PINNACLE
CONSULTING ENGINEERS

Proposed Residnetal Development, Kingswood

Traffic and Transport Assessment

September 2021

Prepared for:

Greenwalk Development Ltd

STRUCTURAL · CIVIL · DUE DILIGENCE · ENGINEERING MASTERPLANNING
FLOOD MANAGEMENT · INFRASTRUCTURE DESIGN
PRE-DEVELOPMENT ENGINEERING · BIM · TRANSPORTATION

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VERSIONS

Number	By	Date	Context
0	Ronan Kearns	08/09/21	Draft
1	Ronan Kearns	26/10/21	Updated with Client comments
2	Ronan Kearns	03/11/21	Issued for planning.
3	Ronan Kearns	11/11/21	Updated Client

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1 INTRODUCTION

1.1 Background

This Traffic and Transport Assessment has been prepared by Pinnacle Consulting Engineers in support of a planning application to South Dublin County Council.

The proposed development consists of 77 no. dwellings, comprised of 63 no. 2 storey houses, and 14 no. apartments & duplex units accommodated in 1 no. 3 storey building. The proposed houses are comprised of 8 no. 2 bed houses & 55 no. 3 bed houses. The proposed apartments & duplex units are comprised of 7 no. 1 bed apartments at ground floor & 7 no. 3 bed duplex units overhead. The proposed development also provides for all associated site development & infrastructural works, car & bicycle parking, open spaces & landscaping, bin & bicycle storage. Access to the development will by via a new vehicular entrance at the south-west corner of the site, off the Old Naas Road. Permission is also sought to demolish the existing building on site, approx. 455m².

The development is bounded to the north by a sports and leisure centre, to the east by Brownsbarn green area, to the south by Silken Park residential development and to the west by Brownsbarn Wood residential development.

Vehicular access would be by means of priority-controlled junction on to the Old Naas Road. The existing access into Clondalkin Rugby Club will be closed as part of this application.

Additional pedestrian and cycle access would be facilitated between the site and the surrounding area, such as existing neighbourhoods.

The subject site currently operates as playing fields for Clondalkin Rugby Club.

The site location is shown in Figure 1.

In order to complete this report, Pinnacle Consulting Engineering has referred to the following documents:

- The Traffic Management Guidelines;
- Guidance on Transport Assessment;
- Design Manual for Urban Road and Streets;
- Design Standards for New Apartments - Guidelines for Planning Authorities (March 2018);
- South Dublin County Development Plan 2016 - 2022; and
- GDA Cycle Network Plan - National Transport Authority.

Figure 1 Site Location (Source: GeoHive)

1.2 Objectives

The main objective of this report is to examine the traffic impact of the proposed development and its access arrangements on the local area road network. The uplift in traffic as a result of the proposed development has been calculated. A qualitative assessment of this uplift is then provided for.

1.3 Study Methodology

The methodology adopted for this report can be summarised as follows:

Existing Transport Infrastructure: - Pinnacle Consulting Engineering collected information on public transport, walking and cycling in the area of the proposed development.

Development Proposals: - Description of proposed development, including proposed improvements to the road accesses to the site and a review of parking and servicing provisions, and facilities for pedestrians and cyclists.

Development Trip Generation Figures: - Based on the schedule of accommodation of the proposed development, Pinnacle Consulting Engineering derived trip rate data and developed development traffic flows.

Quantitative Assessment: - The operation of key junction, with and without the proposed development, was undertaken, to determine future operation and any requirements for mitigation measures.

1.4 Structure of Report

The remainder of this report is divided into the following sections:

- Section 2 considers the location of the site and existing traffic flows.
- Section 3 discusses the proposed development
- Section 4 considers the traffic generation and potential impacts of the development
- Section 5 contains a quantitative assessment of the development impact, and

- Section 6 provides a summary and conclusion.

2 EXISTING TRAFFIC CONDITIONS

2.1 Existing Conditions

The subject site is located off the Old Naas Road and forms the grounds of Clondalkin Rugby Club.

The development is bounded to the north by a sports and leisure centre, to the east by Brownsbarn green area, to the south by Silken Park residential development and to the west by Brownsbarn Wood residential development.

Access to the lands is currently via the main access to Clondalkin Rugby Club.

The location of the site is shown on the map extract at Figure 2 below.

Figure 2 Site Location and Local Road Network (Source: GeoHive)

2.2 Existing Road Network

A summary of the existing road network is provided below:

The road network surrounding the site provides a variety of movement functions. The Old Naas Road forms a left in/left out junction with the N7 to the south and the western arm of westbound interchange of Junction 2 of the N7.

The R136 orbital route connects Lucan with Citywest and provides connections to the N7 and N4..

Old Naas Road will be the primary access point into the proposed development.

This route provides for pedestrians, cyclists and motorists alike and a general commentary on these facilities is presented below:

Old Naas Road is a high-quality single carriageway road c. 6.75m wide.

The Old Naas Road forms a left in/left out junction with the N7 to the south and the western arm of westbound interchange of Junction 2 of the N7.

A footpath measure between 1.8m and 2.0m is located on the western side of the Old Naas Road along the development frontage. It runs in a general north south direction and provides a link with Kingswood village and surrounding residential neighbourhood.

The Old Naas Road has a 50km/h speed limit.

2.1 Public Transport

2.1.1 Background

Local public transport infrastructure is illustrated in Figure 3 below.

Figure 3 Local Public Transport Infrastructure

2.1.2 Bus

There are numerous bus operators providing a bus service locally and within walking distance to the site, with further details shown in Table 1 below.

No.	Route	Service	Mon-Fri	Sat	Sun

69	Hawkins St. - Rathcoole	Hawkins St	First	06:15	06:20	10:00
			Last	23:15	23:15	23:15
		Rathcoole	First	06:00	06:15	11:15
			Last	00:05	00:05	00:10
		Frequency		Up to 18/day	Up to 87/day	Up to 12/day

Table 1 Local Bus Services

Measured from the entrance of the site, the nearest stop is located approximately 100m/1-min walk time for the site.

2.1.3 Luas

Cheverstown Luas stop is located c. 2km/20mins walk time from the development.

Table 2 below summarises the Luas Red Line frequency at Cheverstown Luas stop is.

Luas Red Line				
Monday – Friday (05:30-00:00)		**Saturday (06:30-00:00)**		**Sunday (07:00-23:00)**
Peak	Off Peak	Peak	Off Peak	Off Peak
3-6	6-15	7-8	10-15	11-12

Table 2 Luas Green Line Frequency (minutes) – (source www.luas.ie)

The Luas has a major terminus at the Square, Tallaght which is also a major terminus for Dublin Bus. The Square is served by Dublin Bus with several local routes. Currently timetabled bus services adjacent to the site include the 27 (which has approximately 80 services per day in each direction from Clarehall to Jobstown), the 49 (which has approximately 37 services per day in each direction from Pearse Street to Tallaght), the 54a (which has approximately 30 services per day in each direction from Pearse St. towards Ellensborough / Kiltipper Way), the 65 (which has approximately 14 services per day in each direction from Hawkins Street to Blessington/Ballymore), the 75 (which has approximately 38 services per day in each direction from the Square to Dun Laoghaire), the 76 (which has approximately 40 services per day in each direction from Tallaght to Chapelizod), the 76a (which has approximately 3 services per day in each direction from Tallaght to Blanchardstown Centre) and 77a (which has approximately 56 services per day in each direction from Ringsend to Citywest).

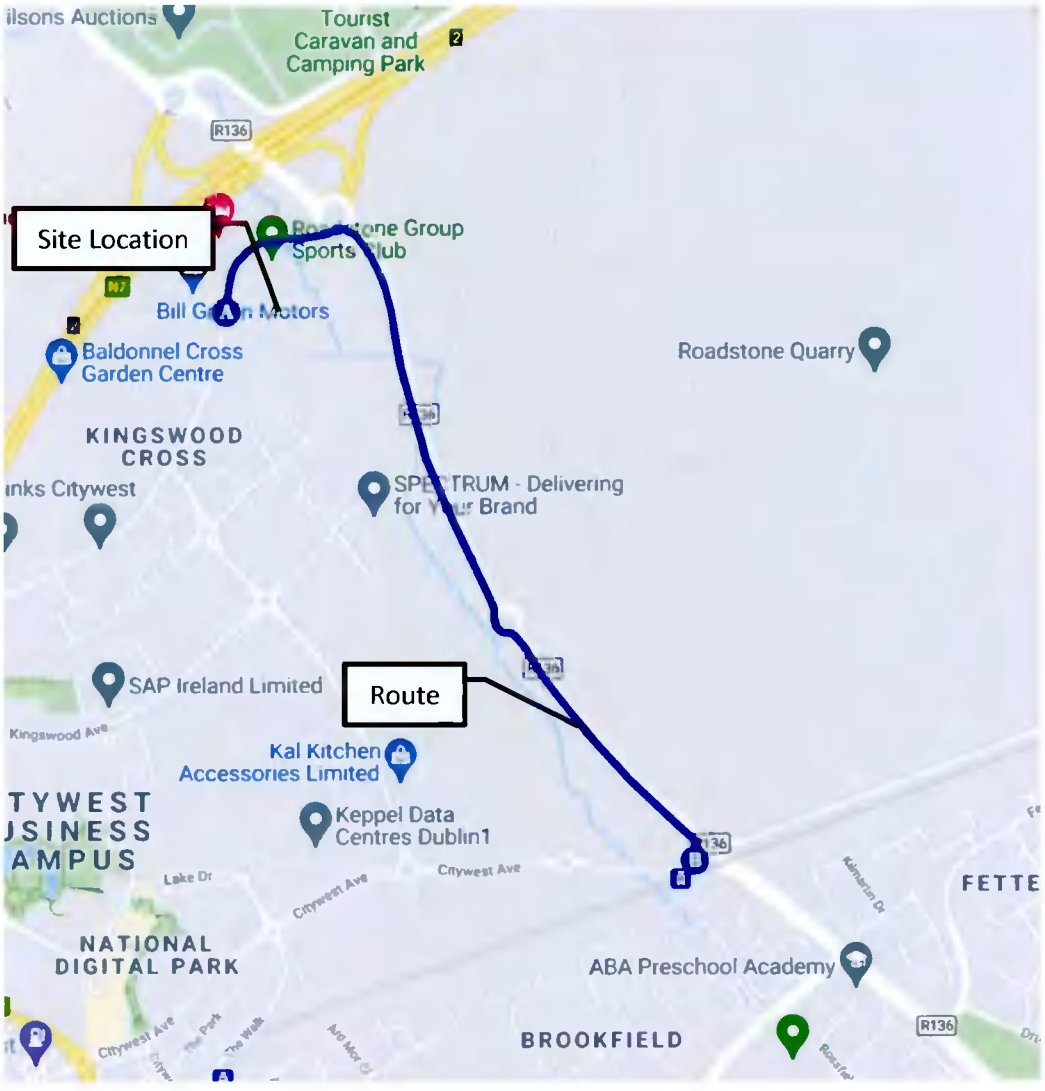

Figure 4 Luas Walk Times

The 90-min public transport travel distance, as illustrated in Figure 5, shows that the site has a significant catchment area for commuters including, Maynooth in the west, Swords to the north, Dublin City/Dun Laoghiare to the west and Blessington to the south.

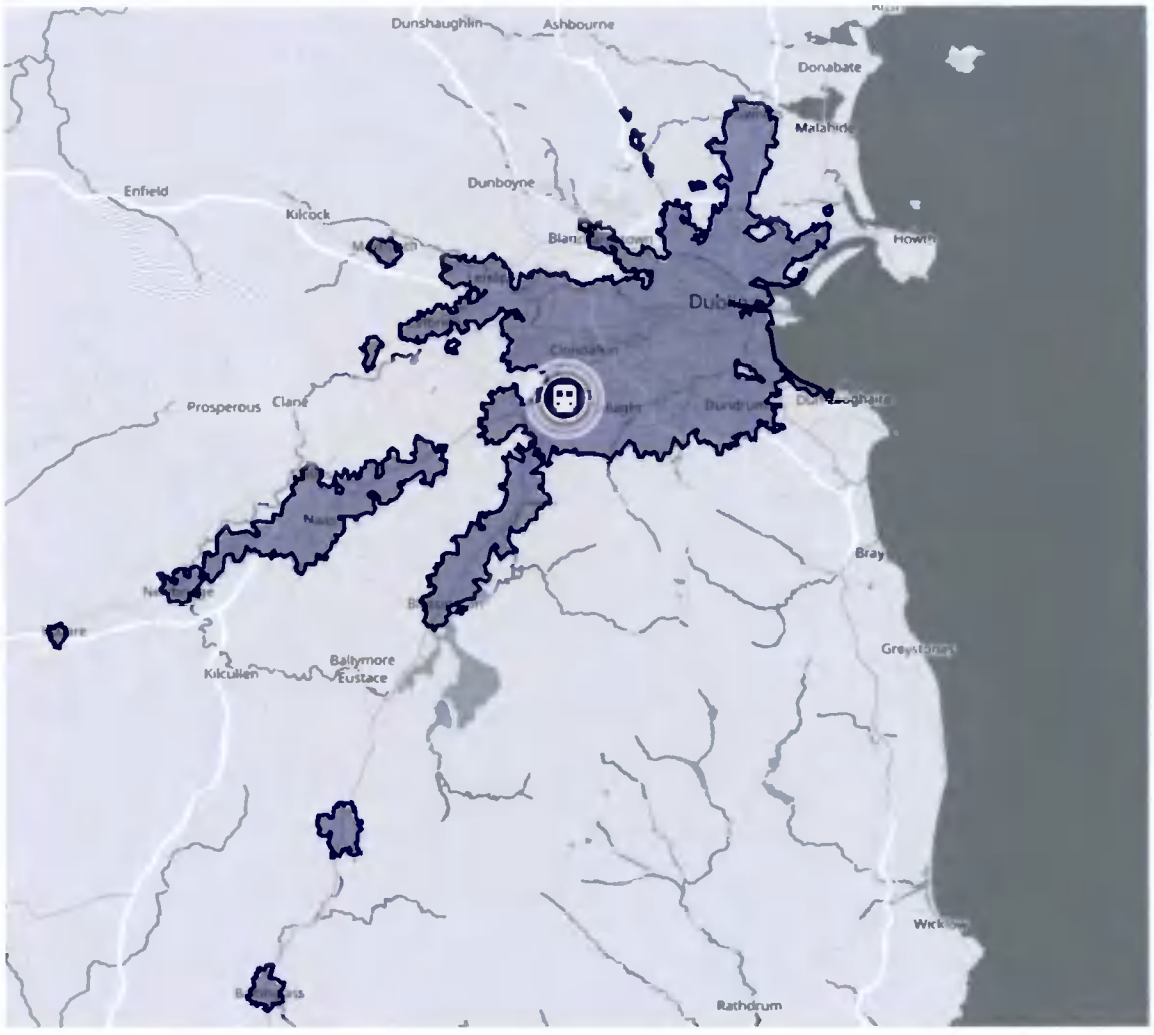

Figure 5 90-min Public Transport Travel Distance

This permeability opens the site to all Third Level Institutions located within Dublin and Kildare. It also offers permeability the major amenities located within Dublin City Centre (shopping, entertainment) and the gateway towns into Dublin where the likes of major retail parks are located.

The proposed site is located within 90-minute public transport link to all major Dublin sporting and event venues.

2.1.4 Walking

There are footpaths located on the western side of Old Naas Road along the site frontage. These footpaths are linked to a network that connect to local desire lines i.e., residential, retail, educational and amenity areas.

There are various uncontrolled crossing points along Old Naas Road with facilities for people with mobility and visual impairment.

A 20-min walking distance, as illustrated by Figure 6 includes a large portion of the Citywest and links the proposed development to many facilities such as public transport, work, school, play amenities and shopping.

Figure 6 20-Min Walking Distance

Local amenities within 15-minutes' walk of the proposed development include:

- Cheverstown Luas Stop
- Access to bus network
- Access to areas of employment

2.1.5 Cycling

Existing cycle routes identified by the National Transport Authority (NTA) in the vicinity of the site are indicated in Figure 7 below.

The extract from Sheet E6 'Existing Cycle Facility Type Dublin South West' from the GDA Cycle Network Plan indicates that there are limited cycle infrastructure on the Old Naas Road. The main cycle infrastructure is located on the R136 providing good cycle accessibility to/from the site to local amintieis.

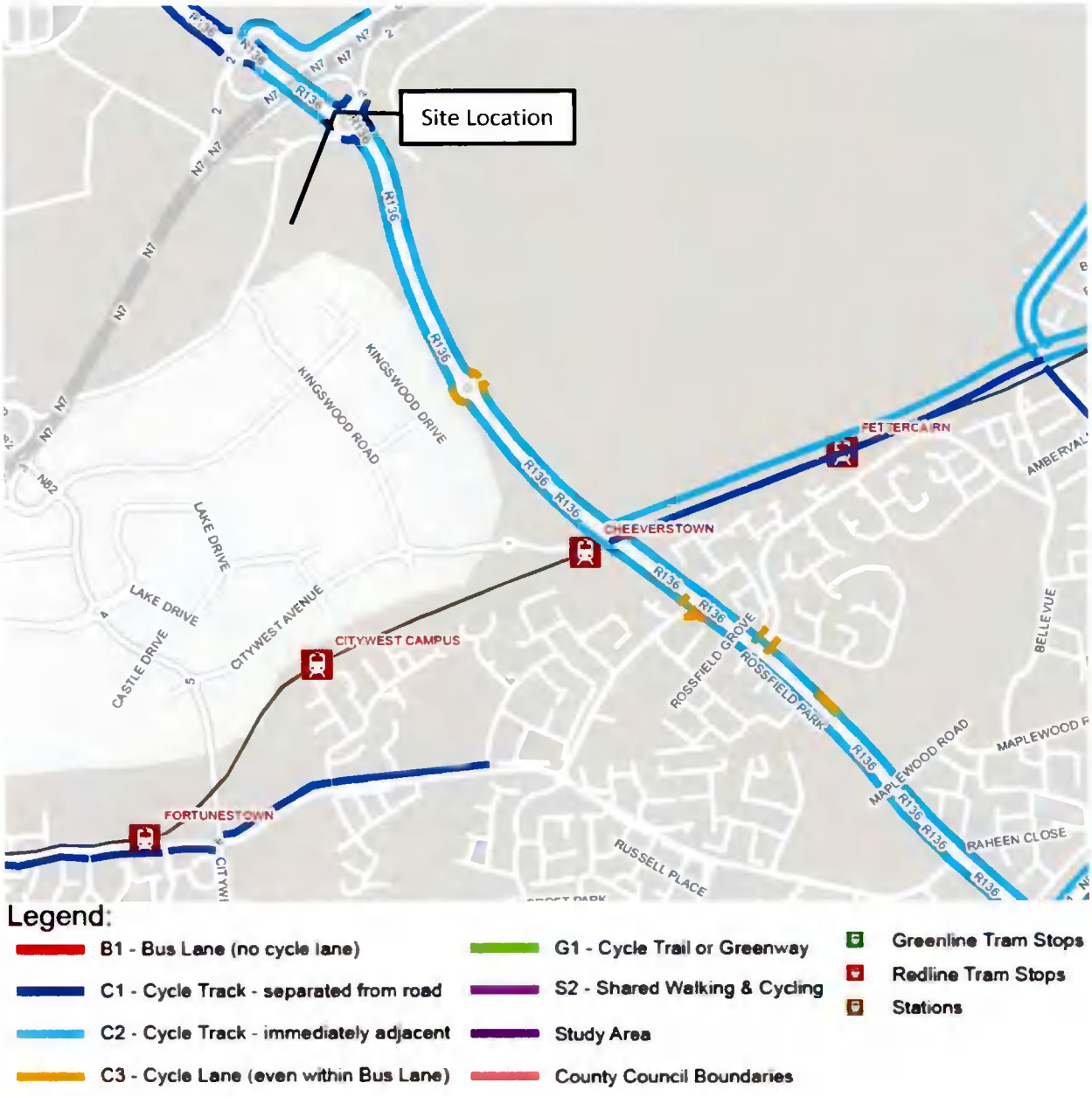

Figure 7 Existing Cycle Routes (Source: NTA)

The 30-min cycle distance, as illustrated in Figure 8, shows that the site has a significant catchment area for cyclists including Ratchoole in the west, Lucan to the north, Templogue to the east and Brittas to the south.

