓	361	100.000
3		✓	784	100.000
4		✓	0	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	118	536	0
	2	228	0	133	0
	3	686	93	3	2
	4	0	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.36	2.81	0.6	A
2	0.27	3.33	0.4	A
3	0.61	6.64	1.6	A
4	0.00	0.00	0.0	A

Main Results for each time segment

07:15 - 07:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	492	72	2024	0.243	491	0.3	2.346	A
2	272	405	1609	0.169	271	0.2	2.690	A
3	590	171	1454	0.406	588	0.7	4.142	A
4	0	757	1074	0.000	0	0.0	0.000	A

07:30 - 07:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	588	86	2013	0.292	588	0.4	2.524	A
2	325	484	1554	0.209	324	0.3	2.926	A
3	705	205	1434	0.492	704	1.0	4.925	A
4	0	907	981	0.000	0	0.0	0.000	A

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	720	105	1999	0.360	719	0.6	2.811	A
2	397	593	1480	0.269	397	0.4	3.325	A
3	863	251	1406	0.614	861	1.6	6.579	A
4	0	1109	855	0.000	0	0.0	0.000	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	720	106	1999	0.360	720	0.6	2.814	A
2	397	593	1479	0.269	397	0.4	3.326	A
3	863	251	1405	0.614	863	1.6	6.635	A
4	0	1112	854	0.000	0	0.0	0.000	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	588	87	2013	0.292	589	0.4	2.527	A
2	325	485	1554	0.209	325	0.3	2.930	A
3	705	205	1433	0.492	707	1.0	4.975	A
4	0	911	979	0.000	0	0.0	0.000	A

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	492	72	2024	0.243	493	0.3	2.351	A
2	272	406	1608	0.169	272	0.2	2.697	A
3	590	172	1454	0.406	591	0.7	4.181	A
4	0	762	1071	0.000	0	0.0	0.000	A

Assess 2028 , PM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Chester Rd W/ Chester Rd East/ Ffordd Dewi	Standard Roundabout		1, 2, 3, 4	4.29	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	Assess 2028	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	968	100.000
2		✓	170	100.000
3		✓	709	100.000
4		✓	0	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	121	847	0
	2	69	0	101	0
	3	576	127	5	1
	4	0	0	0	0

Vehicle Mix

Heavy Vehicle Percentages

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.54	3.98	1.2	A
2	0.15	3.41	0.2	A
3	0.52	4.92	1.1	A
4	0.00	0.00	0.0	A

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	729	99	2004	0.364	726	0.6	2.813	A
2	128	639	1448	0.088	128	0.1	2.726	A
3	534	52	1527	0.350	532	0.5	3.609	A
4	0	583	1182	0.000	0	0.0	0.000	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	870	119	1989	0.437	869	0.8	3.213	A
2	153	765	1362	0.112	153	0.1	2.977	A
3	637	62	1521	0.419	637	0.7	4.068	A
4	0	698	1111	0.000	0	0.0	0.000	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	1066	145	1970	0.541	1064	1.2	3.969	A
2	187	937	1244	0.150	187	0.2	3.405	A
3	781	76	1512	0.516	779	1.1	4.902	A
4	0	854	1014	0.000	0	0.0	0.000	A

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	1066	145	1970	0.541	1066	1.2	3.982	A
2	187	938	1243	0.151	187	0.2	3.408	A
3	781	76	1512	0.516	781	1.1	4.920	A
4	0	855	1013	0.000	0	0.0	0.000	A

