# consulting engineers

Assessment Report incl. Preliminary Travel Plan, DMURS Statement of Consistency, Stage 1 Road Safety Audit and Quality Audit, & Parking Management/Strategy Report.

**Transportation** 

For

Proposed St. Teresa's Strategic Housing Development

At

Temple Hill, Monkstown, Blackrock, Co Dublin.

## SUBMISSION ISSUE

1st Floor, Apollo Building, Dundrum Road, Dundrum, Dublin 14 Tel: +353 1 292 1941, E-mail: info@nrb.ie, Web: <u>www.nrb.ie</u>



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### **EXECUTIVE SUMMARY**

NRB Consulting Engineers Ltd were appointed to address the Traffic/Transportation issues associated with a planning application by Oval Target Ltd for a Strategic Housing Development (SHD) on lands at Temple Hill, Monkstown, Blackrock, Co Dublin. This report assesses the impact of 493 Apartment units on the site, supported by residential amenities, open space, an ancillary Creche & a small Café (Refer to Development Description included within Section 2.0 herein).

The proposed SHD new development shall provide for 493 residential apartments; the conversion and re-use of 'St. Teresa's House'; and the relocation of a 'St. Teresa's Lodge' within the site development area. The vehicular access arrangement from the local roads effectively mirrors the access junction previously approved.

Being located adjacent a busy Bus Corridor, with high quality pedestrian and cyclist provision, and within a short walking distance of both Seapoint and Blackrock Dart Stations, the site is very well placed to take advantage of non-car modes of travel to support the increased scale of development.

This Transportation Assessment Report (TA) has been prepared to address the Traffic and Transportation issues associated with the revised proposal, the capacity of the existing road network and the impact of the increased scale of development locally. An assessment of current & future alternative transportation modes has also been undertaken and is included as **Section 6.0**. The Report has been prepared in accordance with TII's Traffic & Transportation Assessment Guidelines and addresses the worst-case traffic impact of the proposal locally.

This TA addresses the adequacy of the existing road network to safely and appropriately accommodate the worst-case vehicular demands with the development fully occupied, taking account of the existing traffic demands locally and the proposed new access.

Comprehensive classified turning movement surveys of the existing affected roads and junctions were originally carried out during the weekday AM and PM Peak Hours in 2017. These surveys were supplemented by additional validation traffic surveys undertaken in October 2020, due to DLRCC implemented changes at the adjacent traffic signal-controlled junction, together with validation and reference to 2021 TII Traffic Counter Data.

These traffic surveys together formed the basis of the study. The analysis includes the effects of the existing traffic on the local roads and assesses the impact during the



traditional peak commuter peaks periods. The assessment also takes account of the committed development permitted and developments under construction at the Frascati Centre & at Enterprise House.

A separate assessment was again undertaken and included to determine and prove the ability of the proposed traffic signal-controlled junction to accommodate both the subject application for 493 apartments <u>and</u> the future development of the remainder of the entire St Catherines LAP lands to the south.

The Transportation Assessment confirms that the road network and the amended vehicular access junction are more than adequate to accommodate the worst-case traffic associated with the increased scale of development. The assessment also confirms that the construction and full occupation of the scheme will have a negligible and unnoticeable impact upon the operation of the adjacent road network.

Detailed analysis also confirms that there is adequate capacity in the proposed access junction to accommodate the additional demands associated with the development of the lands including those to the south of the subject site.

The assessment includes a Preliminary Travel Plan for the site which is included herein as a separate report as *Appendix H*.

A Statement of Consistency with DMURS has also been prepared, which confirms that the internal layout is compliant with the DMURS requirements, and this is included as a separate report as *Appendix I*.

An independent Quality Audit, including a Stage 1 Quality & Road Safety Audit, together with the Designer Feedback form, has been undertaken and is included as a separate report as *Appendix J*.

A Parking Management/Strategy Report is included as Appendix K.

Based on all of these studies, it is concluded that there are no adverse traffic/transportation capacity or operational issues associated with the construction and occupation of the proposed 493 Unit Residential apartment development, with ancillary uses.



### 1.0 INTRODUCTION

- 1.1 This Transportation Assessment (TA) has been prepared by NRB Consulting Engineers Ltd and addresses the Traffic/ Transportation issues arising from the proposal to construct and occupy a revised residential apartment development on lands at St Teresa's, Blackrock.
- 1.2 Blackrock, and the subject site, is a long-established destination, containing commercial, retail and residential development and in these terms has very well established traffic generation characteristics in its own right. The proposed development on zoned lands, identified for residential use in the Blackrock LAP, benefiting from a planning permission for 291 Residential Apartments, should be considered in this context. A site location plan for the site is included below as *Figure 1.1*.



Figure 1.1 - Site Location

- 1.3 In describing the Receiving Environment and the Proposed Future Environment, this report addresses the following aspects of the proposed development:
  - Relative Small Scale of the development in the context of Blackrock and the busy road network (Reflected in the Low Traffic Generation of the Development),
  - Location of the development on a Bus Corridor and adjacent 2 DART Stations,



- Traffic & Transportation impact, with 291 units previously approved,
- Proposed access junction as previously permitted, with a further improvement to the alignment of St Vincent's Park,
- Capacity of the proposed vehicular access arrangement to accommodate the worst-case development traffic flows associated with 493 Units,
- Pedestrian and cyclist permeability and promotion,
- Capacity of the Existing Road Network,
- Adequacy and safety of the existing roads and junctions locally, within the area of influence.
- Impact upon the adjacent traffic signal-controlled junctions on the N31.
- 1.4 A review of the Road Safety Authority (RSA) online collision database indicates that there is a cluster of (minor) vehicular collisions occurring on the N31 at the adjacent Traffic Signal Controlled Junction, between 2005-date inclusive (Refer *Figure 1.2* Below). It should also be noted that the subject use of the site represents a reduced intensification in terms of traffic generation when compared to the historic former uses, and that the proposals now include significant upgrade and improvement in terms of the design and operation of the existing junction.



Figure 1.2 - RSA On Line Record of Traffic Collisions



- 1.5 The Recommendations contained within this Transportation Assessment are based on the following sources of information and industry-standard practices; -
  - TII Traffic & Transport Assessment Guidelines,
  - Design Manual for Urban Roads and Streets,
  - Recent Traffic Survey Data commissioned to validate veracity of 2017 Data,
  - Relevant Design Guidance,
  - Our experience in assessing the impact of Developments of this Nature, and
  - Site Visits and Observations.
- 1.6 The Report has been prepared in accordance with the requirements of the TII's Traffic & Transport Assessment Guidelines. These are the professional Guidelines used to assess the impact of developments on public roads.
- 1.7 The assessment includes a Preliminary Travel Plan for the site which is included herein as a separate report as *Appendix H*.
- 1.8 We have prepared a Statement of Consistency with DMURS and confirm that the internal layout is compliant with the requirements, and this is included as a separate report as *Appendix I.*
- 1.9 An independent Quality Audit, including a Stage 1 Quality & Road Safety Audit, together with the Designer Feedback form, has been undertaken and is included as a separate report as *Appendix J*.



# 2.0 DEVELOPMENT PROPOSALS, EXISTING CONDITIONS, CAR PARKING & ACCESS JUNCTION DESIGN

- 2.1 The Proposed Development, as set out on the Architects layout Plans, comprises 493 residential units delivered in a combination of new apartment buildings (ranging in height from 3- 10 storeys overall in height) and a relocated St. Teresa's Lodge. St. Teresa's House provides for 6 apartments, comprising 5 no. 2-bed units and 1 no. 3-bed unit. The new build element of 487 units is set out in 11 no. residential development blocks (Blocks A1-C2 and D1 E2) ranging in height from 3-10 storeys over basement comprising:
  - Block A1 (5 storeys) comprising 37 no. apartments (33 no. 1 bed units and 4 no. 2 bed units),
  - Block B1 (10 storeys) comprising 55 no. apartments (37 no. 1 bed units, 10 no. 2 bed units and 8no. 3 bed units),
  - Block B2 (8 storeys) comprising 42 no. apartments (28 no. 1 beds, 9 no. 2 beds and 5 no. 3 beds),
  - Block B3 (8 storeys) comprising 42 no. apartments (28 no. 1 beds, 9 no. 2 beds and 5 no. 3 beds),
  - Block B4 (5 storeys) comprising 41 no. apartments (4 no. studio units, 4 no. 1 bed units, 27 no. 2 bed units and 6 no. 3 bed units),
  - Block C1 (3 storeys) comprising 10 no. apartments (1 no. studio unit, 3 no. 1 bed units and 6 no. 2 bed units),
  - Block C2 (3 storeys) comprising 6 no. apartments (2 no. 1 bed units, 4 no. 2 bed units,) together with a creche facility of 392 sq. m at ground floor level and outdoor play area space of 302m<sup>2</sup>,
  - Block C3 (1 storey plus basement level) comprising residential amenity space of 451m<sup>2</sup>,
  - Block D1 (6 storeys) comprising 134 no. apartments (12 no. studio units, 22 no. 1 bed units, 90 no. 2 bed units and 10 no. 3 bed units),
  - Block E1 (6 storeys) comprising 70 apartment units (34 no. 1 bed units, 26 no. 2 bed units and 10 no. 3 bed units), and
  - Block E2 (6 storeys) comprising 50 units (1 no. studio unit, 29 no. 1 bed units, 18 no.
    2 bed units and 2 no. 3 bed units).
- 2.2 Each residential unit has associated private open space in the form of a terrace/balcony. Resident amenity space of c.451m<sup>2</sup> is provided, accommodating a gym & studio space at basement level; residents' lounge/café, work booths/meeting room & reception/foyer/ parcel store at ground floor. An ancillary Crèche facility of 392m<sup>2</sup> is also proposed



- 2.3 The site already has permission for 291 Residential Units through the Strategic Housing Development Process (*Ref ABP-303804-19*), and this report assesses the impact of 493 Apartment units on effectively the same site with almost the exact same access arrangement as previously approved.
- 2.4 The site is in Blackrock, within easy walking distance of Dublin Bus Stops on the adjacent N31 Bus Corridor, and also close to Seapoint and Blackrock Rail / Dart Stations and is therefore ideally placed to accommodate the Transportation Demands associated with this scale of development.
- 2.5 The site is bound along the northern boundary by the N31 Temple Road, to the east by the existing St Vincent's Park Residential Development, to the west by St Louise's Park and the Alzheimer Society of Ireland, and to the south by undeveloped parklands and the established convent buildings.
- 2.6 The road along the northern boundary of the site is the N31 National Secondary Road, which is one of the city's main commuter routes, also serving the port of Dun Laoghaire, connecting to the N11. The N31 is a wide urban dual carriageway with a series of large traffic signal-controlled junctions along its length, serving local areas as well as commercial development such as Blackrock Village, Blackrock Shopping Centre and the Frascati Shopping Centre located to the north of the subject site. The N31 is subject to a 50kph urban speed restriction. The N31 carries a weekday AM Peak Hour 2-way flow of approximately 2,100 PCUs and a weekday PM Peak Hour 2-Way flow of approximately 2,500 PCUs, and in these terms, it can be considered as quite heavily trafficked.
- 2.7 The junction of the N31/Seapoint Ave/St Vincent's Park takes the form of a large 4-arm traffic signal-controlled junction. The junction has relatively recently been upgraded; however the layout remains substandard in terms of modern & safe roads design, due primarily to the requirement to maintain access to St Vincent's Park with a non-standard geometric layout, and a left turn diverge lane that crosses the city bound cycle lane.
- 2.8 DLRCC previously commissioned studies looking at the accessibility of the subject lands and the existing junction was identified as the preferred location for providing vehicular access, by way of an upgraded traffic signal-controlled junction, as proposed (& as then subsequently approved under the SHD process for 291 Residential Units). The junction proposed to serve the subject 493 Unit Residential scheme is effectively the same junction as previously approved – however, the inclusion of the boundary wall and entrance gateway of Carmond as illustrated below, allows a small but beneficial further



improvement to the alignment of the vehicular access to St Vincent's Park. This is illustrated in the extract below as *Figure 2.1* 



Figure 2.1 – Portion of Carmond Lands within Red Line

- 2.9 The existing residential development of St Vincent's Park adjacent the site is a lowdensity development, consisting of approximately 30 residential houses. In these terms St Vincent's Park is demonstrably a very low generator of vehicular movements.
- 2.10 To the west of the site, St Louise's Park provides access to Traveller Accommodation and also to the Headquarters of the Alzheimer's Society of Ireland. Like St Vincent's Park, it is a low generator of vehicle movements.
- 2.11 A site layout plan showing the development arrangement in relation to the existing site and roads is included herein as *Appendix A* along with further details of the redeveloped improved access and egresses. We also include TRACK (Vehicle Swept Path) drawings and a drawing illustrating how the all parking spaces provided can readily be upgraded to provide for electric vehicle charging if required based on end-user demand.

### Car Parking & Accessibility

2.12 The proposed development consists of a residential apartment scheme with ancillary supporting use in a series of blocks within a courtyard setting, supported by a mix of at grade and basement cycle & car parking, with copious dedicated secure bicycle parking



areas. (Refer to Architects Drawings illustrating same and the annotated site layout drawing included herein as *Appendix A*).

- 2.13 The vehicular access arrangement and the layout and design of the internal road network include for tactile paving and dropped kerbs. The vehicle lanes and geometry internally have been designed in line with the Design Manual for Urban Road and Streets (DMURS) to provide shorter crossing distances and a safer environment for cyclists and pedestrians, including a significant proportion of shared surfaces which emphasise the traffic-calmed residential nature of the environment.
- 2.14 It is expected that a significant number of residents of the proposed development will be willing to cycle to work with safe links and secure parking put in place, and that is reflected in the provision of a total of 1056 new dedicated cycle parking spaces, which is in line with national Design Standards for Apartments. There are 656 secure visitor bicycle spaces in the basement level and 400 at surface level, with the bicycle parking allocation and distribution as outlined in *Table 2.1* below.

Cycle parking provision	
Resident spaces in basement (A) level -1	100
Resident spaces in basement (B) level 0	226
Resident spaces in basement (D) level -1	246
Resident spaces in bike stores at ground level	232
Total resident cycle parking spaces provided	804
Visitor spaces on surface	168
Visitor spaces in basement (B) level 0	84
Total visitor cycle parking spaces provided	252
Total cycle parking spaces provided	1056

- 2.15 The 'Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities' requires a provision of 1 residential bicycle parking space per bedroom PLUS 1 visitor bicycle parking space per apartment unit. In this case there are a total of 795 bedrooms, requiring 795 residential bicycle parking spaces) and with 493 units, requiring 246 visitor bicycle parking spaces. This is a total requirement of 1,041, and with 1,056 bicycle spaces, in excess of the guideline is provided.
- 2.16 The development includes a provision of 260 dedicated Car Parking spaces, divided between Surface and Basement, with the breakdown as shown in *Table 2.2* below.



Total spaces

8

8

Car parking provision-Residential		spaces	accessible spaces	Total spaces
Surface level car parking		86	5	<mark>9</mark> 1
Basement A (level -1)		42	2	44
Basement B ( level 0)		34	2	36
Basement D (level -1)		77	4	81
TOTAL RESIDENTIAL CAR PARKING	SPACES	239	13	252
Car parking provision-residential	(number of spaces	252 / number of un <b>252/493 = 0.51 ca</b>	its 493) r spaces per residential ur	nit
Accessible parking space provision				
5% of spaces	252 x 5% = 12.6 sp	aces Accessible reside	ntial car spaces provided	= 13 spaces

Car parking provision - Creche

TOTAL CRECHE CAR PARKING SPACES

Surface level car parking

2.17 The parking will include 6 spaces dedicated to Car Sharing. There are 20 motorbike parking spaces provided. A total of 50 EV charging spaces are shown distributed around the site, being c10% of the total number of spaces. Notwithstanding, all of the car parking spaces can easily be upgraded to allow conversion for Electric Vehicles.

spaces

7

accessible spaces

1

- 2.18 Whilst DLRCC Development Plan defines the % of EV Spaces to be provided, and the design includes for these dedicated spaces as per the Development Plan. In the case of a large residential development of the nature proposed, with specific spaces likely dedicated to specific apartments, it is considered appropriate to also facilitate the retrofitting of spaces, based on demand following occupation, rather than dedicated electric charge spaces being dedicated to apartments and provided from the outset. The entire car park of the subject scheme can therefore be ducted to accept future cabling to serve a charging point for every car space as demanded. Within the basement area, conduits will be run on the walls where charging points can also be mounted.
- 2.19 Where residents request a charging point to be installed, the relevant charging point will be pre-wired back to their home electricity meter in the designated meter location. The socket point will have a lockable cover on it so that only that resident may use the power point. This provision around the entire parking area will also charging points to be installed at any of the car parking spaces with minimum works as and when required.



<u>Links</u>

- 2.20 There are generous wide footpaths provided internally within the site connecting to existing roads along with the recently upgraded cycle network on the N31 Temple Road, providing direct links to the high-quality public transport services locally.
- 2.21 The development is well serviced by a number of frequent Dublin Bus services along with other services such as Aircoach. There are bus lanes on the N31 approaches to Blackrock and DLRCC have objectives to further upgrade many of these local routes to QBCs. Real time information is available at the nearby Dublin Bus Stops.
- 2.22 Further details of measures to encourage the use of alternative modes of transport are set out in the separate Preliminary Travel Plan (aka Mobility Management Plan or MMP) as *Appendix H*. The enclosed MMP should be read in conjunction with the content of the TA Report, as an integral part.
- 2.23 The <u>Car Parking</u> standards to be applied in new residential developments in Dún Laoghaire-Rathdown are set out in Table 8.2.3 of the County Development Plan (2016-2022). These standards are defined as "Maximum" requirements, with the provision to be determined in accordance with the DLRCC Development Plan on a case-by-case basis, depending on the particular circumstances. In the case of the subject site, there are 493 quality residential apartments proposed immediately beside the N31 Core Radial Bus Route, and within an 8 min walk of both Seapoint **and** Blackrock DART Stations. In addition, there are high quality walking and cycling links between the site and the city centre. In these terms, the development site location is considered to be very highly sustainable.
- 2.24 A total of 252 private car parking spaces are being provided as part of the development. With 493 apartments, this represents a **car parking 'Ratio' of 0.51** parking spaces per unit. This level of parking is considered appropriate given the highly sustainable location characteristics of the apartment scheme, and in consideration of National Guidance.
- 2.25 The recently adopted 'Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities' dated March 2018, updates previous guidance in the context of greater evidence and knowledge of current and likely future housing demand in Ireland taking account of the Housing Agency National Statement on Housing Demand and Supply and projected need for additional housing supply out to 2020, the Government's action programme on housing and homelessness Rebuilding Ireland & National Planning Framework Ireland 2040, (subsequent to 2015 guidelines).



2.26 These new guidelines address car parking and include an objective to 'Remove requirements for car-parking in certain circumstances where there are better mobility solutions and to reduce costs.' Under Car Parking - Section 4.18 the guidelines acknowledge that 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. Under Section 4.19 the guidelines note that in larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be wholly eliminated or substantially reduced. Specifically, Paragraph 4.19 states; -

### Central and/or Accessible Urban Locations

In larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances. The policies above would be particularly applicable in highly accessible areas such as in or adjoining city cores or at a confluence of public transport systems such as rail and bus stations located in close proximity.

2.27 This is to be applied in accessible areas such as in or adjoining city cores or at a confluence of public transport systems. In terms of the stated Policy, the subject site meets all the requirements for significantly reducing or eliminating the provision of Private Car Parking, under the headings;

High Density Development Comprising Wholly of Apartments Central Location Well Served by Public Transport Rail/Bus in Close Proximity

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2.28 The National Apartment Guidance states (Paragraph 4.23);

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

- 2.29 Conscious that the scheme is intended to be actively marketed as Reduced Car Dependency, the layout has been designed with the above issues in mind. For the proposed development it is anticipated that there will be an associated lower car ownership & dependency. Given the restrictions on the number of spaces being provided, the entire scheme will be actively marketed and promoted as a "*Reduced Car Dependency*" scheme, and this will be communicated from the outset as part of sales and marketing. The development will also be managed on an on-going basis to ensure that the Reduced Car Dependency nature of the development is continually promoted and enhanced.
- 2.30 The development will be managed and operated by a Management Company. Car parking will not be an automatic entitlement with the apartments, but spaces will be available to rent and purchase. Renting/sales of parking will be allocated to residents mainly on a first come first served basis by the Management Company and will be continually managed in these terms.
- 2.31 Some parking spaces will be reserved for visitors with other car parking spaces allocated for rent/sale to larger units. The allocation of car parking spaces will reviewed/renewed on an annual/ongoing basis to suit demand.
- 2.32 In terms of **specific measures** to enable car parking provision to be reduced to the level proposed, with a parking ratio of 0.51, the specific measures are:
  - The Active Management and Marketing of the Development from the outset as 'Reduced Car Dependency',
  - Restricted Dedicated Car Parking is intended to be provided to Residents and will be specifically associated with specific private sales or rental properties (and same will be Specified in associated Rental Agreements),



- The Location within walking/cycling distance of a wide range of services, amenities, shops and schools,
- Associated Employment Opportunities locally,
- Proximity to the DART and Bus Services 'on the doorstep' of the site,
- Being on a Core Radial Bus Route,
- 6 No. Dedicated Car Share spaces/cars can be provided within the development,
- Copious Cycle Parking and Cycle Storage (Refer Above),
- On site security & management by permanent staff and by way of CCTV that will ensure the car parking areas are monitored and policed (with a clamping system in operation, so that the car parking restrictions are closely controlled and enforced), and
- The Implementation of a working Mobility Management Plan.
- 2.33 Following our review of the scheme design and location, in light of the above and our interpretation of National Policy, we believe that the provision of 252 managed parking spaces to serve the residential elements of this development is appropriate.

### Access Junction Design - Discussion

- 2.34 The Design of the Access Junction was previously developed following a review of the Local Area Plan and moreover a review of existing traffic safety issues and modern junction design. We concluded, following consultation and agreement with DLRCC Roads/Transportation Officials that, in order to provide an acceptable vehicular access, the Gate-lodge needed to be removed and relocated. The current plan is an effective mirror-image of the design that was previously approved by ABP, but with one very small alignment improvement.
- 2.35 An adjustment to the NE boundary wall of the private house, 'Carmond', located to the east has facilitated a further alignment improvement to the vehicular access to St Vincent's Park.
- 2.36 The proposed redesign of the traffic signal-controlled junction facilitates a very significantly safer junction for all road users. There are currently a significant cluster of historic accidents at this junction (refer to RSA database extract) that the redesign will likely remedy or, at worst, significantly reduce. We note that there do not appear to have been fatal accidents here to date (based on available data).



- 2.37 The Junction accords with the Blackrock LAP, in terms of accessing the subject site as well as facilitating access to the remainder of the lands within St Catherine's.
- 2.38 The proposed design facilitates an improved and straighter road alignment, in a traditional cross-roads arrangement with no 'stagger' with the N31 to Dún Laoghaire opposite the subject site (of course with significant phasing/staging benefits and associated capacity benefits due to associated improved traffic signal timings).
- 2.39 The design provides for 'normal' opposing right turning movements, without the 'stagger' that currently exists, which facilitates traditional opposing right turn filter arrows and a much more efficient junction as a result of the improved alignment.
- 2.40 It allows the provision of the highest quality modern pedestrian and cyclist facilities according with current Design Guidance, that is ordinarily applied to housing applications by DLRCC as best practice, facilitating the most efficient form of crossing with filters allowing 'walk-with-red'.
- 2.41 It allows a significantly improved access to St Vincent's, with the option to close the existing left-in entry to St Vincent's which currently crosses the path of city bound cyclists.



### 3.0 TRIP GENERATION, ASSIGNMENT & DISTRIBUTION

- 3.1 The Trip Rate Information Computer System (TRICS) database is ordinarily used to ascertain vehicular trip generation associated with the use of any particular site. This represents industry standard practice for Transportation Assessments in Ireland. In this case the worst-case assessment is based on Irish Residential Apartment Developments from within TRICS.
- 3.2 A robust and onerous assessment has been undertaken of the impact along the N31 Road Corridor in order to ensure that we thoroughly assess the impact, in terms of stress testing the access junction and the road capacity impact of the scheme on the important local link to and from the city. The Trip Rates applied for the Residential Development in this case are as set out below as **Table 3.1.** It should be noted that the ancillary creche and small café have been considered, and they are not expected to generate any measurable traffic volumes in their own right.

Table 3.1; - TRICS Data Summary, 493 No. Irish Residential Apartments

Apartments	Car Arrivals		Car Departures		Total 2-Way Car
Network Hour	Per Unit	493 Units	Per Unit	493 Units	Traffic Generated
Weekday AM Peak	0.056	28	0.193	95	123
Weekday PM Peak	0.177	87	0.083	41	128

3.3 We have included herein as *Appendix C* the TRICS data output for Residential Apartments upon which the above is based.

### Assignment/Distribution - Future Year Traffic

- 3.4 We have used industry standard hand assignment techniques, with the worst-case traffic as outlined assigned to the roads based on the observed established traffic patterns.
- 3.5 The standard methodology applied was to firstly ascertain the base background traffic conditions for both the weekday AM and weekday PM Commuter Peak periods. We then used the TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3 to establish selected completion/opening year 2025 and design year 2040 traffic conditions on the local road network.



### **Committed Development**

- 3.6 The Transportation Assessment Reports for both the Frascati Shopping Centre extension (Ref D14A/0134) and the redevelopment of Enterprise House (D16A/0418) have been reviewed, in order to assign traffic associated with these permitted and under-construction developments to the local roads. Details of the traffic are included within Pages 2/3 and Pages 7/8 of *Appendix D*. These adjacent committed developments are considered to be the most significant permitted developments locally affecting the roads in proximity to the subject development.
- 3.7 The worst case traffic based on the content of *Table 3.1* above was then applied in order to establish selected Opening Year & associated Design Year Traffic Conditions. This is all included in the calculations included herein as *Appendix D*.
- 3.8 It should be noted that we have selected an opening year of 2025 as being reasonable and appropriate, given the scale of the plans. However, in our experience, varying the opening year and design year by 1-3 years will have no significant impact upon the conclusions of the study.
- 3.9 The resulting Traffic Flow Projections and Figures allowed the assessment of impact of the development to be undertaken.

