Project

Residential Development at Lissywollen, Athlone, Co. Westmeath

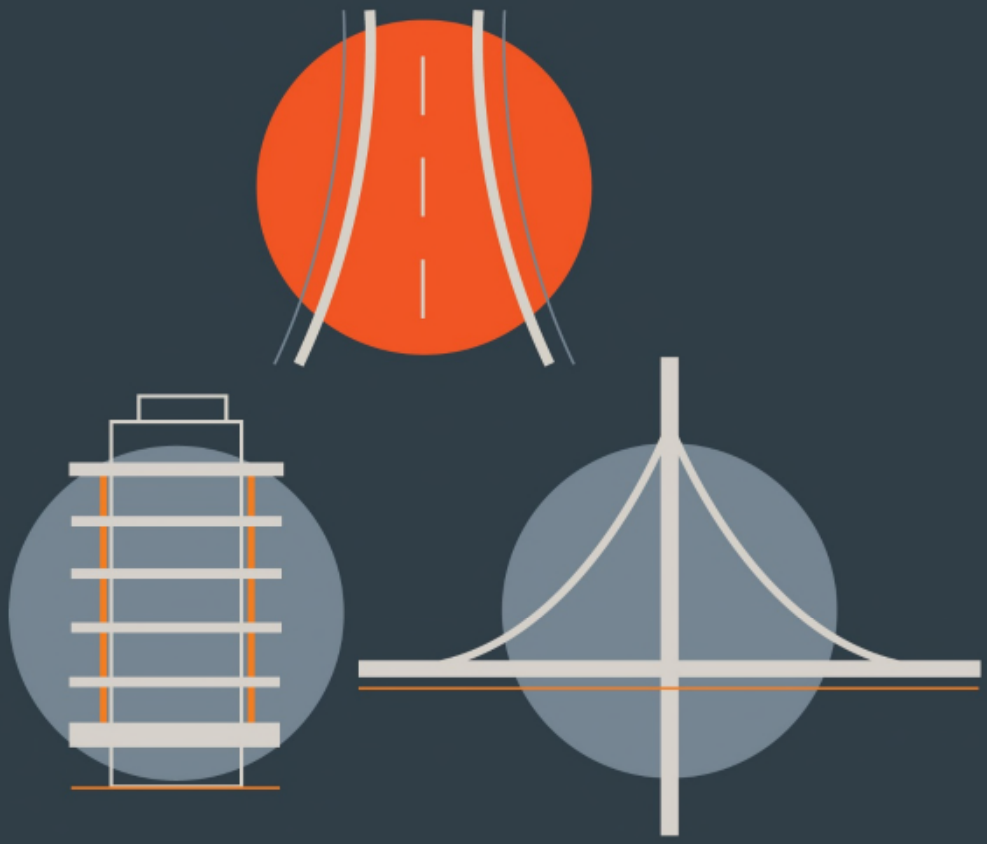
Report Title

TRAFFIC AND TRANSPORT ASSESSMENT

Client

Alanna Roadbridge Developments Ltd.

TRANSPORTATION



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Author: Sayed Ahmad Saeed / Sarah Heung

Reviewed by: Thomas Jennings

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DBFL Consulting Engineers

Dublin Office
Ormond House
Upper Ormond Quay
Dublin 7

Tel 01 4004000
Email info@dbfl.ie
Web www.dbfl.ie

Waterford Office
Suite 8b The Atrium,
Maritana Gate,
Canada Street, Waterford

Tel 051 309500
Email info@dbfl.ie
Web www.dbfl.ie

Cork Office
Phoenix House
Monahan Road
Cork

Tel 021 2024538
Email info@dbfl.ie
Web www.dbfl.ie

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1.0 INTRODUCTION

1.1 BACKGROUND

1.1.1 DBFL Consulting Engineers (DBFL) have been commissioned to prepare a Traffic and Transport Assessment (TTA) for a 576-unit Strategic Housing Development on zoned lands at Lissywollen, Athlone, Co. Westmeath comprising: -

- 246 no. apartment units;
- 45 no. duplex units;
- 285 no. houses, and
- 2 no. crèche facilities (321m^2 and 448m^2 GFA)
- 1 no. community hub (101m^2 GFA)

1.1.2 The objective of this Traffic & Transport Assessment (TTA) is to assess and quantify:-

- The principle accessibility characteristics of the existing local receiving environment, and
- The proposed method of access for pedestrians, cyclists and vehicles travelling to/from the proposed development and the potential scale of impact upon the local road network.

1.1.3 During the development of this report, traffic turning count surveys have been commissioned specifically for this assessment, with the objective of providing background information relating to existing traffic movement patterns across the local road network. This information has been supplemented with data obtained from site audits of the local road network, subsequently enabling the identification of existing local travel characteristics and an appreciation of the local receiving environment from a transportation perspective.

1.1.4 The availability and subsequent review of this information will enable the planning authority to gain a more detailed understanding of the proposed development at an early stage. This information will enable the authority to respond in an appropriate manner in the context of the scale and nature of the potential impact generated by the subject proposals.

1.2 METHODOLOGY

1.2.1 Our approach to the study accords with policy and guidance both at a national and local level. Accordingly, the adopted methodology responds to best practices, current and emerging guidance, exemplified by a series of publications, all of which advocate this method of analysis. Key publications consulted include: -

- '*Traffic and Transport Assessment Guidelines*' (May 2014) National Road Authority;
- *'Traffic Management Guidelines'* Dublin Transportation Office & Department of the Environment and Local Government (May 2003); and
- *'Guidelines for Traffic Impact Assessments'* The Institution of Highways and Transportation.

1.2.2 Our methodology incorporated a number of key inter-related stages, including:-

- **Site Audit**: A site audit was undertaken to quantify existing road network issues and identify local infrastructure characteristics, in addition to establishing the level of accessibility to the site in terms of walking, cycling and public transport. An inventory of the local road network was also developed during this stage of the assessment.
- **Traffic Counts**: Traffic counts were undertaken and analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed development.
- **Trip Generation**: A trip generation exercise has been carried out to establish the potential level of vehicle trips generated by the proposed residential development.
- **Trip Distribution:** Based upon both the existing traffic characteristics and the network layout in addition to the spatial/land use configuration and density of the urban structure across the catchment area of the development, a distribution exercise has been undertaken to assign site generated vehicle trips across the local road network.
- **Network Impact:** in accordance with the Institute of Highways and Transportation; Traffic Impact Assessment guidelines, the specific level of

influence generated by the proposed residential development upon the local road network was ascertained and the junctions which required assessment in greater detail were identified.

- **Network Assessment:** Drawing upon the findings of the previous stages, an operational assessment of the local road network has been undertaken to evaluate the performance of key junctions both prior to and following the implementation and occupation of the proposed development.

1.3 REPORT STRUCTURE

1.3.1 As introduced above, this TTA seeks to clarify the potential level of influence generated by the proposed development upon the local road network and subsequently ascertain the existing and future operational performance of the local transport system. The structure of the report responds to the various stages of this exercise including the key tasks summarised below.

1.3.2 **Chapter Two** of this report describes the existing conditions at the proposed development site and surrounding area whilst the relevant transportation policies that influence the design and appraisal of the subject development proposals are highlighted in **Chapter Three.**

1.3.3 **Chapter Four** provides a summary of the key characteristics of the proposed development itself.

1.3.4 The development's parking strategy is outlined in **Chapter Five**.

1.3.5 In **Chapter Six** a summary of the vehicle trip generation, vehicle distribution, and network assignment exercise is detailed.

1.3.6 The process by which the network impact has been established and the proposed mitigation strategy is reported in **Chapter Seven**. The principal results of detailed junction assessments is outlined within **Chapter Eight**.

1.3.7 DBFL's response to ABP recommendations and the Local Authorities observations in regard to Traffic and Transport is summarised in **Chapter Nine**.

1.3.8 Finally, a summary of our appraisal together with the main conclusions of the assessment are provided in **Chapter Ten**.

2.0 RECEIVING ENVIRONMENT

2.1 LAND USE

2.1.1 The subject development lands are zoned predominantly 'Proposed Residential' with a small parcel of development lands zoned 'Live Work' within the Athlone Town Development Plan 2014-2020 (**Figure 2.1**). The development site is also subject to a Local Area Plan known as the Lissywollen South Framework Plan 2018-2024 which applies land use 'Residential' (Area 4) zoning to the entire development lands.

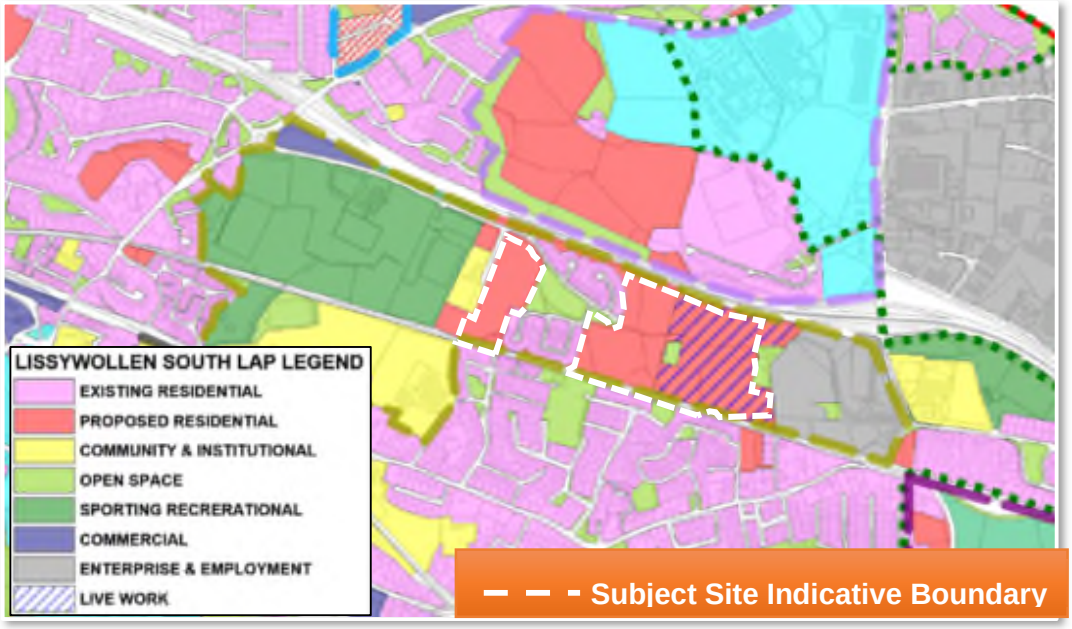


Figure 2.1: Land Use Zoning (Reference: Athlone Town Development Plan 2014-2020)

2.2 LOCATION

2.2.1 The general location of the subject site in relation to the surrounding road network is illustrated in **Figure 2.2** below whilst **Figure 2.3** indicatively shows the extent of the subject residential site boundary and neighbouring lands.

2.2.2 The development site is located approximately 1km to the northeast of Athlone Town Centre. The subject lands are bounded to the north by the N6 National Road corridor and to the south by the 'Old Rail Trail Greenway'. The western boundary of the smaller development plot comprises Athlone Town Stadium lands and Scoil Na Gceirthe Máistrí. The existing Brawny residential development forms the eastern boundary of the smaller development plot and the western boundary of

the larger development plot. The larger development plot's eastern boundary comprises a greenfield site and the existing ESB Networks facility.

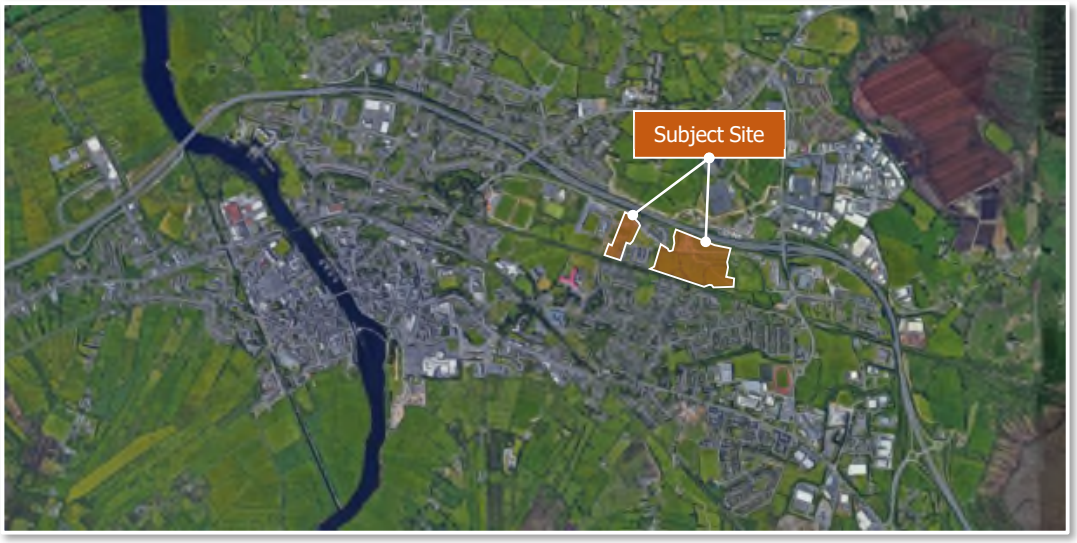


Figure 2.2: Site Location (Reference: google maps)

Figure 2.3: Indicative Site Boundary (Reference: google maps)

2.3 EXISTING TRANSPORTATION INFRASTRUCTURE

Background

2.3.1 An important stage in the development of a Traffic and Transport Assessment is the identification and appreciation of the local network's existing transport conditions and vehicle movement characteristics.

2.3.2 An audit of the local road network has therefore been undertaken to establish the existing transport conditions and vehicle movement patterns across the existing network.

Existing Cycling and Pedestrian Facilities

As introduced above, the Old Rail Trail Greenway is located to the south of the development lands and operates in and East-West direction adjacent to the disused rail line. This facility is currently approximately 40km long and currently operates between the R195 in Athlone (to the west of the development site) and Mullingar to the east, however in due course it will form a section of the Galway to Dublin strategic cycleway.

Figure 2.4A: Existing Formal Access to / from the Old Rail Trail Greenway

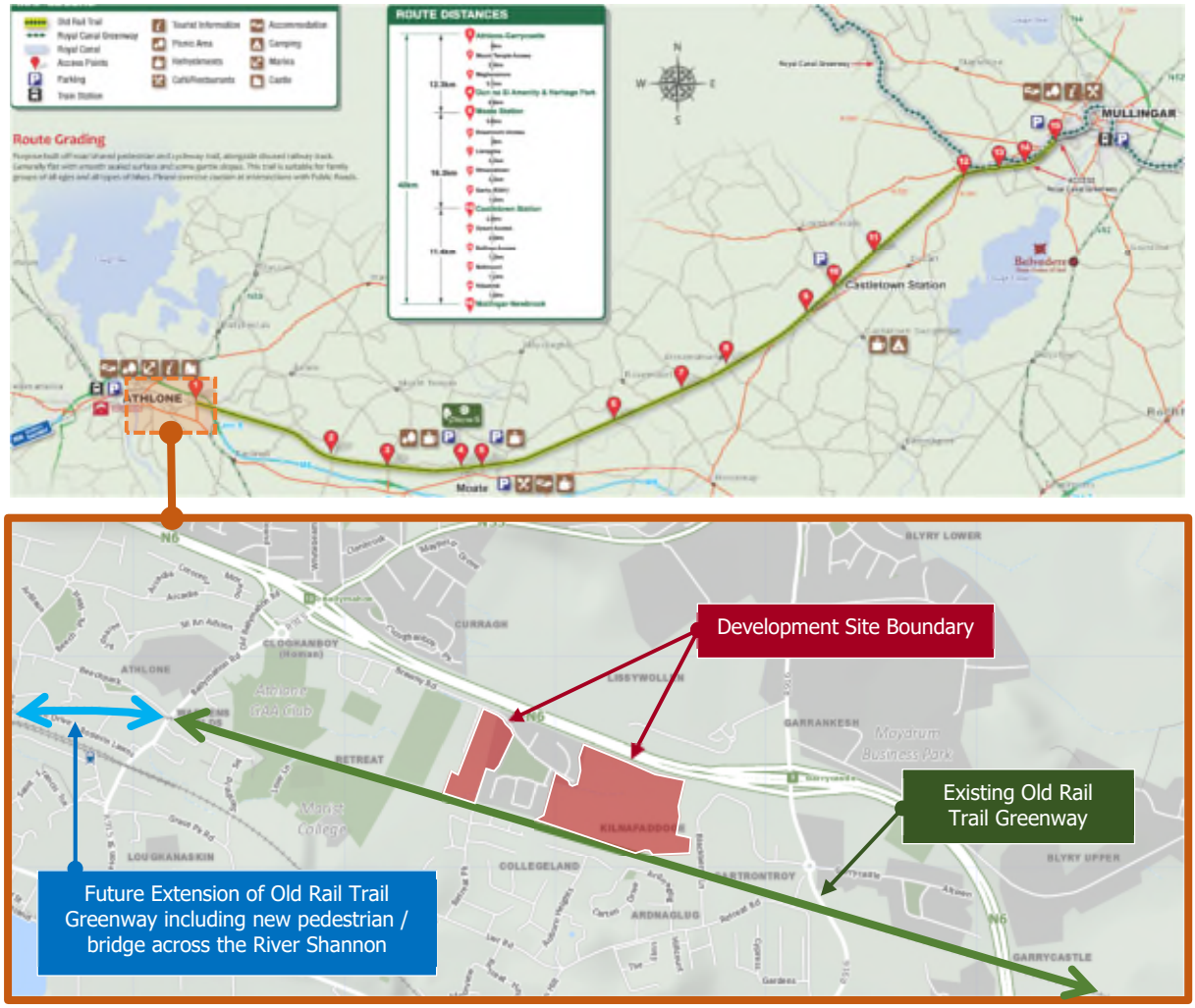


Figure 2.4B: Old Rail Trail Greenway

2.3.3 The Old Rail Trail Greenway is currently easily accessible via a dedicated access link which is positioned along the western boundary of the proposed developments smaller plot, adjacent to Scoil na gCeithre Máistrí school. Furthermore, access for pedestrians / cyclists can be gained to Athlone Community College and Our Lady's Bower Secondary School (and subsequently Athlone Town Centre by continuing along Lower Road) via an access on the opposite side of the greenway as illustrated in **Figure 2.4A** above.

2.3.4 Brawny Road, which provides a connection between the R915 and the subject site, benefits from good quality footways on both sides of the corridor and benefits from traffic calming measures including speed tables at a number of junctions and intermediate locations along the link as illustrated in **Figure 2.5** below.

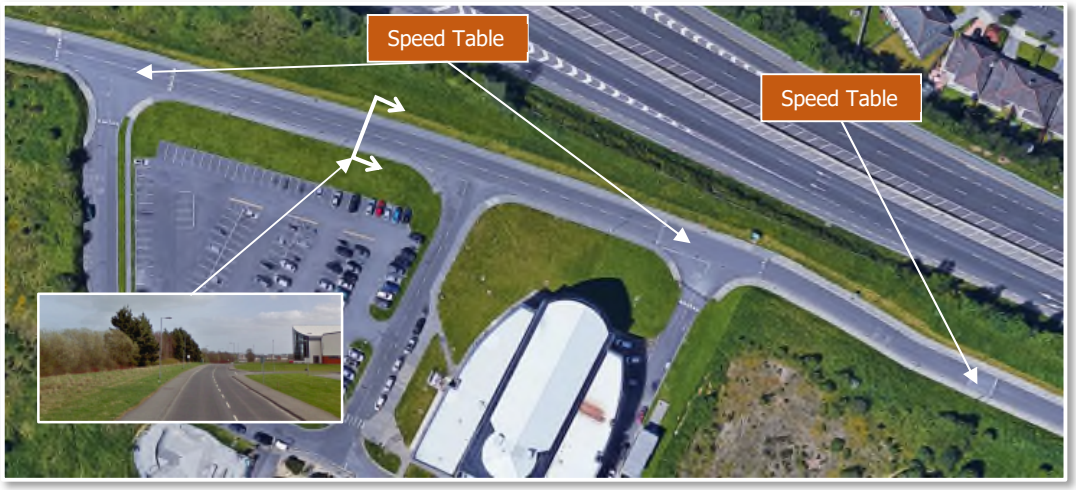


Figure 2.5: Pedestrian Facilities and Traffic Calming Measures along Brawny Road

2.3.5 On all approaches to the Brawny Road / R915 / N55 / One Mile Round roundabout junction, as located at the western extent of Brawny Road, dedicated pedestrian footways are available on both sides of the corridors in addition to dedicated cycle tracks on all arms along the immediate approaches to the roundabout as illustrated in **Figure 2.6** below.

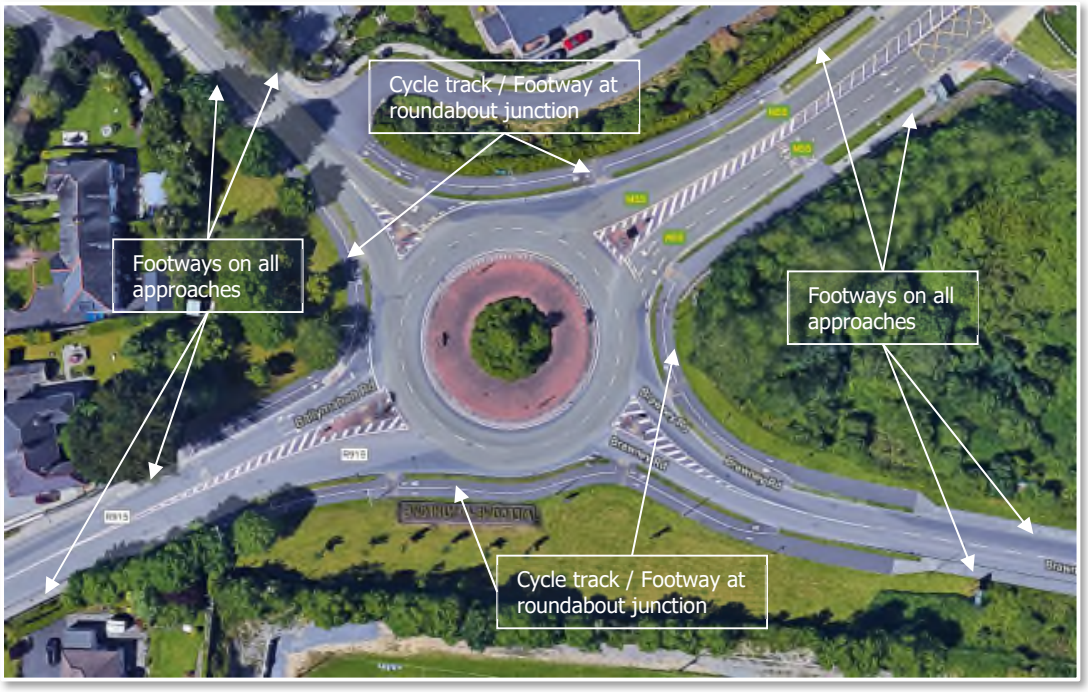


Figure 2.6: Pedestrian and Cycle Facilities at Brawny Road / R915 / N55 / One Mile Round Roundabout

Existing Road Network

2.3.6 The subject development site is currently accessed via Brawny Road. At the

western extent of the Brawny Road corridor is the Brawny Road / R915 / N55 / One Mile Round roundabout junction. Travelling in a southbound direction along the R915 provides access to Athlone Town Centre. Travelling northbound from the aforementioned roundabout along the N55 leads to the N6 road corridor (Junction 10) and subsequently the strategic M6 motorway. The strategic M6 motorway provides access to destinations including Ballinasloe, Athenry and Galway to the west and Kilbeggan, Tyrrelspass, Kinnegad to the east before joining the M4 motorway leading to Dublin City and intermediate destinations.

2.3.7 Continuing north on the N55 from the N6 interchange (J10) leads to destinations including Glasson, Ballymahon, Carrickboy and Edgeworthstown.

Public Transport - Bus

2.3.8 The subject site benefits from good public transport accessibility levels. Bus Eireann operates 2 number town services (A1 and A2) both of which operate between Monksland and Greggan but along different interchange routes. Interchange opportunities for both the A1 and A2 services are located within walking distance of the subject site with the nearest interchanges currently located approximately 600m (A2) and 750m (A1) walking distance to the east from the subject site as detailed in **Figure 2.7** below. Furthermore a second bus interchange for the local A2 bus service is currently available at the Regional Sports Centre and is only 500m from the subject development site.

2.3.9 Furthermore, 3 no. 'local link' services are accessible at Athlone Institute of Technology as located approximately 1.6km from the subject site. These 'local link' services provide access to destinations including Moate, Roscrea, Shannonbridge, Pollagh and Kilcormac. A summary of the aforementioned bus services is presented in **Table 2.1** below.

2.3.10 Three no. regional bus services serve Athlone including Bus Eireann services 70 and 73 which is accessible at Athlone Bus Station (14km from subject site) and Citylink service 763 as accessible at AIT (1.6km from subject site). Bus Eireann route 70 operates between Galway and Dundalk whilst route 73 operates between Waterford / Carlow and Longford. The Citylink 763 service operates between Galway and Dublin Airport. A summary of the aforementioned bus services is presented in **Figure 2.8** and **Table 2.2** below.

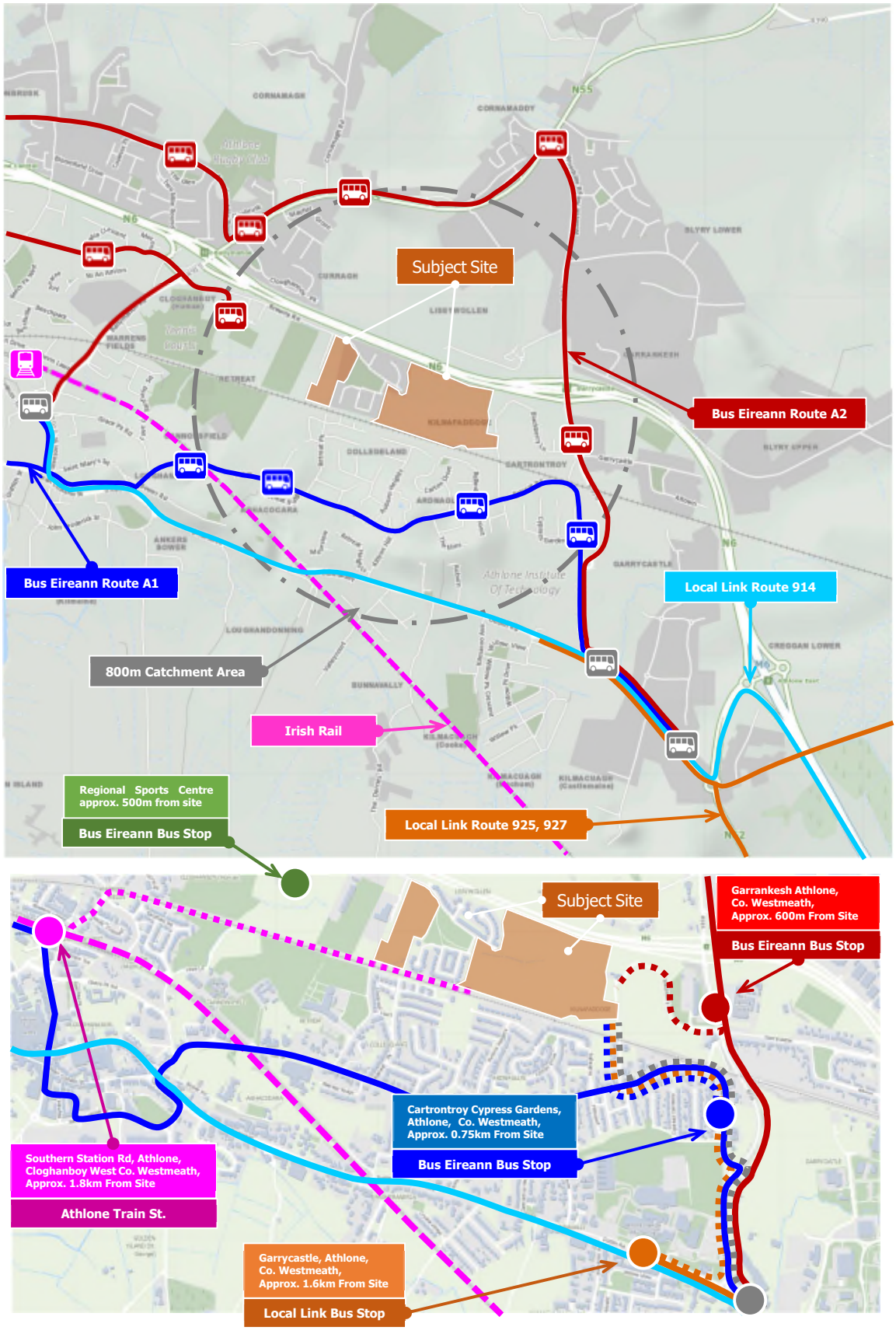


Figure 2.7: Public Transport Connectivity – Local Bus Services

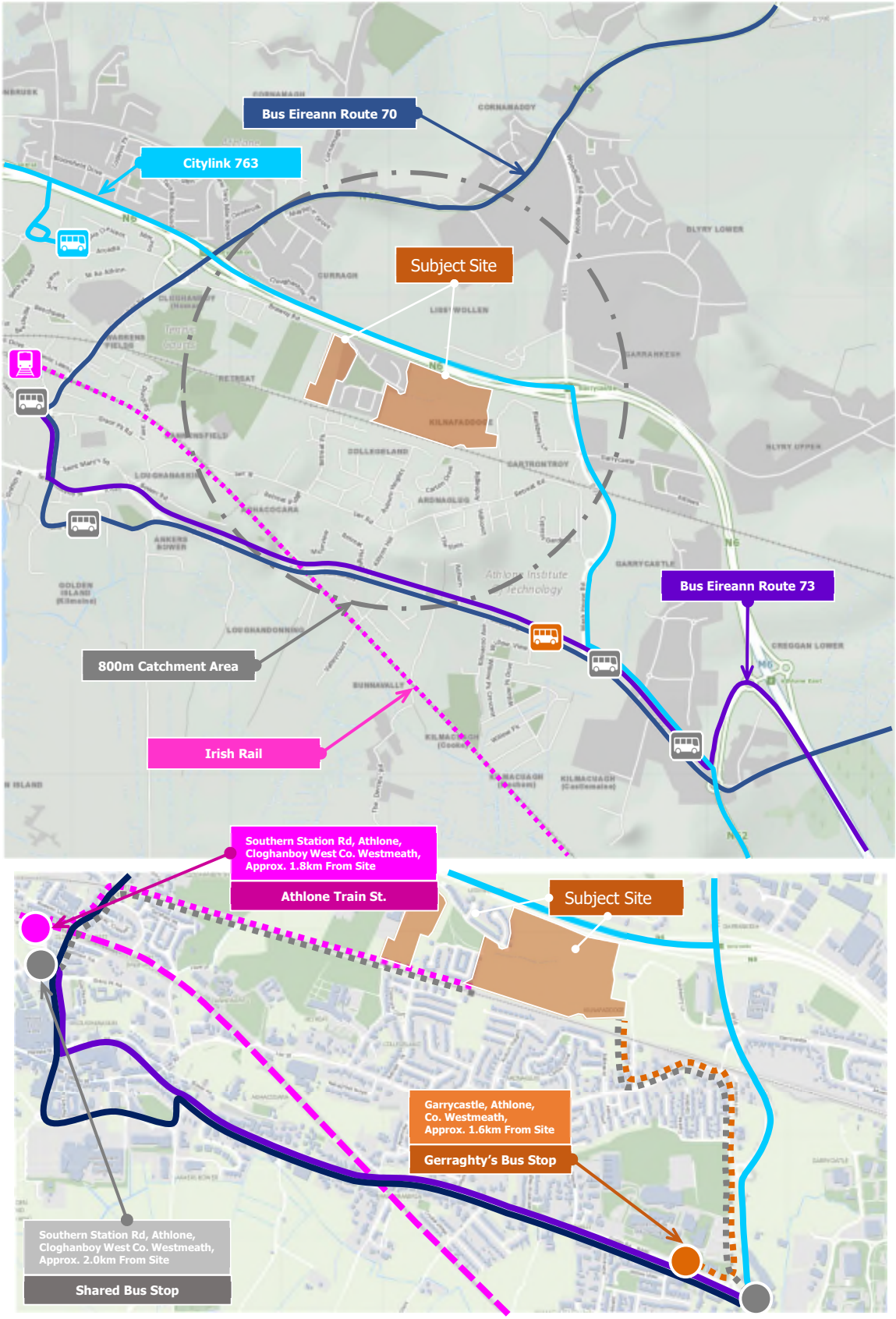


Figure 2.8: Public Transport Connectivity – Regional Coach Services

Provider	Route	Description	Mon-Fri	Sat	Sun
Bus Eireann	A1	Monksland – Creggan Court	27	24	12
		Creggan Court – Monksland	27	25	12
	A2	Monksland – Creggan Court	26	24	12
		Creggan Court – Monksland	25	23	11
Local Link	907	Roscrea - Moate	1	-	-
		Moate - Roscrea	2	-	-
	914	Shannonbridge - Athlone	-	1	-
		Athlone - Shannonbridge	-	1	-
	1925 (a)	Pollagh - Athlone	1	-	-
		Athlone – Kilcormac	2	-	-

Table 2.1: No of Local Bus Services per day

Provider	Route	Description	Mon-Fri	Sat	Sun
Bus Eireann	70	Galway / Athlone – Dundalk	4	3	2
		Dundalk – Galway / Athlone	4	3	2
	73	Waterford / Carlow – Longford	2	2	2
		Longford – Waterford	2	2	1
Citylink	763	Galway - Dublin Airport	8	8	8
		Dublin Airport – Galway	8	8	8

Table 2.2: No of Regional Bus Services per day

Public Transport - Rail

2.3.11 Athlone train station is located approximately 2km from the subject site via the R915 (by all modes) and only 1.4km away via the Old Rail Trail Greenway (pedestrian / cyclists).

2.3.12 This station is serviced by 2 no. rail services including;

- Dublin Heuston to / from Galway, and
- Dublin Heuston to / from Westport and Ballina

2.3.13 A summary of the aforementioned services are presented in **Table 2.3** below.

Destination	Mon – Thur	Fri	Sat	Sun
Dublin to Galway	10	10	10	6
Galway to Dublin	11	11	9	6
Dublin to Westport and Ballina	4	5	4	4
Westport and Ballina to Dublin	5	5	5	4

Table 2.3: Athlone Train Station Services

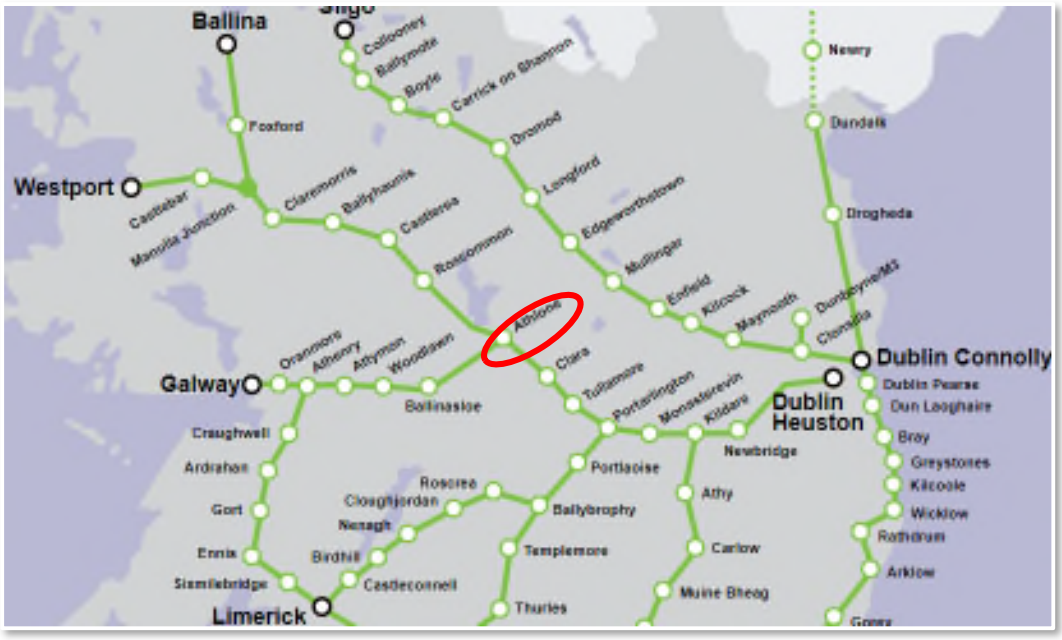


Figure 2.9: Rail Network

2.4 FUTURE TRANSPORT PROPOSALS

Cycle / Walking Proposals

2.4.1 It is an objective of the Athlone Town Development Plan 2014-2020 (O-WC16) *"To provide a walking/cycling route from the Athlone Mullingar railway line in Athlone, to the River Shannon, via a new bridge over the Shannon to the west bank and onwards to the Roscommon County boundary, with the potential to connect to Athlone Castle and southwards around the town"*.

2.4.2 The Westmeath County Council proposed extension of the Old Rail Trail Greenway as far as the River Shannon is expected to be operational within the next 12 months (i.e. in 2021). The future pedestrian / cycle bridge over the River Shannon within the next 3-4 years (funded by the NTA).

2.4.3 Another objective of the development plan is *"To provide north-south pedestrian and cycle linkages between Curragh-Lissywollen and Lissywollen South/Retreat, to overcome barriers to access and movement created by the N6 and rail lines"*.

Public Transport

Rail

2.4.4 The development plan highlights the potential for the reopening of the rail link between Athlone and Mullingar and acknowledges that this *"would serve to further*

strengthen public transport interconnectivity by connecting the Galway/Mayo rail line with the Sligo rail line and potentially provide an additional line option for the Galway-Dublin service. This would also facilitate greater accessibility to Athlone and connectivity within the county and also on a national level providing improved cross linkages, with services to the two main stations in the capital and enabling increases on the Galway Dublin rail line. The Councils are committed to supporting and facilitating the re-opening of the Athlone to Mullingar rail line".

Bus

2.4.5 Bus services are considered a *"key player in offering an alternative to the private car"* within the development plan. The provision of a Quality Bus Corridor is considered to be a possibility within Athlone Town in the future.

2.4.6 The subject scheme layout, specifically the proposed east-west avenue, has been designed to facilitate the existing local bus route A2 to extend eastwards into the subject development lands beyond its existing extents at Athlone Regional Sports Centre (Reference **Section 4.4** for more details).

Road Infrastructure Proposals

2.4.7 A new link road is proposed to the east of Athlone Town known as the Loughandonning Link Road and will provide a local road link between The Creggan LAP lands and Athlone Town Centre.

2.4.8 The Westmeath County Council proposed North / South link between Brawny Road and Retreat Road, once implemented sometime in the future, will *"give priority to buses, cyclists and pedestrians and shall be sited so as not to adversely impact upon the landscape setting of the Marist School ".*

Timescales

2.4.9 The implementation of the above cycle, public transport and road infrastructure schemes by the local authority will be subject to further design, public consultation, approval, and importantly availability of funding and resources.

2.5 LOCAL AMENITIES

2.5.1 As illustrated in **Figure 2.10**, the proposed development site is well placed in terms of the availability of and access to local amenities. There are 6 number primary schools and 4 no. post primary schools within 5km of the subject site.

Athlone IT is located only 1.5km to the southeast. The subject site benefits from good access to local retail and leisure facilities including Athlone Regional Sports Complex located only 550m to the west along Brawny Road. Furthermore, the subject development site is well places to benefit from local employment opportunities at Blyry Industrial estate to the northeast and Monksland Industrial Park / Daneswell Business Park / Westpoint Business Park located to the west via the N6/M6.

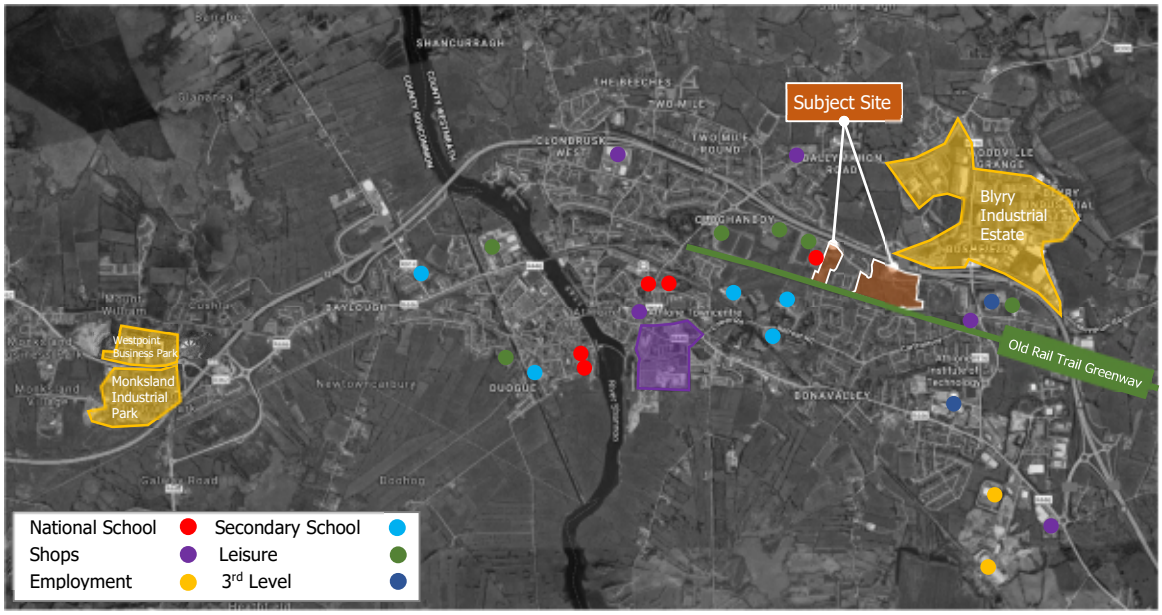


Figure 2.10: Local Amenities

2.6 ROAD SAFETY REVIEW

2.6.1 With the objective of ascertaining the road safety record of the immediate routes leading to/from the subject site, the collision statistics as detailed on the Road Safety Authority's (RSA) website (www.rsa.ie) have been examined. The RSA website includes basic information relating to reported collisions over the most recent eleven-year period, from 2005 to 2015 inclusive.

2.6.2 The RSA database records detail where collision events has been officially recorded such as when the Garda being present to formally record details of the incident.

2.6.3 **Table 2.4** below summarises the RSA Collision Data in the vicinity of the proposed development.

2.6.4 Incident number 1 whose circumstances were recorded as 'Head-on conflict' occurred at the junction of Moydrum Road / R916 and involved a bus, with two

number reported minor injuries arising from this incident. Incident number 2 also occurred at this junction whose circumstances were recorded as 'Angle, right turn' and involved a bus, with one number reported minor injury arising from this incident.

2.6.5 Incident number 3 whose circumstances were recorded as 'Pedestrian' occurred in Brawny Square and involved a car, with one number reported minor injury arising from this incident.

2.6.6 Incident number 4 whose circumstances were recorded as 'Head-on conflict' occurred at the junction of Brawny Road / rear access to Athlone Regional Sports Centre and involved a car, with one number reported minor injury arising from this incident.

2.6.7 Incident number 5 whose circumstances were recorded as 'Rear end, straight' occurred at the junction of Brawny Road / R915 Ballymahon Road and involved a car, with two number reported minor injuries arising from this incident.

2.6.8 Incident numbers 6 to 8 occurred on the immediate southern approach to the Brawny Road / R915 Ballymahon Road roundabout junction. Incident number's 6 and 7 whose circumstances were both recorded as 'Pedestrian' both involved a car, with one number reported minor injury arising from incident 6 and one number reported serious injury arising from incident 7. Incident number 8 whose circumstances were recorded as 'Head-on conflict' involved a car, with one number reported minor injury arising from this incident.

2.6.9 Incident number 9 and 10 occurred in the vicinity of the Southern Gaels GAA club access. Incident number 9 whose circumstances were recorded as 'Rear end, straight' involved a car, with one number reported minor injury arising from this incident. Finally, Incident number 10 whose circumstances were recorded as 'Other' involved a bicycle, with one number reported minor injury arising from this incident.

2.6.10 The review of the RSA data reveals that the local road network exhibits a good safety record considering the volume of traffic traveling across the local road network.

2.6.11 In summary the review confirms that no significant incident trends or significant safety concerns are evident across the local road network.

Figure 2.11: RSA Collision Data (www.rsa.ie)

Ref	Severity	Year	Vehicle	Circumstances	Day	Time	Casualty
1	Minor	2006	Bus	Head-on conflict	Sun	2300-0300	2
2	Minor	2011	Motorcycle	Angle, right turn	Tue	1900-2300	1
3	Minor	2013	Car	Pedestrian	Wed	1900-2300	1
4	Minor	2011	Car	Head-on conflict	Thur	1000-1600	1
5	Minor	2006	Car	Rear end, straight	Fri	2300-0300	2
6	Minor	2007	Car	Pedestrian	Wed	1600-1900	1
7	Serious	2009	Car	Pedestrian	Thur	1000-1600	1
8	Minor	2007	Car	Head-on conflict	Fri	1600-1900	1
9	Minor	2012	Car	Rear end, straight	Thur	1900-2300	1
10	Minor	2014	Bicycle	Other	Fri	1000-1600	1

Table 2.4: RSA Collision Data (www.rsa.ie)

2.7 LIHAF INFRASTRUCTURE

2.7.1 In March 2017 the Minister for Public Expenditure and Reform as part of the governments initiative ***Rebuilding Ireland: Action Plan for Housing and Homelessness*** announced, through the establishment of the Local Infrastructure Housing Activation Fund (LIHAF); approval in principle of 34 public infrastructure projects across 15 Local Authority areas.

2.7.2 Westmeath County Council have been awarded funding for 1 public infrastructure project including €1.83m towards the specific delivery of an access roadway (Lissywollen to Garrycastle). The LIHAF description for the project states;

"The lands which are the subject of this application are immediately adjacent to the South (Town Centre) side of the N6. The proposal is for the provision of an

access roadway (Lissywollen to Garrycastle) at this location would act as a catalyst for the procurement of 200 housing units in the short term with a total long term potential of 670 housing units and would also provide improved permeability to the north of Athlone Town Centre. The road will be 980m in length. Athlone Institute of Technology is located immediately adjacent to the subject lands and would benefit directly from the provision of student accommodation, a student zone and connectivity to the Regional Sports Centre. The majority of the lands are in the ownership of Westmeath County Council or the Housing Agency."

2.7.3 This LIHAF funded road scheme forms an integral part of the development proposal. The proposed east-west access route, 'Lissywollen Avenue', is being delivered as per the objectives of the Lissywollen South Framework Plan 2018-2024. The proposed route runs through the development site and will connect Ballymahon Roundabout (on the R915 - to the west) to Garrycastle Roundabout (on the R916 - to the east).

2.7.4 The design of the LIHAF funded avenue has been the subject of a number of pre-application consultations between the applicant and the local planning authority (Westmeath County Council). Several consultations were also held with the existing local residents at Brawny estate. The design and layout of the proposed avenue was largely agreed prior to the finalisation of the proposed residential layout. The proposed avenue therefore fully incorporates integration of the proposed residential layout and the road connection.

3.0 POLICY FRAMEWORK AND DEVELOPMENT STANDARDS

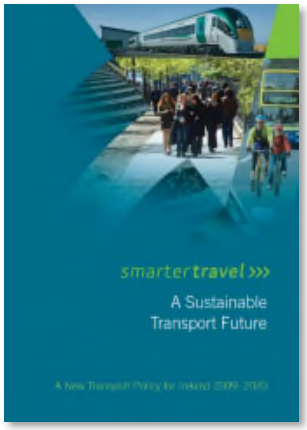
3.1 INTRODUCTION

3.1.1 In the context of transportation, the subject development proposals policy framework is influenced by the following key documentations. A common theme through each of these key documents is the emphasis placed upon the importance of travel demand management, with many identifying the need to implement mobility management plans with the objective of promoting sustainable travel patterns.

- Smarter Travel – A Sustainable Transport Future (2009)
- National Cycle Policy Framework (2009)
- Sustainable Urban Housing: Design Standards for New Apartments (2018)
- Athlone Town Development Plan 2014-2020
- Lissywollen South Framework Plan 2018-2024
- Curragh-Lissywollen North Local Area Plan 2006

3.2 SMARTER TRAVEL – A SUSTAINABLE TRANSPORT FUTURE

3.2.1 *Smarter Travel,* published in 2009 by the Department of Transport, represents the national policy documentation outlining a broad vision for the future and establishes the transport objectives and targets. The document examines past trends in population and economic growth and transport concluding that these trends are unsustainable into the future.



3.2.2 In order to address the unsustainable nature of current travel behaviour, Smarter Travel sets down a number of key goals and targets for 2020 - including:

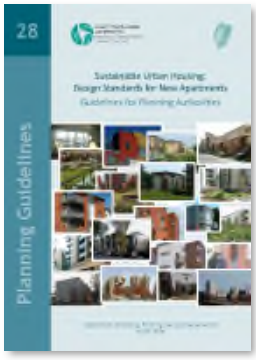
- Total vehicle km travelled by car will not significantly increase;
- Work-related commuting by car will be reduced from 65% to 45%;

- 10% of all trips will be by cycling;
- The efficiency of the transport system will be significantly improved.

3.2.3 The document recognises that these are ambitious targets, and outlines a suite of 49 actions required to achieve these targets – summarised under the following four main headings:

- Actions aimed at reducing distances travelled by car and the use of fiscal measures to discourage use of the car;
- Actions aimed at ensuring that alternatives to the car are more widely available;
- Actions aimed at improving fuel efficiency of motorised travel; and
- Actions aimed at strengthening institutional arrangements to deliver the targets.

3.3 SUSTAINABLE URBAN HOUSING: DESIGN STANDARDS FOR NEW APARTMENTS



3.3.1 This guideline document was produced by the Department of Housing, Planning and Local Government (DHPLG) (March 2018). The purpose of this document is to set out standards for apartment development, mainly in response to circumstances that had arisen whereby some local authority standards were at odds with national guidance.

3.3.2 With the demand for housing increasing, this means that there is a need for an absolute minimum of 275,000 new homes in Ireland's cities by 2040. It is therefore critical to ensure that apartment living is an increasingly attractive and desirable housing option for a range of household types and tenures.

3.3.3 These Guidelines apply to all housing developments that include apartments that may be made available for sale, whether for owner occupation or for individual lease. They also apply to housing developments that include apartments that are built specifically for rental purposes, whether as '*Build To Rent'* or as '*shared accommodation*'.

3.3.4 The guidelines state that cycling provides a flexible, efficient and attractive transport option for urban living and these guidelines require that this transport mode is fully integrated into the design and operation of all new apartment development schemes.

3.3.5 The quantum of car parking or the requirement for any such provision for apartment developments will vary, having regard to the types of location in cities and towns that may be suitable for apartment development, broadly based on proximity and accessibility criteria.

3.3.6 For all types of location, where it is sought to eliminate or reduce car parking provision, it is necessary to ensure, where possible, the provision of an appropriate number of drop off, service, visitor parking spaces and parking for the mobility impaired. Provision is also to be made for alternative mobility solutions including facilities for car sharing club vehicles, cycle parking and secure cycle storage.

3.4 ATHLONE TOWN DEVELOPMENT PLAN 2014-2020

3.4.1 The Athlone Town Development Plan 2014-2020 sets out the *"overall strategy for the proper planning and sustainable development of the administrative area and immediate environs of Athlone Town for the period 2014 to 2020, together with the provision of policies and objectives for the future development of the town and environs".*

3.4.2 In the context of the subject proposals, the following are the relevant transport and development objectives set out in the plan: -

Transportation and Movement – Public Transport

O-PT1: *"To provide for improved bus services both within Athlone and between Athlone and Mullingar and Athlone and Tullamore"*

O-PT2: *"To provide for new transport routes by public and private operators throughout Athlone and its environs"*

O-PT4: *"To support the electrification of railway line between Dublin and Galway and the double tracking of the line between Athlone and Portarlington"*

O-PT5: *"To provide bus priority measures, including QBC's on existing and planned road infrastructure, where appropriate"*

O-PT9: *"To support the expansion of town bus services"*

Transportation and Movement – Walking and Cycling

O-WC1: *"To further the development of an integrated cycle network in Athlone"*

O-WC2: *"To provide for signal controlled pedestrian facilities at all crossing points with an audible signal and dished kerbs with tactile paving to assist visually and mobility-impaired persons in crossing roads"*

O-WC3: *"To provide a cycleway and walkway in the town within the corridor of the Mullingar to Athlone disused railway, pending its reopening as a railway line, together with a pedestrian and cycleway link to the Roscommon County Boundary, including all related signage, way-marking and all associated site works and connection"*

O-WC6: *"To promote the provision of covered shelters for cycles in development schemes"*

O-WC11: *"To provide north-south pedestrian and cycle linkages between Curragh-Lissywollen and Lissywollen South/Retreat, to overcome barriers to access and movement created by the N6 and rail lines"*

O-WC16: *"To provide a walking/cycling route from the Athlone Mullingar railway line in Athlone, to the River Shannon, via a new bridge over the Shannon to the west bank and onwards to the Roscommon County boundary, with the potential to connect to Athlone Castle and southwards around the town"*

O-WC17: *"To provide a network of pedestrian and cycle routes within the town in conjunction with the development of the Dublin Galway National Cycle Network"*

Transportation and Movement – Urban Roads and Traffic Management

O-TM1: *"To seek the reduction of through traffic entering Athlone Town Centre"*

O-TM9: *"To require Mobility Management Plans to be submitted with applications for trip intensive developments"*

O-TM10: *"To ensure that a high standard of design, layout and landscaping accompanies any proposal for surface car parking"*

O-TM13: *"To provide a new north-south avenue from the Dublin Road with appropriate pedestrian and cycleway infrastructure connecting the Chadwick site with the new Loughandonning Link Road"*

O-TM16: *"To overcome the barriers to movement associated with existing railway lines and the River Al, by establishing new pedestrian and cycle connections".*

3.5 LISSYWOLLEN SOUTH FRAMEWORK PLAN 2018-2024

3.5.1 The Lissywollen South Framework Plan 2018-2024 *"provides a development strategy for the proper planning and sustainable development of the Lissywollen South area in Athlone in accordance with the policies and objectives of the Athlone Town Development Plan 2014-2020".*

3.5.2 Map 4 of the Framework Plan illustrates the Land Use zoning of the lands bounded by the LAP. An extract of Map 1 is provided in **Figure 3.1** below and reveals that the lands on which the subject scheme proposals lies are zoned "Proposed Residential".

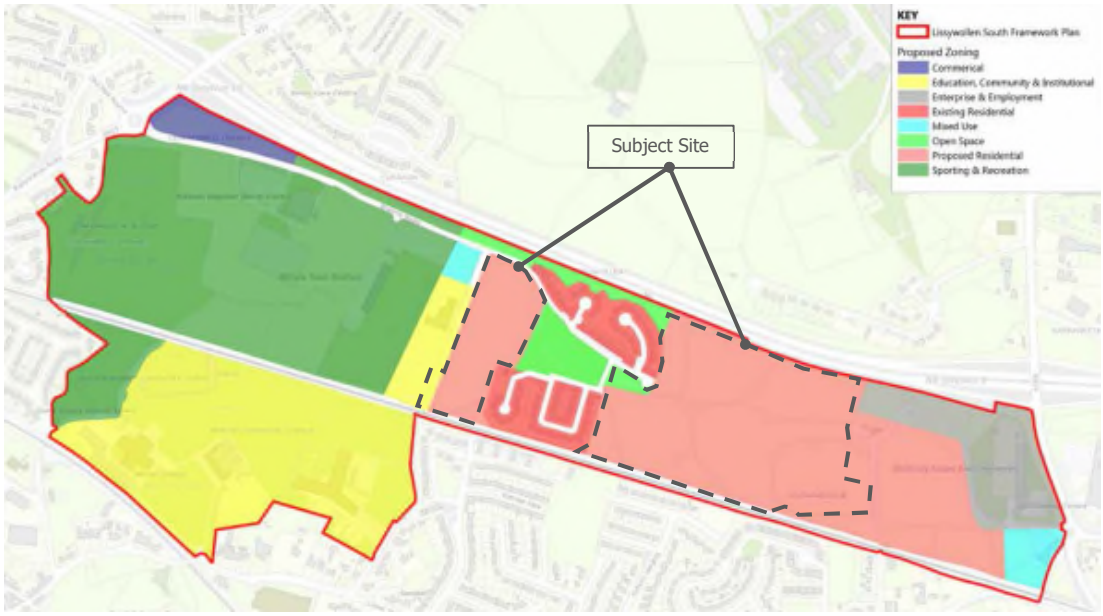


Figure 3.1: Lissywollen Land Use Zoning (extract from Map 4 of the Lissywollen South Framework Plan 2018-2024)

3.5.3 Section 3.6 of the Framework Plan sets out the Access & Movement strategy for the Plan area. It is highlighted that *"It is important that the design of the transport network should reflect urban design qualities and not just traffic considerations - free movement and promoting choice for the user are key elements in positive urban design. New routes should connect into existing routes and movement patterns with pedestrian links following established desire lines and short-cuts across the plan area to ensure ease of movement".*

3.5.4 *The main transport related objectives in the Plan are summarised below;*

Lissywollen Avenue (East-West Road Link)

Objective O-AM1: *"To provide a new and extended east west Lissywollen Avenue in the form of an urban boulevard linking and unifying all parts of the plan area."*

Objective O-AM2: *"To integrate a secondary network of streets with Lissywollen Avenue and the existing street network."*

North-South Avenue

Objective O-AM3: *"To provide a new North-South Avenue connecting Retreat Road with the Lissywollen Avenue via the Old Rail Trail. Said route shall give priority to buses, cyclists and pedestrians and shall be sited so as not to adversely impact upon the landscape setting of the Marist School"*

Public Transport

Objective O-AM8: *"To provide for a bus service to serve the plan area."*

Walking & Cycling

Objective O-AM4: *"To promote and support a culture of sustainable travel in conjunction with the local schools and AIT, whilst maximising the user potential of the Old Rail Trail"*

Objective O-AM5: *"To provide an integrated and permeable network of streets with high quality pedestrian and cycle networks, maximising linkages within the area, to the Old Rail Trail and to the wider environs"*

Objective O-AM6: *"To create a network of safe and attractive streets structured around a compact and walkable layout to ensure ease of movement"*

Objective O-AM7: *"To provide for a high quality safe pedestrian and cycle network within the Plan Area with high levels of permeability, passive surveillance and supervision and to ensure that this network will provide attractive, legible and direct links to the Town Centre, AIT, the Regional Sports Centre, Bus Stops and the wider environs."*

Objective O-AM9: *"To promote the creation of a 5km walking/running circuit within Lissywollen, in the interests of quality of life and promoting healthy communities."*

Objective O-AM14: *"To consider the provision of a Park and Stride facility within the Plan area."*

3.5.5 Map 3 of the Plan highlights the aforementioned objectives as presented in **Figure 3.2** below.

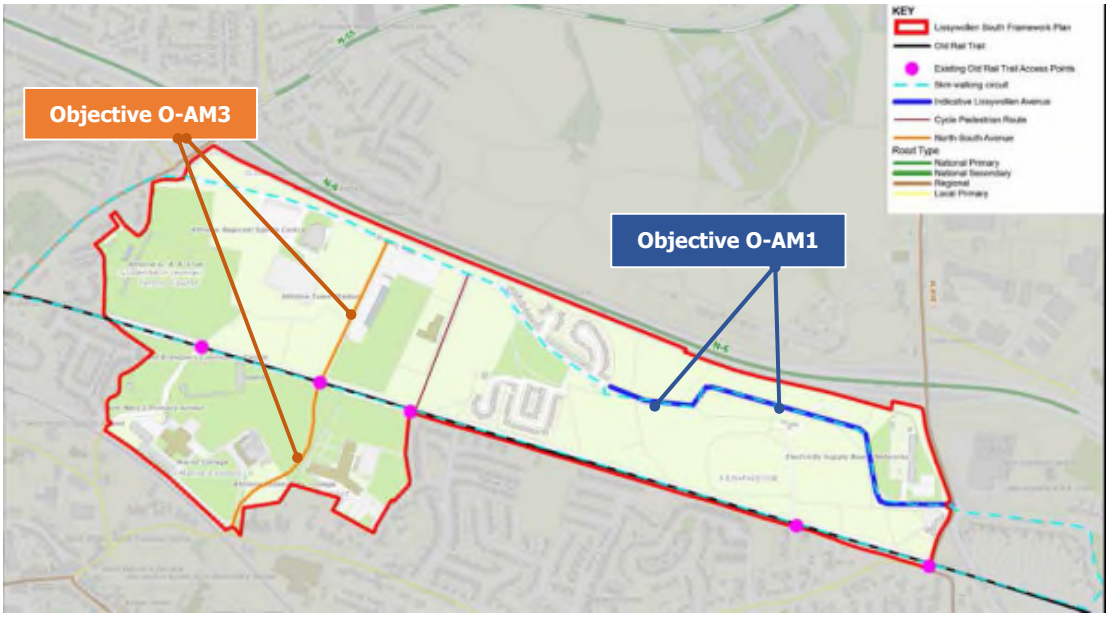


Figure 3.2: Lissywollen Access & Movement Strategy (extract from Map 3 of the Lissywollen South Framework Plan 2018-2024)

3.6 CURRAGH-LISSYWOLLEN NORTH LAP 2006

3.6.1 The Curragh-Lissywollen North LAP 2006 aims to;

- *"Provide a coordinated framework for the future development of the lands which are zoned 'Residential', 'Industrial', and 'Educational', 'Light Industrial Technological', and some 'Commercial'.*
- *Determine a distribution road network for the area.*
- *Facilitate development that integrates with the existing northeast area of Athlone's Environs.*
- *Identify the services, infrastructure and amenities required to serve the area".*

3.6.2 While not directly applicable to the application site, the LAP considers the provision of a strategic link *"from the Curragh and Lissywollen North areas into the proposed Cornamaddy residential area to the north and the Lissywollen residential quarter to the south".*

3.6.3 Map 5 of the LAP presents the "Future Land Use Concept" and illustrates a proposal for a pedestrian / cycle bridge over the N6 linking Northern and Southern

Lissywollen. The proposed layout subject to this application caters for this potential future connection.

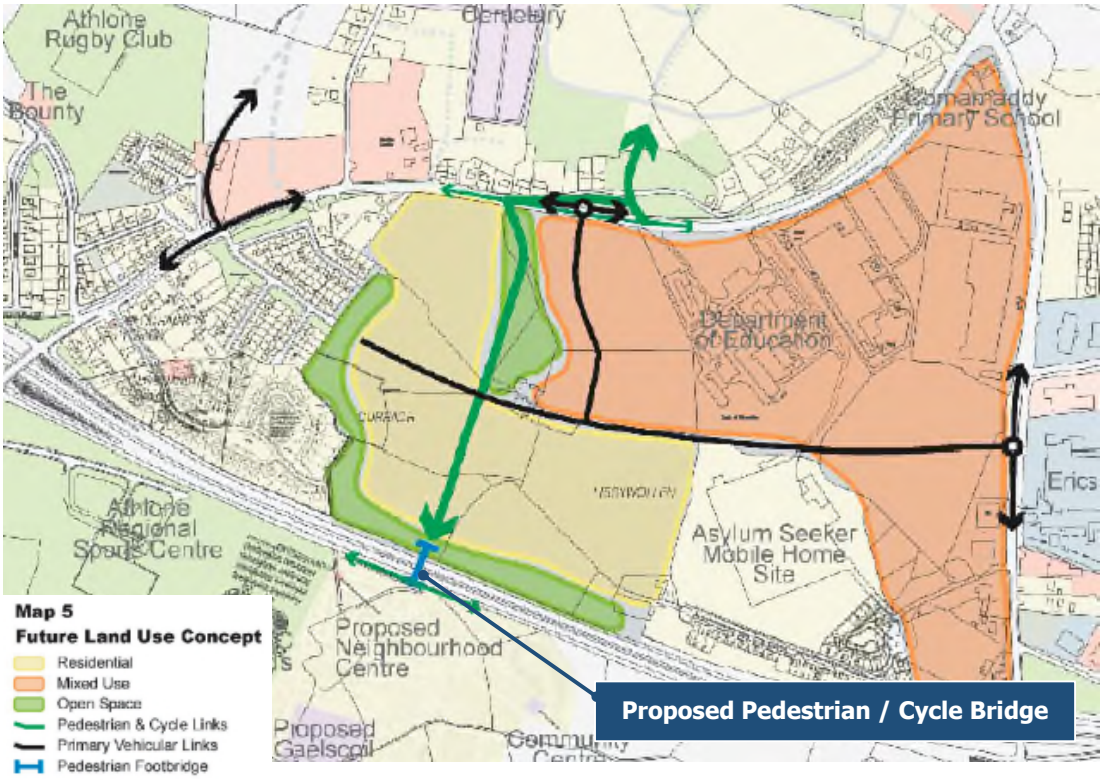


Figure 3.3: Future Land Use Concept (extract from Map 5 of the Curragh-Lissywollen North LAP 2016)

3.7 DEVELOPMENT MANAGEMENT STANDARDS

Car Parking Standards

3.7.1 In order to determine the appropriate quantum of vehicle parking for the proposed residential development, reference was made to the following:-

- Table 12.11 of the Athlone Town Development Plan (2014-2020); and
- Chapter 4 of Sustainable Urban Housing: Design Standards For New Apartments Guidelines For Planning Authorities, as published by the Department of Housing, Planning and Local Government (DHPLG), March 2018.

Athlone Town Development Plan 2014-2020

3.7.2 Reference has been made to Table 12.11 of the Athlone Town Development Plan (2014-2020) which outlines the maximum car parking standards for the county and Section 4.22 of the Department of Housing, planning and Local Government (DHPLG) "Sustainable Urban Housing: Design Standards for New Apartments".

Department of Housing, Planning and Local Government (DHPLG)

3.7.3 The site's location on the Lissywollen lands, can be classified as a 'Peripheral and / or Less Accessible Urban Locations'.

3.7.4 In relation to car parking, within 'Peripheral and / or Less Accessible Urban Locations', the DHPLG document states:

> *'As a benchmark guideline for apartments in relatively peripheral or less accessible urban locations, one car parking space per unit, together with an element of visitor parking, such as one space for every 3-4 apartments, should generally be required.'*

3.7.5 With regard to the proposed development schedule, the associated car parking requirements are outlined in **Table 3.1** below.

3.7.6 In response to the above local development management standards the scheme is required to provide up to 770 on-site car parking spaces based on the development plan requirements and 746-770 based on the departmental requirements.

Unit Type		Athlone Development Plan Standard	DHPLG Standards	No. of Units / Size (GFA)	Development Plan Requirement	DHPLG Requirement
Apts./Duplex	1 bed	1 space 1 unit plus 1 visitor space per 3 units	1 space per unit plus 1 visitor space per 3-4 units	60	388	364-388
	2 bed			177		
	3 bed			54		
Houses	2 bed	1 space per 1 unit plus 1 visitor space per 3 units	-	35	380	380*
	3 bed		-	200		
	4 bed			50		
Creche	321m²	No recommendations detailed	-	-	-	-
	448m²		-	-	-	-
Community Hub	101m²	2 spaces per 100m^m GFA	-	101m²	2	2*
Total					**770**	**746-770**

* N/A Corresponding Athlone Town Council requirements stated

Table 3.1: Car Parking Standards

Disabled Car Parking

3.7.7 The appropriate level of mobility impaired parking provision for the proposed development will also be provided in accordance with Athlone Town Development

Plan requirements. The Development Plan States: -' *The minimum criteria for such parking provisions are detailed in "Building for Everyone - Planning and Policy".'* This document recommends *"Minimum one space of appropriate dimensions in every 25 standard spaces, up to the first 100 spaces; thereafter, one space per every 100 standard spaces or part thereof".*

Cycle Parking Standards

3.7.8 Reference has been made to the Athlone Town County Council Development Plan (2014-2022) which outlines the minimum cycle parking provision sought for new developments within the area governed by Athlone Town Council and Section 4.17 of the Department of Housing, planning and Local Government (DHPLG) "Sustainable Urban Housing: Design Standards for New Apartments".