17:45 - 18:00

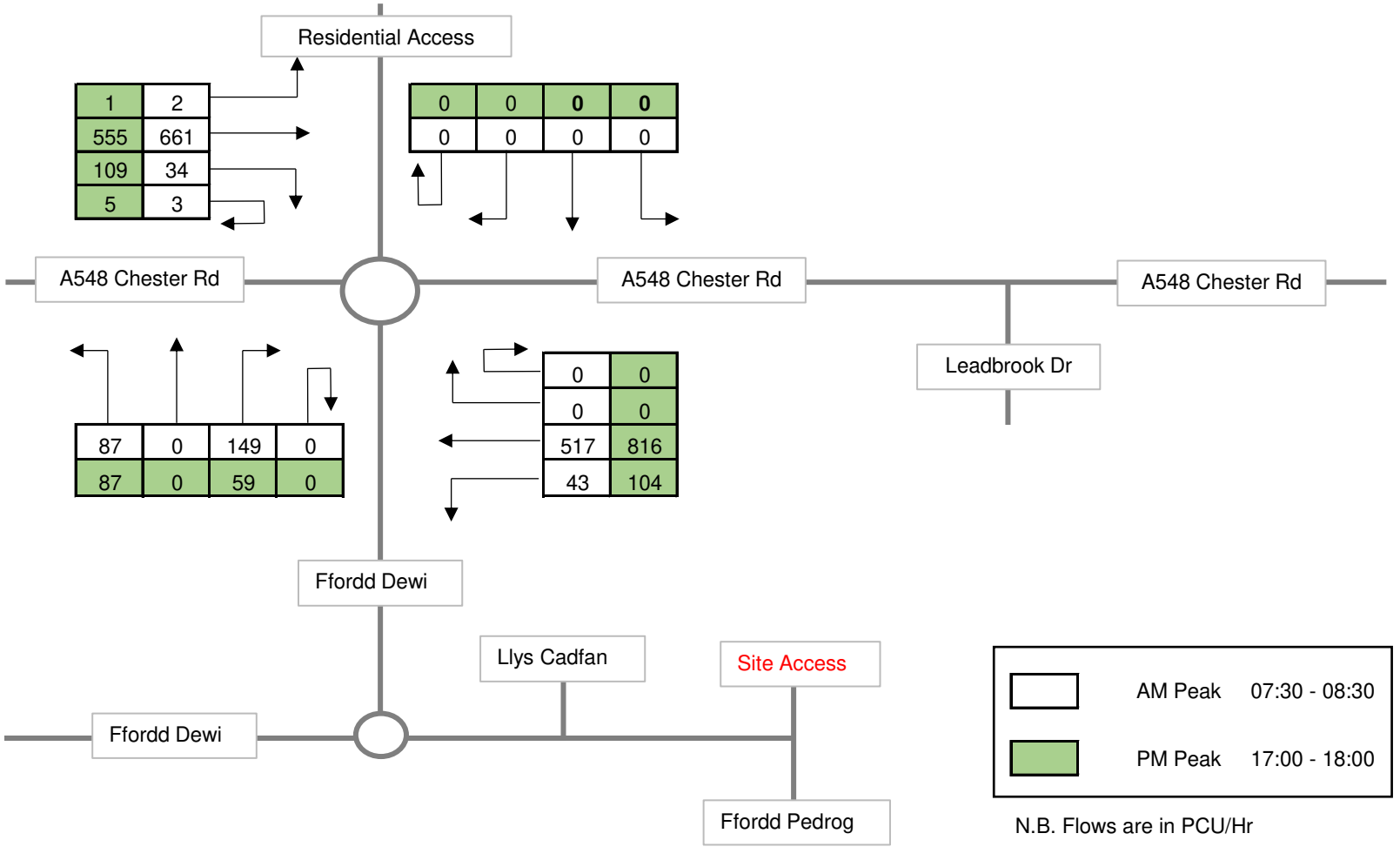
Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	870	119	1989	0.437	872	0.8	3.228	A
2	153	767	1360	0.112	153	0.1	2.981	A
3	637	62	1521	0.419	639	0.7	4.087	A
4	0	700	1110	0.000	0	0.0	0.000	A