### Traffic Associated with the St Catherines LAP Lands

3.10 The Blackrock LAP Mapping identifies the extent of the St Catherines LAP and also the proportion of the Lands that are to be accessed from Temple Hill (ie via the proposed subject junction). An extract from the LAP Mapping is included below as **Figure 3.1** 



Figure 3.1 - Extract from LAP Map 5



- 3.11 The total area of the subject lands measures approximately 6.19Ha, and at an approximate average density (conscious of the nature of the site) or 50 Units/Ha, this equates to a total of 309 Residential Units. Chapter 3, Page 30 of the Blackrock LAP identifies restrictions and access proposals for the subject site, with effectively 50% via Newtownpark Avenue and 50% via the subject Temple Hill Traffic Signal Controlled junction. In this case we have therefore assigned 50% of the St Catherines LAP Traffic through the proposed signal-controlled junction (i.e., 155 Residential Units). This is the same strategy and assessment methodology that was previously deployed for the permitted development of 291 units.
- 3.12 The resulting Traffic generated and assigned to the proposed junction is included below as *Table 3.2*; -

Apartments	Car Arrivals		Car Departures		Total 2-Way Car
Network Hour	Per Unit	155 Units	Per Unit	155 Units	Traffic Generated
Weekday AM Peak	0.056	8	0.193	30	38
Weekday PM Peak	0.177	27	0.083	13	40

Table 3.2; - TRICS Data Summary, 155 No. Irish Residential Apartments From St Catherines



### 4.0 TRAFFIC IMPACT - TRAFFIC CAPACITY ANALYSIS & CONSTRUCTION TRAFFIC

- 4.1 Both the Institution of Highways and Transportation (IHT) Guidelines for Traffic Impact Assessment and the TII Traffic and Transport Assessment Guidelines sets out a mechanism for assessment of developments of this nature and determining whether further assessment is indeed required.
- 4.2 This TII Traffic and Transport Assessment Guidelines requires a **Threshold Assessment** of the impact on the local roads to be provided in order to determine whether further, more detailed modelling and assessment of critical junctions is necessary. This is important in this case as the development is located in proximity to an important arterial route for the city.
- 4.3 The professional guidance referenced above sets out specific increases in traffic volume associated with new development, which, if breeched, requires further detailed analysis to be undertaken. The recommendation is that, if the expected increase is 5% for networks that are considered heavily trafficked or congested, then further analysis is warranted. In this case, given the proximity to the N31 the 5% threshold has again been applied, mirroring the assessment strategy that was deployed for the permitted scheme.
- 4.4 In this regard, it is demonstrated herein that the proposed addition of the construction and occupation of the residential development, with very low volumes of traffic added to a busy network, will not result in any significant level of new trips on the local roads, with all anticipated traffic increases at and beyond the site access expected to be well below the Industry-Standard levels above which further assessment is required.
- 4.5 Our assessment, included within *Appendix D*, (Refer Pages 5 & 10 of Appendix D) confirms that the absolute worst case traffic increase at the adjacent network and at the traffic signal controlled access junction (with all traffic considered as "New" and ignoring and linked/shared trips for robustness) is as summarised below as *Table 4.1* and *Table 4.2*



Assessed Road - Scenario - Year/Period	Traffic Increase %		
N31/Monkstown Road Junction	2.0%		
N31/Seapoint Rd/Site Access	5.0% (~ 5%, therefore Analysed)		
N31/Barclay Ct/Temple Rd Junction	2.6%		
N31/Sweetmans Ave Junction	2.6%		
N31/Carysfort Ave Junction	2.1%		
N31/Georges Ave Junction	2.4%		
N31/Frascati SC/Rockhill Junction	1.9%		
N31/Mt Merrion Ave Junction	1.8%		

Table 4.1; - Threshold Assessment, Worst-Case Impact of Development AM Peak Hour

Table 4.2; - Threshold Assessment, Worst-Case Impact of Development PM Peak Hour

Assessed Road - Scenario - Year/Period	Traffic Increase %	
N31/Monkstown Road Junction	1.6%	
N31/Seapoint Rd/Site Access	4.5%	
N31/Barclay Ct/Temple Rd Junction	2.4%	
N31/Sweetmans Ave Junction	2.5%	
N31/Carysfort Ave Junction	2.0%	
N31/Georges Ave Junction	2.3%	
N31/Frascati SC/Rockhill Junction	2.1%	
N31/Mt Merrion Ave Junction	2.1%	

- 4.6 The Threshold assessment clearly confirms that, beyond the site access (where the impact is c 5%), at less than 3% in all cases, the worst-case traffic increases are <u>way below</u> the IHT and TII Recommended level of 5% above which further assessment is warranted. To set these increased levels of traffic in context, the day-to-day variation in traffic volume (due to day of week or weather conditions) is accepted as 10%, so, in this context alone, increases of in all cases less than 2% in Traffic on the local roads will go entirely unnoticed as the increases are below the day-to-day variation.
- 4.7 It is clear that the introduction of the proposed sustainable residential development of 493 apartments will have an imperceptible impact upon traffic conditions locally.



# N31/Seapoint Ave - Site Vehicular Access - Amended Improved Traffic Signal Controlled Junction

- 4.8 We have undertaken detailed assessment of the capacity of the improved junction using industry-standard software. The capacity of the junction has been assessed using the LiNSiG programme (Linked Signal Design). LiNSIG is TII approved software that enables the user to predict the capacity, queues and delays at traditional traffic signalcontrolled junctions. The outputs from the software present Degrees of Saturation, Practical Reserve Capacity and Queues/Delays as indicators of the operational efficiency of the specific junction type.
- 4.9 The detailed output of the models are included herein as *Appendix E*, and is summarised below as *Table 4.3*; -

Modelled Scenario	Network Saturation %	Total Delay PCUHr
2025 Opening Year PM Peak	84.8	22.2
2040 Design Year PM Peak	96.7	34.9
2025 Opening Year AM Peak	79.6	29.07
2040 Design Year AM Peak	88.6	40.5

Table 4.3; N31/Access/Seapoint Ave - Summary LiNSiG Results

- 4.10 Whilst 100% is technically at capacity, an RFC approaching 90% indicates that the junction is approaching capacity and in this case it is quite clear that all are within capacity during the opening year, and for many years thereafter. This analysis confirms that there will not be any capacity related issues whatsoever associated with the operation of the significantly enhanced access arrangement to facilitate the construction and operation of the proposed residential development.
- 4.11 It should also be noted that the improved junction represents a very significant improvement in local traffic safety conditions and is expected to go some way to addressing and rectifying the established local accident cluster at the junction.

### **Construction Traffic**

4.12 The effect of construction operations and traffic are also addressed in the *Construction & Environmental Management Plan* prepared by JJ Campbell & Associates. This JJC Report includes a description of the proposed works and how these works will be managed for the duration of the demolition and construction works on site. It is normal for these details to be agreed between the Planning Authority and the appointed Contractor for the works, following a planning decision. These details are normally best dealt with when details of construction programme and phasing have been confirmed.



- 4.13 When the demolition contractor is appointed they will prepare a detailed method statement having regard to their own operating procedures, the agreed construction programme, site conditions, and any relevant planning conditions. Any works on the public road (e.g. for services connections) will require an application for a Road Opening Licence and will be submitted by the contractor to the Local Authority, and will include a full detailed Construction Traffic Management Plan prepared in accordance with *Chapter 8 of the Traffic Signs Manual* for pre-approval by the Local Authority. The Construction & Environmental Management Plan should be considered Preliminary in these terms, and the issues covered may be amended or added to by the successful appointed contractor.
- 4.14 It is intended that the first operations on site will be relocating the Gatelodge, immediately followed by the construction of the proposed new/realigned traffic signal-controlled junction, with the dedicated new vehicular access arrangement serving the site thereby delivered as part of the first phases. The Traffic Signals will be fully commissioned and operational, thereby facilitating safe and appropriate access for construction related activities and for construction staff.
- 4.15 Perimeter hoarding will be provided around the entire enclosed site to provide a barrier against unauthorised access from public areas. The Controlled access point to the site, in the form of gates or doors, will be monitored and secured, with a full time Flagman or Banksman during working hours to ensure that any conflicts between construction related traffic and public road users are minimised. These gates will be locked and secured to prevent unauthorised access during periods when these are not monitored (e.g., outside working hours). The hoarding will be maintained and painted, possibly with graphics of the project information, in accordance with current best practice.
- 4.16 Whilst the hours of operation are ordinarily a matter of Condition by the Planning Authority, it is proposed that the site and building works required to implement the development shall only be carried out between the hours of:
  - Mondays to Fridays 7.00am to 6.00pm
  - Saturday 8.00 a.m. to 2.00pm
  - Sundays and Public Holidays No activity on site.
- 4.17 Deviation from these times will only be allowed in exceptional circumstances where prior written approval has been received from Dun Laoghaire Rathdown County Council following an application for same. Such an application is considered unlikely and would only be made in exceptional or emergency circumstances, and approval may be given subject to conditions pertaining to the particular circumstances.



- 4.18 It is proposed that the new access arrangement will be used for all subsequent stages once the site has been secured. For the duration of construction, all traffic will enter and leave via the new access point (via the new traffic signals). The temporary parking of delivery vehicles or construction staff vehicles will not be permitted on public roads outside the site, and a dedicated storage and staff parking area will be constructed as part of the early works to accommodate construction vehicles and worker parking as necessary. Unfettered and unobstructed access will be maintained at all times to neighbouring properties adjacent the site and no parking on public roads will be allowed.
- 4.19 The proposed heavy goods vehicle routes are as follows; From the M50, HGVs will exit the motorway at Junction #13 which is c6.9km from the development. HGVs will travel northeast for c2.1km to the N11, and from there they will travel northwest for c2.5km to the N31 junction at Mount Merrion Ave. HGVs then travel a further 2.3km northeast along the N31 to the entrance to the site. The exit route to the M50 will be the same.
- 4.20 In terms of Construction Staff, and the requirement for parking, in order to provide some measure of reassurance, it is estimated that the max number of staff on site at any one time, including main contractors and fit-out contractors is likely to be approximately 50. At worst, it is expected that this would require 25-30 car parking spaces on site, conscious of the location of the development site adjacent a Core Bus Corridor and being a short walk from 2 separate DART stations. It should be remembered that construction activities and working hours mean that construction staff arrive and depart outside the traditional weekday commuter peak hours of 8-9am and 5-6pm. In this regard, we consider that the impact of construction staff traffic is imperceptible.
- 4.21 The JJC Construction & Environmental Management Plan identifies that the maximum HGV movement during construction will be 4-5 in any one-hour period (Equivalent to 12 PCUs, or 24 PCUs 2-way). This, combined with the worst-case staff traffic volumes (assuming for robustness that all 50 operatives arrive as car drivers) means that the maximum possible hourly traffic generated by the site is 74 PCUs or car equivalents. *Table 3.1* in Section 3.0 above confirms that the fully operational and occupied proposed apartment scheme on the site will generate 125 PCUs in the AM Peak Hour and 131 PCUs in the PM Peak Hour. In this regard the max construction traffic is demonstrably less than the occupied completed development. We have demonstrated that the completed, occupied development traffic can be accommodated with an imperceptible impact. Given that the construction traffic volume is significantly lower, and with the fully completed traffic signals in place, the impact of construction traffic will therefore also be imperceptible.



### 5.0 TRAFFIC IMPACT - TRAFFIC CAPACITY WITH ST CATHERINES LANDS DEVELOPED AND OCCUPIED

- 5.1 We previously assessed the capacity of the proposed new Traffic Signal Controlled Junction to ensure that adequate capacity exists to accommodate the subject site and the traffic associated with the development of the St Catherine's Lands. We have set out above in **Section 3** the rational regarding the density and number of units within St Catherines Lands that we have assumed will be accessed via Temple Hill, based on the content of the Blackrock Local Area Plan and the stated restrictions on access to these lands identified within the body of the LAP.
- 5.2 This allows the assessment of traffic flows for Opening and Design Year with both the subject site and the adjacent St Catherines lands to the south fully developed. The base year traffic and design year traffic projections are included herein as *Appendix F*.
- 5.3 We have again undertaken detailed junction capacity assessment of the improved junction using industry-standard software, LiNSiG (Linked Signal Design). LiNSIG is TII approved software that enables the user to predict the capacity, queues and delays at traditional traffic signal-controlled junctions. The outputs from the software present Degrees of Saturation, Practical Reserve Capacity and Queues/Delays as indicators of the operational efficiency of the specific junction type.
- 5.4 The detailed output of the models for the Junction Sensitivity Test are included herein as *Appendix G*, and is summarised below as *Table 5.1*

Modelled Scenario	Network Saturation %	Total Delay PCUHr
2025 Opening Year PM Peak	84.8	22.6
2040 Design Year PM Peak	96.7	35.84
2025 Opening Year AM Peak	80.4	29.53
2040 Design Year AM Peak	88.7	39.98

Table 5.1; Sensitivity Test (With St Catherines Developed) LiNSiG Results

5.5 The above analysis confirms that the junction will continue to operate in an acceptable manner in terms of capacity during Opening Year, with the assessment confirming that the junction is approaching capacity during 2040, 15 years following opening. And of course, we have assessed the development on a traditional 'predict and provide' basis. Concerns regarding junction traffic carrying capacity are clearly lessened in circumstances where sustainable policies and home-working will have an increasing effect in reducing car based traffic during peak commuter hours.



### 6.0 TRANSPORTATION MODES & PROVISION

### Access By Road

6.1 The new improved Traffic Signal Controlled access junction will provide for improved vehicular capacity and a safer junction arrangement, fully consistent with the requirements of the LAP. The junction has been designed to conform with Roads design Guidance and best practice operational safety. Internally, the layout of the site conforms with the requirements of the Design Manual for Urban Road and Streets (DMURS). The capacity implications and impact assessment of the vehicular traffic demands of the development are set out in this report.

### Public Transport/Bus Provision

6.2 The site is ideally placed to benefit from and contribute to the existing bus services passing immediately adjacent the site, all of which are illustrated in *Figure 6.1* below



Figure 6.1 – Existing Bus Services Passing Site



6.3 The details of each of the current services, including the route origin/destination, frequency and general capacity of buses is as indicated in *Table 6.1* below.

Bus Service No.	Origin-Destination	Approx. Peak Hr Weekday Frequency (Minutes)
4	Harristown – Monkstown Ave - Harristown	12
7	Mountjoy Sq. – Brides Glen - Mountjoy Sq.	20
7A	Mountjoy Sq. – Loughlinstown - Mountjoy Sq.	30
7D	Mountjoy Sq. – Dalkey – Mountjoy Sq.	Infrequent Service
46E	Blackrock DART - Mountjoy Sq.	30 in AM Peak Hr
84/84A	Blackrock – Newcastle - Blackrock	30

Table 6.1: Existing Bus Service Details

\*Based on 95 People on a standard double decker bus.

6.4 In terms of **Future Services**, as part of **Bus Connects** the NTA have recently published details of the overall bus network for the GDA, the 'New Dublin Area Network' - showing Spine Routes, Feeder and Orbital Routes, and an annotated extract from the plan showing the site in context is included below as *Figure 6.2*.



Figure 6.2 – Planned Bus Services, Bus Connects



6.5 This Core Bus network plan shows that the site's accessibility to bus services will be further enhanced, with a high frequency and permeable service passing the site. The site will be located on 2 No Spine Routes (B3 and B4) (Red Colour in Figure 6.2 above). In addition the site will be served by Radial Route #98 (Purple Colour in Figure 6.2 above). The planned frequency of service for each of the B Spine Routes is a bus every 4 minutes. Extracts from the NTA Bus Frequency Tables are included below as *Figure 6.3 & Figure 6.4.* "The number in each box is the expected time in minutes between buses".

pine fre	aquency tables	Spine Routes B3 & B4 Pass Site																	
he number	r in each box is the expected time in minutes between b	ufes	e de la	s su	bjed	et to	adj	justr	nent	t in li	ine v	rith	futur	e pa	isser	nger	nur	mb	ere
Spines	& Branches						and a		18	Wee	2kd	ау	191-			ause l			
Route no.	To and From	5	6	7	8	9	10	11	12	1	2 3	5 4	5	6	7	8	9	10	T
A-SPINE	Swords Rd - City Centre - Terenure	8	4	3	3	3	3	3	5	3	5 3	8 3	3	3	4	4	4	4	
a:	Beaumont - City Centre - Knocklyon	30	15	12	12	12	12	12	12	17 1	2 1	2 15	12	12	15	њ	ъ	15	
2	Airport - City Centre - Ballinteer - Dundrum	30			12	72	12				2 1	2 13	12	12			15		
3	DCU - City Centre - Tailaght	30			12	12	12				2 1	2 1	12	12			35		
4	Swords - City Centre - Dundrum	30	15	12	17	12	12	12	12	17 1	0 1	2 12	12	12	15	1h	35	th.	
SPINE	Blanchardstown SC - City Centre - UCD	8	4	4	4	4	4	4	4	4	4 4	4	4	4	4	4	4	4	
1	Ongar - City Centre - UCD	30	15	15	15	15	15	15	15	15 1	5 1	5 19	15	15	15	15	15	15	l
2	Ongar North - Clonsilla - City Centre - UCD 🛛 🖌	30	15	15	15	15	15	15	15	15 1	S 1	5 19	15	15	15	15	15	15	I
3	Tyrrelstown - City Centre - Dún Laoghaire	30	15	15	15	75	1h	15	15	15 1	5 1	5 15	15	15	Th	ъ	15	ъ	I
4	Blanchardstown SC - City Centre - Sallynoggin	30	15	15	15	15	15	15	15	15 1	5 1	5 19	15	15	15	15	15	њ	
-SPINE	Lucan - City Centre - Ringsend	15	8	4	5	8	8	8	8	8	8 5	3 4	5	8	8	8	8	8	l
a (	Adamstown - City Centre - Sandymount	60	30	8		30	30	30	30	30 3	0 R	8 8		30	30	30	30	30	I
2	Adamstown - City Centre - Sandymount	60	30		15	30	30	30			10	5 8	15	30	30		30	30	I
3	Maynooth - City Centre - Ringsend	60	30		30	30	30				10 3	0 30	30	30			30		I
	Particular day and the second	60	70		20	30	30	30	30	30 3	in 3	0 30	3 30	70	30	30	30	30	Í

Figure 6.3 – NTA Core Bus Extract – Spine Route Frequency

Radial frequency tables The number in each box is the expected time in minutes between buse					Radial Route #98 Passes Site uses, It is subject to adjustment in line with future passenger numbers.															
Radial Routes									٧	Ve	ek	da	iy							
Route no.	To and From	15	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
58	Rathcoole - City Centre - Dublin Port		GO	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
60	Red Cow - Cherry Orchard - Decies Rd Spencer Dock		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
71	Tailaght - Bailymount - Warrenmount - East Wall		30	30	30			30	30	30	30		30	30	30	-30	30	30	30	60
72	Drimnagh - Warrenmount - East Wall		30			30		30	30	30						30	30	30		60
73	Marino - City Centre - Walkinstown	30	15	10			15	15	15	15	15	15	10	15	15	15	15	15	15	30
74	Dundrum - Whitechurch - Crumlin - City Centre		30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	60
80	Liffey Valley - City Centre - Ballinteer	50	15	10	10	15	15	15	15	15	15	10	10	10	15	15	15	15	15	30
81	Greenhills - City Centre - Ringsend		20			20	20	20	20	20	20	15	15	15	20	20	20	20	20	30
82	Killinarden - Crumlin - Ringsend		20	20	20	20	20	20	20	20	20	20	20	20	20	30	30	30	30	30
85	Tallaght - Ballyboden - Harold's Cross - Parne I Square	30	15	10	10	15	15	15	15	15	15	10	10	10	15	15	15	15	15	30
86	Ticknock - Goatstown - Mountjoy Square	30	30	30	30			30	30						30	30	-30	30		60
87	Belarmine - Dundrum - Mountjoy Square		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	
80	Enniskerry - Belarmine - Dundrum - Mounday Square		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
98	Loughlinstown Drive - Dún Laoghaire - Mountjoy Sq.		60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60

Figure 6.4 – NTA Core Bus Extract – Radial Route Frequency



6.6 The site is therefore ideally placed in terms of current and future high frequency bus availability.

### Cycling & Walking

6.7 At present, pedestrian/cycle traffic at/to the existing site is served by an extensive network of footpaths and dedicated cycle lanes/facilities. These facilities are continually improving, and of course the nature of the area and current practices by the Dublin Local Authorities is that the GDA cycle network will be rolled out within a short timeframe. The site is clearly ideally placed in terms of the NTA's GDA Cycle Network Plan for this area of Dublin. An extract from the plan is included and illustrated in *Figure 6.5* below.



Figure 6.5 – NTA Cycle Network Plan Showing Site

6.8 In terms of the 'Legend' for this extract, this is extracted from the NTA Document and included below as *Figure 6.6.* 





Figure 6.6 – NTA Cycle Network Plan Legend Showing Services

6.9 The site is served by a Primary Route, a Secondary Route and indeed a Minor Greenway is identified as passing immediately adjacent the site. These links ensure that the site is highly accessible by bicycle to Dublin City Centre and environs. The Cycle Infrastructure planned for the site feeds into the overall GDA Network Plan, an extract of which is included below as *Figure 6.7* showing the site in context and demonstrating the cyclist permeability of the location to the overall Dublin City Area.



Figure 6.7 – Dublin GDA - NTA Cycle Network Plan



- 6.10 The key to cycle accessibility is convenient safe links, with secure and carefully sited cycle parking. Cycling is ideal for shorter journeys. The provision of cycle parking for the site is addressed in more detail within *Section 2.0* of the *TA Report*
- 6.11 For journeys greater than 8km, it is recognised that a modal shift to cycling could be achievable for some, but not all, and options such as public transport and car sharing should be considered. It is generally accepted that journeys up to 8km can reasonably be undertaken by bicycle and journeys of 2-4km can be undertaken by either walking or cycling.
- 6.12 To illustrate the extent of the GDA accessible by both Bicycle (8km) and on foot (2km, which represents a c25 min walk) we have included below approximate 'Iso-Distance Mapping' for a 2km and 8km radius from the site. These illustrate the extent of the employment, retail, and schools within sustainable pedestrian and cycle travel distance of the site. These are included below as *Figure 6.8* and *Figure 6.9*.



Figure 6.8 – Approx. 2km Iso-distance from Site





Figure 6.9 – Approx. 8km Iso-distance from Site

- 6.13 The proposed site clearly can support sustainable living in terms of cycle and walking accessibility to schools, employment, and services as set out above. The 2km radius illustrates the accessibility to these local services, schools, employment destinations, public transport hubs. The 8km accepted commuting cycle distance also takes in a wide 'swathe' of Dublin City.
- 6.14 Bicycle sharing facilities are becoming ever more popular with the Dublin Bikes and BleeperBike initiatives spreading ever further throughout the City and into Suburbs. These facilities offer a bicycle sharing alternative mode of transport and are easily accessible from the site.
- 6.15 The permeability locally for walking by residents is addressed above and of course, being within Blackrock, and within only 8km of the City Centre (as a comparative example it is an 8km walk distance from Grafton Street), this means that a very significant number of Schools, Services, Employment Destinations and Offices are within an easy and acceptable walk-commute of the site.
- 6.16 The site is also within the heart of the Blackrock and is therefore within the catchment for local Primary and Secondary Schools.



6.17 In these terms we believe that walking will represent the most popular mode of homework-home and home-school-home travel for residents of the Apartments.

### DART/RAIL

- 6.18 The Dublin Area Rapid Transit system, or DART, is an electrified commuter rail railway network serving the coastline & city centre of Dublin. The service makes up the core of Dublin's suburban railway network, stretching from Greystones, County Wicklow, in the south to Howth and Malahide in north County Dublin.
- 6.19 The site is within easy walking commuting distance of both Seapoint and Blackrock Dart & Train Station, (Seapoint being within 550m of the site). This represents an easy 6–7minute walk time for commuting workers who chose to use the Dart and / or the train, using existing services making this a very accessible development by rail. The DART Service at Seapoint or Blackrock provides a link to the entire GDA Rail/Transportation Hub Network as illustrated in the mapping included below as *Figure 6.10*



6.10 – GDA Network Rail/Transport Hub Plan

6.20 The walking route to Seapoint DART is illustrated below as *Figure 6.11*. The DART service runs on an approximate frequency of 10-minute intervals at peak times, and an extract from the published timetable confirming same is included below as *Figure 6.12* 





Figure 6.11 – Walk Distance Seapoint DART Station

8			- 2	_	MO	NDAY	TO FRI	DAY			2 - A
		40			-		1.00		-	-	1.00
	Pare 1			00.50	10		100		-		
Newry	Deb	-	-	00.30		1.0	07.10	1000			
DUNDALK Clarke	Dep	+11-	-	07.00	- 11	-	07.10	1.44		-	
DROGHEDA MacBride	Dep	++0	-	07.21	1.00	-	07:36		1.44	-	1.44
Laytown	Dep	- 220	42.5	07:29	142	62	07:43	22.	114415	1144	120
Gormanston	Dep	110	-			2++	07:49		1.000	1.000	
BALBRIGGAN	Dep	++	-	07:37	144	1++	07:54	1.000			++ 1
Skerries	Dep	-	-	07:44		-	08.01	1.00	1.1.1.1	-	1.00
Rush & Lusk	Dep	442	1	07:51	144	144	08:09	1.44	1.41	144	1244-12
Donabate	Dep	in and the	-	07:56			08:14	1.044	1.000	-	in march
MALAHIDE	Dep	07:52		08:03	1.44	08:10	08,19	11.54	-	-	08:30
Portmarnock	Dep	07:56	-			08:14	and the second	14	1.4	-	08:34
Clongriffin	Dep	07:58	322	4	1	08:16	122	324	4.5	-	08:36
HOWTH	Dep			117	08:00		S		08:20	-	a merel
Sutton	Dep		- 224		08:04		1000	14	08:24	1000	
Bayside	Dep	-		1	08:06		1	2.4	08.26	1	1.12
Howth Jctn. & Donaghmede	Dep	08:01	- 122		08:09	08.21	12	102	08:29	-	08:39
Kilbarrack	Dep	08:03			08:11	08:23			08:31	-	08:41
Raheny	Dep	08:05	5-		08:13	08.25	Alexandre -	5-	08.33	R-	08:43
Harmonstown	Dep	08.07	Spi	100	08.15	08.27	1.000	38	08 35	100	08.45
Killester	Dep	08:09	da a	100	08:17	08.29	125	83	08 37	Ng 3	08:47
Clontart Road	Dep	08:12	-		08:20	08:32		1.00	08:40	9	08:50
DUBLIN Connolly	Arr	08.16	08-19	08-19	08:25	08:36	08:39	08.42	08:46	08:52	08:55
DUBLIN Connolly	Dep	08:17	08.21	00.10	08:26	08:37	08.41	08.44	00:48	08:53	09:58
Tara Street	Den	08:20	08-25	10.1	08:30	08:40	08.45	08:48	08:57	08:56	08:59
DUBI IN Pearse	Arr	08:21	08:27		08:31	08:41	08:46	08:51	08:54	08-58	09.00
Grand Canal Dock	Arr	09:24			08.14	08.43		09:54	08:58	09:02	09:03
Lansdowna Road	Den	08.28	-	100	08.39	08:47	L.COL	08.58	09:07	0.001	00:07
Sandymount	Den	08:30		12	08:40	08:40		00.00	09:05		00:00
Sudney Darado	Den	08:32		100	08.42	08-52	C. P.	00-02	09-07	-	00:12
Bootorstown	Den	00.35		-	00.45	00.52	1.84	00.02	09 10	-	00-14
Blackrock	Den	00.37		-	00 40	09 57	1.000	00.06	09.12	-	09.17
Seanoint	Den	08:30			00.40	00.50		00.00	09:14		00:10
Saithill & Monkstown	Dep	00.00		14	08.40	00.00	10		09.14	-	09:21
DUN LAOGHAIRE Mallin	Arr	08:43	-		08-53	00.02		00-11	00-18	STITES	00.21
Sandungun & Clasthule	Don	00.47	-		08.57	00.02	11	00.11	00.70	-	00:27
Glananoany	Dep	08:40	-		00.07	00.00			09.22	-	09.21
Dalkov	Dop	08-52			00.03	00.13		-0	09.23	++-	09.29
Villinger	Dor	00.52	-		00.02	00.12	- ++	0.044	09.21	1.00	00.32
Chankill	Dep	00.00	-	17	00.10	00 10		-	00.32	-	09.30
DDAY Date	Dep	00:05			00:10	00.75		00.25	00.45	-	00:45
DRAY Date	Dor	09.05			09.16	09.25		09.30	09.41		09.45
CREVETONE C	Arr	09.06		141	- 44			**			09.40
GRETATORES	AIT	09.16	hall.	144	1.00	Tai	1144	- 55		11.64	09:56
Miccole	Dep		-		111					-	1.00
WICKIOW	Dep	11	-	-	-++		-			-	
Rathdrum	Dep		-	++1		**	-			-	40
Arklow	Dep	177	-	-	144	162	-	64	5	-	- 14
GOREY	Arr		-	-			-	-		-	
100000000	1.000	442	144	-	544	244	15-22	1.44	144-0	-	1.44
5X	ú - 11			-			-		14.	-	4

### Figure 6.12 – Extract Published DART Timetable



- 6.21 The Government and the NTA recently announced a new **DART+** Upgrade plan which is funded and within the NTA works programme. The key aspects of the plans, (directly as extracted from the NTA Website) are:
  - New DART service to Maynooth/M3 Parkway on the Sligo Line.
  - New DART service to Hazelhatch & Celbridge on the Kildare Line.
  - Enhanced DART service to Bray / Greystones on the South-East Line.
  - New DART services between City Centre and Drogheda on the Northern Line.
  - Purchase of additional trains to support new and enhanced DART services.
  - Upgrade and reconfiguration of existing railway infrastructure in the city centre.
  - Elimination of a number of level crossings to reduce rail/road conflict that limits train capacity.
  - All civil and bridge works as necessary to accommodate electrification, corridor widenings and increased service level.
  - Upgrades to signalling and communications infrastructure to improve safety and support increase frequency and reliability.
  - Passenger capacity and train service frequency will be significantly increased as a result of this project.
- 6.22 Of course, with the high frequency DART and bus services to/from the city, the site is therefore also within easy reach of the mainline Nationwide Bus & Train Services - trains via Connolly & Heuston Stations and Buses via Busarus Terminus.
- 6.23 With ease of accessibility by Bus and Rail, and with the clear accessibility for walking & cycling, it is therefore considered that the proposed development is very highly sustainable in terms of public & alternative transport accessibility. The proximity of the development to public and alternative transport services means that residents will have viable alternatives to the private car for accessing the site and will not be reliant whatsoever upon the car as a primary mode of travel. In these terms, residents would clearly not have a need to own a car, given the highly accessible nature of the site, thereby supporting sustainable living.