3.7.9 In response to the local Development Plan requirements the scheme is required to provide at least 1431 on-site cycle parking spaces comprising at minimum 1128 long term and 303 short stay bicycle parking spaces as part of the proposed residential development. With reference to the DHPLG requirements, the subject scheme is required to provide a minimum of 721 apartment cycle parking spaces (575 long term and 146 short stay).

Dwelling Type	Development Plan Standards		DHPLG Standards		No. of Units / Size	Development Plan Requirement		DHPLG Requirements	
	Long Term	Short Stay	Long Term	Short Stay		Long Term	Short Stay	Long Term	Short Stay
Apartment/ Duplex	2 spaces per 100m^2	1 space per 2 units	1 space per bed	1 space per 2 apts	1 bed - 60 2 bed - 177 3 bed - 54	477	146	575	146
House*			-	-	285	639	143	-	-
Creche**	"consider separate teacher parking"	10% of registration	-	-	321m^2 & 448m^2	12	14	-	-
Community Hub	No recommendations detailed		-	-	-	-	-	-	-
Total						**1431**		**721**	

* Long Term Standard Area applies to total area of residential units
** Standards for Schools

Table 3.2: Cycle Parking Standards

4.0 CHARACTERISTICS OF PROPOSALS

4.1 OVERVIEW

4.1.1 The proposal seek permission for the provision of a 576-unit residential development plus 2 no. crèche facilities (321m^2 & 448m^2 GFA) and a community hub (101m^2 GFA) on lands at Lissywollen, Athlone, Co. Westmeath. The proposed 576 no. residential units comprise 291 no. apartment / duplex units and 285 no. housing units. The two creche units will accommodate a total of 145 children. A summary of the proposed development schedule is presented in **Table 4.1** below.

Unit Type	Description	Total (unit No. / GFAm^2)
Houses	2 bed	35
	3 bed	200
	4 bed	50
	Total Houses	**285**
Apartments	1 bed	60
	2 bed	169
	3 bed	17
	Total Apartments	**246**
Duplexes	2 bed	8
	3 bed	37
	Total Duplexes	**45**
Total Residential Units		**576**
Community Hub		**101m^2**
Creche		**321m^2 & 448m^2**

Table 4.1: Proposed Development Schedule

Figure 4.1: Proposed Overall Site Layout

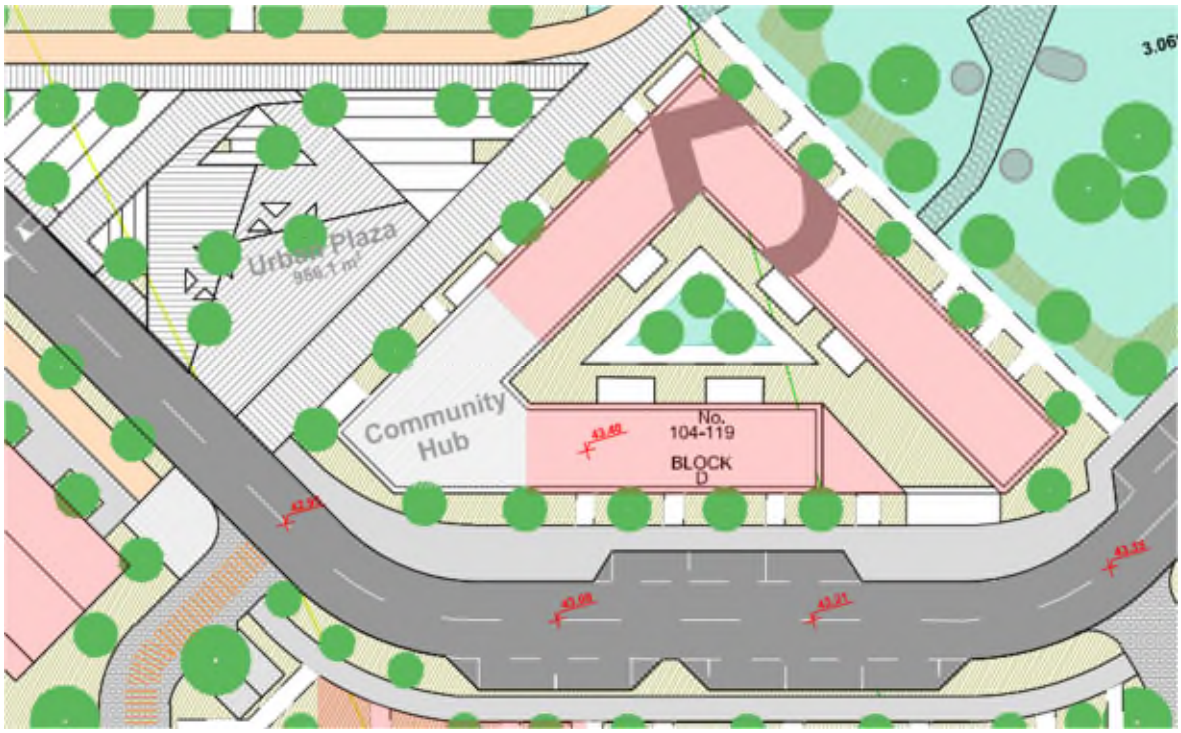


Figure 4.2: Community Hub at Block D

4.1.2 Given the scale of the development proposed, in order to ensure the delivery of the development in a coherent manner which provides for social infrastructure in tandem with residential dwellings, a proposed phasing plan is detailed in Drawing No. D1408-PL10 *'Phasing Plan'* prepared by Delphi Design. As detailed on the drawing the proposed development will be delivered as follows:

- **Phase 1 - Sector 0:** Delivery of the proposed east-west access route through the subject site.
- **Phase 2 - Sector 1A:** Development will commence at the eastern end of the site. Sector 1A is located to the north of the east-west access route. This first phase of development will see the delivery of Blocks A, B, C & D and house no.'s 17-88. Sector 1A will therefore deliver 47 no. duplex and apartment units and 72 no. houses totalling 119 no. dwellings. Sector 1A also includes for the delivery of the childcare facility adjacent to Block C (accommodating circa 62 no. children) and the community hub located in Block D, as wells as the urban plaza and other public open spaces.
- **Phase 2 - Sector 1B:** Sector 1B is located to the east of the site and south of the east-west access route. This phase of development will see the delivery of Blocks E & F and house no.'s 137 – 222. Sector 1B will therefore deliver 17 no. duplex and apartment units and 86 no. houses totalling 103 no. dwellings. Sector 1B also provides for public open spaces and connections to the Old Rail Trail Greenway to the south.
- **Phase 3 - Sector 2A:** Sector 2A is located to the east of the existing Brawny residential estate, west of Sector 1A and north of the proposed east-west access route. This phase of development will see the delivery of Block K and house no.'s 293 – 307. Sector 2A will therefore deliver 21 no. apartments and 15 no. houses totalling 36 no. dwellings.
- **Phase 3 - Sector 2B:** Sector 2B is located to the east of the existing Brawny residential estate, west of Sector 1B and south of the proposed east-west access route. This phase of development will see the delivery of Blocks G & H and house no.'s 227 – 264, 277-292 & 329-364. Sector 2B will therefore deliver 16 no. duplex and apartment units and 90 no. houses totalling 106 no. dwellings.

- **Phase 4 - Sector 3A:** Sector 3A is located to the northwest of the development site, west of the existing public open space at Brawny. This phase of development will see the delivery of Blocks L, M, N, O, P & Q. Sector 3A will therefore deliver 146 duplex and apartment units.
- **Phase 4 - Sector 3B:** – Sector 3B is located to the southwest of the development site. This phase of development will see the delivery of Blocks R,S & T and house no.'s 555-576. Sector 3B will therefore deliver 44 duplex and apartment units and 22 no. houses totalling 66 no. dwellings. Sector 3B also includes for the delivery of the childcare facility located on the ground floor of Block T (accommodating circa 83 no. children).

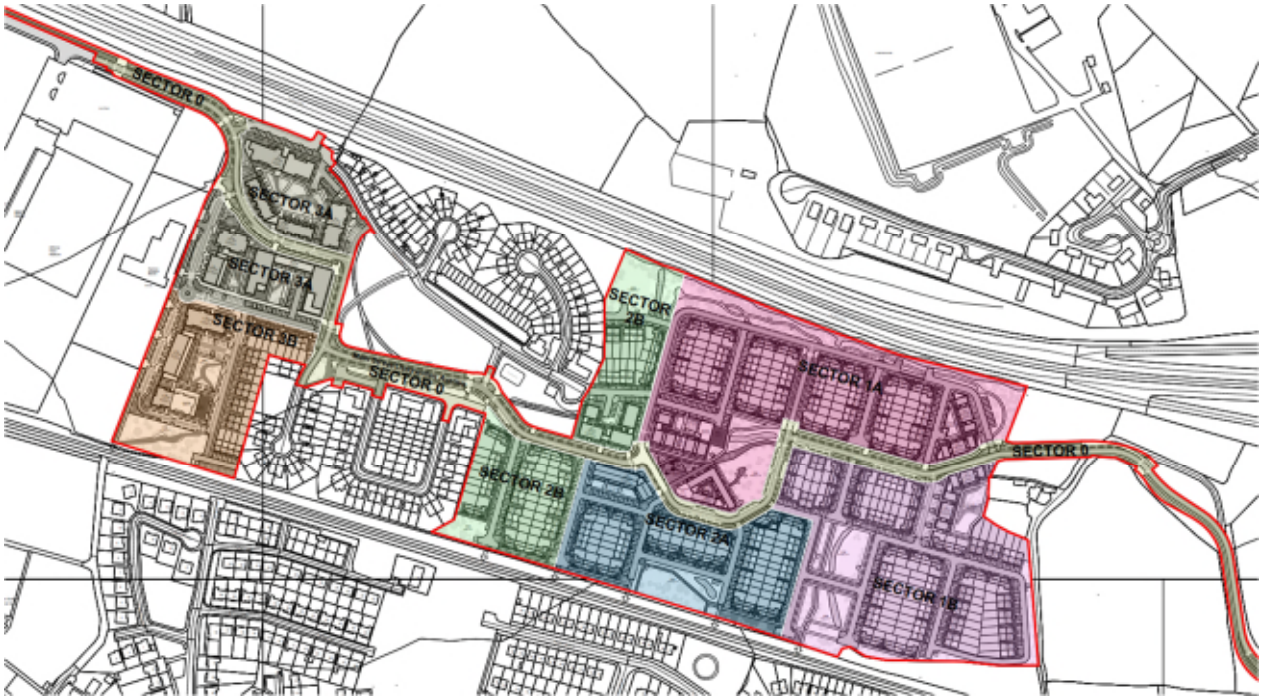


Figure 4.3: Sectors & Phasing of Proposed Development

4.2 SITE ACCESS ARRANGEMENTS

4.2.1 Access to the subject site will be from both the Ballymahon roundabout (on the R915) to the west via Brawny Road, and the Garrycastle roundabout (on the R916) to the east. The development proposal includes for road development works including the construction of a new east-west access route (Lissywollen Avenue) through the subject site from Ballymahon roundabout (on the R915) to the west to Garrycastle roundabout (on the R916) to the east. This route is being delivered

as per the objectives of the Lissywollen South Framework Plan 2018-2024 and, as previous detailed, has received LIHAF funding'.

4.2.2 The development proposal also provides for pedestrian and cyclist connectivity to Old Rail Trail Greenway to the south. A total of 5 no. new formal cycle / pedestrian access points are proposed between the subject site and the Old Rail Trail Greenway to the south of the development site subsequently ensuring excellent cycle / pedestrian accessibility to the lands to the south of the Old Rail Trail but also local destinations to the west (Town Centre) and east (Athlone IT, IDA Business Park) along the Greenway.

Pedestrians and Cyclists Infrastructure

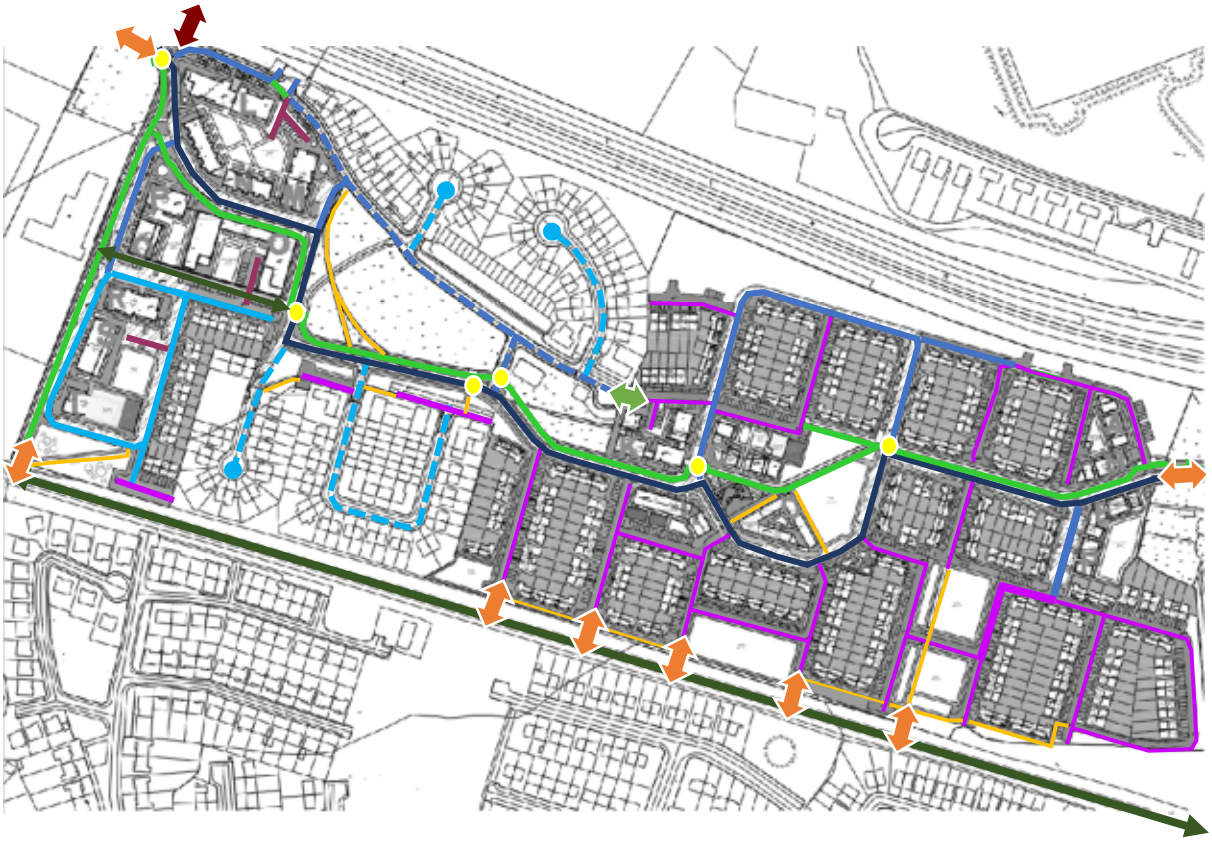
4.2.3 As introduced above, the subject site will be highly accessible to pedestrians and cyclists. A network with an eight tier hierarchy of pedestrian / cycle linkages is proposed to ensure pedestrians and cyclists are given priority along key travel desire lines within the site thereby providing a good level of service and ensuring the risk of vehicle/pedestrian conflict is minimised.

4.2.4 Dedicated pedestrian / cycle paths are proposed as part of the proposed network throughout the site layout providing a range of traffic free and traffic light routes between the different internal sections of the development site and external destinations. In reference to **Figure 4.4** the proposed pedestrian / cycle network incorporates the following hierarchy of linkages;

- Type 1 : The Avenue **LINK** Street – 30kph design speed through residential materplan
- Type 2 : Primary **LOCAL** Street – 20kph design speed
- Type 3 : Secondary **LOCAL** Street – 20kph design speed
- Type 4 : Shared surface 'Homezone' – 20kph design speed
- Type 5 : Private Parking Courtyard – 10-15kph design speed
- Type 6 : Greenway (Segregated pedestrian / cycle facilities)
- Type 7 : Greenway (Shared pedestrian / cycle facilities)
- Type 8 : Pedestrian footpath (leisure route / connection)

4.2.5 A total of six controlled crossing facilities (Zebra) are proposed along the new east-west 'Avenue' corridor each located on key pedestrian / cycle travel desire routes. These formal facilities, supplemented by courtesy crossings, will provide a

high degree of permeability with safe crossing points integrating the residential areas located to the north and south of the new 'Avenue' street corridor.



Linkage Type 1 : Brawny Road - Footpaths along both sides of the street .....

Linkage Type 2 : Primary LOCAL Street – Footpaths on one or both sides of the street

Linkage Type 3 : Secondary LOCAL Street – Footpaths on one or both sides of the street

Linkage Type 4 : 'Homezone' – Pedestrians share the carriageway with other road users

Linkage Type 5 : Courtyard - Pedestrians share the carriageway with other road users ...

Linkage Type 6 : Greenway with segregated pedestrian and cycle facilities .....

Linkage Type 7 : Greenway with shared pedestrian and cycle facilities .....

Linkage Type 8 : Pedestrian Footpath through open space (Existing & Proposed) .....

Controlled Pedestrian / Cycle Crossing Facility (Zebra Crossing) .....

Pedestrian / Cycle Access to/from Development Masterplan Lands .....

Future Pedestrian / Cycle N6 Overbridge (By Others) to / from Curragh-Lissywollen LAP Lands

Pedestrian / Cycle Only Connection between neighbouring streets .....

Figure 4.4: Site Layout and Pedestrian/Cycle Accessibility

4.2.6 As per the objectives of the Curragh – Lissywollen LAP, the development proposal also maintains the potential for the delivery of pedestrian / cycle overbridge across the N6 corridor which will link the subject Lissywollen South masterplan lands to the zoned lands at the Curragh – Lissywollen subject to a future planning application by third parties.

4.2.7 In response to a request from the local authority the scheme proposals also include for the provision of new dedicated bicycle infrastructure off-road along Brawny Road and Blackberry Lane corridors linking the subject masterplan lands with the existing off-site bicycle infrastructure at the R916 / Moydrum Road roundabout and the R915 / Ballymahon Road Roundabout as detailed in **DBFL Drawing No. 180176-DBFL-RD-SP-DR-C-1000**. This new bicycle infrastructure will benefit new residents of the proposed development to access work, leisure and education facilities to the northwest and northeast in addition to providing new sustainable routing opportunities for both existing residents of the area and visitors / patrons of the various leisure and educational facilities currently located along Brawny Road.

4.3 INTERNAL ROAD LAYOUT

4.3.1 The proposed residential scheme's internal road layout has been designed to respect (i) the principles and guidance outlined within the Design Manual for Urban Roads and Streets (DMURS) 2013 (updated May 2019), (ii) a number of requests made by the local planning authority; and (iii) observations received from key stakeholders including local residents. The scheme proposals are the outcome of an integrated design approach that seeks to implement a sustainable community connected by well-designed connections and streets which deliver safe, convenient and attractive networks.

4.3.2 The adopted design approach incorporates traditional road design along with elements of urban design and landscaping to create lower traffic speeds and thereby facilitate a safer street environment for pedestrians and cyclists. DBFL along with the rest of the design team have interrogated the DMURS principles to ensure that the final layout provides for a package of self-regulating design measures providing a high quality urban extension in proximity to Athlone Town Centre.

4.3.3 The proposals incorporate a hierarchy of internal streets which are firmly set within the context of the local Athlone receiving environment. The existing road network in Athlone includes Arterial links such as the N6 to the north, the N55 to the northwest and the N62 and N61 corridor as located to southeast and west of the subject site respectively. Link streets bordering the site, such as R915 Ballymahon Road, and R916 Wash House Road provide the connections between the proposed development, the above Arterial links, and town centre.

4.3.4 In contrast, the internal road network within the site, as illustrated in **Figure 4.5B** has been designed to deliver a hierarchy of link and local streets that provide appropriate access within / across the proposed new residential communities and the road network external to the site. The movement function and design of each internal street network has sought to respect the different levels of motorised traffic whilst optimising access to/from public transport and prioritising the movement of higher number of pedestrians and cyclists. In parallel the adopted DMURS design philosophy has sought to consider the context / place status of each residential local street in terms of level of connectivity provided, quality of the proposed design, level of pedestrian / cyclists activity and vulnerable users requirements whilst identifying appropriate 'transition' solutions between different street types.

4.3.5 The design approach adopted for the subject Lissywollen masterplan has sought to respect best practice examples presented in DMURS (pages 47 and 128) as exemplified by the Newcastle Local Area Plan (LAP) which in turn has influenced the design of the third party SHD scheme ABP-305343-19 as permitted by An Bord Pleanala (ABP). As per the Newscastle LAP example highlighted in Figure 4.5A below the design of the subject Lissywollen 'Avenue' link street has sought to ensure that there is choice of alternative movement corridors for local trips and dissipate vehicular traffic throughout the plan.

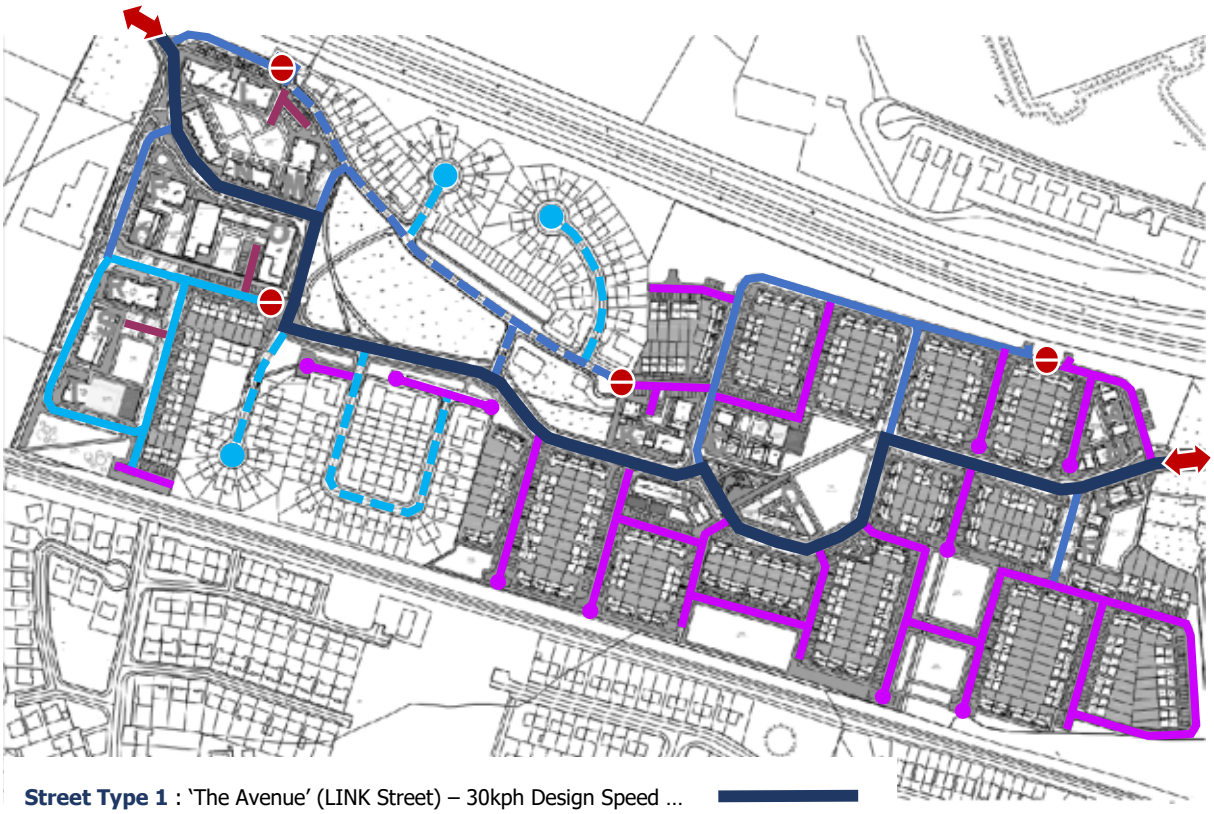
4.3.6 In addition to respecting the concerns of existing local residents (as expressed during local consultation exercises) the design has sought to prevent the overuse of some corridors in parallel with discouraging the potential for non-local rat-running traffic east-west through the site. Slower vehicle speeds are encouraged in the interest of pedestrian and cyclist safety. Movement through the masterplan lands is structured by connecting major focal points in a similar manner to DMURS Newcastle example with proposed focal points also used to slow / discourage

through traffic, deliver a legible network to assist wayfinding and draw people towards key destinations and the masterplans focal points / open spaces and key public realm areas.

4.3.7 Traffic calming measures, devices and design mechanisms adopted throughout the masterplan take the form of the following:

- The promotion of low-speed environments and avoidance of long continuous streets;
- The location of buildings close to street edges;
- Continuity of built frontages;
- Active ground floor uses;
- Encouragement and facilitation of high levels of pedestrian and cyclist activity;
- The provision of frequent pedestrian and cyclist crossing points;
- Horizontal and vertical deflections along carriageways to include raised traffic tables;
- Narrow carriageways;
- On-street parking of appropriate design / layout as per DMURS guidance;
- Tighter corner radii;
- Shared surfaces for vehicles, pedestrians and cyclists in appropriate lightly trafficked environments, and
- Frequent tree planting along streets to provide a sense of enclosure.

Figure 4.5A: Extract of DMURS Page 47 and 128 (Newcastle LAP)



Street Type 1 : 'The Avenue' (LINK Street) – 30kph Design Speed …

Street Type 2 : Primary LOCAL Street – 20kph Design Speed ……..

Street Type 3 : Secondary LOCAL Street – 20kph Design Speed …..

Street Type 4 : Shared Surface 'Homezone' – 20 kph Design Speed

Street Type 5 : Private Parking Courtyard – 10-15 kph Design Speed

Existing Street within the area-wide street hierarchy ……

Vehicle Access to Development Masterplan Lands ……

No Vehicle Through Route (Pedestrians and cyclists only) ……

Figure 4.5B: Proposed Developments Street Hierarchy

4.3.8 In reference to **Figure 4.5B** the proposed residential scheme's hierarchy of internal streets can be summarised as follows:

- The Avenue – **LINK** Street – this is a 6m wide carriageway with a 30kph design speed through the masterplan development lands. Segregated cycle tracks and footways are proposed to the north and / or south of this ***Link*** street.
- Primary **LOCAL** Street – these are narrower 5.5m wide streets with a 20kph design speed branching off the aforementioned ***Link*** street provide access to the new residential areas.
- Secondary **LOCAL** Street – 5.5m wide carriageway with a 20kph design speed.
- 'Homezone' – 20kph design speed.
- Private Parking Courtyard – 10-15kph design speed.

4.3.9 The street layout was derived from several factors which include, the distinct shape of the site, boundary conditions, the need to accommodate travel desire lines, minimise impact on the existing landscaped areas, and ensure that little or no increase in vehicle movements along the existing Brawny Road residential streets would arise as a result of the proposed new development. This has led to the creation of a street network that comprises elements of an orthogonal and organic layout in specific areas. As part of the design and development of the street network, cycle and pedestrian linkages were prioritised through the development to link existing developments with key travel destinations.

4.3.10 The LIHAF funded road scheme forms an integral part of the development proposal. The proposed east-west access route, 'Lissywollen Avenue', is being delivered as per the objectives of the Lissywollen South Framework Plan 2018-2024. The proposed route runs through the development site and will connect Ballymahon Roundabout (on the R915 - to the west) to Garrycastle Roundabout (on the R916 - to the east).

Design Parameters and Development Compliance

4.3.11 Further to the information outlined within the application DMURS Compliance Statement the following paragraphs demonstrate key points from Design Manual for Urban Roads and Streets (DMURS) 2013 (updated May 2019), and the how the development proposals comply with each of these key design criteria.

Street Trees

4.3.12 Street trees are an integral part of the street design and contribute to the sense of enclosure encouraging slower vehicle speeds and a sense of place. DBFL recommend that opportunities are maximised to provide street trees along at least one but preferably both sides of the developments ***Link*** and ***Local*** street types. Further details on street trees can be found in the landscape architect's documents submitted with the application.

Lighting

4.3.13 The lighting design will be fully in compliance with DMURS Specification Section 4.2.5, BS 5489-1:2013 and a level P Classification in accordance IS EN 13201-2:2015. Further details on public lighting can be found in the public lighting consultant's documents submitted with the application.

Road Design Speed

4.3.14 The design speeds for the street typologies as per DMURS Table 4-1 are detailed in **Table 4.2** below in the context of neighbourhood & suburban areas.

Street	DMURS Classification	DMURS Context	DMURS Design Speed Range	Applied Design Speed
The Avenue	Link Street	Neighbourhood	30-50km/h	30km/h
Internal residential 'local' streets within Development	Local Street	Suburban	10-30km/h	20km/h

Table 4.2: Road Design Speeds

Road Cross Sections

4.3.15 The carriageway cross-section was selected from DMURS section 4.41 and figure 4.55, applied carriageways widths are detailed in **Table 4.3** below.

Street	DMURS Classification
The Avenue	3.0m lanes in both directions
Internal residential streets along bus routes	3.0m lanes in both directions
Internal residential streets within development (No Bus)	2.75m lanes in both directions

Table 4.3: Carriageway Widths

Footpaths

4.3.16 Footpaths across the development are no less than 1.8m and are generally 2m wide throughout with connections/tie ins to existing external pedestrian networks. The only exception is with 'shared' foot / cycle paths where a minimum width of 3.0m is recommended.

4.3.17 Internally within the development carriageway kerb heights have been specified as 75-80mm in accordance with the objectives of DMURS. The Link Street (Brawny Road) will have kerb heights of 100mm high.

Cycle Track

4.3.18 Dedicated cycle tracks have been incorporated into the design of the east-west 'link' street in accordance with the National Cycle Manual. All segregated two-way cycle tracks are designed to be 2.5m wide whilst the design of new 'shared' walk / cycle paths are recommended to be 3.0m wide minimum.

Verges

4.3.19 Along the east-west 'Link' street, a green verge of 1.5m has been provided where possible to facilitate street trees, landscaping and streetlights. Verges have been incorporated along streets where possible, to allow trees and planting to add to the streets enclosure and contribute to the sense of security for pedestrians and cyclists. We believe the strategic placement and specification (type) of street trees across the scheme proposals perform a number of important roles including that of influencing vehicle driver behaviour by both narrowing the perceived width of carriageways and providing a sense of enclosure thereby acting as a traffic calming feature. Furthermore, the placement of trees have also been successfully used within the scheme proposals to break up car parking areas and provide a 'green' buffer between rows of residential car parking.

Horizontal and Vertical Geometry

4.3.20 The alignment of street network has been designed to take account of existing site constraints including protecting existing open spaces, minimising impact on existing residential streets and create an urban street network that is organic in nature with the objective of maximising permeability, enhancing legibility and providing enclosure with passive security throughout in parallel with actively managing vehicle speeds delivering a self-enforcing low speed environment.

Visibility Splays

4.3.21 Unobstructed visibility splays are provided at all internal nodes and at site access junction to the external road network. Both visibility splays and stopping site distances are in accordance with DMURS table 4.2.

On-Street Parking

4.3.22 For both operational and safety reasons only 'parallel' car parking spaces are provided for along the length of 'The Avenue' Link Street. All perpendicular parking on the 'local' streets has been designed to ensure at least 6m localised aisle width is included to allow manoeuvring in and out of the space. To avoid wide carriageways, parking spaces have been designed using an additional 0.5m buffer at the front of the perpendicular space as per figure 4.76 of DMURS.

4.3.23 Parallel spaces have been designed as 6m long and 2.5m and perpendicular spaces are 2.5m wide by 5.0m long.

4.3.24 The potential dominance of on-street car parking is mitigated through (i) the provision of either kerb build outs and / or landscaped buffers and the specification of street trees within such landscape buffers and (ii) the length of grouped parking bays not exceeding the guidance contained within DMURS.

Traffic Calming

4.3.25 DMURS recommends the use of the physical and psychological measures used in combination to have an impact on driver behaviour. Within the development the use of narrower streets (5.5m for internal residential streets) is used in combination of using on street parking within the western residential plot and the use of landscaping such as street trees. The design of the scheme proposals has actively sought to ensure that no excessively long straight sections of roads are provided with the strategic placement of different traffic calming features (i.e. junctions and tight bends) are provided to actively reinforce by design the adopted 20-30kph vehicle design speeds. Homezones are restricted to lightly trafficked roads and low speed environments.

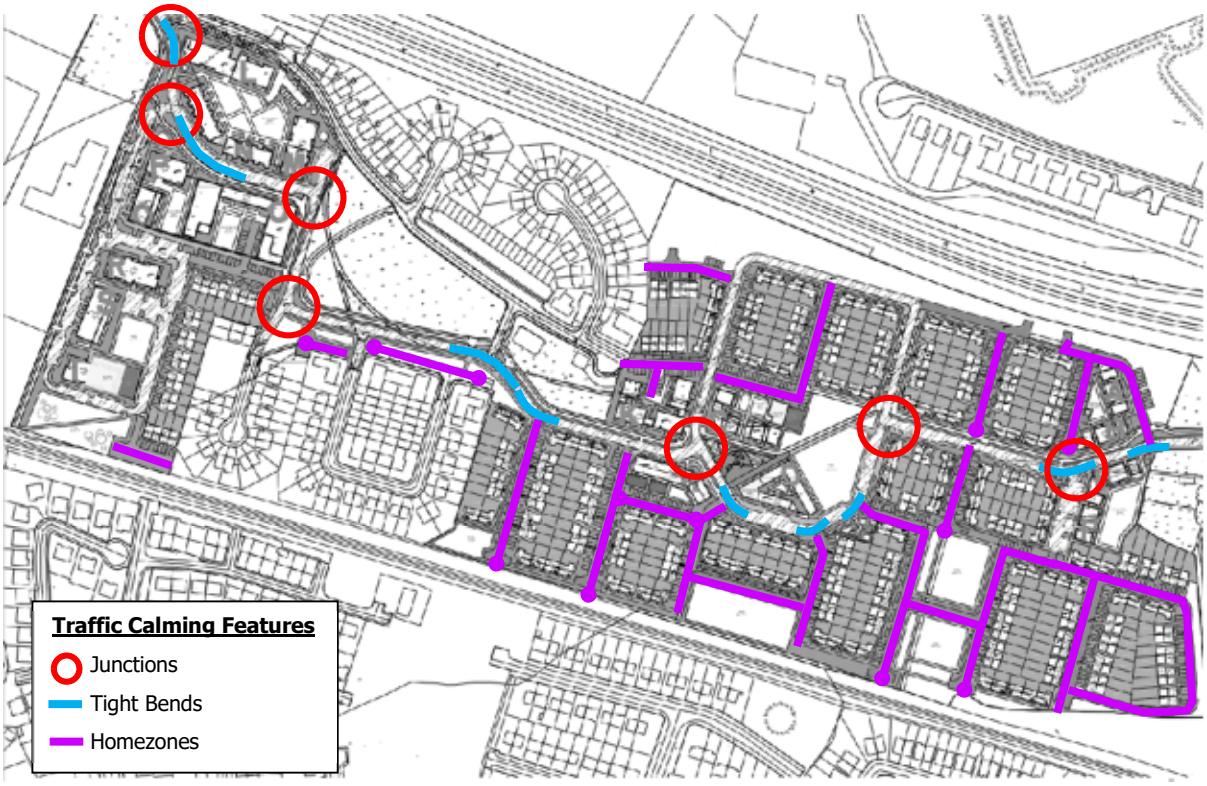


Figure 4.6: Self-Enforcing Traffic Calming Measures within Proposed Development

Pedestrian Crossings

4.3.26 Well designed and frequently provided pedestrian crossing facilities are provided along key travel desire lines throughout the scheme in addition to those located at street nodes. Types and treatments of crossing have been detailed in **Table 4.4**.

Crossing	Location	Width	Treatment
Courtesy Crossing	Within residential areas at key travel desire lines and at street nodes	Minimum 2m	Dropped kerb on local street crossings
Signalised Toucan Crossing	New East-West Link Street (3 no.)	4m	Dropped kerb.

Table 4.4: Crossing Type, Location and Treatment

4.3.27 All courtesy crossings are provided with either dropped kerbs or a raised flat top treatment thereby allowing pedestrians to informally assert a degree of priority.

4.3.28 At each of the at-grade flat top pedestrian crossing / traffic calming table treatments, different surface material treatments are proposed to alert and subsequently influence driver behaviour and vehicle speeds.

4.3.29 Formal signalised TOUCAN crossings are provided with a single straight direct movement to minimise crossing distance and enhance pedestrian/cyclist convenience.

4.4 PUBLIC TRANSPORT

4.4.1 As introduced previously, the proposed masterplan has been designed to facilitate the existing local bus route A2 to be extend eastwards into the subject development lands beyond its existing extents at Athlone Regional Sports Centre.

4.4.2 A total of 2 no. new bus stops are proposed along the new east-west 'link' street. **Figure 4.7** below presents the new routing arrangements for the A2 bus service route, the new bus stop locations and the proposed bus route through the residential development. The design of the internal road network has been undertaken to ensure that the streets along which the bus will travel are at least 6.0m wide as per DMURS requirements. The extension of the local bus route eastwards into the masterplan lands will benefit both existing local residents and residents of the masterplans proposed new dwellings.

4.4.3 The strategic positioning of the two new bus stops will ensure that (i) all new and existing residents will have to walk no more than 300m in order to access the bus service, and (ii) minimises the number of bus interchanges in response to bus service operators specific requirements thereby reducing bus journey times.

Figure 4.7: Proposed Bus Infrastructure Improvements

4.5 CONSTRUCTION SCHEDULE

4.5.1 The subject scheme is proposed to be constructed over four principal phases commencing from the east of the site and developing the subject lands westwards as illustrated in **Figure 4.8**. **Table 4.11** below provides a summary of the proposed residential development's implementation schedule / phasing.

Figure 4.8: Proposed Masterplan Phasing

4.5.2 Incorporating typical construction rates, for the purposes of the subject assessment, it has been assumed that 100 no. of the Phase 1 residential houses will be complete and occupied by the end of the adopted 2021 Opening Year and the full development will be complete before the end of the adopted 2026 Future Design Year.

Phase	Total Residential Units Per Phase
1	Delivery of the proposed east-west access route
2	**222** (119 1A + 103 1B)
3	**142** (36 2A + 36 2B)
4	**212** (146 3A + 66 3B)
Total Units	**576**

Table 4.11: Proposed Residential Development Phasing Strategy

4.5.3 As introduced previously, a number of key pieces of short and long term transport infrastructure are included as part of the local development policies including;

1. Lissywollen Avenue (east-west 'Link' street) – LIHAF scheme due to be implemented by end of 2021,
2. Mitigation works at offsite N55 / Brawny Road / R915 / One Mile Road roundabout and R916 / Moyburn Road / Blackberry Lane roundabout
3. North-South Avenue between Brawny Road and Retreat Road (LAP Objective) – provided by others
4. Pedestrian footbridge between Curragh-North Lissywollen and South Lissywollen – provided by others

4.5.4 **Table 4.12** below summarises what infrastructure and subject development is predicted to be operational during each of the subject scheme's adopted design years. It has been assumed that the LAP's future 'North-South Avenue' corridor will not be operational any earlier than the adopted 2036 Future Design Year. This piece of road infrastructure would considerably improve capacity at the roundabout junction on the N55 / R916 Ballymahon Road and at the roundabout junction on the R916.

4.5.5 Accordingly, the assumption that this corridor is not operational in the subject scheme's design years ensures a robust and potential worst-case assessment is undertaken.

Design Year	Dwelling Units	Crèche	Community Hub	Infrastructure Proposals (Implementation Schedule)				
				Lissywollen Avenue (LIHAF Scheme)	R915 Roundabout Junction Upgrades	R916 Roundabout Junction Upgrades	LAP North-South Ave. Road Link	N6 Foot – Bicycle Overbridge
2021	100	321m²	101m²	✓	✓	✓	×	×
2026	576	769m²	101m²	✓	✓	✓	×	×
2036	576	769m²	101m²	✓	✓	✓	×	✓[1]

1-By Others

Table 4.12: Proposed Infrastructure Construction Schedule

5.0 PARKING STRATEGY

5.1 CAR PARKING PROPOSALS

5.1.1 As outlined previously in **Section 3.7**, the proposed development car parking provision has been developed with reference to the guidance outlined in both the Table 12.11 of the current *Athlone Town Development Plan (2014-2020)* which sets out the minimum parking guidance for residential developments and Chapter 4 of the *Sustainable Urban Housing: Design Standards For New Apartments Guidelines For Planning Authorities*, as published by the Department of Housing, Planning and Local Government (DHPLG) in March 2018. Considering the sites proximity to the town centre and the proposal extension of the bus route through the site, the proposed development could be identified as being "Peripheral and / or Less Accessible Urban Locations" in reference to the DHPLG guidance.

5.1.2 The proposed development layout design provides a total of 752 no. car parking spaces including dedicated disabled, electric charging, visitor and car club spaces. The 752 no. car parking spaces (which includes the 11 no. car parking spaces allocated to the adjacent school during the day) comprise 718 no. car parking spaces at surface level and 34 no. car parking spaces at basement level (located beneath Block L).

5.1.3 **Table 5.1** below provides a summary of the proposed vehicle parking provision. The provision of 455 no. residential housing unit car parking spaces is higher than the local development plans 'minimum' car parking requirements (380) and equates to 1.60 spaces per house unit. The proposed apartment / duplex car parking provision (295) is lower than the development plan requirement (388) and also the DHPLG minimum requirement (364) and equates to 1.01 parking spaces per unit.

Land Use	Unit Nos.	Proposed Development	Development Plan Requirement	DHPLG Requirement	
				Intermediate Urban Location	Less Accessible Urban Location
Apartments	291	295	388	"considers a reduced overall standard and apply a maximum"	364-388
Houses	285	455	380	380*	
Community Hub	101m²	2	2	2*	
Total	**576**	**752**	**770**	**<746**	**746-770**

* As per Development Plan Requirement

Table 5.1: Comparison of Vehicle Parking Requirements and Provision

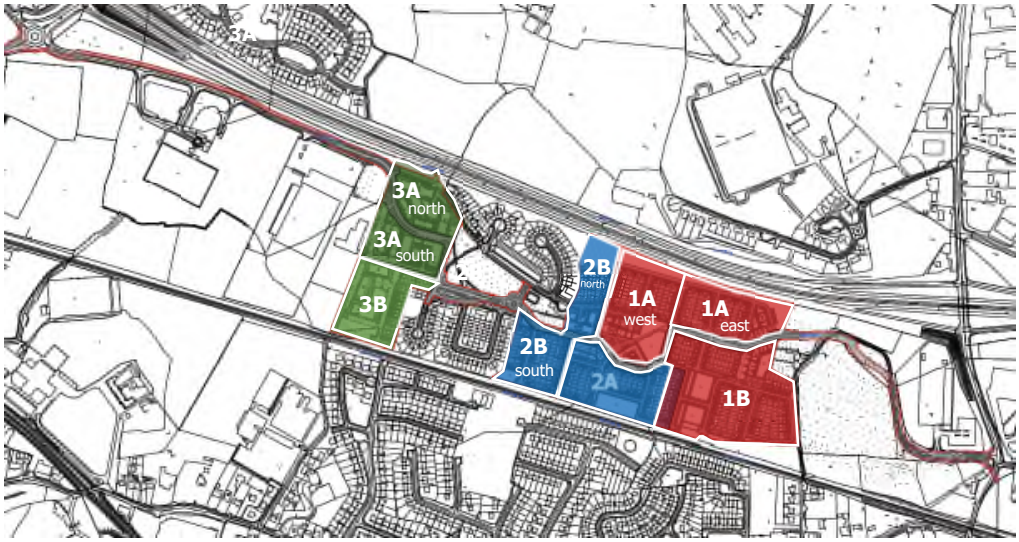


Figure 5.1: Development Sectors

5.1.4 **Figure 5.2** below is an extract from Delphi Architect's 'Block L Basement Layout' drawing D1408-19-PA03. The basement layout design provides for 34 no. car parking spaces (including 2 no. disabled parking spaces) in addition to 36 no. cycle spaces.

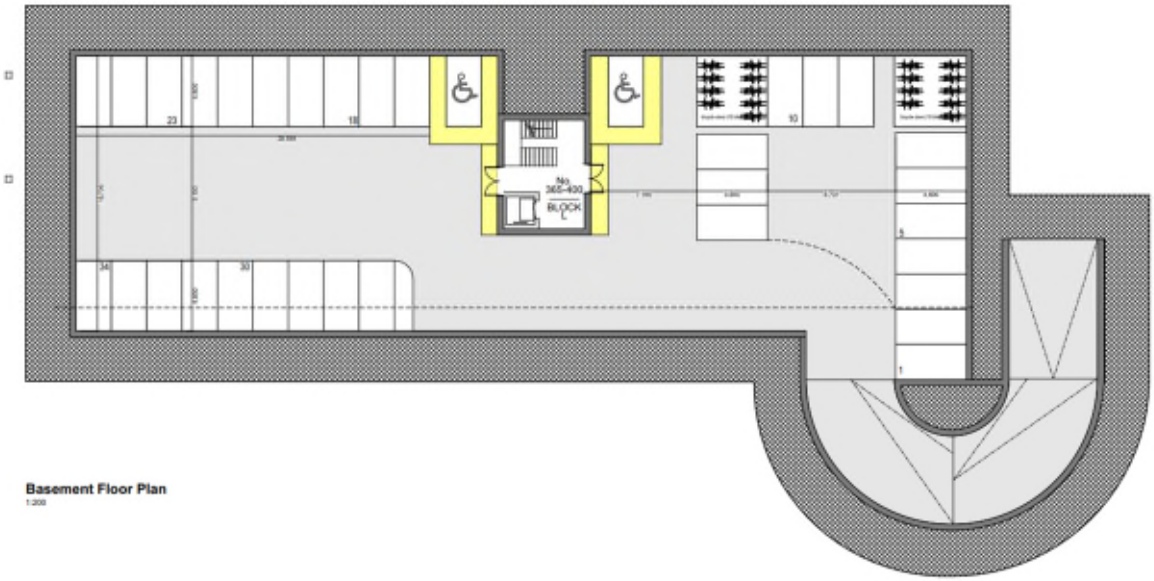


Figure 5.2: Proposed Basement Car Parking Layout (Delphi Architects drawing no. D1408-19-PA03)

Sector	Type	Type of Car Parking Space						Total per Sub Sector	Total per Sector
		In curtilage	On street	Visitor	Disabled	Basement	Subtotal		
Sector 1A East	Block A		7	1	1		9		
	Block B		6	1	2		9		
	Houses	20	26	4			50		
	Total 1A East	***20***	***39***	***6***	***3***		***68***	68	
Sector 1A West	Block C		15	4			19		
	Block D		16	4			20		
	Community Hub		2				2		346
	Houses	20	26	10			56		
	Total 1A West	***20***	***59***	***18***	***0***		***97***	97	
Sector 1B	Block E		9	1			10		
	Block F		8	1			9		
	Houses	74	61	27			162		
	Total 1B	***74***	***78***	***29***	***0***		***181***	181	
Sector 2A	Block G		4	1			5		
	Block H		12	5			17		
	Houses	28	27	7			62		
	Total 2A	***28***	***43***	***13***	***0***		***84***	84	
Sector 2B North	Block K		19	1			20		190
	Houses	10	10	1			21		
	Total 2B North	***10***	***29***	***2***	***0***		***41***	41	
Sector 2B South	Houses	36	18	11			65		
	Total 2B South	***36***	***18***	***11***	***0***		***65***	65	
Sector 3A North	Block L			1	2	32	35		
	Block M		16	1	2		19		
	Block N		22				22		
	Total 3A North	***0***	***38***	***2***	***4***	***32***	***76***	76	
Sector 3A South	Block O		36	1	2		39		
	Block P		10	1			11		
	Block Q		7	1			8		216
	Total 3A South	***0***	***53***	***3***	***2***		***58***	58	
Sector 3B	Block R		16	1	2		19		
	Block S		10	1			11		
	Block T		12	1			13		
	Houses	28	8	3			39		
	Total 3B	***28***	***46***	***6***	***2***		***82***	82	
	Subtotal	**216**	**403**	**90**	**11**	**32**	**752**	**752**	**752**
							Total Car Parking Spaces Proposed	***752***	

*spaces which can be used as visitor car parking outside of school hours (i.e. evenings (Mon-Fri), weekends and holidays)

Table 5.2: Proposed Vehicle Parking by Sector, Dwelling Type & Location

5.1.5 This provision of 295 apartment car parking spaces equates to a ratio of 1.01 per apartment unit. In order to determine if this level of car parking provision is adequate to cater for the potential car parking demand, an assessment of the Census 2016 car ownership data has been undertaken at existing residential areas within Athlone Town. Accordingly, reference is made to **Table 5.3** below which summarises the car ownership at 6 no. existing residential areas in the surrounding area with similar characteristics as the subject development proposal. The assessment of local car ownership using census data at these areas reveals an average car ownership ratio of 0.81 cars per household. In comparison, the subject proposals propose a provision of 1.01 car parking spaces per apartment unit on average and therefore is considered an appropriate quantum to accommodate the predicted demand from the apartment units.

Small Area	Residential Area	Car Ownership	No. Units	Ratio
237004021	Woodlands / Ashdale	76	93	0.82
237003011	Tormey / Ardilaun	86	99	0.87
237003001	Auburn / Montree	92	112	0.82
237003012	Beech Pk / Auburn	99	114	0.87
237004023	Brawny Sq / Drive	50	75	0.67
237004002	Brawny Close / Cres	61	74	0.82
Average				**0.81**

Table 5.3: Existing Residential Area Car Ownership (Source: Census 2016)

5.1.6 Furthermore, it is noted that on evenings and weekends, both the on street car parking adjoining the school and creche facilities could be made available for use as additional visitor car parking spaces. In reference to section 5.1.1 above the site has been classified as "Peripheral and / or Less Accessible Urban Locations", and in such circumstances *"For all types of location, where it is sought to eliminate or reduce car parking provision, it is necessary to ensure, where possible, the provision of an appropriate number of drop off, service, visitor parking spaces and parking for the mobility impaired. Provision is also to be made for alternative mobility solutions including facilities for car sharing club vehicles and cycle parking and secure storage. It is also a requirement to demonstrate specific measures that enable car parking provision to be reduced or avoided".* Accordingly, we have provided for all land uses in addition to set down area and spaces for both creches and the community hub.

5.1.7 A breakdown of the ratio (spaces per unit) of the proposed car parking for the development are detailed in the following **Tables 5.4** to **5.6** which compares the Development Plan requirements, the DHPLG requirements and the proposed car parking for both the long term and short term car parking.

- **Table 5.4** – apartments
- **Table 5.5** – housing units
- **Table 5.6** – combined apartments and houses

Apartments				LONG TERM CAR PARKING				SHORT TERM CAR PARKING				TOTAL	
Sector	Location	Block	No. of Units	WMCC Requirement	DHPLG Requirement	Proposed	Ratio	WMCC Requirement	DHPLG Requirement	Proposed	Ratio	Proposed (L&S)[1]	Ratio (spaces/unit)
1	1A East	A&B	16	16	16	16	1.00	5.33	4.57	2	0.44	18	1.13
	1A West	C&D	31	31	31	31	1.00	10.33	8.86	8	0.90	39	1.26
	1B	E&F	17	17	17	17	1.00	5.67	4.86	2	0.41	19	1.12
			64	64	64	64	1.00	21.33	18.29	12	0.66	76	1.19
2	2A	G&H	16	16	16	16	1.00	5.33	4.57	6	1.31	22	1.38
	2B North	K	21	21	21	19	0.90	7	6	1	0.17	20	0.95
	2B South	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
			37	37	37	35	0.95	12.33	10.57	7	0.66	42	1.14
3	3A North	L,M&N	83	83	83	74	0.89	27.67	23.71	2	0.08	76	0.92
	3A South	O,P&Q	63	63	63	55	0.87	21	18	3	0.17	58	0.92
	3B	R,S&T	44	44	44	40	0.91	14.67	12.57	3	0.24	43	0.98
			190	190	190	169	0.89	63.33	54.29	8	0.15	177	0.93
		Total	**291**	**291**	**291**	**268**	**0.92**	**97.00**	**83.14**	**27**	**0.32**	**295**	**1.01**

*spaces which can be used as visitor car parking outside of school hours (i.e. evenings (Mon-Fri), weekends and holidays)
1. L&S – Long Term and Short Term car parking provision

Table 5.4: Breakdown Ratio of Proposed Car Parking (Apartments)

Houses				LONG TERM CAR PARKING				SHORT TERM CAR PARKING				TOTAL	
Sector	Location	Houses	No. of Units	WMCC Requirement	DHPLG Requirement	Proposed	Ratio	WMCC Requirement	DHPLG Requirement	Proposed	Ratio	Proposed (L&S)[1]	Ratio (spaces/unit)
1	1A East	No. 17-52	36	36	n/a	46	1.28	12	n/a	4	0.33	50	1.39
	1A West	No. 53-88	36	36	n/a	46	1.28	12	n/a	10	0.83	56	1.56
	1B	No. 137-222, 227-239	99	99	n/a	135	1.36	33	n/a	27	0.82	162	1.64
			171	171		227	1.33	57		41	0.72	268	1.57
2	2A	No. 240-264, 277-292	41	41	n/a	53	1.29	13.67	n/a	9	0.66	62	1.51
	2B North	No. 292-307	15	15	n/a	20	1.33	5	n/a	1	0.20	21	1.40
	2B South	No. 329-364	36	36	n/a	54	1.50	12	n/a	11	0.92	65	1.81
			92	92		127	1.38	30.67		19	0.68	148	1.61
3	3A North	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3A South	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3B	No. 555-576	22	22	n/a	36	1.64	7.33	n/a	3	0.41	39	1.77
			22	22		36	1.64	7.33		3	0.41	39	1.77
		Total	**285**	**285**		**392**	**1.38**	**95**		**63**	**0.66**	**455**	**1.60**

*spaces which can be used as visitor car parking outside of school hours (i.e. evenings (Mon-Fri), weekends and holidays)
1. L&S – Long Term and Short Term car parking provision

Table 5.5: Breakdown Ratio of Proposed Car Parking (Houses)

Combined Houses & Apartments				LONG TERM CAR PARKING				SHORT TERM CAR PARKING						TOTAL	
Sector	Sub Sector	Location	No. of Units	WMCC Requirement (Houses)	DHPLG Requirement (Apartments)	Proposed	Ratio	WMCC Requirement (Houses)	Proposed (Houses)	DHPLG Requirement (Apartments)	Proposed (Apartments)	Ratio (Houses)	Ratio (Apartments)	Proposed (L&S)[1]	Ratio (spaces /unit)
1	1A East	Blocks A&B, Houses no. 17-52	52	36	16	62	1.19	12	4	4.57	2	0.33	0.44	68	1.31
	1A West	Blocks C&D, Houses no. 53-88	67	36	31	77	1.15	12	10	8.86	8	0.83	0.90	95	1.42
	1B	Blocks E&F, Houses no. 137-222, 227-239	116	99	17	152	1.31	33	27	4.86	2	0.82	0.41	181	1.56
			235	171	64	291	1.24	57	41	18.29	12	0.72	0.66	346	1.46
2	2A	Blocks G&H, Houses no. No. 240-264, 277-292	57	41	16	69	1.21	13.67	9	4.57	6	0.66	1.31	84	1.47
	2B North	Block K, Houses no. 292-307	36	15	21	39	1.08	5	1	6.00	1	0.20	0.17	41	1.14
	2B South	Houses no. 329-364	36	36	n/a	54	1.50	12	11	n/a	n/a	0.92	n/a	65	1.81
			129	92	37	162	1.26	30.67	21	10.57	7	0.68	0.66	190	1.47
3	3A North	Blocks L,M&N	83	n/a	83	74	0.89	n/a	n/a	23.71	2	n/a	0.08	76	0.92
	3A South	Blocks O,P&Q	63	n/a	63	55	0.87	n/a	n/a	18.00	3	n/a	0.17	58	0.92
	3B	Blocks R,S&T, Houses no. 555-576	66	22	44	76	1.15	7.33	3	12.57	3	0.41	0.24	82	1.24
			212	22	190	205	0.97	7.33	3	54.29	8	0.41	0.15	216	1.02
		Total	**576**	**285**	**291**	**660**	**1.15**	**95**	**63**	**83.14**	**27**	**0.68**	**0.32**	**750**	**1.30**

*spaces which can be used as visitor car parking outside of school hours (i.e. evenings (Mon-Fri), weekends and holidays)
1. L&S – Long Term and Short Term car parking provision

Table 5.6: Breakdown Ratio of Proposed Car Parking (Combined Houses & Apartments)

Mobility Impaired Parking

5.1.8 The Athlone Town Development Plan 2014-2020 states that "*The minimum criteria for such parking provisions are detailed in "Building for Everyone - Planning and Policy published by the National Disability Authority in 2009".'* This document recommends *"Minimum one space of appropriate dimensions in every 25 standard spaces, up to the first 100 spaces; thereafter, one space per every 100 standard spaces or part thereof"* for 'grouped' apartment / duplex parking areas, the subject scheme is required to provide a total of 6 no. mobility impaired car parking spaces (excluding housing units). The subject proposals include for 7 no. spaces as detailed in **Table 5.2** and **Figure 5.3** and is comparable to the development plan standards.

Electric Vehicle (EV) Parking

5.1.9 The current Athlone Town Development Plan 2014-2020 currently does not state a requirement for Electric Vehicle car parking. Nevertheless, following best practise 10% of the car parking spaces allocated for the apartment units will be Electric Vehicle car parking. The scheme proposals include 30 no. EV car parking spaces within the development which are illustrated in DBFL drawing No. 180176-DBFL-RD-SP-DR-C-1003 and 180176-DBFL-RD-SP-DR-C-1004 which accompany this planning application. Of these 30 EV spaces, 27 are at surface level and 3 are in the Block L basement. The residential houses have the option of fitting their own Electric Vehicle point at their own residence as and when the requirement arises.

Sector	Sub Sector	Location	No. of Units	Standard Spaces	EV Spaces	Total
1	1A East	Blocks A & B	16	16	2	18
	1A West	Blocks C & D	31	35	4	39
	1B	Blocks E & F	17	17	2	19
			64	68	8	76
2	2A	Blocks G & H	16	20	2	22
	2B North	Block K	21	18	2	20
	2B South	n/a	n/a	n/a	n/a	n/a
			37	38	4	42
3	3A North	Blocks L, M & N	83	68	8	76
	3A South	Blocks O, P & Q	63	52	6	58
	3B	Blocks R, S & T	44	39	4	43
			190	159	18	177
		Total	**291**	**265**	**30**	**295**

Table 5.7: Proposed Electric Vehicle Car Parking (Apartments)

Car Sharing

5.1.10 The subject scheme proposals include 2 no. dedicated car club spaces located in Sector 1A (See **Figure 5.5**). Managed by a specialised private operator (i.e. ***GoCar***) all residents will have the option to become members of the car share service. On becoming members, residents can then book cars online or via the app for as little as an hour, then unlock with their phone or GoCAR. The keys are in the car, with fuel, insurance and city parking all included. The benefits of such car sharing services include:-

- the reduction of the number of cars on the road and therefore traffic congestion, noise and air pollution;
- minimised demand for car parking and frees up land traditionally used for private parking spaces;
- increased use of public transport, walking and cycling as the need for car ownership is reduced; and
- Car sharing allows those who cannot afford a car the opportunity to drive, thereby encouraging social inclusivity.

Creche

5.1.11 Currently there are no car parking standards in the Athlone Town Development Plan 201-2020 for a creche facility. Nevertheless as detailed in **Figure 5.3** the scheme proposals provide a parking / drop off area for the creche.

Figure 5.3: Creche Parking Opportunities

Community Hub

5.1.12 The subject scheme proposals include 2 no. car parking spaces for the community hub as per Athlone Town Development Plan 2014-2020 requirements which require a minimum of 2 car parking spaces per 100m^2 GFA.

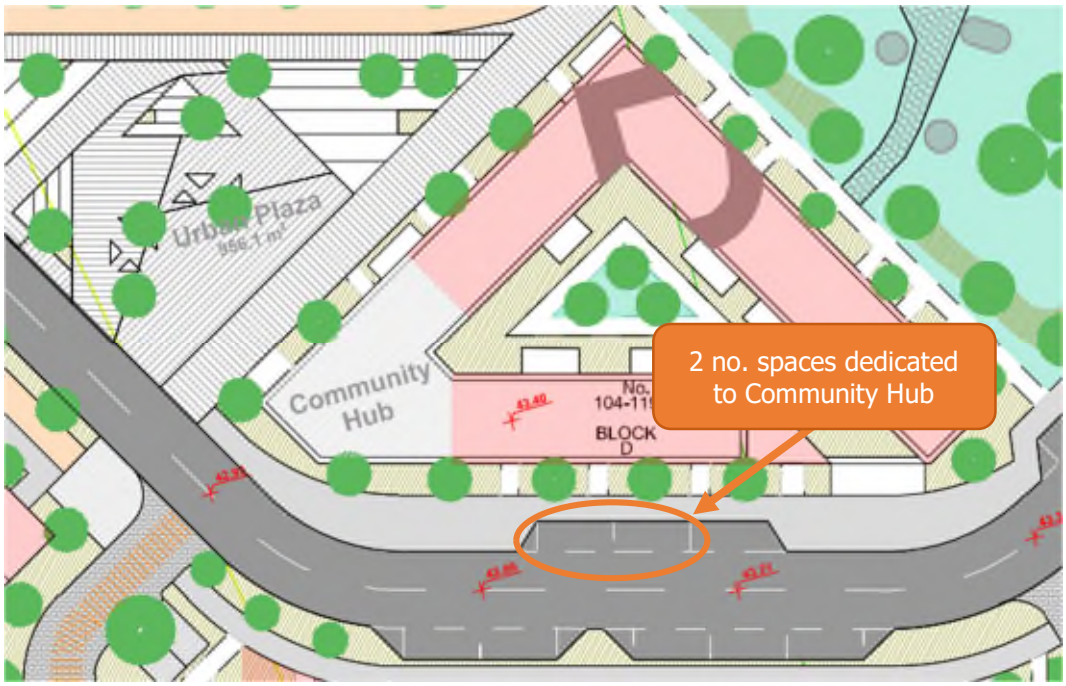


Figure 5.4: Community Hub Car Parking Spaces

Scoil na gCeithre Máistrí

5.1.13 In addition to a private off-road car park for staff (outside the application site), the existing school benefits from 6 no. on street public car parking spaces and 1 no. on street bus parking space within the application site. There is also an existing unformalised walkway (outside the application site) linking the Old Rail Trail Car Park (Athlone Town Football Club) to the school which can be used as a 'Park and Stride' facility for the school. It is envisaged that this walkway link will be maintained and will be formalised at a future stage (by other).

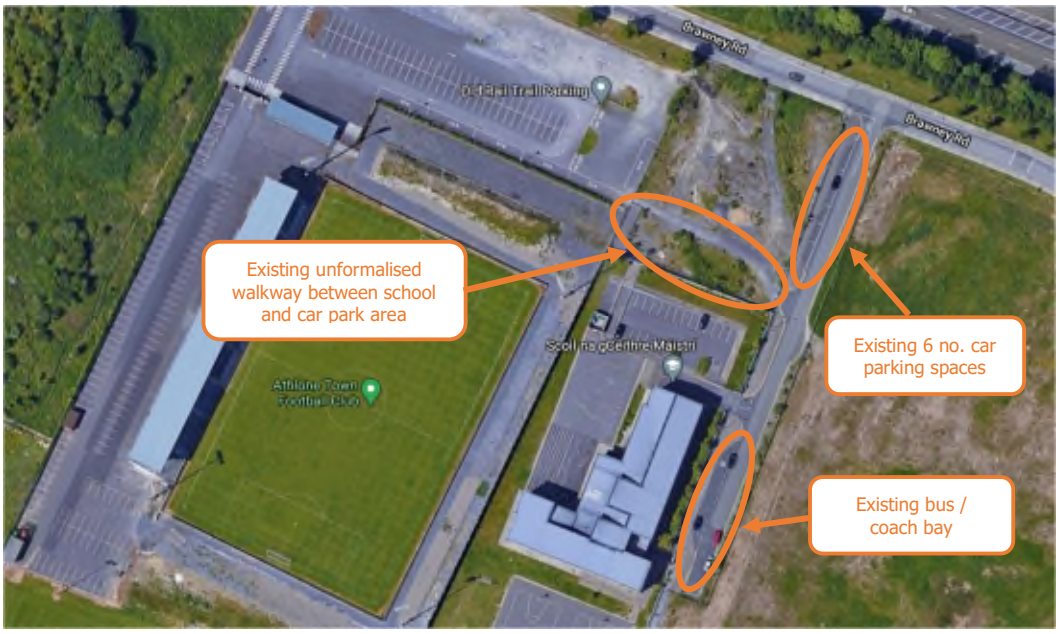


Figure 5.5: Existing Drop-Off / Collection Parking Opportunities at School

5.1.14 The development proposals includes for the provision of one on-street coach parking space and 11 no. car parking spaces immediately adjoining Scoil na gCeithre Máistrí as illustrated in **Figure 5.5**. This layout will replace the existing 6 no. car parking spaces and 1 no. bus space. These 11 on street spaces could be assigned for school use Monday to Friday from 8am to 4pm. Outside of these hours, these parking spaces can be used for visitor parking by the residential development.

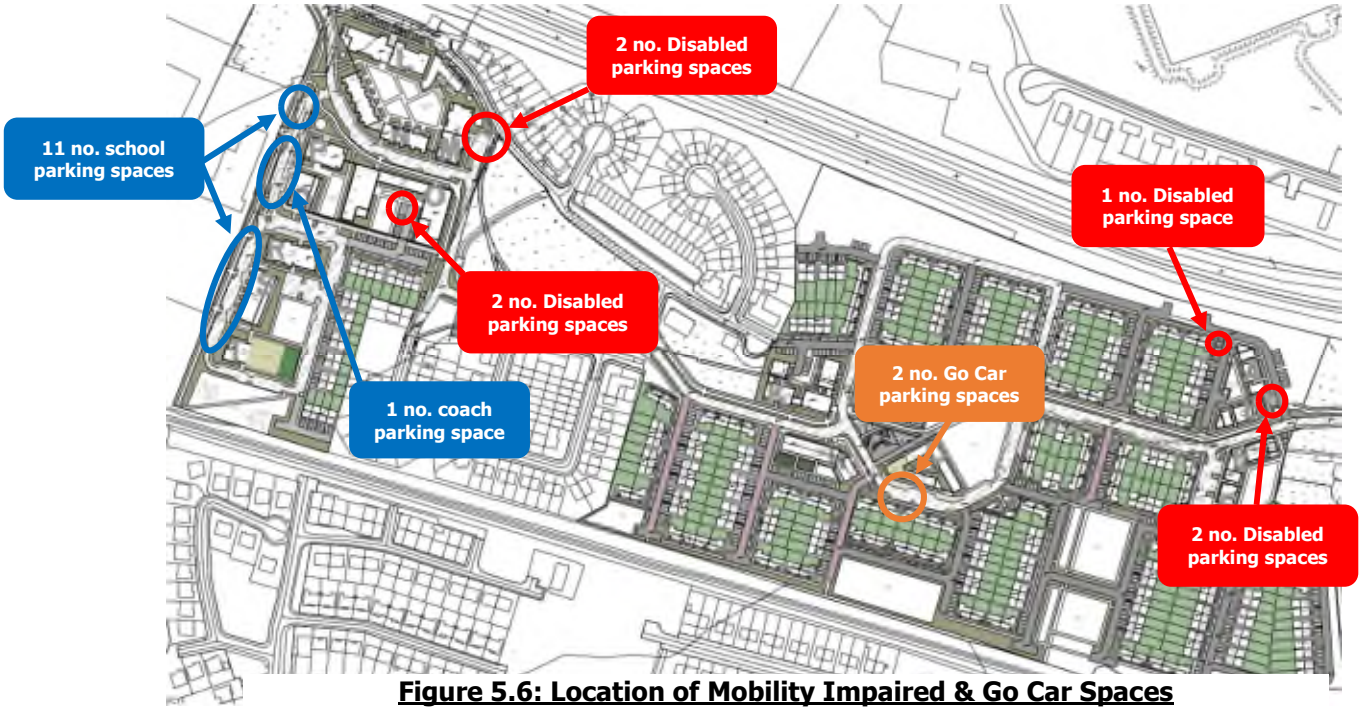


Figure 5.6: Location of Mobility Impaired & Go Car Spaces

5.2 CAR PARKING MANAGEMENT STRATEGY

5.2.1 The following paragraphs will discuss the car parking management strategy for the residential development at Lissywollen.

