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Carmanhall Road SHD at the Former Avid Technology International Site, Carmanhall Road, Sandyford Industrial Estate, Dublin 18

Traffic and Transport Assessment
Stage 3 Submission

Atlas GP Ltd.

Project reference: PR-461030
Project number: 60626107

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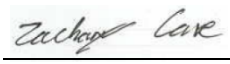
Quality information

Prepared by	Checked by	Verified By	Approved by
			
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Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	22/06/2020	Pre-App Stage 2 Issue	CH	Clodagh Holmes	Principal Engineer
1	21/01/2021	Draft Issue	CH	Clodagh Holmes	Principal Engineer
2	26/01/2021	Draft Issue	CH	Clodagh Holmes	Principal Engineer
3	01/02/2021	Draft Issue	CH	Clodagh Holmes	Principal Engineer
4	17/02/2021	Stage 3 Planning Issue	CH	Clodagh Holmes	Principal Engineer

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Executive Summary

This Traffic and Transport Assessment has been prepared by AECOM to accompany a Strategic Housing Development (SHD) application for a proposed residential development comprising of 428 residential units and residential facilities at a brownfield site located in the Sandyford Industrial Estate, Sandyford, Co. Dublin.

Based upon the information and analysis presented within this TTA, the assessment demonstrates how the scheme has been designed from a traffic and transportation perspective, to integrate within the existing network and to minimise any potential traffic impacts.

Pre-Application Consultation (PAC) - Opinion Case ABP-307978-20

A Pre-Application Consultation (PAC) meeting was held on 30th April 2020, which AECOM attended with Dun Laoghaire Rathdown County Council (DLRCC). The meeting provided an opportunity to present the emerging proposals from a traffic and transport perspective.

At this meeting DLRCC queried the locaiton of the proposed vehicular entrance, relative to the existing pedestrian crossing on Carmanhall Road and the works proposed to the public realm along Blackthron Road and the junction with Carmanhall Road. These details have been clarified in this document.

DLRCC also raised concerns regarding the car parking provision and the proposed cycle parking provision within the development. These have been explained further below.

Proposed Development

The proposed development will comprise of the (i) construction of a Build-To-Rent residential development within a new part six, part eight, part nine, part eleven storey rising to a landmark seventeen storey over basement level apartment building (40,814sq.m) comprising 428 no. apartments (41 no. studio, 285 no. one-bedroom, 94 no. two-bedroom & 8 no. three-bedroom units) of which 413 no. apartments have access to private amenity space, in the form of a balcony or lawn/terrace, and 15 no. apartments have access to a shared private roof terrace (142sq.m) at ninth floor level;

(ii) all apartments have access to 2,600sq.m of communal amenity space, spread over a courtyard at first floor level and roof terraces at sixth, eighth and ninth floor levels, a 142sq.m resident's childcare facility at ground floor level, 392sq.m of resident's amenities, including concierge/meeting rooms, office/co-working space at ground floor level and a meeting/games room at first floor level, and 696sq.m of resident's amenities/community infrastructure inclusive of cinema, gym, yoga studio, laundry and café/lounge at ground floor level. The café/lounge will primarily serve the residents of the development and will be open for community use on a weekly/sessional basis;

(iii) provision of 145 no. vehicular parking spaces (including 8 no. mobility parking spaces, 2 no. club-car spaces and 44 no. electric charging spaces), 5 no. motorcycle parking spaces, bin stores, plant rooms, switch room and 2 no. ESB sub-stations all at ground floor level; provision of bicycle parking (752 no. spaces), plant and storage at basement level; permission is also sought for the removal of the existing vehicular entrance and construction of a replacement vehicular entrance in the north-western corner of the site off Carmanhall Road;

(iv) provision of improvements to street frontages to adjoining public realm of Carmanhall Road & Blackthorn Road comprising an upgraded pedestrian footpath, new cycling infrastructure, an increased quantum of landscaping and street-planting, new street furniture inclusive of bins, benches and cycle parking facilities and the upgrading of the existing Carmanhall Road & Blackthorn Road junction through provision of a new uncontrolled pedestrian crossing; and,

(v) All ancillary works including provision of play equipment, boundary treatments, drainage works - including SuDS drainage, landscaping, lighting, rooftop telecommunications structure and all other associated site services, site infrastructure and site development works. The former Avid Technology International buildings were demolished on foot of Reg. Ref. D16A/0158 which also permitted a part-five rising to eight storey apartment building. The development approved under Reg. Ref. D16A/0158, and a subsequent part-seven rising to nine storey student accommodation development permitted under Reg. Ref. PL06D.303467, will be superseded by the proposed development.

Proposed Site Access

There will be 1 no. vehicular access serving the subject site, the vehicular access point will be located at the northern boundary of the site. This is illustrated in AECOM drawing PR-461030-ACM-XX-00-DR-CE-10-0001.

Proposed Car Parking

It is proposed to provide 145 car parking spaces (inclusive of 8 mobility impaired, 44 electric vehicle spaces and 2 car club spaces) and 5 motorbike spaces to serve the 428 apartment units which AECOM have demonstrated that given the proposed sites characteristics, proximity to sustainable transport alternatives and provision of cycle parking is adequate to serve the development.

Proposed Cycle Parking

Cycle parking has been designed to take account of both the DLRCC Development Plan requirements and the Design Standards for New Apartment Guidelines with a total of 774 cycle parking spaces proposed (752 at basement level and 22 at surface level). The DLRCC Development Plan requires 512 cycle spaces (87 short stay and 428 long stay) and the Design Standards for New Apartment Guidelines require 752 cycle spaces (214 short stay and 538 long stay).

The cycle parking spaces will comprise of secure cycle spaces within the basement for both residents and visitors with an additional quantum (22 no. spaces) provided in the public realm adjoining the site.

Accessibility

The site benefits from being accessible for walking, cycling and public transport. Excellent pedestrian infrastructure facilities, cycling infrastructure and street lighting connect the site to an array of existing services and amenities in Sandyford and Stillorgan such as shops, employment areas, schools, etc. The site is situated to avail of high frequency LUAS services from both Stillorgan and Sandyford LUAS stops which are a 6 minute walk from the development which will allow residents to travel to Dublin City Centre.

DMURS Statement of Compliance

A DMURS statement of Compliance has been prepared outlining how the proposed development conforms to the design standards as set out in DMURS.

Trip Generation

The overall development will generate approximately 107 and 98 two-way movements during the AM and PM peak hours respectively. These figures were obtained using the Trip Rate Information Computer System (TRICS 7.7.4).

Traffic Analysis

The percentage impact analysis of additional traffic generated by the proposed development was less than 5% on all of the junctions assessed during the AM and PM peak hours. This is less than the TII percentage impact standards to warrant detailed assessemnt of the proposed development and as a result 8 of these 9 junctions were not assessed.

AECOM have undertaken a detailed junction modelling analysis of the proposed site access and the Carmanhall Road / Blackthorn Road priority controlled junction using Junctions 9 junction analysis software. The assumed Opening Year (2023) and Future Year scenarios (2028 and 2038) were calcultated using medium growth rates from the TII's Travel Demand Projections (Unit 5.3) to take into account the level of committed developments in the immediate vicnity of the development.

Mobility Management Plan

A Mobility Management Plan has been prepared indicating the measures that will be implemented by the management company to promote more sustainable forms of transport to staff / visitors. These measures are included in Section 7 below.

Outline Construction Traffic Management Plan

An outline for the Construction Traffic Management Plan has been prepared indicating the potential construction traffic route and measures that could be implemented by the contractor to minimise the impact on the surrounding road network, this will be subject to agreement with Dun Laoghaire Rathdown County Council Roads Department.

Table of Contents

1. Introduction

1.1 Background

AECOM has been commissioned by Atlas GP Ltd. to prepare a Traffic and Transport Assessment (TTA) in support of a Strategic Housing Application (SHD) application to An Bord Pleanala (ABP) on a brownfield site located in the Sandyford Industrial Estate, Sandyford, Co. Dublin.

The lands on which the proposed development will be constructed was previously used as a two storey warehouse/ production building with associated car parking and ancillary works. This building has been demolished and the subject site is currently vacant.

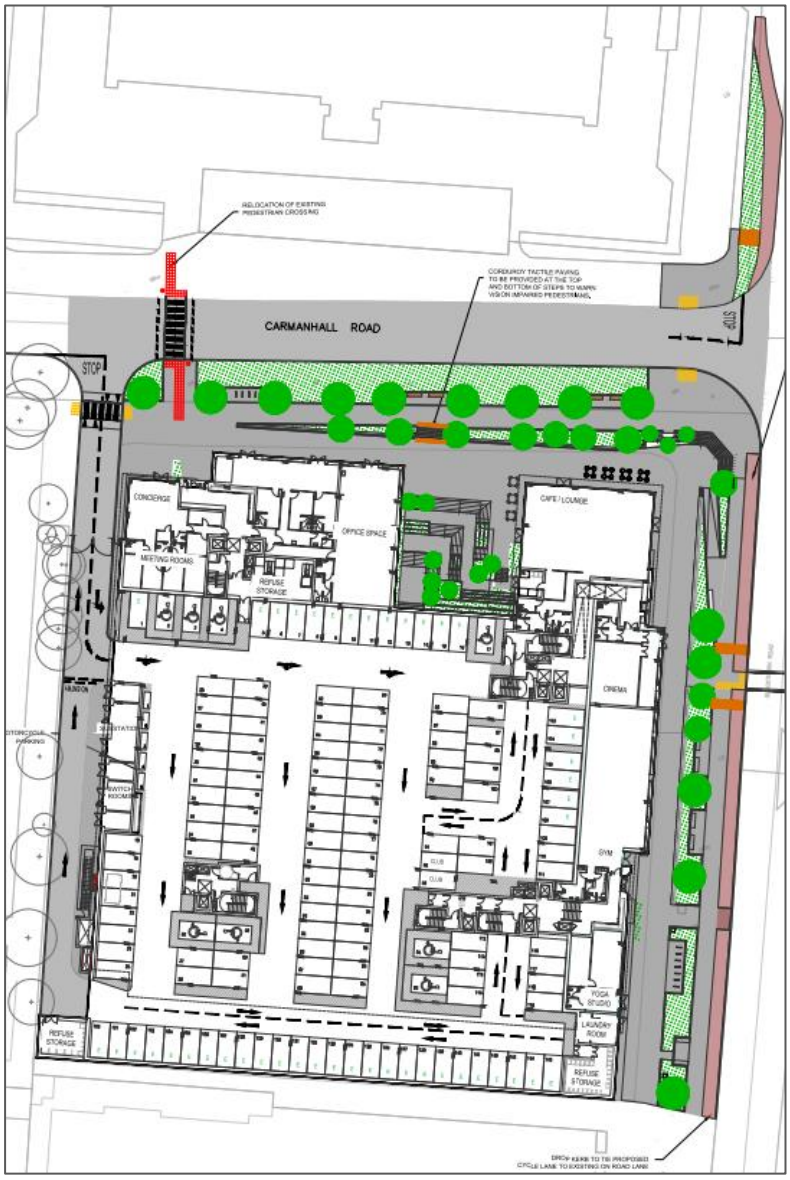

Figure 1.1 – Proposed General Arrangement (AECOM Drawing: PR-461030-ACM-XX-00-DR-CE-10-0001)

1.2 Proposed Development

The proposed development will comprise of the (i) construction of a Build-To-Rent residential development within a new part six, part eight, part nine, part eleven storey rising to a landmark seventeen storey over basement level apartment building (40,814sq.m) comprising 428 no. apartments (41 no. studio, 285 no. one-bedroom, 94 no. two-bedroom & 8 no. three-bedroom units) of which 413 no. apartments have access to private amenity space, in the form of a balcony or lawn/terrace, and 15 no. apartments have access to a shared private roof terrace (142sq.m) at ninth floor level;

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(v) All ancillary works including provision of play equipment, boundary treatments, drainage works - including SuDS drainage, landscaping, lighting, rooftop telecommunications structure and all other associated site services, site infrastructure and site development works. The former Avid Technology International buildings were demolished on foot of Reg. Ref. PL06D.303467 which also permitted a part-seven rising to nine storey student accommodation development. The development approved under Reg. Ref. PL06D.303467 will be superseded by the proposed development.

1.3 Pre-Application Consultation – ABP Opinion ABP- 307978-20

The Pre-Application meeting with An Bord Pleanala was held, via MS Teams meeting on the 23rd November 2020. At this meeting DLRCC queried the location of the proposed vehicular entrance, relative to the existing pedestrian crossing on Carmanhall Road and the works proposed to the public realm along Blackthron Road and the junction wth Carmanhall Road. These details have been clarified in this document.

Following this meeting, AECOM engaged with members of DLRCC Transportation Department (Claire Casey and Thiago Bodini) to discuss the proposals for DLRCC proposed cycle lanes. At our meeting on the 14th of January 2021, DLRCC indicated that their drawings were currently being prepared by the Transportation Department. It was confirmed by DLRCC Roads Department, on the 8th February 2021, that it was likely to be March before the cycle design would be made available and likely to be October 2021 before detailed design would be completed by DLRCC. In the absence of these specific proposals, AECOM have ensured that the scheme will be designed so that it can cater for the design of these proposed cycle lanes along Carmanhall Road and Blackthorn Avenue. Agreement shall be obtained with DLRCC Transportation Department prior to the commencement of any work in the area.

DLRCC Roads Department also raised concerns regarding who was responsible for relocating the existing pedestrian crossing at Carmanhall Road. This has been confirmed in both the general arrangement drawing submitted by AECOM and the phasing plan provided by BKD.

DLRCC also raised concerns regarding the car parking provision and the proposed cycle parking provision within the development. This issue was highlighted in Item 4 of the ABP Opionion 307978-20. The rationale for the proposed car parking provision has been explained further below.

1.4 Planning History

1.4.1 Permitted Mixed Use Development, Planning Ref: ABP30346719

In 2019, a SHD application was submitted on the respective site. The application was granted planning permission by An Bord Pleanala (ABP) on the 30th of April 2019. This application consisted of the construction of a 7 to 9 storey student accommodation complex which comprised of:

- 131 no apartments (817 Bedspaces);
- Entrance/reception (101 sq.m);

- Management office (55 sq.m);
- Gym (297 sq.m);
- 21 no. communal spaces (comprising a total of 842 sq.m);
- 2 no. commercial units fronting Blackthorn Road:
  - Café/lounge (119 sq.m); and
  - laundrette (85 sq.m).
- 57 no. car parking spaces;
- 586 no. bicycle parking spaces;
  - 560 within the ground floor car parking; and
  - 26 along Carmanhall and Blackthorn Road.
- 5 no. motorcycle parking spaces;

In terms of access arrangements, the proposed development would alter the existing site access and create a new vehicular entrance along Blackthorn Road which would serve as bin collection and emergency services only along with the associated ancillary works. As part of this application, works were proposed to the Carmanhall Road which consisted of moving the existing signalised pedestrian crossing along with the inclusion of an off road cycle lane along the Blackthorn Road.

1.4.2 Permitted Mixed Use Development, Planning Ref: D16A/0158.

In 2016, Planning Permission was granted on the 29th of July 2016 by DLRCC. This application consisted of the demolition of the existing two storey warehouse/ production building and the construction of a 5 to 8 storey mixed use development in two blocks comprising of:

- 147 no. apartments;
- Crèche (216 sq.m);
- Gymnasium (46 sq.m);
- Media suite (93 sq.m);
- Café (141 sq.m);
- 151 no car parking spaces; and
- 158 bicycle parking spaces.

In terms of access arrangements, the development would provide a new vehicular entrance from Carmanhall Road and a fire tender/ cycle access from Blackthorn Road along with the associated ancillary works. As part of this application works were proposed to the Carmanhall Road which consisted of moving the existing signalised pedestrian crossing.

1.5 Objectives

The main objective of this assessment is to examine the potential traffic impact of the proposed development and its access arrangements on the adjacent local road network. The net change in traffic on the network due to additional traffic has been calculated and its influence on the adjacent local road network has been investigated.

In order to complete this report, AECOM has made reference to the following documents:

- Dun Laoghaire Rathdown County Development Plan (2016 – 2022);
- Standards for Cycle Parking and associated Cycling Facilities for New Developments (January 2018);
- Greater Dublin Area Cycle Network Plan (National Transport Authority, 2013)
- Design Manual for Urban Roads and Streets, DMURS, May 2019 (Dept of Transport, Tourism and Sport/ Dept of Environment, Community & Local Govt);
- Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated and compact grade separated junctions), DN-GEO-03060, (TII, June 2017); and

- PE-PDV-02045 Traffic and Transport Assessment Guidelines (May 2014), Transport Infrastructure Ireland;

1.6 Study Methodology

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

- **Existing Traffic Flow Assessment** –Traffic flow data for the AM and PM peak conditions was obtained by classified junction turning count surveys in February 2020.
- **Existing Transport Infrastructure** – AECOM collated information on the public transport, walking and cycling in the area of the site.
- **Development Proposals** – Description of the proposed development, including proposed improvements to the road accessing the site and a review of parking and servicing provision and facilities for pedestrians and cyclists.
- **Development Trip Generation** – based on the quantum of proposed development, AECOM reviewed trip rate data for similar uses and developed anticipated traffic flows, by using the industry standard Trip Rate Information Computer System (TRICS) database. These flows were then assigned to the existing network having regard for observed traffic patterns on the surrounding road network.
- **Percentage Impact** – The development traffic impact on the key junctions, with and without the proposed development was undertaken to determine future operation and any requirements for further analysis or required mitigation measures.
- **Impact analysis** – traffic modelling was completed where the need for this was identified using Junctions 9 software.

1.7 Structure of the Report

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

- Section 2 of this report describes the existing conditions at the subject site location and the surrounding area;
- Section 3 provides a summary of the proposed development itself, including the proposed Parking Strategy;
- Section 4 outlines a DMURS statement of compliance for the proposed development;
- Section 5 provides a summary of the vehicle trip generation, vehicle distribution, and network assignment exercise is detailed, in addition to a parking accumulation study and quantifying the potential level of impact, as generated by the subject proposals, upon key junctions across the local road network;
- The operational performance of the proposed site access junctions and adjacent local junctions for a range of different development/traffic scenarios following the commissioning of the development proposals are investigated and reported within Section 6;
- Section 7 provides an outline of the requirements for the Mobility Management Plan;
- Section 8 details an Outline Construction Traffic Management Plan; and
- Finally, a summary of our appraisal together with the main conclusions of the assessment are provided in Section 9.

2. Existing Conditions

2.1 Introduction

This chapter includes a review of the existing baseline conditions of the site including public transport, walking and cycling facilities and the current operation of the surrounding public network. AECOM undertook numerous site audits to identify the existing conditions in the vicinity of the site. The findings from AECOM's analysis are presented within this chapter.

2.2 Location

The subject site is situated on a brownfield site located in the Sandyford Industrial Estate, Sandyford, Co. Dublin. The subject site is a vacant brownfield site at present.

The site is bounded by commercial premises to its southern and western boundaries with the Carmanhall Road to the north and Blackthorn Road to the east.

Figure 2.1 below shows the developments location in relation to Dublin City and Figure 2.2 showing the surrounding environs of the proposed development.

The posted speed limit along the Carmanhall Road is 30km/hr with the posted speed limit along the Blackthorn Road being 50km/hr in the vicinity of the subject site.

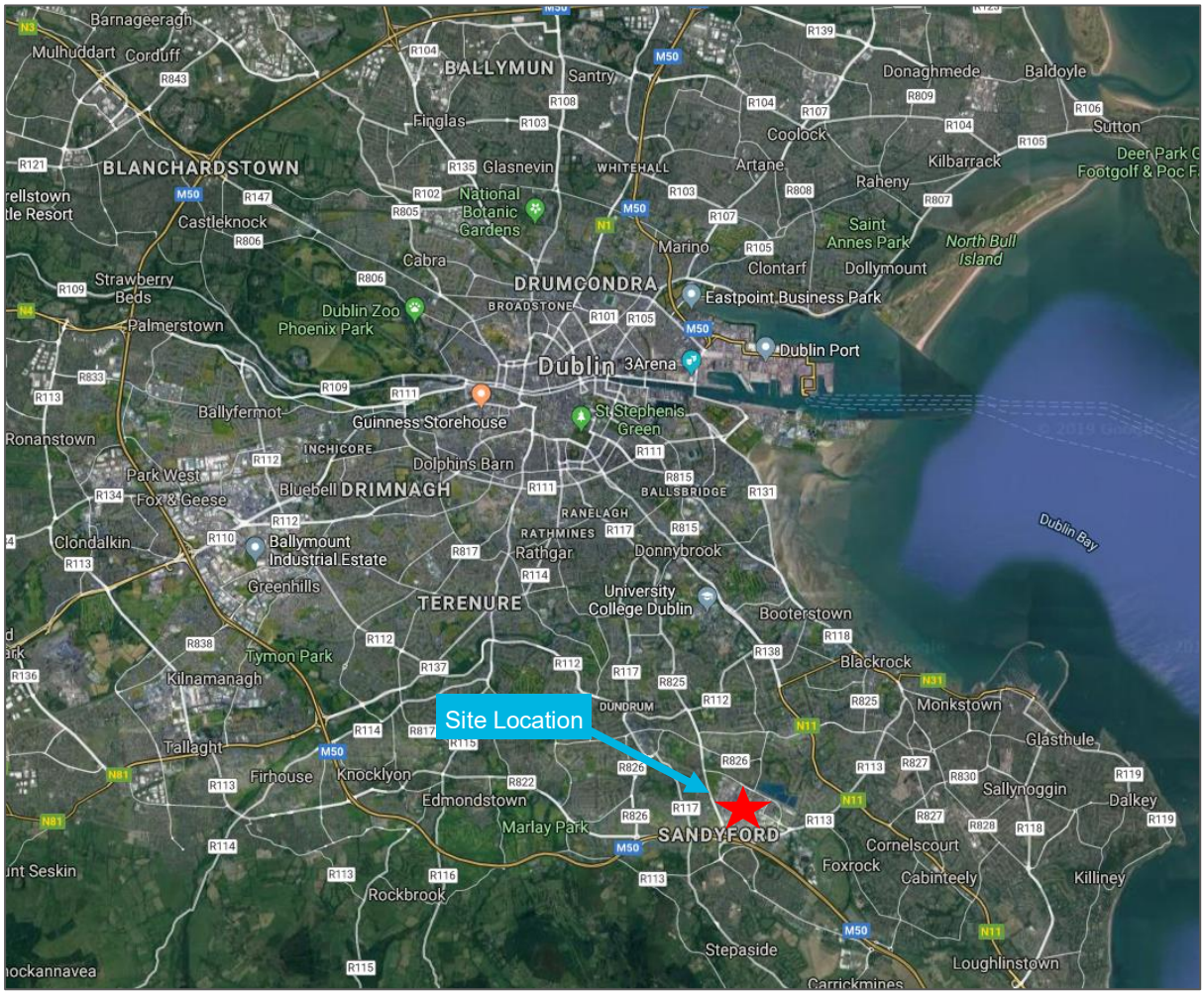


Figure 2.1 – Development Location in Relation to Dublin City (Source: Google Maps)

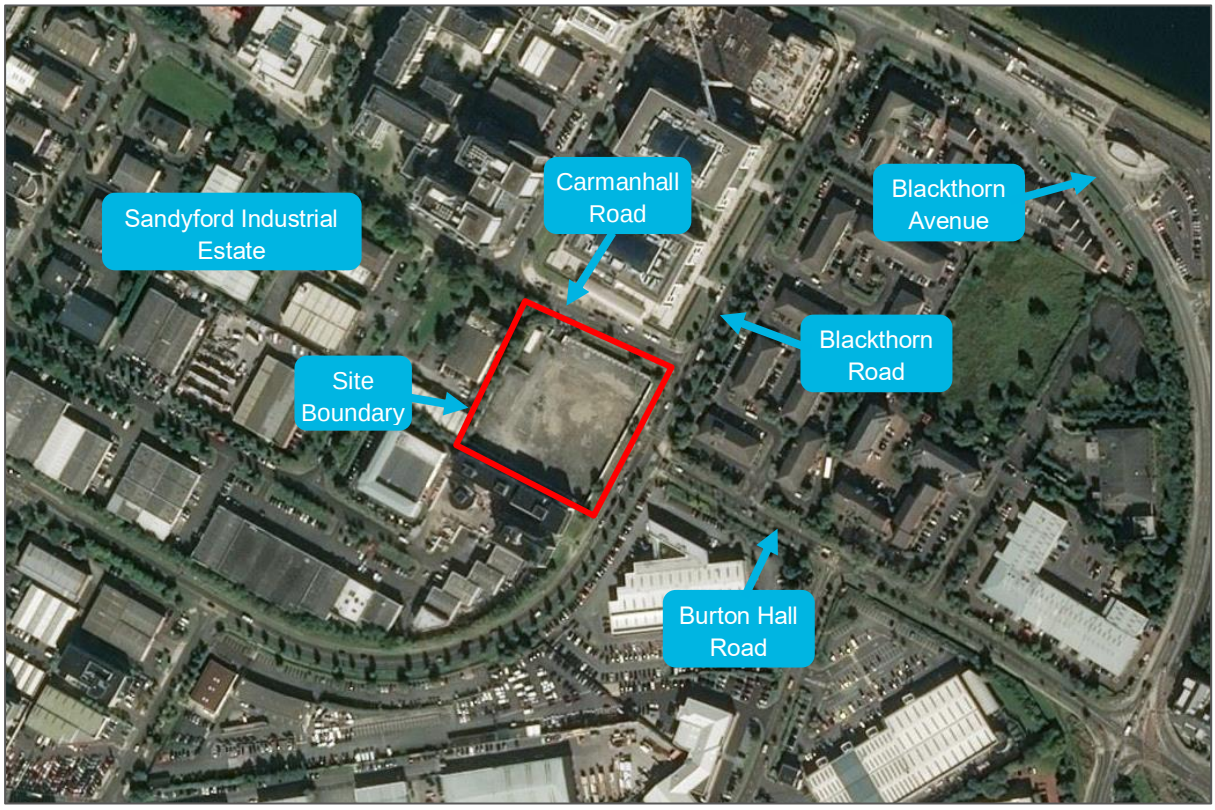


Figure 2.2 – Existing Site Layout (Source: Bing Maps)

2.2.1 Land Use Zoning

The subject lands are zoned '*A2*' within the Dun Laoghaire Rathdown Development Plan (2016-2022) as illustrated within Figure 2.3 below. The zoning objective of lands zoned '*A2*' is as follows "*To provide for the creation of sustainable residential neighbourhoods and preserve and protect residential amenity*". Along the Blackthorn Road there is a roads objective which illustrates that there is a "*Proposed Quality Bus/ Bus Priority Route*" in vicinity to the subject site.