## 7.0 CONCLUSIONS

- 7.1 This Transportation Assessment Report assesses the traffic and transportation impact of the proposal to construct and occupy the 493 Unit Residential Apartment Development at Temple Hill, Monkstown, Blackrock, Co Dublin.
- 7.2 The proposal includes improvements to the existing traffic signal-controlled junction at the N31/Seapoint Ave which will benefit both the development and wider Blackrock community. It will also provide for an improved safer vehicular access for the residents of St Vincent's Park. The vehicular access arrangement mirrors the access junction previously proposed, with the beneficial effect of a further alignment improvement on the access to the adjacent St Vincent's Park.
- 7.3 This Report has been prepared in accordance with the TII Traffic & Transport Assessment Guidelines and is based on industry standard high Trip Generation Rates, in order to provide an onerous and robust assessment of the impact of the proposed development.
- 7.4 The analysis includes the effects of the existing traffic and of the significant recent planning permissions for both Enterprise House & the Frascati Centre. Their effect on the local roads has been modelled and assessed, based on a comprehensive new classified vehicle turning movement survey undertaken for the purposes of this study, and for validation of traffic data.
- 7.5 The proposed development is ideally located adjacent a busy Bus Corridor and with a short walk of Seapoint and Blackrock Dart Stations. The site is well placed to take advantage of non-car modes of travel with the current and future facilities as detailed and set out within *Section 6.0* of this Report.
- 7.6 This report demonstrates that the proposed Development will have a imperceptible impact upon the established local traffic conditions and can easily be accommodated on the road network without any capacity concerns arising. The assessment also confirms that the proposed junction is of sufficient size and is of more than adequate capacity to accommodate the worst case traffic associated with the proposed development of the St Catherines LAP lands located to the south.
- 7.7 The assessment includes a Preliminary Travel Plan for the site which is included herein as a separate report as *Appendix H*.



- 7.8 We have prepared a Statement of Consistency with DMURS and confirm that the internal layout is compliant with the requirements, and this is included as a separate report as *Appendix I*
- 7.9 An independent Quality Audit, including a Stage 1 Quality & Road Safety Audit, together with the Designer Feedback form, has been undertaken and is included as a separate report as *Appendix J*.
- 7.10 A Parking Management/Strategy Report is included as *Appendix K*.
- 7.11 We believe that the Traffic Signal Controlled access junction, mirroring that previously approved, represents a much safer and better junction than the version that is currently in place on Temple Hill. In addition, we believe that the proposed development layout represents good sustainable design for residential developments of the nature proposed in terms of accessibility to alternative non-car modes of travel.
- 7.12 It is considered that there are no significant Operational Transportation, Traffic Safety or Road Capacity issues that prevent a positive determination of the application by An Bord Pleanála.



# **APPENDICES - CONTENT**

Α	Proposed Development – Layout & Access Arrangement
В	Traffic Survey Data Output
С	TRICS Trip Generation Output - Irish Residential Apartments
D	Traffic Surveys, Trip Distribution & Network Traffic Flow Diagrams
Е	LiNSiG Simulation Model Output - Amended Signal Junction
F	Traffic Surveys, Trip Distribution & Network Traffic Flow Diagrams (WITH Entire LAP Lands Developed & Included in Assessment)
G	LiNSiG Simulation Model Output - Amended Signal Junction (WITH Entire LAP Lands Developed & Included in Capacity Assessment)
Н	Preliminary Travel Plan (aka Mobility Management Plan)
I	DMURS Statement of Consistency
J	Stage 1 Road Safety Audit and Quality Audit (& Designer Feedback Form)
К	Parking Management/Strategy Report



# **APPENDIX A**

Proposed Development Layout & Access Arrangement



REV         DATE         AMENDMENTS         DRAWN         CHK         AP	PP C	NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client. This drawing is based upon Architects drawing 1706A-OMP-00-00-DR-A-1103-issue, eceived 15/12/21. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.
NRB Consulting Engineers Ltd 1st Floor, Apollo Building	Client	Project No.         Drawing No.           20-057         NRB-TA-001
Dundrum Road Dundrum Dublin 14 Dublin 14	g Project St. Teresa's, Temple Hill Monkstown, Co. Dublin	PB Checked ER 16/12/21 Approved ER 16/12/21
Phone/Fax: +353 1 292 1941 Email: info@nrb.ie	Title Proposed Site Layout	DateScale @ A3Rev16-Dec-21n.t.s.B
Web: www.nrb.ie Registered in Ireland No. 491679	NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amend this drawing. Only figured dimensions to be worked to.	Iments to Purpose of Issue Draft Information Approval As Built Tender Construction



STOP .	- Secondary 5 Aspect Signal fitted with Green Left Turn Arrow Lens - Audio Tacti	e Push Button Unit
	verified through Le	gal & Land searches by the Client.
REV DATE AMENDMENTS DRAWN CHK APP	This drawing is bas received 15/12/21. or deficiencies.	ed upon Architects drawing 1706A-OMP-00-00-DR-A-1103-issue, NRB Consulting Engineers Ltd shall not be liable for any inaccuracies
	Client	Project No. Drawing No.
tet Share Anglia Budding		
Ist Floor, Apolio Building		20-057 NKB-TA-002
Dundrum Road	Project St. Toroca's Tomplo Hill	Drawn Checked Approved
Dundrum NRB consulting	St. Telesa S, Telliple Till Mankatawa Ca. Dublin	
Dublin 14	Monkstown, Co. Dublin	<b>FD</b> 16/12/21 16/12/21
Phone/Fax: +353 1 292 1941 Email: info@nrb.ie	Title Proposed Site Access General Arrangement	Date         Scale @ A3         Rev           16-Dec-21         1:250         B
Web: www.nrb.ie Registered in Ireland No. 491679	NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions to be worked to.	Purpose of Issue         Draft         Information         Approval           As Built         Tender         Construction



NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.

This drawing is based upon Architects drawing 1706A-OMP-00-00-DR-A-1103-issue, received 15/12/21. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

REV DATE	AMENDMENTS	DRAWN	СНК	APP	or deficiencies.				
NRB Consulting	Engineers Ltd				Client	Project No.		Drawing No.	
1st Floor, Apollo	Building						20-057	NRB-	TA-003
Dundrum Road					Project	Drawn	Checked	Approved	
Dundrum			nsult	ing	St. Teresa's, Temple Hill Mankatawa, Co. Dublin	DR	4 6 14	ER	ER
Dublin 14		<b>D</b> ei	ignie	<u>ers</u>	Monkstown, Co. Dudin		16/1.	2/21	16/12/21
					Title Autotrack of a High Reach Fire Tender	Date		Scale @ A3	Rev
Phone/Fax: +35	3 1 292 1941				At Internal Turning Bay	16	-Dec-21	1:250	B
Email: info@nrb	ie				At Internal Turning Day				
Web: www.nrb.	.ie				NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to	Purpose of 1	Issue 🗌 Draft	Information	Approval
Registered in Irelan	nd No. 491679	001	RIGHT ® REI		this drawing. Only figured dimensions to be worked to.		🗌 As Built	Tender	Construction



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				verified through Leg	al & Land	searches by the Clie	ent.	ip boundaries are
				This drawing is base received 15/12/21.1	ed upon Are NRB Consu	chitects drawing 17 Itina Engineers Ltd	06A-OMP-00-00-DR-A shall not be liable for	A-1103-issue, anv inaccuracies
REV DATE	AMENDMENTS	DRAWN CHK	APP	or deficiencies.				,
NRB Consulting E	ngineers Ltd		C	Client	Project No.		Drawing No.	
8 Leopardstown I	Business Centre					20-057	NRB-	TA-004
Ballyogan Avenue			P	Project St Teresa's Temple Hill	Drawn	Checked	Approved	<b>ED</b>
Leopardstown	NR		ing ers i	Monkstown, Co. Dublin	PB	16/1	2/21	ЕК 16/12/21
Dubin 18			Т	Title Autotrack of a High Reach Fire Tender	Date	-	Scale @ A3	Rev
Phone/Fax: +353 Email: info@nrb.i	8 1 292 1941 ie			At Internal Turning Bay	16-	-Dec-21	1:250	В
Web: www.nrb.i	e			NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to	Purpose of I	ssue 🗌 Draft	Information	Approval
Registered in Treland	I NO. 4910/9	COPYRIGHT @ REE	IER/IED	uns drawing. Only ngured dimensions to be worked to.		🔄 As Built	Tender	Construction



**PROVISION FOR FUTURE ELECTRIC CAR CHARGING POINTS - GROUND FLOOR LEVEL** 





**PROVISION FOR FUTURE** 



**PROVISION FOR FUTURE ELECTRIC CAR CHARGING POI** 

	NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client. This drawing is based upon Architects drawing 1706A-OMP-00-0D-DR-A-1103-issue, received 15/12/21. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.
BLOCK B1 FUNTIRE BASEMENT CAR PARK TO FOR EVERY CAR SPACE. CONDU POINTS CAN ALSO BE MOUNTED TO BE INSTALLED, THE RELEVAN ELECTRICITY METER IN THE DESI LOCKABLE COVER ON IT TO ENS PROVISION AROUND THE PARK ANY OF THE CAR PARKING SPACE Carpark area = 1,413 m <sup>2</sup> Basement area = 2,038 m <sup>2</sup> 12 no. EV drarging polds	D BE DUCTED TO ACCEPT CABLING TO SERVE A CHARGING POINT TS TO BE RUN ON THE WALLS WHERE PRACTICAL. CHARGING D AS REQUIRED. WHERE RESIDENTS REQUEST A CHARGING POINT IT CHARGING POINT WILL BE PRE-WIRED BACK TO THEIR HOME IGNATED METER LOCATION. THE SOCKET POINT WILL HAVE A URE THAT ONLY THAT RESIDENT MAY USE THE POWER POINT. THIS ING AREA ALLOWS FUTURE CHARGING POINTS TO BE INSTALLED AT 25 WITH MINIMUM WORKS AS AND WHEN REQUIRED.
BLOCK	POINTS - BASEMENT A
ABLING TO SERVE A CHARGING POINT LLS WHERE PRACTICAL. CHARGING POINT ESIDENTS REQUEST A CHARGING POINT ESIDENTS REQUEST A CHARGING POINT	REV DATE AMENDMENTS DRAWN CHK APP
N. THE SOCKET POINT WILL HAVE A IDENT MAY USE THE POWER POINT. THIS E CHARGING POINTS TO BE INSTALLED AT KS AS AND WHEN REQUIRED.	NRB Consulting Engineers Ltd         1st Floor, Apollo Building         Dundrum Road         Dublin 14         Phone/Fax: +353 1 292 1941         Email: info@nrb.ie         Web: www.nrb.ie         Registered in Ireland No. 491679         Client         Project         St. Teresa's, Temple Hill Monkstown, Co. Dublin         Title         Provision for Electric Car Charging Points         Project No.         Drawing No.         NDB. TA 000E
DINTS - BASEMENT D	LO-USY       INKD-TA-UUS         Drawn       Checked       Approved         PB       ER 16/12/21       Approved         Date       Scale @ A1       Rev         16-Dec-21       1:500       B         Purpose of Issue       Draft       Information       Approval         As Built       Tender       Construction



## AUTOTRACK OF A MEDIUM SIZED REFUSE VEHICLE EXITING AT ST. VINCENTS PARK

NRB Consulting Engineers Ltd recommend that Road and land ownership boundaries are verified through Legal & Land searches by the Client.

This drawing is based upon Architects drawing 1706A-OMP-00-00-DR-A-1103-issue, received 15/12/21. NRB Consulting Engineers Ltd shall not be liable for any inaccuracies or deficiencies.

REV	DATE	AMENDMENTS	DRAWN	і снк	APP	not be liable for any inaccuracies or deficiencies.				
NRB	Consulting	Engineers Ltd				Client	Project No.		Drawing No.	
1st F	loor, Apollo	Building						20-057	NRB-	-TA-006
Dung	drum Road					Project	Drawn	Checked	Approved	
Dune	drum		PR C	onsult	ing	St. Teresa's, Temple Hill	DD		ER	ER
Dubl	in 14		<b>D</b> e	ngine	ers	Monkstown, Co. Dublin	FD	16/1	2/21	16/12/21
						Title Autotracks of a Refuse Vehicle at	Date		Scale @ A3	Rev
Phor	ne/Fax: +35	3 1 292 1941				Realigned Access to St. Vincents Park	16-	Dec-21	1:250	B
Ema	il: info@nrb	ie								
Web	: www.nrb	.ie				NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to	Purpose of I	ssue 🗌 Draft	Information	Approval
Registered in Ireland No. 491679						this drawing. Only figured dimensions to be worked to.		🔄 As Built	Tender	Construction



## **APPENDIX B**

Traffic Survey Data Output



## **BLACKROCK TRAFFIC COUNTS** MANUAL CLASSIFIED JUNCTION TURNING COUNTS

01

## **OCTOBER 2020** TRA/20/115

Thursday

SITE:

#### DATE: October weekday

DAY:

LOCATION:

Temple Road/Frascati Road/Barclay Court

		N	NOVEN	IENT	1				MOVEMENT 2									N	IOVEN	IENT	3			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
07:30	0	0	9	0	0	0	9	9	0	0	0	0	1	0	1	2	1	0	1	0	0	0	2	1
07:45	0	0	8	2	0	0	10	10	0	0	0	0	0	0	0	0	0	0	1	1	3	1	6	10
08:00	0	0	9	1	1	0	11	12	0	0	0	0	1	0	1	2	1	0	5	0	1	0	7	7
08:15	0	0	10	2	1	0	13	14	0	0	1	0	0	0	1	1	2	0	1	2	0	0	5	3
н/тот	0	0	36	5	2	0	43	45	0	0	1	0	2	0	3	5	4	0	8	3	4	1	20	22
08:30	0	0	8	1	0	0	9	9	1	0	0	0	0	0	1	0	0	0	2	0	0	0	2	2
08:45	0	0	14	1	0	0	15	15	0	0	0	0	0	0	0	0	0	0	3	1	0	0	4	4
09:00	0	0	17	1	0	0	18	18	0	0	1	0	0	0	1	1	0	0	4	0	0	0	4	4
09:15	0	0	16	2	1	0	19	20	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	5
н/тот	0	0	55	5	1	0	61	62	1	0	1	0	0	0	2	1	0	0	14	1	0	0	15	15
P/TOT	0	0	91	10	3	0	104	107	1	0	2	0	2	0	5	6	4	0	22	4	4	1	35	37
								50								3								17

50

17

		M	NOVEN	<b>NENT</b>	1				MOVEMENT 2								MOVEMENT 3							
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
16:00	0	0	20	4	0	0	24	24	1	0	1	0	0	0	2	1	1	0	5	0	0	0	6	5
16:15	0	0	22	2	0	0	24	24	0	0	3	0	0	0	3	3	0	0	7	1	0	0	8	8
16:30	0	0	20	0	0	0	20	20	1	0	1	0	0	0	2	1	0	0	4	0	0	0	4	4
16:45	0	0	20	1	0	0	21	21	0	0	1	0	0	0	1	1	1	0	9	1	0	0	11	10
н/тот	0	0	82	7	0	0	89	89	2	0	6	0	0	0	8	6	2	0	25	2	0	0	29	27
17:00	0	0	25	2	0	0	27	27	0	0	0	1	0	0	1	1	0	0	7	0	0	0	7	7
17:15	0	0	18	0	0	0	18	18	0	0	0	0	0	0	0	0	1	0	8	0	0	0	9	8
17:30	0	0	21	0	0	0	21	21	0	0	1	0	0	0	1	1	0	0	10	1	0	0	11	11
17:45	0	0	17	1	0	0	18	18	0	0	1	1	0	0	2	2	0	0	4	0	0	0	4	4
н/тот	0	0	81	3	0	0	84	84	0	0	2	2	0	0	4	4	1	0	29	1	0	0	31	30
18:00	0	0	17	0	0	0	17	17	0	0	4	0	0	0	4	4	0	0	5	1	0	0	6	6
18:15	0	1	20	0	0	0	21	20	0	0	1	0	0	0	1	1	0	0	2	0	0	0	2	2
Н/ТОТ	0	1	37	0	0	0	38	37	0	0	5	0	0	0	5	5	0	0	7	1	0	0	8	8
Р/ТОТ	0	1	200	10	0	0	211	210	2	0	13	2	0	0	17	15	3	0	61	4	0	0	68	66

## **BLACKROCK TRAFFIC COUNTS** MANUAL CLASSIFIED JUNCTION TURNING COUNTS

## **OCTOBER 2020** TRA/20/115

Thursday

SITE:

#### DATE: October weekday

DAY:

LOCATION:

Temple Road/Frascati Road/Barclay Court

		N	<b>NOVEN</b>	IENT	4		MOVEMENT 5											N	/OVEN	IENT	6			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
07:30	0	0	1	1	0	0	2	2	5	3	114	22	6	1	151	152	0	0	0	0	0	0	0	0
07:45	0	0	2	0	0	0	2	2	12	2	118	27	3	3	165	160	0	0	0	0	0	0	0	0
08:00	0	0	1	0	0	1	2	3	13	1	155	22	8	3	202	202	0	0	0	0	0	0	0	0
08:15	0	0	4	1	0	0	5	5	18	2	165	9	5	2	201	192	0	0	0	0	0	0	0	0
н/тот	0	0	8	2	0	1	11	12	48	8	552	80	22	9	719	707	0	0	0	0	0	0	0	0
08:30	1	0	4	0	0	0	5	4	18	3	213	16	6	4	260	254	0	0	0	0	0	0	0	0
08:45	0	0	8	0	0	0	8	8	9	2	193	15	3	1	223	219	0	0	0	0	0	0	0	0
09:00	1	0	9	1	0	0	11	10	9	3	187	12	10	2	223	226	0	0	0	0	0	0	0	0
09:15	0	0	5	0	0	1	6	7	10	0	161	23	3	3	200	198	0	0	0	0	0	0	0	0
Н/ТОТ	2	0	26	1	0	1	30	29	46	8	754	66	22	10	906	896	0	0	0	0	0	0	0	0
Р/ТОТ	2	0	34	3	0	2	41	41	94	16	1306	146	44	19	1625	1603	0	0	0	0	0	0	0	0
20															867								0	

20	
20	

**MOVEMENT 4 MOVEMENT 5 MOVEMENT 6** PCU TIME PCL MCL CAR LGV HGV BUS тот PCU PCL MCL CAR LGV HGV BUS тот PCU PCL MCL CAR LGV HGV BUS тот 16:00 16:15 16:30 16:45 н/тот 17:00 17:15 17:30 17:45 H/TOT 18:00 18:15 н/тот P/TOT 

## BLACKROCK TRAFFIC COUNTS MANUAL CLASSIFIED JUNCTION TURNING COUNTS

01

## OCTOBER 2020 TRA/20/115

Thursday

SITE:

## DATE: October weekday

DAY:

LOCATION:

Temple Road/Frascati Road/Barclay Court

		N	<b>NOVEN</b>	IENT	7					N	<b>IOVEN</b>	IENT	8				MOVEMENT 9							
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
07:30	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	2	0	3	0	1	0	6	5
07:45	0	0	3	1	0	0	4	4	0	0	0	0	0	0	0	0	1	0	3	0	0	0	4	3
08:00	0	0	1	0	1	0	2	3	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	1
08:15	0	0	4	0	0	0	4	4	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	1
н/тот	0	0	10	1	1	0	12	13	0	0	0	0	0	0	0	0	5	0	8	0	1	0	14	11
08:30	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	6	0	2	0	0	0	8	3
08:45	1	0	2	0	0	0	3	2	0	0	0	0	0	0	0	0	2	0	6	0	0	0	8	6
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
09:15	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
н/тот	1	0	4	0	0	0	5	4	0	0	0	0	0	0	0	0	9	0	11	0	0	0	20	13
Р/ТОТ	1	0	14	1	1	0	17	17	0	0	0	0	0	0	0	0	14	0	19	0	1	0	34	24

0

12

		N	NOVEN	VENT	7					N	/OVEN	IENT	8					Ν	/IOVEN	IENT	9			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
16:00	0	0	2	1	0	0	3	3	1	0	0	0	0	0	1	0	0	0	4	1	0	0	5	5
16:15	0	0	4	1	0	0	5	5	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
16:30	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	3	1	0	0	4	4
16:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	4	0	0	0	4	4
н/тот	0	0	8	2	0	0	10	10	2	0	0	0	0	0	2	0	0	0	14	2	0	0	16	16
17:00	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	1	0	2	0	0	0	3	2
17:15	0	0	3	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
17:45	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
н/тот	0	0	6	0	0	0	6	6	0	0	0	0	0	0	0	0	1	0	5	0	0	0	6	5
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	3	0	0	0	3	3	0	0	0	1	0	0	1	1	0	0	1	1	0	0	2	2
Н/ТОТ	0	0	3	0	0	0	3	3	0	0	0	1	0	0	1	1	0	0	1	1	0	0	2	2
P/TOT	0	0	17	2	0	0	19	19	2	0	0	1	0	0	3	1	1	0	20	3	0	0	24	23

## **BLACKROCK TRAFFIC COUNTS** MANUAL CLASSIFIED JUNCTION TURNING COUNTS

01

## **OCTOBER 2020** TRA/20/115

Thursday

SITE:

#### DATE: October weekday

DAY:

LOCATION:

Temple Road/Frascati Road/Barclay Court

		N	IOVEN	IENT 1	10					N	IOVEN	IENT 1	1					Μ	OVEN	IENT 1	2			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
07:30	2	0	2	0	0	0	4	2	31	2	200	17	3	3	256	236	0	0	7	1	0	1	9	10
07:45	0	0	2	0	0	0	2	2	29	2	252	23	2	2	310	290	0	0	10	3	0	0	13	13
08:00	0	0	0	1	0	0	1	1	29	1	256	12	0	2	300	278	0	0	13	1	0	0	14	14
08:15	0	0	1	0	0	0	1	1	16	0	139	6	1	2	164	154	1	0	20	1	0	0	22	21
н/тот	2	0	5	1	0	0	8	6	105	5	847	58	6	9	1030	958	1	0	50	6	0	1	58	58
08:30	3	0	2	0	0	0	5	3	22	0	187	12	5	2	228	217	1	0	20	0	0	1	22	22
08:45	1	0	1	0	0	0	2	1	27	1	185	14	3	2	232	215	0	1	15	2	0	1	19	19
09:00	0	0	5	0	0	0	5	5	16	1	196	19	5	6	243	241	0	0	18	0	0	0	18	18
09:15	0	0	0	0	0	0	0	0	14	1	178	13	7	3	216	214	0	0	15	2	0	1	18	19
н/тот	4	0	8	0	0	0	12	9	79	3	746	58	20	13	919	887	1	1	68	4	0	3	77	79
P/TOT	6	0	13	1	0	0	20	15	184	8	1593	116	26	22	1949	1845	2	1	118	10	0	4	135	137
								6								865								77