18:00 - 18:15

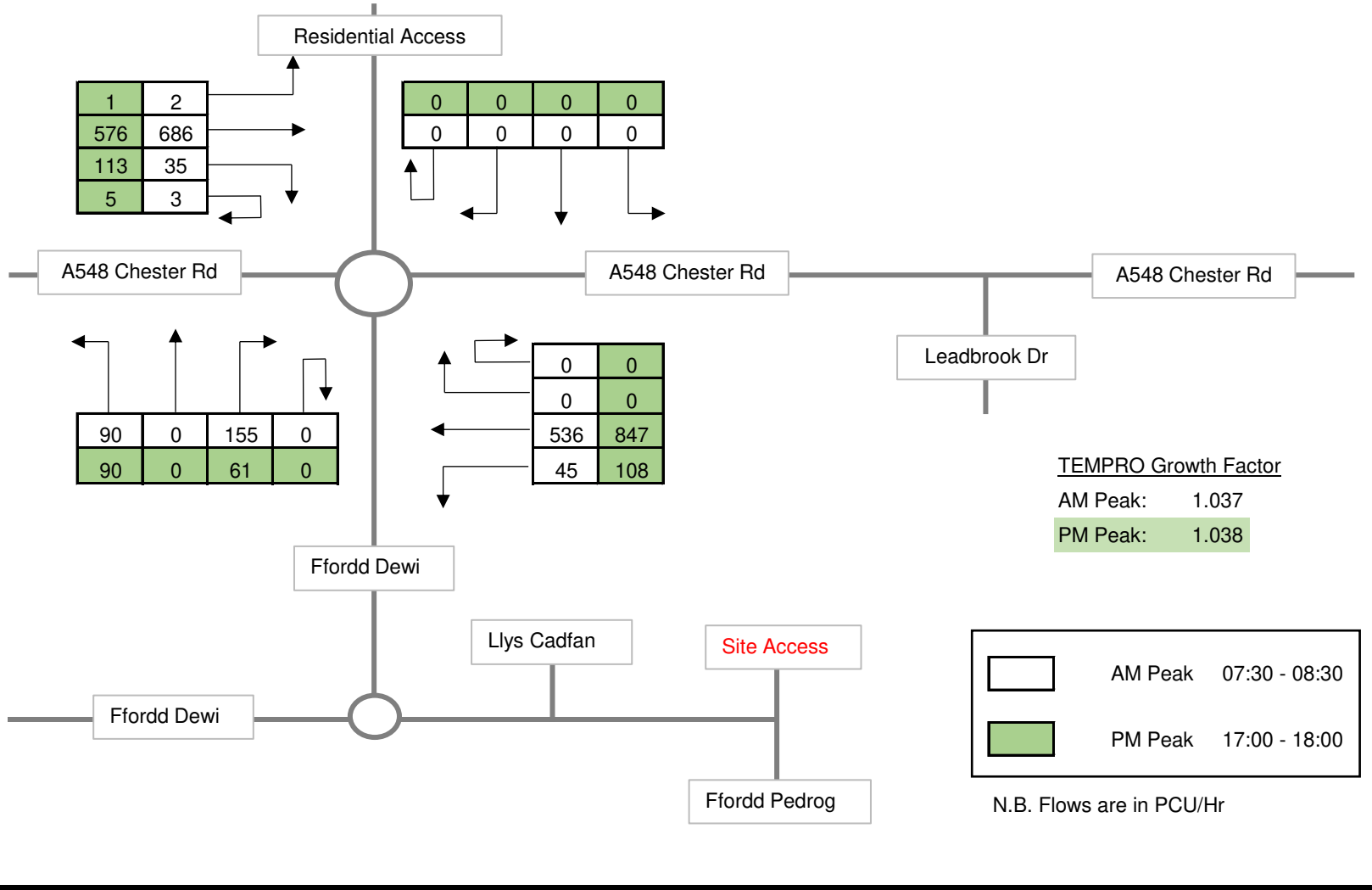
Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	729	100	2004	0.364	730	0.6	2.827	A
2	128	642	1446	0.089	128	0.1	2.733	A
3	534	52	1527	0.350	535	0.5	3.629	A
4	0	586	1181	0.000	0	0.0	0.000	A

