



TRANSPORT STATEMENT

November 2020

**Residential Development
Phase 2
Ty Fry Farm
Glebe Road
Loughor**

acstro

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Revision History

Issue 1	10 th August 2020	First Issue
Issue 2	25 th August 2020	Revised layout
Issue 3	23 rd November 2020	For Planning

1394 Ty Fry Farm.docx

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Acstro Ltd., Ty Penbryn, Salem, Llandeilo, SA19 7LT
www.acstro.com
 T. 01558 824021
 E. mail@acstro.com



1 Introduction

- 1.1 Acstro has been appointed to prepare a Transport Statement in respect to the proposed residential development on land at Ty Fry Farm, Glebe Road, Loughor. The proposed development will deliver 23 new homes.
- 1.2 This will be Phase 2 of a wider residential development, with Phase 1 (92 dwellings, LPA Ref: 2013/0617 and 2018/1537/RES) already under construction.
- 1.3 The site's location is shown below, with Phase 2 outlined in red, and Phase 1 outlined in blue.

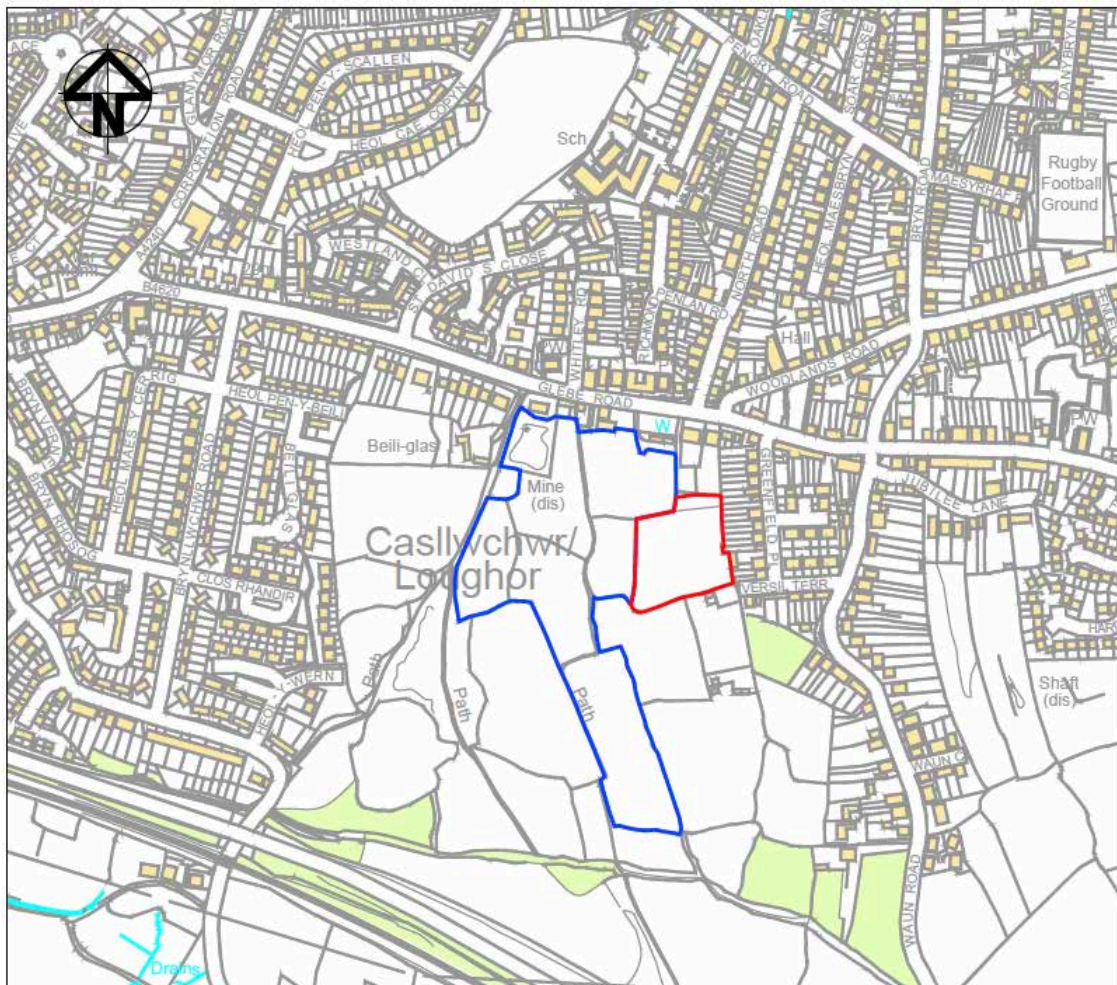


Figure 1 Location Plan

- 1.4 This document considers the transport implications of the proposed development. It demonstrates that the site is in a sustainable location that is closely related to existing facilities and services and is accessible to pedestrians, cyclists and public transport users.
- 1.5 The scope and content of the Transport Statement has been influenced by pre-application comments received from Swansea Council's Highway's Department. The structure of the Transport Statement is as follows:

- Section 2 describes the relevant planning policy context that is relevant in terms of transport issues;
- Section 3 describes the site's location, its proximity to services and facilities and its accessibility by all forms of transport.
- Section 4 describes the proposed development and its access arrangements. An estimate of the likely trip generation of the proposed development of the land is also provided.
- Section 5 provides a summary and conclusion.

2 Policy Context

Planning Policy Wales (10th Edition)

- 2.1 Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales.
- 2.2 In terms of transport related policies paragraph 4.1.1 states that “the planning system should enable people to access jobs and services through shorter, more efficient and sustainable journeys, by walking, cycling and public transport”.
- 2.3 Paragraph 4.1.9 states that “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.”
- 2.4 PPW advocates a sustainable transport hierarchy for planning, the hierarchy being, from top to bottom:
 - Walking and Cycling
 - Public Transport
 - Ultra-Low Emission Vehicles
 - Other Private Motor Vehicles
- 2.5 It is Welsh Government policy to require the use of a sustainable transport hierarchy in relation to new development, which prioritises walking, cycling and public transport ahead of the private motor vehicles.

TAN18 Transportation

- 2.6 Planning Policy Wales Technical Advice Note 18 (TAN18) details the Welsh Government Government’s policies in terms of transportation and repeats the general principles advocated in PPW i.e. that development is encouraged in sustainable, accessible, locations that will reduce the need to travel by car. Its aim is to promote an efficient and sustainable transport system and to counter the negative impacts associated with road traffic growth, for example increased air pollution, green house gases and congestion (2.1). It sees the integration of transport and land use planning as key (2.3) in achieving the Welsh Government Governments’ sustainable development policy objectives by:
 - promoting travel efficient settlement patterns;
 - ensuring new development is located where there is good access by public transport, walking and cycling thereby minimizing the need for travel and fostering social inclusion;
 - managing parking provision;
 - ensuring that new development includes appropriate provision for pedestrians, cycling, public transport, and traffic management and parking/servicing;

- encouraging the location of development near other related uses to encourage multi-purpose trips; and
 - ensuring that transport infrastructure necessary to serve new development allows existing transport networks to continue to perform their identified functions.
- 2.7 The needs of walkers and cyclists must be taken into consideration and the use of these most sustainable forms of transport encouraged in all developments (TAN18 Chapter 6). Similarly, all development should be accessible by public transport (Chapter 7).

The Active Travel (Wales) Act 2013

- 2.8 The Active Travel (Wales) Act 2013 is Welsh Government legislation aimed to support an increase in the level of walking and cycling in Wales; to encourage a shift in travel behaviour to active travel modes, and to facilitate the building of walking and cycling infrastructure.
- 2.9 The Active Travel (Wales) Act 2013 makes it a legal requirement for local authorities in Wales to map and plan for suitable routes for active travel, and to build and improve infrastructure for walking and cycling every year. It creates new duties to consider the needs of walkers and cyclists and make better provision for them. It also requires the consideration of walking and cycling as a mode of transport and the Act focuses on the promotion of walking and cycling for purposeful journeys, rather than as a purely recreational activity.
- 2.10 The Act is supported by the Active Travel Action Plan Wales (2014), and many of the actions of the Active Travel Action Plan Wales document also benefit recreational or competitive walking and cycling. ‘Walking’ in the Active Travel Action Plan for Wales includes the use of wheelchairs and mobility scooters and ‘cycling’ includes the use of electric bikes, but not motorcycles.

Swansea Local Development Plan 2010 - 2025

- 2.11 The Local Development Plan (LDP) sets out the Council’s planning policies over the plan period. Its vision is that “Swansea will be a desirable, sought after place to live, work and visit that:
- Capitalises on the distinctive relationship between its vibrant urban areas and outstanding rural and coastal environments;
 - Supports a competitive and prosperous economy that acts as a focal point for the wider Swansea Bay City Region;
 - Has sustainable, distinct communities, in both urban and rural locations, that benefit from quality homes supporting infrastructure, community facilities and a wide range of opportunities for recreation;
 - Is a thriving City Centre destination that offers excellent shopping facilities and supporting leisure and business opportunities, capitalising on its proximity to the waterfront;
 - Celebrates and conserves its unique natural heritage and cultural and historic environments.”
- 2.12 The site is contained within an area allocated as a non-strategic housing site (Policy H1.32 – Land South of Glebe Road, Loughor), with a stated capacity of 130 dwellings.
- 2.13 In terms of transport related policies, the following are considered relevant to this planning application.

