



Transportation Planning : Infrastructure Design

Transport Assessment

**Proposed Residential Development
Upper Denbigh Road, St Asaph**

Prepared for Castle Green Homes Ltd

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1.0 INTRODUCTION

General

- 1.1 SCP have been appointed by Castle Green Homes to provide specialist transport planning and engineering advice in support of a proposed residential development located to the east of the A525 Upper Denbigh Road, St Asaph. The application site forms part of a site allocated for 201 residential dwellings in the Denbighshire Local Plan (ref 'Additional land at HM Stanley').
- 1.2 The proposed development will provide 124 dwellings comprising a mix of 4no. 1-bed apartments and 120no. 2-4 bedroom houses. Further details of the proposed development are provided in Chapter 3 later.
- 1.3 This Transport Assessment (TA) has been prepared to support the planning application and has produced in accordance with guidance contained in TAN 18. In addition, the specific scope of this report including the study area and survey requirements have been discussed and agreed with the Highway Officer at Denbighshire County Council (DCC).
- 1.4 This report concludes that the proposed development can be accommodated without detriment to the operational capacity or safety of the local highway network and that it can be readily accessed on foot, by bicycle and by local public transport services.

Scope and Structure of Report

- 1.5 The structure of this report is as follows:
- Chapter 2 – summarises relevant national and local transport policies and presents an evaluated 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 – estimates the number trips generated by existing and proposed uses of the site and distributed and assigns the proposed development trips on 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 summary and conclusions to this TA derived from the analysis presented in the above chapters.

2.0 POLICY CONTEXT AND TRANSPORT IMPLEMENTATION STRATEGY

Introduction

2.1 Technical Advice Note 18 (TAN 18) sets out the need for developments 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. Delivering this objective will make an important contribution to decarbonisation, improving air quality, increasing physical activity, improving the health of the nation and realising the goals of the Well-being of Future Generations Act.*

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 4.1.26 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 4.1.56 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 Denbighshire 010 Middle Super Output Area (MSOA). The 2011 UK Census shows that single occupancy travel to work by car mode is, on average; higher in the Denbighshire 010 MSOA (72%) to both Denbighshire County (41%) and Wales (71%). The existing local single occupancy modal share percentage of 72% 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	Denbighshire 010	Denbighshire County	Wales Country
All Usual Residents Aged 16 to 74 in Employment	2,408	67,392	1,363,615
Work Mainly at or From Home	150	2,614	73140
Underground, Metro, Light Rail, Tram	2	28	1175
Train	10	445	27341
Bus, Minibus or Coach	75	1,400	62903
Taxi	5	271	6523
Motorcycle, Scooter or Moped	17	198	7694
Driving a Car or Van	1,734	27,576	918645
Passenger in a Car or Van	136	2,709	92727
Bicycle	38	647	19659
On Foot	226	4,984	145135
Other Method of Travel to Work	15	284	8673
Total Persons Travelling to Work	2,258	64,778	1,290,475
Single Occupancy Car Journeys (%)	72%	41%	71%
Car Shares (%)	6%	4%	7%
Public Transport (%)	4%	3%	7%
Walking (%)	9%	7%	11%
Bicycle (%)	2%	1%	2%
Taxi (%)	0%	0%	1%
Motorcycle (%)	1%	0%	1%

2.11 If it is demonstrated (through surveys) that the level of single occupancy car travel from the proposed development is lower than the 72% MSOA level, the initial short term targets will be reassessed in conjunction with the local authority 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 4% for the MSOA, 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 4%, 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;
 - The anticipated take-up of a car sharing scheme, the use of public transport or other non-car modes of travel to work; and,
 - Information relating to potential areas for sustainable travel improvement, upon which the TPC/s could act and draw up measures to improve the TIS.
- 2.17 On receipt of the completed questionnaires the TPC/s will set up a travel database within 3 months of completion of the travel survey.
- 2.18 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.
- 2.19 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.
- 2.20 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.

- 2.21 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.
- 2.22 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.
- 2.23 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.
- 2.24 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.
- 2.25 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.
- 2.26 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.
- 2.27 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.
- 2.28 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.
- 2.29 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.
- 2.30 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.
- 2.31 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.
- 2.32 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?
- 2.33 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.
- 2.34 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.

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

3.0 EXISTING CONDITIONS

Site Location

- 3.1 The application site comprises an irregular shaped plot of land located to the east the A525 Upper Denbigh Road, St Asaph.
- 3.2 The application site forms part of the ‘Additional land at HM Stanley’ site in Denbighshire Local Plan which is allocated for 201 residential dwellings. The site currently comprises a farm and undeveloped land.
- 3.3 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 is shown in red on **Figure 3.2** overleaf.

Figure 3.1 – Site Location – Wider Highway Network

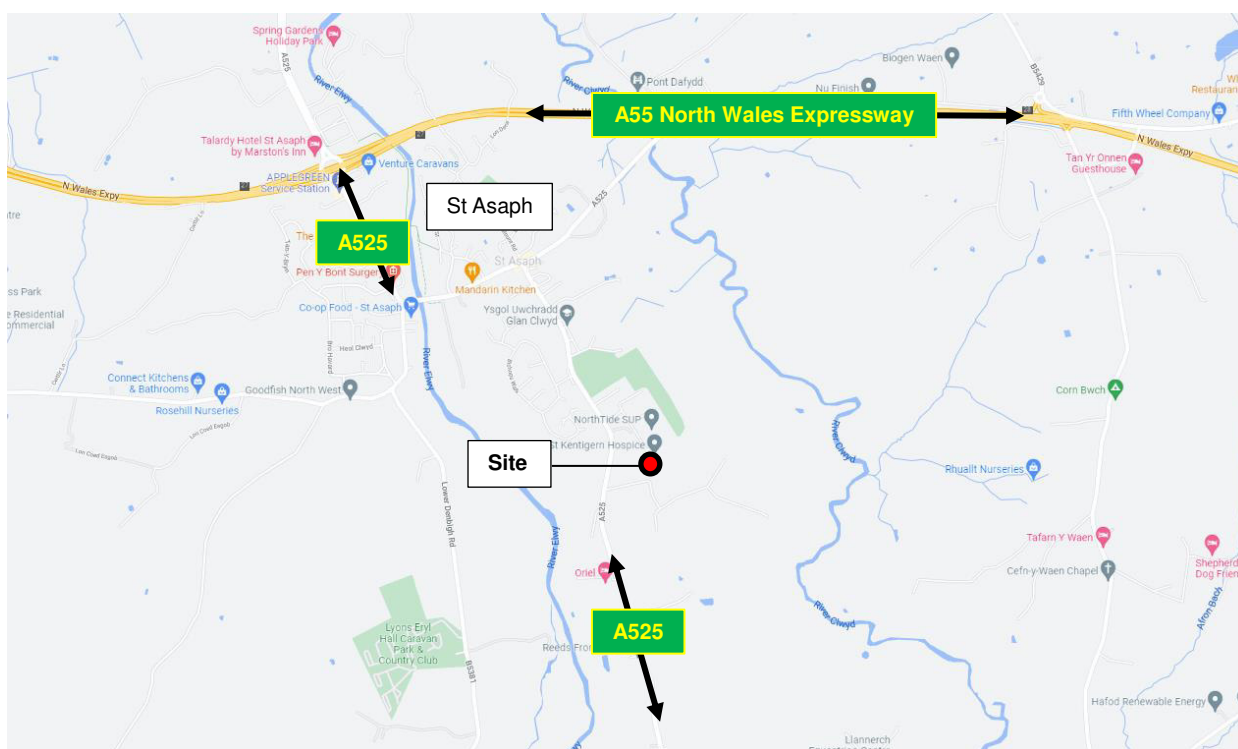
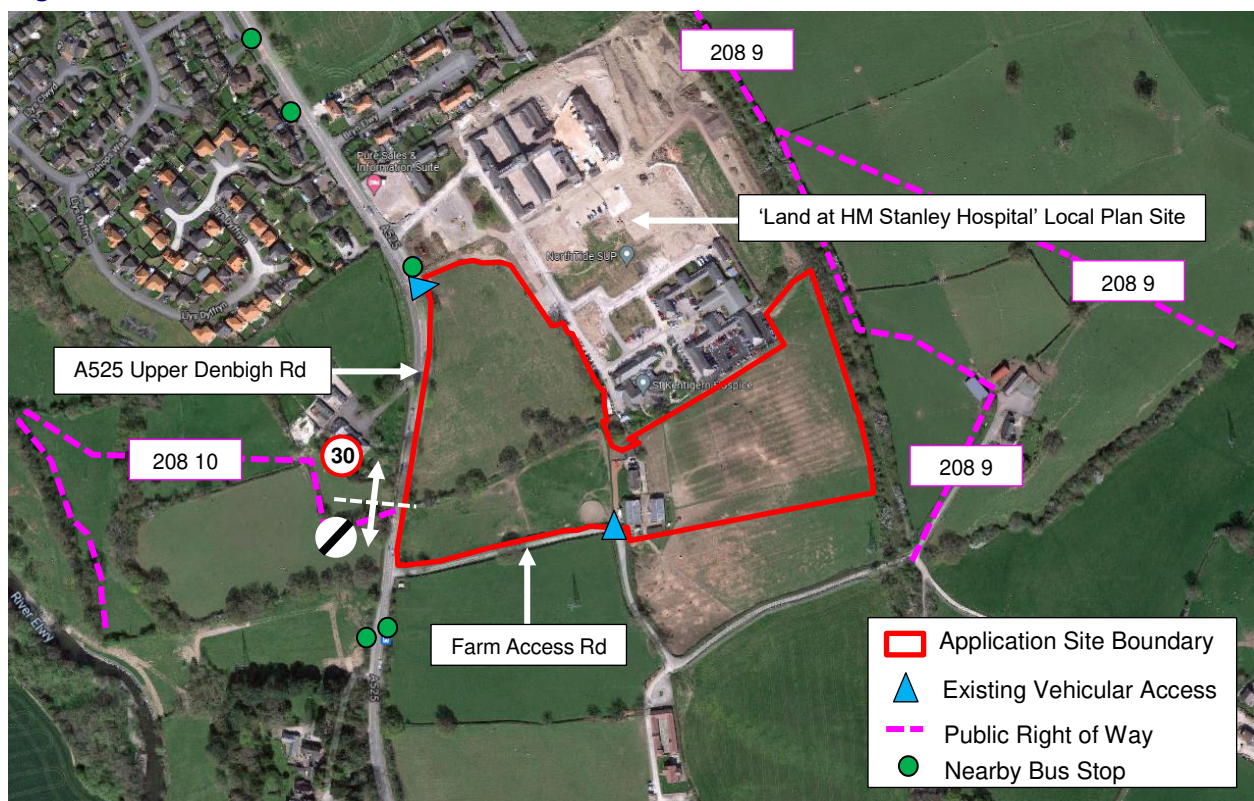


Figure 3.2 – Site Location Plan – Local View



- 3.4 The application site is bounded by undeveloped land to the east, a farm access and undeveloped land to south of the A525 Upper Denbigh Road to the west and the former HM Stanley Hospital site to the north. The HM Stanley Hospital site is also allocated in the Denbighshire Local Plan (referred to as 'Land at HM Stanley Hospital') and is currently under construction (planning ref: 46/2014/0126). The site will deliver up to 158 units and based on DCC's Housing Trajectory dated 2021, 91 units have been built.
- 3.5 There are a number of Public Rights of Way (PROW) which surround the application site. PROW 208 10 is located to the west of the site and provides a link between the A525 Upper Denbigh Rd in the vicinity of the application site and A525 High Street in St Asaph centre to the north-west. PROW 208 9 is located to the east of the site and provides a link between the farm access road to the south and St Asaph Leisure Centre to the north-west.
- 3.6 Vehicular access to the site is currently provided along the A525 and the farm access road via gated farm accesses on the north-western and southern boundaries of the site.

Local Highway Network

A525

- 3.7 The A525 Upper Denbigh Road is a distributor road located along the western boundary of the site and provides a link between High Street in St Asaph to the north and Trefnant in Denbigh to the south.
- 3.8 Within the vicinity of the site, the A525 Upper Denbigh Road has a carriageway width of between 6.8-11.1m and benefits from a footway along the western section of the carriageway, a footway along the eastern section of the carriageway to the north of the application site boundary and benefits from street lighting.
- 3.9 As shown on **Figure 3.2** above, the speed limit along the A525 Upper Denbigh Road changes from the national speed limit (south-bound) to a mandatory 30mph (north-bound) approximately 40m north of the farm access junction.
- 3.10 Nearby bus stops are provided along the A525 immediately to the north-west of the application site boundary for southbound services and approximately 0.1 miles to the south of the site for north-bound services. The nearby bus stops are served by up to two services per hour in either direction and further details on public transport are provided in Chapter 3 of this report.

Farm Access Road

- 3.11 The farm access road located along the southern boundary of the site provides a link between the A525 and the farms located to the south-east of the site. The farm access road is mostly single track and is subject to the national speed limit.

[A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street Priority Mini Roundabout](#)

3.12 The A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street roundabout is located to the north-west of the application site and takes the form of a 4-arm mini priority roundabout.

3.13 Pedestrian crossings including dropped kerbs are provided across the northern, eastern and southern arms of the roundabout and a zebra crossing is provided approximately 20m to the west of the roundabout in order to further assisted pedestrians, as shown on **Figure 3.4** below.

Figure 3.4 - A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street Priority Mini Roundabout



[A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street](#)

- 3.14 The A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street roundabout is located to the north-west of the application site and takes the form of a 3-arm mini priority roundabout.
- 3.15 Pedestrian refuges including dropped kerbs are provided across all arms of the roundabout in order to further assisted pedestrians, as shown on **Figure 3.4** below.

Figure 3.4 - A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street Priority Mini Roundabout



Road Safety

3.16 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 in December 2020 and is summarised in **Figure 3.5**.

Figure 3.5 – Accident Summary



3.17 The accident analysis is summarised as follows:-

- No accidents have occurred along the surrounding highway network within 350m of the site boundary. On this basis, it is concluded that there are no recurring highway safety problems on the local highway network that could be affected by the development proposals;
- Two accidents occurred at the A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street priority controlled roundabout which were both of slight severity; and,

- No accidents occurred at the A525 High Street / A525 The Roe / Lower Denbigh Road priority controlled roundabout.

3.18 Based on the low number of accidents, the severity of the accidents and given there are no specific accident clusters, the existing accident record does not present a concern in the context of the proposed development.

Traffic Survey Data

- 3.19 In order to establish existing traffic flow demand on the local network traffic flow surveys have been undertaken on Tuesday 14th September 2021 at the following junctions, as agreed with the Highway Officer at DCC:
- A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street priority controlled roundabout; and
 - A525 High Street / A525 The Roe / Lower Denbigh Road priority controlled roundabout;
- 3.20 The traffic surveys are presented in **Appendix A** and shown diagrammatically on **Traffic Flow Figure 1**. The peak hours for the local highway network have been calculated as being between 08:00 and 09:00 and 15:45 to 16:45.
- 3.21 Queue length surveys were also included in the surveys for both junctions and were used to validate the capacity assessment models using PICADY as presented in **Appendices B** and **C**.

4.0 PROPOSED DEVELOPMENT

General

4.1 The proposed development will provide 124 dwellings including the following:-

- 4no. 1-bed apartments; and
- 120 houses comprising 35no. 2-bed houses, 54no. 3-bed houses and 31no. 4-bed houses.

4.2 The 4 apartments and 8 of the houses will be affordable.

4.3 The proposed site layout plan is presented in **Appendix D**.

Proposed Site Access Arrangements

4.4 Vehicular access to the site will be provided along the A525 Upper Dengih Road via a simple priority access. The proposed access will include a 5.5m carriageway and 2.0m wide footways either side of the carriageway and 6m junction radii as shown on Drawing Number SCP/210584/F01 presented in **Appendix E**.

4.5 Junction visibility from the site accesses confirm to the visibility requirements set out in TAN18 and the Manual for Streets, providing visibility splays that have an 'x' (minor arm setback distance) of 2.4m and a 'y' (major road visibility) distance in excess of 90m in either direction, as shown on drawing presented in **Appendix E**.

4.6 Pedestrian and cycle access into the site will be provided at the same location as the vehicular accesses. In addition, a pedestrian link will be provided onto the footpath which runs along the eastern boundary of the site and onto the farm access road along the southern boundary of the site which further increases the pedestrian permeability of the site.

Internal Site Layout and Servicing

4.7 The internal road network has been designed to ensure the movements of service and refuse vehicles will be accommodated without allowing their requirements to dominate the layout of the site. Swept path analysis has been undertaken of the site access and internal road layout, which demonstrates that the movements of a large refuse vehicle can be accommodated within the proposed development.

- 4.8 Swept path analysis of a refuse vehicle is shown on drawing number SCP/210584/ATR01 presented in **Appendix F**.

Parking

- 4.9 Car Parking Standards for new developments are outlined in DCC's Supplementary Planning Guidance Note: Parking Requirements in New Development document (published October 2014), as summarised below:

Houses and Apartments

Residents: 1 space per bedroom (maximum requirement 3 spaces)

Visitors: 1 space per 5 units

- 4.10 The parking spaces per dwelling is shown on the proposed site layout plan presented in **Appendix D** and demonstrates the proposed houses provide an average of 2-3 spaces per unit which is in accordance with DCC's standards.

5.0 ACCESSIBILITY

- 5.1 This Chapter presents a review of the accessibility of the site by walking, cycling and public transport modes.
- 5.2 The accessibility of the site by non-car modes has been assessed by comparison with the following threshold distances, as set out by Andrew Davies AM ‘Minister for Economic Development and Transport’ in his foreword to the 2003 “*Walking and Cycling Strategy for Wales*” document:

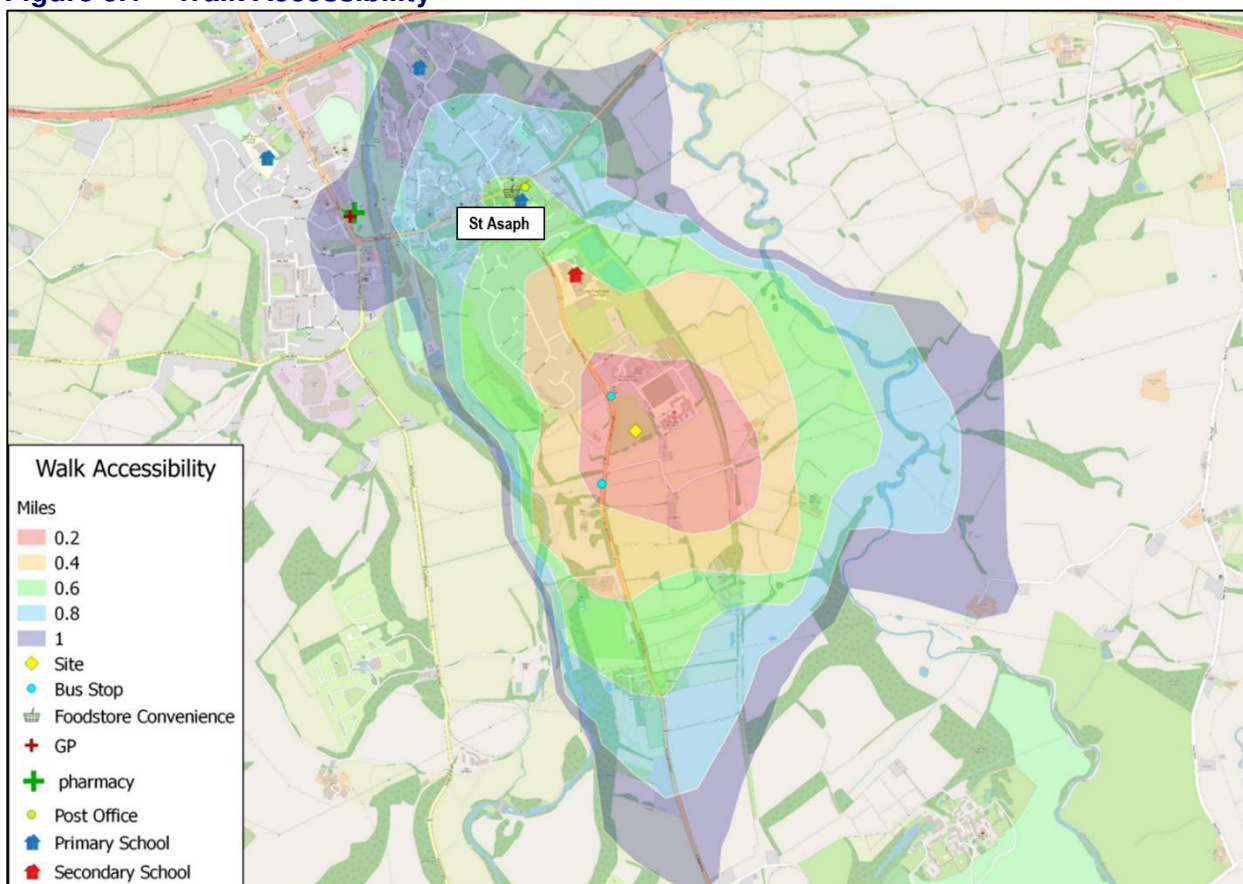
Table 5.1 – Walk / Cycle Distance Thresholds

Threshold Distance	Significance	Reference
1 mile	Walking can offer viable and attractive alternatives [to car trips]	Walking and Cycling Strategy for Wales
5 miles	Cycling can offer viable and attractive alternatives [to car trips]	Walking and Cycling Strategy for Wales

Pedestrian Accessibility

- 5.3 The roads at the site access to the west, the site benefit from footpaths on both sides of the road as well as street lighting and natural surveillance from the existing residential properties that abut the main walking routes into St Asaph.
- 5.4 The pedestrian accessibility of the development has been modelled using the Geographical Information System (GIS) software TRACC to produce isochrone mapping figures. The purpose of the isochrones is to demonstrate the areas within an acceptable walking distance of 1 mile of the site. The areas located within 1-mile walking distance of the site are shown below on **Figure 5.1**.