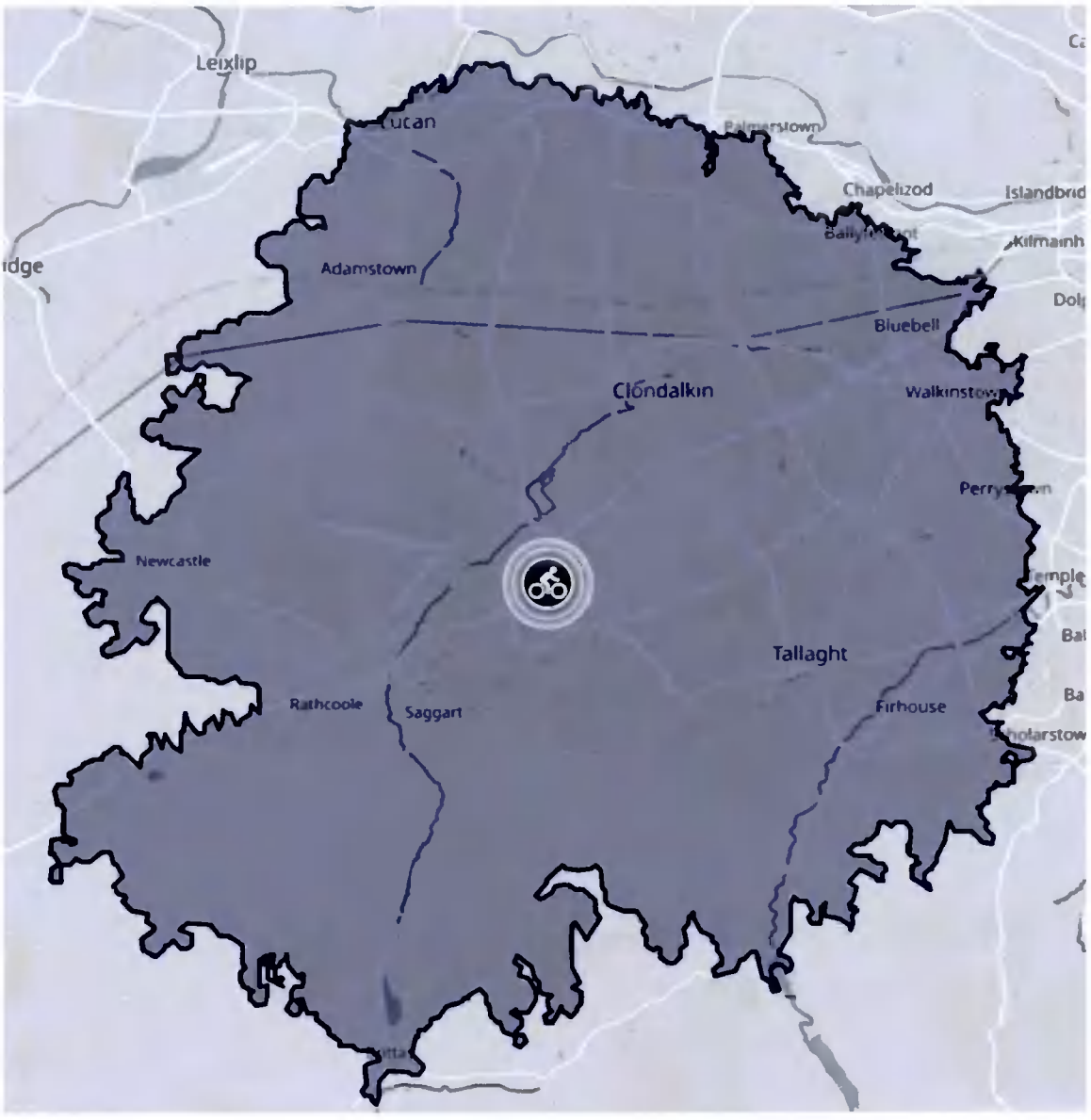

Figure 8 30-min Cycle Distance

Local amenities within 30-minutes cycle of the proposed development include:

- Citywest Shopping Centre
- Luas stops
- Schools
- Local parks
- Access to areas of employment (Citywest Business Campus, Tallaght Village, Grangecastle)
- Allows access to/from surrounding areas including:
    - Tallaght
    - Clondalkin
    - Firhouse

- Rathchoole
- Newcastle

2.1.6 Local Amenities

The proposed development site is well placed in terms of the availability of and access to local amenities. There are several primary and post primary schools within proximity of the subject site. The subject site benefits from good access to local retail and leisure facilities. Furthermore, the subject development site is well placed to benefit from local employment opportunities at Citywest Business Campus and Grangecastle Business Park.

Figure 9 Local Schools

The design of the proposed development will provide a significant level of pedestrian, cyclist and public transport permeability to the site to established local amenities such as Citywest Shopping Centre, Citywest Business Campus and local Schools.

2.1.7 Summary

In summary, the existing site benefits from good levels of existing public transport and walking/cycling infrastructure which will assist to encourage sustainable modes of travel for residents and visitors to/from the proposed development.

2.2 Road Safety Data

A review of the Road Safety Authority (RSA) traffic collision database has been undertaken for the road network in the vicinity of the proposed site to identify any collision trends. This review will assist to identify and potential safety concerns in relation the existing road network.

Traffic collision data was obtained for the period 2005-2016 which is the most recent data available from the RSA website. These incidents are categorised into class of severity, which includes minor, serious or fatal collisions. The analysis is shown in Figure 10.

A head on cloison was report close to the existing access to Clondalkin Rugby Club. This access will be closed as part of the development of the site/.

As part of the proposed development, appropriate design measures will be undertaken to ensure that the required sight lines and forward visibility is provided at access points to reduce the likelihood of incidents occurring.

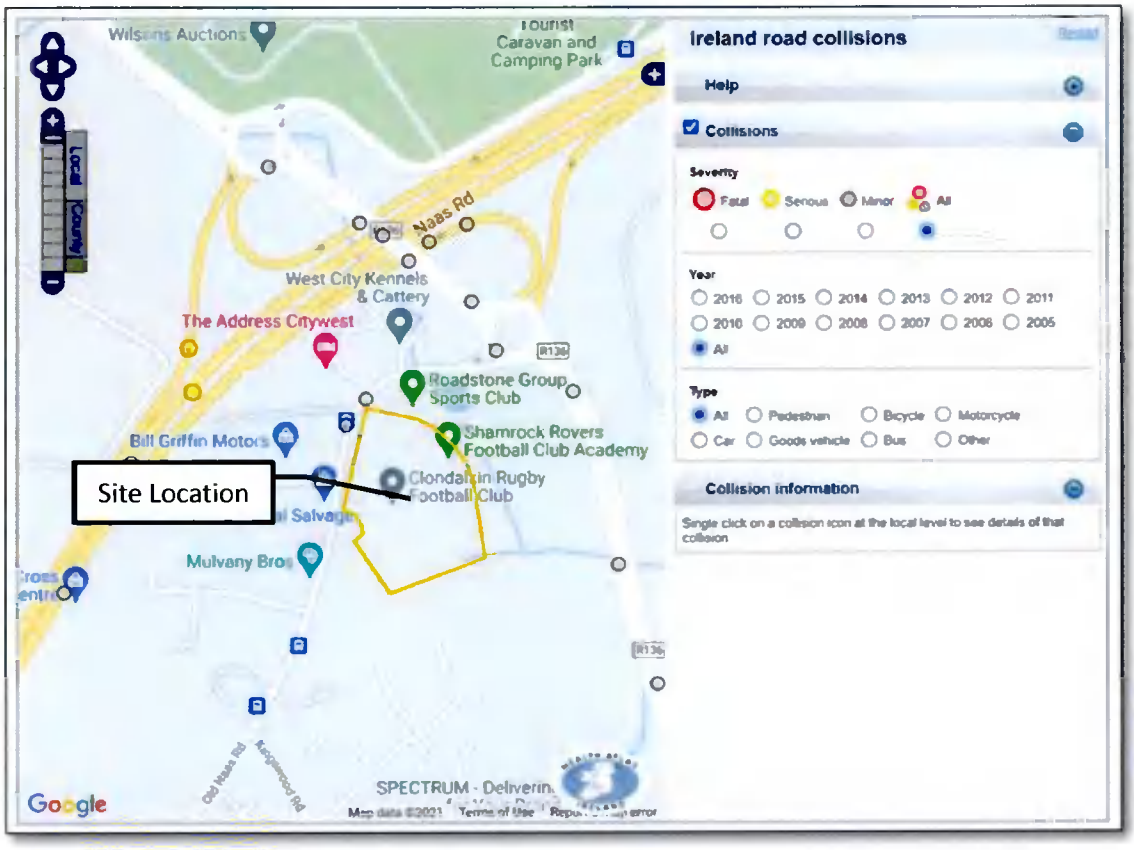

Figure 10 Road Collisions (Source: RSA)

2.3 Planning Search

A planning search was undertaken to identify any developments that have planning permission but are not yet implemented or any schemes that are implemented but are as of yet un-let or empty.

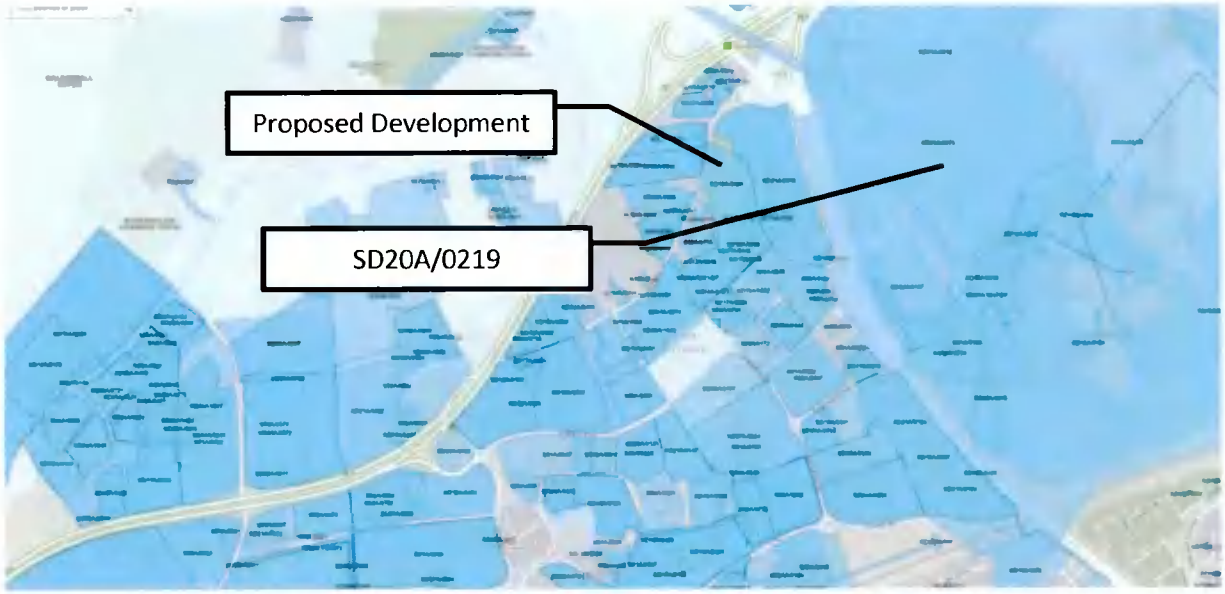

Figure 11 Planning Applications Overview (Source: South Dublin Council)

The following applications were deemed the influence the study area of the proposed site:

Register Reference: SD21A/0012

Status: Granted subject to conditions

Development Description: '*Deepening of part (c. 43ha.) of the existing and permitted quarry (An Bord Pleanala refs. 301177 & QD0026) to a quarry floor level of -10mOD using conventional blasting techniques; use of mobile processing plant; product stockpiles; final restoration scheme and all ancillary works within a planning application area of 49.4ha and within the overall landholding of 241.6ha and will be accompanied by an Environmental Impact Assessment Report (EIAR).*

Traffic generation and count information was extracted from this application and used in the attached junction analysis.

2.4 Potential/Proposed/Committed Infrastructure Works

There are several potential new infrastructure schemes in the vicinity of the proposed development site. Consideration has been given to the impact that these infrastructure schemes may have on the development. This will ensure that provision is allowed for these schemes to be delivered in the future.

A summary of the potential road infrastructure schemes is outlined below.

2.4.1 Bus Connects

The emerging Bus Connects Dublin plan (Ref: Core Bus Corridors Project Report June 2018) proposes revisions to Dublin's bus system through: -

- Building a network of new bus corridors on the busiest bus routes to make bus journeys faster, predictable and reliable;
- Completely redesigning the network of bus routes to provide a more efficient network, connecting more places and carrying more passengers;
- Developing a state-of-the-art ticketing system using credit and debit cards or mobile phones to link with payment accounts and making payment much more convenient;
- Implementing a cashless payment system to vastly speed up passenger boarding times;
- Revamping the fare system to provide a simpler fare structure, allowing seamless movement between different transport services without financial penalty;

- Implementing a new bus livery providing a modern look and feel to the new bus system;
- Rolling out new bus stops with better signage and information and increasing the provision of additional bus shelters; and
- Transitioning - starting now - to a new bus fleet using low emission vehicle technologies.

The Dublin Area Bus Network Redesign (which is currently under review following the public consultation stage) aims "to provide a network designed around the needs of Dublin today and tomorrow, rather than based on the past".

Figure 12 below presents the proposed public transport provision in the vicinity of the subject site compared to the existing provision. The main difference between the existing and proposed is the inclusion of a new bus interchange within the Citywest Shopping Centre located in the immediate vicinity of the subject development site.

As part of the Dublin Area Bus Network Redesign Dublin Bus routes 65B and 77a will be replaced by a new Route W8 between Citywest and Tallaght which is also proposed to provide a direct service to Maynooth / Celbridge. Improved service frequencies are proposed to destinations to the east via several proposed new routes.

The existing 77x bus route will be replaced by new orbital routes (S6 / S7) which will provide direct Dublin Bus route 69 is proposed to be replaced by a new route 63 which does not result in a change to the existing service between Citywest and the City Centre.

Go-Ahead Bus route 175 is not proposed to be subject to change as part of the Bus Connects scheme.

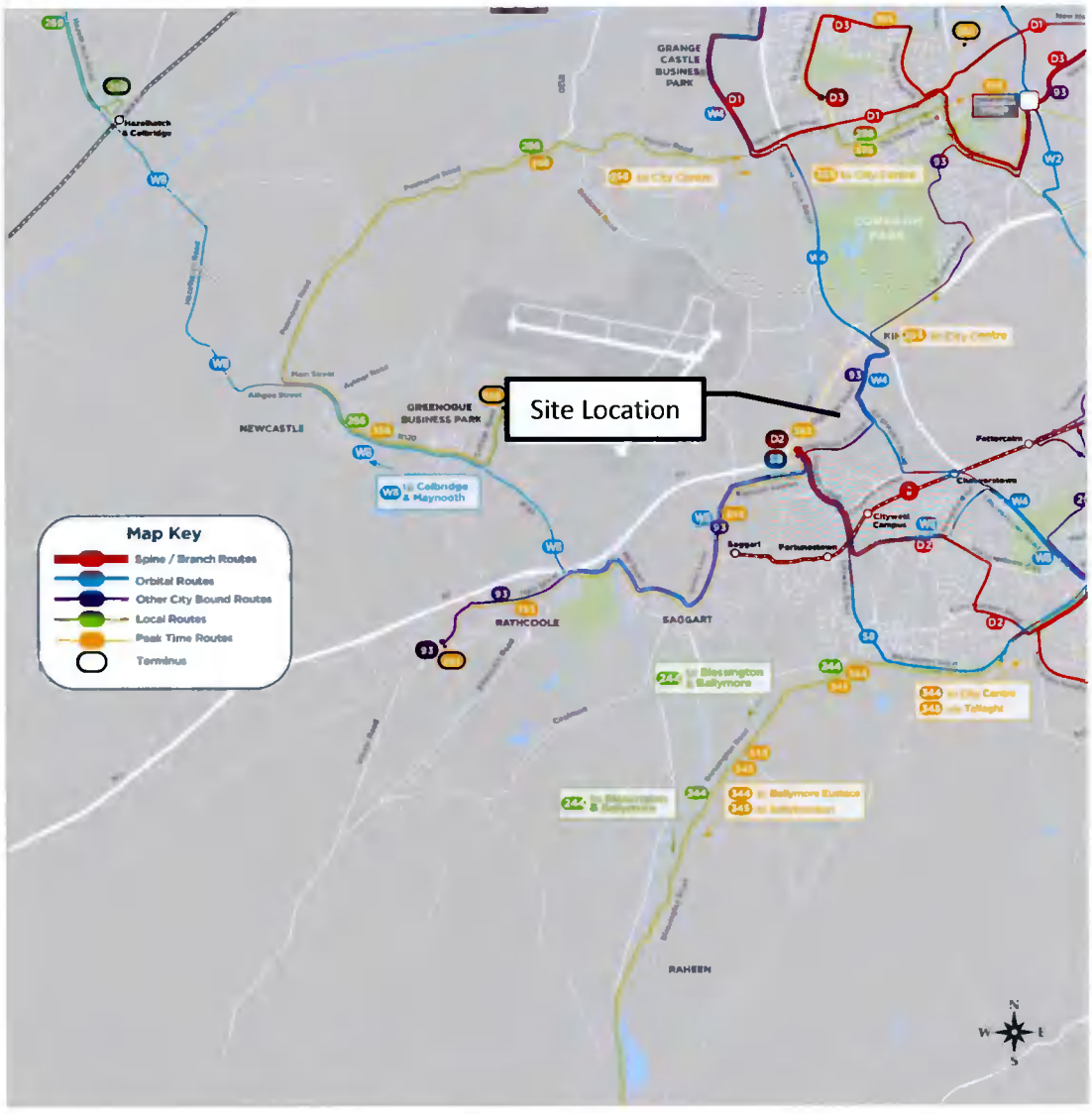

Figure 12 Bus Connects (Source: Map 2 of Bus Connects)

2.4.2 Cycle Network Improvements

Under the National Transport Authority's Cycle Network Plan for the Greater Dublin, the Dublin South West Sector extends outward from the twin corridors of Camden Street and Clanbrassil Street in the city centre. through the inner suburbs of Rathmines and Harold's Cross, to serve the areas of Terenure, Kimmage, Walkinstown, Tallaght, Firhouse and Rathfarnham. There is considerable overlap between the West and South West sectors, with interconnecting routes between the two. Some radial cycle routes originate in one sector at the city centre but end up in the neighbouring sector

In accordance with the National Transport Authority's Cycle Network Plan for the Greater Dublin area the following improvements to the local cycle networks are proposed:

- Route 7C: Camac River Greenway branch from the Grand Canal through Clondalkin Village to Corkagh Park and City West;
- Route 8A follows Crumlin Road past the Children's Hospital, Bunting Road to Walkinstown, through Ballymount to cross the M50 at Junction 10 and out to Citywest / Fortunestown via Belgard; Route 8B

- Route 9C is an alternative to the Harold's Cross route from Route 8C at Clogher Road via Stannaway Road west of Kimmage and then along Wellington Lane to join Route 9A at Spawell to connect to Tallaght. It also provides a continuation from Route 9A west of Tallaght via Fortunestown and Citywest to Saggart.
- Route 9D would provide a traffic-free option branching off Route 9A at Kimmage Cross Roads and following the River Poddle Greenway to Tymon Park where a new bridge is required over the M50 in the centre of the park to connect with Castletymon Road and rejoin Route 9A. West of Tallaght it provides a loop through Jobstown along the N81 and then northward into Citywest
- Slade Valley Trail: a potential route southward from the villages of Rathcoole and Saggart along the upper reaches of the Camac River to Brittas at the edge of the Dublin Mountains. This route is an alternative to the very busy N81 Blessington Road and opens up access to a network of quiet rural roads in West Wicklow.
- Saggart / Rathcoole / Newcastle: These 3 villages at the south-western edge of the city have grown substantially in recent decades and now form moderately significant dormitories. There is also a large logistics and warehouse park at Greenogue between Rathcoole and Newcastle that attracts trips by staff as well as numerous truck movements. Rural cycle route D5 is shown on Map RN10 as a link between these 3 satellite settlements along the R120 road and onward via city Route 8A to the greater Tallaght area at Fortunestown. This route continues north-westward along the R405 road from Newcastle to Hazelhatch railway station on the Dublin to Cork line, and from there connects into Celbridge in County Kildare. Route D6 links Newcastle northeastward along the R120 road to Grange Castle and onward to either Clondalkin via Route 8C2 or to Lucan via Route SO7. These two regional roads (R120 and R405) are not comfortable for cycling due to narrow carriageway, bendy alignment and busy traffic including many trucks. Segregated cycle tracks would be required.