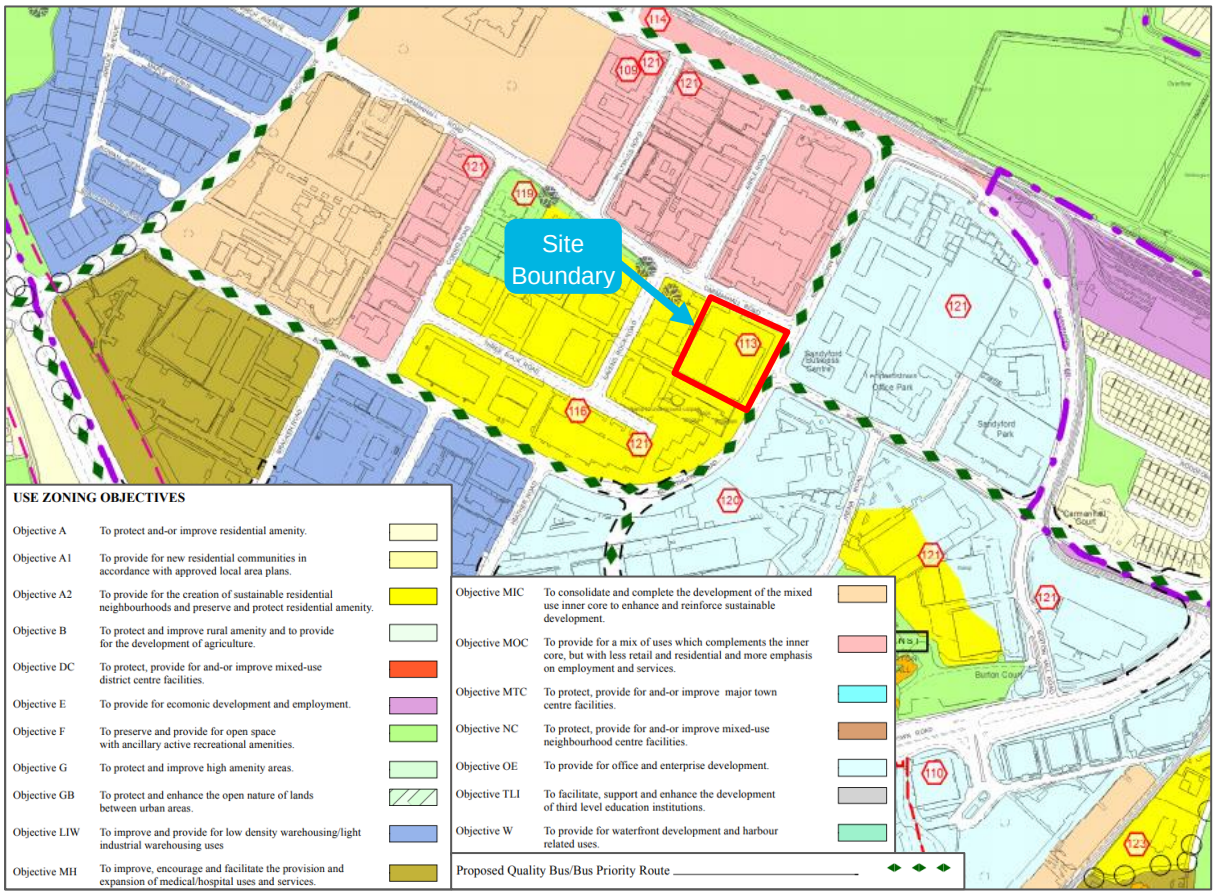


Figure 2.3 – Site Zoning (Source: Dun Laoghaire Rathdown Development Plan)

2.3 Existing Transportation Infrastructure

2.3.1 Background

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

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

2.3.2 Existing Pedestrian / Cyclist Environment

2.3.2.1 Carmanhall Road

Carmanhall Road is a 7.5m wide single carriageway local road which is located along the northern boundary of the site. This road features 3 controlled and numerous uncontrolled crossings, it should be noted that not all crossings feature blister strip paving but are flush with the carriageway. Footpaths are provided along both sides of the carriageway with a grass verge and public lighting is also provided along both sides of the Carmanhall Road. The posted speed limit is 50 km/hr.

2.3.2.2 Blackthorn Road

Blackthorn Road is a 9m wide single carriageway local road which is located along the eastern boundary of the site. In the vicinity of the subject site this road features 2 number signal controlled crossings with associated blister strip paving and flush kerbing. Footpaths are provided along both sides of the carriageway with a grass verge and public lighting is also provided on both side of the Blackthorn Road. The posted speed limit is 50 km/hr.

2.3.3 Sustainable Transport – Bus

As graphically illustrated in Figure 2.4 below, the site is situated to benefit from bus transport connections allowing residents, staff and customers to travel by this sustainable mode.

The closest bus stops to the site are located along the Blackthorn Road both of which are within a 100m walking catchment of the site. These bus stops are operated by Bus Éireann and private companies. Figure 2.4 illustrates

the location of the bus stops in relation to the development with Table 2.1 detailing the number of services per day and the routes.

Figure 2.4 – Bus Stops in the Vicinity of the site (Source: www.journeyplanner.transportforireland.ie)

Table 2.1 – Bus Timetables (Source: www.journeyplanner.transportforireland.ie)

Route No.	Operator	Route	No. of Services		
			Monday to Friday	Saturday	Sunday
11	Dublin Bus	Wadelai – Drumcondra – Dublin City – Milltown – Stillorgan – Sandyford	1 service every 30 mins		
47	Dublin Bus	Dublin City – Sandymount – Stillorgan – Sandyford – Stepaside	1 service every 30 mins	1 service every hour	None
75a	Go-Ahead	Dun Laoghaire – Stillorgan – Sandyford – Ballinteer – Tallaght	2 services per day	2 services per day	None
114	Go-Ahead	Ballinteer – Sandyford – Foxrock - Blackrock	1 service every hour (6am to 8pm)	1 service every hour (8am to 12am)	1 service every hour (1pm to 10pm)
700	Aircoach	Foxrock – Sandyford – Stillorgan – Dublin City – Dublin Airport	1 service every 15 mins		

2.3.4 Sustainable Transport – Light Rail

The closest LUAS stations to the site are the Sandyford and Stillorgan Stations, located 0.35 km (4 minute walk) and 0.55 km (6 minute walk) to the north east and north of the development, respectively. These stations are situated along the LUAS Green Line. It provides light rail services west to Dublin City and east towards Cherrywood.

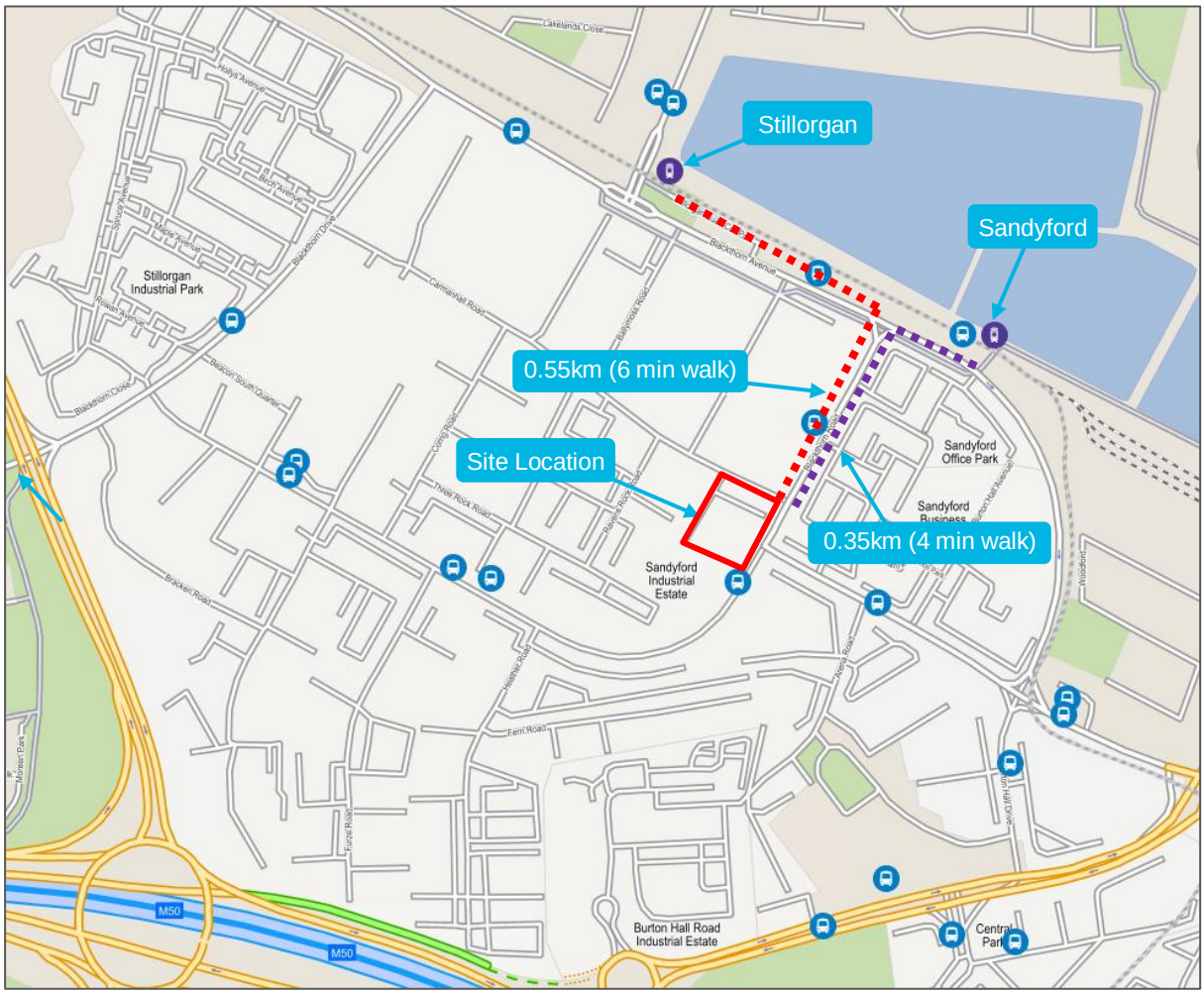


Figure 2.5 – Site Proximity to LUAS Stations (Source: www.journeyplanner.transportforireland.ie)

2.3.5 Sustainable Transport – Car Sharing

There are 7 GoCar hire stations located within a 1km walking catchment, 6 of which are located in the Sandyford Industrial Estate, west of the subject site. GoCar members can book cars online or via the app for durations of as little as an hour. They then unlock the car with their phone or a GoCard; the keys are in the car, with fuel, insurance and city parking all included. The benefits of such car sharing services include:

- The reduction of cars on the road and therefore traffic congestion, noise and air pollution;
- Frees up land traditionally used for private parking spaces;
- Encourages and potentially increases use of public transport, walking and cycling as the need for car ownership is reduced;
- Car sharing allows those who cannot afford a car the opportunity to drive, encouraging social inclusivity; and
- Car share replaces approximately 20 private car parking spaces.

The locations of the GoCar bases are illustrated in Figure 2.6 with Table 2.2 providing additional details in relation to walking distance from the site and the type of GoCar vehicle available.

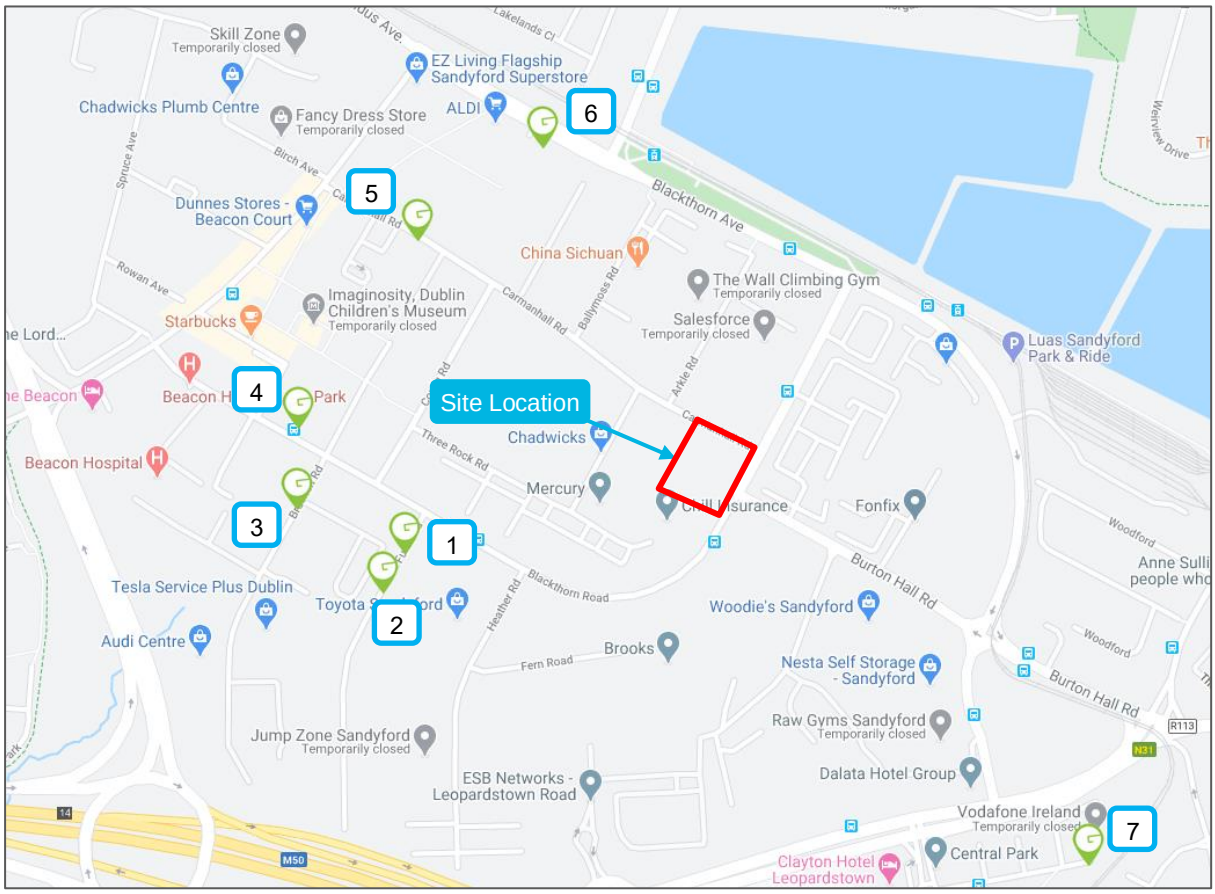


Figure 2.6 – GoBase Locations (Source www.GoCar.ie)

Table 2.2 – GoBase Details

Ref No.	Go Base Location	Vehicle Class	Approximate Distance from the development
1	Sandyford Hub (Heather Road)	GoCity, GoTripper, GoExplore	0.55 km
2	Sandyford Hub (Furze Road)	GoTripper	0.60 km
3	Sandyford Hub (Bracken Road)	GoTripper	0.70 km
4	Blackthorn Road	GoCity, GoExplore	0.70 km
5	Carmanhall Road	GoCity, GoVan	0.60 km
6	Rockbrook Sandyford	GoCity, GoTripper	0.65 km
7	Central Park	GoCity	0.90 km

2.4 Emerging Transportation Infrastructure

2.4.1 Local Road Proposals

The DLRCC Development Plan 2016 – 2022, has outlined both short (6 years) and long-term road network proposals for the DLRCC environs. Within the DLRCC Development Plan, **Policy ST25: Roads** details the following:

"It is Council Policy, in conjunction and co-operation with other transport bodies and authorities such as the TII and the NTA, to secure improvements to the county road network – including improved pedestrian and cycle facilities."

As part of this roads policy DLRCC have indicated that there are to be number of road improvements in the Sandyford Industrial Estate and environs which are as follows:

- *'M50 Diverge Ramp Access to Sandyford (provided via a free-flow slip to ESB Link Road (preferred option) or Heather Road);*
- *Leopardstown Link Road;*
- *Bracken Road Extension to Drummartin Link Road;*

- *ESB Link Road & Link to Arena Road; and*
- *Leopardstown Roundabout Reconfiguration.'*

As part of the development plan these schemes are to be delivered within the 6 years that the development plan covers (2016 – 2022). The extent of the works that will need to be undertaken for the implementation of the schemes is unknown at this stage or what stage of the design process they currently sit at. Figure 2.7 illustrates the proposed roads objectives.

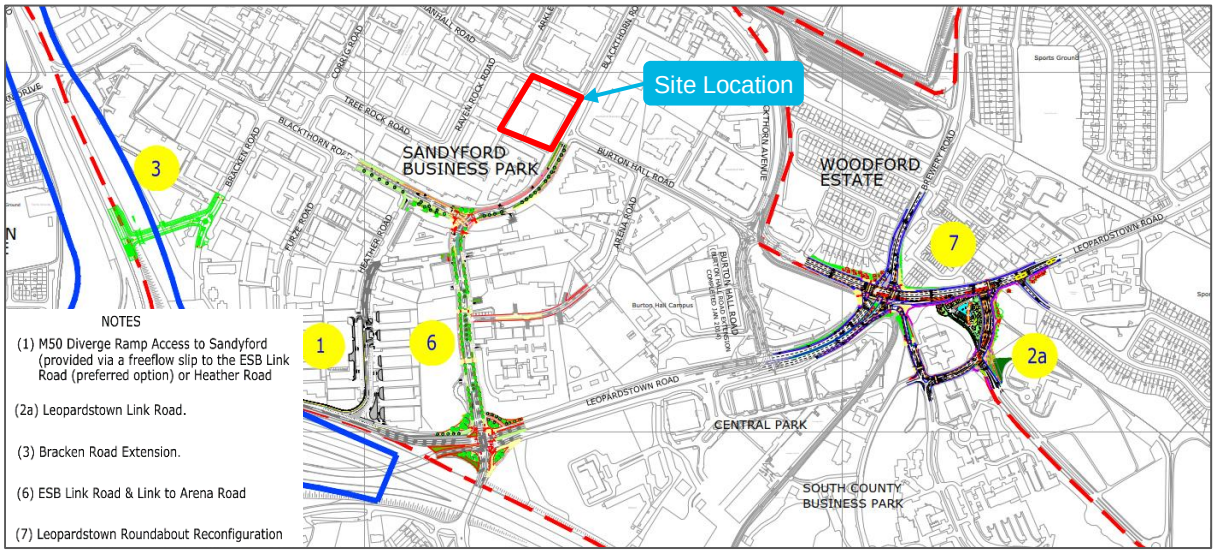


Figure 2.7 – 6 Years Roads Objectives (Source: Dun Laoghaire Rathdown County Development Plan 2016 – 2022)

2.4.2 Cycle Network Proposals

In the vicinity of the subject site, it is planned to upgrade the Blackthorn Road, Burton Hall Road and include a connection from the Blackthorn Road to the Leopardstown Road which would appear to be provided as part of the '*ESB link Road & Link to Arena Road*' roads proposal. Figure 2.8 illustrates the existing cycle facilities in the vicinity of the subject site with Figure 2.9 illustrating the proposed cycle network upgrades as part of the Cycle Network Plan for the Greater Dublin Area

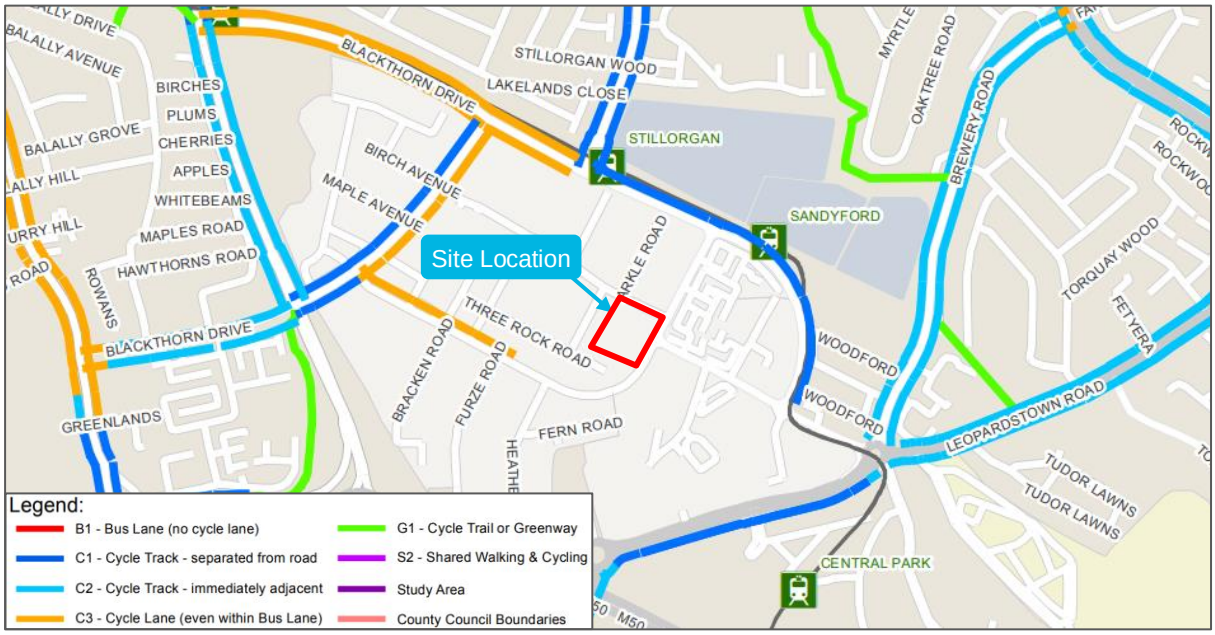


Figure 2.8 – Existing Cycle Facilities (Source: GDA Cycle Network Plan, National Transport Authority)

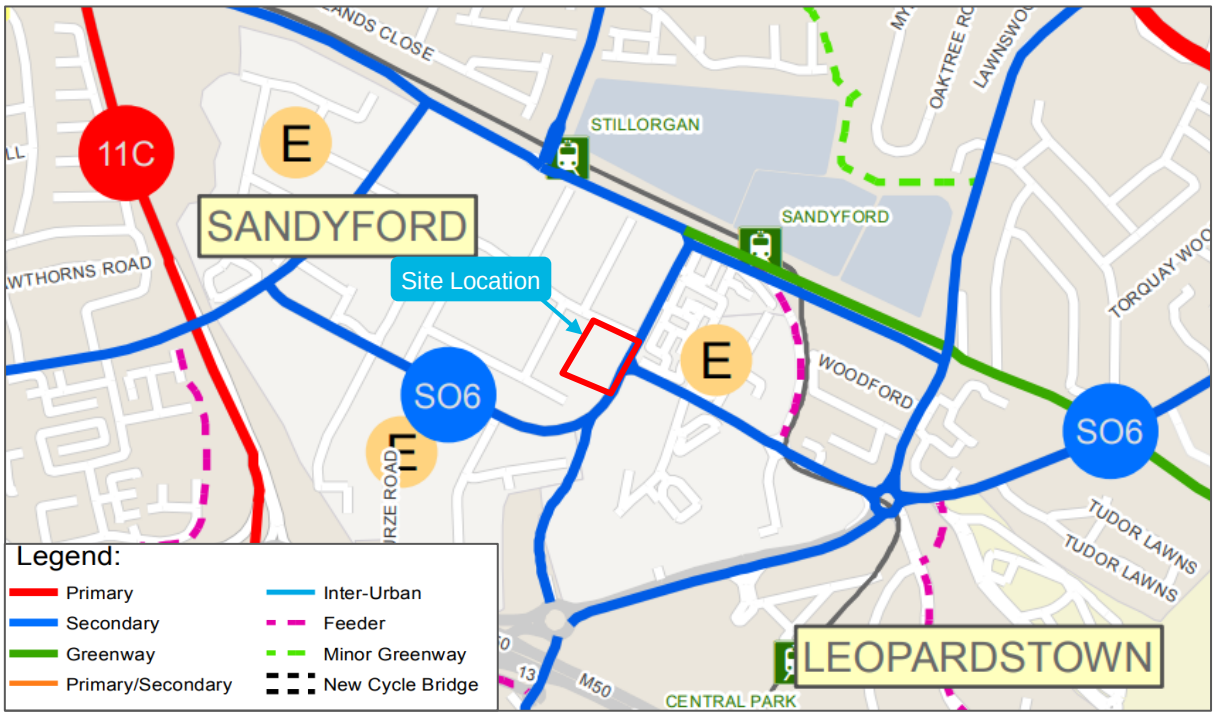


Figure 2.9 – Proposed Cycling Facilities (Source: GDA Cycle Network Plan, National Transport Authority)

2.4.3 Bus Network Proposals

The National Transport Authority (NTA) has put forward proposals to upgrade a number of core bus corridors from the Dublin environs to the City Centre under the title 'BusConnects'. The aim of the project is to:

- *'Make bus journeys faster, predictable and reliable;*
- *New bus stops and better facilities;*
- *More efficient network, connecting more places and carrying more passengers;*
- *Updated ticketing systems and implementing a cashless payment system with a simpler fare structure; and*
- *Improving the cycling network and making it safer.'*

As part of the BusConnects scheme the current bus network is to be revised and more frequent and efficient services are to be provided across the Dublin environs. Table 2.3 details the proposed routes in the vicinity of the subject site with Figure 2.10 illustrating the proposed routing.