Figure 5.1 – Walk Accessibility



Contains Ordnance Survey Data (C) Crown Copyright and Database Right (2020)

5.5 **Figure 5.1** demonstrates that the site is within acceptable walking distance of St Asaph which includes an array of facilities including the following:-

Table 5.1 – Local Facilities

Facility	Details	Distance from the Development Site (miles)
Bus Stop	A525 Upper Denbigh Rd	<0.1miles
Leisure Centre/ Secondary School	St Asaph Leisure Centre, Upper Denbigh Rd	0.3
Primary School	St Asaph V P Infant School	0.4
Post Office	St Asaph Post Office, Chester St	0.5
Convenience Store	Premier Store, Chester St	0.5
Independent School	Fairhome Prep School	0.8
Doctors	Pen Y Bont Surgery, The Roe	0.9
Pharmacy	Rowlands Pharmacy, The Roe	0.9
Supermarket	Co-op Food - St Asaph, Lower Denbigh Rd	0.9
Library	St Asaph Library, The Roe	0.9

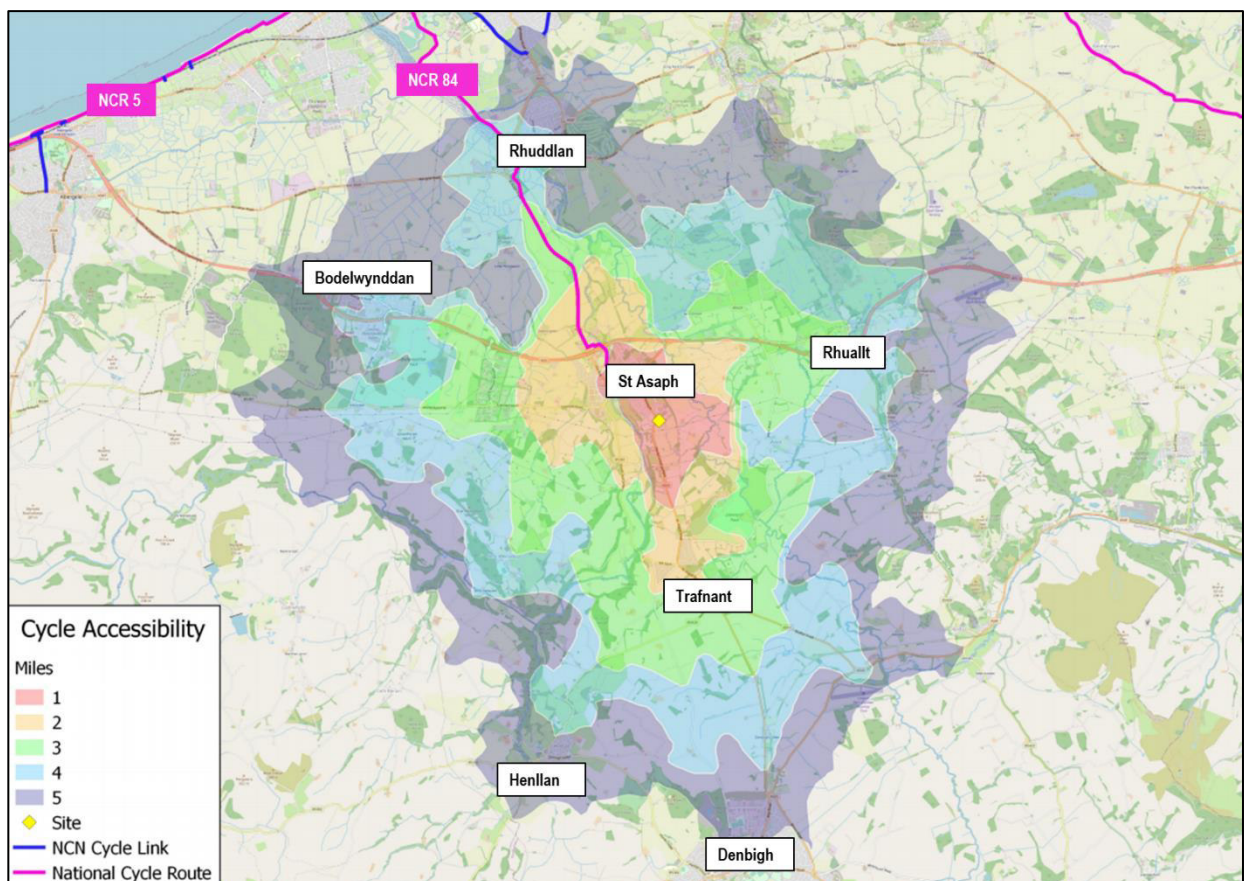
5.6 High Street is also within an acceptable walking distance and includes a selection of public houses, cafes, restaurants, and take-outs.

Cycle Accessibility

5.7 The Walking and Cycling Strategy for Wales identifies that “Cycling can offer viable and attractive alternatives” for short trips and as a substitute for shorter car journeys.

5.8 TRACC software has been used to assess the accessibility of the development by bicycle from the site. Isochrones illustrating the areas which lie within 5 miles of the site can be seen on the **Figure 5.2** below.

Figure 5.2 – Cycle Accessibility



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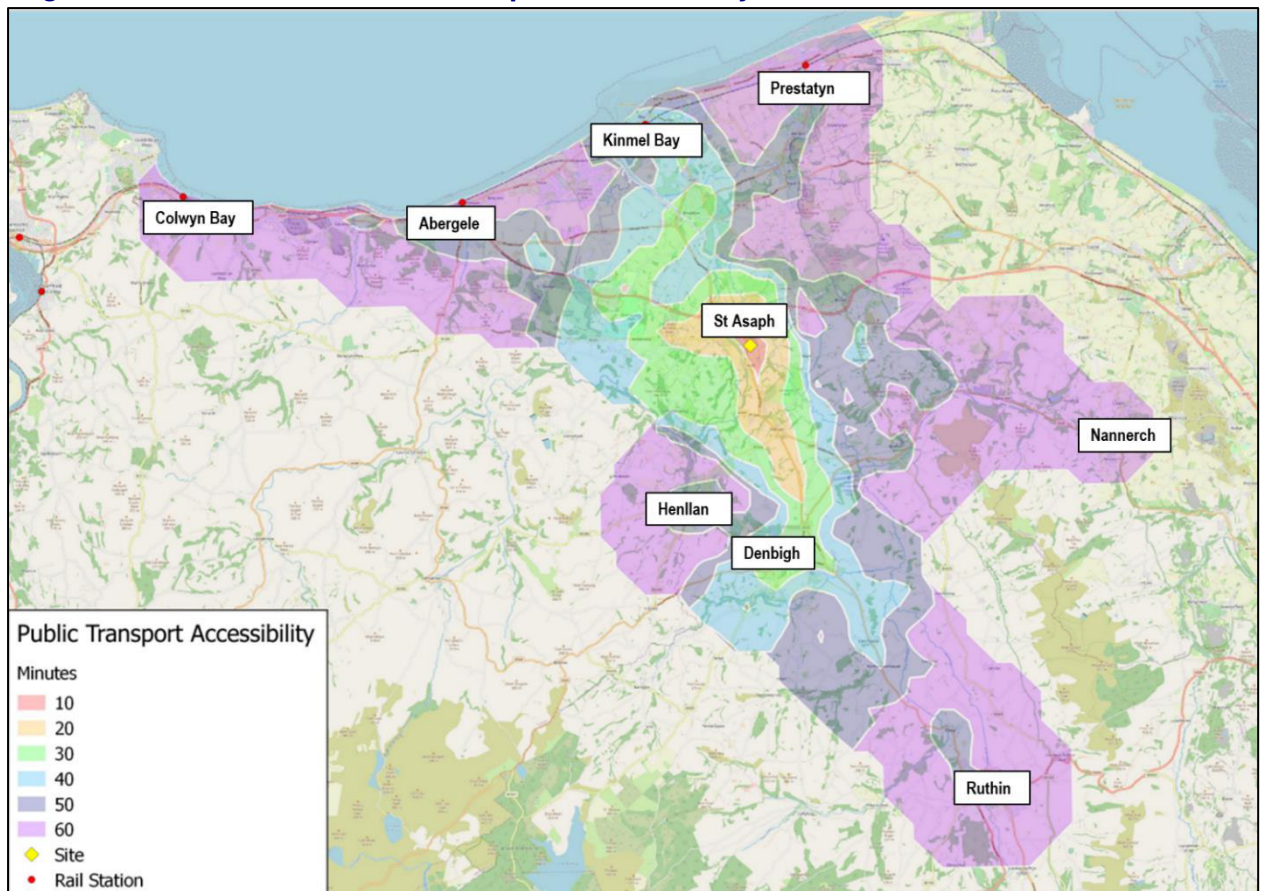
5.9 **Figure 5.2** demonstrates that, the nearby areas of Bodelwynddan, Rhualt and Denbigh, amongst others, are all located within the 5-mile cycle catchment area from the development site.

- 5.10 National Cycle Route (NCR) 5 and 84 are located in close proximity to the site. NCR 84 is located approximately 0.6 miles north of the site, which connects St Asaph to Rhyl. NCR 5 is located approximately 5.9 miles to the north of the site along the coast and provides a mostly traffic free route to the nearby areas within a 5-mile catchment mentioned previously.

Public Transport

- 5.11 The nearest bus stops to the site are located along Upper Denbigh Road approximately 190ft from the site. The bus stops are served by bus service 51 MAX and 51B which provides access to locations including Denbigh and Rhyl. Further bus stops are provided along Upper Denbigh Road approximately 0.1 miles from the site which are served by the 51MAX, 51B, 52 and 54 services which provide up to 2 services per hour in either direction with connections to Rhyl.
- 5.12 Rhyl Railway Station is located approximately 6.6 miles cycle distance to the north of the site. Sheltered cycle parking with CCTV is provided at the station. Rhyl Bay Railway Station provides frequent services throughout the week to locations including Holyhead, Birmingham International, Shrewsbury, Manchester Airport and Llandudno.
- 5.13 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 and rail station.

Figure 5.3 – 60-minute Public Transport Accessibility



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5.14 **Figure 5.3** shows that Colwyn Bay, Abergele, Rhyl, Ruthin, Denbigh and Prestatyn, amongst others, are in an acceptable 60-minute commute time.

6.0 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 Capacity assessments are undertaken in the year of registration of the planning application and 5-years hence, which is in accordance with guidance contained in the DfT's Guidance on Transport Assessment document.

6.3 In order to quantify the level of background traffic growth that could occur on the local network, National Traffic Model (NTM) growth factors, modified by TEMPRO local growth factors, have been used for the Denbighshire 010 dataset.

6.4 The growth factors are summarised in **Table 6.1** below:-

Table 6.1 – Traffic Growth Factors

Period	AM Peak	PM Peak
2021-2026	1.0352	1.0348

6.5 The above growth factors are applied to the surveys traffic flow to obtain the 2026 growthed surveyed traffic flows, as shown in the **Traffic Flow Figure 2**.

Committed Development

6.6 As mentioned previously, the adjacent HM Stanley Hospital is currently under construction (planning ref: 46/2014/0126). The application was supported by a Technical Note (TN) prepared by Savell Bird and Axon (doc ref W04412-TN-R01-MT01) which concluded that the proposed residential use would generate approximately 50% lower trip generation when compared to the existing hospital use. As a result there would be a net reduction of trips at the site.

6.7 As detailed earlier, based on DCC's housing projections in the region 90 units have already been constructed on this site. The traffic generated by the additional 68 units have been estimated based on the trip generation and distribution presented later in this report as shown on **Traffic Flow Figure 3**.

6.8 The residential development located at Bryn Gobaith received planning permission in April 2014 for 14 dwellings (planning ref: 46/2014/0436) however 14 dwellings will not generate a significant number of trips during the peak hour to have an impact on nearby junctions and therefore been taken into account as part of the application of background traffic growth.

7.0 TRIP GENERATION

General

7.1 This Chapter provides an estimation and comparison of the trip generating potential of the proposed residential development during the worst-case weekday highway peak hours.

Proposed Residential Development

7.2 In order to estimate the trip generating potential of the proposed housing element of the development, average trip rates from the industry-standard TRICS Database (V7.8.2) have been obtained. The selection criteria for the TRICS based trip rates is as follows:-

- Residential;
- Houses Privately owned;
- Multi modal surveys;
- Sites in Greater London and Ireland excluded;
- Selection by number of dwellings;
- Weekday surveys only; and
- Only sites in 'Edge of Town', 'Suburban Area' and Neighbourhood Centre' locations have been selected.

7.3 The multi modal TRICS outputs for the proposed development are presented in **Appendix G** and are summarised in **Table 7.1** below.

Table 7.1 - Estimated Trip Rates (Per Dwelling) Associated with the Proposed Residential Development				
Mode	Weekday AM Peak Hour		Weekday PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Vehicles	0.111	0.318	0.293	0.138
Cycles	0.007	0.021	0.013	0.005
Pedestrians	0.052	0.116	0.066	0.030
Pub. Trans.	0.001	0.038	0.018	0.005

7.4 The estimated trip generation associated with the proposed development is therefore as summarised in **Table 7.2** below.

Table 7.2 – Estimated Trip Generation – Based on 124 Dwellings				
Mode	Weekday AM Peak Hour		Weekday PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Vehicles	14	39	36	17
Cycles	1	3	2	1
Pedestrians	6	14	8	4
Pub. Trans.	0	5	2	1

7.5 It should be noted that the above trip generation includes the 4 affordable apartments and 8 affordable dwellings which are both anticipated to generate less trips than privately owned houses. As a result, the above trip generation is considered robust.

7.6 In order to estimate the trip distribution the proposed development, the proposed residential trips have been distributed on the local highway network based on travel to work data obtain from the 2011 National census for all travel to work “out-moves” for the Denbighshire 010 Middle Super Output Area (MSOA), as presented in **Appendix H**.

7.7 Out-moves provide an indication of the numbers and destinations (on a ward basis) of people who reside in the Denbighshire 010 MSOA and who work elsewhere, providing a good proxy for the distribution of the proposed residential development traffic. The trip distribution routes are summarised in **Table 7.3** below:-

Route Reference	Route Description	Percentage
A	A55 (West)	37%
B	A525 The Roe (North)	28%
C	A55 (East)	15%
D	A525 Upper Denbigh Rd (South)	18%
E	Glascoed Road	1%

7.8 The above distribution routes are shown diagrammatically on the **Traffic Flow Figure 4**.

Traffic Assignment

7.9 The development related traffic has been assigned to the above distribution method and are shown on **Traffic Flow Figure 5**.

8.0 HIGHWAY IMPACT

Introduction

8.1 This Chapter describes the impact of the additional trips generated by the proposed development on the operation of the local highway network. As stated earlier, the study area for the TA has been agreed with DCC and includes the following junctions:-

- Proposed Site Access along A525 Upper Denbigh Road;
- A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street priority controlled roundabout; and
- A525 High Street / A525 The Roe / Lower Denbigh Road priority controlled roundabout.

8.2 In addition to the above, the impact of the proposed development along the A55 has been considered in this chapter.

Assessment Methodology

8.3 Assessments of the priority controlled junctions within the study area have been undertaken using Junctions 9 (PICADY and ARCADY) software.

8.4 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).

8.5 Capacity assessments have been undertaken in future assessment year (2026) in the 'with' and 'without' development scenarios. The 2026 'without development' baseline traffic flows are the sum of the growthed traffic flows and commuted development flows and are shown on **Traffic Flow Figure 6**. The 2026 '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**.

8.6 As mentioned previously, the roundabout models have been validated against the observed queue surveys.

Proposed Site Accesses

8.8 Junctions 9 PICADY software has been used in the assessment of the proposed western site access. The PICADY results are presented in **Appendix I** with the results summarised in **Table 8.1** below.

Table 8.1 – Proposed Site Access Junction – 2026 ‘With Development’ PICADY Results

Movement	AM		PM	
	RFC	Queue (PCU)	RFC	Queue (PCU)
Site Access – Left/Right Turn	0.15	0.2	0.06	0.1
Upper Denbigh Rd (S) – Ahead/Right Turn	0.00	0.0	0.02	0.0

8.9 The above results clearly show that the proposed site access will operate well within its practical capacity in the future assessment year of 2026, with minimal queuing and delay.

A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street Priority Controlled Roundabout

8.10 The ARCADY results for the A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street priority controlled roundabout are presented in **Appendix B** with the results summarised in **Table 8.2** below.

Table 8.2 – A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street Priority Controlled Roundabout – 2026 ‘With Development’ ARCADY Results

Approach	AM PEAK (0800 to 0900)		PM PEAK (1700 to 1800)	
	RFC	MMQ	RFC	MMQ
A525 Chester St (E)	0.33	0.5	0.29	0.4
A525 Upper Denbigh Rd (S)	0.84	5.0	0.70	2.3
A525 High St (W)	0.68	2.1	0.66	1.9
Mount Rd	0.22	0.3	0.17	0.2

8.11 The above results clearly show that the A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street priority controlled roundabout will operate within its practical capacity in the future assessment year of 2026, with minimal queuing and delay.

A525 High Street / A525 The Roe / Lower Denbigh Road Priority Controlled Mini Roundabout

8.12 The ARCADY results for the A525 High Street / A525 The Roe / Lower Denbigh Road priority controlled roundabout are presented in **Appendix C** with the results summarised in **Tables 8.3 and 8.4** below.

Table 8.3 – A525 High Street / A525 The Roe / Lower Denbigh Road Mini Roundabout – 2026 ‘Without Development’ ARCADY Results

Approach	AM PEAK (0800 to 0900)		PM PEAK (1700 to 1800)	
	RFC	MMQ	RFC	MMQ
A525 High St	0.96	13.0	0.95	11.2
Lower Denbigh Rd	0.70	2.3	0.72	2.5
A525 The Roe	0.87	5.9	0.90	7.7

Table 8.4 – A525 High Street / A525 The Roe / Lower Denbigh Road Mini Roundabout – 2026 ‘With Development’ ARCADY Results

Approach	AM PEAK (0800 to 0900)		PM PEAK (1700 to 1800)	
	RFC	MMQ	RFC	MMQ
A525 High St	0.99	16.7	0.96	12.4
Lower Denbigh Rd	0.71	2.3	0.73	2.5
A525 The Roe	0.87	6.3	0.92	9.6

8.13 The above table demonstrates that the A525 High Street / A525 The Roe / Lower Denbigh Road mini roundabout is anticipated to operate over the 0.85 RFC threshold in both the ‘with’ and ‘without’ development assessments on all arms.

8.14 However, the results also show that the junction will operate with RFCs of below 1.0 on all arms with the proposed development in place. Furthermore, there is no material change in overall network performance, particularly in terms of the RFC or MMQ when comparing the ‘with’ and ‘without development’ scenarios on all arms, with the maximum increase in queues being only 3.7 PCU which occurs on the A525 High Street in the PM peak hour.

8.15 Having regard to this, the proposed development is not anticipated to have a material impact on the A525 High Street / A525 The Roe / Lower Denbigh Road mini roundabout.

Impact along the A55

- 8.1 An impact assessment of the development flows along the A55 has been undertaken.
- 8.2 Link data located between Junction 27 and 27A of the A55 has been obtained from the Department for Transport for 2019 (pre-COVID) and the raw data is provided in [Appendix J](#).
- 8.3 The data is summarised in [Table 8.5](#) below:

Table 8.5 – Percentage Impact along the A55 (Two-Way)

AM Peak Hour			PM Peak Hour		
A55	Development Traffic	% Impact	A55	Development Traffic	% Impact
3502	29	0.8%	3425	29	0.9%

- 8.4 It can be seen that the proposed development would result in an increase in less than 1% during both peak hours.
- 8.5 The proposed development will therefore not have a material impact on the operation of the A55.

9.0 SUMMARY AND CONCLUSIONS

- 9.1 SCP have been appointed by Castle Green Homes to provide specialist transport planning and engineering advice in support of a proposed residential development located to the east of the A525 Upper Denbigh Road, St Asaph. The application site forms part of a site allocated for 201 residential dwellings in the Denbighshire Local Plan (ref 'Additional land at HM Stanley').
- 9.2 The proposed development will provide 124 dwellings comprising a mix of 4no. 1-bed apartments and 120no. 2-4 bedroom houses.
- 9.3 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.
- 9.4 Vehicular access to the site will be provided along the A525 Upper Denbigh Road via a simple priority access. The proposed access will include a 5.5m carriageway and 2.0m wide footways either side of the carriageway. In addition the achievable levels of visibility comply with the required standards set out in TAN18 for the speed limit of the road.
- 9.5 Pedestrian and cycle access into the site will be provided at the same location as the vehicular accesses. In addition, a pedestrian link will be provided onto the footpath which runs along the eastern boundary of the site and onto the farm access road along the southern boundary of the site which further increases the pedestrian permeability of the site.
- 9.6 The development is compliant with local, regional and national policy as it will promote sustainable modes of travel and reduce the number of car trips to local facilities.
- 9.7 It has been demonstrated that the development is sustainable with good accessibility to the site provided to those travelling by foot and by bicycle and is served by good bus services.
- 9.8 The impact of the traffic arising from the scheme has been tested in detail at the following junctions:-
- A525 High Street / A525 Upper Denbigh Road / Mount Road / Chester Street mini roundabout; and
 - A525 High Street / A525 The Roe / Lower Denbigh Road mini roundabout;
- 9.9 The assessments show that at the majority of the junctions there is either sufficient spare capacity to accommodate the proposed development or the development will not have a material impact on the operation of these junctions.

9.10 Having regard to the above, it is concluded that there is no highway or transport related reason to withhold planning permission for the scheme.

