Project

Richmond Road SHD

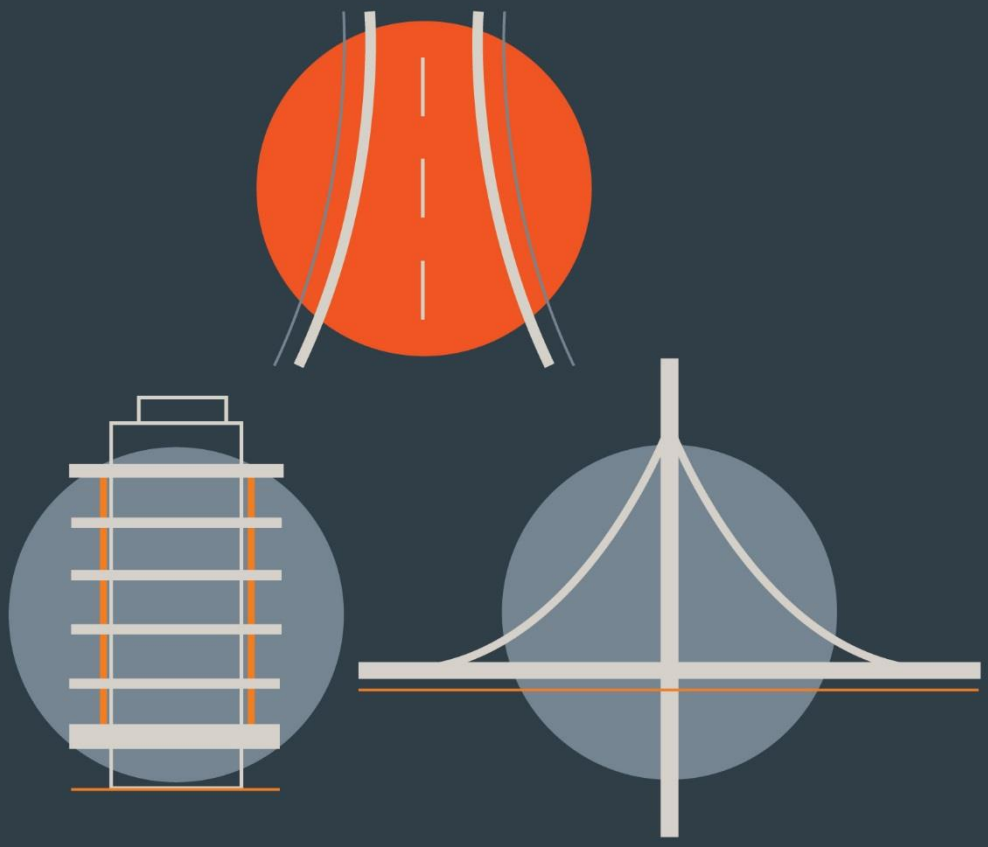
Report Title

TRAFFIC AND TRANSPORT ASSESSMENT REPORT

Client

BIRKEY LIMITED

TRANSPORTATION



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1.0 INTRODUCTION

1.1 BACKGROUND

1.1.1 DBFL Consulting Engineers (hereon referred to as DBFL) have been commissioned to prepare a Traffic and Transport Assessment (TTA) for a strategic housing development at a c. 0.61 hectare (c. 6,067 sq.m) site at No. 146A and No's. 148-148A Richmond Road, Dublin 3. The site is bounded to the north-east by Richmond Road and the Leyden's Wholesalers & Distributor Site, to the north-west by an apartment development (Deakin Court), to the south-west by the Tolka River and to the south-east by a residential and commercial development (Distillery Lofts). Improvement works to Richmond Road are also proposed including carriageway widening and a new signal controlled pedestrian crossing facility on an area of c. 0.08 hectares (c. 762 sq.m). The development site area and road works area will provide a total application site area of c. 0.69 hectares (c. 6,829 sq.m). . The subject site is currently occupied by a number of different businesses and 2 No. dwellings including EQ Audio and Events, and QLX Lighting while benefitting from an access point directly onto Richmond Road.

1.1.2 The proposed development will principally consist of the demolition of all existing structures on site (measuring c. 2,346 sq.m) including warehouses and 2 No. dwellings; and the construction of a part 6 No. to part 10 No. storey over basement development (with roof level telecommunications infrastructure over), comprising 1 No. café/retail unit (157 sq.m) at ground floor level and 183 No. Build-to-Rent apartments (104 No. one bedroom units and 79 No. two bedroom units). The proposed development has a gross floor area of c. 16,366 sq.m over a basement of c. 2,729 sq.m. The proposed development has a gross floor space of c. 15,689 sq.m.

1.1.3 The development also provides ancillary residential amenities and facilities; 71 No. car parking spaces including 8 No. electric vehicle spaces, 4 No. mobility impaired spaces and 1 No. car share space; 5 No. motorcycle parking spaces; bicycle parking; electric scooter storage; a drop off space; the decommissioning of the existing telecommunications mast at ground level and provision of new telecommunications infrastructure at roof level including shrouds, antennas and microwave link dishes; balconies facing all directions; public and communal open space; a pedestrian/bicycle connection along the north-western boundary of the

site from Richmond Road to the proposed pedestrian/bicycle route to the south-west of the site adjoining the River Tolka; roof gardens; hard and soft landscaping; boundary treatments; green roofs; ESB Substation; switch room; comms rooms; generator; lift overruns; stores; plant; and all associated works above and below ground.

1.1.4 The design concept for the scheme proposes a diverse mix of apartment units, interspersed with a small plaza area extending to Richmond Road. The proposed development will include a communal open space to the north. The proposals include the addition of a pedestrian and cycle link along parallel to and along the entire length of the site's southern boundary adjacent to the Tolka River. The scheme design accommodates all car parking spaces at the basement level, with the 'shared' landscaped plaza area to the north and north east of the proposal building facilitating the occasional set down/collection and servicing trip at the development.

1.1.5 This TTA has been produced to address any potential concerns that the local planning authority and/or An Bord Pleanála may have pertaining to the level of influence of the proposed development may generate upon the local transportation system.

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

1.2 SCOPE

1.2.1 The purpose of this TTA is to quantify the existing transport environment and to detail the results of assessment work undertaken to identify the potential level of any transport impact generated as a result of the residential development. The scope of the assessment covers transport and related sustainability issues including means of vehicular access, pedestrian, cyclist, and local public transport

connections. The principal objective of the report is to quantify any level of impact across the local road network and subsequently ascertain both the existing and future operational performance of the local road network.

1.3 METHODOLOGY

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

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

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

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

- **Network Impact:** in accordance with the Institute of Highways and Transportation; Traffic Impact Assessment guidelines, the specific level of influence generated by the proposed mixed-use development upon the local road network was ascertained and the junctions which required assessment in greater detail were identified.
- **Network Assessment:** Drawing upon the findings of the previous stages, an operational assessment of the local road network has been undertaken to evaluate the performance of key junctions following the implementation and occupation of the proposed development.

1.4 REPORT STRUCTURE

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

1.4.2 **Chapter Two** of this report describes the existing conditions at the proposed development location and immediate surrounding area.

1.4.3 The relevant transportation policies that influence the design and appraisal of the subject development proposals are highlighted within **Chapter Three**.

1.4.4 **Chapter Four** provides a summary of the proposed development itself.

1.4.5 **Chapter Five** outlines the requirements and provisions made by the proposed development's parking strategy.

1.4.6 In **Chapter Six** a summary of the vehicle trip generation, vehicle distribution, and network assignment exercise is detailed, in addition to quantifying the potential level of impact, as generated by the subject proposals, upon key junctions across the local road network.

1.4.7 The operational performance of the proposed site access junction for a range of different development/traffic scenarios following the commissioning of the proposed development are investigated and reported within **Chapter Seven**.

1.4.8 **Chapter Eight** of this report describes the initiatives proposed to promote sustainable and safe modes of travel. This accommodated for the construction and operational stages of the proposed development

1.4.9 DBFL's response to comments and concerns raised by DCC in their planning division report (July 2021) as well as ABP in their Pre Application Consultation Opinion (October 2021) is described in **Chapter Nine.**

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

2.0 RECEIVING ENVIRONMENT

2.1 LAND USE

2.1.1 The subject site which measures c. 6,067 m^2, is bound to the north-east by Richmond Road and Leydens Wholesalers and Distributor Site. The recently constructed residential development Deakin Court lies to the north whilst the commercial Distillery Lofts adjoins the site to the southeast. The Tolka River runs along the site's entire southwest boundary. Vehicular access is currently provided directly from Richmond Road. The brownfield site currently accommodates a number of commercial/office/retail warehouse buildings, a 3 No. storey red brick building comprising 2 No. dwellings and an internal access road and car parking areas as accessed from Richmond Road.

2.1.2 The subject lands are zoned Objective Z10 'Inner Suburban and Inner City Sustainable Mixed-Uses' within the Dublin City Development Plan 2016-2022, where the stated aim is '*to consolidate and facilitate the development of inner city and inner suburban sites for mixed-uses, with residential the predominant use in suburban locations, and office/retail/residential the predominant uses in inner city areas.*'

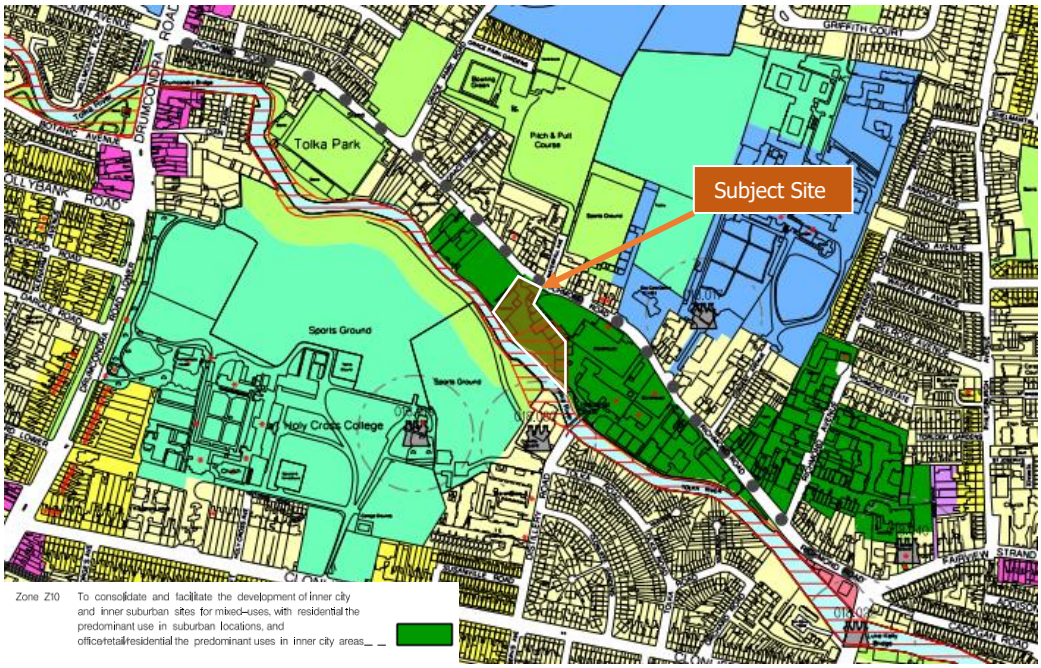


Figure 2.1: Land Use Zoning (Map E Dublin City Development Plan 2016-2022)

2.1.3 Until recent times the site had accommodated a number of businesses including Tolka Joiners and Richmond Builder Providers within the warehouse units to the rear of the red brick dwelling which fronts onto Richmond Road. Since the closure

of the builder's provider, we understand that the warehouse units have been sublet to a number of different businesses including EQ Audio and Events and QLX Lighting amongst others.

2.2 LOCATION

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

2.2.2 The subject development site (**Figure 2.1**) is located circa 2.4km from Dublin City Centre and a 15 min walk to Drumcondra Train Station, a 9-10 minute walk to the R132 Drumcondra Road corridor and R803 Ballybough Road corridor, both of which are serviced by numerous bus routes that link Dublin City Centre to destinations across the city environs.

2.2.3 The development site is bounded to the north-west by a recently constructed 4 No. storey apartment development called Deakin Court and by Richmond Road. The subject site is bounded to the south-west by the Tolka River and Distillery Road (Distillery Lofts) to the south-east and commercial premises (Leydens) to the north-east.

2.2.4 The land uses surrounding the development site and along Richmond Road are a mix of commercial and residential, all of which benefit from direct access to/from Richmond Road.

Figure 2.2: Subject Site Location (Reference: Google Maps)

Figure 2.3: Site Indicative Boundary (Reference: Google Maps)

2.3 EXISTING SITE ACCESSIBILITY

Walking

2.3.1 **Figure 2.4** presents the significant extent of pedestrian catchments accessible from the subject brownfield site for different walking times ranging from 15 minutes to 45 minutes.

2.3.2 Within a 15-minute walking timeframe bus stops along the emerging BusConnects the A, D, E and H spine can be reached with access to a number rail services as detailed further in **Section 2.4** and **2.5**.

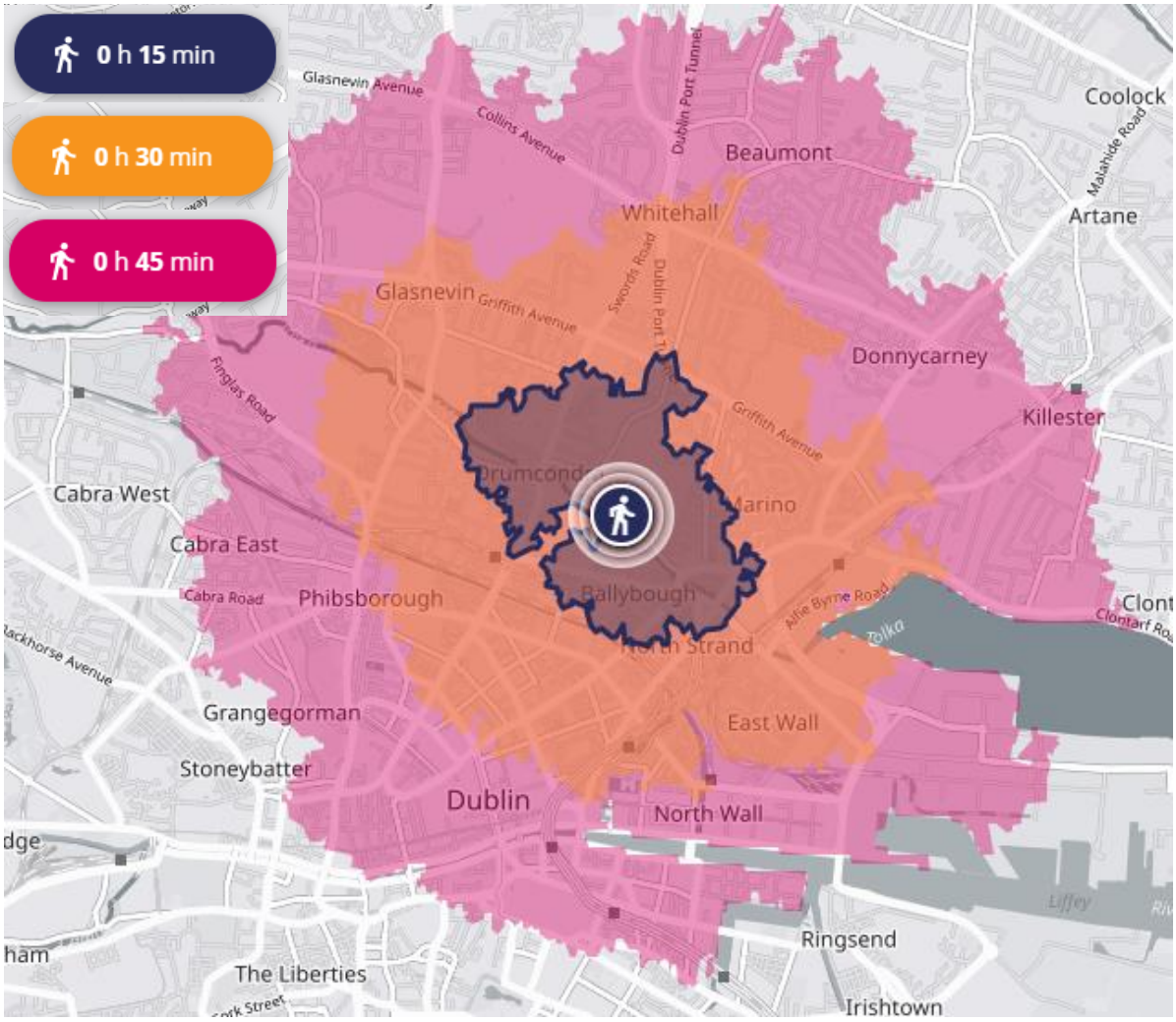


Figure 2.4: Pedestrian Accessibility (Walking from Site) (Reference: Travel Time)

Cycling

2.3.3 **Figure 2.5** indicates cycle travel time catchment areas from the brownfield subject site. In **15 minutes** of cycling, a significant number of nearby neighbourhood centres and their employment / educational facilities are accessible. In **30 minutes** of cycling, Blancardstown and majority of Dublin City Centre can be reached. In **45 minutes** of cycling, areas such as Swords and Malahide in the north and Dundrum in the south are all accessible from the subject site.

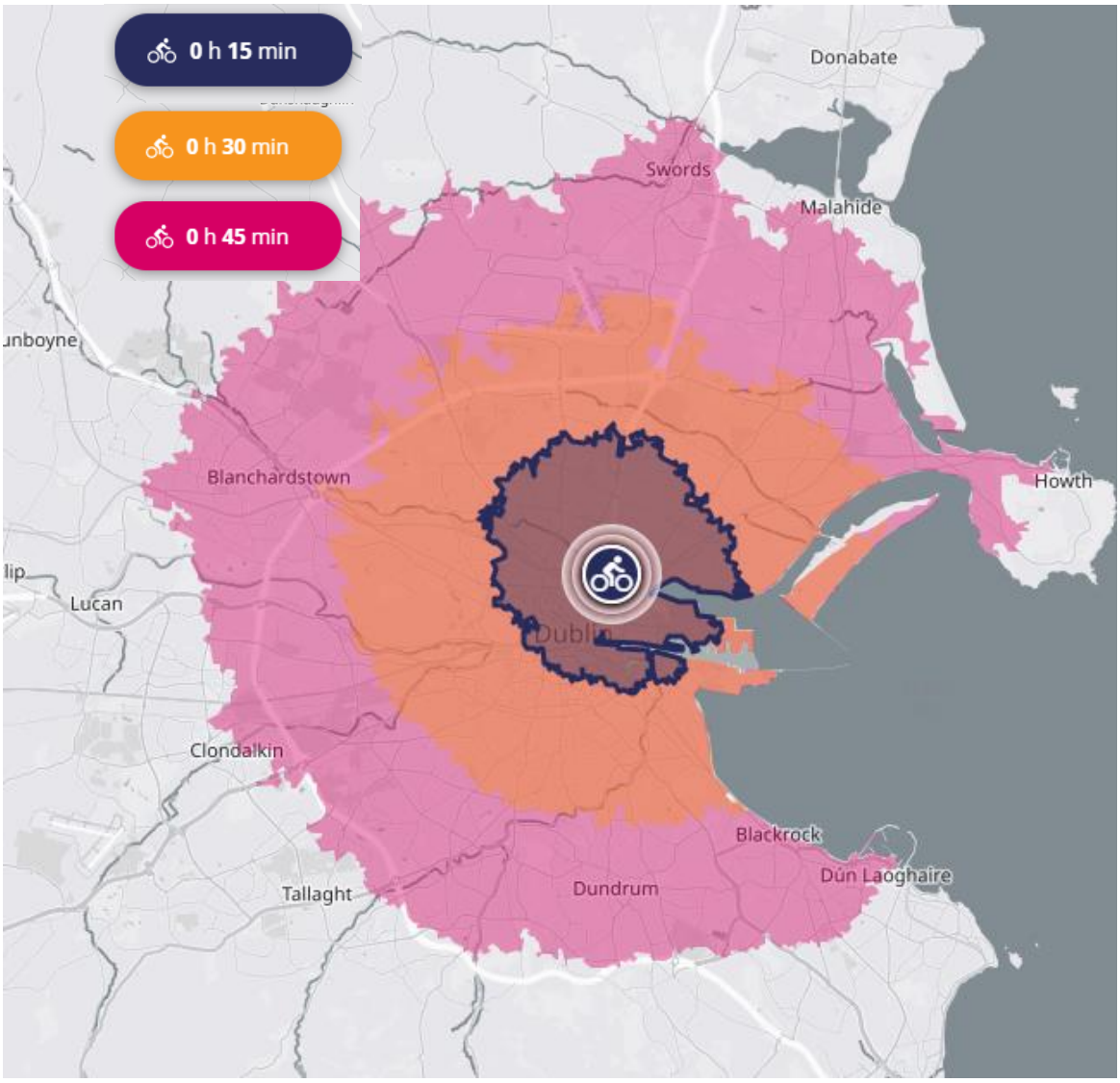


Figure 2.5: Cycling Accessibility (Reference: Travel Time)

Public Transport and Walking

2.3.4 **Figure 2.6** indicates public transport travel time catchment areas from the subject site. In reference to **Section 2.5,** it is noted that the subject development location benefits from a number of different bus service interchanges being within close proximity. In order to obtain realistic journey times, the following maps give travel times during AM peak time hours, in this case 08:00 on a typical Tuesday.

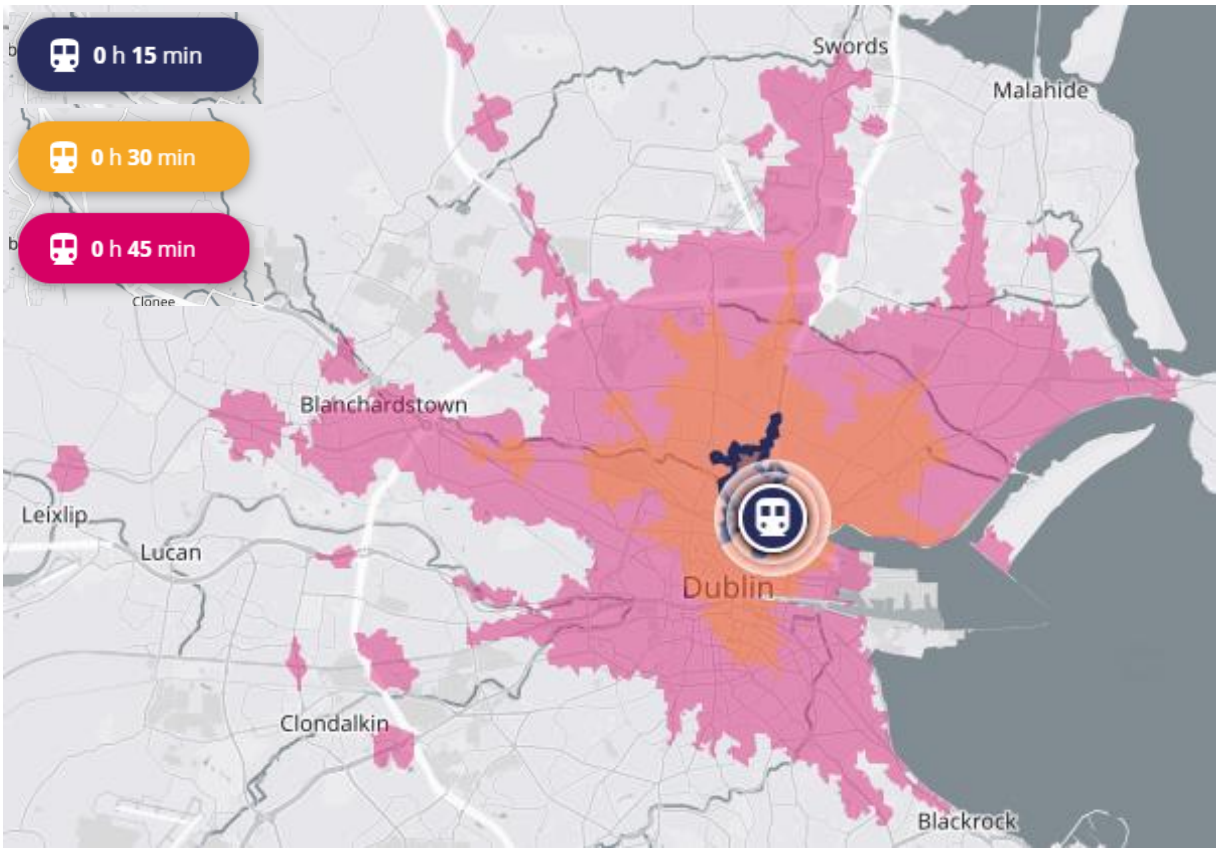


Figure 2.6: Public Transport Accessibility- Travel Time Catchments (Reference: Travel Time)

2.4 EXISTING TRANSPORTATION INFRASTRUCTURE

Background

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

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

Road Network

2.4.3 The Richmond Road corridor is generally aligned in a northwest-southeast direction is subject to 50kph speed regulations and benefits from street lighting. At the northwest extents this corridor terminates at the R312 Drumcondra Road Upper / Richmond Road / Millmount Avenue signal-controlled junction. A right turn ban is in place for vehicles exiting Richmond Road who may only travel straight along Millmount Avenue or turn left travelling in a southbound direction on the N1.

Continuing south on the R312 for approximately 2km leads to Dublin City Centre. Between the subject site access and the aforementioned N1 / Richmond Road / Millmount Avenue signal-controlled junction, Grace Park Road is accessible which provides a connection to the N1 northbound and subsequently the strategic M50 road network.

2.4.4 Travelling in a southeast direction from the proposed development site access along Richmond Road leads to the Richmond Road / R803 signal controlled junction. Travelling south-west on the R803 provides access to Dublin City centre.

Existing Pedestrian Environment

2.4.5 All pedestrian routes leading to/from the subject site benefit from the provision of street lighting in addition to good quality pedestrian footways. There are signal controlled pedestrian crossing facilities available at both signal controlled junctions located at both termini of Richmond Road in addition to a dedicated signal controlled pedestrian crossing located to the west of the Richmond Road / Grace Park junction.

Existing Cycling Environment

2.4.6 In the immediate vicinity of the subject site cyclists currently share the Richmond Road carriageway with general vehicular traffic. Both the N1 corridor and R803 corridor benefit from the provision of a mix of dedicated on-road cycle lanes and shared bus / cycle lanes as presented in **Figure 2.7** below.

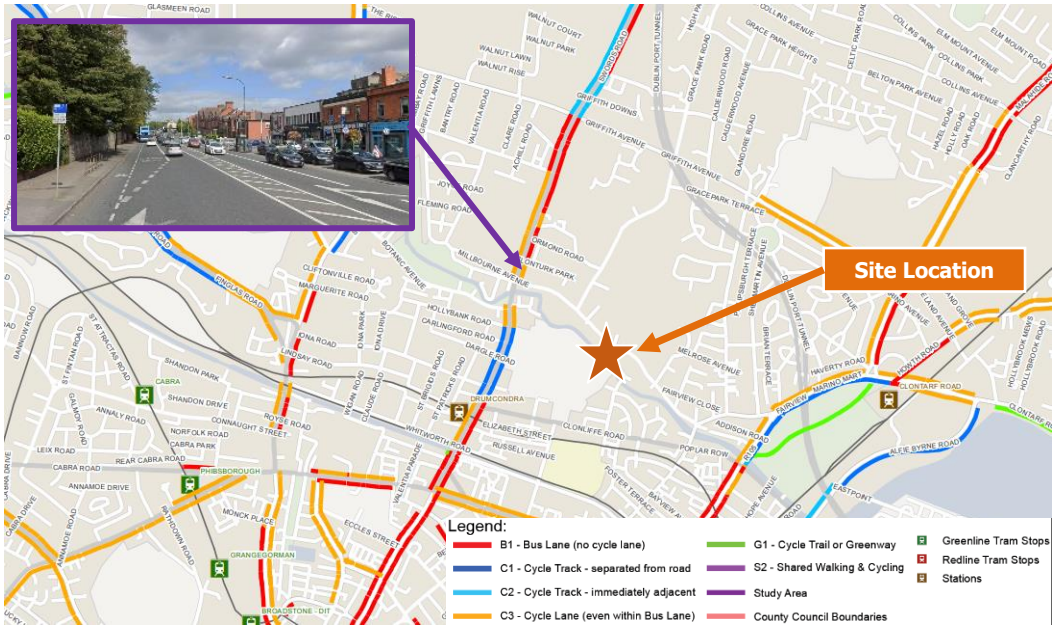


Figure 2.7: Existing Cycle Facilities (source: Sheet E1 GDA Cycle Network Plan)

2.4.7 Dublin Bus currently operates 10 no. routes accessible via bus stops on the R312 and 1 further no. route accessible via bus stops located on the R803 as summarised in **Table 2.1** below. All services are located within easy walking distance from the subject site with the nearest interchange on the R312 located just 700m away (9 minute walk) and the nearest interchange on the R803 located just 650m away (8 minute walk).