Table 2.3 – Revised Bus Network Routes

Route	Route Type	Route	Frequency
S8	Orbital Route	Dun Laoghaire – Sandyford – Ballinteer – Tallaght – City West	Every 20 mins
10	Other City Bound Route	Ticknock – Sandyford – Goatstown – Ranelagh – Mountyjoy Square	Every 30 mins
213	Local Route	Kiltiernan – Sandyford – Stillorgan – Sydney Parade – Sandymount – Ringsend Bus Garage	Every 60 mins
313	Peak Time Route	Kiltiernan – Stepaside – Sandyford – Stillorgan – UCD	Peak – Only
316	Peak Time Route	Whitechurch – Ballinteer – Sandyford – Stillorgan – UCD	Peak – Only

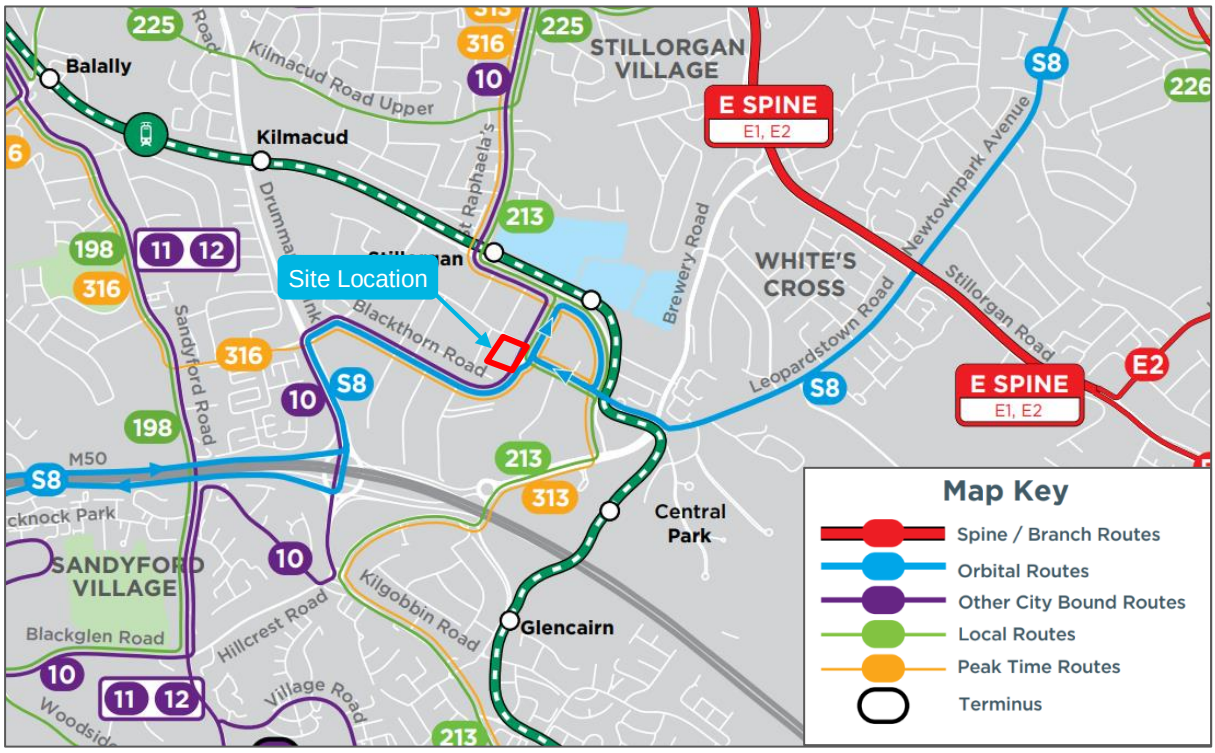


Figure 2.10 – Proposed Public Transport Services (Source: www.busconnects.ie)

2.5 Existing Site Access

At present there is currently one access point into the site which serves both vehicles and pedestrian / cyclist access. Figure 2.11 show the location of the existing access point into the site.

Figure 2.11 – Previous Vehicular Access Point (Source: Google Streetview, July 2018)

2.6 Road Collision Statistics

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 any potential safety concerns in relation to 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. It should be noted that information relating to reported incidents for the years 2017, 2018, 2019 and 2020 is not yet available on the Road Safety Authority (RSA) website. The RSA records detail only those occasions where the incident was officially recorded such as the Garda being present to formally record details of the incident.

The incidents are categorised into class of severity, which includes minor serious and fatal collisions. The collision locations are shown in Figure 2.12 below.

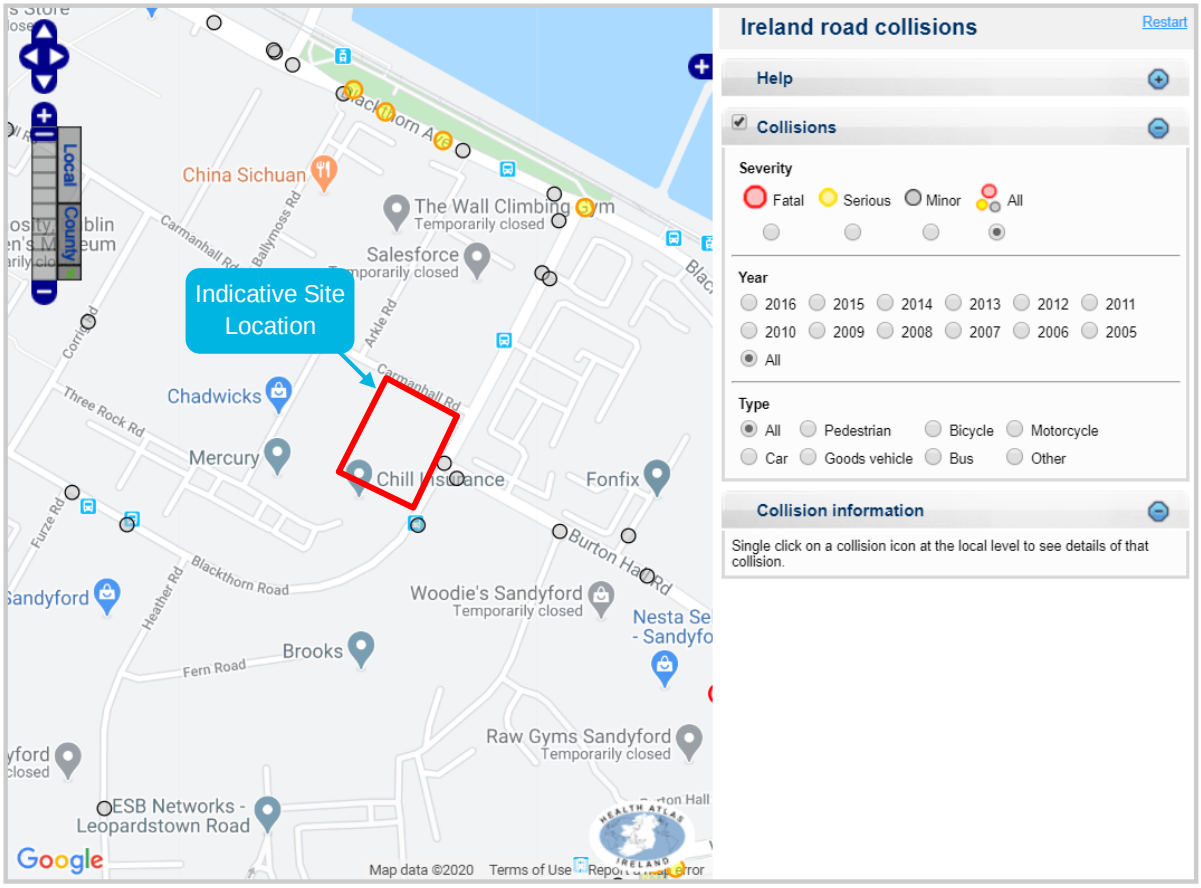


Figure 2.12 – Collision Record within the vicinity of the subject site (source: www.rsa.ie)

Upon inspection there has been 3 number collisions recorded along the Blackthorn Road in the vicinity of the subject site. The collisions are recorded as minor collisions and do not indicate any reoccurring collision hotspots or traffic concerns with the existing road network.

2.7 Existing Conditions Summary

The subject site is ideally positioned within the urban environment to maximise access to/from the site utilising sustainable forms of travel including walking, cycling and public transport.

The sites proximity to the nearby bus stops, approximately within a 100m walking catchment of the site which has a bus service every 15 minutes which further enhances the sustainability characteristics of the site. These services travel towards Dublin City and will allow residents / staff / customers to avail of the wider bus network or train services.

The sites proximity to the nearby LUAS stops, both within a 6 minute walk from the subject site which has a LUAS service every 10 minutes which further enhances the sustainability characteristics of the site. These services travel towards Dublin City and will allow residents / staff / customers to avail of the wider bus network or train services.

3. Proposed Development

3.1 Introduction

This chapter details the proposed development with regard to the transportation elements which includes the internal roads layout, proposed pedestrian/cycling infrastructure and parking provisions within the development area.

3.2 Proposed Development

The subject scheme principally proposes a multi storey apartment complex with associated childcare facility, resident's amenities, community infrastructure and car parking at ground floor level. The proposed development also includes signage and elevational treatment; boundary treatments; hard and soft landscaping; and all necessary site works above and below ground level.

The proposed development will comprise of the (i) construction of a Build-To-Rent residential development within a new part six, part eight, part nine, part eleven storey rising to a landmark seventeen storey over basement level apartment building (40,814sq.m) comprising 428 no. apartments (41 no. studio, 285 no. one-bedroom, 94 no. two-bedroom & 8 no. three-bedroom units) of which 413 no. apartments have access to private amenity space, in the form of a balcony or lawn/terrace, and 15 no. apartments have access to a shared private roof terrace (142sq.m) at ninth floor level;

(ii) all apartments have access to 2,600sq.m of communal amenity space, spread over a courtyard at first floor level and roof terraces at sixth, eighth and ninth floor levels, a 142sq.m resident's childcare facility at ground floor level, 392sq.m of resident's amenities, including concierge/meeting rooms, office/co-working space at ground floor level and a meeting/games room at first floor level, and 696sq.m of resident's amenities/community infrastructure inclusive of cinema, gym, yoga studio, laundry and café/lounge at ground floor level. The café/lounge will primarily serve the residents of the development and will be open for community use on a weekly/sessional basis;

(iii) provision of 145 no. vehicular parking spaces (including 8 no. mobility parking spaces, 2 no. club-car spaces and 44 no. electric charging spaces), 5 no. motorcycle parking spaces, bin stores, plant rooms, switch room and 2 no. ESB sub-stations all at ground floor level; provision of bicycle parking (752 no. spaces), plant and storage at basement level; permission is also sought for the removal of the existing vehicular entrance and construction of a replacement vehicular entrance in the north-western corner of the site off Carmanhall Road;

(iv) provision of improvements to street frontages to adjoining public realm of Carmanhall Road & Blackthorn Road comprising an upgraded pedestrian footpath, new cycling infrastructure, an increased quantum of landscaping and street-planting, new street furniture inclusive of bins, benches and cycle parking facilities and the upgrading of the existing Carmanhall Road & Blackthorn Road junction through provision of a new uncontrolled pedestrian crossing; and,

(v) All ancillary works including provision of play equipment, boundary treatments, drainage works - including SuDS drainage, landscaping, lighting, rooftop telecommunications structure and all other associated site services, site infrastructure and site development works. The former Avid Technology International buildings were demolished on foot of Reg. Ref. PL06D.303467 which also permitted a part-seven rising to nine storey student accommodation development. The development approved under Reg. Ref. PL06D.303467 will be superseded by the proposed development.

Table 3.1 – Proposed Apartment Schedule of Accommodation

Type	Number of Units
Studio Apartment	42
1 Bedroom Apartment	284
2 Bedroom Apartment	94
3 Bedroom	8
Total	**428**

3.3 Site Access

There will be 1 no. vehicular access serving the subject site, the vehicular access point will be located at the northern boundary of the site. Perspective residents, staff and customers can avail of a number of access points along the Carmanhall Road and Blackthorn Road for pedestrians and cyclists only. Figure 3.1 illustrates the proposed vehicular access.

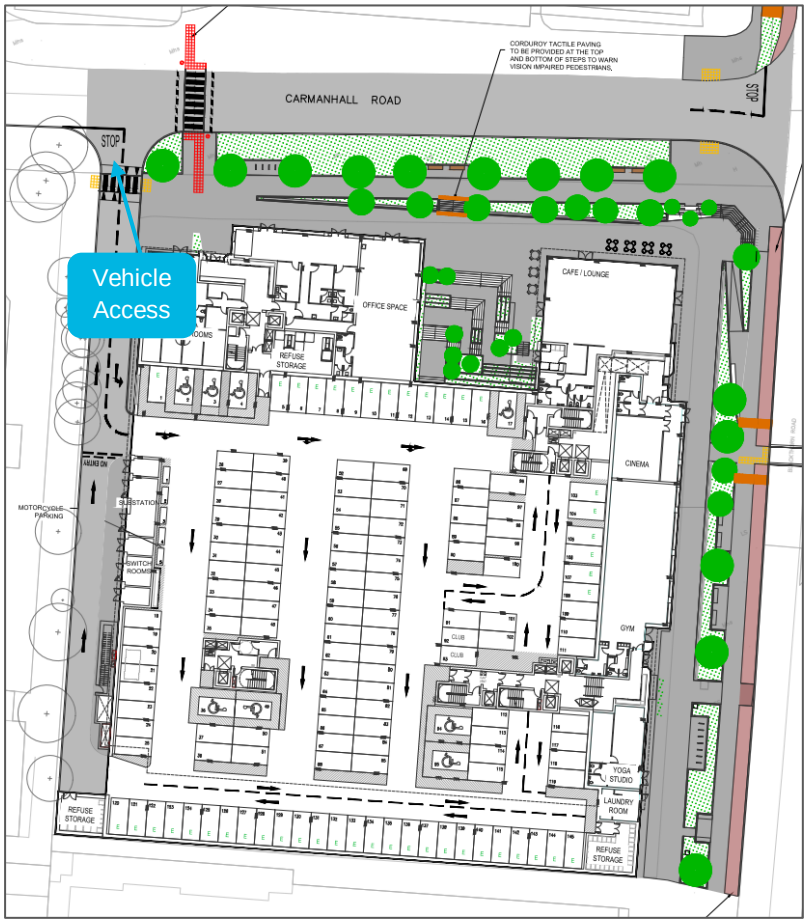


Figure 3.1 – Site Access Points (AECOM Drawing: PR-461030-ACM-XX-00-DR-CE-10-0001)

3.4 External Roads Upgrades

It is proposed that the existing pedestrian crossing along the Carmanhall road will be moved approximately 10m east of its current location to facilitate the construction of the new vehicular access point. Further to this it is proposed to upgrade the existing Carmanhall Road / Blackthorn Road junction by means of providing a new uncontrolled pedestrian crossing. An off road cycle lane is also to be provided along the Blackthorn Road which will tie in with the existing cycle facilities to the north-east of the site. These proposed improvements outside of the applicants ownership are intended at the application stage.

AECOM had a meeting with members of DLRCC Transportation Department (Claire Casey and Thiago Bodini) to discuss the proposals for these cycle lanes on the 14th of January 2021, DLRCC indicated that these drawings were currently being prepared by the Transportation Department. It was later confirmed that the cycle design would not be available until March, with detailed design expected in October 2021.In the absence of these revised design proposals, the scheme has followed the previously granted SHD proposals and can cater for the design of these proposed cycle lanes along Carmanhall Road and Blackthorn Avenue. The external roads upgrades can be seen in AECOM drawing: PR-461030-ACM-XX-00-DR-CE-10-0001. All upgrades must be agreed prior to commencement of development with DLRCC.

3.5 Internal Roads Layout

Due to the undercroft car parking being 90 degree it is required that in line with '*The Design Recommendations for multi-storey and underground car parks, March 2011*' the internal roads through the undercroft car parking are to be 6.0m wide to ensure that there is enough aisle width to facilitate 90 degree parking and two way traffic

movements through the site. The proposed roads layout can be seen in AECOM drawing: PR-461030-ACM-XX-00-DR-CE-10-0001.

3.6 Pedestrian and Cyclists Permeability

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

3.7 Servicing

An AutoTrack analysis has been undertaken to demonstrate the capability of the development to cater for a 10.2m bin lorry. The results of the analysis show that the site access junction can accommodate a bin lorry accessing, exiting and travelling through the site. This is illustrated Figure 3.2 and in AECOM drawing no. PR-461030-ACM-XX-00-DR-CE-10-0101.

Figure 3.2 – Proposed Servicing Strategy (AECOM Drawing: PR-461030-ACM-00-00-DR-CE-10-0101)

3.8 Visibility Splays

In accordance with DMURS, sightlines of 45m are required having regard to the speed limit along the Carmanhall Roads (50km/hr). This visibility splay requirement can be achieved at the subject site access from a 2.4m setback, as shown in Figure 3.3 and illustrated in AECOM drawing: PR-461030-ACM-XX-00-DR-CE-10-0101.

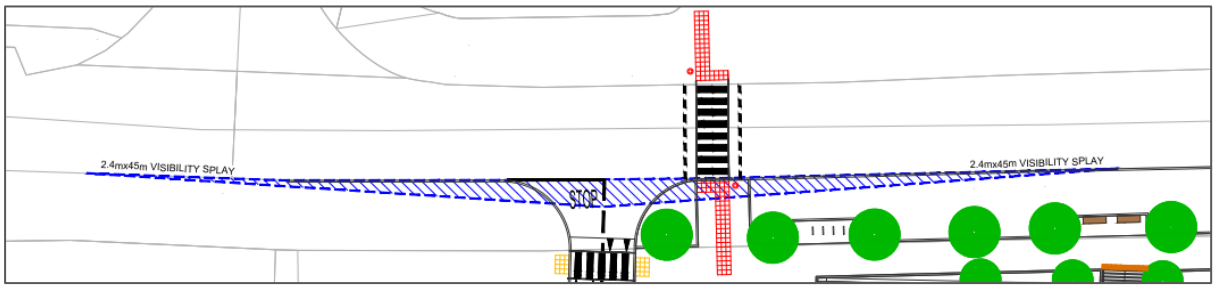


Figure 3.3 – Visibility Splays Along the Carmanhall Road (AECOM Drawing: PR-461030-ACM-XX-00-DR-CE-10-0101)

3.9 Parking Strategy

3.9.1 Standard Vehicle Parking

In order to determine the appropriate quantum of vehicle parking for the proposed residential development, reference has been made to the following guidance:

- Chapter 4 of Sustainable Urban Housing: Design Standards For New Apartments Guidelines For Planning Authorities, as published by the Department of Housing, Planning and Local Government (DHPLG), March 2018; and
- Section 8.2.4.5 of the current Dun Laoghaire Rathdown County Development Plan (2016-2022);

3.9.1.1 Design Standards for New Apartments Guidelines

'Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities Department of Housing, Planning and Local Government (DHPLG) The Department of Housing, Planning and Local Government has recently published (March 2018) new guidance 'Sustainable Urban Housing: Design Standards for New Apartments' (SUHDS). In relation to car parking, within 'Central and/or Accessible Urban Locations' the document states 'In larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances. The policies above would be particularly applicable in highly accessible areas such as in or adjoining city cores or at a confluence of public transport systems such as tail and bus stations located in close proximity.'

The DHPLG guidelines defines Central and/or Accessible Urban Locations as:

'Such locations are generally suitable for small- to large-scale (will vary subject to location) and higher density development (will also vary), that may wholly comprise apartments, including:

- *Sites within walking distance (i.e. up to 15 minutes or 1,000- 1,500m), of principal city centres, or significant employment locations, that may include hospitals and third-level institutions;*
- *Sites within reasonable walking distance (i.e. up to 10 minutes or 800- 1,000m) to/from high capacity urban public transport stops (such as DART or Luas); and*
- *Sites within easy walking distance (i.e. up to 5 minutes or 400-500m) to/ from high frequency (i.e. min 10 minute peak hour frequency) urban bus services.'*

Accordingly the subject site, can be classified as an 'Central and/or Accessible Urban Location' as it is located within a significant employment location (Sandyford Industrial Estate), less than 600m walking distance from both the Stillorgan and Sandyford LUAS stops. Furthermore the site is also ideally located to benefit from the emerging BusConnects network redesign.

AECOM believe parking provision for the proposed development should be provided in accordance with the Department of Housing, Planning and Local Government SUHDS guidance as referred to above, and as such the quantum of vehicle parking provided on site should be '***minimised, substantially reduced or wholly eliminated***'.

3.9.1.2 Dun Laoghaire Rathdown County Development Plan 2016-2022

The Dun Laoghaire Rathdown County Development Plan 2016-2022 states the following in relation to car parking:

"Reduced car parking standards for any development (residential and non-residential) may be acceptable dependent on:

- *The location of the proposed development and specifically its proximity to Town Centres and District Centres and high density commercial / business areas;*
- *The proximity to the proposed development to public transport;*
- *The precise nature and characteristics of the proposed development;*
- *Appropriate mix of land uses within and surrounding the proposed development;*
- *The availability of on-street parking controls in the immediate area;*
- *The implementation of a Travel Plan for the proposed development where a significant modal shift towards sustainable travel modes can be achieved;*
- *Other circumstances where it can be justified on sustainability grounds. "*

In very limited circumstances, the Council may also consider the development of car free housing on suitable small scale sites which have high levels of public transport accessibility, have convenient and safe access to local shops and community facilities and / or are located very close to Town Centres." The proposed site has been reviewed in relation to the accessibility of the above factors and shown in Table 3.2 below.