5.2.2 All marketing material will make it clear that the Lissywollen development on-site car parking spaces for the apartment units will remain within the control of the appointed management company. A management regime will be implemented by the development's management company to control access to the on-site apartment car parking bays thereby actively managing the availability of on-site car parking for residents and visitors.

5.2.3 Nevertheless, all residents of the proposed residential apartment scheme will have the opportunity to apply to the on-site management company for both a;

- Residents car parking permit (updated weekly, fortnightly, monthly, quarterly or annually) and subsequently access to a dedicated (assigned) on-site basement car parking space or
- Visitor's car parking permit for a short period of time.

5.2.4 The building management team will be responsible for the day-to-day management of car parking operations. Residents who request a private car parking space will be allocated one on a 'first come, first served' basis.

5.2.5 A charge will be applied to obtain a permit with the objective of covering the associated management costs, discouraging long term usage of the car parking space and encouraging travel by sustainable modes of travel.

5.2.6 Access to Block L's basement car park will be strictly controlled by barriers. Entry will be facilitated by coded entry and/or number plate recognition which will permit registered vehicles only to enter. The car parking management regime in place at the Lissywollen residential development will therefore ensure that the risk of any 'overspill' car parking on the surrounding residential streets is minimised.

Car Park Vehicle Access Control

5.2.7 The proposals include for 1 no. barrier entry / exit systems to Block L's basement car park facility. The default position of this barrier will be closed at all times and will be controlled by approved residents (those with approved access to a resident parking space) of the apartments.

5.3 CYCLE PARKING

5.3.1 The appropriate level of cycle parking provision for the proposed residential development will also be provided in accordance with Athlone Town Development Plan 2014-2020 and DHPLG – Design Standards for New Apartments (March 2018). The cycle parking standards for residential developments are detailed in **Table 5.7** below: -

Land Use	Unit No. / Size GFA (m^2)	Development Plan Requirement		DHPLG Requirement	
		Long Term	Short Term	Long Term	Short Stay
Apartments	291 No.	477	146	575	146
Houses	285 No.	639	143	N/A	N/A
Creche	$321m^2$ + $448m^2$	-	-	N/A	N/A
Community Hub	$101m^2$	No requirements detailed		-	-
Sub-Total		**1116**	**289**	**575**	**146**
Total		**1405**		**721**	

Table 5.7: Development Plan & DHPLG Cycle Parking Standards

Land Use		Unit No.	Short Term	Long Term
Apartments		491	160	631
Houses	Residents (rear parking via side access)	220	-	510[1]
	Residents (no rear parking via side access)	65	-	130
	Visitors (off-site centralised facility)	285	154	-
Crèche		-	14	14
Subtotal (per parking duration classification)			**328**	**1285**
Subtotal (proposed bicycle parking stands)			**328**	**775[2]**
Total Bicycle Parking Opportunities (minimum)			**1613**	

1) It is not proposed to provide dedicated bicycle stands in the rear garden of the housing units
2) Excludes the parking opportunities in the rear garden of houses with a side access route.

Table 5.8: Proposed Cycle Parking Provision/ Opportunities

5.3.2 In reference to **Table 5.8** above, a total of 1613 no. bicycle parking opportunities are proposed as part of the residential development scheme (comprising a mix of Sheffield stands and single / double stacked Cardiff Stands) which include a total of 328 short term and 1285 long term bicycle parking stands / opportunities on site within the Lissywollen development.

5.3.3 The 1613 bicycle spaces comprise of 1585 residential and 28 creche cycle parking spaces. The 1585 no. residential cycle parking spaces comprise 1271 no. long term secured / sheltered spaces and 314 short term parking spaces. The 28 no. cycle

parking spaces proposed for the creche facilities include 12 no. at the 321m^2 creche located in Sector 1A West of the site (adjacent to Block C) and 16 no. at the 448m^2 creche located on the ground floor apartment Block T.

5.3.4 The proposed cycle parking spaces are conveniently located in close proximity to Block access locations and are well within the recommended distances of 25m for short stay cycle parking spaces and 50m for long stay cycle parking spaces as per best practise recommendations.

Standard/ Proposed	Type	Houses	Apartment/ Duplex	Creche	Sub Total
Development Plan Standards	**Short**	143	146	n/a	289
	Long	639	477	n/a	1116
	Total	**782**	**623**	**n/a**	**1405**
DHPLG Standards	**Short**	143[2]	146	n/a	289
	Long	639[2]	575	n/a	1214
	Total	**782[2]**	**721**	**n/a**	**1503**
Proposed	**Short**	154	160	14	328
	Long	640[1]	631	14	1285
	Total	**794**	**791**	**28**	**1613**

1 – Includes houses with side/rear access to rear gardens
2 – Not applicable so Development Plan requirements stated

Table 5.9: Comparison of Bicycle Parking Provision

5.3.5 The specific locations of the proposed on-site bicycle parking facilities are illustrated in the following drawings which accompany this planning application:

- DBFL Drawing No. 180176-DBFL-TR-SP-DR-C-1001 entitled *Cycle Parking Strategy (1 of 2)*
- DBFL Drawing No. 180176-DBFL-TR-SP-DR-C-1002 entitled *Cycle Parking Strategy (2 of 2)*

5.3.6 The details of the proposed Bicycle Parking Strategy for the proposed residential development can be found in **Appendix D** of this report.

5.3.7 The locations of the internal bicycle parking facilities can be found in **Appendix E** of this report.

Sector	Type	Type of Cycle Parking Space						Total by Sub sector	Total by Sector
		Long Term			Short Term				
		Rear/ Side Garden	External Hub	Internal	Ext Hub (houses)	Ext Hub (apts)	Ext Hub (creche)		
Sector 1A East	Block A	-	-	16	-	4	-		
	Block B	-	-	16	-	4	-		
	Houses	71	8	-	20		-		
		71	**8**	**32**	**20**	**8**	**0**	**139**	
Sector 1A West	Block C	-	-	34	-	8	-		
	Block D	-	10	18	-	8	-		
	Houses	71	8	-	20	-	-		**622**
	Creche	-	6	-	-	-	6		
		71	**24**	**52**	**20**	**16**	**6**	**189**	
Sector 1B	Block E	-	-	36	-	4	-		
	Block F	-	-		-	4	-		
	Houses	164	34	-	52	-	-		
		164	**34**	**36**	**52**	**8**	**0**	**294**	
Sector 2A	Block G	-	-	6	-	2	-		
	Block H	-	16	20	-	6	-		
	Houses	94	26	-	22	-	-		
		94	**42**	**26**	**22**	**8**	**0**	**192**	
Sector 2B North	Block K	-	6	36	-	12	-		**389**
	Houses	17	16	-	8	-	-		
		17	**22**	**36**	**8**	**12**	**0**	**95**	
Sector 2B South	Houses	58	24	-	20	-	-		
		58	**24**	**0**	**20**	**0**	**0**	**102**	
Sector 3A North	Block L	-	40	36	-	18	-		
	Block M	-	44		-	10	-		
	Block N	-	24	33	-	14	-		
		0	**108**	**69**	**0**	**42**	**0**	**219**	
Sector 3A South	Blocks O	-	44	36	-	22	-		
	Blocks P	-		20	-	6	-		
	Blocks Q	-	10	24	-	4	-		**602**
		0	**54**	**80**	**0**	**32**	**0**	**166**	
Sector 3B	Block R	-	-	40	-	10	-		
	Block S	-	-	36	-	12	-		
	Block T	-	-	30	-	12	-		
	Houses	35	14	-	12	-	-		
	Creche	-	8	-	-	-	8		
		35	**22**	**106**	**12**	**34**	**8**	**217**	
	Subtotal	**510**	**338**	**437**	**154**	**160**	**14**		
		Long Term		**1285**	**Short Term**	**328**			
								Total Cycle Parking Spaces Proposed	**1613**

Table 5.10: Proposed Bicycle Parking Provision Per Sector

5.3.8 Dedicated long term cycle parking facilities have not been provided for house units which benefit from either a rear or side access to their gardens as these residents can avail of cycle parking opportunities to the rear garden of their dwellings. Whilst this level of long term provision differs from the Athlone Town Development Plan 2014-2020 standard (1116 no. spaces), it is considered best practice based upon recent SHD application experience to provide in the order of 1.38 no. cycle parking spaces per unit for urban areas such as Athlone. The long term cycle parking provision includes both the proposed dedicated cycle parking infrastructure for the apartments, duplex apartments and terraced houses. As introduced above, there are additional long term cycle parking opportunities to the rear of dwellings which benefit from side accesses.

5.3.9 The long term residential bicycle parking spaces are to be incorporated in dedicated architectural designed storage units in a similar manner to that in the two photos in **Figure 5.7** below, however final details on material finishes etc. can be agreed prior to commencement of the development. This approach will ensure that long term bicycle parking is both secure and weather protected.

Figure 5.7: Typical Secured and Weather Protected Long Term Cycle External Storage Hub Facilities

5.4 MOTORCYCLE

5.4.1 Section 12.21.5 of the *Athlone Town Development Plan (2014-2020)* states that new developments *"at a minimum, one secure motorcycle parking space shall be required for every 20 car parking spaces".* The development proposals include 42 no. motorcycle spaces which is more than the development plan standard of 38 spaces.

5.4.2 The specific locations of the proposed motorcycle parking facilities are illustrated in the following drawings which accompany this planning application:

- DBFL Drawing No. 180176-DBFL-TR-SP-DR-C-1001 entitled Cycle Parking Strategy (1 of 2)
- DBFL Drawing No. 180176-DBFL-TR-SP-DR-C-100 entitled Cycle Parking Strategy (2 of 2)

Sector	Location No.	Location	Total
1A East	MAE1	Block A	2
	MHE1	Houses 17-52	2
1A West	MAE2	Block C	2
	MHE2	Houses 53-88	2
	MHE3	Houses 53-88	2
1B	MHE4	Houses 195-222, 227-239	2
	MHE5	Houses 195-222, 227-239	2
	MHE6	Houses 195-222, 227-239	2
2A	MAE3	Block H	2
	MHE7	Houses 240-264, 277-292	2
	MHE8	Houses 240-264, 277-292	2
2B North	MHE11	Houses 293-307	2
	MHE12	Houses 293-307	2
2B South	MHE10	Houses 355-364	2
	MHE9	Houses 329-354	2
3A North	MAE7	Block N	2
	MAE8	Block M	2
3A South	MAE5	Block Q	2
	MAE6	Block Q	2
3B	MHE13	Houses 555-576	2
	MHE14	Houses 555-576	2
		Total Motorcycle Parking	***42***

Table 5.7: Proposed Motorcycle Parking Provision

6.0 TRIP GENERATION AND DISTRIBUTION

6.1 INTRODUCTION

6.1.1 The following paragraphs present the process by which the potential level of vehicle trips associated with the proposed development have been generated and subsequently assigned across the local road network.

6.2 TRAFFIC SURVEYS

6.2.1 In order to establish the existing local road networks traffic characteristics and subsequently enable the identification of the potential impact of the proposed residential development, traffic surveys were commissioned in May 2019.

6.2.2 The survey brief included 1 no. ATC (automatic traffic count) survey and 11 no. classified JTC's (junction turning counts) at Junctions 1 to 11 as illustrated in **Figure 6.1** below. In addition to the JTC's, queue length surveys were also undertaken at the aforementioned junctions.

6.2.3 The JTC and queue length traffic surveys were conducted by specialist survey firm Idaso. With the exception of survey site No. 3, the surveys were undertaken over two number 2 hour survey periods from 07:30 to 09:30 in the AM and again from 16:30 to 18:30 in the PM period. At survey site No. 3, an eleven hour count was undertaken between 07:30 and 18:30. At the request of local stakeholders, Junction 3 and the ATC were surveyed on a second subsequent neutral weekday (**Figure 6.1**).

- **1** – N55 / N6 Eastbound On-ramp / N6 off-ramp junction;
- **2** – N55 / N6 Westbound off-ramp junction;
- **3** – Brawny Road / R915 / N55 / One Mile Round;
- **4** – R916 / N6 Eastbound On-ramp / N6 off-ramp junction;
- **5** – R916 / N6 Westbound On-ramp / N6 off-ramp junction;
- **6** – R916 / Moydrum Road junction;
- **7** – R446 / R916 Wash House Road junction;
- **8** – R915 / The Crescent / Grace Park Road / Gleeson Street junction;
- **9** – N55 / Coosan Road junction;
- **10** – N55 / Cloghanboy Avenue; and
- **11** – R916 / Moydrum Road junction.

6.2.4 The ATC was placed along Brawny Road and 12 hour vehicle flow and speed data was obtained over two consecutive days at the general location illustrated in **Figure 6.1**.

6.2.5 In order to analyse and assess the predicted traffic generation from the proposed development upon the local road network, an area wide traffic model incorporating all eleven of these external junctions was developed.

6.2.6 The results of the traffic survey established that the local AM and PM peak hours generally occur between 08:30-09:30 and 17:00-18:00. The results confirmed that along Ballymahon Road corridor there is a notable interpeak demand associated with the local schools. Nevertheless, the analysis of the survey data demonstrates that the volume of traffic recorded during this interpeak period is still not as high as that recorded during the PM peak hour (17:00-18:00).

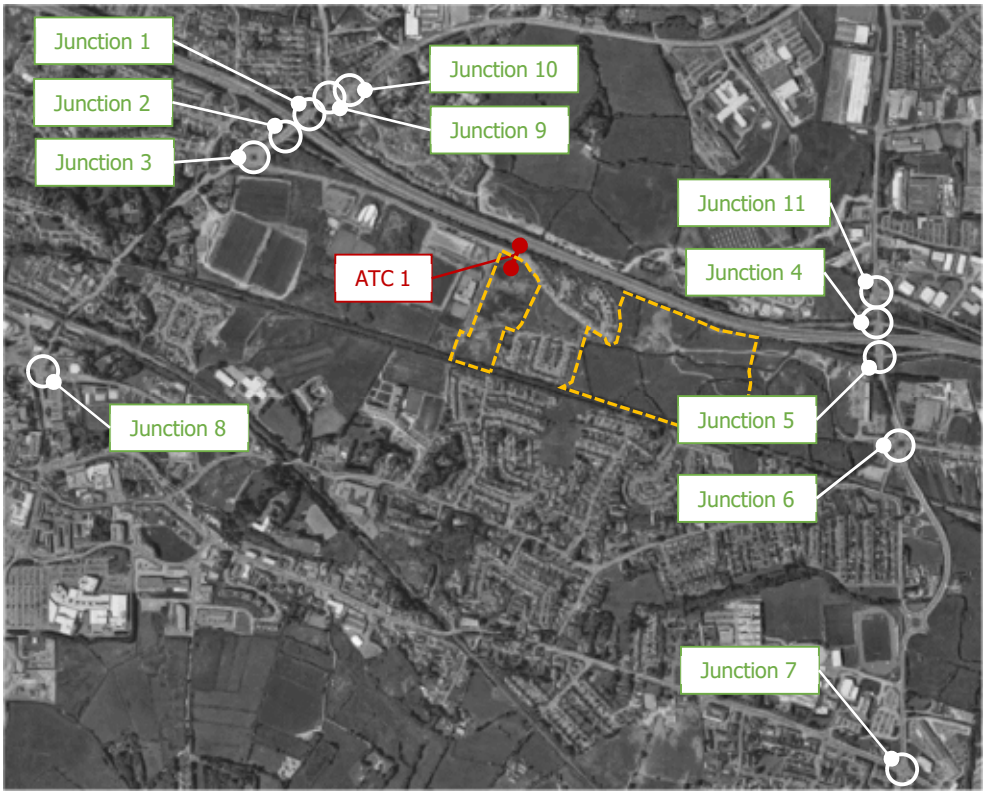


Figure 6.1: Traffic Survey Locations

6.2.7 As introduced previously, in response to requests from local stakeholders, the surveys at Junction 3 and the ATC were again undertaken on a second neutral weekday also. Figures 5.2 to 5.5 illustrate the daily traffic profile at Junction 3 and at the aforementioned ATC location on Brawny Road as recorded on Tuesday 14th May and Wednesday 15th May 2019.

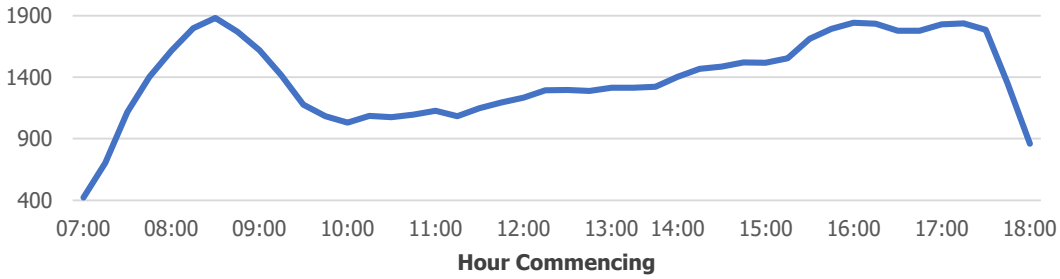


Figure 6.2: Junction 3 Daily Traffic Profile - Tuesday 14th May 2019

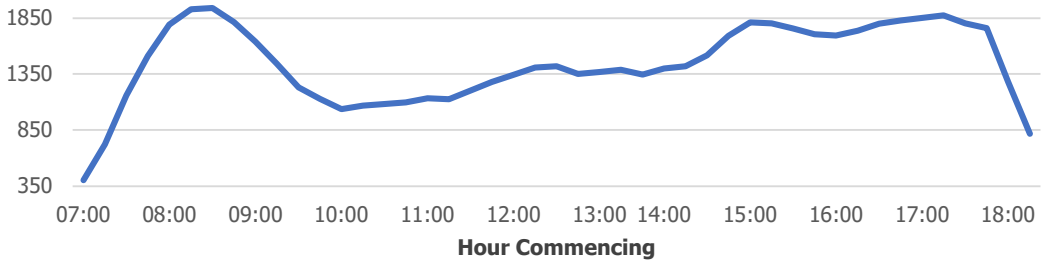


Figure 6.3: Junction 3 Daily Traffic Profile Wednesday - 15th May 2019

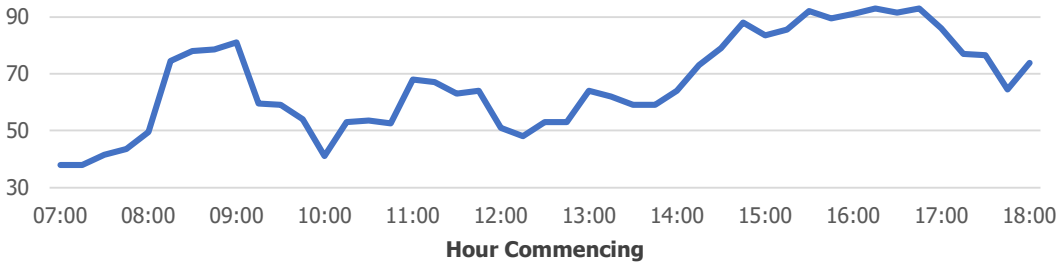


Figure 6.4: Brawny Road ATC Daily 2-Way Traffic Profile - Tuesday 14th May 2019

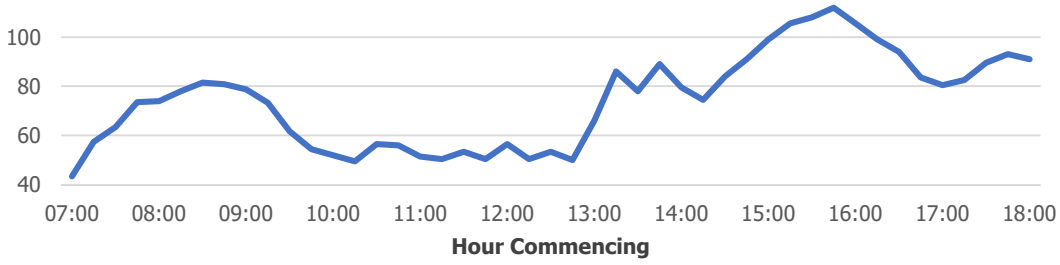


Figure 6.5: Brawny Road ATC Daily 2-Way Traffic Profile - Wednesday 15th May 2019

6.2.8 At the eastern extremity of the Brawny Road where the ATC was located, the survey results varied slightly between the two survey says with slightly different profiles recorded particularly during the interpeak and PM (17:00-18:00) periods.

6.3 TRIP GENERATION

6.3.1 With the objective of establishing robust trip rates and subsequently vehicle trip rates and associated traffic generation figures for the subject site, the following data sources will be reviewed, as detailed in the following paragraphs:-

- Review of 2016 Census Data – Existing local Modal Split trends; and
- TRICS Database

2016 Census Data Area Based Analysis

6.3.2 The SAPMAP tool has been used to extrapolate the findings of the 2016 Census. The following catchment areas as presented in **Figure 6.6** within the immediate vicinity of the subject site have been identified and examined as part of this desktop exercise.

6.3.3 The indicative boundary of each of the above assessment areas are illustrated in **Figure 6.6** below, enabling the accumulative journey characteristics for each of the areas to be established.

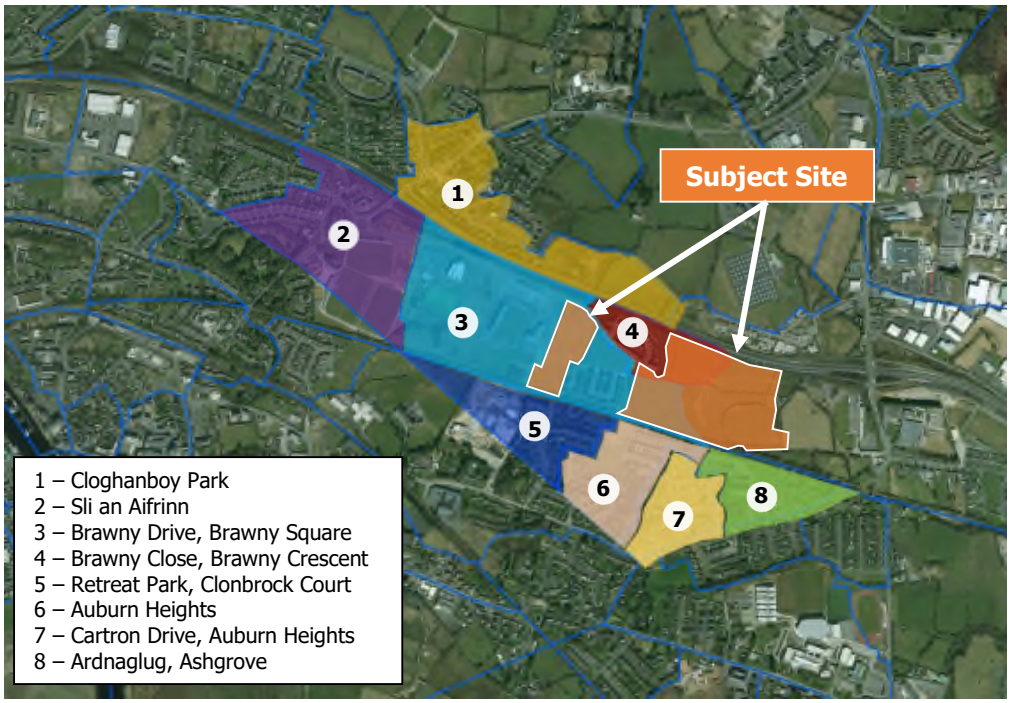


Figure 6.6: Census Catchment Area Boundaries

Mode of Travel to School, College and Work

6.3.4 The initial analysis considered the mode of travel used by residents living in each of the above 8 catchment areas when traveling to school, college and work. The principal mode of travel used by residents in each catchment area is summarised in **Figure 6.7** below.

6.3.5 In summary it can be seen that 19.4% walk, 2.3% cycle and a total of 8.9% use public transport. A total of 66.2% travel by car / van comprising 39.1% as drivers and 27.1% as passengers.

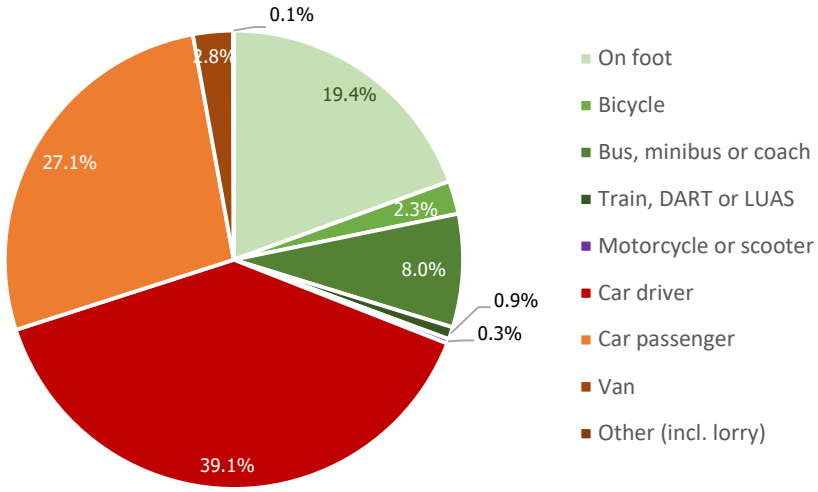


Figure 6.7: Mode of Travel – Commuting to Work/School/College (Areas 1-8)

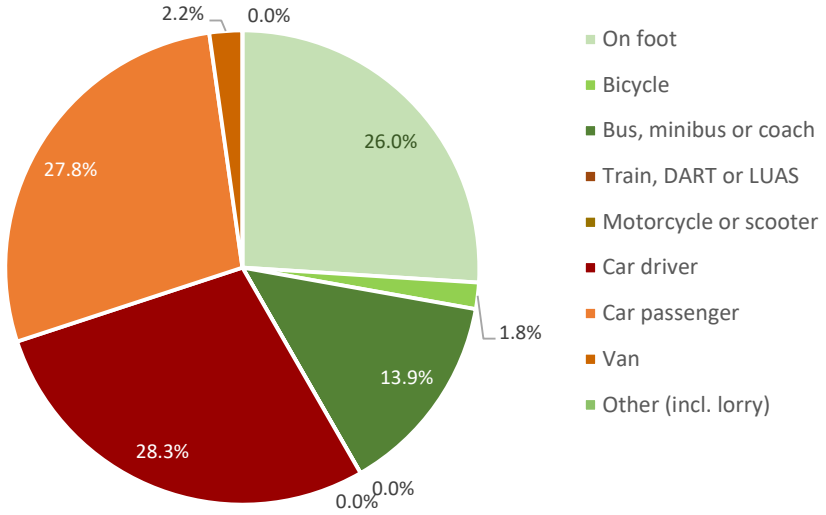


Figure 6.8: Mode of Travel – Commuting to Work/School/College (Areas 3-4)

Person Trips

6.3.6 Based on the mode share proportions derived from the Census 2016 data in above, the total person trips can be estimated. Even though our proposed development represents more similarities with Areas 3 and 4, we have adopted all 8 areas in our assessment to provide a robust appraisal.

6.3.7 It has been assumed that the predicted vehicle trips generated by the subject residential development (as per the TRICS estimated trip rate data discussed in **Sections 6.3.8 to 6.3.11** below) correspond to the proportion of vehicle trips derived within the Census mode share data. Accordingly, knowing the proportion of all trips that comprise vehicle trips, the total person trips and subsequently trips by other modes can be calculated.

6.3.8 **Table 6.1** below presents the predicted person trips generated by the subject residential development during the AM and PM peak hours if the baseline modal split data (for the local areas detailed in Figure 5.6) were applied to the proposed development. In reality DBFL believe that a greater proportion of journeys will be undertaken by sustainable mode of travel including active modes such as walking and bicycle in addition to the public transport due to the mitigation strategy being proposed as part of the scheme proposals and the increased sustainable accessibility levels the area will benefit from following the extension of the local bus route into subject development and connectivity provided by recently implemented and proposed walk / bicycle infrastructure.

Mode of Travel	Average Mode Share (%)	AM Peak Hour		PM Peak Hour	
		Arr	Dep	Arr	Dep
On Foot	19.4%	34	60	72	45
Bicycle	2.3%	4	7	9	5
Bus, minibus or coach	8.0%	14	25	30	19
Train, DART or LUAS	0.9%	2	3	3	2
Motorcycle or scooter	0.3%	1	1	1	1
Car / Van driver	41.9%	69	121	145	91
Car Passenger	27.1%	48	84	100	63
Total Person Trips		186	176	309	370

Table 6.1: Proposed Residential Predicted Person Trips

Vehicle Trip Generation

6.3.9 To estimate the potential level of vehicle trips that could be generated by the proposed subject residential development reference is made to the TRICS

database. TRICS provides trip rate information for a variety of different land uses and development types, which can be applied to the subject development.

6.3.10 It is envisioned that the proposed on-site creches will predominantly serve the proposed masterplan development and the local walk-in catchment and therefore has not been incorporated into the vehicle trip generation exercise.

6.3.11 Based on TRICS generated vehicle trip rates (**Table 6.2**), potential peak hour vehicle trips have been calculated based on the proposed residential development schedule of 576 no. residential units comprising:-

- 285 no. houses; and
- 291 no. apartment / duplex units.

6.3.12 As introduced in **Section 4.5** above, 100 no. of the proposed 285 house units (90 private and 10 social) will be constructed by the 2021 Opening year, with the remaining 185 houses, and 291 duplex / apartment units constructed by the 2026 Future Design Year.

Land Use (Trics)	AM Peak Hour		PM Peak Hour	
	Arrive	Depart	Arrive	Depart
Private Houses	0.166	0.310	0.363	0.211
Affordable Houses	0.162	0.257	0.246	0.128
Private Apartments	0.073	0.143	0.207	0.150
Affordable Apartments	0.154	0.151	0.134	0.110

Table 6.2: TRICS Derived Vehicle Trip Rates

6.3.13 Based on the TRICS trip rates in **Table 6.2** and the aforementioned construction schedule, the potential vehicle trips that could be generated as a result of the subject development proposals are summarised in **Table 6.3** below.

Subject Development	Period	Arrive	Depart
2021 Opening Year	AM	17	30
	PM	35	20
2026 & 2036 Future Year	AM	72	127
	PM	72	127

Table 6.3: Proposed Development Vehicle Trip Generation

6.4 COMMITTED DEVELOPMENT

6.4.1 A review of the local authority planning data has revealed that there is one committed development in the immediate vicinity of the subject site that has received planning permission but has yet to be constructed.

6.4.2 This committed development (Pl. Ref. 167155) is for a petrol filling station and received planning permission in May 2017. It comprises the following;

> *"1. The demolition of residential unit. 2 The provision of filling station, with canopy & car wash adjacent to existing retail unit. 3 The extension to the existing shop to accommodate coffee dock seated area for 40 people at ground floor encompassing an area of 110sqm and office unit, canteen and storage space at first floor encompassing an area of 168sqm (totalling to 278 sqm) and 4. Provision of bicycle hire and storage hut, storage units, car parking spaces, landscaping, pedestrian and bicycle pathways and all associated site works."*

6.4.3 A Traffic and Transport Assessment (undertaken by Alan Lipscombe Traffic & Transport Consultants) was submitted as part of the planning application and therefore the predicted peak hour vehicle trips have been incorporated into the subject assessment. The submitted vehicle trips are summarised in **Table 6.4** below. Whilst the TTA did not detail AM peak hour flow, we have adopted the PM flows as corresponding AM flows also with the objective pf providing a robust appraisal.

Period	Arrive	Depart
Lunch	62	62
PM	62	62

Table 6.4: Committed Development (Pl. Ref. 167155) Vehicle Trip Generation

6.5 TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Trip Distribution

6.5.1 The distribution of the subject development traffic as proposed by DBFL will be based upon the predicted origin / destinations of future residents. For this purpose a local gravity model was developed to evaluate peak hour vehicle origins and destinations reflecting the sites proximity to the Town Centre and both education and employment sites (i.e. within walking / cycling distances the gravity model

focused on longer journeys where the private motor car is more likely to be the mode of choice.

6.5.2 The subsequent assignment has been based upon the shortest peak hour journey time which in some cases may not be the shortest route distance. A total of 8 no. origin / destination zones have been incorporated into the trip distribution and assignment exercise as presented in **Table 6.5** and **Figure 6.9** below.

Zone	Origin / Destination	% Development Vehicle Trips
1A & 1B	**West** - M6 west / Ballinasloe / Westpoint Business Pk / Monksland Ind. Pk	32.5%
2	**East** - M6 East / Mullingar (N52) / Tullamore (N80)	17.5%
3	**South** - AIT / Dublin Rd	10.0%
4	**Northeast** - Blyry Ind. Est. / N55 / R390	17.5%
5	Athlone Town Centre	12.5%
6	**Southeast** - IDA Business Park / N62	7.5%
7	**Northwest** Athlone	2.5%

Table 6.5: Predicted Peak Hour Origin / Destination Vehicle Trip Assignment

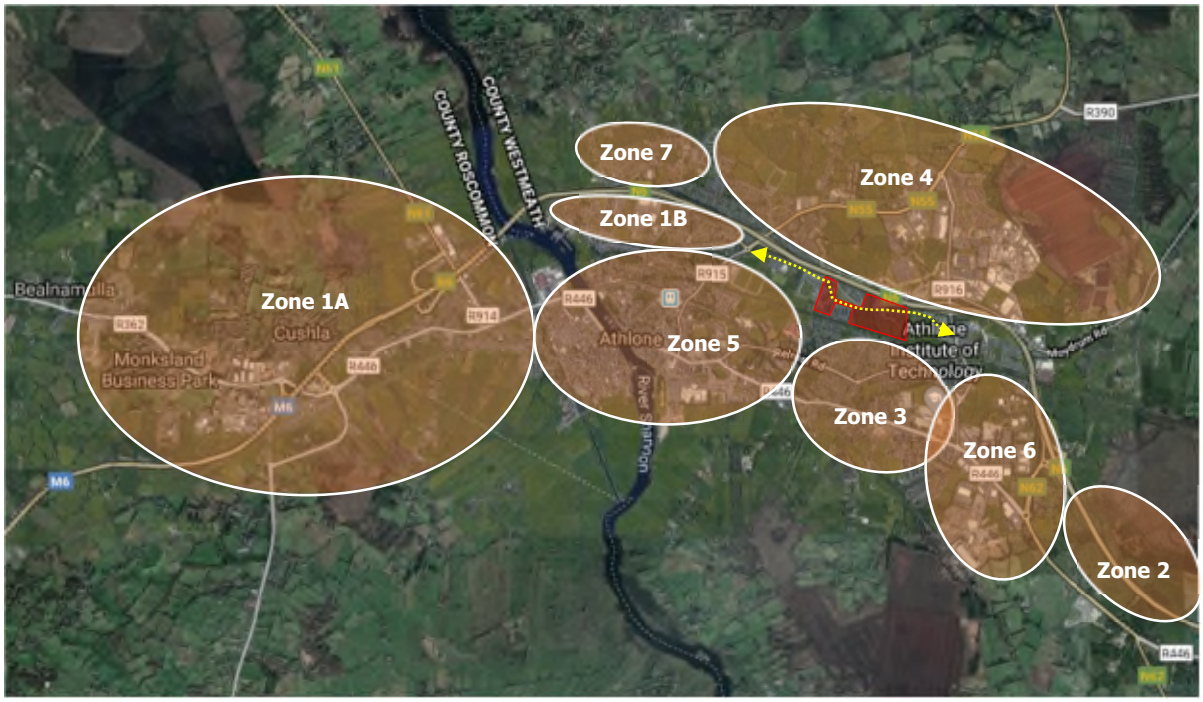


Figure 6.9: Origin / Destination Zones

Trip Redistribution

6.5.3 As introduced previously, the subject masterplan proposals accommodate the delivery of a link route (the proposed Lissywollen Avenue) between Ballymahon Road and the R916 corridors. For the purposes of this assessment, it has been assumed that this link route will be operational in the adopted 2021 Opening Year. Whilst the design of this new link route will incorporate significant traffic calming elements which will make this route less attractive for 'rat running', it is envisioned that a small proportion of existing base traffic will divert along this new link route once operational.

6.5.4 Accordingly, base network traffic flows have been redistributed to account for any potential vehicular trips that may travel along this new through route. As an example, the reassignment exercise adopted a 15% distribution of existing vehicle trips currently travelling to / from the Regional Sports Centre and Scoil Na gCeithre Máistrí will divert away from the R195 / Brawny Road roundabout junction and instead travel to / from these two destinations via the R196 /Moydrum Road roundabout junction.

6.5.5 **Figures 6a to 6c** within **Appendix A** present the adopted quantum of diverted vehicle trips.

6.6 TRAFFIC GROWTH

6.6.1 The TTA adopts an Opening Design Year of 2021. In accordance with TII (NRA) Guidance, Future Design years (+5 and +15 years) of 2026 and 2036 will therefore be adopted.

6.6.2 The TII Project Appraisal Guidelines (PAG) have been utilised to determine the most appropriate traffic growth forecast rates for the Athlone area. The traffic growth forecast rates within the PAG ensures local and regional variations and demographic patterns are accounted for.

6.6.3 Table 6.2 within the PAG provides Annual National Traffic Growth Factors for the different counties within Ireland. The subject site lies within 'Westmeath' with the corresponding TII growth factors outlined within **Table 6.6** below.

Name	Low Sensitivity Growth				Central Growth				High Sensitivity Growth			
	2016-2030		2030-2040		2016-2030		2030-2040		2016-2030		2030-2040	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
Westmeath	1.0145	1.0300	1.0042	1.0126	1.0161	1.0316	1.0062	1.0147	1.0194	1.0352	1.0101	1.0185

Table 6.6: National Traffic Growth Forecasts: Annual Growth Factors (Westmeath) (Extract from Table 6.2 PAG)

6.6.4 Applying the annual factors (medium growth) as outlined in **Table 6.6** above for the adopted Opening Year of 2021 and Future Horizon Years of 2026 (+5 years) and 2036 (+15 years), the following growth rates have been adopted to establish corresponding 2021, 2026 and 2036 baseline network flows: -

- 2019 to 2021 – 1.032 (or 3.2%);
- 2019 to 2026 – 1.118 (or 11.8%); and
- 2019 to 2036 – 1.225 (or 22.5%).

7.0 NETWORK IMPACT

7.1 ASSESSMENT SCOPE

7.1.1 Two different traffic scenarios have been assessed, namely (a) the 'Base' (Do-Nothing) traffic characteristics and (b) the 'Post Development' (Do-Something) traffic characteristics.

7.1.2 The 'Base' traffic scenario takes into account the potential level of traffic that could be generated by the 'committed development' in addition to the existing flows travelling across the network.

7.1.3 The proposed development traffic flows are then added to the network's 'Adjusted Base' (Base + Committed Development) traffic flows to establish the new 'Post Development' traffic flows.

7.1.4 As introduced previously, it is estimated that 100 no. of the proposed 285 house units (90 private and 10 social) could be constructed and occupied by the 2021 Opening year, with the remaining 185 houses, and 291 duplex / apartment units constructed by the 2026 Future Design Year. In summary the following scenarios are considered:-

Do Nothing:

- A1 – 2021 Base Flows + Committed Development;
- A2 – 2026 Base Flows + Committed Development; and
- A3 – 2036 Base Flows + Committed Development

Do Something:

- B1 - 2021 Do Nothing (A1) + Proposed Development Flows (100 houses);
- B2 - 2026 Do Nothing (A2) + Proposed Development Flows (Total Development);
- B3 - 2036 Do Nothing (A3) + Proposed Development Flows (Total Development).

Assessment Periods

7.1.5 The AM and PM peak hour flows have been identified as occurring between 08:30 – 09:30 and 17:00-18:00 respectively.

Infrastructure Scenarios

7.1.6 The above assessment scenarios consider the roll out / phasing of key infrastructure enhancements outlined previously in **Table 4.12** including mitigation works at two off-site junctions.

7.2 NETWORK IMPACT

7.2.1 The Institution of Highways and Transportation document 'Guidelines for Traffic Impact Assessments' states that the impact of a proposed development upon the local road network is considered material when the level of traffic it generates surpasses 10% and 5% on normal and congested networks respectively. When such levels of impact are generated a more detailed assessment should be undertaken to ascertain the specific impact upon the network's operational performance. These same thresholds are reproduced in the TII (NRA) document entitled Traffic and Transport Assessment Guidelines (2014).

7.2.2 In accordance with the IHT and TII guidelines we have undertaken an assessment to establish the potential level of impact upon the key junctions of the local road network. To enable this calculation to be undertaken we have based the analysis upon the 2021 Opening Year and the 2026 and 2036 Future Design Year scenarios. **Table 7.1** below details the specific scale of network impact predicted at each of the key local off-site junctions during the 2021, 2026 and 2036 design years.

7.2.3 The analysis has demonstrated that, with the exception of the R916 / Moydrum Road Roundabout, the proposals will generate a subthreshold impact upon all off-site junctions during the AM and PM peak hours in each of the three adopted design years. Furthermore, due to the redistribution effect of the proposed new 'link' road through the subject masterplan site, a reduced quantum of vehicle movements compared to existing conditions are observed at a number of junctions. Such observations are recorded during all or some of the design years including Junction 1 (N55 / N6 Eastbound On-ramp / N6 off-ramp junction), Junction 2 (N55 / N6 Westbound off-ramp junction), Junction 3 (Brawny Road / R915 / N55 / One Mile Round) and Junction 8 (R915 / The Crescent / Grace Park Road / Gleeson Street junction) as detailed in **Table 7.1**.

7.2.4 The AM and PM peak hour impact recorded at the R916 / Moydrum Road Roundabout are over the 5% threshold for congested networks with 8.59% and

8.81% respectfully in the 2036 Future Design Year. Accordingly, this junction has been subject to further detailed analysis as discussed within **Chapter 6** of this report. Junction 3 (N55 / Brawny Road / R915 / One Mile Road) has also been subject to further assessment due to its close proximity to the subject development even though the impact of the subject development has been established as being subthreshold.

Ref	Junction	Design Year	AM Peak Hour	PM Peak Hour
1	N55 / N6 Eastbound On-ramp / N6 off-ramp junction	2021	-0.53%	0.06%
		2026	0.83%	2.46%
		2036	0.67%	2.18%
2	N55 / N6 Westbound off-ramp junction	2021	-2.47%	-1.10%
		2026	-0.80%	1.88%
		2036	-0.99%	1.54%
3	Brawny Road / R915 / N55 / One Mile Round	2021	-2.08%	-0.79%
		2026	1.63%	4.09%
		2036	1.19%	3.53%
4	R916 / N6 Eastbound On-ramp / N6 off-ramp junction	2021	0.47%	0.56%
		2026	2.48%	2.77%
		2036	2.32%	2.57%
5	R916 / N6 Westbound On-ramp / N6 off-ramp junction	2021	1.85%	1.60%
		2026	6.18%	5.74%
		2036	5.88%	5.39%
6	R916 / Moydrum Road junction	2021	5.15%	4.37%
		2026	8.99%	9.33%
		2036	8.59%	8.81%
7	R446 / R916 Wash House Road junction	2021	0.88%	0.67%
		2026	1.41%	1.18%
		2036	1.33%	3.72%
8	R915 / The Crescent / Grace Park Road / Gleeson Street junction	2021	-0.43%	-0.17%
		2026	0.73%	1.30%
		2036	0.60%	1.14%
9	N55 / Coosan Road junction	2021	0.13%	0.15%
		2026	0.50%	0.62%
		2036	0.46%	0.57%
10	N55 / Cloghanboy Avenue	2021	0.14%	0.16%
		2026	0.56%	0.66%
		2036	0.51%	0.60%
11	R916 / Moydrum Road junction	2021	0.26%	0.34%
		2026	2.80%	2.60%
		2036	2.71%	2.49%

Table 7.1: Proposed Developments Network Impact

7.2.5 In **Table 7.2** (AM Peak Hour) and **Table 7.3** (PM Peak Hour) the predicted impacts have been categorised for the 2036 future design year.

7.2.6 During the AM peak hour, with the exception of Junctions 5 & 6, the subthreshold impacts range from ***Not Significant*** to ***Imperceptible***, whilst impacts at Junctions 5 & 6 are classified as ***Slight***.

7.2.7 Similar to the AM peak hour, during the PM peak hour, with the exception of Junctions 5 & 6, the subthreshold impacts again range from ***Not Significant*** to ***Imperceptible***, whilst impacts at Junctions 5 & 6 are classified as ***Slight***.

Junction		Impact Type	Impact Scale	Impact Significance
1	N55 / N6 Eastbound On-ramp / N6 off-ramp junction	Negative	0.67%	Imperceptible
2	N55 / N6 Westbound off-ramp junction	Positive	0.99%	Not Significant
3	Brawny Road / R915 / N55 / One Mile Round	Negative	1.19%	Not Significant
4	R916 / N6 Eastbound On-ramp / N6 off-ramp junction	Negative	2.32%	Not Significant
5	R916 / N6 Westbound On-ramp / N6 off-ramp junction	Negative	5.88%	Slight
6	R916 / Moydrum Road junction	Negative	8.59%	Slight
7	R446 / R916 Wash House Road junction	Negative	1.33%	Not Significant
8	R915 / The Crescent / Grace Park Road / Gleeson Street junction	Negative	0.60%	Imperceptible
9	N55 / Coosan Road junction	Negative	0.46%	Imperceptible
10	N55 / Cloghanboy Avenue	Negative	0.51%	Imperceptible
11	R916 / Moydrum Road junction	Negative	2.71%	Not Significant

Table 7.2: Network Impact Categorisation 2036 AM Peak Hour

Junction		Impact Type	Impact Scale	Impact Significance
1	N55 / N6 Eastbound On-ramp / N6 off-ramp junction	Negative	2.18%	Not Significant
2	N55 / N6 Westbound off-ramp junction	Negative	1.54%	Not Significant
3	Brawny Road / R915 / N55 / One Mile Round	Negative	3.53%	Not Significant
4	R916 / N6 Eastbound On-ramp / N6 off-ramp junction	Negative	2.57%	Not Significant
5	R916 / N6 Westbound On-ramp / N6 off-ramp junction	Negative	5.39%	Slight
6	R916 / Moydrum Road junction	Negative	8.81%	Slight
7	R446 / R916 Wash House Road junction	Negative	3.72%	Not Significant
8	R915 / The Crescent / Grace Park Road / Gleeson Street junction	Negative	1.14%	Not Significant
9	N55 / Coosan Road junction	Negative	0.57%	Imperceptible
10	N55 / Cloghanboy Avenue	Negative	0.60%	Imperceptible
11	R916 / Moydrum Road junction	Negative	2.49%	Not Significant

Table 7.3: Network Impact Categorisation 2036 PM Peak Hour

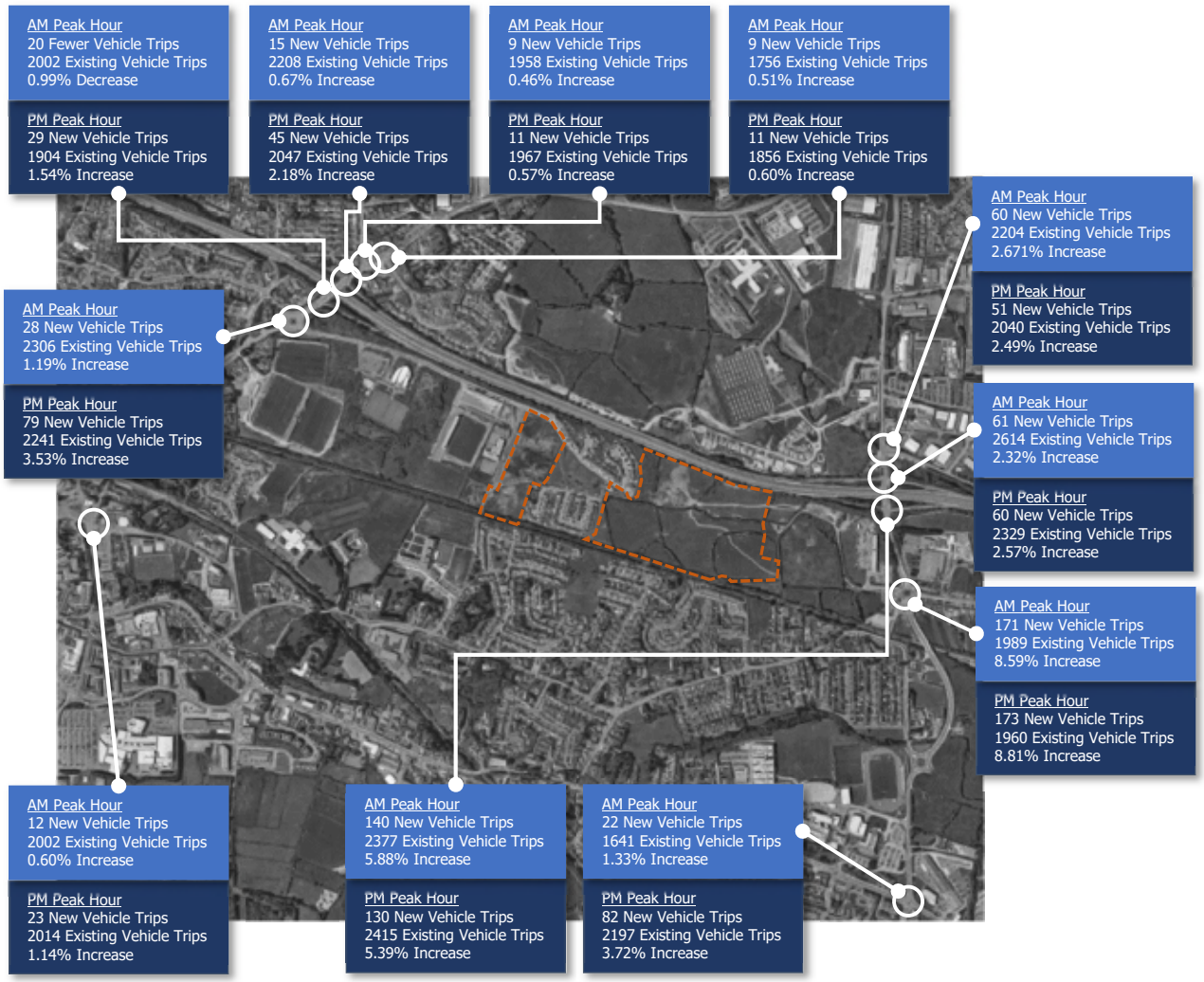


Figure 7.1: Increase in Vehicle Trips Generated Through Key Of-Site Junctions (2036)

7.3 MITIGATION STRATEGY

7.3.1 A package of integrated mitigation measures has been identified to off-set the additional local demand that the proposed residential development on the subject zoned lands could potentially generate as a result of the forecast increase in vehicle movements by residents of the scheme. The strategy includes specific measures for both the construction and operational stages of the proposed development.

Construction Stage

7.3.2 The Construction Management Plan (which is a standalone report and included in the planning documentation) and the associated section addressing Construction Traffic Management Plan (CTMP) in addition to the applications accompanying Construction and Waste Management Plan will incorporate a range of integrated control measures and associated management initiatives with the objective of mitigating the impact of the proposed developments on-site construction activities.

7.3.3 The CTMP will be prepared prior to the commencement of construction work on site. This plan will be prepared in consultation with Westmeath County Council and submitted for approval in order to agree on traffic management and monitoring measures (in advance of works commencing) some of which are outlined below:

- All works on site will be undertaken during hour of the day in accordance with Westmeath County Council requirements.
- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads.
- The surrounding road network will be signed to define the access and egress routes for the development including dedicated 'haul' routes to/from the development site.
- The traffic generated by the construction phase of the development will be strictly controlled in order to minimise the impact of this traffic on the surrounding road network and local properties. All HGV trips could potentially be restricted from traveling to / from the development during the local road networks peak hours.
- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.

- All employees and visitors' vehicle parking demands will be accommodated either on-site or at a predetermined off-site location. On-street parking of construction vehicles and construction personnel vehicles will be discouraged.
- A programme of street cleaning across the local street and identified 'haul' routes' will be implemented.
- A Construction Mobility Management Plan will be developed by the appointed contractor to encourage all construction personnel to utilise the vast range of sustainable travel options available when travelling to/from the subject Lissywollen site.

Operational Stage

7.3.4 With the objective of mitigating the potential impact of the proposed development as predicted in **Chapter 6** above during its operational stage, the following initiatives and associated timescale for their implementation have been identified and subsequently form an integral part of the subject development proposals.

- Management – A Mobility Management Plan (MMP) has been compiled and accompanies the application with the aim of guiding the delivery and management of coordinated initiatives by the scheme promotor. The MMP ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development.
- Infrastructure – The development proposals accommodate the extension of Brawny Road eastwards through the subject development lands as far as Blackberry Lane. The implementation of this 'link' will provide a new through route between the Brawny Road / R915 / N55 / One Mile Round roundabout and the R916 / Moydrum Road roundabout junction. This new road infrastructure will include minor junctions along the corridor providing access for all modes of travel to the different sections of the subject development in addition to local schools and the leisure centre resulting in a reduction in baseline traffic flows through the R915 / Brawny Road roundabout junction.
- Infrastructure – Mitigation works have been identified including upgrade works to the existing R915 / N55 / Brawny Road / One Mile Road roundabout geometry including;

i. Increase the length of the flare length on the R915 southern approach to the junction, and

ii. Introduce a flared approach on the Brawny Road arm of the junction.

- Infrastructure – Mitigation works have been identified including upgrade works to the existing R916 / Moydrum Road / Blackberry Lane roundabout geometry by introducing a flared approach on the Blackberry Lane arm in the short term as part of the subject scheme.
- Infrastructure – The implementation of a new segregated East-West cycle track along the Brawny Rd – Lissywollen Ave corridor between the external R915 and R916 roundabout junctions.
- Infrastructure – The implementation of a new segregated North-South cycle track and accommodation of future connection to the proposed (Curragh-Lisswollen LAP) N6 pedestrian / cycle overbridge (by others) thereby enhancing access and connectivity to zoned development plans located to the north of the strategic N6 corridor.
- Infrastructure – The integration of the proposed masterplans street network with the existing Old Rail Trail Greenway with numerous permeable connections provided for with the objective of maximising accessibility for walking and cycling journeys thereby making active modes of travel the most convenient and attractive choice for all local journeys.
- Facility – The incorporation of an appropriate number of high quality bicycle parking provision (Long terms and Short term) located conveniently to each dwelling.
- Facility / Service – The provision of two new bus stops internally within the masterplan proposals to accommodate the extension of the existing bus service into the heart of the masterplan development. The strategic location of these two interchanges will ensure that ever dwelling (proposed and existing) in Lissywollen South will be located within a maximum walking distance of only 250m of a bus stop.

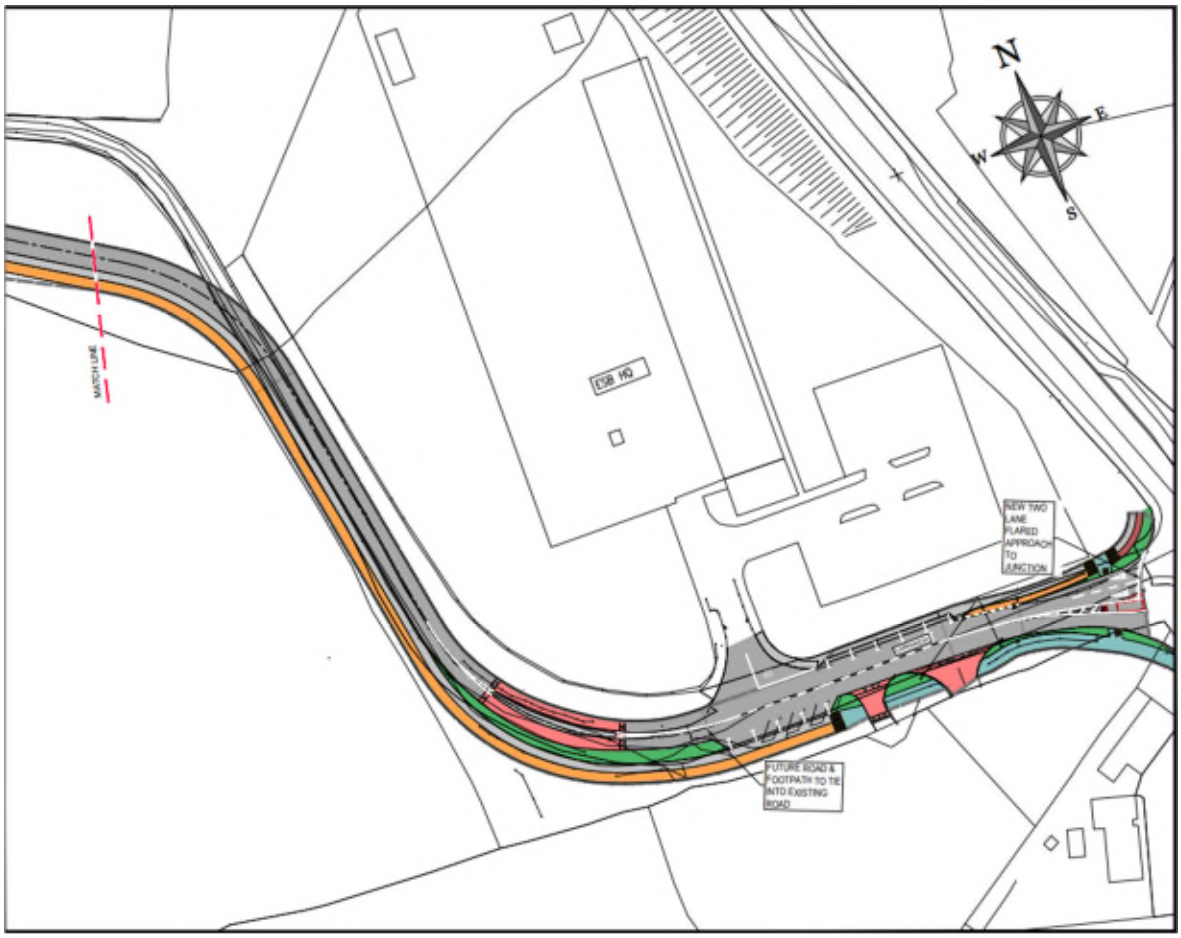


Figure 7.2: Proposed Mitigation works (Extract: DBFL Drawing No. 180176-DBFL-RD-SP-DR-C-1001)

8.0 NETWORK ANALYSIS

8.1 INTRODUCTION

8.1.1 The operational assessment of the local road network has been undertaken using the Transport Research Laboratory (TRL) computer package ARCADY (JUNCTIONS 9) for roundabout junctions.

8.1.2 When considering roundabout junctions, a Ratio of Flow to Capacity (RFC) of greater than 85% (0.85) would indicate a junction to be approaching capacity, as operation above this RFC value is poor and deteriorates quickly. A RFC value of 100% (1.00) or above would indicate a junction to be operating over capacity for some or all of the peak hour period.

8.1.3 For the ARCADY analysis a 90-minute AM period has been simulated; from 08:15 to 09:45 and 16:45 to 18:15. Traffic flows were entered using an Origin-Destination table for the peak hours.

8.1.4 In order to determine if the junctions will cater for the predicted level of traffic generation, a traffic simulation modal of the junctions listed below was analysed for the schemes 2021 opening year and subsequent 2026 and 2036 Future Design Years as per TII guidance. The following two junctions have been subject to further detailed assessment;

- Junction 3 : R915 / Brawny Road / N55 / One Mile Road Junction, and
- Junction 6 : R916 / Moydrum Road Junction

8.1.5 As introduced in **Section 4.6.4**, junction enhancement works at both of these two junctions are incorporated into the Do-Something scenarios.

8.1.6 As introduced previously, queue length surveys were commissioned with the objective of undertaking junction model calibration and validation exercises. Accordingly, in addition to the commissioned traffic surveys, queue lengths at the aforementioned Junctions 3 & 6 were also recorded. Vehicle queue lengths (recorded and modelled) have been adopted as the method of model calibration and validation, thereby ensuring the model's robustness for investigating each of the proposed development's "Do Something" scenarios with the objective of mitigating the impact of the development proposals at these two key junctions.

8.1.7 Both the AM and PM peak hour baseline 2019 models were revisited a number of times with geometric and capacity parameters adjusted and then the model re-

run. This exercise was repeated until such time that the simulation data correlated with the independent vehicle queue length surveys.

8.1.8 The extent of correlation between the simulated data and the vehicle queue lengths was evaluated for the AM and PM peak hour models. The peak hour period model predictions closely resemble the adjusted survey results with an accuracy of 100% being achieved at the four arms of both roundabout junctions.

8.2 R915 / BRAWNY ROAD / N55 / ONE MILE ROAD JUNCTION

8.2.1 The results of the operational assessment of this four-arm roundabout controlled junction during the weekday morning and evening peaks are summarised in **Tables 8.1** to **8.3** below. The mitigation works introduced previously in **Section 4.5.3** at this junction have been incorporated into the Do-Something scenario simulation models. The arms were labelled as follows within the ARCADY model:

Arm A: N55
Arm B: Brawny Road
Arm C: R915
Arm D: One Mile Road

2021 Opening Year

8.2.2 The 2021 Do-Nothing ARCADY results (**Table 8.1**) indicate that the junction will operate within capacity during the AM peak hour with a maximum Ratio of Flow to Capacity (RFC) value of 0.84 and a corresponding queue of 4.4 pcu's recorded on the R915 approach. Similarly, during the PM peak hour, the junction is again predicted to be operating within capacity with a maximum RFC value of 0.82 and a corresponding queue of 4.2 pcu's recorded on the R915 approach. A copy of the ARCADY results is provided in **Appendix C** of this report.

8.2.3 The Do-Something ARCADY results (**Table 8.1**) indicate that the junction will operate within capacity in the 2021 AM peak hour with a maximum Ratio of Flow to Capacity (RFC) value of 0.81 and a corresponding queue of 4.2 pcu's recorded on the N55 approach. Similarly, during the 2021 "Do Something" PM peak hour, the junction is again predicted to be operating within capacity with a maximum RFC value of 0.76 and a corresponding queue of 3.1 pcu's recorded on the R915 approach. The assessment reveals that, with the introduction of the proposed

mitigation works on the Brawny Road and R915 approaches to this roundabout, the roundabout is predicted to operate with increased reserve capacity compared to the Do-nothing scenario.

Scenario	Arm	AM Peak Hour		PM Peak Hour	
		RFC	Queue	RFC	Queue
Do Nothing	A	0.81	4.1	0.75	2.9
	B	0.76	3.0	0.73	2.5
	C	0.84	4.4	0.82	4.2
	D	0.62	1.6	0.72	2.4
Do Something	A	0.81	4.2	0.76	3.1
	B	0.24	0.3	0.16	0.2
	C	0.27	0.4	0.42	0.7
	D	0.62	1.6	0.73	2.4

Table 8.1: Junction 3 ARCADY Results: 2021 Opening Year

2026 Future Design Year

8.2.4 The 2026 "Do Nothing" ARCADY results (**Table 8.2**) indicate that the junction will operate within capacity during the AM peak hour with a maximum Ratio of Flow to Capacity (RFC) value of 0.94 and a corresponding queue of 8.6 pcu's recorded on the Brawny Road approach. Similarly, during the PM peak hour, the junction is again predicted to be operating within capacity with a maximum RFC value of 0.91 and a corresponding queue of 7.7 pcu's recorded on the R915 approach.

Scenario	Arm	AM Peak Hour		PM Peak Hour	
		RFC	Queue	RFC	Queue
Do Nothing	A	0.88	6.7	0.81	4.1
	B	0.94	8.5	0.84	4.2
	C	0.94	8.6	0.91	7.7
	D	0.69	1.6	0.80	3.4
Do Something	A	0.90	8.3	0.86	5.8
	B	0.31	0.4	0.22	0.3
	C	0.31	0.4	0.48	0.9
	D	0.70	2.2	0.82	3.7

Table 8.2: Junction 3 ARCADY Results: 2026 Future Design Year

8.2.5 The Do-Something ARCADY results (**Table 8.2**) indicate that the junction will operate within capacity in the 2026 AM peak hour with a maximum Ratio of Flow to Capacity (RFC) value of 0.90 and a corresponding queue of 8.3 pcu's recorded on the N55 approach. Similarly, during the 2026 "Do Something" PM peak hour, the junction is again predicted to be operating within capacity with a maximum

RFC value of 0.86 and a corresponding queue of 5.8 pcu's recorded on the N55 approach.

8.2.6 Similar to the 2021 assessment above, the 2026 assessment reveals that, with the introduction of the proposed mitigation works on the Brawny Road and R915 approaches to this roundabout, the roundabout is predicted to operate with increased reserve capacity compared to the Do-nothing scenario.

2036 Future Design Year

8.2.7 The 2036 "Do Nothing" ARCADY results (**Table 8.3**) indicate that the junction will operate slightly over capacity during the AM peak hour with a maximum Ratio of Flow to Capacity (RFC) value of 1.05 and a corresponding queue of 16.8 vehicles recorded on the Brawny Road approach. Similarly, during the PM peak hour, the junction is again predicted to be operating slightly over capacity with a maximum RFC value of 1.0 and a corresponding queue of 10.7 vehicles recorded on the Brawny Road approach.

Scenario	Arm	AM Peak Hour		PM Peak Hour	
		RFC	Queue	RFC	Queue
Do Nothing	A	0.97	17.1	0.89	7.5
	B	1.05	16.8	1.00	10.7
	C	1.04	19.2	1.03	22.5
	D	0.76	2.9	0.89	5.6
Do Something	A	0.99	24.4	0.95	12.8
	B	0.35	0.5	0.24	0.3
	C	0.35	0.5	0.55	1.2
	D	0.78	3.2	0.92	6.7

Table 8.3: Junction 3 ARCADY Results: 2036 Future Design Year

8.2.8 The Do-Something ARCADY results (**Table 8.3**) indicate that the junction will operate within capacity in the 2036 AM peak hour with a maximum Ratio of Flow to Capacity (RFC) value of 0.99 and a corresponding queue of 24.4 pcu's recorded on the N55 approach. Similarly, during the 2036 "Do Something" PM peak hour, the junction is again predicted to be operating within capacity with a maximum RFC value of 0.95 and a corresponding queue of 12.8 vehicles recorded on the N55 approach. Similar to the 2021 and 2026 assessments, the 2036 assessment reveals that, with the introduction of the proposed mitigation works on the Brawny Road and R915 approaches to this roundabout, the roundabout is predicted to operate with increased reserve capacity compared to the Do-nothing scenario.

8.3 R916 / MOYDRUM ROAD JUNCTION

8.3.1 The results of the operational assessment of this four-arm roundabout controlled junction during the weekday morning and evening peaks are summarised in **Tables 8.4** to **8.6** below. The mitigation works introduced previously in **Section 4.6.4** at this junction have been incorporated into the Do-Something scenario simulation models. The arms were labelled as follows within the ARCADY model:

- Arm A: R916 (N)
- Arm B: Moydrum Road
- Arm C: R916 (S)
- Arm D: Blackberry Lane

2021 Opening Year

8.3.2 The 2021 Do-Nothing ARCADY results (**Table 8.4**) indicate that the junction will operate over capacity during the AM peak hour with a maximum Ratio of Flow to Capacity (RFC) value of 1.41 and a corresponding queue of 39.3 pcu's recorded on the Blackberry Lane approach. Similarly, during the PM peak hour, the junction is again predicted to be operating over capacity with a maximum RFC value of 1.37 and a corresponding queue of 33.4 pcu's recorded on the Blackberry Lane approach.

Scenario	Arm	AM Peak Hour		PM Peak Hour	
		RFC	Queue	RFC	Queue
Do Nothing	A	0.85	5.3	0.75	3.0
	B	0.76	2.5	0.74	2.4
	C	0.80	3.7	0.67	2.0
	D	1.41	39.3	1.37	33.4
Do Something	A	0.87	5.9	0.77	3.3
	B	0.78	2.7	0.76	2.5
	C	0.80	3.9	0.67	2.0
	D	0.17	0.2	0.21	0.3

Table 8.4: Junction 6 ARCADY Results: 2021 Opening Year

8.3.3 The Do-Something ARCADY results (**Table 8.4**) indicate that the junction will operate within capacity in the 2021 AM peak hour with a maximum Ratio of Flow to Capacity (RFC) value of 0.87 and a corresponding queue of 5.9 pcu's recorded on the R916 (N) approach. Similarly, during the 2021 "Do Something" PM peak hour, the junction is again predicted to be operating within capacity with a maximum RFC value of 0.77 and a corresponding queue of 3.3 pcu's recorded on

the R916 (N) approach. The 2021 assessment reveals that, with the introduction of the proposed mitigation works on the Blackberry Lane approach to this roundabout, the roundabout is predicted to operate with increased reserve capacity compared to the Do-nothing scenario.