Route No.	Route	Mon – Fri	Sat	Sun
1	Sandymount-Santry	89	48	42
11	Wadelai Park- Sandyford Business District	43	34	27
13	Harristown-Grange Castle	85	68	59
16	Dublin Airport- Balinteer	86	82	64
33	Lower Abbey - Balbriggan	59	39	33
41	Lower Abbey – Swords Manor	62	58	48
41B	Lower Abbey - Rolestown	5	4	3
41C	Lower Abbey – Swords Manor	43	42	28
41D	Lower Abbey – Swords Business Park	2	No Service	No Service
44	DCU - Enniskerry	19	16	14
123	Walkinson (Kilnamanagh) - Marinho	77	65	39

Table 2.1: Dublin Bus Service Frequency – no. of services (Source www.dublinbus.ie)

Public Transport - Heavy Rail Network

2.4.8 The Drumcondra Train Station is located approximately 1.2 km (15-minute walk) from the subject site where the following rail services can be accessed: -

- Dublin Connolly – Sligo
- Dublin – Maynooth, Longford and M3 Parkway; and
- Grand Canal Dock and Dublin Heuston - Portlaoise

2.4.9 In addition, the Clontarf Road Train Station is located approximately 1.7km (20-minute walk) walking distance to the west of the subject site. This interchange provides access to DART and regional Commuter rail services.

2.5 FUTURE TRANSPORT INFRASTRUCTURE

Cycle Network Proposals

2.5.1 The subject site is located within the *'Dublin City Centre Sector'* within the NTA's Greater Dublin Area Cycle Network Plan (2013). According to the GDA Plan '*The Dublin City Centre Sector is defined by the Royal Canal and Grand Canal ring on*

the northern, eastern and southern side. The western boundary is taken as about 0.5km west of a north-south line between Phibsborough and Harold's Cross, and includes areas such as Pimlico, Thomas Street, Manor Street and Grangegorman. This area includes the commercial heart of the city where most employment is concentrated. It excludes the mostly residential areas within the canal ring further west, as these are in effect inner suburbs that do not attract significant numbers of non-local inward trips. On the other hand, the recently redeveloped Docklands area spreads a little way east of the canal ring and has been included in the City Centre sector as it contains significant employment'.

2.5.2 In the vicinity of the subject site the following route additions are proposed by the NTA (**Figure 2.8**): -

- Secondary Route 2B (along) - *Drumcondra Road - Clonliffe Road - Jones' Road- Mountjoy Square - Parnell Square - O'Connell Street;*
- Orbital Route NO2 - Tolka Valley route from Route 1D at Ballybough to Drumcondra, Glasnevin and Finglas South;
- NO2 Greenway - *along the River Tolka / Richmond Road from Fairview to Drumcondra*
- Primary Route 2A - *to Swords via Drumcondra, Whitehall and Santry; and*
- Primary Route 1: - *Beresford Place to the North East Sector via Amiens Street, North Strand and Fairview, with 3 branches along the coastal Clontarf Road, the Howth Road and the Malahide Road.*

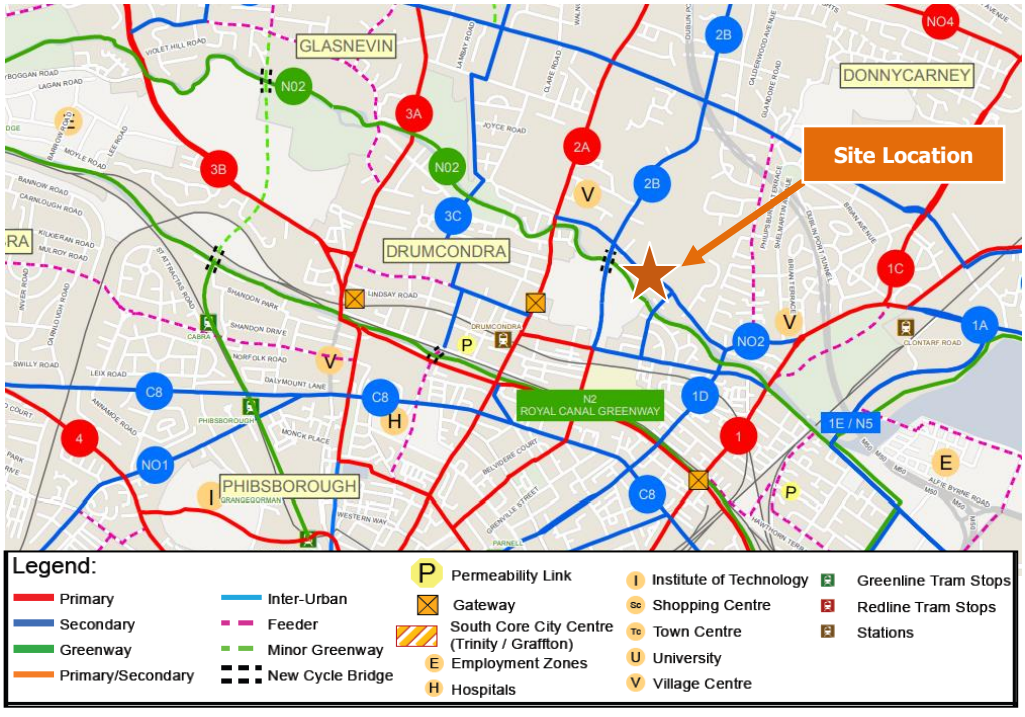


Figure 2.8: Proposed Cycle Network Enhancements (extract Sheet N1a GDA

Public Transport Proposals - Metrolink

2.5.3 The proposed high frequency rail line running from Swords to Charlemont, linking Dublin Airport, Irish RAIL, dart, Dublin Bus and Luas service creating fully integrated public transport in the Greater Dublin Area is presented in **Figure 2.9** below.

2.5.4 The underground Tunnel as presented in Figure 2.9 below has both the Griffith Park and Glasnevin interchanges within the near vicinity of the subject site and accessible within 20 minutes walking distance. The proposed Metrolink will cater for 20,000 passengers per direction per hour providing a connection between Swords and the Dublin City Centre of 25 minutes travel time.

Figure 2.9: Metrolink Proposed Public Transport Routes

Public Transport - BusConnects

2.5.5 BusConnects is an initiative launched by the NTA with the aim of overhauling the bus system in the Dublin Region. This initiative includes review of bus services, and the implementation of the core bus network which comprises radial, orbital, and regional core bus corridors. It also includes enhancements to ticketing and fare systems as well as transition to a new low emission vehicle fleet.

2.5.6 This initiative proposes a complete redesign of the existing bus network. The fundamental changes to the network expected would be as follows:

- Increasing the overall amount of bus services. Providing new and frequent orbital services connecting more outer parts of the city together;
- Simplifying the bus services on the key radial into "spines" where all buses will operate under a common letter system and buses will run very frequently and be more evenly spaced;
- Increasing the number of routes where buses will come every 15 minutes or less all day;
- The frequent network would become a web-shaped grid, with many interchange opportunities to reach more destinations. Everywhere that two frequent routes cross, a fast interchange is possible;
- Additional service would be provided at peak hours to limit overcrowding.
- developing a state-of-the-art ticketing system using credit and debit cards or mobile phones to link with payment accounts and making payment much more convenient;
- implementing a cashless payment system to vastly speed up passenger boarding times;
- revamping the fare system to provide a simpler fare structure, allowing seamless movement between different transport services without financial penalty;
- implementing a new bus livery providing a modern look and feel to the new bus system;
- rolling out new bus stops with better signage and information and increasing the provision of additional bus shelters; and
- transitioning to a new bus fleet using low emission vehicle technologies.

2.5.7 The Dublin Area Bus Network Redesign (which has gone through three rounds of public consultation before reaching the now final version) aims *"to provide a*

network designed around the needs of Dublin today and tomorrow, rather than based on the past". **Figure 2.10** below presents the proposed public transport provision in the vicinity of the subject development site as per the emerging Dublin Area Bus Network Redesign.

2.5.8 Under the BusConnects proposals, the following high frequency routes will be available within the vicinity of the subject site: -

- **A-Spine:** High frequency services every 12 minutes along the R312
- **D-Spine:** High frequency services every 15 minutes along the R803

Figure 2.10: Existing Public Transport Services (weekday midday frequency)
(Extract of Map 1 - https://busconnects.ie/initiatives/dublin-area-bus-network-redesign-maps/)

Public Transport - DART + West

2.5.9 The first of the infrastructural projects of the DART + Programme to be delivered will be the DART + West project. This will provide a sustainable, reliable, and more frequent rail service improving capacity to city centre rail corridors.

2.5.10 Delivery of this DART+ West will support existing communities and support future sustainable development. It will serve all existing stations along the railway corridor between Maynooth Station and M3 Parkway Station to Connolly Station and to the proposed Spencer Dock Station using electrical power, which has a lower carbon footprint than the current diesel trains. The frequency and quality of service will provide a viable transport alternative for surrounding communities other than private car travel.

2.5.11 The DART+ programme intends to:

- Expand its current network from 50km in length to over 150km.
- Increase train capacity from the current 6 trains per hour per direction up to 12 trains per hour per direction subject to demand. Passenger capacity will increase from 5,000 in 2019 to 13,200 passengers in 2025.
- Reduce carbon emissions through the deployment of new electric trains.

It aims to promote multi modal transit, active transport, boost regional connectivity and make public transport the preferred option. The Drumcondra Station is within 1.5km from the site and within the 15-minutes walking catchment illustrated in **Figure 2.11**.

Figure 2.11: Proposed Greater Dublin Integrated Transport Network

Road Infrastructure Proposals

2.5.12 Map E of the Dublin City Development Plan 2016-2022 reveals that there are proposals for roads improvements along the length of Richmond Road which is identified as a 6-year objective as presented in **Figure 2.12** below. The Richmond Road Area Action Plan (2007) proposal to upgrade the existing corridor to a consistent 7.5 m wide carriageway incorporating 1.3 m wide Advisory Cycle Lanes on both sides of 1.45 m wide general traffic lanes .

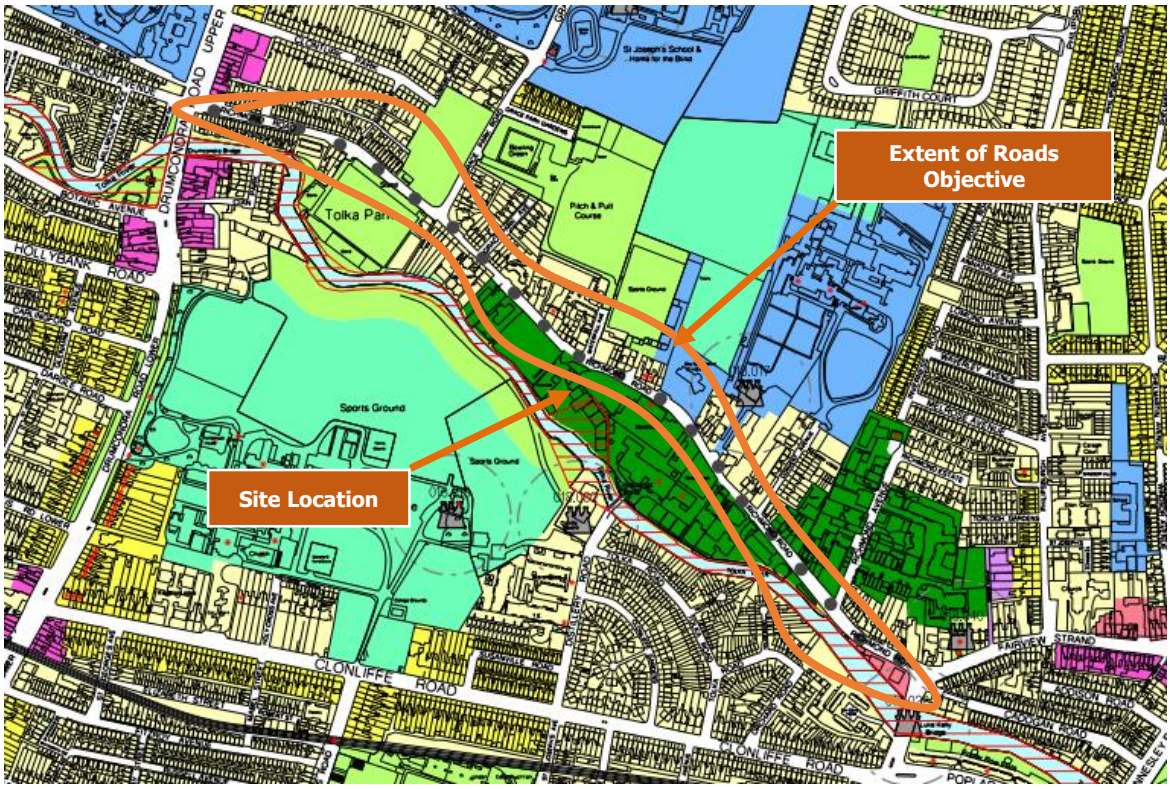


Figure 2.12: Proposed Road Improvements along Richmond Road (Extract from DCC Dev. Plan, Zoning Map)

Timescales

2.5.13 The implementation of the above infrastructure schemes will be subject to further design, public consultation, approval, and importantly availability of funding and resources. However, it is noted that the design proposals accommodate enhancements of the Roads objectives and widening of the dedicated bicycle lane as per the National Cycle Manual as shown in DBFL drawing No: **210027-DBFL-TR-SP-DR-C-1002.**

2.6 RSA COLLISION HISTORY

2.6.1 The collision statistics on the Road Safety Authority (RSA) website were reviewed in order to ascertain the safety record of the local road network over the most recent twelve-year period. This includes information for the years 2005 to 2016 inclusive and indicates basic information on all reported incidents. 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.

2.6.2 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.

According to the RSA website there were thirteen reported incidents within the immediate vicinity of the subject scheme, as detailed in the following paragraphs (**Figure 2.13**).

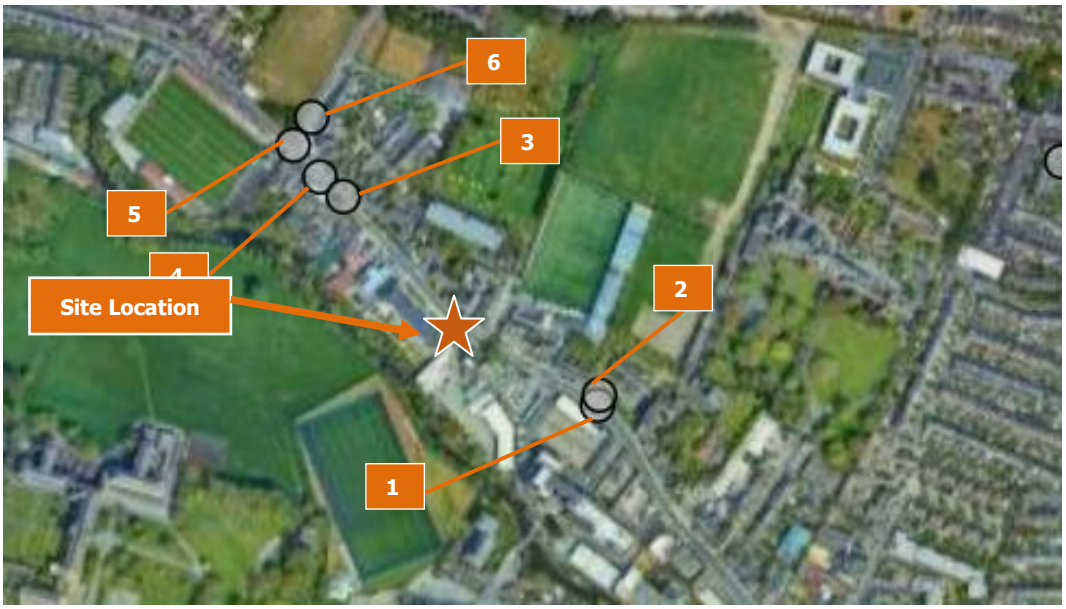


Figure 2.13: Collision Records - (source www.rsa.ie)

2.6.3 The review of the RSA data reveals that all incidents recorded along Richmond Road have been classified as 'Minor'.

2.6.4 In reference to **Figure 2.13** above and **Table 2.2** below incident numbers 1 & 2, occurred approximately 120m east of the subject site whilst incident numbers 3, 4, 5 & 6 occurred in vicinity of the Grace Park Road junction. All incidents resulted in 1 no. minor casualty.

Ref	Year	Vehicle	Circumstances	Day	Time	Severity	Total Casualties
1	2014	Bicycle	Other	Thu	10:00-16:00	Minor	1
2	2005	Goods	Pedestrian	Tue	10:00-16:00	Minor	1
3	2010	Goods	Pedestrian	Thu	16:00-19:00	Minor	1
4	2009	Bus	Pedestrian	Sat	23:00-03:00	Minor	1
5	2012	Car	Pedestrian	Fri	10:00-16:00	Minor	1
6	2012	Car	Angle, both straight	Sun	10:00-16:00	Minor	1

Table 2.2: Collision Records - (source www.rsa.ie)

2.6.5 Without the provision of more detailed collision data, DBFL have concluded that there are no apparent significant trends in the collisions occurring on and in the vicinity of the proposed developments site access junction on Richmond Road.

3.0 POLICY FRAMEWORK

3.1 TRANSPORT STRATEGY FOR THE GREATER DUBLIN AREA

3.1.1 The Transport Strategy for the Greater Dublin Area 2016-2035 is a document compiled by the National Transport Authority (NTA) which sets out the Strategic Transport Plan for the Greater Dublin Area for the period up to 2035. This sets out an integrated long-term strategy for the area, including new public transport proposals such as expansions to DART and Luas services and also a new Metro route.

3.1.2 This document will influence transport planning across the region until 2035 and replaces 'A Platform for Change – An Integrated Transportation Strategy for the Greater Dublin Area 2000 to 2016'. It thereby underpins all transportation strategies, traffic management schemes and development plans prepared by Dublin City Council during this timeframe.

3.1.3 The Strategy sets out a clear hierarchy of transport users, commencing with the sustainable modes of travel such as walking, cycling and public transport users at the very top of the hierarchy. The Strategy adopts the general principle that these users should have their safety and convenience needs considered first and that the hierarchy is applied where a large share of travel is (or could be) made by walking, cycling and public transport.

3.1.4 In addition to guiding the development of specific Strategy measures, the NTA encourages that the "transport user hierarchy should guide engineers, planners and urban designers on the order in which the needs of transport users should be considered in designing new developments or traffic schemes in the Greater Dublin Area."

3.1.5 The National Transport Authority (NTA) has prepared an updated Draft Transport Strategy for the Greater Dublin Area (2022-2042) with the aim of replacing the previous 2016-2035 version. This new strategy sets out the framework for investment in transport infrastructure and services over the next two decades to 2042. The draft transport strategy is currently progressing through a public consultation exercise which closes on Friday 17th December 2021.

3.1.6 The overall aim of the Transport Strategy is: "*To provide a sustainable, accessible and effective transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the needs of urban and rural communities, and supports economic growth.*"

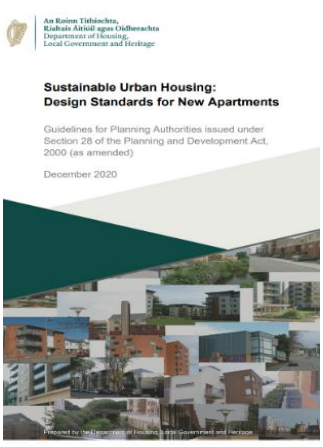
3.1.7 The Draft Transport Strategy includes measures that are considered to be essential in meeting the high level objectives of fostering sustainable development and fully integrating land use planning and transport planning, including the following:

- Consolidation of development, to ensure more people live close to services and public transport, and to minimise urban sprawl and long distance commuting;
- Transit-oriented development to guide the growth of our cities and towns on the basis of accessibility;
- Mixed use development, to minimise travel distances between homes and local services, and to ensure vibrancy of urban areas;
- Filtered Permeability so that people can move about more easily by walking and cycling than by car;

3.1.8 The strategy includes a number of integrated and inclusive initiatives with specific projects / programmes / sub strategies in regard to (i) Walking, Accessibility and Public Realm, (ii) Cycling and Personal Mobility Devices, (iii) Public Transport including bus, light rail, and heavy rail, (iv) Road Infrastructure, (v) Traffic Management and Travel Options, (vi) Freight, Delivery and Servicing, and (vii) Climate Action Management measures.

3.2 SUSTAINABLE URBAN HOUSING: DESIGN STANDARDS FOR NEW APARTMENTS

3.2.1 This guideline document was initially produced by the Department of Housing, Planning and Local Government (DHPLG) in 2018 with an update released in December 2020. The purpose of this document is to set out standards for apartment focused developments, mainly in response to circumstances that had arisen whereby some local authority standards were at odds with national guidance.



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

3.2.3 These Guidelines apply to all residential developments that include apartments that may be made available for sale, whether for owner occupation or for individual lease. They also apply to developments that include apartments that are built specifically for rental purposes, whether as 'shared accommodation' or as 'Build to Rent' such as the subject Richmond Road scheme.

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

3.2.5 The quantum of car parking or the requirement for any such provision for apartment developments will vary, having regard to the types of location in cities and towns that may be suitable for apartment development, broadly based on proximity and accessibility criteria. With specific regard to areas classified as 'Intermediate Urban Locations' the guidelines specify that a number of distinct planning criteria may be applied, stating;

"Planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard".

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

3.3 THE DUBLIN CITY DEVELOPMENT PLAN 2016-2022

3.3.1 The Dublin City Council Development Plan 2016-2022 sets out the policies and objectives for sustainable development in the County up to 2022. It has been prepared in accordance with the requirements and various provisions of the

Planning and Development Act 2000 as amended and the Planning and Development (Strategic Environmental Assessment Regulations 2004).

3.3.2 The Development Plan states that *"The ultimate purpose of the development plan is social, providing for people's needs in all aspects of their lives and across their life cycle in areas such as housing, employment, recreation, social and commercial services, in a sustainable manner. This is reflected in the three principles of the core strategy and in every chapter of the development plan. The social purpose of the development plan is complemented by the Local Economic and Community Plan."*

3.3.3 In the context of the subject proposals, the following are the relevant transport and development policies set out in the plan:

Integrated Land-use and Transportation Policies & Objectives

- ***MTO1:*** *To encourage intensification and mixed-use development along existing and planned public transport corridors and at transport nodes where sufficient public transport capacity and accessibility exists to meet the sustainable transport requirements of the development, having regard to conservation policies set out elsewhere in this plan and the need to make best use of urban land …*

Public Transport Policies & Objectives

- ***MT3:*** *To support and facilitate the development of an integrated public transport network with efficient interchange between transport modes, serving the existing and future needs of the city in association with relevant transport providers, agencies, and stakeholders.*
- ***MTO2****: To support the development and implementation of integrated ticketing and real time passenger information systems across the public transport network in association with relevant transport providers and agencies. Progress on the integration of Dublin shared bike scheme and Leap Card schemes will be monitored.*
- ***MTO4:*** *To support improvements to the city's bus network and related services to encourage greater usage of public transport in accordance with the objectives of the NTA's strategy and the Government's 'Smarter Travel' document.*

Promoting Active Travel: Cycling & Walking Policies & Objectives

- ***MT7:*** *To improve the city's environment for walking and cycling through the implementation of improvements to thoroughfares and junctions and also through the development of new and safe routes, including the provision of foot and cycle bridges. Routes within the network will be planned in conjunction with green infrastructure objectives and on foot of (inter alia) the NTA's Cycle Network Plan for the Greater Dublin Area, and the National Cycle Manual, having regard to policy GI5 and objective GIO18.*
- ***MTO8:*** *To promote and facilitate, in co-operation with key agencies and stakeholders, the provision of high density cycle parking facilities at appropriate locations, taking into consideration (inter alia) the NTAs Cycle Network Plan, Dublin City Centre Cycle Parking Strategy, and Dublin City Council's Public Realm Strategy.*
- ***MTO9:*** *To develop, within the lifetime of this plan, the Strategic Cycle Network for Dublin city - connecting key city centre destinations to the wider city and the national cycle network, and to implement the NTA's Greater Dublin Area Cycle Network Plan to bring forward planning and design of the Santry River Greenway, incorporating strongly integrative social and community development initiatives.*
- ***MTO10:*** *"To improve existing cycleways and bicycle priority measures throughout the city, and to create guarded cycle lanes, where appropriate and feasible".*
- ***MTO11:*** *To review the 30kph speed limit that applies within the city centre (i.e., area between the canals).*
- ***MTO12:*** *(i) To monitor the success of the shared bike scheme and to expand it to the entire city, in accordance with the content of the dublinbikes Strategic Planning Framework 2011-2016 or any subsequent review (ii) That developers will agree to fund the provision of a shared bike station near large developments, as community gain.*
- ***MTO18:*** *To develop a high-quality pedestrian environment at new public transport interchanges and to consider the needs of pedestrians in the design of all infrastructure projects.*

- ***MTO21:*** *To avail of opportunities to increase footpath widths particularly within the city centre where appropriate.*

Mobility Management & Travel Planning Polices & Objectives

- ***MT13:*** *To promote best practice mobility management and travel planning to balance car use to capacity and provide for necessary mobility via sustainable transport modes.*
- ***MTO23:*** *To require Travel Plans and Transport Assessments for all relevant new developments and/or extensions or alterations to existing developments,*
- ***MT14:*** *To minimise loss of on-street, car parking, whilst recognizing that some loss of spaces is required for, or in relation to, sustainable transport provision, access to new developments, or public realm improvements.*
- ***MT15:*** *To discourage commuter parking and to ensure adequate but not excessive parking provision for short-term shopping, business and leisure uses.*
- ***MT16:*** *To control the supply and price of all parking in the city in order to achieve sustainable transportation policy objectives.*
- ***MT17:*** *To provide for sustainable levels of car parking and car storage in residential schemes in accordance with development plan car parking standards (section 16.38) so as to promote city centre living and reduce the requirement for car parking.*
- ***MT18:*** *To encourage new ways of addressing the parking needs of residents (such as car clubs) to reduce the requirement for car parking.*
- ***MT19:*** *To safeguard the residential parking component in mixed-use developments*
- ***MTO26:*** *To progressively eliminate all 'free' on street parking, both within the canals and in adjacent areas where there is evidence of 'all day' commuter parking, through the imposition of appropriate parking controls, including disc parking.*

Road & Bridge Improvements

- ***MT20:*** *To increase capacity of public transport, cycling and walking, where required, in order to achieve sustainable transportation policy objectives. Any works undertaken will include as an objective, enhanced provision for safety, public transportation, cyclists, and pedestrians, and will be subject to environmental and conservation considerations.*
- ***MTO31:*** *To initiate and/or implement the following road improvement schemes and bridges within the six year period of the development plan, subject to the availability of funding and environmental requirements and compliance with the 'Principles of Road Development' set out in the NTA Transport Strategy.*
    - *Roads*
        - *Richmond Road*

3.4 THE DRAFT DUBLIN CITY DEVELOPMENT PLAN 2022-2028

3.4.1 The Dublin City Development Plan (2022-2028) is a plan which sets out how the city will develop to meet the needs of all residents, workers, and visitors. The draft development standard states regarding Street/Road, Bridge and Tunnel Infrastructure (Section 8.5.9) that:

It is an objective of Dublin City Council

- **SMTO23:** *-To initiate and/or implement the following street/road schemes and bridges within the six year period of the development plan, subject to the availability of funding and environmental requirements and compliance with the 'Principles of Road Development' set out in the NTA Transport Strategy.*

    Roads and Streets

    - *Richmond Road*

3.5 RICHMOND ROAD AREA ACTION PLAN

3.5.1 The Planning and Economic Development Department of Dublin City Council published the Richmond Road Area Action Plan (AAP) in April 2007. Whilst primarily associated with former development plans the Action Plan remains available on the

DCC website as it continues to have some relevance in regard to topics not addressed in subsequent plans. The Action plan provides guidance for future development with the aim of improving connections and providing a variety of uses within an enhanced public domain including the banks of River Tolka. Reference has been made where relevant in regard to the subject development. The Area Action Plan States the following objectives:

3.5.2 ***7.3(a)*** *- To develop and exploit the amenity and recreational value of the Tolka River in the layout and access arrangements for all new development, with the aim of creating both new pedestrian access and a continuous linear park along the river.*

3.5.3 In addition, the Road Area Action Plan introduces the objective to implement enhancements in the form of upgraded pedestrian and road carriageway provision as per the details illustrated in **Figure 3.1**.

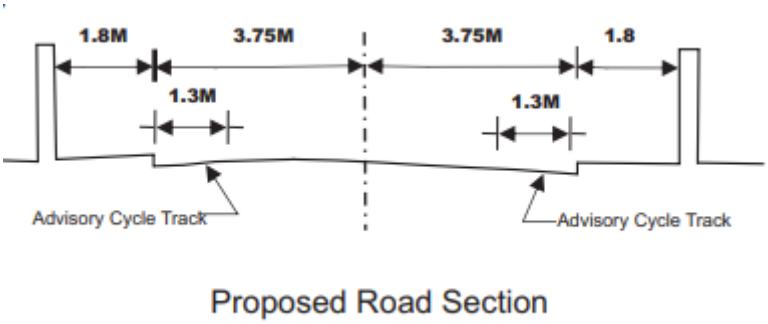


Figure 3.1: Proposed Richmond Road AAA Corridor Enhancements

3.6 DEVELOPMENT CONTROL

Car Parking Standards

3.6.1 In order to determine the appropriate quantum of vehicle parking for the proposed development, reference will be 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), December 2020; and
- Table 16.1 of the current Dublin City County (DCC) Development Plan (2016-2022).

Department of Housing, Planning and Local Government (DHPLG)

3.6.2 The subject site's location, being within 1200m walking distance of Drumcondra DART station and less than 600m of a proposed Core BusConnects (CBC) corridor can be classified as an Intermediate Urban Location.

3.6.3 In relation to car parking, within 'intermediate Urban Locations', the DHPLG document states:

- *'In suburban/urban locations served by public transport or close town centres or employment areas and particularly for housing schemes with more than 45 dwellings per hectare net (18 per acre), planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard'.*

3.6.4 Accordingly, the DHPLG design standards provide the opportunity to consider car parking provision (quantum) below the local development management standards maximum requirements.