Please refer to Section 5.9.3 of the Statement of Consistency & Planning Report which also addresses car parking within the development.

Table 3.2 – DLRCC Reduced Car Parking Criteria

Criteria	AECOM Response	Criteria Met
Proximity to Town Centre	The subject site is located in the Sandyford Industrial Estate which features a number of commercial and retail developments. The site is located near Goatstown, Stillorgan and Dundrum which are all within a 15 minute cycle distance of the site.	Yes
Proximity to Public Transport	5 minute walk to high frequency Stillorgan and Sandyford LUAS stops, where services connect the site to Dublin City Centre. 1 min walk to bus service within Sandyford where services connect the site to Dublin City Centre and surrounding environs. There are 7 no. GoCar GoBase stations located within a 1km walking catchment of the site.	Yes
Nature of the Development	Development comprises of a residential land uses where opportunity for promoting sustainable travel and modal shift for future occupants will be high.	Yes
Approximate Mix of Land Uses surrounding the development	The site is situated within Sandyford Industrial Estate where a mix of land uses are situated including retail, financial institutions, restaurants and major employers. The proposed site will therefore benefit from being situated within walking and cycling distance to an array of different land uses which will reduce the requirement for private car use. The site is located approximately 1.3km from St. Raphaelas Primary and Secondary schools.	Yes
Availability of On Street Parking Controls	As the development is adopting an undercroft car parking and no provisions have been made for on-street car parking, on-street parking controls do not apply to the development. As part of the proposed development, landscaping is to be provided along the Carmanhall Road. This will prevent and deter existing residents from attempting to park along the site frontage along the Carmanhall Road.	Yes
Implementation of a Travel Plan	A Residential Travel Plan will be prepared to accompany the planning application and will be adopted prior to operation of the residential development. The Travel Plan will set out a framework of measures to promote sustainable travel amongst future residents, whilst reducing the reliance on private car modes.	Yes
Other Circumstances	Due to the sites central proximity to Goatstown, Stillorgan and Dundrum, there is an array of existing walking and cycling facilities within the vicinity of the site that will allow for safe travel of pedestrians / cyclists. Of note, pedestrian footpaths connect the site to the aforementioned towns and also to nearby Dublin Bus and LUAS stops. In addition, the site is located within the vicinity of the GoCar car share scheme, with GoBase stations located in the Sandyford Industrial Estate. The existing facilities will further assist to promote sustainable modes and reduce the need for private vehicle ownership.	Yes

With regard to the proposed development schedule, the associated DLRCC standard car parking requirements are outlined in Table 3.3.

Table 3.3 – DLRCC Development Plan Vehicle Parking Maximum Requirements & Development Parking Provision

Description	Quantum	DLRCC Standard Parking Rate		Proposed Parking Provision	
		Parking Required	Parking to be Provided	Residential Parking	Visitor Parking
1 bed apartment	326 Units	1 space per 1 bed unit	326	145	0
2 Bed apartment	94 Units	1.5 space per 2 bed unit	141		
3 bed apartment	8 Units	2 spaces per 3 bed unit	16		
Total			**483**	**145**	

In regard to the development proposals for the 428 residential apartment units, it is noted that the car parking proposals for these apartment units are below (approximately 66.12%) the car parking requirement when compared with the DLRCC Development Plan requirements.

AECOM believe this level of car parking should is acceptable given the sites public transport accessibility, the provision of car club spaces, electric vehicle spaces and motorbike spaces. A Mobility Management Plan will also be prepared by AECOM outlining the existing travel patterns for residents in this area along with the target goals for using various modes of transport with detailed measures which can be utilised by the Mobility Management Plan Coordinator to achieve these target goals.

Considering the DHPLG guidelines' opportunity of reducing the quantum of on-site car parking for developments such as the subject proposals, AECOM believe that the proposed provision of only 33.88% of the DLRCC Development Plan maximum standards complies fully with the principles and recommendations of the DHPLG guidelines.

Mobility Impaired Parking

The appropriate level of mobility impaired parking for the proposed development will be provided in accordance with the Dun Laoghaire Rathdown County Development Plan requirements.

The Development Plan requires that '4% *of car parking spaces shall be suitable for use by disabled persons',* which equates to 6 number space being required.

The proposed development provides 8 spaces which is in line with the Dun Laoghaire Rathdown County Development Plan.

Electric Vehicle Parking

The appropriate level of electric vehicle parking for the proposed development will be provided in accordance with the Dun Laoghaire Rathdown County Development Plan requirements.

The development plan requires that for residential developments '*A minimum of one car parking space per ten residential units should be equipped with one fully functional Electric Vehicle Charging Point*', which equates to 44 number spaces being required.

The proposed development will provide 44 number spaces which is in line with the Dun Laoghaire Rathdown County Development Plan.

Motorcycle Parking

The appropriate level of motorbike parking for the proposed development will be provided in accordance with the Dun Laoghaire Rathdown County Development Plan requirements.

The development plan requires that '*A minimum of four or more spaces per 100 car spaces'*, which equates to 4 number spaces being required.

The proposed development will provide 5 number spaces which is in line with the Dun Laoghaire Rathdown County Development Plan.

Car Club

There is no specific requirement within the Dun Laoghaire Rathdown County Development Plan with respect to the quantum of car club spaces to be provided as part of a scheme.

In absence of specific guidance within the DLRCC development plan, as part of the scheme proposals it is proposed to provide 2 number spaces within the basement. Engagement will be required with an operator for these spaces.

3.9.2 Cycle Parking

The appropriate level of cycle parking provision for the proposed development should also be provided in reference to both (i) the DLRCC Development Plan requirements; and (ii) the Design Standards for New Apartments Guidelines. The DLRCC Development Plan & Design Standards for New Apartments Guidelines cycle parking standards are detailed in Table 3.4 below.

Table 3.4 – DLRCC and Design Standards for New Apartments Guidelines Parking Provision

Description	DLRCC Parking Requirement		Design Standards for New Apartments, Guidelines	
	Short Stay	Long Stay	Short Stay	Long Stay
Apartment	1 space per 5 units	1 space per unit	1 space per 2 units	1 space per bedroom

Table 3.5 – Cycle Parking Requirements & Development Provision

Description	Quantum	DLRCC Parking Requirement			Design Standards for New Apartments, Guidelines			Development Provision		
		Short Stay	Long Stay	Total	Short Stay	Long Stay	Total	Short Stay	Long Stay	Total
1 bedroom apartment	326 Units	66	326	392	163	326	489	22	752	774
2 bedroom apartment	94 Units	19	94	113	47	188	235			
3 bedroom apartment	8 Units	2	8	10	4	24	28			
Totals		**87**	**428**	**512**	**214**	**538**	**752**	**22**	**752**	**774**

In reference to Table 3.5 above, the proposals include the provision of 774 bicycle parking spaces (752 within the basement and 22 at surface level) on-site within the development. The DLRCC bicycle parking standards are considered to be 'minimum' standards, whereas the DHPLG requirements are considered to be the preferred level of provision in situations where on-site car parking has been substantially or completely removed as permitted in certain situations by the corresponding DHPLG car parking guidance.

The level of bicycle parking proposed on-site for the apartment units has been provided in the context that the development car parking proposals are below the DLRCC development plan standards (i.e. 145 spaces opposed to 428 for the residential units). AECOM consider this reduction to be consistent with the reduction that the DHPLG guidelines recommend and at which the high DHPLG bicycle parking requirements would be of greater relevance.

Accordingly, the design approach in regard to the specification of bicycle parking on-site, in the context of the sites' accessibility characteristics (including the proposed car parking provision), is considered to appropriate and is above the DLRCC cycle parking standards and leans towards the 'maximum' DHPLG requirements.

In reference to Table 3.5 above, it can be established that the proposed on-site bicycle parking provision of 774 spaces (including Short and Long-term parking spaces) is approximately 51% more than the 512 cycle parking spaces required by the DLRCC development management standards and approximately 3% more than the DHPLG requirements.

It is proposed within the Mobility Management Plan to monitor the usage of the cycle stands following the opening of the proposed development. Should demand meet the proposed level of cycle parking, the management company will allocate additional cycle parking for the development i.e. increasing the number of cycle stands. There is ample space to add more cycle stands following a review of the demand.

4. DMURS Statement of Compliance

4.1 Introduction

This section has considered how the proposed development complies with the DMURS guidelines in compliance with Section 19 of the Section 5 Pre-Application Consultation Request Form, which is as follows:

"Please submit a statement indicating, in the prospective applicant's opinion, the proposal is consistent with the Design Manual for Urban Roads and Streets (Department of Transport, Tourism and Sport & Department of Environment, Community and Local Government, 2013)."

4.2 Proposed External Upgrades

The planning application comprises proposals to provide an off road cycle track along the Blackthorn Road, relocation of the existing signalised pedestrian crossing and alternations to the junction of the Carmanhall Road / Blackthorn Road. These upgrades result in providing a safer and more friendly environment for perspective residents. Further to these works as part of the proposed development, the footpaths will also be widened which will enhance resident / visitor permeability to the site. This will improve pedestrian / cyclist connectivity to the site with both Carmanhall Road and Blackthorn Road. These public realm improvements are intended at application stage.

4.3 Internal Proposed Development Layout

The internal layout design has been informed by the DMURS guidelines. The following measures are examples of where compliance with the DMURS guidelines has been demonstrated.

Pedestrian Capability: As per Figure 4.34 of DMURS, the internal footpaths have been proposed at a minimum width of 1.8m, which is the space required to allow two wheelchairs to pass each other or travel side by side.

Carriageway widths: The internal carriageway width is typically 6m as per the DMURS guidelines (Section 4.4.1) for a standard carriageway. The increased 6m width is to facilitate refuse lorries accessing the proposed site off Carmanhall Road, and also in the undercroft where there is perpendicular parking, where 6m is required for a vehicle to reverse.

Pedestrian Crossings: There is to be a raised uncontrolled pedestrian crossing provided at the proposed vehicular access to facilitate the safe movement of pedestrians travelling along Carmanhall Road, which will comprise of tactile paving and flushed kerbs to facilitate pedestrian movements crossing the carriageway at the junction. This raised table is to let vehicular and pedestrian / cycling traffic know that they are entering an area of conflict and must proceed with caution. The existing pelican crossing along Carmanhall Road is proposed to be relocated south of its current position to facilitate the proposed site access while also allowing pedestrians to cross safely at this location.

Corner Radii: The proposed corner radii at the junctions comply with DMURS (Section 4.3.3) to 4.0 – 6.0m in order to reduce vehicular speeds and reduce pedestrian crossing distances.

Car Parking: Car parking provision is proposed within the undercroft car park for residents. All car parking spaces are proposed at the required dimensions i.e. 2.5m x 5.0m for a standard parking space. The standard length of the parallel parking spaces is 6m.

Landscaping: Section 4.2.7 of DMURS recommends providing softer landscaping areas in order to provide a sense of "place function" within the development. The site therefore provides a significant amount of landscaping, including trees located along the Carmanhall Road and Blackthorn Road. This landscaping is situated so that it does not impact on sightlines along Carmanhall Road and Blackthorn Road.

Material and Finished: DMURS also gives guidance on the types of materials and finishes to be used in order to provide a sense of calm for traffic and improve legibility for vulnerable road users. The road markings will be flush so as to permit refuse vehicles and fire tenders manoeuvring within the development infrequently.

Signing and lining: As per section 4.2.4 of DMURS, signing and lining has been provided appropriately at the required locations throughout the development. However, the proposed development has been designed to have a self-regulating approach to increase the road safety as opposed to relying on mandatory warning signs.

5. Trip Generation and Distribution

5.1 Introduction

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

5.2 Traffic Surveys

In order to establish the existing local road networks traffic characteristics and subsequently enable the identification of the potential impact of the proposed development, traffic surveys (weekday classified junction turning counts) were conducted by Irish Traffic Surveys, ITS, over a 12 hr survey period from 07:00 – 19:00 on Tuesday the 25th of February 2020 at the following locations and as illustrated in Figure 5.1:

- J1: Drummartin Link Road / Blackthorn Drive;
- J2: Blackthorn Drive / Blackthorn Road;
- J3: Blackthorn Drive / Carmanhall Road;
- J4: Blackthorn Drive / Blackthorn Avenue / Stillorgan Wood;
- J5: Blackthorn Avenue / Blackthorn Road;
- J6: Carmanhall Road / Blackthorn Road;
- J7: Blackthorn Road / Burton Hall Road;
- J8: N31 / Burton Hall Road; and
- J9: N31 / R113 / Burton Hall Road.

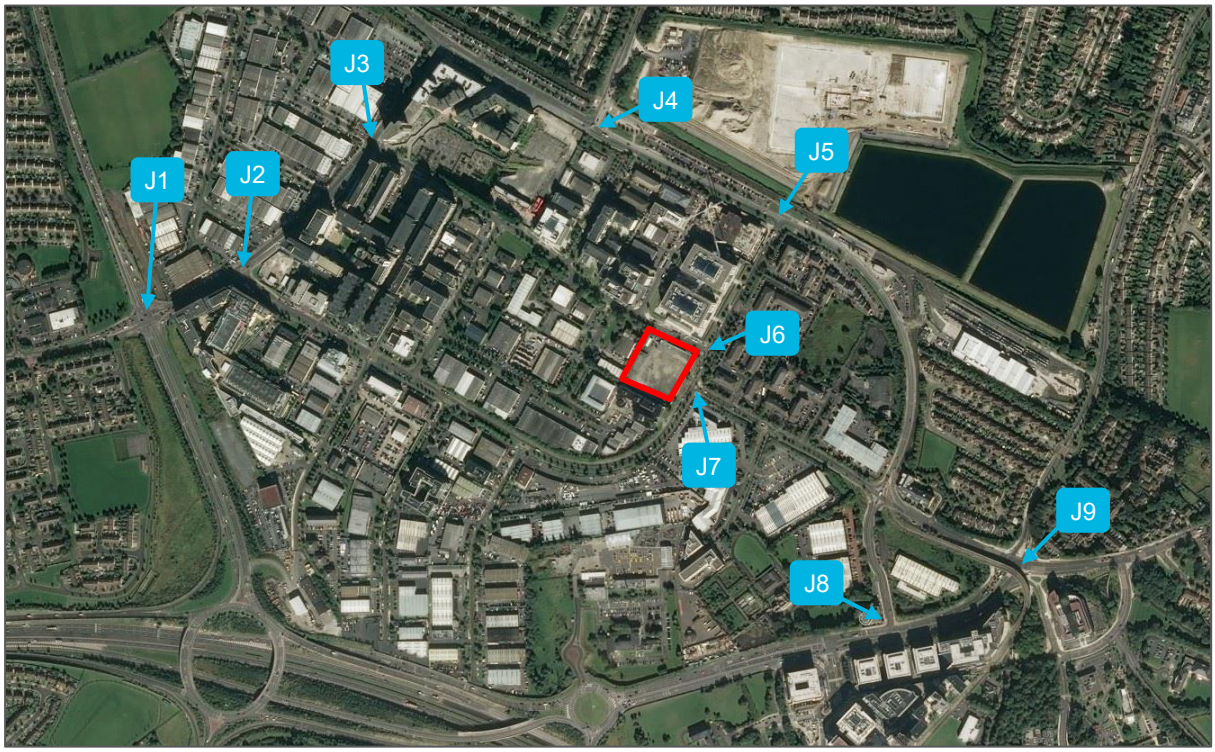


Figure 5.1 – Traffic Survey Locations (Source: Google Maps)

The traffic survey established that the local AM and PM peak hours occur between 08:00 – 09:00 and 16:30 – 17:30, respectively. The recorded peak hour traffic flows are presented within Appendix A.

5.3 Trip Generation

5.3.1 Permitted Trips

It should be noted that the subject site currently has two previous planning applications that were granted planning permission by DLRCC as detailed in section 1 of this report, Planning Ref: D16A/0158 and ABP30346719. Both of these applications would generate an envelope of traffic, which would have been considered and approved as part of the planning permission process.

The following peak hour traffic generation associated with the permitted planning applications are detailed in Table 5.1.

Table 5.1 – Permitted Developments Trip Generations

Planning Application Ref:	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
D16A/0158	15	29	34	24
ABP30346719	7	13	10	11

5.3.2 Proposed Development

In order to determine the potential vehicle trip generation for the subject site, the trip rates were taken from the industry standard TRICS for 'Privately owned Flats'. Table 5.2 below indicates the proposed trip rate for the associated land use with Table 5.3 showing the predicted vehicle trip generation of the likely vehicle traffic flows travelling to/from the proposed subject development during the morning (08:00 – 09:00) and evening (16:30 – 17:30) peak hour periods. The TRICS output is included in Appendix B of this report.

Table 5.2 – Proposed Development Trip Generation

Land Use	Quantum	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (16:30 – 17:30)	
		Arrival Rate	Departure Rate	Arrival Rate	Departure Rate
Apartments	428 Units	0.055	0.194	0.149	0.081

Table 5.3 – Proposed Development Traffic Generations

Land Use	TRICS Land Use	Quantum	AM Peak Hour		PM Peak Hour	
			Arrivals	Departures	Arrivals	Departures
Apartments	Flats Privately Owned	428 Units	24	83	64	35
Total Two Way Trips			107		98	

Table 5.4 presents a review of the proposed development trips in comparison to the permitted scheme D16A/0158, as this scheme generated a greater volume of traffic during the peak periods.

Table 5.4 – Permitted Vs Proposed Trip Generations

Scenario	AM Peak Hour		PM Peak Hour	
	Arrivals	Departures	Arrivals	Departures
Permitted Scheme: D16A/0158	15	29	34	24
Proposed Scheme	24	83	64	35
Additional Trip Generation above Permitted	9	59	30	11

The review identifies that the proposed development will generate an additional 68 vehicular trips during the morning peak hour and an additional 41 trips during the evening peak hour, respectively.

5.4 Trip Distribution & Assignment

To understand the potential distribution of the trips arriving and departing the site, the base traffic survey results have been interrogated. The base traffic surveys indicate the direction that motorists currently travel to/from when arriving onto the immediate road network immediately adjacent the site during the typical peak periods. Figure 5.2 illustrates the proposed trip distribution patterns during the AM and PM Peak Hours at the site access location. Appendix A illustrates the trip distribution splits across the road network.

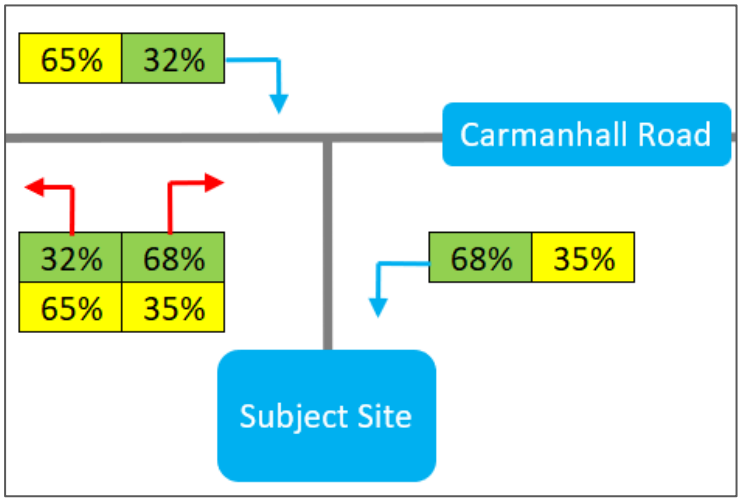


Figure 5.2 – Trip Distribution during the AM & PM Peak Hour along the Carmanhall Road

5.5 Traffic Growth

The TTA adopts an Opening Design Year of 2023. In accordance with TII Guidance, Future Design years (+5 and +15 years) of 2028 and 2038 will therefore be adopted.

The Transport Infrastructure Ireland (TII) 'Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (May 2019)' sets out growth rates for forecasting future year traffic for use in scheme modelling and appraisal. It is noted that in respect of Sandyford, which is in the 'Dublin Metropolitan' area, the growth during the period 2016 – 2030 is set at 1.62% per annum for medium growth which reduces 0.51% per annum from 2030 – 2040 (LV rates used).

The development has assessed the opening year of the development (2023) and the two horizon year assessments (2028 and 2038), as per the TII Traffic Assessment Guidelines. The assessment years used for this assessment are as follows for the traffic surveys carried out by ITS:

- 2020 to 2023 – 1.0494 (or 4.94%);
- 2020 to 2028 – 1.0458 (or 13.72%); and
- 2020 to 2038 – 1.0557 (or 21.06%).

5.6 Threshold Analysis

The TII Guidelines for Transport Assessments state that the thresholds for junction analysis in Transport Assessments are as follows:

- *'Traffic to and from the development exceeds 10% of the existing two-way traffic flow on the adjoining highway.'*
- *'Traffic to and from the development exceeds 5% of the existing two-way flow on the adjoining highway, where traffic congestion exists or will exist within the assessment period or in other sensitive locations.*'

5.7 Impact of the Proposed Development

5.7.1 Local Road Network

A comparison was made between the pre-development and post-development scenarios, to identify the percentage impact of the development within the Sandyford Industrial Estate.

The projected percentage impact of operational traffic on the surrounding road junctions in the year of opening (2023) is set out in Table 5.5 and shown indicatively in Figure 5.3.

Figure 5.3 – Proposed Development Impact at Junction Locations

It should be noted that the opening year of the development has been assessed only. Any future year base flows would be greater than the flows presented in Table 5.5, hence a smaller percentage impact in comparison to the development flows would be recorded.

Table 5.5 – Percentage Impact on adjacent road network during Opening Year

Junction		Opening Year – 2023	
		AM Peak	PM Peak
J1 – Drummartin Link Road / Blackthorn Road	Base Flows at Junction	3959	3743
	Development	25	47
	% Impact	**0.6%**	**1.3%**
J2 – Blackthorn Drive / Blackthorn Road	Base Flows at Junction	2731	2294
	Development	25	47
	% Impact	**0.9%**	**2.1%**
J3 – Blackthorn Drive / Carmanhall Road	Base Flows at Junction	1759	1716
	Development	34	64
	% Impact	**1.9%**	**3.8%**
J4 – Blackthorn Avenue / St. Raphaela's Road	Base Flows at Junction	2223	1343
	Development	30	8
	% Impact	**1.4%**	**0.6%**
J5 – Blackthorn Avenue / Blackthorn Road	Base Flows at Junction	1652	1793
	Development	55	15

	% Impact	**3.3%**	**0.8%**
J6 – Blackthorn Road / Carmanhall Road	Base Flows at Junction	1553	905
	Development	73	34
	% Impact	**4.7%**	**3.8%**
J7 – Blackthorn Road / Burton Hall Road	Base Flows at Junction	1873	1430
	Development	18	19
	% Impact	**0.9%**	**1.3%**
J8 – Leopardstown Road / N31	Base Flows at Junction	4046	3825
	Development	14	9
	% Impact	**0.4%**	**0.2%**
J9 – N31 / R113 / Burton Hall Road	Base Flows at Junction	4449	3959
	Development	22	11
	% Impact	**0.5%**	**0.3%**

On the basis of the TII traffic and Transport Assessment Guidelines (May 2014), given the impact upon Each junction does not exceed 10% (or even 5%) modelling will not be required at the any of the junctions. Each of the junctions is discussed in more detail in the paragraphs below.

Junction 1: 0.6% and 1.3% upon the Drummartin Link Road / Blackthorn Road 4-arm signalised junction in the respective AM and PM peak therefore modelling is not required for this junction. The traffic impacts upon this junction will be nominal.

Junction 2: 0.9% and 2.1% upon the Blackthorn Drive / Blackthorn Road 3-arm signalised junction in the respective AM and PM peak, therefore modelling is not required for this junction. The traffic impacts upon this junction will be nominal.

Junction 3: 1.9% and 3.8% upon the Blackthorn Drive / Carmanhall Road 4-arm signalised junction in the respective AM and PM peak therefore modelling is not required for this junction. The traffic impacts upon this junction will be nominal.

Junction 4: 1.4% and 0.6% upon the Blackthorn Avenue / St. Raphaela's Road 3-arm signalised junction in the respective AM and PM peak therefore modelling is not required for this junction. The traffic impacts upon this junction will be nominal.

Junction 5: 3.3% and 0.8% upon the Blackthorn Avenue / Blackthorn Drive 3-arm signalised junction in the respective AM and PM peak therefore modelling is not required for this junction. The traffic impacts upon this junction will be nominal.