T 1: Transport Measures and Infrastructure

Development must be supported by appropriate transport measures and infrastructure, and depending on the nature, scale and siting of the proposal will be required to:

- i. Within SDAs and relevant H 1 sites, prioritise the delivery of the key transport measures and schemes identified in the Transport Measures Priority Schedule, which must be delivered in an efficient and timely manner in accordance with development phases;*
- ii. Be designed to provide safe and efficient access to the transport network, which includes the Active Travel, public transport and street networks;*
- iii. Safeguard, enhance and expand the Active Travel network, particularly by means of improving connectivity;*
- iv. Reduce reliance on car use by maximising the potential of movement to/from the development by public transport, including ensuring developments within the urban area are located a walkable distance to a public transport access point on a route with a high frequency service;*
- v. Ensure all new transport measures are designed as integral elements of a scheme by means of a Placemaking approach;*
- vi. Deliver the new transport infrastructure and improvement measures that are required to mitigate the impact of the development; and*
- vii. Ensure developments are served by appropriate parking provision and circulation areas, including adequate roadwidths to allow access for service vehicles.*

Development that would have an unacceptable impact on the safe and efficient operation of the transport network will not be permitted.

T 2: Active Travel

Development must take opportunities to enhance walking and cycling access by incorporating within the site, and/or making financial contributions towards the delivery off-site of, the following measures as appropriate:

- i. Permeable, legible, direct, convenient, attractive and safe walking and cycling routes that connect the proposed development to: surrounding settlements; public transport nodes; community facilities; commercial and employment areas; tourism facilities; and leisure opportunities;*
- ii. Improvements, connections, and/or extensions to: existing PROWs (particularly bridleways); the Wales Coastal Path; the Cycle Swansea Bay routes; National Cycle Network Routes 4 and 43; Safe Routes to School; shared use paths; and routes forming part of the Green Infrastructure network;*
- iii. The delivery of infrastructure designed in accordance with standards of good practice; and*
- iv. Facilities that encourage the uptake of walking and cycling, including but not limited to: appropriate signage; secure and convenient cycle parking; and changing and shower facilities.*

Developments must not have a significant adverse impact on PROWs or existing routes identified by the Active Travel (Wales) Act (2013's) Swansea Integrated Network Map and should be designed to help deliver the Council's Active Travel Plan.

T 5: Design Principles For Transport Measures and Infrastructure

All proposals must ensure that the design of development, together with any supporting transport measures and infrastructure:

- i. Maximises the accessibility of the site via public transport and Active Travel;*
- ii. Provides suitable facilities and a safe, attractive environment for pedestrians, cyclists and other nonmotorized modes of transport;*
- iii. Allows for the safe, efficient and effective movement of vehicles, inclusive of service vehicles;*
- iv. Minimises vehicle speeds where appropriate;*
- v. Considers the place and movement of any transport infrastructure in-line with Streets Hierarchy and User Hierarchy concepts to ensure appropriately designed transport infrastructure;*
- vi. Does not encourage extraneous traffic unless there is a specific strategic need for an access route through the area;*
- vii. Does not give rise to any significant adverse effect on the natural heritage, and the historic and cultural environment is preserved or enhanced;*
- viii. Maintains the character of rural lanes and public paths;*
- ix. Complies with the principles of Access For All;*
- x. Accords with standards of good practice, including the Active Travel Act Design Standards; and*
- xi. Considers, and responds to, the findings of any relevant Travel Plan and/or Transport Assessment.*

T 6: Parking

Proposals must be served by appropriate parking provision, in accordance with maximum parking standards, and consider the requirements for cycles, cars, motorcycles and service vehicles. In those instances where sufficient parking cannot be provided on site, or is judged not to be appropriate, the developer will be required to provide a financial contribution towards alternative transport measures where appropriate.

The provision of secure cycle parking and associated facilities will be sought in all major development schemes, inclusive of residential, business and retail in addition to any proposed transport interchanges.

Proposals on existing car parks that would reduce parking provision will not be permitted where the loss of the parking facility would:

- i. Compromise highway safety;*
- ii. Adversely affect accessibility and/or the free flow of traffic; or*
- iii. Significantly reduce parking provision for residents, businesses or visitors in the absence of any appropriate alternative parking opportunities.*

Swansea Parking Standards Supplementary Planning Guidance (2012)

- 2.14 The site is located within the area defined as the 'Central Core' by this Supplementary Planning Guidance (SPG).
- 2.15 The Parking Standards recommend that 1 car parking space per bedroom be provided, up to a maximum of 3 spaces per dwelling. Also that 1 visitor car parking space be provided for every 5 dwellings.

3 Existing Conditions

The Site

3.1 The site is shown in the context of surrounding facilities in Appendix 1.

[Appendix 1 Site Context](#)

3.2 The site currently is located to the south of Glebe Road. The site is bounded by the Phase 1 housing development to the north and west and by Greenfield Place properties to the east.

Proximity to Facilities and Services

3.3 There are a number of facilities and services located near to the site. Walk distances to a selection of these facilities from the site are provided in the table below.

Facility / Location	Walk Distance from Site
Nisa local Fueling Station and Convenience Store	Adjacent to site
Place of Worship	Adjacent to site
Dragon Plaza Takeaway	Adjacent to site
Bus Stop	100m
The Globe Inn	120m
Community Centre	150m
Tre Uchaf Primary School	600m
Town Centre	600m
Gower Collage Swansea	700m
Post Office	1km

Table 1 Walk Distances from the Site to Local Facilities

Active Travel

- 3.4 The Chartered Institution of Highways and Transportation's (CIHT) 'Planning for Walking' (2015) states that "Across Britain about 80 per cent of journeys shorter than 1 mile (1.6km) are made wholly on foot – something that has changed little in thirty years. In 2012 walkers accounted for 79 per cent of all journeys shorter than 1 mile, but beyond that distance cars are the dominant mode (DfT, annual)". It is considered that 2km, a distance that can be walked in around 25 to 30 minutes, represents a reasonable distance to expect that walking can be a viable option.
- 3.5 All of the services and facilities listed in Table 1 are within a comfortable walking distance to the application site. The site is accessible to pedestrians from the existing footways that run along both sides of highway.
- 3.6 Due to the site's location close to services and facilities and the good quality pedestrian network that is available, there is a probability that many of the trips generated by development can be made on foot.