2026 Future Design Year

8.3.4 The 2026 Do-Nothing ARCADY results (**Table 8.5**) indicate that the junction will operate over capacity during the AM peak hour with a maximum Ratio of Flow to Capacity (RFC) value of 1.54 and a corresponding queue of 39.3 pcu's recorded on the Blackberry Lane approach. Similarly, during the PM peak hour, the junction is again predicted to be operating over capacity with a maximum RFC value of 1.52 and a corresponding queue of 48.2 pcu's recorded on the Blackberry Lane approach.

8.3.5 The Do-Something ARCADY results (**Table 8.5**) indicate that the junction will operate within capacity in the 2026 AM peak hour with a maximum Ratio of Flow to Capacity (RFC) value of 0.96 and a corresponding queue of 14.6 pcu's recorded on the R916 (N) approach. Similarly, during the 2026 "Do Something" PM peak hour, the junction is again predicted to be operating within capacity with a maximum RFC value of 0.89 and a corresponding queue of 6.8 pcu's recorded on the R916 (N) approach. The 2026 assessment reveals that, with the introduction of the proposed mitigation works on the Blackberry Lane approach to this roundabout, the roundabout is predicted to operate more efficiently compared to the Do-nothing scenario.

Scenario	Arm	AM Peak Hour		PM Peak Hour	
		RFC	Queue	RFC	Queue
Do Nothing	A	0.92	5.3	0.81	4.1
	B	0.87	2.5	0.83	3.3
	C	0.87	3.7	0.72	2.6
	D	1.54	39.3	1.52	48.2
Do Something	A	0.96	14.6	0.89	6.8
	B	0.92	4.9	0.88	4.2
	C	0.89	6.9	0.76	3.1
	D	0.22	0.3	0.27	0.4

Table 8.5: Junction 6 ARCADY Results: 2026 Future Design Year

2036 Future Design Year

8.3.6 The 2036 Do-Nothing ARCADY results (**Table 8.6**) indicate that the junction will operate over capacity during the AM peak hour with a maximum Ratio of Flow to

Capacity (RFC) value of 1.70 and a corresponding queue of 69.8 pcu's recorded on the Blackberry Lane approach. Similarly, during the PM peak hour, the junction is again predicted to be operating over capacity with a maximum RFC value of 1.52 and a corresponding queue of 68 pcu's recorded on the Blackberry Lane approach.

8.3.7 The Do-Something ARCADY results (**Table 8.6**) indicate that the junction will operate at capacity in the 2036 AM peak hour with a maximum Ratio of Flow to Capacity (RFC) value of 1.05 and a corresponding queue of 43.4 pcu's recorded on the R916 (N) approach. Similarly, during the 2036 "Do Something" PM peak hour, the junction is again predicted to be operating at capacity with a maximum RFC value of 1.00 and a maximum queue of 6.8 pcu's recorded. The 2036 assessment reveals that, with the introduction of the proposed mitigation works on the Blackberry Lane approach to this roundabout, the roundabout is predicted to operate more efficiently compared to the Do-nothing scenario.

Scenario	Arm	AM Peak Hour		PM Peak Hour	
		RFC	Queue	RFC	Queue
Do Nothing	A	1.01	25.9	0.89	7.0
	B	1.00	7.1	0.83	5.3
	C	0.95	11.9	0.72	3.7
	D	1.70	69.8	1.52	68.0
Do Something	A	1.05	43.4	0.97	14.7
	B	1.04	8.3	1.00	6.8
	C	0.97	14.8	0.83	4.6
	D	0.24	0.3	0.30	0.4

Table 8.6: Junction 6 ARCADY Results: 2036 Future Design Year

8.4 INTERNAL JUNCTIONS

8.4.1 A total of 15 no. new internal junctions (**Figure 8.1**) are proposed along the east-west 'link' road providing access to the various residential 'local' streets of the masterplan development. All junctions are proposed to take the form of 'simple' three arm priority-controlled layout except junction C which will take form of a three arm roundabout junction.

8.4.2 In order to assess the appropriateness of the proposed priority-controlled internal junctions, the internal junction predicted to have the highest traffic movements travelling through it (Junction N) during the AM and PM peak hours has been assessed based on the worst case 2036 Future Design Year network flows. The results of the analysis will ascertain if the proposed junction arrangement is

appropriate (in terms of capacity) for the predicted future vehicle flows passing through it (inclusive of the predicted subject development vehicle flows plus committed development flows).

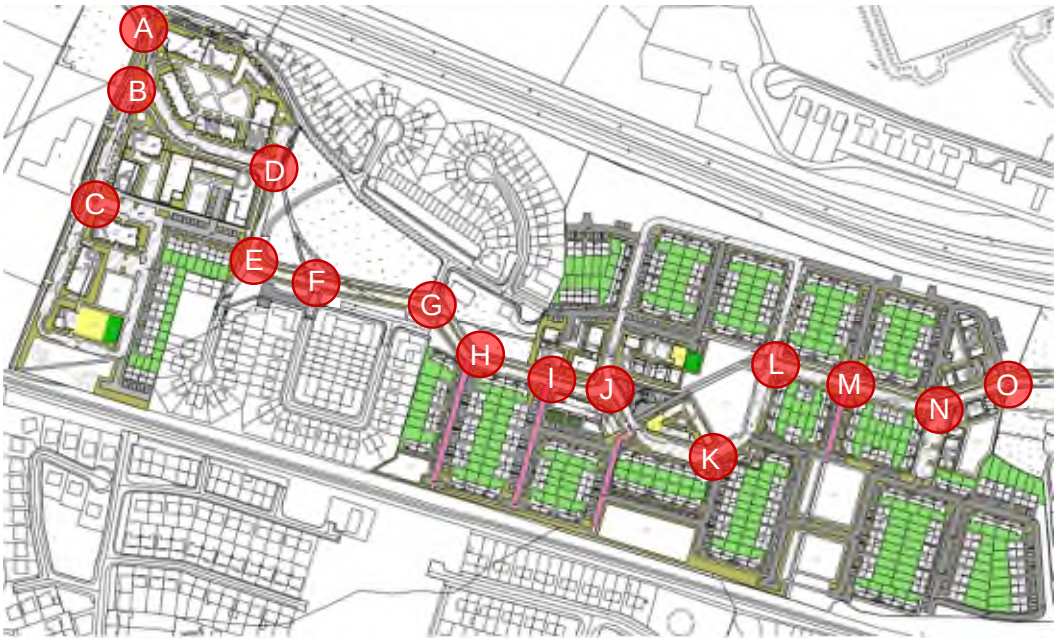


Figure 8.1: Masterplans Internal Junctions Location

8.4.3 In reference to **Figure 8.2** below (extract of Diagram 8.1 from the Traffic Management Guidelines), it is possible to establish that, for the 2036 Future Design Year, a simple priority-controlled junction is more than acceptable (significant reserve capacity available) to serve the predicted levels of traffic movements travelling through this off-site junction. Accordingly, it can be concluded that all 15 internal junctions along the east-west spine road will operate well within capacity in the 2036 Future Design Year.

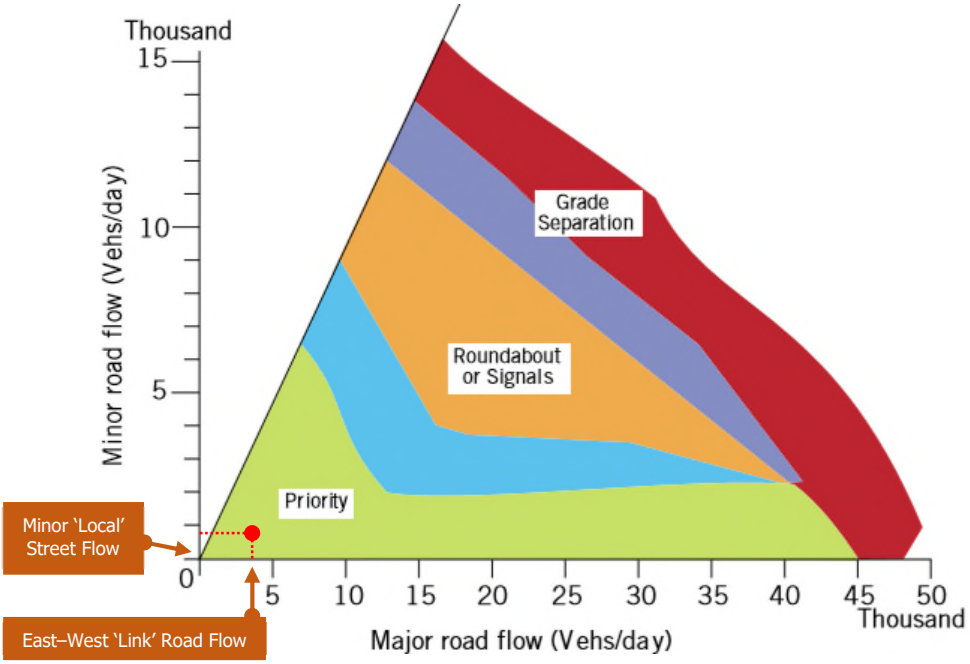


Figure 8.2: Identification of Junction Type

(Extract from Figure 8.1 of the Traffic Management Guidelines)

8.5 NETWORK ANALYSIS CONCLUSIONS

External Roundabout Junctions

8.5.1 The network analysis summarised in this chapter reveals that, with the introduction of the proposed mitigation / enhancement works to both the N55 / Brawny Road / R915 / One Mile Road and R916 / Moyburn Road / Blackberry Lane roundabouts, the operational performance in the Do-Something scenario improves slightly at both junctions when compared to the corresponding results in the Do-Nothing scenario. Even with the introduction of the additional masterplan development traffic, maximum RFC values and queue lengths are predicted to reduce as a result of the introduction of the identified mitigation works at both of these key off-site junctions.

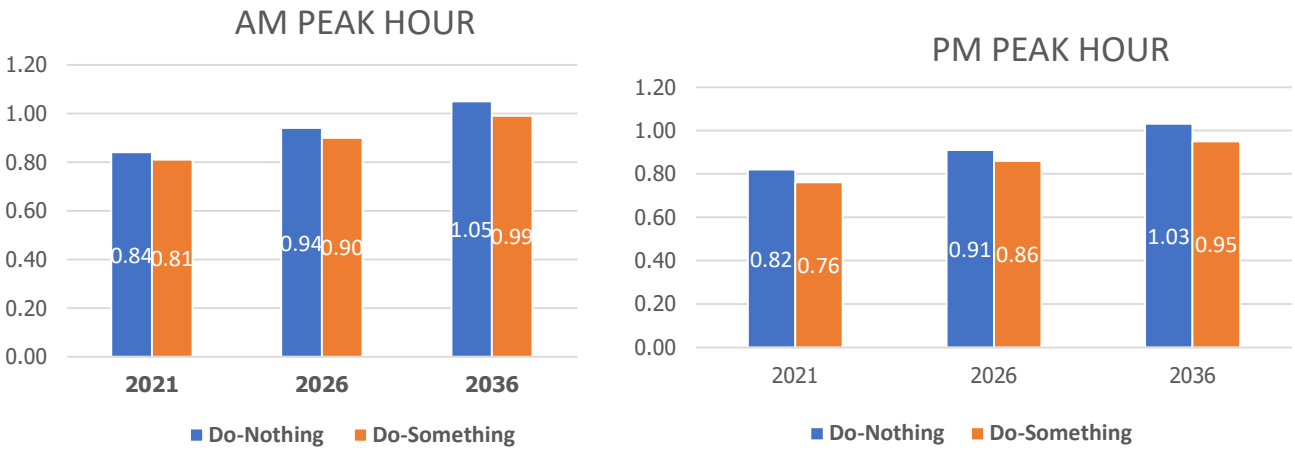


Figure 8.3: Junction 3 Do-Nothing & Do-Something Maximum RFC Values

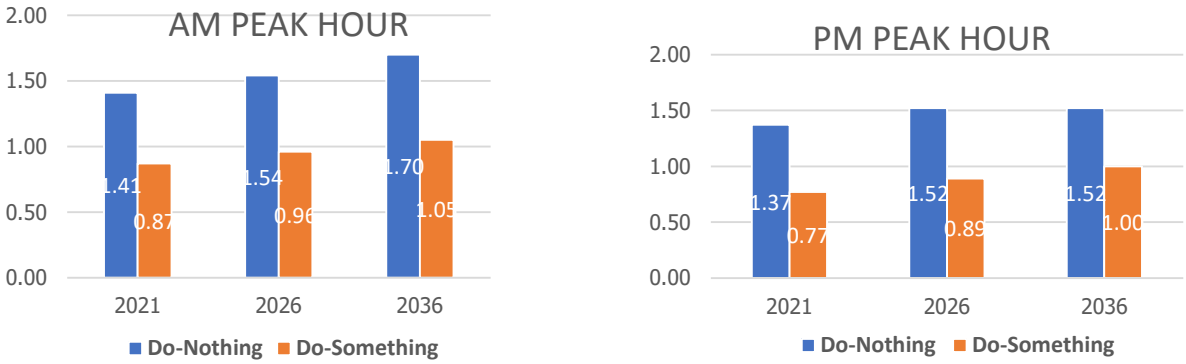


Figure 8.4: Junction 6 Do-Nothing & Do-Something Maximum RFC Recorded Values

Internal 'Link' Road Priority Junctions

8.5.2 The analysis reveals that all 15 of the internal priority-controlled junctions located along the masterplans main east-west 'link' road will continue to operate well within capacity in the adopted 2036 future design year.

8.6 POTENTIAL FUTURE ENHANCEMENT WORKS BY OTHERS

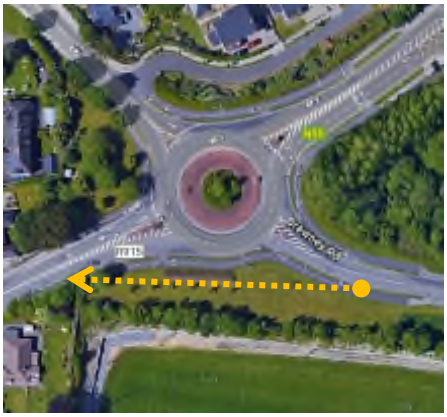
External R915 and R916 Roundabouts

8.6.1 The results of the junction assessments summarised above reveals that, with the implementation of the proposed mitigation works at Junction 3 and Junction 6, the operational performance of these two key junctions is predicted to improve slightly.

8.6.2 Nevertheless, should the need arise in the long term, additional mitigation measures could be implemented (by others) should the need arise in the future. Such medium / long term mitigation measures (as need requires) could include;

- R915 / N55 / Brawny Rd junction – The implementation of a left turn slip lane to facilitate vehicles traveling from the N55 into Brawny Rd and thereby reduce queue lengths on the N55 approach to the junction. This could be facilitated in parallel with the development of the adjoining zoned commercial lands to the east or by the local authority (may necessitate the CPO of lands).

- R915 / N55 / Brawny Rd Junction – The potential also exists to provide a left turn slip lane to enhance vehicle accessibility for vehicles exiting from Brawny Rd and seeking to travel south-westwards towards the town centre via Ballymahon Rd should the need arise in the future.



- R916 / Moyburn Rd / Blackberry Junction – In parallel with the mitigation works already proposed at this key junction the potential remains to implement of a left turn slip lane on the Blackberry Lane approach to the R916 / Moyburn Rd / Blackberry Lane roundabout junction. This additional intervention is likely to require the CPO of a small parcel of ESB lands as located to the northwest of this roundabout.

- R916 / Moyburn Rd / Blackberry Junction – In the future as and when the need requires this existing roundabout junction could be converted to a signal controlled arrangement.

8.6.3 The implementation of the subject residential development and associated mitigation strategy (which incorporates upgrades to the aforementioned roundabouts) do not impede or restrict the ability to undertake the above enhancement works as and when required in the future.

Athlone Town Centre

8.6.4 As outlined earlier in Section 6.2 the proposed development has the potential to give rise to a small increase in vehicle movements travelling to/from the Town Centre. This is evident in reference to the predicted changes in baseline vehicle volumes (Figure 6.2) at Junction 8 (R915 Ballymahon Rd / The Crescent / Grace Pk Rd / Gleeson St Junction) with an impact of 0.56% and 1.0% being predicted in the AM and PM peak hour periods.

8.6.5 Notwithstanding the fact that the scale of the recorded peak hour impact at Junction 8 is subthreshold DBFL have been made aware that Westmeath County Council are in the process of compiling tender documentation with the aim of commissioning (by the end Q4 2019) engineering / planning consultants to undertake a Town Centre Traffic Management Study. This study focusing upon the core town centre (including Junction 8 amongst others) is tasked with identifying a sustainable mobility strategy including the active management of vehicle movements across the town centre for a number of future design year scenarios. The deliverables of the study will include the identification of new infrastructure and traffic management interventions to enhance accessibility for all road users.

Strategic N6 Junctions

8.6.6 Since 1991 the existing N6 corridor has provided a vital bypass for Athlone town and its environs removing strategic traffic from the sensitive urban centre. Nevertheless, the existing dual carriageway infrastructure also acts as a barrier to the ease of movement between the urban areas located to the north and south of its alignment in Athlone and its environs.

8.6.7 Accordingly the existing N6 grade separated junctions that serve Athlone, including Junctions 8, 9, 10 and 11 (as located to the east of the River Shannon) all currently accommodate strategic in addition to regional / local traffic movements as these junctions are the only opportunity for regional / local traffic have to 'bridge' the N6 barrier and travel between the urban areas to the north and south of its alignment.

8.6.8 In response to increasing traffic demands the N6 bypass benefited from infrastructure improvements implemented in 2011. These works included capacity upgrades to J9 (Garrycastle) and J10 (Ballymahon) in the form of the introduction of traffic signals, additional traffic lanes and new pedestrian / cycle infrastructure.

8.6.9 The assessment of the subject masterplan development has established that the residential proposals are predicted to generate the following impacts (Ref. Figure 6.2) at these two local N6 interchanges;

- J9 (Garrycastle) between 5.88% and 5.39% in the AM and PM peak hours.
- J10 (Ballymahon) between 1.19% and 3.53% in the AM and PM peak hours.

8.6.10 This predicted scale of impact upon J9 and J10 of the N6 corridor is not expected to result is a significant deterioration of either junctions overall operational performance in the short to medium term. Nevertheless, considering the scale of zoned development lands to the north of the N6 corridor across the Cornamagh, Cornamaddy and Curragh Lissywollen areas it is likely that these two junctions will require further enhancement works to accommodate the additional travel demands generated by the large scale development of these lands in the future (subject to planning permission). Subject to more detailed assessments such junction enhances may take the form of one or more of the following;

<u>Junction 9 N6 (Garrycastle)</u>

a) Southern Junction - Extend the length of the existing northbound R916 flared approach to the southern signal-controlled junction.
b) Southern Junction - Introduce a left turn slip lane between the northbound approach and the N6 westbound on-ramp.
c) N6 Overbridge - Implement a parallel ped/cycle bridge along the western side of the N6 overbridge (similar to what has already been done on the eastern side of the bridge) with the objective of introducing an additional general traffic lane on the existing road bridge structure.
d) Northern Junction – On the southbound approach introduce a new dedicated left turn flare for vehicle drivers seeking to gain access to the N6 eastbound on-ramp.
e) Northern Junction – In parallel with intervention (d) above introduce a segregated left turn slip lane between the southbound approach and the N6 eastbound on-ramp.

f) Northern Junction – In parallel with intervention (c) above introduce (i) a third northbound lane (ahead only) between J9's northern signal-controlled junction and the Moydrum Rd Junction, (ii) two ahead lanes on the southern approach to the R916 / Moydrum Rd Junction and (iii) a two into one lane merge facility on the R915 northbound exit of the R916 / Moydrum Rd Junction.

Junction 10 N6 (Ballymahon)

a) N6 Overbridge - Implement a parallel ped/cycle bridge along the western side of the N6 overbridge (similar to what has already been done at along the eastern side of J9) with the objective of introducing an additional general traffic lane on the existing road bridge structure.
b) In parallel with intervention (a) above introduce a second northbound lane (left turn only) between J10's northern signal-controlled junction and the N55 / Coosan Rd Junction.
c) As previously introduced in section 7.6.2 the introduction of a left turn slip lane to facilitate vehicles traveling from the N55 into Brawny Rd (at the R915 / N55 / Brawny Rd roundabout junction) would ensure that delays exiting (southbound across the overbridge) the northern signal controlled junction of J10 is minimised.

8.6.11 It is noted that the subject Lissywollen South residential development does not in any way curtail or limit the opportunity for any of the above long term junction enhancement works to J9 and J10 on the N6 to be implemented.

8.6.12 Notwithstanding the potential to implement some or all of the above enhancements to the existing J9 and J10 junctions on the N6 (in parallel with the roll out of future development across the Cornamagh, Cornamaddy and Curragh Lissywollen areas) a further potential opportunity (albeit in the longer term) may prove to be (subject to further environmental, engineering and economic assessments) the potential long term delivery a new N55 eastern bypass

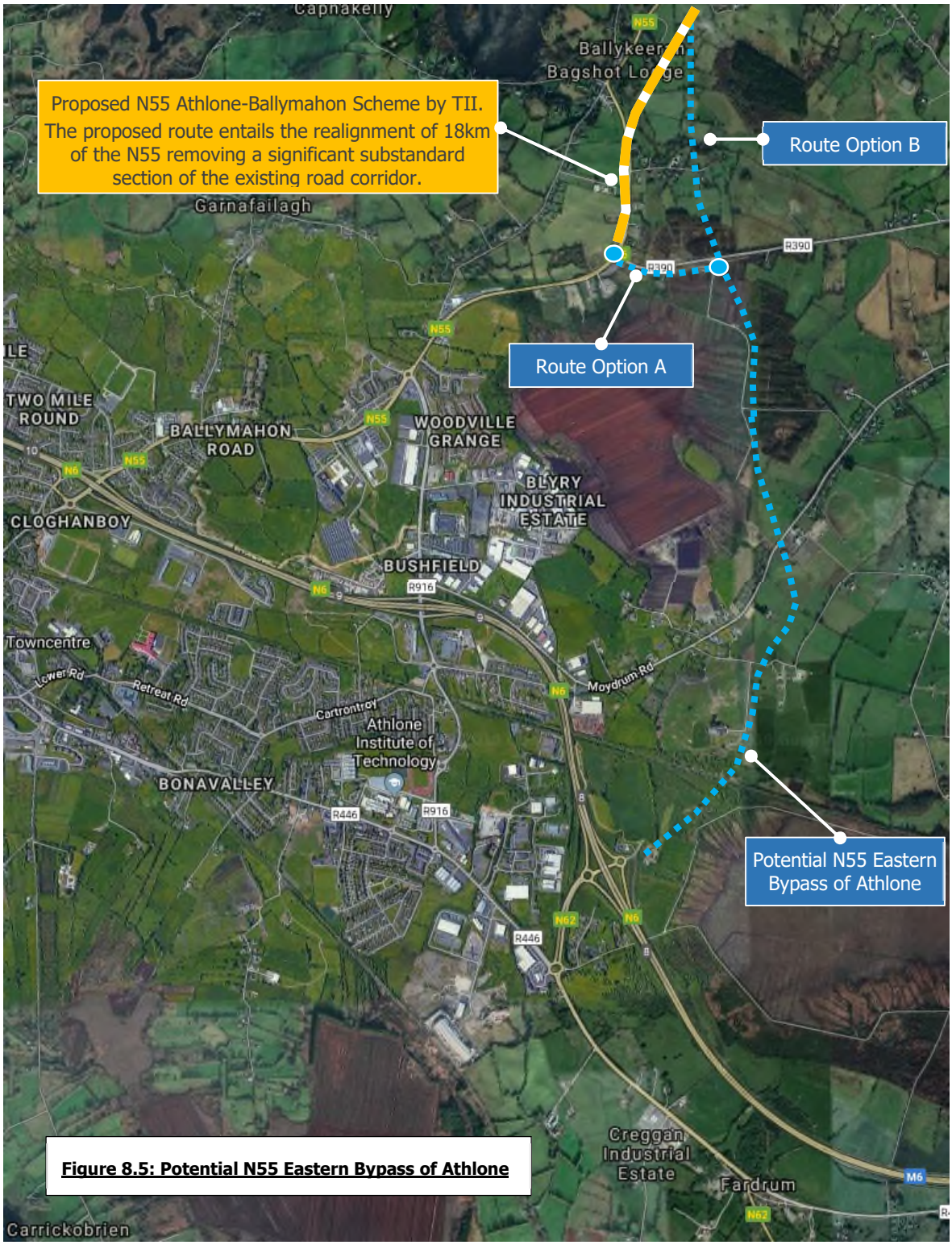


Figure 8.5: Potential N55 Eastern Bypass of Athlone

8.6.13 Whilst no desk top exploratory works have to date been undertaken in regard to investigating the opportunities offered and constraints influencing the potential delivery of the N55 Eastern Bypass concept indicatively illustrated in **Figure 8.5** above, the implementation of this potential road connection in the long term (via the Creggan LAP lands) has the potential for;

- the existing N55 corridor through the Athlone northern environs (e.g. Ballymahon Rd corridor) to be reclassified to a regional route,
- reduce the volume of traffic movements through the existing J9 and J10 of the N6,
- provide the opportunity to reassign urban road space to more sustainable modes of travel,
- reduce air and noise pollution levels along the sensitive urban section of the Ballymahon Rd corridor,
- addresses permeability constraints of the existing Garrankesh and Blyry areas (Zoned Enterprise & Employment) of Athlone north-eastern environs,
- deliver journey time savings for vehicles traveling along the strategic road network particularly north-south along the N55 - N62 corridors, and
- maximise the use of the existing strategic J8 N6 which is currently very much underutilised.

9.0 RESPONSE TO AUTHORITIES COMMENTS

9.1 OVERVIEW

9.1.1 This section provides responses to the items raised by An Bord Pleanala and Westmeath County Council for this application and is put forward in response to the requests made in An Bord Pleanála's Notice of Pre-Application Consultation Opinion. The items raised are discussed in detail in the following sections.

9.2 ABP RECOMMENDATIONS AND DBFL RESPONSES

Site Layout Plan

"1. (a) Site layout plan and design of the east-west link road/Lissywollen Avenue. This should be designed as a street and not as a distributor road, with an active and strong urban edge, and further consideration should be given across the development to achieving an appropriate level of enclosure of streets and open spaces (proposed and existing) through the built form, in addition to landscaping. This may involve a realignment of the east-west route, re-examination of the location and scale of the proposed central public open space, and re-examination of the layout of the building blocks relative to streets and open spaces."

DBFL Response

9.2.1 Reference is made to **DBFL Drawing No. 180176-DBFL-RD-SP-C-1001** which presents the proposed east-west link road. The adopted design approach has been formulated to respect the principles and guidance outlined within the Design Manual for Urban Roads and Streets (DMURS) 2013 (updated May 2019) and incorporates traditional road design along with elements of urban design and landscaping to create lower traffic speeds and thereby facilitate a safer road environment for pedestrians and cyclists.

9.2.2 The proposed east-west link road has also been designed with due cognisance to the objectives of the Lissywollen South Framework Plan 2018-2024, and pre-application consultations held with both the local planning authority and existing local residents at Brawny estate.

9.2.3 The proposed east-west link road incorporates a number of mitigation and design measures to ensure that the route will not act as a distributor road. The redesigned roads layout is illustrated in DBFL drawings 180176-DBFL-RD-SP-DR-C-1000 and

180176-DBFL-RD-SP-DR-C-1001 with further details. Regarding built form, landscaping etc. further details can be found in the other associated documents submitted with the planning application, including the Architectural Design Statement & Planning Report prepared by Delphi Design, the DMURS Compliance Statement prepared by DBFL, and the Landscape Design Rationale prepared by Ronan MacDairmada & Associates.

9.2.4 In compliance with DMURS, the parking spaces along 'Lissywollen Avenue' are parallel to the vehicular carriageway. There are no on street perpendicular to perpendicular parking except for in private parking courtyards. The design of the number of parking spaces per bay has been limited to three parallel spaces and six perpendicular spaces, as per DMURS recommendations.

9.2.5 The parking design for houses is a combination of in-curtilage and on-street where appropriate. The parking for apartments/duplexes has been reduced in accordance with the apartment guidelines to ensure that the layout is not car dominant.

9.2.6 As previously mentioned in Section 5.1.10, the subject scheme proposals include 2 no. dedicated car club spaces located in Sector 1A which will be managed by a specialised private operator (i.e. *GoCar*). All residents will have the option to become members of this car share service.

Car Parking Strategy

"1. (b) Car Parking Strategy, which should be re-examined in accordance with DMURS, with a focus on a layout which is not car dominant and which considers the level of in-curtilage parking across the site, including the potential for additional communal parking options such as positioning of car parking behind the building line and in carefully designed courtyards, as well as in communal areas along the street."

DBFL Response

9.2.7 The street layout of the proposed development has been influenced by several factors including the Athlone Town Development Plan 2014-2020, boundary conditions, future and existing development, watercourses and hedgerows. The resulting street pattern is predominantly a grid pattern with some minor curvilinear sections, creating attractive legible streetscapes. The street layout was derived from several factors which include, the distinct shape of the site, boundary

conditions and travel desire lines. This has led to the creation of a street network that comprises elements of an orthogonal and organic layout in specific areas but with through access maintained for walking and cycling throughout, thereby maximising connections within the site and complying with DMURS principles. Further details can be found in the DMURS Compliance Statement (180176-DBFL-XX-XX-RP-Z-1004) which accompanies the planning application.

Pedestrians & Cyclists

"1. (c) Pedestrian and Cyclist Movement across the site, specifically north south across the proposed east-west Lissywollen Avenue."

DBFL Response

9.2.8 The development proposes 5 no. new formal cycle / pedestrian access points between the masterplan lands and the Old Rail Trail Greenway to the south of the development site subsequently ensuring excellent cycle / pedestrian accessibility.

9.2.9 The subject site will be highly accessible to pedestrians and cyclists. Pedestrians and cyclists will be given priority within the internal site layout to ensure travel desire lines within the site are accommodated providing a good level of service and ensures the risk of vehicle/pedestrian conflict is minimised.

9.2.10 Dedicated pedestrian / cycle paths are proposed throughout the site layout providing a traffic free route between the different sections of the development site. Furthermore, pedestrian facilities are proposed on two sides and two-way cycle facilities on one side of the extended Brawny Road corridor.

9.2.11 A total of six controlled crossing facilities (Zebra) are proposed along the new east-west 'Avenue' street each located on key pedestrian / cycle travel desire routes. These formal facilities, supplemented by courtesy crossings, will provide a high degree of permeability with safe crossing points integrating the residential areas located to the north and south of the new "Avenue' street.

Car Parking Strategy

"2. A detailed Car Parking Strategy identifying parking provision and allocation for apartments and houses."

DBFL Response

9.2.12 A Car Parking Strategy has been identified for the proposed residential development and is discussed in detail in **Chapter 5** of this report. The proposed development layout design provides a total of 752 no. car parking spaces, including 34 no. basement car parking spaces at Block L.

Pedestrian and Cyclist Strategy

"3. Pedestrian and Cyclist Strategy, which considers north-south as well as east-west movements and re-consideration of the location of the cycle lane relative to the school site."

DBFL Response

9.2.13 The pedestrian and cyclist strategy considering north south movements as well as east-west movements have been addressed above in paragraphs 9.2.3 - 9.2.6.

9.2.14 The location of the cycle lane relative to the school site is detailed in **DBFL Drawing No. 180176-DBFL-RD-SP-DR-C-1001.**

Cycle Parking

"4. Cycle Parking Strategy to be submitted and considered in accordance with national guidance."

DBFL Response

9.2.15 The subject scheme proposals include for a total of 1613 no. cycle parking spaces (comprising a mix of Sheffield and single / double stacked Cardiff Stands) comprising 1585 residential and 28 creche cycle parking spaces. The 1585 no. residential cycle parking spaces comprise 1271 no. long term secured / sheltered spaces and 314 short term parking spaces.

9.2.16 The proposed cycle parking spaces are conveniently located in close proximity to Block access locations and are well within the recommended distances of 25m for short stay cycle parking spaces and 50m for long stay cycle parking spaces.

9.2.17 Details of the proposed cycle parking strategy can be found in Section 5.3 of this TTA and also reference to **DBFL Drawing No. 180176-DBFL-TR-SP-DR-C-1001** and **DBFL Drawing No. 180176-DBFL-TR-SP-DR-C-1002.**

Mobility Management Plan

"13. Mobility Management Plan"

DBFL Response

9.2.18 A Mobility Management Plan for the residential development has been addressed in a separate document (180176-DBFL-XX-XX-RP-Z-1003) submitted with this application.

Electric Vehicles

"18. Consideration to be given to e-car infrastructure."

DBFL Response

9.2.19 This has been addressed in Section 5.1 of this report. There are currently no standards in the Athlone Town Development Plan 2014-2020 regarding e-car infrastructure. Nonetheless we have included 30 no. spaces within the proposals which are dedicated to electric vehicles.

Detailed Phasing Plan

"20. A detailed phasing plan, including proposals in relation to the east-west Lissywollen Avenue and upgrades to the existing roundabouts at both access points, in addition to the associated bicycle and pedestrian infrastructure."

DBFL Response

9.2.20 Reference is made to **DBFL Drawing No. 180176-DBFL-RD-SP-DR-C-1001.**

9.2.21 The subject scheme is proposed to be constructed over four phases commencing from the east of the site and developing the subject lands westwards as illustrated in **Figure 9.1**.

Figure 9.1: Proposed Masterplan Phasing

9.2.22 Incorporating typical construction rates, for the purposes of the subject assessment, it has been assumed that 100 no. of the Phase 1 residential houses will be complete and occupied by the end of the adopted 2021 Opening Year and the full development will be complete before the end of the adopted 2026 Future Design Year.

Phase	Total Residential Units Per Phase
1	Delivery of the proposed east-west access route
2	**222** (119 1A + 103 1B)
3	**142** (36 2A + 36 2B)
4	**212** (146 3A + 66 3B)
Total Units	**576**

Table 9.1: Proposed Residential Development Phasing Strategy

9.3 WCC COMMENTS AND DBFL RESPONSES

Site Layout Plan

"1. (a) Site layout plan and design of the east-west link road/Lissywollen Avenue. This should be designed as a street and not as a distributor road, with an active and strong urban edge, and further consideration should be given across the development to achieving an appropriate level of enclosure of streets and open spaces (proposed and existing) through the built form, in addition to landscaping. This may involve a realignment of the east-west route, re-examination of the location and scale of the proposed central public open space, and re-examination of the layout of the building blocks relative to streets and open spaces."

DBFL Response

9.3.1 This has been addressed in Section 9.2.1 above.

Car Parking

"1. (b) Car Parking Strategy, which should be re-examined in accordance with DMURS, with a focus on a layout which is not car dominant and which considers the level of in-curtilage parking across the site, including the potential for additional communal parking options such as positioning of car parking behind the building line and in carefully designed courtyards, as well as in communal areas along the street."

DBFL Response

9.3.2 This has been addressed in Section 9.2.2 above.

Pedestrians & Cyclists

"1. (c) Pedestrian and Cyclist Movement across the site, specifically north south across the proposed east-west Lissywollen Avenue."

DBFL Response

9.3.3 This has been addressed in Section 9.2.3 above.

10.0 SUMMARY AND CONCLUSION

10.1 OVERVIEW

10.1.1 DBFL Consulting Engineers (DBFL) have been commissioned to prepare a Traffic and Transport Assessment (TTA) for a Strategic Housing Development located at Lissywollen South, Athlone. The proposed 576 no. residential units comprise 291 no apartment / duplex units and 285 no. housing units, 2 no. creche (321m^2 and 448m^2 GFA) and a community hub (101m^2 GFA).

10.1.2 The development masterplan incorporates the extension of Brawny Road eastwards (LIHAF scheme) through the subject development lands and ultimately connects with Blackberry Lane (to the east) and onwards to the R916 corridor. The implementation of this 'link' street will provide a new vehicle link route (Lissywollen Avenue) between the existing Brawny Road / R915 / N55 / One Mile Round roundabout (to the west) and the R916 / Moydrum Road roundabout junction (to the east). This new 'link' street incorporates a number of minor junctions which provide access for all modes of travel to the different residential areas of the proposed masterplan and the existing residential developments.

10.1.3 The purpose of this TTA is to quantify the existing transport environment and to detail the results of assessment work undertaken to identify the potential level of transport impact generated as a result of the proposed residential development. Our methodology incorporated a number of key inter-related stages, including;

- Site Audit,
- Planning Framework Review,
- Transportation Policy Review,
- Commissioning and Analysis of Traffic Surveys,
- Trip Generation, Distribution and Assignment, and Network Impact
- Details Network Analysis utilising standard industry simulation software.

10.1.4 As per best practice guidance this TTA has carried out a range of network assessments investigating different traffic conditions for an Opening Year of 2021, and Future Design Year assessments of 2026 and 2036.

10.1.5 In reference to Table 4.6 (Chapter 4) the TTA has been undertaken in the context that both (i) the new 'link' street (Lissywollen Ave) is delivered in full by the end of 2021, and (ii) the mitigation works at the external R915 and R916 roundabout

junctions are completed by the end of 2021 in parallel with the occupation of the first 100 residential units on the masterplan lands. The entire masterplans proposals (remaining 476 dwelling units) are scheduled to be completed prior to the end of 2026. The assessment has assumed that the Lissywollen South Framework Plan's road objective for a new north-south road link between Brawny Road and Lower Street will not be implemented until sometime after the 2036 design year.

10.2 SUMMARY ASSESSMENT

10.2.1 Based upon the information and analysis detailed within this Traffic and Transport Assessment it has been demonstrated that: -

- The subject site is highly accessible to pedestrians and cyclists from the surrounding area. The Old Rail Trail Greenway is located to the south of the development lands and operates in and East-West direction adjacent to the disused rail line. This facility is approximately 40km long and operates between the R195 in Athlone (to the west of the development site) and Mullingar to the east.
- Future proposals as stated within the Athlone Town Development Plan include "*To provide a walking/cycling route from the Athlone Mullingar railway line in Athlone, to the River Shannon, via a new bridge over the Shannon to the west bank and onwards to the Roscommon County boundary, with the potential to connect to Athlone Castle and southwards around the town".* Support by the NTA this new pedestrian / cycle infrastructure is predicted to be delivered over the net 2-3 years further enhancing the site accessibility levels.
- The subject site benefits from good public transport accessibility levels with bus-based services already calling close to the masterplan lands and providing connections to additional public transport services at Athlone Rail Station and Bus Station located approximately 2km to the southwest.
- The proposed scheme's internal road layout has been designed to be consistent with both the principles and guidance outlined within the Design Manual for Urban Roads and Streets (DMURS) 2013 (updated May 2019). The scheme proposals are the outcome of an integrated design approach that seeks to

implement a sustainable community connected by well-designed streets which deliver safe, convenient and attractive networks.

- The proposed masterplan has been designed to facilitate the existing local bus route A2 to be extend eastwards into the subject development lands beyond its existing extents at Athlone Regional Sports Centre. A total of 2 no. new bus stops are proposed along the new east-west 'link' street. **Figure 10.1** below presents the new routing arrangements for the A2 bus service route, the new bus stop locations and the proposed bus route through the proposed site. The extension of the local bus route eastwards into the masterplan lands will benefit both existing local residents and residents of the masterplans proposed new dwellings. The strategic positioning of the two new bus stops will ensure that all new and existing residents will have to walk no more than 250m in order to access the bus service. This walking distance is below best practice recommended maximum walking distance of 300m thereby enhancing public transport accessibility levels.

Figure 10.1: Proposed Bus Infrastructure Improvements

- The proposed development layout design provides a total of 752 no. car parking spaces comprising 455 no. housing car parking spaces and 295 no. apartment car parking spaces. The provision of 455 no. residential housing unit car parking spaces are slightly higher than the local development plans 'minimum' car parking requirements (380). The proposed apartment / duplex car parking provision (295) is lower than the development plan requirement (388).
- This provision of 295 apartment car parking spaces equates to a ratio of 1.01 per apartment unit. In order to determine if this level of car parking provision is adequate to cater for the potential car parking demand, an assessment of the Census 2016 car ownership data has been undertaken at existing residential areas within Athlone Town. The assessment of Census car ownership data at 6 no. residential areas with similar site characteristics to the subject development site reveals an average car ownership ratio of 0.81 cars per household. In comparison, the subject proposals propose a provision of 1.01 cars per apartment unit and therefore is considered an appropriate quantum to accommodate the predicted demand.
- A total of 1613 no. bicycle parking opportunities are proposed as part of the residential development scheme comprising 1585 residential and 28 creche cycle parking spaces. The 1585 no. residential cycle parking spaces comprise 1271 no. long term secured / sheltered spaces and 314 short term parking spaces. The 28 no. cycle parking spaces proposed for the creche facilities include 12 no. at the 321m^2 creche located in Sector 1A West of the site (adjacent to Block C) and 16 no. at the 448m^2 creche located on the ground floor apartment Block T.
- A total of 1 no. third party committed development has been identified and included into the network assessment.
- A junction impact analysis was undertaken and has demonstrated that, with the exception of the R916 / Moydrum Road Roundabout, the proposals will generate a subthreshold impact upon all the junctions during the AM and PM peak hours during all adopted design years.
- Furthermore, due to the redistribution effect of the proposed new 'link' road through the subject masterplan site, a reduced quantum of baseline vehicle movements compared to existing conditions are observed at a number of junctions. Such observations are recorded during all or some of the design years

including Junction 1 (N55 / N6 Eastbound On-ramp / N6 off-ramp junction), Junction 2 (N55 / N6 Westbound off-ramp junction), Junction 3 (Brawny Road / R915 / N55 / One Mile Round) and Junction 8 (R915 / The Crescent / Grace Park Road / Gleeson Street junction).

- The AM and PM peak hour impact recorded at the R916 / Moydrum Road Roundabout are over the 5% threshold for congested networks with 8.59% and 8.81% respectfully in the 2036 Future Design Year. Accordingly, this junction has been subject to further analysis as discussed within **Chapter 7** of this report. Junction 3 (N55 / Brawny Road / R915 / One Mile Road) has also been subject to further assessment due to its close proximity to the subject development even though the impact of the subject development has been established as being subthreshold.

Figure 10.2: Increase in Vehicle Trips Generated Through Key Of-Site Junctions (2036)

- The junction analysis undertaken at the two key off-site junctions reveals that with the introduction of the proposed alterations to both the N55 / Brawny Road / R915 / One Mile Road junction, and the R916 / Moyburn Road / Blackberry Lane junction; the operational performance of the two existing roundabout junctions improves slightly. These enhancements proposed as part of an integrated package of mitigation measures; provides the capacity required to accommodate the proposed masterplans residential development. Even with the introduction of the subject developments additional traffic volumes, maximum RFC values and queue lengths are predicted to reduce slightly when compared to the corresponding Do-Nothing scenario results in each of the three adopted 2021, 2026 and 2036 design year scenarios.

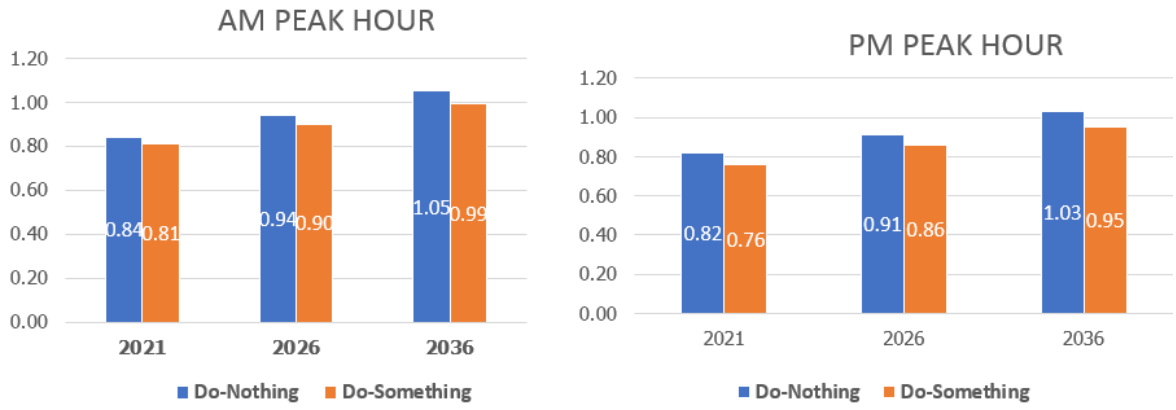


Figure 10.3: Junction 3 (R915 Roundabout) Do-Nothing & Do-Something Max Recorded RFC Values

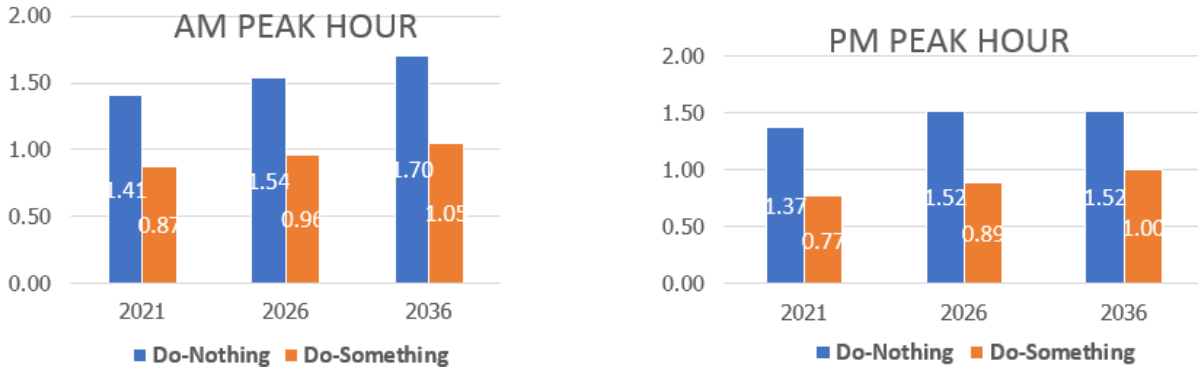


Figure 10.4: Junction 6 (R916 Roundabout) Do-Nothing & Do-Something Max Recorded RFC Values

10.3 CONCLUSION

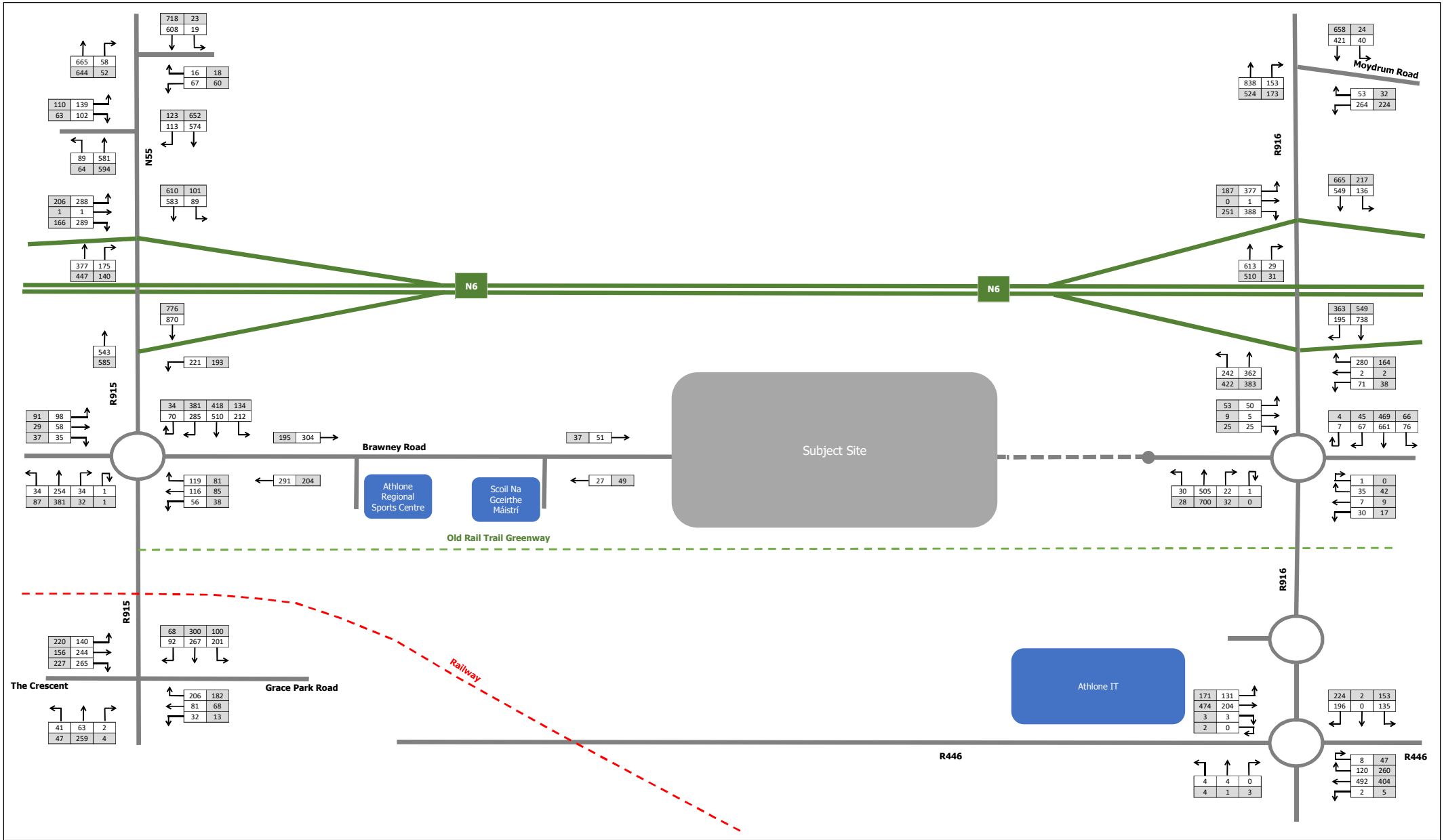
10.3.1 In conclusion, it is considered that the impact on the surrounding road network, as a result of the proposed masterplan development on the surrounding road network will be negligible. This is based on the anticipated levels of traffic generated by the proposed development, the level of mitigation achieved following the implementation of the proposed road infrastructure upgrades at the two off-site roundabouts and the information and analysis summarised in the above report.

10.3.2 It is concluded that the proposal represents a sustainable and practical approach to development on the subject Lissywollen South lands and there are no traffic or transportation related reasons that should prevent the granting of planning permission for the proposed residential development.

APPENDICES

APPENDIX A

Traffic Flow Diagrams



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Network Traffic Flows -PCU's
2019 Base Flows

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

Flows measured in PCU's

Dwn:	Ckd:	Date:
MMK	TJ	30/07/2019

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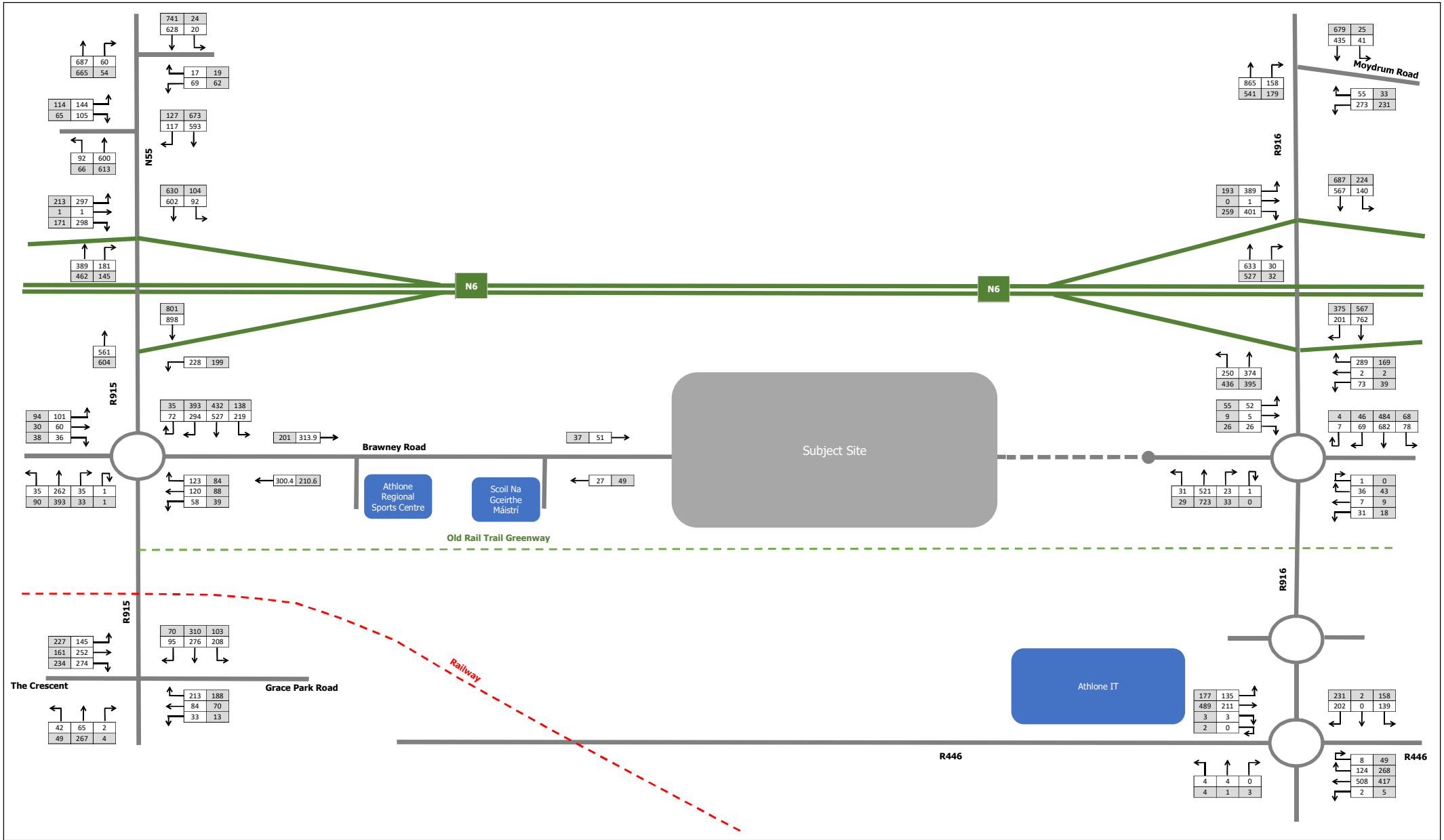

DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Network Traffic Flows -PCU's
2021 Base Flows

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

Flows measured in PCU's

Dwn:	Ckd:	Date:
MMK	TJ	30/07/2019

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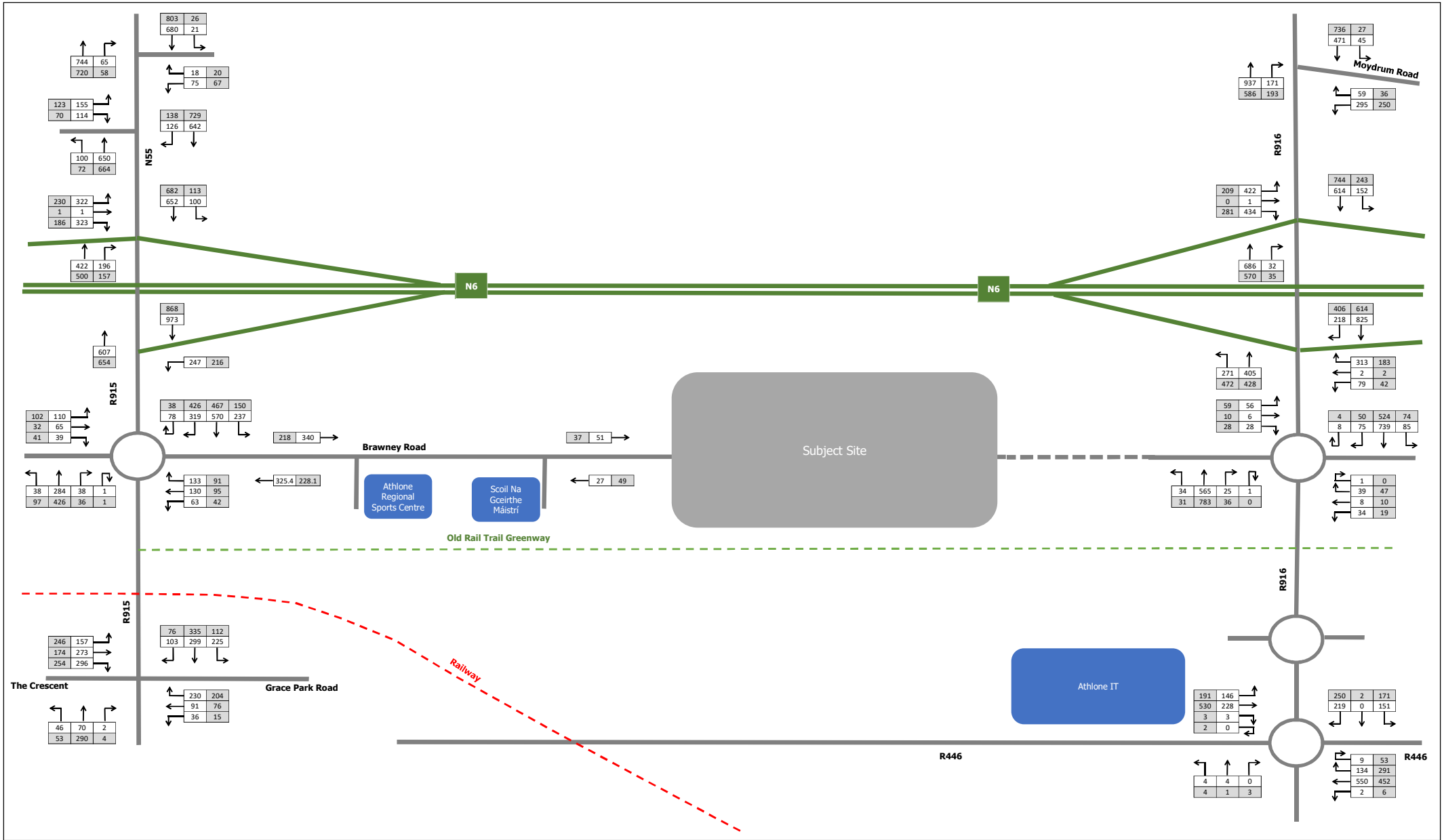

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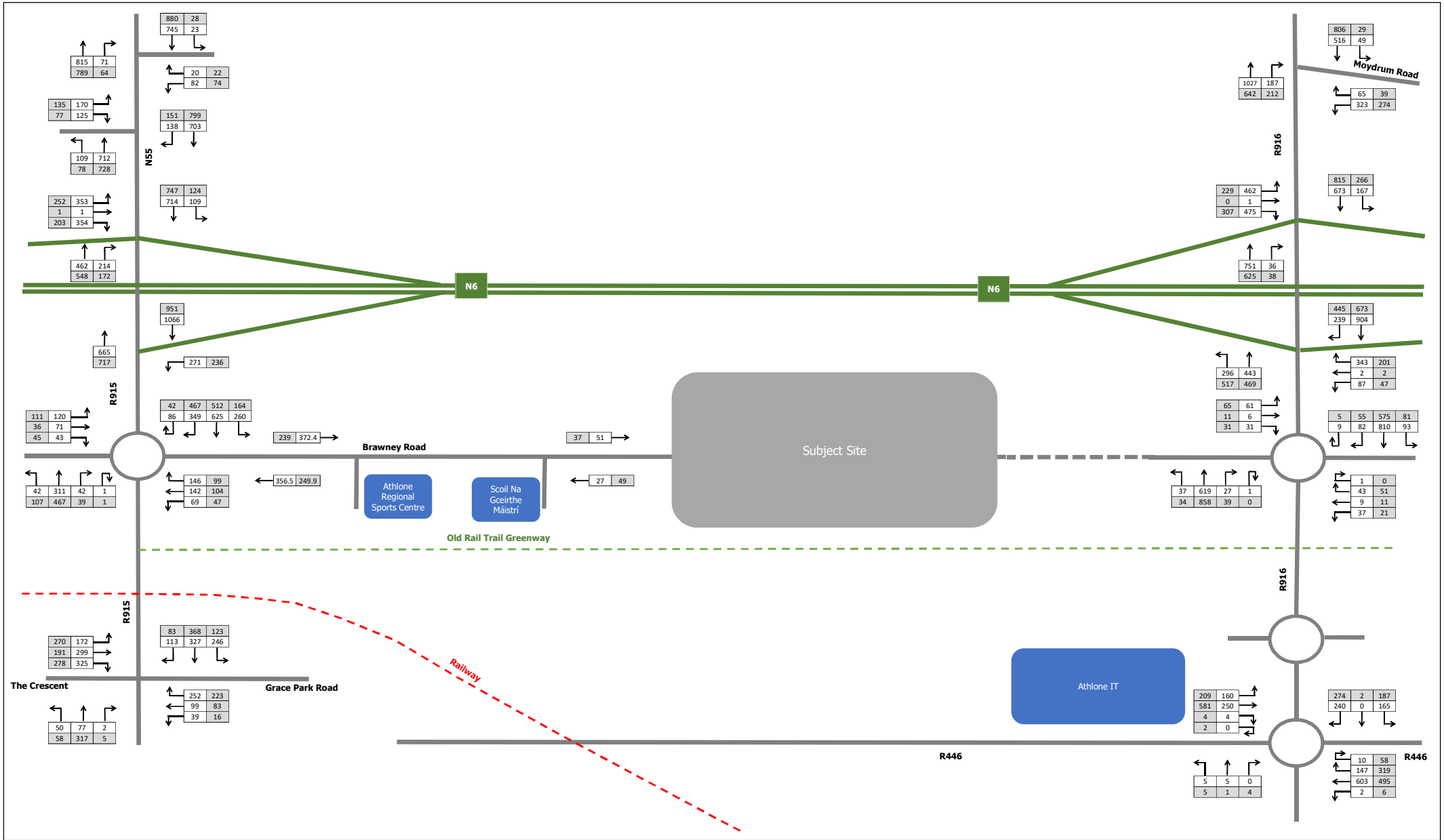

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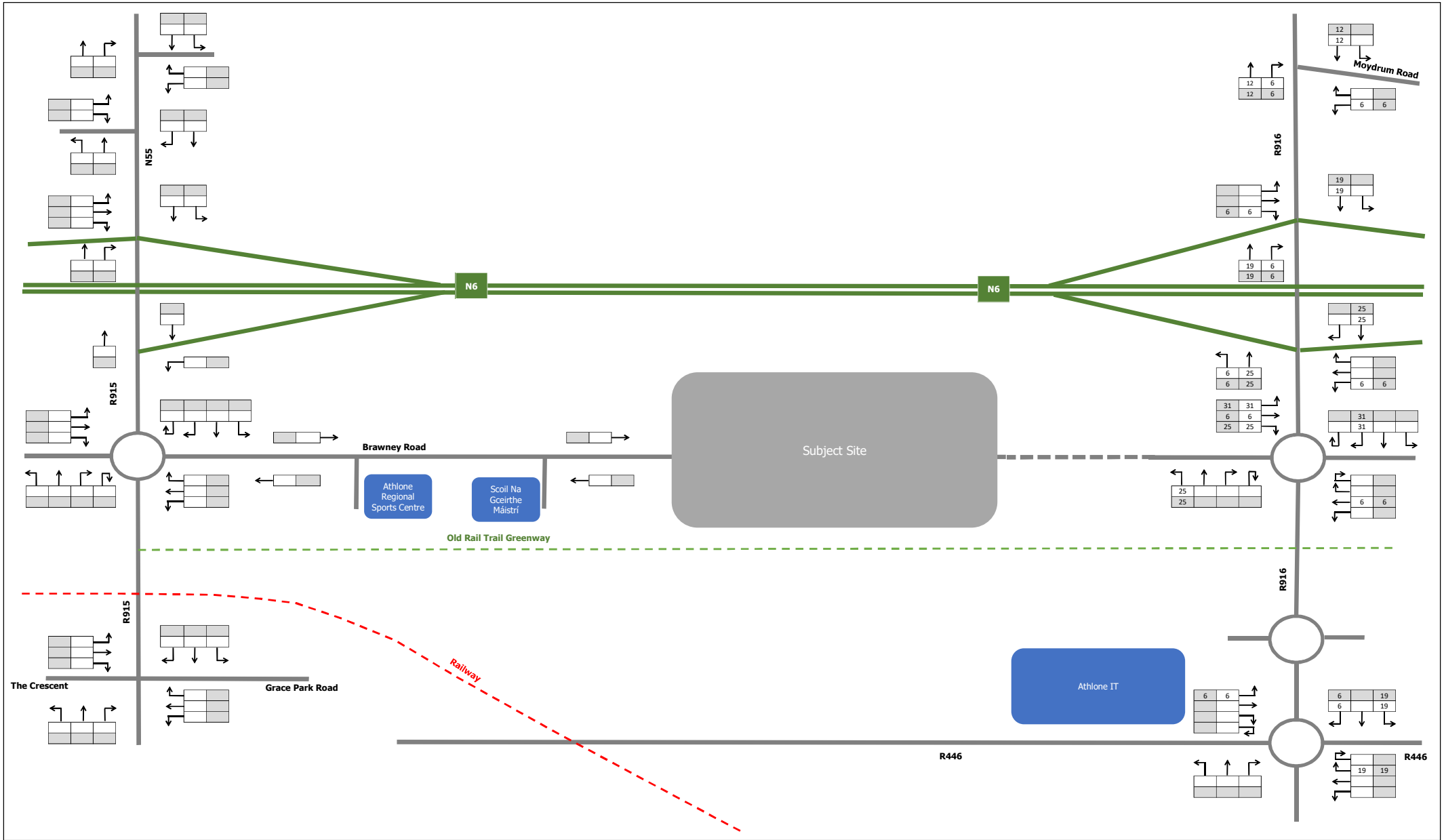

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Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Committed Development
Filling Station (Ref: 167155)

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

Flows measured in PCU's

Dwn:	Ckd:	Date:
MMK	TJ	30/07/2019

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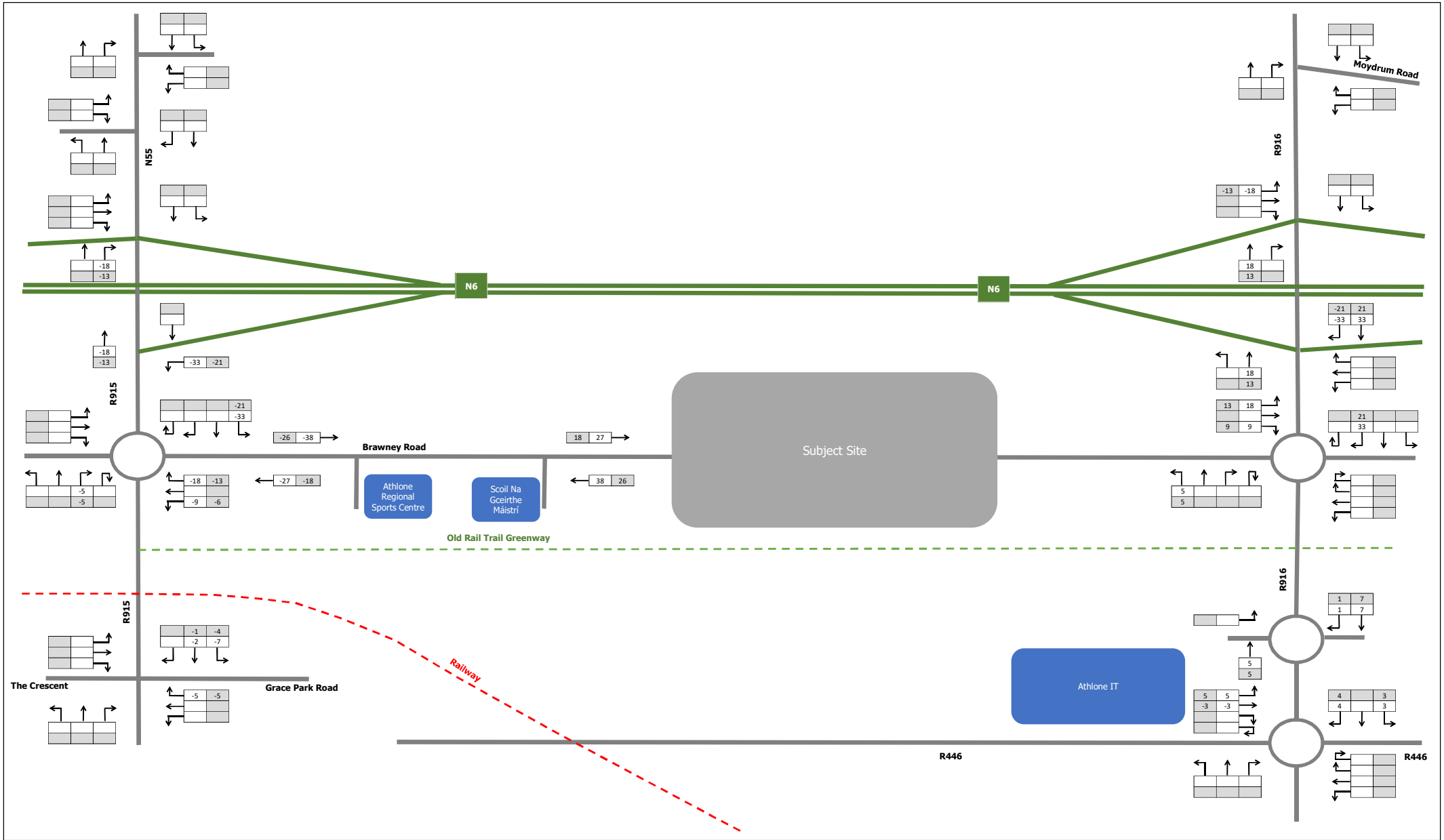