S|C|P

APPENDIX A

Site 1: A525 Chester Road/A525 Upper Denbigh Road/A525 High St./Mount Rd

Day: Tuesday

Date: 14 September 2021

Weather: Rain & Dull AM/Fine & Mainly Sunny PM

A: A525 Chester Road

B: A525 Upper Denbigh Road

C: A525 High Street

D: Mount Road

A - B

A - C

A - D

Time	Car	LGV	OGVI	0GV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	0GV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	0GV2	P/C	M/C	PSV	Total
07:30	2	8	1	1	0	1	0	13	1	3	2	0	0	0	0	6	2	0	0	0	0	0	0	2
07:45	14	8	0	0	0	0	0	22	1	2	1	0	0	0	0	4	0	0	0	0	0	0	0	0
08:00	11	7	1	0	0	0	2	21	3	3	0	0	0	0	0	6	0	0	0	0	0	0	0	0
08:15	20	4	0	0	0	0	1	25	6	3	0	0	0	0	1	10	6	1	0	0	0	0	0	7
08:30	18	2	0	0	0	0	1	21	7	3	0	0	0	0	0	10	3	1	0	0	0	0	0	4
08:45	12	1	0	0	0	0	0	13	3	1	0	0	0	0	0	4	3	0	0	0	0	0	0	3
09:00	8	2	1	0	0	0	0	11	2	3	1	0	0	0	0	6	2	0	0	0	0	0	0	2
09:15	9	3	2	0	1	0	0	15	5	4	0	0	0	0	0	9	0	1	0	0	0	0	0	1
Total	94	35	5	1	1	1	4	141	28	22	4	0	0	0	1	55	16	3	0	0	0	0	0	19

A - B

A - C

A - D

Time	A - B								A - C								A - D							
	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total
14:30	7	3	0	0	0	0	0	10	4	3	0	0	0	0	0	7	2	0	0	0	0	0	0	2
14:45	9	2	0	0	0	2	0	13	8	4	0	0	0	0	0	12	1	0	0	0	0	0	0	1
15:00	7	1	0	0	0	0	0	8	8	1	0	0	0	1	0	10	2	0	0	0	0	0	0	2
15:15	8	1	1	1	0	0	1	12	8	2	0	0	0	1	0	11	0	0	0	0	0	0	0	0
15:30	2	0	0	0	0	0	0	2	2	1	0	0	0	0	0	3	2	0	0	0	0	0	0	2
15:45	12	0	1	0	0	0	0	13	7	1	0	0	0	0	0	8	4	0	0	0	0	0	0	4
16:00	10	2	0	0	0	0	0	12	6	1	0	0	0	0	0	7	4	0	0	0	0	0	0	4
16:15	17	2	1	0	0	0	0	20	8	0	0	0	0	0	0	8	6	1	0	0	0	0	0	7
16:30	10	2	0	0	0	0	0	12	10	2	0	0	0	0	0	12	1	1	0	0	0	0	0	2
16:45	15	4	0	0	0	0	0	19	4	3	1	0	0	0	0	8	5	0	0	0	0	0	0	5
17:00	21	8	0	0	0	0	0	29	12	2	0	0	0	0	1	15	2	1	0	0	0	0	0	3
17:15	14	2	0	0	0	0	0	16	9	2	0	0	0	0	0	11	2	1	0	0	0	0	0	3
17:30	21	1	0	0	1	0	0	23	3	3	0	0	0	0	0	6	1	1	0	0	0	0	0	2
17:45	5	3	0	0	0	0	0	8	5	1	0	0	0	0	0	6	1	1	0	0	0	0	0	2
18:00	17	3	0	0	0	0	0	20	7	0	0	0	0	0	0	7	1	1	0	0	0	0	0	2
18:15	9	1	0	0	0	0	0	10	6	2	0	0	0	0	0	8	2	0	0	0	0	0	0	2
Total	184	35	3	1	1	2	1	227	107	28	1	0	0	2	1	139	36	7	0	0	0	0	0	43

B - A

B - C

B - D

Time	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total
07:30	6	1	0	0	0	0	0	7	78	14	4	0	1	0	2	99	2	0	0	0	0	0	0	2
07:45	4	3	0	0	0	0	0	7	103	19	2	1	0	0	2	127	3	1	0	0	1	0	0	5
08:00	12	1	0	0	0	0	0	13	102	14	3	1	0	1	5	126	5	1	1	0	0	0	0	7
08:15	15	4	0	0	0	0	0	19	105	9	1	0	0	0	2	117	4	0	0	0	0	0	0	4
08:30	6	4	0	0	0	0	0	10	104	18	1	0	0	0	4	127	7	1	0	0	0	0	0	8
08:45	11	0	2	0	0	0	0	13	127	11	2	0	0	0	13	153	8	0	0	0	0	0	0	8
09:00	8	1	1	0	0	0	1	11	80	12	5	2	0	0	6	105	5	0	0	0	0	0	0	5
09:15	6	1	0	0	0	0	0	7	86	16	2	4	0	0	2	110	4	0	0	0	1	0	0	5
Total	68	15	3	0	0	0	1	87	785	113	20	8	1	1	36	964	38	3	1	0	2	0	0	44

14:30	6	3	0	0	0	0	0	9	82	14	4	1	2	2	1	106	5	1	0	0	0	0	0	6
14:45	6	3	0	0	0	0	0	9	93	21	5	4	0	2	1	126	3	1	0	0	1	0	0	5
15:00	10	4	0	0	0	0	0	14	87	16	1	0	0	3	1	108	7	0	0	0	0	0	0	7
15:15	5	1	0	0	0	2	0	8	87	14	1	1	0	1	1	105	8	0	0	0	0	0	0	8
15:30	9	2	1	0	0	0	1	13	93	16	2	1	0	1	12	125	6	0	0	0	1	0	0	7
15:45	11	3	0	0	0	0	0	14	88	18	3	0	0	1	5	115	9	1	0	0	0	0	0	10
16:00	4	2	0	0	0	0	0	6	93	16	1	0	0	2	1	113	5	1	0	0	0	0	0	6
16:15	5	1	0	0	1	0	0	7	96	19	2	1	0	0	1	119	7	0	0	0	0	0	0	7
16:30	9	2	0	0	0	0	0	11	103	16	3	0	0	1	2	125	4	0	0	0	0	0	0	4
16:45	9	0	0	0	0	0	0	9	109	20	3	0	0	3	0	135	6	2	0	0	0	0	0	8
17:00	5	0	1	0	0	0	0	6	101	21	3	0	0	0	1	126	5	2	0	0	0	0	0	7
17:15	5	2	0	0	0	0	0	7	105	21	5	0	1	0	1	133	4	1	0	0	0	0	0	5
17:30	9	0	0	0	1	0	0	10	90	17	1	0	0	3	4	115	5	0	0	0	0	0	0	5
17:45	5	1	0	0	2	0	0	8	78	14	0	0	0	0	0	92	3	0	0	0	0	0	0	3
18:00	7	1	0	0	0	0	0	8	75	12	1	0	0	0	1	89	11	0	0	0	0	0	0	11
18:15	2	1	0	0	0	0	0	3	65	14	0	0	0	0	0	79	7	1	0	0	0	0	0	8
Total	107	26	2	0	4	2	1	142	1445	269	35	8	3	19	32	1811	95	10	0	0	2	0	0	107

C - A

C - B

C - D

Time	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total
07:30	2	2	0	0	0	0	0	4	75	18	4	0	0	1	3	101	7	2	0	0	0	0	0	9
07:45	2	2	0	0	0	0	0	4	95	21	2	2	0	1	4	125	6	1	0	0	0	0	0	7
08:00	3	0	0	0	0	0	0	3	109	18	3	2	0	0	7	139	5	0	0	0	0	0	0	5
08:15	4	0	0	0	0	0	0	4	77	15	3	2	0	0	5	102	6	1	0	0	0	0	0	7
08:30	5	0	0	0	0	0	1	6	90	19	8	2	0	0	7	126	8	3	0	0	0	0	0	11
08:45	3	0	2	0	0	0	0	5	81	18	2	1	0	0	8	110	9	1	0	0	0	0	0	10
09:00	1	3	1	0	0	0	0	5	84	14	1	2	1	0	1	103	5	0	0	0	0	0	0	5
09:15	3	0	0	0	0	0	0	3	63	15	5	1	0	0	1	85	2	2	0	0	0	0	0	4
Total	23	7	3	0	0	0	1	34	674	138	28	12	1	2	36	891	48	10	0	0	0	0	0	58

14:30	0	1	0	0	0	0	0	1	93	12	2	2	0	1	3	113	3	3	0	1	0	0	0	7
14:45	0	1	0	0	1	0	0	2	105	15	3	0	0	0	6	129	4	1	0	1	0	0	0	6
15:00	3	1	0	0	0	0	0	4	85	16	3	0	0	1	9	114	9	2	0	1	1	0	0	13
15:15	5	0	0	0	0	0	0	5	100	12	1	5	2	1	5	126	10	1	0	1	0	0	0	12
15:30	1	1	0	0	0	0	0	2	76	14	5	1	0	0	1	97	13	0	0	0	0	0	0	13
15:45	5	2	0	0	0	0	0	7	91	17	1	2	0	0	0	111	8	2	0	0	0	0	0	10
16:00	3	2	0	0	0	0	0	5	93	14	4	1	0	0	2	114	11	2	1	0	0	0	0	14
16:15	4	1	0	0	0	0	0	5	94	15	2	2	0	0	1	114	8	1	0	0	0	0	0	9
16:30	3	0	0	0	2	0	0	5	99	17	1	1	0	2	0	120	15	0	0	0	0	0	0	15
16:45	2	0	0	0	0	0	0	2	91	14	0	0	0	1	2	108	7	0	0	0	0	0	0	7
17:00	0	1	0	0	0	0	0	1	90	16	0	0	0	0	2	108	11	1	0	0	0	0	0	12
17:15	0	0	0	0	0	0	0	0	94	12	1	0	0	0	0	107	16	1	0	0	0	0	0	17
17:30	2	0	0	0	0	0	0	2	92	14	2	1	0	0	0	109	12	2	0	0	0	0	0	14
17:45	3	0	0	0	1	0	0	4	90	16	1	0	1	0	2	110	10	1	0	0	1	0	0	12
18:00	1	0	0	0	1	0	0	2	86	15	2	0	0	1	1	105	12	1	0	0	0	0	0	13
18:15	1	0	0	0	0	0	0	1	90	10	0	0	0	1	2	103	7	1	0	0	0	0	0	8
Total	33	10	0	0	5	0	0	48	1469	229	28	15	3	8	36	1788	156	19	1	4	2	0	0	182

D - A

D - B

D - C

Time	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total
07:30	2	1	0	0	0	0	0	3	5	0	0	0	0	0	0	5	11	2	0	0	0	0	0	13
07:45	3	1	0	0	0	0	0	4	5	1	0	0	0	0	0	6	15	3	1	0	0	1	0	20
08:00	2	0	0	0	0	0	0	2	4	1	0	0	0	0	0	5	15	4	0	0	0	0	0	19
08:15	3	0	0	0	0	0	0	3	11	0	1	0	0	0	0	12	9	2	0	0	0	0	0	11
08:30	4	0	0	0	0	0	0	4	6	1	0	0	0	0	1	8	19	2	0	0	0	0	0	21
08:45	7	0	0	0	1	0	0	8	2	1	0	0	0	0	0	3	15	0	0	0	0	0	0	15
09:00	2	1	0	0	0	0	0	3	5	1	0	0	0	0	0	6	19	3	0	0	0	0	0	22
09:15	0	0	0	0	0	0	0	0	1	2	0	0	1	0	0	4	6	0	0	0	0	0	0	6
Total	23	3	0	0	1	0	0	27	39	7	1	0	1	0	1	49	109	16	1	0	0	1	0	127

14:30	0	0	0	0	1	0	0	1	10	1	0	0	0	0	0	11	5	1	0	0	0	0	0	6
14:45	1	0	0	0	0	0	0	1	7	1	0	0	0	0	0	8	5	1	0	1	0	0	0	7
15:00	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	6	1	0	0	0	0	0	7
15:15	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	7	4	4	0	0	0	0	0	8
15:30	2	0	0	0	0	0	0	2	5	0	0	0	0	0	0	5	5	0	0	1	0	0	0	6
15:45	1	0	0	0	0	0	0	1	7	0	0	0	0	0	0	7	11	0	0	0	0	0	0	11
16:00	2	1	0	0	0	0	0	3	8	1	1	0	0	0	0	10	16	2	0	0	0	0	0	18
16:15	2	1	0	0	0	0	0	3	4	0	0	0	0	0	0	4	15	4	1	0	0	0	0	20
16:30	1	0	0	0	0	0	0	1	3	1	0	0	0	0	0	4	11	1	0	0	0	0	0	12
16:45	2	0	0	0	0	0	0	2	1	1	0	0	1	0	0	3	10	1	0	0	0	0	0	11
17:00	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5	17	2	0	0	0	0	0	19
17:15	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	19	5	0	0	0	0	0	24
17:30	4	0	0	0	0	0	0	4	3	0	0	0	1	0	0	4	15	1	0	0	0	0	0	16
17:45	0	1	0	0	0	0	0	1	4	0	0	0	0	0	0	4	9	2	0	0	0	0	0	11
18:00	1	0	0	0	0	0	0	1	7	0	0	0	0	0	0	7	8	2	0	0	0	0	0	10
18:15	2	0	0	0	0	0	0	2	2	1	0	0	0	0	0	3	8	0	0	0	0	0	0	8
Total	19	3	0	0	1	0	0	23	75	7	1	0	2	0	0	85	164	27	1	2	0	0	0	194

A525 CHESTER ROAD/A525 HIGH STREET/MOUNT ROAD. ST ASAPH

QUEUE LENGTH SURVEY - TUESDAY 14 SEPTEMBER 2021

Arm	A	B	C	D
07:30	1	-	-	1
07:35	1	-	-	-
07:40	3	2	1	-
07:45	-	1	-	-
07:50	-	-	-	2
07:55	2	2	-	-
08:00	1	3	2	-
08:05	-	-	-	-
08:10	2	4	1	5
08:15	1	-	-	-
08:20	-	2	-	-
08:25	-	-	-	1
08:30	1	-	-	-
08:35	2	-	-	1
08:40	2	2	-	1
08:45	2	-	2	2
08:50	-	-	5	-
08:55	-	-	-	-
09:00	2	3	4	2
09:05	-	-	-	-
09:10	1	3	1	2
09:15	1	-	-	-
09:20	2	-	-	1
09:25	1	-	-	-

Arm	A	B	C	D
14:30	-	1	3	-
14:35	-	-	-	-
14:40	-	-	-	-
14:45	-	-	-	1
14:50	2	-	-	-
14:55	-	-	-	-
15:00	2	-	-	-
15:05	2	4	6	2
15:10	-	3	-	-
15:15	-	-	-	-
15:20	-	2	2	2
15:25	1	1	2	-
15:30	-	-	-	-
15:35	-	-	-	-
15:40	-	19	6	-
15:45	1	11	10	1
15:50	-	4	2	-
15:55	-	-	-	-
16:00	1	-	-	1
16:05	-	-	1	1
16:10	1	-	-	-
16:15	-	-	-	-
16:20	2	-	-	2
16:25	1	-	2	1
16:30	-	-	-	-
16:35	2	2	1	1
16:40	1	2	-	-
16:45	-	-	-	-
16:50	2	3	-	-
16:55	1	-	-	2
17:00	2	-	3	1
17:05	2	3	-	2
17:10	-	-	-	-
17:15	2	-	-	-
17:20	-	-	3	1
17:25	-	3	14	-
17:30	1	6	2	-
17:35	-	1	-	-
17:40	-	-	-	4
17:45	2	3	6	4
17:50	4	3	-	2
17:55	-	-	2	2
18:00	-	-	-	-
18:05	1	1	1	2
18:10	-	-	-	1
18:15	-	-	-	-
18:20	-	-	1	1
18:25	-	-	-	-

Site 2: A525/B5381 Lower Denbigh Road

A: A525 The Roe

Day: Tuesday

B: A525 High Street

Date: 14 September 2021

C: B5381 Lower Denbigh Road

Weather: Rain & Dull AM/Fine & Mainly Sunny PM

A - B

A - C

Time	A - B								A - C							
	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total
07:30	81	19	4	1	0	1	4	110	37	10	0	1	0	0	0	48
07:45	90	19	1	1	0	1	3	115	51	25	3	2	0	0	1	82
08:00	107	18	2	2	0	0	8	137	53	9	2	0	0	0	1	65
08:15	69	16	4	3	0	0	2	94	55	12	4	1	0	0	0	72
08:30	93	20	10	2	0	0	8	133	46	10	5	0	0	2	0	63
08:45	86	16	2	2	0	0	9	115	45	6	8	1	0	0	1	61
09:00	72	16	0	0	0	1	0	89	38	16	1	1	0	0	0	56
09:15	64	11	5	1	0	0	0	81	36	8	4	1	0	1	0	50
Total	662	135	28	12	0	3	34	874	361	96	27	7	0	3	3	497

14:30	93	7	2	1	0	2	4	109	46	8	2	3	0	0	2	61
14:45	107	18	2	4	0	0	5	136	51	8	1	0	0	1	0	61
15:00	94	19	2	1	2	2	10	130	54	9	1	1	0	1	1	67
15:15	105	14	1	7	0	0	4	131	64	5	1	1	0	0	0	71
15:30	92	16	4	0	0	0	1	113	56	10	0	1	0	1	0	68
15:45	102	20	0	3	0	0	2	127	73	10	1	0	1	0	0	85
16:00	107	13	4	0	0	0	0	124	59	10	2	3	0	1	1	76
16:15	97	14	3	2	1	0	1	118	50	17	1	2	0	0	0	70
16:30	102	21	0	1	1	1	0	126	62	15	5	0	0	0	0	82
16:45	90	10	0	0	0	1	1	102	53	7	2	0	0	0	0	62
17:00	95	17	0	0	0	0	3	115	58	8	2	0	0	2	0	70
17:15	95	13	1	0	0	0	0	109	67	21	1	4	1	0	0	94
17:30	105	17	2	1	1	0	0	126	65	12	0	1	0	1	0	79
17:45	96	16	0	0	1	0	3	116	66	18	0	0	0	1	0	85
18:00	90	17	1	0	1	1	0	110	72	16	1	0	0	1	0	90
18:15	78	10	0	0	0	2	3	93	53	15	0	0	0	0	0	68
Total	1548	242	22	20	7	9	37	1885	949	189	20	16	2	9	4	1189

B - A

B - C

Time	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total
07:30	98	17	7	0	0	0	1	123	7	3	0	0	0	0	1	11
07:45	114	23	3	1	0	1	2	144	8	0	0	0	0	0	0	8
08:00	107	19	2	0	0	0	4	132	14	2	0	1	0	0	1	18
08:15	100	15	1	0	0	1	2	119	10	1	1	0	0	0	1	13
08:30	99	24	1	0	0	0	3	127	6	2	1	0	0	0	0	9
08:45	147	11	3	0	0	0	11	172	10	2	0	0	0	0	1	13
09:00	101	13	4	2	0	0	6	126	8	2	0	0	0	0	0	10
09:15	99	19	2	3	0	1	3	127	7	1	1	0	0	0	0	9
Total	865	141	23	6	0	3	32	1070	70	13	3	1	0	0	4	91

14:30	96	17	5	1	1	1	1	122	5	1	0	0	0	1	0	7
14:45	88	22	4	4	0	2	0	120	8	0	0	0	0	0	0	8
15:00	104	19	1	1	0	2	1	128	9	2	0	0	0	0	1	12
15:15	103	20	0	0	0	2	1	126	6	3	1	0	0	0	0	10
15:30	107	14	2	2	0	0	11	136	8	2	0	0	0	0	0	10
15:45	98	20	3	1	0	2	5	129	6	1	0	0	0	0	1	8
16:00	122	18	1	0	1	1	1	144	9	3	0	1	0	1	1	15
16:15	100	20	3	1	0	0	0	124	15	4	0	0	0	0	0	19
16:30	116	20	2	0	1	2	3	144	10	1	0	0	0	0	0	11
16:45	125	18	4	0	0	2	0	149	9	3	1	0	0	0	0	13
17:00	125	21	4	0	0	0	1	151	11	2	1	0	0	0	1	15
17:15	120	27	4	0	1	0	1	153	7	3	0	0	0	0	0	10
17:30	97	15	1	0	0	2	3	118	10	5	0	0	0	0	1	16
17:45	100	16	0	0	0	1	0	117	10	0	0	0	0	1	0	11
18:00	88	15	1	0	0	0	0	104	11	2	0	0	0	0	0	13
18:15	66	15	1	0	0	1	0	83	11	0	0	0	0	0	0	11
Total	1655	297	36	10	4	18	28	2048	145	32	3	1	0	3	5	189

C - A

C - B

Time	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total	Car	LGV	OGVI	OGV2	P/C	M/C	PSV	Total
07:30	39	13	3	3	0	0	0	58	10	2	0	0	0	0	0	12
07:45	59	11	2	0	0	0	0	72	12	6	0	0	0	0	0	18
08:00	76	22	2	0	0	0	0	100	8	2	1	0	0	0	0	11
08:15	63	12	1	0	0	0	0	76	8	0	0	0	0	0	3	11
08:30	60	12	0	1	0	0	4	77	15	2	1	0	0	0	0	18
08:45	59	12	3	2	0	0	0	76	15	1	1	0	0	0	0	17
09:00	56	18	4	0	0	1	0	79	17	0	0	0	0	0	0	17
09:15	64	11	2	2	0	0	2	81	10	3	0	0	0	0	1	14
Total	476	111	17	8	0	1	6	619	95	16	3	0	0	0	4	118