S|C|P

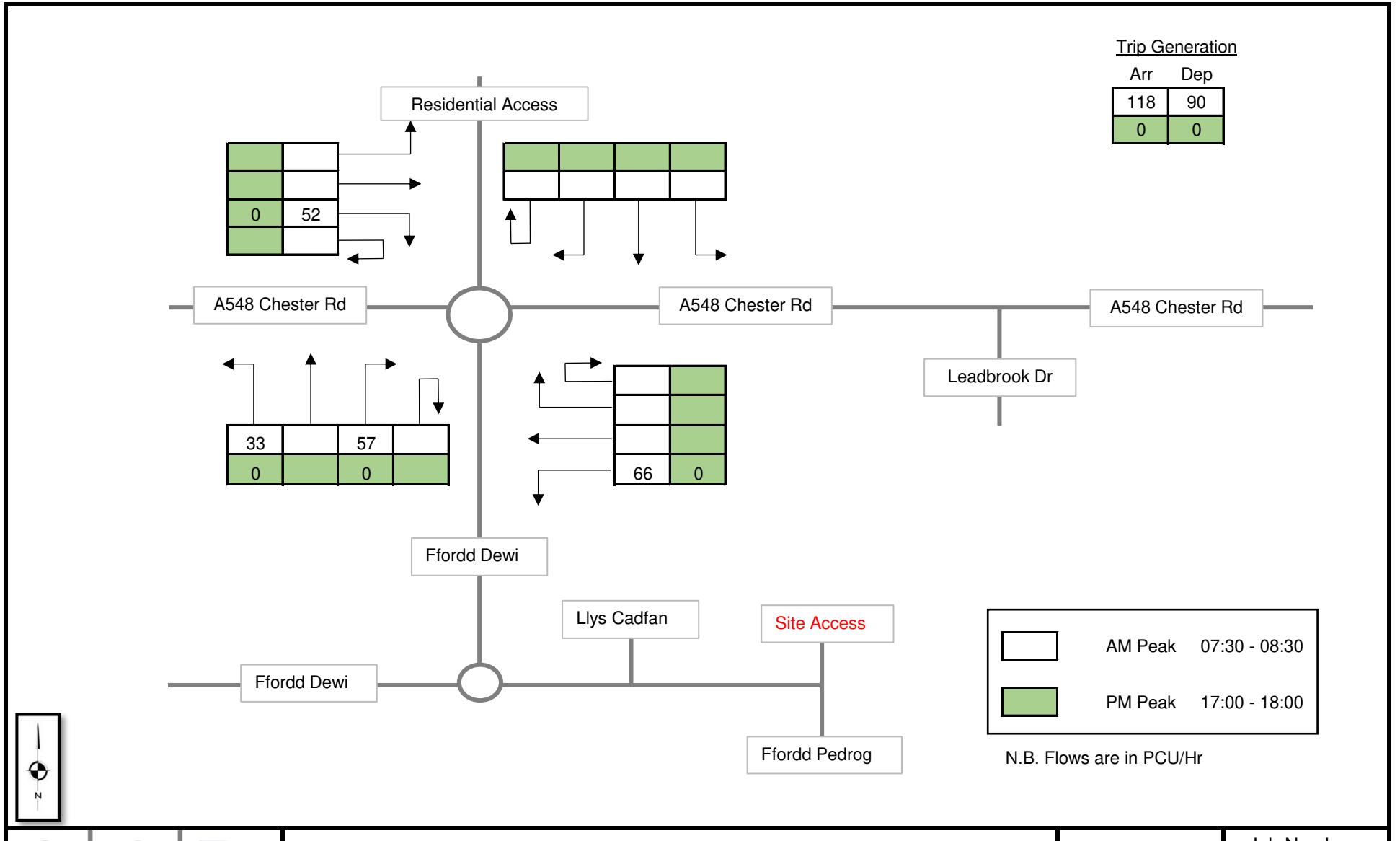
TRAFFIC FLOW FIGURES



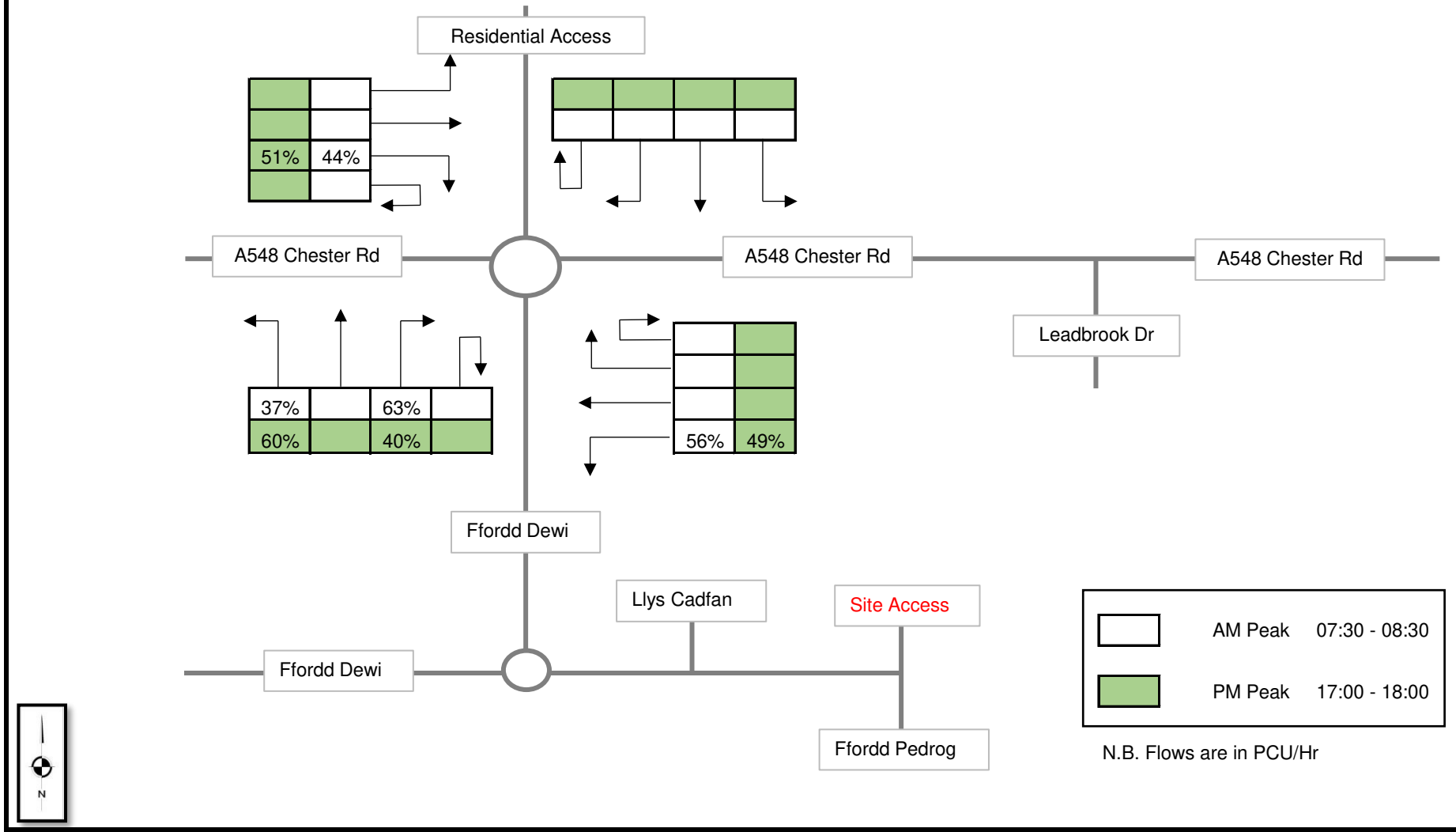
SCP Transportation Planning : Infrastructure Design	**Survey Flows 2023**	**03/08/2023**	Job Number - SCP/230489
	Proposed Residential Development, Quarry Farm, Oakenholt		**Traffic Figure 1**