The proposed cycle routes are illustrated in Figure 13 below.

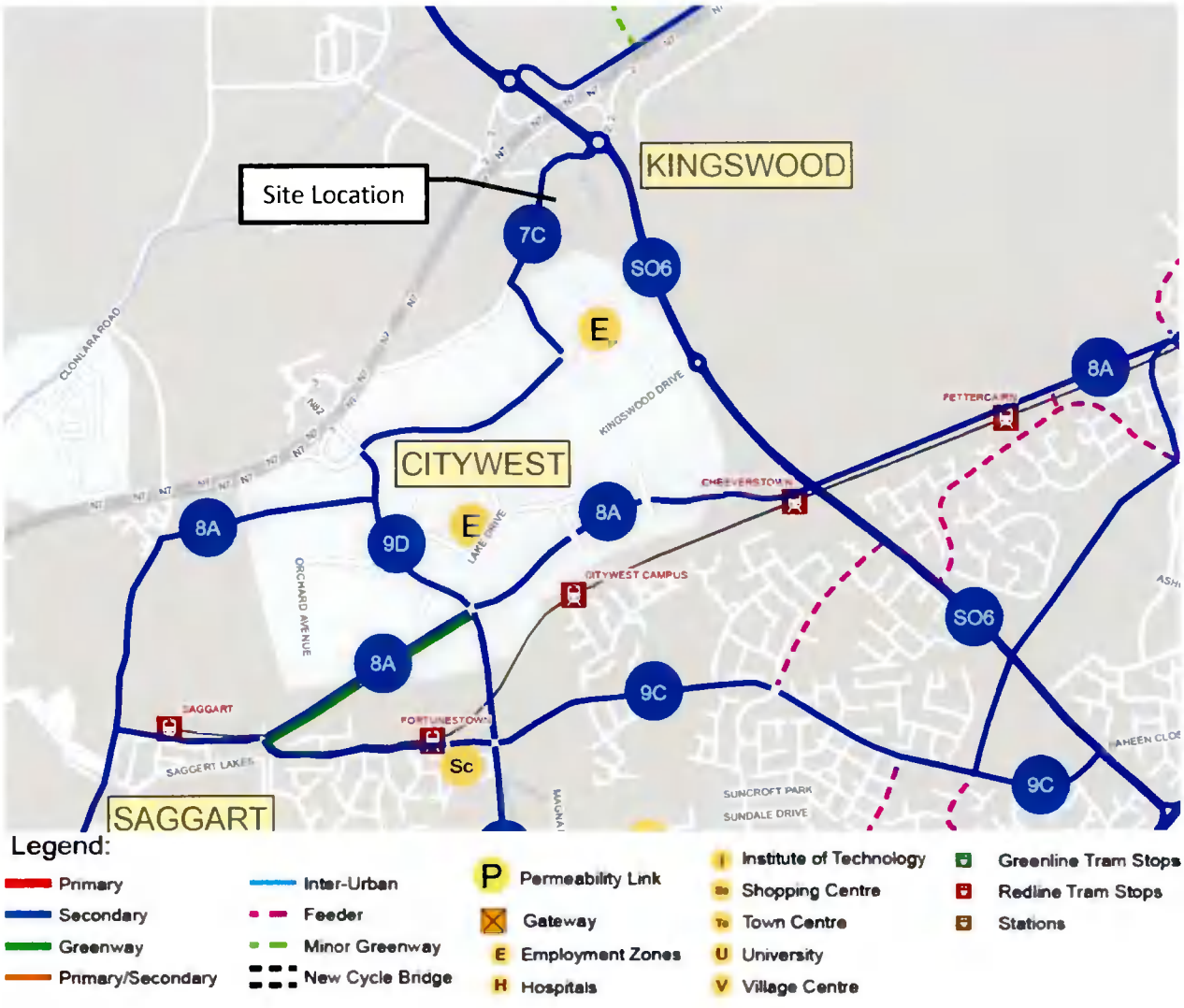

Figure 13 Proposed Cycle Network Upgrades (Source: NTA)

2.4.3 Road Improvement Schemes

2.4.3.1 Fortunestown LAP

The Fortunestown Local Area Plan (2012) includes an objective "AM10" for the provision of a new Primary Road which will run in an east-west direction from Fortunestown Way to Citywest Road. This is illustrated in Figure 14 below.

Objective AM10 states:

"That Old Naas Road (and its extension when constructed) will act as a primary movement corridor that bypasses the District Centre and allows the junction between Fortunestown Way/Lane and Citywest Road to be upgraded to a pedestrian and cyclist friendly junction."

A significant section of the Old Naas Road Road was completed as part of a previous planning application (Ref. SD/04A/0099). The remaining section is proposed to be completed as part of the approved Cooldown Commons Strategic Housing Development scheme (Pl. Ref. SHD3ABP-302398-18).

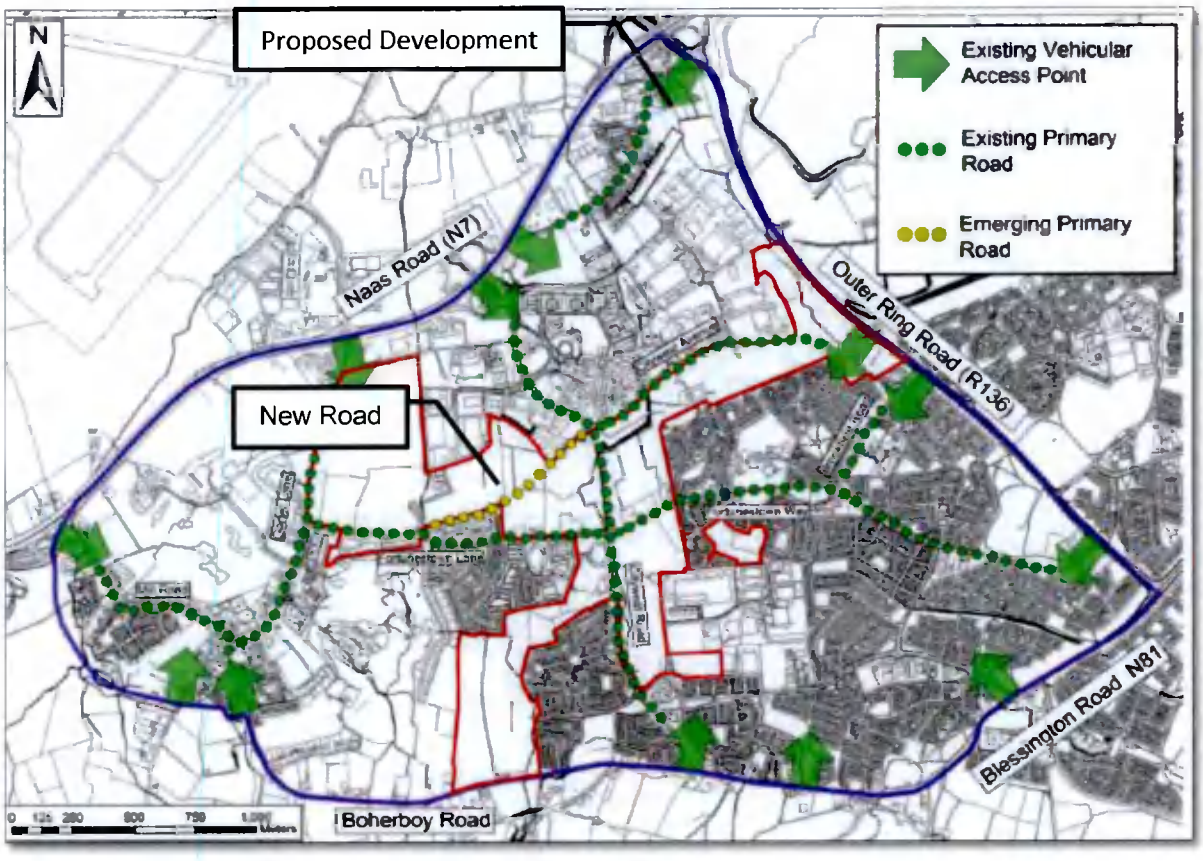

Figure 14 Proposed Road Infrastructure (Extract of Fig 4.2 Fortunestown LAP)

3 PROPOSED DEVELOPMENT

3.1 General

The proposed development consists of 77 no. dwellings, comprised of 63 no. 2 storey houses, and 14 no. apartments & duplex units accommodated in 1 no. 3 storey building. The proposed houses are comprised of 8 no. 2 bed houses & 55 no. 3 bed houses. The proposed apartments & duplex units are comprised of 7 no. 1 bed apartments at ground floor & 7 no. 3 bed duplex units overhead. The proposed development also provides for all associated site development & infrastructural works, car & bicycle parking, open spaces & landscaping, bin & bicycle storage. Access to the development will by via a new vehicular entrance at the south-west corner of the site, off the Old Naas Road. Permission is also sought to demolish the existing building on site, approx. 455m².

It is proposed to develop this site based on the following schedule of accommodation: -

Proposed Land Uses	
Land Use	Size
Houses	63
Duplex	14
Total	**77**

Table 3 Proposed Land Uses

3.2 Site Access

The proposed site access points are illustrated in Figure 15 below.

Figure 15 Proposed Access

Access will be via a priority-controlled junction.

A 2.4m x 45m sight line in accordance with section 4.4.5 and table 4.2 of DMURS for a 50km/h speed limit. Internal junctions will be design will be designed for a 30km/h speed limit and will include a 2.4mx23m sight line.

Refer to Pinnacle Engineering Drawing No. P210514-PIN-XX-DR-D-0002-S1 for the proposed sight lines.

3.3 Servicing

An AutoTrack analysis has been carried on the internal service access to demonstrate its capability to cater for residents and service vehicles such as refuse vehicles.

The results of this analysis show that the proposed development can accommodate the anticipated service vehicles that will serve the proposed development.

Refer to Pinnacle Engineering Drawing No. P210514-PIN-XX-DR-D-0010-S1 and P210514-PIN-XX-DR-D-0011-S1 for details of the AutoTrack layouts.

3.4 Car Parking Provision

3.4.1 Car Parking Standards

Table 11.24 'Maximum Parking Rates (Residential Development)' of South Dublin County Council's Development Plan 2016-2022 sets out the car parking requirements for various types of development.

The site is not within 400m of a Luas stop, therefore the Z1 standard has been applied.

South Dublin County Council Development Plan Parking standards are provided in Table 4 below.

General Parking Standards			
Land Use		**Standards**	
		Z1	*Z2*
Apartment/Duplex	*1 bed*	*1 space*	*0.75 spaces*
	2 bed	*1.25 spaces*	*1 space*
	3 bed+	*1.5 spaces*	*1.25 spaces*
House	*1 bed*	*1 space*	*1 space*
	2 bed	*1.5 spaces*	*1.25 spaces*
	3+ bed	*2 spaces*	*1.5 spaces*

Table 4 Parking Standards

3.4.2 Car Parking Provision

Parking provision for the development will be in accordance with table 11.24 'Maximum Parking Rates (Residential Development)' of South Dublin County Council's Development Plan 2016-2022.

Car Parking Standards			
Land Use	*Zone*	*Units*	Standards *Zone 1*
House - 3 Bed +	*Zone 1*	*55*	*110*
Houses - 2 Bed	*Zone 1*	*8*	*12*
Duplex - 2 Bed	*Zone 1*	*7*	*9*
Duplex – 1 Bed	*Zone 1*	*7*	*7*
Total			***138***

Table 5 Parking Provision – Houses

A total of 138 spaces for houses will be provided in this development.

3.5 Cycle Parking Standards

Table 11.22 'Minimum Bicycle Parking Rates' of South Dublin County Council's Development Plan 2016-2022 sets out the cycle parking requirements for various types of development.

Cycle parking standards are described in terms of long term and short-term use.

Cycle Parking Standards		
Land Use	Standards	
	Long Term	Short Stay
Residential Apartment	1 per 5 apartments	1 per 10 apartments

Table 6 Cycle Parking Standards

The quantum of cycle parking will be in accordance with the Development Plan standard is illustrated in Table 7.

Cycle Parking Provision			
Land Use		Standards	
		Long Stay	Short Stay
Duplex	14	3	2
Sub Total		3	2
Total		**6**	

Table 7 Cycle Parking Provision

Under Table 11.22 'Minimum Bicycle Parking Rates' of South Dublin County Council's Development Plan 2016-2022 a total of 4 cycle spaces are required.

3.6 Pedestrian and Cycle networks

It is a necessary part of the design framework for a residential development such as this to ensure that there is good permeability for those residents and visitors to the development who choose not to travel by car. The development has been designed to ensure that there is good permeability for pedestrians and cyclists. Connections between the internal layout and the external pedestrian and cycle networks form part of the overall access strategy for the site. With this development pedestrian movement is

suitably catered for by footpath connections within and adjacent to the development up to the relevant boundaries. These provide good linkage to the surrounding urban areas.

The internal layout demands that all visitors to the site are catered for and so pedestrian routes between dwelling areas and key nodes within the layout are well designed and clearly delineated. This applicant is very experienced in creating safe environments that satisfy resident's requirements and convenience. Accordingly, every effort has been made to ensure that vehicular access will be restricted in areas where there are likely to be the highest concentrations of pedestrian/cycle movements.

The internal site layout will include several crossing facilities that are located along key desire lines and which coordinate well with the circulation within the car park area to enhance the safety, visibility and convenience of those people on foot. These facilities will include features such as tactile paving and surface treatments that will benefit all users and assist those with impaired mobility.

Pedestrian linkage will be provided to the boundary of the local estates and other future developments as part of the development. Pedestrian linkage to the lands that form part of the South Dublin County Council's Development Plan 2016-2022 (and subsequent Local Area Plans) will be provided as part of subsequent stages of development.

Given the desire in current planning guidance to improve accessibility for non-car modes of travel, access by cycle is increasingly important. Since the weather and topography inevitably have an influence on cycle use, the key to cycle accessibility is the existence of convenient and safe links associated with secure and carefully sited cycle parking.

3.6.1 Facilities and access for those with impaired mobility

The design has sought to ensure that the environment created within this development will be accessible to residents and visitors with disabilities. Footpaths will be designed in accordance with the latest design criteria to ensure safe access for those that have a mobility impairment.

4 TRAFFIC GENERATION AND DISTRIBUTION

4.1 General

The methodology for assessing the traffic implications of this development involves quantifying the number and nature of trips that would be generated and reviewing these trips in the context of the prevailing conditions, the area of influence and the available infrastructure.

The nature of the development and its relative location to the catchment dictates that the modal choice to and from the site would primarily be via private car but with some elements of public transport use.

Accordingly, the development will attract private car, pedestrian and cycle visitation that will need to be catered for in terms of access routes and internal design. Visitation will also include residents and visitors using public transport connections.

A significant factor in trip attraction and hence resultant impact on the surrounding network is the relationship between trips that already utilise the road network which would choose to visit the development and those trips which would be newly generated onto the road network by the creation of the development in this location.

Research into trips associated with developments of this type has been extensive and in order to try and determine a realistic level of resultant impact the following classifications are adopted.

Primary New trip ~ a single purpose trip (such as development-work-development) that would not exist on the network prior to the opening of the development.

Primary Transfer trip ~ an existing single purpose trip to another destination (such as another similar development) that would transfer to the new development once it becomes operational.

Non-Primary Diverted trip ~ an existing multi-purpose (linked) trip that involves deviating from the normal route in order to visit the new development whilst on the way to another destination.

Non-Primary Pass-By trip ~ an existing multi-purpose (linked) trip that arises from visiting the new development without having to deviate significantly from the existing route being taken.

A Primary trip is one which has the same origin on visiting the site as destination when leaving the site, but only a proportion of these are newly generated (i.e. would not have taken place if the development didn't exist). The remainder of primary trips already exist on the road network as they would be those visiting another similar but existing destination.

A pass-by trip is a form of trip that doesn't result in any additional load to the impact area, since it already exists on the network adjacent to the site.

For the purpose of this assessment, it is assumed that the proposed development will generate primary new trips.

4.2 TRICS

The Trip Rate Information Computer System [TRICS] database has been interrogated to derive trip rates commensurate with developments of the character proposed in this case, notably a 77-unit residential development.

The use of the TRICS database has also enabled the profile of arrivals and departures throughout the day to be assessed and this has served to confirm the choice of the highest respective peak hours for use in the analyses.

This database is a well-established and constantly updated tool used in the determination of generated traffic for developments since it is a substantial source of validated empirical data on the arrival and departure rates for a range of differing types and sizes of developments in a variety of locations.

4.3 Dwellings

Using the TRICS database, the rip rates for each land use within in the development was calculated. These trip rates are illustrated in Table 8 below.

Peak Hour Trip Rates					
Trip Generation from TRICS		**Weekday AM 08:00-09:00**		**Weekday PM 17:00-18:00**	
Usage	**Units**	**Arrivals**	**Departures**	**Arrivals**	**Departures**
Houses	Per Unit	0.110	0.347	0.369	0.205
Duplex	Per Unit	0.057	0.157	0.195	0.124

Table 8 House Trip Rates

4.4 Trip Attraction

These trip rates are used in conjunction with the proposed schedule of accommodation to determine the resultant total trips generated by the proposed development.

For the proposed development, these figures can be seen in Table 9 below.

Peak Hour Trips					
Trip Generation from TRICS		**Weekday AM 08:00-09:00**		**Weekday PM 17:00-18:00**	
Usage	**Units**	**Arrivals**	**Departures**	**Arrivals**	**Departures**
House	63	7	22	23	13
Duplex	14	1	2	3	2
Peak Total		**8**	**24**	**26**	**15**
Two Way Total		**32**		**41**	

Table 9 Peak Hour Trips - Proposed Development

It can be seen from the above that the total vehicle movements generated by the proposed development will be 8 arrivals and 24 departures in the AM peak (two-way total of 32). The total number of vehicle movements in the PM peak hour are 26 arrivals and 15 departures (two-way total of 41).

5 Junction Analysis

5.1 Introduction

To assess the resultant impact on the surrounding road network, the anticipated traffic generation and distribution through the network has been applied to the traffic model in order to assess comparative flow levels at the surveyed locations and to analyse resultant junction performance.

In addition to traffic generated due to the proposed development, there is also an expected increase in traffic flows due to general development and an increase in car ownership that needs to be considered. Using Table 5.5.1 of the Project Appraisal Guidelines – Unit 5.5 Link-Based Traffic Growth Forecasting published by the NRA, reference has been made to the percentage increase expected on all roads surrounding the site.

5.2 Growth Factors

The estimated opening year for the proposed development is 2025. This has therefore been the focus of the road network assessment. These flows are shown in Appendix C and for the weekday AM and PM peaks respectively.

NRA PAG Unit 5.5 sets out growth rates for forecasting future traffic. It is noted that in respect Dublin County (Fingal South Dublin Dun Laoghaire Rathdown) the growth during the period 2006-2025 is set at 0.5% per annum for medium growth decreasing to 0.4% for the period 2026 onwards (LV rates used).

The factor used is outlined below:

Traffic Growth Rates, NRA Project Appraisal Guidelines		
Year	To Year	Table 5.5.1
2017	2025	1.025
2017	2030	1.041
2017	2040	1.081

Table 10 Growth Factors

These growth rates are applicable to Dublin County (Fingal South Dublin Dun Laoghaire Rathdown) and no distinction is offered between rural and urban locations. It has been assumed that medium growth would occur.