14:30	53	12	1	2	0	0	0	68	9	2	1	0	0	0	0	12
14:45	53	15	3	3	0	0	0	74	9	0	1	0	0	0	0	10
15:00	51	23	6	4	0	1	0	85	6	1	1	0	0	0	0	8
15:15	61	15	1	1	0	0	0	78	9	1	0	0	0	0	1	11
15:30	68	32	0	1	0	0	0	101	1	1	1	0	0	0	0	3
15:45	74	16	2	1	0	1	3	97	4	0	0	0	0	0	0	4
16:00	65	19	4	0	0	1	0	89	9	2	0	0	0	0	0	11
16:15	63	16	3	3	0	1	1	87	6	1	0	0	0	0	1	8
16:30	72	18	0	1	1	0	0	92	25	0	0	0	1	0	0	26
16:45	77	21	3	1	0	0	1	103	19	3	0	0	0	0	0	22
17:00	66	11	2	2	0	1	0	82	12	2	0	0	0	0	0	14
17:15	81	10	0	0	0	1	0	92	8	4	1	0	3	0	1	17
17:30	68	9	0	0	0	0	1	78	8	1	0	0	0	0	0	9
17:45	44	12	0	1	0	0	1	58	12	3	0	0	0	0	0	15
18:00	42	15	0	0	1	3	0	61	14	2	0	0	0	0	0	16
18:15	42	3	0	0	0	0	0	45	18	0	0	0	0	0	0	18
Total	980	247	25	20	2	9	7	1290	169	23	5	0	4	0	3	204

A525 THE ROE/A525 HIGH STREET/B5391 LOWER DENDIGH ROAD. ST ASAPH

QUEUE LENGTH SURVEY - TUESDAY 14 SEPTEMBER 2021

Arm	A		B	C	
	Inside	Outside		-	Inside
07:30	-	-	-	1	-
07:35	1	-	-	-	-
07:40	2	-	4	4	-
07:45	-	-	2	2	-
07:50	4	-	1	1	-
07:55	-	-	7	4	-
08:00	2	1	-	-	-
08:05	6	-	3	-	-
08:10	-	-	1	6	-
08:15	1	-	2	2	-
08:20	3	-	9	4	-
08:25	4	-	4	2	-
08:30	-	-	5	2	2
08:35	1	-	6	1	-
08:40	2	-	3	1	-
08:45	1	-	2	3	-
08:50	-	-	1	-	2
08:55	1	-	-	1	-
09:00	2	-	2	2	-
09:05	1	-	-	-	-
09:10	-	-	4	-	-
09:15	2	-	2	-	1
09:20	1	-	1	-	-
09:25	-	-	-	-	-

Arm	A		B	C	
	Inside	Outside		-	Inside
14:30	1	-	2	-	-
14:35	-	-	-	1	-
14:40	-	-	3	2	-
14:45	1	-	2	-	-
14:50	-	-	-	-	-
14:55	1	1	6	2	1
15:00	-	-	2	-	-
15:05	2	1	4	-	-
15:10	2	-	2	-	-
15:15	2	-	4	-	1
15:20	-	-	2	-	-
15:25	1	-	-	1	-
15:30	2	-	3	2	-
15:35	-	-	2	-	-
15:40	-	-	1	1	-
15:45	1	-	7	3	-
15:50	-	-	2	-	-
15:55	1	-	3	1	-
16:00	3	-	5	-	-
16:05	1	-	1	1	-
16:10	2	-	3	2	-
16:15	1	-	-	-	-
16:20	-	-	4	5	2
16:25	1	-	2	2	1
16:30	2	-	8	4	1
16:35	2	-	1	2	-
16:40	-	-	2	-	-
16:45	1	-	0	1	-
16:50	-	-	1	2	1
16:55	1	-	4	-	-
17:00	-	-	3	2	-
17:05	1	-	4	-	-
17:10	2	-	10	3	1
17:15	-	-	4	-	-
17:20	-	-	-	3	1
17:25	-	1	6	1	-
17:30	-	-	-	2	-
17:35	2	-	2	2	-
17:40	1	-	-	3	-
17:45	2	-	3	-	-
17:50	3	-	2	-	-
17:55	1	-	-	1	-
18:00	1	-	2	3	-
18:05	-	-	1	-	-
18:10	-	-	7	4	1
18:15	-	-	2	-	-
18:20	-	-	-	-	-
18:25	-	-	-	-	-

S|C|P

APPENDIX B

Junctions 9
ARCADY 9 - Roundabout 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: 210584 St Asaph_ARCADY_A525.Mount Rd.Upper Denbigh Rd..j9
 Path: Z:\Job Library\2021\210584 - Upper Denbigh Road, St Asaph\Traffic Data\Junction Assessments
 Report generation date: 21/09/2021 09:36:59

- »2021 Survey, AM
- »2021 Survey, PM
- »2026 Assess, AM
- »2026 Assess, PM

Summary of junction performance

	AM							PM						
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Network Residual Capacity
2021 Survey														
Arm 1	D1	0.4	10.77	0.30	B	12.05	18 % [Arm 2]	D2	0.3	9.14	0.24	A	9.45	35 % [Arm 2]
Arm 2		2.9	15.34	0.75	C				1.8	10.96	0.65	B		
Arm 3		1.7	9.67	0.63	A				1.4	8.56	0.59	A		
Arm 4		0.2	7.11	0.20	A				0.2	6.31	0.16	A		
2026 Assess														
Arm 1	D3	0.5	11.97	0.33	B	16.98	6 % [Arm 2]	D4	0.4	10.64	0.29	B	11.35	25 % [Arm 2]
Arm 2		5.0	24.06	0.84	C				2.3	13.06	0.70	B		
Arm 3		2.1	11.56	0.68	B				1.9	10.51	0.66	B		
Arm 4		0.3	7.87	0.22	A				0.2	6.95	0.17	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. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	A525 / Mount Rd / Upper Denbigh Rd
Location	St Asaph
Site number	210584
Date	06/09/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	SCP\liam bessell
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

Mini-roundabout model	Calculate Queue Percentiles	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9		✓	Delay	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	2021 Survey	AM	ONE HOUR	08:00	09:30	15
D2	2021 Survey	PM	ONE HOUR	17:00	18:30	15
D3	2026 Assess	AM	ONE HOUR	08:00	09:30	15
D4	2026 Assess	PM	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2021 Survey, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 83% of the total flow for the roundabout for one or more time segments]
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	A525 / Mount Rd / Upper Denbigh Rd	Mini-roundabout		1, 2, 3, 4	12.05	B

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		18	Arm 2

Arms

Arms

Arm	Name	Description
1	A525 Chester St (E)	
2	A525 Upper Denbigh Rd (S)	
3	A525 High St (W)	
4	Mount Rd	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1	3.00	3.00	3.40	4.4	7.90	3.70	0.0	
2	3.10	3.10	4.50	3.1	12.00	12.00	0.0	
3	4.30	4.30	4.30	0.0	9.80	7.00	0.0	
4	3.70	3.70	4.70	0.5	8.70	8.00	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.602	886
2	0.621	1008
3	0.640	1072
4	0.622	1038

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	2021 Survey	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	130	100.000
2		✓	635	100.000
3		✓	573	100.000
4		✓	112	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	85	31	14
	2	56	0	551	28
	3	20	520	0	33
	4	16	30	66	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	0.30	10.77	0.4	B
2	0.75	15.34	2.9	C
3	0.63	9.67	1.7	A
4	0.20	7.11	0.2	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	98	461	608	0.161	97	0.2	7.033	A
2	478	83	957	0.500	474	1.0	7.400	A
3	431	73	1025	0.421	429	0.7	6.004	A
4	84	446	761	0.111	84	0.1	5.316	A

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	117	553	553	0.211	117	0.3	8.243	A
2	571	100	947	0.603	569	1.5	9.478	A
3	515	88	1016	0.507	514	1.0	7.154	A
4	101	535	705	0.143	101	0.2	5.951	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	143	676	479	0.299	143	0.4	10.683	B
2	699	122	933	0.750	694	2.8	14.737	B
3	631	107	1003	0.629	628	1.6	9.531	A
4	123	653	631	0.195	123	0.2	7.077	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	143	678	477	0.300	143	0.4	10.767	B
2	699	122	933	0.750	699	2.9	15.344	C
3	631	108	1003	0.629	631	1.7	9.666	A
4	123	656	630	0.196	123	0.2	7.110	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	117	556	551	0.212	117	0.3	8.320	A
2	571	100	946	0.603	576	1.6	9.867	A
3	515	89	1015	0.507	518	1.0	7.270	A
4	101	539	703	0.143	101	0.2	5.985	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	98	465	606	0.162	98	0.2	7.100	A
2	478	84	956	0.500	480	1.0	7.594	A
3	431	74	1025	0.421	433	0.7	6.095	A
4	84	450	758	0.111	84	0.1	5.349	A

2021 Survey, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 84% of the total flow for the roundabout for one or more time segments]
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	A525 / Mount Rd / Upper Denbigh Rd	Mini-roundabout		1, 2, 3, 4	9.45	A

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		35	Arm 2

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	2021 Survey	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	110	100.000
2		✓	547	100.000
3		✓	540	100.000
4		✓	96	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	58	35	17
	2	37	0	483	27
	3	20	471	0	49
	4	8	26	62	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	0.24	9.14	0.3	A
2	0.65	10.96	1.8	B
3	0.59	8.56	1.4	A
4	0.16	6.31	0.2	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	83	418	634	0.131	82	0.1	6.519	A
2	412	85	955	0.431	409	0.7	6.551	A
3	407	61	1033	0.393	404	0.6	5.698	A
4	72	395	792	0.091	72	0.1	4.996	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	99	502	584	0.169	99	0.2	7.419	A
2	492	102	945	0.520	490	1.1	7.899	A
3	485	73	1026	0.473	484	0.9	6.641	A
4	86	474	743	0.116	86	0.1	5.480	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	121	614	516	0.235	121	0.3	9.092	A
2	602	125	931	0.647	599	1.8	10.773	B
3	595	89	1015	0.586	593	1.4	8.477	A
4	106	579	677	0.156	105	0.2	6.294	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	121	615	515	0.235	121	0.3	9.135	A
2	602	126	930	0.647	602	1.8	10.955	B
3	595	89	1015	0.586	594	1.4	8.559	A
4	106	581	676	0.156	106	0.2	6.310	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	99	504	582	0.170	99	0.2	7.466	A
2	492	103	945	0.521	495	1.1	8.048	A
3	485	73	1025	0.474	487	0.9	6.717	A
4	86	477	741	0.116	87	0.1	5.499	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	83	422	632	0.131	83	0.2	6.563	A
2	412	86	955	0.431	413	0.8	6.662	A
3	407	61	1033	0.394	408	0.7	5.766	A
4	72	399	790	0.092	72	0.1	5.017	A

2026 Assess, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 83% of the total flow for the roundabout for one or more time segments]
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	A525 / Mount Rd / Upper Denbigh Rd	Mini-roundabout		1, 2, 3, 4	16.98	C

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		6	Arm 2

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2026 Assess	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	137	100.000
2		✓	713	100.000
3		✓	611	100.000
4		✓	116	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	91	32	14
	2	84	0	601	28
	3	21	556	0	34
	4	17	31	68	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	0.33	11.97	0.5	B
2	0.84	24.06	5.0	C
3	0.68	11.56	2.1	B
4	0.22	7.87	0.3	A

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	103	490	591	0.175	102	0.2	7.357	A
2	537	85	955	0.562	532	1.3	8.401	A
3	460	94	1012	0.455	457	0.8	6.448	A
4	87	494	731	0.120	87	0.1	5.587	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	123	587	532	0.231	123	0.3	8.789	A
2	641	102	945	0.678	638	2.0	11.603	B
3	549	113	1000	0.549	548	1.2	7.935	A
4	104	592	669	0.156	104	0.2	6.369	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	151	718	454	0.333	150	0.5	11.832	B
2	785	125	931	0.843	774	4.7	21.653	C
3	673	137	984	0.683	669	2.1	11.293	B
4	128	723	588	0.217	127	0.3	7.812	A

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	151	721	452	0.334	151	0.5	11.966	B
2	785	126	930	0.844	784	5.0	24.057	C
3	673	139	983	0.684	673	2.1	11.565	B
4	128	727	585	0.218	128	0.3	7.870	A

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	123	592	529	0.233	124	0.3	8.902	A
2	641	103	944	0.679	652	2.2	12.754	B
3	549	115	998	0.550	553	1.2	8.142	A
4	104	599	665	0.157	105	0.2	6.428	A

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	103	495	588	0.175	104	0.2	7.441	A
2	537	86	955	0.562	540	1.3	8.754	A
3	460	95	1011	0.455	462	0.8	6.571	A
4	87	500	727	0.120	88	0.1	5.633	A

2026 Assess, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 2 and 3 have 84% of the total flow for the roundabout for one or more time segments]
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	A525 / Mount Rd / Upper Denbigh Rd	Mini-roundabout		1, 2, 3, 4	11.35	B

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		25	Arm 2

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2026 Assess	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	124	100.000
2		✓	593	100.000
3		✓	601	100.000
4		✓	98	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	70	36	18
	2	51	0	514	28
	3	21	530	0	50
	4	8	26	64	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	0.29	10.64	0.4	B
2	0.70	13.06	2.3	B
3	0.66	10.51	1.9	B
4	0.17	6.95	0.2	A

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	93	464	607	0.154	93	0.2	6.995	A
2	446	88	954	0.468	443	0.9	7.003	A
3	452	72	1026	0.441	449	0.8	6.213	A
4	74	450	758	0.097	73	0.1	5.256	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	111	556	551	0.202	111	0.3	8.183	A
2	533	106	943	0.566	531	1.3	8.719	A
3	540	87	1016	0.532	539	1.1	7.519	A
4	88	540	702	0.126	88	0.1	5.861	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	137	680	476	0.287	136	0.4	10.555	B
2	653	130	928	0.704	649	2.3	12.716	B
3	662	106	1004	0.659	659	1.9	10.332	B
4	108	660	627	0.172	108	0.2	6.924	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	137	683	475	0.288	137	0.4	10.642	B
2	653	130	928	0.704	653	2.3	13.063	B
3	662	107	1004	0.659	662	1.9	10.511	B
4	108	663	625	0.173	108	0.2	6.954	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	111	560	548	0.203	112	0.3	8.261	A
2	533	106	942	0.566	537	1.3	8.970	A
3	540	88	1016	0.532	543	1.2	7.664	A
4	88	544	699	0.126	88	0.1	5.895	A

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	93	468	604	0.155	94	0.2	7.060	A
2	446	89	953	0.468	448	0.9	7.154	A
3	452	73	1025	0.441	454	0.8	6.317	A
4	74	455	755	0.098	74	0.1	5.286	A

S|C|P

APPENDIX C

<h1>Junctions 9</h1>
<h2>ARCADY 9 - Roundabout Module</h2>
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Filename: 210584 St Asaph_ARCADY_A525.Lower Denbigh Rd..j9
Path: Z:\Job Library\2021\210584 - Upper Denbigh Road, St Asaph\Traffic Data\Junction Assessments
Report generation date: 21/09/2021 09:19:41

- »2021 Survey, AM
- »2021 Survey, PM
- »2026 Base, AM
- »2026 Base, PM
- »2026 Assess, AM
- »2026 Assess, PM

Summary of junction performance

		AM						PM						
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Network Residual Capacity
2021 Survey														
Arm 1	D1	7.6	42.32	0.90	E	26.38	-3 % [Arm 1]	D2	7.3	42.46	0.90	E	27.33	-3 % [Arm 1]
Arm 2		1.9	15.80	0.66	C				2.1	16.56	0.68	C		
Arm 3		4.5	19.12	0.83	C				5.3	21.82	0.85	C		
2026 Base														
Arm 1	D3	13.0	67.09	0.96	F	37.85	-8 % [Arm 1]	D4	11.2	61.66	0.95	F	38.18	-7 % [Arm 1]
Arm 2		2.3	18.37	0.70	C				2.5	19.18	0.72	C		
Arm 3		5.9	24.22	0.87	C				7.7	30.75	0.90	D		
2026 Assess														
Arm 1	D5	16.7	82.14	0.99	F	44.17	-9 % [Arm 1]	D6	12.4	66.66	0.96	F	42.88	-8 % [Arm 1]
Arm 2		2.3	19.08	0.71	C				2.5	19.53	0.73	C		
Arm 3		6.3	25.79	0.87	D				9.6	37.37	0.92	E		

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. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	
Location	
Site number	
Date	06/09/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	SCP\liam bessell
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

Mini-roundabout model	Calculate Queue Percentiles	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9		✓	Delay	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	2021 Survey	AM	ONE HOUR	08:00	09:30	15
D2	2021 Survey	PM	ONE HOUR	17:00	18:30	15
D3	2026 Base	AM	ONE HOUR	08:00	09:30	15
D4	2026 Base	PM	ONE HOUR	17:00	18:30	15
D5	2026 Assess	AM	ONE HOUR	08:00	09:30	15
D6	2026 Assess	PM	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2021 Survey, AM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	26.38	D

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		-3	Arm 1

Arms

Arms

Arm	Name	Description
1	A525 (E)	
2	Lower Denbigh Rd	
3	A525 (N)	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1	2.70	2.70	5.40	7.8	17.00	11.00	0.0	✓
2	4.50	4.50	5.30	2.3	17.00	15.40	0.0	✓
3	3.60	3.60	5.90	8.2	17.00	16.30	0.0	✓

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.520	925
2	0.581	1034
3	0.596	1106

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	2021 Survey	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	631	100.000
2		✓	402	100.000
3		✓	799	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	1	2	3	
From	1	0	58	573
	2	62	0	340
	3	526	273	0

Vehicle Mix

Heavy Vehicle Percentages

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.90	42.32	7.6	E
2	0.66	15.80	1.9	C
3	0.83	19.12	4.5	C

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	475	204	819	0.580	470	1.3	10.161	B
2	303	426	786	0.385	300	0.6	7.372	A
3	602	46	1078	0.558	597	1.2	7.404	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	567	244	798	0.711	563	2.3	15.093	C
2	361	512	737	0.491	360	0.9	9.524	A
3	718	56	1072	0.670	715	2.0	9.997	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	695	297	770	0.902	677	6.7	33.762	D
2	443	615	677	0.654	439	1.8	14.947	B
3	880	68	1065	0.826	870	4.3	17.681	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	695	300	769	0.904	691	7.6	42.321	E
2	443	627	669	0.661	442	1.9	15.798	C
3	880	68	1065	0.826	879	4.5	19.125	C

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	567	249	796	0.713	587	2.6	18.709	C
2	361	533	724	0.499	365	1.0	10.114	B
3	718	56	1072	0.670	728	2.1	10.732	B

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	475	207	817	0.581	480	1.4	10.813	B
2	303	436	781	0.388	304	0.6	7.579	A
3	602	47	1078	0.558	605	1.3	7.667	A

2021 Survey, PM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	27.33	D

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		-3	Arm 1

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	2021 Survey	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	605	100.000
2		✓	425	100.000
3		✓	829	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	55	550
	2	49	0	376
	3	506	323	0

Vehicle Mix

Heavy Vehicle Percentages

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.90	42.46	7.3	E
2	0.68	16.56	2.1	C
3	0.85	21.82	5.3	C

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	455	241	800	0.570	450	1.3	10.167	B
2	320	409	796	0.402	317	0.7	7.480	A
3	624	37	1084	0.576	619	1.3	7.659	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	544	289	775	0.702	540	2.2	15.103	C
2	382	491	749	0.510	381	1.0	9.742	A
3	745	44	1079	0.690	742	2.2	10.562	B

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	666	351	742	0.897	649	6.4	33.904	D
2	468	590	691	0.677	464	2.0	15.600	C
3	913	54	1074	0.850	901	5.0	19.702	C

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	666	355	740	0.900	662	7.3	42.457	E
2	468	602	684	0.684	468	2.1	16.561	C
3	913	54	1073	0.850	912	5.3	21.821	C

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	544	295	772	0.705	563	2.5	18.655	C
2	382	512	737	0.519	386	1.1	10.384	B
3	745	45	1079	0.691	757	2.3	11.563	B

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	455	245	798	0.571	460	1.4	10.805	B
2	320	418	791	0.405	322	0.7	7.699	A
3	624	37	1083	0.576	628	1.4	7.964	A

2026 Base, AM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	37.85	E

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		-8	Arm 1

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2026 Base	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	667	100.000
2		✓	416	100.000
3		✓	836	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	61	606
	2	64	0	352
	3	553	283	0

Vehicle Mix

Heavy Vehicle Percentages

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.96	67.09	13.0	F
2	0.70	18.37	2.3	C
3	0.87	24.22	5.9	C

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	502	211	815	0.616	496	1.6	11.077	B
2	313	451	772	0.406	310	0.7	7.754	A
3	629	48	1077	0.584	624	1.4	7.852	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	600	253	793	0.756	594	2.9	17.626	C
2	374	540	720	0.519	372	1.1	10.305	B
3	752	57	1071	0.701	748	2.3	11.007	B

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	734	307	765	0.960	705	10.1	46.092	E
2	458	641	662	0.692	454	2.1	16.972	C
3	920	70	1064	0.865	908	5.5	21.420	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	734	311	763	0.962	723	13.0	67.089	F
2	458	657	652	0.702	457	2.3	18.371	C
3	920	70	1064	0.865	919	5.9	24.221	C

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	600	259	790	0.759	638	3.4	28.133	D
2	374	580	697	0.536	378	1.2	11.431	B
3	752	58	1071	0.702	765	2.4	12.264	B

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	502	214	813	0.617	509	1.7	12.096	B
2	313	463	765	0.409	315	0.7	8.035	A
3	629	48	1077	0.585	633	1.4	8.196	A

2026 Base, PM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	38.18	E

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		-7	Arm 1

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2026 Base	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	633	100.000
2		✓	440	100.000
3		✓	876	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	57	576
	2	51	0	389
	3	542	334	0

Vehicle Mix

Heavy Vehicle Percentages

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.95	61.66	11.2	F
2	0.72	19.18	2.5	C
3	0.90	30.75	7.7	D

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	477	249	795	0.599	471	1.5	10.908	B
2	331	428	785	0.422	328	0.7	7.835	A
3	659	38	1083	0.609	653	1.5	8.267	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	569	299	770	0.739	564	2.7	17.123	C
2	396	513	736	0.538	394	1.1	10.481	B
3	788	46	1078	0.730	783	2.6	12.021	B