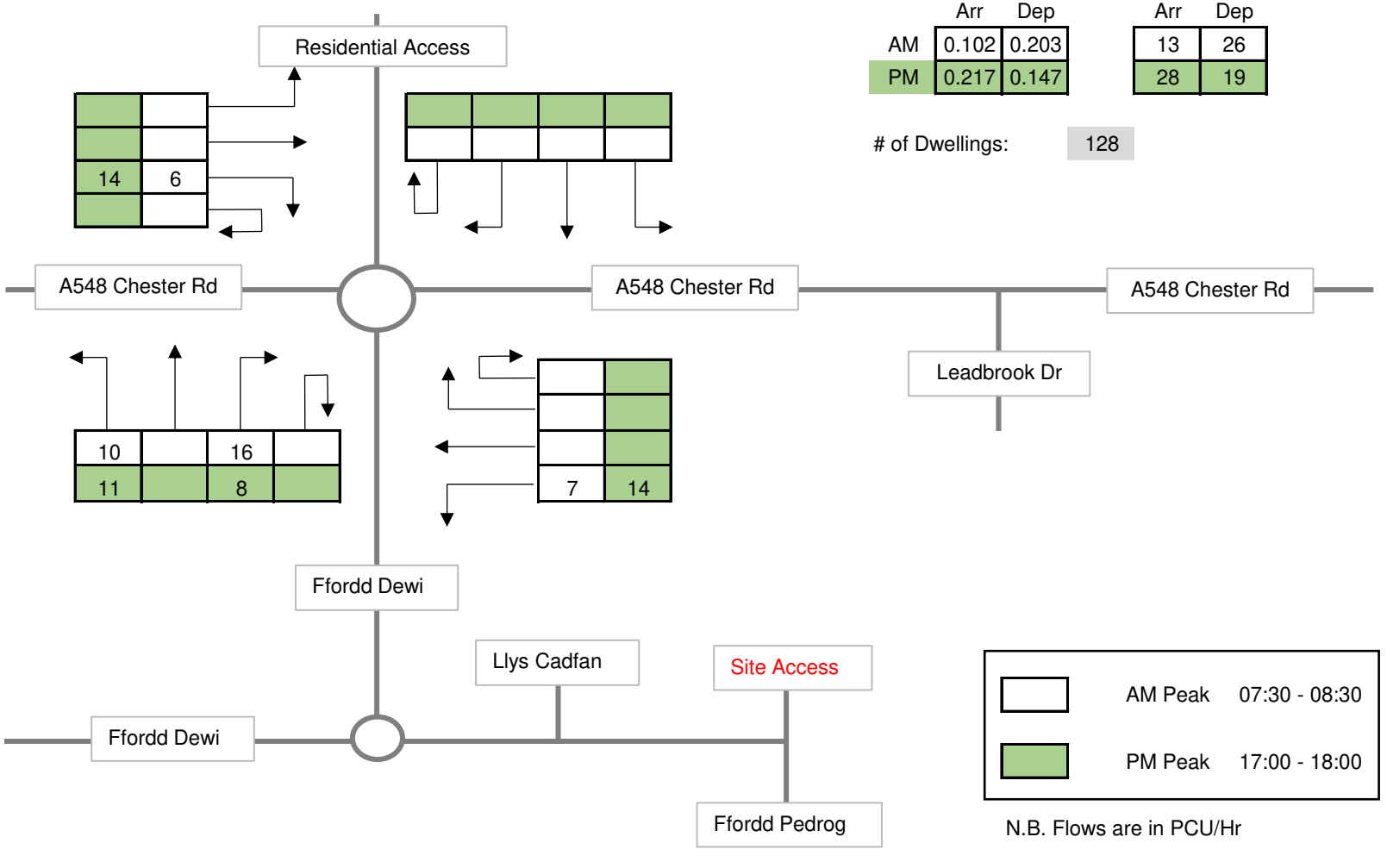
SCP Transportation Planning : Infrastructure Design	**Growthed Flows 2028**	**03/08/2023**	Job Number - SCP/230489
	Proposed Residential Development, Quarry Farm, Oakenholt		**Traffic Figure 2**