The use of these rates in this urban location is highly conservative as the predicted traffic growth is not likely to occur in built up urban locations, such as South Dublin, with good public transport in the future. However, the rates have been applied in the interests of providing a robust assessment of the performance of the road network in the future.

5.3 Junction Capacity Analyses

Junction capacity analyses have been undertaken at the site access junction and at the key junctions at which existing flow data had been obtained. These tests have been carried out using industry standard and approved software for the existing junctions with no development and the assumed year of opening of the development, namely 2025, and for a 5-year design horizon, namely 2030 and for a 15-year design horizon, namely 2040 with development flows added. It may be the case at some nodes within the network that following the distribution and assignment of the traffic generated by the development, the actual proportional impact or change in traffic demand would not necessarily warrant

further assessment. For the purpose of a robust assessment, all junctions have been put forward for assessment.

The use of the TRL capacity model programme ARCADY [Assessment of Roundabout Capacity and Delay]] is well established and accepted by the South Dublin Council for the prediction of capacity and provides comparable measures of the operational efficiency of roundabout junctions.

With these well-established methods the results are expressed in terms of a ratio of flow to capacity (RFC) on each approach and the maximum queue length on that approach during the period tested. If the RFC value approaches 1.0 then queuing and delay can be expected to increase. It is normal practice to ensure that the RFC is below 0.85 to achieve a theoretical reserve capacity of greater than 15%, although a value of 1.0 can be marginally exceeded in a future design year situation without any detrimental effect on the satisfactory and safe operation of the junction.

The results of the various capacity assessments are summarised in a series of tables. For each flow condition and for each junction the ARCADY output has been assessed and the maximum Ratio of flow to Capacity [RFC] tabulated together with the maximum (end) queue value for the relevant time segment.

5.4 Geometric Parameters

The geometric parameters used for the junctions have been ascertained from the topographical survey details of the junction and other relevant sources such as OS mapping. In this way a very good approximation of the relevant geometric inputs has been used.

5.5 Trip Distribution

The trips generated by the proposed development have been distributed on the surrounding road network using the directional flows on the surrounding road network. The proposed movements created by the development in the AM and PM peak hour are shown in Appendix C.

5.6 Junction Capacity Analysis

The junctions, as surveyed, have been put forward for analysis with the development traffic dispersed through the network as per the current follow conditions.

The results of this analysis are presented below.

5.6.1 Study Area

As part of the junction capacity assessments the following junctions were modelled in isolation –

- Site 1 – Junction 2 N7, Southern Roundabout

5.6.2 Traffic Flows

Pinnacle Consulting collected traffic flows for the study area junctions the flows covered the morning and evening peak hours. As part of the junction analysis the following scenarios were modelled – 2020 Survey Year, 2025 Opening Year, 2030 Opening Year + 5 Years and 2040 Opening Year + 15 Years. Each year was modelled with and without development.

5.6.3 Site 1 – Junction 2 N7, Southern Roundabout

5.6.3.1 Background

The operation of the roundabout was modelled using ARCADY software, and tested with the 2020 Survey Year, 2025 Opening Year, 2030 Opening Year + 5 Years and 2040 Opening Year + 15 Years. Each year was modelled with and without development.

	Roundabout Flow	Development Flows	% Increase
AM	3515	32	0.90%
PM	3981	41	1.02%

Table 11 % Impact

The proposed development will increase traffic at Junction 2 N7 Roundabout by c. 0.0% in the AM and 1.02% in the PM.

5.6.3.2 Qualitative Assessment

Table 2.1 of the NRA's Traffic and Transport Assessment Guidelines sets out the thresholds for when a transport assessment is required.

The proposed development does not exceed the 200-unit threshold and the trips rates identified in Table 12 are not expected to exceed the 10% of the traffic flow on the adjoining road or the 5% of the traffic flow on the adjoining road where congestion exists, or where the location is sensitive.

The addition of the trips from the proposed development to the local network will be immaterial with minimal reduction in capacity or increase in queuing/delays at the local junctions.

5.6.3.3 Quantitative Assessment

The results of the modelling are summarised in in Table 12.

IN the design year 2040, with no development included, the junction operates with a max RFC of 1.20 and 1.13 in the Am and PM peaks respectively.

With development included, the junction operates with a max RFC of 1.20 and 1.09 in the Am and PM peaks respectively.

A RFC value of 0.85 or below indicates that the junction is operating within capacity. A RFC value of between 08.85 and 1 indicates that the junction remains within capacity but is beginning to show signs of queuing and delay. A RFC value of less than 1 is desirable in urban areas during peak period traffic. However, values of greater than 1 are typical at many junctions particularly in areas that exercise tidal flows such as this location.

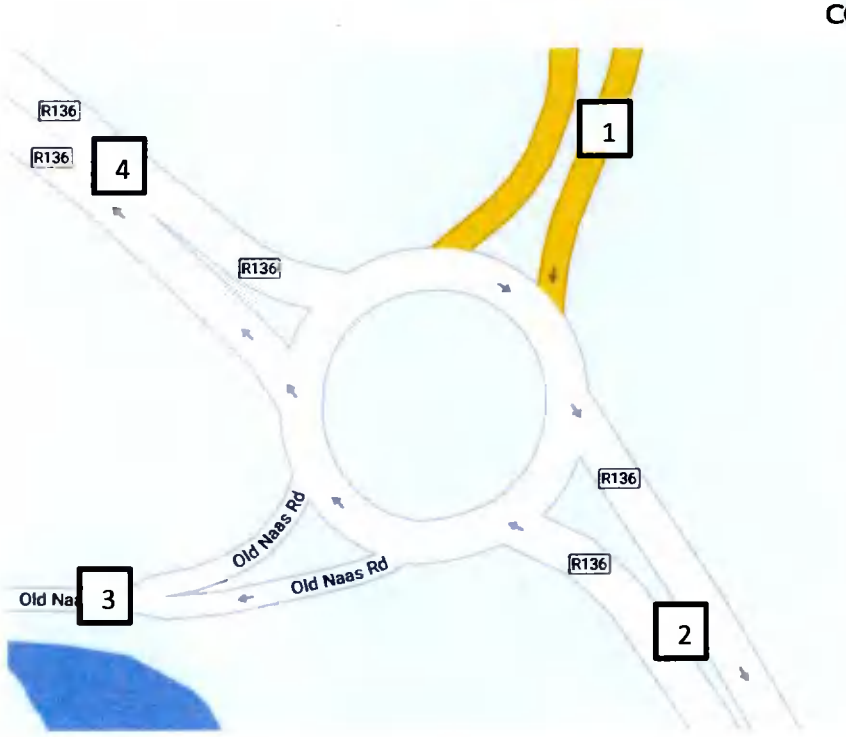

Figure 16 Roundabout Layout

The following arm destinations are used:

- Arm1 – N7 Interchange
- Arm 2 – R136 South
- Arm 3 – Old Naas Road
- Arm 4 – R136 North

	AM			PM		
	Queue (PCU)	Delay (min)	RFC	Queue (PCU)	Delay (min)	RFC
	2025 – No Development					
Arm 2	1.86	0.11	0.65	13.20	0.53	0.95
Arm 3	0.19	0.04	0.16	0.66	0.07	0.40
Arm 4	59.50	1.40	1.04	12.67	0.41	0.94
Arm 1	1.79	0.14	0.65	1.06	0.08	0.52
	2025 – With Development					
Arm 2	1.88	0.11	0.66	20.74	0.80	0.98
Arm 3	0.21	0.04	0.17	0.69	0.07	0.41
Arm 4	62.77	1.47	1.04	14.00	0.45	0.95
Arm 1	1.82	0.14	0.65	0.96	0.07	0.49
	2030 – No Development					
Arm 2	2.18	0.12	0.69	60.34	1.95	1.06
Arm 3	0.20	0.04	0.17	0.71	0.07	0.42
Arm 4	105.25	2.29	1.08	83.33	2.00	1.07
Arm 1	2.04	0.15	0.67	1.36	0.10	0.58
	2030 – With Development					
Arm 2	2.19	0.13	0.69	33.04	1.15	1.01
Arm 3	0.22	0.04	0.18	0.77	0.08	0.44
Arm 4	109.17	2.37	1.09	27.52	0.81	0.99
Arm 1	2.06	0.16	0.68	1.28	0.09	0.56
	2040 – No Development					
Arm 2	10.61	0.49	0.93	113.40	3.30	1.13
Arm 3	0.24	0.05	0.19	0.95	0.08	0.49
Arm 4	239.45	6.19	1.20	103.23	2.44	1.09
Arm 1	2.81	0.19	0.74	1.61	0.10	0.62
	2040 – With Development					
Arm 2	3.39	0.18	0.78	3.05	0.16	0.76
Arm 3	0.27	0.05	0.21	0.71	0.06	0.42
Arm 4	244.66	6.34	1.20	242.71	6.27	1.20
Arm 1	2.92	0.20	0.75	4.19	0.27	0.81
	Survey					
Arm 2	1.13	0.08	0.53	3.69	0.16	0.79
Arm 3	0.16	0.04	0.13	0.50	0.06	0.33
Arm 4	9.26	0.28	0.91	58.17	1.45	1.04
Arm 1	1.17	0.10	0.54	1.08	0.09	0.52

Table 12 Site 4 – N7 Roundabout

6 SUMMARY

This Traffic and Transport Assessment has been prepared by Pinnacle Consulting Engineers in support of a planning application to South Dublin County Council.

The development is bounded to the north by a sports and leisure centre, to the east by Brownsbarn green area, to the south by Silken Park residential development and to the west by Brownsbarn Wood residential development.

Additional pedestrian and cycle access would be facilitated between the site and the surrounding area, such as existing neighbourhoods.

The subject site currently operates as playing fields for Clondalkin Rugby Club.

6.1 Development Proposals

The proposed development consists of 77 no. dwellings, comprised of 63 no. 2 storey houses, and 14 no. apartments & duplex units accommodated in 1 no. 3 storey building. The proposed houses are comprised of 8 no. 2 bed houses & 55 no. 3 bed houses. The proposed apartments & duplex units are comprised of 7 no. 1 bed apartments at ground floor & 7 no. 3 bed duplex units overhead. The proposed development also provides for all associated site development & infrastructural works, car & bicycle parking, open spaces & landscaping, bin & bicycle storage. Access to the development will by via a new vehicular entrance at the south-west corner of the site, off the Old Naas Road. Permission is also sought to demolish the existing building on site, approx. 455m².

6.2 Development Access

Vehicular access would be by means of priority-controlled junction on to the Old Naas Road. Additional pedestrian and cycle access would be facilitated between the site and the surrounding area, such as existing neighbourhoods.

Pedestrian access will be provided in conjunction with the vehicular access as well as access along the stream on the eastern boundary that will link the district park to Old Naas Road.

6.3 Parking

A total of 138 parking spaces will be provided for the development.

On street surface and in curtilage car parking will be provided for the houses, apartments and duplexs elements of the proposed development.

A total of 6 cycle spaces will be provided for the development.

6.4 Servicing

The proposed development has been designed such that service vehicles, including fire tenders and refuse vehicles, can circulate internally throughout the development.

6.5 Trip Generation

For the scale and type of development proposed, it is expected the total vehicle movements generated by the proposed development will be 8 arrivals and 24 departures in the AM peak (two-way total of 32). The total number of vehicle movements in the PM peak hour are 26 arrivals and 15 departures (two-way total of 41).

6.6 Quantitative Assessment

The proposed development does not exceed the 200-unit threshold and the trips rates identified in Table 9 are not expected to exceed the 10% of the traffic flow on the adjoining road or the 5% of the traffic flow on the adjoining road where congestion exists, or where the location is sensitive.

The addition of the trips from the proposed development to the local network will be immaterial with minimal reduction in capacity or increase in queuing/delays at the local junctions. Accordingly, no junction assessment has been carried out.

6.7 Conclusion

This traffic assessment has confirmed that the proposed access arrangements would adequately accommodate anticipated levels of traffic visitation. The traffic generated by the development would have no material adverse impact on the operation of local junctions due to the marginal uplift in volumes compared to the existing traffic volumes.

It has been shown by the application of recognised assessment techniques that there is a marginal uplift in traffic levels arising from the development as a result of the distribution of resultant flows around the adjacent road network.

The results in terms of flows and movements can be accommodated by the neighbouring junctions with an anticipated little or no uplift congestion and delays at these junctions.

This assessment has also considered the transportation aspects of the internal arrangements of the development and has concluded that the proposals would provide enhanced facilities and improved accessibility for all users of the site. Where applicable, the proposed development is also fully compliant with DMURS.

Accordingly, there are no reasons in relation to traffic and transportation aspects why this scheme should not be granted planning permission.

Appendix A TRICS DATA

Calculation Reference: AUDIT-800401-200701-0752

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

VEHICLES

Selected regions and areas:

02	**SOUTH EAST**		
	HC	HAMPSHIRE	1 days
	KC	KENT	2 days
	WS	WEST SUSSEX	1 days
03	**SOUTH WEST**		
	DV	DEVON	3 days
	WL	WILTSHIRE	1 days
04	**EAST ANGLIA**		
	CA	CAMBRIDGESHIRE	1 days
	NF	NORFOLK	2 days
	SF	SUFFOLK	2 days
05	**EAST MIDLANDS**		
	LN	LINCOLNSHIRE	1 days
	NR	NORTHAMPTONSHIRE	1 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	NY	NORTH YORKSHIRE	3 days
08	**NORTH WEST**		
	CH	CHESHIRE	2 days
09	**NORTH**		
	DH	DURHAM	1 days
10	**WALES**		
	PS	POWYS	1 days
11	**SCOTLAND**		
	AG	ANGUS	1 days
	FA	FALKIRK	2 days
	HI	HIGHLAND	1 days
12	**CONNAUGHT**		
	LT	LEITRIM	1 days
	RO	ROSCOMMON	1 days
16	**ULSTER (REPUBLIC OF IRELAND)**		
	DN	DONEGAL	1 days
17	**ULSTER (NORTHERN IRELAND)**		
	AN	ANTRIM	1 days

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

Primary Filtering selection:

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

Parameter:	No of Dwellings
Actual Range:	7 to 363 (units:)
Range Selected by User:	200 to 300 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/12 to 19/11/19

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

Selected survey days:

Monday	6 days
Tuesday	8 days
Wednesday	7 days
Thursday	5 days
Friday	3 days
Saturday	1 days

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

Selected survey types:

Manual count	30 days
Directional ATC Count	0 days

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

Selected Locations:

Suburban Area (PPS6 Out of Centre)	30

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	30

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	30 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	3 days
5,001 to 10,000	5 days
10,001 to 15,000	5 days
15,001 to 20,000	7 days
20,001 to 25,000	7 days
25,001 to 50,000	3 days

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

Secondary Filtering selection (Cont.):

Population within 5 miles:

5,001 to 25,000	6 days
25,001 to 50,000	2 days
50,001 to 75,000	5 days
75,001 to 100,000	7 days
100,001 to 125,000	2 days
125,001 to 250,000	8 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	8 days
1.1 to 1.5	22 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	4 days
No	26 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	30 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 No of Dwellings: 7
Survey date: TUESDAY *22/05/12* *Survey Type: MANUAL*

2 **AN-03-A-08** **HOUSES & FLATS** **ANTRIM**
BALLINDERRY ROAD
LISBURN

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 204
Survey date: TUESDAY *29/10/13* *Survey Type: MANUAL*

3 **CA-03-A-05** **DETACHED HOUSES** **CAMBRIDGESHIRE**
EASTFIELD ROAD
PETERBOROUGH

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 28
Survey date: MONDAY *17/10/16* *Survey Type: MANUAL*

4 **CH-03-A-08** **DETACHED** **CHESHIRE**
WHITCHURCH ROAD
CHESTER
BOUGHTON HEATH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 11
Survey date: TUESDAY *22/05/12* *Survey Type: MANUAL*

5 **CH-03-A-11** **TOWN HOUSES** **CHESHIRE**
LONDON ROAD
NORTHWICH
LEFTWICH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 24
Survey date: THURSDAY *06/06/19* *Survey Type: MANUAL*

6 **DH-03-A-01** **SEMI DETACHED** **DURHAM**
GREENFIELDS ROAD
BISHOP AUCKLAND

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 50
Survey date: TUESDAY *28/03/17* *Survey Type: MANUAL*

7 **DN-03-A-05** **DETACHED/SEMI-DETACHED** **DONEGAL**
GORTLEE ROAD
LETTERKENNY
GORTLEE
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 146
Survey date: WEDNESDAY *03/09/14* *Survey Type: MANUAL*

8 **DV-03-A-01** **TERRACED HOUSES** **DEVON**
BRONSHILL ROAD
TORQUAY

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 37
Survey date: WEDNESDAY *30/09/15* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

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

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 116
Survey date: FRIDAY *25/09/15* *Survey Type: MANUAL*

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

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 70
Survey date: MONDAY *28/09/15* *Survey Type: MANUAL*

11 **FA-03-A-01** **SEMI-DETACHED/TERRACED** **FALKIRK**
MANDELA AVENUE
FALKIRK

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 37
Survey date: THURSDAY *30/05/13* *Survey Type: MANUAL*

12 **FA-03-A-02** **MIXED HOUSES** **FALKIRK**
ROSEBANK AVENUE & SPRINGFIELD DRIVE
FALKIRK

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 161
Survey date: WEDNESDAY *29/05/13* *Survey Type: MANUAL*

13 **HC-03-A-23** **HOUSES & FLATS** **HAMPSHIRE**
CANADA WAY
LIPHOOK

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 62
Survey date: TUESDAY *19/11/19* *Survey Type: MANUAL*

14 **HI-03-A-14** **SEMI-DETACHED & TERRACED** **HIGHLAND**
KING BRUDE ROAD
INVERNESS
SCORGUIE
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 40
Survey date: WEDNESDAY *23/03/16* *Survey Type: MANUAL*

15 **KC-03-A-03** **MIXED HOUSES & FLATS** **KENT**
HYTHE ROAD
ASHFORD
WILLESBOROUGH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 51
Survey date: THURSDAY *14/07/16* *Survey Type: MANUAL*

16 **KC-03-A-06** **MIXED HOUSES & FLATS** **KENT**
MARGATE ROAD
HERNE BAY

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 363
Survey date: WEDNESDAY *27/09/17* *Survey Type: MANUAL*

17 **LN-03-A-03** **SEMI DETACHED** **LINCOLNSHIRE**
ROOKERY LANE
LINCOLN
BOULTHAM
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 22
Survey date: TUESDAY *18/09/12* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

18 **LT-03-A-01** **SEMI-DETACHED & DETACHED** **LEITRIM**
ARD NA SI
CARRICK-ON-SHANNON
ATTIRORY
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 90
Survey date: FRIDAY *24/04/15* *Survey Type: MANUAL*

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

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 27
Survey date: TUESDAY *16/10/12* *Survey Type: MANUAL*

20 **NF-03-A-02** **HOUSES & FLATS** **NORFOLK**
DEREHAM ROAD
NORWICH

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 98
Survey date: MONDAY *22/10/12* *Survey Type: MANUAL*

21 **NR-03-A-01** **HOUSES** **NORTHAMPTONSHIRE**
BOUGHTON GREEN ROAD
NORTHAMPTON
KINGSTHORPE
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 102
Survey date: SATURDAY *22/09/12* *Survey Type: MANUAL*

22 **NY-03-A-08** **TERRACED HOUSES** **NORTH YORKSHIRE**
NICHOLAS STREET
YORK

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 21
Survey date: MONDAY *16/09/13* *Survey Type: MANUAL*

23 **NY-03-A-09** **MIXED HOUSING** **NORTH YORKSHIRE**
GRAMMAR SCHOOL LANE
NORTHALLERTON

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 52
Survey date: MONDAY *16/09/13* *Survey Type: MANUAL*

24 **NY-03-A-13** **TERRACED HOUSES** **NORTH YORKSHIRE**
CATTERICK ROAD
CATTERICK GARRISON
OLD HOSPITAL COMPOUND
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 10
Survey date: WEDNESDAY *10/05/17* *Survey Type: MANUAL*

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

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 28
Survey date: MONDAY *11/05/15* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

26	**RO-03-A-04**	**SEMI DET. & BUNGALOWS**		**ROSCOMMON**
	EAGLE COURT			
	ROSCOMMON			
	ARDNANAGH			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total No of Dwellings:		39	
	Survey date: FRIDAY		*26/09/14*	*Survey Type: MANUAL*
27	**SF-03-A-04**	**DETACHED & BUNGALOWS**		**SUFFOLK**
	NORMANSTON DRIVE			
	LOWESTOFT			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total No of Dwellings:		7	
	Survey date: TUESDAY		*23/10/12*	*Survey Type: MANUAL*
28	**SF-03-A-07**	**MIXED HOUSES**		**SUFFOLK**
	FOXHALL ROAD			
	IPSWICH			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total No of Dwellings:		73	
	Survey date: THURSDAY		*09/05/19*	*Survey Type: MANUAL*
29	**WL-03-A-02**	**SEMI DETACHED**		**WILTSHIRE**
	HEADLANDS GROVE			
	SWINDON			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total No of Dwellings:		27	
	Survey date: THURSDAY		*22/09/16*	*Survey Type: MANUAL*
30	**WS-03-A-05**	**TERRACED & FLATS**		**WEST SUSSEX**
	UPPER SHOREHAM ROAD			
	SHOREHAM BY SEA			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total No of Dwellings:		48	
	Survey date: WEDNESDAY		*18/04/12*	*Survey Type: MANUAL*

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

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

VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS 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	30	68	0.051	30	68	0.235	30	68	0.286
08:00 - 09:00	30	68	0.110	**30**	**68**	**0.347**	30	68	0.457
09:00 - 10:00	30	68	0.157	30	68	0.198	30	68	0.355
10:00 - 11:00	30	68	0.126	30	68	0.161	30	68	0.287
11:00 - 12:00	30	68	0.134	30	68	0.145	30	68	0.279
12:00 - 13:00	30	68	0.179	30	68	0.172	30	68	0.351
13:00 - 14:00	30	68	0.176	30	68	0.187	30	68	0.363
14:00 - 15:00	30	68	0.175	30	68	0.195	30	68	0.370
15:00 - 16:00	30	68	0.250	30	68	0.169	30	68	0.419
16:00 - 17:00	30	68	0.285	30	68	0.179	30	68	0.464
17:00 - 18:00	**30**	**68**	**0.369**	30	68	0.205	**30**	**68**	**0.574**
18:00 - 19:00	30	68	0.271	30	68	0.195	30	68	0.466
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.283			2.388			4.671

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:	7 - 363 (units:)
Survey date date range:	01/01/12 - 19/11/19
Number of weekdays (Monday-Friday):	29
Number of Saturdays:	1
Number of Sundays:	0
Surveys automatically removed from selection:	4
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.