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	697	361	737	0.945	672	9.0	43.638	E
2	484	611	679	0.714	480	2.3	17.651	C
3	964	56	1072	0.899	947	7.0	25.646	D

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	697	367	734	0.949	688	11.2	61.660	F
2	484	626	670	0.723	484	2.5	19.178	C
3	964	56	1072	0.900	961	7.7	30.747	D

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	569	308	765	0.744	601	3.1	25.495	D
2	396	547	716	0.552	400	1.3	11.580	B
3	788	46	1078	0.731	807	2.8	14.148	B

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	477	253	793	0.601	483	1.6	11.830	B
2	331	439	779	0.425	333	0.8	8.122	A
3	659	39	1083	0.609	665	1.6	8.713	A

2026 Assess, AM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	44.17	E

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		-9	Arm 1

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2026 Assess	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	684	100.000
2		✓	416	100.000
3		✓	845	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	61	623
	2	64	0	352
	3	562	283	0

Vehicle Mix

Heavy Vehicle Percentages

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.99	82.14	16.7	F
2	0.71	19.08	2.3	C
3	0.87	25.79	6.3	D

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	515	211	815	0.632	508	1.7	11.506	B
2	313	463	765	0.409	310	0.7	7.875	A
3	636	48	1077	0.591	631	1.4	7.964	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	615	253	793	0.775	609	3.2	18.906	C
2	374	555	712	0.525	372	1.1	10.557	B
3	760	57	1071	0.709	756	2.3	11.273	B

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	753	307	765	0.984	717	12.2	52.643	F
2	458	653	655	0.700	454	2.2	17.523	C
3	930	70	1064	0.874	916	5.8	22.490	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	753	311	763	0.987	735	16.7	82.140	F
2	458	670	645	0.710	457	2.3	19.078	C
3	930	70	1064	0.875	928	6.3	25.789	D

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	615	259	790	0.778	666	3.9	36.784	E
2	374	607	681	0.549	378	1.2	12.040	B
3	760	58	1071	0.709	775	2.5	12.716	B

09:15 - 09:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	515	214	813	0.633	524	1.8	12.762	B
2	313	477	757	0.414	315	0.7	8.190	A
3	636	49	1077	0.591	640	1.5	8.331	A

2026 Assess, PM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3	42.88	E

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		-8	Arm 1

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2026 Assess	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		✓	640	100.000
2		✓	440	100.000
3		✓	899	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	57	583
	2	51	0	389
	3	565	334	0

Vehicle Mix

Heavy Vehicle Percentages

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.96	66.66	12.4	F
2	0.73	19.53	2.5	C
3	0.92	37.37	9.6	E

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	482	249	795	0.606	476	1.5	11.072	B
2	331	433	782	0.424	328	0.7	7.936	A
3	677	38	1083	0.625	670	1.6	8.596	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	575	298	770	0.747	570	2.8	17.599	C
2	396	519	732	0.540	394	1.1	10.588	B
3	808	46	1078	0.749	803	2.8	12.858	B

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	705	360	738	0.955	677	9.6	45.865	E
2	484	617	676	0.717	480	2.4	17.923	C
3	990	56	1072	0.923	968	8.4	29.471	D

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	705	366	735	0.959	694	12.4	66.664	F
2	484	632	667	0.727	484	2.5	19.530	C
3	990	56	1072	0.923	985	9.6	37.375	E

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	575	310	764	0.753	612	3.3	27.933	D
2	396	557	710	0.557	401	1.3	11.799	B
3	808	46	1078	0.750	834	3.2	16.111	C

18:15 - 18:30

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	482	254	793	0.608	489	1.6	12.088	B
2	331	445	775	0.427	333	0.8	8.187	A
3	677	39	1083	0.625	683	1.7	9.129	A

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APPENDIX D



SYMBOL	DESCRIPTION	QUANTITY	UNIT	TOTAL
1	1 Bed Villa w/ 2nd Floor	525	SQFT	1,611
2	2 Bed Villa w/ 2nd Floor	800	SQFT	2,400
3	3 Bed Villa w/ 2nd Floor	400	SQFT	1,200
4	4 Bed Villa w/ 2nd Floor	200	SQFT	600
5	5 Bed Villa w/ 2nd Floor	100	SQFT	300
6	6 Bed Villa w/ 2nd Floor	50	SQFT	150
7	7 Bed Villa w/ 2nd Floor	25	SQFT	75
8	8 Bed Villa w/ 2nd Floor	12	SQFT	36
9	9 Bed Villa w/ 2nd Floor	6	SQFT	18
10	10 Bed Villa w/ 2nd Floor	3	SQFT	9
11	11 Bed Villa w/ 2nd Floor	1	SQFT	3
12	12 Bed Villa w/ 2nd Floor	0	SQFT	0
13	13 Bed Villa w/ 2nd Floor	0	SQFT	0
14	14 Bed Villa w/ 2nd Floor	0	SQFT	0
15	15 Bed Villa w/ 2nd Floor	0	SQFT	0
16	16 Bed Villa w/ 2nd Floor	0	SQFT	0
17	17 Bed Villa w/ 2nd Floor	0	SQFT	0
18	18 Bed Villa w/ 2nd Floor	0	SQFT	0
19	19 Bed Villa w/ 2nd Floor	0	SQFT	0
20	20 Bed Villa w/ 2nd Floor	0	SQFT	0
21	21 Bed Villa w/ 2nd Floor	0	SQFT	0
22	22 Bed Villa w/ 2nd Floor	0	SQFT	0
23	23 Bed Villa w/ 2nd Floor	0	SQFT	0
24	24 Bed Villa w/ 2nd Floor	0	SQFT	0
25	25 Bed Villa w/ 2nd Floor	0	SQFT	0
26	26 Bed Villa w/ 2nd Floor	0	SQFT	0
27	27 Bed Villa w/ 2nd Floor	0	SQFT	0
28	28 Bed Villa w/ 2nd Floor	0	SQFT	0
29	29 Bed Villa w/ 2nd Floor	0	SQFT	0
30	30 Bed Villa w/ 2nd Floor	0	SQFT	0
31	31 Bed Villa w/ 2nd Floor	0	SQFT	0
32	32 Bed Villa w/ 2nd Floor	0	SQFT	0
33	33 Bed Villa w/ 2nd Floor	0	SQFT	0
34	34 Bed Villa w/ 2nd Floor	0	SQFT	0
35	35 Bed Villa w/ 2nd Floor	0	SQFT	0
36	36 Bed Villa w/ 2nd Floor	0	SQFT	0
37	37 Bed Villa w/ 2nd Floor	0	SQFT	0
38	38 Bed Villa w/ 2nd Floor	0	SQFT	0
39	39 Bed Villa w/ 2nd Floor	0	SQFT	0
40	40 Bed Villa w/ 2nd Floor	0	SQFT	0
41	41 Bed Villa w/ 2nd Floor	0	SQFT	0
42	42 Bed Villa w/ 2nd Floor	0	SQFT	0
43	43 Bed Villa w/ 2nd Floor	0	SQFT	0
44	44 Bed Villa w/ 2nd Floor	0	SQFT	0
45	45 Bed Villa w/ 2nd Floor	0	SQFT	0
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67	67 Bed Villa w/ 2nd Floor	0	SQFT	0
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69	69 Bed Villa w/ 2nd Floor	0	SQFT	0
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73	73 Bed Villa w/ 2nd Floor	0	SQFT	0
74	74 Bed Villa w/ 2nd Floor	0	SQFT	0
75	75 Bed Villa w/ 2nd Floor	0	SQFT	0
76	76 Bed Villa w/ 2nd Floor	0	SQFT	0
77	77 Bed Villa w/ 2nd Floor	0	SQFT	0
78	78 Bed Villa w/ 2nd Floor	0	SQFT	0
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84	84 Bed Villa w/ 2nd Floor	0	SQFT	0
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95	95 Bed Villa w/ 2nd Floor	0	SQFT	0
96	96 Bed Villa w/ 2nd Floor	0	SQFT	0
97	97 Bed Villa w/ 2nd Floor	0	SQFT	0
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100	100 Bed Villa w/ 2nd Floor	0	SQFT	0
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105	105 Bed Villa w/ 2nd Floor	0	SQFT	0
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114	114 Bed Villa w/ 2nd Floor	0	SQFT	0
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123	123 Bed Villa w/ 2nd Floor	0	SQFT	0
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134	134 Bed Villa w/ 2nd Floor	0	SQFT	0
135	135 Bed Villa w/ 2nd Floor	0	SQFT	0
136	136 Bed Villa w/ 2nd Floor	0	SQFT	0
137	137 Bed Villa w/ 2nd Floor	0	SQFT	0
138	138 Bed Villa w/ 2nd Floor	0	SQFT	0
TOTAL		13100	SQFT	404

SYMBOL	DESCRIPTION
[Red line]	Site Boundary
[Dashed line]	1.8m high boundary fence
[Solid line]	1.8m high screen wall / fence
[Hatched area]	Raised feature junction
[Grey area]	Private Drive
[Dashed line]	Visibility Splays - 2.4x43m to Site Entrances
[Green circles]	Indicative Landscaping. Refer to landscaping design for exact details
[Blue squares]	Number of parking spaces proposed to Semi-Detached and Detached Dwellings in accordance with LPA Parking Standards
[Blue squares]	Parking space allocation to Frontage Parking Dwellings
[Star symbol]	Affordable Housing
[Green outline]	Existing retained hedges/landscaping

REV	DESCRIPTION	DATE
A	Internal design review	11/06/21
B	Plot Sub & Buffer to Hospice added	22/07/21
C	Amended in line with Engineering appraisal & Tree Survey info added	24/08/21
D	Nevet mitigation added	27/08/21

SYMBOL	DESCRIPTION
[Red line]	Site Boundary
[Dashed line]	1.8m high boundary fence
[Solid line]	1.8m high screen wall / fence
[Hatched area]	Raised feature junction
[Grey area]	Private Drive
[Dashed line]	Visibility Splays - 2.4x43m to Site Entrances
[Green circles]	Indicative Landscaping. Refer to landscaping design for exact details
[Blue squares]	Number of parking spaces proposed to Semi-Detached and Detached Dwellings in accordance with LPA Parking Standards
[Blue squares]	Parking space allocation to Frontage Parking Dwellings
[Star symbol]	Affordable Housing
[Green outline]	Existing retained hedges/landscaping

Castle Green

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

Site:
Land off Upper Denbigh Road, St Asaph

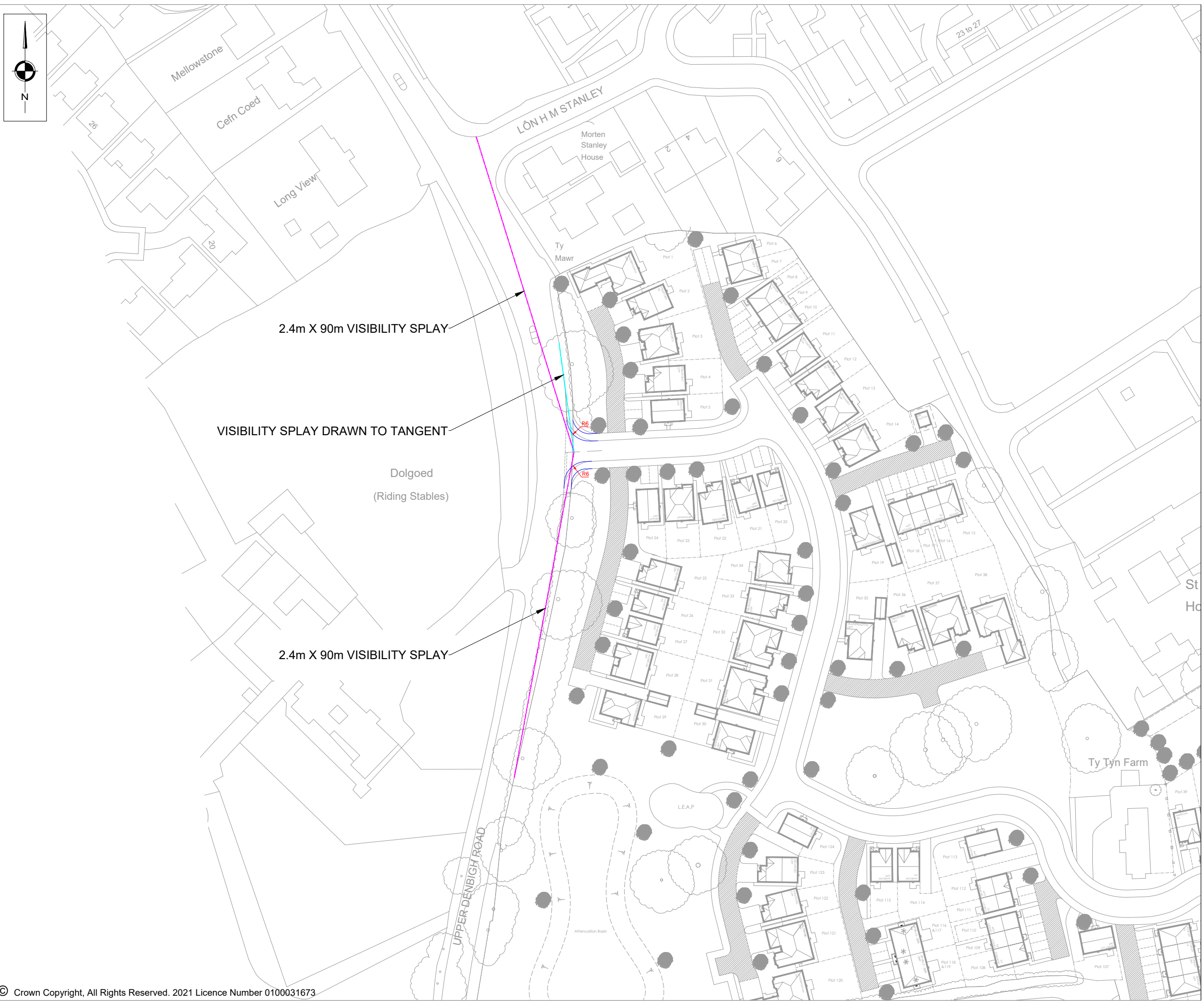
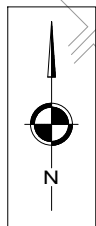
Title:
Proposed Site Plan

Scale: 1:500@A0 Date: 11.06.21

Ref: UPD-STA-SP01 Rev: D

S|C|P

APPENDIX E



NOTES

REVISIONS			
REV	DESCRIPTION	DATE	BY
-	-	-	-

SCP
 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:
**UPPER DENBIGH ROAD,
 ST ASAPH**

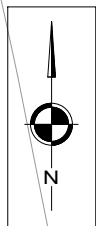
Drawing Title:
VISIBILITY SPLAYS

Drawn By:	BH	Date:	14.09.2021
Checked:	LB	Scale:	1:1000 @ A3
Status:	PLANNING	Approved/Unapproved:	-

Drawing No.	SCP/210584/F01	Rev.	-
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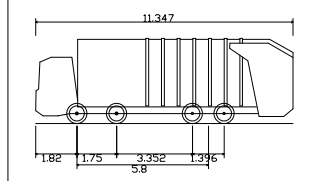
S|C|P

APPENDIX F



1:2000

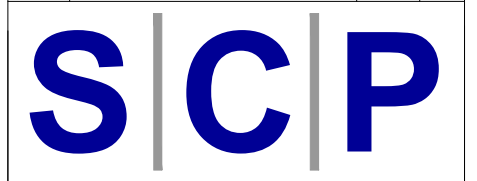
NOTES



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

REVISIONS

REV	DESCRIPTION	DATE	BY
-	-	-	-



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

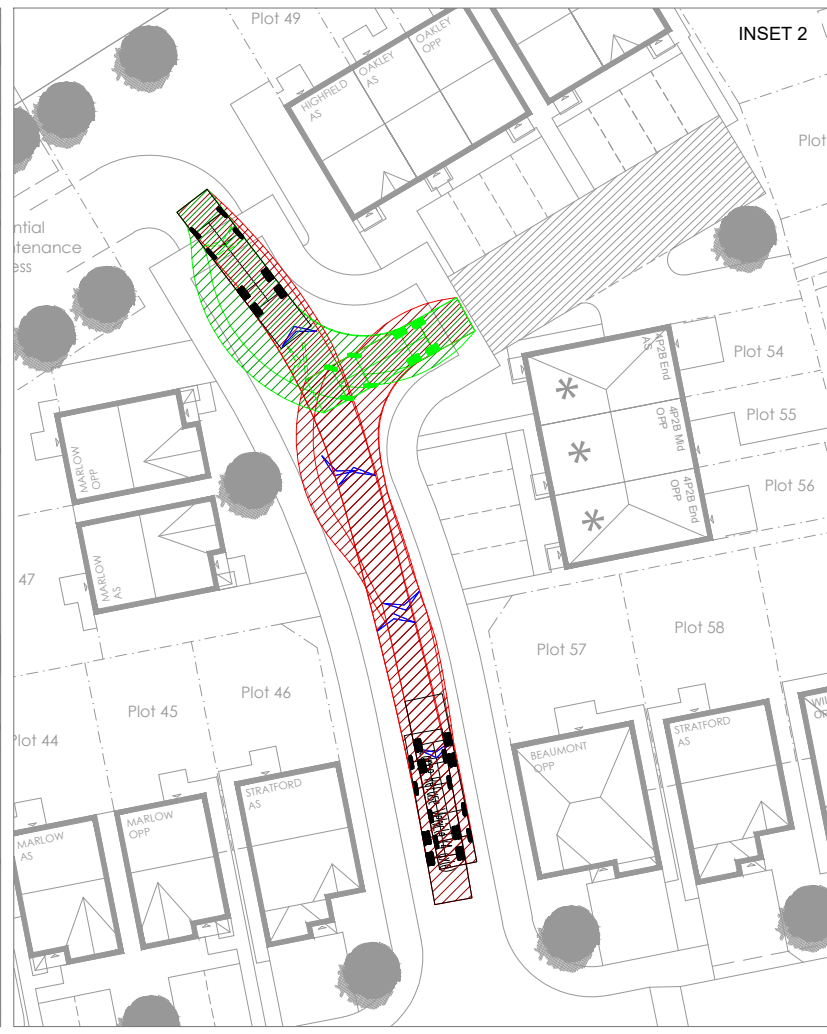
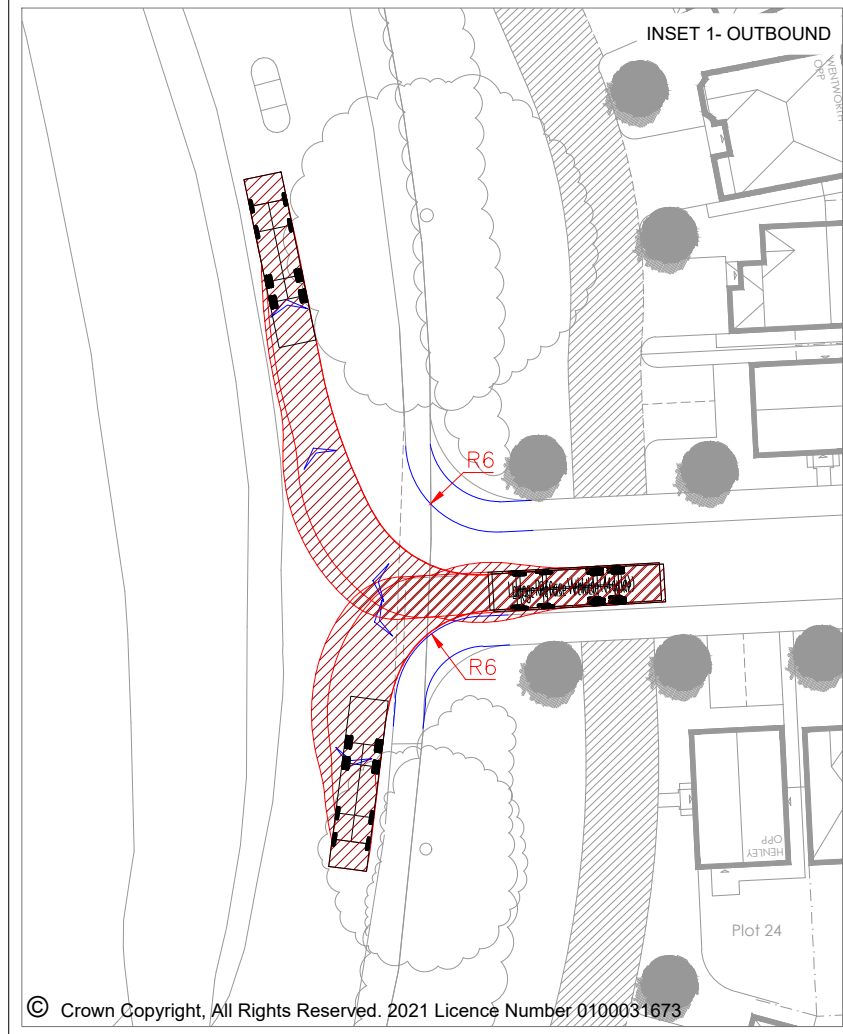
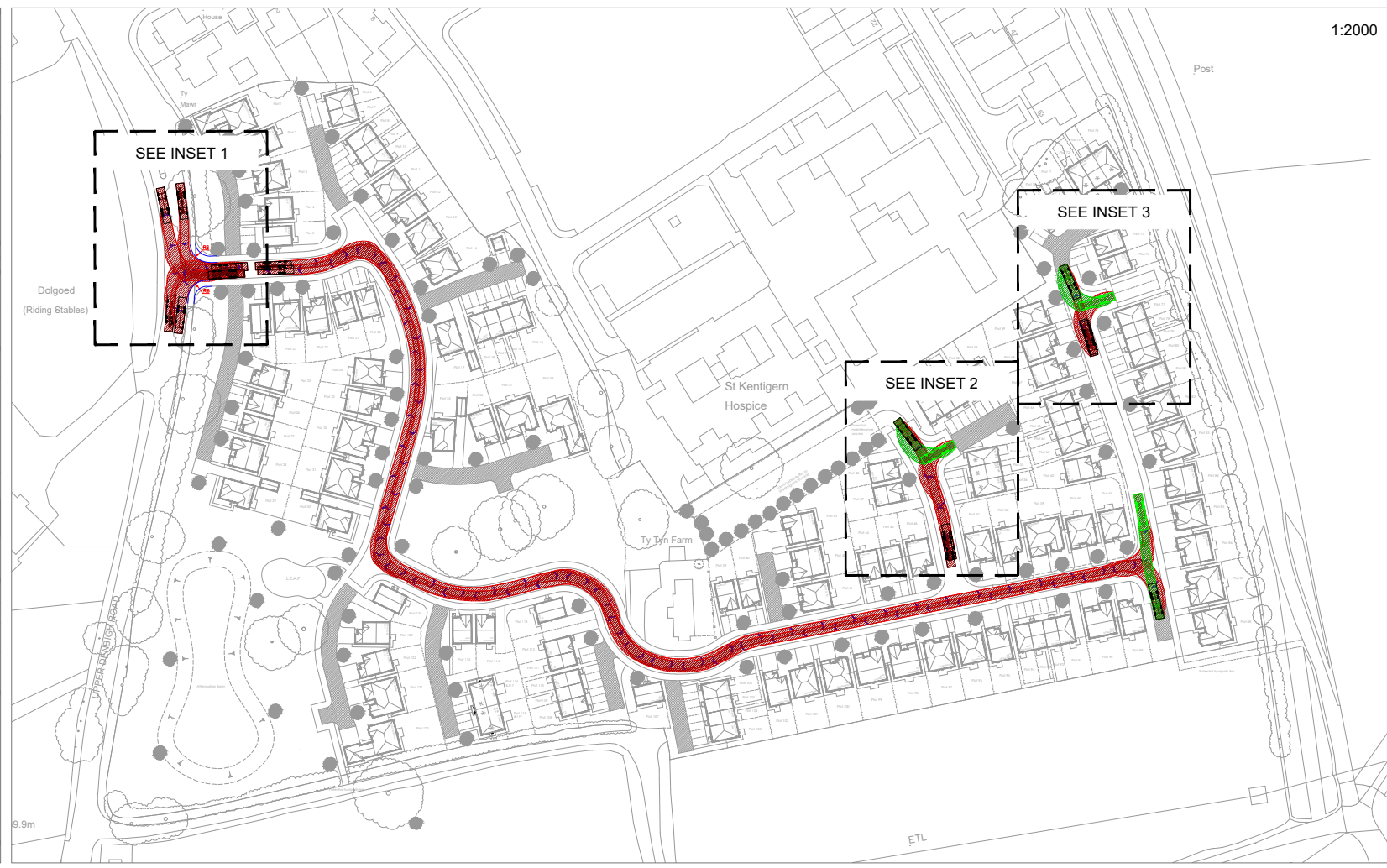
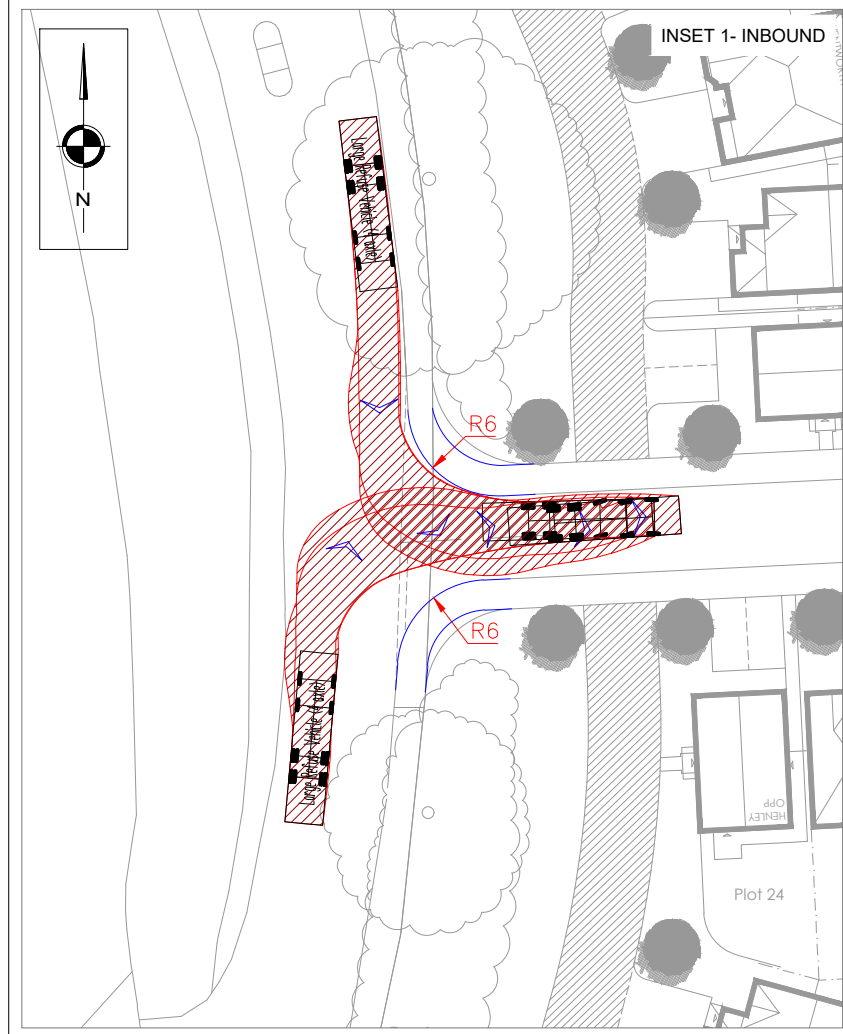
Client Name:
CASTLE GREEN HOMES LTD