Dublin City Development Plan 2016-2022

3.6.5 The Dublin City Development Plan 2016-2022 (Section 11.4.2, Table 11.23) states the following in relation to car parking: -

- *'Apartment parking spaces are mainly to provide for car storage to support family friendly living policies in the city and make apartments more attractive for all residents. It is not intended to promote the use of the car within the city. If the car space is not required in the short-term, it should be given over to other residential storage or utility uses.'*
- Table 16.1 of the development plan outlines the maximum car parking standards applicable to different land uses in the Plan area. Parking areas in Dublin City are divided into 3 no. zones for the purposes of applying car parking standards:
    - *Zone 1:* generally, within an inner-city location where transport corridors intersect, or that has significant interchange potential.
    - *Zone 2:* occurs alongside transport corridors.
    - *Zone 3:* the remainder of the city falls under Parking Zone 3.

3.6.6 With regard to the proposed development schedule, its location is within Zone 2, the associated DCC *Maximum Zone 2* car parking requirements are outlined in **Table 4.1** below.

Development Standard		No. of Units	Quantum Permitted/ Required	
DCC Zone 2	DHPLG		DCC Zone 2	DHPLG
1 / unit	Minimise/reduce Parking Provision	183	183	"Reduced Provision"
1/150 sq.m seating area	Minimise/reduce Parking Provision	157 sq.m	1	"Reduced Provision"

Table 3.1: Car Parking Standards (Maximum)

3.6.7 In response to the above local development management standards the scheme proposals would be permitted to provide up to a maximum of 184 on-site car parking spaces within the proposed development.

Cycle Parking Standards

3.6.8 Reference has again been made to the Dublin City Development Plan (2016-2022) which outlines the cycle parking provision sought for new developments within the area governed by DCC and Section 4.17 of the aforementioned DHPLG requirements. The cycle parking standards applicable to the subject residential development are detailed in **Table 3.2** below.

DCC Standard		DHPLG Standard		No. of Units/Area	DCC Requirement		DHPLG Requirement	
Long Stay	Short Stay	Long Stay	Short Stay		Long Stay	Short Stay	Long Stay	Short Stay
Residential - 1/unit		1 / bed	1/2 apts	104 1-bed	104		104	52
				79 2-bed	79		158	40
Café/Retail – 1/150 sq.m		-	-	157 sq.m	1		-	-
Total					**184**		**262**	**92**
							354	

Table 3.2: Cycle Parking Standards and Recommendations

Disabled Parking

3.6.9 Whilst Chapter 11 of the development plan does not explicitly raise the requirement for the provision of electric vehicle charge points / bays in private developments, it is suggested that in reference to national guidance that at least 5% of all on-site car parking spaces are be dedicated disabled parking spaces.

Electric Vehicle Car Parking

3.6.10 The provision of electric vehicle charge points / bays in private developments is suggested that at least 10% of all on-site car parking spaces are be equipped with one functional Electric Vehicle Charging Point.

4.0 CHARACTERISTICS OF PROPOSALS

4.1 OVERVIEW

4.1.1 The proposed development will principally consist of the demolition of all existing structures on site (measuring c. 2,346 sq.m) including warehouses and 2 No. dwellings; and the construction of a part 6 No. to part 10 No. storey over basement development (with roof level telecommunications infrastructure over), comprising 1 No. café/retail unit (157 sq.m) at ground floor level and 183 No. Build-to-Rent apartments (104 No. one bedroom units and 79 No. two bedroom units). The proposed development has a gross floor area of c. 16,366 sq.m over a basement of c. 2,729 sq.m. The proposed development has a gross floor space of c. 15,689 sq.m.

4.1.2 The development also provides ancillary residential amenities and facilities; 71 No. car parking spaces including 8 No. electric vehicle spaces, 4 No. mobility impaired spaces and 1 No. car share space; 5 No. motorcycle parking spaces; bicycle parking; electric scooter storage; a drop off space; the decommissioning of the existing telecommunications mast at ground level and provision of new telecommunications infrastructure at roof level including shrouds, antennas and microwave link dishes; balconies facing all directions; public and communal open space; a pedestrian/bicycle connection along the north-western boundary of the site from Richmond Road to the proposed pedestrian/bicycle route to the south-west of the site adjoining the River Tolka; roof gardens; hard and soft landscaping; boundary treatments; green roofs; ESB Substation; switch room; comms rooms; generator; lift overruns; stores; plant; and all associated works above and below ground.

4.1.3 A summary of the BTR residential apartment unit's breakdown is provided in **Table 4.1** below.

Floor	1-bed	2-bed	Total
1	11	11	**22**
2	11	11	**22**
3	11	11	**22**
4	11	11	**22**
5	11	11	**22**
6	11	9	**20**
7	11	9	**20**
8	11	3	**14**
9	11	3	**14**
Total	**104**	**79**	**183**

Table 4.1: Proposed BTR Residential Accommodation Schedule

4.2 SITE ACCESS

Vehicles

4.2.1 The subject development will benefit from direct vehicular access onto Richmond Road as shown in **Figure 4.1** below. The proposed access will be in the same general location as that currently provided to the existing on-site commercial/ residential buildings. This vehicle access will be priority controlled and will provide direct access between Richmond Road and the proposed development's basement car parking facility. Further details of the proposed site access arrangements, which includes increasing the carriageway width from 4.6m to 5.5m along Richmond Road as presented in DBFL drawing No: **210027-DBFL-TR-SP-DR-C-1001.**

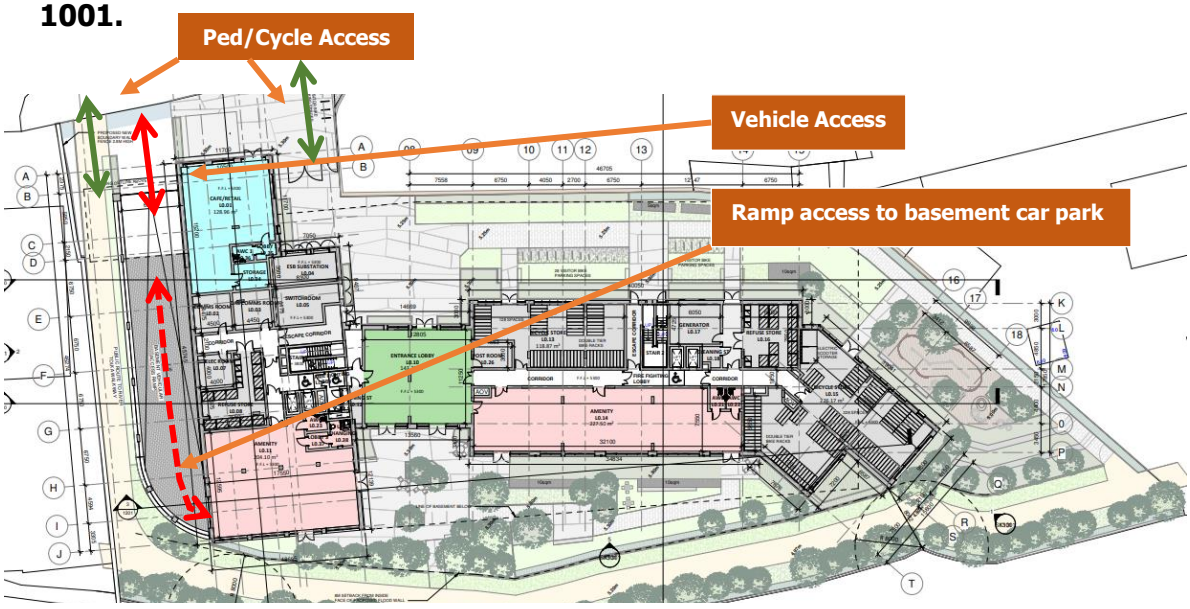


Figure 4.1A: Proposed Site Access

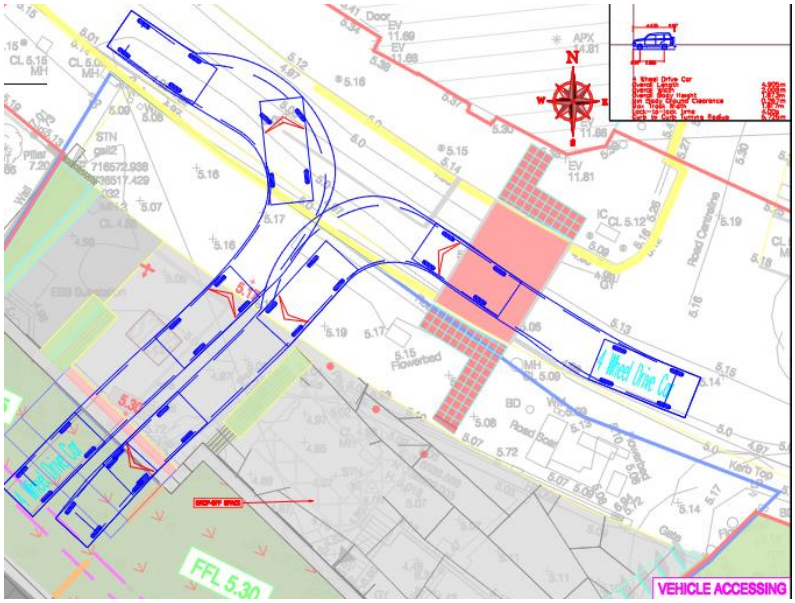


Figure 4.1B: Proposed Site Access Integration – (4 wheel drive car swept path analysis - **210027-DBFL-RD-SP-DR-C-1011**)

Pedestrians and Cyclists

4.2.2 Dedicated pedestrian and cycle accesses are provided adjacent to the proposed vehicular site access on Richmond Road as presented in **Figure 4.2**. Carriageway widening (5.5m wide) and a new signal controlled pedestrian crossing facility on an area of c. 0.08 hectares is proposed along Richmond Road. A direct and segregated pedestrian/cycle access is available to the west of the proposed vehicular access which provides access to a shared cycle/pedestrian connection which continue along the subject site's western boundary. The proposals include the opportunity for further access/egress points for pedestrians and cyclists by continuing the proposed dedicated pedestrian/cyclist links (as proposed along the developments southern boundary with the Tolka River) thereby, allowing for future permeable connections with adjacent lands and future cycle / pedestrian enhancements along the Tolka River bank as per the DCC objectives. It is thus noted that pedestrians will benefit from an internal network of footpaths which are proposed to connect with existing pedestrian facilities on the surrounding road network.

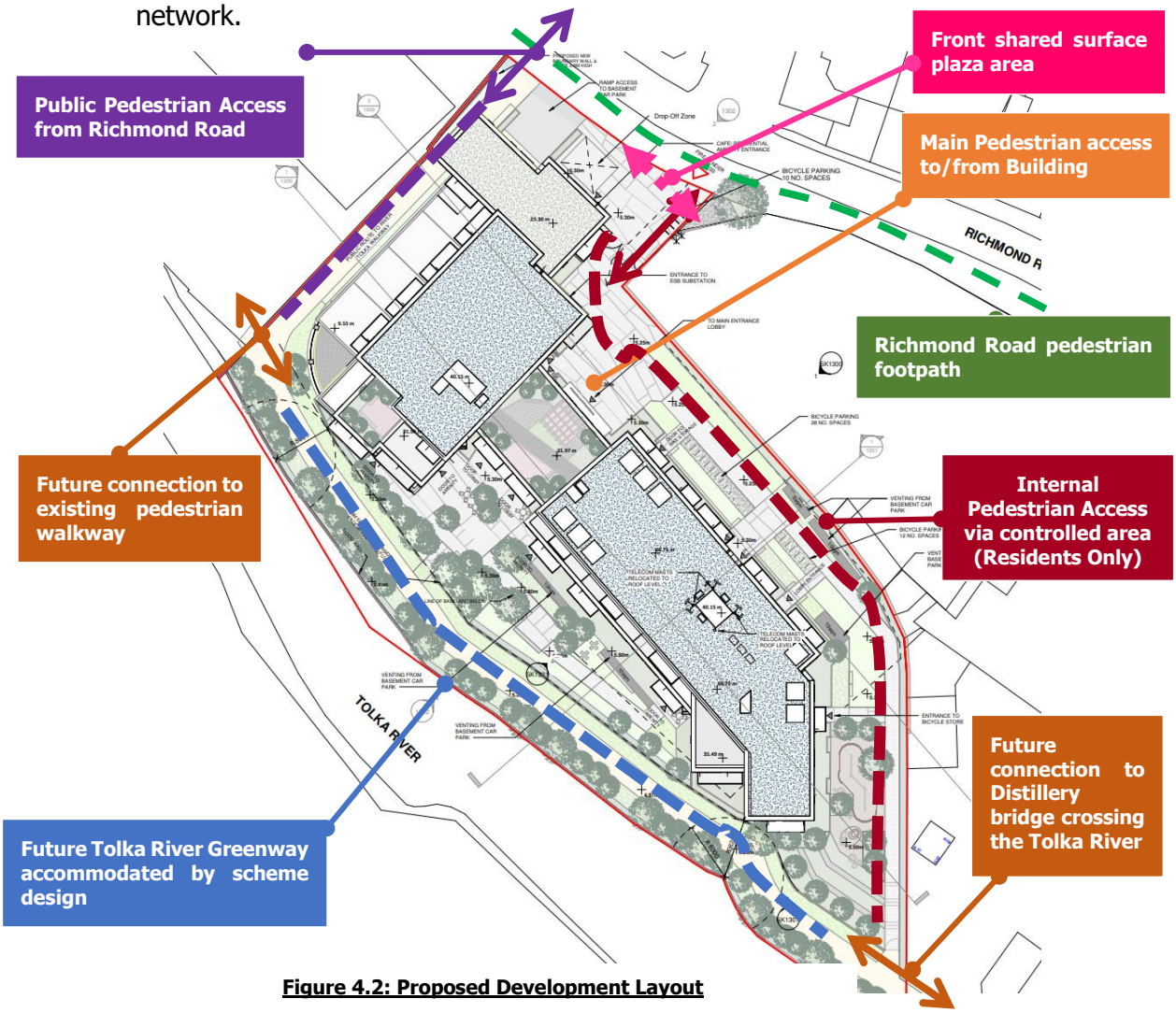


Figure 4.2: Proposed Development Layout

4.2.3 The proposed pedestrian/cycle facility located to the south of the subject site also aligns with the aforementioned "**NO2 Greenway** - *along the River Tolka / Richmond Road from Fairview to Drumcondra*" proposed as part of the NTA's Greater Dublin Area Cycle Network Plan (as introduced in section 2.5.2 of this TTA). As introduced above, this facility will be constructed up to the subject site boundary promoting future implementation of the NO2 Greenway by encouraging adjacent lands and enabling linkage through the subject site as part of the subject residential development proposals.

Emergency Vehicle Access Arrangements

4.2.4 The proposed developments designs accommodate the access/egress and manoeuvring requirements of an emergency vehicle (i.e., ambulance/fire tender) without obstructing the public road or obstruct the proposed development site access. as shown in **Figure 4.3** below and DBFL drawing: **210027-DBFL-RD-SP-DR-C-1011.**

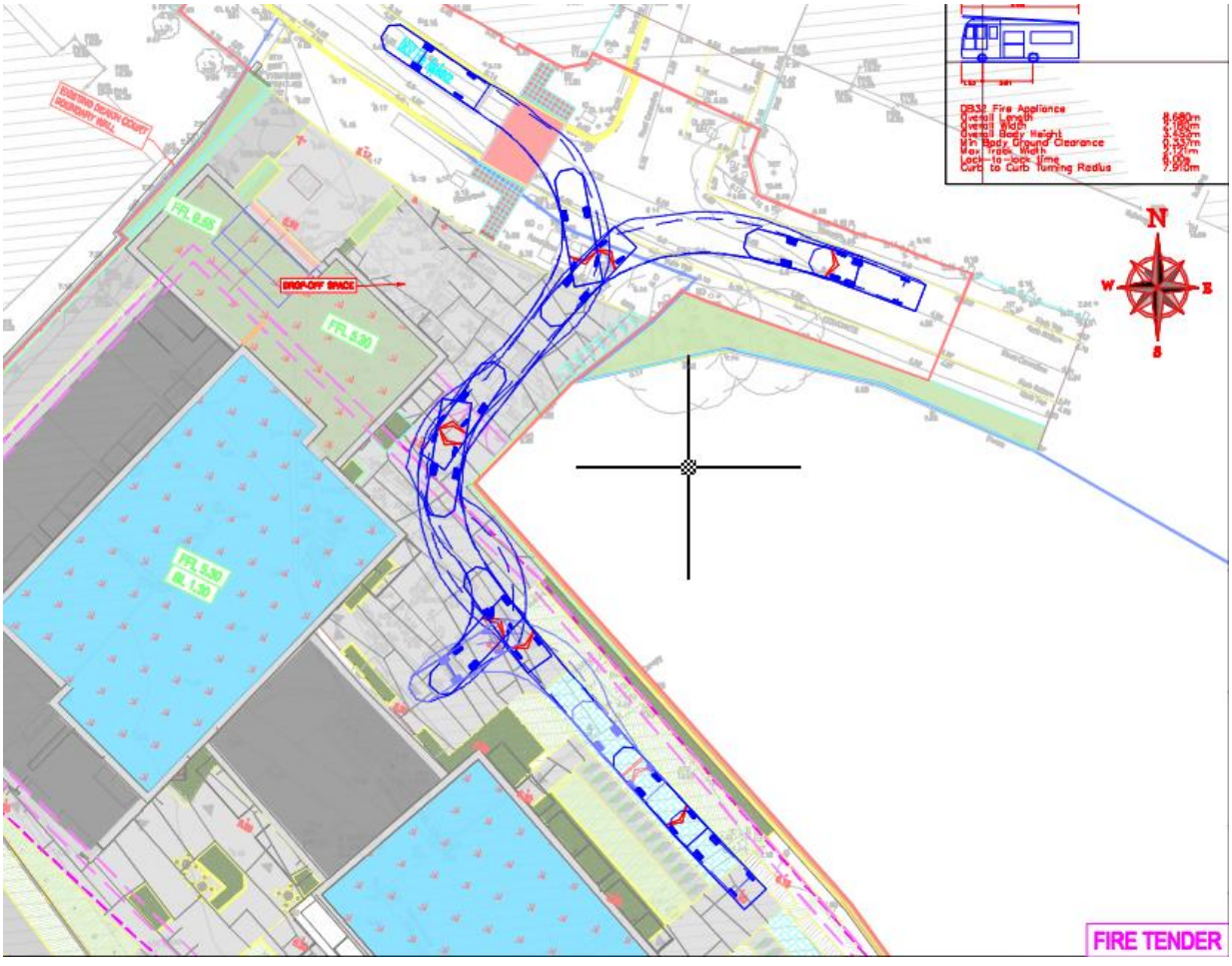


Figure 4.3: Proposed Emergency Vehicle Access

Service Vehicle Access Arrangements

4.2.5 The ability for service vehicles such as a waste collection lorry to safely gain access/egress to the subject development has been accommodated in the scheme design. With the objective of ensuring that all such servicing requirements are facilitated on-site within the development and off the public road (e.g., Richmond Road) specific design considerations have been adopted that will enable a waste collection vehicle to pull off the road carriageway and utilise the on-site 'drop-off' /collection facility, whilst loading the vehicle. Furthermore, the swept path analysis detailed in Figure 4.4 below and DBFL drawing No: **210027-DBFL-RD-SP-DR-C-1011.** Additional details are provided regarding the subject developments service strategy in the Service and Delivery Management Plan, in Section 5.5. within this TTA report.

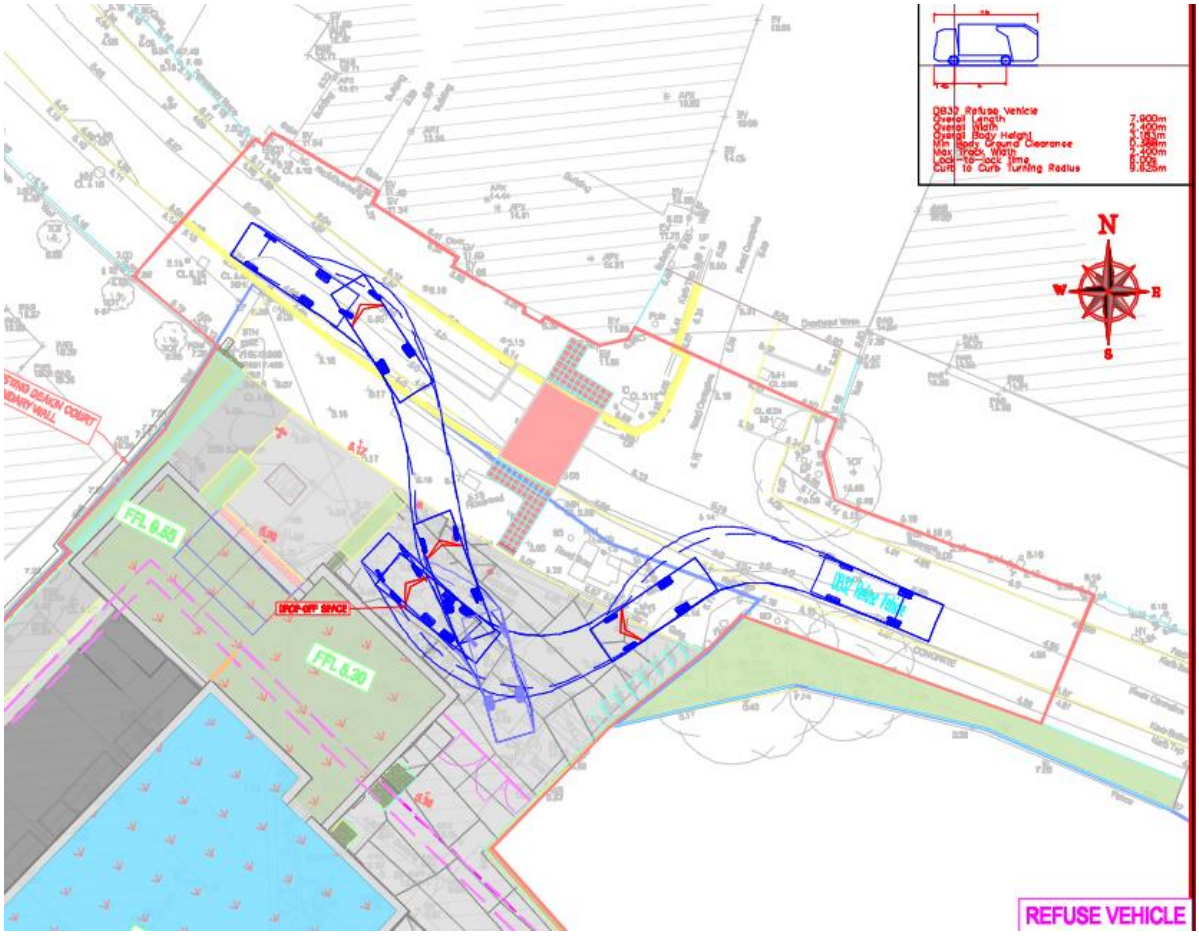


Figure 4.4: Proposed Vehicle Access (Waste Collection)

4.2.6 The proposed developments frontage and access along Richmond Road takes into account available future road objectives and accommodates road infrastructure enhancements such as the widening and upgrading of the pedestrian and road carriageway provisions as mentioned in the previously published Area Action Plan

(2007) (as referenced and illustrated in **Section 3.6** of this TTA). Furthermore, reference has been made to the National Cycle Manual (2011) and sufficient clearance has been provided for to accommodate a 9.0m carriageway (1.5m wider than that identified in the Richmond Road AAP) as illustrated in DBFL drawing No: **210027-DBFL-TR-SP-DR-C-1001**

4.3 PARKING PROVISION

4.3.1 The development proposals include the provision of 71 No. car parking to be provided within the development basement level with an additional 1 no. set down/pick-up accessible space located at surface level. Further details outlining the guidelines, standards and policies being met as well as parking provisions made for ability impaired vehicle users, electric vehicles as well as cyclists are detailed in section 5 below. The strategy is influenced by studying the existing preferred mode choice in the immediate area of the subject site as described in section 5.3.1 below.

5.0 PARKING STRATEGY

5.1 CAR PARKING

5.1.1 The scheme proposals include the provision of 71 no. car parking spaces within the development basement . This level of on-site car parking equates to 0.39 car parking spaces per apartment unit which is considered appropriate for the subject developments BTR characteristics and the excellent accessibility credentials of the subject site as introduced in Chapter 2. The assignment of these basement car parking spaces as illustrated in Figure 5.1A include:

- 1 No. dedicated car share space (GoCar);
- 6 No. Dedicated 'Visitor' spaces;
- 1 dual-use space operating as a dedicated 'Service' bay in the day between 08:00-20:00 (Monday to Saturday). At all other times it will be available for the use of visitors.
- 63 'Residents' spaces of which 8 are EV spaces and 4 are designated as formal 'Accessible' bays.

5.1.2 The proposed provision of 71 no. residential car parking spaces is some 111 spaces lower than the maximum development plan standards of 183 residential bays. This aligns with the proposed provision set out in the DHPLG car parking guidance which states for developments located within Intermediate Urban Locations that *"planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard".* It is noted that no car parking is being assigned to the small café/retail unit.

Development Standard		Proposed	Ratio
DCC Zone 2	DHPLG		
183	Minimise Parking Provision	71	**0.40**

Table 5.1: Proposed Residential Car Parking Provision

5.1.3 In addition to the basement parking facility, a dedicated drop off/collection bay is provided at surface level as detailed in **Figure 5.1B**. This facility, located on private lands and managed by the building's management company will accommodate pick-ups/drop off activities at the development, and therefore off the public road carriageway. As outlined further in Section 5.45, the management regime for this facility will ensure that it is utilised for short duration pick-up/drop-

offs with all longer duration pick-ups/deliveries being directed to utilise the service bay in the basement when appropriate/possible.

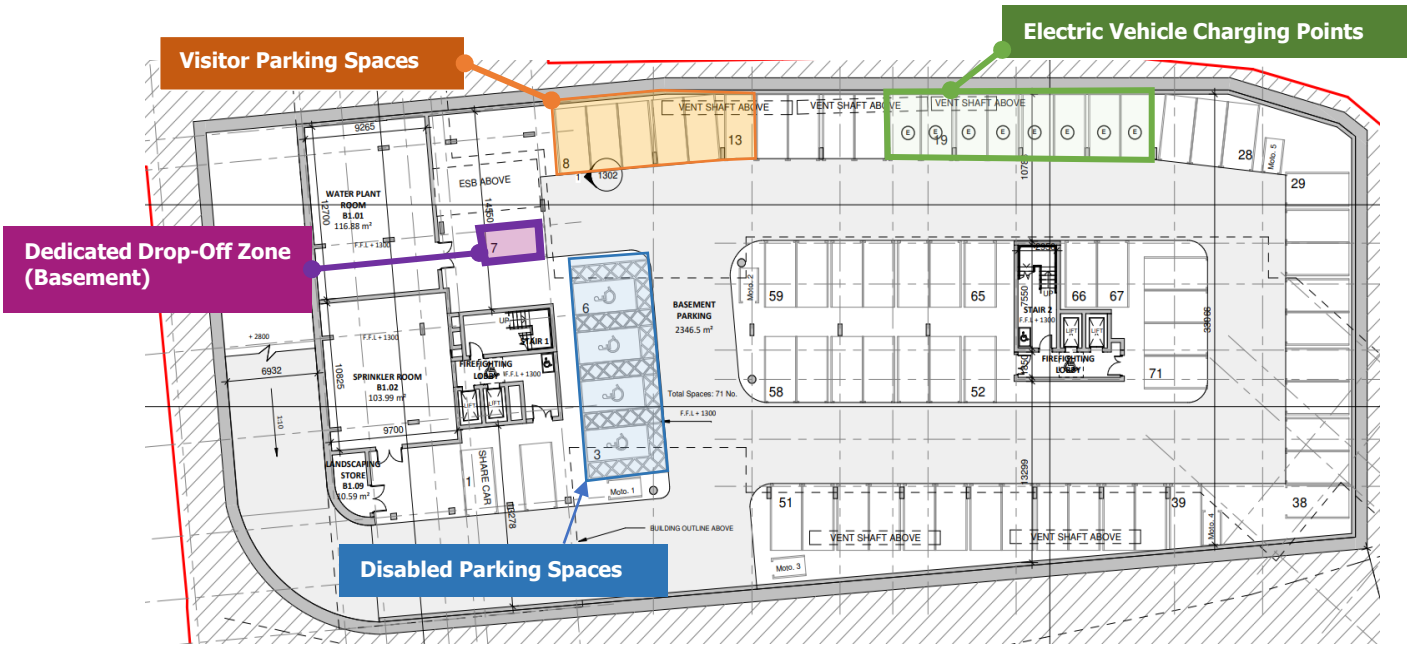


Figure 5.1A: Proposed Basement Car Parking

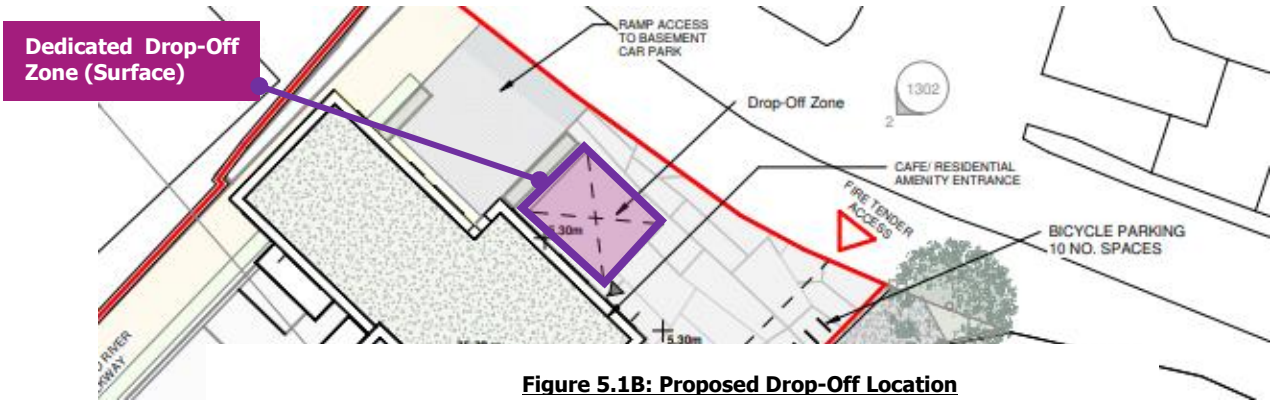


Figure 5.1B: Proposed Drop-Off Location

5.2 PARKING MANAGEMENT REGIME

5.2.1 The level of car parking provision proposed as part of this development scheme is considered appropriate for both the residential and the café/retail unit due to the following: -

- The BTR characteristics of the scheme proposals;
- High quality and frequent public transport services available in close proximity to the subject site (9-minute walk) and accordingly, the application of the DHPLG recommended "*reduced overall car parking standard*" is deemed appropriate for a development at this location;
- A much higher cycle parking provision is proposed compared to the

development plan minimum requirement (as discussed in more detail below) and exceeds the DHPLG requirements thereby ensuring travel by bicycle to / from the subject development site is a viable mode of travel;

- The availability of car share vehicles in the locality in addition to the provisions of a residents dedicated GoCar vehicle.
- The café'/retail unit is to serve the local walk-in catchment.