Junction 6: 4.7% and 3.8% upon the Blackthorn Road / Carmanhall Road 3-arm priority junction in the respective AM and PM peak therefore modelling is required for this junction. The traffic impacts upon this junction will be nominal. For robustness in our approach, AECOM have undertaken a modelling analysis using Junctions 9 software of this junction.

Junction 7: 0.9% and 1.3% upon the Blackthorn Road / Burton Hall Road 3-arm signalised junction in the respective AM and PM peak therefore modelling is not required for this junction. The traffic impacts upon this junction will be nominal.

Junction 8: 0.4% and 0.2% upon the Leopardstown Road / N31 3-arm signalised junction in the respective AM and PM peak therefore modelling is not required for this junction. The traffic impacts upon this junction will be nominal.

Junction 9: 0.5% and 0.3% upon the N31 / R113 / Burton Hall Road 5-arm signalised junction in the respective AM and PM peak therefore modelling is not required for this junction. The traffic impacts upon this junction will be nominal.

To summarise the percentage impact assessment, it has been found that none of the junctions warrant further traffic analysis but to be robust in AECOM's approach, the junctions immediately adjacent to the proposed development, Junction 6 (Blackthorn Road / Carmanhall Road) and the site access junction, will be subject to traffic modelling using the industry standard Junctions 9 software.

6. Network Analysis

6.1 Introduction

This chapter presents the impact analysis to identify the potential effects of the proposed development upon the surrounding road network at the junctions as identified in Chapter 5 of this report. Figure 6.1 shows the junctions that have been analysed as part of this assessment. As the junctions are both unsignalized priority controlled, they will be assessed using the industry standard Junctions 9 (PICADY) software developed by Transport Research Laboratory (TRL). The analysis does not take into account the proposed 6 years roads objectives as detailed in section 2.4.1 of this report and AECOM believes that this presents the worst case scenario.

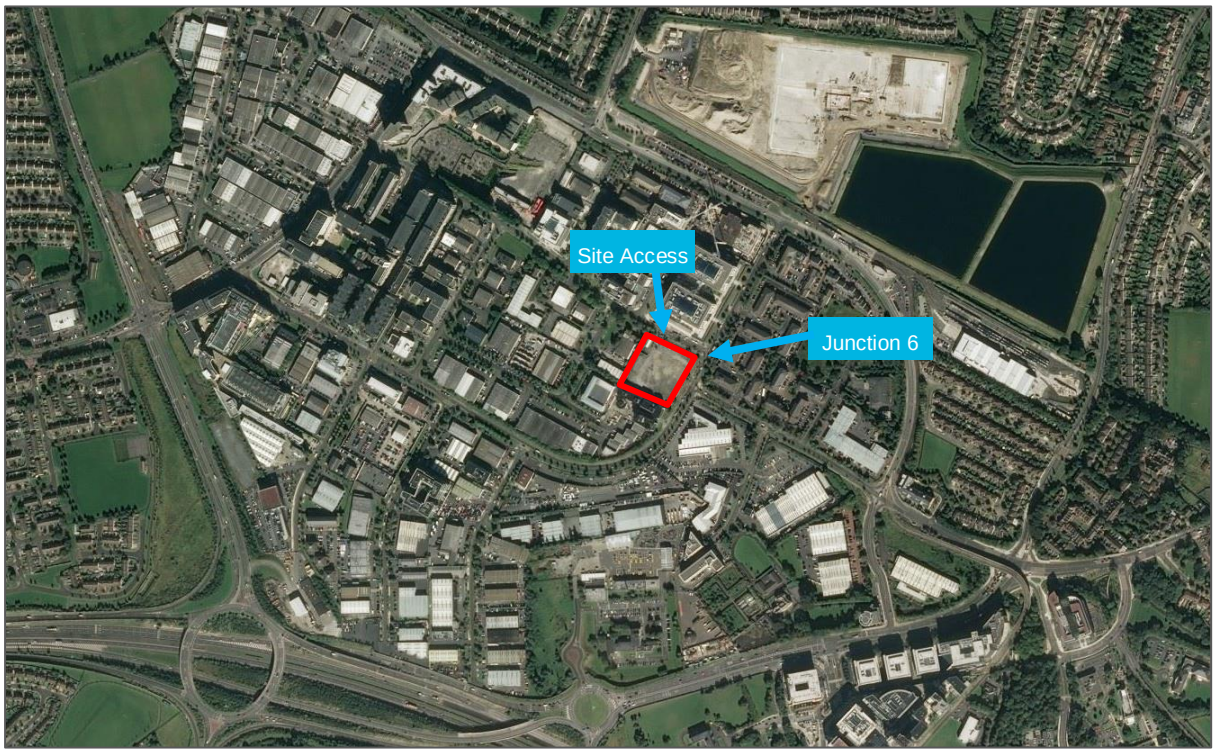


Figure 6.1 – Junctions to be Analysed (Source: Google Maps)

6.2 Junction Analysis

The operational assessment of the local road network has been undertaken TRL Junctions 9 for non-signalised junctions. When considering priority controlled junctions, a Ratio to Flow Capacity (RFC) of greater than 85% (0.85) would indicate a junction to be approaching capacity, as operation above this RFC value is poor and deteriorates quickly resulting in traffic congestion in the form of longer queues.

Junctions 9 is an industry standard software to model the capacity and queuing of non-signalised junctions (Priority controlled, intersections, roundabouts). The meaning of the acronyms used within the capacity assessment results are discussed below.

- RFC Ratio to Flow Capacity (for non-signalised junctions)
- Q Queue length (PCU's) i.e. 1 PCU equates to a 5.75m long car

It is generally accepted that RFC values of 0.85 (85%) and less are indicators that a junction is operating within capacity. Junctions are only identified as operating over capacity if these values are exceeded.

6.2.1 Site Access / Carmanhall Road

A model was completed for observed traffic volume scenario for AM and PM and future assessment years, as shown in Table 6.1 below. Full Junctions 9 results are contained within Appendix C.

Table 6.1 – Site Access / Carmanhall Road Analysis

Assessment Year	Arm	AM		PM	
		Queue (PCU)	RFC	Queue (PCU)	RFC
2020 Baseline	Site Access	0	0	0	0
	Carmanhall Road (Western Arm)	0	0	0	0
	Carmanhall Road (Eastern Arm)	0.4	0.25	0.1	0.12
2023 Without Development	Site Access	0	0	0	0
	Carmanhall Road (Western Arm)	0	0	0	0
	Carmanhall Road (Eastern Arm)	0.4	0.27	0.2	0.12
2023 With Development	Site Access	0.3	0.24	0.1	0.08
	Carmanhall Road (Western Arm)	0	0.02	0.3	0.11
	Carmanhall Road (Eastern Arm)	0.4	0.28	0.2	0.13
2028 Without Development	Site Access	0	0	0	0
	Carmanhall Road (Western Arm)	0	0	0	0
	Carmanhall Road (Eastern Arm)	0.4	0.29	0.2	0.13
2028 With Development	Site Access	0.3	0.24	0.1	0.08
	Carmanhall Road (Western Arm)	0	0.02	0.3	0.11
	Carmanhall Road (Eastern Arm)	0.5	0.3	0.2	0.14
2038 Without Development	Site Access	0	0	0	0
	Carmanhall Road (Western Arm)	0	0	0	0
	Carmanhall Road (Eastern Arm)	0.5	0.31	0.2	0.14
2038 With Development	Site Access	0.4	0.25	0.1	0.08
	Carmanhall Road (Western Arm)	0	0.02	0.3	0.12
	Carmanhall Road (Eastern Arm)	0.5	0.32	0.2	0.15

Based on the analysis of Site Access Junction, it is clear that the with the inclusion of the junction along the Carmanhall Road will continue to operate within capacity throughout the 2023 (opening year) to the 2038 (opening year + 15) assessment with the development in place.

As demonstrated in the 2023 assessment year, the proposed site access will result in a RFC value of 0.24 (24%) with a corresponding queue of 0.3 PCU during the AM Peak period whilst during the PM Peak it is anticipated that the RFC will be 0.08 (8%) with a corresponding queue of 0.1 PCU.

When comparing the 2038 assessment years with and without development, the proposed development results in an increase of 0.01 (1%) to the RFC of the Carmanhall Road (Eastern Arm) during both the AM and PM Peak Periods with no increase to the queuing at the junction.

6.2.2 Junction 6 – Blackthorn Road / Carmanhall Road

A model was completed for observed traffic volume scenario for AM and PM and future assessment years, as shown in Table 6.2 below. Full Junctions 9 results are contained within Appendix C.

Table 6.2 – Junction 6 Blackthorn Road / Carmanhall Road Analysis

Assessment Year	Arm	AM		PM	
		Queue (PCU)	RFC	Queue (PCU)	RFC
2020 Baseline	Carmanhall Road (Western Arm)	1	0.49	2.2	0.67
	Blackthorn Road (Northern Arm)	0.3	0.18	0.1	0.07
	Blackthorn Road (Southern Arm)	1.3	0.54	0.3	0.19
2023 Without Development	Carmanhall Road (Western Arm)	1.2	0.52	2.6	0.71
	Blackthorn Road (Northern Arm)	0.3	0.19	0.1	0.08
	Blackthorn Road (Southern Arm)	1.4	0.57	0.3	0.2
2023 With Development	Carmanhall Road (Western Arm)	2.1	0.66	2.8	0.73
	Blackthorn Road (Northern Arm)	0.3	0.2	0.1	0.08
	Blackthorn Road (Southern Arm)	1.5	0.58	0.3	0.21
2028 Without Development	Carmanhall Road (Western Arm)	1.5	0.59	3.5	0.77
	Blackthorn Road (Northern Arm)	0.4	0.22	0.1	0.08
	Blackthorn Road (Southern Arm)	1.8	0.62	0.3	0.22
2028 With Development	Carmanhall Road (Western Arm)	2.9	0.74	4	0.8
	Blackthorn Road (Northern Arm)	0.4	0.23	0.1	0.09
	Blackthorn Road (Southern Arm)	1.8	0.62	0.3	0.23
2038 Without Development	Carmanhall Road (Western Arm)	2	0.66	4.9	0.83
	Blackthorn Road (Northern Arm)	0.5	0.25	0.1	0.09
	Blackthorn Road (Southern Arm)	2.1	0.66	0.3	0.23
2038 With Development	Carmanhall Road (Western Arm)	4.1	0.81	5.7	0.85
	Blackthorn Road (Northern Arm)	0.5	0.26	0.1	0.1
	Blackthorn Road (Southern Arm)	2.1	0.66	0.3	0.24

Based on the analysis of Junction 6, it is clear that the junction will continue to operate within capacity throughout the 2023 (opening year) to the 2038 (opening year + 15) assessment with and without the development in place during the AM Peak period.

When comparing the 2038 assessment years with and without development, the proposed development results in an increase of 0.15 (15%) to the RFC of the Carmanhall Road (Western Arm) arm during the AM Peak Period with a 1.5 PCU increase to the queuing at the junction. During the PM Peak period the proposed development results in an increase of 0.02 (2%) to the RFC of the Carmanhall Road (Western Arm) with a 0.8 PCU increase to queuing at the junction.

7. Mobility Management Plan

7.1 General

The environmental and congestion impacts of road transport have led to policy changes by officials of the industry. These changes have led to increasing the priority of more sustainable modes of transport. The aim of a Mobility Management Plan (MMP) is to encourage modes of travel other than the car, whilst recognising that some residents and visitors of the development would still need to use the car.

This section will present an overview of the mobility management measures for the proposed development. A review of the key measures and policies outlined in the existing Dun Laoghaire Rathdown County Development (2016 – 2022) plan has been undertaken. This section is also informed by the existing and proposed provision of public transport outlined in Section 2 of this report.

Upon completion of the development, when the scheme is occupied it is recommended that an update to the Mobility Management plan is undertaken in unison with travel surveys for residents and visitors which will inform travel targets for site users.

7.2 Aims

A MMP broadly seeks to reduce the number of car journeys associated with the development, which in reduce the environmental impact associated with the proposed development on the receiving environment. The specific aims of this MMP are;

- To discourage private car as a means of travel to and from the development;
- To increase and facilitate the number of people choosing to walk, cycle or travel by public transport to and from the development;
- To work with DLRCC, the National Transport Authority and public transport providers to support and encourage resident and staff uptake;
- To develop an integrated and unified plan for public transport, private vehicle, business fleet management and suppliers of commercial services to the development; and
- To liaise and co-operate with adjacent developments in relation to a coordinated approach to Mobility Management between to and from the various employment areas.
- To achieve the above targets, measures have been proposed for the specific modes of transport. These are based on existing infrastructure and public transport systems. These objectives are preliminary and will be further developed in the light of ongoing monitoring as the proposed development is occupied and information becomes available on future travel behaviour of residents.

In order to achieve these aims a two-stage approach has been adopted. These stages are summarised below:

- Stage 1: To provide a package of measures from the outset as part of the development to provide residents and visitors with safe and viable transport alternatives to the car for accessing the site;
- Stage 2: To continually monitor the travel patterns of people using the site to ensure that the most sustainable travel patterns to and from the development are encouraged.

It is recommended that an Action Plan Coordinator is appointed, as someone who will take ownership of implementing the measures. To achieve these objectives, measures have been proposed for specific modes pf transport. These objectives and measures are preliminary and will be further developed in light of ongoing monitoring as the proposed development is occupied and information becomes available on future resident travel behaviour.

7.3 Benefits

Mobility Management Plans are intended to bring the following benefits:

- A partnership approach between residents and management to influence travel behaviour;
- Widen accessibility of the site and buildings;
- Encourage safe and viable alternatives for accessing the site;
- Pragmatic initiatives based on a continual appraisal of resident travel patterns;
- A benchmark from which future developments can be assessed;
- Improvement to the amenity of the area around their buildings;
- Reduction in overall vehicle mileage;

- Reduction in congestion and air pollution;
- Fewer vehicular trips than would otherwise be the case;
- Improved road safety on and near the site;
- Accommodate those journeys, which need to be made by car;
- Preservation of valuable land and avoiding the costs of providing too much parking and;
- Health benefits for residents due to the use of active modes of transport (i.e. cycling and walking)

7.4 Monitoring

A critical part of any MMP is ongoing monitoring. It is proposed that an initial evaluation of the operation of the plan will take place one year into the operation.

Upon occupation of the development it would be proposed to undertake travel attitude surveys to establish baseline modal split of residents. This would assist considerably in the setting of appropriate trip rate and modal share targets for the development.

An after study should then be undertaken following the operation of the MMP for a reasonable period of time. The two datasets could then be compared to review what changes are necessary after implementation of the various infrastructural measures and initiatives.

Campaigns and promotions would be run throughout the year to maintain public awareness of modes of travel other than the car and the benefits accrued to both the individual and the environment.

The occupiers of the proposed development will be encouraged to continually monitor the MMP initiatives in order to maximise on their success. Monitoring results could be included in the annual report or a separate environmental report. The results will also be forwarded to DLRCC at intervals to be determined by agreement.

7.5 Targets and Timescales

The targets and timescales will be set further to completion of a travel survey when the development is occupied, reflecting the existing conditions and mindful of the environmental, health and social benefits of increasing active and sustainable travel to and from the proposed development.

- Total % change in numbers of people walking/cycling to the subject site;
- Total % of people choosing to travel to work using the car;
- Increase in occupancy of cycle stands;
- Observed levels of car parking (both on and off street);
- Change in overall modal split over time (five-yearly monitoring);

The list is intended to provide an initial list of potential success criteria as it relates to this MMP.

7.6 Measures

7.6.1 Mobility Management Plan Partners

This section presents a ‘Toolkit’ of measures, identifying a number of ‘hard’ and ‘soft’ measures that should be promoted and delivered where possible, to ensure that the theme of sustainability is entrenched within the design of the proposed development.

This section identifies the key individuals and groups that will be responsible for the managing the delivery of the MMP. These are;

- MMP Co-ordinator;
- A member of the local Garda Siochana;
- Site developer;
- MMP advisor (engineer).

7.6.2 Mobility Management Plan Coordinator

A Mobility Management Plan Coordinator should be identified by the management company of the development, who would be responsible for internally monitoring the travel plan, promoting the travel plan and distributing travel plan information. The coordinator will work in conjunction with Dun Laoghaire Rathdown County Council, the local community and other interested parties for the continuing progression of the MMP.

The coordinator should be appointed prior to occupation of the proposed development, to ensure they are involved in developing a travel pack which should be sent out to all residents prior to the opening date. The role of the coordinator should be as follows:

- Overseeing the development and implementation of the MMP;
- Designing and implementing effective marketing and awareness raising campaigns;
- Provide a point of contact and travel information;
- Liaison with external organisations; and
- Coordinating the monitoring programme for the MMP.

7.6.3 Mobility Management Plan 'Toolkit'

A 'Toolkit' contains a range of 'soft' and 'hard' options, to encourage sustainable travel and achieve the aims of the plans. Example of 'softer' measures include, promoting of sustainable travel via marketing material on staff notice boards, whilst examples of 'harder' measures include new cycle parking stands. The table overleaf presents a list of sustainable travel planning initiatives for the development.

8. Outline Construction Management Plan

This chapter of the report deals directly with the impacts of construction of the subject development. As with any construction project, the contractor will be required to prepare a comprehensive traffic management plan for the construction phase. The purpose of such a plan is to outline measures to manage the expected construction traffic activity during the construction period.

This chapter will provide an overview of the likely routing of construction vehicles, based on a most likely scenario of construction. It should be noted that the impacts of the construction will be temporary and it will be the contractor's responsibility to prepare a Traffic Management Plan for the approval of Dun Laoghaire Rathdown County Council in advance of any works.

8.1 Policy Guidance

Guidance for the temporary control of traffic at road works to facilitate the safety of the public during the works is provided below:

- Traffic Signs Manual Chapter 8 Temporary Traffic Measures and Signs for Roadworks (2019);
- Traffic Management Guidelines, Department of Transport (2003);
- Requirements of Dun Laoghaire Rathdown County Council.

8.2 Likely Construction Programme & Phasing

The construction programme is expected to require approximately 24 to 30 months to complete from occupation of the site.

8.3 Construction Route

To minimise construction impacts upon the surrounding road network, it is recommended that all construction traffic accesses and exits from the M50 Junction 14 travelling along the Drummartin Link Road turning right onto Blackthorn Drive then right again onto Carmanhall Road and then turning into the subject site. Figure 8.1 illustrates the recommended construction routing.

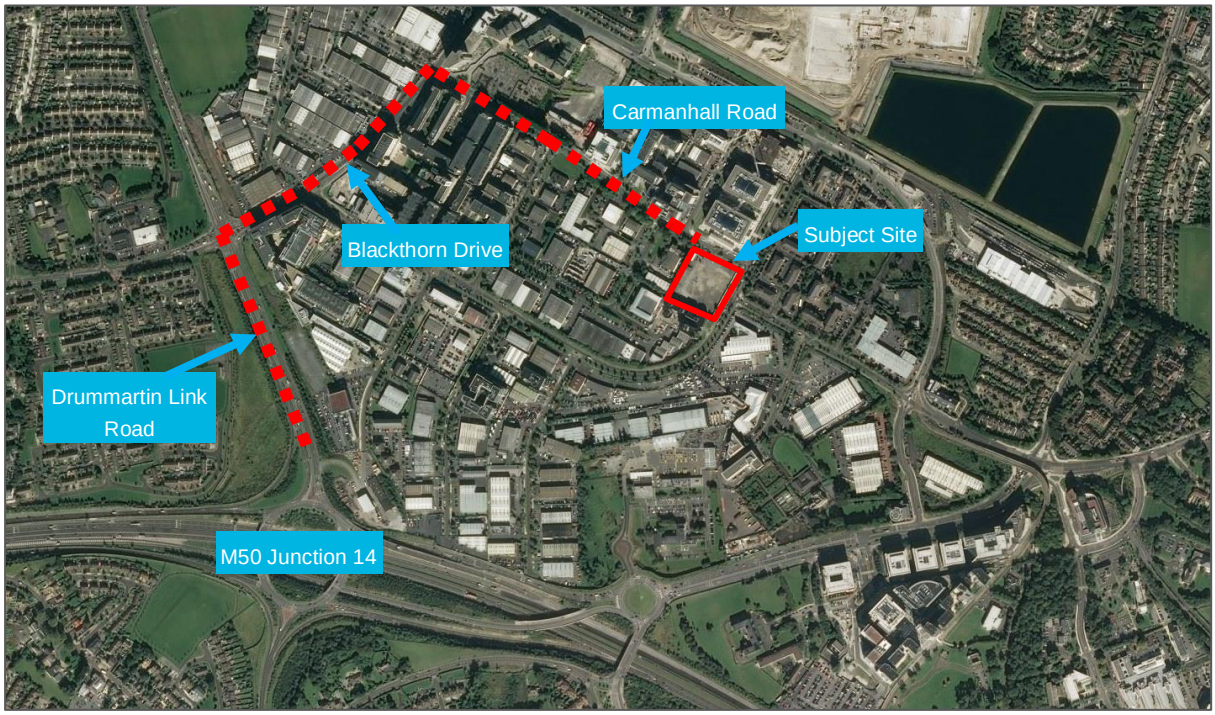


Figure 8.1 – Proposed Construction Routing (Source: Bing Maps)

8.4 Parking

All contractors vehicles will park within the development site area, it is recommended that as park of the construction management plan the contactor designates an area within the confines of the site dedicated to operative car parking. There will be no parking permitted on the surrounding road network or estate roads by the contractor or site operatives.

8.5 Mitigation Measures

A construction management plan will be developed by the contractor prior to the commencement of work on site and will be prepared in consultation with Dun Laoghaire Rathdown County Council.

Construction debris particularly site clearance, spoil removal and dirty water run off can have a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with.

8.6 Hours of Operation

Site development and building works shall be carried out between the hours of operation recommended by DLRCC to safeguard the residential amenities of properties in the vicinity. The typical hours of operation are as follows:

- Monday to Friday, 8am – 7pm, Saturdays 8am – 2pm and no works on Sundays or Public holidays.

8.7 Traffic Management Measures

Below is a list of the proposed traffic management measures to be adopted during the construction works. Please note that this is not an exhaustive list, and that it will be the appointed contractor's responsibility to prepare a detailed construction management plan.

- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access locations;
- Construction and delivery vehicles will be instructed to use only the approved and agreed means of access; and movement of construction vehicles will be restricted to these designated routes;
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material;
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the site;
- Parking of site vehicles will be managed and will not be permitted on public road, unless proposed within a designated area that is subject to traffic management measures and agreed with DLRCC;
- A road sweeper will be employed to clean the public roads adjacent to the site of any residual debris that may be deposited on the public roads leading away from the construction works;
- On site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the site, to remove any potential debris on the local roads;
- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. Spill kits will be available on site. All scheduled maintenance carried out off-site will not be carried out on the public highway; and
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons.

The mitigation measures will therefore ensure that the presence of construction traffic will not lead to any significant environmental degradation or safety concerns in the vicinity of the proposed works. Furthermore, it is in the interests of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of haulage routes, delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.

9. Summary and Conclusions

AECOM has been commissioned by Atlas GP Limited to prepare a Traffic and Transport Assessment in support of a SHD planning application submission to An Bord Pleanala and Dun Laoghaire Rathdown County Council for a proposed Strategic Housing Development within the Sandyford Industrial Estate Park, Sandyford, Co. Dublin.

The receiving environment has been assessed in terms of walking, cycling, public transport and road infrastructure.