Project Title:
**UPPER DENBIGH ROAD,
 ST ASAPH**

Drawing Title:
**SWEPT PATH ANALYSIS
 - REFUSE VEHICLE**

Drawn By:	BH	Date:	14.09.2021
Checked:	LB	Scale:	1:500 @ A3 UNLESS SHOWN
Status:	PLANNING	Approved/Unapproved:	-

Drawing No.	SCP/210584/ATR01	Rev.	-
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APPENDIX G

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
 Category : A - HOUSES PRIVATELY OWNED

MULTI-MODAL TOTAL VEHICLESSelected regions and areas:

02	SOUTH EAST	
	ES EAST SUSSEX	2 days
	HC HAMPSHIRE	1 days
	HF HERTFORDSHIRE	1 days
	KC KENT	3 days
	SC SURREY	3 days
	WS WEST SUSSEX	5 days
03	SOUTH WEST	
	DV DEVON	2 days
04	EAST ANGLIA	
	NF NORFOLK	1 days
	SF SUFFOLK	1 days
05	EAST MIDLANDS	
	LE LEICESTERSHIRE	1 days
06	WEST MIDLANDS	
	SH SHROPSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	NY NORTH YORKSHIRE	2 days
	SY SOUTH YORKSHIRE	1 days
09	NORTH	
	DH DURHAM	3 days
11	SCOTLAND	
	FA FALKIRK	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: 50 to 207 (units:)
 Range Selected by User: 50 to 210 (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: 01/01/13 to 08/10/20

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	5 days
Tuesday	4 days
Wednesday	5 days
Thursday	10 days
Friday	4 days

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

Selected survey types:

Manual count	28 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.

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

Selected Location Sub Categories:

Residential Zone	23
Village	4
No Sub Category	1

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

Secondary Filtering selection:

Use Class:

C3	28 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 500m Range:

All Surveys Included

Population within 1 mile:

1,000 or Less	1 days
1,001 to 5,000	4 days
5,001 to 10,000	10 days
10,001 to 15,000	6 days
15,001 to 20,000	4 days
20,001 to 25,000	2 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	5 days
25,001 to 50,000	6 days
50,001 to 75,000	1 days
75,001 to 100,000	6 days
100,001 to 125,000	2 days
125,001 to 250,000	7 days
250,001 to 500,000	1 days

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

Car ownership within 5 miles:

0.6 to 1.0	4 days
1.1 to 1.5	20 days
1.6 to 2.0	4 days

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

Travel Plan:

Yes	10 days
No	18 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	28 days
-----------------	---------

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

Covid-19 Restrictions	Yes	At least one survey within the selected data set was undertaken at a time of Covid-19 restrictions
-----------------------	-----	--

LIST OF SITES relevant to selection parameters

- | | | | |
|----------|--|-------------------------------------|---------------------|
| 1 | DH-03-A-01 | SEMI DETACHED | DURHAM |
| | GREENFIELDS ROAD
BISHOP AUCKLAND | | |
| | Suburban Area (PPS6 Out of Centre)
Residential Zone | | |
| | Total No of Dwellings: | 50 | |
| | Survey date: TUESDAY | 28/03/17 | Survey Type: MANUAL |
| 2 | DH-03-A-02 | MIXED HOUSES | DURHAM |
| | LEAZES LANE
BISHOP AUCKLAND
ST HELEN AUCKLAND | | |
| | Neighbourhood Centre (PPS6 Local Centre)
Residential Zone | | |
| | Total No of Dwellings: | 125 | |
| | Survey date: MONDAY | 27/03/17 | Survey Type: MANUAL |
| 3 | DH-03-A-03 | SEMI-DETACHED & TERRACED | DURHAM |
| | PILGRIMS WAY
DURHAM | | |
| | Edge of Town
Residential Zone | | |
| | Total No of Dwellings: | 57 | |
| | Survey date: FRIDAY | 19/10/18 | Survey Type: MANUAL |
| 4 | DV-03-A-02 | HOUSES & BUNGALOWS | DEVON |
| | MILLHEAD ROAD
HONITON | | |
| | Suburban Area (PPS6 Out of Centre)
Residential Zone | | |
| | Total No of Dwellings: | 116 | |
| | Survey date: FRIDAY | 25/09/15 | Survey Type: MANUAL |
| 5 | DV-03-A-03 | TERRACED & SEMI DETACHED | DEVON |
| | LOWER BRAND LANE
HONITON | | |
| | Suburban Area (PPS6 Out of Centre)
Residential Zone | | |
| | Total No of Dwellings: | 70 | |
| | Survey date: MONDAY | 28/09/15 | Survey Type: MANUAL |
| 6 | ES-03-A-04 | MIXED HOUSES & FLATS | EAST SUSSEX |
| | NEW LYDD ROAD
CAMBER | | |
| | Edge of Town
Residential Zone | | |
| | Total No of Dwellings: | 134 | |
| | Survey date: FRIDAY | 15/07/16 | Survey Type: MANUAL |
| 7 | ES-03-A-05 | MIXED HOUSES & FLATS | EAST SUSSEX |
| | RATTLE ROAD
NEAR EASTBOURNE
STONE CROSS | | |
| | Edge of Town
Residential Zone | | |
| | Total No of Dwellings: | 99 | |
| | Survey date: WEDNESDAY | 05/06/19 | Survey Type: MANUAL |
| 8 | FA-03-A-02 | MIXED HOUSES | FALKIRK |
| | ROSEBANK AVENUE & SPRINGFIELD DRIVE
FALKIRK | | |
| | Suburban Area (PPS6 Out of Centre)
Residential Zone | | |
| | Total No of Dwellings: | 161 | |
| | Survey date: WEDNESDAY | 29/05/13 | Survey Type: MANUAL |

LIST OF SITES relevant to selection parameters (Cont.)

9	HC-03-A-23 CANADA WAY LIPHOOK	HOUSES & FLATS	HAMPSHIRE
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 62 Survey date: <i>TUESDAY</i> 19/11/19		Survey Type: <i>MANUAL</i>
10	HF-03-A-03 HARE STREET ROAD BUNTINGFORD	MIXED HOUSES	HERTFORDSHIRE
	Edge of Town Residential Zone Total No of Dwellings: 160 Survey date: <i>MONDAY</i> 08/07/19		Survey Type: <i>MANUAL</i>
11	KC-03-A-03 HYTHE ROAD ASHFORD WILLESBOROUGH	MIXED HOUSES & FLATS	KENT
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 51 Survey date: <i>THURSDAY</i> 14/07/16		Survey Type: <i>MANUAL</i>
12	KC-03-A-04 KILN BARN ROAD AYLESFORD DITTON	SEMI-DETACHED & TERRACED	KENT
	Edge of Town Residential Zone Total No of Dwellings: 110 Survey date: <i>FRIDAY</i> 22/09/17		Survey Type: <i>MANUAL</i>
13	KC-03-A-08 MAIDSTONE ROAD CHARING	MIXED HOUSES	KENT
	Neighbourhood Centre (PPS6 Local Centre) Village Total No of Dwellings: 159 Survey date: <i>TUESDAY</i> 22/05/18		Survey Type: <i>MANUAL</i>
14	LE-03-A-02 MELBOURNE ROAD IBSTOCK	DETACHED & OTHERS	LEICESTERSHIRE
	Neighbourhood Centre (PPS6 Local Centre) Village Total No of Dwellings: 85 Survey date: <i>THURSDAY</i> 28/06/18		Survey Type: <i>MANUAL</i>
15	NF-03-A-04 NORTH WALSHAM ROAD NORTH WALSHAM	MIXED HOUSES	NORFOLK
	Edge of Town Residential Zone Total No of Dwellings: 70 Survey date: <i>WEDNESDAY</i> 18/09/19		Survey Type: <i>MANUAL</i>
16	NY-03-A-09 GRAMMAR SCHOOL LANE NORTHALLERTON	MIXED HOUSING	NORTH YORKSHIRE
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 52 Survey date: <i>MONDAY</i> 16/09/13		Survey Type: <i>MANUAL</i>

LIST OF SITES relevant to selection parameters (Cont.)

17	NY-03-A-10	HOUSES AND FLATS	NORTH YORKSHIRE
	BOROUGHBRIDGE ROAD RIPON		
	Edge of Town No Sub Category Total No of Dwellings: 71 Survey date: TUESDAY 17/09/13		Survey Type: MANUAL
18	SC-03-A-04	DETACHED & TERRACED	SURREY
	HIGH ROAD BYFLEET		
	Edge of Town Residential Zone Total No of Dwellings: 71 Survey date: THURSDAY 23/01/14		Survey Type: MANUAL
19	SC-03-A-05	MIXED HOUSES	SURREY
	REIGATE ROAD HORLEY		
	Edge of Town Residential Zone Total No of Dwellings: 207 Survey date: MONDAY 01/04/19		Survey Type: MANUAL
20	SC-03-A-06	MIXED HOUSES & FLATS	SURREY
	AMLETS LANE CRANLEIGH		
	Neighbourhood Centre (PPS6 Local Centre) Village Total No of Dwellings: 116 Survey date: THURSDAY 08/10/20		Survey Type: MANUAL
21	SF-03-A-07	MIXED HOUSES	SUFFOLK
	FOXHALL ROAD IPSWICH		
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 73 Survey date: THURSDAY 09/05/19		Survey Type: MANUAL
22	SH-03-A-05	SEMI-DETACHED/TERRACED	SHROPSHIRE
	SANDCROFT TELFORD SUTTON HILL		
	Edge of Town Residential Zone Total No of Dwellings: 54 Survey date: THURSDAY 24/10/13		Survey Type: MANUAL
23	SY-03-A-01	SEMI DETACHED HOUSES	SOUTH YORKSHIRE
	A19 BENTLEY ROAD DONCASTER BENTLEY RISE		
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 54 Survey date: WEDNESDAY 18/09/13		Survey Type: MANUAL
24	WS-03-A-04	MIXED HOUSES	WEST SUSSEX
	HILLS FARM LANE HORSHAM BROADBRIDGE HEATH		
	Edge of Town Residential Zone Total No of Dwellings: 151 Survey date: THURSDAY 11/12/14		Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

25	WS-03-A-07	BUNGALOWS	WEST SUSSEX
	EMMS LANE NEAR HORSHAM BROOKS GREEN Neighbourhood Centre (PPS6 Local Centre) Village		
	Total No of Dwellings:	57	
	Survey date: THURSDAY	19/10/17	Survey Type: MANUAL
26	WS-03-A-08	MIXED HOUSES	WEST SUSSEX
	ROUNDSTONE LANE ANGMERING		
	Edge of Town Residential Zone		
	Total No of Dwellings:	180	
	Survey date: THURSDAY	19/04/18	Survey Type: MANUAL
27	WS-03-A-09	MIXED HOUSES & FLATS	WEST SUSSEX
	LITTLEHAMPTON ROAD WORTHING WEST DURRINGTON		
	Edge of Town Residential Zone		
	Total No of Dwellings:	197	
	Survey date: THURSDAY	05/07/18	Survey Type: MANUAL
28	WS-03-A-10	MIXED HOUSES	WEST SUSSEX
	TODDINGTON LANE LITTLEHAMPTON WICK		
	Edge of Town Residential Zone		
	Total No of Dwellings:	79	
	Survey date: WEDNESDAY	07/11/18	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/A - HOUSES PRIVATELY OWNED

MULTI-MODAL TOTAL VEHICLES**Calculation factor: 1 DWELLS****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	28	103	0.063	28	103	0.271	28	103	0.334
08:00 - 09:00	28	103	0.111	28	103	0.318	28	103	0.429
09:00 - 10:00	28	103	0.145	28	103	0.170	28	103	0.315
10:00 - 11:00	28	103	0.129	28	103	0.174	28	103	0.303
11:00 - 12:00	28	103	0.128	28	103	0.147	28	103	0.275
12:00 - 13:00	28	103	0.153	28	103	0.139	28	103	0.292
13:00 - 14:00	28	103	0.161	28	103	0.165	28	103	0.326
14:00 - 15:00	28	103	0.152	28	103	0.184	28	103	0.336
15:00 - 16:00	28	103	0.243	28	103	0.148	28	103	0.391
16:00 - 17:00	28	103	0.250	28	103	0.145	28	103	0.395
17:00 - 18:00	28	103	0.293	28	103	0.138	28	103	0.431
18:00 - 19:00	28	103	0.249	28	103	0.138	28	103	0.387
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.077			2.137			4.214

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: 50 - 207 (units:)
Survey date range: 01/01/13 - 08/10/20
Number of weekdays (Monday-Friday): 28
Number of Saturdays: 0
Number of Sundays: 0
Surveys automatically removed from selection: 3
Surveys manually removed from selection: 0

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

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

MULTI-MODAL CYCLISTS**Calculation factor: 1 DWELLS****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	28	103	0.005	28	103	0.010	28	103	0.015
08:00 - 09:00	28	103	0.007	28	103	0.021	28	103	0.028
09:00 - 10:00	28	103	0.001	28	103	0.006	28	103	0.007
10:00 - 11:00	28	103	0.005	28	103	0.005	28	103	0.010
11:00 - 12:00	28	103	0.003	28	103	0.005	28	103	0.008
12:00 - 13:00	28	103	0.006	28	103	0.006	28	103	0.012
13:00 - 14:00	28	103	0.003	28	103	0.001	28	103	0.004
14:00 - 15:00	28	103	0.006	28	103	0.003	28	103	0.009
15:00 - 16:00	28	103	0.009	28	103	0.005	28	103	0.014
16:00 - 17:00	28	103	0.014	28	103	0.009	28	103	0.023
17:00 - 18:00	28	103	0.013	28	103	0.005	28	103	0.018
18:00 - 19:00	28	103	0.013	28	103	0.010	28	103	0.023
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.085			0.086			0.171

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/A - HOUSES PRIVATELY OWNED

MULTI-MODAL PEDESTRIANS**Calculation factor: 1 DWELLS****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	28	103	0.019	28	103	0.049	28	103	0.068
08:00 - 09:00	28	103	0.052	28	103	0.116	28	103	0.168
09:00 - 10:00	28	103	0.056	28	103	0.059	28	103	0.115
10:00 - 11:00	28	103	0.040	28	103	0.056	28	103	0.096
11:00 - 12:00	28	103	0.039	28	103	0.038	28	103	0.077
12:00 - 13:00	28	103	0.050	28	103	0.035	28	103	0.085
13:00 - 14:00	28	103	0.036	28	103	0.039	28	103	0.075
14:00 - 15:00	28	103	0.037	28	103	0.044	28	103	0.081
15:00 - 16:00	28	103	0.102	28	103	0.064	28	103	0.166
16:00 - 17:00	28	103	0.075	28	103	0.052	28	103	0.127
17:00 - 18:00	28	103	0.066	28	103	0.030	28	103	0.096
18:00 - 19:00	28	103	0.043	28	103	0.038	28	103	0.081
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.615			0.620			1.235

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/A - HOUSES PRIVATELY OWNED

MULTI-MODAL PUBLIC TRANSPORT USERS**Calculation factor: 1 DWELLS****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	28	103	0.002	28	103	0.028	28	103	0.030
08:00 - 09:00	28	103	0.001	28	103	0.038	28	103	0.039
09:00 - 10:00	28	103	0.004	28	103	0.017	28	103	0.021
10:00 - 11:00	28	103	0.009	28	103	0.009	28	103	0.018
11:00 - 12:00	28	103	0.006	28	103	0.006	28	103	0.012
12:00 - 13:00	28	103	0.009	28	103	0.011	28	103	0.020
13:00 - 14:00	28	103	0.005	28	103	0.005	28	103	0.010
14:00 - 15:00	28	103	0.008	28	103	0.005	28	103	0.013
15:00 - 16:00	28	103	0.023	28	103	0.009	28	103	0.032
16:00 - 17:00	28	103	0.017	28	103	0.005	28	103	0.022
17:00 - 18:00	28	103	0.018	28	103	0.005	28	103	0.023
18:00 - 19:00	28	103	0.023	28	103	0.003	28	103	0.026
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.125			0.141			0.266