5.2.2 The proposed developments on-site car parking spaces will remain within the control of the appointed management company. A management regime will be implemented by the development's management company to control access to these on-site apartment car parking bays thereby actively managing the availability of on-site car parking for residents / visitors. The residents within one of the proposed residential apartments will NOT include the ownership of a designated parking space.

5.2.3 All residents of the proposed residential scheme will have the opportunity to apply to the management company for both:

- Residents' car parking permit (updated annually or upon return of same permit) to the management company to gain access to a dedicated (assigned) on-site car parking space; or
- Visitor's car parking permit (which will be issued electronically and subject to time restrictions).

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

5.2.5 A nominal charge will be applied to obtain a permit with the objective of covering the associated management and enforcement costs. Each permit will enable the resident (or visitor) to park a vehicle within a specific assigned parking bay within the basement for a defined period of time. This management regime will enhance the availability of on-site car parking, ensure that every resident who needs car parking can avail of an on-site car parking space whilst residents that do not own a car are not unnecessarily assigned a car parking space.

5.2.6 Taking the above factors into account, including:

- The characteristics of BTR schemes as evidenced by the increasing number of UK case studies;
- The low levels of car ownership based on tenure;
- The low levels of car ownership based on location (as detailed in Section 5.3);
- The proposed scheme marketing (e.g., 'car-lite' scheme with low parking allocation) and car parking management strategy to be implemented on site;
- The requirement for car parking to be 'minimised, substantially reduced or wholly eliminated' as set out in the DHPLG guidelines (2019) for new apartments; and
- The site is located within an established parking controlled area (with updated controls adopted by DCC as outlined in the Dublin City Council parking Control Bye-Laws 2019) which will discourage any overspill parking onto the existing on-street parking bays across the neighbouring streets.

5.2.7 It is therefore considered that the proposed provision of 71 car park spaces, for the subject Strategic Housing Development assigned to the 183 apartments in this location is appropriate.

Mobility Impaired Parking

5.2.8 The Development Plan requires the provision of mobility impaired car parking at a rate of 5% of all car parking spaces which equates to 4 no. spaces. The subject proposals include for a total of 4 no. mobility impaired car parking spaces (located within the development basement) and is therefore considered compliant with the Development Plan standards.

Electric Vehicle Parking

5.2.9 In line with best practice, the subject proposals include for a total of 8 no. electric vehicle parking spaces which equates to 10% of all onsite car parking spaces. In addition to this, ducting will be provided so that electric charger facilities can be easily retrofitted at all car parking spaces at a later date, as and when demand requires.

Motorcycle Parking

5.2.10 The Development Plan requires the provision of motorcycle parking at a rate of 4% of all car parking spaces which equates to 3 no. spaces. The subject proposals

include for a total of 5 no. motorcycle spaces (7% of all car parking spaces) located at basement level and is therefore compliant with the Development Plan standards.

5.3 LOCAL AREA TRAVEL BEHAVIOR

5.3.1 A review of the Census 2016 mode share data for residents along Richmond Road as presented in **Figure 5.2** below, was undertaken to establish the existing travel patterns. This analysis reveals that existing (2016) travel to work/school/college practices are undertaken primarily by non-car modes as presented in **Figure 5.3** below. The mode share data reveals that less than 30% (28%) travel as car drivers whilst approximately two thirds (66%) travel by more sustainable modes including active travel (walking & cycling) which accounts for 40% and public transport which accounts for 26%. It is noted that this assessment of baseline travel choices does not include BTR schemes which would exhibit trends with even lower levels of private car utilisation. As a result, the adaptation of the mode share illustrated in Figure 5.3 represents a worst case scenario as it is likely an overestimate of car use and under estimation of sustainable modes of travel for residential BTR type of schemes.

5.3.2 Accordingly, the proposal for the provision of car parking for 40% of apartments within the subject development will be sufficient to meet the demand for car parking at this location.

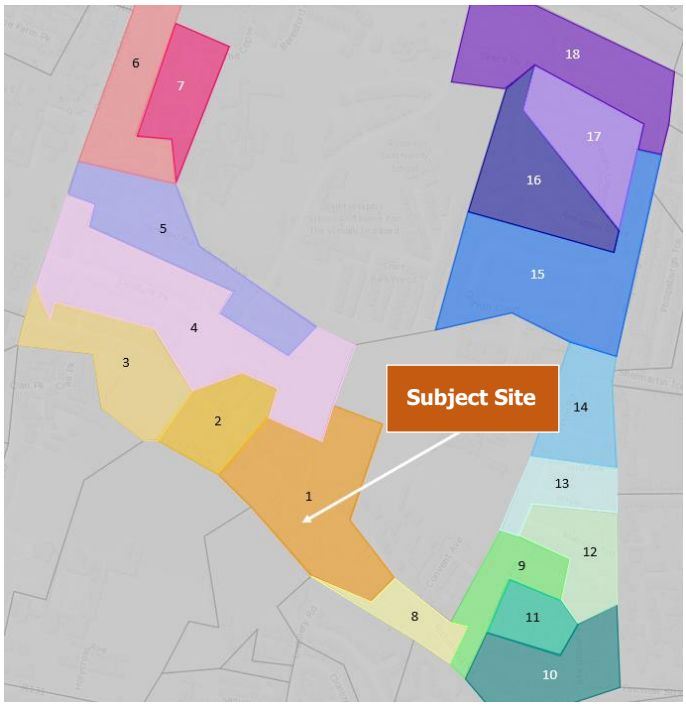


Figure 5.2: Areas Used for Mode of Travel Analysis (Source: http://census.cso.ie/sapmap/)

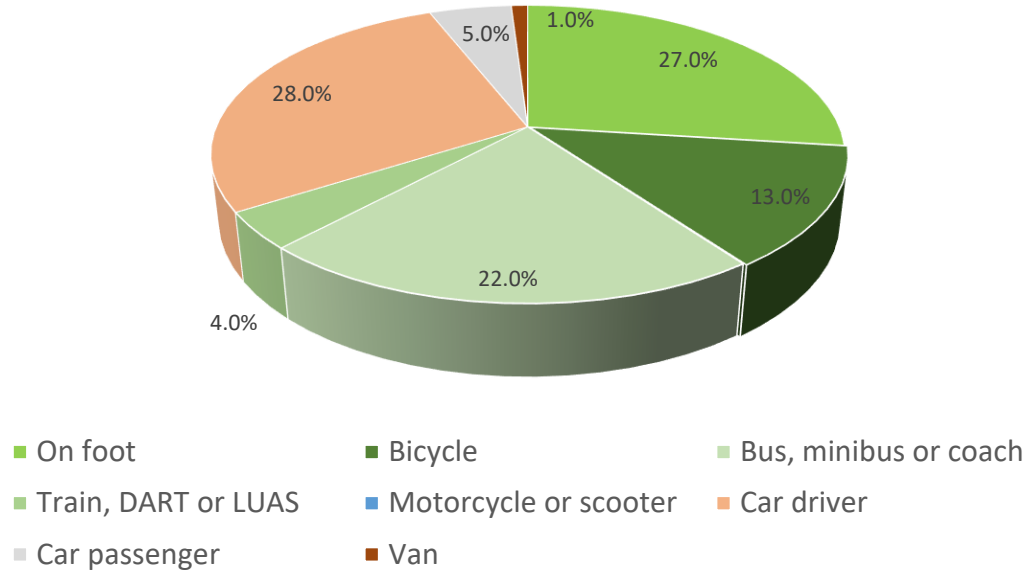


Figure 5.3: 2016 Census Travel to Work / School / College Mode Share

5.4 BICYCLE PARKING

5.4.1 The appropriate level of cycle parking provision for the proposed development will be provided in reference to both (i) the Dublin City Council requirements; and (ii) the DHPLG guidelines. The relevant development guideline's cycle parking standards are detailed in **Table 5.2** below:

DCC Requirement		DHPLG Requirement		Proposed	
Long Stay	Short Stay	Long Stay	Short Stay	Long Stay	Short Stay
184	N/A	262	92	338	52
184	N/A	354		390	

Table 5.2: Comparison of Proposed and Recommended Cycle Parking

5.4.2 In reference to **Table 5.2** above, the proposals include the provision of a total of 390 no. cycle parking spaces comprising 52 short-stay spaces, 338 long-stay bicycle parking, and 2 residential cargo bike spaces all located at surface level. The DCC bicycle parking standards are considered to be 'minimum' standards, whereas the DHPLG requirements are considered to be the preferred level of provision particularly in situations where on-site car parking has been reduced/limited as permitted in certain situations by the corresponding DHPLG car parking guidance. **Figure 5.4** depicts the long-term (2 No. storage areas) and the short-term bicycle parking provisions as detailed in the RKD drawing no: 20199-RKD-ZZ-00-DR-A-1100.

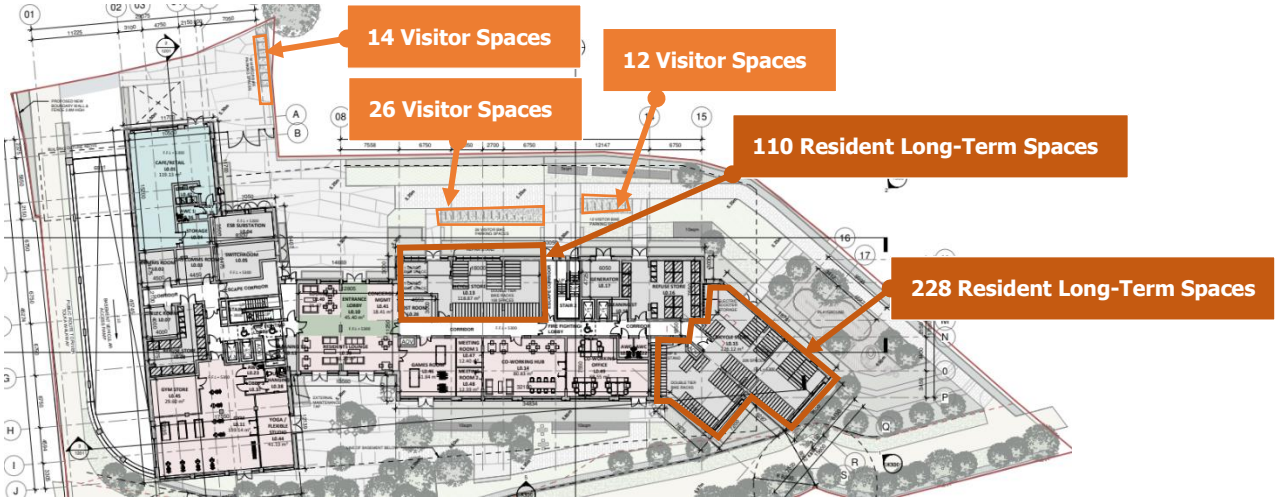


Figure 5.4: Proposed Development Cycle Parking Provision

5.4.3 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 DCC development plan standards (71 spaces opposed to 183). DBFL consider this reduction to be consistent with the DHPLG guidelines as recommend for Intermediate Urban Locations and at which the higher 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 site's accessibility characteristics (including the proposed car parking provision), is considered to be an appropriate number of bicycle parking opportunities on-site, which is above the DCC cycle parking standards and in accordance with the higher DHPLG requirements.

5.4.4 The development proposals further include the provision of electric scooter storage spaces within the long-term/residents (228 spaces) bicycle store as shown in Figure 5.5 below.

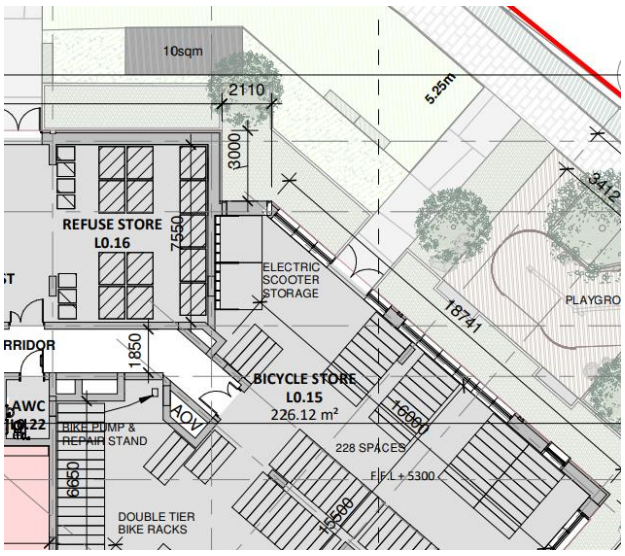


Figure 5.5: Proposed Electric Scooter Storage Facility

5.4.5 With the benefits of balancing residents' access to a bicycle, the proposals include the provision of 10No. 'private' bike share bicycles further to decisions with Bleeper Bike and Moby in regard to the proportion of standard bike or electric bike, or combination of both.

5.4.6 Bicycle pump and repair stations are to be implemented within each of the long term bicycle parking storage area. These pump and repair stands allow for a self-service facility. The stand will include all necessary tools to fix up a bike (pump to inflate the wheels, Allen keys of 3,4 and 5mm, spanners, pliers, screwdriver, and 2 levers to remove the wheel cover). These tools are attached to the stand through steel cables. In order to avail utilise the station, a bike can be lifted and placed onto the repair stand as illustration in **Figure 5.6**.

Figure 5.6: Typical Bike Pump and Repair Stand by BDS

5.5 DELIVERY AND SERVICING PLAN

5.5.1 A Delivery and Servicing Management Plan (DSMP) is a framework identifying the requirement to manage the transport impacts associated with the delivery of goods, servicing of equipment and to provide details on the management of drop-off/pick-up from on-site servicing areas/facilities.

5.5.2 The DSMP is bespoke to the developments Management Company and the local site characteristics. It aims to improve efficiency of all activities such as deliveries,

collection, servicing trips and catering as appropriate to local network requirements.

5.5.3 This preliminary DSMP should be read in conjunction with both the '**Operational Waste Management Plan**' and the '**Construction & Demolition Waste Management Plan**' produced by AWN Consulting and submitted as standalone reports with the subject Planning Application.

Benefits of a DSMP

5.5.4 The benefits of the DSMP to the local authority, residents of the proposed scheme, the developments management company and freight operators includes:

- Help developers, designers, and local authorities planning officials consider service requirements and comply with best practice, which encourages the promotion of more sustainable transport choices for moving freight;
- Demonstrate that goods and services can be delivered, and waste removed in a safe, efficient, and sustainable way;
- Identify deliveries that could be reduced, re-timed or consolidated, particularly in busy periods;
- Help cut congestion on external streets and ease on the environmental pressure;
- Improve the reliability and efficiency of deliveries to the subject site concerned;
- Reduce the operating costs for the building occupants and freight companies,
- Reduce the impacts of freight activity on local residents

Objectives and Measures

5.5.5 The proposed residential development considerations have taken into account the overall objective of managing freight effectively by incorporating the following key considerations:

- Demonstration that goods and services can be delivered, and waste removed (refer to AWN **Operational Waste Management Plan**), in a safe, efficient, and sustainable way.
- Reduce the impact of freight activity on existing and future local residents.
- The provision of appropriate facilities to accommodate the maintenance both commercial and personal deliveries (such as meal deliveries by the likes of 'Just Eat', Amazon and similar courier services) to residents of the proposed development in a safe and efficient manner.

Site Specific Information

5.5.6 The design of the proposed development includes for two designated 'Drop-Off'/collection spaces as indicated in **Figure 5.7** below. The designated drop-off/collection bay at surface level, as located to the front of the development and accessed from Richmond Road aims to serve as a short duration drop-off/collection facility not requiring the vehicle to park for more than 5-10-minutes at any given time (deliveries such as meal drop offs or personal packages primarily done by motorcycles, passenger cars or light commercial vehicles). The second delivery/service facility located within the development's basement area aims to serve all business deliveries servicing, and maintenance requires a longer parking duration. This internal space will be available between 08:00 and 20:00 Monday to Saturday. Out of these times the parking space will be available for visitors.

5.5.7 As part of an operational service management plan, additional measures and opportunities that are to be used to further promote the objectives of the DSMP(i), limit and control servicing demands(ii) and reduce the impacts of the servicing for the development(iii), include the following key provisions/measures:

- The Build to Rent proposal and overall reduced car parking quantum (and subsequent increased bicycle parking provision) aims to help the congestion within Dublin and reduce negative impacts on the environment.
- The proposed café/retail contains a designated storage room catering for sufficient space for business deliveries thereby minimising the need for daily deliveries.
- Where possible, designated delivery times (avoiding peak-hours) will be encouraged
- Dwell times are minimised by the provision of a drop-off/collection bay located at surface level, in close proximity to the development's café/retail unit as well as a designated delivery service bay located within the development main pedestrian access to the residential building and basement.
- Deliveries can be met with a site operative on arrival on site such as the BTR reception area. This will allow the deliveries to be received immediately, further minimising vehicle dwell times.
- The management company will coordinate and raise awareness of all service vehicles visiting the site. This should include the identifying of any impacts

associated with the servicing and deliveries of the development while identifying measures to mitigate them.

- As servicing and supplier contracts are agreed, the management of the relationship with them, there is the opportunity to consolidate deliveries at source thus minimising the amount of service vehicles at the site.
- The provision of an appropriate number of conveniently located parking opportunities at surface level within the site enables deliveries by both cargo bikes and motorcycle/moped to be accommodated off the external public road network.

5.5.8 It is noted that while the development proposals include for all the physical infrastructure to accommodate the delivery and servicing of the subject site, the Management Company, once appointed will coordinate the day to day policies and operational details.

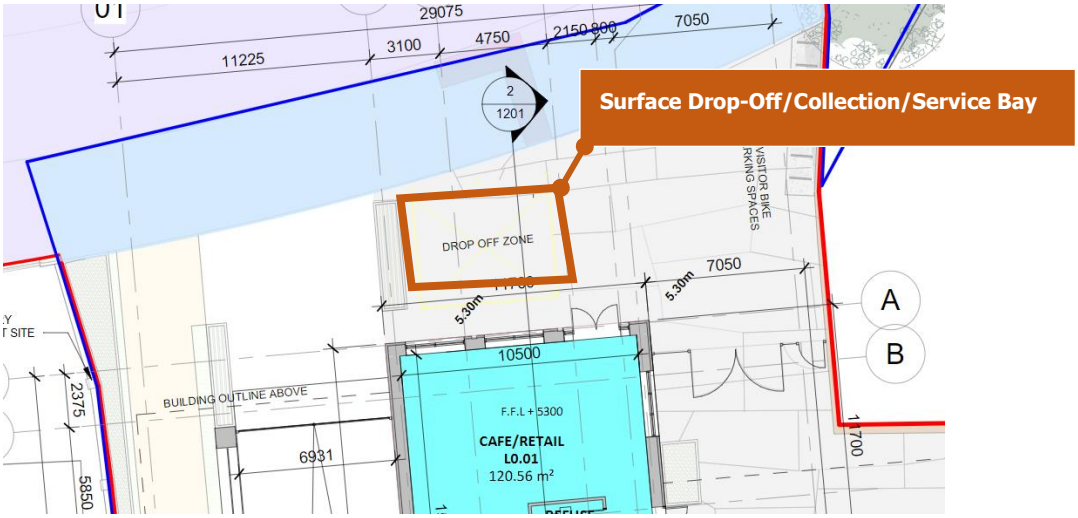


Figure 5.7A: Proposed Drop-Off / Collection / Service Bays

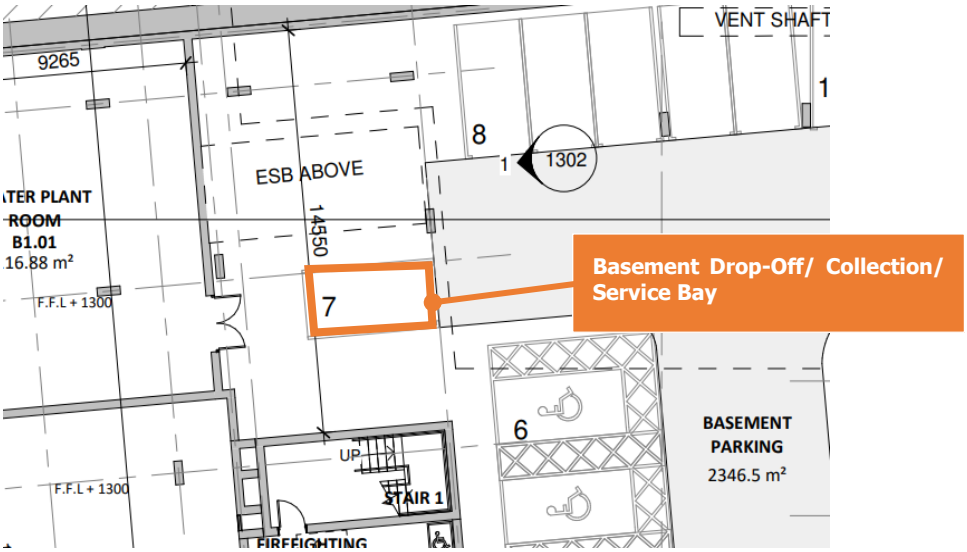


Figure 5.7B: Proposed Drop-Off / Collection / Service Bays

Anticipated Delivery/Collection/Maintenance Trips

5.5.9 Once the subject development is complete, it is anticipated that the level of servicing will be in line with typical BTR levels of operational trips. Deliveries for both business (including management company) and personal/residents use will be subject to operational management requirements of the appointed management company and are recommended as per the Operational Waste Management Plan and the Construction and Demolition Waste Management Plan. The anticipated delivery/service generated by the proposed development site is summarised in **Table 5.4** below.

Delivery	Vehicle	Location	Frequency	Dwell Time
Take Away (hot food)	Bicycle / Motorcycle / Car	Surface	10-20 / day	5-8 minutes
Grocery Delivery (Personal)	LCV (Van)	Surface / Basement	2-4 / day	10-12 Minutes
Maintenance Trips	LCV / Van	Basement	1 / week	120 minutes
Waste Collection	Rigid Lorry	(refer to Operational Waste Management Report)	2 / week	15 minutes
ESB Access	LCV	Basement	4-6 / year	60 minutes
Café/Retail Unit	LCV (Van) / Rigid Lorry	Surface / Basement (Depending on Vehicle)	3-5 / week	10-20 minutes
Courier	Bicycle/Mc/Car/LCV	Surface	4-10/day	5-6 minutes

Figure 5.4: Proposed Development Delivery/Servicing Schedule

5.6 ROAD SAFETY AUDIT

5.6.1 An independent Stage 1 Road Safety Audit (RSA) has been undertaken on the scheme proposals. The Stage 1 RSA has been included in the Quality Audit (QA) undertaken by Bruton Consulting Engineers in accordance with DMURS and TII requirements. The following scheme drawings were provided for the purpose of the audit;

- DBFL Drawing 210027-DBFL-TR-SP-DR-C-1001 P0

- DBFL Drawing 210027-DBFL-RD-SP-DR-C-1001 P01
- RKD Drawing 20199-RKD-ZZ-00-DR-A-1100 Rev P2
- RKD Drawing 20199-RKD-ZZ-00-DR-A-1002 Rev P2
- MA Drawing ROC0001- MA-XX-XX-DR-L-100 Rev 00

5.6.2 The findings and associated recommendations of the audit process were initially issued in the DRAFT QA report on 13th December 2021. Following a review of the recommendations the scheme proposals were updated and the audit feedback form returned to the auditors. The FINAL QA report was subsequently issued on 20th December 2021.

5.6.3 The recommendations of the auditors have been incorporated into the final scheme proposals presented for planning. The most significant amendment to the scheme included the widening of the road carriageway on Richmond Road to a consistent width of 5.5m across the site frontage as now detailed in the submitted Architects and Engineers drawings. The auditors recommended the incorporated of additional tactile paving and other traffic management measures as now detailed in DBFL drawing 210027-DBFL-TR-SP-DR-C-1001 P04 as submitted with the planning application.

5.6.4 Whilst the site layout will still be subject to any specific planning conditions requested by the local road's authority during the planning process, the eventual layout will also be influenced by a Stage 2 Road Safety Audit during the detail design stage.

6.0 TRIP GENERATION AND DISTRIBUTION

6.1 INTRODUCTION

6.1.1 The following paragraphs present the process by which the potential level of person trips and associated vehicle trips, generated by the subject mixed-use development have been quantified and subsequently assigned across the local road network.

6.1.2 In order to assess the operation of the proposed road network and its future capacity, a traffic model of the existing local road network and proposed links has been created.

6.2 TRAFFIC SURVEYS

6.2.1 With the objective of quantifying existing 'baseline' traffic characteristics across the surrounding local road network, vehicle turning count surveys were undertaken at (i) the R132 /Richmond Road / Millmount Ave junction and (ii) the R803 / Richmond Road signal-controlled junction in February 2020 (pre Covid-19 travel restrictions).

6.2.2 For an accurate and relevant representation of the vehicular movement surrounding the subject development, DBFL commissioned additional traffic surveys which were undertaken in May 2021. This included a junction turning count (JTC) survey at the proposed site access and an automatic traffic count (ATC) survey between the R132 /Richmond Road / Millmount Avenue signal-controlled junction and the Grace Park Road junction. The ATC survey allowed for the calculation of a conversion factor (to be applied to the recorded site access JTC traffic flows) thereby converting the 2021 flows to corresponding, pre Covid-19 vehicle movements in February 2020.

6.2.3 The results of the traffic survey established has that the local AM and PM peak hours occur between 07:15-08:15 and 18:00-19:00.

6.2.1 In order to analyse and assess the impact of the proposed development on the surrounding road network, a traffic generation and distribution model (excel based) of the above three key junctions has been created.

6.2.2 The recorded 2020 peak hour traffic flows are presented in **Figure 6.1** as included within **Appendix B**. The analysis reveals that the existing on-site facilities could

potentially generate 7 and 5 two-way vehicle trips during the AM and PM peak hour periods respectively.

Figure 6.1: Traffic Survey Locations

6.3 TRIP GENERATION – EXISTING FACILITIES

6.3.1 The existing onsite facilities including (i) the two red brick dwellings and rear warehouse units have the potential to currently generate traffic. Whilst a number of rear warehouse units are vacant, they were until recent times occupied by Richmond Builders Providers. However, to allow for the most conservative approach and robust analysis, the predicted impact of the proposed development (referred to in section 6.4) has been analysed by assigning all the generated and attracted vehicles as additional vehicles onto the network. This allows that impact the proposed development is predicted to generate (referred to in section 6.8) represents a worst-case estimation.

6.3.2 Nevertheless, a trip generation exercise has been undertaken of the existing onsite facilities with **Table 6.1**, **6.2** and **6.3** detailing the potential vehicle trip generation and attraction for the existing site facilities.

	AM Peak Hour		PM Peak Hour	
	Arr	Dep	Arr	Dep
Trip Rate	0.703	0.139	0.048	0.496
Vehicle Trip Generation	3	1	0	2

Table 6.1: Existing Site Trip Rates (Red Brick Building)

	AM Peak Hour		PM Peak Hour	
	Arr	Dep	Arr	Dep
Trip Rate	0.11	0.029	0.031	0.091
Vehicle Trip Generation	2	1	1	2

Table 6.2: Existing Site Trip Rates (Rear Warehouse Space)

	AM Peak Hour		PM Peak Hour	
	Arr	Dep	Arr	Dep
Vehicle Trip Generation	5	2	1	4

Table 6.3: Existing Baseline Site Generated Vehicle Trips

6.4 TRIP GENERATION PROPOSED DEVELOPMENT

6.4.1 The following paragraphs present the process by which the potential level of person trips and subsequently vehicle trips, associated with the proposed redevelopment have been generated.

Modal Split & Person Trips

6.4.2 Based on the mode share proportions derived from the Census 2016 data in **Section 5.3** above, the potential total person trips can be estimated. Accordingly, it is expected that the subject residential development will exhibit similar sustainable travel characteristics which will be encouraged through the various initiatives introduced in Chapter 8 of this report. The mode share data reveals that less than 30% (28%) travel as car drivers whilst approximately two thirds (66%) travel by more sustainable modes including active travel (walking & cycling) and public transport. As discussed in the following section, the vehicle trip rates have been predicted using the TRICS database.