		N	IOVEN	IENT 1	10					N	IOVEN	IENT 1	1					N	IOVEN	IENT 1	2			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
16:00	1	0	1	0	0	0	2	1	6	4	160	15	0	2	187	182	0	0	7	0	1	1	9	11
16:15	0	0	4	0	0	0	4	4	12	2	138	24	5	4	185	183	0	0	9	2	0	0	11	11
16:30	2	0	2	0	0	0	4	2	10	1	162	21	4	4	202	201	1	0	7	1	0	0	9	8
16:45	0	0	3	0	0	0	3	3	6	2	138	19	5	2	172	173	0	0	6	0	1	0	7	8
н/тот	3	0	10	0	0	0	13	11	34	9	598	79	14	12	746	739	1	0	29	3	2	1	36	38
17:00	1	0	3	0	0	0	4	3	9	2	138	19	1	2	171	166	0	0	13	0	0	0	13	13
17:15	0	0	2	0	0	0	2	2	8	4	180	13	2	2	209	204	0	0	10	0	0	1	11	12
17:30	0	0	3	0	0	0	3	3	14	3	141	20	2	3	183	175	0	0	8	0	0	0	8	8
17:45	0	0	3	0	0	0	3	3	14	4	160	8	1	2	189	178	0	0	9	0	0	0	9	9
н/тот	1	0	11	0	0	0	12	11	45	13	619	60	6	9	752	723	0	0	40	0	0	1	41	42
18:00	0	0	2	0	0	0	2	2	16	1	149	14	1	2	183	173	1	0	7	0	0	1	9	9
18:15	0	0	3	0	0	0	3	3	8	2	133	9	0	3	155	150	0	0	5	0	0	0	5	5
н/тот	0	0	5	0	0	0	5	5	24	3	282	23	1	5	338	323	1	0	12	0	0	1	14	14
P/TOT	4	0	26	0	0	0	30	27	103	25	1499	162	21	26	1836	1786	2	0	81	3	2	3	91	94

## BLACKROCK TRAFFIC COUNTS MANUAL CLASSIFIED JUNCTION TURNING COUNTS

## OCTOBER 2020 TRA/20/115

Thursday

SITE: 02 & 03

# DATE: October Weekday

DAY:

LOCATION:

Temple Road Slip & Craigmore Gardens

		м	OVEM	ENT 2	.1					М	OVEM	ENT 3	.1					М	OVEM	IENT 3	.2			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
07:30	0	0	1	1	1	2	5	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	4	1	0	1	6	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	1	0	8	0	0	2	11	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	7	0	0	1	8	9	0	0	1	0	0	0	1	1	0	0	2	0	0	0	2	2
н/тот	1	0	20	2	1	6	30	36	0	0	1	0	0	0	1	1	0	0	2	0	0	0	2	2
08:30	1	0	3	2	2	1	9	11	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
08:45	1	0	4	0	1	1	7	8	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
09:00	1	0	4	1	0	1	7	7	0	0	2	0	0	0	2	2	0	0	1	0	0	0	1	1
09:15	2	0	6	1	0	2	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
н/тот	5	0	17	4	3	5	34	38	0	0	2	0	0	0	2	2	0	0	3	0	0	0	3	3
P/TOT	6	0	37	6	4	11	64	74	0	0	3	0	0	0	3	3	0	0	5	0	0	0	5	5
								41								1								4

		Μ	IOVEN	IENT 2	2.1					м	OVEM	ENT 3	.1					М	OVEM	ENT 3	.2			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
16:00	1	0	11	2	0	0	14	13	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
16:15	2	0	2	0	0	1	5	4	1	0	1	0	0	0	2	1	0	0	1	0	0	0	1	1
16:30	1	0	7	0	0	1	9	9	1	0	1	0	0	0	2	1	0	0	1	0	0	0	1	1
16:45	1	0	4	0	0	1	6	6	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Н/ТОТ	5	0	24	2	0	3	34	33	3	0	3	0	0	0	6	4	0	0	2	0	0	0	2	2
17:00	1	0	7	0	0	1	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	1	0	5	0	0	1	7	7	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
17:30	0	0	10	1	0	1	12	13	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
17:45	1	0	5	0	0	2	8	9	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1	1
Н/ТОТ	3	0	27	1	0	5	36	39	0	0	2	0	0	0	2	2	0	0	3	0	0	0	3	3
18:00	1	0	1	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
18:15	0	0	8	1	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
н/тот	1	0	9	1	0	0	11	10	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
P/TOT	9	0	60	4	0	8	81	82	3	0	5	0	0	0	8	6	0	0	6	0	0	0	6	6

## BLACKROCK TRAFFIC COUNTS MANUAL CLASSIFIED JUNCTION TURNING COUNTS

## OCTOBER 2020 TRA/20/115

Thursday

SITE: 04

DATE: October Weekday

DAY:

LOCATION: Newtown Avenue/Frascati Road/Daughters of Charity/St. Vincent's Park/Temple Park Avenue

		м	OVEN	/ENT	r 1			T PCU PCL MCL CAR LGV HGV BUS TOT PCU										М	OVE	MEN	т з					м	OVE	MEN	Г4					м	OVE	MEN.	T 5					м	OVEN	IENT	5a			
TIME	PCL	MCL	CAR	LGV	HGV B	us	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS .	тот	PCU
07:30	3	0	2	0	0	0	5	3	0	0	0	0	0	0	0	0	4	3	124	23	8	3	165	171	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	4	0	8	2	1	0	15	13	0	0	2	0	0	0	2	2	9	2	122	28	1	4	166	163	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
08:00	9	0	8	0	0	0	17	10	0	0	0	0	0	0	0	0	6	1	164	23	9	5	208	217	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
08:15	9	0	2	1	0	0	12	5	0	0	1	0	0	0	1	1	10	2	177	10	6	3	208	208	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	3	0	0	0	3	3
н/тот	25	0	20	3	1	0	49	30	0	0	3	0	0	0	3	3	29	8	587	84	24	15	747	758	0	0	1	0	1	0	2	3	0	0	1	0	0	0	1	1	0	0	5	0	0	0	5	5
08:30	16	0	9	2	0	0	27	14	0	0	1	0	0	0	1	1	9	3	210	17	8	4	251	254	0	0	1	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	6
08:45	6	0	7	2	0	0	15	10	0	0	2	0	0	0	2	2	6	2	207	13	4	2	234	234	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	1	0	0	2	2
09:00	7	0	7	2	0	0	16	10	0	0	2	1	1	0	4	5	3	3	200	11	9	3	229	237	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
09:15	7	0	7	0	0	0	14	8	0	0	0	0	0	0	0	0	6	0	170	24	4	5	209	213	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3	0	0	3	2	0	0	5	5
н/тот	36	0	30	6	0	0	72	43	0	0	5	1	1	0	7	8	24	8	787	65	25	14	923	938	0	0	1	0	0	1	2	3	0	0	4	0	0	0	4	4	0	0	11	3	0	0	14	14
P/TOT	61	0	50	9	1	0	121	73	0	0	8	1	1	0	10	11	53	16	1374	149	49	29	1670	1696	0	0	2	0	1	1	4	6	0	0	5	0	0	0	5	5	0	0	16	3	0	0	19	19

								39								4								912								3								2								12
		м	OVE	NEN.	T 1					М	OVE	MEN	Т 2					М	OVE	MEN	т 3					M	OVE	MEN.	Т4					м	OVEN	IEN	Г 5					M	OVEN	/IENT	5a			
TIME	PCL	мс	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
16:00	4	0	8	0	0	0	12	9	0	0	5	0	0	0	5	5	11	2	241	33	2	3	292	287	0	0	0	1	0	0	1	1	0	0	2	0	0	0	2	2	0	0	2	0	0	0	2	2
16:15	8	0	5	1	0	0	14	8	0	0	0	0	0	0	0	0	11	2	235	26	5	4	283	282	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	6	0	4	0	0	0	10	5	0	0	1	0	0	0	1	1	17	3	238	24	2	2	286	275	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
16:45	6	0	3	1	0	0	10	5	0	0	2	0	0	0	2	2	19	5	205	27	1	2	259	244	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Н/ТОТ	24	0	20	2	0	0	46	27	0	0	8	0	0	0	8	8	58	12	919	110	10	11	1120	1087	0	0	3	1	0	0	4	4	0	0	2	0	0	0	2	2	0	0	5	0	0	0	5	5
17:00	7	0	8	1	0	0	16	10	0	0	1	0	1	0	2	3	13	5	225	20	0	3	266	256	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
17:15	13	0	5	0	0	0	18	8	0	0	0	0	0	0	0	0	17	5	219	15	0	3	259	245	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
17:30	17	0	8	0	0	0	25	11	0	0	2	0	0	0	2	2	19	4	225	14	1	4	267	254	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	3
17:45	14	0	6	0	0	0	20	9	0	0	1	0	0	0	1	1	23	7	221	12	1	4	268	250	0	0	2	0	0	0	2	2	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1	1
Н/ТОТ	51	0	27	1	0	0	79	38	0	0	4	0	1	0	5	6	72	21	890	61	2	14	1060	1006	0	0	3	0	0	0	3	3	0	0	1	0	0	0	1	1	0	0	7	1	0	0	8	8
18:00	8	0	3	1	0	0	12	6	0	0	1	0	0	0	1	1	9	1	212	9	1	3	235	231	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	11	0	5	0	0	0	16	7	0	0	0	0	0	0	0	0	11	4	198	16	1	2	232	224	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Н/ТОТ	19	0	8	1	0	0	28	13	0	0	1	0	0	0	1	1	20	5	410	25	2	5	467	455	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Р/ТОТ	94	0	55	4	0	0	153	78	0	0	13	0	1	0	14	15	150	38	2219	196	14	30	2647	2548	0	0	7	1	0	0	8	8	0	0	3	0	0	0	3	3	0	0	13	1	0	0	14	14

Traffinomics Limited for NRB Consulting Engineers

## **BLACKROCK TRAFFIC COUNTS** MANUAL CLASSIFIED JUNCTION TURNING COUNTS

## **OCTOBER 2020** TRA/20/115

Thursday

SITE: 04 DATE: October Weekday

DAY:

LOCATION: Newtown Avenue/Frascati Road/Daughters of Charity/St. Vincent's Park/Temple Park Avenue

				Μ	IOVE	MENT	7					N	IOVEN	MENT	8					N	/OVE	MENT	9					М	OVEN	IENT	10									
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
н/тот	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
н/тот	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
Ρ/ΤΟΤ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0

								0								0								0								1								0
		Ν	IOVE	MENT	6					N	IOVE	MENT	7					N	IOVEN	IENT	8					N	IOVEN	/ENT	9					М	OVEN	IENT	10			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
16:00	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
н/тот	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	6	0	0	1	0	0	0	1	1
17:00	0	0	1	0	0	0	1	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
17:15	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
н/тот	0	0	2	0	0	0	2	2	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
н/тот	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0
Р/ТОТ	0	0	4	0	0	0	4	4	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	8	0	0	0	8	8	0	0	1	0	0	0	1	1

Traffinomics Limited for NRB Consulting Engineers

## **BLACKROCK TRAFFIC COUNTS** MANUAL CLASSIFIED JUNCTION TURNING COUNTS

## **OCTOBER 2020** TRA/20/115

Thursday

SITE: 04 DATE: October Weekday

DAY:

LOCATION: Newtown Avenue/Frascati Road/Daughters of Charity/St. Vincent's Park/Temple Park Avenue

		Μ	OVEM	IENT	11					М	OVEN	IENT	12					м	OVEN	IENT	13					М	OVEN	IENT	14					М	OVEN	IENT	15			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
07:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
н/тот	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	4
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	3
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
н/тот	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	4	5
P/TOT	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	7	0	0	1	8	9

								0								1								0								0								4
		М	OVEN	IENT	11					М	OVEN	IENT	12					М	OVEN	IENT	13					М	IOVEN	IENT	14					М	OVEN	IENT	15			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
16:00	0	0	1	0	0	0	1	1	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
н/тот	0	0	1	0	0	0	1	1	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3	4
17:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
н/тот	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	4
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
н/тот	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Р/ТОТ	0	0	1	0	0	0	1	1	0	0	3	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	7	8

Traffinomics Limited for

## BLACKROCK TRAFFIC COUNTS MANUAL CLASSIFIED JUNCTION TURNING COUNTS

## OCTOBER 2020 TRA/20/115

Thursday

SITE: 04

DATE: October Weekday

DAY:

LOCATION: Newtown Avenue/Frascati Road/Daughters of Charity/St. Vincent's Park/Temple Park Avenue

		м	OVEN	IENT	16					м	OVEN	IENT	17					м	OVEN	IENT	18					мс	OVEN	1EN1	19					мс	VEN	IENT	20					мо	VEM	ENT	20a			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
07:30	0	0	1	0	0	0	1	1	1	0	2	0	0	0	3	2	29	2	182	17	3	4	237	220	0	0	10	2	2	0	14	16	0	0	1	0	0	0	1	1	0	0	13	1	0	0	14	14
07:45	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	5	23	2	224	25	1	2	277	260	1	0	12	2	0	1	16	16	0	0	0	0	0	0	0	0	0	0	7	1	0	0	8	8
08:00	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	23	1	213	13	0	2	252	235	0	0	9	0	1	1	11	13	0	0	2	0	0	0	2	2	0	0	11	3	0	1	15	16
08:15	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	15	0	115	6	1	2	139	130	0	0	13	3	1	0	17	18	0	0	1	0	0	0	1	1	0	0	8	1	0	0	9	9
Н/ТОТ	0	0	1	0	0	0	1	1	1	0	11	0	0	0	12	11	90	5	734	61	5	10	905	845	1	0	44	7	4	2	58	63	0	0	4	0	0	0	4	4	0	0	39	6	0	1	46	47
08:30	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	22	0	167	10	5	3	207	197	0	0	10	1	0	1	12	13	0	0	0	0	0	0	0	0	0	0	16	2	0	0	18	18
08:45	0	0	1	0	0	0	1	1	0	0	2	0	0	0	2	2	19	1	157	14	2	3	196	185	0	0	24	0	0	0	24	24	0	0	0	0	0	0	0	0	0	0	14	1	0	0	15	15
09:00	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	5	12	1	180	16	5	6	220	221	1	0	20	0	0	2	23	24	0	0	0	0	0	0	0	0	0	0	11	3	0	0	14	14
09:15	0	0	1	1	0	0	2	2	0	0	1	0	0	0	1	1	12	1	161	10	7	3	194	194	0	0	17	0	1	1	19	21	0	0	0	0	0	0	0	0	0	0	20	3	0	0	23	23
Н/ТОТ	0	0	2	1	0	0	3	3	0	0	10	0	0	0	10	10	65	3	665	50	19	15	817	797	1	0	71	1	1	4	78	82	0	0	0	0	0	0	0	0	0	0	61	9	0	0	70	70
Р/ТОТ	0	0	3	1	0	0	4	4	1	0	21	0	0	0	22	21	155	8	1399	111	24	25	1722	1642	2	0	115	8	5	6	136	145	0	0	4	0	0	0	4	4	0	0	100	15	0	1	116	117

									1								8								748								68								3								58
		М	OVE	MEN	T 16	5					мс	OVEN	IENT	17					м	OVEN	IENT	18					мо	VEM	IENT	19					мо	VEN	IENT	20					мо	VEM	ENT	20a			
TIME	PCL	мсі	L CA	R LG	VHG	iV B	US 1	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS 1	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV I	sus .	тот	PCU
16:00	0	0	3	0	0		0	3	3	0	0	0	0	0	0	0	0	4	3	113	14	1	2	137	135	1	0	13	0	0	1	15	15	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	4
16:15	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	7	2	113	19	5	4	150	152	0	1	9	1	0	1	12	12	0	0	1	0	0	0	1	1	0	0	13	0	0	0	13	13
16:30	0	0	2	0	0		0	2	2	0	0	0	0	0	0	0	0	2	1	115	20	4	3	145	150	0	0	1	1	0	1	3	4	0	0	1	0	0	0	1	1	0	0	18	0	0	0	18	18
16:45	0	0	1	0	0		0	1	1	0	0	0	0	0	0	0	0	4	1	94	19	5	1	124	126	0	0	12	0	0	1	13	14	0	0	2	0	0	0	2	2	0	0	12	0	0	0	12	12
н/тот	0	0	6	0	0		0	6	6	0	0	0	0	0	0	0	0	17	7	435	72	15	10	556	563	1	1	35	2	0	4	43	46	0	0	4	0	0	0	4	4	0	0	47	0	0	0	47	47
17:00	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	3	2	96	16	1	2	120	119	1	0	3	1	0	1	6	6	0	0	2	0	0	0	2	2	0	0	12	2	0	0	14	14
17:15	0	0	1	0	0		0	1	1	0	0	0	0	0	0	0	0	5	0	129	9	2	3	148	149	0	0	9	0	0	0	9	9	0	0	1	0	0	0	1	1	0	0	17	0	0	0	17	17
17:30	0	0	2	0	0		0	2	2	0	0	0	0	0	0	0	0	5	1	112	17	2	3	140	140	3	0	8	1	0	1	13	12	0	0	3	0	0	0	3	3	0	0	7	0	1	0	8	9
17:45	0	0	2	0	0		0	2	2	0	0	0	0	0	0	0	0	7	4	120	7	1	2	141	136	2	0	7	1	0	0	10	8	0	0	0	0	0	0	0	0	0	0	16	2	0	0	18	18
н/тот	0	0	5	0	0		0	5	5	0	0	0	0	0	0	0	0	20	7	457	49	6	10	549	545	6	0	27	3	0	2	38	35	0	0	6	0	0	0	6	6	0	0	52	4	1	0	57	58
18:00	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	6	1	124	12	1	3	147	146	1	0	9	0	0	0	10	9	0	0	2	0	0	0	2	2	0	0	15	1	0	0	16	16
18:15	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	1	2	109	8	0	1	121	120	0	0	2	0	0	0	2	2	0	0	2	0	0	0	2	2	0	0	25	0	1	0	26	27
н/тот	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	7	3	233	20	1	4	268	266	1	0	11	0	0	0	12	11	0	0	4	0	0	0	4	4	0	0	40	1	1	0	42	43
Р/ТОТ	0	0	11	0	0		0	11	11	0	0	0	0	0	0	0	0	44	17	1125	141	22	24	1373	1374	8	1	73	5	0	6	93	92	0	0	14	0	0	0	14	14	0	0	139	5	2	0	146	148

4

## BLACKROCK TRAFFIC COUNTS MANUAL CLASSIFIED JUNCTION TURNING COUNTS

## OCTOBER 2020 TRA/20/115

Thursday

SITE: 04

DATE: October Weekday

DAY:

LOCATION: Newtown Avenue/Frascati Road/Daughters of Charity/St. Vincent's Park/Temple Park Avenue

		мс	OVEM	ENT	21					мо	VEM	ENT	22					мс	OVEN	IENT	23					м	OVEN	/EN1	24					мс	OVEN	IENT	25					м	OVEN	/EN1	r 26			
TIME	PCL	MCL	CAR	LGV	HGV B	JS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
07:30	0	0	1	0	0	D	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	27	1	0	0	32	29
07:45	0	0	3	0	0	D	3	3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	38	1	1	0	46	42
08:00	0	0	1	0	0	D	1	1	0	0	0	0	0	0	0	0	0	0	10	0	1	0	11	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	55	1	0	0	62	57
08:15	0	0	3	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	11	2	1	0	14	15	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	2	0	41	1	0	0	44	42
н/тот	0	0	8	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	22	3	3	0	28	31	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	18	0	161	4	1	0	184	171
08:30	0	0	1	0	0	D	1	1	0	0	0	0	0	0	0	0	0	0	7	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	36	2	0	0	42	39
08:45	0	0	1	0	0	D	1	1	0	0	0	0	0	0	0	0	0	0	10	1	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	1	43	1	1	0	55	48
09:00	0	0	2	0	0	D	2	2	0	0	0	0	0	0	0	0	0	0	14	2	0	0	16	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	38	3	0	0	45	42
09:15	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	7	0	1	0	8	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	29	3	0	1	35	34
н/тот	0	0	5	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	38	3	1	0	42	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	1	146	9	1	1	177	163
P/TOT	0	0	13	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	60	6	4	0	70	74	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	37	1	307	13	2	1	361	334

								6								0								45								1								0								187
		м	OVEN		r 21					м	OVEN		r 22					М	OVEN	/ENT	r 23					мс	OVEN	IENT	24					мс	OVEN	IENT	25					мс	OVEN	IENT	26			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCI	. MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS .	тот	PCU
16:00	0	0	3	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	7	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	50	1	0	1	56	54
16:15	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	6	1	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	38	7	0	0	50	46
16:30	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	54	2	0	1	68	60
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	52	0	1	1	57	57
н/тот	0	0	4	1	0	0	5	5	0	0	0	0	0	0	0	0	0	0	22	2	0	0	24	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	2	194	10	1	3	231	217
17:00	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	3	1	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	54	3	0	0	64	58
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	9	1	0	0	11	10	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	3	4	60	4	0	0	71	66
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	2	38	2	0	0	51	43
17:45	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	10	0	0	0	10	10	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	7	0	51	1	0	0	59	53
Н/ТОТ	0	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	1	0	26	3	0	0	30	29	0	0	3	0	0	0	3	3	0	0	0	0	0	0	0	0	26	6	203	10	0	0	245	221
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	34	2	0	0	47	38
18:15	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	13	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	30	1	0	2	40	36
н/тот	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	21	1	0	0	22	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	64	3	0	2	87	75
P/TOT	0	0	7	1	0	0	8	8	0	0	0	0	0	0	0	0	1	0	69	6	0	0	76	75	0	0	3	0	0	0	3	3	0	0	0	0	0	0	0	0	65	8	461	23	1	5	563	512

Traffinomics Limited for NRB Consulting Engineers

## BLACKROCK TRAFFIC COUNTS MANUAL CLASSIFIED JUNCTION TURNING COUNTS

05

## OCTOBER 2020 TRA/20/115

Thursday

SITE:

### DATE: October Weekday

DAY:

LOCATION:

Newtown Avenue/Seapoint Avenue

	MOVEMENT 1									Ν	NOVEN	/IENT	2					Ν	/OVEN	ИЕМТ	3			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
07:30	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	12	2	2	0	17	18
07:45	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	20	4	2	1	27	30
08:00	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	17	0	1	1	21	21
08:15	3	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	1	0	15	4	1	0	21	21
н/тот	8	0	0	0	0	0	8	2	0	0	0	0	0	0	0	0	4	0	64	10	6	2	86	91
08:30	7	0	0	0	0	0	7	1	0	0	0	0	0	0	0	0	2	0	19	3	0	1	25	24
08:45	6	0	0	0	0	0	6	1	0	0	0	0	0	0	0	0	1	0	31	2	0	0	34	33
09:00	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	27	2	0	2	33	33
09:15	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	24	0	1	1	27	28
н/тот	16	0	0	0	0	0	16	3	0	0	0	0	0	0	0	0	6	0	101	7	1	4	119	119
P/TOT	24	0	0	0	0	0	24	5	0	0	0	0	0	0	0	0	10	0	165	17	7	6	205	210
								3								0								100

	MOVEMENT 1								N	<b>NOVEN</b>	/IENT	2					Ν	/OVEN	IENT	3				
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
16:00	10	0	0	0	0	0	10	2	0	0	0	0	0	0	0	0	1	0	21	0	0	1	23	23
16:15	7	0	0	0	0	0	7	1	0	0	0	0	0	0	0	0	0	1	14	2	0	1	18	18
16:30	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	5	1	0	1	8	8
16:45	14	0	0	0	0	0	14	3	1	0	0	0	0	0	1	0	1	0	15	1	0	1	18	18
н/тот	32	0	0	0	0	0	32	6	1	0	0	0	0	0	1	0	3	1	55	4	0	4	67	68
17:00	13	0	0	0	0	0	13	3	0	0	0	0	0	0	0	0	0	0	12	2	0	1	15	16
17:15	6	0	0	0	0	0	6	1	0	0	0	0	0	0	0	0	2	0	14	0	0	0	16	14
17:30	12	0	0	0	0	0	12	2	0	0	0	0	0	0	0	0	2	0	16	1	0	1	20	19
17:45	6	0	0	0	0	0	6	1	0	0	0	0	0	0	0	0	1	0	13	1	0	0	15	14
н/тот	37	0	0	0	0	0	37	7	0	0	0	0	0	0	0	0	5	0	55	4	0	2	66	64
18:00	17	0	0	0	0	0	17	3	0	0	0	0	0	0	0	0	1	0	12	1	0	0	14	13
18:15	12	0	0	0	0	0	12	2	0	0	0	0	0	0	0	0	1	0	7	0	0	0	8	7
н/тот	29	0	0	0	0	0	29	6	0	0	0	0	0	0	0	0	2	0	19	1	0	0	22	20
Р/ТОТ	98	0	0	0	0	0	98	20	1	0	0	0	0	0	1	0	10	1	129	9	0	6	155	152

## **BLACKROCK TRAFFIC COUNTS** MANUAL CLASSIFIED JUNCTION TURNING COUNTS

05

## **OCTOBER 2020** TRA/20/115

Thursday

SITE:

#### DATE: October Weekday

DAY:

LOCATION:

Newtown Avenue/Seapoint Avenue

										N	NOVEN	/IENT	5					N	IOVEN	<b>IENT</b>	6			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
07:30	2	0	0	0	0	0	2	0	4	0	28	1	0	0	33	30	9	0	15	1	0	0	25	18
07:45	5	0	0	0	0	0	5	1	6	0	38	2	2	0	48	45	7	1	34	0	0	0	42	36
08:00	7	0	0	0	0	0	7	1	6	0	65	1	1	0	73	69	14	0	43	1	0	0	58	47
08:15	8	0	0	0	0	0	8	2	2	0	53	3	1	0	59	58	29	0	52	0	1	0	82	60
н/тот	22	0	0	0	0	0	22	4	18	0	184	7	4	0	213	203	59	1	144	2	1	0	207	160
08:30	14	0	0	0	0	0	14	3	4	0	43	2	0	0	49	46	11	1	31	2	2	0	47	40
08:45	5	0	0	0	0	0	5	1	9	1	53	2	1	0	66	59	9	1	31	2	0	0	43	35
09:00	6	0	0	0	0	0	6	1	4	0	52	5	0	0	61	58	14	0	18	0	0	0	32	21
09:15	6	0	0	0	0	0	6	1	2	0	36	3	1	1	43	43	7	1	12	1	0	0	21	15
н/тот	31	0	0	0	0	0	31	6	19	1	184	12	2	1	219	206	41	3	92	5	2	0	143	110
P/TOT	53	0	0	0	0	0	53	11	37	1	368	19	6	1	432	409	100	4	236	7	3	0	350	271
								7								233								181