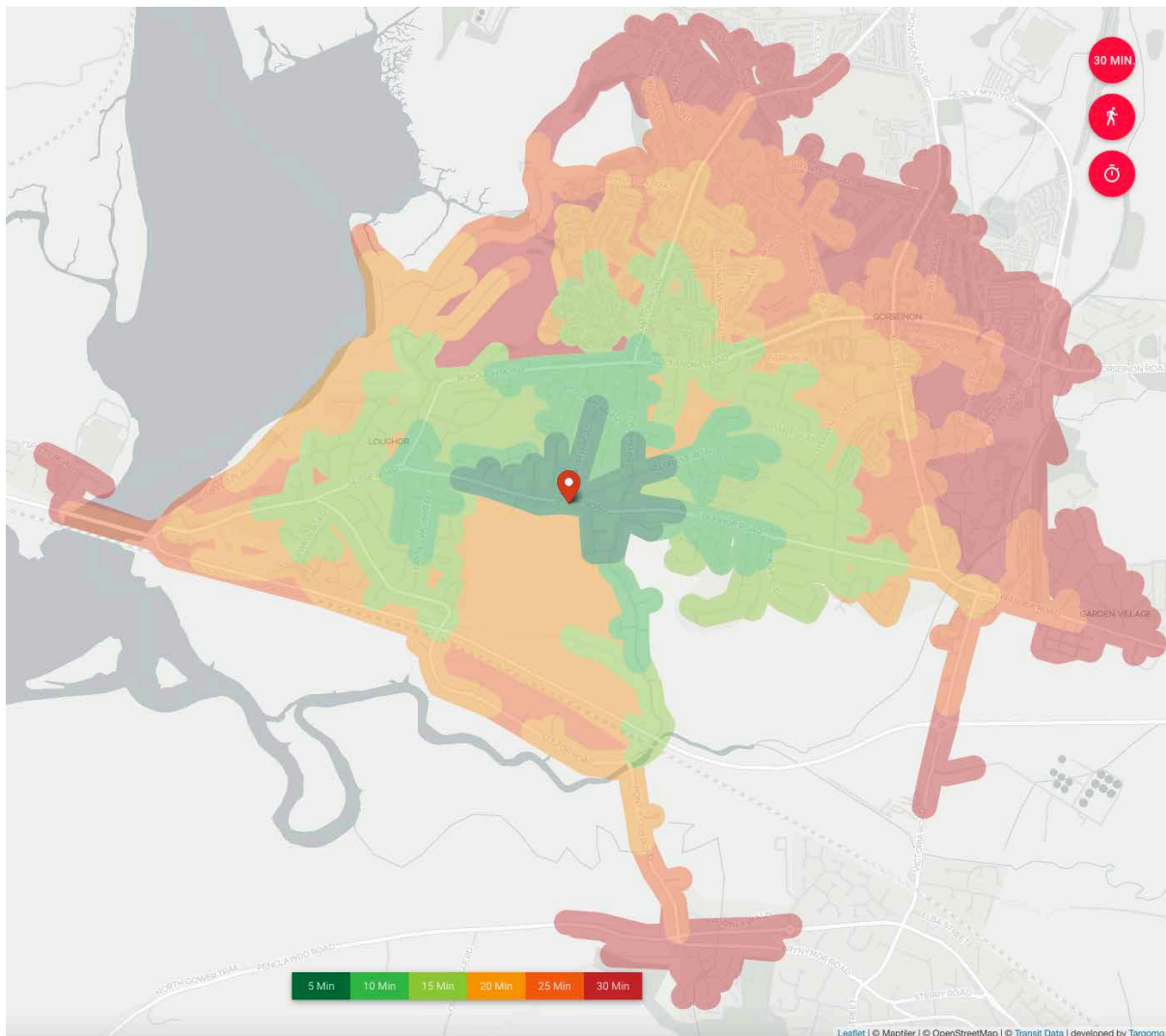


Figure 2 30-Minute Walking Catchment

- 3.7 The Chartered Institution of Highways and Transportation's 'Planning for Cycling' (2014) states that 'cycle use is more seasonal than for other modes, with up to twice as many cyclists in summer compared with winter. The majority of cycling trips are for short distances, with 80% being less than five miles (8km) and with 40% being less than two miles (3km). However, the majority of trips by all modes are also short distances (67% are less than five miles, and 38% are less than two miles); therefore, the bicycle is a potential mode for many of these trips (National Travel Survey, 2013, Department for Transport).'
- 3.8 National Cycle Network (NCN) Route 4 runs through the lower west side of Loughor and continues to east to Swansea and Port Talbot and west to Llanelli. The cycle route can be accessed via Station Road approximately 1.4km from the site entrance.

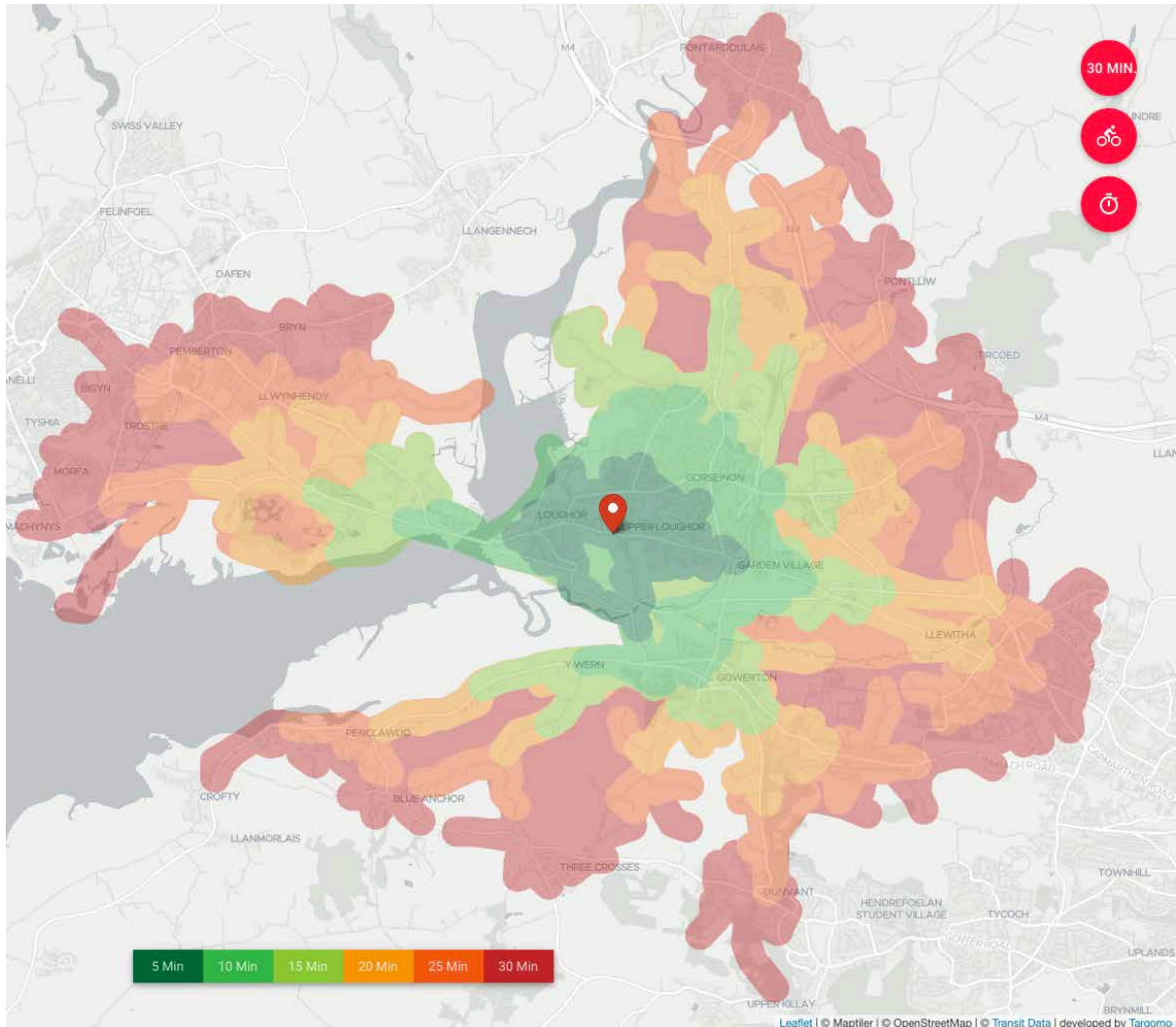


Figure 3 30-Minute Cycle Catchment

Public Transport Network

- 3.9 There are regular local bus services in the area providing viable public transport links to Swansea’s city centre and Llanelli.
- 3.10 The nearest bus stop to the site is located adjacent to the site’s entrance on the B4620 Glebe Road. Shown below are details of the bus services that serve Loughor.

Service	Route	General Details
111	Kidwelly - Swansea via Burry Port, Llanelli & Gorseinon	2 Hourly Service
46	Gorseinon - Gorseinon via Gorseinon Hospital	2 Hourly Service
16	Swansea - Pontardulais via Gowerton & Gorseinin	Twice Hourly Service

Table 2 Loughor Bus Services

- 3.11 The nearest railway station is located at Gowerton, some 3km to the south east of the site. The railway station is served by hourly trains to the east (to Swansea and Cardiff) and to the west (to Llanelli and west Wales).

Highway Network

- 3.12 The site will be accessed from a new mini-roundabout on Glebe Road shown below, constructed during Phase 1 of the development. To the north of the site running in an east-west alignment is the B4620 Glebe Road. This road has a speed limit of 30mph. To the east the road passes Kingsbridge and Garden Village, and then connects with the A484 at a roundabout. Continuing south east along the A484 the road leads to Fforestfach and then to Swansea.



Figure 4 Mini-Roundabout Access

- 3.13 West of the site the B4620 joins the A4240 and then continues onto the A484 which leads to Trostre and Llanelli to the west.
- 3.14 A review of injury accident records for the area around the site has been undertaken for latest five-year period for which data is available (2015 – 2019 inclusive). There are 2 slight severity accidents recorded on Glebe Road to the east and to the west of the developments access. These are in different locations and the absence of clustering of accidents or accidents of greater severity suggests that the highway operates safely. Furthermore, the recent introduction of mini-roundabout at the developments access will act to slow traffic to the benefit of road safety.