The proposed development will comprise of the (i) construction of a Build-To-Rent residential development within a new part six, part eight, part nine, part eleven storey rising to a landmark seventeen storey over basement level apartment building (40,814sq.m) comprising 428 no. apartments (41 no. studio, 285 no. one-bedroom, 94 no. two-bedroom & 8 no. three-bedroom units) of which 413 no. apartments have access to private amenity space, in the form of a balcony or lawn/terrace, and 15 no. apartments have access to a shared private roof terrace (142sq.m) at ninth floor level;

(ii) all apartments have access to 2,600sq.m of communal amenity space, spread over a courtyard at first floor level and roof terraces at sixth, eighth and ninth floor levels, a 142sq.m resident's childcare facility at ground floor level, 392sq.m of resident's amenities, including concierge/meeting rooms, office/co-working space at ground floor level and a meeting/games room at first floor level, and 696sq.m of resident's amenities/community infrastructure inclusive of cinema, gym, yoga studio, laundry and café/lounge at ground floor level. The café/lounge will primarily serve the residents of the development and will be open for community use on a weekly/sessional basis;

(iii) provision of 145 no. vehicular parking spaces (including 8 no. mobility parking spaces, 2 no. club-car spaces and 44 no. electric charging spaces), 5 no. motorcycle parking spaces, bin stores, plant rooms, switch room and 2 no. ESB sub-stations all at ground floor level; provision of bicycle parking (752 no. spaces), plant and storage at basement level; permission is also sought for the removal of the existing vehicular entrance and construction of a replacement vehicular entrance in the north-western corner of the site off Carmanhall Road;

(iv) provision of improvements to street frontages to adjoining public realm of Carmanhall Road & Blackthorn Road comprising an upgraded pedestrian footpath, new cycling infrastructure, an increased quantum of landscaping and street-planting, new street furniture inclusive of bins, benches and cycle parking facilities and the upgrading of the existing Carmanhall Road & Blackthorn Road junction through provision of a new uncontrolled pedestrian crossing; and,

(v) All ancillary works including provision of play equipment, boundary treatments, drainage works - including SuDS drainage, landscaping, lighting, rooftop telecommunications structure and all other associated site services, site infrastructure and site development works. The former Avid Technology International buildings were demolished on foot of Reg. Ref. PL06D.303467 which also permitted a part-seven rising to nine storey student accommodation development. The development approved under Reg. Ref. PL06D.303467 will be superseded by the proposed development.

The site is proposed to be accessed by way of a vehicular priority junction off the Carmanhall Road.

Visibility requirements are provided for in line with DMURS for 50km/hr. Site servicing is provided for in terms of a 10.2m bin lorry for access and circulation, which have been tested in AutoTrack and included in AECOMs drawings.

Car parking has been provided in line with DLRCC Development Plan requirements with 145 car parking spaces proposed including 8 mobility impaired spaces, 44 electric vehicle spaces, 2 car club spaces and 5 motorcycle spaces.

Cycle parking has been provided in line with both the DLRCC Development Plan requirements and the Design Standards for New Apartment Guidelines with a total of 774 cycle parking spaces being provided (752 within the basement and 22 at surface).

A trip generation assessment has been completed. The trip generation assessment has been completed utilising the trip rate as determined by TRICS. The calculation has established that the anticipated trip generation is 107 two-way trips in the AM peak and 98 two-way trips in the PM peak.

Trip distribution onto the network was established cognisant of current and future traffic patterns.

A percentage impact assessment has been completed in line with TII guidance. This has established that the following percentage impacts are anticipated at local junctions:

- 0.6% and 1.3% upon the Drummartin Link Road / Blackthorn Road 4-arm signalised junction in the respective AM and PM peaks;
- 0.9% and 2.1% upon the Blackthorn Drive / Blackthorn Road 3-arm signalised junction in the respective AM and PM peaks;
- 1.9% and 3.8% upon the Blackthorn Drive / Carmanhall Road 4-arm signalised junction in the respective AM and PM Peaks;
- 1.4% and 0.6% upon the Blackthorn Avenue / St. Raphaela's Road 3-arm signalised junction in the respective AM and PM peaks;
- 3.3% and 0.8% upon the Blackthorn Avenue / Blackthorn Drive 3-arm signalised junction in the respective AM and PM peaks;
- 4.7% and 3.8% upon the Blackthorn Road / Carmanhall Road 3-arm priority junction in the respective AM and PM peaks;
- 0.9% and 1.3% upon the Blackthorn Road / Burton Hall Road 3-arm signalised junction in the respective AM and PM peaks;
- 0.4% and 0.2% upon the Leopardstown Road / N31 3-arm signalised junction in the respective AM and PM peaks; and
- 0.5% and 0.3% upon the N31 / R113 / Burton Hall Road 5-arm signalised junction in the respective AM and PM peaks.

For robustness, AECOM have undertaken a detailed junction modelling analysis of the proposed site access and the Carmanhall Road / Blackthorn Road priority controlled junctions using Junctions 9. The assumed Opening Year (2023) and Future Year scenarios (2028 and 2038) were calcultated using central growth rates from the TII's Travel Demand Projections (Unit 5.3) to take into account the level of committed developments in the immediate vicnity of the development.

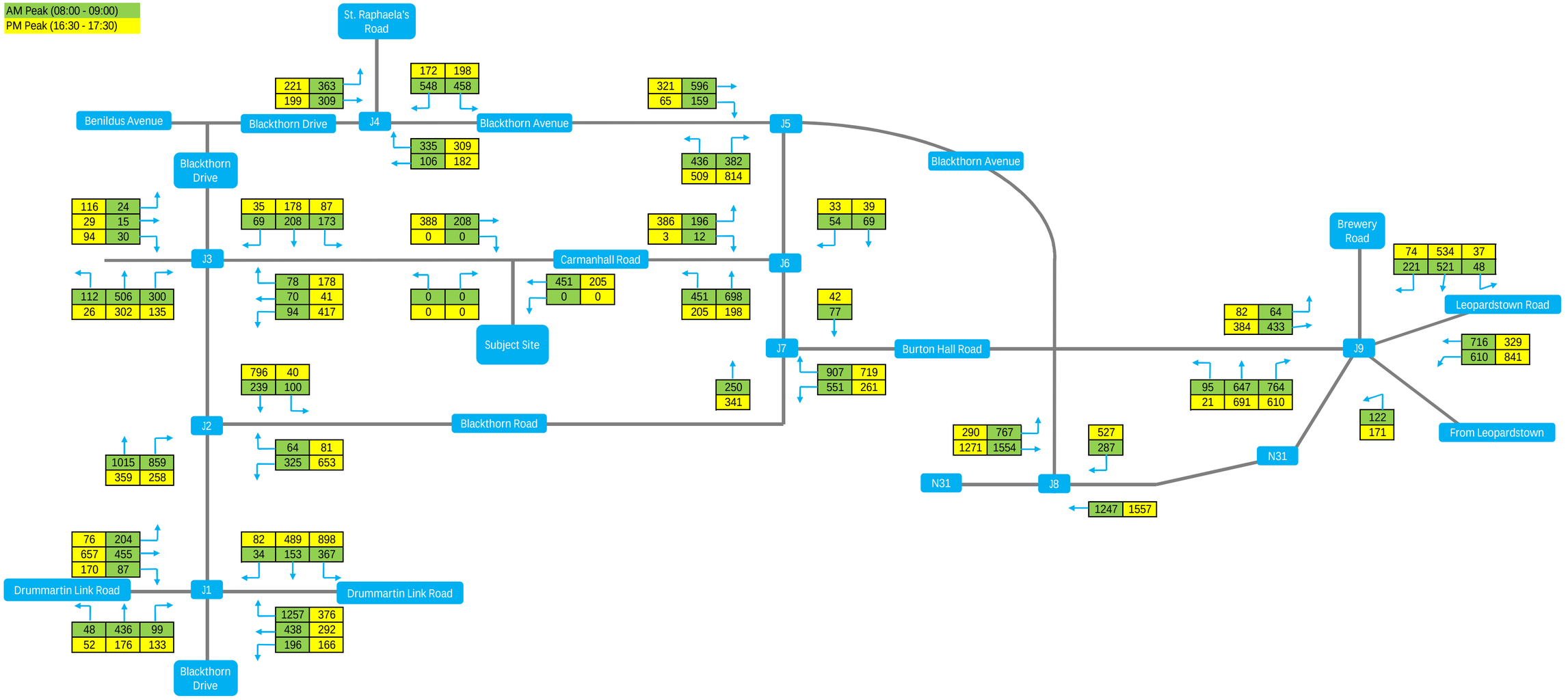
A Mobility Management Plan has been prepared indicating the measures that will be implemented by the management company to promote more sustainable forms of transport to staff / visitors

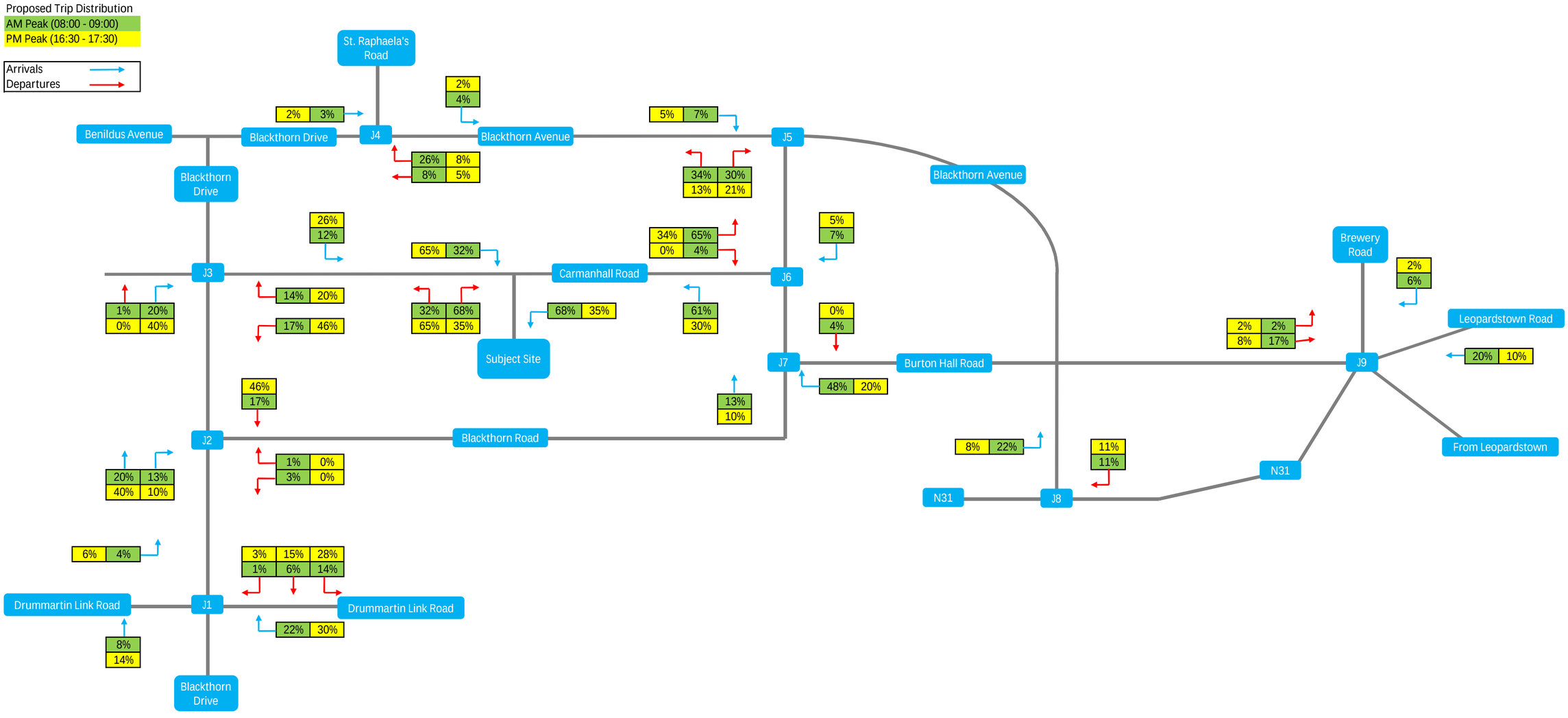
An outline for the Construction Traffic Management Plan has been prepared indicating the potential construction traffic route and measures that could be implemented by the contractor to minimise the impact on the surrounding road network, this will be subject to agreement with Dun Laoghaire Rathdown County Council Roads Department.

It is AECOM's considered opinion that there is no traffic or transportation reason why this development should not proceed.

Appendix A Network Flow Diagrams

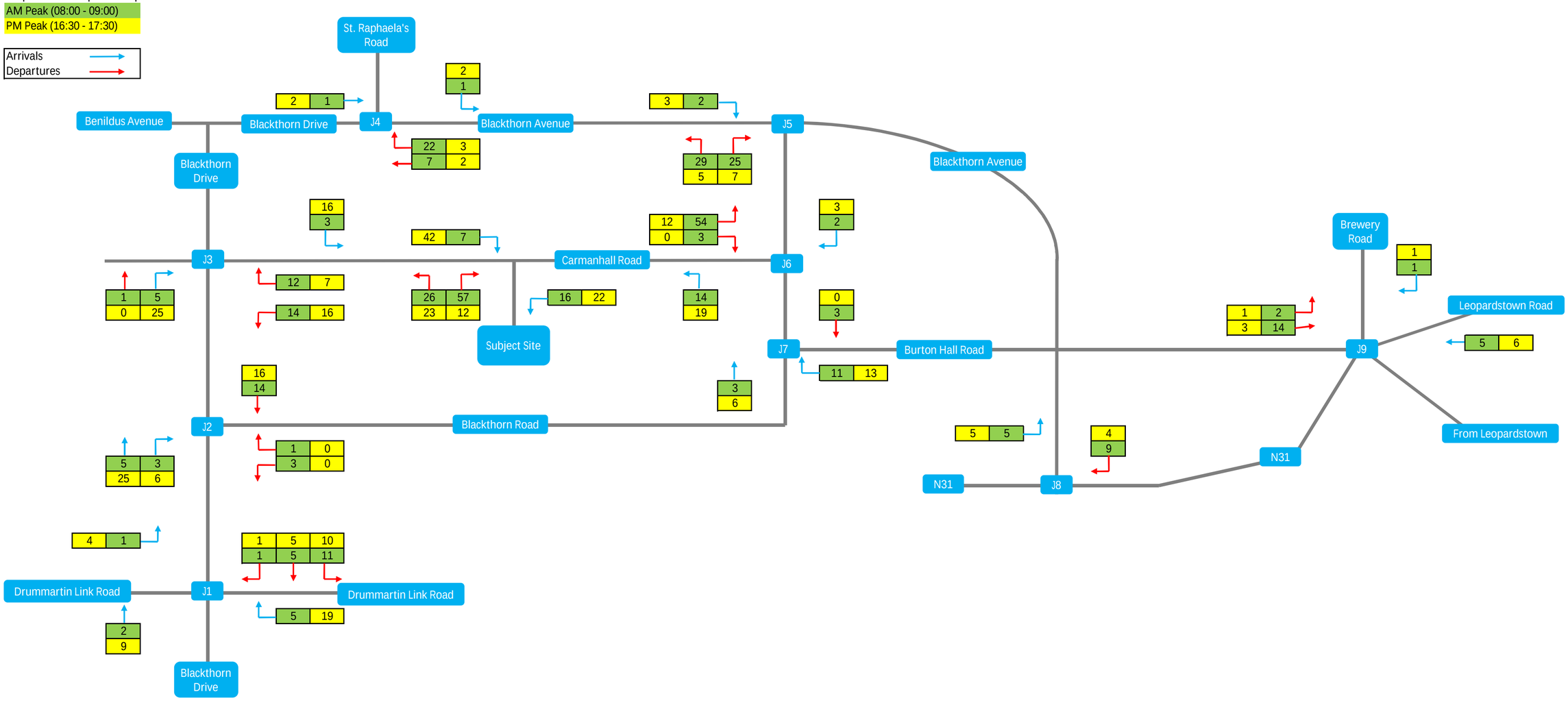
2020 Baseline Traffic Flows
AM Peak (08:00 - 09:00)
PM Peak (16:30 - 17:30)




Proposed Trip Distribution
AM Peak (08:00 - 09:00)
PM Peak (16:30 - 17:30)
Arrivals
Departures
St. Raphaela's Road
Benildus Avenue
Blackthorn Drive
J4
Blackthorn Avenue
J5
Blackthorn Avenue
Blackthorn Drive
J3
Carmanhall Road
J6
Subject Site
J7
Burton Hall Road
J9
Brewery Road
Leopardstown Road
From Leopardstown
N31
J8
N31
J2
Blackthorn Road
Drummartin Link Road
J1
Drummartin Link Road
Blackthorn Drive
2% 3%
2% 4%
5% 7%
26% 8%
8% 5%
34% 30%
13% 21%
26% 12%
65% 32%
34% 65%
0% 4%
5% 7%
1% 20%
0% 40%
14% 20%
17% 46%
32% 68%
65% 35%
68% 35%
61% 30%
0% 4%
2% 2%
8% 17%
2% 6%
20% 10%
48% 20%
46% 17%
13% 10%
8% 22%
11% 11%
20% 13%
40% 10%
1% 0%
3% 0%
6% 4%
3% 15% 28%
1% 6% 14%
22% 30%
8% 14%

Proposed Development Trips
AM Peak (08:00 - 09:00)
PM Peak (16:30 - 17:30)

Arrivals
Departures

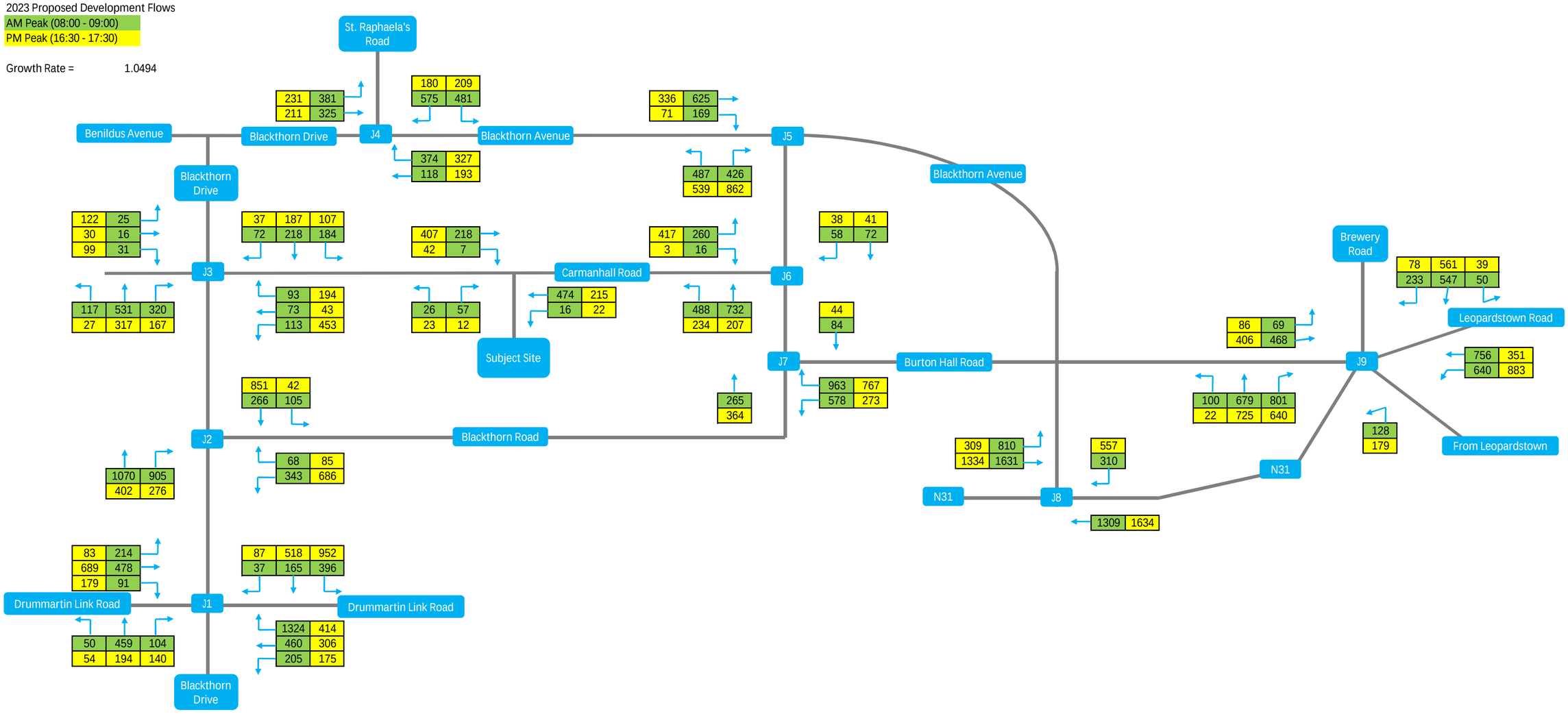


2023 Proposed Development Flows

AM Peak (08:00 - 09:00)

PM Peak (16:30 - 17:30)

Growth Rate = 1.0494

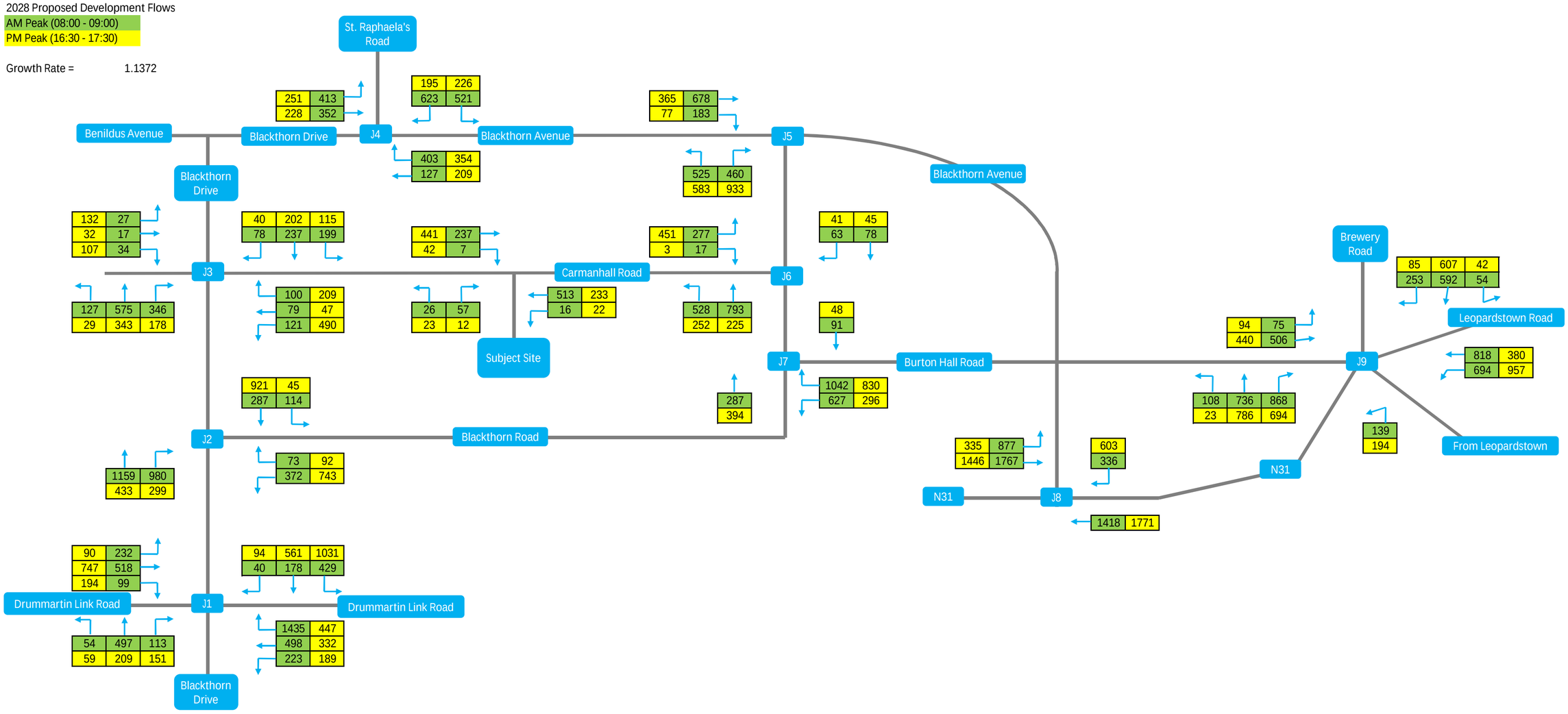


2028 Proposed Development Flows

AM Peak (08:00 - 09:00)

PM Peak (16:30 - 17:30)