6.4.3 The adoption of the local areas baseline travel characteristics as detailed in Figure 6.2 for the geographical areas outlined in Figure 5.2 is considered to represent a worst case argument of the proposed BTR development. These specific areas do not reflect more sustainable travel patterns seen at BTR types of residential

scheme and such are expected to be overestimating the level of motorised vehicle trips that the subject BTR scheme will actually generate.

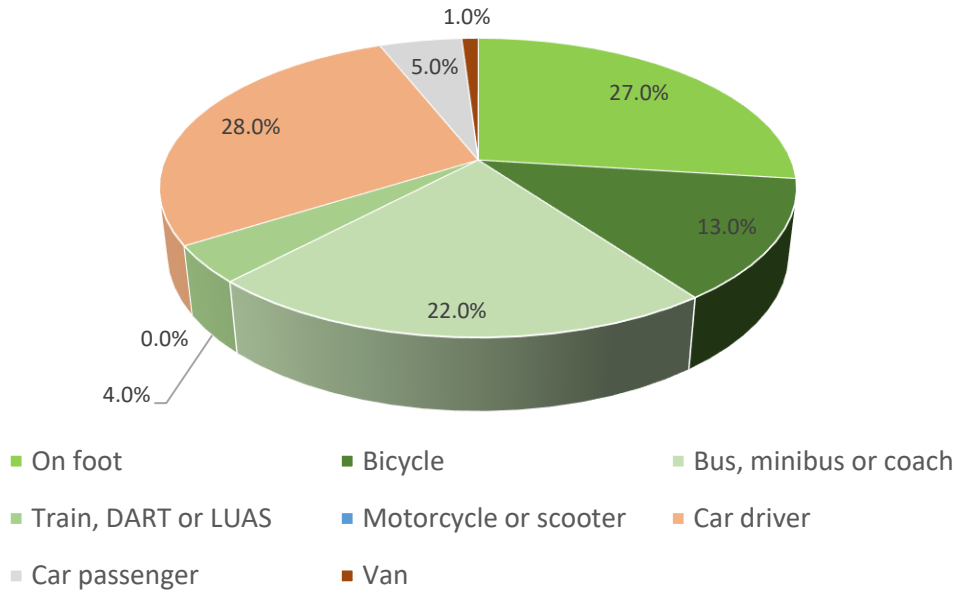


Figure 6.2: Census 2016 Modal Split – Travel to Work / School / College

6.4.4 Based on the modal split outlined above, the total quantum of residential person trips (i.e., all modes) that could be generated by the subject development once operational in the adopted worst case overestimate is to be in the region of 177 no. two-way person trips in the AM peak hour and 205 no. two-way person trips in the PM peak hour as summarised in **Table 6.4** below.

Mode of Travel	%	AM Peak Hour			PM Peak Hour		
		Arr	Dep	2-way	Arr	Dep	2-way
On foot	25.5%	13	32	45	36	16	52
Bicycle	13.3%	7	17	23	19	8	27
Bus, minibus, or coach	24.1%	12	31	43	34	15	50
Train,Dart or Luas	3.1%	2	4	5	4	2	6
Motorcycle or scooter	0.9%	0	1	2	1	1	2
Car, Van, Lorry driver	29.0%	14	37	51	41	18	60
Car passenger	2.6%	1	3	5	4	2	5
Van	1.1%	1	1	2	2	1	2
Total		**50**	**127**	**177**	**143**	**62**	**205**

Table 6.4: Proposed Residential Development Trips Categorised by Mode

6.4.1 A review of trip generation factors contained within the TRICS database was carried out. Whilst TRICS data was initially UK based, although a significant number of Irish sites have been included in recent years and the number of Irish sites continues to expand. Accordingly, we consider that TRICS will provide a reasonable indication of traffic generation from the proposed development.

6.4.2 Notwithstanding the above, internal research undertaken by TRICS has shown that there is no direct evidence of trip rate variation by country or region. The use of English, Scottish or Welsh data can be equally applicable to Ireland if users take into account important site selection filtering factors such as levels of population, location type, local public transport provision, and development size and car ownership level, amongst others.

6.4.3 The vehicle trip generation exercise has selected the closest available land use category available (Flats Privately Owned) in the TRICS database for apartment sites based in the Dublin City area in order to establish robust trip generation characteristics. It is noted that, due to (i) the restrictive car parking provision proposed, and (ii) the BTR characteristics of the proposed development, the TRICS derived trip rates will actually overestimate the number of car trips that the subject BTR development could generate. Accordingly, the subject assessment is considered to represent a robust worst case approach.

6.4.4 The resulting predicted TRICS derived trip rates and subsequent vehicle trip generation during the morning and evening peak hour periods is presented in **Table 6.5** below. The TRICS output files are included in **Appendix A** of this report.

Peak Period	AM Peak Hour		PM Peak Hour	
	Arr	Dep	Arr	Dep
Trip Rate	0.079	0.201	0.227	0.099
Trip Generation	14	37	41	18

Table 6.5: Proposed Residential Development Vehicle Trip Rates

6.4.5 For the purpose of this TTA it has been assumed that the small ground floor café/retail unit in the scheme proposals will accommodate predominantly local 'walking' catchment, particularly as none of the on-site car parking spaces are being assigned to this mode's commercial element of the subject residential scheme.

6.4.6 For the purposes of this assessment, it is estimated that the entire development could be constructed and occupied by the end of the adopted 2023 Opening Year.

6.5 COMMITTED DEVELOPMENT

6.5.1 DBFL have undertaken a review of the DCC's planning portal to establish the extent of committed developments in the area. The review established that there are no significant third party committed developments in the immediate local area accessed via Richmond Road that will generate a material impact on the local transport network.

6.6 TRIP DISTRIBUTION & ASSIGNMENT

Proposed Development Trip Distribution

6.6.1 For the adopted Opening Year of 2023 and Future Design Years of 2028 (Opening Year +5 years) and 2038 (Opening Year +15 years), the distribution of proposed development traffic as proposed by DBFL is presented in **Figure 5** as included in **Appendix B** of this report. The associated residential vehicle trips have been assigned to the network based on the surveyed traffic movements at the key off-site junctions on the N1 and R803 corridor.

6.7 TRAFFIC GROWTH

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

6.7.2 Although traffic growth may not increase at the rates once predicted, to ensure a robust analysis of the impact of traffic upon the local road network we have adopted growth rates using the Transport Infrastructure Ireland (TII) traffic projections. Table 6.1 (Unit 5.3 – Travel Demand Projections) within the TII Project Appraisal Guidelines provides Annual Growth Factors for the different regions within Ireland. The subject site lies within 'Dublin Metropolitan Area' with the growth factors as outlined within **Table 6.6** below.

Metropolitan Area	Low Sensitivity Growth				Central Growth				High Sensitivity Growth			
	2016-2030		2030-2040		2016-2030		2030-2040		2016-2030		2030-2040	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
Dublin	1.0146	1.0280	1.0034	1.0116	1.0162	1.0295	1.0051	1.0136	1.0191	1.0328	1.0087	1.0172

Table 6.6 National Traffic Growth Forecasts: Annual Growth Factors

(Extract from Table 6.1 PAG)

6.7.3 Applying the annual factors (medium growth) as outlined in **Table 5.6** above for the adopted Opening Year of 2023 and Future Design Years of 2028 (+5 years) and 2038 (+15 years), the following growth rates have been adopted to establish corresponding 2023, 2028 and 2038 baseline network flows: -

- 2020 to 2023 – 1.049 (or 4.9%);
- 2020 to 2028 – 1.137 (or 13.7%); and
- 2028 to 2038 – 1.210 (or 21.0%).

6.7.4 The 'baseline' Do-Nothing traffic movements for the periods 2023, 2028 and 2038 are presented in Figures 2 to 4 within **Appendix B.**

6.8 ASSESSMENT SCOPE

Assessment Scenarios

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

6.8.2 The 'Base' traffic scenario takes into account the potential level of traffic that could be generated by the 'committed development' (if any applicable), in addition to the existing vehicle flows as surveyed travelling across the local network.

6.8.3 The proposed development traffic flows are then added to the network's 'Base' traffic flows to establish the new 'Post Development' traffic flows.

6.8.4 In summary the following scenarios are considered: -

Do Nothing:

- A1 – 2023 Base Flows;
- A2 – 2028 Base Flows; and
- A3 – 2038 Base Flows

Do Something:

- B1 - 2023 Do Nothing (A1) + Proposed Development Flows;
- B2 - 2028 Do Nothing (A2) + Proposed Development Flows; and
- B3 - 2038 Do Nothing (A3) + Proposed Development Flows.

Assessment Periods

6.8.5 The AM and PM peak hour flows have been identified as occurring between 07:15-08:15 and 18:00-19:00 respectively.

Network Vehicle Flows

6.8.6 The following Figures as included in **Appendix B** present the vehicle flows across the local road network for each of the adopted development scenarios: -

- **Figure 2** – 2023 Do Nothing (Scenario A1);
- **Figure 3** – 2028 Do Nothing (Scenario A2);
- **Figure 4** – 2038 Do Nothing (Scenario A3);
- **Figure 7** – 2023 Do Something; (Scenario B1);
- **Figure 8** – 2028 Do Something (Scenario B2); and
- **Figure 9** - 2038 Something (Scenario B3).

6.9 NETWORK IMPACT

6.9.1 **Figure 5.3** below details the amount of two-way vehicle trips to/from the proposed development site that will travel along Richmond Road in the 2038 design year as result of the proposed subject development.

6.9.2 The resulting percentage increase in traffic flows as a result of the traffic generated by the proposed development is established as below the 10% threshold (5% for congested networks) at the local key off-site junctions.

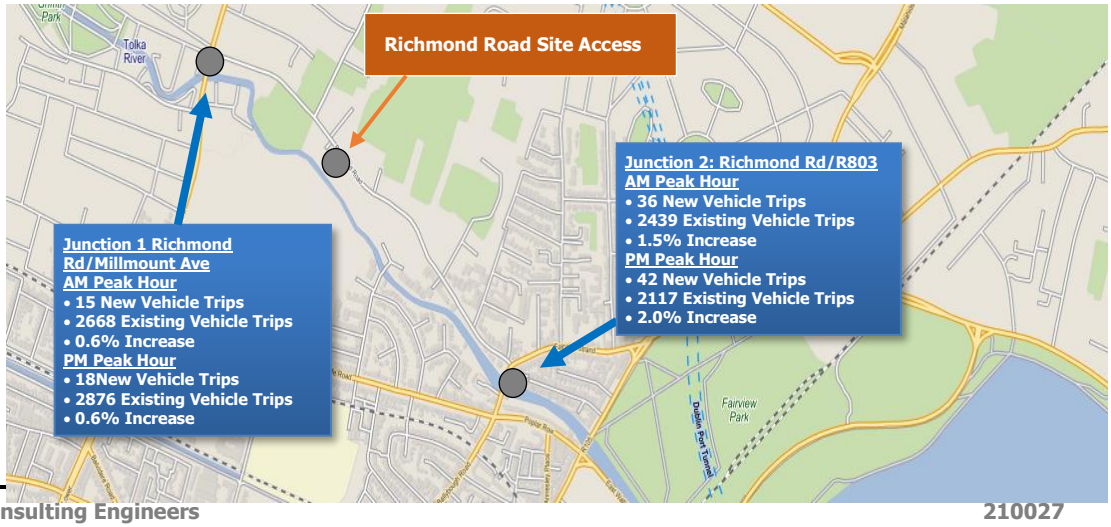


Figure 6.3: Increase in Vehicle Trips Generated at Key Local Junctions 2038

potential impacts during the 2038 Future Design Year (Opening Year +15): -

- Junction 1: Richmond Road/Millmount Avenue/N1 signal-controlled junction - an increase of 0.6% (15 New Vehicle Trips) in the AM peak period, and 0.6% (18 New Vehicle Trips) in the PM peak period.
- Junction 2: Richmond Road/R803 Signal controlled junction - an increase of 1.5% (36 New Vehicle Trips) in the AM peak period, and 2.0% (42 New Vehicle Trips) in the PM peak period

6.9.4 When the existing onsite facilities potential traffic impact is considered, the actual increase in vehicle trips due to the proposed redevelopment will decrease slightly. The overall impact the additional vehicles caused by the development (difference between proposal and existing impact) can be classified as the following:

- Junction 1: Richmond Road/Millmount Avenue/N1 signal-controlled junction - an increase of 0.5% (13 New Vehicle Trips) in the AM peak period, and 0.6% (16 New Vehicle Trips) in the PM peak period.
- Junction 2: Richmond Road/R803 Signal controlled junction - an increase of 1.3% (31 New Vehicle Trips) in the AM peak period, and 1.8% (38 New Vehicle Trips) in the PM peak period

6.9.5 Based on the network impact assessment above, neither of the 2 key off site junctions assessed exceed the threshold requiring further assessment. Accordingly, only the proposed site access junction has been subject to detailed junction analysis as outlined in **Chapter 7** of this TTA report.

7.0 NETWORK ANALYSIS

7.1 INTRODUCTION

7.1.1 The operational assessment of the local road network has been undertaken using the Transport Research Laboratory (TRL) computer package Junctions 9 PICADY for the site access junction.

7.1.2 When considering priority-controlled junctions, a Ratio of Flow to Capacity (RFC) of greater than 0.85 would indicate a junction to be approaching operational capacity. A 90-minute AM and PM period has been simulated, from 07:15 to 08:45 and 17:45 to 19:15. Traffic flows were entered using an Origin-Destination table for the peak hours.

7.1.3 In order to determine if the proposed site access junction will cater for the predicted level of traffic generation, a traffic modal of the site access junction was analysed for the schemes 2023 Opening Year and subsequent 2028 and 2038 Future Design Years.

7.1.4 As the existing onsite land use currently generate negligible traffic flows (i.e. only 4 two-way vehicle movements recorded in the AM and PM peak hours respectively), only a Do-Something assessment has been undertaken in the following section.

7.2 SITE ACCESS JUNCTION ANALYSIS

7.2.1 The results of the operational assessment of this proposed priority-controlled site access junction during the weekday morning and evening peaks are summarised in **Table 7.1** below. The arms were labelled as follows within the PICADY model:

Arm A: Richmond Road (East)
Arm B: Site Access
Arm C: Richmond Road (West)

7.2.2 The results reveal that even in the 2038 Future Design Year scenario with 18 years of traffic growth applied to the 2020 base traffic, the proposed site access junction is predicted to be operating with significant reserve capacity remaining available. A maximum RFC of only 0.13 and associated queue length of 0.1 pcu is predicted which is significantly below the RFC value of 0.85 that signifies that a priority controlled is approaching operational capacity.

Scenario	Stream	AM Peak Hour		PM Peak Hour	
		Queue	RFC	Queue	RFC
2023 OY	B-AC	0.1	0.11	0.1	0.06
	C-AB	0.0	0.01	0.0	0.03
2028 FDY	B-AC	0.1	0.12	0.1	0.06
	C-AB	0.0	0.01	0.0	0.03
2038 FDY	B-AC	0.1	0.13	0.1	0.06
	C-AB	0.0	0.01	0.0	0.03

Table 7.1: Site Access Junction PICADY Results

8.0 INITIATIVES TO PROMOTE SUSTAINABLE AND SAFE TRAVEL

8.1 OVERVIEW

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

8.2 CONSTRUCTION STAGE

8.2.1 The Construction Environmental Management Plan (which is a standalone report and included in the planning documentation) and the associated preliminary Construction Traffic Management Plan (CTMP) in addition to the application's accompanying Construction and Waste Management Plan (by AWN) incorporates a range of integrated control measures and associated management initiatives with the objective of mitigating the impact of the proposed development's on-site construction activities.

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

- All works on site will be undertaken during hours of the day in accordance with DCC requirements.
- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths, and roads.
- The surrounding road network will be signed to define the access and egress routes for the development including dedicated 'haul' routes to/from the development site.
- The traffic generated by the construction phase of the development will be strictly controlled in order to minimise the impact of this traffic on the surrounding road network and local properties. All HGV trips could

potentially be restricted from traveling to / from the development during the local road network's peak hours.

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

8.3 OPERATIONAL STAGE

8.3.1 With the objective of mitigating the potential impact of the proposed development as predicted in Section 6 and 7 of this report during its operational stage, and with the objective of promoting sustainable travel for all residents, staff, and visitors to the development; the following initiatives have been identified and subsequently form an integral part of the subject development proposals.

- Management – A Mobility Management (MMP) is to be rolled out with the aim of guiding the delivery and management of a range of coordinated initiatives by the scheme promotor. The MMP ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development site. The final MMP will be developed in partnership with DCC to specifically consider the opportunities of shaping all journeys and promoting sustainable transport habits at the proposed residential apartments units.
- Management – A Car Park Management Strategy. The availability of parking spaces is a key determinant of mode choice and car usage. With the objective of minimizing travel by car and encouraging the use of sustainable modes instead, it is proposed to limit the car parking provision

and promote a 'car-lite' scheme. This is considered an appropriate approach considering the site's excellent accessibility characteristics (e.g., walking, cycling, bus and DART opportunities) to places of work, education, and essential services. This 'car lite' approach will help to reduce car dependency in Dublin, reduce traffic congestion and pollution levels, improve the quality of the environment, and help tackle climate change in addition to encouraging sustainable travel.

- Facilities - In addition to facilitating and encouraging bicycle use, increasing the number of cycle parking provision on-site is considered beneficial in situations such as when reducing on-site car parking spaces. A total of 390 no. cycle spaces are proposed for within the development site all of which are located at ground floor (residents long-term) and surface 'visitors' facilities. With 183 residential units being proposed, this equates to approximately 2.13 cycle spaces per residential unit.
- Facilities – The subject development site is located within the 'Purple one' of 'Bleeper' bikes public bicycle share catchment thereby offering benefits in terms of access to a bicycle. Notwithstanding the benefit, the proposals also include a 'private' bike share scheme for residents thereby for the enhancing access and availability of bicycles for residents. In partnership with a commercial provider, up to 10 'private' bicycles are to be made available for residents to share.
- Service – Whilst located in a part of the city that already benefits from the provision of on-street publicly accessible car share vehicles, as operated by both **GoCar** and **YUKO**; the facilitation of a dedicated car share parking bay and associated vehicle on-site within the basement facility (for the sole use of the residents of the development) will reduce the need for residents to own a private motor car thereby contributing to reducing the overall number of vehicle trips generated by the proposed development. This service is to be operated by specialist operator **GoCar** further to the letter of support included in **Appendix D** of this report
- Infrastructure (by applicant) – A number of infrastructure measures have been identified at locations where the proposed development is forecast to give rise to additional traffic including pedestrians and cyclists. The implementation of the following infrastructure focused infrastructure, as

proposed in parallel with this application and in agreement with the local road's authority; ensures that the local road network will continue to operate safely and within appropriate operational parameters;

- New 'shared' active travel path along the southern side of the subject site for the sole use of pedestrians and cyclists (parallel to the Tolka Rover) respects the NTA's / DCC aspirations to implement Tolka River Greenway. The scheme proposals not only safeguard the opportunity but will deliver the Greenway infrastructure thereby advancing the full staged role out of the Greenway objective in the future.
- New 'shared' active travel path along the western boundary of the subject development that will provide a safe and permeable connection between Richmond Road and the route of the Tolka River Greenway for the benefits of both residents of the subject development and the residents, staff and visitors to the various off-site properties located off-site along Richmond Road.
- New signal controlled pedestrian crossing on Richmond Road at the development site frontage as requested by the local planning authority in response to the Stage 2 SHD scheme proposals.

- Infrastructure (by others) – Emerging infrastructure investment and scheme delivery that will further enhance the sites sustainable accessibility credentials include;
  - BusConnects (e.g., Core Bus Corridor) scheme will also deliver improvements to bus and cycling facilities along the R132 (previous N1) Drumcondra Rd Lower (to the west) and R105 North Strand Road (to the east) corridors,
  - The Greater Dublin Area Cycle Network Plan proposals, including the Tolka River Greenway and Richmond Rd enhancement proposals will encourage a greater uptake in walking and cycling amongst residents.
  - The first of the infrastructural projects of the DART+ Programme to be delivered will be the DART+ West project.

This rail improvement project will provide a sustainable, electrified, reliable and more frequent (from 6 to 12 No. of trains per hour) rail service thereby improving capacity (from 5k to 13.2k) on Maynooth and M3 Parkway to city centre rail corridors as accessible via Drumcondra Station to the west of the subject development.

- Management – A Delivery and Servicing Management Plan (DSMP) has been identified with the objective of maximising the efficiency of all activities such as deliveries, collections, and servicing trips and ensuring that all such practices are accommodate in an appropriate manner on-site with the development and subsequently safeguarding the operational performance and road safely levels of the local transportation networks.

9.0 RESPONSE TO AUTHORITIES' COMMENTS

9.1 INTRODUCTION

9.1.1 This chapter provides responses to the specific queries/clarification requests raised by Dublin City Council and An Bord Pleanála for this application during the stage 2 process. Accordingly, the requests/queries outlined in the Transportation Planning Division Report (dated 21st July 2021) and in An Bord Pleanála's Notice of Pre-Application Consultation Opinion (dated October 2021) are addressed in the following sections.

9.2 DCC COMMENTS & DBFL RESPONSES

9.2.1 This section provides responses to the recommendations and observations outlined within DCC's Transportation Planning Division Report (dated 21st July 2021).

Within the Recommendations chapter of report, it has been noted: *The principle of the proposed development is accepted by this Division. However, in order to comprehensively assess the proposal, this division requires additional documentation to be submitted and the following issues to be addressed in any forthcoming SHD application submission:*

1) *The location of the set-down area and accessible parking bay to the north of the site may conflict with the proposed future Richmond Road Improvement Scheme, resulting in the future loss of the set-down area and parking bay to accommodate works. The applicant is requested to include alternative servicing set-down area, drop-off/collection, and accessible parking bay within the site.*

DBFL Response to Item 1

9.2.2 In reference to both DBFL drawing No. **210027-DBFL-TR-SP-DR-C-1001** and section 5.1.3 of this TTA report, it has been demonstrated that sufficient provision/clearance has been allowed for accessing the set-down parking when considering the future Richmond Road Improvement Scheme. It is further noted the updated proposal as shown in drawing no. **210027-DBFL-TR-SP-DR-C-1001** proposes a segregated access for the accessible/drop-down parking space and the development basement.

2) The Tolka River Greenway/NO2 route as proposed as part of the NTA's Greater Dublin Area Cycle Network Plan is planned to traverse along the south of the site. A minimum of 8 metre set back of the development from the River Tolka to allow for the future 'NO2 Greenway' route is required. This set-back distance should not be solely restricted to the development building line but also include open space allocated to private or semi-private communal space associated with the development. Further clarification is required as to the delivery of the proposed pedestrian / cycle facility located to the south of the subject site under this SHD development proposal having regard to its proposed alignment with the future 'NO2 Greenway' route and its interface with the development's open space provision.

DBFL Response to Item 2

9.2.3 Reference has been made to DBFL drawing no. **20199-RKD-ZZ-ZZ-DR-A-1002** which illustrates the setback provision of at least 8.0 m to the frontage of the River Tolka along the entirety of the southern boundary of the development site. The proposed alignment with the future NO2 Greenway has been considered while referring to the guidelines as set out in the Dublin City Council Development Plan (2016-2022) as well as the Dublin City Council Draft Plan as depicted in drawing no. **20199-RKD-ZZ-ZZ-DR-A-1002**.

3) Insufficient design details have been provided in respect of the site interface design with the public realm on Richmond Road and the plaza, including the site entrance points i.e., the vehicular entrance to the surface and basement parking areas, pedestrian, and cyclist accesses, parking/set-down within the Plaza and pedestrian priority on Richmond Road and interaction between pedestrians and vehicles within the plaza area. At the vehicular access/exit point to the development on Richmond Street, the public footpath should be continued at a raised level across the site access but should be ramped and dropped as necessary to facilitate car-entry/exit. Measures including contrasting materials, signing, and road marking, etc. should be incorporated to ensure that vehicles entering/egressing the development are aware that pedestrians/cyclists have priority across the site entrance and that vehicles must yield right-of-way. The applicant is requested to ensure consistency in drawings as discrepancies are noted.

DBFL Response to Item 3

9.2.4 In response to the above requirements, the site interface with Richmond Road have been amended and addressed in drawing no. **210027-DBFL-TR-SP-DR-C-1001**. DBFL confirm that the public footpath along the southern side of Richmond Road is continued at a raised level across the site's entire frontage with dropped kerbs provided at the two areas vehicle cross the path in order to provide priority to pedestrians. Further details regarding material specifications are detailed in the Landscape Architects drawings.

4) Insufficient information has been submitted in respect of site servicing and operation. The applicant is requested to address the following:

a) Submit a Servicing and Operations Plan, to include details of all anticipated servicing and operational requirements for the residential and commercial components of the development. This Plan should include details of arrivals/departures, drops-offs and collections, café deliveries, and all refuse management requirements, and supporting site layout plans should be submitted where appropriate.

b) Address the significant vehicular conflicts demonstrated in the north west of the site at the entrance to the basement car park, parking and set-down bays and proposed 'Surface level drop-off spaces.

c) Submit revised site layout plans clearly showing the waste staging / collection point.

DBFL Response to Item 4 a

9.2.5 A Delivery and Servicing Management Plan is now included in **Section 5.5** of this TTA report. Furthermore, supplementary information is outlined in the Operational Waste Management Plan compiled by AWN and submitted with the Planning Application.

DBFL Response to Item 4 b

9.2.6 Architects drawing no. **20199-RKD-ZZ-ZZ-DR-A-1002** details the proposed segregation (physical landscape planter) of accesses to the set-down/collection

bay and access to/from the basement vehicle car park. This alleviates the potential vehicular conflict recognised in the initial design. The inclusion of the physical planter separating the set-down/collection bay from the basement access further enhances safety levels and completely removes conflict points between vehicles intending to access the basement and the surface level accessible bay. The clear demarcation and visibility of the designated pedestrian path on the western boundary of the proposed development and the predicted modest volume of vehicles frequenting of the developments basement car park ensures both pedestrian and cyclist safety at the site access is provided for in an appropriate manner. The updated design has also been subject to an independent Quality Audit (Incorporating a Road Safety Audit) as reported in a separate report included with the Planning Documentation.

DBFL Response to Item 4 c

9.2.7 The result of a swept path analysis is presented in a dedicated Vehicle Tracking Drawing (drawing : **210027-DBFL-RD-SP-DR-C-1011**).The swept path analysis details the accessing/egressing requirements of a waste collection vehicle within the subject proposal. Furthermore, an Operational Waste Management Plan has been compiled and submitted as a stand alone report within the Planning Application. With only two collections/week for the residential development, the utilisation of the on-site set down/collection service space as located to the front of the development is considered an appropriate balanced solution in the context of (i) the minimum level of reversing required by the waste collection (ii) the availability of operations wo assist the waste lorry and (iii) the relative proximity of internal bin stores at ground level within the building.

5) Clarity is required on pedestrian/cycle route to the west of the site which appears to be partially split with a portion of the route traversing through an undercroft and the remaining section separated by the western elevation (refer to Drawing Ref. 20199-RKD-ZZ-00-DR-A-1100). Demonstrate sufficient width for pedestrians and cyclists on the pedestrian/cycle route from Richmond Road to River Tolka

DBFL Response to Item 5

9.2.8 The proposed scheme has been amended with RKD Drawing no. **20199-RKD-ZZ-ZZ-DR-A-1002** has been updated and the pedestrian/cycle route has been

freed up of all columns/obstructions ensuring sufficient width along the entirety of the proposed pedestrian/cycle route.

6) Having regard to the creation of a new linkage between Richmond Road and River Tolka and the increased footfall arising from the development, assess enhanced pedestrian and cyclist crossing routes and connectivity on Richmond Road. The applicant is invited to liaise with this division prior to the submission of a forthcoming SHD application. Any proposed works should be included in the application site 'red line' boundary of any forthcoming application and a letter of consent may be required from DCC.

DBFL Response to Item 6

9.2.9 In response to the above query, external road enhancement works have been incorporated into the scheme proposals including the implementation of a new signal controlled pedestrian crossing on Richmond Road. A number of different locations were examined in regard to the specific location of the new crossing facility, however, have given due consideration to the potential impact on neighbouring third party properties, the location presented in DBFL drawing No. **210027-DBFL-TR-SP-DR-C-1001** was found to offer the optimum design solutions. Further to the identification of a letter for consent being requested from the local authority regarding proposed works outside of the Applicant's ownership and is now included within the Planning Application documentation.

7) The Vehicle Tracking drawings highlight road safety concerns regarding encroachment of vehicles on to the pedestrian/cyclist route to the west of the site and conflict with other vehicles entering/egressing the basement carpark. Furthermore, this area is demarcated as a drop-off area. The proposed layout at the north west of the site creates significant potential for conflict between pedestrians, cyclists and vehicles and requires a substantial design review. The applicant should include additional Autotracking of vehicles entering and egressing basement carpark from Richmond Road.

DBFL Response to Item 7

9.2.10 The revised drawing no. **20199-RKD-ZZ-ZZ-DR-A-1002** shows the segregation of the set-down/collection service space from the vehicle access route to/from the basement, hereby removing the potential conflict. Furthermore, as illustrated in DBFL drawing No. **210027-DBFL-RD-SP-DR-C-1011** the vehicle tracking has been adjusted to stay clear of the pedestrian/cyclist route along both the western and southern boundaries of the site. In addition to this, the familiarity of vehicles accessing the site, the clear demarcation and priority of the pedestrian cycle route, and the location of the dropped kerbs on Richmond Road partnered with the largely reduced parking provision of 71 no. spaces located within the development basement significantly reduces the potential for any potential vehicle/pedestrian/cyclist conflict.