Calculation Reference: AUDIT-800401-200701-0717

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**		
	SF	SUFFOLK	1 days
05	**EAST MIDLANDS**		
	DS	DERBYSHIRE	1 days
09	**NORTH**		
	CB	CUMBRIA	1 days
11	**SCOTLAND**		
	EB	CITY OF EDINBURGH	1 days
13	**MUNSTER**		
	WA	WATERFORD	1 days
15	**GREATER DUBLIN**		
	DL	DUBLIN	1 days

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

Primary Filtering selection:

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

Parameter: No of Dwellings
Actual Range: 14 to 51 (units:)
Range Selected by User: 450 to 1000 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/12 to 14/11/19

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

Selected survey days:

Monday	1 days
Tuesday	2 days
Wednesday	3 days
Friday	1 days

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

Selected survey types:

Manual count	7 days
Directional ATC Count	0 days

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

Selected Locations:

Suburban Area (PPS6 Out of Centre)	7

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	7

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	7 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:

5,001 to 10,000	1 days
10,001 to 15,000	2 days
20,001 to 25,000	3 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:

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

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

Car ownership within 5 miles:

0.6 to 1.0	2 days
1.1 to 1.5	5 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	7 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	7 days

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

LIST OF SITES relevant to selection parameters

1 **CB-03-C-03** **FLATS & BUNGALOWS** **CUMBRIA**
LOUND STREET
KENDAL

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 33
Survey date: MONDAY *09/06/14* *Survey Type: MANUAL*

2 **DC-03-C-02** **FLATS IN BLOCKS** **DORSET**
PALM COURT
WEYMOUTH
SPA ROAD
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 14
Survey date: FRIDAY *28/03/14* *Survey Type: MANUAL*

3 **DL-03-C-15** **BLOCKS OF FLATS** **DUBLIN**
MONKSTOWN ROAD
DUBLIN
MONKSTOWN
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 20
Survey date: WEDNESDAY *01/10/14* *Survey Type: MANUAL*

4 **DS-03-C-03** **BLOCKS OF FLATS** **DERBYSHIRE**
CAESAR STREET
DERBY

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 30
Survey date: WEDNESDAY *25/09/19* *Survey Type: MANUAL*

5 **EB-03-C-01** **BLOCKS OF FLATS** **CITY OF EDINBURGH**
MYRESIDE ROAD
EDINBURGH
CRAIGLOCKHART
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 32
Survey date: TUESDAY *26/05/15* *Survey Type: MANUAL*

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

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 30
Survey date: WEDNESDAY *03/12/14* *Survey Type: MANUAL*

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

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No 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

	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	7	30	0.052	7	30	0.100	7	30	0.152
08:00 - 09:00	7	30	0.057	**7**	**30**	**0.157**	7	30	0.214
09:00 - 10:00	7	30	0.071	7	30	0.090	7	30	0.161
10:00 - 11:00	7	30	0.067	7	30	0.081	7	30	0.148
11:00 - 12:00	7	30	0.090	7	30	0.110	7	30	0.200
12:00 - 13:00	7	30	0.086	7	30	0.081	7	30	0.167
13:00 - 14:00	7	30	0.100	7	30	0.090	7	30	0.190
14:00 - 15:00	7	30	0.129	7	30	0.114	7	30	0.243
15:00 - 16:00	7	30	0.105	7	30	0.105	7	30	0.210
16:00 - 17:00	7	30	0.129	7	30	0.105	7	30	0.234
17:00 - 18:00	**7**	**30**	**0.195**	7	30	0.124	**7**	**30**	**0.319**
18:00 - 19:00	7	30	0.124	7	30	0.119	7	30	0.243
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.205			1.276			2.481

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 - 51 (units:)
Survey date date range:	01/01/12 - 14/11/19
Number of weekdays (Monday-Friday):	7
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	**7**	**30**	**0.005**	**7**	**30**	**0.005**	**7**	**30**	**0.010**
08:00 - 09:00	7	30	0.000	7	30	0.000	7	30	0.000
09:00 - 10:00	7	30	0.000	7	30	0.000	7	30	0.000
10:00 - 11:00	7	30	0.000	7	30	0.000	7	30	0.000
11:00 - 12:00	7	30	0.000	7	30	0.000	7	30	0.000
12:00 - 13:00	7	30	0.000	7	30	0.000	7	30	0.000
13:00 - 14:00	7	30	0.000	7	30	0.000	7	30	0.000
14:00 - 15:00	7	30	0.000	7	30	0.000	7	30	0.000
15:00 - 16:00	7	30	0.000	7	30	0.000	7	30	0.000
16:00 - 17:00	7	30	0.000	7	30	0.000	7	30	0.000
17:00 - 18:00	7	30	0.000	7	30	0.000	7	30	0.000
18:00 - 19:00	7	30	0.000	7	30	0.000	7	30	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			0.005			0.010

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

	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	7	30	0.000	**7**	**30**	**0.005**	7	30	0.005
08:00 - 09:00	**7**	**30**	**0.005**	7	30	0.005	**7**	**30**	**0.010**
09:00 - 10:00	7	30	0.005	7	30	0.005	7	30	0.010
10:00 - 11:00	7	30	0.005	7	30	0.005	7	30	0.010
11:00 - 12:00	7	30	0.000	7	30	0.000	7	30	0.000
12:00 - 13:00	7	30	0.005	7	30	0.005	7	30	0.010
13:00 - 14:00	7	30	0.000	7	30	0.000	7	30	0.000
14:00 - 15:00	7	30	0.005	7	30	0.005	7	30	0.010
15:00 - 16:00	7	30	0.000	7	30	0.000	7	30	0.000
16:00 - 17:00	7	30	0.005	7	30	0.005	7	30	0.010
17:00 - 18:00	7	30	0.000	7	30	0.000	7	30	0.000
18:00 - 19:00	7	30	0.000	7	30	0.000	7	30	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			0.035			0.065

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	7	30	0.000	7	30	0.000	7	30	0.000
08:00 - 09:00	7	30	0.000	7	30	0.000	7	30	0.000
09:00 - 10:00	7	30	0.000	7	30	0.000	7	30	0.000
10:00 - 11:00	7	30	0.000	7	30	0.000	7	30	0.000
11:00 - 12:00	7	30	0.000	7	30	0.000	7	30	0.000
12:00 - 13:00	7	30	0.000	7	30	0.000	7	30	0.000
13:00 - 14:00	7	30	0.000	7	30	0.000	7	30	0.000
14:00 - 15:00	**7**	**30**	**0.005**	**7**	**30**	**0.005**	**7**	**30**	**0.010**
15:00 - 16:00	7	30	0.000	7	30	0.000	7	30	0.000
16:00 - 17:00	7	30	0.005	7	30	0.005	7	30	0.010
17:00 - 18:00	7	30	0.005	7	30	0.005	7	30	0.010
18:00 - 19:00	7	30	0.000	7	30	0.000	7	30	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.

*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	7	30	0.010	7	30	0.010	**7**	**30**	**0.020**
08:00 - 09:00	7	30	0.000	**7**	**30**	**0.019**	7	30	0.019
09:00 - 10:00	7	30	0.010	7	30	0.010	7	30	0.020
10:00 - 11:00	7	30	0.005	7	30	0.000	7	30	0.005
11:00 - 12:00	7	30	0.005	7	30	0.000	7	30	0.005
12:00 - 13:00	7	30	0.005	7	30	0.000	7	30	0.005
13:00 - 14:00	7	30	0.000	7	30	0.005	7	30	0.005
14:00 - 15:00	7	30	0.000	7	30	0.000	7	30	0.000
15:00 - 16:00	7	30	0.000	7	30	0.000	7	30	0.000
16:00 - 17:00	7	30	0.000	7	30	0.005	7	30	0.005
17:00 - 18:00	**7**	**30**	**0.014**	7	30	0.005	7	30	0.019
18:00 - 19:00	7	30	0.005	7	30	0.005	7	30	0.010
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.054			0.059			0.113

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	7	30	0.029	7	30	0.076	7	30	0.105
08:00 - 09:00	7	30	0.024	**7**	**30**	**0.114**	7	30	0.138
09:00 - 10:00	7	30	0.038	7	30	0.043	7	30	0.081
10:00 - 11:00	7	30	0.033	7	30	0.048	7	30	0.081
11:00 - 12:00	7	30	0.038	7	30	0.067	7	30	0.105
12:00 - 13:00	7	30	0.052	7	30	0.048	7	30	0.100
13:00 - 14:00	7	30	0.076	7	30	0.071	7	30	0.147
14:00 - 15:00	7	30	0.062	7	30	0.038	7	30	0.100
15:00 - 16:00	7	30	0.057	7	30	0.057	7	30	0.114
16:00 - 17:00	7	30	0.095	7	30	0.067	7	30	0.162
17:00 - 18:00	**7**	**30**	**0.114**	7	30	0.062	**7**	**30**	**0.176**
18:00 - 19:00	7	30	0.081	7	30	0.067	7	30	0.148
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.699			0.758			1.457

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	7	30	0.005	7	30	0.000	7	30	0.005
08:00 - 09:00	7	30	0.010	7	30	0.005	7	30	0.015
09:00 - 10:00	7	30	0.019	7	30	0.010	7	30	0.029
10:00 - 11:00	7	30	0.005	7	30	0.014	7	30	0.019
11:00 - 12:00	7	30	0.024	7	30	0.019	7	30	0.043
12:00 - 13:00	7	30	0.005	7	30	0.005	7	30	0.010
13:00 - 14:00	7	30	0.005	7	30	0.005	7	30	0.010
14:00 - 15:00	7	30	0.019	7	30	0.014	7	30	0.033
15:00 - 16:00	7	30	0.019	**7**	**30**	**0.029**	7	30	0.048
16:00 - 17:00	7	30	0.014	7	30	0.014	7	30	0.028
17:00 - 18:00	**7**	**30**	**0.029**	7	30	0.029	**7**	**30**	**0.058**
18:00 - 19:00	7	30	0.014	7	30	0.024	7	30	0.038
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.168			0.168			0.336

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

	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	7	30	0.000	7	30	0.000	7	30	0.000
08:00 - 09:00	7	30	0.000	7	30	0.000	7	30	0.000
09:00 - 10:00	7	30	0.000	7	30	0.000	7	30	0.000
10:00 - 11:00	7	30	0.000	7	30	0.000	7	30	0.000
11:00 - 12:00	7	30	0.000	7	30	0.000	7	30	0.000
12:00 - 13:00	7	30	0.000	7	30	0.000	7	30	0.000
13:00 - 14:00	7	30	0.000	7	30	0.000	7	30	0.000
14:00 - 15:00	7	30	0.000	7	30	0.000	7	30	0.000
15:00 - 16:00	**7**	**30**	**0.005**	7	30	0.005	7	30	0.010
16:00 - 17:00	7	30	0.005	7	30	0.000	7	30	0.005
17:00 - 18:00	7	30	0.005	**7**	**30**	**0.010**	**7**	**30**	**0.015**
18:00 - 19:00	7	30	0.000	7	30	0.005	7	30	0.005
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.015			0.020			0.035

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

Light Vehicles (LV)

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	7	30	0.000	7	30	0.000	7	30	0.000
08:00 - 09:00	7	30	0.000	7	30	0.000	7	30	0.000
09:00 - 10:00	7	30	0.000	7	30	0.000	7	30	0.000
10:00 - 11:00	7	30	0.000	7	30	0.000	7	30	0.000
11:00 - 12:00	7	30	0.000	7	30	0.000	7	30	0.000
12:00 - 13:00	7	30	0.000	7	30	0.000	7	30	0.000
13:00 - 14:00	7	30	0.000	7	30	0.000	7	30	0.000
14:00 - 15:00	7	30	0.000	7	30	0.000	7	30	0.000
15:00 - 16:00	7	30	0.000	7	30	0.000	7	30	0.000
16:00 - 17:00	7	30	0.000	7	30	0.000	7	30	0.000
17:00 - 18:00	7	30	0.000	7	30	0.000	7	30	0.000
18:00 - 19:00	7	30	0.000	7	30	0.000	7	30	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.000			0.000

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

*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
Rigid Trucks - No Trailer (OGV1)
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	7	30	0.000	7	30	0.000	7	30	0.000
08:00 - 09:00	7	30	0.000	7	30	0.000	7	30	0.000
09:00 - 10:00	7	30	0.000	7	30	0.000	7	30	0.000
10:00 - 11:00	7	30	0.000	7	30	0.000	7	30	0.000
11:00 - 12:00	7	30	0.000	7	30	0.000	7	30	0.000
12:00 - 13:00	7	30	0.000	7	30	0.000	7	30	0.000
13:00 - 14:00	7	30	0.000	7	30	0.000	7	30	0.000
14:00 - 15:00	7	30	0.000	7	30	0.000	7	30	0.000
15:00 - 16:00	7	30	0.000	7	30	0.000	7	30	0.000
16:00 - 17:00	7	30	0.000	7	30	0.000	7	30	0.000
17:00 - 18:00	7	30	0.000	7	30	0.000	7	30	0.000
18:00 - 19:00	7	30	0.000	7	30	0.000	7	30	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.000			0.000

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

*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

Trucks Towing Trailers (OGV2)

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	7	30	0.000	7	30	0.000	7	30	0.000
08:00 - 09:00	7	30	0.000	7	30	0.000	7	30	0.000
09:00 - 10:00	7	30	0.000	7	30	0.000	7	30	0.000
10:00 - 11:00	7	30	0.000	7	30	0.000	7	30	0.000
11:00 - 12:00	7	30	0.000	7	30	0.000	7	30	0.000
12:00 - 13:00	7	30	0.000	7	30	0.000	7	30	0.000
13:00 - 14:00	7	30	0.000	7	30	0.000	7	30	0.000
14:00 - 15:00	7	30	0.000	7	30	0.000	7	30	0.000
15:00 - 16:00	7	30	0.000	7	30	0.000	7	30	0.000
16:00 - 17:00	7	30	0.000	7	30	0.000	7	30	0.000
17:00 - 18:00	7	30	0.000	7	30	0.000	7	30	0.000
18:00 - 19:00	7	30	0.000	7	30	0.000	7	30	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.000			0.000

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

*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

Buses

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	7	30	0.000	7	30	0.000	7	30	0.000
08:00 - 09:00	7	30	0.000	7	30	0.000	7	30	0.000
09:00 - 10:00	7	30	0.000	7	30	0.000	7	30	0.000
10:00 - 11:00	7	30	0.000	7	30	0.000	7	30	0.000
11:00 - 12:00	7	30	0.000	7	30	0.000	7	30	0.000
12:00 - 13:00	7	30	0.000	7	30	0.000	7	30	0.000
13:00 - 14:00	7	30	0.000	7	30	0.000	7	30	0.000
14:00 - 15:00	7	30	0.000	7	30	0.000	7	30	0.000
15:00 - 16:00	7	30	0.000	7	30	0.000	7	30	0.000
16:00 - 17:00	7	30	0.000	7	30	0.000	7	30	0.000
17:00 - 18:00	7	30	0.000	7	30	0.000	7	30	0.000
18:00 - 19:00	7	30	0.000	7	30	0.000	7	30	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.000			0.000

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

*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

Non-Motorised Vehicles (NMV)

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	7	30	0.000	7	30	0.000	7	30	0.000
08:00 - 09:00	7	30	0.000	7	30	0.000	7	30	0.000
09:00 - 10:00	7	30	0.000	7	30	0.000	7	30	0.000
10:00 - 11:00	7	30	0.000	7	30	0.000	7	30	0.000
11:00 - 12:00	7	30	0.000	7	30	0.000	7	30	0.000
12:00 - 13:00	7	30	0.000	7	30	0.000	7	30	0.000
13:00 - 14:00	7	30	0.000	7	30	0.000	7	30	0.000
14:00 - 15:00	7	30	0.000	7	30	0.000	7	30	0.000
15:00 - 16:00	7	30	0.000	7	30	0.000	7	30	0.000
16:00 - 17:00	7	30	0.000	7	30	0.000	7	30	0.000
17:00 - 18:00	7	30	0.000	7	30	0.000	7	30	0.000
18:00 - 19:00	7	30	0.000	7	30	0.000	7	30	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.000			0.000

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

*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

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	7	30	0.000	7	30	0.000	7	30	0.000
08:00 - 09:00	7	30	0.000	7	30	0.000	7	30	0.000
09:00 - 10:00	7	30	0.000	7	30	0.000	7	30	0.000
10:00 - 11:00	7	30	0.000	7	30	0.000	7	30	0.000
11:00 - 12:00	7	30	0.000	7	30	0.000	7	30	0.000
12:00 - 13:00	7	30	0.000	7	30	0.000	7	30	0.000
13:00 - 14:00	7	30	0.000	7	30	0.000	7	30	0.000
14:00 - 15:00	7	30	0.000	7	30	0.000	7	30	0.000
15:00 - 16:00	7	30	0.000	7	30	0.000	7	30	0.000
16:00 - 17:00	7	30	0.000	7	30	0.000	7	30	0.000
17:00 - 18:00	7	30	0.000	7	30	0.000	7	30	0.000
18:00 - 19:00	7	30	0.000	7	30	0.000	7	30	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.000			0.000