Growth Rate = 1.1372

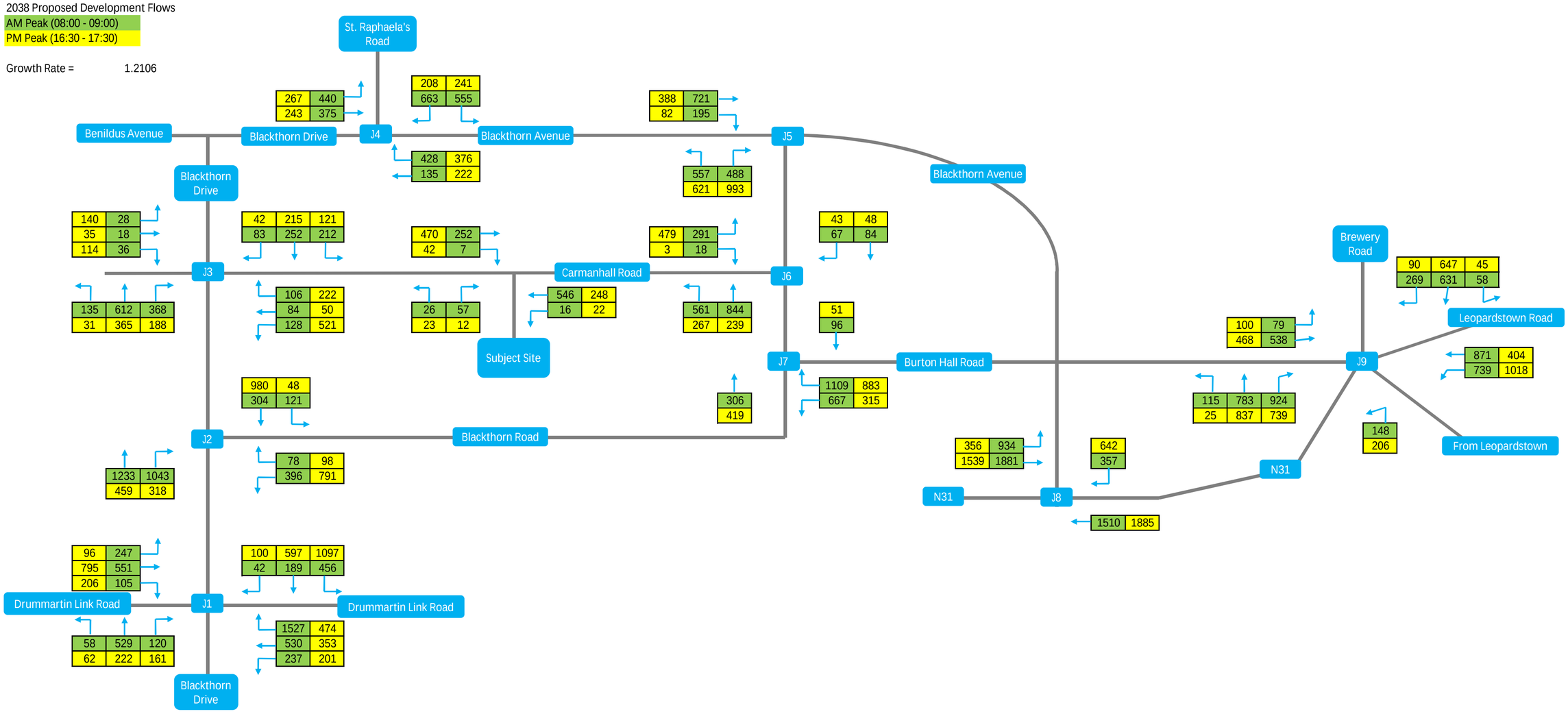


2038 Proposed Development Flows

AM Peak (08:00 - 09:00)

PM Peak (16:30 - 17:30)

Growth Rate = 1.2106



Appendix B TRICS

Calculation Reference: AUDIT-204602-210121-0134

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

02	SOUTH EAST		
	BD	BEDFORDSHIRE	3 days
	EX	ESSEX	2 days
	HC	HAMPSHIRE	1 days
	HF	HERTFORDSHIRE	1 days
03	SOUTH WEST		
	DC	DORSET	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
	NF	NORFOLK	2 days
	SF	SUFFOLK	2 days
05	EAST MIDLANDS		
	DS	DERBYSHIRE	1 days
	NT	NOTTINGHAMSHIRE	2 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	RI	EAST RIDING OF YORKSHIRE	1 days
08	NORTH WEST		
	MS	MERSEYSIDE	2 days
09	NORTH		
	CB	CUMBRIA	2 days
10	WALES		
	CO	CONWY	1 days
11	SCOTLAND		
	EB	CITY OF EDINBURGH	1 days
	SA	SOUTH AYRSHIRE	1 days
	SR	STIRLING	2 days
12	CONNAUGHT		
	GA	GALWAY	1 days
14	LEINSTER		
	LU	LOUTH	3 days
15	GREATER DUBLIN		
	DL	DUBLIN	3 days
16	ULSTER (REPUBLIC OF IRELAND)		
	MG	MONAGHAN	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: 6 to 184 (units:)
Range Selected by User: 6 to 372 (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 18/11/19

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	14 days
Wednesday	7 days
Thursday	5 days
Friday	3 days

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

Selected survey types:

Manual count	35 days
Directional ATC Count	0 days

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

Selected Locations:

Edge of Town Centre	17
Suburban Area (PPS6 Out of Centre)	15
Edge of Town	3

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

Selected Location Sub Categories:

Development Zone	2
Residential Zone	20
Built-Up Zone	5
No Sub Category	8

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

Secondary Filtering selection:

Use Class:

C3	35 days

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

Population within 500m Range:
All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,001 to 5,000	3 days
5,001 to 10,000	2 days
10,001 to 15,000	8 days
15,001 to 20,000	4 days
20,001 to 25,000	6 days
25,001 to 50,000	12 days

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

Population within 5 miles:

5,001 to 25,000	2 days
25,001 to 50,000	4 days
50,001 to 75,000	10 days
75,001 to 100,000	2 days
125,001 to 250,000	6 days
250,001 to 500,000	7 days
500,001 or More	4 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	11 days
1.1 to 1.5	24 days

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

Travel Plan:

Yes	2 days
No	33 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	35 days

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

LIST OF SITES relevant to selection parameters

1 AN-03-C-02 BLOCK OF FLATS ANTRIM
SUMMERHILL AVENUE
BELFAST
KNOCK
Edge of Town
Residential Zone
Total No of Dwellings: 22
Survey date: FRIDAY *28/11/14* *Survey Type: MANUAL*

2 BD-03-C-01 BLOCKS OF FLATS BEDFORDSHIRE
WING ROAD
LEIGHTON BUZZARD
LINSLADE
Edge of Town Centre
Residential Zone
Total No of Dwellings: 175
Survey date: TUESDAY *15/05/18* *Survey Type: MANUAL*

3 BD-03-C-02 BLOCKS OF FLATS BEDFORDSHIRE
STANBRIDGE ROAD
LEIGHTON BUZZARD

Edge of Town Centre
Residential Zone
Total No of Dwellings: 62
Survey date: TUESDAY *15/05/18* *Survey Type: MANUAL*

4 BD-03-C-03 BLOCKS OF FLATS BEDFORDSHIRE
COURT DRIVE
DUNSTABLE

Edge of Town Centre
No Sub Category
Total No of Dwellings: 146
Survey date: TUESDAY *15/05/18* *Survey Type: MANUAL*

5 CA-03-C-03 BLOCKS OF FLATS CAMBRIDGESHIRE
CROMWELL ROAD
CAMBRIDGE

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total No of Dwellings: 82
Survey date: MONDAY *18/09/17* *Survey Type: MANUAL*

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

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

7 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*

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

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 37
Survey date: MONDAY *26/03/18* *Survey Type: MANUAL*

9 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*

LIST OF SITES relevant to selection parameters (Cont.)

10 DL-03-C-12 BLOCK OF FLATS DUBLIN
BOOTERSTOWN AVENUE
DUBLIN

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 47
Survey date: TUESDAY *10/09/13* *Survey Type: MANUAL*

11 DL-03-C-14 BLOCKS OF FLATS DUBLIN
BALLINTEER ROAD
DUBLIN
DUNDRUM
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 140
Survey date: TUESDAY *10/09/13* *Survey Type: MANUAL*

12 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*

13 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*

14 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*

15 EX-03-C-01 FLATS ESSEX
WESTCLIFF PARADE
SOUTHEND-ON-SEA
WESTCLIFF
Edge of Town Centre
Residential Zone
Total No of Dwellings: 6
Survey date: TUESDAY *22/10/13* *Survey Type: MANUAL*

16 EX-03-C-02 BLOCK OF FLATS ESSEX
WESTCLIFF PARADE
SOUTHEND-ON-SEA
WESTCLIFF
Edge of Town Centre
Residential Zone
Total No of Dwellings: 94
Survey date: TUESDAY *22/10/13* *Survey Type: MANUAL*

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

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

LIST OF SITES relevant to selection parameters (Cont.)

18 HC-03-C-01 BLOCKS OF FLATS HAMPSHIRE
CROSS STREET
PORTSMOUTH

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 90
Survey date: TUESDAY *05/06/18* *Survey Type: MANUAL*

19 HF-03-C-03 BLOCK OF FLATS HERTFORDSHIRE
SHENLEY ROAD
BOREHAMWOOD

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 91
Survey date: THURSDAY *14/11/19* *Survey Type: MANUAL*

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

Edge of Town Centre
Residential Zone
Total No of Dwellings: 52
Survey date: THURSDAY *12/09/13* *Survey Type: MANUAL*

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

Edge of Town Centre
Residential Zone
Total No of Dwellings: 33
Survey date: MONDAY *16/09/13* *Survey Type: MANUAL*

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

Edge of Town Centre
Residential Zone
Total No of Dwellings: 20
Survey date: MONDAY *16/09/13* *Survey Type: MANUAL*

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

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

24 MS-03-C-02 BLOCKS OF FLATS MERSEYSIDE
SOUTH FERRY QUAY
LIVERPOOL
BRUNSWICK DOCK
Suburban Area (PPS6 Out of Centre)
Development Zone
Total No of Dwellings: 184
Survey date: TUESDAY *13/11/18* *Survey Type: MANUAL*

25 MS-03-C-03 BLOCK OF FLATS MERSEYSIDE
MARINERS WHARF
LIVERPOOL
QUEENS DOCK
Suburban Area (PPS6 Out of Centre)
Development Zone
Total No of Dwellings: 9
Survey date: TUESDAY *13/11/18* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

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

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 51
Survey date: THURSDAY *11/12/14* *Survey Type: MANUAL*

27 NF-03-C-02 MIXED FLATS & HOUSES NORFOLK
HALL ROAD
NORWICH
LAKENHAM

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 82
Survey date: MONDAY *18/11/19* *Survey Type: MANUAL*

28 NT-03-C-01 HOUSES (SPLIT INTO FLATS) NOTTINGHAMSHIRE
LAWRENCE WAY
NOTTINGHAM

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total No of Dwellings: 56
Survey date: TUESDAY *08/11/16* *Survey Type: MANUAL*

29 NT-03-C-02 HOUSES (SPLIT INTO FLATS) NOTTINGHAMSHIRE
CASTLE MARINA ROAD
NOTTINGHAM

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total No of Dwellings: 135
Survey date: WEDNESDAY *09/11/16* *Survey Type: MANUAL*

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

Edge of Town
Residential Zone
Total No of Dwellings: 20
Survey date: TUESDAY *13/05/14* *Survey Type: MANUAL*

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

Edge of Town Centre
Residential Zone
Total No of Dwellings: 51
Survey date: TUESDAY *16/09/14* *Survey Type: MANUAL*

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

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 85
Survey date: THURSDAY *18/12/14* *Survey Type: MANUAL*

33 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*

LIST OF SITES relevant to selection parameters (Cont.)

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

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

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

Edge of Town Centre
Residential Zone
Total No of Dwellings: 48
Survey date: WEDNESDAY 18/06/14 Survey Type: MANUAL

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

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED
MULTI-MODAL TOTAL 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	35	62	0.043	35	62	0.149	35	62	0.192
08:00 - 09:00	35	62	0.055	35	62	0.194	35	62	0.249
09:00 - 10:00	35	62	0.076	35	62	0.104	35	62	0.180
10:00 - 11:00	35	62	0.064	35	62	0.084	35	62	0.148
11:00 - 12:00	35	62	0.072	35	62	0.084	35	62	0.156
12:00 - 13:00	35	62	0.098	35	62	0.092	35	62	0.190
13:00 - 14:00	35	62	0.073	35	62	0.087	35	62	0.160
14:00 - 15:00	35	62	0.083	35	62	0.082	35	62	0.165
15:00 - 16:00	35	62	0.104	35	62	0.065	35	62	0.169
16:00 - 17:00	35	62	0.119	35	62	0.076	35	62	0.195
17:00 - 18:00	35	62	0.179	35	62	0.086	35	62	0.265
18:00 - 19:00	35	62	0.168	35	62	0.097	35	62	0.265
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.134			1.200			2.334

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

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

Parameter summary

Trip rate parameter range selected:	6 - 184 (units:)
Survey date date range:	01/01/12 - 18/11/19
Number of weekdays (Monday-Friday):	35
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
MULTI-MODAL TAXIS
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	35	62	0.004	35	62	0.004	35	62	0.008
08:00 - 09:00	35	62	0.002	35	62	0.001	35	62	0.003
09:00 - 10:00	35	62	0.004	35	62	0.004	35	62	0.008
10:00 - 11:00	35	62	0.001	35	62	0.002	35	62	0.003
11:00 - 12:00	35	62	0.006	35	62	0.006	35	62	0.012
12:00 - 13:00	35	62	0.004	35	62	0.003	35	62	0.007
13:00 - 14:00	35	62	0.004	35	62	0.004	35	62	0.008
14:00 - 15:00	35	62	0.003	35	62	0.003	35	62	0.006
15:00 - 16:00	35	62	0.004	35	62	0.004	35	62	0.008
16:00 - 17:00	35	62	0.004	35	62	0.004	35	62	0.008
17:00 - 18:00	35	62	0.003	35	62	0.003	35	62	0.006
18:00 - 19:00	35	62	0.005	35	62	0.005	35	62	0.010
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.044			0.043			0.087

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
MULTI-MODAL 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	35	62	0.002	35	62	0.002	35	62	0.004
08:00 - 09:00	35	62	0.001	35	62	0.000	35	62	0.001
09:00 - 10:00	35	62	0.003	35	62	0.003	35	62	0.006
10:00 - 11:00	35	62	0.000	35	62	0.001	35	62	0.001
11:00 - 12:00	35	62	0.000	35	62	0.000	35	62	0.000
12:00 - 13:00	35	62	0.002	35	62	0.002	35	62	0.004
13:00 - 14:00	35	62	0.000	35	62	0.001	35	62	0.001
14:00 - 15:00	35	62	0.001	35	62	0.001	35	62	0.002
15:00 - 16:00	35	62	0.001	35	62	0.000	35	62	0.001
16:00 - 17:00	35	62	0.001	35	62	0.001	35	62	0.002
17:00 - 18:00	35	62	0.000	35	62	0.000	35	62	0.000
18:00 - 19:00	35	62	0.000	35	62	0.000	35	62	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.011			0.011			0.022

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
MULTI-MODAL 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	35	62	0.000	35	62	0.000	35	62	0.000
08:00 - 09:00	35	62	0.000	35	62	0.000	35	62	0.000
09:00 - 10:00	35	62	0.000	35	62	0.000	35	62	0.000
10:00 - 11:00	35	62	0.000	35	62	0.000	35	62	0.000
11:00 - 12:00	35	62	0.000	35	62	0.000	35	62	0.000
12:00 - 13:00	35	62	0.000	35	62	0.000	35	62	0.000
13:00 - 14:00	35	62	0.000	35	62	0.000	35	62	0.000
14:00 - 15:00	35	62	0.000	35	62	0.000	35	62	0.000
15:00 - 16:00	35	62	0.000	35	62	0.000	35	62	0.000
16:00 - 17:00	35	62	0.000	35	62	0.001	35	62	0.001
17:00 - 18:00	35	62	0.000	35	62	0.000	35	62	0.000
18:00 - 19:00	35	62	0.000	35	62	0.000	35	62	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			0.001			0.001

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

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	35	62	0.003	35	62	0.010	35	62	0.013
08:00 - 09:00	35	62	0.003	35	62	0.017	35	62	0.020
09:00 - 10:00	35	62	0.003	35	62	0.004	35	62	0.007
10:00 - 11:00	35	62	0.002	35	62	0.004	35	62	0.006
11:00 - 12:00	35	62	0.005	35	62	0.003	35	62	0.008
12:00 - 13:00	35	62	0.003	35	62	0.002	35	62	0.005
13:00 - 14:00	35	62	0.002	35	62	0.002	35	62	0.004
14:00 - 15:00	35	62	0.004	35	62	0.003	35	62	0.007
15:00 - 16:00	35	62	0.005	35	62	0.003	35	62	0.008
16:00 - 17:00	35	62	0.004	35	62	0.001	35	62	0.005
17:00 - 18:00	35	62	0.008	35	62	0.004	35	62	0.012
18:00 - 19:00	35	62	0.007	35	62	0.003	35	62	0.010
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.049			0.056			0.105

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
MULTI-MODAL VEHICLE OCCUPANTS
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	35	62	0.049	35	62	0.199	35	62	0.248
08:00 - 09:00	35	62	0.066	35	62	0.293	35	62	0.359
09:00 - 10:00	35	62	0.099	35	62	0.135	35	62	0.234
10:00 - 11:00	35	62	0.082	35	62	0.111	35	62	0.193
11:00 - 12:00	35	62	0.092	35	62	0.116	35	62	0.208
12:00 - 13:00	35	62	0.130	35	62	0.126	35	62	0.256
13:00 - 14:00	35	62	0.097	35	62	0.107	35	62	0.204
14:00 - 15:00	35	62	0.104	35	62	0.106	35	62	0.210
15:00 - 16:00	35	62	0.155	35	62	0.089	35	62	0.244
16:00 - 17:00	35	62	0.168	35	62	0.097	35	62	0.265
17:00 - 18:00	35	62	0.252	35	62	0.115	35	62	0.367
18:00 - 19:00	35	62	0.240	35	62	0.136	35	62	0.376
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.534			1.630			3.164

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

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	35	62	0.017	35	62	0.071	35	62	0.088
08:00 - 09:00	35	62	0.026	35	62	0.106	35	62	0.132
09:00 - 10:00	35	62	0.052	35	62	0.079	35	62	0.131
10:00 - 11:00	35	62	0.049	35	62	0.049	35	62	0.098
11:00 - 12:00	35	62	0.039	35	62	0.047	35	62	0.086
12:00 - 13:00	35	62	0.052	35	62	0.052	35	62	0.104
13:00 - 14:00	35	62	0.046	35	62	0.051	35	62	0.097
14:00 - 15:00	35	62	0.057	35	62	0.052	35	62	0.109
15:00 - 16:00	35	62	0.078	35	62	0.046	35	62	0.124
16:00 - 17:00	35	62	0.070	35	62	0.051	35	62	0.121
17:00 - 18:00	35	62	0.098	35	62	0.059	35	62	0.157
18:00 - 19:00	35	62	0.074	35	62	0.057	35	62	0.131
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.658			0.720			1.378

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
MULTI-MODAL BUS/TRAM PASSENGERS
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	35	62	0.001	35	62	0.033	35	62	0.034
08:00 - 09:00	35	62	0.005	35	62	0.076	35	62	0.081
09:00 - 10:00	35	62	0.006	35	62	0.026	35	62	0.032
10:00 - 11:00	35	62	0.008	35	62	0.015	35	62	0.023
11:00 - 12:00	35	62	0.009	35	62	0.010	35	62	0.019
12:00 - 13:00	35	62	0.016	35	62	0.017	35	62	0.033
13:00 - 14:00	35	62	0.011	35	62	0.021	35	62	0.032
14:00 - 15:00	35	62	0.016	35	62	0.015	35	62	0.031
15:00 - 16:00	35	62	0.040	35	62	0.014	35	62	0.054
16:00 - 17:00	35	62	0.031	35	62	0.007	35	62	0.038
17:00 - 18:00	35	62	0.052	35	62	0.013	35	62	0.065
18:00 - 19:00	35	62	0.041	35	62	0.019	35	62	0.060
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.236			0.266			0.502

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
MULTI-MODAL TOTAL RAIL PASSENGERS
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	35	62	0.000	35	62	0.024	35	62	0.024
08:00 - 09:00	35	62	0.000	35	62	0.024	35	62	0.024
09:00 - 10:00	35	62	0.001	35	62	0.007	35	62	0.008
10:00 - 11:00	35	62	0.003	35	62	0.004	35	62	0.007
11:00 - 12:00	35	62	0.001	35	62	0.004	35	62	0.005
12:00 - 13:00	35	62	0.003	35	62	0.002	35	62	0.005
13:00 - 14:00	35	62	0.002	35	62	0.003	35	62	0.005
14:00 - 15:00	35	62	0.002	35	62	0.003	35	62	0.005
15:00 - 16:00	35	62	0.006	35	62	0.003	35	62	0.009
16:00 - 17:00	35	62	0.011	35	62	0.001	35	62	0.012
17:00 - 18:00	35	62	0.019	35	62	0.000	35	62	0.019
18:00 - 19:00	35	62	0.017	35	62	0.001	35	62	0.018
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.065			0.076			0.141

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
MULTI-MODAL COACH PASSENGERS
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	35	62	0.000	35	62	0.000	35	62	0.000
08:00 - 09:00	35	62	0.000	35	62	0.000	35	62	0.000
09:00 - 10:00	35	62	0.000	35	62	0.000	35	62	0.000
10:00 - 11:00	35	62	0.000	35	62	0.001	35	62	0.001
11:00 - 12:00	35	62	0.005	35	62	0.000	35	62	0.005
12:00 - 13:00	35	62	0.000	35	62	0.000	35	62	0.000
13:00 - 14:00	35	62	0.000	35	62	0.000	35	62	0.000
14:00 - 15:00	35	62	0.000	35	62	0.000	35	62	0.000
15:00 - 16:00	35	62	0.000	35	62	0.000	35	62	0.000
16:00 - 17:00	35	62	0.000	35	62	0.000	35	62	0.000
17:00 - 18:00	35	62	0.001	35	62	0.000	35	62	0.001
18:00 - 19:00	35	62	0.000	35	62	0.000	35	62	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.006			0.001			0.007

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

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	35	62	0.002	35	62	0.058	35	62	0.060
08:00 - 09:00	35	62	0.006	35	62	0.100	35	62	0.106
09:00 - 10:00	35	62	0.007	35	62	0.033	35	62	0.040
10:00 - 11:00	35	62	0.011	35	62	0.019	35	62	0.030
11:00 - 12:00	35	62	0.014	35	62	0.014	35	62	0.028
12:00 - 13:00	35	62	0.019	35	62	0.019	35	62	0.038
13:00 - 14:00	35	62	0.013	35	62	0.024	35	62	0.037
14:00 - 15:00	35	62	0.017	35	62	0.019	35	62	0.036
15:00 - 16:00	35	62	0.047	35	62	0.017	35	62	0.064
16:00 - 17:00	35	62	0.042	35	62	0.009	35	62	0.051
17:00 - 18:00	35	62	0.073	35	62	0.014	35	62	0.087
18:00 - 19:00	35	62	0.059	35	62	0.020	35	62	0.079
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.310			0.346			0.656

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
MULTI-MODAL TOTAL PEOPLE
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	35	62	0.071	35	62	0.338	35	62	0.409
08:00 - 09:00	35	62	0.102	35	62	0.517	35	62	0.619
09:00 - 10:00	35	62	0.162	35	62	0.251	35	62	0.413
10:00 - 11:00	35	62	0.144	35	62	0.183	35	62	0.327
11:00 - 12:00	35	62	0.150	35	62	0.180	35	62	0.330
12:00 - 13:00	35	62	0.205	35	62	0.198	35	62	0.403
13:00 - 14:00	35	62	0.159	35	62	0.184	35	62	0.343
14:00 - 15:00	35	62	0.182	35	62	0.179	35	62	0.361
15:00 - 16:00	35	62	0.285	35	62	0.154	35	62	0.439
16:00 - 17:00	35	62	0.284	35	62	0.158	35	62	0.442
17:00 - 18:00	35	62	0.431	35	62	0.192	35	62	0.623
18:00 - 19:00	35	62	0.380	35	62	0.216	35	62	0.596
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.555			2.750			5.305

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
MULTI-MODAL 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	35	62	0.027	35	62	0.105	35	62	0.132
08:00 - 09:00	35	62	0.033	35	62	0.134	35	62	0.167
09:00 - 10:00	35	62	0.042	35	62	0.057	35	62	0.099
10:00 - 11:00	35	62	0.041	35	62	0.050	35	62	0.091
11:00 - 12:00	35	62	0.036	35	62	0.050	35	62	0.086
12:00 - 13:00	35	62	0.057	35	62	0.053	35	62	0.110
13:00 - 14:00	35	62	0.039	35	62	0.051	35	62	0.090
14:00 - 15:00	35	62	0.043	35	62	0.049	35	62	0.092
15:00 - 16:00	35	62	0.065	35	62	0.037	35	62	0.102
16:00 - 17:00	35	62	0.080	35	62	0.045	35	62	0.125
17:00 - 18:00	35	62	0.122	35	62	0.059	35	62	0.181
18:00 - 19:00	35	62	0.110	35	62	0.066	35	62	0.176
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.695			0.756			1.451