8) The fire emergency access route relies on the section of the pedestrian and cycle way along the south of the site adjacent to the River Tolka (future NO2 Greenway) to access the site (refer to 'Vehicle Manoeuvres Sheet 3'). This division does not support the use of the future Greenway for such use having regard to future taking-in-charge, impact on potential landscaping of the future NO2 Greenway and establishment of an undesirable precedence for developments to use proposed greenways for emergency servicing route. Furthermore, as the site is located within a flood zone, the possibility of whether the southern portion of the site may be inaccessible to fire service vehicles at critical times should be considered. The applicant should review the fire vehicle access proposals.

DBFL Response to Item 8

9.2.11 DBFL drawing no. **210027-DBFL-RD-SP-DR-C-1011** indicates a revised emergency access route which does not require the reliance on any part of the designated southern pedestrian/cycle route (future Greenway) when accessing/egressing the site. The new emergency route will not require the emergency vehicle to travel to/from the southern portion of the site at all with the provision of an adequate turn-around facility located along the northern section of the internal emergency network in front of the main entrance lobby.

9) The following car parking issues should be addressed in any forthcoming SHD application:

a) Clarity within the Car Parking Strategy is required on the allocation of parking spaces to residents, commercial and visitor. Failure to adequately address these may result in overspill parking on the surrounding residential streets

b) Having regard to the reduced car parking provision together with the nature and scale of the development, this division would favour the inclusion of additional shared transport mobility measures such as a car club vehicle.

c) Review of basement car park layout design. Access to parking bay No. 53 appears significantly impeded and parking bay nos. 1-4 should be reviewed in terms of safety having regard to the proximity to the basement ramp bend.

d) Reports and layout plans should be consistent in terms of proposed number of electric vehicle parking spaces.

DBFL Response to Item 9

a) Further details provided in Section 5.1 of this TTA addresses these queries. DBFL confirm that 10% of the total parking provided is allocated for the use of visitors resulting in a total of 7 visitor spaces at night time (6 during the day with 1 dual-use bay being utilised as a drop-off/collection space but available for visitors at night and Sundays/bank holidays) provided within the proposed development basement thereby minimising the potential for overspill parking.

b) Notwithstanding the availability locally of both GoCar and YUKO externally to the site, the proposed development now includes the provision of a car share parking space (and vehicle) located within the development basement to serve residents of the proposed development. A letter of support from GoCar is appended to this report (Appendix D).

c) A revised layout of the proposed development basement car parking has been produced by RKD Architects with drawing no. **20199-RKD-ZZ-B1-DR-A-1099** with a new layout with the relocation of parking space 53 (originally a car share space now proposed as motorcycle parking). Furthermore, the introduction of 2 additional motorcycle spaces alongside the parking spaces 1 and 2 replace the original orientation of 4 car parking spaces with 2-motorcycle spaces and 2 car parking spaces, allowing sufficient space between the parking and the basement ramp.

d) A review of all original layout plans has been conducted to ensure all revised layout plans remain consistent with regard to all vehicle, electric, accessible and motorcycle parking spaces. DBFL confirm that 8 No. EV charging points are included within the scheme proposals.

10) The following cycle issues should be addressed:

a) Demonstrate on the site layout plans the number of bicycle parking spaces proposed per bicycle parking spaces store and demonstrate functionality of spaces in terms of ease of access, sufficient space to the front of cycle racks, sufficient heights etc.

b) Include dedicated parking provisions for non-standard bike parking such as cargo bikes.

c) Include area within bicycle parking areas for dedicated bicycle repair bicycle pump and repair station.

d) Consider the incorporation of a resident cargo bike scheme to support residents in a low-car dependency scheme.

DBFL Response to Item 10 a

9.2.12 A revised drawing has been prepared by RKD Architects drawing no. **20199-RKDZ-ZZ-00-DR-A-1100** indicating the designated bicycle parking areas including the quantum of spaces located in each parking area. The parking has been reviewed by DBFL with the specific 'Double Tier Bike Racks' functionality and ease of access.

DBFL Response to Item 10 b

9.2.13 The amended bicycle parking provision now also includes dedicated cargo bike spaces as indicated in drawing no. **20199-RKDZ-ZZ-00-DR-A-1100**.

DBFL Response to Item 10 c

9.2.14 The amended bicycle parking provision includes a bicycle pump and repair station in each of the secure dedicated bicycle parking areas as indicated in RKD drawing no. **20199-RKDZ-ZZ-00-DR-A-1100** and as highlighted in section 5.4.6 of this report.

DBFL Response to Item 10 d

9.2.15 The proposed development amendments include the provision of designated cargo bicycle parking spaces within the secure (long-term) bicycle parking store at ground floor level. The Management Company, once appointed, for the proposed Build-to-Rent apartments will be implementing a private resident's bike share scheme of up to 10 bicycles. Further to the provision of these specific bicycle spaces within the development the inclusion of 9 No. standard bicycles and 1 cargo share spaces for the sole use of the residents within the proposed development is advocated. The appointed Management Company will have the opportunity to partner with any similar specialist company in support of the bike-share scheme, comprising 9 bicycle spaces (1 No. designated cargo bicycle spaces subject to demand). If required, the Management Company can incorporate this as a standalone scheme, internally managed, as it aims solely to cater for the residents of the proposed development

11) The applicant is requested to outline lands for Taking in Charge.

DBFL Response to Item 11

9.2.16 RKD Drawing no. **20199-RKD-ZZ-ZZ-DR-A-1003**, displayed in Figure 9.1 below shows the extent of all lands to be taken in charge submitted within the Planning Application documentation.

Figure 9.1: Lands for Taking in Charge

9.3 AN BORD PLEANALA COMMENTS & DBFL RESPONSES

9.3.1 This section provides responses to the observations raised by An Bord Pleanála 's Notice of Pre-Application Consultation Opinion (dated October 2021) regarding all transportation issues within the application (ABP-310653-21). It has been noted within the Notice of Pre-Application Consultation Opinion that: *An Bord Pleanála considers that the following issues need to be addressed in the documents submitted that could result in them constituting a reasonable basis for an application for strategic housing development*

3) The Applicant should provide full and detailed design proposals in respect of access arrangements from Richmond Road. Such proposals should provide for safe vehicular, pedestrian and cycle access to the site and demonstrate that conflicting movements do not arise. An operational service management plan for the site should also be submitted in this regard. The design proposals should demonstrate how satisfactory access and egress to the site will be provided in both the current scenario and following completion of proposed future widening and improvement works on Richmond Road

DBFL Response to Item 3

9.3.2 A detailed design proposal has been included in the amended DBFL drawing no. **210027-DBFL-TR-SP-DR-C-1001** showing the pedestrian facilities to access the subject site while RKD amended drawing no. **20199-RKD-ZZ-00-DR-A-1002** shows the designated pedestrian/service/resident vehicular accesses. Vehicle swept path analysis are detailed in DBFL drawing **210027-DBFL-RD-SP-DR-C-1011**. The scheme proposals have subsequently been the subject of the Quality Audit as detailed in a separate stand alone report as per DMURS requirements.

a) Clarity with regard to ownership of the site and where the applicant is not the legal owner of the land concerned, the written consent of the owner to make the application should be provided.

DBFL Response to Item a)

9.3.3 The updated Proposed Site Plan drawing no. **20199-RKD-ZZ-ZZ-DR-A-1002** clearly indicates the extend of ownership as well as extent of works to be included

(Road works in application area measuring c.0.0601 ha) included within the development proposals. Furthermore, DBFL drawing no. **210027-DBFL-TR-SP-DR-C-1002** shows the area required for the DCC letter of consent which has been received and included within the Planning Application Documents.

DBFL Response to Item b)

b) *Application documentation should demonstrate how the proposed development and the mix of uses therein, complies with the Z10 land use zoning objective for the site under the current Dublin City Development Plan 2016-2022.*

9.3.4 The subject lands are zoned Objective Z10 'Inner Suburban and Inner City Sustainable Mixed-Uses' within the Dublin City Development Plan 2016-2022, where the stated aim is '*to consolidate and facilitate the development of inner city and inner suburban sites for mixed-uses, with residential the predominant use in suburban locations.'* The proposed development comprising 1 no. café/retail unit (157 sq.m) at ground floor level and 183 no. Build to Rent (BTR) apartments aligns with the aim of the DCC Development Plan 2016-2022. Further justification is provided for within the application planning statement

j) *The application should be accompanied by the following:*

i. A Traffic Impact Assessment, a preliminary Construction Traffic Management Plan, and a Mobility Management Plan.

ii. A quality audit in accordance with Annex 4 of DMURS.

iii. A rationale for the quantum of car parking proposed on the site having regard to the provisions of the SPPR8 of the Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities, in respect of Build-to-Rent developments. A Car Park Management Strategy Plan should be provided in in this regard.

iv. A rationale for the proposed fire / emergency vehicle access arrangements having regard to the comments of the Dublin City Council Transportation planning section with regard to use of the proposed pedestrian / cycle greenway in this regard.

DBFL Response to Item j i).

9.3.5 DBFL have compiled both a Traffic Impact Assessment (this TTA) as well as a separate, dedicated Mobility Management Plan which is included within the Planning Application for the proposed development. AWN Consulting have prepared a Construction and Demolition Plan whilst an Outline Construction Environmental Management (incorporating a Construction Management Plan) has been compiled by DBFL, also included within the Planning Application documentation.

DBFL Response to Item j ii).

9.3.6 Bruton Consulting Engineers have been commissioned to undertake an independent Quality Audit as a standalone report which is to be submitted/included within the Planning Application. The audit has been undertaken in accordance with Annex 4 of DMURS as per the above request.

DBFL Response to Item j iii).

9.3.7 Section 5.2.1 of this TTA makes reference to SPPR8 of the Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities. This revised and amended TTA makes reference to the reduced car parking provision on the basis of BTR development being more suitable for central locations and/ or proximity to public transport services such as accessibility levels available at the subject site. Furthermore, the preliminary Car Park Management Strategy Plan (presented in Chapter 5) will be finalised and developed and rolled out by the Management Company, once appointed.

DBFL Response to Item j iv).

9.3.8 The revised site layout plan submitted within the Planning Application documents depicts the amendments which have removed the fire tender vehicle's use of the proposed pedestrian / cycle greenway. This has been further highlighted in Figures 4.2 and 4.3 withing this TTA and DBFL drawing No. **210027-DBFL-RD-SP-DR-C-1011.**

10.0 SUMMARY AND CONCLUSIONS

10.1 SUMMARY

10.1.1 DBFL Consulting Engineers (hereon referred to as DBFL) have been commissioned to prepare a Traffic and Transport Assessment (TTA) for a strategic housing development at a c. 0.61 hectare (c. 6,067 sq.m) site at No. 146A and No's. 148-148A Richmond Road, Dublin 3. Improvement works to Richmond Road are also proposed including carriageway widening (from 4.6m to 5.5m wide) and a new signal controlled pedestrian crossing facility on an area of c. 0.08 hectares (c. 762 sq.m). The development site area and road works area will provide a total application site area of c. 0.69 hectares (c. 6,829 sq.m). . The subject site is currently occupied by a number of different businesses and 2 No. dwellings including EQ Audio and Events, and QLX Lighting while benefitting from an access point directly onto Richmond Road.

10.1.2 The proposed development will principally consist of the demolition of all existing structures on site (measuring c. 2,346 sq.m) including warehouses and 2 No. dwellings; and the construction of a part 6 No. to part 10 No. storey over basement development (with roof level telecommunications infrastructure over), comprising 1 No. café/retail unit (157 sq.m) at ground floor level and 183 No. Build-to-Rent apartments (104 No. one bedroom units and 79 No. two bedroom units). The proposed development has a gross floor area of c. 16,366 sq.m over a basement of c. 2,729 sq.m. The proposed development has a gross floor space of c. 15,689 sq.m.

10.1.3 This Traffic and Transport Assessment has been undertaken to quantify the potential influence of the proposed residential development on lands at Richmond Road, upon the operational performance of the local area road network. Our methodology incorporated a number of key inter-related stages, including: -

- Site Audit;
- Planning File Review;
- Policy Review;
- Traffic Surveys;
- Trip Generation, Distribution and Assignment;
- Network Impact; and
- Network Assessment.

10.2 CONCLUSION

10.2.1 The principal findings that can be drawn from this TTA are as follows:

- The site currently accommodates a number of commercial and residential buildings with the principal site access junction being retained to serve the proposed development
- The proposed development will be ideally situated to benefit from a comprehensive range of public transport, bus and rail connections which result in the site benefiting from very good accessibility levels. Furthermore, the range and proximity of a number of public transport service and infrastructure enhancements will, when implemented, further enhances the sustainability characteristics of the site.
- The subject site on Richmond Road is ideally located to benefit from the enhanced accessibility levels delivered by the emerging DART+ West via Drumcondra Railway Interchange and NTA's BusConnects proposals on both the R132 (to the west) and R105 (to the east) corridors.
- The NTA's Cycle Network Plan for the Greater Dublin Area will enhance the attraction of cycling and includes proposals for the provision of a Greenway route along the Tolka Riverbank through the subject site and along Richmond Road which will provide additional permeability and convent connections to the south via both the Greenway and a new link via Distillery Road.
- Car parking is proposed to be provided at basement level thereby ensuring that the consideration and movement of active travel modes are prioritised at surface level across the development. An additional set down-collection space located at surface level in the shared plaza area to the front of the development adjoining Richmond Road. The proposals incorporate a total of 71 no. car parking spaces at basement level. The proposed provision is lower than the maximum permitted by DCC development plan and conforms to the direction set out in the DHPLG- Design Standards for New Apartments guidance which states for developments located within Intermediate Urban Locations that "planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard". The assignment of the onsite parking includes:
    - 1 No. dedicated car share space (GoCar);

- 6 No. Dedicated 'Visitor' spaces;
- 1 dedicated 'Service' space which operates as such between 08:00-20:00 Monday to Saturday. At all other times it will be available to visitors.
- 63 'Residents' spaces of which 8 are EV spaces and 4 are designated as formal 'Accessible' bays.

- The proposals include the provision of a total of 390no. cycle parking spaces comprising 52 short stay spaces at surface level and 338 long stay bicycle parking (including 2 designated cargo bicycle parking spaces) at ground level. The total 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 DCC development plan standards. Accordingly, the design approach in regard to the specification of bicycle parking on-site, is significantly above the DCC standards and even slightly above the DHPLG requirements.
- The development proposals include the provision of electric scooter storage facilities within the long-term bicycles store facility located at ground floor. The facility allows safe storage both weather and theft protected.
- The Richmond Road site is well positioned in regard to access to existing GoCar and YUKO car share vehicles. These existing off-site care share vehicles are to be supplemented with the provision of a dedicated car share vehicle for the sole use of residents and located in the basement car park (as referred to in Appendix D of this report)
- With the low on-site car parking provision proposed, the TRICS derived trip rates may actually overestimate the number of car trips that the subject BTR development could generate. Accordingly, the subject vehicle trip generation exercise which predicts 51 two-way trips and 59 two-way vehicle trips in the AM and PM peak hours respectively, is considered to represent a robust worst-case approach.
- The resulting percentage increase in traffic flows as a result of the traffic generated by the proposed development is established as being well below the 10% threshold (5% for congested networks) at the adjacent local key junctions (even in the adopted worst case scenario). Based on the network

impact assessment results in Figure 9.1, neither of the 2 key off site junctions assessed exceed the threshold requiring further operational assessments. Accordingly, the proposed site access junction on Richmond Road has been subject to a more detailed junction analysis.

Figure 9.1: Increase in Vehicle Trips Generated at Key Local Junctions 2035

- The junction analysis of the proposed priority-controlled Site Access junction reveals that this junction will operate with significant reserve capacity in the adopted 2023 Opening Year, 2028 and 2038 Future Design years.
- The design of the scheme proposals including its interface with Richmond Road ensures more than sufficient flexibility and space are being safeguarded to enable DCC to implement corridor enhancements in some time in the future.
- A mitigation strategy has been identified in Chapter 8 which includes an integrated package of measures/initiatives aimed at reducing the impact of the development on the surrounding local road network and prioritising sustainable travel practices at the proposed development.
- The scheme proposals have been subject to an independent Quality Audit which will the Auditors' recommendations addressed ensures that all users including pedestrians, cyclists and motor vehicle are provided with considered and safe access arrangements

10.2.2 In conclusion, it is considered that the impact on the surrounding road network, as a result of the proposed redevelopment on the subject brownfield Richmond Road lands will be minimal. This is based on the anticipated levels of traffic generated by the proposed development, the existing and future road infrastructure and the information and analysis summarised in the above report.

10.2.3 The development will be, in relative terms, a 'car lite' BTR scheme and accordingly will be marketed as such. The proposed mitigation strategy included within the Car Parking Management Strategy in Chapter 5 of this TTA will ensure that the proposed development will not result in any adverse impacts in terms of overspill parking onto the surrounding streets.

10.2.4 Accordingly, it is concluded that the proposals will not result in a material deterioration of the road conditions and as a result there are no significant traffic or transportation related reasons that should prevent the granting of planning permission for the proposed development.

APPENDICES

APPENDIX A

TRICS Output Files

Calculation Reference: AUDIT-638801-210526-0539

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

15	GREATER DUBLIN	
	DL DUBLIN	7 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:	20 to 332 (units:)
Range Selected by User:	18 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: 01/01/13 to 23/10/20

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

Selected survey days:

Tuesday	5 days
Wednesday	1 days
Friday	1 days

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

Selected survey types:

Manual count	7 days
Directional ATC Count	0 days

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

Selected Locations:

Suburban Area (PPS6 Out of Centre)	5
Neighbourhood Centre (PPS6 Local Centre)	2

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

Selected Location Sub Categories:

Residential Zone	6
Built-Up Zone	1

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

Secondary Filtering selection:

Use Class:

C3	7 days

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

Population within 500m Range:
All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:

20,001 to 25,000	1 days
25,001 to 50,000	6 days

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

Population within 5 miles:

250,001 to 500,000	1 days
500,001 or More	6 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	3 days
1.1 to 1.5	4 days

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

Travel Plan:

No	7 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	7 days

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

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

LIST OF SITES relevant to selection parameters

1 DL-03-C-11 BLOCK OF FLATS DUBLIN
WYCKHAM WAY
DUBLIN
DUNDRUM
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total No of Dwellings: 96
Survey date: TUESDAY *10/09/13* *Survey Type: MANUAL*

2 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*

3 DL-03-C-13 BLOCK OF FLATS DUBLIN
SANDYFORD ROAD
DUBLIN

Neighbourhood Centre (PPS6 Local Centre)
Built-Up Zone
Total No of Dwellings: 52
Survey date: TUESDAY *10/09/13* *Survey Type: MANUAL*

4 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*

5 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*

6 DL-03-C-16 BLOCKS OF FLATS DUBLIN
BOTANIC AVENUE
DUBLIN
DRUMCONDRA
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 31
Survey date: TUESDAY *22/11/16* *Survey Type: MANUAL*

7 DL-03-C-17 BLOCKS OF FLATS DUBLIN
FINGLAS ROAD
DUBLIN
FINGLAS
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 332
Survey date: FRIDAY *23/10/20* *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
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	7	103	0.054	7	103	0.224	7	103	0.278
08:00 - 09:00	7	103	0.079	7	103	0.276	7	103	0.355
09:00 - 10:00	7	103	0.079	7	103	0.078	7	103	0.157
10:00 - 11:00	7	103	0.038	7	103	0.061	7	103	0.099
11:00 - 12:00	7	103	0.045	7	103	0.067	7	103	0.112
12:00 - 13:00	7	103	0.063	7	103	0.084	7	103	0.147
13:00 - 14:00	7	103	0.093	7	103	0.089	7	103	0.182
14:00 - 15:00	7	103	0.127	7	103	0.088	7	103	0.215
15:00 - 16:00	7	103	0.106	7	103	0.075	7	103	0.181
16:00 - 17:00	7	103	0.124	7	103	0.061	7	103	0.185
17:00 - 18:00	7	103	0.187	7	103	0.079	7	103	0.266
18:00 - 19:00	7	103	0.201	7	103	0.099	7	103	0.300
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.196			1.281			2.477

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

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

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Parameter summary

Trip rate parameter range selected:	20 - 332 (units:)
Survey date date range:	01/01/13 - 23/10/20
Number of weekdays (Monday-Friday):	7
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

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

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

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	7	103	0.021	7	103	0.075	7	103	0.096
08:00 - 09:00	7	103	0.039	7	103	0.113	7	103	0.152
09:00 - 10:00	7	103	0.052	7	103	0.022	7	103	0.074
10:00 - 11:00	7	103	0.024	7	103	0.021	7	103	0.045
11:00 - 12:00	7	103	0.025	7	103	0.042	7	103	0.067
12:00 - 13:00	7	103	0.024	7	103	0.038	7	103	0.062
13:00 - 14:00	7	103	0.047	7	103	0.049	7	103	0.096
14:00 - 15:00	7	103	0.068	7	103	0.052	7	103	0.120
15:00 - 16:00	7	103	0.057	7	103	0.043	7	103	0.100
16:00 - 17:00	7	103	0.056	7	103	0.029	7	103	0.085
17:00 - 18:00	7	103	0.081	7	103	0.052	7	103	0.133
18:00 - 19:00	7	103	0.054	7	103	0.047	7	103	0.101
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.548			0.583			1.131

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

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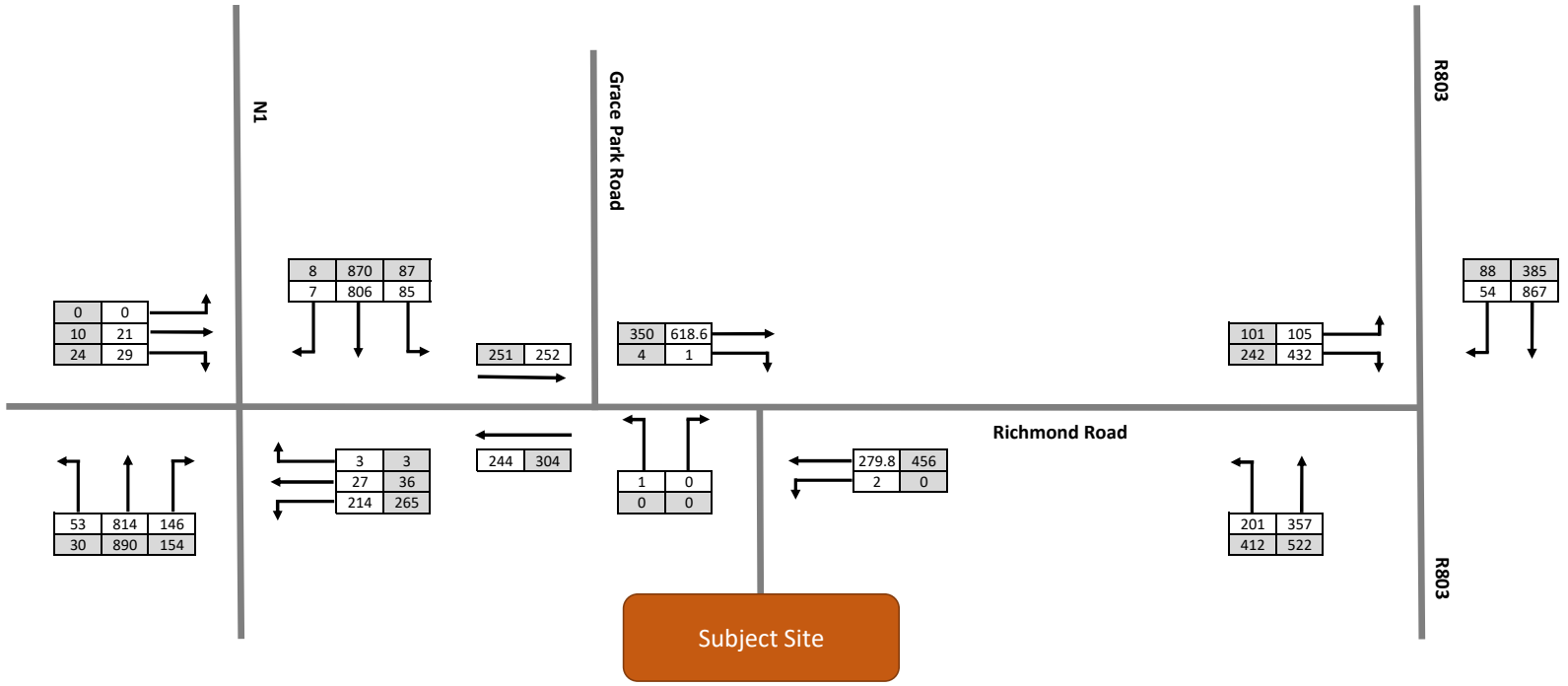
APPENDIX B

Traffic Flow Diagrams



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email: info@dbfl.ie
website: www.dbfl.ie

Project : Proposed Residential Development Richmond Road, Dublin

DRG. Title : Network Traffic Flows - PCU's 2020 Base Flows

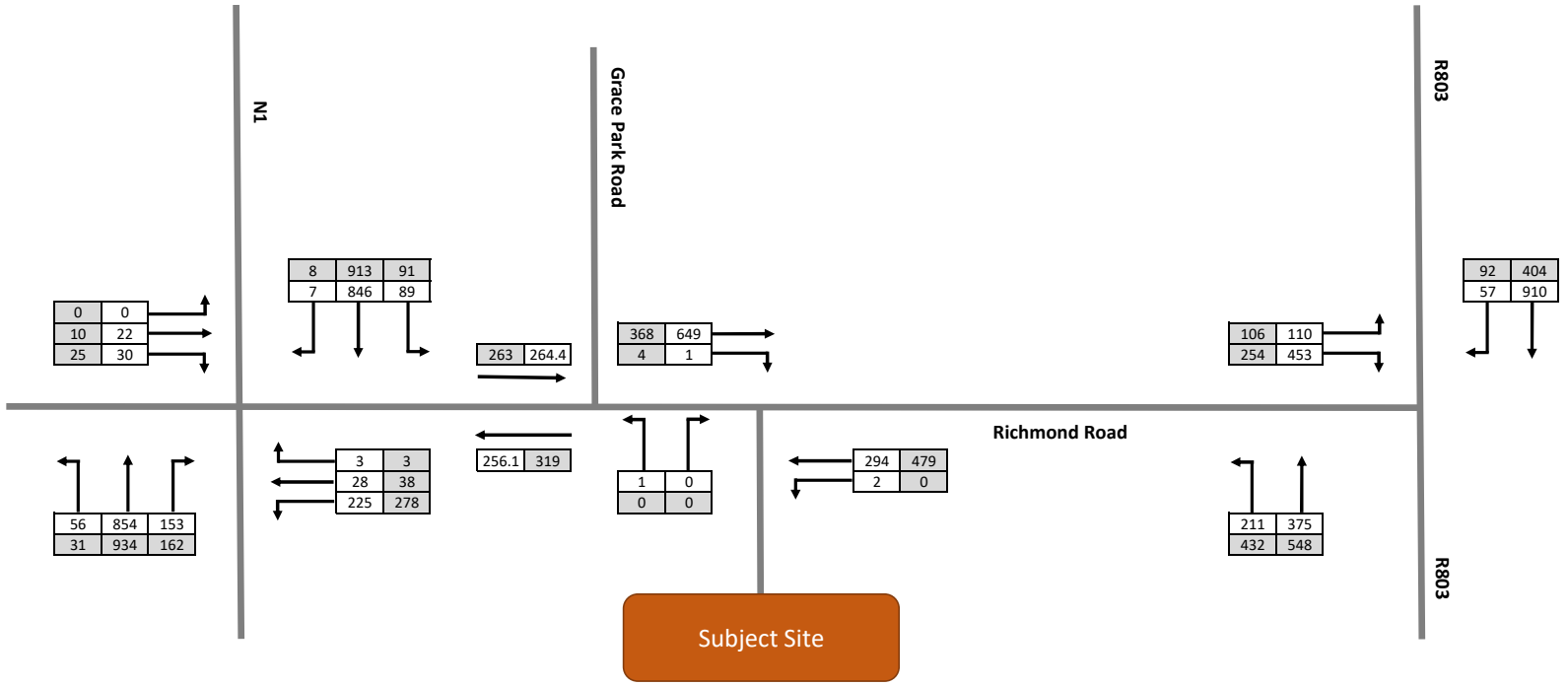
Key:
- AM Peak Hour (07:15 to 08:15)
- PM Peak Hour (18:00 to 19:00)

Dwn:	Ckd:	Date:
IA	MMK	26/05/2021

Ref: p210027\calcs\excel\Traffic\

Figure: 1

Rev: -



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Project : Proposed Residential Development Richmond Road, Dublin