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

*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
Scooters
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	7	30	0.000	7	30	0.000	7	30	0.000
08:00 - 09:00	7	30	0.000	7	30	0.000	7	30	0.000
09:00 - 10:00	7	30	0.000	7	30	0.000	7	30	0.000
10:00 - 11:00	7	30	0.000	7	30	0.000	7	30	0.000
11:00 - 12:00	7	30	0.000	7	30	0.000	7	30	0.000
12:00 - 13:00	7	30	0.000	7	30	0.000	7	30	0.000
13:00 - 14:00	7	30	0.000	7	30	0.000	7	30	0.000
14:00 - 15:00	7	30	0.000	7	30	0.000	7	30	0.000
15:00 - 16:00	7	30	0.000	7	30	0.000	7	30	0.000
16:00 - 17:00	7	30	0.000	7	30	0.000	7	30	0.000
17:00 - 18:00	7	30	0.000	7	30	0.000	7	30	0.000
18:00 - 19:00	7	30	0.000	7	30	0.000	7	30	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.000			0.000

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

*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

Non-Vehicular People Movements (NVPM)

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	7	30	0.000	7	30	0.000	7	30	0.000
08:00 - 09:00	7	30	0.000	7	30	0.000	7	30	0.000
09:00 - 10:00	7	30	0.000	7	30	0.000	7	30	0.000
10:00 - 11:00	7	30	0.000	7	30	0.000	7	30	0.000
11:00 - 12:00	7	30	0.000	7	30	0.000	7	30	0.000
12:00 - 13:00	7	30	0.000	7	30	0.000	7	30	0.000
13:00 - 14:00	7	30	0.000	7	30	0.000	7	30	0.000
14:00 - 15:00	7	30	0.000	7	30	0.000	7	30	0.000
15:00 - 16:00	7	30	0.000	7	30	0.000	7	30	0.000
16:00 - 17:00	7	30	0.000	7	30	0.000	7	30	0.000
17:00 - 18:00	7	30	0.000	7	30	0.000	7	30	0.000
18:00 - 19:00	7	30	0.000	7	30	0.000	7	30	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.000			0.000

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

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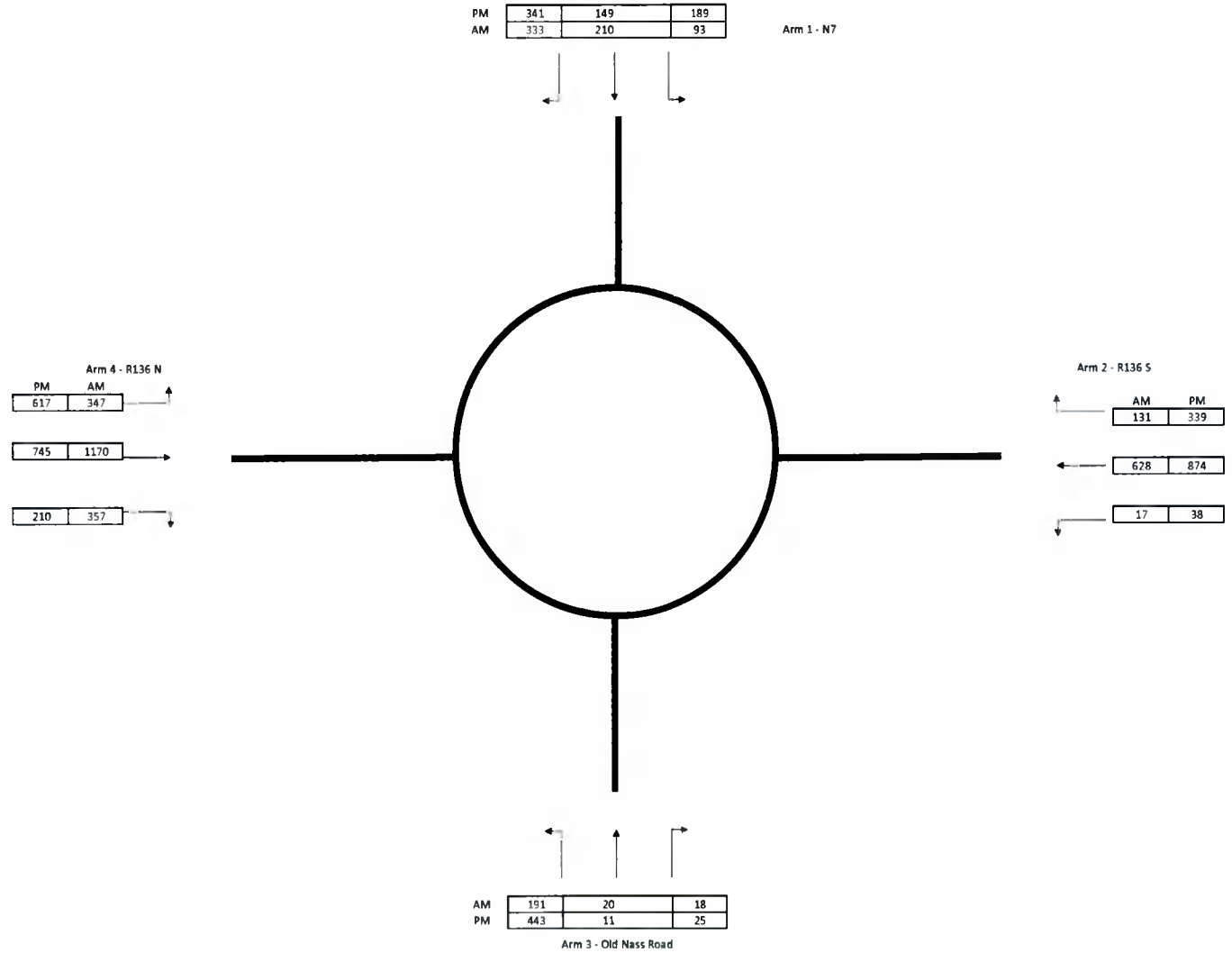
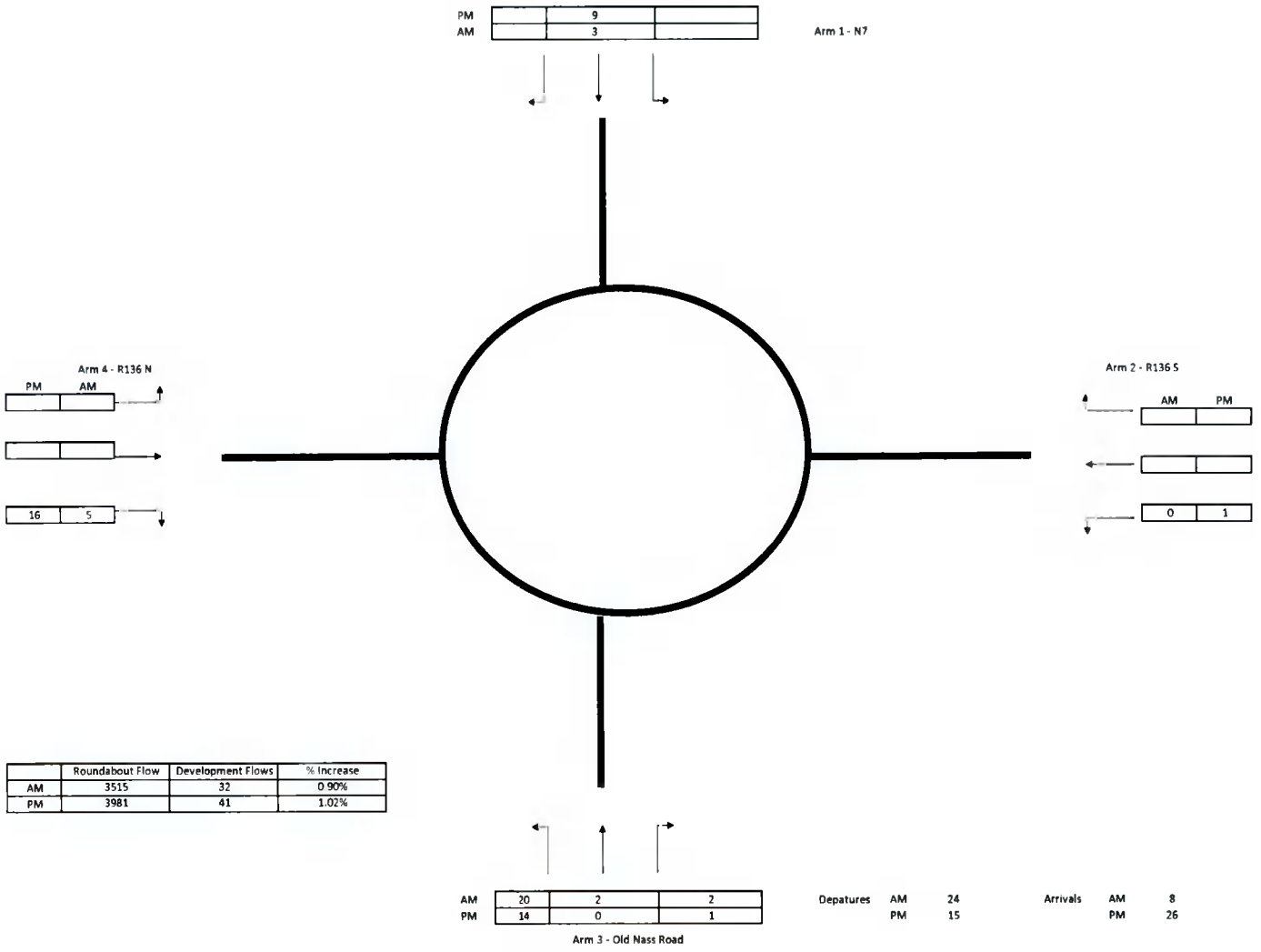
Appendix B Flow Diagrams



PINNACLE
CONSULTING ENGINEERS

Job Number:	P210514		
Client:	Greenwalk Development Ltd		
	Year	Time	Scenario
Flow Condition	2019	AM/PM	Survey
Appendix	C1		

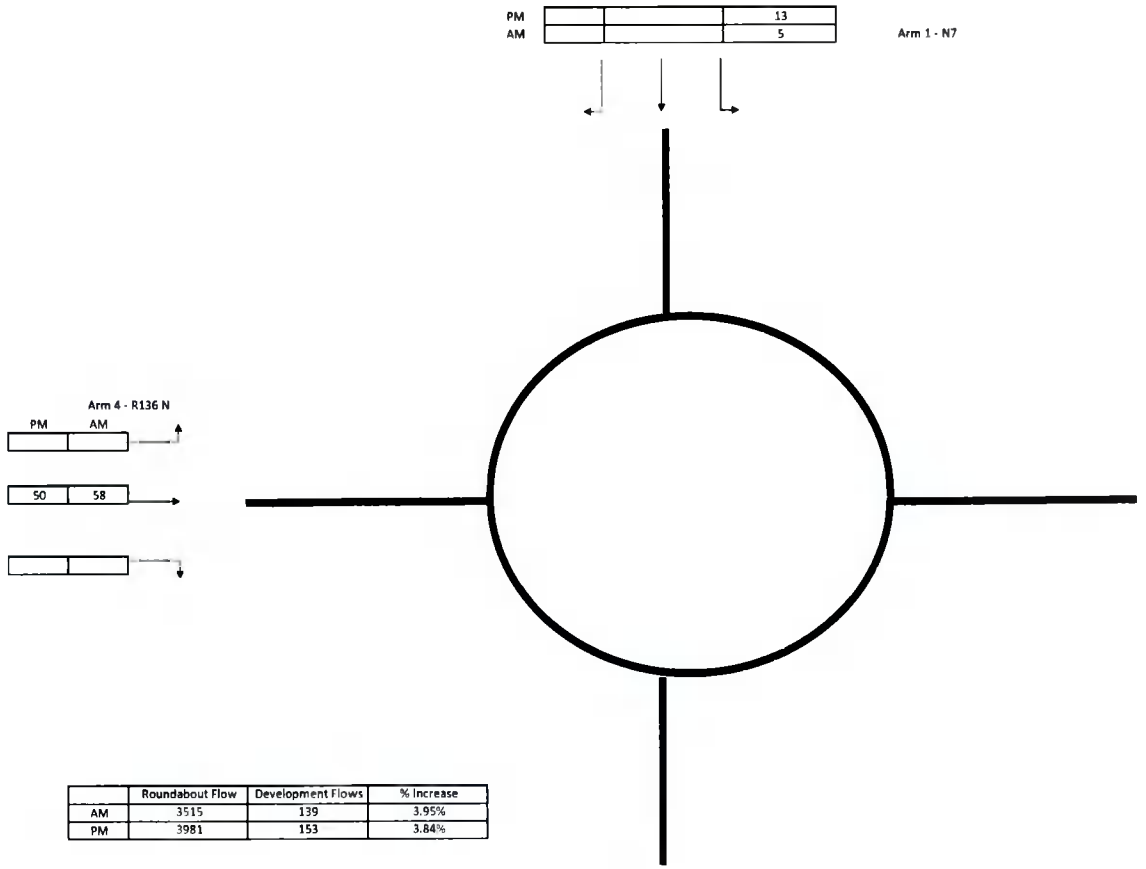


	Roundabout Flow	Development Flows	% Increase
AM	3515	32	0.90%
PM	3981	41	1.02%

Depatures	AM	24	
	PM	15	
Arrivals	AM	8	
	PM	26	

PINNACLE
CONSULTING ENGINEERS

Job Number:	P210514		
Client:	Greenwalk Development Ltd.		
	Year	Time	Scenario
Flow Condition	2019	AM/PM	Dev Flows
Appendix	C2		

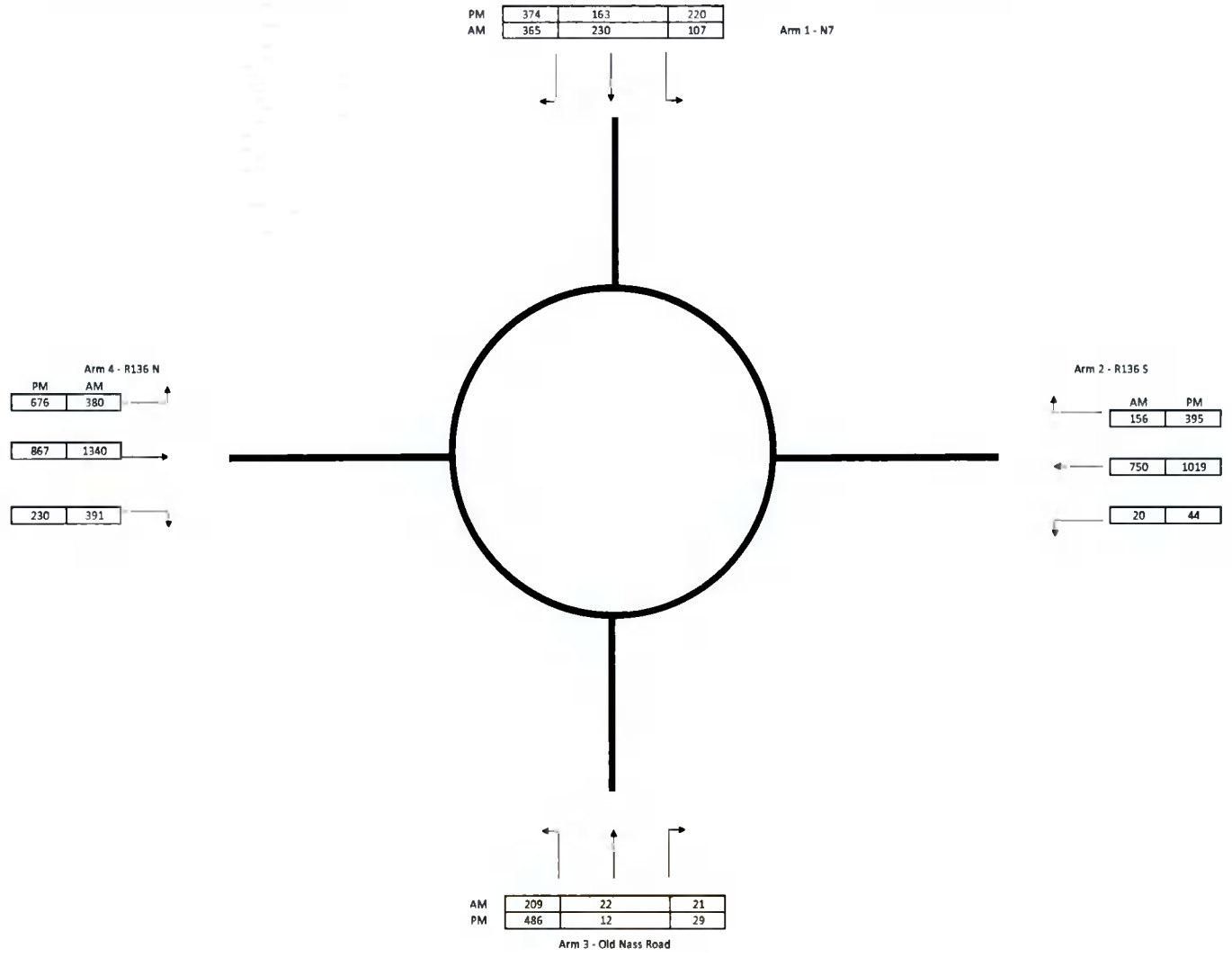


	Roundabout Flow	Development Flows	% Increase
AM	3515	139	3.95%
PM	3981	153	3.84%

Departure	AM	76	
	PM	88	
Arrivals	AM	63	
	PM	65	

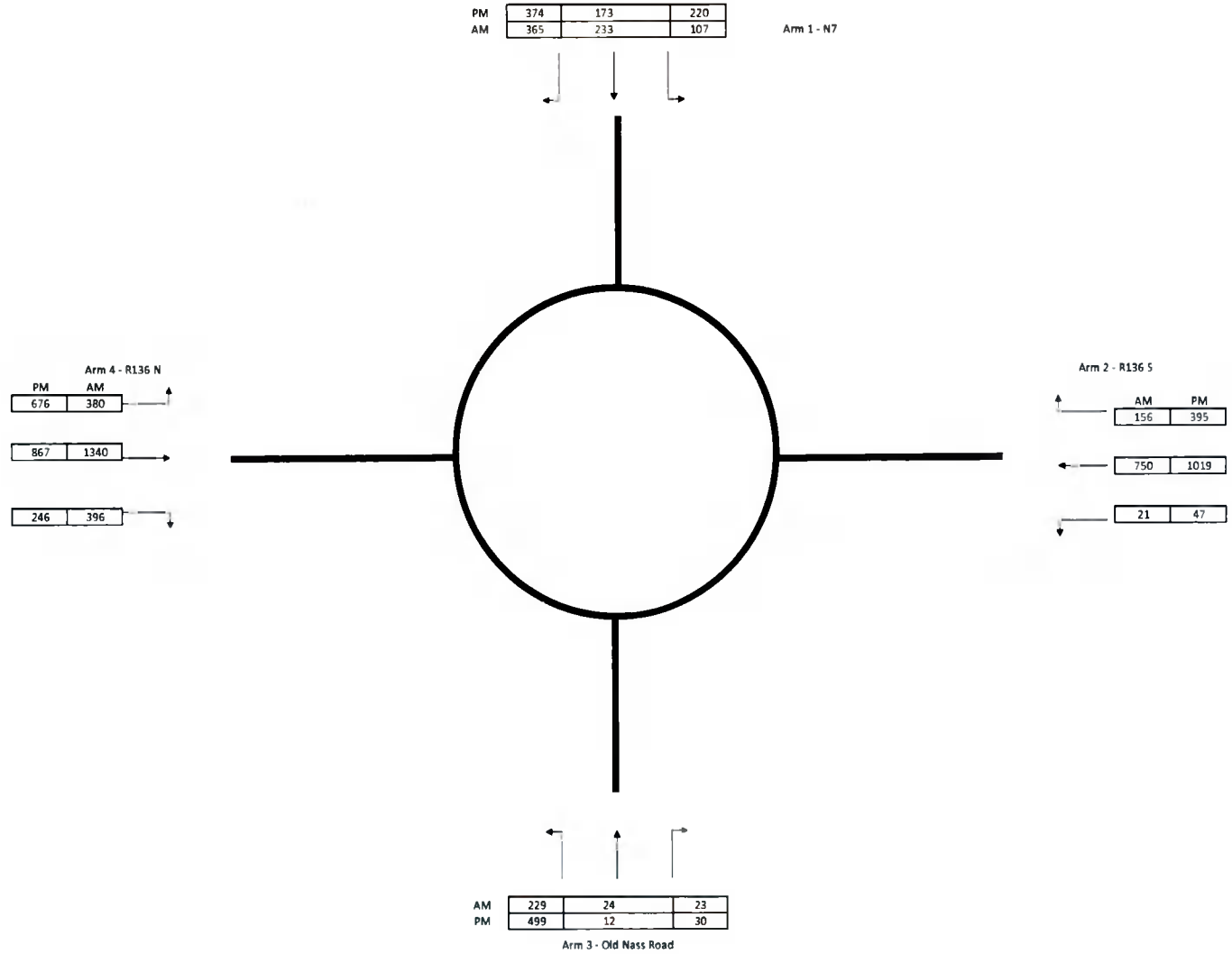
PINNACLE
CONSULTING ENGINEERS

Job Number:	P210514		
Client:	Greenwalk Development Ltd.		
	Year	Time	Scenario
Flow Condition	2019	AM/PM	Committed
Appendix	C3		