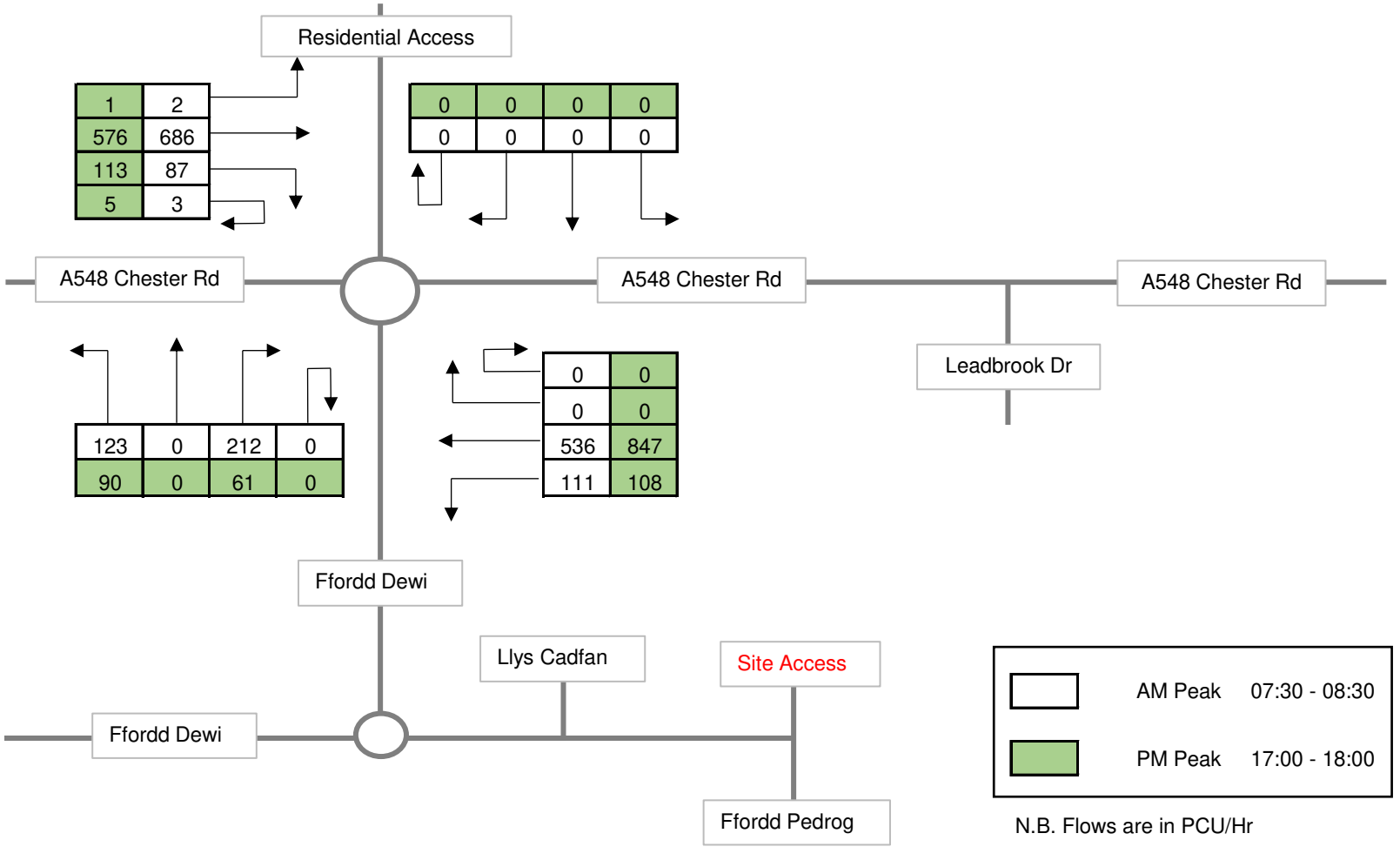
S C P Transportation Planning : Infrastructure Design	**Committed Development - New Welsh Medium Primary School**	**03/08/2023**	Job Number - SCP/230489
	Proposed Residential Development, Quarry Farm, Oakenholt		**Traffic Figure 3**