181

										Ν	NOVEN	/IENT	5					M	/OVEN	/IENT	6			
TIME	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU	PCL	MCL	CAR	LGV	HGV	BUS	тот	PCU
16:00	4	0	0	0	0	0	4	1	3	1	57	1	0	1	63	61	7	0	9	1	0	0	17	11
16:15	8	0	0	0	0	0	8	2	5	0	44	8	0	0	57	53	6	0	17	0	0	0	23	18
16:30	5	0	0	0	0	0	5	1	11	0	59	2	0	1	73	65	3	0	12	1	0	0	16	14
16:45	5	0	0	0	0	0	5	1	1	1	56	1	1	1	61	62	15	0	9	1	0	0	25	13
н/тот	22	0	0	0	0	0	22	4	20	2	216	12	1	3	254	241	31	0	47	3	0	0	81	56
17:00	8	0	0	0	0	0	8	2	7	0	57	4	0	0	68	62	12	0	8	0	0	0	20	10
17:15	11	0	0	0	0	0	11	2	4	4	70	5	0	0	83	77	8	0	9	0	0	0	17	11
17:30	18	0	0	0	0	0	18	4	9	2	42	3	0	0	56	48	3	0	3	2	0	0	8	6
17:45	15	0	0	0	0	0	15	3	7	0	63	1	0	0	71	65	23	0	6	0	0	0	29	11
н/тот	52	0	0	0	0	0	52	10	27	6	232	13	0	0	278	253	46	0	26	2	0	0	74	37
18:00	8	0	0	0	0	0	8	2	11	0	42	3	0	0	56	47	10	0	6	0	0	0	16	8
18:15	10	0	0	0	0	0	10	2	7	0	43	1	0	2	53	49	13	0	3	1	0	0	17	7
н/тот	18	0	0	0	0	0	18	4	18	0	85	4	0	2	109	97	23	0	9	1	0	0	33	15
Р/ТОТ	92	0	0	0	0	0	92	18	65	8	533	29	1	5	641	590	100	0	82	6	0	0	188	108



## **APPENDIX C**

TRICS Trip Generation Output Irish Residential Apartments

TRICS 7.7.4	161220 B20.07	Database right of TRICS Co	nsortium Limited, 2021. Al	II rights reserved	Monday 01/03/21
NRB Consulti	ina Enaineers I td	8 Leopardstown Business (	entre, Ballvogan Avenue	Dublin 18	Licence No: 160301
			entre, zanjegan neende		
			Cal	Iculation Reference: AUDI	T-160301-210301-0326
TRH	P RATE CALCULATI	ON SELECTION PARAME	TERS:		
Land	IUse : 03 - RES				
Cate	GORY : C - FLAT	5 PRIVATELY OWNED			
101	IAL VEHICLES				
Cala	atad radiana and ar				
<u>Sele</u>	SOUTU MEST	Pas:			
03			1 days		
			1 days		
04	FAST ANGULA		T days		
04		FSHIRF	1 days		
		ESHINE	2 days		
	SF SUFFOLK		2 days		
05	EAST MIDLANDS				
	DS DERBYSHIF	RE	1 davs		
	NT NOTTINGH	AMSHIRE	2 days		
06	WEST MIDLANDS	6	3		
	WM WEST MIDI	ANDS	1 days		
07	YORKSHIRE & N	ORTH LINCOLNSHIRE	5		
	RI EAST RIDI	NG OF YORKSHIRE	1 days		
	SY SOUTH YO	RKSHIRE	1 days		
08	NORTH WEST				
	MS MERSEYSIE	DE	2 days		
09	NORTH				
	CB CUMBRIA		3 days		
10	WALES				
	CO CONWY		1 days		
11	SCOTLAND				
	EB CITY OF EL	DINBURGH	1 days		
	SA SUUTHAT	SHIRE	I days		
10	SR STIRLING		3 days		
12			1 dovo		
10	GA GALWAY		T days		
15		Π	1 days		
11		D	T days		
14			3 days		
15	GREATER DUBLI	N	5 4435		
	DI DUBLIN		6 days		
16	ULSTER (REPUBI	IC OF IRELAND)	, 0		
	MG MÔNAGHAN	۱ ١	1 days		
17	ULSTER (NORTH	ERN I RELAND)	2		
	AN ANTRIM	-	1 davs		

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

## 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	5		TOTALS	
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	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	37	55	0.045	37	55	0.157	37	55	0.202
08:00 - 09:00	37	55	0.056	37	55	0.193	37	55	0.249
09:00 - 10:00	37	55	0.069	37	55	0.095	37	55	0.164
10:00 - 11:00	37	55	0.056	37	55	0.075	37	55	0.131
11:00 - 12:00	37	55	0.065	37	55	0.076	37	55	0.141
12:00 - 13:00	37	55	0.085	37	55	0.079	37	55	0.164
13:00 - 14:00	37	55	0.068	37	55	0.083	37	55	0.151
14:00 - 15:00	37	55	0.081	37	55	0.079	37	55	0.160
15:00 - 16:00	37	55	0.102	37	55	0.061	37	55	0.163
16:00 - 17:00	37	55	0.115	37	55	0.082	37	55	0.197
17:00 - 18:00	37	55	0.177	37	55	0.083	37	55	0.260
18:00 - 19:00	37	55	0.161	37	55	0.096	37	55	0.257
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.080			1.159			2.239

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

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

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#### Parameter summary

Trip rate parameter range selected:	9 - 184 (units: )
Survey date date range:	01/01/12 - 08/09/20
Number of weekdays (Monday-Friday):	37
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.

NRB Consulting Engineers Ltd 8 Leopardstown Busin

8 Leopardstown Business Centre, Ballyogan Avenue Dublin 18

Licence No: 160301



NRB Consulting Engineers Ltd 8 Leopardstown Business

8 Leopardstown Business Centre, Ballyogan Avenue Dublin 18

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NRB Consulting Engineers Ltd 8 Leopardstown Business Centre, Ballyogan Avenue

Ballyogan Avenue Dublin 18

Licence No: 160301



Dublin 18

8 Leopardstown Business Centre, Ballyogan Avenue

TRIP RATE for Land Use 03 - RESIDENTIAL/C - FLATS PRIVATELY OWNED

#### CYCLISTS Calculation factor: 1 DWELLS BOLD print indicates peak (busiest) period

NRB Consulting Engineers Ltd

	ARRIVALS			DEPARTURES		TOTALS			
	No.	Ave.	Trip	No.	Ave.	Trip	No.	Ave.	Trip
Time Range	Days	DWELLS	Rate	Days	DWELLS	Rate	Days	DWELLS	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	37	55	0.003	37	55	0.008	37	55	0.011
08:00 - 09:00	37	55	0.003	37	55	0.014	37	55	0.017
09:00 - 10:00	37	55	0.003	37	55	0.005	37	55	0.008
10:00 - 11:00	37	55	0.002	37	55	0.003	37	55	0.005
11:00 - 12:00	37	55	0.003	37	55	0.002	37	55	0.005
12:00 - 13:00	37	55	0.003	37	55	0.002	37	55	0.005
13:00 - 14:00	37	55	0.003	37	55	0.002	37	55	0.005
14:00 - 15:00	37	55	0.003	37	55	0.003	37	55	0.006
15:00 - 16:00	37	55	0.004	37	55	0.003	37	55	0.007
16:00 - 17:00	37	55	0.004	37	55	0.002	37	55	0.006
17:00 - 18:00	37	55	0.007	37	55	0.004	37	55	0.011
18:00 - 19:00	37	55	0.006	37	55	0.003	37	55	0.009
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:         0.044         0.051         0.095									

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. NRB Consulting Engineers Ltd

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#### RATE TRIP RATE GRAPH - ARRIVALS 03 - RESIDENTIAL C - FLATS PRIVATELY OWNED 96 CYCLISTS

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Licence No: 160301



NRB Consulting Engineers Ltd 8 Leopardstown Bus

8 Leopardstown Business Centre, Ballyogan Avenue Dublin 18

Licence No: 160301





## **APPENDIX D**

# Traffic Surveys, Trip Distribution & Network Traffic Flow Diagrams



TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3 (Travel Demand Projections 2019, Table 6.1: Central Growth Rates: Annual Growth Factors Metropolitan Dublin)

2020 TO 2025, Factor is; 1.084

2025 TO 2040, Factor is; 1.140



Figure Total traffic Flow Through Individual Junctions represented by Figure in Black Box




*P2 of 10* NRB Consulting Engineers Ltd





Figure In Black Boxes Above is the Projected Opening Year Total traffic Flow Through Individual Junctions



493 No. Apartment/Residential Units	Car A	rrivals	Car Dep	oartures	Total 2 May DCU Tring	<u>TRICS</u>
Network Period	Per Unit	Total Dev	Per Unit	Total Dev	Total 2-way PCO Trips	ASSESSMENT OF
Weekday AM Peak Hour	0.056	28	0.193	95	123	<u>DEVELOPMENT</u>
Weekday PM Peak Hour	0.177	87	0.083	41	128	TRAFFIC

For TRICS Output Data, Ref to Appendix C Herein....





Figure In Black Boxes Above is the Total Worst Case % Increase in Traffic Through Individual Junctions Due to the Subject Scheme



PROJECTED 15Yr DESIGN YEAR TRAFFIC FLOWS WEEKDAY AM PEAK HOUR WITH PERMITTED and PROPOSED DEVELOPMENT

P5 of 10



TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3 (Travel Demand Projections 2019, Table 6.1: Central Growth Rates: Annual Growth Factors Metropolitan Dublin)

2020 TO 2025, Factor is; 1.084

2025 TO 2040, Factor is; 1.140



Figure Total traffic Flow Through Individual Junctions represented by Figure in Black Box









Figure In Black Boxes Above is the Projected Opening Year Total traffic Flow Through Individual Junctions



#### ASSIGNMENT OF PROPOSED DEVELOPMENT TRAFFIC (PCUs) - PM Peak Hour (1700-1800H)

Figure In Black Boxes Above is the Total Worst Case New Traffic Flow Through Individual Junctions Due to the Subject Scheme



Figure In Black Boxes Above is the Total Worst Case % Increase in Traffic Through Individual Junctions Due to the Subject Scheme



PROJECTED Traffic Flow Local Network (PCUs) - PM Peak Hour (1700-1800H) 2040 - WITH COMMITTED & SUBJECT DEVELOPMENT (PCUs)

PROJECTED 15Yr DESIGN YEAR TRAFFIC FLOWS WEEKDAY PM PEAK HOUR WITH PERMITTED and PROPOSED DEVELOPMENT

P10 of 10



# **APPENDIX E**

# LiNSiG Simulation Model Output Traffic Signal Controlled Junction - Access

#### Access, Summary LiNSiG Results in Order as included herein (Robust & Worst Case - with ALL Permitted AND Proposed Development)

Modelled	Network	PRC	Total Delay
Scenario	Saturation %	%	PCUHr
2025 Opening Year PM Peak	84.8	6.1	22.2
2040 Design Year PM Peak	96.7	-7.4	34.9
2025 Opening Year AM Peak	79.6	13	29.07
2040 Design Year AM Peak	88.6	1.6	40.5

<u>The Selected Opening Year and design year Results Above are below 100% -</u> <u>In this regard, the results are considered acceptable.</u> This is particularly the case <u>in circumstances where sustainable policies will have an increasing effect in</u> <u>reducing car based traffic at peak commuter hours.</u>

**NB** Any Small Changes to Selected Opening Year 2025 or Design Year 2040 will have no significant implications in terms of the conclusions of the Study, due to the low background <u>Network Traffic Growth</u>

# Full Input Data And Results SITE ACCESS JUNCTION – LINSIG OUTPUT

#### **User and Project Details**

Project:	500 Apartments on SHD Site at Temple Rd
Title:	Temple Rd SHD
Location:	20-057 Calculations Folder
File name:	Site Access.lsg3x
Author:	ER
Company:	NRB Consulting Engineers Ltd.,
Address:	Apollo Building, Dundrum Rd., Dublin 14
Notes:	AM 2025 & 2040 PM 2025 & 2040

#### Network Layout Diagram



#### Phase Diagram



#### Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
А	Traffic		7	7
В	Traffic		7	7
С	Traffic		7	7
D	Pedestrian		10	10
E	Traffic		7	7

## Phase Intergreens Matrix

	Starting Phase								
		Α	В	С	D	E			
	А		-	7	7	7			
Terminating	В	-		7	7	7			
Phase	С	7	7		7	-			
	D	7	7	7		7			
	Е	7	7	-	7				

# Phases in Stage

Stage No.	Phases in Stage
1	AB
2	CE
3	С
4	D



#### Phase Delays

Term. Stage	Start Stage	Phase	Туре	Value	Cont value

#### Prohibited Stage Change

	To Stage								
		1	2	3	4				
	1		7	7	7				
From Stage	2	7		0	7				
U	3	7	2		7				
	4	7	7	7					

# Lane Input Data

Junction: Temple Site Ac	cess S	ignal Jun	ction									
Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (N31 West Out of City)	U	С	2	3	12.2	Geom	-	3.50	0.00	Y	Arm 6 Ahead	Inf
1/2 (N31 West Out of City)	U	с	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 6 Ahead	Inf
1/3 (N31 West Out of City)	U	с	2	3	5.2	Geom	-	3.10	0.00	Ν	Arm 4 Right	Inf
2/1	U	А	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 5 Ahead	Inf
(St Catherines Access)											Arm 8 Left	Inf
2/2 (St Catherines Access)	U	Α	2	3	60.0	Geom	-	3.25	0.00	Ν	Arm 6 Right	Inf
3/1		Б	2	2	60.0	Coom		2 50	0.00	N	Arm 4 Ahead	Inf
(Seapoint Avenue Entry)	0	D	2	3	60.0	Geom	-	3.50	0.00	IN	Arm 6 Left	Inf
3/2 (Seapoint Avenue Entry)	U	В	2	3	60.0	User	1800	-	-	-	-	-
4/1 (To St Catherines)	U		2	3	60.0	User	1800	-	-	-	-	-
5/1 (Seapoint Ave Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (N31 East out of City)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/2 (N31 East out of City)	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1		-	~	2	60.0	Caam		0.05	0.00	V	Arm 4 Left	Inf
(N31 East To City)	U	E	2	3	60.0	Geom	-	3.20	0.00	ř	Arm 8 Ahead	Inf
7/2 (N31 East To City)	U	В	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 8 Ahead	Inf
7/3 (N31 East To City)	U	В	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 5 Right	Inf
8/1 (N31 Westbound To City)	U		2	3	60.0	Inf	-	-	-	-	-	-
8/2 (N31 Westbound To City)	U		2	3	60.0	Inf	-	-	-	-	-	-

#### Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2025 AM Peak 500 Apartments'	08:00	09:00	01:00	
2: '2040 AM Peak 500 Apartments'	08:00	09:00	01:00	
3: '2025 PM Peak 500 Apartments'	17:00	18:00	01:00	
4: '2040 PM Peak 500 Apartments'	17:00	18:00	01:00	

# Network Results - 2025 AM Peak 500 Apartments

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	84.8%
Temple Site Access Signal Junction	-	-	N/A	-	-		-	-	-	-	-	-	84.8%
1/1	N31 West Out of City Ahead	U	N/A	N/A	С		1	72	-	541	1965	1195	45.3%
1/2	N31 West Out of City Ahead	U	N/A	N/A	С		1	72	-	532	1940	1180	45.1%
1/3	N31 West Out of City Right	U	N/A	N/A	С		1	72	-	16	2065	1256	1.3%
2/1	St Catherines Access Ahead Left	U	N/A	N/A	А		1	17	-	64	1940	291	22.0%
2/2	St Catherines Access Right	U	N/A	N/A	А		1	17	-	92	2080	312	29.5%
3/1	Seapoint Avenue Entry Ahead Left	U	N/A	N/A	В		1	17	-	56	2105	316	17.7%
3/2	Seapoint Avenue Entry Right	U	N/A	N/A	В		1	17	-	229	1800	270	84.8%
4/1	To St Catherines	U	N/A	N/A	-		-	-	-	39	1800	1800	2.2%
5/1	Seapoint Ave Exit	U	N/A	N/A	-		-	-	-	84	Inf	Inf	0.0%
6/1	N31 East out of City	U	N/A	N/A	-		-	-	-	590	Inf	Inf	0.0%
6/2	N31 East out of City	U	N/A	N/A	-		-	-	-	624	Inf	Inf	0.0%
7/1	N31 East To City Left Ahead	U	N/A	N/A	E		1	72	-	992	1940	1180	84.1%
7/2	N31 East To City Ahead	U	N/A	N/A	В		1	17	-	0	1940	291	0.0%
7/3	N31 East To City Right	U	N/A	N/A	В		1	17	-	74	1940	291	25.4%
8/1	N31 Westbound To City	U	N/A	N/A	-		-	-	-	1030	Inf	Inf	0.0%
8/2	N31 Westbound To City	U	N/A	N/A	-		-	-	-	229	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	0	0	0	15.8	6.5	0.0	22.3	-	-	-	-
Temple Site Access Signal Junction	-	-	0	0	0	15.8	6.5	0.0	22.3	-	-	-	-
1/1	541	541	-	-	-	1.9	0.4	-	2.3	15.4	9.6	0.4	10.0
1/2	532	532	-	-	-	1.9	0.4	-	2.3	15.5	9.5	0.4	9.9
1/3	16	16	-	-	-	0.0	0.0	-	0.0	10.9	0.2	0.0	0.2
2/1	64	64	-	-	-	0.8	0.1	-	0.9	52.8	1.9	0.1	2.0
2/2	92	92	-	-	-	1.2	0.2	-	1.4	53.5	2.7	0.2	2.9
3/1	56	56	-	-	-	0.7	0.1	-	0.8	51.5	1.6	0.1	1.7
3/2	229	229	-	-	-	3.2	2.5	-	5.6	88.8	7.4	2.5	9.9
4/1	39	39	-	-	-	0.0	0.0	-	0.0	1.0	0.0	0.0	0.0
5/1	84	84	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	590	590	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	624	624	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	992	992	-	-	-	5.2	2.6	-	7.8	28.1	26.5	2.6	29.0
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/3	74	74	-	-	-	0.9	0.2	-	1.1	53.4	2.2	0.2	2.3
8/1	1030	1030	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	229	229	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
C1 PRC for Signalled Lanes (%): 6.1 Total Delay for Signalled Lanes (pcuHr): 22.26 Cycle Time (s): 120 PRC Over All Lanes (%): 6.1 Total Delay Over All Lanes(pcuHr): 22.28								-					

#### Network Results - 2040 AM Peak 500 Apartments

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route		Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-		-		-	-	-	-	-	-	96.7%
Temple Site Access Signal Junction	-	-	N/A	-		-		-	-	-	-	-	-	96.7%
1/1	N31 West Out of City Ahead	U	N/A	N/A		с		1	72	-	615	1965	1195	51.4%
1/2	N31 West Out of City Ahead	U	N/A	N/A		с		1	72	-	605	1940	1180	51.3%
1/3	N31 West Out of City Right	U	N/A	N/A		с		1	72	-	16	2065	1256	1.3%
2/1	St Catherines Access Ahead Left	U	N/A	N/A		A		1	17	-	64	1940	291	22.0%
2/2	St Catherines Access Right	U	N/A	N/A		А		1	17	-	100	2080	312	32.1%
3/1	Seapoint Avenue Entry Ahead Left	U	N/A	N/A		В		1	17	-	63	2105	316	20.0%
3/2	Seapoint Avenue Entry Right	U	N/A	N/A		В		1	17	-	261	1800	270	96.7%
4/1	To St Catherines	U	N/A	N/A		-		-	-	-	40	1800	1800	2.2%
5/1	Seapoint Ave Exit	U	N/A	N/A		-		-	-	-	94	Inf	Inf	0.0%
6/1	N31 East out of City	U	N/A	N/A		-		-	-	-	671	Inf	Inf	0.0%
6/2	N31 East out of City	U	N/A	N/A		-		-	-	-	705	Inf	Inf	0.0%
7/1	N31 East To City Left Ahead	U	N/A	N/A		E		1	72	-	1126	1940	1180	95.4%
7/2	N31 East To City Ahead	U	N/A	N/A		В		1	17	-	0	1940	291	0.0%
7/3	N31 East To City Right	U	N/A	N/A		В		1	17	-	84	1940	291	28.9%
8/1	N31 Westbound To City	U	N/A	N/A		-		-	-	-	1163	Inf	Inf	0.0%
8/2	N31 Westbound To City	U	N/A	N/A		-		-	-	-	261	Inf	Inf	0.0%

Full Input Dat	a And Results
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Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)		Turners In Intergree n (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	0	0		0	19.0	15.9	0.0	34.9	-	-	-	-
Temple Site Access Signal Junction	-	-	0	0		0	19.0	15.9	0.0	34.9	-	-	-	-
1/1	615	615	-	-		-	2.3	0.5	-	2.8	16.5	11.6	0.5	12.1
1/2	605	605	-	-		-	2.2	0.5	-	2.8	16.5	11.4	0.5	12.0
1/3	16	16	-	-		-	0.0	0.0	-	0.0	10.9	0.2	0.0	0.2
2/1	64	64	-	-		-	0.8	0.1	-	0.9	52.8	1.9	0.1	2.0
2/2	100	100	-	-		-	1.3	0.2	-	1.5	54.0	3.0	0.2	3.2
3/1	63	63	-	-		-	0.8	0.1	-	0.9	51.8	1.8	0.1	2.0
3/2	261	261	-	-		-	3.7	6.1	-	9.8	135.3	8.6	6.1	14.8
4/1	40	40	-	-		-	0.0	0.0	-	0.0	1.0	0.0	0.0	0.0
5/1	94	94	-	-		-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	671	671	-	-		-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	705	705	-	-		-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	1126	1126	-	-		-	6.9	8.0	-	14.9	47.6	35.0	8.0	43.1
7/2	0	0	-	-		-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/3	84	84	-	-		-	1.1	0.2	-	1.3	54.0	2.5	0.2	2.7
8/1	1163	1163	-	-		-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	261	261	-	-		-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
				C1	PRC f	or Signalled L RC Over All L	anes (%): anes (%):	-7.4 -7.4	-	Total Delay Total I	for Signalled La Delay Over All L	nes (pcuHr): 34.94 anes(pcuHr): 34.95	Cycle Time (s): 12	20

#### Network Results – 2025 PM Peak 500 Apartments

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	79.6%
Temple Site Access Signal Junction	-	-	N/A	-	-		-	-	-	-	-	-	79.6%
1/1	N31 West Out of City Ahead	U	N/A	N/A	С		1	61	-	778	1965	1015	76.6%
1/2	N31 West Out of City Ahead	U	N/A	N/A	с		1	61	-	765	1940	1002	76.3%
1/3	N31 West Out of City Right	U	N/A	N/A	С		1	61	-	46	2065	1067	4.3%
2/1	St Catherines Access Ahead Left	U	N/A	N/A	А		1	28	-	29	1940	469	6.2%
2/2	St Catherines Access Right	U	N/A	N/A	А		1	28	-	61	2080	503	12.1%
3/1	Seapoint Avenue Entry Ahead Left	U	N/A	N/A	В		1	28	-	78	2105	509	15.3%
3/2	Seapoint Avenue Entry Right	U	N/A	N/A	В		1	28	-	338	1800	435	77.7%
4/1	To St Catherines	U	N/A	N/A	-		-	-	-	92	1800	1800	5.1%
5/1	Seapoint Ave Exit	U	N/A	N/A	-		-	-	-	90	Inf	Inf	0.0%
6/1	N31 East out of City	U	N/A	N/A	-		-	-	-	837	Inf	Inf	0.0%
6/2	N31 East out of City	U	N/A	N/A	-		-	-	-	826	Inf	Inf	0.0%
7/1	N31 East To City Left Ahead	U	N/A	N/A	E		1	61	-	798	1940	1002	79.6%
7/2	N31 East To City Ahead	U	N/A	N/A	В		1	28	-	0	1940	469	0.0%
7/3	N31 East To City Right	U	N/A	N/A	В		1	28	-	86	1940	469	18.3%
8/1	N31 Westbound To City	U	N/A	N/A	-		-	-	-	796	Inf	Inf	0.0%
8/2	N31 Westbound To City	U	N/A	N/A	-		-	-	-	338	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	0	0	0	21.9	7.2	0.0	29.1	-	-	-	-
Temple Site Access Signal Junction	-	-	0	0	0	21.9	7.2	0.0	29.1	-	-	-	-
1/1	778	778	-	-	-	5.0	1.6	-	6.6	30.7	20.7	1.6	22.4
1/2	765	765	-	-	-	4.9	1.6	-	6.5	30.6	20.2	1.6	21.8
1/3	46	46	-	-	-	0.2	0.0	-	0.2	16.1	0.8	0.0	0.8
2/1	29	29	-	-	-	0.3	0.0	-	0.3	39.2	0.7	0.0	0.8
2/2	61	61	-	-	-	0.6	0.1	-	0.7	39.6	1.6	0.1	1.6
3/1	78	78	-	-	-	0.8	0.1	-	0.9	40.0	2.0	0.1	2.1
3/2	338	338	-	-	-	4.0	1.7	-	5.7	60.4	10.5	1.7	12.2
4/1	92	92	-	-	-	0.0	0.0	-	0.0	1.1	0.0	0.0	0.0
5/1	90	90	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	837	837	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	826	826	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	798	798	-	-	-	5.3	1.9	-	7.2	32.5	21.7	1.9	23.6
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/3	86	86	-	-	-	0.9	0.1	-	1.0	40.8	2.3	0.1	2.4
8/1	796	796	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	338	338	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
		C1	PRC f P	or Signalled Lanes (%): RC Over All Lanes (%):	13.0 13.0	Total D	Delay for Signalled La otal Delay Over All La	nes (pcuHr): 29.0 anes(pcuHr): 29.0	04 Cyc 07	cle Time (s): 120			

Network Results – 2040 PM Peak 500 Apartments

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	88.6%
Temple Site Access Signal Junction	-	-	N/A	-	-		-	-	-	-	-	-	88.6%
1/1	N31 West Out of City Ahead	U	N/A	N/A	С		1	60	-	878	1965	999	87.9%
1/2	N31 West Out of City Ahead	U	N/A	N/A	с		1	60	-	866	1940	986	87.8%
1/3	N31 West Out of City Right	U	N/A	N/A	С		1	60	-	47	2065	1050	4.5%
2/1	St Catherines Access Ahead Left	U	N/A	N/A	А		1	29	-	30	1940	485	6.2%
2/2	St Catherines Access Right	U	N/A	N/A	А		1	29	-	67	2080	520	12.9%
3/1	Seapoint Avenue Entry Ahead Left	U	N/A	N/A	В		1	29	-	86	2105	526	16.3%
3/2	Seapoint Avenue Entry Right	U	N/A	N/A	В		1	29	-	386	1800	450	85.8%
4/1	To St Catherines	U	N/A	N/A	-		-	-	-	93	1800	1800	5.2%
5/1	Seapoint Ave Exit	U	N/A	N/A	-		-	-	-	102	Inf	Inf	0.0%
6/1	N31 East out of City	U	N/A	N/A	-		-	-	-	945	Inf	Inf	0.0%
6/2	N31 East out of City	U	N/A	N/A	-		-	-	-	933	Inf	Inf	0.0%
7/1	N31 East To City Left Ahead	U	N/A	N/A	E		1	60	-	874	1940	986	88.6%
7/2	N31 East To City Ahead	U	N/A	N/A	В		1	29	-	20	1940	485	4.1%
7/3	N31 East To City Right	U	N/A	N/A	В		1	29	-	98	1940	485	20.2%
8/1	N31 Westbound To City	U	N/A	N/A	-		-	-	-	873	Inf	Inf	0.0%
8/2	N31 Westbound To City	U	N/A	N/A	-		-	-	-	406	Inf	Inf	0.0%