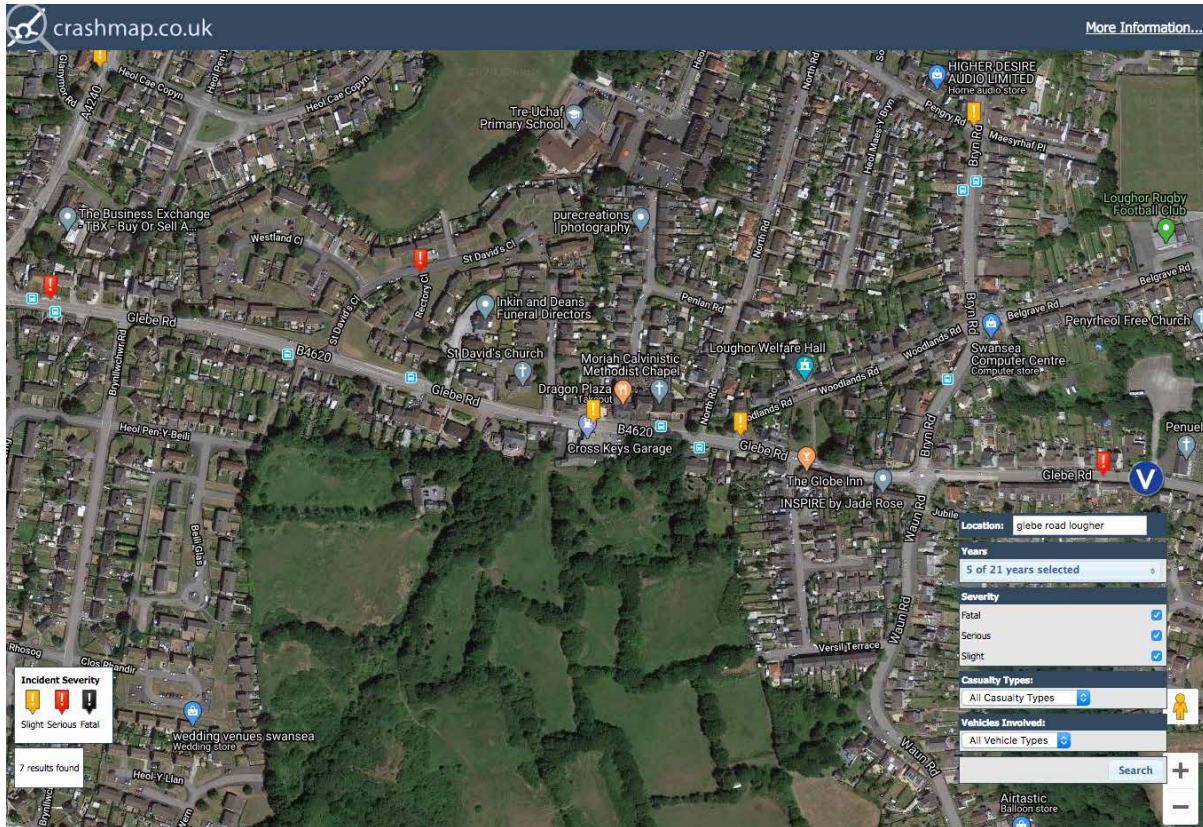


Figure 5 Injury Accident Records 2015 – 2019

Summary

3.15 The site is in a sustainable and accessible location. The site is accessible to pedestrians, cyclists and public transport users. The site is located close to services and facilities. It has good public transport links and this increases the possibility that journeys generated by the development can be made by sustainable forms of transport. It is considered that the public highway from which the site will be accessed operates safely.

4 Proposed Development

- 4.1 Planning permission is sought for the construction of 23 dwellings. The proposed development layout is provided as Appendix 2.

[Appendix 2 Proposed Development Layout](#)

- 4.2 The development constitutes a second phase of development within the area allocated for residential development by the LDP (Policy H1.32). Phase 1 (LPA Ref: 2013/0617 & 2018/1537/RES) will deliver 92 units and therefore the second phase's 23 dwellings will increase the total number of dwellings to 115.

[Access](#)

- 4.3 Access to the development will be via the Phase 1 development and its mini-roundabout junction with Glebe Road.
- 4.4 A review of the Transport Assessment (TA) that accompanied the outline planning application for Phase 1 (2013/0617) reveals that an operational assessment of the mini roundabout was undertaken at that time. To ensure that the assessment was robust and that potential extensions to the developable area were allowed for, the junction's ability to accommodate the traffic generation of 200 new dwellings was tested. The TA concluded that "the proposed junction has a great deal of spare capacity to accommodate existing and forecast traffic flows". Relevant extracts from the previous TA are provided as Appendix 3.

[Appendix 3 Previous Transport Assessment](#)

- 4.5 It is evident therefore that junction has ample capacity for the traffic associated with the combined 115 dwellings of the permitted Phase 1 and proposed Phase 2 developments.
- 4.6 Within Phase 2 an adoptable street layout will be provided with 5.5m wide carriageway and 2m wide footways.
- 4.7 Swept path analysis (Appendix 4) demonstrates that the proposed street alignment comfortably accommodates the movement of vehicles through the development. Opposing cars can pass one another comfortably. There is also sufficient carriageway width for cars to pass home delivery vehicles, and vice versa.
- 4.8 Refuse vehicles are expected to visit the site weekly. Other large vehicles, for example removal lorries and emergency vehicles, will access the development infrequently. Manual for Streets advice¹ in terms of designing for larger vehicles that have no need to frequently access the site is that streets should be able to accommodate these service vehicles "without allowing their requirements to dominate the layout. On streets with low traffic flows and speeds, it may be assumed that they will be able to use the full width of the carriageway to manoeuvre".
- 4.9 Swept path analysis, showing a refuse vehicle manoeuvring through the development and using the turning area at the end of the cul-de-sac, is provided in Appendix 4. This demonstrates that large vehicles can be accommodated by the development layout.

[Appendix 4 Swept Path Analysis](#)

¹ Manual for Streets Paragraph 6.8.1

Parking

- 4.10 The current Parking Standards recommend that 1 car parking space per bedroom be provided, up to a maximum of 3 spaces per dwelling. Also, that 1 visitor car parking space be provided for every 5 dwellings.
- 4.11 Some 15 of the 28 dwellings comply fully with the Parking Standard recommendation of 1 parking space per bedroom. All garages within the development have internal dimensions that exceed 3m x 6m and are therefore included in the calculation of available parking spaces.
- 4.12 There are 8 3-bed properties that each have 2 off-street car parking spaces, a shortfall of 1 space each compared to the Parking Standard recommendation. This level of parking provision is consistent with that which was agreed for the already permitted first phase of development. The committee report that accompanied the reserved matters application (2018/1537/RES) states that *“parking levels are slightly below the standard, the space reduction is associated with the smaller 3 bed units, however each dwelling is indicated to have a minimum of 2 parking spaces and this is thought to be acceptable”*
- 4.13 At 1 space per 5 units, a total of 4 visitor parking spaces is required within the development. This can be accommodated through kerb-side parking within the development.

Trip Generation

- 4.14 The potential trip generation of the proposed development of 23 dwellings has been estimated by reference to the TRICS trip rate database.

Land use: Residential – Houses privately owned

Trip Rate Parameter: Number of dwellings

Parameter Range: From 13 to 38

Regions: England (Excluding Greater London), Scotland and Wales

Survey Days: Weekdays

Locations: Edge of Town, Suburban and Neighbourhood Centre

- 4.15 The TRICS output is provided in detail in Appendix 5 and summarised below:

[Appendix 5 TRICS Trip Rate Data - Residential](#)

Time Range	Trip Rate per Dwelling			Trip Generation (23 Dwellings)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
08:00-09:00	0.149	0.357	0.506	3	8	12*
17:00-18:00	0.287	0.16	0.447	7	4	10*
Daily	2.312	2.374	4.686	53	55	108

Table 3 Vehicle Trip Rates & Proposed Development Trip Generation

* Total rounded to the nearest whole figure

- 4.16 The TRICS data suggests that the proposed development will generate some 12 vehicle movements during the morning highway network peak hour (8-9am) and 10 movements during the evening highway network peak hour (5-6pm).
- 4.17 This equates to no more than on average, one additional vehicle every 5 minutes or so during the peak periods. This is insignificant and will have no material impact on highway conditions.

5 Summary & Conclusion

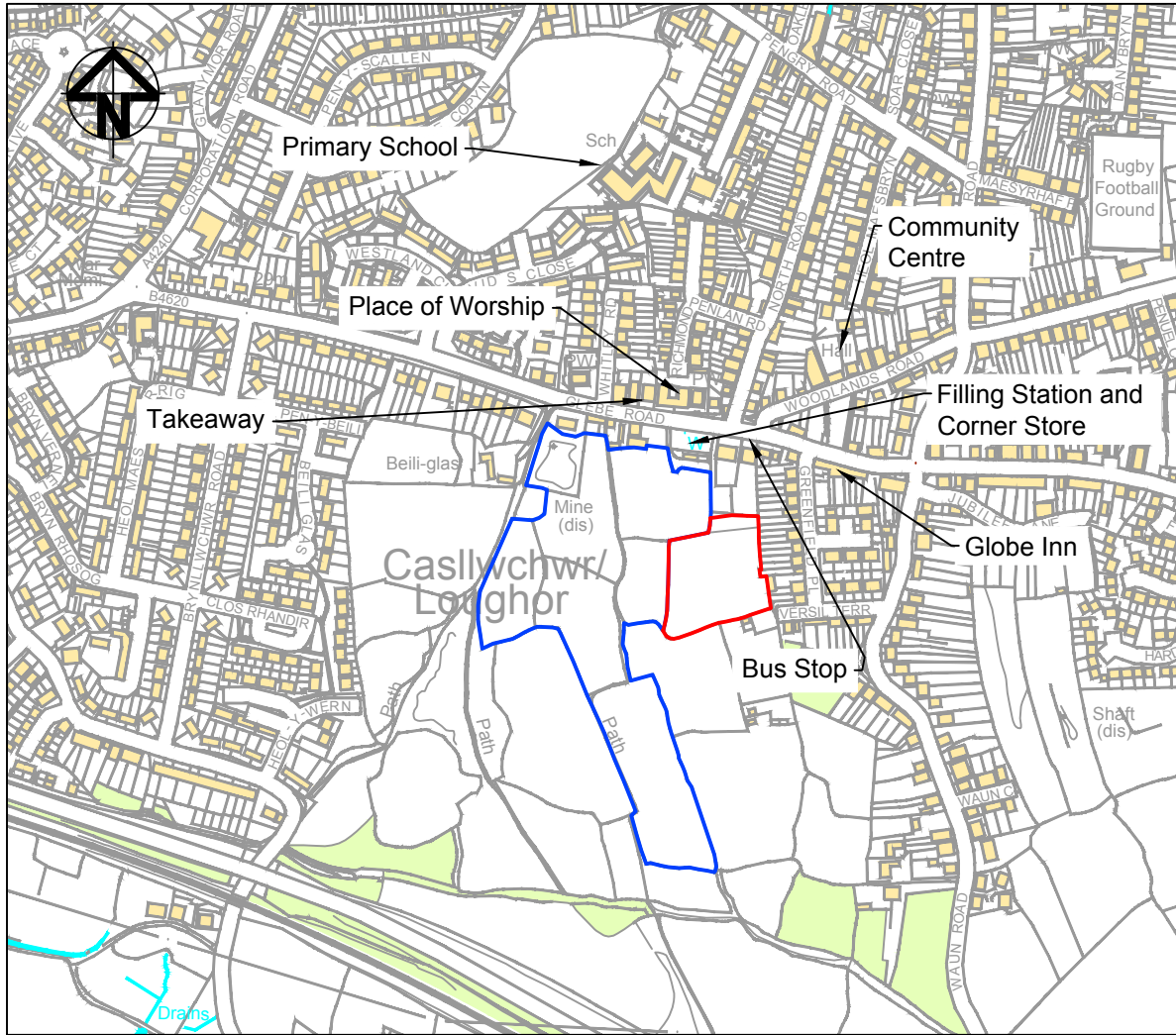
5.1 In summary this Transport Statement has demonstrated that:

- The proposal is for a development of 23 dwellings. This will constitute a second phase of development on land allocated for housing (130 dwellings; Policy H1.32). The first phase of development (LPA Ref: 2013/0617 & 2018/1537/RES) is already under construction and will deliver 92 units. Therefore, the second phase's 23 dwellings will increase the total number of dwellings to 115.
- The site's location is closely related to Loughor's services and facilities. It is accessible to pedestrians and cyclists and is well connected to the existing active travel and public transport networks.
- The site will be accessed via the Phase 1 development and its mini-roundabout junction with Glebe Road. A robust assessment of the mini-roundabout has previously been undertaken and it was concluded that it has the capacity to comfortably accommodate the traffic of a 200-dwelling development. The combined 115 dwellings of the permitted Phase 1 and proposed Phase 2 is well below this threshold.
- The estimated traffic generation of the proposed 23-unit development is considered to be insignificant, amounting to around 10 to 12 movements during peak hours.

5.2 As such it is considered that the site meets planning policy requirements in terms of being in an appropriate location that is safely accessible by all forms of transport and that the impacts of the development on the continued operation and safety of the surrounding highway network would be acceptable.

5.3 It is concluded therefore that there are no transport related issues that should prevent planning permission for the proposed development.

Appendix 1 Site Context



B	Red Line	24/08/20
A	First Issue	04/08/20

acstro
 Prifffydd a Thrafnidiaeth
 Highways & Transportation
 Ty Penbryn, Salem, Llandeilo.SA19 7LT
 E-mail: mail@acstro.com
www.acstro.com
 Tel: 01558 824021

**GLEBE ROAD
 LOUGHOR**

SITE CONTEXT


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
Appendix 2 Proposed Development Layout

KEY: SITE LAYOUT


 APPLICATION BOUNDARY


SURFACE MATERIALS:


 GARDEN/POS/HIGHWAY VERGE
(SEE DETAILED LANDSCAPE PROPOSALS)


 TARMACADUM

ENCLOSURE DETAILS:


 1.8M HIGH BRICK WALL


 1.8M HIGH CLOSE BOARDED FENCING


 0.9M HIGH TIMBER KNEE RAIL

 RETAINING WALL
(SEE ENGINEERING FOR MORE INFO)


LANDSCAPING:


 INDICATIVE TREE PLANTING


 EXISTING TREE/VEGETATION
(SEE TREE SURVEY FOR MORE INFO)


 ROOT PROTECTION AREA
(SEE TREE SURVEY FOR MORE INFO)


OTHER:

 PUBLIC OPEN SPACE

 15M RADIUS EXCLUSION ZONE FROM WET WELL

 AFFORDABLE HOUSING (RENTED)

 GATE/PERSONNEL DOOR

 BIN COLLECTION POINT



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Appendix 3 Previous Transport Assessment

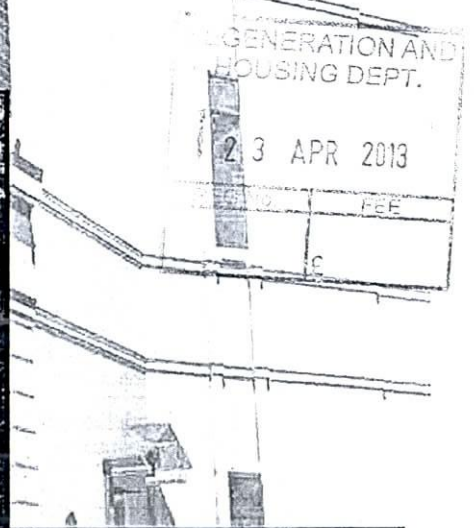
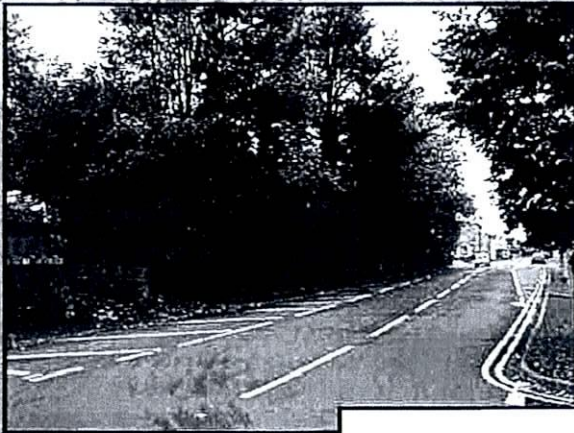
2013/0617

BANNERS GATE

HIGHWAYS & TRANSPORTATION

RESIDENTIAL DEVELOPMENT AT GLEBE ROAD
LOUGHOR, NEAR SWANSEA

TRANSPORT ASSESSMENT
(FEBRUARY 2013)



6 OPERATIONAL ASSESSMENT OF THE GLEBE ROAD ROUNDABOUT

6.1 Comments on the Glebe Road Roundabout

6.1.1 A mini roundabout would be constructed to form an access to the site. This 3 arm roundabout would have a conventional geometric layout. The junction would accommodate existing traffic flows on the route of Glebe Road and development traffic. It is recognised there are a number of potential residential sites in the area that may generate traffic and increase flows of Glebe Road. In addition, in the long term there is a possibility that additional housing would be provided on land to the south of the allocation site of HC1(105). Whilst this possibility has been rejected at the moment, primarily on landscape impact grounds, it is appropriate to ensure that the design of the access junction would not prejudice further development at some stage in the future.

6.2 Expected traffic flows including forecast growth

6.2.1 The potential flows, in the longer term, that may use the roundabout are compiled below. The design year matrix is based on existing traffic flows, potential growth and a total development of perhaps 200 houses (Site HC1(105) plus southern fields). This figure of 200 houses is only used to illustrate how the proposed roundabout would operate and does not provide a recommendation of the amount of houses at this location.

Traffic flows, Glebe Road 2011 (total vehicles)

AM Peak	Glebe Rd East	Site	Glebe Rd West	PM Peak	Glebe Rd East	Site	Glebe Rd West
Glebe Rd East	0	0	206	Glebe Rd East	0	0	321
Site	0	0	0	Site	0	0	0
Glebe Rd West	279	0	0	Glebe Rd West	207	0	0

6.2.2 A development of 200 houses would create the following additional traffic to the junction, assuming a 70 / 30 distribution to routes east and west respectively onto Glebe Road.

Traffic flows, Glebe Road 2011 plus development of 200 houses (total vehicles)

AM Peak	Glebe Rd East	Site	Glebe Rd West	PM Peak	Glebe Rd East	Site	Glebe Rd West
Glebe Rd East	0	15	206	Glebe Rd East	0	52	321
Site	58	0	25	Site	31	0	13
Glebe Rd West	279	7	0	Glebe Rd West	207	22	0

6.2.3 Traffic growth can be estimated using TEMPRO. Opening year is assumed to be 2014. Therefore, growth factors to an assessment year of 2024, 10 years after opening, have been considered. The growth figures for Gorseinon and Swansea are quantified below.

Tempro Growth factor	AM Peak (0700 – 0959)		PM Peak (1600 to 1859)	
	Production	Attraction	Production	Attraction
2011 to 2024				
Gorseinon	1.1504	1.1164	1.1315	1.1097
Swansea	1.1478	1.1141	1.1263	1.1019

6.2.4 These traffic growth figures are based on Dataset 6.2 which in many parts of Britain predicts lower growth than the previous dataset (5.4). The economic downturn has affected car ownership forecasts. However, there is expected to be some local growth in the City and County of Swansea.

6.2.5 It is known that there are a number of residential sites that would be brought forward and completed in this timescale. By definition, this growth is included in the TEMPRO figures and considering each site individually creates an element of double counting. Therefore, for simplicity, a growth figure of 20% has been chosen in the operational assessment of the Glebe Road Roundabout.