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Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Network Traffic Flows -PCU's
2021 Diverted Trips

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

Flows measured in PCU's

Dwn:	Ckd:	Date:
MMK	TJ	30/07/2019

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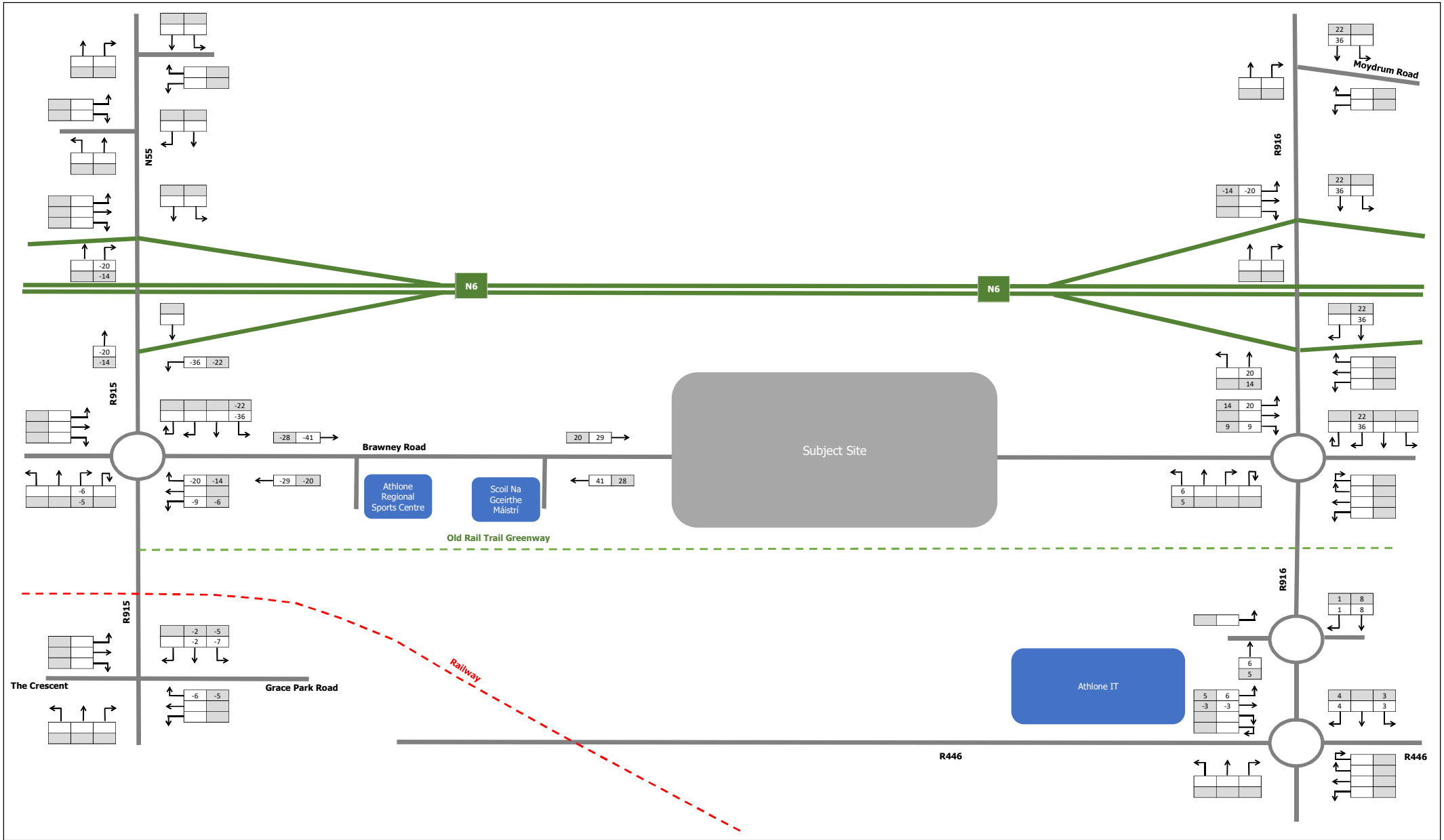

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Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Network Traffic Flows -PCU's
2026 Diverted Trips

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

Flows measured in PCU's

Dwn:	Ckd:	Date:
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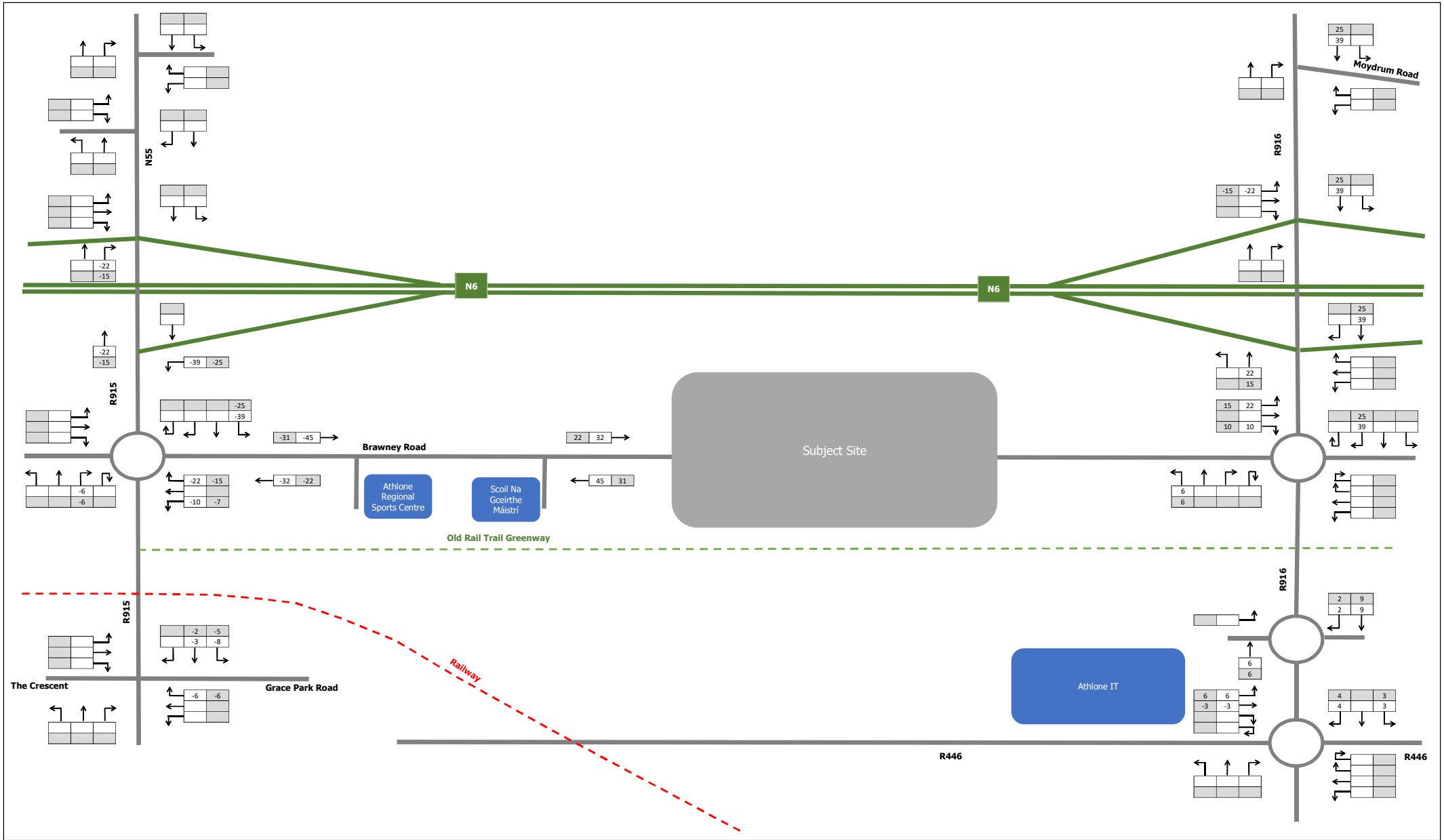

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Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Network Traffic Flows -PCU's
2036 Diverted Trips

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

Flows measured in PCU's

Dwn:	Ckd:	Date:
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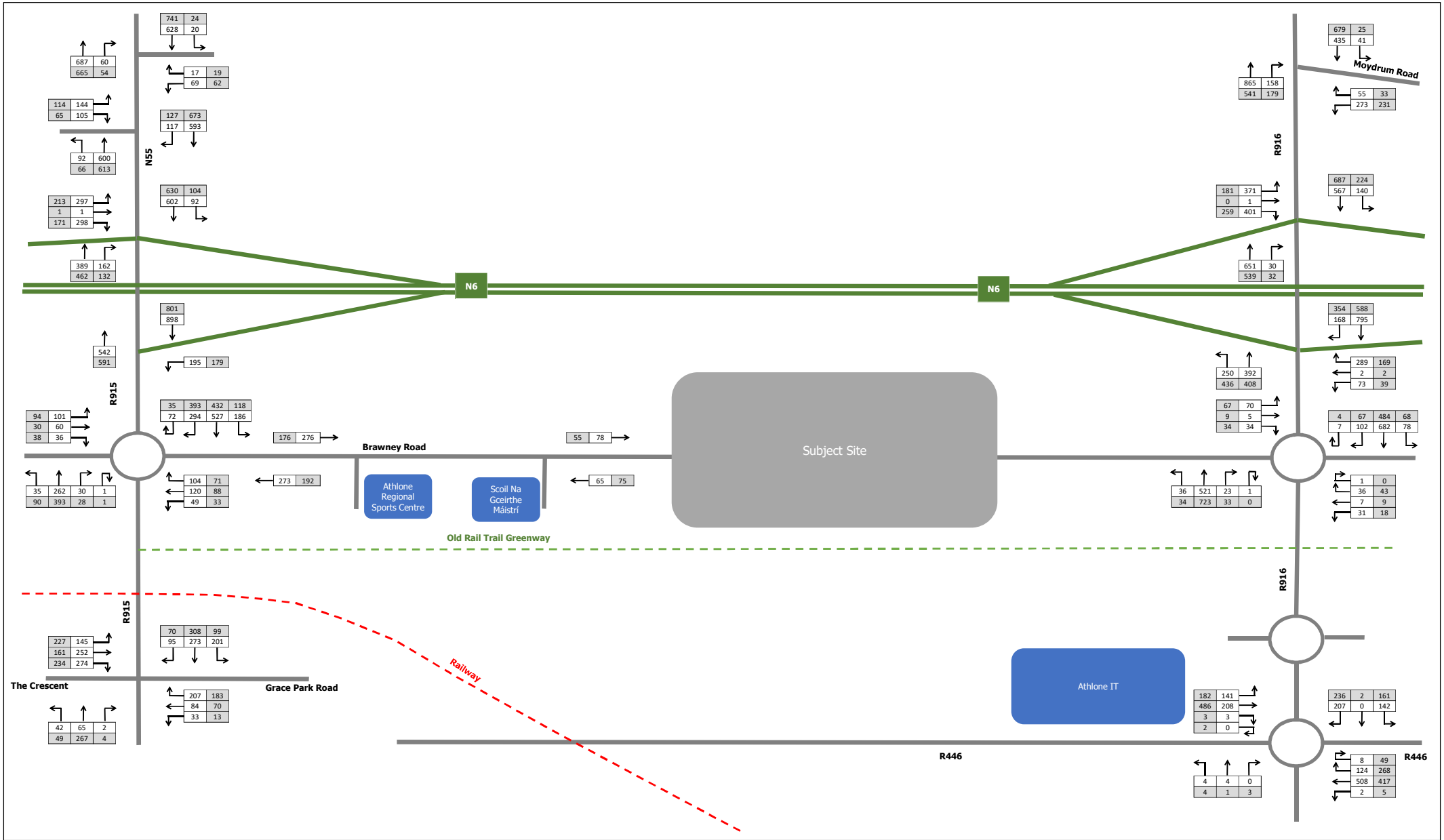

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Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Network Traffic Flows -PCU's
2021 Adjusted Base

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

Flows measured in PCU's

Dwn:	Ckd:	Date:
MMK	TJ	30/07/2019

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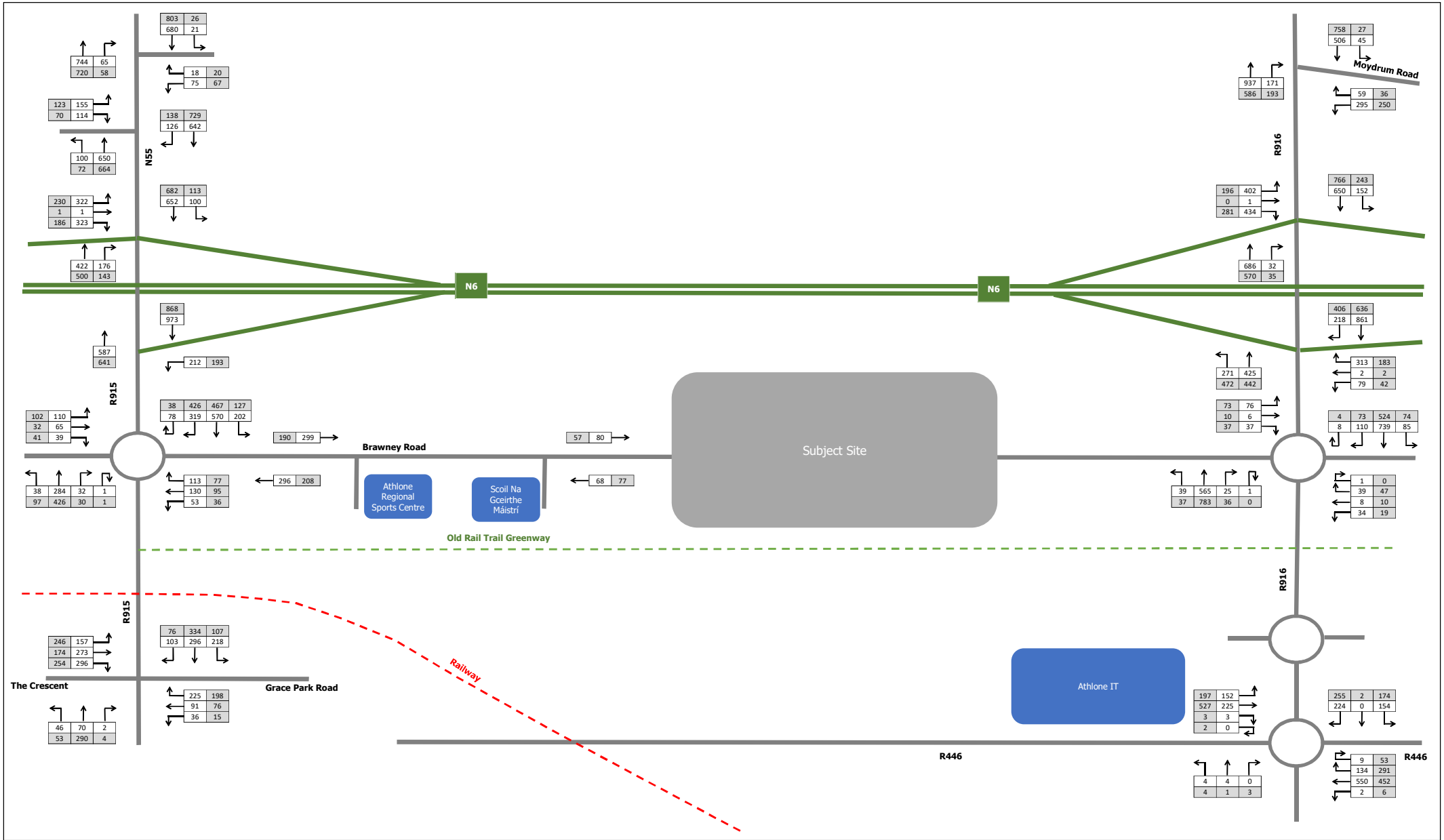

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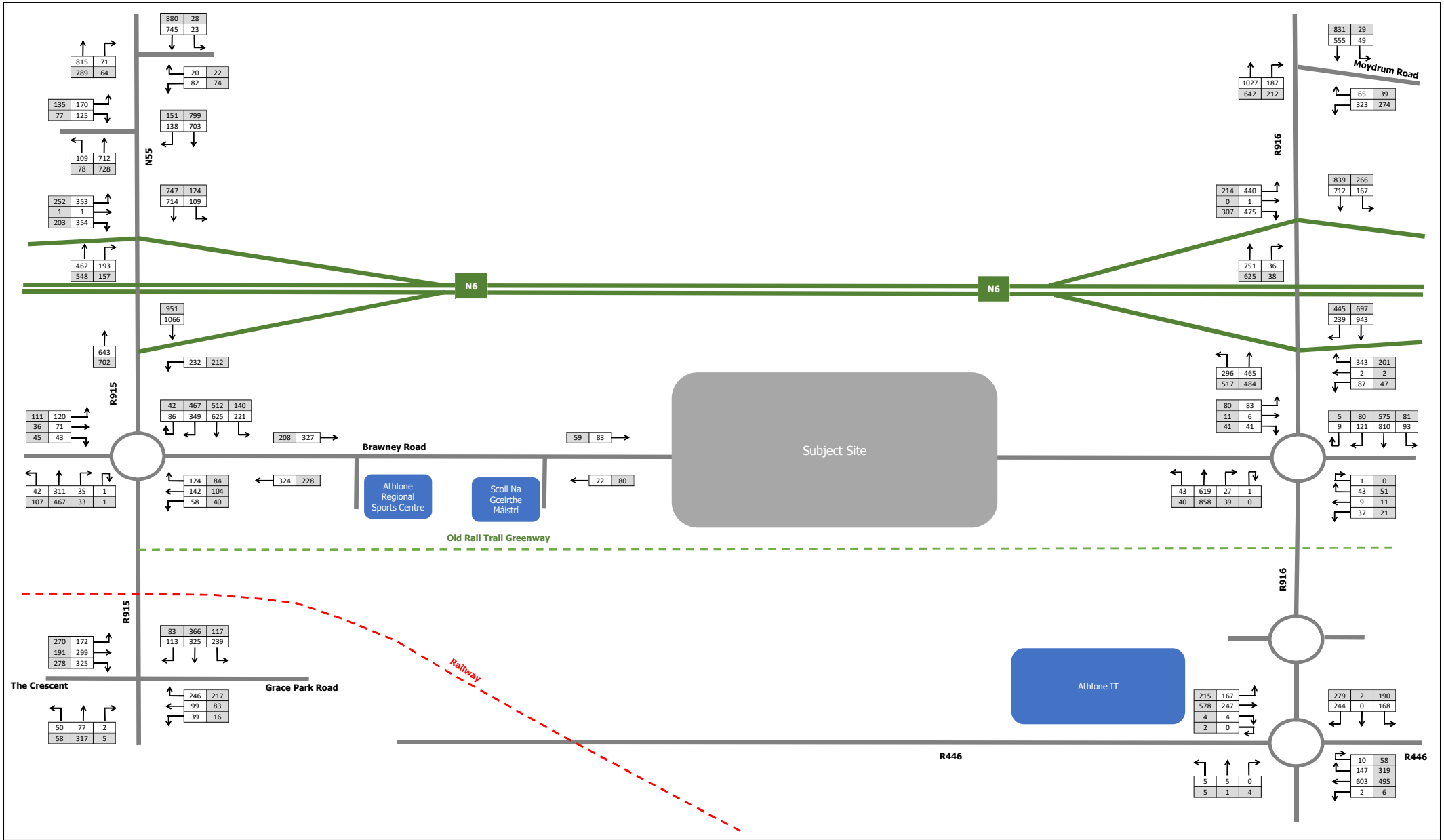

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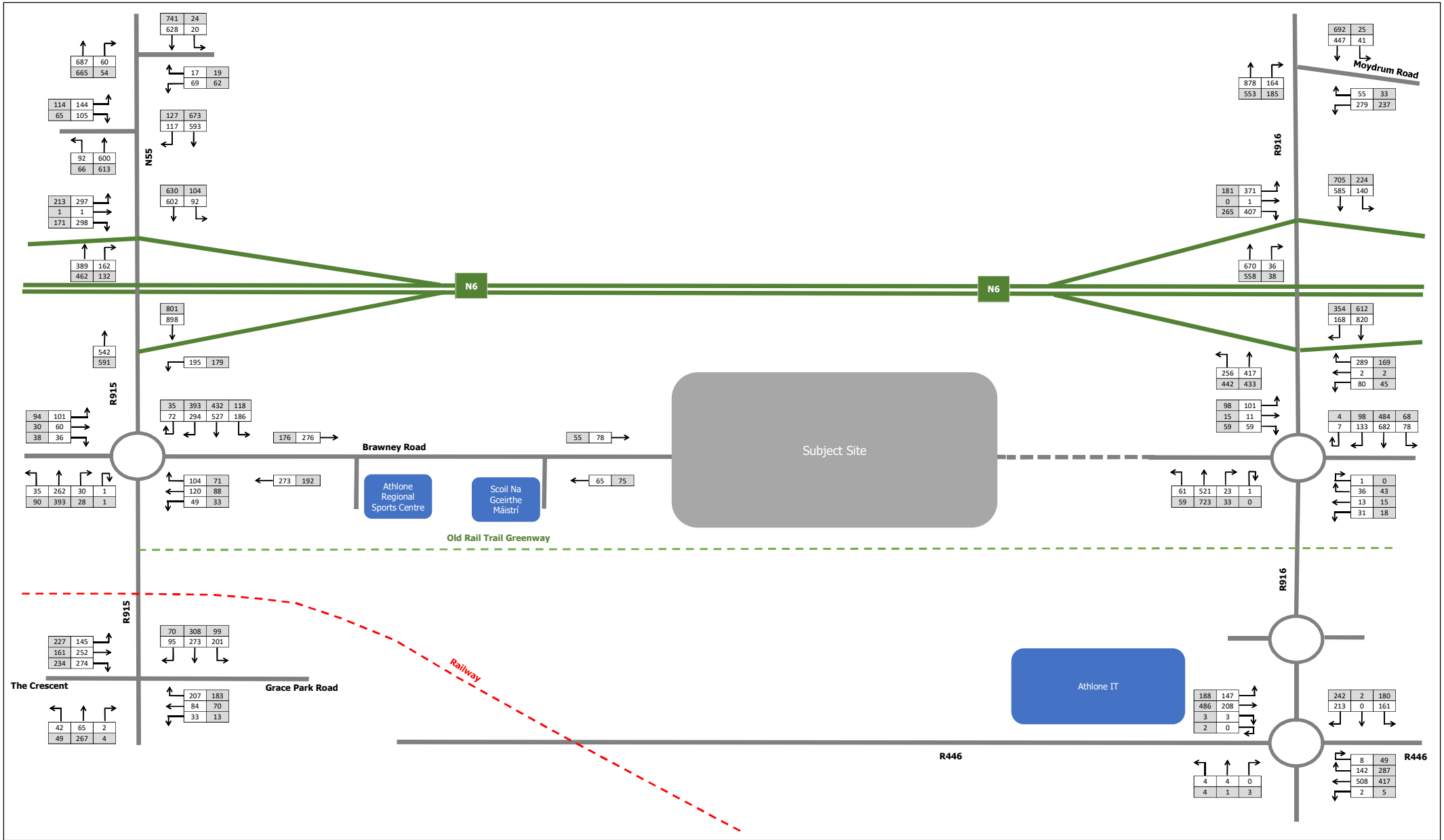

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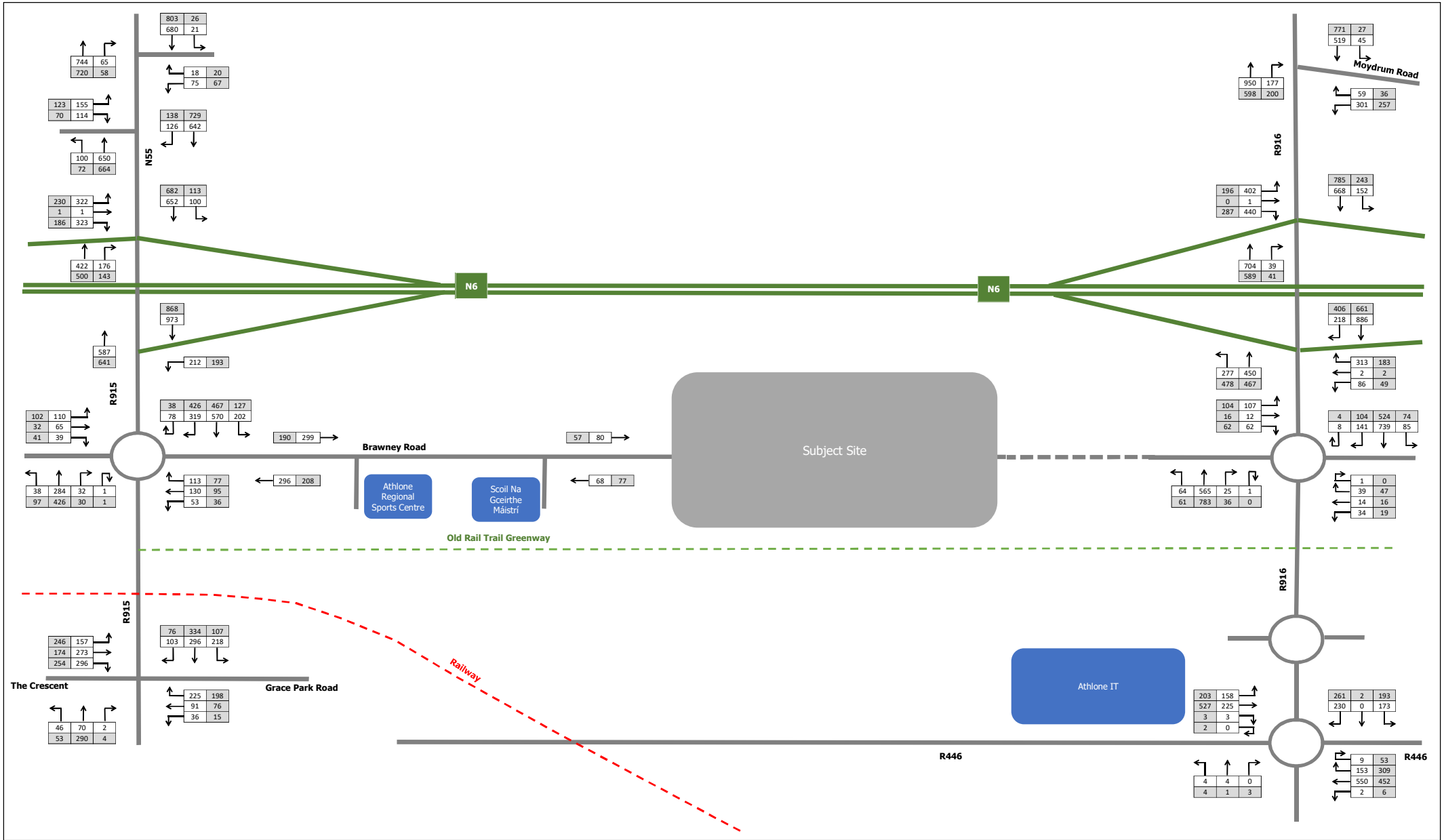

DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Do-Minimum
2026 Opening Year

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

Flows measured in PCU's

Dwn:	Ckd:	Date:
MMK	TJ	30/07/2019

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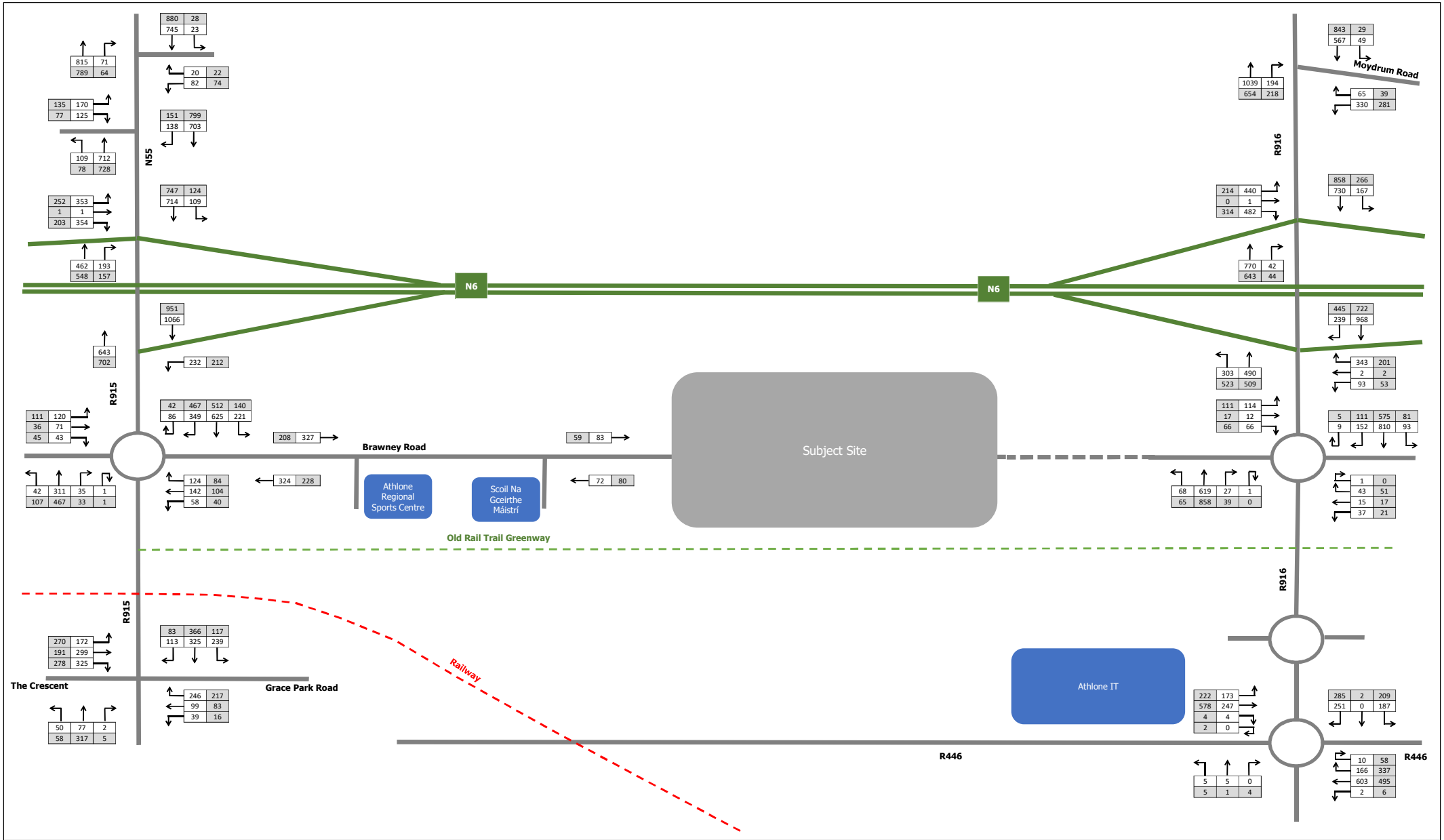

DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Do-Minimum
2036 Opening Year

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

Flows measured in PCU's

Dwn:	Ckd:	Date:
MMK	TJ	30/07/2019

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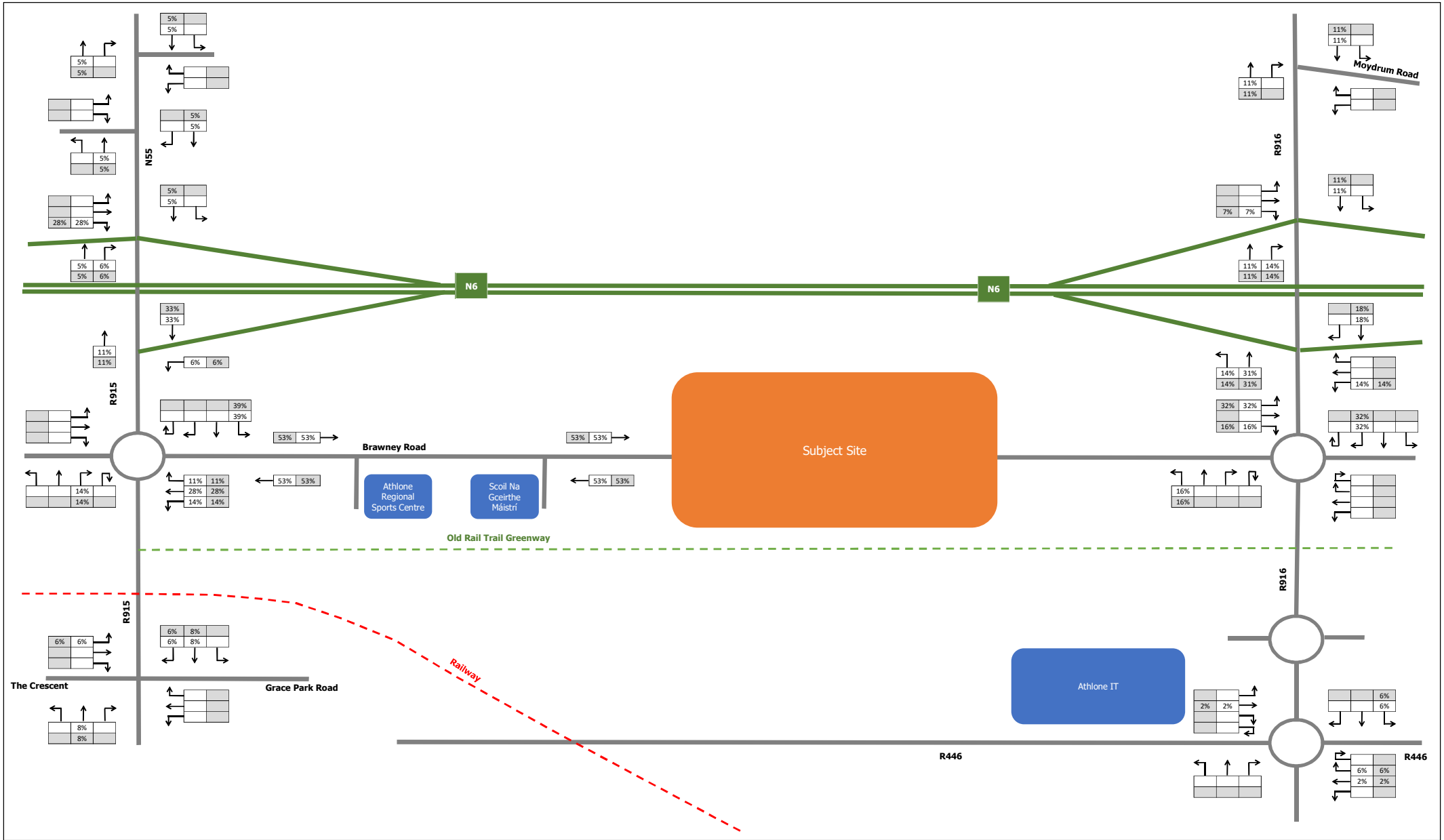

DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Trip Distribution
2026/2036 Future Design Years

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

Flows measured in PCU's

Dwn:	Ckd:	Date:
MMK	TJ	30/07/2019

Ref: p180176\calcs\excel\traffic\180176-traffic model-001

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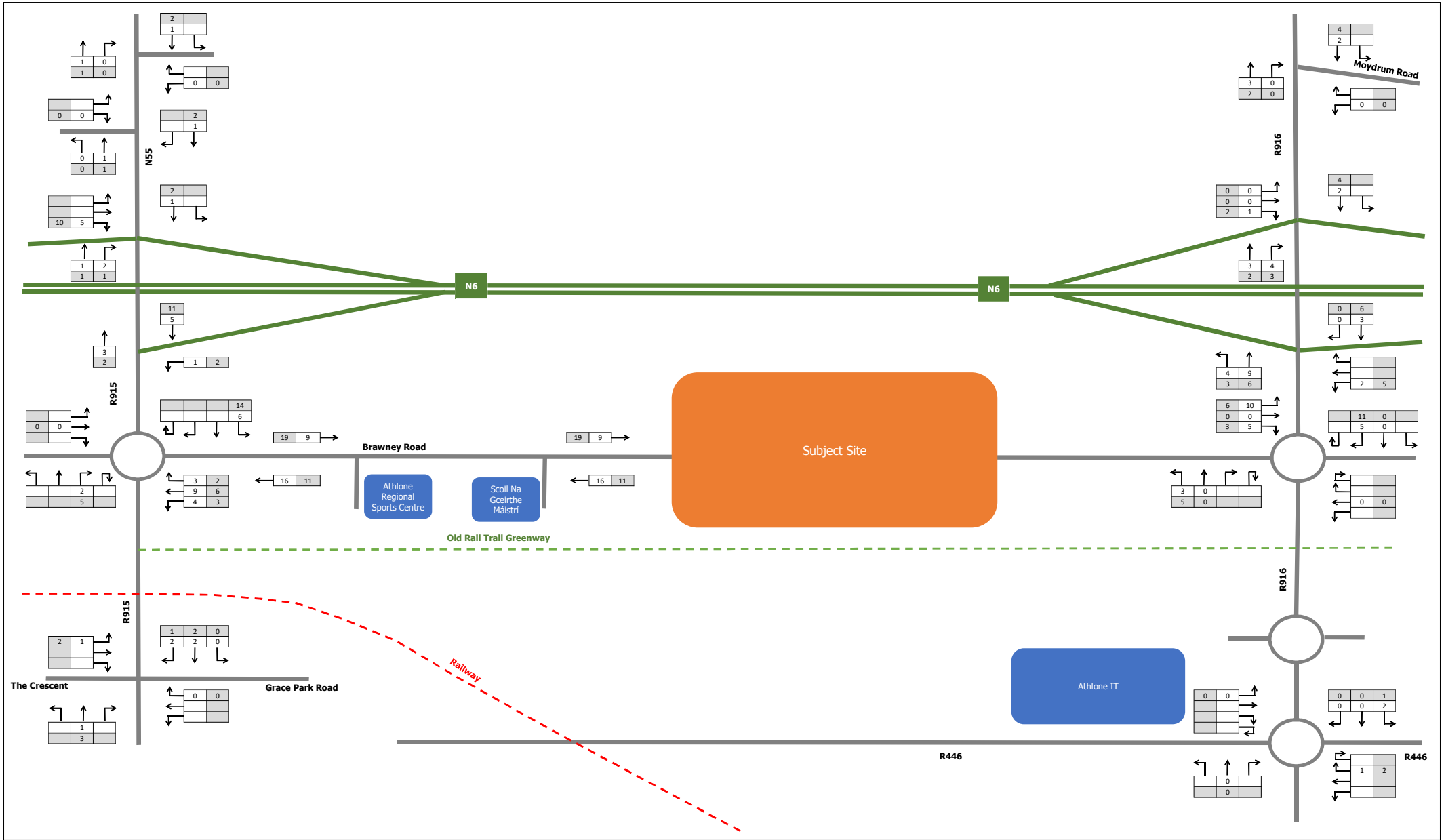

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Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Development Trips
2021 Future Design Year

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

Flows measured in PCU's

Dwn:	Ckd:	Date:
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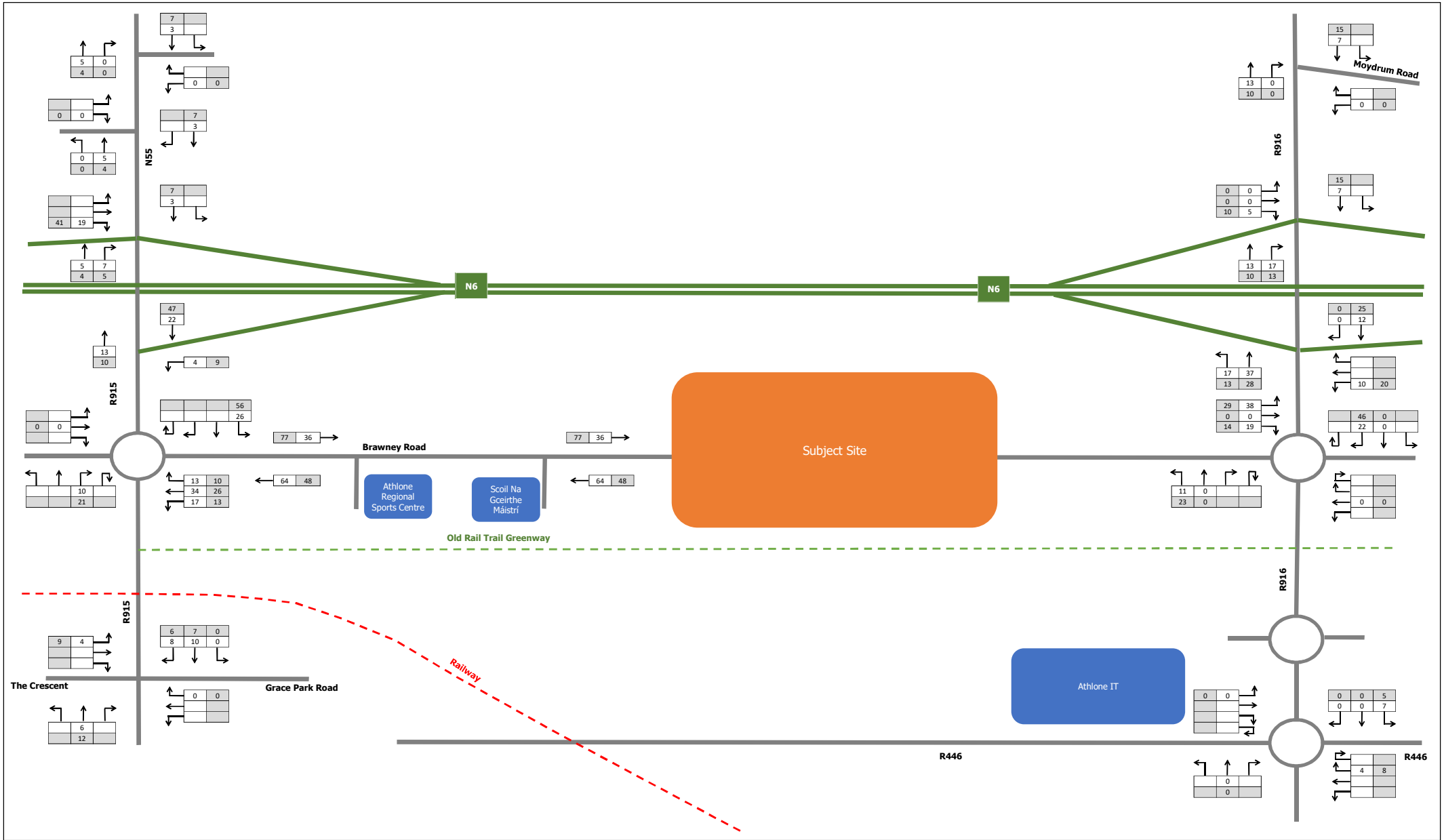


DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Development Trips
2026 / 2036 Future Design Years

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

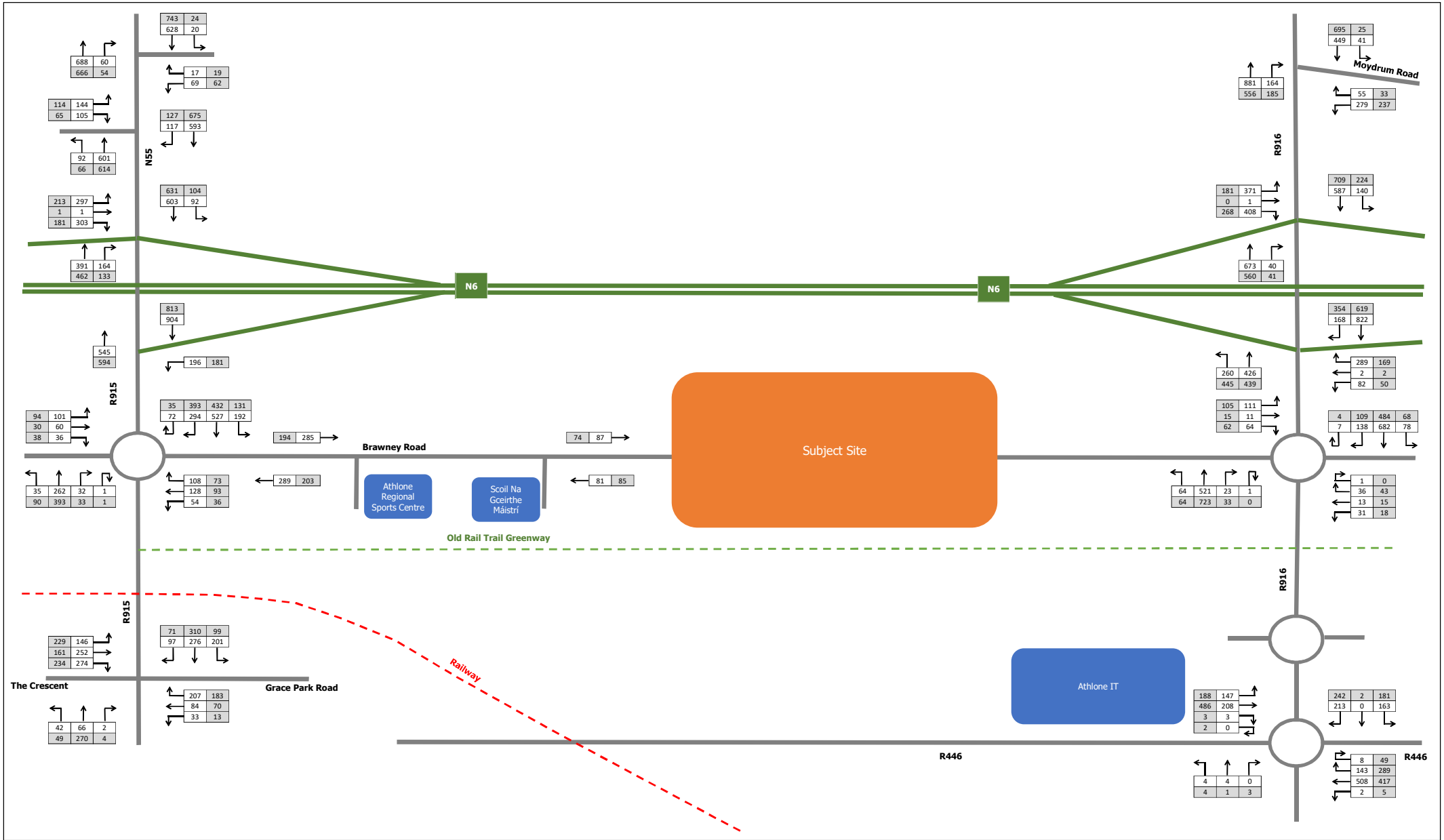
Flows measured in PCU's

Dwn:	Ckd:	Date:
MMK	TJ	30/07/2019

Ref: p180176\calcs\excel\traffic\180176-traffic model-001

Figure: 11

Rev: -



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7
phone: +353 1 400 4000
Waterford Office:
Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Do-Something
2021 Opening Year

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

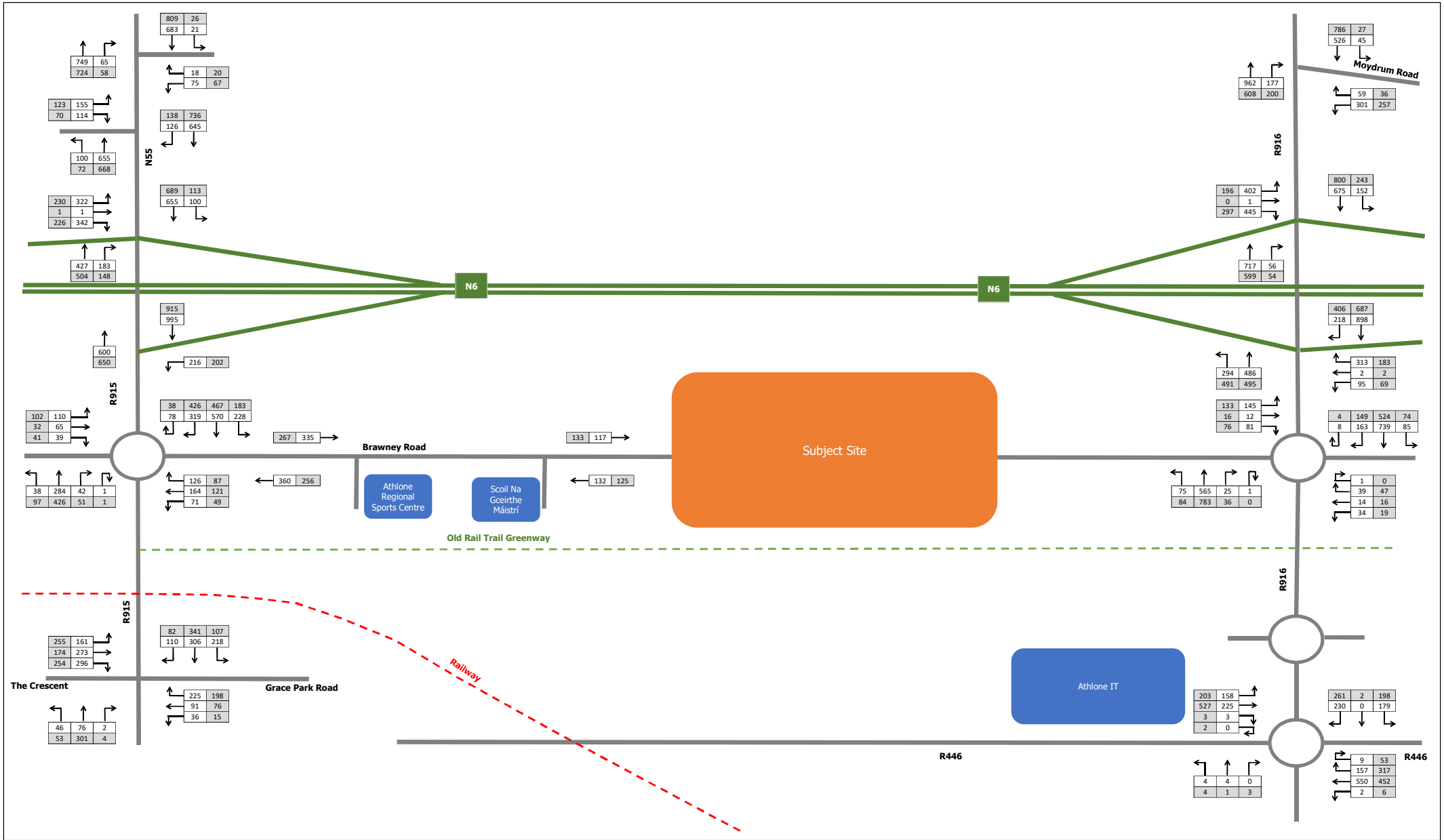
Flows measured in PCU's

Dwn:	Ckd:	Date:
MMK	TJ	30/07/2019

Ref: p180176\calcs\excel\traffic\180176-traffic model-001

Figure: 12

Rev: -



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phone: +353 1 400 4000
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Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford
phone: +353 51 309 500
email: info@dbfl.ie
website: www.dbfl.ie

Project :
Proposed Residential Development
Lissywollen, Athlone

DRG. Title :
Do-Something
2026 Future Design Year

Key:
AM Peak Hour (0830-0930)
PM Peak Hour (1700-1800)

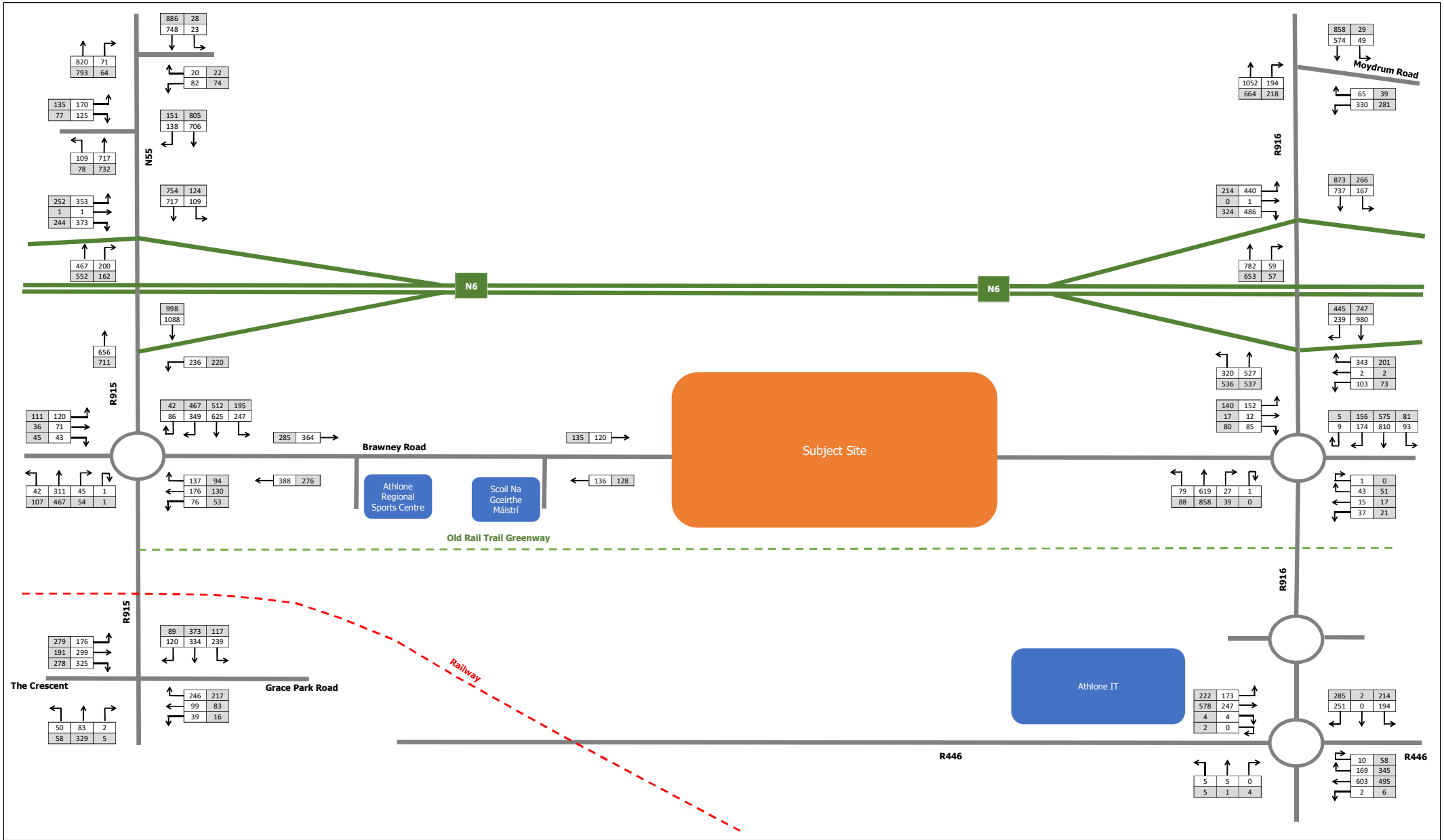
Flows measured in PCU's

Dwn:	Ckd:	Date:
MMK	TJ	30/07/2019

Ref: p180176\calcs\excel\traffic\180176-traffic model-001

Figure: 13

Rev: -



DBFL Consulting Engineers	**Dublin Office:** Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 **phone:** +353 1 400 4000 **Waterford Office:** Unit 2, The Chandlery, 1-2 O'Connell Street, Waterford **phone:** +353 51 309 500 **email:** info@dbfl.ie **website:** www.dbfl.ie	**Project :** Proposed Residential Development Lissywollen, Athlone **DRG. Title :** Do-Something 2036 Future Design Year	**Key:** AM Peak Hour (0830-0930) PM Peak Hour (1700-1800) Flows measured in PCU's	**Dwn:** MMK	**Ckd:** TJ	**Date:** 30/07/2019
				Ref: p180176\calcs\excel\traffic\180176-traffic model-001		
				Figure: 14	**Rev:** -	

APPENDIX B

TRICS Database Outputs

Calculation Reference: AUDIT-638801-190719-0742

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : C - FLATS PRIVATELY OWNED
VEHICLES

Selected regions and areas:

03	SOUTH WEST		
	DC	DORSET	1 days
04	EAST ANGLIA		
	NF	NORFOLK	1 days
	SF	SUFFOLK	2 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	RI	EAST RIDING OF YORKSHIRE	1 days
09	NORTH		
	CB	CUMBRIA	2 days
10	WALES		
	CO	CONWY	1 days
11	SCOTLAND		
	SA	SOUTH AYRSHIRE	1 days
	SR	STIRLING	2 days
12	CONNAUGHT		
	GA	GALWAY	1 days
13	MUNSTER		
	WA	WATERFORD	1 days
14	LEINSTER		
	LU	LOUTH	3 days
16	ULSTER (REPUBLIC OF IRELAND)		
	MG	MONAGHAN	1 days

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

Secondary Filtering selection:

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

Parameter: Number of dwellings
Actual Range: 14 to 85 (units:)
Range Selected by User: 6 to 215 (units:)

Parking Spaces Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/11 to 05/06/18

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	4 days
Tuesday	3 days
Wednesday	4 days
Thursday	4 days
Friday	2 days

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

Selected survey types:

Manual count	17 days
Directional ATC Count	0 days

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

Selected Locations:

Edge of Town Centre	10
Suburban Area (PPS6 Out of Centre)	5
Edge of Town	2

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

Selected Location Sub Categories:

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	17 days

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

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	3 days
10,001 to 15,000	8 days
15,001 to 20,000	4 days
20,001 to 25,000	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	4 days
50,001 to 75,000	9 days
75,001 to 100,000	2 days

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

Car ownership within 5 miles:

0.6 to 1.0	4 days
1.1 to 1.5	13 days

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

Travel Plan:

No	17 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	17 days

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

LIST OF SITES relevant to selection parameters

1 CB-03-C-02 BLOCK OF FLATS CUMBRIA
BRIDGE LANE
PENRITH

Edge of Town
No Sub Category
Total Number of dwellings: 35
Survey date: WEDNESDAY 11/06/14 Survey Type: MANUAL

2 CB-03-C-03 FLATS & BUNGALOWS CUMBRIA
LOUND STREET
KENDAL

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 33
Survey date: MONDAY 09/06/14 Survey Type: MANUAL

3 CO-03-C-01 BLOCKS OF FLATS CONWY
MOSTYN BROADWAY
LLANDUDNO

Edge of Town Centre
Built-Up Zone
Total Number of dwellings: 37
Survey date: MONDAY 26/03/18 Survey Type: MANUAL

4 DC-03-C-02 FLATS IN BLOCKS DORSET
PALM COURT
WEYMOUTH
SPA ROAD
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 14
Survey date: FRIDAY 28/03/14 Survey Type: MANUAL

5 GA-03-C-01 FLATS GALWAY
BALLYLOUGHANE ROAD
GALWAY

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total Number of dwellings: 34
Survey date: THURSDAY 31/10/13 Survey Type: MANUAL

6 LU-03-C-01 BLOCKS OF FLATS LOUTH
DONORE ROAD
DROGHEDA

Edge of Town Centre
Residential Zone
Total Number of dwellings: 52
Survey date: THURSDAY 12/09/13 Survey Type: MANUAL

7 LU-03-C-02 BLOCK OF FLATS LOUTH
NICHOLAS STREET
DUNDALK

Edge of Town Centre
Residential Zone
Total Number of dwellings: 33
Survey date: MONDAY 16/09/13 Survey Type: MANUAL

8 LU-03-C-03 BLOCK OF FLATS LOUTH
NICHOLAS STREET
DUNDALK

Edge of Town Centre
Residential Zone
Total Number of dwellings: 20
Survey date: MONDAY 16/09/13 Survey Type: MANUAL

9 MG-03-C-01 BLOCK OF FLATS MONAGHAN
MALL ROAD
MONAGHAN

Edge of Town Centre
No Sub Category
Total Number of dwellings: 28
Survey date: FRIDAY 06/09/13 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

10 NF-03-C-01 BLOCKS OF FLATS NORFOLK
PAGE STAIR LANE
KING'S LYNN

Edge of Town Centre
Built-Up Zone
Total Number of dwellings: 51
Survey date: THURSDAY 11/12/14 Survey Type: MANUAL

11 RI-03-C-01 FLATS EAST RIDING OF YORKSHIRE
465 PRIORY ROAD
HULL

Edge of Town
Residential Zone
Total Number of dwellings: 20
Survey date: TUESDAY 13/05/14 Survey Type: MANUAL

12 SA-03-C-01 BLOCK OF FLATS SOUTH AYRSHIRE
RACECOURSE ROAD
AYR

Edge of Town Centre
Residential Zone
Total Number of dwellings: 51
Survey date: TUESDAY 16/09/14 Survey Type: MANUAL

13 SF-03-C-01 BLOCKS OF FLATS SUFFOLK
STATION HILL
BURY ST EDMUNDS

Edge of Town Centre
Built-Up Zone
Total Number of dwellings: 85
Survey date: THURSDAY 18/12/14 Survey Type: MANUAL

14 SF-03-C-03 BLOCKS OF FLATS SUFFOLK
TOLLGATE LANE
BURY ST EDMUNDS

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 30
Survey date: WEDNESDAY 03/12/14 Survey Type: MANUAL

15 SR-03-C-01 FLATS STIRLING
FORTHSIDE WAY
STIRLING

Edge of Town Centre
No Sub Category
Total Number of dwellings: 80
Survey date: WEDNESDAY 18/06/14 Survey Type: MANUAL

16 SR-03-C-02 FLATS STIRLING
ROSEBERRY TERRACE
STIRLING

Edge of Town Centre
Residential Zone
Total Number of dwellings: 48
Survey date: WEDNESDAY 18/06/14 Survey Type: MANUAL

17 WA-03-C-01 BLOCKS OF FLATS WATERFORD
UPPER YELLOW ROAD
WATERFORD

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 51
Survey date: TUESDAY 12/05/15 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/C - FLATS 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	17	41	0.041	17	41	0.110	17	41	0.151
08:00 - 09:00	17	41	0.061	17	41	0.172	17	41	0.233
09:00 - 10:00	17	41	0.085	17	41	0.114	17	41	0.199
10:00 - 11:00	17	41	0.068	17	41	0.083	17	41	0.151
11:00 - 12:00	17	41	0.098	17	41	0.110	17	41	0.208
12:00 - 13:00	17	41	0.115	17	41	0.085	17	41	0.200
13:00 - 14:00	17	41	0.081	17	41	0.103	17	41	0.184
14:00 - 15:00	17	41	0.094	17	41	0.111	17	41	0.205
15:00 - 16:00	17	41	0.113	17	41	0.080	17	41	0.193
16:00 - 17:00	17	41	0.105	17	41	0.091	17	41	0.196
17:00 - 18:00	17	41	0.207	17	41	0.115	17	41	0.322
18:00 - 19:00	17	41	0.150	17	41	0.121	17	41	0.271
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.218			1.295			2.513

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

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

Parameter summary

Trip rate parameter range selected:	14 - 85 (units:)
Survey date date range:	01/01/11 - 05/06/18
Number of weekdays (Monday-Friday):	17
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 show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
TAXIS
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	17	41	0.003	17	41	0.003	17	41	0.006
08:00 - 09:00	17	41	0.000	17	41	0.000	17	41	0.000
09:00 - 10:00	17	41	0.003	17	41	0.003	17	41	0.006
10:00 - 11:00	17	41	0.000	17	41	0.000	17	41	0.000
11:00 - 12:00	17	41	0.007	17	41	0.007	17	41	0.014
12:00 - 13:00	17	41	0.001	17	41	0.001	17	41	0.002
13:00 - 14:00	17	41	0.006	17	41	0.006	17	41	0.012
14:00 - 15:00	17	41	0.003	17	41	0.003	17	41	0.006
15:00 - 16:00	17	41	0.004	17	41	0.004	17	41	0.008
16:00 - 17:00	17	41	0.003	17	41	0.003	17	41	0.006
17:00 - 18:00	17	41	0.004	17	41	0.003	17	41	0.007
18:00 - 19:00	17	41	0.006	17	41	0.006	17	41	0.012
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.040			0.039			0.079

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

*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/C - FLATS PRIVATELY OWNED
OGVS
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	17	41	0.001	17	41	0.003	17	41	0.004
08:00 - 09:00	17	41	0.003	17	41	0.001	17	41	0.004
09:00 - 10:00	17	41	0.007	17	41	0.007	17	41	0.014
10:00 - 11:00	17	41	0.000	17	41	0.001	17	41	0.001
11:00 - 12:00	17	41	0.000	17	41	0.000	17	41	0.000
12:00 - 13:00	17	41	0.004	17	41	0.003	17	41	0.007
13:00 - 14:00	17	41	0.001	17	41	0.003	17	41	0.004
14:00 - 15:00	17	41	0.003	17	41	0.003	17	41	0.006
15:00 - 16:00	17	41	0.001	17	41	0.000	17	41	0.001
16:00 - 17:00	17	41	0.000	17	41	0.001	17	41	0.001
17:00 - 18:00	17	41	0.000	17	41	0.000	17	41	0.000
18:00 - 19:00	17	41	0.000	17	41	0.000	17	41	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.020			0.022			0.042

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/C - FLATS PRIVATELY OWNED
PSVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	17	41	0.000	17	41	0.000	17	41	0.000
08:00 - 09:00	17	41	0.000	17	41	0.000	17	41	0.000
09:00 - 10:00	17	41	0.000	17	41	0.000	17	41	0.000
10:00 - 11:00	17	41	0.001	17	41	0.001	17	41	0.002
11:00 - 12:00	17	41	0.001	17	41	0.001	17	41	0.002
12:00 - 13:00	17	41	0.000	17	41	0.000	17	41	0.000
13:00 - 14:00	17	41	0.000	17	41	0.000	17	41	0.000
14:00 - 15:00	17	41	0.000	17	41	0.000	17	41	0.000
15:00 - 16:00	17	41	0.001	17	41	0.000	17	41	0.001
16:00 - 17:00	17	41	0.000	17	41	0.001	17	41	0.001
17:00 - 18:00	17	41	0.001	17	41	0.001	17	41	0.002
18:00 - 19:00	17	41	0.000	17	41	0.000	17	41	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.004			0.004			0.008