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	0	0	0	26.8	13.7	0.0	40.5	-	-	-	-
Temple Site Access Signal Junction	-	-	0	0	0	26.8	13.7	0.0	40.5	-	-	-	-
1/1	878	878	-	-	-	6.4	3.4	-	9.8	40.3	25.9	3.4	29.3
1/2	866	866	-	-	-	6.3	3.4	-	9.7	40.4	25.5	3.4	28.9
1/3	47	47	-	-	-	0.2	0.0	-	0.2	16.7	0.8	0.0	0.8
2/1	30	30	-	-	-	0.3	0.0	-	0.3	38.3	0.8	0.0	0.8
2/2	67	67	-	-	-	0.6	0.1	-	0.7	38.8	1.7	0.1	1.8
3/1	86	86	-	-	-	0.8	0.1	-	0.9	39.3	2.2	0.1	2.3
3/2	386	386	-	-	-	4.6	2.8	-	7.4	68.8	12.2	2.8	15.0
4/1	93	93	-	-	-	0.0	0.0	-	0.0	1.1	0.0	0.0	0.0
5/1	102	102	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	945	945	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	933	933	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	874	874	-	-	-	6.4	3.7	-	10.1	41.5	26.0	3.7	29.6
7/2	20	20	-	-	-	0.2	0.0	-	0.2	38.0	0.5	0.0	0.5
7/3	98	98	-	-	-	1.0	0.1	-	1.1	40.2	2.6	0.1	2.7
8/1	873	873	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	406	406	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
		C1	PRC f	or Signalled Lanes (%): RC Over All Lanes (%):	1.6 1.6	Total D	Delay for Signalled La otal Delay Over All La	nes (pcuHr): 40. anes(pcuHr): 40.	50 Cyc 52	cle Time (s): 120			



# **APPENDIX F**

# Traffic Surveys, Trip Distribution & Network Traffic Flow Diagrams

(WITH Entire LAP Lands Developed & Included in Assessment)



2020 TO 2025, Factor is; 1.084

2025 TO 2040, Factor is; 1.140



ASSESSMENT WITH LAP LANDS





20/057 Blackrock SHD TA

NRB Consulting Engineers Ltd





**Figure** In Black Boxes Above is the Projected Opening Year Total traffic Flow Through Individual Junctions ASSESSMENT WITH LAP LANDS





Figure In Black Boxes Above is the Total Worst Case % Increase in Traffic Through Individual Junctions Due to the Entire LAP Lands



## PROJECTED 15Yr DESIGN YEAR TRAFFIC FLOWS WEEKDAY AM PEAK HOUR WITH PERMITTED and LAP LANDS DEVELOPMENT

P5 of 10



PROJECTED Traffic Flow Local Network (PCUs) PM Peak Hour (1700-1800H) 2025 - <u>Without Any Development</u> on Subject Site, LAP Lands OR Any Committed Development PROJECTED OPENING/OCCUPATION YEAR TRAFFIC FLOWS WEEKDAY PM PEAK HOUR NO LAP DEVELOPMENT

 Figure
 Total traffic Flow Through Individual Junctions represented by Figure in Black Box

ASSESSMENT WITH LAP LANDS









**Figure** In Black Boxes Above is the Projected Opening Year Total traffic Flow Through Individual Junctions ASSESSMENT WITH LAP LANDS





Figure In Black Boxes Above is the Total Worst Case % Increase in Traffic Through Individual Junctions Due to the Subject Scheme



PROJECTED 15Yr DESIGN YEAR TRAFFIC FLOWS WEEKDAY PM PEAK HOUR WITH PERMITTED & ENTIRE LAP LANDS DEVELOPMENT

P10 of 10



# **APPENDIX G**

### LiNSiG Simulation Model Output Traffic Signal Controlled Junction – Access (With LAP Lands Developed & Included)

#### Access, Summary LiNSiG Results in Order as included herein (Robust & Worst Case - with ALL Permitted AND FULL LAP Development)

Modelled	Network	PRC	Total Delay
Scenario	Saturation %	%	PCUHr
2025 Opening Year PM Peak	84.8	6.1	22.6
2040 Design Year PM Peak	96.7	-7.4	35.84
2025 Opening Year AM Peak	80.4	11.9	29.53
2040 Design Year AM Peak	88.7	1.4	39.98

#### <u>The Selected Opening Year and design year Results Above are below 100% -</u> <u>In this regard, the results are considered acceptable.</u> This is particularly the case in circumstances where sustainable policies will have an increasing effect in <u>reducing car based traffic at peak commuter hours.</u>

**NB** Any Small Changes to Selected Opening Year 2025 or Design Year 2040 will have no significant implications in terms of the conclusions of the Study, due to the low background <u>Network Traffic Growth</u>

# Full Input Data And Results SITE ACCESS JUNCTION – LINSIG OUTPUT

#### **User and Project Details**

Project:	Full LAP Lands Developed - Temple Rd			
Title:	Temple Rd SHD			
Location:	20-057 Calculations Folder			
File name:	Site Access LAP.lsg3x			
Author:	ER			
Company:	NRB Consulting Engineers Ltd.,			
Address:	Apollo Building, Dundrum Rd., Dublin 14			
Notes:	AM 2025 & 2040 PM 2025 & 2040			

# Network Layout Diagram



# Phase Diagram



# Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
А	Traffic		7	7
В	Traffic		7	7
С	Traffic		7	7
D	Pedestrian		10	10
E	Traffic		7	7

### Phase Intergreens Matrix

	Starting Phase							
		А	В	С	D	Е		
	А		-	7	7	7		
Terminating	В	-		7	7	7		
Phase	С	7	7		7	-		
	D	7	7	7		7		
	Е	7	7	-	7			

# Phases in Stage

Stage No.	Phases in Stage
1	AB
2	CE
3	С
4	D
### Full Input Data And Results



### Phase Delays

Term. Stage	Start Stage	Phase	Туре	Value	Cont value
	There are no	Phase D	elays d	efined	

### **Prohibited Stage Change**

		То	Sta	ige	
		1	2	3	4
	1		7	7	7
From Stage	2	7		0	7
U	3	7	2		7
	4	7	7	7	

# Full Input Data And Results Lane Input Data

Iunction: Temple Site Access Signal Junction													
Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)	
1/1 (N31 West Out of City)	U	С	2	3	12.2	Geom	-	3.50	0.00	Y	Arm 6 Ahead	Inf	
1/2 (N31 West Out of City)	U	С	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 6 Ahead	Inf	
1/3 (N31 West Out of City)	U	С	2	3	5.2	Geom	-	3.10	0.00	Ν	Arm 4 Right	Inf	
2/1		۸	2	з	60.0	Geom		3.25	0.00	v	Arm 5 Ahead	Inf	
(St Catherines Access)	0	~	۷	5	00.0	Geom		0.20	0.00	1	Arm 8 Left	Inf	
2/2 (St Catherines Access)	U	А	2	3	60.0	Geom	-	3.25	0.00	Ν	Arm 6 Right	Inf	
3/1		в	2	ç	60.0	Geom	_	3 50	0.00	N	Arm 4 Ahead	Inf	
(Seapoint Avenue Entry)	0		2	0	00.0	Geom		0.00	0.00		Arm 6 Left	Inf	
3/2 (Seapoint Avenue Entry)	U	В	2	3	60.0	User	1800	-	-	-	_	-	
4/1 (To St Catherines)	U		2	3	60.0	User	1800	-	-	-	-	-	
5/1 (Seapoint Ave Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-	
6/1 (N31 East out of City)	U		2	3	60.0	Inf	-	-	-	-	-	-	
6/2 (N31 East out of City)	U		2	3	60.0	Inf	-	-	-	-	-	-	
7/1		F	2	З	60.0	Geom		3.25	0.00	v	Arm 4 Left	Inf	
(N31 East To City)	0		2	5	00.0	Geom	_	0.20	0.00		Arm 8 Ahead	Inf	
7/2 (N31 East To City)	U	В	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 8 Ahead	Inf	
7/3 (N31 East To City)	U	В	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 5 Right	Inf	

### Full Input Data And Results

8/1 (N31 Westbound To City)	U	2	3	60.0	Inf	-	-	-	-	-	-
8/2 (N31 Westbound To City)	U	2	3	60.0	Inf	-	-	-	-	-	-

### Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2025 AM Peak Full LAP Lands'	08:00	09:00	01:00	

 Scenario 1: 'Scenario' (FG1: '2025 AM Peak Full LAP Lands', Plan 1: 'Signal Plan No. 1')

 Stage Sequence Diagram

 1
 Min: 7
 2
 Min: 7
 3
 Min: 0
 4
 Min: 10



### Stage Timings

Stage	1	2	3	4
Duration	17	72	0	10
Change Point	0	24	103	103

### Full Input Data And Results

### Signal Timings Diagram



### Network Results - 2025 AM Peak Full LAP Lands Developed

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	84.8%
Temple Site Access Signal Junction	-	-	N/A	-	-		-	-	-	-	-	-	84.8%
1/1	N31 West Out of City Ahead	U	N/A	N/A	С		1	72	-	541	1965	1195	45.3%
1/2	N31 West Out of City Ahead	U	N/A	N/A	с		1	72	-	532	1940	1180	45.1%
1/3	N31 West Out of City Right	U	N/A	N/A	С		1	72	-	21	2065	1256	1.7%
2/1	St Catherines Access Ahead Left	U	N/A	N/A	А		1	17	-	67	1940	291	23.0%
2/2	St Catherines Access Right	U	N/A	N/A	А		1	17	-	104	2080	312	33.3%
3/1	Seapoint Avenue Entry Ahead Left	U	N/A	N/A	В		1	17	-	57	2105	316	18.1%
3/2	Seapoint Avenue Entry Right	U	N/A	N/A	В		1	17	-	229	1800	270	84.8%
4/1	To St Catherines	U	N/A	N/A	-		-	-	-	48	1800	1800	2.7%
5/1	Seapoint Ave Exit	U	N/A	N/A	-		-	-	-	87	Inf	Inf	0.0%
6/1	N31 East out of City	U	N/A	N/A	-		-	-	-	590	Inf	Inf	0.0%
6/2	N31 East out of City	U	N/A	N/A	-		-	-	-	636	Inf	Inf	0.0%
7/1	N31 East To City Left Ahead	U	N/A	N/A	E		1	72	-	995	1940	1180	84.3%
7/2	N31 East To City Ahead	U	N/A	N/A	В		1	17	-	0	1940	291	0.0%
7/3	N31 East To City Right	U	N/A	N/A	В		1	17	-	74	1940	291	25.4%
8/1	N31 Westbound To City	U	N/A	N/A	-		-	-	-	1030	Inf	Inf	0.0%
8/2	N31 Westbound To City	U	N/A	N/A	-		-	-	-	229	Inf	Inf	0.0%

### Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	0	0	0	16.0	6.6	0.0	22.6	-	-	-	-
Temple Site Access Signal Junction	-	-	0	0	0	16.0	6.6	0.0	22.6	-	-	-	
1/1	541	541	-	-	-	1.9	0.4	-	2.3	15.4	9.6	0.4	10.0
1/2	532	532	-	-	-	1.9	0.4	-	2.3	15.5	9.5	0.4	9.9
1/3	21	21	-	-	-	0.1	0.0	-	0.1	10.9	0.3	0.0	0.3
2/1	67	67	-	-	-	0.8	0.1	-	1.0	53.0	2.0	0.1	2.1
2/2	104	104	-	-	-	1.3	0.2	-	1.6	54.3	3.1	0.2	3.3
3/1	57	57	-	-	-	0.7	0.1	-	0.8	51.5	1.6	0.1	1.8
3/2	229	229	-	-	-	3.2	2.5	-	5.6	88.8	7.4	2.5	9.9
4/1	48	48	-	-	-	0.0	0.0	-	0.0	1.0	0.0	0.0	0.0
5/1	87	87	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	590	590	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	636	636	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	995	995	-	-	-	5.2	2.6	-	7.8	28.4	26.5	2.6	29.1
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/3	74	74	-	-	-	0.9	0.2	-	1.1	53.4	2.2	0.2	2.3
8/1	1030	1030	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	229	229	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
		C1	PRC 1 P	or Signalled Lanes (%): RC Over All Lanes (%):	6.1 6.1	Total E T	Delay for Signalled La otal Delay Over All La	nes (pcuHr): 22.6 anes(pcuHr): 22.6	2 Cy 3	cle Time (s): 120			

### Network Results - 2040 AM Peak Full LAP Lands Developed

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	96.7%
Temple Site Access Signal Junction	-	-	N/A	-	-		-	-	-	-	-	-	96.7%
1/1	N31 West Out of City Ahead	U	N/A	N/A	С		1	72	-	615	1965	1195	51.4%
1/2	N31 West Out of City Ahead	U	N/A	N/A	с		1	72	-	605	1940	1180	51.3%
1/3	N31 West Out of City Right	U	N/A	N/A	С		1	72	-	21	2065	1256	1.7%
2/1	St Catherines Access Ahead Left	U	N/A	N/A	А		1	17	-	82	1940	291	28.2%
2/2	St Catherines Access Right	U	N/A	N/A	А		1	17	-	112	2080	312	35.9%
3/1	Seapoint Avenue Entry Ahead Left	U	N/A	N/A	В		1	17	-	65	2105	316	20.6%
3/2	Seapoint Avenue Entry Right	U	N/A	N/A	В		1	17	-	261	1800	270	96.7%
4/1	To St Catherines	U	N/A	N/A	-		-	-	-	50	1800	1800	2.8%
5/1	Seapoint Ave Exit	U	N/A	N/A	-		-	-	-	97	Inf	Inf	0.0%
6/1	N31 East out of City	U	N/A	N/A	-		-	-	-	671	Inf	Inf	0.0%
6/2	N31 East out of City	U	N/A	N/A	-		-	-	-	717	Inf	Inf	0.0%
7/1	N31 East To City Left Ahead	U	N/A	N/A	E		1	72	-	1129	1940	1180	95.7%
7/2	N31 East To City Ahead	U	N/A	N/A	В		1	17	-	0	1940	291	0.0%
7/3	N31 East To City Right	U	N/A	N/A	В		1	17	-	84	1940	291	28.9%
8/1	N31 Westbound To City	U	N/A	N/A	-		-	-	-	1178	Inf	Inf	0.0%
8/2	N31 Westbound To City	U	N/A	N/A	-		-	-	-	261	Inf	Inf	0.0%

### Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	0	0	0	19.5	16.3	0.0	35.8	-	-	-	-
Temple Site Access Signal Junction	-	-	0	0	0	19.5	16.3	0.0	35.8	-	-	-	-
1/1	615	615	-	-	-	2.3	0.5	-	2.8	16.5	11.6	0.5	12.1
1/2	605	605	-	-	-	2.2	0.5	-	2.8	16.5	11.4	0.5	12.0
1/3	21	21	-	-	-	0.1	0.0	-	0.1	10.9	0.3	0.0	0.3
2/1	82	82	-	-	-	1.0	0.2	-	1.2	53.9	2.4	0.2	2.6
2/2	112	112	-	-	-	1.4	0.3	-	1.7	54.8	3.3	0.3	3.6
3/1	65	65	-	-	-	0.8	0.1	-	0.9	51.9	1.9	0.1	2.0
3/2	261	261	-	-	-	3.7	6.1	-	9.8	135.3	8.6	6.1	14.8
4/1	50	50	-	-	-	0.0	0.0	-	0.0	1.0	0.0	0.0	0.0
5/1	97	97	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	671	671	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	717	717	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	1129	1129	-	-	-	6.9	8.3	-	15.2	48.6	35.1	8.3	43.4
7/2	0	0	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/3	84	84	-	-	-	1.1	0.2	-	1.3	54.0	2.5	0.2	2.7
8/1	1178	1178	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	261	261	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
		C1	PRC	for Signalled Lanes (%): PRC Over All Lanes (%):	-7.4 -7.4	Total	Delay for Signalled I Total Delay Over All	Lanes (pcuHr): 3 Lanes(pcuHr): 3	5.83 5.84	Cycle Time (s): 1	20		

Full Input Data And Results



### Network Results - 2025 PM Peak Full LAP Lands Developed

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	80.4%
Temple Site Access Signal Junction	-	-	N/A	-	-		-	-	-	-	-	-	80.4%
1/1	N31 West Out of City Ahead	U	N/A	N/A	с		1	61	-	778	1965	1015	76.6%
1/2	N31 West Out of City Ahead	U	N/A	N/A	с		1	61	-	765	1940	1002	76.3%
1/3	N31 West Out of City Right	U	N/A	N/A	с		1	61	-	60	2065	1067	5.6%
2/1	St Catherines Access Ahead Left	U	N/A	N/A	А		1	28	-	37	1940	469	7.9%
2/2	St Catherines Access Right	U	N/A	N/A	А		1	28	-	66	2080	503	13.1%
3/1	Seapoint Avenue Entry Ahead Left	U	N/A	N/A	В		1	28	-	83	2105	509	16.3%
3/2	Seapoint Avenue Entry Right	U	N/A	N/A	В		1	28	-	338	1800	435	77.7%
4/1	To St Catherines	U	N/A	N/A	-		-	-	-	119	1800	1800	6.6%
5/1	Seapoint Ave Exit	U	N/A	N/A	-		-	-	-	91	Inf	Inf	0.0%
6/1	N31 East out of City	U	N/A	N/A	-		-	-	-	837	Inf	Inf	0.0%
6/2	N31 East out of City	U	N/A	N/A	-		-	-	-	831	Inf	Inf	0.0%
7/1	N31 East To City Left Ahead	U	N/A	N/A	E		1	61	-	806	1940	1002	80.4%
7/2	N31 East To City Ahead	U	N/A	N/A	В		1	28	-	0	1940	469	0.0%
7/3	N31 East To City Right	U	N/A	N/A	В		1	28	-	86	1940	469	18.3%
8/1	N31 Westbound To City	U	N/A	N/A	-		-	-	-	803	Inf	Inf	0.0%
8/2	N31 Westbound To City	U	N/A	N/A	-		-	-	-	338	Inf	Inf	0.0%

### Network Results - 2040 PM Peak Full LAP Lands Developed

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network	-	-	N/A	-	-		-	-	-	-	-	-	88.7%
Temple Site Access Signal Junction	-	-	N/A	-	-		-	-	-	-	-	-	88.7%
1/1	N31 West Out of City Ahead	U	N/A	N/A	С		1	61	-	878	1965	1015	86.5%
1/2	N31 West Out of City Ahead	U	N/A	N/A	С		1	61	-	866	1940	1002	86.4%
1/3	N31 West Out of City Right	U	N/A	N/A	С		1	61	-	60	2065	1067	5.6%
2/1	St Catherines Access Ahead Left	U	N/A	N/A	А		1	28	-	37	1940	469	7.9%
2/2	St Catherines Access Right	U	N/A	N/A	А		1	28	-	72	2080	503	14.3%
3/1	Seapoint Avenue Entry Ahead Left	U	N/A	N/A	В		1	28	-	91	2105	509	17.9%
3/2	Seapoint Avenue Entry Right	U	N/A	N/A	В		1	28	-	386	1800	435	88.7%
4/1	To St Catherines	U	N/A	N/A	-		-	-	-	119	1800	1800	6.6%
5/1	Seapoint Ave Exit	U	N/A	N/A	-		-	-	-	103	Inf	Inf	0.0%
6/1	N31 East out of City	U	N/A	N/A	-		-	-	-	945	Inf	Inf	0.0%
6/2	N31 East out of City	U	N/A	N/A	-		-	-	-	938	Inf	Inf	0.0%
7/1	N31 East To City Left Ahead	U	N/A	N/A	E		1	61	-	876	1940	1002	87.4%
7/2	N31 East To City Ahead	U	N/A	N/A	В		1	28	-	26	1940	469	5.5%
7/3	N31 East To City Right	U	N/A	N/A	В		1	28	-	98	1940	469	20.9%

Full Input Dat	a And Results		i.					1		i	i	i.	i
8/1	N31 Westbound To City	U	N/A	N/A	-		-	-	-	873	Inf	Inf	0.0%
8/2	N31 Westbound To City	U	N/A	N/A	-		-	-	-	412	Inf	Inf	0.0%
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	-	-	0	0	0	26.7	13.3	0.0	40.0	-	-	-	-
Temple Site Access Signal Junction	-	-	0	0	0	26.7	13.3	0.0	40.0	-	-	-	-
1/1	878	878	-	-	-	6.2	3.1	-	9.2	37.9	25.4	3.1	28.4
1/2	866	866	-	-	-	6.1	3.0	-	9.1	38.0	25.0	3.0	28.1
1/3	60	60	-	-	-	0.2	0.0	-	0.3	16.3	1.0	0.0	1.0
2/1	37	37	-	-	-	0.4	0.0	-	0.4	39.4	0.9	0.0	1.0
2/2	72	72	-	-	-	0.7	0.1	-	0.8	39.9	1.9	0.1	2.0
3/1	91	91	-	-	-	0.9	0.1	-	1.0	40.4	2.4	0.1	2.5
3/2	386	386	-	-	-	4.7	3.5	-	8.2	76.1	12.3	3.5	15.8
4/1	119	119	-	-	-	0.0	0.0	-	0.0	1.1	0.0	0.0	0.0
5/1	103	103	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	945	945	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/2	938	938	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	876	876	-	-	-	6.2	3.3	-	9.5	39.1	25.5	3.3	28.8
7/2	26	26	-	-	-	0.3	0.0	-	0.3	39.1	0.7	0.0	0.7
7/3	98	98	-	-	-	1.0	0.1	-	1.1	41.2	2.6	0.1	2.7
8/1	873	873	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/2	412	412	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
		C1	PRC for S PRC C	Signalled Lanes (%): Over All Lanes (%):	1.4 1.4	Total Delay for Total Dela	Signalled Lanes ( ay Over All Lanes)	(pcuHr): 39.95 (pcuHr): 39.98	Cycle	Time (s): 120			



### **APPENDIX H**

Preliminary Travel Plan (aka Mobility Management Plan)

# consulting engineers



Preliminary Travel Plan (Appendix H)

for

Proposed Residential Development on Lands

At

Temple Hill, Monkstown, Blackrock, Co Dublin.

SUBMISSION ISSUE

1st Floor, Apollo Building, Dundrum Road, Dundrum, Dublin 14 Tel: +353 1 292 1941, E-mail: info@nrb.ie, Web: <u>www.nrb.ie</u>

Registered in Ireland No. 491679

### Contents

Page	Section	Description
2	1.0	Introduction
4	2.0	Access to the Site
10	3.0	Baseline Information
11	4.0	The Mobility Management Plan
17	5.0	Implementing the Plan
19	6.0	Monitoring and Review

### Appendices

Α	DLRCC Cycle Network Mapping (from DLRCC Website)
В	Bus Connects Route 15 (Blackrock/Mount Merrion)

### 1.0 INTRODUCTION

1.1 NRB Consulting Engineers have been commissioned to prepare a Preliminary Travel Plan in support of a new application for the redevelopment of lands at Temple Hill, Monkstown, Blackrock, Co Dublin, in order to explain the applicants commitment to the promotion of more sustainable and cost effective travel habits among the end occupiers/residents of the scheme.

### What is a Travel Plan?

- 1.2 Originally and elsewhere called Mobility Management Plans (MMPs), they originated in the United States and the Netherlands in the late 1980s. In the US, employers over a certain size (generally over 100 employees) were required to implement 'Trip Reduction Plans' in order to reduce singleoccupancy car commuting trips, and to increase car occupancy.
- 1.3 A MMP or Travel Plan (TP) consists of a package of measures put in place by an organisation to encourage and support more sustainable travel patterns among staff and other visitors. Such a plan usually concentrates on staff commuting patterns. In essence, a TP is useful not only to reduce the attractiveness of private car use, but also for the ability to promote and support the use of more sustainable transport modes such as walking, cycling, shared transport and mass transit such as buses and trains.

### Aims and Objectives of this Travel Plan

- 1.4 The package generally includes measures to promote and improve the attractiveness of using public transport, cycling, walking, car sharing, flexible working or a combination of these as alternatives to single-occupancy car journeys to work. A TP can consider all travel associated with the work site, including business travel, fleet management, customer access and deliveries. It should be considered as a dynamic process where a package of measures and campaigns are identified, piloted and monitored on an on-going basis. This MMP recognises the fact that, for some employees, car use is often essential as part of the home to work commute, as the work commute is often combined with other important trips, for example having to drop children to school or crèche on the way.
- 1.5 Travel Planning is not inherently anti-car. Instead its primary goal is to initiate small but consistent changes in our overall approach to car use.
- 1.6 The changes which are being sought as part of any plan may be as simple as car sharing one-day per week, or walking on Wednesdays, or taking the bus on days which do not conflict with other commitments, leisure or work activities.
- 1.7 It is envisaged that once in place, the Travel Plan will enable the following benefits to be realised for the Development:

- Reduced residential car parking demand and reduced congestion on the local road network due to lower demand for private transport and/or more efficient use of private motor vehicles,
- Improved safety for cyclists and pedestrians,
- Direct financial savings for those taking part in the developed initiatives, through higher than average vehicle occupancy rates,
- A reduction in car parking and car set-down demand, resulting in improved operational efficiency and safety for all,
- Improved social networking between all those participating in the shared initiatives,
- Improved environmental consideration and performance,
- Improved public image for the development, which sets an example to the broader community and may lead to residents making better travel decisions in the future,
- Improved health and well-being for those using active non-car transport modes,
- On-going liaison with the Local Authority and public transport providers to maintain, improve, and support transportation services to and from the site,
- Improved attractiveness of the development to prospective residents,
- Optimal levels of safety for all staff and visitors.

### Methodology

- 1.8 As part of this Travel Plan, reference has been made to the following documents:
  - Your Step By Step Guide To Travel Plans (NTA 2012);
  - Achieving Effective Workplace Travel Plans (NTA 2011);
  - Traffic and Transport Assessment Guidelines (NRA);
  - Traffic Management Guidelines (DoELG, 2003);
  - Mobility Management Plans DTO Advice Note (DTO, 2002);
  - The Route to Sustainable Commuting (DTO 2001);
  - Smarter Travel: A Sustainable Transport Future (DOT)
- 1.9 Consultation with key stakeholders is an essential part of any Travel plan. As discussed below, as part of the operational phase of this development, a Travel Plan Coordinator Role will be appointed from with the Management Company. Following on, once occupied, Residents will be asked to complete detailed questionnaires on essential data in relation to their existing travel patterns. This information will be used to inform the ongoing implementation, monitoring and review of the plan for this development.
- 1.10 This information has been used herein as the basis for the assessment, conclusions and recommendations.

### 2.0 ACCESS TO THE SITE

2.1 The development consists of the construction of a 493 Unit Residential Apartment Development on lands in the heart of Blackrock, within easy walking distance of Dublin Bus Stops and Seapoint/Blackrock Rail / Dart Stations. A location plan is shown below as Figure 2.1.