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 H

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

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population All usual residents aged 16 and over in employment the week before the census
 units Persons
 date 2011
 usual residence W02000051 : Denbighshire 010 (2011 super output area - middle layer)

place of work : 2011 super output area - middle layer

Driving a car or van

E02001089 : Manchester 045	3	0%	C
E02001419 : St. Helens 014	4	0%	C
E02001503 : Wirral 037	4	0%	C
E02003795 : Cheshire West and Chester 025	3	0%	C
E02003797 : Cheshire West and Chester 028	7	0%	C
E02003802 : Cheshire West and Chester 033	3	0%	C
E02003803 : Cheshire West and Chester 034	10	1%	C
E02003805 : Cheshire West and Chester 039	4	0%	C
E02003809 : Cheshire West and Chester 046	8	1%	C
E02003849 : Cheshire West and Chester 011	4	0%	C
E02006932 : Liverpool 060	3	0%	C
E02006934 : Liverpool 062	4	0%	C
W02000010 : Gwynedd 001	4	0%	A
W02000011 : Gwynedd 002	3	0%	A
W02000014 : Gwynedd 005	4	0%	A
W02000015 : Gwynedd 006	3	0%	A
W02000016 : Gwynedd 007	3	0%	A
W02000027 : Conwy 001	22	2%	A
W02000030 : Conwy 004	13	1%	A
W02000031 : Conwy 005	33	2%	B
W02000032 : Conwy 006	6	0%	A
W02000033 : Conwy 007	50	4%	A
W02000034 : Conwy 008	17	1%	B
W02000035 : Conwy 009	4	0%	A
W02000036 : Conwy 010	27	2%	A
W02000037 : Conwy 011	17	1%	A
W02000038 : Conwy 012	11	1%	A
W02000040 : Conwy 014	9	1%	E
W02000041 : Conwy 015	7	0%	E
W02000042 : Denbighshire 001	5	0%	B
W02000043 : Denbighshire 002	31	2%	B
W02000044 : Denbighshire 003	6	0%	B
W02000045 : Denbighshire 004	69	5%	B
W02000047 : Denbighshire 006	33	2%	B
W02000049 : Denbighshire 008	19	1%	B
W02000050 : Denbighshire 009	278	20%	Split between A&B
W02000051 : Denbighshire 010	222	16%	A
W02000052 : Denbighshire 011	64	5%	D
W02000053 : Denbighshire 012	73	5%	D
W02000054 : Denbighshire 013	19	1%	D
W02000055 : Denbighshire 014	80	6%	D
W02000056 : Denbighshire 015	4	0%	D
W02000057 : Denbighshire 016	4	0%	D
W02000058 : Flintshire 001	14	1%	B
W02000059 : Flintshire 002	12	1%	C
W02000060 : Flintshire 003	26	2%	B
W02000061 : Flintshire 004	18	1%	C
W02000063 : Flintshire 006	11	1%	D
W02000064 : Flintshire 007	7	0%	C
W02000065 : Flintshire 008	4	0%	C
W02000066 : Flintshire 009	20	1%	C
W02000068 : Flintshire 011	7	0%	C
W02000069 : Flintshire 012	6	0%	C
W02000070 : Flintshire 013	8	1%	C
W02000071 : Flintshire 014	3	0%	C
W02000072 : Flintshire 015	19	1%	C
W02000073 : Flintshire 016	26	2%	C
W02000074 : Flintshire 017	3	0%	C
W02000076 : Flintshire 019	3	0%	C
W02000085 : Wrexham 008	5	0%	C
W02000088 : Wrexham 011	9	1%	C
W02000419 : Denbighshire 017	9	1%	B
W02000420 : Wrexham 020	6	0%	C
	1,413		

A	B	C	D	E
A55 (W)	A525 (N)	A55 (E)	A525 (S)	Glascoed Road
37%	28%	15%	18%	1%

In order to protect against disclosure of personal information, records have been swapped between different geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

S|C|P

APPENDIX I

Junctions 9
PICADY 9 - Priority Intersection Module
Version: 9.5.1.7462 © Copyright TRL Limited, 2019
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Filename: 210584 St Asaph_PICADY_Site Access.j9
Path: Z:\Job Library\2021\210584 - Upper Denbigh Road, St Asaph\Traffic Data\Junction Assessments
Report generation date: 21/09/2021 09:41:22

- »2026 Assessment, AM
- »2026 Assessment, PM

Summary of junction performance

	AM							PM						
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Junction Delay (s)	Network Residual Capacity
2026 Assessment														
Stream B-AC	D1	0.2	14.47	0.15	B	0.41	47 %	D2	0.1	11.91	0.06	B	0.23	78 %
Stream C-AB		0.0	0.00	0.00	A		[Stream B-AC]		0.0	4.37	0.02	A		[Stream B-AC]

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. Junction LOS and Junction Delay are demand-weighted averages. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	Proposed Site Access
Location	St Asaph
Site number	210584
Date	20/09/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	210584
Enumerator	SCP\Liam Bessell
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	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
	✓	Delay	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	2026 Assessment	AM	ONE HOUR	08:00	09:30	15
D2	2026 Assessment	PM	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2026 Assessment, AM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.41	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	47	Stream B-AC

Arms

Arms

Arm	Name	Description	Arm type
A	A525 (N)		Major
B	Site Access		Minor
C	A525 (S)		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	8.30			100.0	✓	0.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	2.75	42	100

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	527	0.086	0.218	0.137	0.312
B-C	670	0.092	0.234	-	-
C-B	632	0.220	0.220	-	-

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

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

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2026 Assessment	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	673	100.000
B		✓	39	100.000
C		✓	657	100.000

Origin-Destination Data

Demand (PCU/hr)

	To			
	A	B	C	
From	A	0	11	662
	B	32	0	7
	C	657	0	0

Vehicle Mix

Heavy Vehicle Percentages

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

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.15	14.47	0.2	B
C-AB	0.00	0.00	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	29	374	0.078	29	0.1	10.418	B
C-AB	0	520	0.000	0	0.0	0.000	A
C-A	495			495			
A-B	8			8			
A-C	498			498			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	35	340	0.103	35	0.1	11.797	B
C-AB	0	499	0.000	0	0.0	0.000	A
C-A	591			591			
A-B	10			10			
A-C	595			595			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	43	292	0.147	43	0.2	14.441	B
C-AB	0	469	0.000	0	0.0	0.000	A
C-A	723			723			
A-B	12			12			
A-C	729			729			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	43	292	0.147	43	0.2	14.467	B
C-AB	0	469	0.000	0	0.0	0.000	A
C-A	723			723			
A-B	12			12			
A-C	729			729			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	35	340	0.103	35	0.1	11.827	B
C-AB	0	499	0.000	0	0.0	0.000	A
C-A	591			591			
A-B	10			10			
A-C	595			595			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	29	374	0.078	29	0.1	10.446	B
C-AB	0	520	0.000	0	0.0	0.000	A
C-A	495			495			
A-B	8			8			
A-C	498			498			

2026 Assessment, PM

Data Errors and Warnings

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

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		0.23	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	78	Stream B-AC

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	2026 Assessment	PM	ONE HOUR	17:00	18:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	606	100.000
B		✓	17	100.000
C		✓	578	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	29	577
	B	14	0	3
	C	571	7	0

Vehicle Mix

Heavy Vehicle Percentages

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

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.06	11.91	0.1	B
C-AB	0.02	4.37	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	13	394	0.033	13	0.0	9.443	A
C-AB	11	834	0.013	11	0.0	4.371	A
C-A	424			424			
A-B	22			22			
A-C	434			434			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	363	0.042	15	0.0	10.339	B
C-AB	15	879	0.017	15	0.0	4.166	A
C-A	504			504			
A-B	26			26			
A-C	519			519			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	19	321	0.058	19	0.1	11.902	B
C-AB	23	944	0.025	23	0.0	3.908	A
C-A	613			613			
A-B	32			32			
A-C	635			635			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	19	321	0.058	19	0.1	11.907	B
C-AB	23	944	0.025	23	0.0	3.908	A
C-A	613			613			
A-B	32			32			
A-C	635			635			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	363	0.042	15	0.0	10.347	B
C-AB	15	879	0.017	15	0.0	4.168	A
C-A	504			504			
A-B	26			26			
A-C	519			519			

18:15 - 18:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	13	394	0.033	13	0.0	9.451	A
C-AB	11	834	0.013	11	0.0	4.373	A
C-A	424			424			
A-B	22			22			
A-C	434			434			

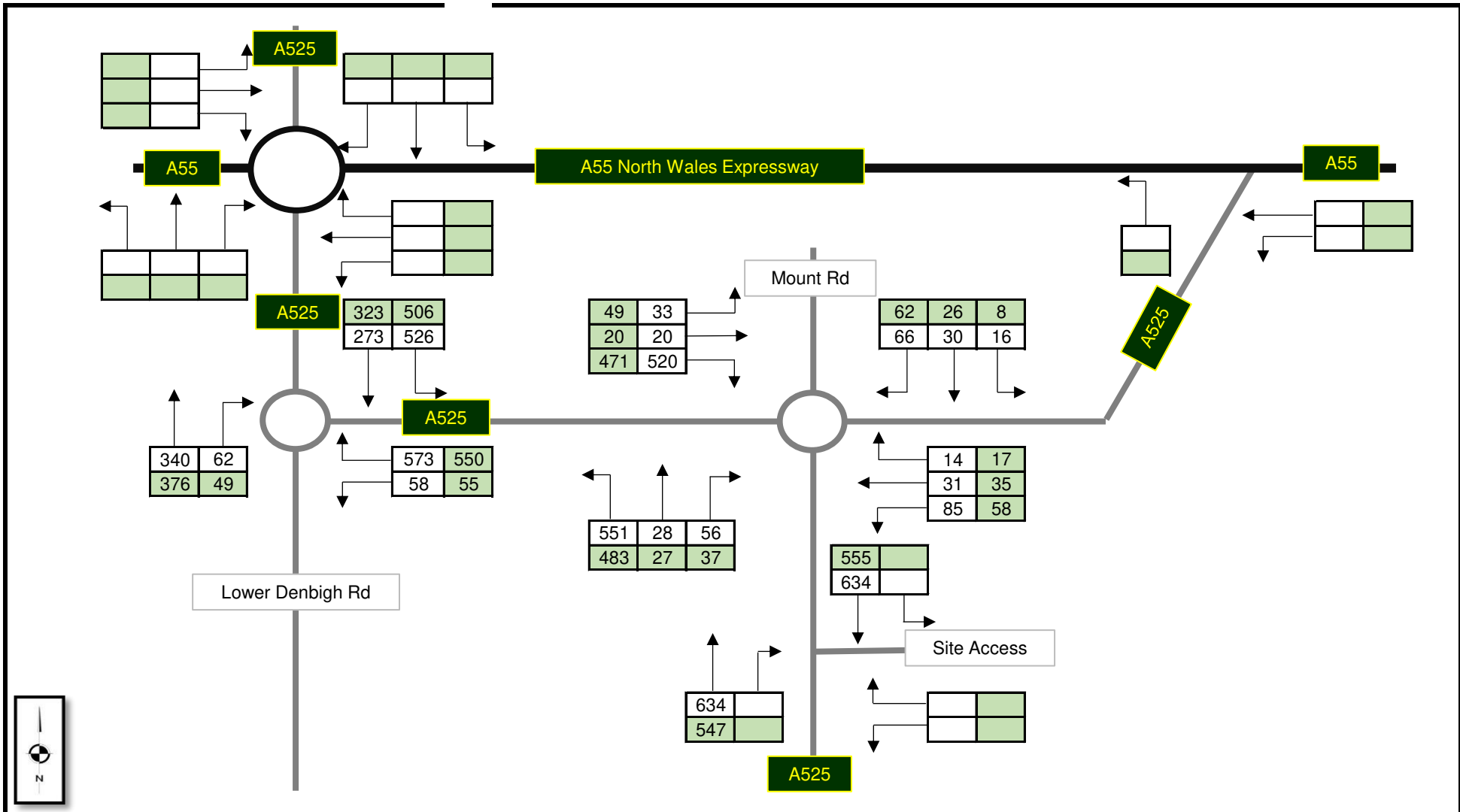
S|C|P

APPENDIX J

count_point_id	direction	year	count_date	hour	region_id	region_nar	local_auth	road_name	road_type	start_junct	end_junct	easting	northing	latitude	longitude	link_length	link_length_cyl	two_whears	cars	buses	and_lgvs	h2s	h3s	h4s	h5s	h6s	h7s	h8s	h9s	h10s	h11s	h12s	h13s	h14s	h15s	h16s	h17s	h18s	h19s	h20s	h21s	h22s	h23s	h24s	h25s	h26s	h27s	h28s	h29s	h30s	h31s	h32s	h33s	h34s	h35s	h36s	h37s	h38s	h39s	h40s	h41s	h42s	h43s	h44s	h45s	h46s	h47s	h48s	h49s	h50s	h51s	h52s	h53s	h54s	h55s	h56s	h57s	h58s	h59s	h60s	h61s	h62s	h63s	h64s	h65s	h66s	h67s	h68s	h69s	h70s	h71s	h72s	h73s	h74s	h75s	h76s	h77s	h78s	h79s	h80s	h81s	h82s	h83s	h84s	h85s	h86s	h87s	h88s	h89s	h90s	h91s	h92s	h93s	h94s	h95s	h96s	h97s	h98s	h99s	h100s	h101s	h102s	h103s	h104s	h105s	h106s	h107s	h108s	h109s	h110s	h111s	h112s	h113s	h114s	h115s	h116s	h117s	h118s	h119s	h120s	h121s	h122s	h123s	h124s	h125s	h126s	h127s	h128s	h129s	h130s	h131s	h132s	h133s	h134s	h135s	h136s	h137s	h138s	h139s	h140s	h141s	h142s	h143s	h144s	h145s	h146s	h147s	h148s	h149s	h150s	h151s	h152s	h153s	h154s	h155s	h156s	h157s	h158s	h159s	h160s	h161s	h162s	h163s	h164s	h165s	h166s	h167s	h168s	h169s	h170s	h171s	h172s	h173s	h174s	h175s	h176s	h177s	h178s	h179s	h180s	h181s	h182s	h183s	h184s	h185s	h186s	h187s	h188s	h189s	h190s	h191s	h192s	h193s	h194s	h195s	h196s	h197s	h198s	h199s	h200s	h201s	h202s	h203s	h204s	h205s	h206s	h207s	h208s	h209s	h210s	h211s	h212s	h213s	h214s	h215s	h216s	h217s	h218s	h219s	h220s	h221s	h222s	h223s	h224s	h225s	h226s	h227s	h228s	h229s	h230s	h231s	h232s	h233s	h234s	h235s	h236s	h237s	h238s	h239s	h240s	h241s	h242s	h243s	h244s	h245s	h246s	h247s	h248s	h249s	h250s	h251s	h252s	h253s	h254s	h255s	h256s	h257s	h258s	h259s	h260s	h261s	h262s	h263s	h264s	h265s	h266s	h267s	h268s	h269s	h270s	h271s	h272s	h273s	h274s	h275s	h276s	h277s	h278s	h279s	h280s	h281s	h282s	h283s	h284s	h285s	h286s	h287s	h288s	h289s	h290s	h291s	h292s	h293s	h294s	h295s	h296s	h297s	h298s	h299s	h300s	h301s	h302s	h303s	h304s	h305s	h306s	h307s	h308s	h309s	h310s	h311s	h312s	h313s	h314s	h315s	h316s	h317s	h318s	h319s	h320s	h321s	h322s	h323s	h324s	h325s	h326s	h327s	h328s	h329s	h330s	h331s	h332s	h333s	h334s	h335s	h336s	h337s	h338s	h339s	h340s	h341s	h342s	h343s	h344s	h345s	h346s	h347s	h348s	h349s	h350s	h351s	h352s	h353s	h354s	h355s	h356s	h357s	h358s	h359s	h360s	h361s	h362s	h363s	h364s	h365s	h366s	h367s	h368s	h369s	h370s	h371s	h372s	h373s	h374s	h375s	h376s	h377s	h378s	h379s	h380s	h381s	h382s	h383s	h384s	h385s	h386s	h387s	h388s	h389s	h390s	h391s	h392s	h393s	h394s	h395s	h396s	h397s	h398s	h399s	h400s	h401s	h402s	h403s	h404s	h405s	h406s	h407s	h408s	h409s	h410s	h411s	h412s	h413s	h414s	h415s	h416s	h417s	h418s	h419s	h420s	h421s	h422s	h423s	h424s	h425s	h426s	h427s	h428s	h429s	h430s	h431s	h432s	h433s	h434s	h435s	h436s	h437s	h438s	h439s	h440s	h441s	h442s	h443s	h444s	h445s	h446s	h447s	h448s	h449s	h450s	h451s	h452s	h453s	h454s	h455s	h456s	h457s	h458s	h459s	h460s	h461s	h462s	h463s	h464s	h465s	h466s	h467s	h468s	h469s	h470s	h471s	h472s	h473s	h474s	h475s	h476s	h477s	h478s	h479s	h480s	h481s	h482s	h483s	h484s	h485s	h486s	h487s	h488s	h489s	h490s	h491s	h492s	h493s	h494s	h495s	h496s	h497s	h498s	h499s	h500s	h501s	h502s	h503s	h504s	h505s	h506s	h507s	h508s	h509s	h510s	h511s	h512s	h513s	h514s	h515s	h516s	h517s	h518s	h519s	h520s	h521s	h522s	h523s	h524s	h525s	h526s	h527s	h528s	h529s	h530s	h531s	h532s	h533s	h534s	h535s	h536s	h537s	h538s	h539s	h540s	h541s	h542s	h543s	h544s	h545s	h546s	h547s	h548s	h549s	h550s	h551s	h552s	h553s	h554s	h555s	h556s	h557s	h558s	h559s	h560s	h561s	h562s	h563s	h564s	h565s	h566s	h567s	h568s	h569s	h570s	h571s	h572s	h573s	h574s	h575s	h576s	h577s	h578s	h579s	h580s	h581s	h582s	h583s	h584s	h585s	h586s	h587s	h588s	h589s	h590s	h591s	h592s	h593s	h594s	h595s	h596s	h597s	h598s	h599s	h600s	h601s	h602s	h603s	h604s	h605s	h606s	h607s	h608s	h609s	h610s	h611s	h612s	h613s	h614s	h615s	h616s	h617s	h618s	h619s	h620s	h621s	h622s	h623s	h624s	h625s	h626s	h627s	h628s	h629s	h630s	h631s	h632s	h633s	h634s	h635s	h636s	h637s	h638s	h639s	h640s	h641s	h642s	h643s	h644s	h645s	h646s	h647s	h648s	h649s	h650s	h651s	h652s	h653s	h654s	h655s	h656s	h657s	h658s	h659s	h660s	h661s	h662s	h663s	h664s	h665s	h666s	h667s	h668s	h669s	h670s	h671s	h672s	h673s	h674s	h675s	h676s	h677s	h678s	h679s	h680s	h681s	h682s	h683s	h684s	h685s	h686s	h687s	h688s	h689s	h690s	h691s	h692s	h693s	h694s	h695s	h696s	h697s	h698s	h699s	h700s	h701s	h702s	h703s	h704s	h705s	h706s	h707s	h708s	h709s	h710s	h711s	h712s	h713s	h714s	h715s	h716s	h717s	h718s	h719s	h720s	h721s	h722s	h723s	h724s	h725s	h726s	h727s	h728s	h729s	h730s	h731s	h732s	h733s	h734s	h735s	h736s	h737s	h738s	h739s	h740s	h741s	h742s	h743s	h744s	h745s	h746s	h747s	h748s	h749s	h750s	h751s	h752s	h753s	h754s	h755s	h756s	h757s	h758s	h759s	h760s	h761s	h762s	h763s	h764s	h765s	h766s	h767s	h768s	h769s	h770s	h771s	h772s	h773s	h774s	h775s	h776s	h777s	h778s	h779s	h780s	h781s	h782s	h783s	h784s	h785s	h786s	h787s	h788s	h789s	h790s	h791s	h792s	h793s	h794s	h795s	h796s	h797s	h798s	h799s	h800s	h801s	h802s	h803s	h804s	h805s	h806s	h807s	h808s	h809s	h810s	h811s	h812s	h813s	h814s	h815s	h816s	h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S|C|P