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

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

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
CYCLISTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	17	41	0.006	17	41	0.007	17	41	0.013
08:00 - 09:00	17	41	0.007	17	41	0.010	17	41	0.017
09:00 - 10:00	17	41	0.007	17	41	0.010	17	41	0.017
10:00 - 11:00	17	41	0.001	17	41	0.007	17	41	0.008
11:00 - 12:00	17	41	0.001	17	41	0.004	17	41	0.005
12:00 - 13:00	17	41	0.003	17	41	0.003	17	41	0.006
13:00 - 14:00	17	41	0.001	17	41	0.003	17	41	0.004
14:00 - 15:00	17	41	0.001	17	41	0.000	17	41	0.001
15:00 - 16:00	17	41	0.007	17	41	0.007	17	41	0.014
16:00 - 17:00	17	41	0.007	17	41	0.003	17	41	0.010
17:00 - 18:00	17	41	0.004	17	41	0.001	17	41	0.005
18:00 - 19:00	17	41	0.003	17	41	0.001	17	41	0.004
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.048			0.056			0.104

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/C - FLATS PRIVATELY OWNED
CARS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	17	41	0.023	17	41	0.066	17	41	0.089
08:00 - 09:00	17	41	0.034	17	41	0.113	17	41	0.147
09:00 - 10:00	17	41	0.037	17	41	0.048	17	41	0.085
10:00 - 11:00	17	41	0.046	17	41	0.046	17	41	0.092
11:00 - 12:00	17	41	0.044	17	41	0.064	17	41	0.108
12:00 - 13:00	17	41	0.074	17	41	0.046	17	41	0.120
13:00 - 14:00	17	41	0.037	17	41	0.061	17	41	0.098
14:00 - 15:00	17	41	0.050	17	41	0.061	17	41	0.111
15:00 - 16:00	17	41	0.061	17	41	0.037	17	41	0.098
16:00 - 17:00	17	41	0.077	17	41	0.051	17	41	0.128
17:00 - 18:00	17	41	0.114	17	41	0.068	17	41	0.182
18:00 - 19:00	17	41	0.081	17	41	0.070	17	41	0.151
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.678			0.731			1.409

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/C - FLATS PRIVATELY OWNED
LGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	17	41	0.004	17	41	0.007	17	41	0.011
08:00 - 09:00	17	41	0.006	17	41	0.009	17	41	0.015
09:00 - 10:00	17	41	0.014	17	41	0.010	17	41	0.024
10:00 - 11:00	17	41	0.009	17	41	0.011	17	41	0.020
11:00 - 12:00	17	41	0.020	17	41	0.019	17	41	0.039
12:00 - 13:00	17	41	0.009	17	41	0.007	17	41	0.016
13:00 - 14:00	17	41	0.009	17	41	0.011	17	41	0.020
14:00 - 15:00	17	41	0.010	17	41	0.011	17	41	0.021
15:00 - 16:00	17	41	0.011	17	41	0.011	17	41	0.022
16:00 - 17:00	17	41	0.004	17	41	0.010	17	41	0.014
17:00 - 18:00	17	41	0.011	17	41	0.007	17	41	0.018
18:00 - 19:00	17	41	0.009	17	41	0.010	17	41	0.019
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.116			0.123			0.239

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/C - FLATS PRIVATELY OWNED
MOTOR CYCLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS No. Days	ARRIVALS Ave. DWELLS	ARRIVALS Trip Rate	DEPARTURES No. Days	DEPARTURES Ave. DWELLS	DEPARTURES Trip Rate	TOTALS No. Days	TOTALS Ave. DWELLS	TOTALS 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	17	41	0.000	17	41	0.000	17	41	0.000
08:00 - 09:00	17	41	0.000	17	41	0.000	17	41	0.000
09:00 - 10:00	17	41	0.000	17	41	0.001	17	41	0.001
10:00 - 11:00	17	41	0.000	17	41	0.001	17	41	0.001
11:00 - 12:00	17	41	0.000	17	41	0.000	17	41	0.000
12:00 - 13:00	17	41	0.000	17	41	0.000	17	41	0.000
13:00 - 14:00	17	41	0.001	17	41	0.000	17	41	0.001
14:00 - 15:00	17	41	0.000	17	41	0.000	17	41	0.000
15:00 - 16:00	17	41	0.003	17	41	0.001	17	41	0.004
16:00 - 17:00	17	41	0.000	17	41	0.000	17	41	0.000
17:00 - 18:00	17	41	0.001	17	41	0.001	17	41	0.002
18:00 - 19:00	17	41	0.000	17	41	0.000	17	41	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.005			0.004			0.009

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

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Calculation Reference: AUDIT-638801-190719-0737

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

02	SOUTH EAST		
	ES	EAST SUSSEX	1 days
	HC	HAMPSHIRE	1 days
	KC	KENT	1 days
03	SOUTH WEST		
	DV	DEVON	2 days
04	EAST ANGLIA		
	NF	NORFOLK	2 days
	SF	SUFFOLK	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NE	NORTH EAST LINCOLNSHIRE	2 days
	NY	NORTH YORKSHIRE	5 days
09	NORTH		
	CB	CUMBRIA	1 days
10	WALES		
	PS	POWYS	2 days
11	SCOTLAND		
	AG	ANGUS	1 days
	HI	HIGHLAND	1 days
	PK	PERTH & KINROSS	1 days
12	CONNAUGHT		
	GA	GALWAY	1 days
	LT	LEITRIM	2 days
	MA	MAYO	1 days
	RO	ROSCOMMON	3 days
13	MUNSTER		
	WA	WATERFORD	1 days
14	LEINSTER		
	CC	CARLOW	1 days
	WC	WICKLOW	2 days
	WX	WEXFORD	1 days
16	ULSTER (REPUBLIC OF IRELAND)		
	CV	CAVAN	2 days
	DN	DONEGAL	4 days
17	ULSTER (NORTHERN IRELAND)		
	AN	ANTRIM	2 days

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

Secondary Filtering selection:

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

Parameter: Number of dwellings
Actual Range: 6 to 432 (units:)
Range Selected by User: 4 to 4334 (units:)

Parking Spaces Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/11 to 20/11/18

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	10 days
Tuesday	10 days
Wednesday	11 days
Thursday	4 days
Friday	7 days

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

Selected survey types:

Manual count	42 days
Directional ATC Count	0 days

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

Selected Locations:

Edge of Town Centre	7
Suburban Area (PPS6 Out of Centre)	17
Edge of Town	18

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	34
No Sub Category	8

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	42 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	13 days
5,001 to 10,000	12 days
10,001 to 15,000	11 days
15,001 to 20,000	5 days

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

Secondary Filtering selection (Cont.):

Population within 5 miles:

5,000 or Less	3 days
5,001 to 25,000	24 days
25,001 to 50,000	8 days
50,001 to 75,000	7 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	13 days
1.1 to 1.5	28 days
1.6 to 2.0	1 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	1 days
No	41 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	42 days

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

LIST OF SITES relevant to selection parameters

1 AG-03-A-01 BUNGALOWS/DET. ANGUS
KEPTIE ROAD
ARBROATH

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 7
Survey date: TUESDAY 22/05/12 Survey Type: MANUAL

2 AN-03-A-07 SEMI DETACHED/TERRACED HOUSING ANTRIM
CASTLE WAY
ANTRIM

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 55
Survey date: TUESDAY 20/12/11 Survey Type: MANUAL

3 AN-03-A-09 DETACHED & SEMI-DETACHED ANTRIM
SLOEFIELD DRIVE
CARRICKFERGUS

Edge of Town
No Sub Category
Total Number of dwellings: 151
Survey date: WEDNESDAY 12/10/16 Survey Type: MANUAL

4 CB-03-A-05 DETACHED/TERRACED HOUSING CUMBRIA
MACADAM WAY
PENRITH

Edge of Town Centre
Residential Zone
Total Number of dwellings: 50
Survey date: TUESDAY 21/06/16 Survey Type: MANUAL

5 CC-03-A-01 DETACHED HOUSES CARLOW
R417 ANTHY ROAD
CARLOW

Edge of Town
Residential Zone
Total Number of dwellings: 23
Survey date: WEDNESDAY 25/05/16 Survey Type: MANUAL

6 CV-03-A-02 DETACHED & SEMI DETACHED CAVAN
R212 DUBLIN ROAD
CAVAN
KILLYNEBBER
Edge of Town
No Sub Category
Total Number of dwellings: 80
Survey date: MONDAY 22/05/17 Survey Type: MANUAL

7 CV-03-A-03 DETACHED HOUSES CAVAN
R212 DUBLIN ROAD
CAVAN
PULLAMORE NEAR
Edge of Town
No Sub Category
Total Number of dwellings: 37
Survey date: MONDAY 22/05/17 Survey Type: MANUAL

8 DN-03-A-03 DETACHED/SEMI-DETACHED DONEGAL
THE GRANGE
LETTERKENNY
GLENCAR IRISH
Edge of Town
Residential Zone
Total Number of dwellings: 50
Survey date: MONDAY 01/09/14 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

9 DN-03-A-04 SEMI-DETACHED DONEGAL
GORTLEE ROAD
LETTERKENNY
GORTLEE
Edge of Town
Residential Zone
Total Number of dwellings: 83
Survey date: FRIDAY 26/09/14 Survey Type: MANUAL

10 DN-03-A-05 DETACHED/SEMI-DETACHED DONEGAL
GORTLEE ROAD
LETTERKENNY
GORTLEE
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 146
Survey date: WEDNESDAY 03/09/14 Survey Type: MANUAL

11 DN-03-A-06 DETACHED HOUSING DONEGAL
GLENFIN ROAD
BALLYBOFEY

Edge of Town
Residential Zone
Total Number of dwellings: 6
Survey date: WEDNESDAY 10/10/18 Survey Type: MANUAL

12 DV-03-A-02 HOUSES & BUNGALOWS DEVON
MILLHEAD ROAD
HONITON

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 116
Survey date: FRIDAY 25/09/15 Survey Type: MANUAL

13 DV-03-A-03 TERRACED & SEMI DETACHED DEVON
LOWER BRAND LANE
HONITON

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 70
Survey date: MONDAY 28/09/15 Survey Type: MANUAL

14 ES-03-A-04 MIXED HOUSES & FLATS EAST SUSSEX
NEW LYDD ROAD
CAMBER

Edge of Town
Residential Zone
Total Number of dwellings: 134
Survey date: FRIDAY 15/07/16 Survey Type: MANUAL

15 GA-03-A-04 SEMi DET. & BUNGALOWS GALWAY
R347 CAHEROYN ROAD
ATHENRY

Edge of Town Centre
Residential Zone
Total Number of dwellings: 21
Survey date: TUESDAY 09/10/12 Survey Type: MANUAL

16 HC-03-A-20 HOUSES & FLATS HAMPSHIRE
CANADA WAY
LIPHOOK

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 62
Survey date: TUESDAY 20/11/18 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

17 HI-03-A-14 SEMI-DETACHED & TERRACED HIGHLAND
KING BRUDE ROAD
INVERNESS
SCORGUIE
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 40
Survey date: WEDNESDAY 23/03/16 Survey Type: MANUAL

18 KC-03-A-07 MIXED HOUSES KENT
RECULVER ROAD
HERNE BAY

Edge of Town
Residential Zone
Total Number of dwellings: 288
Survey date: WEDNESDAY 27/09/17 Survey Type: MANUAL

19 LT-03-A-01 SEMI-DETACHED & DETACHED LEITRIM
ARD NA SI
CARRICK-ON-SHANNON
ATTIRORY
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 90
Survey date: FRIDAY 24/04/15 Survey Type: MANUAL

20 LT-03-A-02 BUNGALOWS LEITRIM
ARD ÁLAINN
CARRICK-ON-SHANNON
GALLOW'S HILL
Edge of Town Centre
Residential Zone
Total Number of dwellings: 10
Survey date: MONDAY 22/05/17 Survey Type: MANUAL

21 MA-03-A-01 SEMI-DET. & TERRACED MAYO
N26 STATION ROAD
BALLINA

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 74
Survey date: FRIDAY 15/07/11 Survey Type: MANUAL

22 NE-03-A-02 SEMI DETACHED & DETACHED NORTH EAST LINCOLNSHIRE
HANOVER WALK
SCUNTHORPE

Edge of Town
No Sub Category
Total Number of dwellings: 432
Survey date: MONDAY 12/05/14 Survey Type: MANUAL

23 NE-03-A-03 PRIVATE HOUSES NORTH EAST LINCOLNSHIRE
STATION ROAD
SCUNTHORPE

Edge of Town Centre
Residential Zone
Total Number of dwellings: 180
Survey date: TUESDAY 20/05/14 Survey Type: MANUAL

24 NF-03-A-01 SEMI DET. & BUNGALOWS NORFOLK
YARMOUTH ROAD
CAISTER-ON-SEA

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 27
Survey date: TUESDAY 16/10/12 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

25 NF-03-A-03 DETACHED HOUSES NORFOLK
HALING WAY
THETFORD

Edge of Town
Residential Zone
Total Number of dwellings: 10
Survey date: WEDNESDAY 16/09/15 Survey Type: MANUAL

26 NY-03-A-06 BUNGALOWS & SEMI DET. NORTH YORKSHIRE
HORSEFAIR
BOROUGHBRIDGE

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 115
Survey date: FRIDAY 14/10/11 Survey Type: MANUAL

27 NY-03-A-07 DETACHED & SEMI DET. NORTH YORKSHIRE
CRAVEN WAY
BOROUGHBRIDGE

Edge of Town
No Sub Category
Total Number of dwellings: 23
Survey date: TUESDAY 18/10/11 Survey Type: MANUAL

28 NY-03-A-11 PRIVATE HOUSING NORTH YORKSHIRE
HORSEFAIR
BOROUGHBRIDGE

Edge of Town
Residential Zone
Total Number of dwellings: 23
Survey date: WEDNESDAY 18/09/13 Survey Type: MANUAL

29 NY-03-A-12 TOWN HOUSES NORTH YORKSHIRE
RACECOURSE LANE
NORTHALLERTON

Edge of Town Centre
Residential Zone
Total Number of dwellings: 47
Survey date: TUESDAY 27/09/16 Survey Type: MANUAL

30 NY-03-A-13 TERRACED HOUSES NORTH YORKSHIRE
CATTERICK ROAD
CATTERICK GARRISON
OLD HOSPITAL COMPOUND
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 10
Survey date: WEDNESDAY 10/05/17 Survey Type: MANUAL

31 PK-03-A-01 DETAC. & BUNGALOWS PERTH & KINROSS
TULLYLUMB TERRACE
PERTH
CORNHILL
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 36
Survey date: WEDNESDAY 11/05/11 Survey Type: MANUAL

32 PS-03-A-01 MIXED HOUSES POWYS
BRYN GLAS
WELSHPOOL

Edge of Town Centre
Residential Zone
Total Number of dwellings: 16
Survey date: MONDAY 11/05/15 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

33 PS-03-A-02 DETACHED/SEMI-DETACHED POWYS
GUNROG ROAD
WELSHPOOL

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 28
Survey date: MONDAY *11/05/15* *Survey Type: MANUAL*

34 RO-03-A-02 SEMI DET. & BUNGALOWS ROSCOMMON
SLIGO ROAD
BALLAGHADERREEN

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 31
Survey date: THURSDAY *14/07/11* *Survey Type: MANUAL*

35 RO-03-A-03 DETACHED HOUSES ROSCOMMON
N61
BOYLE
GREATMEADOW
Edge of Town
No Sub Category
Total Number of dwellings: 23
Survey date: THURSDAY *25/09/14* *Survey Type: MANUAL*

36 RO-03-A-04 SEMI DET. & BUNGALOWS ROSCOMMON
EAGLE COURT
ROSCOMMON
ARDNANAGH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 39
Survey date: FRIDAY *26/09/14* *Survey Type: MANUAL*

37 SF-03-A-05 DETACHED HOUSES SUFFOLK
VALE LANE
BURY ST EDMUNDS

Edge of Town
Residential Zone
Total Number of dwellings: 18
Survey date: WEDNESDAY *09/09/15* *Survey Type: MANUAL*

38 SH-03-A-05 SEMI-DETACHED/TERRACED SHROPSHIRE
SANDCROFT
TELFORD
SUTTON HILL
Edge of Town
Residential Zone
Total Number of dwellings: 54
Survey date: THURSDAY *24/10/13* *Survey Type: MANUAL*

39 WA-03-A-04 DETACHED WATERFORD
MAYPARK LANE
WATERFORD

Edge of Town
Residential Zone
Total Number of dwellings: 280
Survey date: TUESDAY *24/06/14* *Survey Type: MANUAL*

40 WC-03-A-01 DETACHED HOUSES WICKLOW
STATION ROAD
WICKLOW
CORPORATION MURRAGH
Edge of Town
No Sub Category
Total Number of dwellings: 50
Survey date: MONDAY *28/05/18* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

41 WC-03-A-02 DETACHED HOUSES WICKLOW
MARLTON ROAD
WICKLOW
FRIARSHILL
Edge of Town Centre
Residential Zone
Total Number of dwellings: 45
Survey date: MONDAY *28/05/18* *Survey Type: MANUAL*

42 WX-03-A-01 SEMI-DETACHED WEXFORD
CLONARD ROAD
WEXFORD

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total Number of dwellings: 34
Survey date: THURSDAY *25/09/14* *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

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	42	74	0.056	42	74	0.216	42	74	0.272
08:00 - 09:00	42	74	0.154	42	74	0.422	42	74	0.576
09:00 - 10:00	42	74	0.178	42	74	0.198	42	74	0.376
10:00 - 11:00	42	74	0.146	42	74	0.177	42	74	0.323
11:00 - 12:00	42	74	0.144	42	74	0.171	42	74	0.315
12:00 - 13:00	42	74	0.198	42	74	0.182	42	74	0.380
13:00 - 14:00	42	74	0.198	42	74	0.203	42	74	0.401
14:00 - 15:00	42	74	0.223	42	74	0.226	42	74	0.449
15:00 - 16:00	42	74	0.290	42	74	0.198	42	74	0.488
16:00 - 17:00	42	74	0.312	42	74	0.200	42	74	0.512
17:00 - 18:00	42	74	0.363	42	74	0.211	42	74	0.574
18:00 - 19:00	42	74	0.291	42	74	0.220	42	74	0.511
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.553			2.624			5.177

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

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

Parameter summary

Trip rate parameter range selected:	6 - 432 (units:)
Survey date date range:	01/01/11 - 20/11/18
Number of weekdays (Monday-Friday):	42
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	5
Surveys manually removed from selection:	0

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

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
TAXIS
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	42	74	0.002	42	74	0.002	42	74	0.004
08:00 - 09:00	42	74	0.004	42	74	0.004	42	74	0.008
09:00 - 10:00	42	74	0.002	42	74	0.002	42	74	0.004
10:00 - 11:00	42	74	0.001	42	74	0.001	42	74	0.002
11:00 - 12:00	42	74	0.005	42	74	0.004	42	74	0.009
12:00 - 13:00	42	74	0.003	42	74	0.003	42	74	0.006
13:00 - 14:00	42	74	0.003	42	74	0.003	42	74	0.006
14:00 - 15:00	42	74	0.001	42	74	0.002	42	74	0.003
15:00 - 16:00	42	74	0.003	42	74	0.003	42	74	0.006
16:00 - 17:00	42	74	0.004	42	74	0.004	42	74	0.008
17:00 - 18:00	42	74	0.003	42	74	0.003	42	74	0.006
18:00 - 19:00	42	74	0.004	42	74	0.004	42	74	0.008
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.035			0.035			0.070

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
OGVS
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	42	74	0.001	42	74	0.002	42	74	0.003
08:00 - 09:00	42	74	0.003	42	74	0.002	42	74	0.005
09:00 - 10:00	42	74	0.004	42	74	0.003	42	74	0.007
10:00 - 11:00	42	74	0.003	42	74	0.003	42	74	0.006
11:00 - 12:00	42	74	0.002	42	74	0.002	42	74	0.004
12:00 - 13:00	42	74	0.000	42	74	0.001	42	74	0.001
13:00 - 14:00	42	74	0.001	42	74	0.001	42	74	0.002
14:00 - 15:00	42	74	0.002	42	74	0.003	42	74	0.005
15:00 - 16:00	42	74	0.002	42	74	0.002	42	74	0.004
16:00 - 17:00	42	74	0.002	42	74	0.002	42	74	0.004
17:00 - 18:00	42	74	0.001	42	74	0.000	42	74	0.001
18:00 - 19:00	42	74	0.000	42	74	0.000	42	74	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.021			0.021			0.042

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
PSVS
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	42	74	0.000	42	74	0.000	42	74	0.000
08:00 - 09:00	42	74	0.005	42	74	0.005	42	74	0.010
09:00 - 10:00	42	74	0.000	42	74	0.000	42	74	0.000
10:00 - 11:00	42	74	0.000	42	74	0.000	42	74	0.000
11:00 - 12:00	42	74	0.001	42	74	0.001	42	74	0.002
12:00 - 13:00	42	74	0.000	42	74	0.000	42	74	0.000
13:00 - 14:00	42	74	0.000	42	74	0.000	42	74	0.000
14:00 - 15:00	42	74	0.002	42	74	0.002	42	74	0.004
15:00 - 16:00	42	74	0.003	42	74	0.003	42	74	0.006
16:00 - 17:00	42	74	0.000	42	74	0.001	42	74	0.001
17:00 - 18:00	42	74	0.000	42	74	0.000	42	74	0.000
18:00 - 19:00	42	74	0.000	42	74	0.000	42	74	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.011			0.012			0.023

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
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	42	74	0.001	42	74	0.007	42	74	0.008
08:00 - 09:00	42	74	0.002	42	74	0.006	42	74	0.008
09:00 - 10:00	42	74	0.001	42	74	0.002	42	74	0.003
10:00 - 11:00	42	74	0.004	42	74	0.004	42	74	0.008
11:00 - 12:00	42	74	0.004	42	74	0.002	42	74	0.006
12:00 - 13:00	42	74	0.003	42	74	0.003	42	74	0.006
13:00 - 14:00	42	74	0.004	42	74	0.004	42	74	0.008
14:00 - 15:00	42	74	0.004	42	74	0.004	42	74	0.008
15:00 - 16:00	42	74	0.005	42	74	0.004	42	74	0.009
16:00 - 17:00	42	74	0.007	42	74	0.003	42	74	0.010
17:00 - 18:00	42	74	0.007	42	74	0.005	42	74	0.012
18:00 - 19:00	42	74	0.004	42	74	0.004	42	74	0.008
19:00 - 20:00	1	7	0.000	1	7	0.000	1	7	0.000
20:00 - 21:00	1	7	0.000	1	7	0.000	1	7	0.000
21:00 - 22:00	1	7	0.000	1	7	0.000	1	7	0.000
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.046			0.048			0.094

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.*

Calculation Reference: AUDIT-638801-190719-0718

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : D - AFFORDABLE/LOCAL AUTHORITY FLATS
VEHICLES

Selected regions and areas:

07	YORKSHIRE & NORTH LINCOLNSHIRE		
	WY	WEST YORKSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	1 days
11	SCOTLAND		
	DU	DUNDEE CITY	1 days
12	CONNAUGHT		
	RO	ROSCOMMON	1 days
17	ULSTER (NORTHERN IRELAND)		
	AN	ANTRIM	1 days
	DO	DOWN	1 days

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

Secondary Filtering selection:

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

Parameter: Number of dwellings
Actual Range: 12 to 56 (units:)
Range Selected by User: 6 to 234 (units:)

Parking Spaces Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/11 to 07/10/16

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

Selected survey days:

Wednesday	1 days
Thursday	4 days
Friday	1 days

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

Selected survey types:

Manual count	6 days
Directional ATC Count	0 days

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

Selected Locations:

Edge of Town Centre	1
Suburban Area (PPS6 Out of Centre)	4
Edge of Town	1

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

Selected Location Sub Categories:

Residential Zone	6

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	6 days

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

Population within 1 mile:

1,001 to 5,000	5 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:

5,000 or Less	1 days
5,001 to 25,000	2 days
25,001 to 50,000	2 days
100,001 to 125,000	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	2 days
1.1 to 1.5	4 days

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

Travel Plan:

No	6 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	6 days

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

LIST OF SITES relevant to selection parameters

1 AN-03-D-03 FLATS & BUNGALOWS ANTRIM
BELFAST ROAD
CARRICKFERGUS
WEST DIVISION
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 37
Survey date: WEDNESDAY 07/12/11 Survey Type: MANUAL

2 CH-03-D-01 BLOCK OF FLATS CHESHIRE
HEATH LANE
CHESTER
BOUGHTON HEATH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 30
Survey date: THURSDAY 24/05/12 Survey Type: MANUAL

3 DO-03-D-01 BLOCK OF FLATS DOWN
CHURCH STREET
NEWTOWNARDS

Edge of Town Centre
Residential Zone
Total Number of dwellings: 20
Survey date: THURSDAY 17/11/11 Survey Type: MANUAL

4 DU-03-D-01 FLATS IN HOUSES DUNDEE CITY
JUBILEE PARK
NEAR DUNDEE
LETHAM
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 17
Survey date: FRIDAY 06/05/11 Survey Type: MANUAL

5 RO-03-D-01 FLATS ROSCOMMON
CIRCULAR ROAD
BALLAGHADEREEN

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 12
Survey date: THURSDAY 14/07/11 Survey Type: MANUAL

6 WY-03-D-03 BLOCK OF FLATS WEST YORKSHIRE
CARR STREET
HECKMONDWIKE
LIVERSEDGE
Edge of Town
Residential Zone
Total Number of dwellings: 56
Survey date: THURSDAY 01/05/14 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/D - AFFORDABLE/LOCAL AUTHORITY FLATS
VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	29	0.052	6	29	0.093	6	29	0.145
08:00 - 09:00	6	29	0.151	6	29	0.145	6	29	0.296
09:00 - 10:00	6	29	0.157	6	29	0.157	6	29	0.314
10:00 - 11:00	6	29	0.174	6	29	0.215	6	29	0.389
11:00 - 12:00	6	29	0.134	6	29	0.157	6	29	0.291
12:00 - 13:00	6	29	0.203	6	29	0.151	6	29	0.354
13:00 - 14:00	6	29	0.151	6	29	0.134	6	29	0.285
14:00 - 15:00	6	29	0.203	6	29	0.192	6	29	0.395
15:00 - 16:00	6	29	0.134	6	29	0.122	6	29	0.256
16:00 - 17:00	6	29	0.099	6	29	0.052	6	29	0.151
17:00 - 18:00	6	29	0.134	6	29	0.110	6	29	0.244
18:00 - 19:00	6	29	0.122	6	29	0.140	6	29	0.262
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.714			1.668			3.382

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

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

Parameter summary

Trip rate parameter range selected:	12 - 56 (units:)
Survey date date range:	01/01/11 - 07/10/16
Number of weekdays (Monday-Friday):	6
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 show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/D - AFFORDABLE/LOCAL AUTHORITY FLATS
TAXIS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	29	0.000	6	29	0.000	6	29	0.000
08:00 - 09:00	6	29	0.006	6	29	0.006	6	29	0.012
09:00 - 10:00	6	29	0.006	6	29	0.006	6	29	0.012
10:00 - 11:00	6	29	0.017	6	29	0.017	6	29	0.034
11:00 - 12:00	6	29	0.012	6	29	0.012	6	29	0.024
12:00 - 13:00	6	29	0.012	6	29	0.006	6	29	0.018
13:00 - 14:00	6	29	0.012	6	29	0.006	6	29	0.018
14:00 - 15:00	6	29	0.006	6	29	0.012	6	29	0.018
15:00 - 16:00	6	29	0.012	6	29	0.017	6	29	0.029
16:00 - 17:00	6	29	0.000	6	29	0.000	6	29	0.000
17:00 - 18:00	6	29	0.012	6	29	0.006	6	29	0.018
18:00 - 19:00	6	29	0.000	6	29	0.006	6	29	0.006
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.095			0.094			0.189

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/D - AFFORDABLE/LOCAL AUTHORITY FLATS
OGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	29	0.000	6	29	0.000	6	29	0.000
08:00 - 09:00	6	29	0.006	6	29	0.000	6	29	0.006
09:00 - 10:00	6	29	0.006	6	29	0.012	6	29	0.018
10:00 - 11:00	6	29	0.000	6	29	0.000	6	29	0.000
11:00 - 12:00	6	29	0.006	6	29	0.006	6	29	0.012
12:00 - 13:00	6	29	0.000	6	29	0.000	6	29	0.000
13:00 - 14:00	6	29	0.000	6	29	0.000	6	29	0.000
14:00 - 15:00	6	29	0.000	6	29	0.000	6	29	0.000
15:00 - 16:00	6	29	0.000	6	29	0.000	6	29	0.000
16:00 - 17:00	6	29	0.000	6	29	0.000	6	29	0.000
17:00 - 18:00	6	29	0.000	6	29	0.000	6	29	0.000
18:00 - 19:00	6	29	0.000	6	29	0.000	6	29	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.018			0.018			0.036

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/D - AFFORDABLE/LOCAL AUTHORITY FLATS
PSVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	29	0.000	6	29	0.000	6	29	0.000
08:00 - 09:00	6	29	0.000	6	29	0.000	6	29	0.000
09:00 - 10:00	6	29	0.000	6	29	0.000	6	29	0.000
10:00 - 11:00	6	29	0.000	6	29	0.000	6	29	0.000
11:00 - 12:00	6	29	0.000	6	29	0.000	6	29	0.000
12:00 - 13:00	6	29	0.000	6	29	0.000	6	29	0.000
13:00 - 14:00	6	29	0.000	6	29	0.000	6	29	0.000
14:00 - 15:00	6	29	0.006	6	29	0.006	6	29	0.012
15:00 - 16:00	6	29	0.000	6	29	0.000	6	29	0.000
16:00 - 17:00	6	29	0.000	6	29	0.000	6	29	0.000
17:00 - 18:00	6	29	0.000	6	29	0.000	6	29	0.000
18:00 - 19:00	6	29	0.000	6	29	0.000	6	29	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.006			0.006			0.012

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/D - AFFORDABLE/LOCAL AUTHORITY FLATS
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	6	29	0.000	6	29	0.000	6	29	0.000
08:00 - 09:00	6	29	0.000	6	29	0.000	6	29	0.000
09:00 - 10:00	6	29	0.000	6	29	0.006	6	29	0.006
10:00 - 11:00	6	29	0.006	6	29	0.000	6	29	0.006
11:00 - 12:00	6	29	0.006	6	29	0.006	6	29	0.012
12:00 - 13:00	6	29	0.000	6	29	0.000	6	29	0.000
13:00 - 14:00	6	29	0.000	6	29	0.000	6	29	0.000
14:00 - 15:00	6	29	0.000	6	29	0.000	6	29	0.000
15:00 - 16:00	6	29	0.000	6	29	0.000	6	29	0.000
16:00 - 17:00	6	29	0.000	6	29	0.000	6	29	0.000
17:00 - 18:00	6	29	0.000	6	29	0.000	6	29	0.000
18:00 - 19:00	6	29	0.000	6	29	0.000	6	29	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.012			0.012			0.024

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.*

Calculation Reference: AUDIT-638801-190719-0726

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

04	EAST ANGLIA		
	NF	NORFOLK	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	WY	WEST YORKSHIRE	2 days
08	NORTH WEST		
	MS	MERSEYSIDE	1 days
13	MUNSTER		
	TI	TIPPERARY	2 days

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

Secondary Filtering selection:

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

Parameter: Number of dwellings
Actual Range: 8 to 54 (units:)
Range Selected by User: 8 to 516 (units:)

Parking Spaces Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/11 to 19/10/18

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

Selected survey days:

Monday	1 days
Tuesday	2 days
Wednesday	1 days
Thursday	1 days
Friday	1 days

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

Selected survey types:

Manual count	6 days
Directional ATC Count	0 days

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

Selected Locations:

Edge of Town Centre	1
Suburban Area (PPS6 Out of Centre)	3
Edge of Town	2

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

Selected Location Sub Categories:

Residential Zone	5
Built-Up Zone	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	6 days

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

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	2 days
10,001 to 15,000	1 days
25,001 to 50,000	2 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	3 days
75,001 to 100,000	3 days

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

Car ownership within 5 miles:

0.6 to 1.0	5 days
1.1 to 1.5	1 days

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

Travel Plan:

No	6 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	6 days

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

LIST OF SITES relevant to selection parameters

1	MS-03-B-01	TERRACED	MERSEYSIDE
	TARBOCK ROAD		
	LIVERPOOL		
	SPEKE		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	16	
	Survey date: TUESDAY	*18/06/13*	*Survey Type: MANUAL*
2	NF-03-B-01	TERRACED HOUSES	NORFOLK
	NELSON ROAD NORTH		
	GREAT YARMOUTH		
	Edge of Town Centre		
	Residential Zone		
	Total Number of dwellings:	45	
	Survey date: WEDNESDAY	*13/09/17*	*Survey Type: MANUAL*
3	TI-03-B-01	MIXED HOUSES	TIPPERARY
	LIMERICK ROAD		
	NENAGH		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total Number of dwellings:	43	
	Survey date: FRIDAY	*27/05/16*	*Survey Type: MANUAL*
4	TI-03-B-02	BUNGALOWS	TIPPERARY
	STRADAVOHER		
	THURLES		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total Number of dwellings:	8	
	Survey date: MONDAY	*20/11/17*	*Survey Type: MANUAL*
5	WY-03-B-02	MIXED HOUSES	WEST YORKSHIRE
	WHITEACRE STREET		
	HUDDERSFIELD		
	DEIGHTON		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	54	
	Survey date: TUESDAY	*17/09/13*	*Survey Type: MANUAL*
6	WY-03-B-03	TERRACED HOUSES	WEST YORKSHIRE
	LINCOLN GREEN ROAD		
	LEEDS		
	Suburban Area (PPS6 Out of Centre)		
	Built-Up Zone		
	Total Number of dwellings:	29	
	Survey date: THURSDAY	*19/09/13*	*Survey Type: MANUAL*

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

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	33	0.056	6	33	0.133	6	33	0.189
08:00 - 09:00	6	33	0.149	6	33	0.272	6	33	0.421
09:00 - 10:00	6	33	0.174	6	33	0.241	6	33	0.415
10:00 - 11:00	6	33	0.164	6	33	0.149	6	33	0.313
11:00 - 12:00	6	33	0.154	6	33	0.118	6	33	0.272
12:00 - 13:00	6	33	0.123	6	33	0.118	6	33	0.241
13:00 - 14:00	6	33	0.087	6	33	0.113	6	33	0.200
14:00 - 15:00	6	33	0.149	6	33	0.154	6	33	0.303
15:00 - 16:00	6	33	0.179	6	33	0.185	6	33	0.364
16:00 - 17:00	6	33	0.164	6	33	0.133	6	33	0.297
17:00 - 18:00	6	33	0.246	6	33	0.128	6	33	0.374
18:00 - 19:00	6	33	0.159	6	33	0.092	6	33	0.251
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.804			1.836			3.640

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

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

Parameter summary

Trip rate parameter range selected:	8 - 54 (units:)
Survey date date range:	01/01/11 - 19/10/18
Number of weekdays (Monday-Friday):	6
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 show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
TAXIS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	33	0.000	6	33	0.000	6	33	0.000
08:00 - 09:00	6	33	0.005	6	33	0.005	6	33	0.010
09:00 - 10:00	6	33	0.021	6	33	0.015	6	33	0.036
10:00 - 11:00	6	33	0.010	6	33	0.021	6	33	0.031
11:00 - 12:00	6	33	0.021	6	33	0.021	6	33	0.042
12:00 - 13:00	6	33	0.015	6	33	0.010	6	33	0.025
13:00 - 14:00	6	33	0.000	6	33	0.005	6	33	0.005
14:00 - 15:00	6	33	0.015	6	33	0.010	6	33	0.025
15:00 - 16:00	6	33	0.010	6	33	0.010	6	33	0.020
16:00 - 17:00	6	33	0.010	6	33	0.010	6	33	0.020
17:00 - 18:00	6	33	0.005	6	33	0.005	6	33	0.010
18:00 - 19:00	6	33	0.010	6	33	0.010	6	33	0.020
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.122			0.122			0.244

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

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

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
OGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	33	0.005	6	33	0.005	6	33	0.010
08:00 - 09:00	6	33	0.000	6	33	0.000	6	33	0.000
09:00 - 10:00	6	33	0.000	6	33	0.000	6	33	0.000
10:00 - 11:00	6	33	0.005	6	33	0.005	6	33	0.010
11:00 - 12:00	6	33	0.000	6	33	0.000	6	33	0.000
12:00 - 13:00	6	33	0.010	6	33	0.010	6	33	0.020
13:00 - 14:00	6	33	0.000	6	33	0.000	6	33	0.000
14:00 - 15:00	6	33	0.000	6	33	0.000	6	33	0.000
15:00 - 16:00	6	33	0.005	6	33	0.005	6	33	0.010
16:00 - 17:00	6	33	0.005	6	33	0.005	6	33	0.010
17:00 - 18:00	6	33	0.000	6	33	0.000	6	33	0.000
18:00 - 19:00	6	33	0.000	6	33	0.000	6	33	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.030			0.030			0.060

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

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

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
CYCLISTS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	33	0.005	6	33	0.000	6	33	0.005
08:00 - 09:00	6	33	0.021	6	33	0.026	6	33	0.047
09:00 - 10:00	6	33	0.015	6	33	0.010	6	33	0.025
10:00 - 11:00	6	33	0.005	6	33	0.000	6	33	0.005
11:00 - 12:00	6	33	0.000	6	33	0.005	6	33	0.005
12:00 - 13:00	6	33	0.000	6	33	0.000	6	33	0.000
13:00 - 14:00	6	33	0.010	6	33	0.005	6	33	0.015
14:00 - 15:00	6	33	0.000	6	33	0.015	6	33	0.015
15:00 - 16:00	6	33	0.015	6	33	0.005	6	33	0.020
16:00 - 17:00	6	33	0.015	6	33	0.005	6	33	0.020
17:00 - 18:00	6	33	0.021	6	33	0.005	6	33	0.026
18:00 - 19:00	6	33	0.010	6	33	0.021	6	33	0.031
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.117			0.097			0.214

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.*

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
CARS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	33	0.010	6	33	0.082	6	33	0.092
08:00 - 09:00	6	33	0.056	6	33	0.108	6	33	0.164
09:00 - 10:00	6	33	0.031	6	33	0.077	6	33	0.108
10:00 - 11:00	6	33	0.067	6	33	0.041	6	33	0.108
11:00 - 12:00	6	33	0.072	6	33	0.051	6	33	0.123
12:00 - 13:00	6	33	0.036	6	33	0.036	6	33	0.072
13:00 - 14:00	6	33	0.031	6	33	0.051	6	33	0.082
14:00 - 15:00	6	33	0.036	6	33	0.067	6	33	0.103
15:00 - 16:00	6	33	0.082	6	33	0.067	6	33	0.149
16:00 - 17:00	6	33	0.097	6	33	0.041	6	33	0.138
17:00 - 18:00	6	33	0.133	6	33	0.041	6	33	0.174
18:00 - 19:00	6	33	0.062	6	33	0.051	6	33	0.113
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.713			0.713			1.426

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

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

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
LGVS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	33	0.005	6	33	0.000	6	33	0.005
08:00 - 09:00	6	33	0.010	6	33	0.010	6	33	0.020
09:00 - 10:00	6	33	0.015	6	33	0.026	6	33	0.041
10:00 - 11:00	6	33	0.010	6	33	0.021	6	33	0.031
11:00 - 12:00	6	33	0.021	6	33	0.015	6	33	0.036
12:00 - 13:00	6	33	0.010	6	33	0.005	6	33	0.015
13:00 - 14:00	6	33	0.005	6	33	0.010	6	33	0.015
14:00 - 15:00	6	33	0.021	6	33	0.021	6	33	0.042
15:00 - 16:00	6	33	0.005	6	33	0.015	6	33	0.020
16:00 - 17:00	6	33	0.005	6	33	0.005	6	33	0.010
17:00 - 18:00	6	33	0.021	6	33	0.021	6	33	0.042
18:00 - 19:00	6	33	0.021	6	33	0.000	6	33	0.021
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.149			0.149			0.298

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

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

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
MOTOR CYCLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	6	33	0.000	6	33	0.000	6	33	0.000
08:00 - 09:00	6	33	0.000	6	33	0.005	6	33	0.005
09:00 - 10:00	6	33	0.000	6	33	0.000	6	33	0.000
10:00 - 11:00	6	33	0.000	6	33	0.000	6	33	0.000
11:00 - 12:00	6	33	0.005	6	33	0.000	6	33	0.005
12:00 - 13:00	6	33	0.000	6	33	0.000	6	33	0.000
13:00 - 14:00	6	33	0.005	6	33	0.000	6	33	0.005
14:00 - 15:00	6	33	0.000	6	33	0.005	6	33	0.005
15:00 - 16:00	6	33	0.000	6	33	0.005	6	33	0.005
16:00 - 17:00	6	33	0.005	6	33	0.000	6	33	0.005
17:00 - 18:00	6	33	0.000	6	33	0.000	6	33	0.000
18:00 - 19:00	6	33	0.000	6	33	0.000	6	33	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.015			0.015			0.030

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

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APPENDIX C

ARCADY Output Files

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction 3 AM Peak Hour.j9
Path: G:\2018\p180176\calcs\arcady
Report generation date: 23/08/2019 11:55:49

Summary of junction performance

	AM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
AM Peak Hour - 2021 Do-Nothing					
Arm A	4.8	14.74	0.84	B	-8 % [Arm C]
Arm B	4.5	52.27	0.84	F	
Arm C	5.0	53.10	0.86	F	
Arm D	1.6	27.83	0.63	D	
AM Peak Hour - 2026 Do-Nothing					
Arm A	8.6	24.88	0.91	C	-15 % [Arm C]
Arm B	10.4	109.26	0.97	F	
Arm C	9.6	92.45	0.95	F	
Arm D	2.1	34.13	0.69	D	
AM Peak Hour - 2036 Do-Nothing					
Arm A	26.5	65.77	1.00	F	-22 % [Arm C]
Arm B	29.6	260.65	1.14	F	
Arm C	22.0	179.49	1.06	F	
Arm D	3.0	44.04	0.77	E	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

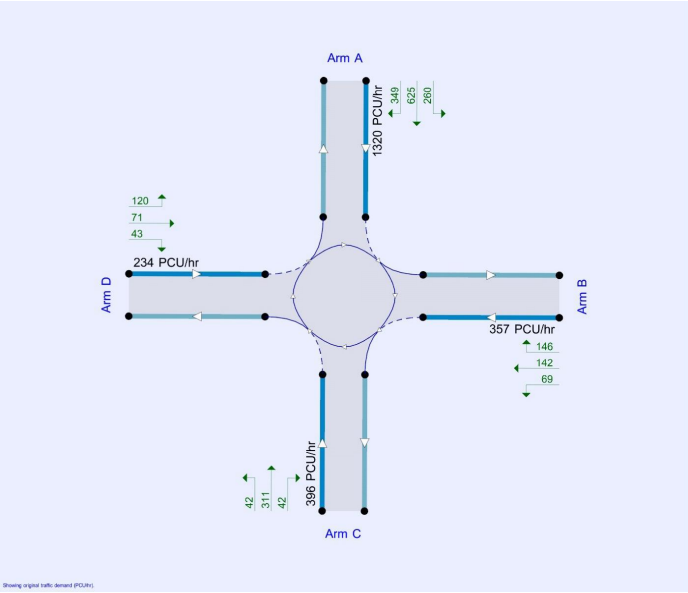
File summary

File Description

Title	Lissywollen Residential Development
Location	N55 / Brawney Road / R915 / One Mile Road
Site number	3
Date	23/08/2019
Version	
Status	Planning
Identifier	
Client	Alanna
Jobnumber	180176
Enumerator	HEADOFFICE\mckennam
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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2021 Do-Nothing	AM	ONE HOUR	08:15	09:45	15	✓
2026 Do-Nothing	AM	ONE HOUR	08:15	09:45	15	✓
2036 Do-Nothing	AM	ONE HOUR	08:15	09:45	15	✓

AM Peak Hour - 2021 Do-Nothing, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	28.46	D

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-8	Arm C

Arms

Arms

Arm	Name	Description
A	N55	
B	Brawney Rd	
C	R915	
D	One Mile Road	

Capacity Options

Arm	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Assume flat start profile	Initial queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00
D	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	7.00	7.90	25.0	18.0	48.0	31.0	
B	3.40	5.70	3.6	17.0	48.0	38.0	
C	4.00	6.20	17.7	13.0	48.0	25.0	
D	3.80	7.30	6.3	28.0	48.0	25.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.738	2344.469
B	0.513	1213.291
C	0.609	1673.745
D	0.603	1581.201

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
A	Percentage		65.50
B	Percentage		57.25
C	Percentage		33.75
D	Percentage		27.50

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2021 Do-Nothing	AM	ONE HOUR	08:15	09:45	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1112.00	100.000
B		ONE HOUR	✓	301.00	100.000
C		ONE HOUR	✓	333.00	100.000
D		ONE HOUR	✓	197.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	72.000	219.000	527.000	294.000
	B	123.000	0.000	58.000	120.000
	C	262.000	35.000	1.000	35.000
	D	101.000	60.000	36.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.06	0.20	0.47	0.26
	B	0.41	0.00	0.19	0.40
	C	0.79	0.11	0.00	0.11
	D	0.51	0.30	0.18	0.00

Generated on 23/08/2019 11:56:17 using Junctions 9 (9.0.0.4211)

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.84	14.74	4.8	B	1020.39	1530.59
B	0.84	52.27	4.5	F	276.20	414.30
C	0.86	53.10	5.0	F	305.57	458.35
D	0.63	27.83	1.6	D	180.77	271.16

Main Results for each time segment

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	837.17	209.29	97.66	1488.42	0.562	832.10	413.65	0.0	1.3	5.445	A
B	226.61	56.65	695.60	490.35	0.462	223.26	234.16	0.0	0.8	13.321	B
C	250.70	62.67	454.12	471.51	0.532	246.32	464.75	0.0	1.1	15.702	C
D	148.31	37.08	365.55	374.19	0.396	145.76	334.90	0.0	0.6	15.594	C

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	999.67	249.92	117.80	1478.69	0.676	996.59	497.57	1.3	2.0	7.420	A
B	270.59	67.65	833.36	449.89	0.601	268.20	281.02	0.8	1.4	19.547	C
C	299.36	74.84	544.53	452.92	0.661	296.44	557.03	1.1	1.8	22.567	C
D	177.10	44.27	439.40	361.94	0.489	175.96	401.57	0.6	0.9	19.230	C

Generated on 23/08/2019 11:56:17 using Junctions 9 (9.0.0.4211)

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1224.33	306.08	142.98	1466.52	0.835	1213.93	600.10	2.0	4.6	13.711	B
B	331.41	82.85	1015.10	396.53	0.836	321.33	341.81	1.4	4.0	43.067	E
C	366.64	91.66	658.97	429.39	0.854	356.23	677.47	1.8	4.4	43.884	E
D	216.90	54.23	528.70	347.13	0.625	214.38	486.50	0.9	1.6	26.595	D

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1224.33	306.08	144.94	1465.57	0.835	1223.53	611.43	4.6	4.8	14.744	B
B	331.41	82.85	1023.24	394.14	0.841	329.31	345.23	4.0	4.5	52.265	F
C	366.64	91.66	668.56	427.42	0.858	364.24	683.99	4.4	5.0	53.097	F
D	216.90	54.23	539.74	345.30	0.628	216.63	493.06	1.6	1.6	27.834	D

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	999.67	249.92	121.09	1477.09	0.677	1010.44	517.32	4.8	2.1	7.885	A
B	270.59	67.65	845.18	446.42	0.606	282.00	286.35	4.5	1.6	23.219	C
C	299.36	74.84	560.23	449.69	0.666	310.91	566.95	5.0	2.1	27.731	D
D	177.10	44.27	458.90	358.71	0.494	179.52	412.25	1.6	1.0	20.354	C

Main results: (09:30-09:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	837.17	209.29	100.44	1487.08	0.563	840.53	425.20	2.1	1.3	5.596	A
B	226.61	56.65	703.11	488.14	0.464	229.55	237.87	1.6	0.9	14.072	B
C	250.70	62.67	461.97	469.90	0.534	254.51	470.69	2.1	1.2	16.994	C
D	148.31	37.08	375.99	372.46	0.398	149.65	340.49	1.0	0.7	16.255	C

Generated on 23/08/2019 11:56:17 using Junctions 9 (9.0.0.4211)

AM Peak Hour - 2026 Do-Nothing, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	50.48	F

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 Do-Nothing	AM	ONE HOUR	08:15	09:45	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1204.00	100.000
B		ONE HOUR	✓	326.00	100.000
C		ONE HOUR	✓	361.00	100.000
D		ONE HOUR	✓	214.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	78.000	237.000	570.000	319.000
	B	133.000	0.000	63.000	130.000
	C	284.000	38.000	1.000	38.000
	D	110.000	65.000	39.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.06	0.20	0.47	0.26
	B	0.41	0.00	0.19	0.40
	C	0.79	0.11	0.00	0.11
	D	0.51	0.30	0.18	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.91	24.88	8.6	C	1104.81	1657.22
B	0.97	109.26	10.4	F	299.14	448.71
C	0.95	92.45	9.6	F	331.26	496.89
D	0.69	34.13	2.1	D	196.37	294.56

Main Results for each time segment

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	906.43	226.61	105.62	1484.57	0.611	900.27	447.60	0.0	1.5	6.099	A
B	245.43	61.36	752.61	473.61	0.518	241.28	253.28	0.0	1.0	15.240	C
C	271.78	67.94	491.50	463.83	0.586	266.38	502.39	0.0	1.3	17.789	C
D	161.11	40.28	395.10	369.29	0.436	158.12	362.78	0.0	0.7	16.824	C

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1082.37	270.59	127.35	1474.07	0.734	1077.87	537.81	1.5	2.7	8.982	A
B	293.07	73.27	901.37	429.92	0.682	289.31	303.85	1.0	2.0	24.934	C
C	324.53	81.13	588.81	443.82	0.731	320.10	601.87	1.3	2.5	28.082	D
D	192.38	48.10	474.27	356.16	0.540	190.89	434.64	0.7	1.1	21.574	C

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1325.63	331.41	153.59	1461.39	0.907	1305.04	638.23	2.7	7.8	20.723	C
B	358.93	89.73	1091.49	374.10	0.959	336.46	367.14	2.0	7.6	71.221	F
C	397.47	99.37	701.75	420.60	0.945	377.68	726.20	2.5	7.4	64.529	F
D	235.62	58.90	559.74	341.98	0.689	232.08	519.70	1.1	2.0	31.717	D

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1325.63	331.41	156.24	1460.11	0.908	1322.39	654.05	7.8	8.6	24.882	C
B	358.93	89.73	1106.01	369.83	0.971	347.58	372.62	7.6	10.4	109.259	F
C	397.47	99.37	716.45	417.57	0.952	388.61	737.14	7.4	9.6	92.451	F
D	235.62	58.90	575.18	339.42	0.694	235.11	529.88	2.0	2.1	34.126	D

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1082.37	270.59	132.91	1471.38	0.736	1105.31	579.88	8.6	2.9	10.403	B
B	293.07	73.27	924.38	423.17	0.693	324.80	313.85	10.4	2.5	44.651	E
C	324.53	81.13	626.49	436.07	0.744	349.75	622.69	9.6	3.3	48.751	E
D	192.38	48.10	517.05	349.06	0.551	195.75	459.19	2.1	1.3	23.968	C

Main results: (09:30-09:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	906.43	226.61	109.38	1482.76	0.611	911.59	464.73	2.9	1.6	6.360	A
B	245.43	61.36	762.63	470.66	0.521	250.92	258.33	2.5	1.1	16.762	C
C	271.78	67.94	503.01	461.46	0.589	279.02	510.54	3.3	1.5	20.437	C
D	161.11	40.28	411.07	366.64	0.439	163.04	370.96	1.3	0.8	17.844	C

AM Peak Hour - 2036 Do-Nothing, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	113.24	F

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2036 Do-Nothing	AM	ONE HOUR	08:15	09:45	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1320.00	100.000
B		ONE HOUR	✓	357.00	100.000
C		ONE HOUR	✓	396.00	100.000
D		ONE HOUR	✓	234.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	86.000	260.000	625.000	349.000
	B	146.000	0.000	69.000	142.000
	C	311.000	42.000	1.000	42.000
	D	120.000	71.000	43.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.07	0.20	0.47	0.26
	B	0.41	0.00	0.19	0.40
	C	0.79	0.11	0.00	0.11
	D	0.51	0.30	0.18	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	1.00	65.77	26.5	F	1211.26	1816.88
B	1.14	260.65	29.6	F	327.59	491.38
C	1.06	179.49	22.0	F	363.38	545.06
D	0.77	44.04	3.0	E	214.72	322.08

Main Results for each time segment

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	993.77	248.44	115.66	1479.72	0.672	985.78	488.90	0.0	2.0	7.178	A
B	268.77	67.19	824.06	452.63	0.594	263.21	277.39	0.0	1.4	18.510	C
C	298.13	74.53	537.20	454.43	0.656	291.01	550.07	0.0	1.8	21.212	C
D	176.17	44.04	432.01	363.17	0.485	172.55	396.19	0.0	0.9	18.558	C

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1186.65	296.66	139.27	1468.31	0.808	1178.85	585.23	2.0	3.9	12.114	B
B	320.94	80.23	985.81	405.13	0.792	313.66	332.31	1.4	3.2	36.692	E
C	356.00	89.00	641.52	432.98	0.822	348.05	657.95	1.8	3.8	39.014	E
D	210.36	52.59	516.21	349.20	0.602	208.29	473.35	0.9	1.4	25.153	D

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1453.35	363.34	165.84	1455.46	0.999	1393.91	668.95	3.9	18.8	39.651	E
B	393.06	98.27	1166.73	352.00	1.117	338.78	393.02	3.2	16.8	131.094	F
C	436.00	109.00	732.66	414.24	1.053	394.93	772.85	3.8	14.0	103.092	F
D	257.64	64.41	582.40	338.22	0.762	252.39	545.18	1.4	2.7	39.581	E

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1453.35	363.34	168.95	1453.96	1.000	1422.44	681.55	18.8	26.5	65.767	F
B	393.06	98.27	1190.46	345.04	1.139	341.84	400.94	16.8	29.6	260.654	F
C	436.00	109.00	744.53	411.80	1.059	404.20	787.77	14.0	22.0	179.490	F
D	257.64	64.41	593.80	336.33	0.766	256.70	554.92	2.7	3.0	44.045	E

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1186.65	296.66	148.46	1463.87	0.811	1274.05	660.45	26.5	4.7	25.643	D
B	320.94	80.23	1063.64	382.27	0.840	369.78	358.87	29.6	17.4	231.161	F
C	356.00	89.00	718.17	417.22	0.853	402.28	715.25	22.0	10.4	156.659	F
D	210.36	52.59	593.84	336.32	0.625	215.06	526.60	3.0	1.8	30.723	D

Main results: (09:30-09:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	993.77	248.44	123.20	1476.08	0.673	1004.05	552.72	4.7	2.1	7.786	A
B	268.77	67.19	840.04	447.93	0.600	331.80	287.21	17.4	1.6	46.119	E
C	298.13	74.53	598.55	441.81	0.675	330.72	573.29	10.4	2.3	39.508	E
D	176.17	44.04	496.75	352.43	0.500	179.17	432.52	1.8	1.0	21.121	C

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction 3 PM Peak Hour.j9
Path: G:\2018\p180176\calcs\arcady
Report generation date: 23/08/2019 11:52:40

»PM Peak Hour - 2021 Do-Nothing, PM
»PM Peak Hour - 2026 Do-Nothing, PM
»PM Peak Hour - 2036 Do-Nothing, PM

Summary of junction performance

	PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	PM Peak Hour - 2021 Do-Nothing				
Arm A	3.2	10.63	0.77	B	-14 %
Arm B	3.5	58.53	0.80	F	
Arm C	4.5	30.23	0.83	D	[Arm D]
Arm D	2.5	52.90	0.73	F	
	PM Peak Hour - 2026 Do-Nothing				
Arm A	4.7	14.69	0.83	B	-20 %
Arm B	6.8	104.73	0.92	F	
Arm C	8.8	54.84	0.92	F	[Arm D]
Arm D	3.5	71.03	0.81	F	
	PM Peak Hour - 2036 Do-Nothing				
Arm A	9.1	26.66	0.91	D	-27 %
Arm B	18.7	241.02	1.10	F	
Arm C	25.1	130.07	1.04	F	[Arm D]
Arm D	5.7	106.21	0.90	F	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

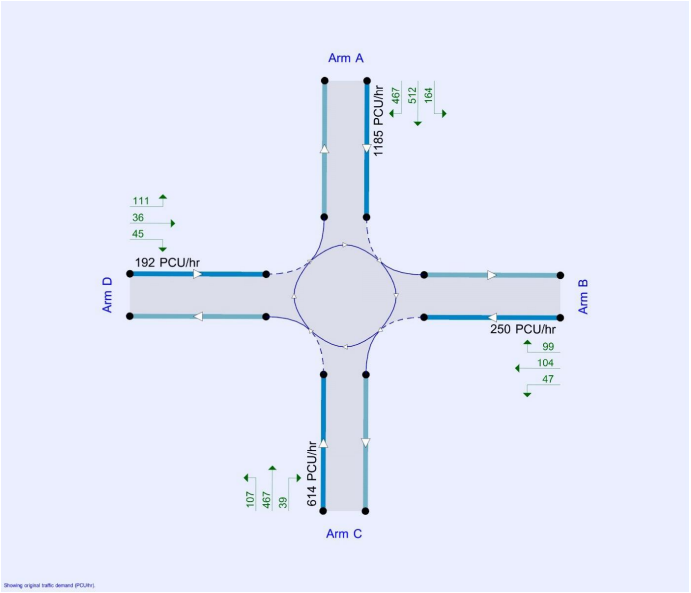
File summary

File Description

Title	Lissywollen Residential Development
Location	N55 / Brawney Road / R915 / One Mile Road
Site number	3
Date	23/08/2019
Version	
Status	Planning
Identifier	
Client	Alanna
Jobnumber	180176
Enumerator	HEADOFFICE"mckennam
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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2021 Do-Nothing	PM	ONE HOUR	16:45	18:15	15	✓
2026 Do-Nothing	PM	ONE HOUR	16:45	18:15	15	✓
2036 Do-Nothing	PM	ONE HOUR	16:45	18:15	15	✓

PM Peak Hour - 2021 Do-Nothing, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	PM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	24.98	C

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-14	Arm D

Arms

Arms

Arm	Name	Description
A	N55	
B	Brawney Rd	
C	R915	
D	One Mile Road	

Capacity Options

Arm	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Assume flat start profile	Initial queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00
D	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	7.00	7.90	25.0	18.0	48.0	31.0	
B	3.40	5.70	3.6	17.0	48.0	38.0	
C	4.00	6.20	17.7	13.0	48.0	25.0	
D	3.80	7.30	6.3	28.0	48.0	25.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.738	2344.469
B	0.513	1213.291
C	0.609	1673.745
D	0.603	1581.201

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
A	Percentage		63.50
B	Percentage		41.00
C	Percentage		53.75
D	Percentage		20.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2021 Do-Nothing	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	998.00	100.000
B		ONE HOUR	✓	211.00	100.000
C		ONE HOUR	✓	517.00	100.000
D		ONE HOUR	✓	162.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	35.000	138.000	432.000	393.000
	B	84.000	0.000	39.000	88.000
	C	393.000	33.000	1.000	90.000
	D	94.000	30.000	38.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.04	0.14	0.43	0.39
	B	0.40	0.00	0.18	0.42
	C	0.76	0.06	0.00	0.17
	D	0.58	0.19	0.23	0.00

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C	D
A	0	0	0	0
B	0	0	0	0
C	0	0	0	0
D	0	0	0	0

Average PCU Per Veh

From \ To	A	B	C	D
A	1.000	1.000	1.000	1.000
B	1.000	1.000	1.000	1.000
C	1.000	1.000	1.000	1.000
D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.77	10.63	3.2	B	915.78	1373.67
B	0.80	58.53	3.5	F	193.62	290.43
C	0.83	30.23	4.5	D	474.41	711.61
D	0.73	52.90	2.5	F	148.65	222.98

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	751.35	187.84	75.17	1453.51	0.517	747.12	449.80	0.0	1.1	5.066	A
B	158.85	39.71	672.41	356.04	0.446	155.74	149.88	0.0	0.8	17.715	C
C	389.22	97.31	447.36	753.14	0.517	385.04	380.79	0.0	1.0	9.675	A
D	121.96	30.49	406.22	267.23	0.456	118.76	426.19	0.0	0.8	23.777	C

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	897.18	224.30	90.82	1446.18	0.620	894.99	540.86	1.1	1.6	6.505	A
B	189.68	47.42	805.90	327.97	0.578	187.63	179.91	0.8	1.3	25.267	D
C	464.77	116.19	536.77	723.86	0.642	462.06	456.76	1.0	1.7	13.606	B
D	145.63	36.41	487.71	257.40	0.566	143.97	511.13	0.8	1.2	31.240	D

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1098.82	274.70	109.89	1437.24	0.765	1092.83	654.16	1.6	3.1	10.273	B
B	232.32	58.08	983.65	290.59	0.799	224.88	219.07	1.3	3.2	49.889	E
C	569.23	142.31	651.98	686.14	0.830	559.45	556.54	1.7	4.2	26.549	D
D	178.37	44.59	589.91	245.07	0.728	174.14	621.52	1.2	2.3	47.942	E

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1098.82	274.70	111.89	1436.30	0.765	1098.52	665.12	3.1	3.2	10.631	B
B	232.32	58.08	989.38	289.39	0.803	230.86	221.03	3.2	3.5	58.534	F
C	569.23	142.31	659.30	683.74	0.833	567.82	560.94	4.2	4.5	30.228	D
D	178.37	44.59	599.40	243.93	0.731	177.61	627.71	2.3	2.5	52.897	F

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	897.18	224.30	94.13	1444.63	0.621	903.21	558.62	3.2	1.7	6.723	A
B	189.68	47.42	814.37	326.19	0.582	197.82	182.97	3.5	1.5	29.555	D
C	464.77	116.19	548.60	719.99	0.646	475.26	463.59	4.5	1.9	15.285	C
D	145.63	36.41	502.96	255.56	0.570	149.79	520.91	2.5	1.4	35.215	E

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	751.35	187.84	77.90	1452.23	0.517	753.69	461.01	1.7	1.1	5.172	A
B	158.85	39.71	679.34	354.59	0.448	161.42	152.25	1.5	0.8	18.871	C
C	389.22	97.31	454.81	750.70	0.518	392.42	385.95	1.9	1.1	10.134	B
D	121.96	30.49	414.80	266.20	0.458	124.11	432.43	1.4	0.9	25.703	D

PM Peak Hour - 2026 Do-Nothing, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	PM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	40.56	E

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 Do-Nothing	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1081.00	100.000
B		ONE HOUR	✓	228.00	100.000
C		ONE HOUR	✓	560.00	100.000
D		ONE HOUR	✓	175.00	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C	D
A	38.000	150.000	467.000	426.000
B	91.000	0.000	42.000	95.000
C	426.000	36.000	1.000	97.000
D	102.000	32.000	41.000	0.000

Proportions

From \ To	A	B	C	D
A	0.04	0.14	0.43	0.39
B	0.40	0.00	0.18	0.42
C	0.76	0.06	0.00	0.17
D	0.58	0.18	0.23	0.00

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C	D
A	0	0	0	0
B	0	0	0	0
C	0	0	0	0
D	0	0	0	0

Average PCU Per Veh

From \ To	A	B	C	D
A	1.000	1.000	1.000	1.000
B	1.000	1.000	1.000	1.000
C	1.000	1.000	1.000	1.000
D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.83	14.69	4.7	B	991.94	1487.92
B	0.92	104.73	6.8	F	209.22	313.83
C	0.92	54.84	8.8	F	513.87	770.80
D	0.81	71.03	3.5	F	160.58	240.87

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	813.83	203.46	80.90	1450.83	0.561	808.79	486.82	0.0	1.3	5.564	A
B	171.65	42.91	727.29	344.50	0.498	167.85	162.40	0.0	1.0	19.984	C
C	421.60	105.40	484.09	741.11	0.569	416.47	411.05	0.0	1.3	10.925	B
D	131.75	32.94	439.75	263.19	0.501	127.96	460.80	0.0	0.9	25.970	D

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	971.80	242.95	97.68	1442.96	0.673	968.79	584.89	1.3	2.0	7.544	A
B	204.97	51.24	871.58	314.16	0.652	201.90	194.89	1.0	1.7	31.203	D
C	503.43	125.86	580.54	709.53	0.710	499.35	492.94	1.3	2.3	16.798	C
D	157.32	39.33	527.49	252.60	0.623	155.07	552.40	0.9	1.5	36.024	E

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1190.20	297.55	117.15	1433.84	0.830	1180.28	698.43	2.0	4.5	13.681	B
B	251.03	62.76	1061.22	274.28	0.915	236.39	236.21	1.7	5.4	75.631	F
C	616.57	154.14	699.46	670.59	0.919	596.79	598.15	2.3	7.2	40.755	E
D	192.68	48.17	629.26	240.33	0.802	186.32	666.99	1.5	3.1	60.243	F

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1190.20	297.55	120.02	1432.50	0.831	1189.42	715.49	4.5	4.7	14.688	B
B	251.03	62.76	1070.22	272.39	0.922	245.33	239.22	5.4	6.8	104.729	F
C	616.57	154.14	710.68	666.91	0.925	610.51	604.87	7.2	8.8	54.840	F
D	192.68	48.17	644.49	238.49	0.808	191.01	676.70	3.1	3.5	71.034	F

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	971.80	242.95	103.18	1440.39	0.675	982.05	620.60	4.7	2.1	8.023	A
B	204.97	51.24	885.09	311.32	0.658	223.62	200.14	6.8	2.1	47.065	E
C	503.43	125.86	603.95	701.86	0.717	527.60	504.76	8.8	2.7	23.038	C
D	157.32	39.33	559.99	248.68	0.633	163.79	571.57	3.5	1.9	44.946	E

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	813.83	203.46	84.55	1449.12	0.562	817.14	502.50	2.1	1.3	5.725	A
B	171.65	42.91	736.16	342.64	0.501	176.02	165.53	2.1	1.0	22.126	C
C	421.60	105.40	494.34	737.76	0.571	426.98	417.84	2.7	1.4	11.774	B
D	131.75	32.94	452.00	261.71	0.503	135.05	469.32	1.9	1.1	29.097	D

PM Peak Hour - 2036 Do-Nothing, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	PM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	85.72	F

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2036 Do-Nothing	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1185.00	100.000
B		ONE HOUR	✓	250.00	100.000
C		ONE HOUR	✓	614.00	100.000
D		ONE HOUR	✓	192.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	42.000	164.000	512.000	467.000
	B	99.000	0.000	47.000	104.000
	C	467.000	39.000	1.000	107.000
	D	111.000	36.000	45.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.04	0.14	0.43	0.39
	B	0.40	0.00	0.19	0.42
	C	0.76	0.06	0.00	0.17
	D	0.58	0.19	0.23	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.91	26.66	9.1	D	1087.38	1631.07
B	1.10	241.02	18.7	F	229.40	344.11
C	1.04	130.07	25.1	F	563.42	845.13
D	0.90	106.21	5.7	F	176.18	264.27

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	892.13	223.03	88.67	1447.19	0.616	885.82	531.25	0.0	1.6	6.345	A
B	188.21	47.05	796.74	329.90	0.571	183.22	177.75	0.0	1.2	23.819	C
C	462.25	115.56	529.26	726.32	0.636	455.52	450.69	0.0	1.7	12.995	B
D	144.55	36.14	480.09	258.32	0.560	139.83	504.70	0.0	1.2	29.357	D

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1065.29	266.32	106.87	1438.66	0.740	1060.62	636.49	1.6	2.7	9.404	A
B	224.74	56.19	954.38	296.75	0.757	219.22	213.11	1.2	2.6	43.526	E
C	551.97	137.99	633.58	692.16	0.797	544.66	540.02	1.7	3.5	23.282	C
D	172.60	43.15	574.15	246.98	0.699	169.22	604.09	1.2	2.0	44.309	E

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1304.71	326.18	125.49	1429.93	0.912	1283.14	732.69	2.7	8.1	21.858	C
B	275.26	68.81	1153.64	254.84	1.080	240.10	254.99	2.6	11.4	134.810	F
C	676.03	169.01	746.11	655.31	1.032	625.90	647.62	3.5	16.0	72.939	F
D	211.40	52.85	657.38	236.93	0.892	200.80	714.63	2.0	4.7	81.440	F