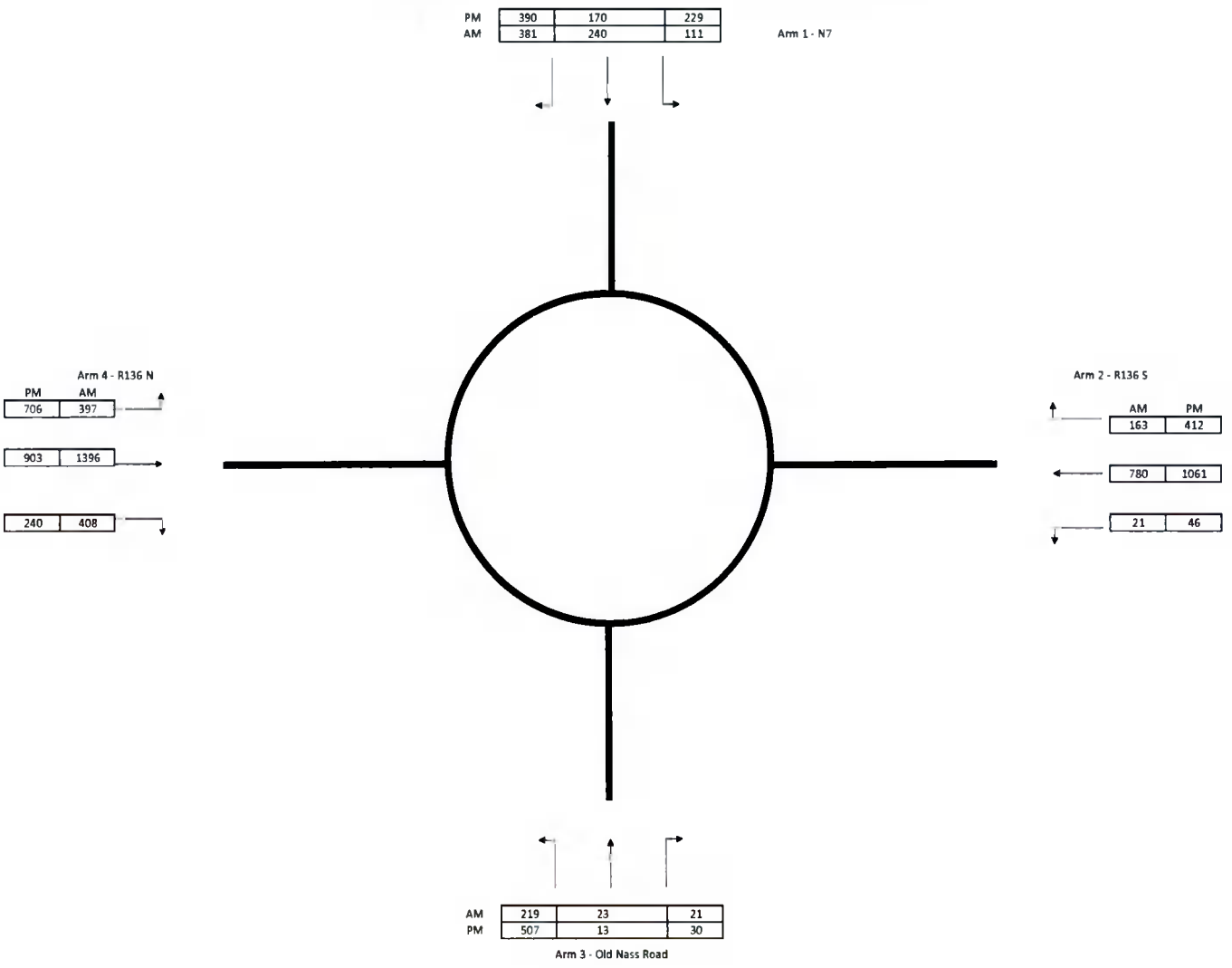
PINNACLE
CONSULTING ENGINEERS

Job Number	P210514		
Client:	Greenwalk Development Ltd.		
	Year	Time	Scenario
Flow Condition	2025	AM/PM	No Dev
Appendix	C4		



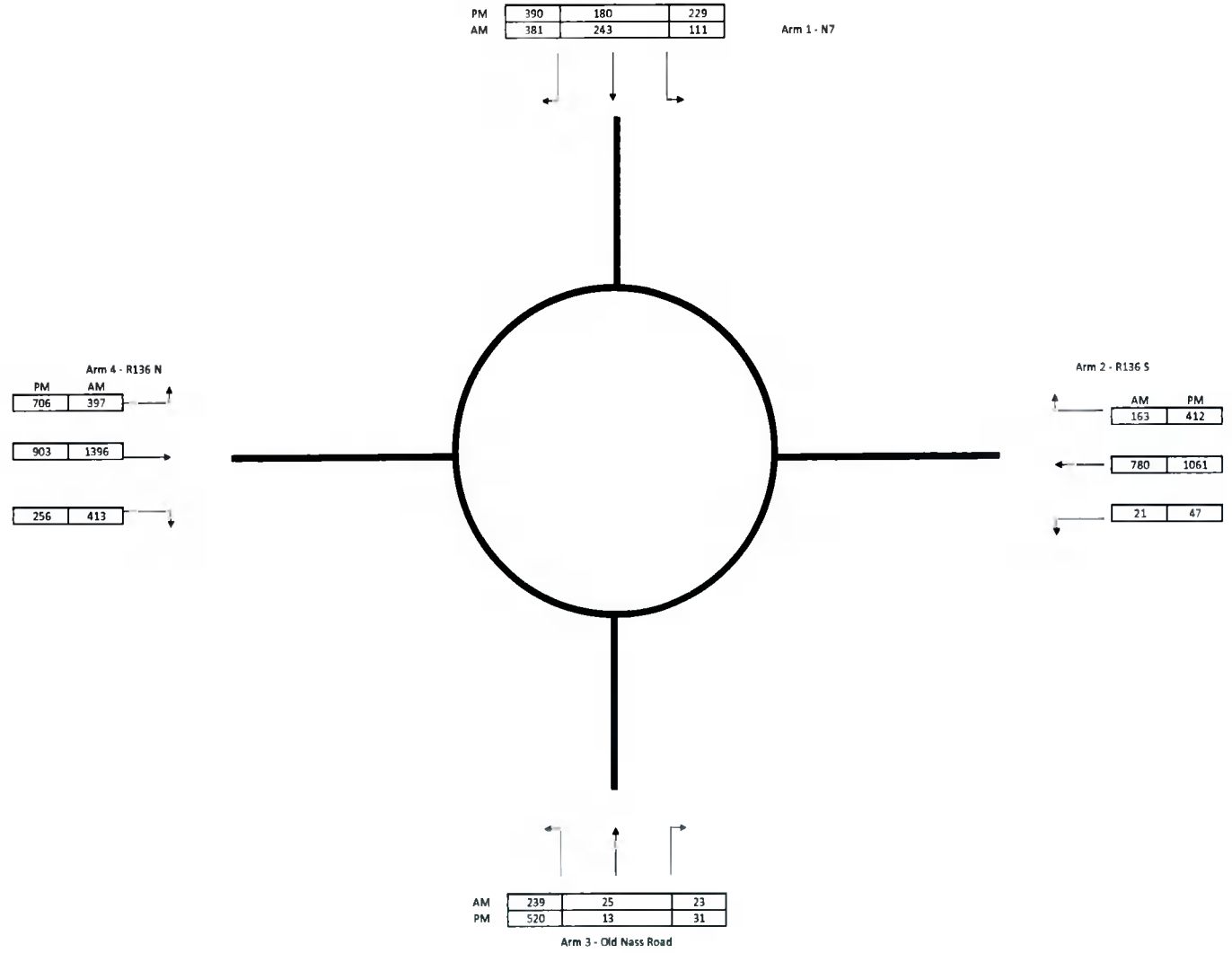
PINNACLE
CONSULTING ENGINEERS

Job Number	P210514		
Client	Greenwalk Development Ltd		
	Year	Time	Scenario
Flow Condition	2025	AM/PM	With Dev
Appendix	C5		



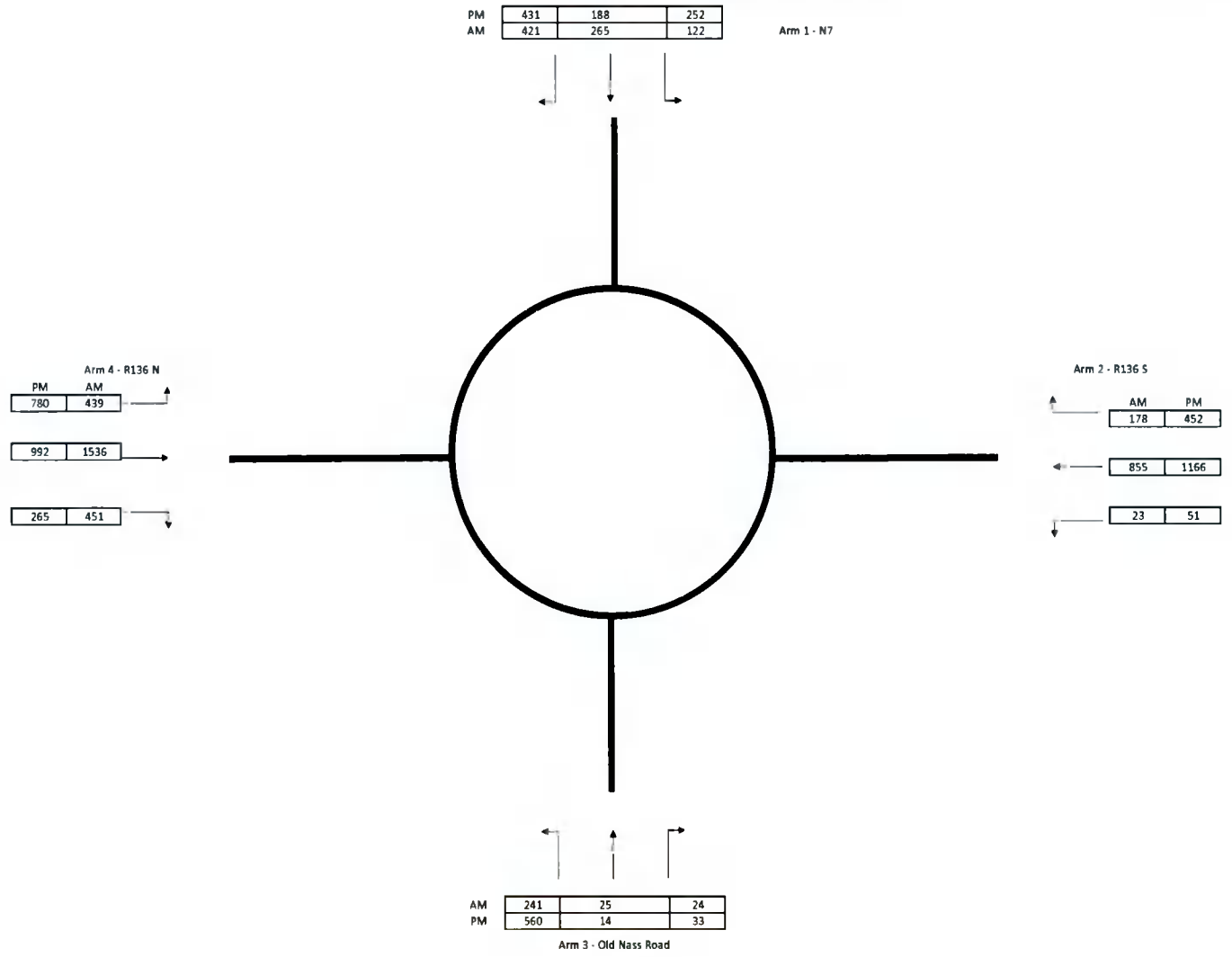
PINNACLE
CONSULTING ENGINEERS

Job Number	P210514		
Client:	Greenwalk Development Ltd.		
	Year	Time	Scenario
Flow Condition	2030	AM/PM	No Dev
Appendix:	C6		



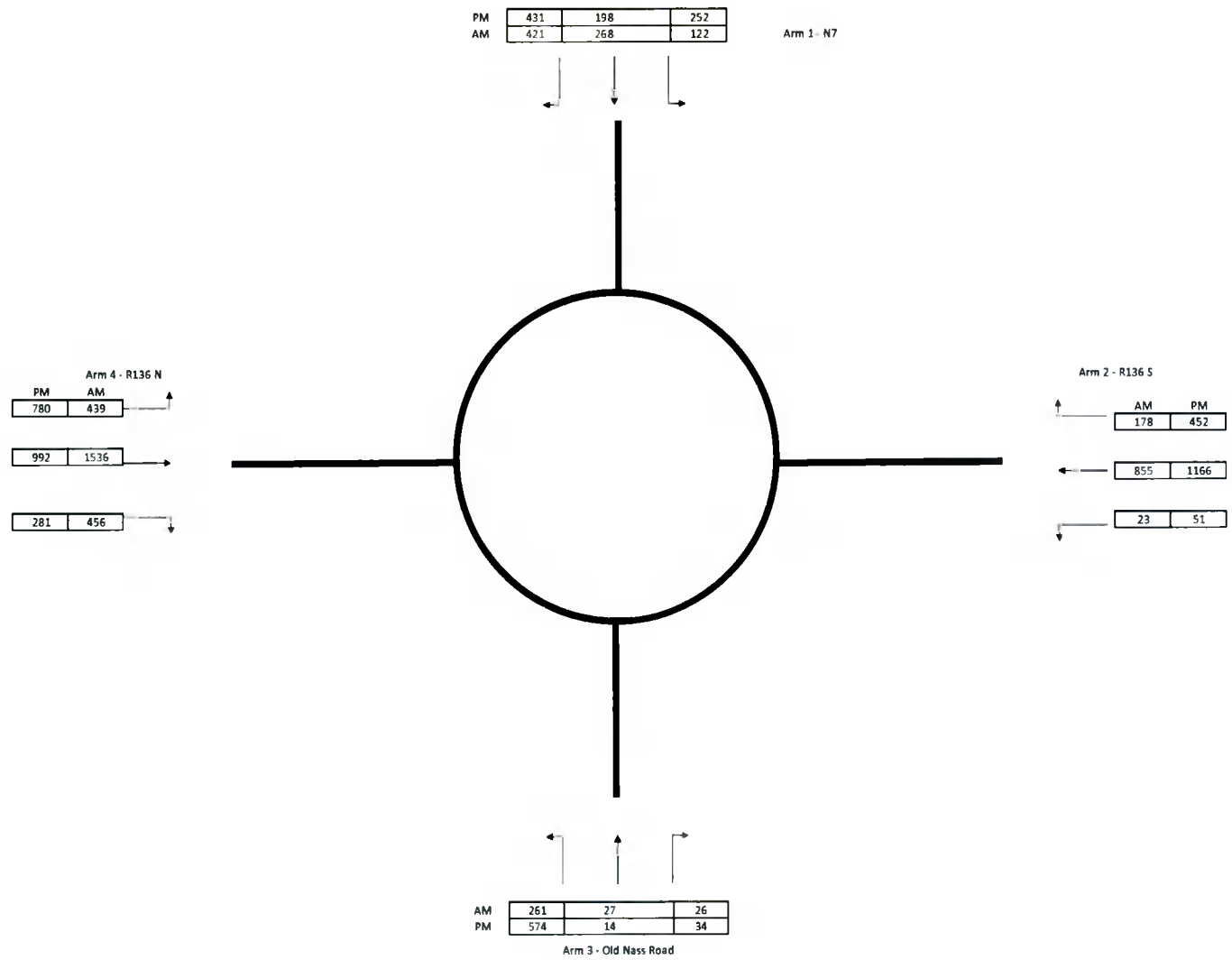
PINNACLE
CONSULTING ENGINEERS

Job Number	P210514		
Client	Greenwalk Development Ltd		
	Year	Time	Scenario
Flow Condition	2030	AM/PM	With Dev
Appendix	C7		



PINNACLE
CONSULTING ENGINEERS

Job Number:	P210514		
Client:	Greenwalk Development Ltd.		
	Year	Time	Scenario
Flow Condition	2040	AM/PM	No Dev
Appendix:	C8		



PINNACLE
CONSULTING ENGINEERS

Job Number:	P210514		
Client	Greenwalk Development Ltd		
	Year	Time	Scenario
Flow Condition	2040	AM/PM	With Dev
Appendix	C9		

PINNACLE
CONSULTING ENGINEERS

Appendix C Modelling Calculations

ARCADY 7

File: S:\02.Projects\2021 Projects\P210514 - DUBLIN, Kingswood\5.0 Calculations\5.3 Higways\Site 1.arc7
Report generation date: 03/11/2021 12:24:57

« A1 - (Default Analysis Set) - D1 - Survey, AM
- » Roundabout Network
- » Arms
- » Traffic Flows
- » Entry Flows
- » Direct/Resultant Flows
- » Turning Proportions
- » Vehicle Mix
- » Results
- » Overview: Standard Roundabout Geometry
- » Overview: Time Segment Results

Summary of roundabout performance

	AM				PM			
	Queue (PCU)	Delay (min)	RFC	LOS	Queue (PCU)	Delay (min)	RFC	LOS
(Default Analysis Set) - 2025 - No Dev								
Arm 2	1.86	0.11	0.65	A	13.20	0.53	0.95	D
Arm 3	0.19	0.04	0.16	A	0.66	0.07	0.40	A
Arm 4	59.50	1.40	1.04	F	12.67	0.41	0.94	C
Arm 1	1.79	0.14	0.65	A	1.06	0.08	0.52	A
(Default Analysis Set) - 2025 - With Dev								
Arm 2	1.88	0.11	0.66	A	20.74	0.80	0.98	E
Arm 3	0.21	0.04	0.17	A	0.69	0.07	0.41	A
Arm 4	62.77	1.47	1.04	F	14.00	0.45	0.95	D
Arm 1	1.82	0.14	0.65	A	0.96	0.07	0.49	A
(Default Analysis Set) - 2030 - No Dev								
Arm 2	2.18	0.12	0.69	A	60.34	1.95	1.06	F
Arm 3	0.20	0.04	0.17	A	0.71	0.07	0.42	A
Arm 4	105.25	2.29	1.08	F	83.33	2.00	1.07	F
Arm 1	2.04	0.15	0.67	A	1.36	0.10	0.58	A
(Default Analysis Set) - 2030 - With Dev								
Arm 2	2.19	0.13	0.69	A	33.04	1.15	1.01	F
Arm 3	0.22	0.04	0.18	A	0.77	0.08	0.44	A
Arm 4	109.17	2.37	1.09	F	27.52	0.81	0.99	E
Arm 1	2.06	0.16	0.68	A	1.28	0.09	0.56	A
(Default Analysis Set) - 2040 - No Dev								
Arm 2	10.61	0.49	0.93	D	113.40	3.30	1.13	F
Arm 3	0.24	0.05	0.19	A	0.95	0.08	0.49	A
Arm 4	239.45	6.19	1.20	F	103.23	2.44	1.09	F
Arm 1	2.81	0.19	0.74	B	1.61	0.10	0.62	A
(Default Analysis Set) - 2040 - With Dev								
Arm 2	3.39	0.18	0.78	B	3.05	0.16	0.76	A