FIGURES



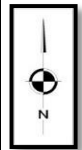
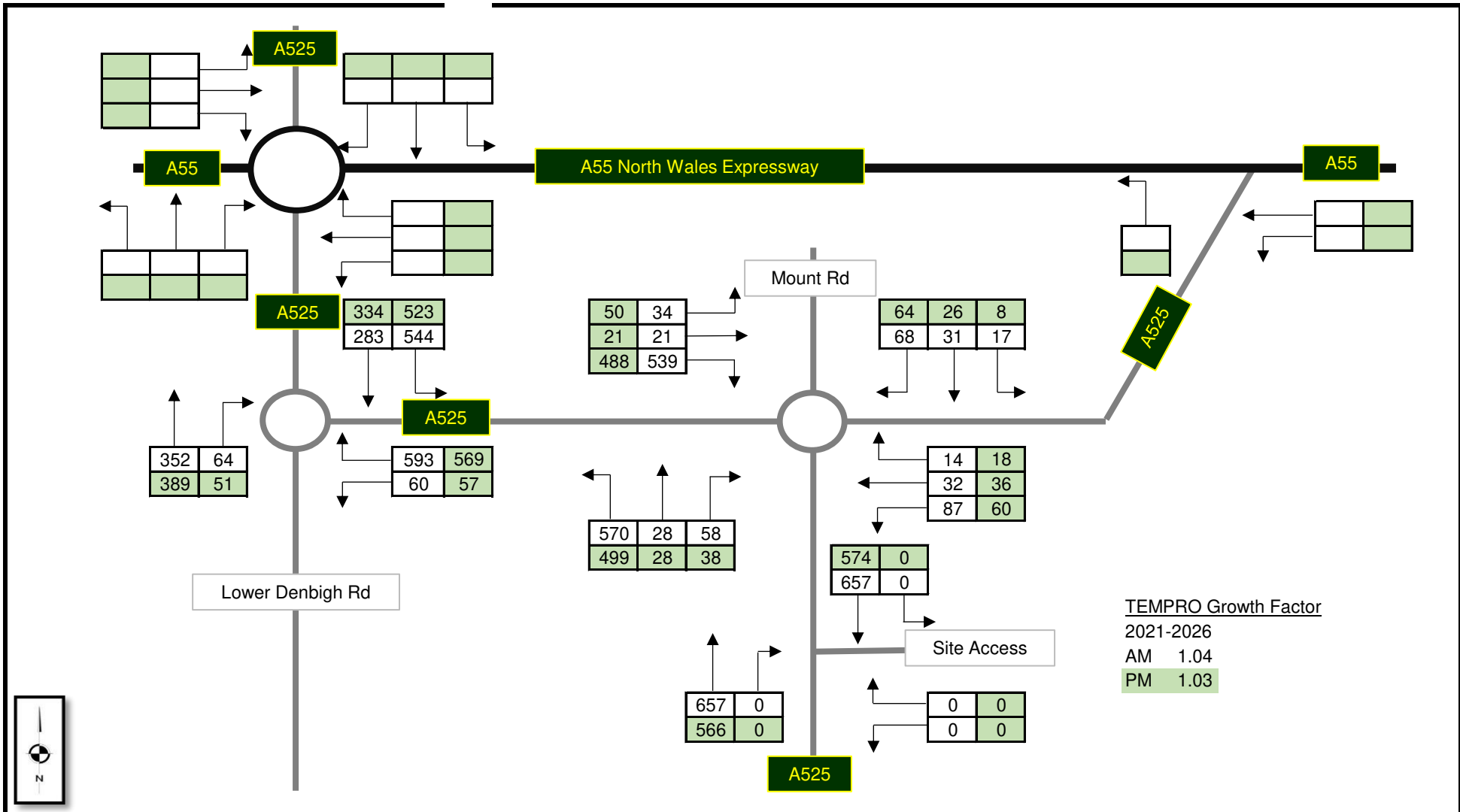
Survey Flows 2021

21/09/2021

Job Number - SCP/14***

Upper Denbigh Road, St Asaph

Traffic Figure 1



S | C | P

Transportation Planning : Infrastructure Design

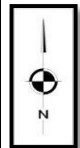
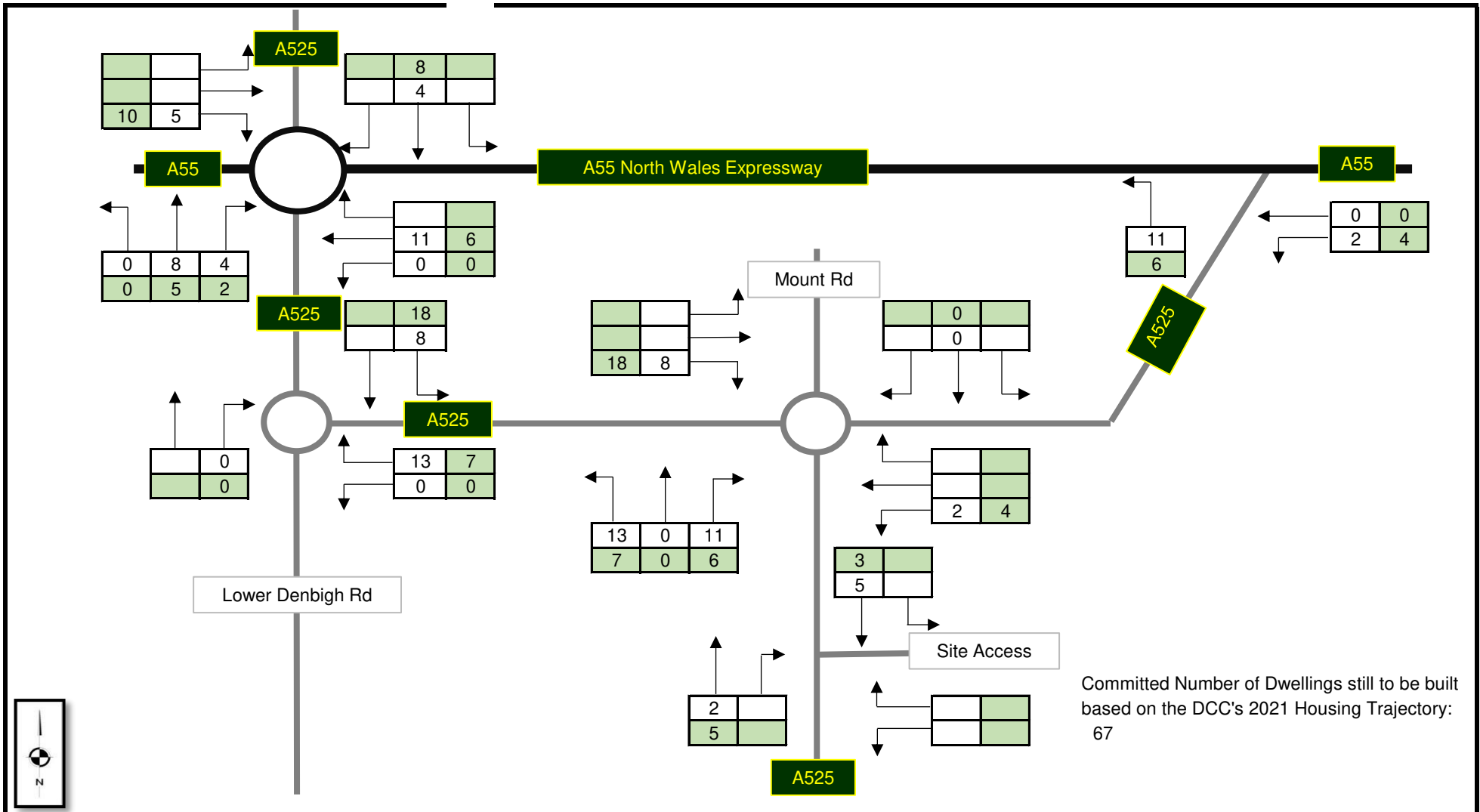
Growthed Flows 2026

21/09/2021

Job Number -
SCP/14***

Upper Denbigh Road, St Asaph

Traffic Figure 2



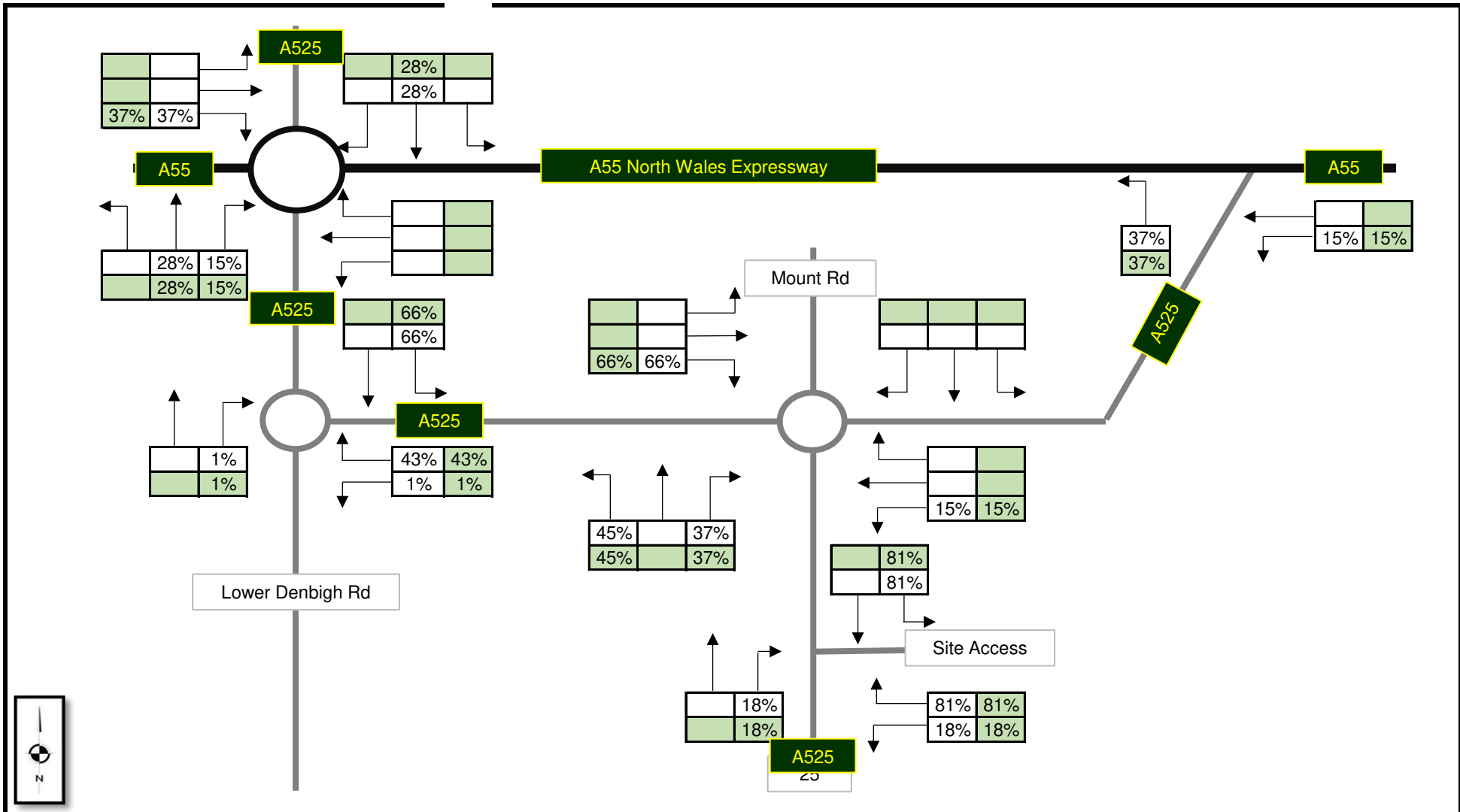
Committed Development - HM Stanley Hospital (planning ref: 46/2014/0126)

21/09/2021

Job Number - SCP/14***

Upper Denbigh Road, St Asaph

Traffic Figure 3



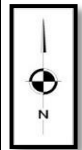
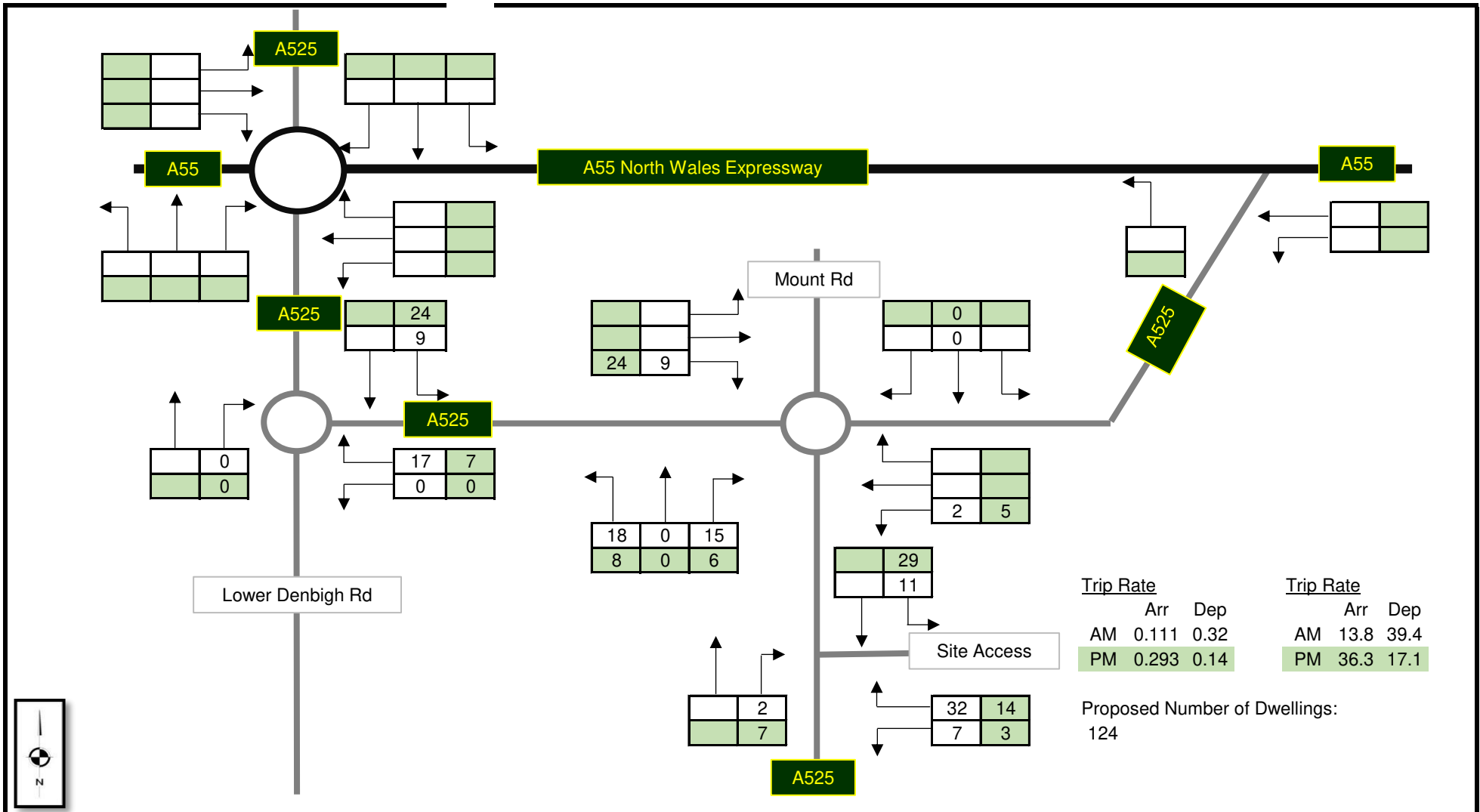
Trip Distribution

21/09/2021

Job Number - SCP/14***

Upper Denbigh Road, St Asaphs

Traffic Figure 4



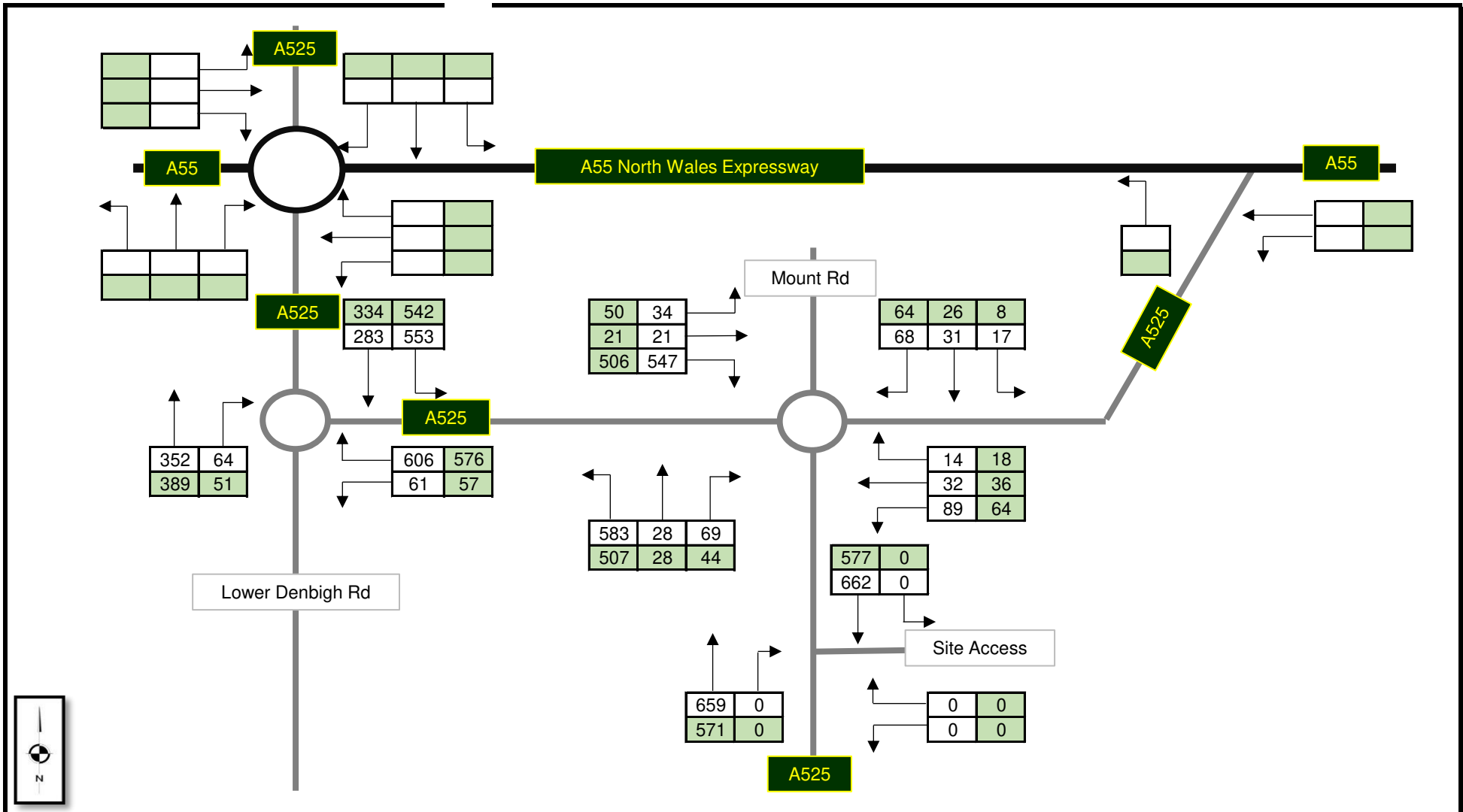
Traffic Assignment

21/09/2021

Job Number - SCP/14***

Upper Denbigh Road, St Asaph

Traffic Figure 5



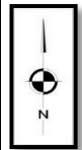
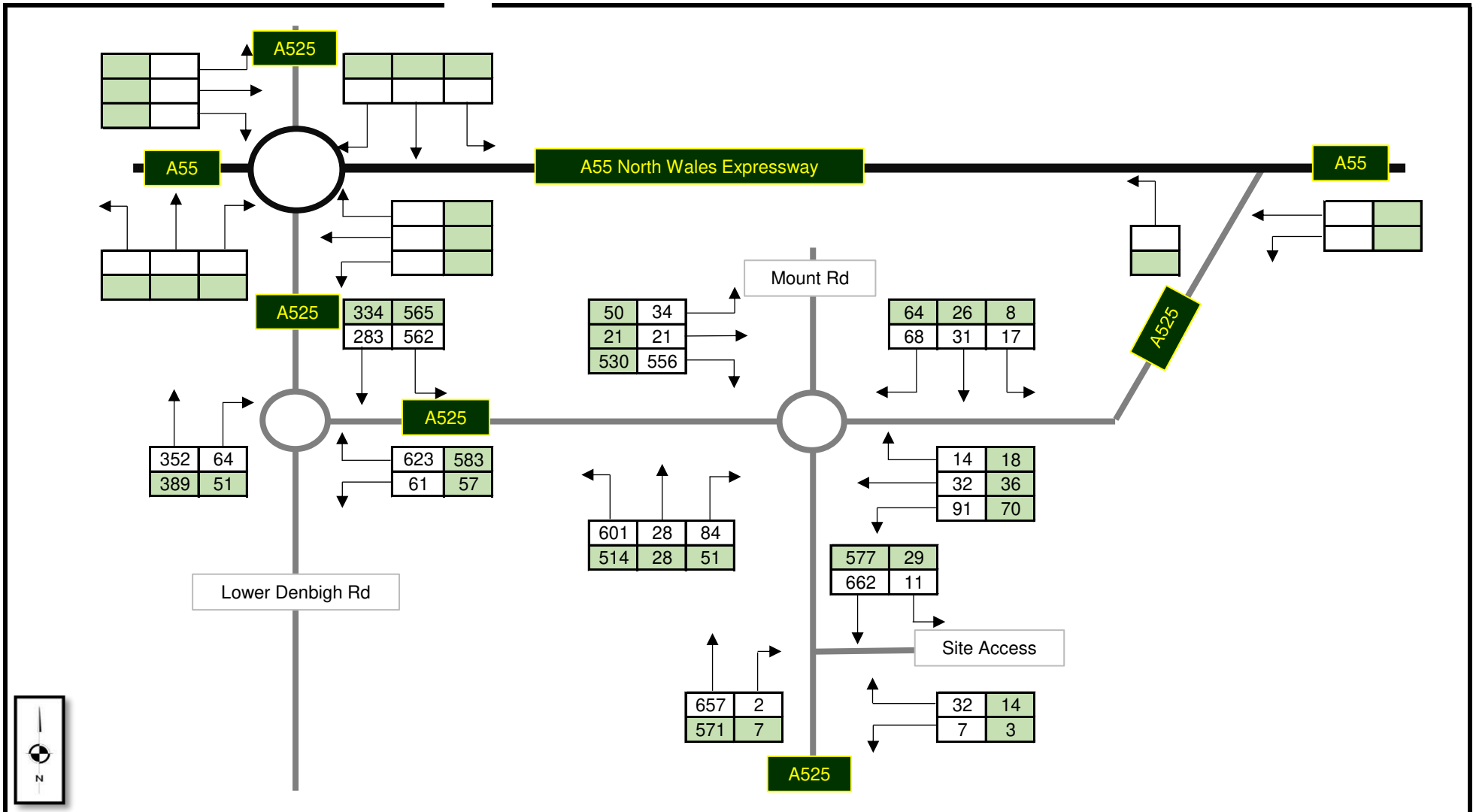
Base Flows 2026

21/09/2021

Job Number - SCP/14***

Upper Denbigh Road, St Asaph

Traffic Figure 6



SCP

Transportation Planning : Infrastructure Design

Assessment Flows 2026

21/09/2021

Job Number - SCP/14***

Upper Denbigh Road, St Asaphs

Traffic Figure 7