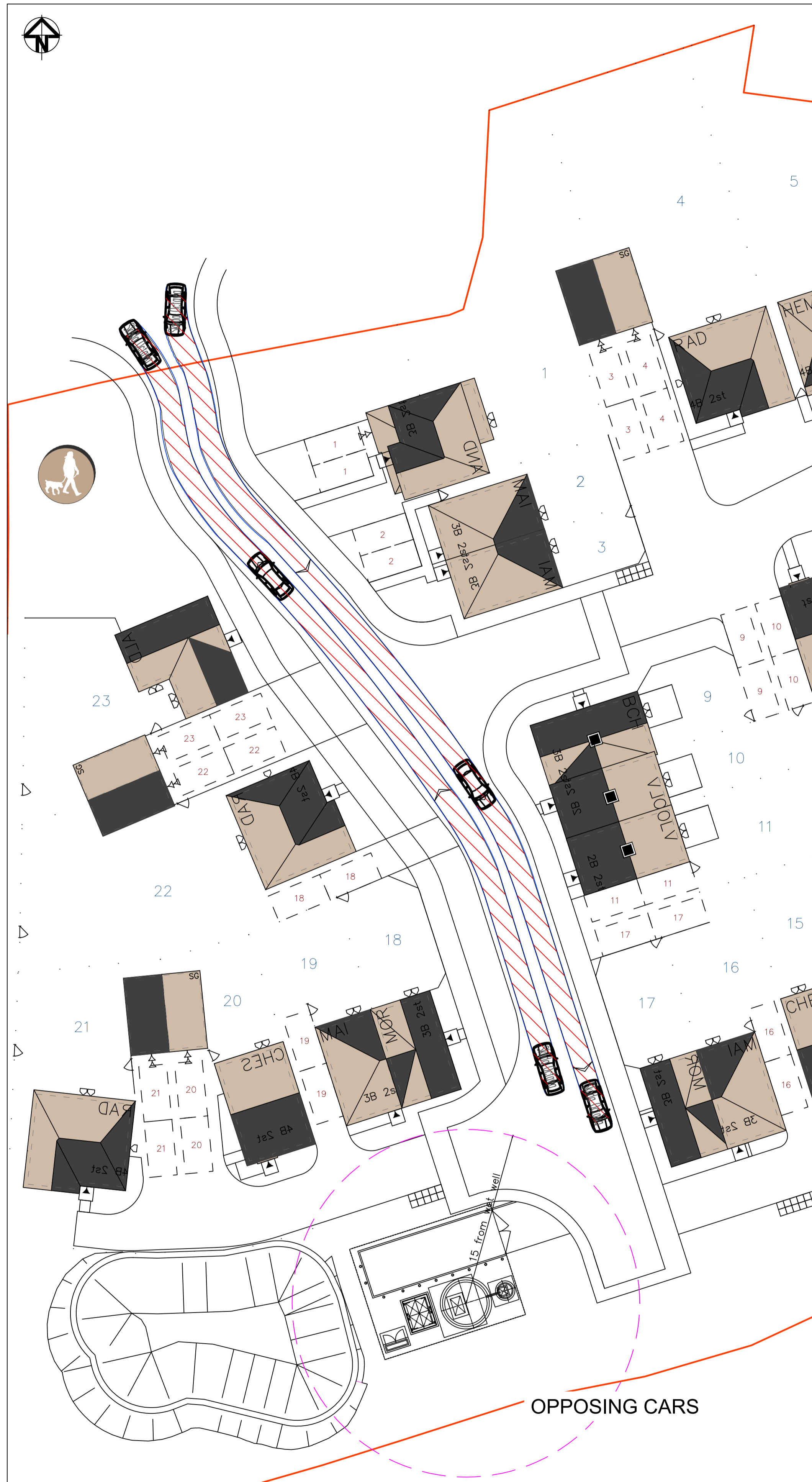
6.3 Assessment of the Glebe Road Roundabout 2024

6.3.1 The operation of the roundabout has been carried out using the Transport Research Laboratory software ARCADY6. Traffic flow matrices (included at Appendix G) quantified above have been used in the assessment with a calculation of traffic growth. Heavy goods percentages are defined as any vehicles with more than 4 wheels in contact with the road. ARCADY6 output for the proposed junction in the morning and afternoon peak hours are included at Appendix H. The results of the analysis are outlined below.

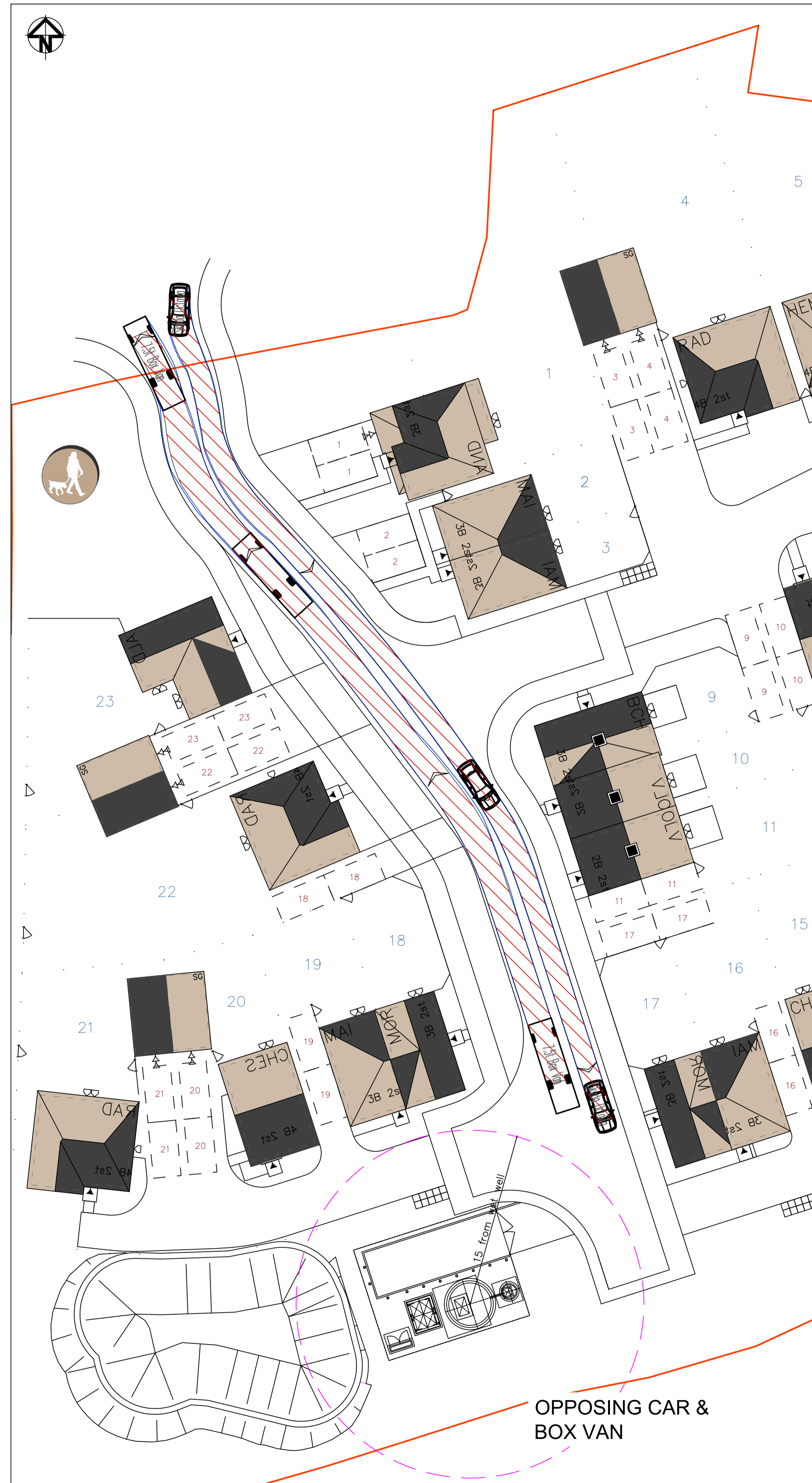
<u>Proposed Roundabout</u>	<u>AM PEAK (0800 to 0900)</u>		<u>PM PEAK (1700 to 1800)</u>	
	Max RFC	Max queue	Max RFC	Max queue
Design year flows 2024				
A Glebe Road East	0.407	0.7 vehs	0.697	2.2 vehs
B Development access	0.261	0.3 vehs	0.157	0.2 vehs
C Glebe Road West	0.548	1.2 vehs	0.424	0.7 vehs

6.3.2 The prediction of traffic figures using the roundabout is based on a robust methodology yet flows at the junction within one hour would be less than 800 vehicles. Such flows are modest for a junction of this type and the analysis demonstrates that the queuing and congestion would be minimal. The proposed junction has a great deal of spare capacity to accommodate existing and forecast traffic flows.