DRG. Title : Do-Nothing 2023 Opening Year

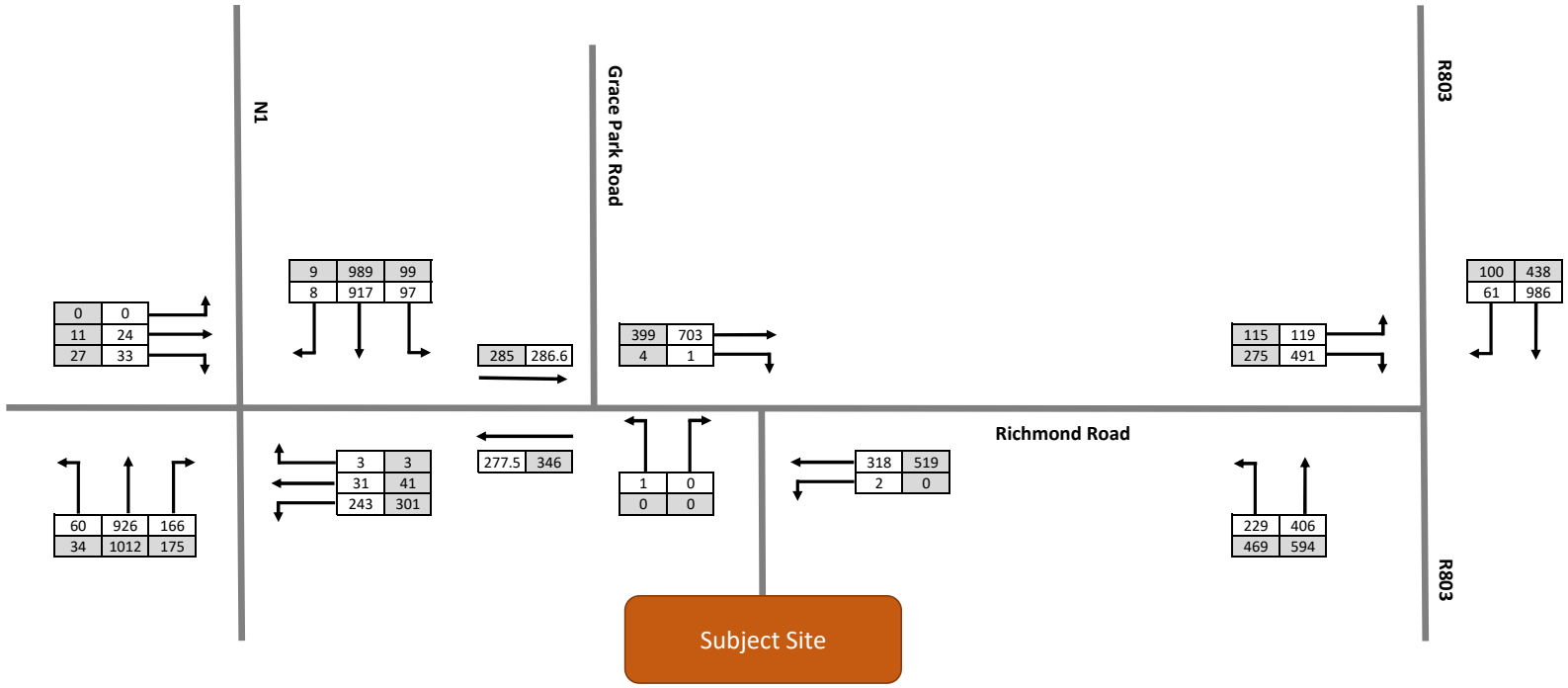
Key:
AM Peak Hour (07:15 to 08:15)
PM Peak Hour (18:00 to 19:00)

Dwn:	Ckd:	Date:
IA	MMK	26/05/2021

Ref: p210027\calcs\excel\Traffic\

Figure: 2

Rev: -



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Project : Proposed Residential Development Richmond Road, Dublin

DRG. Title : Do-Nothing 2028 Future Design Year

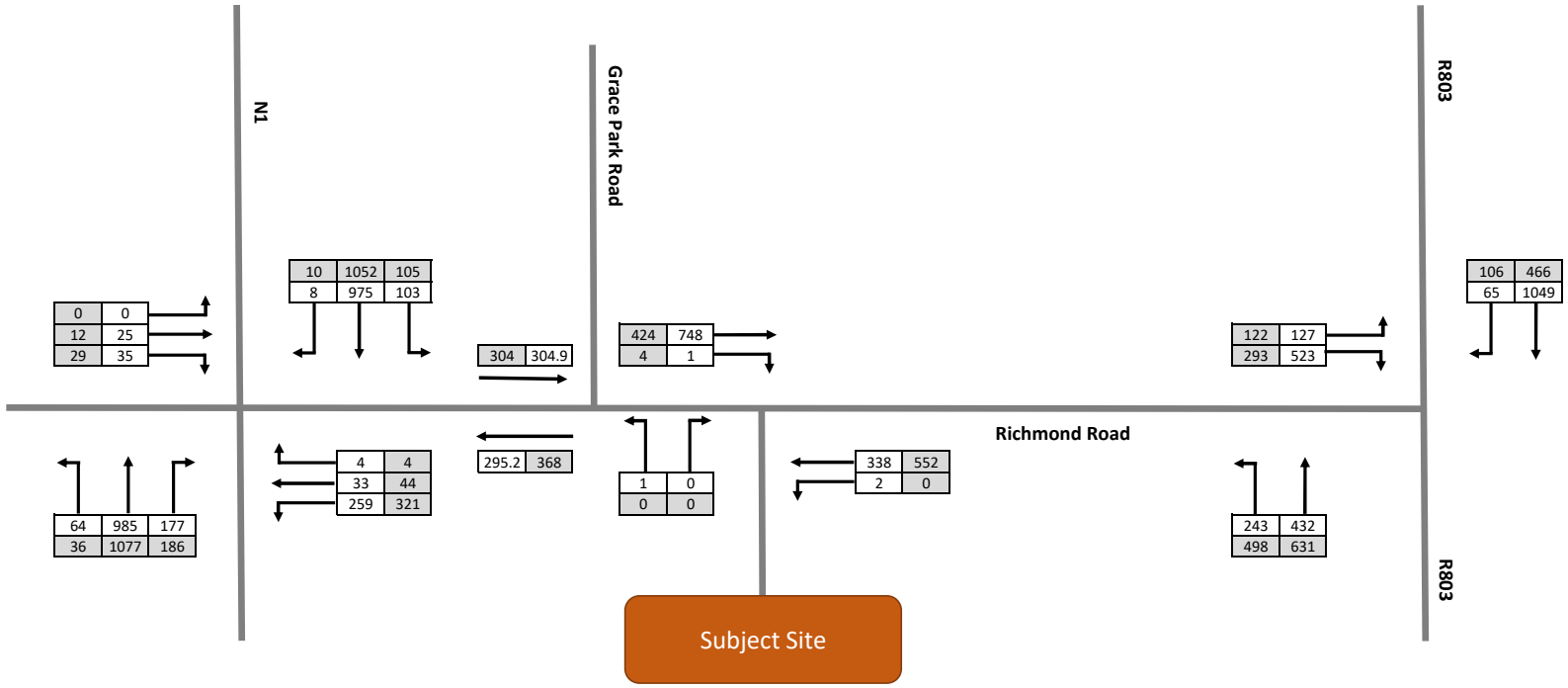
Key:
AM Peak Hour (07:15 to 08:15)
PM Peak Hour (18:00 to 19:00)

Dwn:	Ckd:	Date:
IA	MMK	26/05/2021

Ref: p210027\calcs\excel\Traffic\

Figure: 3

Rev: -



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Project : Proposed Residential Development Richmond Road, Dublin

DRG. Title : Do-Nothing 2038 Future Design Year

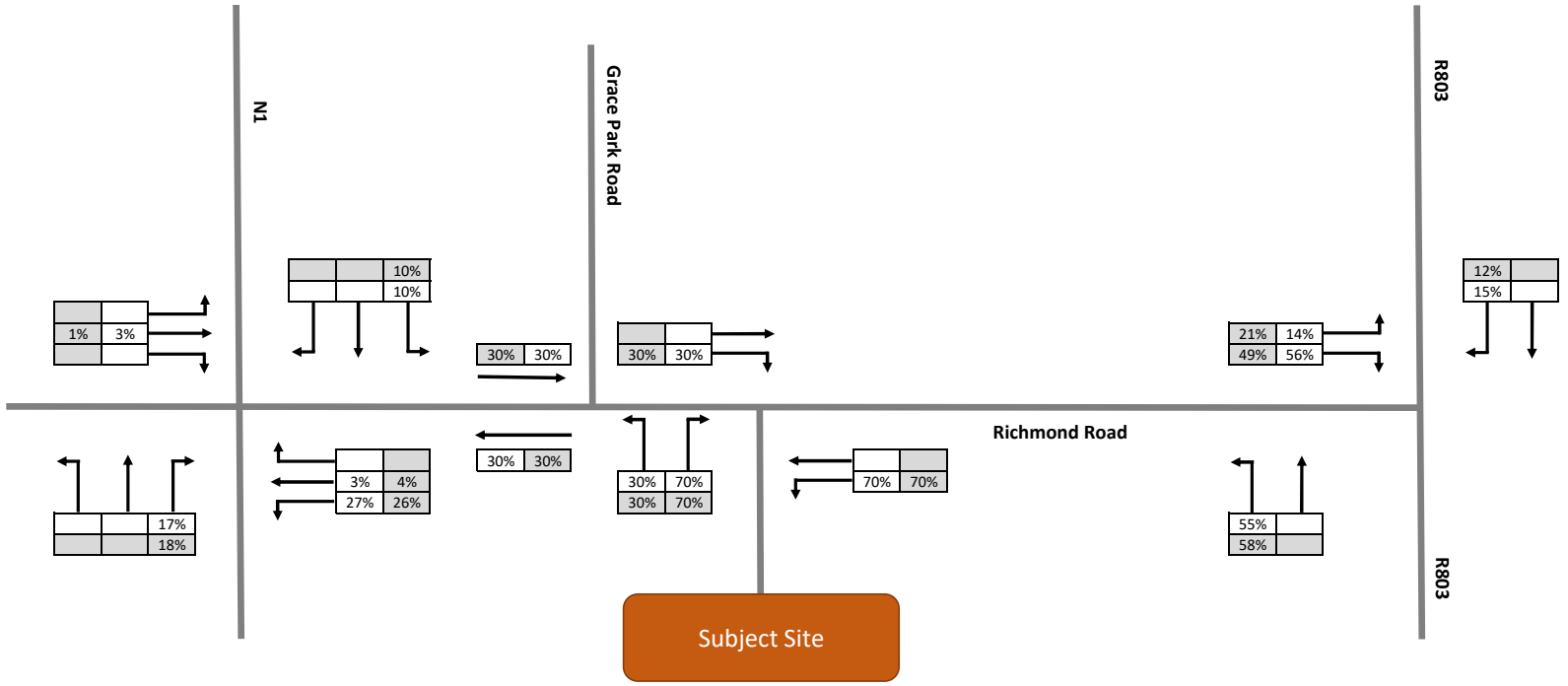
Key:
AM Peak Hour (07:15 to 08:15)
PM Peak Hour (18:00 to 19:00)

Dwn:	Ckd:	Date:
IA	MMK	26/05/2021

Ref: p210027\calcs\excel\Traffic\

Figure: 4

Rev: -



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Project : Proposed Residential Development Richmond Road, Dublin

DRG. Title : Trip Distribution

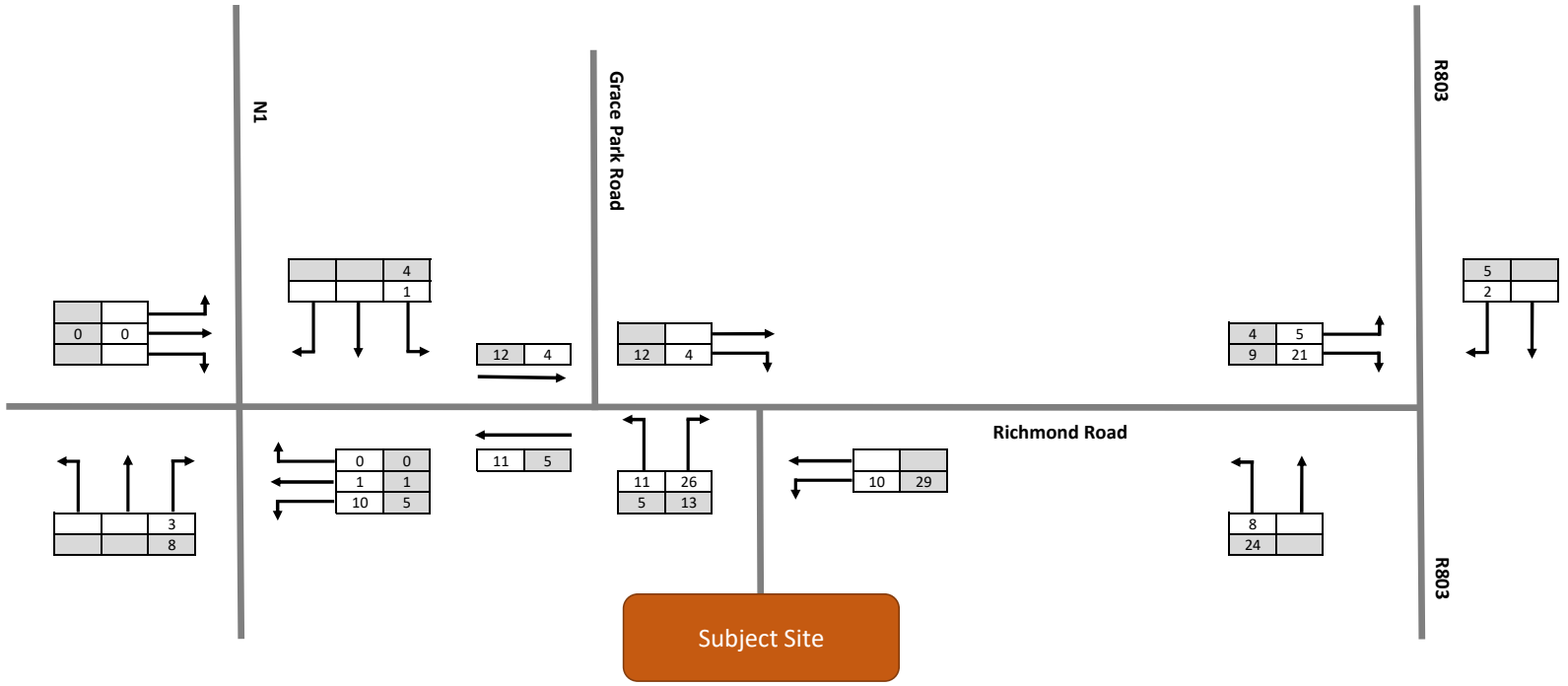
Key:
AM Peak Hour (07:15 to 08:15)
PM Peak Hour (18:00 to 19:00)

Dwn:	Ckd:	Date:
IA	MMK	26/05/2021

Ref: p210027\calcs\excel\Traffic\

Figure: 5

Rev: -



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Project : Proposed Residential Development Richmond Road, Dublin

DRG. Title : Proposed Development Trip Generation

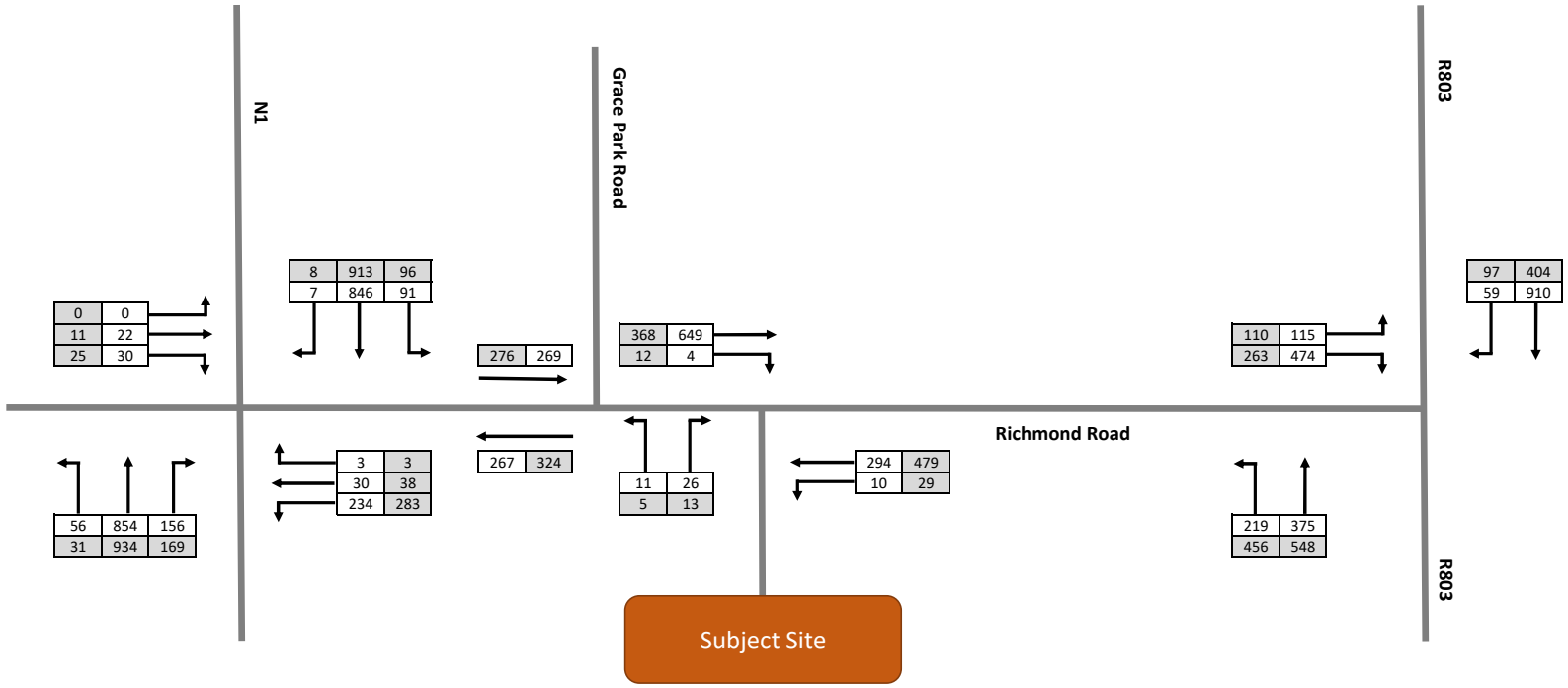
Key:
AM Peak Hour (07:15 to 08:15)
PM Peak Hour (18:00 to 19:00)

Dwn:	Ckd:	Date:
IA	MMK	26/05/2021

Ref: p210027\calcs\excel\Traffic\

Figure: 6

Rev: -



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website: www.dbfl.ie

Project : Proposed Residential Development Richmond Road, Dublin

DRG. Title : Do-Something 2023 Opening Year

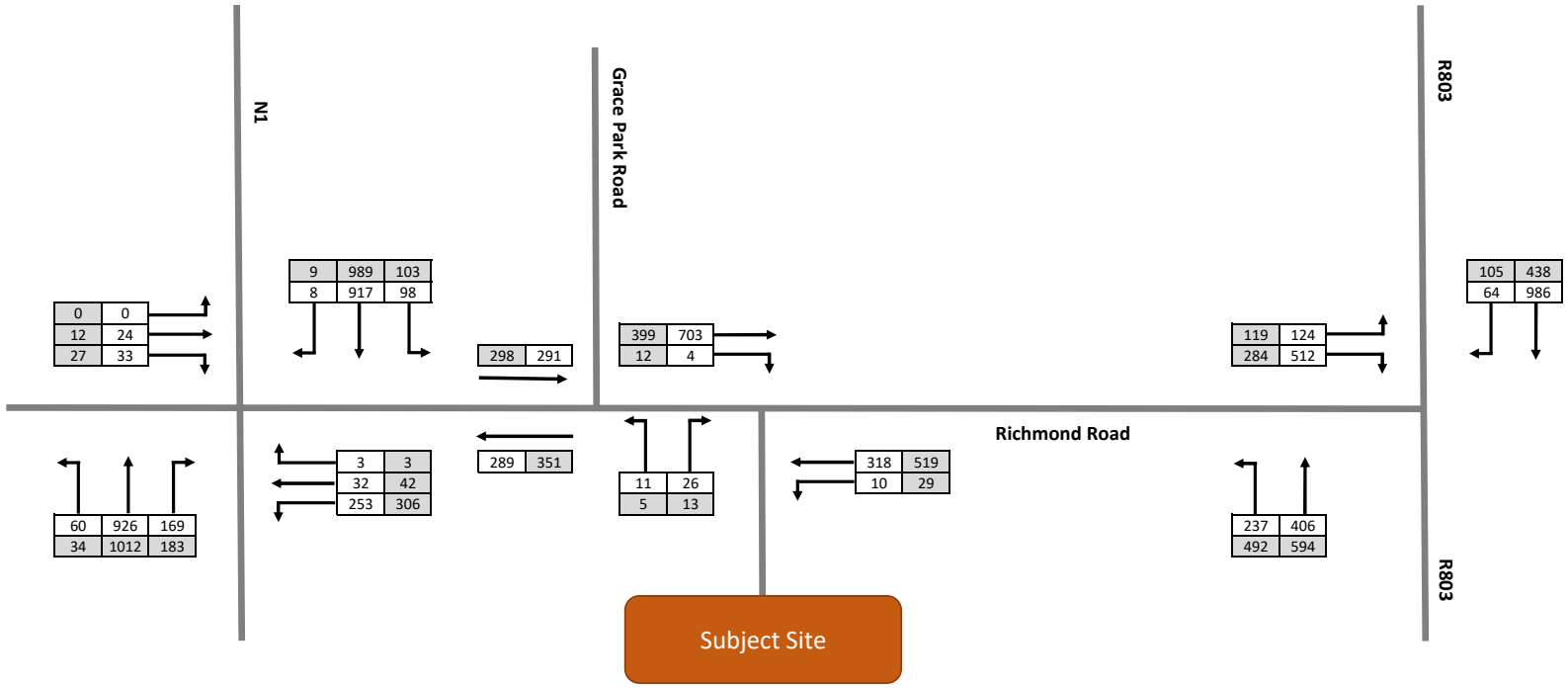
Key:
AM Peak Hour (07:15 to 08:15)
PM Peak Hour (18:00 to 19:00)

Dwn:	Ckd:	Date:
IA	MMK	26/05/2021

Ref: p210027\calcs\excel\Traffic\

Figure: 7

Rev: -



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Project : Proposed Residential Development Richmond Road, Dublin

DRG. Title : Do-Something 2028 Future Design Year

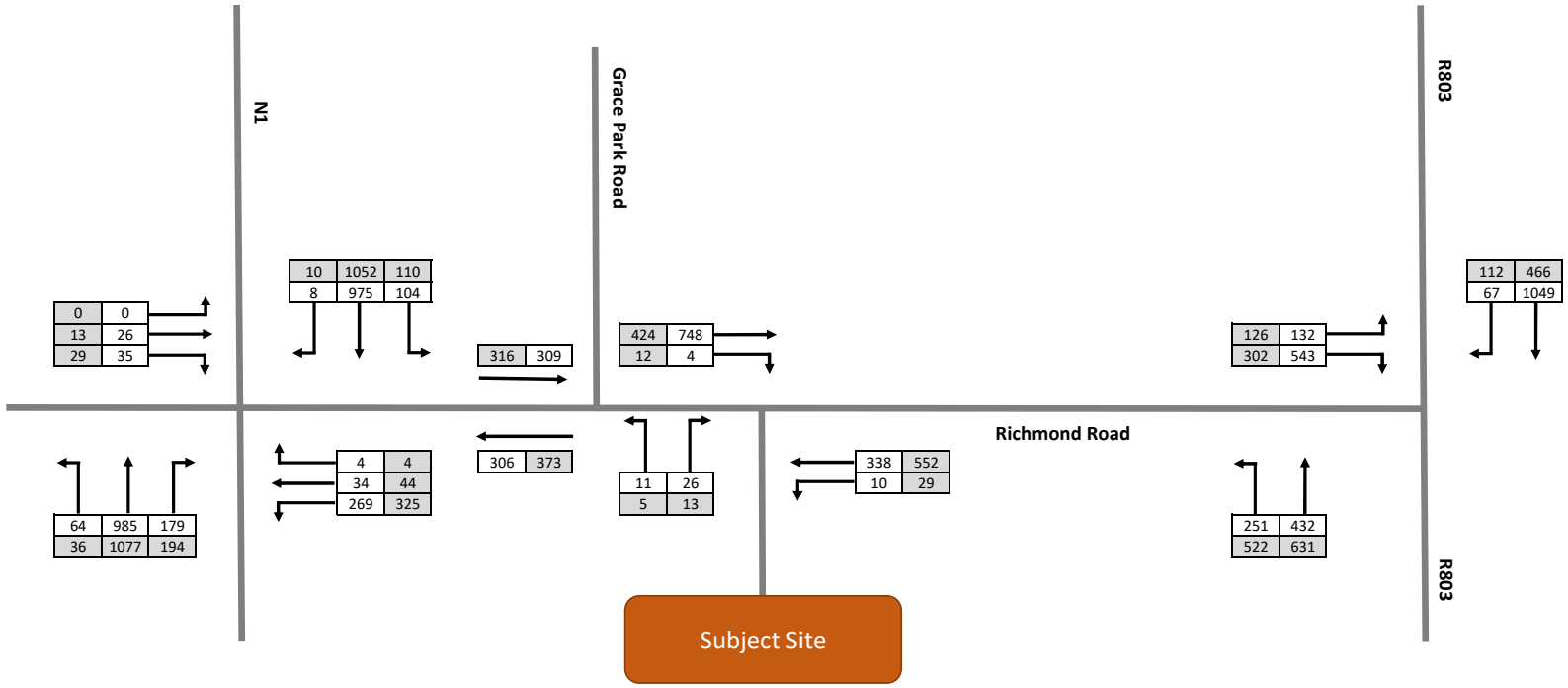
Key:
AM Peak Hour (07:15 to 08:15)
PM Peak Hour (18:00 to 19:00)

Dwn:	Ckd:	Date:
IA	MMK	26/05/2021

Ref: p210027\calcs\excel\Traffic\

Figure: 8

Rev: -



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website: www.dbfl.ie

Project : Proposed Residential Development Richmond Road, Dublin

DRG. Title : Do-Something 2038 Future Design Year

Key:
AM Peak Hour (07:15 to 08:15)
PM Peak Hour (18:00 to 19:00)

Dwn:	Ckd:	Date:
IA	MMK	26/05/2021

Ref: p210027\calcs\excel\Traffic\

Figure: 9

Rev: -

APPENDIX C

PICADY Output Files

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.0.0.4211 []
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The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: Site Access Junction.j9
Path: G:\2021\p210027\calcs\picady
Report generation date: 28/05/2021 14:17:10

»2023 DN, AM
»2023 DN, PM
»2028 DN, AM
»2028 DN, PM
»2038 DN, AM
»2038 DN, PM
»2023 DS, AM
»2023 DS, PM
»2028 DS, AM
»2028 DS, PM
»2038 DS, AM
»2038 DS, PM

Summary of junction performance

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2023 DN									
Stream B-AC	0.0	0.00	0.00	A	202 % [Stream C-AB]	0.0	0.00	0.00	A	278 % [Stream C-AB]
Stream C-AB	0.0	3.99	0.00	A		0.0	4.86	0.01	A	
	2028 DN									
Stream B-AC	0.0	0.00	0.00	A	187 % [Stream C-AB]	0.0	0.00	0.00	A	251 % [Stream C-AB]
Stream C-AB	0.0	3.91	0.00	A		0.0	4.80	0.01	A	
	2038 DN									
Stream B-AC	0.0	0.00	0.00	A	177 % [Stream C-AB]	0.0	0.00	0.00	A	232 % [Stream C-AB]
Stream C-AB	0.0	3.84	0.00	A		0.0	4.76	0.01	A	
	2023 DS									
Stream B-AC	0.1	10.84	0.11	B	120 % [Stream B-AC]	0.1	11.53	0.06	B	102 % [Stream B-AC]
Stream C-AB	0.0	3.96	0.01	A		0.0	4.95	0.03	A	
	2028 DS									
Stream B-AC	0.1	12.29	0.12	B	81 % [Stream B-AC]	0.1	12.09	0.06	B	88 % [Stream B-AC]
Stream C-AB	0.0	3.93	0.01	A		0.0	4.89	0.03	A	
	2038 DS									
Stream B-AC	0.1	12.79	0.13	B	72 % [Stream B-AC]	0.1	12.59	0.06	B	78 % [Stream B-AC]
Stream C-AB	0.0	3.87	0.01	A		0.0	4.85	0.03	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

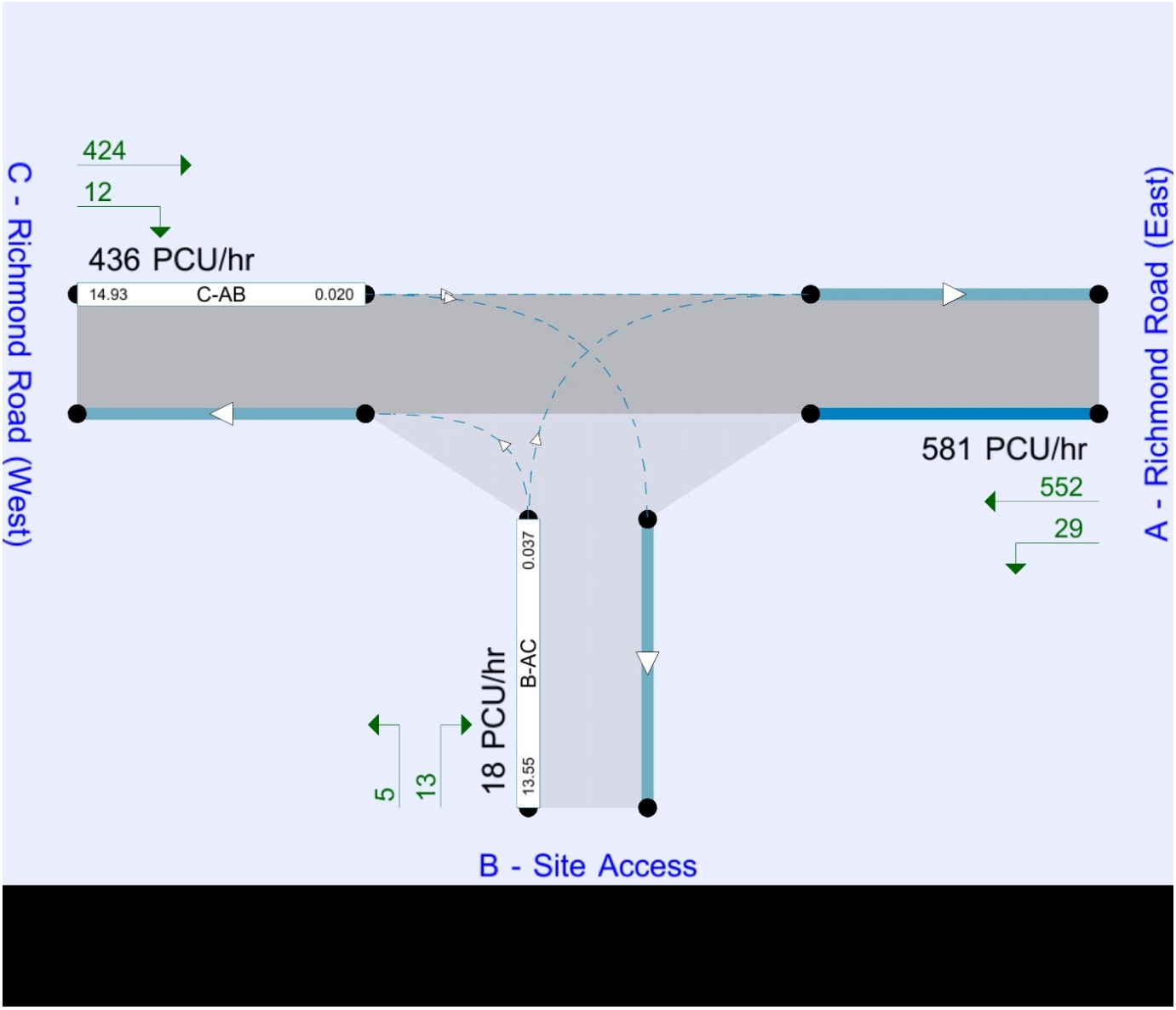
File summary

File Description

Title	residential Development at Richmond Road
Location	Site Access
Site number	
Date	27/05/2021
Version	
Status	TTA
Identifier	
Client	
Jobnumber	210027
Enumerator	HEADOFFICE"mckennam
Description	

Units

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



The junction diagram reflects the last run of Junctions.