Figure 2.1 – Site Location Map

- 2.2 The proposed Residential Development is of the highest quality with attractive living and leisure spaces incorporated into the Masterplan.
- 2.3 It is essential for the successful Travel Planning to concentrate on journeys associated with work and school commuting patterns. These are the groups which can most practically be encouraged to use modes of transport other than the car.
- 2.4 Notwithstanding this, the development is located in the heart of Blackrock and is in very close proximity to the range of public and alternative transport services in Blackrock.

### **Cycling and Walking Facilities**

2.5 At present, pedestrian/cycle traffic at/to the existing site is served by an extensive network of recently upgraded footpaths and cycle lanes. The development includes sensible and simple at grade links to these facilities which are immediately adjacent the development.

- 2.6 The key to cycle accessibility is convenient safe links, with secure and carefully sited cycle parking. Cycling is ideal for shorter journeys. Dún Laoghaire-Rathdown County Council (DLR) have developed their Cycle Policy. A significant amount of work has been carried out in the provision of facilities for Cyclists in DLR (more that 200km of cycle facilities has been provided to date). Details of the Current DLRCC Cycle Network is shown on mapping included as **Appendix A**.
- 2.7 The DLRCC vision is to cultivate a cycling culture, through the implementation of appropriate infrastructure and promotional measures, which positively encourages all members of the community to cycle at all life stages and abilities as a mode of sustainable transport that delivers environmental, health and economic benefits to both the individual and the community.
- 2.8 To help meet the target set in Ireland's first National Cycle Policy Framework launched in April 2009 (that 10% of all journeys will be by bike by 2020), DLRCC stated their intention to do the following:
  - Improve cycling conditions on primary cycle routes in the County as per the County Cycle Network;
  - Develop new cycle route/ greenways through parks and open spaces;
  - Improve connectivity/permeability from cycle routes to key destinations
  - Provide 30kph zones within residential areas and other suitable locations;
  - Provide new secure cycle parking;
  - Continue cycle training in schools;
  - Ensure that cycling is a key element of all development; and
  - Monitor trends in cycle number using cycle counter data.
- 2.9 The DLRCC Cycling Policy outlines the various objectives and actions to be carried out in line with the 19 specific objectives in the National Cycle Policy Framework. The proposed residential development on the subject site, through good design, will assist in the promotion of cycling as a primary mode of travel.
- 2.10 For journeys greater than 8km, it is recognised that a modal shift to cycling could be achievable for some, but not all, and options such as public transport and car sharing should be considered. Journeys up to 8km could be undertaken by bicycle and journeys up to 3-4km could be undertaken by walking or cycling.

### **Cycle Parking**

2.11 It is expected that a significant number of residents will be willing to cycle to work or school, if safe links and secure parking are in place, and that is reflected in the provision of a total of 1056 new dedicated cycle parking spaces, a number which is over and above the DLR Cycle Policy requirements and in line with new national Design Standards for Apartments. Once occupied, advice can be provided on routes by the appointed Travel Plan Coordinator, possibly with the help of a bicycle user group. This can be further facilitated in consultation with the DLR Unit, as the ongoing provision of cycle facilities is fully implemented.

2.12 It is acknowledged that cyclists need to be confident that their cycles will not be tampered with while they are in storage. With this in mind, it is proposed to install the cycle parking will be in prominent and visible locations with racks which allow both frame and wheels to be secured. These cycle racks are located in an active, well lit & security monitored place or where they can be seen by a security guard, either directly, or by closed circuit television. Within the basement, the arriving and departing cyclists will be required to dismount and walk to the cycle racks with their cycles in a safe manner (something which occurs without any difficulty at similar facilities in cities throughout the world).

### **Bus & Rail Provision**

- 2.13 The proposed development is located within the heart of Blackrock and is well placed to take advantage of the existing Dublin Bus services, with several stops in close proximity to the site along the site frontage with Temple Hill (N31).
- 2.14 The development is currently very well serviced by a number of frequent Dublin Bus services along with other services such as Bus Éireann and Aircoach. There are currently bus lanes on many of the approach roads to Blackrock. Real time information is available at the nearby Dublin Bus Stops, and information is available through the use of Bus Passenger Apps for Mobile Phones.
- 2.15 The new Bus Connects Network Changes were recently announced and this network included a very significant improvement in the service for Blackrock, with original Bus Connects Route 15 passing the site. An extract including the plan for Route 15 is included herein as Appendix B. An extract showing the site in context is included below as Figure 2.1



Figure 2.1 – Extract Bus Connects Route 15 Showing Site

- 2.16 All of the Dublin Bus routes currently passing the development are operated using new low-floor wheelchair accessible city buses. Detail of route, timetable and fares are provided on <u>www.dublinbus.ie</u>, on the Dublin Bus App, and on the Transport for Ireland National Journey Planner App.
- 2.17 The site is also within easy walking commuting distance of both Seapoint and Blackrock Dart & Train Station, (Seapoint being within 550m of the site). This represents an easy 6-7 minute walk time for commuting workers who chose to use the Dart and / or the train, using existing services making this a very accessible development by rail. The route is illustrated below as *Figure 2.2*



Figure 2.2 - Seapoint Dart Walk Distance

- 2.18 In terms of number of routes of trains and buses easily available to Residents, it is considered that the proposed development is very highly sustainable indeed in terms of public transport accessibility. The proximity of the development to existing public transport services means that all residents will have viable alternatives to the private car for accessing the site and will not be reliant upon the car as a primary mode of travel.
- 2.19 Direct and high quality pedestrian linkages are provided between the site and the existing pedestrian facilities on the surrounding road network. The entrances to the site will be well lit, so that people can feel secure in using the facilities.
- 2.20 Public transport maps and timetables can be provided in prominent locations on site and the information will be kept up to date by the appointed Travel Plan Coordinator, a role for the Management Company.

- 2.21 Working Residents are generally now offered the opportunity to purchase public transport commuter tickets under the current 'Employer Pass' and 'TaxSaver' programmes, by individual Employers. Under these schemes the employer applies to larnród Éireann / Bus Éireann for tax free public transport tickets for their employees as an incentive for them to use public transport to travel to work.
- 2.22 With this in mind, the main focus of this Travel Plan will be to promote and support the use of alternative modes to the private car.

### Car Parking

- 2.23 The proposal includes 252 new parking spaces for the residential elements of the development, representing just 0.51 car parking spaces per residential apartment. This reduced number of car parking spaces reflects the Blackrock Urban location of the development, it's easy accessibility via public transport and the desire to encourage modal shift through an effective travel demand management measures.
- 2.24 Dedicated parking is also provided to cater for mobility impaired users, in line with appropriate guidance. The requirement for Mobility Impaired Spaces will be monitored and can easily be adjusted in the event that the Residential Profile requires more spaces.
- 2.25 If considered appropriate, as part of a working MMP, priority parking spaces could in future be allocated to car-sharing workers when they travel together, with car share parking spaces provided. If appropriate, this allocation could be some of the most accessible spaces and would be clearly visible to other car park users. We believe that an allocation of 6 spaces would be appropriate.
- 2.26 A total of 50 EV charging spaces are shown distributed around the site, being c10% of the total number of spaces. Notwithstanding, all of the car parking spaces can easily be upgraded to allow conversion for Electric Vehicles. Whilst DLRCC Development Plan defines the % of Charge Spaces to be provided, and the design includes for these dedicated spaces as per the Development Plan. In the case of a large residential development of the nature proposed, with specific spaces likely dedicated to specific apartments, it is considered appropriate to also facilitate the retrofitting of spaces, based on demand following occupation, rather than dedicated electric charge spaces being dedicated to apartments and provided from the outset. The entire car park of the subject scheme can therefore be ducted to accept future cabling to serve a charging point for every car space as demanded. Within the basement area, conduits will be run on the walls where charging points can also be mounted. Where residents request a charging point to be installed, the relevant charging point can be pre-wired back to their home electricity meter in the designated meter location. The socket point will have a lockable cover on it so that only that resident may use the power point. This provision around the parking area allows future charging points to be installed at any of the car parking spaces with minimum works as and when required.

### **DLR Proposals**

- 2.27 Within the *DLR Development Plan 2016-2022*, the Council acknowledges that making provision for walking and cycling within an overall integrated transportation strategy is critical to the success of the strategy providing for safe routes to school, places of employment, the town centre and key connections to public transport and local services. Given the compact urban form of Dublin, there is huge potential for a modal change from the private car.
- 2.28 The location of relatively dense residential development on a site of this nature provides a critical mass of public transport users that affect the commercial viability of services in a positive way. The transportation network proposed for Dublin is based on linking primary attractions within Dún Laoghaire-Rathdown. This has been taken into account when assessing the accessibility options for the proposed development.

### 3.0 COLLECTION OF BASELINE INFORMATION

### **Possible Travel Pattern Questionnaires**

- 3.1 Once occupied, and when the Travel Plan Coordinator is appointed, the occupiers of the proposed development will be encouraged to continually monitor the Travel Plan initiatives in order to maximise on their success.
- 3.2 Shortly after occupation of the new development, a detailed travel-questionnaire will likely be complied and distributed to Residents for completion. The aim of the travel questionnaire will be to establish travel patterns between work and home and school travel demand. The information gathered from this survey will be used to inform the further development of the Travel Plan.
- 3.3 The Baseline Survey information will also allow the Travel Plan Coordinator for the development to set realistic modal-split targets for the development.
- 3.4 It is anticipated that, given the town centre location and good transport links at this development, there will be a high percentage of use via public transport. The Travel Plan will need to maintain this positive modal split and improve it, where possible. It is informative to note that the "Smarter Travel: A Sustainable Transport Future" (DOT) Objective for 2020 is to achieve a reduced work related commuting by car modal share of 65% to 45%.
- 3.5 The Travel Plan is not seeking a radical change in terms of a modal shift; it is recognised that the use of the car is often essential for many users. Instead, the Plan seeks small but consistent increments of change in our approach to, and the use of, alternatives to the car.

### 4.0 THE TRAVEL PLAN

- 4.1 The successful implementation of a Travel Plan will ensure that, in-so-far-as-possible, the impacts of this traffic are reduced and minimised where practical, while providing a number of environmental and economic advantages detailed in Section 1 and Section 4 below.
- 4.2 The following sub-sections detail the available initiatives which will serve to better manage travel demand, and therefore the traffic impact of work-related journeys, focused on the movement of staff during peak times.

Walking - Key Information	
Approx Zone of Influence	3.5km
Percentage of Residents working in area of influence	TBC in each survey when occupied
Percentage of Residents interested in Walking	TBC in each survey when occupied

### Walking

### Table 4 – Key Information: Walking

- 4.4 There are many local, global, and personal benefits to walking to work, a few of which are listed following:
  - <u>W</u> Wake Up! Studies have shown that people who walk to work are more awake and find it easier to concentrate.
  - <u>A</u> Always one step ahead Walking makes people more aware of road safety issues and helps them develop stronger personal safety skills.
  - <u>L</u> Less congestion If you leave the car at home and walk, there are fewer cars on the road which makes it safer for those who walk and cycle.
  - <u>K</u> Kinder to the environment By leaving the car at home you are reducing the amount of CO 2 produced and helping to reduce the effects of climate change and air pollution.
  - <u>I</u> Interpersonal skills Walking to work or school can be a great way to meet other walkers, share the experience, and develop personal skills.
  - <u>N</u> New adventures Walking to work or school is a great way to learn about your local environment and community. It's also a fun way to learn about the weather, landscape, and local ecosystems.
  - <u>**G**</u> Get fit and stay active Walking to and from work or school helps people incorporate physical activity into their daily routines. Research shows that regular physical activity can benefit your body and mind.

- 4.5 Most adults will consider walking a maximum of 3.5 km (Approx 30/40 minutes) to work. Residents working within a 3.5 km radius of the site will be encouraged to walk to work as often as their schedule permits. Similarly school trips can be encouraged on foot.
- 4.6 The following initiatives and incentives will be used to encourage walking to work or school:
  - Take part in a 'Pedometer Challenge' which is organised through the Irish Heart Foundation or Smarter Travel Workplaces;
  - Organise special events such as a 'Walk to work/school on Wednesdays' where participants are rewarded for their participation;
  - Keep umbrellas in public areas on a deposit system for use when raining;
  - Display Smarter Travel Workplaces Accessibility Walking maps on notice boards areas so Residents can plan journeys;
  - Organise lunch time or afternoon walks as part of a health and well-being programme;
  - Highlight the direct savings gained due to reduced use of private vehicles.

### Cycling

Cycling – Key Information	
Approx. zone of influence	10km
Percentage of Residents Surveyed known to Work within the area of influence	TBC in each survey when occupied
Percentage of Residents interested in cycling	TBC in each survey when occupied

### Table 5: Key Information - Cycling

- 4.7 Research suggests that cycling is a viable mode of transport for people who live up to 10 km from work or school.
- 4.8 Cycling is a great way to travel. It helps foster independence, raises awareness of road safety, and helps the environment.
- 4.9 Some positive aspects of cycling to work or school are listed following:
  - <u>C</u> Cycling is fun! Cycling is a great form of transport but it's also a great recreational activity. Cycling is a skill that stays with you for life and it's a fantastic way to explore your local community.
  - <u>Y</u> You save time & money cycling to work reduces the need to travel by car thus reducing fuel costs and freeing up road space for more cyclists;
  - <u>C</u> Confidence building travelling to work as an independent cyclist can give people

increased confidence proving beneficial in all aspects of life;

- <u>L</u> Less congestion If you leave the car at home and cycle to work there are fewer cars on the road which makes it safer for those who cycle and walk to work or school;
- <u>I</u> Interpersonal skills Cycling to work or to school can be a great way to meet other cyclists and share the experience;
- <u>N</u> New adventures Cycling to work or school is a great way to learn about your local environment and community. It helps people to understand where they live and how their actions affect their local environment;
- <u>**G**</u> Get fit and stay active cycling to and from work or school helps people incorporate physical activity into their daily routines. Research shows that regular physical activity can benefit your body and mind.
- 4.10 The provision of enhanced and attractive cycle parking facilities at the site will clearly play a critical role in promoting journeys by bicycle.
- 4.11 The following initiatives and incentives will be used to encourage cycling to work and school:
  - New cycle parking installed within the development, secure and well lit;
  - It will publicise cycle parking availability by way of signage and on notice boards;
  - It will display maps on notice boards areas so people can plan journeys;
  - The development can provide free cycle accessories (panniers, lights, visi-vests, helmets) in periodic draws for cyclists,
  - The Travel Plan Coordinator can organise cycle training sessions on site on the rules of the road and the specific risks associated with the locality;
  - The Travel Plan Coordinator can invite bike suppliers on site for a 'Green Day' or 'Green Week' so that people can try bikes before buying;
  - The Travel Plan Coordinator can set up a Bicycle User Group (BUG) to promote cycling;
  - The Travel Plan Coordinator can highlight the direct savings gained due to reduced use of private vehicles;
  - The Travel Plan Coordinator can encourage residents to take part in National Bike Week, see <u>www.bikeweek.ie</u>.

### Public Transport

Public Transport – Key Information	
Approx. zone of influence	All Residents
Percentage of Residents in area of influence	100%
Percentage of Residents using Public Transport	TBC in each survey when occupied

### Table 6: Key Information: Public Transport

- 4.12 There are many benefits to taking public transport, some of which include:
  - Personal Opportunities Public transportation provides personal mobility and freedom;
  - Saving fuel Every full standard bus can take more than 50 cars off the road, resulting in fuel savings from reduced congestion;
  - Reducing congestion The more people who travel to work or to school on public transport, especially during peak periods, the less people travelling by private car;
  - Saving money Taking public transport to and from work or school is a lot cheaper than travelling by car and saves the cost of buying, maintaining and running a vehicle;
  - Reducing fuel consumption A full standard bus uses significantly less fuel per passenger than the average car;
  - Reducing carbon footprint Public transport is at least twice as energy efficient as private cars. Buses produce less than half the CO2 emissions per passenger kilometre compared to cars and a full bus produces 377 times less carbon monoxide than a full car;
  - Get fit and stay active Walking to and from work or school to public transport helps people incorporate physical activity into their daily routines. Research shows that regular physical activity can benefit your body and mind.
  - Less stress Using public transport can be less stressful than driving yourself, allowing you to relax, read, or listen to music.
- 4.13 The following initiatives and incentives can be used to encourage people to take public transport:
  - Publicise Employee Tax Saver Commuter tickets, which offer savings to employers in PSRI per ticket sold and significant savings to employees in marginal tax rate and levies on the price of their ticket;
  - Encourage public transport use for travel by promoting smart cards, advertising the availability of these tickets to Residents;
  - Publicise the availability of Real Time Information. Real Time Information shows when your bus is due to arrive at your bus stop so you can plan your journey more accurately;
  - Provide maps of local bus routes and the nearest bus stops, and the length of time it takes to walk to them;
  - Contact local providers about issues such as location of existing and new bus stops, timing of routes, or where you have market information about a potential new route.

### Car Sharing

Car Sharing – Key Information	
Approx. zone of influence	All Residents
Percentage of Residents in area of influence	100%
Percentage of Residents Car Sharing	TBC in each survey when occupied

### Table 7: Key Information - Car Sharing

- 4.14 Every day thousands of commuters drive to work or to school on the same routes to the same destinations, at the same time as their colleagues. By car sharing just once a week, a commuter's fuel costs can be reduced by 20%, and in a similar fashion, the demand for work place parking can be reduced by 20%. If every single-occupancy driver carried another driver, there would be 50% less cars on the road at peak times.
- 4.15 Although use of the car to get to work or to school is essential for a large proportion of people, car sharing schemes have the potential to deliver a significant reduction in private vehicle trips by promoting higher than average occupancy rates for each vehicle.
- 4.16 A car sharing scheme relies on a database containing workplace information, working hours, and peoples preferences such as gender/driver/passenger and their preferred route to and from work.
- 4.17 The car-sharing database can be a map showing where Residents work, a database of carsharers' details hosted on an organisations intranet site, or an on map-based matching website.
- 4.18 Car sharing often happens informally, however some participants often prefer a formal scheme which will normally generate a higher take-up for car sharing, and more efficiency in terms of increased occupancy rates. Car sharing is much easier promoted within a community such as is proposed here.
- 4.19 Encouraging more Residents to share car journeys to work rather than driving alone as well as encouraging more to set up and take part in car sharing/pooling would prove a very effective means of reducing daily car trips to and from the site.
- 4.20 The following initiatives and incentives can be used to encourage car sharing:
  - Provide incentives to sign up to a car sharing scheme with preferential parking spaces in the most convenient location;
  - Draw up a car-sharing policy for how the scheme will operate, and issue carsharing permits to those qualifying to use the car-sharing spaces;

- Highlight to drivers that they do not have to share with a person that doesn't suit them allow choice based on gender, route, smoking or non-smoking;
- Clarify the financial implications of the scheme those accepting a lift could contribute towards fuel costs.
- Use existing online databases for car sharing. For example, the development could set up its own private car sharing site using <u>www.carsharing.ie</u>.
- Allocate parking spaces for use solely by car sharers, for example near to building entrances.

### **Action Plan Summary Table**

4.25 The Redevelopment Summary Action Plan is described in the Table below. Modal Split Targets will be determined following on from the first Residential survey shortly after full occupation, typically within the first six months. This will be part of the role of the Travel Plan Coordinator. This will show existing travel patterns with realistic targets set to improve the modal split of Residents.

	Initiative	Impact on Delivery	Difficulty Delivering	Current Modal Split	Target MS
	Walking	Medium	Low	TBC	ТВС
Residents Initiatives	Cycling	Medium	Medium	TBC	ТВС
	Public Transport	High	Low	TBC	ТВС
	Other	Medium	Medium	TBC	ТВС
	Car - Sharing	Medium	Medium	TBC	ТВС
	Cars - 1 Passenger Only	High - Negative	High	TBC	ТВС
oting TP	Marketing the Plan	High	Low	Driven By TF	P Coordinator
Prom	Measuring Success	High	Medium	Annual Sta	aff Surveys

### Action Plan Summary Table

### 5.0 IMPLEMENTING THE PLAN

### Background

- 5.1 Setting realistic targets and a sustained approach to the promotion of the Travel Plan is important if the measures are to be successful. An 'anti-car' approach will be avoided at all costs. The objectives and benefits of the Plan will be made clear and broadcast during the full lifecycle of the Plan.
- 5.2 The implementation of a successful Travel plan will require the upfront investment of resources. As well as reviewing objectives and initiatives regularly, it is equally important to measure results. This provides an indication of any Plan's success, and ensures that the targets remain realistic.

### The Travel Plan Coordinator

- 5.4 The key objective of this Travel Plan is to ensure that the traffic impacts associated with the operation of Redevelopment are minimised. Achieving this objective will result in a wide array of benefits for the development and its stakeholders.
- 5.5 To ensure the plan is effective it is essential for a Travel Plan Coordinator to be appointed for the Development upon 100% occupation. <u>The nominated person and their contact details will be provided to the Planning Authority upon occupation of the development</u>
- 5.6 It is envisaged that the Coordinator will work closely with residents to enthusiastically promote and market the Travel Plan. As Residents will be the focus of the plan; their involvement must be sought from the outset.
- 5.7 To support the Travel Plan Coordinator's efforts, the Management Company must ensure that they have sufficient time to carry out their duties. In addition, it is essential that the powers of decision making are bestowed upon him/her, along with a suitable budget and programme for implementation.

### Promoting the Travel Plan

- 5.9 Active promotion and marketing is needed if the Travel Plan is to have a positive impact on stakeholder travel patterns to and from the site.
- 5.10 All marketing initiatives should be focused on areas where there is willingness to change. Such information has been extracted from the questionnaires and has been described in Section 3 of this Plan.
  - Identify the Aim e.g. to reduce low occupancy car commuting, school, and business travel & to promote active travel, public transport & alternatives to travelling by car.

- **Brand the Plan** as part of communicating the Travel Plan, visually brand all work relating to it with a consistent look, slogan, identity or logo.
- Identify the Target Audience 'segment the audience' (e.g. shift workers, school travel, sedentary workers, people travelling long/ short distances, mode used, members of a walking club or green team) so you can target the message and events towards these different groups.
- 5.11 As part of the marketing process, the Travel Plan coordinator can personalise a plan for the Development, drawing attention to the benefits of participation and support for its implementation.
- 5.12 The Coordinator can identify communication tools and networks used by the different audiences in the Residences, and use these to communicate about travel.
- 5.13 Promotional material regardless of its quality is only as good as its distribution network; material incentives assist greatly in introducing people to alternative modes of commuting.
- 5.14 The plan should not be anti-car it should be about promoting equity among modes and offering choice and accessibility.
- 5.15 The Coordinator can promote positive messages associated with a plan, for example, reduced tax/PRSI payments, getting fit and active, reducing congestion, reducing CO2 emissions and so on, and encourage people to start small changing one day per week for example, to explore their options.
- 5.16 Marketing drives which feature individual Residents who have reduced their car use can carry a strong message. This will serve to raise not only the profile of the Plan, but also send a clear message in relation to the Residents commitment to the Plan.

### 6.0 CONCLUSIONS

- 6.1 The development forming the subject of this application accords fully with the principles of sustainable development, being located within an established town centre neighbourhood within clear and easy access to alternative modes of travel, employment and services. The Management Company, once the development is occupied, will utilise pragmatic measures that encourage safe and viable alternatives to the private car for accessing the development.
- 6.2 Good Travel Planning is not a one-off event, it is instead an ongoing iterative process requiring continued effort. This Preliminary report assists these efforts by forming an outline framework and providing guidance for its success. Monitoring and reviewing the initiatives set out within the plan will form a far greater part of the Final Travel Plan itself.
- 6.3 The key to the Plans success will be the appointment of a Travel Plan Coordinator for the development, once occupied. They will be vested with total responsibility for implementing the plan. They should be granted the authority and time to execute the Plan, and be provided with sufficient resources to realise the Plans success.
- 6.4 As Residents are the focus of the plan; their involvement should be sought from the outset following occupation. To this end, the Plan Coordinator should be assisted and supported by the Management Company and Residents. This will serve to spread the work load, and also give the Residents a valuable input into the operation of the Plan.
- 6.5 Successful Travel Plans require extensive marketing and regular review. The measures set out in the Action Plan Summary Table (Chapter 4) should form the basis of a sound, realistic Plan and should be clearly set out and be fully transparent to all users.
- 6.6 Residents also have an essential responsibility in terms of co-operating with, and taking an active part in the plan. They are, after all, the plan's primary focus.
- 6.7 It is recommended that the Final Travel Plan be set in motion at full occupation. The plan should evolve and develop with the development, taking into account changing Residents and their travel preferences and needs.
- 6.8 Annual reviews of the Plan should include a full stakeholder survey, providing valuable information for target setting and marketing target groups. It is emphasised that failing to meet initial targets should not be seen as failure, as the preliminary 12 to 18 months of the plan should be viewed as a calibration exercise for target setting.



## **APPENDICES - CONTENT**

А	DLRCC Cycle Network Mapping (from DLRCC Website)
В	Bus Connects Route 15 (Blackrock/Mount Merrion)



### **APPENDIX A**

### DLRCC Cycle Network Mapping (from DLRCC Website)




**APPENDIX B** 

Extract Bus Connects Route 15 (Blackrock/Mount Merrion)

BusConnects Core Bus Corridors / 15: Blackrock > Merrion

**MAP 11: Preferred Route** 





## **APPENDIX I**

# **DMURS Statement of Consistency**

# consulting engineers



Consistency (Appendix I)

for

Proposed Residential Development on Lands

At

Temple Hill, Monkstown, Blackrock, Co Dublin.

# SUBMISSION ISSUE

1st Floor, Apollo Building, Dundrum Road, Dundrum, Dublin 14 Tel: +353 1 292 1941, E-mail: info@nrb.ie, Web: <u>www.nrb.ie</u>

Registered in Ireland No. 491679



#### 1.0 INTRODUCTION

- 1.1 It is NRB's opinion that the proposed residential development is consistent with both the principles and guidance outlined within the *Design Manual for Urban Roads and Streets* (DMURS, May 2019). The scheme proposals are the outcome of an integrated design approach. This approach seeks to implement a sustainable community connected by well-designed streets footpaths and cycleways, which combined deliver attractive, convenient and safe access in addition to promoting modal shift and viable alternatives to car based journeys.
- 1.2 The following section discusses design features which are incorporated within the proposed residential scheme with the objective of delivering a design that is consistent with the principles of DMURS.

#### 2.0 DESIGN ATTRIBUTES

- 2.1 The proposed layout strategy seeks to maximise connectivity between key local destinations through the provision of a high level of permeability and legibility for all journeys, particularly for sustainable forms of travel (cycling and walking). The proposed residential scheme delivers greater mode and route choices via a network of internal footpaths and a traffic calmed 30 Km/Hr *Homezone* environment which promotes non car modes of travel.
- 2.2 The Development will be a 30kph Slow-Zone ('Homezone') in line with the recent Department of Tourism and Transport advice note TSAN-2016-02.
- 2.3 The internal road network has itself been designed to deliver a hierarchy of local streets which provide access within / across the proposed new residential community, linking the site and community with the established network to the north within Blackrock.
- 2.4 As part of the development the movement function of internal local streets are designed to respect the different levels of motorised traffic whilst optimising access to/from alternative transport and catering for higher numbers of pedestrians and cyclists, which will compliment and promote the provision of improved local facilities consistent with Blackrock LAP and local DLRCC policies.