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1304.71	326.18	129.07	1428.25	0.914	1300.96	749.96	8.1	9.1	26.659	D
B	275.26	68.81	1170.51	251.29	1.095	246.23	259.53	11.4	18.7	241.019	F
C	676.03	169.01	758.75	651.17	1.038	639.74	657.99	16.0	25.1	130.066	F
D	211.40	52.85	671.87	235.19	0.899	207.16	726.62	4.7	5.7	106.209	F

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1065.29	266.32	118.02	1433.43	0.743	1089.54	732.11	9.1	3.0	11.146	B
B	224.74	56.19	982.59	290.81	0.773	277.08	224.97	18.7	5.6	172.795	F
C	551.97	137.99	692.99	672.71	0.821	628.68	566.68	25.1	5.9	86.747	F
D	172.60	43.15	667.46	235.72	0.732	182.67	654.20	5.7	3.2	74.548	F

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	892.13	223.03	95.20	1444.13	0.618	897.60	564.58	3.0	1.6	6.650	A
B	188.21	47.05	809.73	327.17	0.575	204.79	183.08	5.6	1.4	32.726	D
C	462.25	115.56	551.84	718.93	0.643	478.48	462.68	5.9	1.9	15.889	C
D	144.55	36.14	508.01	254.95	0.567	151.77	522.31	3.2	1.4	36.895	E

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction 3 AM Peak Hour_Altered Layout_DS.j9
Path: G:\2018\p180176\calcs\arcady
Report generation date: 29/08/2019 13:38:59

»AM Peak Hour - 2021 Do-Something, AM
»AM Peak Hour - 2026 Do-Something, AM
»AM Peak Hour - 2036 Do-Something, AM

Summary of junction performance

	AM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
AM Peak Hour - 2021 Do-Something					
Arm A	4.2	13.11	0.81	B	10 %
Arm B	0.3	3.51	0.24	A	
Arm C	0.4	3.63	0.27	A	[Arm D]
Arm D	1.6	27.28	0.62	D	
AM Peak Hour - 2026 Do-Something					
Arm A	8.3	24.08	0.90	C	1 %
Arm B	0.4	4.04	0.31	A	
Arm C	0.4	4.01	0.31	A	[Arm D]
Arm D	2.2	34.75	0.70	D	
AM Peak Hour - 2036 Do-Something					
Arm A	24.4	61.75	0.99	F	-8 %
Arm B	0.5	4.48	0.35	A	
Arm C	0.5	4.36	0.35	A	[Arm D]
Arm D	3.2	48.16	0.78	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. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

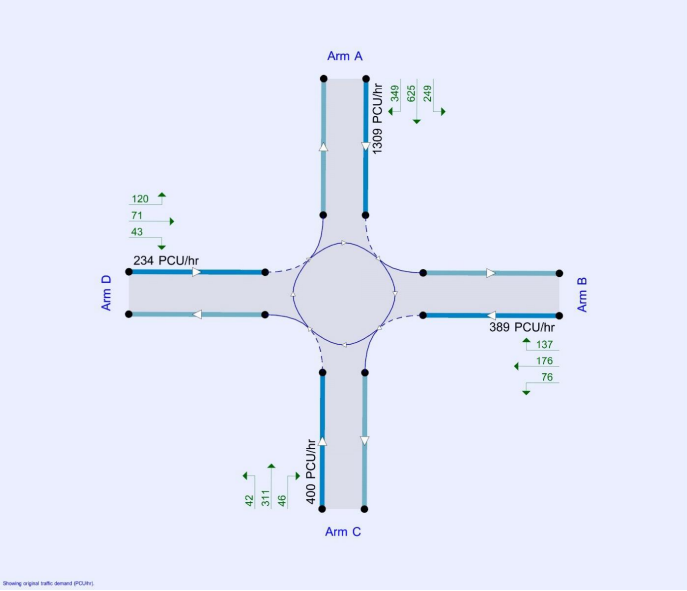
File summary

File Description

Title	Lissywollen Residential Development
Location	N55 / Brawney Road / R915 / One Mile Road
Site number	3
Date	23/08/2019
Version	
Status	Planning
Identifier	
Client	Alanna
Jobnumber	180176
Enumerator	HEADOFFICE"mckennam
Description	AM Peak Hour DS

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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2021 Do-Something	AM	ONE HOUR	08:15	09:45	15	✓
2026 Do-Something	AM	ONE HOUR	08:15	09:45	15	✓
2036 Do-Something	AM	ONE HOUR	08:15	09:45	15	✓

AM Peak Hour - 2021 Do-Something, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	11.47	B

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	10	Arm D

Arms

Arms

Arm	Name	Description
A	N55	
B	Brawney Rd	
C	R915	
D	One Mile Road	

Capacity Options

Arm	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Assume flat start profile	Initial queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00
D	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	7.00	7.90	25.0	18.0	48.0	31.0	
B	3.40	8.30	55.3	20.0	48.0	53.0	
C	4.00	8.10	21.9	20.0	48.0	65.0	
D	3.80	7.30	6.3	28.0	48.0	25.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.738	2344.469
B	0.654	2012.381
C	0.591	1747.331
D	0.603	1581.201

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
A	Percentage		65.50
D	Percentage		27.50

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2021 Do-Something	AM	ONE HOUR	08:15	09:45	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1085.00	100.000
B		ONE HOUR	✓	290.00	100.000
C		ONE HOUR	✓	330.00	100.000
D		ONE HOUR	✓	197.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	72.000	192.000	527.000	294.000
	B	108.000	0.000	54.000	128.000
	C	262.000	32.000	1.000	35.000
	D	101.000	60.000	36.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.07	0.18	0.49	0.27
	B	0.37	0.00	0.19	0.44
	C	0.79	0.10	0.00	0.11
	D	0.51	0.30	0.18	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.81	13.11	4.2	B	995.61	1493.42
B	0.24	3.51	0.3	A	266.11	399.16
C	0.27	3.63	0.4	A	302.81	454.22
D	0.62	27.28	1.6	D	180.77	271.16

Main Results for each time segment

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	816.84	204.21	95.80	1489.32	0.548	812.05	406.30	0.0	1.2	5.279	A
B	218.33	54.58	695.74	1557.62	0.140	217.68	212.11	0.0	0.2	2.685	A
C	248.44	62.11	451.07	1480.90	0.168	247.64	462.35	0.0	0.2	2.918	A
D	148.31	37.08	356.33	375.72	0.395	145.78	342.38	0.0	0.6	15.494	C

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	975.39	243.85	115.40	1479.85	0.659	972.62	487.12	1.2	1.9	7.057	A
B	260.70	65.18	833.57	1467.54	0.178	260.49	254.46	0.2	0.2	2.982	A
C	296.66	74.17	540.08	1428.33	0.208	296.42	553.98	0.2	0.3	3.180	A
D	177.10	44.27	426.54	364.08	0.486	175.99	409.96	0.6	0.9	19.018	C

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1194.61	298.65	140.77	1467.59	0.814	1185.85	595.52	1.9	4.1	12.401	B
B	319.30	79.82	1016.28	1348.11	0.237	318.92	310.33	0.2	0.3	3.498	A
C	363.34	90.83	659.55	1357.76	0.268	362.93	675.65	0.3	0.4	3.616	A
D	216.90	54.23	521.90	348.26	0.623	214.39	500.58	0.9	1.5	26.380	D

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1194.61	298.65	141.93	1467.02	0.814	1194.04	597.70	4.1	4.2	13.113	B
B	319.30	79.82	1023.44	1343.43	0.238	319.29	312.53	0.3	0.3	3.514	A
C	363.34	90.83	662.62	1355.95	0.268	363.33	680.12	0.4	0.4	3.625	A
D	216.90	54.23	522.94	348.09	0.623	216.69	503.01	1.5	1.6	27.280	D

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	975.39	243.85	117.19	1478.98	0.660	984.36	490.44	4.2	2.0	7.404	A
B	260.70	65.18	843.88	1460.80	0.178	261.07	257.68	0.3	0.2	3.003	A
C	296.66	74.17	544.51	1425.71	0.208	297.07	560.44	0.4	0.3	3.192	A
D	177.10	44.27	428.11	363.82	0.487	179.53	413.47	1.6	1.0	19.784	C

Main results: (09:30-09:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	816.84	204.21	97.76	1488.38	0.549	819.84	409.92	2.0	1.2	5.410	A
B	218.33	54.58	702.85	1552.98	0.141	218.54	214.75	0.2	0.2	2.697	A
C	248.44	62.11	454.40	1478.93	0.168	248.69	466.99	0.3	0.2	2.926	A
D	148.31	37.08	358.10	375.43	0.395	149.57	344.99	1.0	0.7	16.027	C

AM Peak Hour - 2026 Do-Something, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	18.32	C

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 Do-Something	AM	ONE HOUR	08:15	09:45	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1196.00	100.000
B		ONE HOUR	✓	361.00	100.000
C		ONE HOUR	✓	366.00	100.000
D		ONE HOUR	✓	214.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	78.000	229.000	570.000	319.000
	B	126.000	0.000	71.000	164.000
	C	284.000	43.000	1.000	38.000
	D	110.000	65.000	39.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.07	0.19	0.48	0.27
	B	0.35	0.00	0.20	0.45
	C	0.78	0.12	0.00	0.10
	D	0.51	0.30	0.18	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.90	24.08	8.3	C	1097.47	1646.21
B	0.31	4.04	0.4	A	331.26	496.89
C	0.31	4.01	0.4	A	335.85	503.77
D	0.70	34.75	2.2	D	196.37	294.56

Main Results for each time segment

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	900.41	225.10	109.85	1482.53	0.607	894.33	447.23	0.0	1.5	6.060	A
B	271.78	67.94	752.66	1520.42	0.179	270.91	251.52	0.0	0.2	2.880	A
C	275.54	68.89	514.49	1443.44	0.191	274.60	509.07	0.0	0.2	3.076	A
D	161.11	40.28	398.98	368.65	0.437	158.11	390.12	0.0	0.8	16.873	C

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1075.18	268.79	132.29	1471.68	0.731	1070.79	536.19	1.5	2.6	8.880	A
B	324.53	81.13	901.45	1423.17	0.228	324.22	301.63	0.2	0.3	3.276	A
C	329.03	82.26	615.89	1383.55	0.238	328.72	609.78	0.2	0.3	3.413	A
D	192.38	48.10	477.59	355.61	0.541	190.89	467.02	0.8	1.1	21.645	C

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1316.82	329.21	161.05	1457.78	0.903	1297.01	654.56	2.6	7.6	20.265	C
B	397.47	99.37	1092.02	1298.60	0.306	396.89	366.04	0.3	0.4	3.990	A
C	402.97	100.74	749.36	1304.71	0.309	402.44	739.55	0.3	0.4	3.987	A
D	235.62	58.90	583.77	337.99	0.697	231.83	568.03	1.1	2.1	32.736	D

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1316.82	329.21	162.75	1456.96	0.904	1313.90	657.99	7.6	8.3	24.077	C
B	397.47	99.37	1106.29	1289.28	0.308	397.45	370.36	0.4	0.4	4.036	A
C	402.97	100.74	755.41	1301.14	0.310	402.96	748.32	0.4	0.4	4.007	A
D	235.62	58.90	585.53	337.70	0.698	235.20	572.84	2.1	2.2	34.751	D

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1075.18	268.79	134.93	1470.41	0.731	1097.10	541.55	8.3	2.8	10.169	B
B	324.53	81.13	923.68	1408.63	0.230	325.10	308.35	0.4	0.3	3.326	A
C	329.03	82.26	625.34	1377.97	0.239	329.55	623.45	0.4	0.3	3.437	A
D	192.38	48.10	480.36	355.15	0.542	196.13	474.53	2.2	1.2	23.133	C

Main results: (09:30-09:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	900.41	225.10	112.31	1481.34	0.608	905.39	451.78	2.8	1.6	6.302	A
B	271.78	67.94	762.47	1514.01	0.180	272.10	255.23	0.3	0.2	2.898	A
C	275.54	68.89	519.12	1440.71	0.191	275.85	515.45	0.3	0.2	3.093	A
D	161.11	40.28	401.23	368.27	0.437	162.86	393.74	1.2	0.8	17.672	C

AM Peak Hour - 2036 Do-Something, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	40.99	E

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2036 Do-Something	AM	ONE HOUR	08:15	09:45	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1309.00	100.000
B		ONE HOUR	✓	389.00	100.000
C		ONE HOUR	✓	400.00	100.000
D		ONE HOUR	✓	234.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	86.000	249.000	625.000	349.000
	B	137.000	0.000	76.000	176.000
	C	311.000	46.000	1.000	42.000
	D	120.000	71.000	43.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.07	0.19	0.48	0.27
	B	0.35	0.00	0.20	0.45
	C	0.78	0.12	0.00	0.11
	D	0.51	0.30	0.18	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.99	61.75	24.4	F	1201.16	1801.74
B	0.35	4.48	0.5	A	356.95	535.43
C	0.35	4.36	0.5	A	367.05	550.57
D	0.78	48.16	3.2	E	214.72	322.08

Main Results for each time segment

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	985.48	246.37	119.31	1477.96	0.667	977.67	488.81	0.0	2.0	7.089	A
B	292.86	73.21	824.15	1473.69	0.199	291.87	272.83	0.0	0.2	3.043	A
C	301.14	75.29	559.74	1416.71	0.213	300.07	556.28	0.0	0.3	3.221	A
D	176.17	44.04	435.58	362.58	0.486	172.54	424.22	0.0	0.9	18.614	C

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1176.76	294.19	143.67	1466.18	0.803	1169.30	585.95	2.0	3.8	11.830	B
B	349.70	87.43	986.04	1367.87	0.256	349.32	326.93	0.2	0.3	3.534	A
C	359.59	89.90	669.65	1351.80	0.266	359.22	665.72	0.3	0.4	3.627	A
D	210.36	52.59	521.35	348.35	0.604	208.27	507.52	0.9	1.4	25.298	D

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1441.24	360.31	174.17	1451.44	0.993	1385.65	712.47	3.8	17.7	38.094	E
B	428.30	107.07	1169.37	1248.05	0.343	427.59	390.44	0.3	0.5	4.384	A
C	440.41	110.10	804.52	1272.13	0.346	439.75	792.44	0.4	0.5	4.321	A
D	257.64	64.41	635.20	329.46	0.782	251.44	609.07	1.4	3.0	42.950	E

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1441.24	360.31	176.76	1450.19	0.994	1414.35	717.75	17.7	24.4	61.751	F
B	428.30	107.07	1193.57	1232.23	0.348	428.25	397.55	0.5	0.5	4.477	A
C	440.41	110.10	814.59	1266.18	0.348	440.39	807.23	0.5	0.5	4.359	A
D	257.64	64.41	637.89	329.02	0.783	256.62	617.09	3.0	3.2	48.164	E

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1176.76	294.19	147.92	1464.13	0.804	1256.76	597.19	24.4	4.4	22.786	C
B	349.70	87.43	1058.43	1320.56	0.265	350.37	346.25	0.5	0.4	3.715	A
C	359.59	89.90	699.56	1334.13	0.270	360.23	709.24	0.5	0.4	3.697	A
D	210.36	52.59	528.37	347.18	0.606	216.74	531.42	3.2	1.6	28.769	D

Main results: (09:30-09:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	985.48	246.37	122.53	1476.40	0.667	995.03	494.80	4.4	2.1	7.619	A
B	292.86	73.21	839.36	1463.75	0.200	293.30	278.20	0.4	0.3	3.078	A
C	301.14	75.29	566.66	1412.63	0.213	301.54	566.00	0.4	0.3	3.242	A
D	176.17	44.04	438.54	362.08	0.487	178.79	429.65	1.6	1.0	19.911	C

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction 3 PM Peak Hour_Altered Layout_DS.j9
Path: G:\2018\p180176\calcs\arcady
Report generation date: 29/08/2019 13:44:06

Summary of junction performance

	PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
PM Peak Hour - 2021 Do-Something					
Arm A	3.1	10.40	0.76	B	-13 %
Arm B	0.2	3.15	0.16	A	
Arm C	0.7	4.55	0.42	A	[Arm D]
Arm D	2.4	52.11	0.73	F	
PM Peak Hour - 2026 Do-Something					
Arm A	5.8	17.69	0.86	C	-21 %
Arm B	0.3	3.49	0.21	A	
Arm C	0.9	5.30	0.48	A	[Arm D]
Arm D	3.7	74.27	0.82	F	
PM Peak Hour - 2036 Do-Something					
Arm A	12.3	35.42	0.94	E	-28 %
Arm B	0.3	3.80	0.24	A	
Arm C	1.2	6.20	0.54	A	[Arm D]
Arm D	6.6	122.13	0.92	F	

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

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

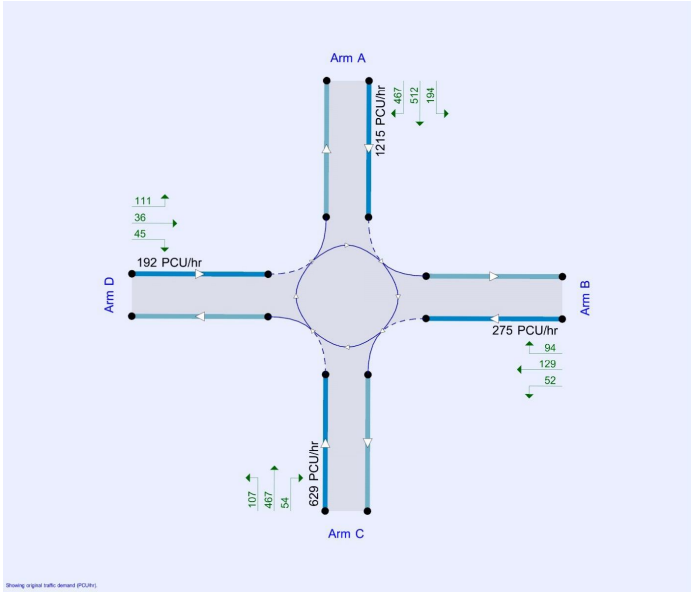
File summary

File Description

Title	Lissywollen Residential Development
Location	N55 / Brawney Road / R915 / One Mile Road
Site number	3
Date	23/08/2019
Version	
Status	Planning
Identifier	
Client	Alanna
Jobnumber	180176
Enumerator	HEADOFFICE\mckennam
Description	PM Peak Hour DS

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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2021 Do-Something	PM	ONE HOUR	16:45	18:15	15	✓
2026 Do-Something	PM	ONE HOUR	16:45	18:15	15	✓
2036 Do-Something	PM	ONE HOUR	16:45	18:15	15	✓

PM Peak Hour - 2021 Do-Something, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	PM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	11.61	B

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-13	Arm D

Arms

Arms

Arm	Name	Description
A	N55	
B	Brawney Rd	
C	R915	
D	One Mile Road	

Capacity Options

Arm	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Assume flat start profile	Initial queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00
D	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	7.00	7.90	25.0	18.0	48.0	31.0	
B	3.40	8.30	55.3	20.0	48.0	53.0	
C	4.00	8.10	21.9	20.0	48.0	65.0	
D	3.80	7.30	6.3	28.0	48.0	25.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.738	2344.469
B	0.654	2012.381
C	0.591	1747.331
D	0.603	1581.201

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
A	Percentage		63.50
D	Percentage		20.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2021 Do-Something	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	991.00	100.000
B		ONE HOUR	✓	202.00	100.000
C		ONE HOUR	✓	517.00	100.000
D		ONE HOUR	✓	162.00	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C	D
A	35.000	131.000	432.000	393.000
B	73.000	0.000	36.000	93.000
C	393.000	33.000	1.000	90.000
D	94.000	30.000	38.000	0.000

Proportions

From \ To	A	B	C	D
A	0.04	0.13	0.44	0.40
B	0.36	0.00	0.18	0.46
C	0.76	0.06	0.00	0.17
D	0.58	0.19	0.23	0.00

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C	D
A	0	0	0	0
B	0	0	0	0
C	0	0	0	0
D	0	0	0	0

Average PCU Per Veh

From \ To	A	B	C	D
A	1.000	1.000	1.000	1.000
B	1.000	1.000	1.000	1.000
C	1.000	1.000	1.000	1.000
D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.76	10.40	3.1	B	909.36	1364.04
B	0.16	3.15	0.2	A	185.36	278.04
C	0.42	4.55	0.7	A	474.41	711.61
D	0.73	52.11	2.4	F	148.65	222.98

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	746.08	186.52	75.36	1453.42	0.513	741.91	444.72	0.0	1.0	5.031	A
B	152.08	38.02	672.44	1572.85	0.097	151.65	144.82	0.0	0.1	2.533	A
C	389.22	97.31	445.04	1484.46	0.262	387.81	379.05	0.0	0.4	3.278	A
D	121.96	30.49	401.31	267.83	0.455	118.77	431.55	0.0	0.8	23.689	C

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	890.89	222.72	90.97	1446.11	0.616	888.76	533.44	1.0	1.6	6.435	A
B	181.59	45.40	805.95	1485.59	0.122	181.47	173.78	0.1	0.1	2.760	A
C	464.77	116.19	532.97	1432.53	0.324	464.28	454.44	0.4	0.5	3.716	A
D	145.63	36.41	480.42	258.28	0.564	143.99	516.82	0.8	1.2	31.015	D

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1091.11	272.78	110.46	1436.97	0.759	1085.34	651.66	3.0	10.072	B	
B	222.41	55.60	983.82	1369.33	0.162	222.19	211.99	0.1	0.2	3.138	A
C	569.23	142.31	651.34	1362.61	0.418	568.29	554.67	0.5	0.7	4.526	A
D	178.37	44.59	587.99	245.31	0.727	174.13	631.64	1.2	2.3	47.789	E

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1091.11	272.78	112.03	1436.24	0.760	1090.83	654.70	3.0	3.1	10.399	B
B	222.41	55.60	989.42	1365.67	0.163	222.40	213.44	0.2	0.2	3.148	A
C	569.23	142.31	653.88	1361.11	0.418	569.21	557.94	0.7	0.7	4.545	A
D	178.37	44.59	589.02	245.18	0.727	177.70	634.07	2.3	2.4	52.113	F

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	890.89	222.72	93.51	1444.92	0.617	896.69	538.30	3.1	1.6	6.636	A
B	181.59	45.40	814.20	1480.20	0.123	181.81	176.00	0.2	0.1	2.772	A
C	464.77	116.19	536.68	1430.34	0.325	465.70	459.33	0.7	0.5	3.734	A
D	145.63	36.41	482.00	258.09	0.564	149.81	520.37	2.4	1.4	34.378	D

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	746.08	186.52	77.68	1452.33	0.514	748.35	449.65	1.6	1.1	5.129	A
B	152.08	38.02	679.27	1568.39	0.097	152.21	146.77	0.1	0.1	2.543	A
C	389.22	97.31	448.28	1482.55	0.263	389.73	383.19	0.5	0.4	3.297	A
D	121.96	30.49	403.32	267.58	0.456	124.01	434.69	1.4	0.9	25.418	D

PM Peak Hour - 2026 Do-Something, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	PM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	17.29	C

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 Do-Something	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1113.00	100.000
B		ONE HOUR	✓	255.00	100.000
C		ONE HOUR	✓	575.00	100.000
D		ONE HOUR	✓	175.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	38.000	182.000	467.000	426.000
	B	86.000	0.000	49.000	120.000
	C	426.000	51.000	1.000	97.000
	D	102.000	32.000	41.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.03	0.16	0.42	0.38
	B	0.34	0.00	0.19	0.47
	C	0.74	0.09	0.00	0.17
	D	0.58	0.18	0.23	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.86	17.69	5.8	C	1021.31	1531.96
B	0.21	3.49	0.3	A	233.99	350.99
C	0.48	5.30	0.9	A	527.63	791.45
D	0.82	74.27	3.7	F	160.58	240.87

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	837.92	209.48	92.36	1445.46	0.580	832.49	487.00	0.0	1.4	5.823	A
B	191.98	47.99	727.08	1537.14	0.125	191.41	197.77	0.0	0.1	2.673	A
C	432.89	108.22	501.69	1451.01	0.298	431.20	416.80	0.0	0.4	3.524	A
D	131.75	32.94	451.43	261.78	0.503	127.93	481.45	0.0	1.0	26.222	D

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1000.56	250.14	111.36	1436.56	0.697	997.07	584.13	1.4	2.2	8.126	A
B	229.24	57.31	871.25	1442.91	0.159	229.06	237.18	0.1	0.2	2.965	A
C	516.91	129.23	600.71	1392.51	0.371	516.26	499.59	0.4	0.6	4.106	A
D	157.32	39.33	540.46	251.04	0.627	155.02	576.51	1.0	1.5	36.564	E

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1225.44	306.36	134.61	1425.66	0.860	1212.58	712.29	2.2	5.4	15.997	C
B	280.76	70.19	1058.91	1320.24	0.213	280.44	288.28	0.2	0.3	3.462	A
C	633.09	158.27	732.06	1314.93	0.481	631.76	607.28	0.6	0.9	5.257	A
D	192.68	48.17	661.16	236.48	0.815	185.73	702.66	1.5	3.3	63.334	F

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1225.44	306.36	136.95	1424.56	0.860	1224.17	716.85	5.4	5.8	17.686	C
B	280.76	70.19	1069.85	1313.09	0.214	280.75	291.26	0.3	0.3	3.486	A
C	633.09	158.27	737.15	1311.93	0.483	633.05	613.46	0.9	0.9	5.302	A
D	192.68	48.17	662.74	236.29	0.815	191.05	707.46	3.3	3.7	74.266	F

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1000.56	250.14	115.53	1434.60	0.697	1014.12	591.92	5.8	2.4	8.821	A
B	229.24	57.31	887.75	1432.12	0.160	229.56	241.89	0.3	0.2	2.996	A
C	516.91	129.23	608.22	1388.08	0.372	518.23	509.09	0.9	0.6	4.144	A
D	157.32	39.33	542.85	250.75	0.627	164.60	583.60	3.7	1.9	44.522	E

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	837.92	209.48	95.47	1444.00	0.580	841.80	493.37	2.4	1.4	6.017	A
B	191.98	47.99	736.50	1530.98	0.125	192.17	200.77	0.2	0.1	2.688	A
C	432.89	108.22	506.18	1448.35	0.299	433.57	422.49	0.6	0.4	3.549	A
D	131.75	32.94	453.98	261.47	0.504	134.87	485.77	1.9	1.1	29.080	D

PM Peak Hour - 2036 Do-Something, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm B - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	PM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	30.91	D

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2036 Do-Something	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1215.00	100.000
B		ONE HOUR	✓	275.00	100.000
C		ONE HOUR	✓	629.00	100.000
D		ONE HOUR	✓	192.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	42.000	194.000	512.000	467.000
	B	94.000	0.000	52.000	129.000
	C	467.000	54.000	1.000	107.000
	D	111.000	36.000	45.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.03	0.16	0.42	0.38
	B	0.34	0.00	0.19	0.47
	C	0.74	0.09	0.00	0.17
	D	0.58	0.19	0.23	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.94	35.42	12.3	E	1114.91	1672.36
B	0.24	3.80	0.3	A	252.34	378.52
C	0.54	6.20	1.2	A	577.18	865.77
D	0.92	122.13	6.6	F	176.18	264.27

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	914.72	228.68	100.20	1441.78	0.634	907.91	532.85	0.0	1.7	6.661	A
B	207.03	51.76	796.45	1491.79	0.139	206.39	211.66	0.0	0.2	2.799	A
C	473.54	118.39	547.72	1423.82	0.333	471.56	455.13	0.0	0.5	3.772	A
D	144.55	36.14	493.28	256.73	0.563	139.77	526.00	0.0	1.2	29.720	D

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1092.26	273.07	120.71	1432.17	0.763	1086.78	638.96	1.7	3.1	10.257	B
B	247.22	61.80	953.78	1388.96	0.178	247.00	253.71	0.2	0.2	3.152	A
C	565.46	141.36	655.58	1360.11	0.416	564.62	545.20	0.5	0.7	4.521	A
D	172.60	43.15	590.57	244.99	0.705	169.10	629.63	1.2	2.1	45.290	E

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1337.74	334.43	144.11	1421.21	0.941	1308.03	776.11	3.1	10.5	26.652	D
B	302.78	75.70	1146.78	1262.81	0.240	302.39	305.36	0.2	0.3	3.746	A
C	692.54	173.14	793.18	1278.83	0.542	690.71	655.99	0.7	1.2	6.101	A
D	211.40	52.85	721.79	229.16	0.922	198.44	762.10	2.1	5.3	91.021	F

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1337.74	334.43	147.49	1419.62	0.942	1330.38	782.74	10.5	12.3	35.421	E
B	302.78	75.70	1167.36	1249.36	0.242	302.76	310.51	0.3	0.3	3.802	A
C	692.54	173.14	802.85	1273.12	0.544	692.47	667.27	1.2	1.2	6.200	A
D	211.40	52.85	724.15	228.88	0.924	206.07	771.17	5.3	6.6	122.128	F

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1092.26	273.07	128.89	1428.34	0.765	1127.94	653.46	12.3	3.4	13.262	B
B	247.22	61.80	992.80	1363.46	0.181	247.60	264.04	0.3	0.2	3.229	A
C	565.46	141.36	673.31	1349.63	0.419	567.28	567.09	1.2	0.7	4.613	A
D	172.60	43.15	594.40	244.53	0.706	187.95	646.19	6.6	2.8	72.067	F

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	914.72	228.68	104.86	1439.60	0.635	921.27	541.79	3.4	1.8	7.029	A
B	207.03	51.76	810.13	1482.85	0.140	207.27	216.00	0.2	0.2	2.824	A
C	473.54	118.39	554.03	1420.09	0.333	474.44	463.38	0.7	0.5	3.812	A
D	144.55	36.14	496.43	256.35	0.564	150.22	532.04	2.8	1.4	35.452	E

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction 6 AM Peak Hour.j9
Path: G:\2018\p180176\calcs\arcady
Report generation date: 26/08/2019 11:28:44

Summary of junction performance

	AM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
AM Peak Hour - 2021 Do-Nothing					
Arm A	4.3	16.97	0.82	C	-60 % [Arm D]
Arm B	2.3	102.64	0.74	F	
Arm C	3.4	19.10	0.78	C	
Arm D	19.1	487.60	1.20	F	
AM Peak Hour - 2026 Do-Nothing					
Arm A	7.0	25.99	0.89	D	-62 % [Arm D]
Arm B	3.6	148.97	0.84	F	
Arm C	5.0	26.73	0.85	D	
Arm D	25.9	688.08	1.30	F	
AM Peak Hour - 2036 Do-Nothing					
Arm A	16.3	54.58	0.97	F	-64 % [Arm D]
Arm B	6.4	237.95	0.98	F	
Arm C	9.6	47.30	0.93	E	
Arm D	35.9	968.85	1.41	F	

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

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

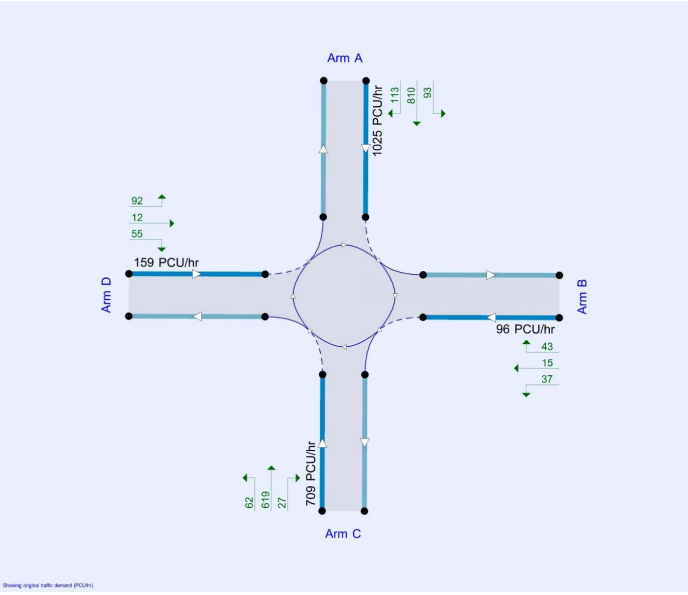
File summary

File Description

Title	Lissywollen Residential Development
Location	R914 / Moydrum Road
Site number	6
Date	23/08/2019
Version	
Status	Planning
Identifier	
Client	Alanna
Jobnumber	180176
Enumerator	HEADOFFICE"mckennam
Description	AM Peak Hour

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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2021 Do-Nothing	AM	ONE HOUR	08:15	09:45	15	✓
2026 Do-Nothing	AM	ONE HOUR	08:15	09:45	15	✓
2036 Do-Nothing	AM	ONE HOUR	08:15	09:45	15	✓

AM Peak Hour - 2021 Do-Nothing, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm C - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	62.11	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-60	Arm D

Arms

Arms

Arm	Name	Description
A	N55	
B	Brawney Rd	
C	R915	
D	One Mile Road	

Capacity Options

Arm	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Assume flat start profile	Initial queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00
D	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	4.50	6.60	5.1	23.0	38.0	34.0	
B	2.60	4.70	13.4	20.0	38.0	29.0	
C	3.70	6.60	35.0	21.0	38.0	37.0	
D	3.00	5.90	8.6	25.0	38.0	45.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.629	1625.757
B	0.550	1215.783
C	0.655	1775.772
D	0.548	1275.352

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
A	Percentage		74.00
B	Percentage		17.00
C	Percentage		51.00
D	Percentage		14.50

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2021 Do-Nothing	AM	ONE HOUR	08:15	09:45	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	867.00	100.000
B		ONE HOUR	✓	81.00	100.000
C		ONE HOUR	✓	601.00	100.000
D		ONE HOUR	✓	145.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	7.000	78.000	682.000	100.000
	B	36.000	1.000	31.000	13.000
	C	521.000	23.000	1.000	56.000
	D	83.000	11.000	51.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.01	0.09	0.79	0.12
	B	0.44	0.01	0.38	0.16
	C	0.87	0.04	0.00	0.09
	D	0.57	0.08	0.35	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.82	16.97	4.3	C	795.57	1193.36
B	0.74	102.64	2.3	F	74.33	111.49
C	0.78	19.10	3.4	C	551.49	827.23
D	1.20	487.60	19.1	F	133.05	199.58

Main Results for each time segment

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	652.72	163.18	61.78	1174.30	0.556	647.80	477.49	0.0	1.2	6.777	A
B	60.98	15.25	625.77	148.18	0.412	58.38	83.81	0.0	0.7	39.100	E
C	452.46	113.12	115.99	866.91	0.522	448.18	568.17	0.0	1.1	8.514	A
D	109.16	27.29	438.32	150.10	0.727	100.95	125.85	0.0	2.1	65.656	F

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	779.42	194.85	74.17	1168.53	0.667	776.55	573.70	1.2	1.9	9.115	A
B	72.82	18.20	750.20	136.54	0.533	71.31	100.52	0.7	1.0	53.842	F
C	540.29	135.07	139.85	858.94	0.629	537.99	681.66	1.1	1.6	11.133	B
D	130.35	32.59	526.71	143.07	0.911	121.17	151.14	2.1	4.3	126.407	F

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	954.58	238.65	82.30	1164.75	0.820	945.76	687.24	1.9	4.2	15.820	C
B	89.18	22.30	907.08	121.88	0.732	85.06	120.99	1.0	2.1	88.823	F
C	661.71	165.43	169.23	849.13	0.779	655.29	822.91	1.6	3.2	17.982	C
D	159.65	39.91	640.72	134.01	1.191	128.82	183.79	4.3	12.1	274.162	F

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	954.58	238.65	83.74	1164.08	0.820	953.84	695.32	4.2	4.3	16.967	C
B	89.18	22.30	915.41	121.10	0.736	88.11	122.18	2.1	2.3	102.644	F
C	661.71	165.43	172.11	848.17	0.780	661.16	831.41	3.2	3.4	19.103	C
D	159.65	39.91	647.50	133.47	1.196	131.56	185.76	12.1	19.1	457.672	F

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	779.42	194.85	81.70	1165.03	0.669	788.43	593.43	4.3	2.1	9.777	A
B	72.82	18.20	766.87	134.99	0.539	76.89	103.26	2.3	1.3	65.285	F
C	540.29	135.07	144.77	857.30	0.630	546.80	699.00	3.4	1.8	11.824	B
D	130.35	32.59	537.34	142.23	0.917	137.78	154.23	19.1	17.2	487.598	F

Main results: (09:30-09:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	652.72	163.18	79.34	1166.13	0.560	655.88	508.66	2.1	1.3	7.100	A
B	60.98	15.25	647.30	146.16	0.417	63.14	87.91	1.3	0.8	44.367	E
C	452.46	113.12	119.92	865.60	0.523	455.04	590.52	1.8	1.1	8.824	A
D	109.16	27.29	446.77	149.42	0.731	141.22	128.18	17.2	9.2	348.794	F

AM Peak Hour - 2026 Do-Nothing, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm C - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	87.26	F

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 Do-Nothing	AM	ONE HOUR	08:15	09:45	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	938.00	100.000
B		ONE HOUR	✓	88.00	100.000
C		ONE HOUR	✓	649.00	100.000
D		ONE HOUR	✓	152.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	8.000	85.000	739.000	106.000
	B	39.000	1.000	34.000	14.000
	C	565.000	25.000	1.000	58.000
	D	87.000	12.000	53.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.01	0.09	0.79	0.11
	B	0.44	0.01	0.39	0.16
	C	0.87	0.04	0.00	0.09
	D	0.57	0.08	0.35	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.89	25.99	7.0	D	860.73	1291.09
B	0.84	148.97	3.6	F	80.75	121.13
C	0.85	26.73	5.0	D	595.53	893.30
D	1.30	688.08	25.9	F	139.48	209.22

Main Results for each time segment

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	706.18	176.54	64.82	1172.89	0.602	700.25	514.76	0.0	1.5	7.526	A
B	66.25	16.56	674.01	143.67	0.461	63.12	91.06	0.0	0.8	43.256	E
C	488.60	122.15	123.84	864.29	0.565	483.52	613.29	0.0	1.3	9.336	A
D	114.43	28.61	474.97	147.18	0.777	104.61	132.39	0.0	2.5	73.691	F

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	843.24	210.81	77.05	1167.19	0.722	839.17	617.32	1.5	2.5	10.836	B
B	79.11	19.78	807.18	131.22	0.603	76.99	109.04	0.8	1.3	63.787	F
C	583.44	145.86	149.23	855.81	0.682	580.30	734.94	1.3	2.1	12.914	B
D	136.64	34.16	570.59	139.59	0.979	123.78	158.94	2.5	5.7	155.851	F

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1032.76	258.19	83.53	1164.18	0.887	1016.91	734.30	2.5	6.5	22.333	C
B	96.89	24.22	970.12	115.98	0.835	90.28	130.32	1.3	3.0	117.068	F
C	714.56	178.64	178.99	845.87	0.845	704.07	881.41	2.1	4.7	23.758	C
D	167.36	41.84	690.86	130.03	1.287	126.96	192.20	5.7	15.8	350.188	F

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1032.76	258.19	84.49	1163.73	0.887	1030.46	744.83	6.5	7.0	25.992	D
B	96.89	24.22	982.90	114.79	0.844	94.29	132.05	3.0	3.6	148.969	F
C	714.56	178.64	183.10	844.50	0.846	713.15	894.09	4.7	5.0	26.727	D
D	167.36	41.84	701.06	129.22	1.295	128.26	195.18	15.8	25.5	604.636	F

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	843.24	210.81	82.58	1164.62	0.724	860.43	640.44	7.0	2.7	12.443	B
B	79.11	19.78	830.50	129.04	0.613	86.17	112.52	3.6	1.9	91.648	F
C	583.44	145.86	157.45	853.07	0.684	594.52	759.22	5.0	2.3	14.470	B
D	136.64	34.16	587.89	138.21	0.989	135.13	164.07	25.5	25.9	688.082	F

Main results: (09:30-09:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	706.18	176.54	80.75	1165.47	0.606	710.85	546.21	2.7	1.6	7.997	A
B	66.25	16.56	696.31	141.58	0.468	69.83	95.29	1.9	1.0	52.210	F
C	488.60	122.15	129.24	862.49	0.567	492.29	636.89	2.3	1.3	9.820	A
D	114.43	28.61	486.10	146.30	0.782	140.87	135.43	25.9	19.3	583.497	F

AM Peak Hour - 2036 Do-Nothing, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm C - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	133.92	F

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2036 Do-Nothing	AM	ONE HOUR	08:15	09:45	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1025.00	100.000
B		ONE HOUR	✓	96.00	100.000
C		ONE HOUR	✓	709.00	100.000
D		ONE HOUR	✓	159.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	9.000	93.000	810.000	113.000
	B	43.000	1.000	37.000	15.000
	C	619.000	27.000	1.000	62.000
	D	92.000	12.000	55.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.01	0.09	0.79	0.11
	B	0.45	0.01	0.39	0.16
	C	0.87	0.04	0.00	0.09
	D	0.58	0.08	0.35	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.97	54.58	16.3	F	940.56	1410.84
B	0.98	237.95	6.4	F	88.09	132.14
C	0.93	47.30	9.6	E	650.59	975.89
D	1.41	968.85	35.9	F	145.90	218.85

Main Results for each time segment

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	771.67	192.92	66.93	1171.90	0.658	764.18	560.15	0.0	1.9	8.678	A
B	72.27	18.07	732.85	138.17	0.523	68.36	98.26	0.0	1.0	49.295	E
C	533.77	133.44	132.97	861.24	0.620	527.45	668.24	0.0	1.6	10.595	B
D	119.70	29.93	519.37	143.66	0.833	107.72	141.05	0.0	3.0	84.107	F

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	921.45	230.36	78.42	1166.56	0.790	914.90	669.69	1.9	3.5	13.940	B
B	86.30	21.58	875.94	124.79	0.692	83.05	117.38	1.0	1.8	80.198	F
C	637.38	159.34	159.93	852.24	0.748	632.57	799.05	1.6	2.8	16.029	C
D	142.94	35.73	623.35	135.39	1.056	124.76	169.15	3.0	7.5	195.394	F

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1128.55	282.14	83.19	1164.34	0.969	1091.22	786.49	3.5	12.8	37.361	E
B	105.70	26.42	1036.15	109.81	0.963	94.35	138.26	1.8	4.6	164.761	F
C	780.62	195.16	187.87	842.91	0.926	759.34	942.63	2.8	8.1	36.115	E
D	175.06	43.77	745.76	125.67	1.393	123.92	201.44	7.5	20.3	451.793	F

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1128.55	282.14	83.82	1164.04	0.970	1114.65	801.94	12.8	16.3	54.584	F
B	105.70	26.42	1057.46	107.82	0.980	98.43	141.01	4.6	6.4	237.946	F
C	780.62	195.16	193.16	841.14	0.928	774.72	962.73	8.1	9.6	47.300	E
D	175.06	43.77	761.87	124.39	1.407	123.89	206.01	20.3	33.1	792.235	F

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	921.45	230.36	82.72	1164.56	0.791	970.28	707.38	16.3	4.1	22.213	C
B	86.30	21.58	928.76	119.85	0.720	98.53	124.24	6.4	3.4	175.019	F
C	637.38	159.34	176.04	846.86	0.753	662.60	851.25	9.6	3.3	21.721	C
D	142.94	35.73	658.34	132.61	1.078	131.76	180.31	33.1	35.9	968.853	F

Main results: (09:30-09:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	771.67	192.92	80.50	1165.59	0.662	780.05	594.62	4.1	2.0	9.532	A
B	72.27	18.07	757.92	135.82	0.532	80.72	102.63	3.4	1.3	71.859	F
C	533.77	133.44	142.45	858.07	0.622	540.07	696.18	3.3	1.7	11.535	B
D	119.70	29.93	536.69	142.28	0.841	138.43	145.84	35.9	31.2	875.589	F

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction 6 PM Peak Hour.j9
Path: G:\2018\p180176\calcs\arcady
Report generation date: 23/08/2019 12:27:07

»PM Peak Hour - 2021 Do-Nothing, PM
»PM Peak Hour - 2026 Do-Nothing, PM
»PM Peak Hour - 2036 Do-Nothing, PM

Summary of junction performance

	PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
PM Peak Hour - 2021 Do-Nothing					
Arm A	2.6	13.89	0.73	B	-53 %
Arm B	2.3	106.45	0.73	F	
Arm C	1.9	7.76	0.66	A	[Arm B]
Arm D	20.1	460.98	1.21	F	
PM Peak Hour - 2026 Do-Nothing					
Arm A	3.6	17.59	0.79	C	-56 %
Arm B	3.2	139.52	0.81	F	
Arm C	2.4	9.23	0.71	A	[Arm B]
Arm D	28.0	687.49	1.33	F	
PM Peak Hour - 2036 Do-Nothing					
Arm A	5.6	26.09	0.86	D	-60 %
Arm B	5.0	200.48	0.92	F	
Arm C	3.5	12.15	0.78	B	[Arm B]
Arm D	42.2	1064.84	1.51	F	

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

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

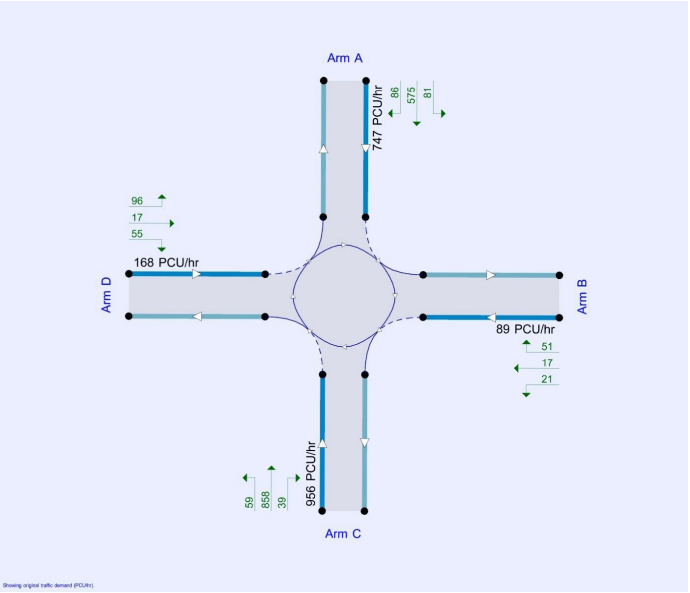
File summary

File Description

Title	Lissywollen Residential Development
Location	R914 / Moydrum Road
Site number	6
Date	23/08/2019
Version	
Status	Planning
Identifier	
Client	Alanna
Jobnumber	180176
Enumerator	HEADOFFICE"mckennam
Description	PM Peak Hour

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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2021 Do-Nothing	PM	ONE HOUR	16:45	18:15	15	✓
2026 Do-Nothing	PM	ONE HOUR	16:45	18:15	15	✓
2036 Do-Nothing	PM	ONE HOUR	16:45	18:15	15	✓

PM Peak Hour - 2021 Do-Nothing, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm C - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	PM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	55.74	F

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-53	Arm B

Arms

Arms

Arm	Name	Description
A	N55	
B	Brawney Rd	
C	R915	
D	One Mile Road	

Capacity Options

Arm	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Assume flat start profile	Initial queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00
D	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	4.50	6.60	5.1	23.0	38.0	34.0	
B	2.60	4.70	13.4	20.0	38.0	29.0	
C	3.70	6.60	35.0	21.0	38.0	37.0	
D	3.00	5.90	8.6	25.0	38.0	45.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.629	1625.757
B	0.550	1215.783
C	0.655	1775.772
D	0.548	1275.352

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
A	Percentage		61.00
B	Percentage		13.50
C	Percentage		81.00
D	Percentage		17.50

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2021 Do-Nothing	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	633.00	100.000
B		ONE HOUR	✓	76.00	100.000
C		ONE HOUR	✓	812.00	100.000
D		ONE HOUR	✓	152.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	4.000	68.000	484.000	77.000
	B	43.000	0.000	18.000	15.000
	C	723.000	33.000	0.000	56.000
	D	86.000	15.000	51.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.01	0.11	0.76	0.12
	B	0.57	0.00	0.24	0.20
	C	0.89	0.04	0.00	0.07
	D	0.57	0.10	0.34	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.73	13.89	2.6	B	580.85	871.28
B	0.73	106.45	2.3	F	69.74	104.61
C	0.66	7.76	1.9	A	745.11	1117.66
D	1.21	460.98	20.1	F	139.48	209.22

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	476.56	119.14	71.23	964.38	0.494	472.71	635.86	0.0	1.0	7.266	A
B	57.22	14.30	457.87	130.14	0.440	54.35	86.07	0.0	0.7	46.020	E
C	611.32	152.83	101.97	1384.30	0.442	608.18	410.25	0.0	0.8	4.620	A
D	114.43	28.61	599.97	165.65	0.691	107.11	110.17	0.0	1.8	56.310	F

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	569.05	142.26	85.18	959.03	0.593	567.20	762.55	1.0	1.4	9.142	A
B	68.32	17.08	549.21	123.35	0.554	66.80	103.17	0.7	1.1	61.826	F
C	729.97	182.49	123.56	1372.84	0.532	728.62	492.45	0.8	1.1	5.577	A
D	136.64	34.16	719.75	154.16	0.886	127.98	132.43	1.8	4.0	110.258	F

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	696.95	174.24	94.18	955.57	0.729	692.41	918.52	1.4	2.6	13.445	B
B	83.68	20.92	662.82	114.92	0.728	79.99	123.77	1.1	2.0	93.755	F
C	894.03	223.51	149.65	1359.01	0.658	891.00	593.17	1.1	1.9	7.642	A
D	167.36	41.84	879.19	138.87	1.205	133.51	161.46	4.0	12.5	265.889	F

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	696.95	174.24	95.67	955.00	0.730	696.68	924.46	2.6	2.6	13.895	B
B	83.68	20.92	667.69	114.56	0.730	82.70	124.66	2.0	2.3	106.449	F
C	894.03	223.51	152.26	1357.62	0.659	893.92	598.13	1.9	1.9	7.759	A
D	167.36	41.84	883.47	138.46	1.209	136.66	162.72	12.5	20.1	454.580	F

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	569.05	142.26	93.29	955.92	0.595	573.53	779.54	2.6	1.5	9.521	A
B	68.32	17.08	560.99	122.48	0.558	71.67	105.83	2.3	1.4	74.498	F
C	729.97	182.49	128.09	1370.44	0.533	732.97	504.57	1.9	1.2	5.672	A
D	136.64	34.16	726.59	153.51	0.890	146.24	134.46	20.1	17.7	460.980	F

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	476.56	119.14	92.71	956.14	0.498	478.54	670.58	1.5	1.0	7.571	A
B	57.22	14.30	479.53	128.53	0.445	59.44	91.72	1.4	0.9	53.574	F
C	611.32	152.83	106.60	1381.84	0.442	612.73	432.37	1.2	0.8	4.688	A
D	114.43	28.61	607.13	164.96	0.694	156.16	112.20	17.7	7.3	303.314	F

PM Peak Hour - 2026 Do-Nothing, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm C - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	PM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	78.29	F

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 Do-Nothing	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	683.00	100.000
B		ONE HOUR	✓	82.00	100.000
C		ONE HOUR	✓	875.00	100.000
D		ONE HOUR	✓	159.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	4.000	74.000	524.000	81.000
	B	47.000	0.000	19.000	16.000
	C	783.000	36.000	0.000	56.000
	D	90.000	16.000	53.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.01	0.11	0.77	0.12
	B	0.57	0.00	0.23	0.20
	C	0.89	0.04	0.00	0.06
	D	0.57	0.10	0.33	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.79	17.59	3.6	C	626.73	940.10
B	0.81	139.52	3.2	F	75.24	112.87
C	0.71	9.23	2.4	A	802.92	1204.37
D	1.33	687.49	28.0	F	145.90	218.85

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	514.20	128.55	75.06	962.91	0.534	509.70	685.43	0.0	1.1	7.869	A
B	61.73	15.43	491.42	127.65	0.484	58.36	93.33	0.0	0.8	49.945	E
C	658.75	164.69	108.27	1380.95	0.477	655.14	441.51	0.0	0.9	4.935	A
D	119.70	29.93	649.64	160.88	0.744	110.84	113.76	0.0	2.2	64.152	F

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	614.00	153.50	88.81	957.64	0.641	611.57	820.76	1.1	1.7	10.326	B
B	73.72	18.43	588.71	120.42	0.612	71.69	111.66	0.8	1.3	70.734	F
C	786.61	196.65	131.19	1368.80	0.575	784.90	529.22	0.9	1.3	6.146	A
D	142.94	35.73	779.34	148.45	0.963	130.23	136.75	2.2	5.4	141.056	F

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	752.00	188.00	95.49	955.07	0.787	745.26	984.45	1.7	3.4	16.629	C
B	90.28	22.57	707.55	111.60	0.809	84.92	133.20	1.3	2.7	115.496	F
C	963.39	240.85	157.99	1354.58	0.711	959.18	634.48	1.3	2.4	9.008	A
D	175.06	43.77	950.83	132.00	1.326	129.11	166.34	5.4	16.9	356.097	F

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	752.00	188.00	96.32	954.75	0.788	751.47	990.95	3.4	3.6	17.587	C
B	90.28	22.57	713.60	111.15	0.812	88.40	134.19	2.7	3.2	139.517	F
C	963.39	240.85	161.44	1352.75	0.712	963.21	640.56	2.4	2.4	9.231	A
D	175.06	43.77	956.63	131.44	1.332	130.64	168.01	16.9	28.0	628.514	F

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	614.00	153.50	94.54	955.43	0.643	620.79	837.35	3.6	1.9	10.965	B
B	73.72	18.43	601.16	119.50	0.617	78.83	114.17	3.2	1.9	95.265	F
C	786.61	196.65	137.82	1365.28	0.576	790.80	542.17	2.4	1.4	6.310	A
D	142.94	35.73	789.01	147.52	0.969	142.89	139.62	28.0	28.0	687.493	F

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	514.20	128.55	94.23	955.56	0.538	516.87	718.87	1.9	1.2	8.255	A
B	61.73	15.43	512.37	126.09	0.490	65.03	98.73	1.9	1.1	61.507	F
C	658.75	164.69	114.29	1377.76	0.478	660.57	463.11	1.4	0.9	5.031	A
D	119.70	29.93	658.59	160.03	0.748	154.51	116.26	28.0	19.3	557.131	F

PM Peak Hour - 2036 Do-Nothing, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm C - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	PM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	116.25	F

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2036 Do-Nothing	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	747.00	100.000
B		ONE HOUR	✓	89.00	100.000
C		ONE HOUR	✓	956.00	100.000
D		ONE HOUR	✓	168.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	5.000	81.000	575.000	86.000
	B	51.000	0.000	21.000	17.000
	C	858.000	39.000	0.000	59.000
	D	96.000	17.000	55.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.01	0.11	0.77	0.12
	B	0.57	0.00	0.24	0.19
	C	0.90	0.04	0.00	0.06
	D	0.57	0.10	0.33	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.86	26.09	5.6	D	685.46	1028.19
B	0.92	200.48	5.0	F	81.67	122.50
C	0.78	12.15	3.5	B	877.24	1315.86
D	1.51	1064.84	42.2	F	154.16	231.24

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	562.38	140.60	78.46	961.60	0.585	556.88	747.55	0.0	1.4	8.781	A
B	67.00	16.75	534.14	124.47	0.538	62.92	101.20	0.0	1.0	55.528	F
C	719.73	179.93	115.91	1376.90	0.523	715.40	481.14	0.0	1.1	5.408	A
D	126.48	31.62	711.03	155.00	0.816	114.98	120.28	0.0	2.9	76.700	F

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	671.54	167.88	91.00	956.80	0.702	668.02	892.59	1.4	2.3	12.311	B
B	80.01	20.00	638.39	116.73	0.685	77.13	120.63	1.0	1.7	84.680	F
C	859.42	214.86	140.31	1363.96	0.630	857.07	575.21	1.1	1.7	7.080	A
D	151.03	37.76	852.85	141.40	1.068	130.75	144.53	2.9	7.9	193.605	F

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	822.46	205.62	95.09	955.22	0.861	810.46	1065.24	2.3	5.3	23.111	C
B	97.99	24.50	762.63	107.51	0.911	89.47	142.93	1.7	3.9	151.562	F
C	1052.58	263.14	167.09	1349.76	0.780	1045.85	685.01	1.7	3.4	11.590	B
D	184.97	46.24	1037.99	123.64	1.496	122.34	174.94	7.9	23.6	510.651	F

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	822.46	205.62	95.43	955.10	0.861	820.89	1073.44	5.3	5.6	26.094	D
B	97.99	24.50	771.99	106.81	0.917	93.63	144.33	3.9	5.0	200.479	F
C	1052.58	263.14	171.54	1347.39	0.781	1052.14	694.08	3.4	3.5	12.148	B
D	184.97	46.24	1046.36	122.84	1.506	122.51	177.33	23.6	39.2	898.274	F

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	671.54	167.88	95.02	955.25	0.703	684.24	912.32	5.6	2.5	13.851	B
B	80.01	20.00	655.63	115.45	0.693	88.53	123.62	5.0	2.8	144.711	F
C	859.42	214.86	151.00	1358.29	0.633	866.23	593.17	3.5	1.8	7.413	A
D	151.03	37.76	868.08	139.94	1.079	139.25	149.14	39.2	42.2	1064.844	F

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	562.38	140.60	93.86	955.70	0.588	566.42	779.68	2.5	1.5	9.343	A
B	67.00	16.75	554.19	122.98	0.545	72.89	106.09	2.8	1.4	77.428	F
C	719.73	179.93	124.69	1372.24	0.524	722.30	502.39	1.8	1.1	5.562	A
D	126.48	31.62	723.28	153.82	0.822	150.26	123.71	42.2	36.2	941.367	F

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction 6 AM Peak Hour_Altered Layout_DS.j9
Path: G:\2018\p180176\calcs\arcady
Report generation date: 29/08/2019 13:31:18

»AM Peak Hour - 2021 Do-Something, AM
»AM Peak Hour - 2026 Do-Something, AM
»AM Peak Hour - 2036 Do-Something, AM

Summary of junction performance

	AM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
AM Peak Hour - 2021 Do-Something					
Arm A	5.9	22.41	0.87	C	-41 %
Arm B	2.7	120.27	0.78	F	
Arm C	3.9	21.61	0.80	C	[Arm B]
Arm D	0.2	3.63	0.17	A	
AM Peak Hour - 2026 Do-Something					
Arm A	14.6	50.50	0.96	F	-47 %
Arm B	4.9	197.59	0.92	F	
Arm C	6.9	36.03	0.89	E	[Arm B]
Arm D	0.3	3.99	0.22	A	
AM Peak Hour - 2036 Do-Something					
Arm A	43.4	121.97	1.05	F	-51 %
Arm B	8.3	306.22	1.04	F	
Arm C	14.8	69.74	0.97	F	[Arm B]
Arm D	0.3	4.20	0.24	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. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

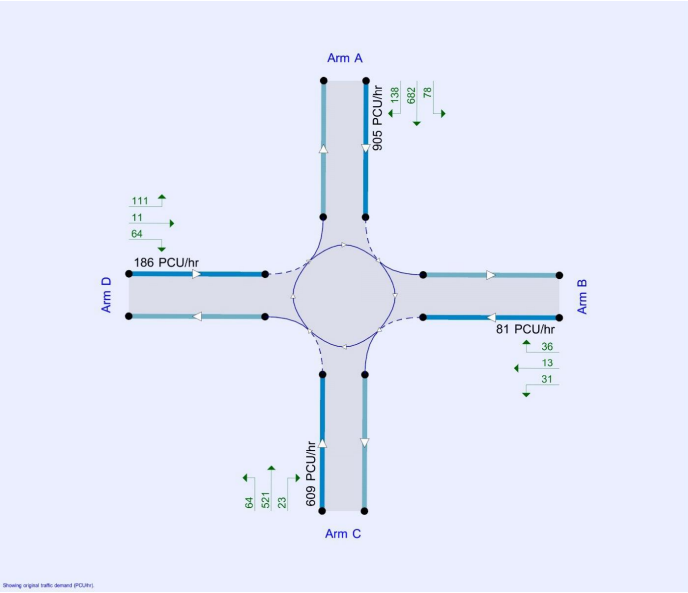
File summary

File Description

Title	Lissywollen Residential Development
Location	R914 / Moydrum Road
Site number	6
Date	23/08/2019
Version	
Status	Planning
Identifier	
Client	Alanna
Jobnumber	180176
Enumerator	HEADOFFICE"mckennam
Description	AM Peak Hour DS

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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2021 Do-Something	AM	ONE HOUR	08:15	09:45	15	✓
2026 Do-Something	AM	ONE HOUR	08:15	09:45	15	✓
2036 Do-Something	AM	ONE HOUR	08:15	09:45	15	✓

AM Peak Hour - 2021 Do-Something, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm C - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	24.63	C

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-41	Arm B

Arms

Arms

Arm	Name	Description
A	N55	
B	Brawney Rd	
C	R915	
D	One Mile Road	

Capacity Options

Arm	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Assume flat start profile	Initial queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00
D	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	4.50	6.60	5.1	23.0	38.0	34.0	
B	2.60	4.70	13.4	20.0	38.0	29.0	
C	3.70	6.60	35.0	21.0	38.0	37.0	
D	3.00	8.50	14.5	20.0	38.0	42.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.629	1625.757
B	0.550	1215.783
C	0.655	1775.772
D	0.612	1592.584

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
A	Percentage		74.00
B	Percentage		17.00
C	Percentage		51.00
D	Percentage		100.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2021 Do-Something	AM	ONE HOUR	08:15	09:45	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	905.00	100.000
B		ONE HOUR	✓	81.00	100.000
C		ONE HOUR	✓	609.00	100.000
D		ONE HOUR	✓	186.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	7.000	78.000	682.000	138.000
	B	36.000	1.000	31.000	13.000
	C	521.000	23.000	1.000	64.000
	D	111.000	11.000	64.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.01	0.09	0.75	0.15
	B	0.44	0.01	0.38	0.16
	C	0.86	0.04	0.00	0.11
	D	0.60	0.06	0.34	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.87	22.41	5.9	C	830.44	1245.67
B	0.78	120.27	2.7	F	74.33	111.49
C	0.80	21.61	3.9	C	558.83	838.24
D	0.17	3.63	0.2	A	170.68	256.02

Main Results for each time segment

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	681.33	170.33	74.88	1168.20	0.583	675.84	502.80	0.0	1.4	7.234	A
B	60.98	15.25	666.36	144.38	0.422	58.27	84.37	0.0	0.7	40.697	E
C	458.49	114.62	144.26	857.47	0.535	453.99	580.38	0.0	1.1	8.828	A
D	140.03	35.01	438.12	1324.47	0.106	139.56	160.12	0.0	0.1	3.036	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	813.58	203.39	89.72	1161.30	0.701	810.03	603.78	1.4	2.3	10.144	B
B	72.82	18.20	798.60	132.02	0.552	71.15	101.15	0.7	1.1	57.464	F
C	547.48	136.87	173.70	847.64	0.646	544.93	696.05	1.1	1.8	11.789	B
D	167.21	41.80	526.43	1270.42	0.132	167.08	192.20	0.1	0.2	3.262	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	996.42	249.11	109.65	1152.02	0.865	983.38	734.25	2.3	5.5	19.936	C
B	89.18	22.30	970.10	115.98	0.769	84.25	122.93	1.1	2.3	100.285	F
C	670.52	167.63	209.57	835.66	0.802	662.90	844.79	1.8	3.7	19.983	C
D	204.79	51.20	639.33	1201.33	0.170	204.58	233.14	0.2	0.2	3.611	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	996.42	249.11	110.05	1151.83	0.865	994.91	741.84	5.5	5.9	22.412	C
B	89.18	22.30	980.72	114.99	0.776	87.67	124.24	2.3	2.7	120.267	F
C	670.52	167.63	213.53	834.34	0.804	669.74	854.87	3.7	3.9	21.614	C
D	204.79	51.20	647.10	1196.58	0.171	204.78	236.16	0.2	0.2	3.628	A

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	813.58	203.39	90.35	1161.00	0.701	827.45	616.01	5.9	2.4	11.208	B
B	72.82	18.20	814.66	130.52	0.558	77.92	103.15	2.7	1.4	73.067	F
C	547.48	136.87	180.68	845.31	0.648	555.31	711.90	3.9	1.9	12.729	B
D	167.21	41.80	538.94	1262.77	0.132	167.42	197.04	0.2	0.2	3.289	A

Main results: (09:30-09:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	681.33	170.33	75.49	1167.92	0.583	685.34	511.90	2.4	1.4	7.522	A
B	60.98	15.25	675.26	143.55	0.425	63.51	85.57	1.4	0.8	46.215	E
C	458.49	114.62	149.01	855.88	0.536	461.39	589.76	1.9	1.2	9.191	A
D	140.03	35.01	447.22	1318.90	0.106	140.17	163.19	0.2	0.1	3.056	A

AM Peak Hour - 2026 Do-Something, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm C - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	46.59	E

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 Do-Something	AM	ONE HOUR	08:15	09:45	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	996.00	100.000
B		ONE HOUR	✓	88.00	100.000
C		ONE HOUR	✓	666.00	100.000
D		ONE HOUR	✓	238.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	8.000	85.000	739.000	164.000
	B	39.000	1.000	34.000	14.000
	C	565.000	25.000	1.000	75.000
	D	145.000	12.000	81.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.01	0.09	0.74	0.16
	B	0.44	0.01	0.39	0.16
	C	0.85	0.04	0.00	0.11
	D	0.61	0.05	0.34	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.96	50.50	14.6	F	913.95	1370.92
B	0.92	197.59	4.9	F	80.75	121.13
C	0.89	36.03	6.9	E	611.13	916.70
D	0.22	3.99	0.3	A	218.39	327.59

Main Results for each time segment

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	749.84	187.46	89.84	1161.24	0.646	742.74	563.22	0.0	1.8	8.466	A
B	66.25	16.56	740.86	137.42	0.482	62.88	91.71	0.0	0.8	46.526	E
C	501.40	125.35	166.85	849.93	0.590	495.80	636.89	0.0	1.4	10.015	B
D	179.18	44.79	474.51	1302.20	0.138	178.54	188.14	0.0	0.2	3.202	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	895.38	223.85	107.62	1152.96	0.777	889.41	675.94	1.8	3.3	13.352	B
B	79.11	19.78	887.15	123.74	0.639	76.54	109.88	0.8	1.5	72.331	F
C	598.72	149.68	200.56	838.67	0.714	594.85	763.13	1.4	2.4	14.527	B
D	213.96	53.49	569.80	1243.89	0.172	213.77	225.61	0.2	0.2	3.494	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1096.62	274.15	131.31	1141.94	0.960	1062.74	816.39	3.3	11.7	35.527	E
B	96.89	24.22	1062.20	107.37	0.902	88.11	131.86	1.5	3.7	144.087	F
C	733.28	183.32	237.59	826.30	0.887	718.28	912.72	2.4	6.1	29.803	D
D	262.04	65.51	685.98	1172.79	0.223	261.73	269.89	0.2	0.3	3.951	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1096.62	274.15	131.95	1141.64	0.961	1085.34	828.75	11.7	14.6	50.498	F
B	96.89	24.22	1082.99	105.43	0.919	92.19	134.30	3.7	4.9	197.590	F
C	733.28	183.32	244.00	824.16	0.890	730.28	931.18	6.1	6.9	36.030	E
D	262.04	65.51	698.66	1165.02	0.225	262.03	275.62	0.3	0.3	3.986	A

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	895.38	223.85	108.76	1152.43	0.777	938.65	699.54	14.6	3.7	19.674	C
B	79.11	19.78	932.39	119.51	0.662	88.87	115.02	4.9	2.4	129.195	F
C	598.72	149.68	216.63	833.30	0.718	615.40	804.63	6.9	2.7	17.623	C
D	213.96	53.49	594.03	1229.06	0.174	214.27	238.00	0.3	0.2	3.550	A

Main results: (09:30-09:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	749.84	187.46	90.67	1160.85	0.646	757.30	576.63	3.7	1.9	9.080	A
B	66.25	16.56	754.48	136.14	0.487	71.73	93.49	2.4	1.0	59.450	F
C	501.40	125.35	174.80	847.27	0.592	506.24	651.42	2.7	1.5	10.700	B
D	179.18	44.79	487.92	1293.99	0.138	179.38	193.12	0.2	0.2	3.232	A