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
	✓	Delay	0.85	36.00	20.00

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
2023 DN	AM	ONE HOUR	08:00	09:30	15
2023 DN	PM	ONE HOUR	17:45	19:15	15
2028 DN	AM	ONE HOUR	08:00	09:30	15
2028 DN	PM	ONE HOUR	17:45	19:15	15
2038 DN	AM	ONE HOUR	08:00	09:30	15
2038 DN	PM	ONE HOUR	17:45	19:15	15
2023 DS	AM	ONE HOUR	08:00	09:30	15
2023 DS	PM	ONE HOUR	17:45	19:15	15
2028 DS	AM	ONE HOUR	08:00	09:30	15
2028 DS	PM	ONE HOUR	17:45	19:15	15
2038 DS	AM	ONE HOUR	08:00	09:30	15
2038 DS	PM	ONE HOUR	17:45	19:15	15

2023 DN, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1 - untitled	untitled	T-Junction	Two-way	0.01	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	202	Stream C-AB

Arms

Arms

Arm	Name	Description	Arm type
A	Richmond Road (East)		Major
B	Site Access		Minor
C	Richmond Road (West)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Richmond Road (West)	6.00			130.0	✓	0.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Site Access	One lane	2.50	20	30

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	473.838	0.086	0.218	0.137	0.312
1	B-C	610.644	0.094	0.237	-	-
1	C-B	649.248	0.252	0.252	-	-

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	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D1	2023 DN	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Richmond Road (East)		✓	296.00	100.000
B - Site Access		✓	1.00	100.000
C - Richmond Road (West)		✓	650.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0.000	2.000	294.000
	B - Site Access	0.000	0.000	1.000
	C - Richmond Road (West)	649.000	1.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0	0	0
	B - Site Access	0	0	0
	C - Richmond Road (West)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.00	3.99	0.0	A

Main Results for each time segment

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	436.31	0.000	0.00	0.0	0.000	A
C-AB	1.46	902.83	0.002	1.45	0.0	3.993	A
C-A	487.90			487.90			
A-B	1.51			1.51			
A-C	221.34			221.34			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	416.31	0.000	0.00	0.0	0.000	A
C-AB	1.94	947.99	0.002	1.94	0.0	3.804	A
C-A	582.39			582.39			
A-B	1.80			1.80			
A-C	264.30			264.30			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	387.91	0.000	0.00	0.0	0.000	A
C-AB	2.74	1007.03	0.003	2.73	0.0	3.583	A
C-A	712.93			712.93			
A-B	2.20			2.20			
A-C	323.70			323.70			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	387.91	0.000	0.00	0.0	0.000	A
C-AB	2.74	1007.03	0.003	2.74	0.0	3.583	A
C-A	712.93			712.93			
A-B	2.20			2.20			
A-C	323.70			323.70			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	416.31	0.000	0.00	0.0	0.000	A
C-AB	1.94	947.99	0.002	1.95	0.0	3.807	A
C-A	582.39			582.39			
A-B	1.80			1.80			
A-C	264.30			264.30			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	436.31	0.000	0.00	0.0	0.000	A
C-AB	1.46	902.83	0.002	1.46	0.0	3.993	A
C-A	487.89			487.89			
A-B	1.51			1.51			
A-C	221.34			221.34			

2023 DN, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1 - untitled	untitled	T-Junction	Two-way	0.04	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D2	2023 DN	PM	ONE HOUR	17:45	19:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Richmond Road (East)		✓	479.00	100.000
B - Site Access		✓	0.00	100.000
C - Richmond Road (West)		✓	372.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0.000	0.000	479.000
	B - Site Access	0.000	0.000	0.000
	C - Richmond Road (West)	368.000	4.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0	0	0
	B - Site Access	0	0	0
	C - Richmond Road (West)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.01	4.86	0.0	A

Main Results for each time segment

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	424.55	0.000	0.00	0.0	0.000	A
C-AB	4.64	745.77	0.006	4.61	0.0	4.856	A
C-A	275.42			275.42			
A-B	0.00			0.00			
A-C	360.62			360.62			

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	402.81	0.000	0.00	0.0	0.000	A
C-AB	6.04	765.92	0.008	6.03	0.0	4.737	A
C-A	328.38			328.38			
A-B	0.00			0.00			
A-C	430.61			430.61			

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	372.33	0.000	0.00	0.0	0.000	A
C-AB	8.31	794.01	0.010	8.30	0.0	4.581	A
C-A	401.27			401.27			
A-B	0.00			0.00			
A-C	527.39			527.39			

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	372.33	0.000	0.00	0.0	0.000	A
C-AB	8.31	794.02	0.010	8.31	0.0	4.583	A
C-A	401.27			401.27			
A-B	0.00			0.00			
A-C	527.39			527.39			

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	402.80	0.000	0.00	0.0	0.000	A
C-AB	6.04	765.93	0.008	6.06	0.0	4.739	A
C-A	328.38			328.38			
A-B	0.00			0.00			
A-C	430.61			430.61			

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	424.54	0.000	0.00	0.0	0.000	A
C-AB	4.65	745.78	0.006	4.66	0.0	4.859	A
C-A	275.41			275.41			
A-B	0.00			0.00			
A-C	360.62			360.62			

2028 DN, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1 - untitled	untitled	T-Junction	Two-way	0.01	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D3	2028 DN	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Richmond Road (East)		✓	320.00	100.000
B - Site Access		✓	1.00	100.000
C - Richmond Road (West)		✓	704.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0.000	2.000	318.000
	B - Site Access	0.000	0.000	1.000
	C - Richmond Road (West)	703.000	1.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0	0	0
	B - Site Access	0	0	0
	C - Richmond Road (West)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.00	3.91	0.0	A

Main Results for each time segment

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	427.90	0.000	0.00	0.0	0.000	A
C-AB	1.53	922.52	0.002	1.52	0.0	3.908	A
C-A	528.48			528.48			
A-B	1.51			1.51			
A-C	239.41			239.41			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	406.04	0.000	0.00	0.0	0.000	A
C-AB	2.05	970.42	0.002	2.05	0.0	3.716	A
C-A	630.83			630.83			
A-B	1.80			1.80			
A-C	285.88			285.88			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	374.86	0.000	0.00	0.0	0.000	A
C-AB	2.91	1032.54	0.003	2.90	0.0	3.495	A
C-A	772.21			772.21			
A-B	2.20			2.20			
A-C	350.12			350.12			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	374.86	0.000	0.00	0.0	0.000	A
C-AB	2.91	1032.55	0.003	2.91	0.0	3.495	A
C-A	772.21			772.21			
A-B	2.20			2.20			
A-C	350.12			350.12			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	406.04	0.000	0.00	0.0	0.000	A
C-AB	2.05	970.42	0.002	2.05	0.0	3.719	A
C-A	630.83			630.83			
A-B	1.80			1.80			
A-C	285.88			285.88			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	427.90	0.000	0.00	0.0	0.000	A
C-AB	1.53	922.52	0.002	1.53	0.0	3.908	A
C-A	528.48			528.48			
A-B	1.51			1.51			
A-C	239.41			239.41			

2028 DN, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1 - untitled	untitled	T-Junction	Two-way	0.04	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D4	2028 DN	PM	ONE HOUR	17:45	19:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Richmond Road (East)		✓	519.00	100.000
B - Site Access		✓	0.00	100.000
C - Richmond Road (West)		✓	403.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0.000	0.000	519.000
	B - Site Access	0.000	0.000	0.000
	C - Richmond Road (West)	399.000	4.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0	0	0
	B - Site Access	0	0	0
	C - Richmond Road (West)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.01	4.80	0.0	A

Main Results for each time segment

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	415.26	0.000	0.00	0.0	0.000	A
C-AB	4.81	754.54	0.006	4.79	0.0	4.801	A
C-A	298.59			298.59			
A-B	0.00			0.00			
A-C	390.73			390.73			

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	391.59	0.000	0.00	0.0	0.000	A
C-AB	6.31	776.49	0.008	6.30	0.0	4.673	A
C-A	355.98			355.98			
A-B	0.00			0.00			
A-C	466.57			466.57			

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	358.34	0.000	0.00	0.0	0.000	A
C-AB	8.77	807.01	0.011	8.75	0.0	4.509	A
C-A	434.94			434.94			
A-B	0.00			0.00			
A-C	571.43			571.43			

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	358.33	0.000	0.00	0.0	0.000	A
C-AB	8.77	807.02	0.011	8.77	0.0	4.511	A
C-A	434.94			434.94			
A-B	0.00			0.00			
A-C	571.43			571.43			

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	391.59	0.000	0.00	0.0	0.000	A
C-AB	6.31	776.50	0.008	6.33	0.0	4.675	A
C-A	355.97			355.97			
A-B	0.00			0.00			
A-C	466.57			466.57			

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	415.25	0.000	0.00	0.0	0.000	A
C-AB	4.82	754.55	0.006	4.83	0.0	4.803	A
C-A	298.58			298.58			
A-B	0.00			0.00			
A-C	390.73			390.73			

2038 DN, AM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1 - untitled	untitled	T-Junction	Two-way	0.01	A

Junction Network Options
[same as above]

Arms

Arms
[same as above]

Major Arm Geometry
[same as above]

Minor Arm Geometry
[same as above]

Slope / Intercept / Capacity
[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D5	2038 DN	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Richmond Road (East)		✓	340.00	100.000
B - Site Access		✓	1.00	100.000
C - Richmond Road (West)		✓	749.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0.000	2.000	338.000
	B - Site Access	0.000	0.000	1.000
	C - Richmond Road (West)	748.000	1.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0	0	0
	B - Site Access	0	0	0
	C - Richmond Road (West)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.00	3.84	0.0	A

Main Results for each time segment

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	420.83	0.000	0.00	0.0	0.000	A
C-AB	1.59	938.64	0.002	1.58	0.0	3.841	A
C-A	562.30			562.30			
A-B	1.51			1.51			
A-C	254.46			254.46			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	397.38	0.000	0.00	0.0	0.000	A
C-AB	2.14	988.68	0.002	2.14	0.0	3.648	A
C-A	671.20			671.20			
A-B	1.80			1.80			
A-C	303.86			303.86			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	363.82	0.000	0.00	0.0	0.000	A
C-AB	3.05	1053.14	0.003	3.05	0.0	3.427	A
C-A	821.61			821.61			
A-B	2.20			2.20			
A-C	372.14			372.14			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	363.82	0.000	0.00	0.0	0.000	A
C-AB	3.05	1053.14	0.003	3.05	0.0	3.427	A
C-A	821.61			821.61			
A-B	2.20			2.20			
A-C	372.14			372.14			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	397.38	0.000	0.00	0.0	0.000	A
C-AB	2.14	988.68	0.002	2.14	0.0	3.651	A
C-A	671.20			671.20			
A-B	1.80			1.80			
A-C	303.86			303.86			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	420.83	0.000	0.00	0.0	0.000	A
C-AB	1.59	938.64	0.002	1.59	0.0	3.841	A
C-A	562.30			562.30			
A-B	1.51			1.51			
A-C	254.46			254.46			

2038 DN, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1 - untitled	untitled	T-Junction	Two-way	0.04	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D6	2038 DN	PM	ONE HOUR	17:45	19:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Richmond Road (East)		✓	552.00	100.000
B - Site Access		✓	0.00	100.000
C - Richmond Road (West)		✓	428.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0.000	0.000	552.000
	B - Site Access	0.000	0.000	0.000
	C - Richmond Road (West)	424.000	4.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0	0	0
	B - Site Access	0	0	0
	C - Richmond Road (West)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.00	0.00	0.0	A
C-AB	0.01	4.76	0.0	A

Main Results for each time segment

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	407.61	0.000	0.00	0.0	0.000	A
C-AB	4.96	761.53	0.007	4.93	0.0	4.757	A
C-A	317.26			317.26			
A-B	0.00			0.00			
A-C	415.57			415.57			

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	382.34	0.000	0.00	0.0	0.000	A
C-AB	6.54	784.90	0.008	6.53	0.0	4.624	A
C-A	378.23			378.23			
A-B	0.00			0.00			
A-C	496.24			496.24			

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	346.76	0.000	0.00	0.0	0.000	A
C-AB	9.15	817.33	0.011	9.14	0.0	4.454	A
C-A	462.08			462.08			
A-B	0.00			0.00			
A-C	607.76			607.76			

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	346.76	0.000	0.00	0.0	0.000	A
C-AB	9.16	817.34	0.011	9.16	0.0	4.454	A
C-A	462.08			462.08			
A-B	0.00			0.00			
A-C	607.76			607.76			

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	382.33	0.000	0.00	0.0	0.000	A
C-AB	6.54	784.91	0.008	6.55	0.0	4.626	A
C-A	378.22			378.22			
A-B	0.00			0.00			
A-C	496.24			496.24			

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	0.00	407.60	0.000	0.00	0.0	0.000	A
C-AB	4.97	761.54	0.007	4.98	0.0	4.758	A
C-A	317.25			317.25			
A-B	0.00			0.00			
A-C	415.57			415.57			

2023 DS, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1 - untitled	untitled	T-Junction	Two-way	0.49	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D7	2023 DS	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Richmond Road (East)		✓	204.00	100.000
B - Site Access		✓	37.00	100.000
C - Richmond Road (West)		✓	653.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0.000	10.000	194.000
	B - Site Access	26.000	0.000	11.000
	C - Richmond Road (West)	649.000	4.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0	0	0
	B - Site Access	0	0	0
	C - Richmond Road (West)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.11	10.84	0.1	B
C-AB	0.01	3.96	0.0	A

Main Results for each time segment

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	27.86	416.85	0.067	27.57	0.1	9.241	A
C-AB	5.74	915.78	0.006	5.72	0.0	3.955	A
C-A	485.87			485.87			
A-B	7.53			7.53			
A-C	146.05			146.05			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	33.26	398.57	0.083	33.19	0.1	9.850	A
C-AB	7.61	962.55	0.008	7.61	0.0	3.768	A
C-A	579.42			579.42			
A-B	8.99			8.99			
A-C	174.40			174.40			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	40.74	372.90	0.109	40.61	0.1	10.834	B
C-AB	10.65	1023.43	0.010	10.63	0.0	3.553	A
C-A	708.32			708.32			
A-B	11.01			11.01			
A-C	213.60			213.60			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	40.74	372.90	0.109	40.73	0.1	10.837	B
C-AB	10.65	1023.43	0.010	10.65	0.0	3.553	A
C-A	708.32			708.32			
A-B	11.01			11.01			
A-C	213.60			213.60			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	33.26	398.57	0.083	33.38	0.1	9.862	A
C-AB	7.62	962.56	0.008	7.63	0.0	3.769	A
C-A	579.41			579.41			
A-B	8.99			8.99			
A-C	174.40			174.40			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	27.86	416.85	0.067	27.93	0.1	9.259	A
C-AB	5.76	915.79	0.006	5.76	0.0	3.957	A
C-A	485.86			485.86			
A-B	7.53			7.53			
A-C	146.05			146.05			

2023 DS, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1 - untitled	untitled	T-Junction	Two-way	0.34	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D8	2023 DS	PM	ONE HOUR	17:45	19:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Richmond Road (East)		✓	508.00	100.000
B - Site Access		✓	18.00	100.000
C - Richmond Road (West)		✓	380.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0.000	29.000	479.000
	B - Site Access	13.000	0.000	5.000
	C - Richmond Road (West)	368.000	12.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0	0	0
	B - Site Access	0	0	0
	C - Richmond Road (West)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.06	11.53	0.1	B
C-AB	0.03	4.95	0.0	A

Main Results for each time segment

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	13.55	387.60	0.035	13.41	0.0	9.618	A
C-AB	13.97	741.11	0.019	13.88	0.0	4.950	A
C-A	272.11			272.11			
A-B	21.83			21.83			
A-C	360.62			360.62			

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	16.18	364.34	0.044	16.14	0.0	10.337	B
C-AB	18.21	760.55	0.024	18.19	0.0	4.849	A
C-A	323.40			323.40			
A-B	26.07			26.07			
A-C	430.61			430.61			

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	19.82	331.91	0.060	19.75	0.1	11.529	B
C-AB	25.13	787.74	0.032	25.08	0.0	4.720	A
C-A	393.25			393.25			
A-B	31.93			31.93			
A-C	527.39			527.39			

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	19.82	331.90	0.060	19.82	0.1	11.534	B
C-AB	25.15	787.76	0.032	25.15	0.0	4.720	A
C-A	393.24			393.24			
A-B	31.93			31.93			
A-C	527.39			527.39			

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	16.18	364.32	0.044	16.25	0.0	10.343	B
C-AB	18.24	760.58	0.024	18.28	0.0	4.851	A
C-A	323.38			323.38			
A-B	26.07			26.07			
A-C	430.61			430.61			

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	13.55	387.58	0.035	13.59	0.0	9.628	A
C-AB	14.01	741.14	0.019	14.04	0.0	4.953	A
C-A	272.08			272.08			
A-B	21.83			21.83			
A-C	360.62			360.62			

2028 DS, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1 - untitled	untitled	T-Junction	Two-way	0.46	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D9	2028 DS	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Richmond Road (East)		✓	328.00	100.000
B - Site Access		✓	37.00	100.000
C - Richmond Road (West)		✓	707.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0.000	10.000	318.000
	B - Site Access	26.000	0.000	11.000
	C - Richmond Road (West)	703.000	4.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0	0	0
	B - Site Access	0	0	0
	C - Richmond Road (West)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.12	12.29	0.1	B
C-AB	0.01	3.93	0.0	A

Main Results for each time segment

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	27.86	390.61	0.071	27.55	0.1	9.908	A
C-AB	6.12	921.42	0.007	6.09	0.0	3.932	A
C-A	526.15			526.15			
A-B	7.53			7.53			
A-C	239.41			239.41			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	33.26	366.98	0.091	33.17	0.1	10.782	B
C-AB	8.21	969.20	0.008	8.20	0.0	3.745	A
C-A	627.37			627.37			
A-B	8.99			8.99			
A-C	285.88			285.88			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	40.74	333.71	0.122	40.58	0.1	12.275	B
C-AB	11.66	1031.18	0.011	11.64	0.0	3.530	A
C-A	766.77			766.77			
A-B	11.01			11.01			
A-C	350.12			350.12			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	40.74	333.70	0.122	40.73	0.1	12.287	B
C-AB	11.66	1031.19	0.011	11.66	0.0	3.532	A
C-A	766.76			766.76			
A-B	11.01			11.01			
A-C	350.12			350.12			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	33.26	366.97	0.091	33.41	0.1	10.796	B
C-AB	8.21	969.21	0.008	8.23	0.0	3.748	A
C-A	627.37			627.37			
A-B	8.99			8.99			
A-C	285.88			285.88			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	27.86	390.60	0.071	27.95	0.1	9.930	A
C-AB	6.13	921.43	0.007	6.14	0.0	3.934	A
C-A	526.13			526.13			
A-B	7.53			7.53			
A-C	239.41			239.41			

2028 DS, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1 - untitled	untitled	T-Junction	Two-way	0.33	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D10	2028 DS	PM	ONE HOUR	17:45	19:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Richmond Road (East)		✓	548.00	100.000
B - Site Access		✓	18.00	100.000
C - Richmond Road (West)		✓	411.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0.000	29.000	519.000
	B - Site Access	13.000	0.000	5.000
	C - Richmond Road (West)	399.000	12.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0	0	0
	B - Site Access	0	0	0
	C - Richmond Road (West)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.06	12.09	0.1	B
C-AB	0.03	4.89	0.0	A

Main Results for each time segment

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	13.55	377.97	0.036	13.40	0.0	9.867	A
C-AB	14.49	749.95	0.019	14.40	0.0	4.894	A
C-A	294.93			294.93			
A-B	21.83			21.83			
A-C	390.73			390.73			

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	16.18	352.75	0.046	16.14	0.0	10.693	B
C-AB	19.04	771.21	0.025	19.01	0.0	4.785	A
C-A	350.44			350.44			
A-B	26.07			26.07			
A-C	466.57			466.57			

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	19.82	317.56	0.062	19.75	0.1	12.085	B
C-AB	26.53	800.87	0.033	26.48	0.0	4.648	A
C-A	425.99			425.99			
A-B	31.93			31.93			
A-C	571.43			571.43			

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	19.82	317.55	0.062	19.82	0.1	12.090	B
C-AB	26.55	800.90	0.033	26.55	0.0	4.650	A
C-A	425.97			425.97			
A-B	31.93			31.93			
A-C	571.43			571.43			

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	16.18	352.74	0.046	16.25	0.0	10.702	B
C-AB	19.06	771.25	0.025	19.11	0.0	4.788	A
C-A	350.42			350.42			
A-B	26.07			26.07			
A-C	466.57			466.57			

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	13.55	377.94	0.036	13.60	0.0	9.883	A
C-AB	14.54	749.98	0.019	14.57	0.0	4.895	A
C-A	294.89			294.89			
A-B	21.83			21.83			
A-C	390.73			390.73			

2038 DS, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1 - untitled	untitled	T-Junction	Two-way	0.45	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D11	2038 DS	AM	ONE HOUR	08:00	09:30	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Richmond Road (East)		✓	348.00	100.000
B - Site Access		✓	37.00	100.000
C - Richmond Road (West)		✓	752.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0.000	10.000	338.000
	B - Site Access	26.000	0.000	11.000
	C - Richmond Road (West)	748.000	4.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0	0	0
	B - Site Access	0	0	0
	C - Richmond Road (West)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.13	12.79	0.1	B
C-AB	0.01	3.87	0.0	A

Main Results for each time segment

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	27.86	383.01	0.073	27.55	0.1	10.120	B
C-AB	6.35	937.57	0.007	6.33	0.0	3.865	A
C-A	559.79			559.79			
A-B	7.53			7.53			
A-C	254.46			254.46			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	33.26	357.77	0.093	33.17	0.1	11.086	B
C-AB	8.57	987.49	0.009	8.56	0.0	3.676	A
C-A	667.47			667.47			
A-B	8.99			8.99			
A-C	303.86			303.86			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	40.74	322.16	0.126	40.57	0.1	12.776	B
C-AB	12.24	1051.82	0.012	12.23	0.0	3.462	A
C-A	815.73			815.73			
A-B	11.01			11.01			
A-C	372.14			372.14			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	40.74	322.16	0.126	40.73	0.1	12.791	B
C-AB	12.25	1051.83	0.012	12.25	0.0	3.464	A
C-A	815.72			815.72			
A-B	11.01			11.01			
A-C	372.14			372.14			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	33.26	357.77	0.093	33.42	0.1	11.106	B
C-AB	8.57	987.50	0.009	8.59	0.0	3.679	A
C-A	667.46			667.46			
A-B	8.99			8.99			
A-C	303.86			303.86			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	27.86	383.01	0.073	27.95	0.1	10.143	B
C-AB	6.37	937.58	0.007	6.38	0.0	3.867	A
C-A	559.77			559.77			
A-B	7.53			7.53			
A-C	254.46			254.46			

2038 DS, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1 - untitled	untitled	T-Junction	Two-way	0.33	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D12	2038 DS	PM	ONE HOUR	17:45	19:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A - Richmond Road (East)		✓	581.00	100.000
B - Site Access		✓	18.00	100.000
C - Richmond Road (West)		✓	436.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0.000	29.000	552.000
	B - Site Access	13.000	0.000	5.000
	C - Richmond Road (West)	424.000	12.000	0.000

Vehicle Mix

Heavy Vehicle proportion

		To		
		A - Richmond Road (East)	B - Site Access	C - Richmond Road (West)
From	A - Richmond Road (East)	0	0	0
	B - Site Access	0	0	0
	C - Richmond Road (West)	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.06	12.59	0.1	B
C-AB	0.03	4.85	0.0	A

Main Results for each time segment

Main results: (17:45-18:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	13.55	370.05	0.037	13.40	0.0	10.089	B
C-AB	14.93	756.99	0.020	14.84	0.0	4.850	A
C-A	313.31			313.31			
A-B	21.83			21.83			
A-C	415.57			415.57			

Main results: (18:00-18:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	16.18	343.22	0.047	16.14	0.0	11.005	B
C-AB	19.73	779.70	0.025	19.70	0.0	4.736	A
C-A	372.23			372.23			
A-B	26.07			26.07			
A-C	496.24			496.24			

Main results: (18:15-18:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	19.82	305.73	0.065	19.74	0.1	12.585	B
C-AB	27.72	811.30	0.034	27.66	0.0	4.593	A
C-A	452.33			452.33			
A-B	31.93			31.93			
A-C	607.76			607.76			

Main results: (18:30-18:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	19.82	305.72	0.065	19.82	0.1	12.590	B
C-AB	27.74	811.33	0.034	27.74	0.0	4.596	A
C-A	452.31			452.31			
A-B	31.93			31.93			
A-C	607.76			607.76			

Main results: (18:45-19:00)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	16.18	343.21	0.047	16.26	0.1	11.012	B
C-AB	19.75	779.74	0.025	19.81	0.0	4.737	A
C-A	372.20			372.20			
A-B	26.07			26.07			
A-C	496.24			496.24			

Main results: (19:00-19:15)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	13.55	370.02	0.037	13.60	0.0	10.103	B
C-AB	14.98	757.02	0.020	15.01	0.0	4.853	A
C-A	313.27			313.27			
A-B	21.83			21.83			
A-C	415.57			415.57			

APPENDIX D

GoCar Letter of Consent

Birkey Ltd,
No.28 The Drive,
Graigavern Lodge,
Ballybrittas,
Co. Laois

12/12/2021

To Whom It May Concern,

This is a letter to confirm that GoCar intends to provide a service of (One) 1 shared car club vehicles in the proposed Strategic Hosing Development (SHD) at Richmond Road, Dublin 3. GoCar representatives have discussed the project with representatives of DBFL Consulting Engineers, who are the Transport Planners for the development, and are excited to provide a car sharing service at this location.

It is understood that the vehicles at this development will be positioned in a number of small 'hubs' to allow for ease of access for all residents. While it is the intention for most of these vehicles to be used exclusively by the residents of the development, GoCar may agree with the eventual managers of the site to allow some vehicles to be open for access to other GoCar members nearby. This will depend on usership levels, and will be reviewed at various periods to ensure adequate supply for the residents of the development.

GoCar is Ireland's leading car sharing service with over 60,000 members and over 800 cars and vans on fleet. Each GoCar which is placed in a community has the potential to replace the journeys of up to 15 private cars. The Department of Housing's Design Standards for New Apartments - Guidelines for Planning Authorities 2018 outline: "For all types of location, where it is sought to eliminate or reduce car parking provision, it is necessary to ensure... provision is also to be made for alternative mobility solutions including facilities for car sharing club vehicles."

Carsharing is a sustainable service. By allowing multiple people to use the same vehicle at different times, car sharing reduces car ownership, car dependency, congestion, noise and air pollution. It frees up land which would otherwise be used for additional parking spaces. Most GoCar users only use a car when necessary, and walk and use public transport more often than car owners.

By having GoCar car sharing vehicles in a development such as this, the staff therein will have access to pay-as-you-go driving, in close proximity to their offices, which will increase usership of the service.

I trust that this information is satisfactory. For any queries, please do not hesitate to contact me.

Jonathan Roche
Head of Carsharing
GoCar Carsharing Ltd
E:jonathan.roche@gocar.