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
MULTI-MODAL 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	35	62	0.003	35	62	0.006	35	62	0.009
08:00 - 09:00	35	62	0.007	35	62	0.009	35	62	0.016
09:00 - 10:00	35	62	0.010	35	62	0.007	35	62	0.017
10:00 - 11:00	35	62	0.008	35	62	0.010	35	62	0.018
11:00 - 12:00	35	62	0.012	35	62	0.012	35	62	0.024
12:00 - 13:00	35	62	0.013	35	62	0.011	35	62	0.024
13:00 - 14:00	35	62	0.006	35	62	0.011	35	62	0.017
14:00 - 15:00	35	62	0.006	35	62	0.006	35	62	0.012
15:00 - 16:00	35	62	0.009	35	62	0.006	35	62	0.015
16:00 - 17:00	35	62	0.008	35	62	0.009	35	62	0.017
17:00 - 18:00	35	62	0.007	35	62	0.005	35	62	0.012
18:00 - 19:00	35	62	0.005	35	62	0.004	35	62	0.009
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.094			0.096			0.190

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
MULTI-MODAL 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	35	62	0.000	35	62	0.000	35	62	0.000
08:00 - 09:00	35	62	0.000	35	62	0.000	35	62	0.000
09:00 - 10:00	35	62	0.000	35	62	0.000	35	62	0.000
10:00 - 11:00	35	62	0.000	35	62	0.000	35	62	0.000
11:00 - 12:00	35	62	0.000	35	62	0.000	35	62	0.000
12:00 - 13:00	35	62	0.000	35	62	0.000	35	62	0.000
13:00 - 14:00	35	62	0.001	35	62	0.001	35	62	0.002
14:00 - 15:00	35	62	0.000	35	62	0.000	35	62	0.000
15:00 - 16:00	35	62	0.001	35	62	0.000	35	62	0.001
16:00 - 17:00	35	62	0.000	35	62	0.000	35	62	0.000
17:00 - 18:00	35	62	0.001	35	62	0.002	35	62	0.003
18:00 - 19:00	35	62	0.001	35	62	0.001	35	62	0.002
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.004			0.004			0.008

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

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

Appendix C Junctions 9 Outputs

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: Site Access_Carmanhall Rd_Blackthorn Rd.j9
Path: \\eu.aecomnet.com\EMIA\UKI\IEDBL2\Jobs\PR-461030_Avid,_Sandyford_Marlet\400_Technical\404_CE\Traffic
Report generation date: 21/01/2021 15:44:09

Summary of junction performance

	AM		PM	
	Queue (PCU)	RFC	Queue (PCU)	RFC
2020 Baseline				
Junction 1 - Stream B-AC	0.0	0.00	0.0	0.00
Junction 1 - Stream C-AB	0.0	0.00	0.0	0.00
Junction 1 - Stream A-BC	0.4	0.25	0.1	0.12
Junction 2 - Stream B-AC	1.0	0.49	2.2	0.67
Junction 2 - Stream C-AB	0.3	0.18	0.1	0.07
Junction 2 - Stream A-BC	1.3	0.54	0.3	0.19
2023 Without Development				
Junction 1 - Stream B-AC	0.0	0.00	0.0	0.00
Junction 1 - Stream C-AB	0.0	0.00	0.0	0.00
Junction 1 - Stream A-BC	0.4	0.27	0.2	0.12
Junction 2 - Stream B-AC	1.2	0.52	2.6	0.71
Junction 2 - Stream C-AB	0.3	0.19	0.1	0.08
Junction 2 - Stream A-BC	1.4	0.57	0.3	0.20
2028 Without Development				

Junction 1 - Stream B-AC	0.0	0.00	0.0	0.00
Junction 1 - Stream C-AB	0.0	0.00	0.0	0.00
Junction 1 - Stream A-BC	0.4	0.29	0.2	0.13
Junction 2 - Stream B-AC	1.5	0.59	3.5	0.77
Junction 2 - Stream C-AB	0.4	0.22	0.1	0.08
Junction 2 - Stream A-BC	1.8	0.62	0.3	0.22
	2038 Without Development			
Junction 1 - Stream B-AC	0.0	0.00	0.0	0.00
Junction 1 - Stream C-AB	0.0	0.00	0.0	0.00
Junction 1 - Stream A-BC	0.5	0.31	0.2	0.14
Junction 2 - Stream B-AC	2.0	0.66	4.9	0.83
Junction 2 - Stream C-AB	0.5	0.25	0.1	0.09
Junction 2 - Stream A-BC	2.1	0.66	0.3	0.23
	2023 With Development			
Junction 1 - Stream B-AC	0.3	0.24	0.1	0.08
Junction 1 - Stream C-AB	0.0	0.02	0.3	0.11
Junction 1 - Stream A-BC	0.4	0.28	0.2	0.13
Junction 2 - Stream B-AC	2.1	0.66	2.8	0.73
Junction 2 - Stream C-AB	0.3	0.20	0.1	0.08
Junction 2 - Stream A-BC	1.5	0.58	0.3	0.21
	2028 With Development			
Junction 1 - Stream B-AC	0.3	0.24	0.1	0.08
Junction 1 - Stream C-AB	0.0	0.02	0.3	0.11
Junction 1 - Stream A-BC	0.5	0.30	0.2	0.14
Junction 2 - Stream B-AC	2.9	0.74	4.0	0.80
Junction 2 - Stream C-AB	0.4	0.23	0.1	0.09
Junction 2 - Stream A-BC	1.8	0.62	0.3	0.23
	2038 With Development			
Junction 1 - Stream B-AC	0.4	0.25	0.1	0.08
Junction 1 - Stream C-AB	0.0	0.02	0.3	0.12
Junction 1 - Stream A-BC	0.5	0.32	0.2	0.15
Junction 2 - Stream B-AC	4.1	0.81	5.7	0.85
Junction 2 - Stream C-AB	0.5	0.26	0.1	0.10
Junction 2 - Stream A-BC	2.1	0.66	0.3	0.24

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

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

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	18/06/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	EU\Zac.Cave
Description	

Units

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

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D1	2020 Baseline	AM	ONE HOUR	07:45	09:15	15	✓		
D2	2020 Baseline	PM	ONE HOUR	16:15	17:45	15	✓		
D3	Development Flows	AM	ONE HOUR	07:45	09:15	15			
D4	Development Flows	PM	ONE HOUR	16:15	17:45	15			
D5	2023 Without Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D1*1.0494
D6	2023 Without Development	PM	ONE HOUR	16:15	17:45	15	✓	Simple	D2*1.0494
D7	2028 Without Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D1*1.1372
D8	2028 Without Development	PM	ONE HOUR	16:15	17:45	15	✓	Simple	D2*1.1372
D9	2038 Without Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D1*1.2106
D10	2038 Without Development	PM	ONE HOUR	16:15	17:45	15	✓	Simple	D2*1.2106
D11	2023 With Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D3+D5
D12	2023 With Development	PM	ONE HOUR	16:15	17:45	15	✓	Simple	D4+D6
D13	2028 With Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D3+D7
D14	2028 With Development	PM	ONE HOUR	16:15	17:45	15	✓	Simple	D4+D8
D15	2038 With Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D3+D9
D16	2038 With Development	PM	ONE HOUR	16:15	17:45	15	✓	Simple	D4+D10

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2020 Baseline, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	1.87	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	5.66	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Junction	Arm	Name	Description	Arm type
1	A	Carmanhall Road (Eastern Arm)		Major
	B	Site Access		Minor
	C	Carmanhall Road (Western Arm)		Major
2	A	Blackthorn Road (Southern Arm)		Major
	B	Carmanhall Road (Western Arm)		Minor
	C	Blackthorn Road (Northern Arm)		Major

Major Arm Geometry

Junction	Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
1	C	8.10			90.0	✓	0.00
2	C	9.50			55.0	✓	0.00

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

Minor Arm Geometry

Junction	Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
1	B	One lane	2.75	76	14
2	B	One lane	4.05	45	34

Pelican/Puffin Crossings

Junction	Arm	Space between crossing and junction entry (Signalised) (PCU)	Amber time preceding red (s)	Amber time regarded as green (s)	Time from traffic red start to green man start (s)	Time period green man shown (s)	Clearance Period (s)	Traffic minimum green (s)
1	A	1.00	3.00	2.90	1.00	6.00	6.00	7.00
2	A	5.20	3.00	2.90	1.00	6.00	6.00	7.00

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	496	0.082	0.208	0.131	0.297
1	B-C	617	0.086	0.217	-	-
1	C-B	626	0.220	0.220	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B

2	B-A	562	0.087	0.219	0.138	0.314
2	B-C	713	0.093	0.234	-	-
2	C-B	606	0.199	0.199	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2020 Baseline	AM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	**A**		ONE HOUR	✓	451	100.000
	B		ONE HOUR	✓	0	100.000
	C		ONE HOUR	✓	208	100.000
2	**A**		ONE HOUR	✓	1149	100.000
	B		ONE HOUR	✓	208	100.000
	C		ONE HOUR	✓	123	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	**A**	Global	10.00
	B		
	C		
2	**A**	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	**B**	**C**
From	**A**	0	0	451
	B	0	0	0
	C	208	0	0

Demand (PCU/hr)

Junction 2

		To		
		A	**B**	**C**
From	**A**	0	451	698
	B	12	0	196
	C	69	54	0

Vehicle Mix

Heavy Vehicle Percentages

Junction 1

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Heavy Vehicle Percentages

Junction 2

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.00	0.00	0.0	A	0	0
	C-AB	0.00	0.00	0.0	A	0	0
	C-A					191	286
	A-BC	0.25	2.73	0.4	A	414	621
2	B-AC	0.49	16.27	1.0	C	191	286
	C-AB	0.18	11.61	0.3	B	58	88
	C-A					54	82
	A-BC	0.54	3.70	1.3	A	1054	1582

2020 Baseline, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	0.79	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	9.71	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2020 Baseline	PM	ONE HOUR	16:15	17:45	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	205	100.000
	B		ONE HOUR	✓	0	100.000
	C		ONE HOUR	✓	388	100.000
2	A		ONE HOUR	✓	403	100.000
	B		ONE HOUR	✓	389	100.000
	C		ONE HOUR	✓	72	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	0	205
	B	0	0	0
	C	388	0	0

Demand (PCU/hr)

Junction 2

		To		
		A	B	C
From	A	0	205	198
	B	3	0	386
	C	39	33	0

Vehicle Mix

Heavy Vehicle Percentages

Junction 1

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Heavy Vehicle Percentages

Junction 2

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.00	0.00	0.0	A	0	0
	C-AB	0.00	0.00	0.0	A	0	0
	C-A					356	534
	A-BC	0.12	2.30	0.1	A	188	282
2	B-AC	0.67	18.69	2.2	C	357	535
	C-AB	0.07	7.79	0.1	A	32	49
	C-A					34	50
	A-BC	0.19	2.09	0.3	A	370	555

2023 Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	1.90	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	6.10	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D5	2023 Without Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D1*1.0494

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	473	100.000
	B		ONE HOUR	✓	0	100.000
	C		ONE HOUR	✓	218	100.000
2	A		ONE HOUR	✓	1206	100.000
	B		ONE HOUR	✓	218	100.000
	C		ONE HOUR	✓	129	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Junction 1

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	0	473
	B	0	0	0
	C	218	0	0

Junction 2

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	473	732
	B	13	0	206
	C	72	57	0

Vehicle Mix

Junction 1

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	10
	B	0	0	0
	C	10	0	0

Junction 2

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.00	0.00	0.0	A	0	0
	C-AB	0.00	0.00	0.0	A	0	0
	C-A					200	300
	A-BC	0.27	2.77	0.4	A	434	651
2	B-AC	0.52	17.95	1.2	C	200	300
	C-AB	0.19	12.11	0.3	B	62	93
	C-A					56	85
	A-BC	0.57	3.93	1.4	A	1106	1660

2023 Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	0.80	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	10.82	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D6	2023 Without Development	PM	ONE HOUR	16:15	17:45	15	✓	Simple	D2*1.0494

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	215	100.000
	B		ONE HOUR	✓	0	100.000
	C		ONE HOUR	✓	407	100.000
2	A		ONE HOUR	✓	423	100.000
	B		ONE HOUR	✓	408	100.000
	C		ONE HOUR	✓	76	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	0	215
	B	0	0	0
	C	407	0	0

Demand (PCU/hr)

Junction 2

		To		
		A	B	C
From	A	0	215	208
	B	3	0	405
	C	41	35	0

Vehicle Mix

Junction 1

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	10
	B	0	0	0
	C	10	0	0

Junction 2

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.00	0.00	0.0	A	0	0
	C-AB	0.00	0.00	0.0	A	0	0
	C-A					374	560
	A-BC	0.12	2.31	0.2	A	197	296
2	B-AC	0.71	21.12	2.6	C	375	562
	C-AB	0.08	7.87	0.1	A	34	51
	C-A					35	53
	A-BC	0.20	2.12	0.3	A	388	582

2028 Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	1.96	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	7.11	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D7	2028 Without Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D1*1.1372

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	513	100.000
	B		ONE HOUR	✓	0	100.000
	C		ONE HOUR	✓	237	100.000
2	A		ONE HOUR	✓	1307	100.000
	B		ONE HOUR	✓	237	100.000
	C		ONE HOUR	✓	140	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	0	513
	B	0	0	0
	C	237	0	0

Demand (PCU/hr)

Junction 2

		To		
		A	B	C
From	A	0	513	794
	B	14	0	223
	C	78	61	0

Vehicle Mix

Junction 1

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	10
	B	0	0	0
	C	10	0	0

Junction 2

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.00	0.00	0.0	A	0	0
	C-AB	0.00	0.00	0.0	A	0	0
	C-A					217	326
	A-BC	0.29	2.86	0.4	A	471	706
2	B-AC	0.59	21.98	1.5	C	217	326
	C-AB	0.22	13.12	0.4	B	69	103
	C-A					59	89
	A-BC	0.62	4.42	1.8	A	1199	1798

2028 Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	0.81	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	13.65	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D8	2028 Without Development	PM	ONE HOUR	16:15	17:45	15	✓	Simple	D2*1.1372

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	233	100.000
	B		ONE HOUR	✓	0	100.000
	C		ONE HOUR	✓	441	100.000
2	A		ONE HOUR	✓	458	100.000
	B		ONE HOUR	✓	442	100.000
	C		ONE HOUR	✓	82	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	0	233
	B	0	0	0
	C	441	0	0

Demand (PCU/hr)

Junction 2

		To		
		A	B	C
From	A	0	233	225
	B	3	0	439
	C	44	38	0

Vehicle Mix

Heavy Vehicle Percentages

Junction 1

		To		
		A	B	C
From	A	0	0	10
	B	0	0	0
	C	10	0	0

Heavy Vehicle Percentages

Junction 2

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.00	0.00	0.0	A	0	0
	C-AB	0.00	0.00	0.0	A	0	0
	C-A					405	607
	A-BC	0.13	2.34	0.2	A	214	321
2	B-AC	0.77	27.34	3.5	D	406	609
	C-AB	0.08	8.00	0.1	A	37	56
	C-A					38	57
	A-BC	0.22	2.16	0.3	A	421	631

2038 Without Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	2.01	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	8.27	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D9	2038 Without Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D1*1.2106

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	546	100.000
	B		ONE HOUR	✓	0	100.000
	C		ONE HOUR	✓	252	100.000
2	A		ONE HOUR	✓	1391	100.000
	B		ONE HOUR	✓	252	100.000
	C		ONE HOUR	✓	149	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	0	546
	B	0	0	0
	C	252	0	0

Demand (PCU/hr)

Junction 2

		To		
		A	B	C
From	A	0	546	845
	B	15	0	237
	C	84	65	0

Vehicle Mix

Junction 1

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	10
	B	0	0	0
	C	10	0	0

Junction 2

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.00	0.00	0.0	A	0	0
	C-AB	0.00	0.00	0.0	A	0	0
	C-A					231	347
	A-BC	0.31	2.94	0.5	A	501	752
2	B-AC	0.66	27.02	2.0	D	231	347
	C-AB	0.25	14.14	0.5	B	75	112
	C-A					62	92
	A-BC	0.66	4.93	2.1	A	1276	1915

2038 Without Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	0.82	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	17.51	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D10	2038 Without Development	PM	ONE HOUR	16:15	17:45	15	✓	Simple	D2*1.2106

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	248	100.000
	B		ONE HOUR	✓	0	100.000
	C		ONE HOUR	✓	470	100.000
2	A		ONE HOUR	✓	488	100.000
	B		ONE HOUR	✓	471	100.000
	C		ONE HOUR	✓	87	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	0	248
	B	0	0	0
	C	470	0	0

Demand (PCU/hr)

Junction 2

		To		
		A	B	C
From	A	0	248	240
	B	4	0	467
	C	47	40	0

Vehicle Mix

Junction 1

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	10
	B	0	0	0
	C	10	0	0

Junction 2

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.00	0.00	0.0	A	0	0
	C-AB	0.00	0.00	0.0	A	0	0
	C-A					431	647
	A-BC	0.14	2.36	0.2	A	228	342
2	B-AC	0.83	35.85	4.9	E	432	648
	C-AB	0.09	8.12	0.1	A	40	60
	C-A					40	60
	A-BC	0.23	2.20	0.3	A	448	672

2023 With Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	3.19	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	7.79	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D11	2023 With Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D3+D5

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	489	100.000
	B		ONE HOUR	✓	83	100.000
	C		ONE HOUR	✓	225	100.000
2	A		ONE HOUR	✓	1220	100.000
	B		ONE HOUR	✓	275	100.000
	C		ONE HOUR	✓	131	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	16	473
	B	57	0	26
	C	218	7	0

Demand (PCU/hr)

Junction 2

		To		
		A	B	C
From	A	0	487	732
	B	16	0	260
	C	72	59	0

Vehicle Mix

Junction 1

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Junction 2

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.24	13.31	0.3	B	76	114
	C-AB	0.02	6.07	0.0	A	9	14
	C-A					197	296
	A-BC	0.28	2.81	0.4	A	449	673
2	B-AC	0.66	25.18	2.1	D	253	379
	C-AB	0.20	12.33	0.3	B	64	96
	C-A					56	84
	A-BC	0.58	3.99	1.5	A	1119	1679

2023 With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	1.79	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	11.59	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D12	2023 With Development	PM	ONE HOUR	16:15	17:45	15	✓	Simple	D4+D6

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	237	100.000
	B		ONE HOUR	✓	35	100.000
	C		ONE HOUR	✓	449	100.000
2	A		ONE HOUR	✓	442	100.000
	B		ONE HOUR	✓	420	100.000
	C		ONE HOUR	✓	79	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	22	215
	B	12	0	23
	C	407	42	0

Demand (PCU/hr)

Junction 2

		To		
		A	B	C
From	A	0	234	208
	B	3	0	417
	C	41	38	0

Vehicle Mix

Junction 1

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Junction 2

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.08	8.99	0.1	A	32	48
	C-AB	0.11	5.34	0.3	A	72	107
	C-A					340	511
	A-BC	0.13	2.35	0.2	A	218	326
2	B-AC	0.73	22.92	2.8	C	386	578
	C-AB	0.08	7.99	0.1	A	37	56
	C-A					35	52
	A-BC	0.21	2.14	0.3	A	406	608

2028 With Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	3.21	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	9.60	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D13	2028 With Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D3+D7

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	529	100.000
	B		ONE HOUR	✓	83	100.000
	C		ONE HOUR	✓	244	100.000
2	A		ONE HOUR	✓	1321	100.000
	B		ONE HOUR	✓	294	100.000
	C		ONE HOUR	✓	142	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	16	513
	B	57	0	26
	C	237	7	0

Demand (PCU/hr)

Junction 2

		To		
		A	B	C
From	A	0	527	794
	B	17	0	277
	C	78	63	0

Vehicle Mix

Junction 1

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Junction 2

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.24	13.85	0.3	B	76	114
	C-AB	0.02	6.04	0.0	A	10	14
	C-A					214	321
	A-BC	0.30	2.90	0.5	A	485	728
2	B-AC	0.74	33.64	2.9	D	269	404
	C-AB	0.23	13.39	0.4	B	71	107
	C-A					59	88
	A-BC	0.62	4.50	1.8	A	1212	1818

2028 With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	1.76	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	14.94	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D14	2028 With Development	PM	ONE HOUR	16:15	17:45	15	✓	Simple	D4+D8

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	255	100.000
	B		ONE HOUR	✓	35	100.000
	C		ONE HOUR	✓	483	100.000
2	A		ONE HOUR	✓	477	100.000
	B		ONE HOUR	✓	454	100.000
	C		ONE HOUR	✓	85	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	22	233
	B	12	0	23
	C	441	42	0

Demand (PCU/hr)

Junction 2

		To		
		A	B	C
From	A	0	252	225
	B	3	0	451
	C	44	41	0

Vehicle Mix

Heavy Vehicle Percentages

Junction 1

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Heavy Vehicle Percentages

Junction 2

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.08	9.14	0.1	A	32	48
	C-AB	0.11	5.26	0.3	A	76	113
	C-A					368	552
	A-BC	0.14	2.37	0.2	A	234	351
2	B-AC	0.80	30.35	4.0	D	417	625
	C-AB	0.09	8.13	0.1	A	40	60
	C-A					38	56
	A-BC	0.23	2.19	0.3	A	438	657

2038 With Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	3.24	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	12.08	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D15	2038 With Development	AM	ONE HOUR	07:45	09:15	15	✓	Simple	D3+D9

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	562	100.000
	B		ONE HOUR	✓	83	100.000
	C		ONE HOUR	✓	259	100.000
2	A		ONE HOUR	✓	1405	100.000
	B		ONE HOUR	✓	309	100.000
	C		ONE HOUR	✓	151	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	16	546
	B	57	0	26
	C	252	7	0

Demand (PCU/hr)

Junction 2

		To		
		A	B	C
From	A	0	560	845
	B	18	0	291
	C	84	67	0

Vehicle Mix

Heavy Vehicle Percentages

Junction 1

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Heavy Vehicle Percentages

Junction 2

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.25	14.34	0.4	B	76	114
	C-AB	0.02	6.01	0.0	A	10	15
	C-A					228	341
	A-BC	0.32	2.98	0.5	A	516	774
2	B-AC	0.81	46.10	4.1	E	283	425
	C-AB	0.26	14.46	0.5	B	77	116
	C-A					61	92
	A-BC	0.66	5.03	2.1	A	1289	1934

2038 With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Set Relationship	D11 - 2023 With Development, AM	Demand Set relationships are chained. This may slow down the file.

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	Site Access Junction	T-Junction	Two-way	1.74	A
2	Carmanhall Road / Blackthorn Road	T-Junction	Two-way	19.66	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically	Relationship type	Relationship
D16	2038 With Development	PM	ONE HOUR	16:15	17:45	15	✓	Simple	D4+D10

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Junction	Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1	A		ONE HOUR	✓	270	100.000
	B		ONE HOUR	✓	35	100.000
	C		ONE HOUR	✓	512	100.000
2	A		ONE HOUR	✓	507	100.000
	B		ONE HOUR	✓	483	100.000
	C		ONE HOUR	✓	90	100.000

Demand overview (Pedestrians)

Junction	Arm	Profile type	Average pedestrian flow (Ped/hr)
1	A	Global	10.00
	B		
	C		
2	A	Global	10.00
	B		
	C		

Origin-Destination Data

Demand (PCU/hr)

Junction 1

		To		
		A	B	C
From	A	0	22	248
	B	12	0	23
	C	470	42	0

Demand (PCU/hr)

Junction 2

		To		
		A	B	C
From	A	0	267	240
	B	4	0	479
	C	47	43	0

Vehicle Mix

Heavy Vehicle Percentages

Junction 1

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Heavy Vehicle Percentages

Junction 2

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	B-AC	0.08	9.27	0.1	A	32	48
	C-AB	0.12	5.18	0.3	A	79	118
	C-A					391	586
	A-BC	0.15	2.40	0.2	A	248	372
2	B-AC	0.85	40.84	5.7	E	443	665
	C-AB	0.10	8.26	0.1	A	43	64
	C-A					40	60
	A-BC	0.24	2.23	0.3	A	465	698