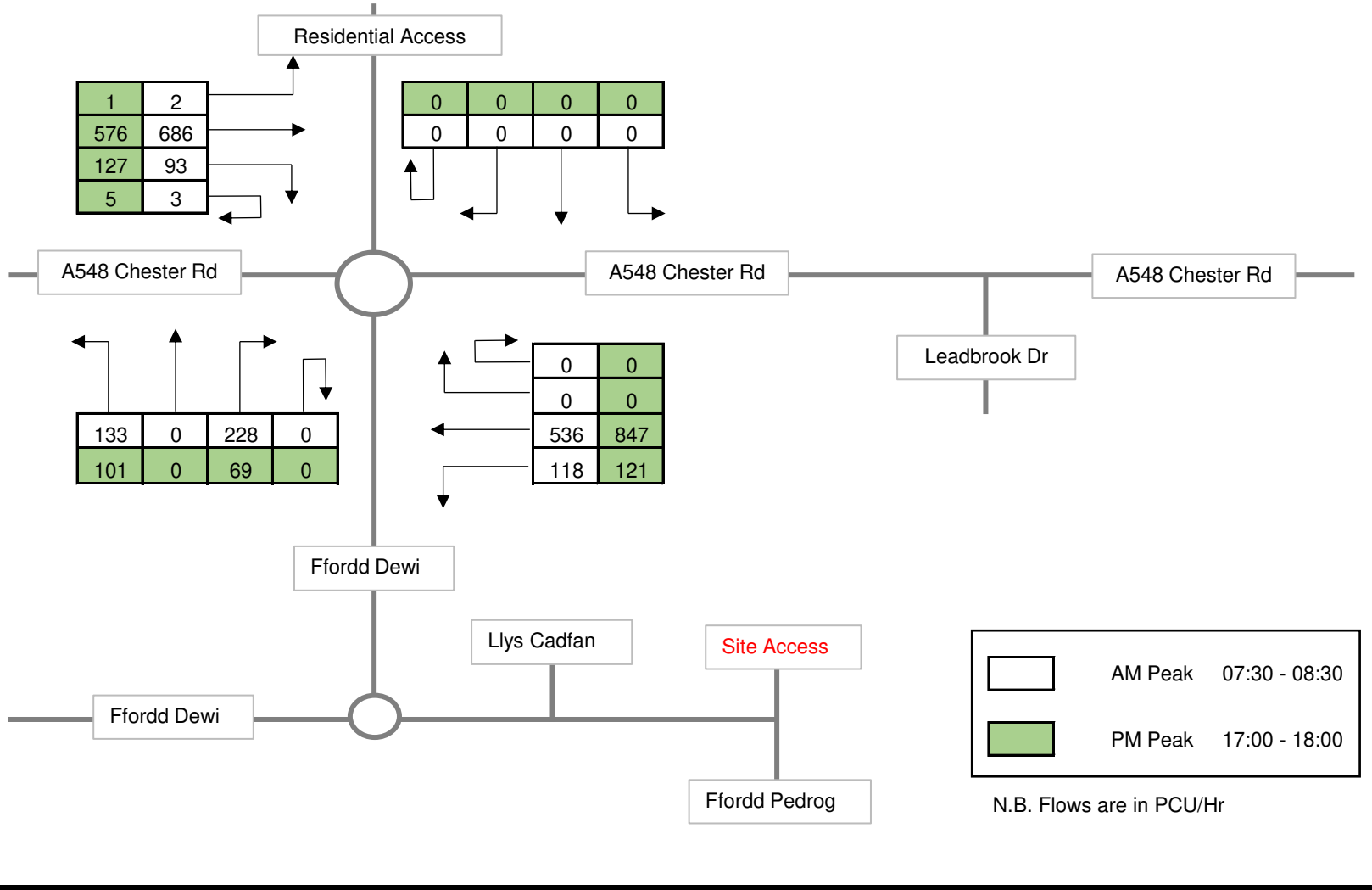
SCP Transportation Planning : Infrastructure Design	**Committed Development**	**03/08/2023**	Job Number - SCP/230489
	Proposed Residential Development, Quarry Farm, Oakenholt		**Traffic Figure 4**



SCP Transportation Planning : Infrastructure Design	**Base Flows 2028**	**03/08/2023**	Job Number - SCP/230489
	Proposed Residential Development, Quarry Farm, Oakenholt		**Traffic Figure 5**



S C P Transportation Planning : Infrastructure Design	**Base Flows 2028**	**03/08/2023**	Job Number - SCP/230489
	Proposed Residential Development, Quarry Farm, Oakenholt		**Traffic Figure 6**



SCP Transportation Planning : Infrastructure Design	**Assessment Flows 2028**	**03/08/2023**	Job Number - SCP/230489
	Proposed Residential Development, Quarry Farm, Oakenholt		**Traffic Figure 7**