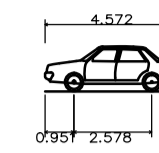
Appendix 4 Swept Path Analysis



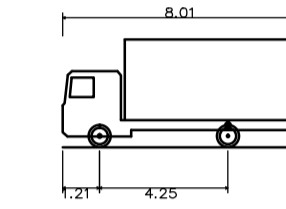
OPPOSING CARS




OPPOSING CAR & BOX VAN

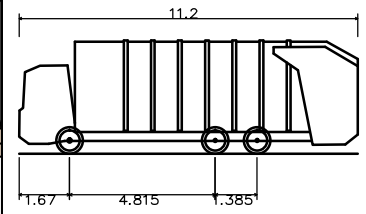
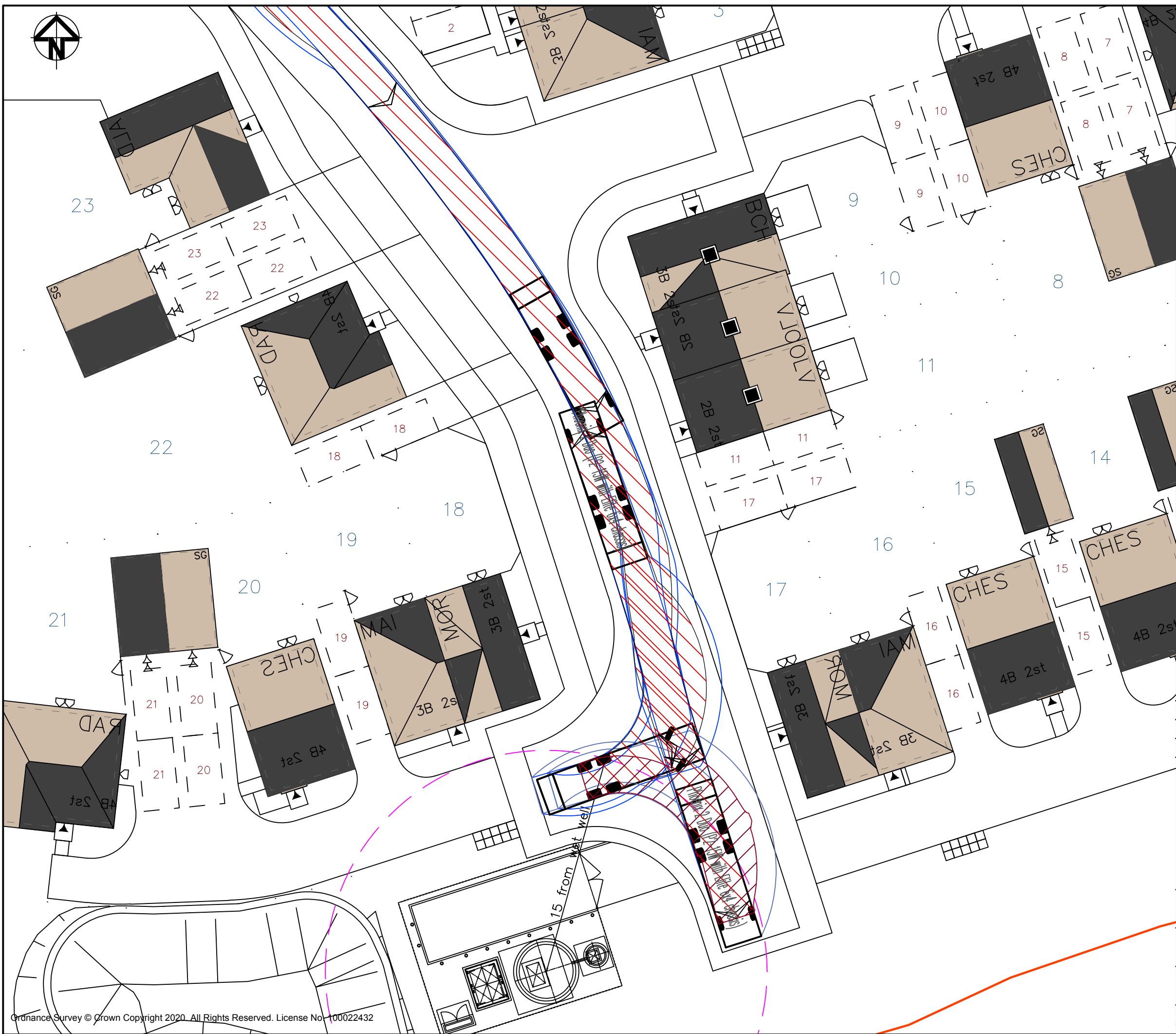


Skoda Octavia
 Overall Length 4.572m
 Overall Width 1.763m
 Overall Body Height 1.488m
 Min Body Ground Clearance 0.249m
 Max Track Width 1.715m
 Lock to Lock Time 4.00s
 Kerb to Kerb Turning Radius 5.100m
 Hatched area shows envelope of vehicle's chassis
 Blue Lines show envelope of vehicle's body



7.5t Box Van
 Overall Length 8.010m
 Overall Width 2.100m
 Overall Body Height 3.550m
 Min Body Ground Clearance 0.355m
 Track Width 2.064m
 Lock to Lock Time 4.00s
 Kerb to Kerb Turning Radius 7.400m
 Hatched area shows envelope of vehicle's chassis
 Blue Lines show envelope of vehicle's body

A	First Issue	20-11-20
 Prifffyrdd a Thrafnidiaeth Highways & Transportation Ty Penbryn, Salem, Llanddeilo, SA19 7LT E-mail: mail@acstro.com www.acstro.com Tel: 01558 824021		
TY FRY FARM PHASE 2, GLEBE ROAD LOUGHER		
CAR & BOX VAN SWEEP PATH ANALYSIS		
1394	004	A
	1:250	@ A1



Phoenix 2 Duo (P2-15W with Elite 6x4 chassis)
 Overall Length 11.200m
 Overall Width 4.815m
 Overall Body Height 3.751m
 Min Body Ground Clearance 0.304m
 Track Width 2.500m
 Lock to Lock Time 4.00s
 Kerb to Kerb Turning Radius 9.500m

Hatched area shows envelope of vehicle's chassis
 Blue Lines show envelope of vehicle's body

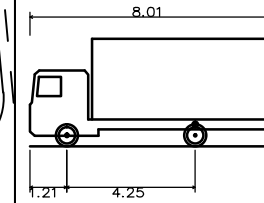
C	Revised Layout	20-11-20
B	Revised Layout	25-08-20
A	First Issue	29/07/20

acstro
 Prifffyrdd a Thrafnidiaeth
 Highways & Transportation
 Ty Penbryn, Salem, Llandeilo, SA19 7LT
 E-mail: mail@acstro.com
 www.acstro.com
 Tel: 01558 824021

TY FRY FARM PHASE 2, GLEBE ROAD LOUGHER

REFUSE LORRY SWEEP PATH ANALYSIS

1394	001	C
	1:250	@ A3



7.5t Box Van
 Overall Length 8.010m
 Overall Width 2.100m
 Overall Body Height 3.556m
 Min Body Ground Clearance 0.351m
 Track Width 2.064m
 Lock to Lock Time 4.00s
 Kerb to Kerb Turning Radius 7.400m

Hatched area shows envelope of vehicle's chassis
 Blue Lines show envelope of vehicle's body



A	First Issue	20-11-20
 Priffyrdd a Thrafnidiaeth Highways & Transportation Ty Penbryn, Salem, Llandeilo, SA19 7LT E-mail: mail@acstro.com www.acstro.com Tel: 01558 824021		

TY FRY FARM PHASE 2, GLEBE ROAD LOUGHER		
BOX VAN SWEEP PATH ANALYSIS		
1394	005	A
	1:250	@ A3

Appendix 5 TRICS Trip Rate Data - Residential

Calculation Reference: AUDIT-648801-200804-0838

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

02	SOUTH EAST		
	HC	HAMPSHIRE	1 days
03	SOUTH WEST		
	DC	DORSET	1 days
	DV	DEVON	1 days
	SM	SOMERSET	1 days
	WL	WILTSHIRE	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
	NF	NORFOLK	2 days
	SF	SUFFOLK	2 days
05	EAST MIDLANDS		
	LN	LINCOLNSHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	1 days
	ST	STAFFORDSHIRE	1 days
	WK	WARWICKSHIRE	2 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NY	NORTH YORKSHIRE	2 days
08	NORTH WEST		
	CH	CHESHIRE	2 days
	GM	GREATER MANCHESTER	1 days
	LC	LANCASHIRE	1 days
	MS	MERSEYSIDE	1 days
09	NORTH		
	TW	TYNE & WEAR	2 days
10	WALES		
	PS	POWYS	1 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: 15 to 38 (units:)
 Range Selected by User: 13 to 38 (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: 01/01/12 to 25/09/19

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	7 days
Tuesday	2 days
Wednesday	6 days
Thursday	7 days
Friday	4 days

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

Selected survey types:

Manual count	25 days
Directional ATC Count	1 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

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	24
Village	2

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

Secondary Filtering selection:

Use Class:

C3	26 days
----	---------

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

Population within 1 mile:

1,000 or Less	1 days
1,001 to 5,000	2 days
5,001 to 10,000	8 days
10,001 to 15,000	6 days
15,001 to 20,000	1 days
20,001 to 25,000	3 days
25,001 to 50,000	4 days
50,001 to 100,000	1 days

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

Population within 5 miles:

5,001 to 25,000	2 days
25,001 to 50,000	3 days
50,001 to 75,000	4 days
75,001 to 100,000	5 days
125,001 to 250,000	5 days
250,001 to 500,000	6 days
500,001 or More	1 days

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

Car ownership within 5 miles:

0.6 to 1.0	12 days
1.1 to 1.5	14 days

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

Travel Plan:

Yes	2 days
No	24 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	26 days
-----------------	---------

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

LIST OF SITES relevant to selection parameters

1	CA-03-A-05 EASTFIELD ROAD PETERBOROUGH	DETACHED HOUSES	CAMBRI D G E S H I R E
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 28 <i>Survey date: MONDAY 17/10/16</i>		<i>Survey Type: MANUAL</i>
2	CH-03-A-09 GREYSTOKE ROAD MACCLESFIELD HURDSFIELD	TERRACED HOUSES	C H E S H I R E
	Edge of Town Residential Zone Total No of Dwellings: 24 <i>Survey date: MONDAY 24/11/14</i>		<i>Survey Type: MANUAL</i>
3	CH-03-A-11 LONDON ROAD NORTHWICH LEFTWICH	TOWN HOUSES	C H E S H I R E
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 24 <i>Survey date: THURSDAY 06/06/19</i>		<i>Survey Type: MANUAL</i>
4	DC-03-A-08 HURSTDENE ROAD BOURNEMOUTH CASTLE LANE WEST	BUNGALOWS	D O R S E T
	Edge of Town Residential Zone Total No of Dwellings: 28 <i>Survey date: MONDAY 24/03/14</i>		<i>Survey Type: MANUAL</i>
5	DV-03-A-01 BRONSHILL ROAD TORQUAY	TERRACED HOUSES	D E V O N
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 37 <i>Survey date: WEDNESDAY 30/09/15</i>		<i>Survey Type: MANUAL</i>
6	FA-03-A-01 MANDELA AVENUE FALKIRK	SEMI -DETACHED/TERRACED	F A L K I R K
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 37 <i>Survey date: THURSDAY 30/05/13</i>		<i>Survey Type: MANUAL</i>
7	GM-03-A-11 RUSHFORD STREET MANCHESTER LEVENSHULME	TERRACED & SEMI -DETACHED	G R E A T E R M A N C H E S T E R
	Neighbourhood Centre (PPS6 Local Centre) Residential Zone Total No of Dwellings: 37 <i>Survey date: MONDAY 26/09/16</i>		<i>Survey Type: MANUAL</i>
8	HC-03-A-17 CANADA WAY LIPHOOK	HOUSES & FLATS	H A M P S H I R E
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 36 <i>Survey date: THURSDAY 12/11/15</i>		<i>Survey Type: MANUAL</i>
9	LC-03-A-31 GREENSIDE PRESTON COTTAM	DETACHED HOUSES	L A N C A S H I R E
	Edge of Town Residential Zone Total No of Dwellings: 32 <i>Survey date: FRIDAY 17/11/17</i>		<i>Survey Type: MANUAL</i>

LIST OF SITES relevant to selection parameters (Cont.)

10	LN-03-A-03 ROOKERY LANE LINCOLN BOULTHAM Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 22 <i>Survey date: TUESDAY 18/09/12</i>	SEMI DETACHED	LINCOLNSHIRE	<i>Survey Type: MANUAL</i>
11	MS-03-A-03 BEMPTON ROAD LIVERPOOL OTTERSPOOL Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 15 <i>Survey date: FRIDAY 21/06/13</i>	DETACHED	MERSEYSIDE	<i>Survey Type: MANUAL</i>
12	NF-03-A-01 YARMOUTH ROAD CAISTER-ON-SEA Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 27 <i>Survey date: TUESDAY 16/10/12</i>	SEMI DET. & BUNGALOWS	NORFOLK	<i>Survey Type: MANUAL</i>
13	NF-03-A-10 HUNSTANTON ROAD HUNSTANTON Edge of Town Residential Zone Total No of Dwellings: 17 <i>Survey date: WEDNESDAY 12/09/18</i>	MIXED HOUSES & FLATS	NORFOLK	<i>Survey Type: MANUAL</i>
14	NY-03-A-08 NICHOLAS STREET YORK Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 21 <i>Survey date: MONDAY 16/09/13</i>	TERRACED HOUSES	NORTH YORKSHIRE	<i>Survey Type: DIRECTIONAL ATC COUNT</i>
15	NY-03-A-11 HORSEFAIR BOROUGHBRIDGE Edge of Town Residential Zone Total No of Dwellings: 23 <i>Survey date: WEDNESDAY 18/09/13</i>	PRIVATE HOUSING	NORTH YORKSHIRE	<i>Survey Type: MANUAL</i>
16	PS-03-A-02 GUNROG ROAD WELSHPOOL Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 28 <i>Survey date: MONDAY 11/05/15</i>	DETACHED/SEMI-DETACHED	POWYS	<i>Survey Type: MANUAL</i>
17	SF-03-A-05 VALE LANE BURY ST EDMUNDS Edge of Town Residential Zone Total No of Dwellings: 18 <i>Survey date: WEDNESDAY 09/09/15</i>	DETACHED HOUSES	SUFFOLK	<i>Survey Type: MANUAL</i>

LIST OF SITES relevant to selection parameters (Cont.)

18	SF-03-A-06 BURY ROAD KENTFORD	DETACHED & SEMI -DETACHED	SUFFOLK
	Neighbourhood Centre (PPS6 Local Centre) Village Total No of Dwellings: 38 <i>Survey date: FRIDAY 22/09/17</i>		
19	SH-03-A-06 ELLESMERE ROAD SHREWSBURY	BUNGALOWS	SHROPSHIRE
	Edge of Town Residential Zone Total No of Dwellings: 16 <i>Survey date: THURSDAY 22/05/14</i>		
20	SM-03-A-01 WEMBDON ROAD BRIDGWATER NORTHFIELD	DETACHED & SEMI	SOMERSET
	Edge of Town Residential Zone Total No of Dwellings: 33 <i>Survey date: THURSDAY 24/09/15</i>		
21	ST-03-A-08 SILKMORE CRESCENT STAFFORD MEADOWCROFT PARK	DETACHED HOUSES	STAFFORDSHIRE
	Edge of Town Residential Zone Total No of Dwellings: 26 <i>Survey date: WEDNESDAY 22/11/17</i>		
22	TW-03-A-02 WEST PARK ROAD GATESHEAD	SEMI -DETACHED	TYNE & WEAR
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 16 <i>Survey date: MONDAY 07/10/13</i>		
23	TW-03-A-03 STATION ROAD NEAR NEWCASTLE BACKWORTH	MIXED HOUSES	TYNE & WEAR
	Neighbourhood Centre (PPS6 Local Centre) Village Total No of Dwellings: 33 <i>Survey date: FRIDAY 13/11/15</i>		
24	WK-03-A-02 NARBERTH WAY COVENTRY POTTERS GREEN	BUNGALOWS	WARWICKSHIRE
	Edge of Town Residential Zone Total No of Dwellings: 17 <i>Survey date: THURSDAY 17/10/13</i>		
25	WK-03-A-03 BRESE AVENUE WARWICK GUYS CLIFFE	DETACHED HOUSES	WARWICKSHIRE
	Suburban Area (PPS6 Out of Centre) Residential Zone Total No of Dwellings: 23 <i>Survey date: WEDNESDAY 25/09/19</i>		

LIST OF SITES relevant to selection parameters (Cont.)

26 WL-03-A-02 SEMI DETACHED WILTSHIRE
HEADLANDS GROVE
SWINDON

Suburban Area (PPS6 Out of Centre)
Residential Zone

Total No of Dwellings:

27

Survey date: THURSDAY

22/09/16

Survey Type: MANUAL

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

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
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	26	26	0.070	26	26	0.233	26	26	0.303
08:00 - 09:00	26	26	0.149	26	26	0.357	26	26	0.506
09:00 - 10:00	26	26	0.148	26	26	0.189	26	26	0.337
10:00 - 11:00	26	26	0.171	26	26	0.152	26	26	0.323
11:00 - 12:00	26	26	0.174	26	26	0.177	26	26	0.351
12:00 - 13:00	26	26	0.189	26	26	0.187	26	26	0.376
13:00 - 14:00	26	26	0.161	26	26	0.176	26	26	0.337
14:00 - 15:00	26	26	0.193	26	26	0.209	26	26	0.402
15:00 - 16:00	26	26	0.271	26	26	0.234	26	26	0.505
16:00 - 17:00	26	26	0.278	26	26	0.168	26	26	0.446
17:00 - 18:00	26	26	0.287	26	26	0.160	26	26	0.447
18:00 - 19:00	26	26	0.221	26	26	0.132	26	26	0.353
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.312			2.374			4.686

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: 15 - 38 (units:)
Survey date range: 01/01/12 - 25/09/19
Number of weekdays (Monday-Friday): 26
Number of Saturdays: 0
Number of Sundays: 0
Surveys automatically removed from selection: 0
Surveys manually removed from selection: 0

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



Acstro Limited
Ty Penbryn
Salem
Llandeilo
Carmarthenshire
SA19 7LT

W. www.acstro.com
E. mail@acstro.com
T. 01558 824021