Arm 3	0.27	0.05	0.21	A	0.71	0.06	0.42	A
Arm 4	244.66	6.34	1.20	F	242.71	6.27	1.20	F
Arm 1	2.92	0.20	0.75	B	4.19	0.27	0.81	C
(Default Analysis Set) - Survey								
Arm 2	1.13	0.08	0.53	A	3.69	0.16	0.79	A
Arm 3	0.16	0.04	0.13	A	0.50	0.06	0.33	A
Arm 4	9.26	0.28	0.91	C	58.17	1.45	1.04	F
Arm 1	1.17	0.10	0.54	A	1.08	0.09	0.52	A

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

Survey - AM runs from 08:00:00 to 09:30:00
2025 - No Dev - AM runs from 08:00:00 to 09:30:00
2025 - With Dev - AM runs from 08:00:00 to 09:30:00
2030 - No Dev - AM runs from 08:00:00 to 09:30:00
2030 - With Dev - AM runs from 08:00:00 to 09:30:00
2040 - No Dev - AM runs from 08:00:00 to 09:30:00
2040 - With Dev - AM runs from 08:00:00 to 09:30:00
Survey - PM runs from 17:00:00 to 18:30:00
2025 - No Dev - PM runs from 17:00:00 to 18:30:00
2025 - With Dev - PM runs from 17:00:00 to 18:30:00
2030 - No Dev - PM runs from 17:00:00 to 18:30:00
2030 - With Dev - PM runs from 17:00:00 to 18:30:00
2040 - No Dev - PM runs from 17:00:00 to 18:30:00
2040 - With Dev - PM runs from 17:00:00 to 18:30:00

File summary

File Description

Title	(untitled)
Location	
Site Number	
Date	13/09/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	PINNACLE\ronan.kearns
Description	

Analysis Options

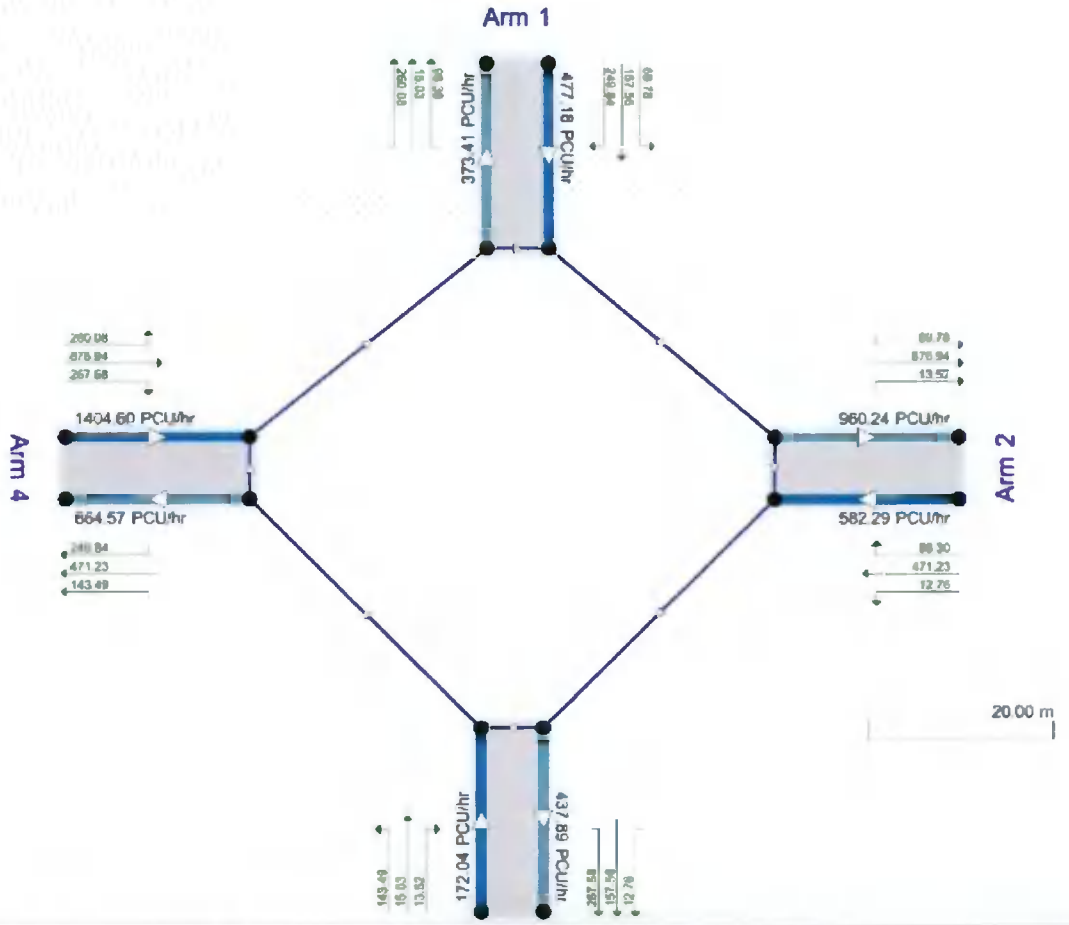
RFC Threshold	Vehicle Length (m)	Do Queue Variations
0.85	5.75	

Sorting and Display

Show Arm Names	Arm Grouping	Sorting Direction	Sorting Type	Data Matrix Style	Time Style
	Order	Ascending	Numerical	By Destination	Absolute Time

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	min	-Min	perMin



The junction diagram reflects the last run of ARCADY.

A1 - (Default Analysis Set) - D1 - Survey, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Include In Report	Use Specific Demand Set	Demand Set	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)		Yes		(D1)		100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Locked	Run Automatically	Use Relationship	Relationship	Start Time (HH:mm)	Finish Time (HH:mm)	Time Period Length (min)	Time Segment Length (min)	Traffic Profile Type

Survey, AM	Survey	AM			Yes			08:00	09:30	90	15	ONE HOUR

Roundabout Network

Roundabout Type(s)

ID	Name	Arm Order	Roundabout Type	Grade Separated	Large Roundabout	Do Geometric Delay
1	(untitled)	2,3,4,1	Standard			

Roundabout Network Options

Driving Side	Lighting	Road Surface	In London
Left	Normal/unknown	((Mini-roundabouts only))	

Arms

Arms

ID	Name	Description
2	R138 S	
3	Old Nass Road	
4	R138 N	R138 N
1	N7	N

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)	Assume Flat Start Profile	Initial Queue (PCU)
2	0.00	99999.00		0.00
3	0.00	99999.00		0.00
4	0.00	99999.00		0.00
1	0.00	99999.00		0.00

Standard 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
2	7.00	7.21	1.68	30.69	69.00	31.72	
3	7.00	14.44	9.66	30.00	89.29	58.76	
4	7.00	7.18	1.60	31.01	69.00	5.06	
1	7.00	7.18	1.60	31.00	69.00	4.30	

Pedestrian Crossings

Arm	Crossing Type
2	None
3	None
4	None
1	None

Arm Slope/ Intercept and Capacity

Slope and Intercept used in model

Arm	Enter Directly	Slope	Intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
2		((calculated))	((calculated))	0.591	2190.421
3		((calculated))	((calculated))	0.558	2540.246
4		((calculated))	((calculated))	0.644	2385.649

1		((calculated))	((calculated))	0.645	2391.327

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

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		Yes	Yes	HV Percentages	2.00				Yes	Yes

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)	PHF
2	ONE HOUR	Yes	776.00	100.000	N/A
3	ONE HOUR	Yes	229.00	100.000	N/A
4	ONE HOUR	Yes	1874.00	100.000	N/A
1	ONE HOUR	Yes	636.00	100.000	N/A

Direct/Resultant Flows

Direct Flows Data

Time Segment	Arm	Direct Demand Entry Flow (PCU/hr)	DirectDemandEntryFlowInPCU (PCU/hr)	Direct Demand Exit Flow (PCU/hr)	Direct Demand Pedestrian Flow (Ped/hr)
1	1	478.81	478.81	N/A	N/A
1	2	584.21	584.21	N/A	N/A
1	3	172.40	172.40	N/A	N/A
1	4	1410.85	1410.85	N/A	N/A
2	1	571.75	571.75	N/A	N/A
2	2	697.61	697.61	N/A	N/A
2	3	205.87	205.87	N/A	N/A
2	4	1684.69	1684.69	N/A	N/A
3	1	700.25	700.25	N/A	N/A
3	2	854.39	854.39	N/A	N/A
3	3	252.13	252.13	N/A	N/A
3	4	2063.31	2063.31	N/A	N/A
4	1	700.25	700.25	N/A	N/A
4	2	854.39	854.39	N/A	N/A
4	3	252.13	252.13	N/A	N/A
4	4	2063.31	2063.31	N/A	N/A
5	1	571.75	571.75	N/A	N/A
5	2	697.61	697.61	N/A	N/A
5	3	205.87	205.87	N/A	N/A
5	4	1684.69	1684.69	N/A	N/A
6	1	478.81	478.81	N/A	N/A
6	2	584.21	584.21	N/A	N/A
6	3	172.40	172.40	N/A	N/A
6	4	1410.85	1410.85	N/A	N/A

Turning Proportions

Turning Counts or Proportions (PCU/hr) - Roundabout 1 (for whole period)

		To			
		2	3	4	1
From	2	0.000	17.000	628.000	131.000
	3	18.000	0.000	191.000	20.000
	4	1170.000	357.000	0.000	347.000
	1	93.000	210.000	333.000	0.000

Turning Proportions (PCU) - Roundabout 1 (for whole period)

		To			
		2	3	4	1
From	2	0.00	0.02	0.81	0.17
	3	0.08	0.00	0.83	0.09
	4	0.62	0.19	0.00	0.19
	1	0.15	0.33	0.52	0.00

Vehicle Mix

Average PCU Per Vehicle - Roundabout 1 (for whole period)

		To			
		2	3	4	1
From	2	1.000	1.000	1.000	1.000
	3	1.000	1.000	1.000	1.000
	4	1.000	1.000	1.000	1.000
	1	1.000	1.000	1.000	1.000

Heavy Vehicle Percentages - Roundabout 1 (for whole period)

		To			
		2	3	4	1
From	2	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000
	4	0.000	0.000	0.000	0.000
	1	0.000	0.000	0.000	0.000

Results

Results Summary

Arm	Max RFC	Max Delay (min)	Max Queue (PCU)	Max LOS	Total Demand (PCU/hr)	Total Arrivals (PCU)	Total Queueing Delay (PCU-min)	Average Queueing Delay (min)	Rate Of Queueing Delay (PCU-min/min)	Inclusive Queueing Total Delay (PCU-min)	Inclusive Queueing Average Delay (min)	Slope	Intercept (PCU/hr)
2	0.53	0.08	1.13	A	712.07	1068.11	68.40	0.06	0.76	68.40	0.06	0.591	2190.421
3	0.13	0.04	0.16	A	210.13	315.20	10.81	0.03	0.12	10.81	0.03	0.558	2540.246
4	0.91	0.28	9.26	C	1719.62	2579.42	377.51	0.15	4.19	377.55	0.15	0.644	2385.649
1	0.54	0.10	1.17	A	583.60	875.41	64.95	0.07	0.72	64.95	0.07	0.645	2391.327

Main Results

Main results: (08:00-08:15)

-	Demand	Arrivals	Entry Flow	Exit Flow	Circulating Flow	Pedestrian	Capacity	Saturation		Start	End

Arm	(PCU/hr)	(PCU)	(PCU/hr)	(PCU/hr)	(PCU/hr)	Demand (Ped/hr)	(PCU/hr)	Capacity (PCU/hr)	RFC	Queue (PCU)	Queue (PCU)
2	584.21	146.05	582.29	960.24	674.98	0.00	1791.84	1340.11	0.326	0.00	0.48
3	172.40	43.10	172.04	437.89	819.37	0.00	2082.72	1451.25	0.083	0.00	0.09
4	1410.85	352.71	1404.60	864.57	126.85	0.00	2303.99	2084.96	0.612	0.00	1.56
1	478.81	119.70	477.18	373.41	1158.04	0.00	1644.01	1221.36	0.291	0.00	0.41

Main results: (08:15-08:30)

Arm	Demand (PCU/hr)	Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)
2	697.61	174.40	696.81	1148.56	807.50	0.00	1713.59	1340.11	0.407	0.48	0.68
3	205.87	51.47	205.77	523.83	980.47	0.00	1992.76	1451.25	0.103	0.09	0.11
4	1684.69	421.17	1680.03	1034.46	151.78	0.00	2287.94	2084.96	0.736	1.56	2.73
1	571.75	142.94	570.93	446.68	1385.12	0.00	1497.47	1221.36	0.382	0.41	0.61

Main results: (08:30-08:45)

Arm	Demand (PCU/hr)	Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)
2	854.39	213.60	852.64	1395.44	984.65	0.00	1608.98	1340.11	0.531	0.68	1.12
3	252.13	63.03	251.97	637.79	1199.50	0.00	1870.46	1451.25	0.135	0.11	0.16
4	2063.31	515.83	2039.85	1265.72	185.75	0.00	2266.06	2084.96	0.911	2.73	8.59
1	700.25	175.06	698.14	543.65	1681.94	0.00	1305.92	1221.36	0.536	0.61	1.14

Main results: (08:45-09:00)

Arm	Demand (PCU/hr)	Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)
2	854.39	213.60	854.35	1408.73	990.32	0.00	1605.62	1340.11	0.532	1.12	1.13
3	252.13	63.03	252.13	642.45	1202.22	0.00	1868.94	1451.25	0.135	0.16	0.16
4	2063.31	515.83	2060.65	1268.29	186.07	0.00	2265.86	2084.96	0.911	8.59	9.26
1	700.25	175.06	700.15	547.81	1698.91	0.00	1294.97	1221.36	0.541	1.14	1.17

Main results: (09:00-09:15)

Arm	Demand (PCU/hr)	Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)
2	697.61	174.40	699.35	1167.89	815.77	0.00	1708.70	1340.11	0.408	1.13	0.69
3	205.87	51.47	206.03	530.62	984.50	0.00	1990.51	1451.25	0.103	0.16	0.12
4	1684.69	421.17	1710.27	1038.28	152.25	0.00	2287.63	2084.96	0.736	9.26	2.86
1	571.75	142.94	573.88	452.74	1409.78	0.00	1481.55	1221.36	0.386	1.17	0.63

Main results: (09:15-09:30)

Arm	Demand (PCU/hr)	Arrivals (PCU)	Entry Flow (PCU/hr)	Exit Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	Saturation Capacity (PCU/hr)	RFC	Start Queue (PCU)	End Queue (PCU)
2	584.21	146.05	585.04	967.70	679.28	0.00	1789.30	1340.11	0.327	0.69	0.49
3	172.40	43.10	172.50	440.94	823.38	0.00	2080.48	1451.25	0.083	0.12	0.09
4	1410.85	352.71	1415.91	868.50	127.39	0.00	2303.64	2084.96	0.612	2.86	1.60
1	478.81	119.70	479.69	376.01	1167.29	0.00	1638.04	1221.36	0.292	0.63	0.42

Queueing Delay Results

Queueing Delay results: (08:00-08:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (min)	Unsignalised Level Of Service	Signalised Level Of Service
2	7.07	0.47	0.050	A	A
3	1.34	0.09	0.031	A	A

4	22.55	1.50	0.066	A	A
1	6.01	0.40	0.051	A	A

Queueing Delay results: (08:15-08:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (min)	Unsignalised Level Of Service	Signalised Level Of Service
2	10.04	0.67	0.059	A	A
3	1.71	0.11	0.034	A	A
4	38.88	2.59	0.098	A	A
1	9.01	0.60	0.065	A	A

Queueing Delay results: (08:30-08:45)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (min)	Unsignalised Level Of Service	Signalised Level Of Service
2	16.30	1.09	0.079	A	A
3	2.31	0.15	0.037	A	A
4	108.37	7.22	0.243	B	B
1	16.49	1.10	0.098	A	A

Queueing Delay results: (08:45-09:00)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (min)	Unsignalised Level Of Service	Signalised Level Of Service
2	16.89	1.13	0.080	A	A
3	2.33	0.16	0.037	A	A
4	134.79	8.99	0.284	C	B
1	17.36	1.16	0.101	A	A

Queueing Delay results: (09:00-09:15)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (min)	Unsignalised Level Of Service	Signalised Level Of Service
2	10.66	0.71	0.060	A	A
3	1.75	0.12	0.034	A	A
4	48.10	3.21	0.108	A	A
1	9.74	0.65	0.066	A	A

Queueing Delay results: (09:15-09:30)

Arm	Queueing Total Delay (PCU-min)	Queueing Rate Of Delay (PCU-min/min)	Average Delay Per Arriving Vehicle (min)	Unsignalised Level Of Service	Signalised Level Of Service
2	7.43	0.50	0.050	A	A
3	1.37	0.09	0.031	A	A
4	24.82	1.65	0.068	A	A
1	6.34	0.42	0.052	A	A

Overview: Standard Roundabout Geometry

Standard 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	Final Slope	Final Intercept (PCU/hr)
1	7.00	7.18	1.60	31.00	69.00	4.30		0.645	2391.327
2	7.00	7.21	1.68	30.69	69.00	31.72		0.591	2190.421
3	7.00	14.44	9.66	30.00	89.29	58.76		0.558	2540.246
4	7.00	7.18	1.60	31.01	69.00	5.06		0.644	2385.649

Overview: Time Segment Results

Time Segment Results

Time Segment	Arm	Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Pedestrian Demand (Ped/hr)	Start Queue (PCU)	End Queue (PCU)	Queueing Total Delay (PCU-min)	Geometric Total Delay (PCU-min)	Average Delay Per Arriving Vehicle (min)
1	1	478.81	1644.01	0.291	0.00	0.00	0.41	6.01	(0.02)	0.051
1	2	584.21	1791.84	0.326	0.00	0.00	0.48	7.07	(0.02)	0.050
1	3	172.40	2082.72	0.083	0.00	0.00	0.09	1.34	(0.02)	0.031
1	4	1410.85	2303.99	0.612	0.00	0.00	1.56	22.55	(0.02)	0.066
2	1	571.75	1497.47	0.382	0.00	0.41	0.61	9.01	(0.02)	0.065
2	2	697.61	1713.59	0.407	0.00	0.48	0.68	10.04	(0.02)	0.059
2	3	205.87	1992.76	0.103	0.00	0.09	0.11	1.71	(0.02)	0.034
2	4	1684.69	2287.94	0.736	0.00	1.56	2.73	38.88	(0.02)	0.098
3	1	700.25	1305.92	0.536	0.00	0.61	1.14	16.49	(0.02)	0.098
3	2	854.39	1608.98	0.531	0.00	0.68	1.12	16.30	(0.02)	0.079
3	3	252.13	1870.46	0.135	0.00	0.11	0.16	2.31	(0.02)	0.037
3	4	2063.31	2266.06	0.911	0.00	2.73	8.59	108.37	(0.02)	0.243
4	1	700.25	1294.97	0.541	0.00	1.14	1.17	17.36	(0.02)	0.101
4	2	854.39	1605.62	0.532	0.00	1.12	1.13	16.89	(0.02)	0.080
4	3	252.13	1868.94	0.135	0.00	0.16	0.16	2.33	(0.02)	0.037
4	4	2063.31	2265.86	0.911	0.00	8.59	9.26	134.79	(0.02)	0.284
5	1	571.75	1481.55	0.386	0.00	1.17	0.63	9.74	(0.02)	0.066
5	2	697.61	1708.70	0.408	0.00	1.13	0.69	10.66	(0.02)	0.060
5	3	205.87	1990.51	0.103	0.00	0.16	0.12	1.75	(0.02)	0.034
5	4	1684.69	2287.63	0.736	0.00	9.26	2.86	48.10	(0.02)	0.108
6	1	478.81	1638.04	0.292	0.00	0.63	0.42	6.34	(0.02)	0.052
6	2	584.21	1789.30	0.327	0.00	0.69	0.49	7.43	(0.02)	0.050
6	3	172.40	2080.48	0.083	0.00	0.12	0.09	1.37	(0.02)	0.031
6	4	1410.85	2303.64	0.612	0.00	2.86	1.60	24.82	(0.02)	0.068

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