AM Peak Hour - 2036 Do-Something, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm C - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	AM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	99.00	F

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2036 Do-Something	AM	ONE HOUR	08:15	09:45	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	1087.00	100.000
B		ONE HOUR	✓	96.00	100.000
C		ONE HOUR	✓	726.00	100.000
D		ONE HOUR	✓	249.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	9.000	93.000	810.000	175.000
	B	43.000	1.000	37.000	15.000
	C	619.000	27.000	1.000	79.000
	D	152.000	12.000	85.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.01	0.09	0.75	0.16
	B	0.45	0.01	0.39	0.16
	C	0.85	0.04	0.00	0.11
	D	0.61	0.05	0.34	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	1.05	121.97	43.4	F	997.45	1496.18
B	1.04	306.22	8.3	F	88.09	132.14
C	0.97	69.74	14.8	F	666.19	999.29
D	0.24	4.20	0.3	A	228.49	342.73

Main Results for each time segment

Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	818.35	204.59	94.28	1159.18	0.706	809.11	611.18	0.0	2.3	10.038	B
B	72.27	18.07	804.38	131.48	0.550	67.99	99.00	0.0	1.1	53.794	F
C	546.57	136.64	178.75	845.95	0.646	539.53	693.63	0.0	1.8	11.502	B
D	187.46	46.87	518.68	1275.17	0.147	186.77	199.59	0.0	0.2	3.306	A

Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	977.19	244.30	112.91	1150.50	0.849	966.50	732.55	2.3	5.0	18.534	C
B	86.30	21.58	961.04	116.83	0.739	82.20	118.37	1.1	2.1	93.906	F
C	652.66	163.16	214.12	834.14	0.782	646.50	829.12	1.8	3.3	18.573	C
D	223.85	55.96	621.83	1212.04	0.185	223.63	238.79	0.2	0.2	3.642	A

Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1196.81	299.20	137.20	1139.19	1.051	1110.03	871.46	5.0	26.7	63.921	F
B	105.70	26.42	1109.59	102.94	1.027	91.55	137.65	2.1	5.6	199.763	F
C	799.34	199.84	244.17	824.11	0.970	767.19	956.97	3.3	11.3	47.046	E
D	274.15	68.54	734.86	1142.87	0.240	273.80	276.50	0.2	0.3	4.140	A

Main results: (09:00-09:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	1196.81	299.20	138.08	1138.79	1.051	1129.84	889.03	26.7	43.4	121.970	F
B	105.70	26.42	1127.84	101.24	1.044	95.23	140.08	5.6	8.3	306.215	F
C	799.34	199.84	249.78	822.23	0.972	785.43	973.29	11.3	14.8	69.737	F
D	274.15	68.54	752.97	1131.79	0.242	274.14	282.24	0.3	0.3	4.197	A

Main results: (09:15-09:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	977.19	244.30	115.08	1149.49	0.850	1118.22	779.55	43.4	8.2	87.726	F
B	86.30	21.58	1100.03	103.84	0.831	91.55	133.27	8.3	6.9	289.905	F
C	652.66	163.16	245.55	823.65	0.792	694.84	946.03	14.8	4.3	33.835	D
D	223.85	55.96	670.45	1182.29	0.189	224.18	269.94	0.3	0.2	3.757	A

Main results: (09:30-09:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	818.35	204.59	95.54	1158.59	0.706	841.00	637.55	8.2	2.5	12.081	B
B	72.27	18.07	833.89	128.72	0.561	93.87	102.65	6.9	1.5	125.203	F
C	546.57	136.64	200.05	838.84	0.652	555.89	727.71	4.3	1.9	13.114	B
D	187.46	46.87	545.39	1258.82	0.149	187.70	210.55	0.2	0.2	3.360	A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction 6 PM Peak Hour_Altered Layout_DS.j9
Path: G:\2018\p180176\calcs\arcady
Report generation date: 29/08/2019 13:29:37

Summary of junction performance

	PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
PM Peak Hour - 2021 Do-Something					
Arm A	3.3	16.77	0.77	C	-54 % [Arm B]
Arm B	2.5	119.35	0.76	F	
Arm C	2.0	8.24	0.67	A	
Arm D	0.3	4.71	0.21	A	
PM Peak Hour - 2026 Do-Something					
Arm A	6.5	30.22	0.88	D	-58 % [Arm B]
Arm B	4.1	180.47	0.88	F	
Arm C	3.0	11.16	0.76	B	
Arm D	0.4	5.34	0.27	A	
PM Peak Hour - 2036 Do-Something					
Arm A	13.9	58.73	0.96	F	-61 % [Arm B]
Arm B	6.7	269.27	1.00	F	
Arm C	4.6	15.71	0.83	C	
Arm D	0.4	5.91	0.30	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. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

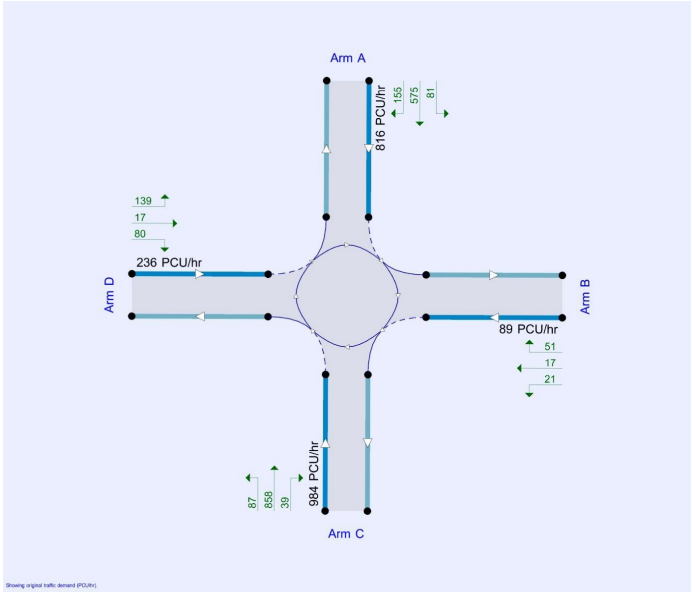
File summary

File Description

Title	Lissywollen Residential Development
Location	R914 / Moydrum Road
Site number	6
Date	23/08/2019
Version	
Status	Planning
Identifier	
Client	Alanna
Jobnumber	180176
Enumerator	HEADOFFICE"mckennam
Description	PM Peak Hour DS

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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
2021 Do-Something	PM	ONE HOUR	16:45	18:15	15	✓
2026 Do-Something	PM	ONE HOUR	16:45	18:15	15	✓
2036 Do-Something	PM	ONE HOUR	16:45	18:15	15	✓

PM Peak Hour - 2021 Do-Something, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm C - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	PM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	15.97	C

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	-54	Arm B

Arms

Arms

Arm	Name	Description
A	N55	
B	Brawney Rd	
C	R915	
D	One Mile Road	

Capacity Options

Arm	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Assume flat start profile	Initial queue (PCU)
A	0.00	99999.00		0.00
B	0.00	99999.00		0.00
C	0.00	99999.00		0.00
D	0.00	99999.00		0.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	4.50	6.60	5.1	23.0	38.0	34.0	
B	2.60	4.70	13.4	20.0	38.0	29.0	
C	3.70	6.60	35.0	21.0	38.0	37.0	
D	3.00	8.50	11.0	20.0	38.0	42.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.629	1625.757
B	0.550	1215.783
C	0.655	1775.772
D	0.590	1485.421

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
A	Percentage		61.00
B	Percentage		13.50
C	Percentage		81.00
D	Percentage		100.00

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2021 Do-Something	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	665.00	100.000
B		ONE HOUR	✓	76.00	100.000
C		ONE HOUR	✓	820.00	100.000
D		ONE HOUR	✓	182.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	4.000	68.000	484.000	109.000
	B	43.000	0.000	18.000	15.000
	C	723.000	33.000	0.000	64.000
	D	105.000	15.000	62.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.01	0.10	0.73	0.16
	B	0.57	0.00	0.24	0.20
	C	0.88	0.04	0.00	0.08
	D	0.58	0.08	0.34	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.77	16.77	3.3	C	610.22	915.32
B	0.76	119.35	2.5	F	69.74	104.61
C	0.67	8.24	2.0	A	752.45	1128.67
D	0.21	4.71	0.3	A	167.01	250.51

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	500.65	125.16	82.45	960.07	0.521	496.37	653.87	0.0	1.1	7.694	A
B	57.22	14.30	492.10	127.59	0.448	54.26	86.72	0.0	0.7	47.469	E
C	617.34	154.33	125.75	1371.68	0.450	614.10	420.60	0.0	0.8	4.732	A
D	137.02	34.25	599.85	1131.25	0.121	136.47	140.00	0.0	0.1	3.617	A

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	597.82	149.46	98.75	953.82	0.627	595.57	784.28	1.1	1.6	9.983	A
B	68.32	17.08	590.35	120.30	0.568	66.67	103.98	0.7	1.2	64.954	F
C	737.16	184.29	152.09	1357.71	0.543	735.72	504.94	0.8	1.2	5.773	A
D	163.61	40.90	719.60	1060.55	0.154	163.44	168.20	0.1	0.2	4.011	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	732.18	183.04	120.85	945.34	0.775	725.93	957.83	1.6	3.2	15.956	C
B	83.68	20.92	719.86	110.68	0.756	79.43	126.92	1.2	2.2	102.699	F
C	902.84	225.71	183.98	1340.80	0.673	899.49	615.32	1.2	2.0	8.095	A
D	200.39	50.10	878.60	966.67	0.207	200.07	204.87	0.2	0.3	4.693	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	732.18	183.04	121.10	945.24	0.775	731.73	962.57	3.2	3.3	16.765	C
B	83.68	20.92	725.17	110.29	0.759	82.44	127.67	2.2	2.5	119.350	F
C	902.84	225.71	187.25	1339.06	0.674	902.71	620.36	2.0	2.0	8.244	A
D	200.39	50.10	883.30	963.90	0.208	200.38	206.66	0.3	0.3	4.714	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	597.82	149.46	99.15	953.67	0.627	604.13	792.02	3.3	1.7	10.476	B
B	68.32	17.08	598.20	119.72	0.571	72.34	105.09	2.5	1.5	80.607	F
C	737.16	184.29	157.86	1354.65	0.544	740.48	512.67	2.0	1.2	5.892	A
D	163.61	40.90	727.25	1056.03	0.155	163.92	171.09	0.3	0.2	4.036	A

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	500.65	125.16	82.95	959.88	0.522	503.12	661.63	1.7	1.1	7.925	A
B	57.22	14.30	498.41	127.13	0.450	59.72	87.66	1.5	0.9	55.100	F
C	617.34	154.33	131.07	1368.86	0.451	618.86	427.06	1.2	0.8	4.809	A
D	137.02	34.25	607.38	1126.81	0.122	137.20	142.55	0.2	0.1	3.640	A

PM Peak Hour - 2026 Do-Something, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm C - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	PM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	24.89	C

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 Do-Something	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	750.00	100.000
B		ONE HOUR	✓	82.00	100.000
C		ONE HOUR	✓	902.00	100.000
D		ONE HOUR	✓	224.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	4.000	74.000	524.000	148.000
	B	47.000	0.000	19.000	16.000
	C	783.000	36.000	0.000	83.000
	D	132.000	16.000	76.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.01	0.10	0.70	0.20
	B	0.57	0.00	0.23	0.20
	C	0.87	0.04	0.00	0.09
	D	0.59	0.07	0.34	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.88	30.22	6.5	D	688.21	1032.32
B	0.88	180.47	4.1	F	75.24	112.87
C	0.76	11.16	3.0	B	827.69	1241.54
D	0.27	5.34	0.4	A	205.55	308.32

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	564.64	141.16	95.91	954.91	0.591	558.99	721.28	0.0	1.4	8.971	A
B	61.73	15.43	560.81	122.49	0.504	58.12	94.09	0.0	0.9	53.480	F
C	679.07	169.77	157.94	1354.61	0.501	675.10	460.99	0.0	1.0	5.268	A
D	168.64	42.16	649.27	1102.07	0.153	167.92	183.77	0.0	0.2	3.851	A

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	674.23	168.56	114.88	947.63	0.712	670.46	865.06	1.4	2.4	12.809	B
B	73.72	18.43	672.54	114.20	0.646	71.30	112.80	0.9	1.5	79.319	F
C	810.88	202.72	190.66	1337.25	0.606	808.80	553.19	1.0	1.5	6.784	A
D	201.37	50.34	778.82	1025.58	0.196	201.12	220.64	0.2	0.2	4.365	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	825.77	206.44	140.51	937.80	0.881	811.32	1054.24	2.4	6.0	25.877	D
B	90.28	22.57	814.79	103.64	0.871	83.16	137.04	1.5	3.3	140.407	F
C	993.12	248.28	228.32	1317.28	0.754	987.47	669.63	1.5	2.9	10.731	B
D	246.63	61.66	948.59	925.34	0.267	246.16	267.19	0.2	0.4	5.297	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	825.77	206.44	140.91	937.64	0.881	823.53	1061.41	6.0	6.5	30.221	D
B	90.28	22.57	825.95	102.81	0.878	87.03	138.49	3.3	4.1	180.474	F
C	993.12	248.28	233.77	1314.39	0.756	992.78	679.21	2.9	3.0	11.163	B
D	246.63	61.66	955.71	921.14	0.268	246.62	270.85	0.4	0.4	5.336	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	674.23	168.56	115.49	947.40	0.712	689.98	877.86	6.5	2.6	14.754	B
B	73.72	18.43	690.38	112.87	0.653	80.96	115.09	4.1	2.3	123.114	F
C	810.88	202.72	202.04	1331.22	0.609	816.57	569.30	3.0	1.6	7.072	A
D	201.37	50.34	791.52	1018.09	0.198	201.83	227.09	0.4	0.2	4.412	A

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	564.64	141.16	96.56	954.66	0.591	569.06	732.01	2.6	1.5	9.439	A
B	61.73	15.43	570.22	121.79	0.507	66.29	95.40	2.3	1.1	68.750	F
C	679.07	169.77	166.26	1350.19	0.503	681.33	470.25	1.6	1.0	5.401	A
D	168.64	42.16	659.67	1095.93	0.154	168.90	187.93	0.2	0.2	3.885	A

PM Peak Hour - 2036 Do-Something, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm C - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	PM Peak Hour	✓	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	A,B,C,D	41.76	E

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2036 Do-Something	PM	ONE HOUR	16:45	18:15	15	✓

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

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	816.00	100.000
B		ONE HOUR	✓	89.00	100.000
C		ONE HOUR	✓	984.00	100.000
D		ONE HOUR	✓	236.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	5.000	81.000	575.000	155.000
	B	51.000	0.000	21.000	17.000
	C	858.000	39.000	0.000	87.000
	D	139.000	17.000	80.000	0.000

Proportions

		To			
		A	B	C	D
From	A	0.01	0.10	0.70	0.19
	B	0.57	0.00	0.24	0.19
	C	0.87	0.04	0.00	0.09
	D	0.59	0.07	0.34	0.00

Vehicle Mix

Heavy Vehicle proportion

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

Average PCU Per Veh

		To			
		A	B	C	D
From	A	1.000	1.000	1.000	1.000
	B	1.000	1.000	1.000	1.000
	C	1.000	1.000	1.000	1.000
	D	1.000	1.000	1.000	1.000

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
A	0.96	58.73	13.9	F	748.78	1123.16
B	1.00	269.27	6.7	F	81.67	122.50
C	0.83	15.71	4.6	C	902.94	1354.40
D	0.30	5.91	0.4	A	216.56	324.84

Main Results for each time segment

Main results: (16:45-17:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	614.33	153.58	101.87	952.62	0.645	607.29	785.52	0.0	1.8	10.229	B
B	67.00	16.75	606.97	119.07	0.563	62.57	102.20	0.0	1.1	60.049	F
C	740.81	185.20	166.89	1349.86	0.549	736.01	502.66	0.0	1.2	5.820	A
D	177.67	44.42	710.51	1065.91	0.167	176.88	192.38	0.0	0.2	4.046	A

Main results: (17:00-17:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	733.57	183.39	122.02	944.89	0.776	727.70	941.83	1.8	3.2	16.135	C
B	80.01	20.00	727.28	110.13	0.726	76.46	122.44	1.1	2.0	97.176	F
C	884.60	221.15	201.10	1331.72	0.664	881.67	602.63	1.2	1.9	7.947	A
D	212.16	53.04	851.99	982.38	0.216	211.86	230.78	0.2	0.3	4.669	A

Main results: (17:15-17:30)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	898.43	224.61	149.12	934.49	0.961	867.07	1143.96	3.2	11.1	41.099	E
B	97.99	24.50	868.89	99.62	0.984	86.63	147.30	2.0	4.8	187.883	F
C	1083.40	270.85	236.20	1313.10	0.825	1073.81	719.31	1.9	4.3	14.491	B
D	259.84	64.96	1033.82	875.02	0.297	259.26	276.19	0.3	0.4	5.842	A

Main results: (17:30-17:45)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	898.43	224.61	149.69	934.27	0.962	887.14	1154.15	11.1	13.9	58.730	F
B	97.99	24.50	887.16	98.26	0.997	90.39	149.68	4.8	6.7	269.274	F
C	1083.40	270.85	243.01	1309.49	0.827	1082.50	734.54	4.3	4.6	15.709	C
D	259.84	64.96	1044.03	869.00	0.299	259.82	281.49	0.4	0.4	5.909	A

Main results: (17:45-18:00)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	733.57	183.39	122.89	944.56	0.777	773.98	962.02	13.9	3.8	24.956	C
B	80.01	20.00	769.26	107.02	0.748	90.81	127.61	6.7	4.0	215.236	F
C	884.60	221.15	221.14	1321.09	0.670	894.49	638.93	4.6	2.1	8.624	A
D	212.16	53.04	872.18	970.46	0.219	212.73	243.45	0.4	0.3	4.754	A

Main results: (18:00-18:15)

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	LOS
A	614.33	153.58	102.65	952.32	0.645	621.97	801.61	3.8	1.9	11.135	B
B	67.00	16.75	620.56	118.06	0.568	77.00	104.05	4.0	1.5	98.398	F
C	740.81	185.20	180.79	1342.49	0.552	744.13	516.78	2.1	1.2	6.048	A
D	177.67	44.42	726.28	1056.61	0.168	177.99	198.64	0.3	0.2	4.098	A

APPENDIX D

Bicycle Parking Strategy

Sector		Dwelling Type	No. of Units	LONG TERM (Residents)							SHORT TERM (Visitors)			
				Location Reference No.	Proposed Provision				Requirements		Location No.	Provision	Requirement	
					External Hub	Rear Garden of House	Internal in Apartment Block	Sub Total	WMCC	DHPLG		External Hub	WMCC	DHPLG
Sector 1	1A East	Block A	8	LAI1	0	n/a	16	16	14	16	SAE1	2	4	4
											SAE2	2		
		Block B	8	LAI2	0	n/a	16	16	14	16	SAE3	4	4	4
		Apartment Total			**0**	**0**	**32**	**32**	**28**	**32**	**Apartment Total**	**8**	**8**	**8**
		House E22, E33, E40, E51	36	LHE1	*8*	0	n/a	8	79	n/a	SHE1	2	18	n/a
		House 17-21		R17-R22	-	12	n/a	12			SHE2	2		
		House 23-32		R23-R32	-	21	n/a	21			SHE3	2		
		House 34		R34	-	2	n/a	2			SHE4	2		
		House 35-39		R35-39	-	12	n/a	12			SHE5	2		
		House 41-50		R41-50	-	22	n/a	22			SHE6	2		
		House 52		R52	-	2	n/a	2			SHE7	2		
											SHE8	2		
											SHE9	2		
											SHE10	2		
		House Total			**8**	**71**	**0**	**79**	**79**	**0**	**House Total**	**20**	**18**	**0**
		TOTAL (1A East)			**8**	**71**	**32**	**111**	**107**	**32**	**TOTAL (1A East)**	**28**	**26**	**8**
	1A West	House E58, E69, E76, E87	36	LHE2	*8*	0	n/a	8	79	n/a	SHE11	2	18	n/a
		House 53-57		R53-R57	-	12	n/a	12			SHE12	2		
		House 59-68		R59-R68	-	21	n/a	21			SHE13	2		
		House 70		R70	-	2	n/a	2			SHE14	2		
											SHE15	2		
		House 71-75		R71-R75	-	12	n/a	12			SHE16	2		
		House 77-86		R77-R86	-	22	n/a	22			SHE17	2		
		House 88		R88	-	2	n/a	2			SHE18	2		
											SHE19	2		
											SHE20	2		
		House Total			**8**	**71**	**0**	**79**	**79**	**0**	**House Total**	**20**	**18**	**0**
		Block C	15	LAI3	-	n/a	6	6	25	30	SAE4	8	7.5	7.5
				LAI4	-	n/a	14	14						
				LAI5	-	n/a	14	14						
		Block D	16	LAE1	10	n/a	-	10	28	28	SAE5	8	8	8
				LAI6	-	n/a	18	18						
		Apartment Total			**10**	**0**	**52**	**62**	**53**	**58**	**Apartment Total**	**16**	**15.5**	**15.5**
		Creche		LCE1	6	n/a	n/a	6	6	n/a	SCE1	6	5	n/a
		Creche Total			**6**	**0**	**0**	**6**	**6**	**0**	**Creche Total**	**6**	**5**	**0**
		TOTAL (1A West)			**24**	**71**	**52**	**147**	**138**	**58**	**TOTAL (1A West)**	**42**	**38.5**	**15.5**
	1B	Block E	9	LAI7	-	n/a	36	36	14	16	SAE6	8	4.5	4.5
		Block F	8						17	20			4	4
		Apartment Total			**0**	**0**	**36**	**36**	**31**	**36**	**Apartment Total**	**8**	**8.5**	**8.5**
		House 211-222	99	R211-R222	-	24	n/a	24	197	n/a	SHE21	2	49.5	n/a
											SHE22	2		
											SHE23	2		
		House E196, E197, E204, E205		LHE3	*8*	0	n/a	8						
		House 195		R195	-	2	n/a	2			SHE24	2		
		House 198-203		R198-R203	-	12	n/a	12			SHE25	2		
		House 206-210		R206-R210	-	10	n/a	10			SHE26	2		
											SHE27	2		
		House E230, E233, E236		LHE4	*6*	0	n/a	6						
		House 227-229		R227-229	-	6	n/a	6			SHE28	2		
		House 231-232		R231-232	-	4	n/a	4			SHE29	2		
		House 234-235		R234-235	-	4	n/a	4			SHE30	2		
		House 237-239		R237-239	-	6	n/a	6			SHE31	2		
		House E138,E145		LHE5	*4*	0	n/a	4						
		House 137		R137	-	2	n/a	2			SHE32	2		
		House 139-144		R139-R144	-	12	n/a	12			SHE33	2		
		House 146		R146	-	2	n/a	2			SHE34	2		
		House E173, E176, E179, E182		LHE6	*8*	0	n/a	8						
		House E170, E187, E190, E193		LHE7	*8*	0	n/a	8						
		House 167-169		R167-R170	-	6	n/a	6			SHE35	2		
		House 171-172		R171-R172	-	4	n/a	4			SHE36	2		
		House 174-175		R174-R175	-	4	n/a	4			SHE37	2		
		House 177-178		R177-R178	-	4	n/a	4			SHE38	2		
		House 180-181		R180-R181	-	4	n/a	4			SHE39	2		
		House 183-186		R183-R186	-	8	n/a	8			SHE40	2		
		House 188-189		R188-R189	-	4	n/a	4			SHE41	2		
		House 191-192		R191-R192	-	4	n/a	4						
		House 194		R194	-	2	n/a	2						
		House 147-166		R147-R166	-	40	n/a	40			SHE42	2		
											SHE43	2		
											SHE44	2		
											SHE45	2		
											SHE46	2		
		House Total			**34**	**164**	**0**	**198**	**197**	**0**	**House Total**	**52**	**49.5**	**0**
		TOTAL (1B)			**34**	**164**	**36**	**234**	**228**	**36**	**TOTAL (1B)**	**60**	**58**	**8.5**
	TOTAL Sector 1				**66**	**306**	**120**	**492**	**473**	**126**	**TOTAL Sector 1**	**130**	**122.5**	**32**
	2A	House E243, E246, E249	41	LHE8	*6*	0	n/a	6	120	n/a			20.5	n/a
		House 240-242		R240-R242	-	9	n/a	9			SHE47	2		
		House 244-245		R244-R245	-	7	n/a	7			SHE48	2		
		House 247-248		R247-R248	-	7	n/a	7			SHE49	2		
		House 250		R250	-	3	n/a	3						
		House E255, E256, E259, E260		LHE8	*8*	0	n/a	8						
		House E252, E263		LHE9	*4*	0	n/a	4						
		House 251		R251	-	3	n/a	3			SHE50	2		
		House 253-254		R253-254	-	10	n/a	10			SHE51	2		
		House 257-258		R257-258	-	10	n/a	10			SHE52	2		
		House 261-262		R261-262	-	7	n/a	7			SHE53	2		
		House 264		R264	-	3	n/a	3						

Sector		Dwelling Type	No. of Units	LONG TERM (Residents)							SHORT TERM (Visitors)			
				Location Reference No.	Proposed Provision				Requirements		Location No.	Provision	Requirement	
					External Hub	Rear Garden of House	Internal in Apartment Block	Sub Total	WMCC	DHPLG		External Hub	WMCC	DHPLG
Sector 2		House E282, E283		LHE9	*4*	0	n/a	4						
		House E290, E291		LHE10	*4*	0	n/a	4						
		House 277-281		R277-R281	-	16	n/a	16			SHE54	2		
		House 284-289		R284-R289	-	16	n/a	16			SHE55	2		
		House 292		R292	-	3	n/a	3			SHE56	2		
											SHE57	2		
		House Total			26	94	0	120	120	0	**House Total**	22	20.5	0
		Block G	4	LAI8	-	n/a	6	6	4	4	SAE7	2	2	2
		Block H	12	LAI9	-	n/a	20	20	25	36	SAE8	6	6	6
				LAE2	16	n/a	0	16						
		Apartment Total			16	0	26	42	29	40	**Apartment Total**	8	8	8
		TOTAL (2A)			42	94	26	162	149	40	**TOTAL (2A)**	30	28.5	8
	2B North	House E296, E299, E300, E301	15	LHE11	*8*	0	n/a	8	33	n/a	SHE58	2	7.5	n/a
		House E304, E305, E306, E307		LHE12	*8*	0	n/a	8			SHE59	2		
		House 293-295		R293-R295	-	7	n/a	7			SHE60	2		
		House 297-298		R297-R298	-	5	n/a	5			SHE61	2		
		House 302-303		R302-R303	-	5	n/a	5						
		House Total			16	17	0	33	33	0	**House Total**	8	7.5	0
		Block K	21	LAI10	-	n/a	12	12	36	42	SAE9	12	10.5	10.5
				LAI11	-	n/a	12	12						
				LAI12	-	n/a	12	12						
				LAE3	6	n/a	-	6						
		Apartment Total			6	0	36	42	36	42	**Apartment Total**	12	10.5	10.5
		TOTAL (2B North)			22	17	36	75	69	42	**TOTAL (2B North)**	20	18	10.5
	2B South	House E358	36	LHE13	*2*	0	n/a	2	82	n/a			18	n/a
		House E361		LHE14	*2*	0	n/a	2						
		House 355-357		R355-R357	-	7	n/a	7			SHE62	2		
		House 359-360		R359-R360	-	5	n/a	5			SHE63	2		
		House 362-364		R362-R364	-	7	n/a	7			SHE64	2		
		House E330		LHE13	*2*	0	n/a	2						
		House E331, E334, E337		LHE10	*6*	0	n/a	6						
		House E340, E343		LHE15	*4*	0	n/a	4						
		House E344, E347, E350, E353		LHE14	*8*	0	n/a	8						
		House 329		R329	-	2	n/a	2			SHE65	2		
		House 332-333		R332-R333	-	5	n/a	5			SHE66	2		
		House 335-336		R335-R336	-	5	n/a	5			SHE67	2		
		House 338-339		R338-R339	-	5	n/a	5			SHE68	2		
		House 341-342		R341-R342	-	5	n/a	5			SHE69	2		
		House 345-346		R345-R346	-	5	n/a	5			SHE70	2		
		House 348-349		R348-R349	-	5	n/a	5			SHE71	2		
		House 351-352		R351-R352	-	5	n/a	5						
		House 354		R354	-	2	n/a	2						
		House Total			24	58	0	82	82	0	**House Total**	20	18	0
		TOTAL (2B South)			24	58		82	82	0	**TOTAL (2B South)**	20	18	0
	TOTAL Sector 2				88	169	62	319	300	82	**TOTAL Sector 2**	70	64.5	18.5
Sector 3	3A North	Block L	36	LAI13	-	n/a	18	18	59	72	SAE10	18	18	18
				LAI14	-	n/a	18	18						
				LAE4	40	n/a	-	40						
		Block M	20	LAE5	4	n/a	-	4	33	42	SAE11	10	10	10
				LAE6	40	n/a	-	40						
		Block N	27	LAE7	24	n/a	-	24	42	54	SAE12	4	13.5	13.5
				LAI15	-	n/a	33	33			SAE13	4		
											SAE14	6		
		Apartment Total			108	0	69	177	134	168	**Apartment Total**	42	41.5	41.5
		TOTAL (3A North)			108		69	177	134	168	**TOTAL (3A North)**	42	41.5	41.5
	3A South	Block O	43	LAE8	44	n/a	-	44	65	77	SAE15	22	21.5	21.5
				LAI16	-	n/a	26	26						
				LAI17	-	n/a	10	10						
		Block P	12	LAI18	-	n/a	20	20	18	18	SAE16	2	6	6
											SAE17	2		
											SAE18	2		
		Block Q	8	LAI19	-	n/a	24	24	16	20	SAE19	2	4	4
				LAE9	10	n/a	-	10			SAE20	2		
		Apartment Total			54	0	80	134	99	115	**Apartment Total**	32	31.5	31.5
		TOTAL (3A South)			54	0	80	134	99	115	**TOTAL (3A South)**	32	31.5	31.5
	3B	House E573, E574, E575	22	LHE16	*6*	0	n/a	6	49	n/a	SHE72	2	11	n/a
		House E556, E557, E560, E561		LHE17	*8*	0	n/a	8			SHE73	2		
		House 555		R555	-	3	n/a	3			SHE74	2		
		House 558-559		R558-R559	-	6	n/a	6			SHE75	2		
		House 562-572		R562-R573	-	23	n/a	23			SHE76	2		
		House 576		R576	-	3	n/a	3			SHE77	2		
		House Total			14	35	0	49	49	0	**House Total**	12	11	0
		Block R	18	LAI20	-	n/a	40	40	24	30	SAE21	10	9	9
		Block S	12	LAI21	-	n/a	22	22	24	30	SAE22	12	6	6
				LAI22	-	n/a	14	14						
		Block T	14	LAI23	-	n/a	30	30	19	24	SAE23	12	7	7
		Apartment Total			0	0	106	106	67	84	**Apartment Total**	34	22	22
		Creche		LCE2	8	n/a	n/a	8	8	n/a	SCE2	8	7	n/a
		Creche Total			8	0	0	8	8	0	**Creche Total**	8	7	0
		TOTAL (3B)			22	35	106	163	124	84	**TOTAL (3B)**	54	40	22
	TOTAL Sector 3				184	35	255	474	357	367	**TOTAL Sector 3**	128	113	95
TOTAL (Sectors 1,2 & 3)					338	510	437	1285	1130	575	**TOTAL (Sectors 1,2 & 3)**	328	300	145.5
Cycle Parking Spaces Proposed					1285							328	TOTAL	1613

Items in Italics - Long Term bicycle spaces - External Hub - we have provided 2 no. cycle spaces for these houses

APPENDIX E

Locations of Internal Bicycle Parking

The following figures are extracts from Delphi Architects drawings, which show the locations of the **internal** bicycle facilities for the proposed development.

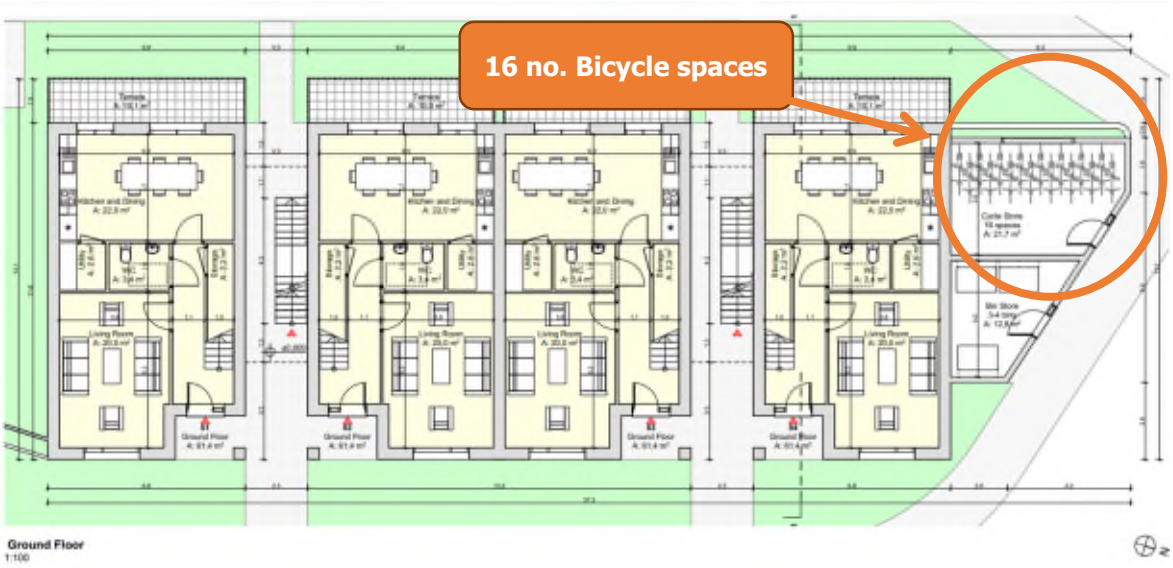


Figure E1: Block A Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA01-CA2)

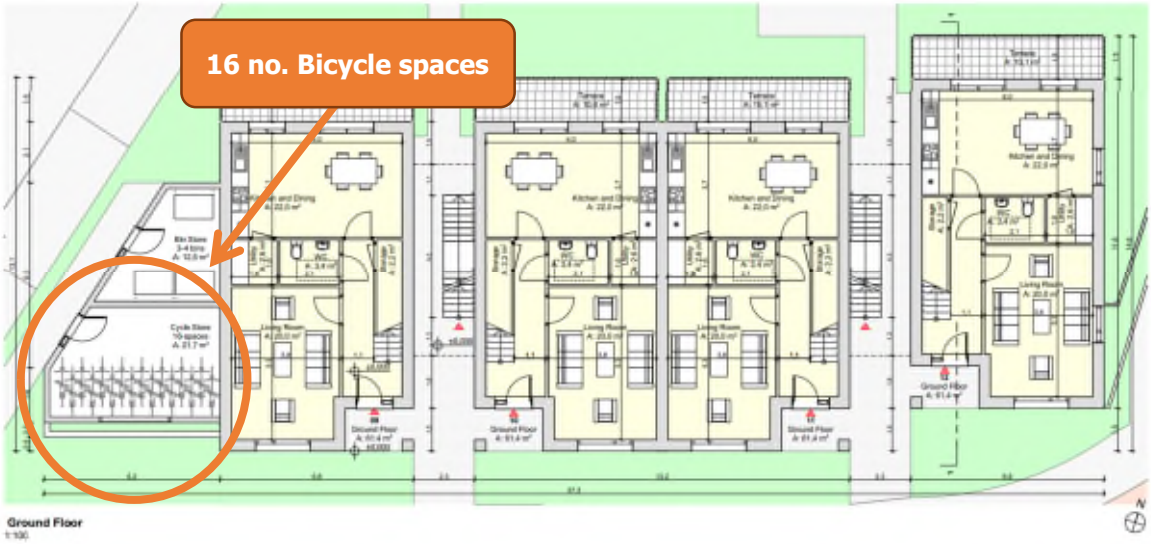


Figure E2: Block B Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA03-CA2)

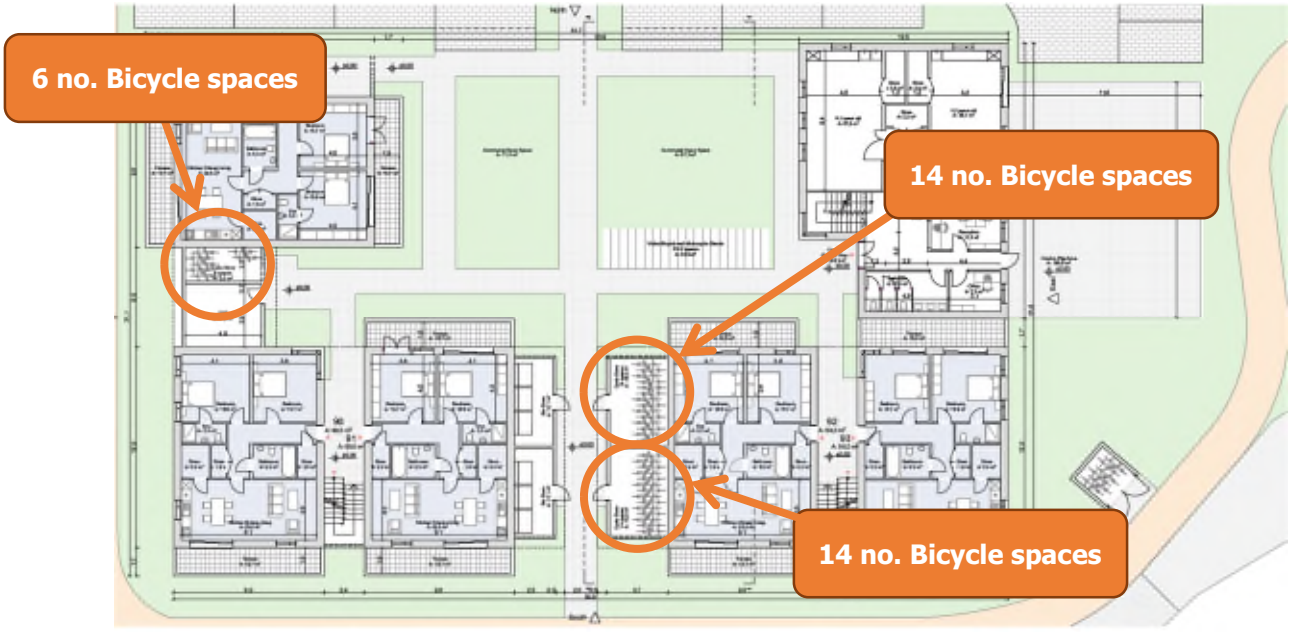


Figure E3: Block C Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA05-CA3)

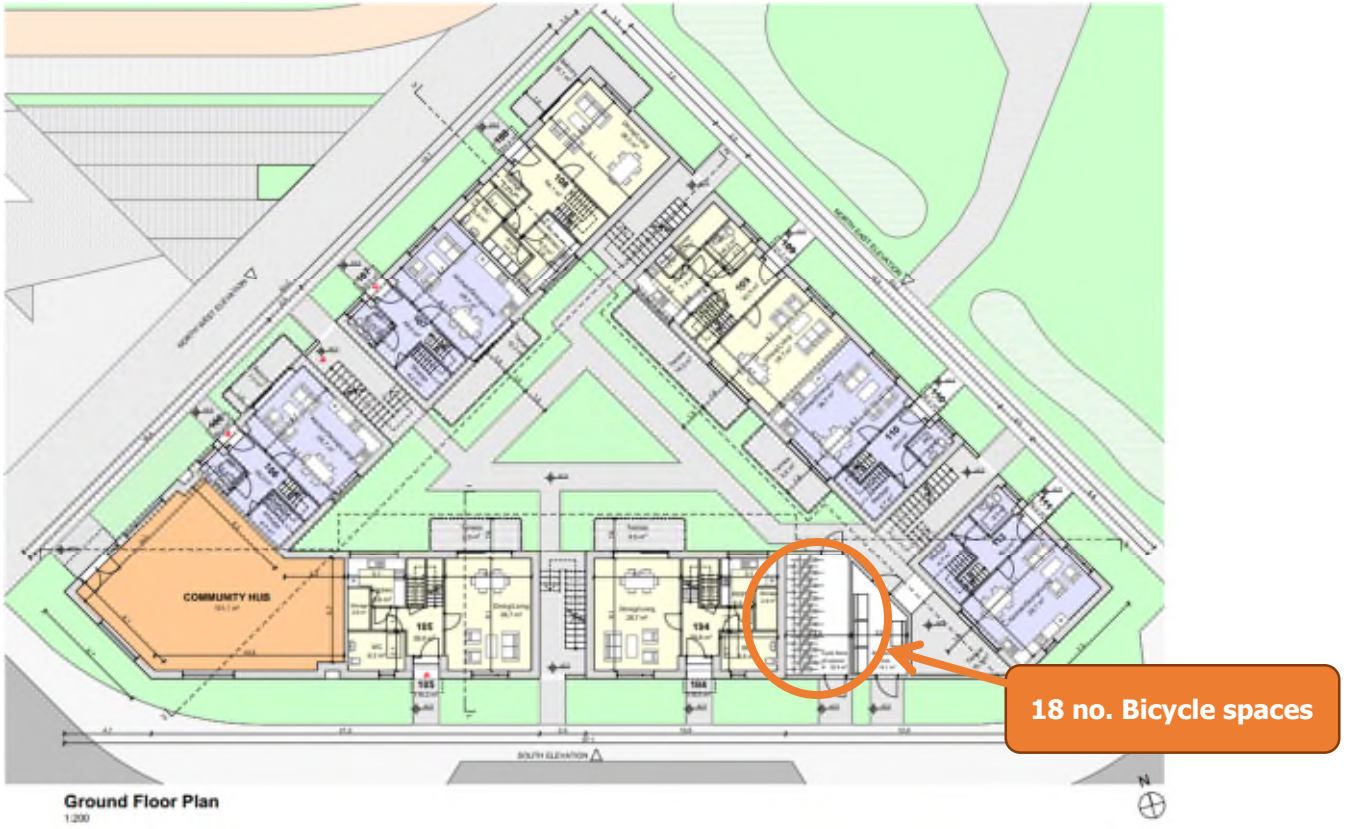


Figure E4: Block D Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA07-CA3)

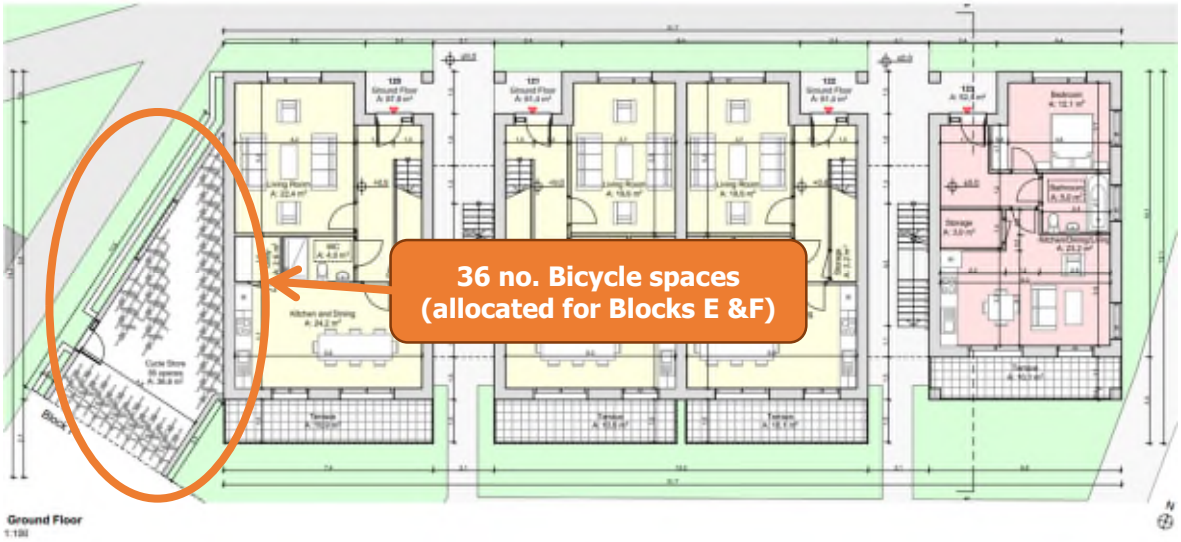


Figure E5: Block E Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA09-CA1)

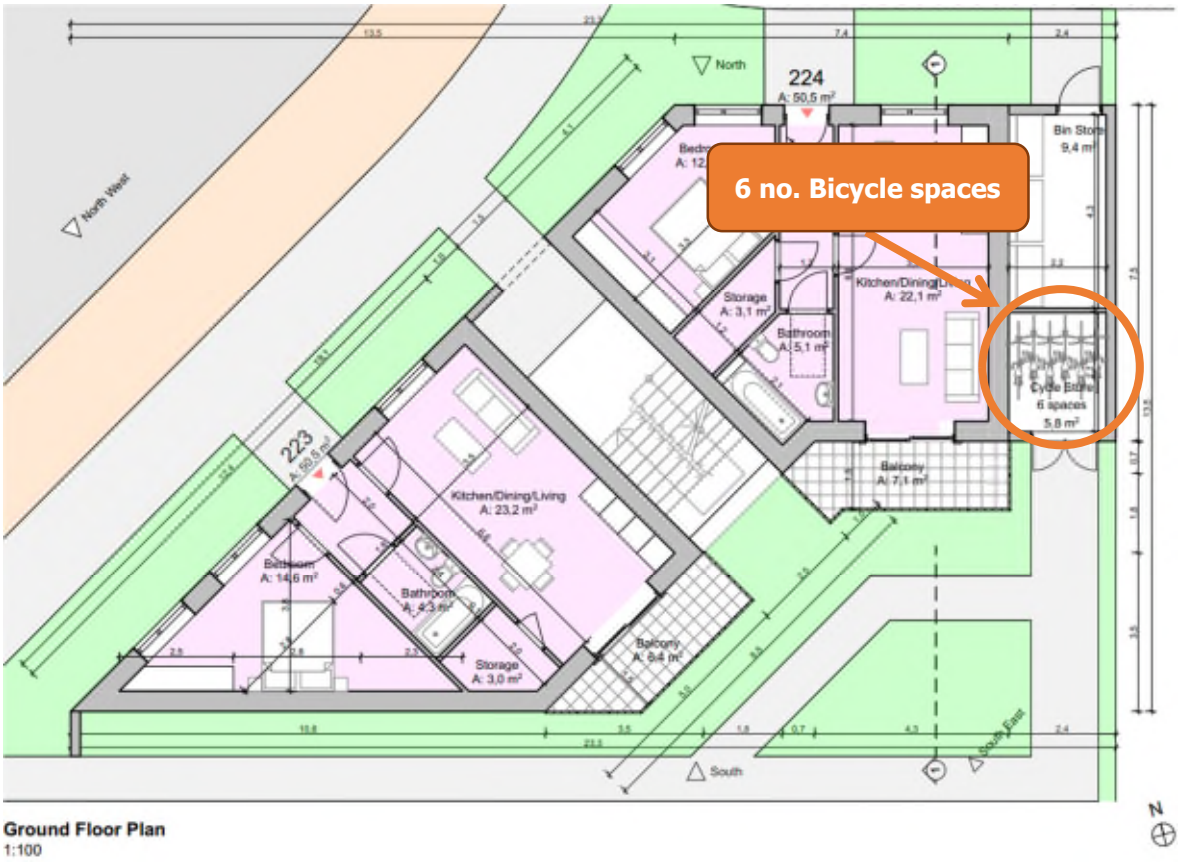


Figure E6: Block G Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA13-CA1)

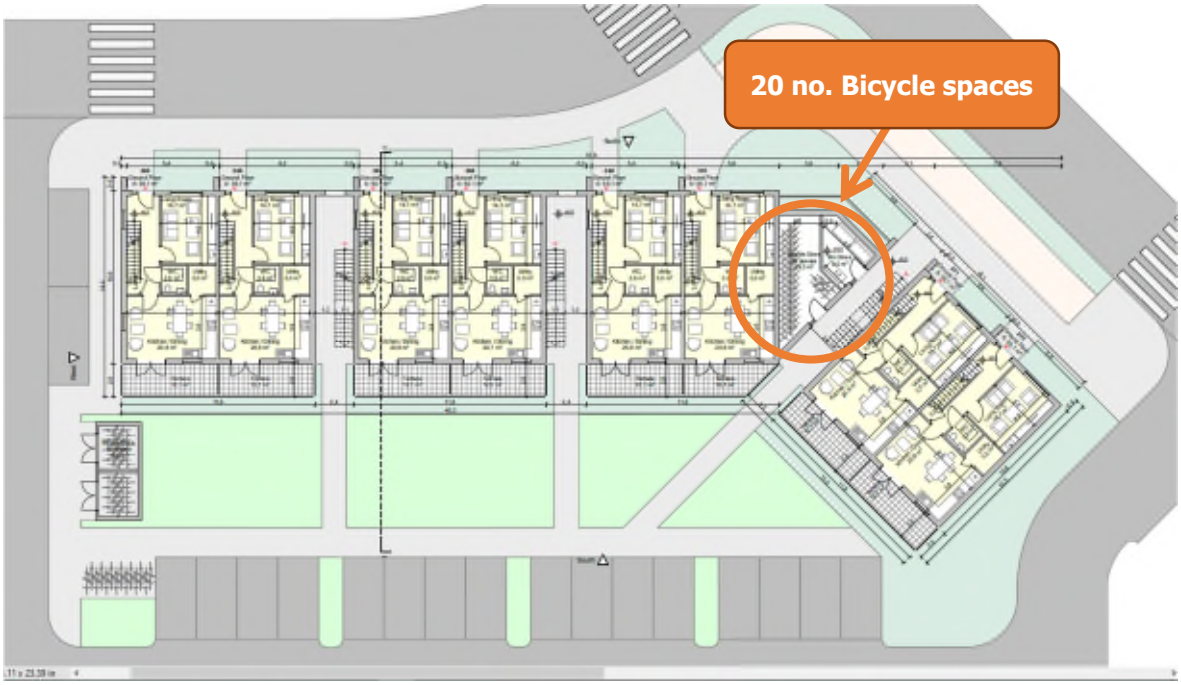


Figure E7: Block H Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA14-CA3)

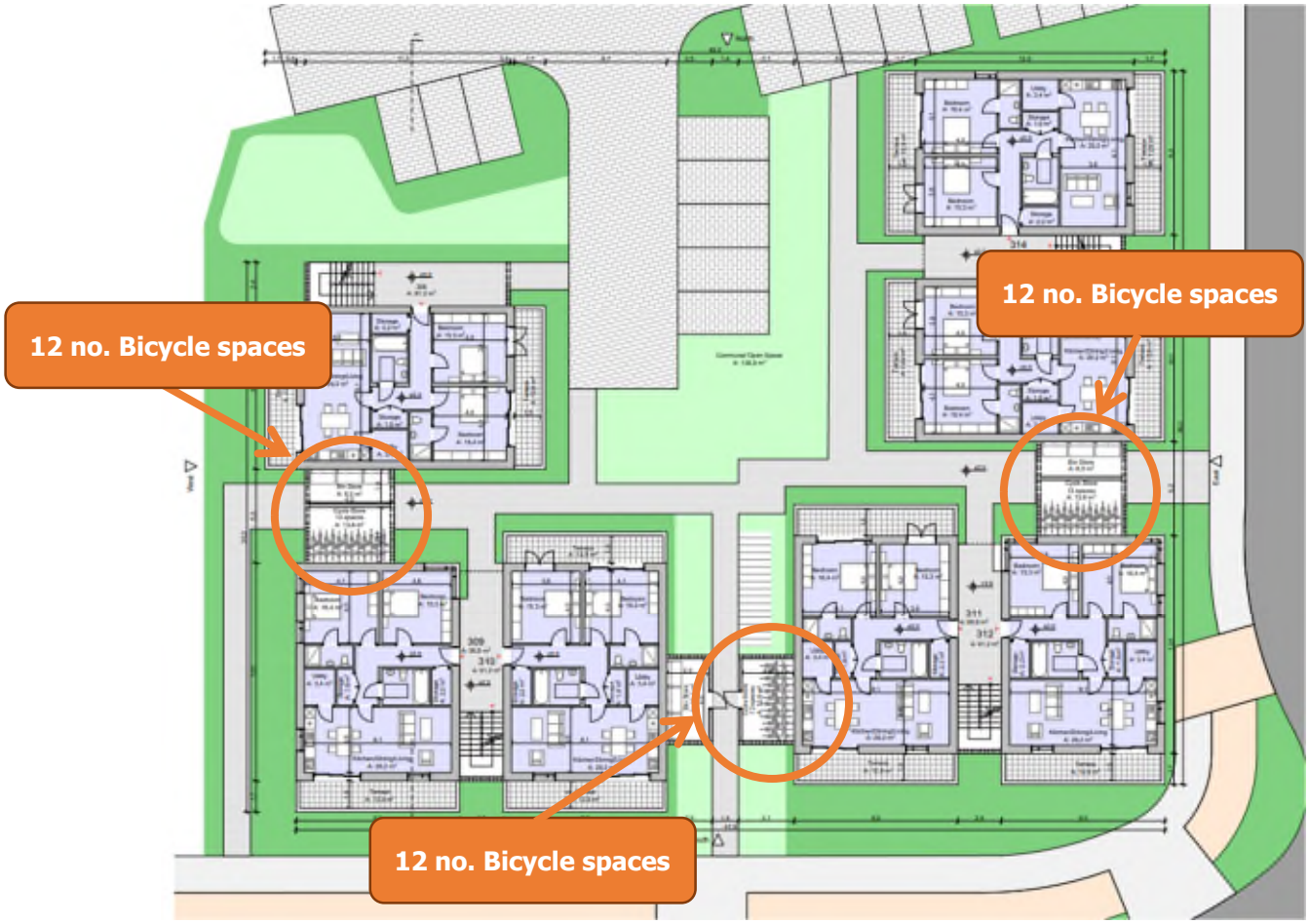


Figure E8: Block K Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA16 – CA3)

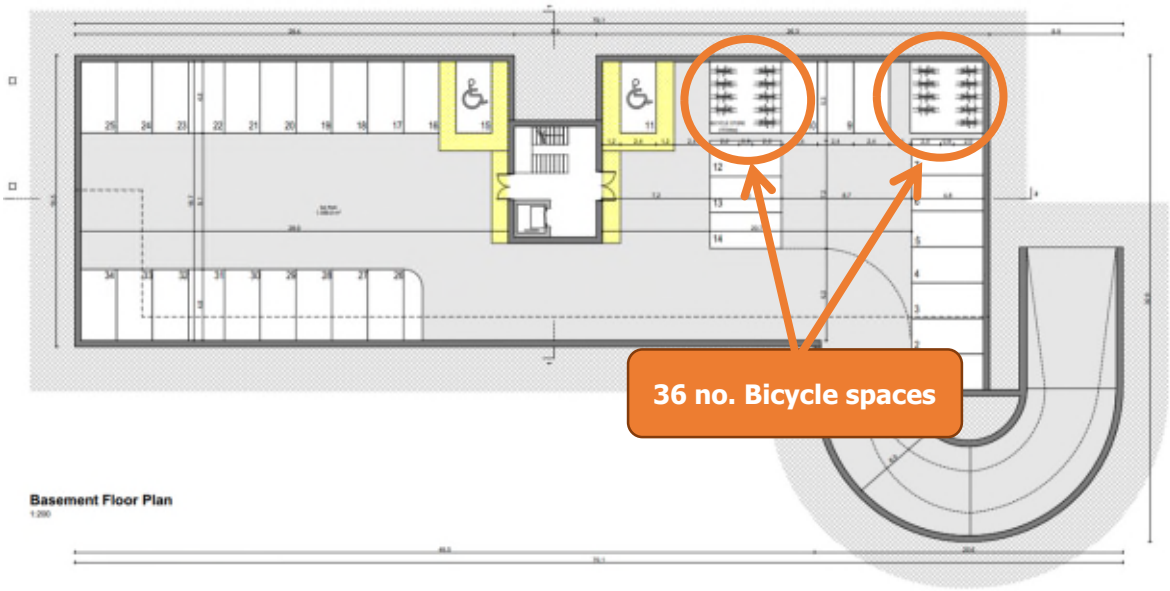


Figure E9: Proposed Block L Basement Car Parking Layout (Delphi Architects drawing no. D1408-19-PA18-CA5)

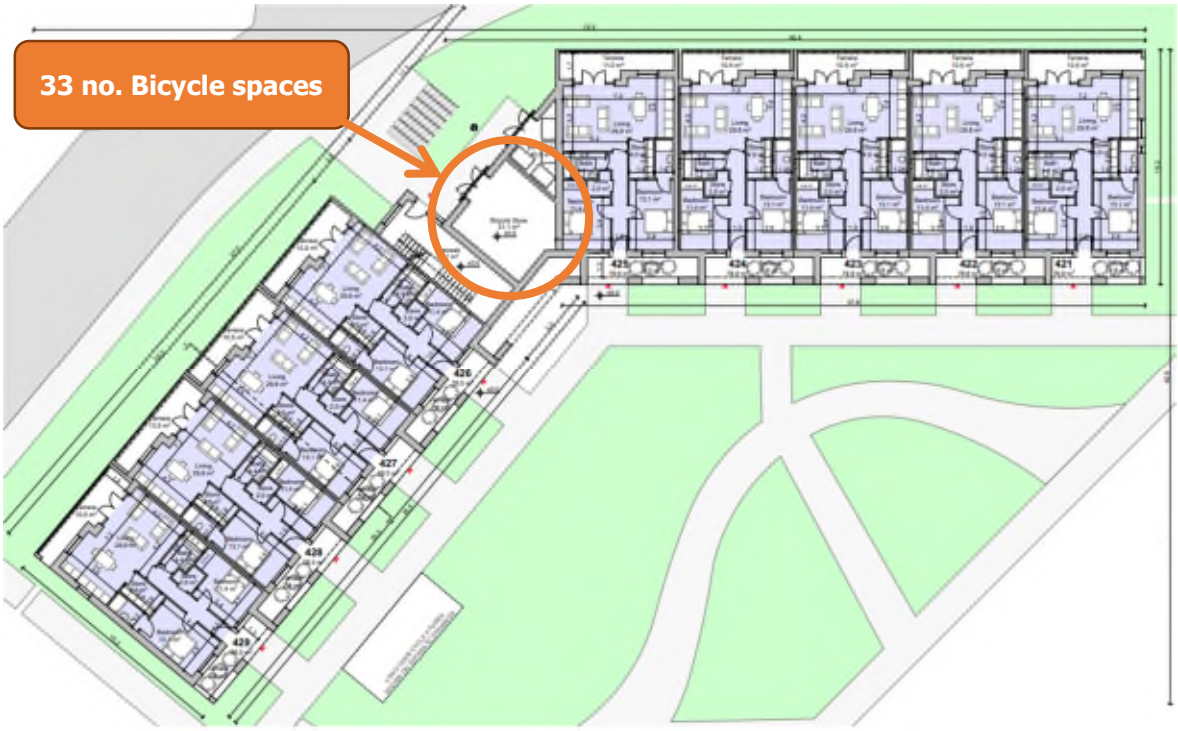


Figure E10: Block N Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA22)

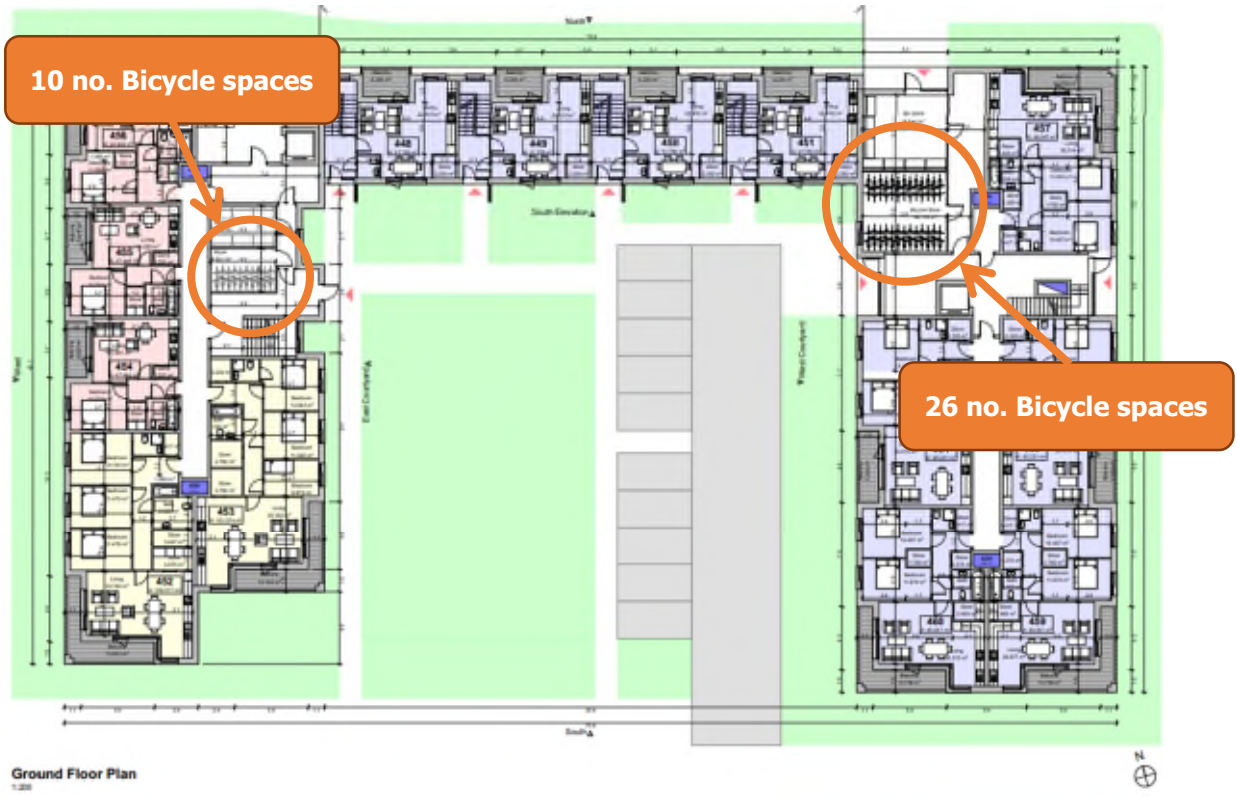


Figure E11: Block O Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA24-CA5)

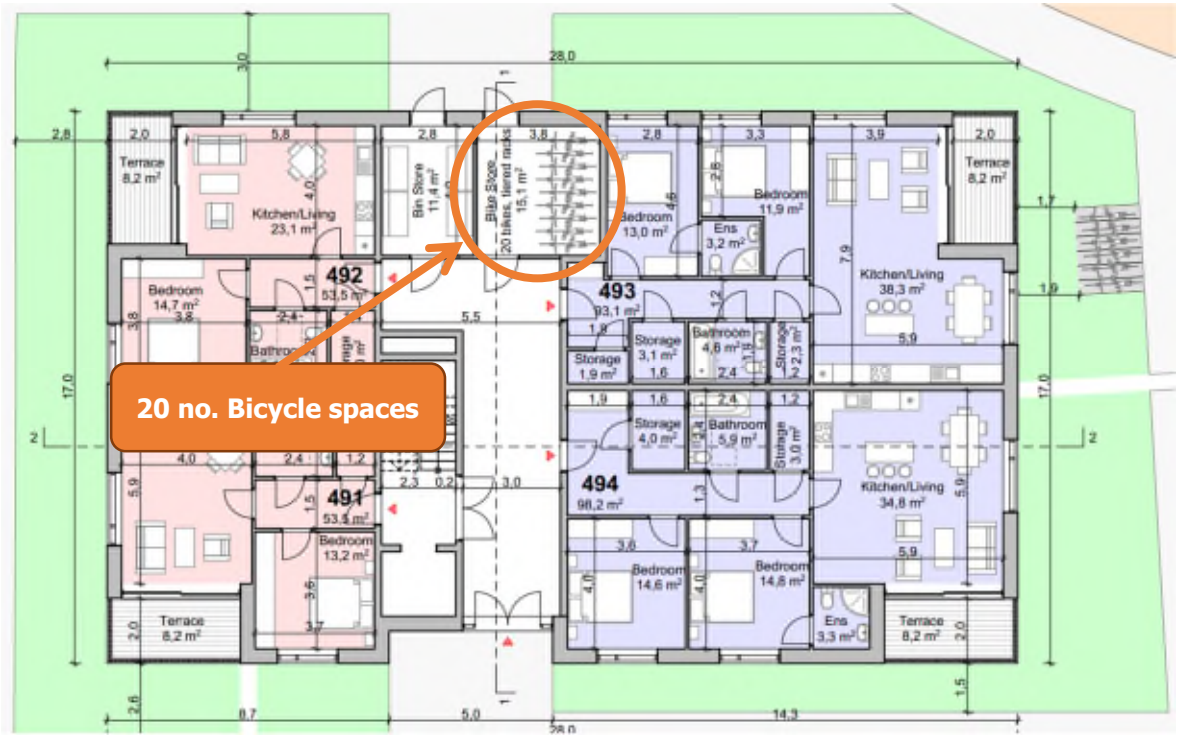


Figure E12: Block P Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA27-CA5)

Figure E13: Block Q Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA28-CA5)

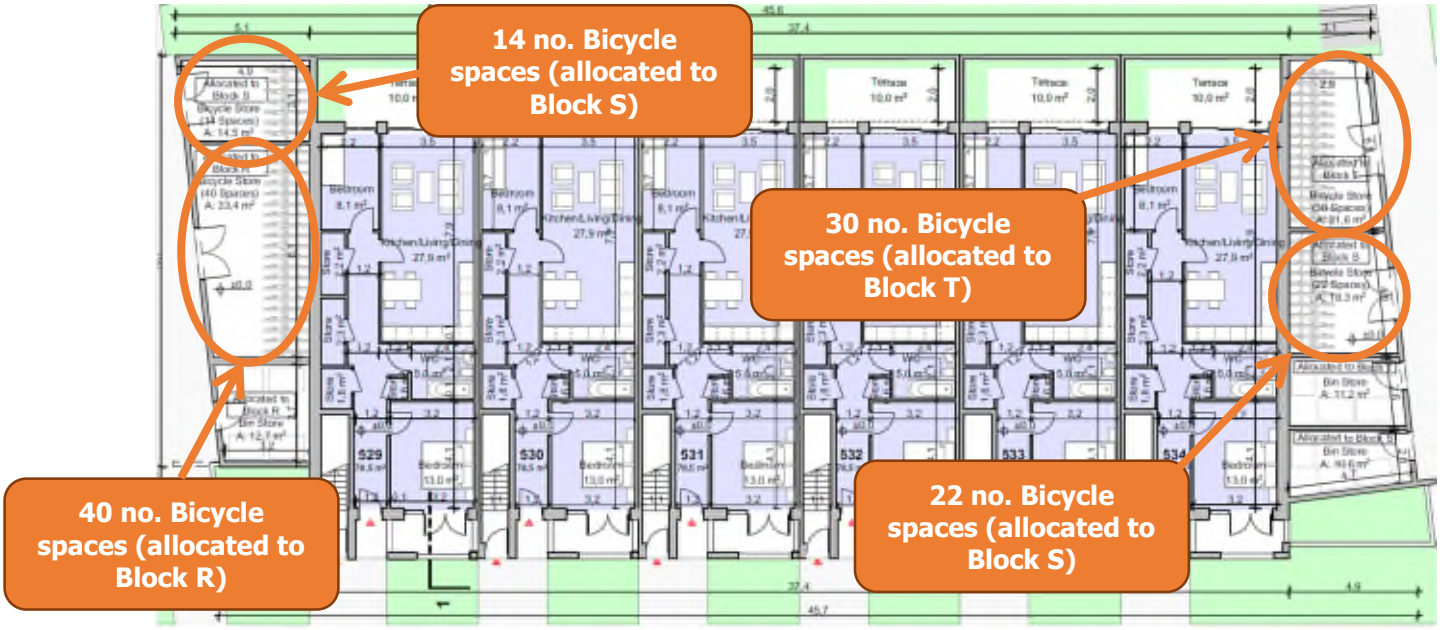


Figure E14: Block S Ground Floor Layout (Delphi Architects drawing no. D1408-19-PA30-CA5)