- 2.5 In parallel the adopted design philosophy has sought to consider the context / place status of each residential local street in terms of level of connectivity provided, quality of the proposed design, level of pedestrian / cyclist activity and vulnerable users requirements whilst identifying appropriate 'transition' solutions particularly at street junctions.
- 2.6 High levels of internal connectivity are also delivered for motorised vehicles, albeit at muck slower appropriate speeds, to that achievable along the main routes. The layout offers a well-connected traffic-calmed-by-design street network, and includes shared and calmed surfaces consistent with section 4.55 of DMURS (Carriageway Widths).
- 2.7 The layout of the proposed development seeks to maximise permeability and enhances legibility, and the design of appropriately sized blocks actively contributes to a highly permeable and accessible community for both pedestrians and cyclists.
- 2.1 As shown on the site plans, the development also includes provision for cyclist and pedestrian connection to parklands to the south, within Rockfield Park. The main roads through the site are designed to the appropriate widths, whilst also maintaining manoeuvrability for parking spaces, meeting the requirements of *Fig 4.82 of DMURS*.
- 2.8 The proposed layout seeks to successfully create an appropriate balance between the functional requirements of different network users whilst enhancing the 'sense of place'. Design attributes of the proposed layout which contribute to achieving this DMURS objective include:
  - A self-regulating street environment created through the introduction of on-street parking, tight corner radii, reduced visibility splays, raised tables where appropriate and staggered junctions.
  - b) On-street activity promoted internally along the residential streets through the provision of on-street parking where appropriate,
  - c) Through the provision of an improved vehicular access by way of a safer and higher capacity traffic signal controlled junction onto Temple Hill, the layout offers a well-connected but permeable traffic-calmed-by-design street network,



- d) Whilst the plan is to create a 30kph Home Zone, the proposed design deliberately seeks to specify minimal signage and line markings along the internal local streets, with such treatments used sensitively throughout and predominately at key nodes and 'transition' areas where raised platforms and road surface treatments are identified as appropriate.
- e) Where required, footpaths no less than 1.8m (generally 2.0m or wider) are provided throughout the scheme with connections and tie-ins to existing external pedestrian networks. Of course, the development plans include shared surfaces which is consistent with a home zone calmed environment.
- f) Appropriate clear unobstructed visibility splays, as per DMURS requirements, will be provided / safeguarded at all internal nodes, corners and junctions and at the site access junctions to the external road network.
- g) Well designed and frequent pedestrian facilities are provided along key travel desire lines throughout the scheme in addition to those located at street nodes. All courtesy crossings will be provided with either dropped kerbs or a raised 'flattop' treatment thereby allowing pedestrians to informally assert a degree of priority.
- h) All informal pedestrian crossing facilities will be at least 2.0m wide.
- With the objective of encouraging low vehicle speeds and maximising pedestrian safety and convenience, corner radii will be 6m where swept path analysis permits and radii will be further reduced where feasible in line with DMURS guidance.
- j) A variety of materials and finishes will be specified in the Shared Areas to indicate that the carriageway is an extension of the pedestrian domain (Refer to Landscape Architects Plans).
- k) Internally within the development carriageway kerb heights will be typically 75-80mm in accordance with the objectives of DMURS.



- I) Within the development, along the lightly trafficked internal Link streets, cyclists will share the carriageway with other street users as per the National Cycle Manual guidance for such situations, and in accordance with best practice.
- m) Once within the development, the proposed internal hierarchy of Local streets incorporates predominantly c 5.5-6.0m wide carriageways on main access routes, with 4.8m wide shared surface streets also incorporated.
- At any at-grade flat top pedestrian crossing / traffic calming table treatments, different surface material treatments will be proposed to alert and subsequently influence driver behaviour and vehicle speeds.
- o) Vertical deflections in the form of raised tables can be strategically placed across the internal local street network to promote lower design speeds and enable pedestrians to cross the streets at-grade. The maximum height of these raised flat-top treatments is designed to be 75mm with a minimum flat-top width of 2.0m.
- p) The provision of on-street car parking includes both parallel and perpendicular parking bays along either one or both sides of the internal streets.
- q) Any required street signage and road markings will be in accordance with the Department of Transport Traffic Signs Manual, and the location and form will be agreed in advance with Dun Laoighre Rathdown County Council.
- r) The layout and access has been subjected to an independent Road Safety & Quality Audit as required under DMURS Section 5.4.



## **APPENDIX J**

Stage 1 Road Safety Audit and Quality Audit (& Designer Feedback Form)

BRUTON CONSULTING ENGINEERS

Title: STAGE 1 ROAD SAFETY AUDIT & QUALITY AUDIT. For; Residential Development,

Temple Road, Blackrock Co. Dublin.

Client: NRB Consulting Engineers Ltd.

Date: November 2021

Report reference: **1221R01** 

VERSION: FINAL

Prepared By:

# **Bruton Consulting Engineers Ltd**

Glaspistol

Clogherhead

Drogheda

Co. Louth.

Tel: 041 9881456 Mob: 086 8067075 E: admin@brutonceng.ie W: www.brutonceng.ie



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# 1.0 Introduction

This report was prepared in response to a request from Mr. Eoin Reynolds of NRB Consulting Engineers Ltd for a Stage 1 Road Safety Audit & Quality Audit for a proposed residential development at Temple Hill, Blackrock, Co. Dublin.

The Stage 1 Road Safety Audit & Quality Audit has been carried out in accordance with the guidance in the Design Manual for Urban Roads and Streets (DMURS), produced by Department of Transport Tourism and Sport in March 2013 and updated in 2019 and TII Publications GE-STY-01024.

The Quality Audit aspects includes an access audit, a walking audit and a cycle audit. These are in aspects of a quality audit undertaken by a team independent of the Design Team.

The Road Safety and Quality Audit Team comprised of;

Team Leader: Norman Bruton, BE CEng FIEI, Cert Comp RSA.

Team Member: Owen O'Reilly B.SC. Eng Dip Struct. Eng NCEA Civil Dip Civil.Eng CEng MIEI

The Road Safety Audit and Quality Audit involved the examination of drawings and other material provided by NRB and a site visit by the Audit Team, together, on the 10<sup>th</sup> of November 2021.

The weather at the time of the site visit was dry and the road surface was also dry.

The problems raised in this Stage 1 Road Safety Audit & Quality Audit may belong to more than one of the categories of Audit named above. A table has been provided at the start of Section 3 of this report detailing which category of audit each problem is associated with.

Recommendations have been provided to help improve the quality of the design with regard to the areas described above. A feedback form has also been provided for the designer to complete indicating whether or not he/she will accept those recommendations or provide alternative recommendations for implementation.

An audit for a similar scheme at this location was carried out by the same Audit Team in November and December 2018. Many of the issues raised in that audit have been addressed in this proposed design.

The information supplied to the Audit Team is listed in Appendix A.

A feedback form for the Designer to complete is contained in Appendix B.

A plan drawing showing the problem locations is contained in **Appendix C**.



# 2.0 Background

It is proposed to develop a portion of the Daughters of Charity site in Blackrock and to construct circa 493 apartments including an ancillary creche and small café. The access to the development will be via a widened carriageway where the existing signalised junction to the lands is located on Temple Road. (Junction of R113 and N31)

Temple Road is an urban dual carriageway with pedestrian and cyclist facilities.

There is a left turn lane on the R113 for access to St. Vincent's Park which is a relatively small housing development.

It is assumed by the Design Team that this lane and access will be closed by Dun Laoghaire Rathdown County Council.

The Internal road layout of the proposed development consists of carriageways, footpaths and parking (including basement parking) for motorists and cyclists.

It is proposed to provide a pedestrian and cyclist links between the development and the adjacent Rockfield Park.

The upgraded access on Temple Road will also be used to access St Catherine's Provincial House and associated dwellings.

#### The location of the site is shown below.







Site Location Map (courtesy of openstreetmap.org). Approximate site boundary shown in red.

A review of the Road Safety Authority's website shows that between the years 2005 and 2016 there have been 13 minor injury collisions recorded at, or close to the existing signalised junction on Temple Road. A number of those collisions involved vulnerable road users.





# 3.0 Issues Identified in This St 1 Road Safety Audit & Quality Audit.

Summary Table of Problem Categories

Problem Reference	Access Audit	Walking Audit	Cycling Audit	Road Safety Audit	Quality Audit
3.1	~			1	~
3.2				1	✓
3.3			•	✓	✓
3.4				✓	V
3.5	√	√	✓	✓	✓

#### 3.1 Problem

LOCATION Drawing NRB-TA-002 Rev A.

#### PROBLEM

It is proposded to provide left turn filter arrows on the temple road junction. The lane arrows however indicate both left turning and striaght ahead movements. This could lead to driver frustration if the filter arrow is showing and they cannot turn due to a stationary vehicle in front that wishes to travel straight ahead.





#### RECOMMENDATION

It is recommended that filter arrows only be provided if those movements are taking place in isolation without straight ahead movements.

#### 3.2 Problem

#### LOCATION

Drawing NRB-Ta-002-Rev A

#### PROBLEM

The indicative location of a public lighting column at the junction of St. Vincent's Park and the main access to the development is such that it could be easily struck by turning vehicles.



#### RECOMMENDATION

It is recommended that the lighting column be relocated away from the corner radius and where it will not be a hazard for pedestrians.

#### 3.3 Problem

LOCATION Drawing NRB-TA-001 Rev A

#### PROBLEM

It is unclear how cyclists exiting the development and wishing to turn right onto Temple Road will be able to do so without having to mix with general traffic. A lack of dedicated cycle facilities could lead to collisions with turning and through vehicles.





#### RECOMMENDATION

It is recommended that an advance stacking area be provided for cyclists.

#### 3.4 Problem

## LOCATION

Drawing NRB-TA-001 & 006 - Rev A.

#### PROBLEM

The drawing shows the swept path of a refuse truck entering and leaving St. Vincents. The truck occupies some of the opposing lane. It is not clear over what distance this occurs before there is space for another vehicle to stop and wait for the truck to pass and if they will have visibility to an oncoming refuse vehicle so as to know when they should utilise that space.





#### RECOMMENDATION

It is recommended that a suitable area be provided for vehicles to wait as refuse vehicles approach with unobstructed visibility to approaching vehicles.

#### 3.5 Problem

#### LOCATION

Drawing NRB-TA-001 Rev A, Emergency access from Temple Hill.

#### PROBLEM

It is proposed to provide an emergency access only for the development via St Louise's Park from Temple Hill. This emergency access may also be suitable for regular use by pedestrians and cyclists and may be on a desire line for those vulnerable road users coming from Blackrock village.



#### RECOMMENDATION

It is recommended that a non-motorised user desire line assessment be undertaken and, if suitable provision be made for pedestrians and cyclists to enter the development via the emergency access route.

## 4.0 Observations

#### 4.1 Observation

It is assumed that dropped kerbs and tactile paving at the uncontrolled pedestrian crossing points within the development will be provided at the detailed design stage.



# 5.0 Road Safety Audit & Quality Audit Statement

This Stage 1 Road Safety Audit & Quality Audit has been carried out in accordance with the guidance given in DMURS and takes into consideration the principles approaches and standards of that Manual.

The quality audit has been carried out by the persons named below who have not been involved in any design work on this scheme as a member of the Design Team.

**Norman Bruton** 

Signed:

Dated:

Reputer Bruten

24/11/2021

**Owen O'Reilly** 

Signed:

Owen O'K

(RSA & Quality Audit Team Member) Dated:

(RSA &Quality Audit Team Leader)

24/11/2021



# Appendix A

# List of material Supplied for this RSA 1 & Quality Audit;

- Drawing NRB-TA-001 Rev A
- Drawing NRB-TA-002 Rev A
- Drawing NRB-TA-003 Rev A
- Drawing NRB-TA-004 Rev A
- Drawing NRB-TA-005 Rev A
- Drawing NRB-TA-006 Rev A For Information & Background
- Transport Assessment & associated Reports, NRB, Sept 2021.



# Appendix B

Feedback Form



#### STAGE 1 ROAD SAFETY & QUALITY AUDIT FORM – FEEDBACK ON RSA/QUALITY AUDIT REPORT

Scheme: Proposed Development, Temple Road Blackrock. Road Safety Audit & Quality Audit Stage – Stage 1, Planning Date Audit Completed: 10-11-2021

Paragraph No. in Quality Audit Report	Problem accepted (yes/no)	Recommended measure accepted (yes/no)	Alternative measures (describe)	Alternative measures accepted by Auditors (Yes/No)
3.1	Y	Y – traffic signal head staging will be such that the left and straight on Temple Road will be green at the same time thus avoiding the issue.		
3.2	Y	Y – public lighting column to be relocated to the back of the footpath.		
3.3	Y	Y – advance stacking area for right turning cyclists now included as recommended.		
3.4	Y	<ul> <li>Y – adequate visibility (23m) in relation to DMURS is achievable and refuse collection is infrequent. The width of the entry is consistent with the established width of the existing road. St. Vincents Park is very lightly trafficked road in traffic generation terms. Driver courtesy will of course apply in the event of an incoming slow moving early morning Refuse lorry arrival.</li> </ul>		
3.5	Y	Y – It is intended that this access will facilitate access for pedestrians and cyclists with the inclusion of gates to the east of the vehicular access.		

**Observations:** 

4.1 Appropriate dropped kerbs and tactile paving will be included at crossing locations at detailed design stage.

Signed.....

Design Team Leader

Meyulds ader Emen Bruton Signed.....

**Date: 22/11/21** 

**Audit Team Leader** 

Date: 24/11/2021



# Appendix C

Problem Location Plan.



REV         DATE         AMENDMENTS         DRAWN         CHK         APP	NRB Consu verified the This drawi 08/11/21. deficiencie	Ilting Engineers Ltd recommend that Road rough Legal & Land searches by the Clien ng is based upon Architects drawing 1706 NRB Consulting Engineers Ltd shall not be s.	d and land ownership boundaries are it. 5A-OMP-00-00-M2-A-1100, received e liable for any inaccuracies or
NRB Consulting Engineers Ltd	Client	Project No.	Drawing No.
1st Floor, Apollo Building		20-057	NRB-TA-001
Dundrum Road Dundrum Dublin 14 Dublin 14	Project St. Teresa's, Temple Hill Monkstown, Co. Dublin	Drawn Checked PB 09/11,	ER ER ER /21 ER
Phone/Fax: +353 1 292 1941 Email: info@nrb.ie	Title Proposed Site Layout	Date 9-Nov-21	Scale @ A3 Rev <b>n.t.s. A</b>
Web: www.nrb.ie Registered in Ireland No. 491679	NRB Consulting Engineers Ltd accept no responsibility for any unauthorised amendments to this drawing. Only figured dimensions to be worked to.	Purpose of Issue Draft As Built	Information Approval Tender Construction



## **APPENDIX K**

Parking Management/Strategy Report

# consulting engineers



PARKING MANAGAMENT/STRATEGY REPORT Appendix K

For

Proposed Residential Development on Lands

At

Temple Hill, Monkstown, Blackrock, Co Dublin.

## SUBMISSION ISSUE

1st Floor, Apollo Building, Dundrum Road, Dundrum, Dublin 14 Tel: +353 1 292 1941, E-mail: info@nrb.ie, Web: <u>www.nrb.ie</u>

Registered in Ireland No. 491679



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4	2.0	Policy Context & Standards
6	3.0	Car Parking Provision
8	4.0	Bicycle Parking
9	5.0	Sustainable Travel Initiatives
11	6.0	Management of Parking Facilities
13	7.0	Conclusion



#### 1.0 INTRODUCTION

- 1.1 This Parking Strategy Report (PSR) has been prepared by NRB Consulting Engineers Ltd and sets out the proposed car parking management strategy for the Residential Apartment Development at Temple Hill, Monkstown, Blackrock, Co Dublin.
- 1.2 The local area and the subject site is already a long-established destination, containing a mixture of commercial, schools & residential development within easy walking or cycling distance, and in these terms has very well established urban transportation characteristics in its own right. The proposed development, being on a prominent & highly accessible site should be considered in this context. A site location plan for the site is included below as *Figure 1.1*.



Figure 1.1 - Site Location

1.3 The site already has permission for 291 Residential Units through the Strategic Housing Development Process. The now proposed development provides a new replacement residential scheme of 493 residential apartments in a combination of new apartment buildings; the conversion and re-use of 'St. Teresa's House'; and the relocation of a 'St. Teresa's Lodge' within the slightly extended site development area. The detailed development description is included within Section



2.0 of the TA Report. The vehicular access arrangement from the local roads mirrors the access junction previously proposed, with the beneficial effect of a further alignment improvement at the access to the adjacent St Vincent's Park, facilitated by the inclusion of an additional property.

- 1.4 This document presents the rationale behind the provision of vehicle parking (including mobility impaired parking, motorcycle parking, service vehicle parking and car club spaces) and cycle parking being proposed as part of the subject site development proposals. The Report sets out the management measures which will be implemented to allocate the use and control the parking provided at the site.
- 1.5 The document sets out the principles of the parking management strategy proposed at the development and should be read in conjunction with the following complementary reports;
  - Traffic & Transportation Assessment (TTA),
  - Mobility Management Plan (MMP).
- 1.6 The TTA and the MMP set out the details of the multi-modal accessibility of the site, together with providing details of the existing conditions pertaining.



#### 2.0 POLICY CONTEXT AND STANDARDS

#### CAR PARKING POLICY

- 2.1 The adopted 'Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities', updates previous guidance in the context of greater evidence and knowledge of current and likely future housing demand in Ireland taking account of the Housing Agency National Statement on Housing Demand and Supply and projected need for additional housing supply out to 2020, the Government's action programme on housing and homelessness Rebuilding Ireland & National Planning Framework Ireland 2040, (subsequent to 2015 guidelines).
- 2.2 These new guidelines address car parking and include an objective to 'Remove requirements for car-parking in certain circumstances where there are better mobility solutions, and to reduce costs.' Under Car Parking Section 4.18 the guidelines acknowledge that 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.
- 2.3 Under Section 4.19 the guidelines note that in larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be **wholly eliminated or substantially reduced**. Specifically Paragraph 4.19 states

#### Central and/or Accessible Urban Locations

In larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances. The policies above would be particularly applicable in highly accessible areas such as in or adjoining city cores or at a confluence of public transport systems such as rail and bus stations located in close proximity.

2.4 In terms of the stated Policy, we believe that the subject site meets all the requirements for reducing the provision of Private Car Parking, under the headings;



High Density Development Comprising Wholly of Apartments Central Location Well Served by Public Transport

- 2.5 In these terms the proposed subject development meets all the necessary requirements for reduced car parking provision, in this case a parking 'Ratio' of 0.51 per residential unit. Following our review of the scheme design and location, and following our interpretation of National Policy, we believe that the provision of a total of 252 managed car parking spaces to serve this development is adequate and is appropriate, reflecting the requirements of Policy Guidance.
- 2.6 The multi modal accessibility of the site is demonstrated and addressed in the accompanying Preliminary Mobility Management Plan.

#### **Bicycle Parking**

2.7 The Department of Housing Planning & Local Government "*Sustainable Urban Housing Design Standards for New Apartments*" includes recommendations on the appropriate level of Bicycle Parking. An extract from the Guidance is included below as *Figure 2.1* 

Quantity – a general minimum standard of 1 cycle storage space per bedroom shall be applied. For studio units, at least 1 cycle storage space shall be provided. Visitor cycle parking shall also be provided at a standard of 1 space per 2 residential units. Any deviation from these standards shall be at the discretion of the planning authority and shall be justified with respect to factors such as location, quality of facilities proposed, flexibility for future enhancement/enlargement, etc.

#### Figure 2.1 - Extract from National Apartment Guidelines

- 2.8 With a total of 795 bedrooms within the apartments, the Policy therefore requires the provision of 795 Residential Bicycle Spaces. With 493 Apartment Units, this requires a total of 246 visitor bicycle spaces.
- 2.9 There are a total of 804 Residents Bicycle Parking spaces provided, and 252 visitor parking spaces, divided between surface level and basement areas. We believe that this is therefore more than adequate for a development of this nature, fully complying with National Policy.



#### 3.0 CAR PARKING PROVISION

#### **Overview**

3.1 The car parking provision is divided between distinct areas of the site. There are 3 separate basements, in addition to parking provided at surface level including dedicated Go-Car spaces. A summary parking schedule has been extracted and is included below as *Figure 3.1* 

Car parking provision-Residential		spaces	accessible spaces	Total spaces
Surface level car parking		86	5	91
Basement A (level -1)		42	2	44
Basement B ( level 0)		34	2	36
Basement D (level -1)		77	4	81
TOTAL RESIDENTIAL CAR PARKING	SPACES	239	13	252
Car parking provision-residential	(number of spaces	252 / number of uni 252/493 = 0.51 car	its 493) · spaces per residential u	nit
Accessible parking space provision 5% of spaces	252 x 5% = 12.6 sp	aces Accessible resider	ntial car spaces provided	= 13 spaces
Car parking provision - Creche		spaces	accessible spaces	Total spaces
Surface level car parking		7	1	8
TOTAL CRECHE CAR PARKING SPAC	CES	7	1	0

Figure 3.1 – Schedule of Car Parking

- 3.2 All of the car parking spaces have been designed with accessibility in mind, having being designed in accordance with best practice and current design guidance. Whilst 50 No EV spaces are provided, it is also proposed that Electric Vehicle (EV) charging will be provided for in a flexible manner as outlined below
- 3.3 A total of 50 EV charging spaces are shown distributed around the site, being c10% of the total number of spaces. Notwithstanding, all of the car parking spaces can easily be upgraded to allow conversion for Electric Vehicles. DLRCC Development Plan defines the % of Charge Spaces to be provided, and the design includes for these dedicated spaces as per the Plan. In the case of a large residential development of the nature proposed, with specific spaces likely dedicated to specific apartments, it is considered appropriate to also facilitate the retrofitting of spaces, based on demand following occupation, rather than dedicated electric charge spaces being dedicated to apartments and provided from the outset. The entire car park of the subject scheme can therefore be ducted to accept future cabling to serve a charging point for every car space as demanded. Within the basement area, conduits will be run on the walls where charging points can also be mounted.



- 3.4 The entire car park of the subject scheme can therefore to be ducted ready to accept future cabling to serve a charging point for every car space, as demanded. Within the basement parking areas, conduits can be run on the walls where charging points can also be mounted.
- 3.5 Where residents request a charging point to be installed, the relevant charging point will be pre-wired back to their home electricity meter in the designated meter location. The socket point will have a lockable cover on it so that only that resident may use the power point. This provision around the entire parking area allows future charging points to be installed at any of the car parking spaces with minimum works as and when required.
- 3.6 Externally, there are 8 car parking spaces provided at Surface Level dedicated and allocated to the proposed ancillary Creche, to allow safe set down and pick up of children, as illustrated in the drawing extract included below as *Figure 3.2*



Figure 3.2 – Extract from Drawings Showing Creche Surface Parking Area

#### Car Share

3.7 The Building Management Company will engage with potential car share or car club operators, with a view to establishing a base at the site. To this end the layout can include provision for a cluster of dedicated Car Club spaces intended for use by 'car sharers' close to the main vehicular access. We believe that an allocation of 6 No Car Share Parking Spaces would be appropriate.



#### 4.0 BICYCLE PARKING

4.1 It is anticipated that a very significant number of residents can be encouraged to cycle to work and school etc., with the safe links and secure parking which is in place. That is reflected in the provision of a total of 804 dedicated secure residential cycle parking spaces, with 252 spaces for visitors. This number is consistent with the requirements as set out in the National Apartment Guidelines. A breakdown of the cycle parking provided is included below as *Figure 4.1* 

Resident spaces in basement (A) level -1	100
Resident spaces in basement (B) level 0	226
Resident spaces in basement (D) level -1	246
Resident spaces in bike stores at ground level	232
Total resident cycle parking spaces provided	804
Visitor spaces on surface	168
Visitor spaces in basement (B) level 0	84
Total visitor cycle parking spaces provided	252

Figure 4.1 – Schedule of Bicycle Parking

- 4.2 There are 168 visitor spaces provided at surface level, and 84 visitor spaces provided within the basement. The majority of visitor parking spaces are provided in the form of traditional 'Sheffield Stands'.
- 4.3 It is acknowledged that for visitors, cyclists need to be confident that their cycles will not be tampered with, and in these terms the cycle storage in the basement and at surface level are in secure areas, all of which will be monitored by CCTV.
- 4.4 There are a total of 168 Bicycle Parking Spaces for visitors, dotted throughout the landscape areas and within the courtyards at surface level.
- 4.5 The cycle parking spaces at ground surface level are also beneficially in areas subject to passive surveillance and they will of course also be monitored by CCTV.
- 4.6 It is important to cultivate a cycling culture, through the implementation of appropriate infrastructure and promotional measures, which positively encourages all members of the community to cycle at all life stages and abilities as a mode of sustainable transport that delivers environmental, health and economic benefits to both the individual and the community.



#### 5.0 INITIATIVES FOR SUSTAINABLE TRAVEL

- 5.1 It is acknowledged that residents may require a vehicle of some sort for purposes other than commuting on an everyday basis, and simply reducing car parking would not be realistic without implementing alternative measures to accommodate residents and visitors alike. Therefore the following alternative arrangements are proposed in support of the slightly reduced car parking and car ownership levels within the development;
  - A working Mobility Management Plan once Residents are in place,
  - Increased & Well Designed Cycle Parking Provision,
  - Parking Management and Control,
  - Dedicated legal controls within Sales or Letting Agreements associated with all Residential Apartments, and
  - Provision of dedicated *Car Share* Parking Spaces within the Site.

#### Mobility Management Plan

5.2 An outline MMP has been prepared and should be read in conjunction with this Parking Strategy Report. The MMP will be further developed at occupation/operational stage by the Development Management Company.

#### Increased Bicycle Parking

5.3 Increased bicycle parking provides a realistic alternative transport mode when there is reduced car parking provision. As previously set out on page 5, the bicycle parking provision exceeds the requirements of the National Apartment Guidelines. With a total of 1056 bicycle parking spaces provided within the site, and with 493 apartments, this represents a net provision of 2.2 bicycle spaces per apartment.

#### Parking Management Strategy

5.4 A key component in ensuring the efficient controlled operation of any car parking is an active and enforced parking management strategy. In this case, this strategy will be managed by the Development Management Company with the specific details as set out in Section 6.0 of this Report.

#### Legal Controls – Sales/Letting Agreements

5.5 Dedicated Clauses can and will be contained within Sales or Letting Agreements for all Residential Apartments, which specifically address Car Parking. In the event where a parking space is an entitlement as part of a Sale or Letting Agreement, this will be clearly enunciated by way of a dedicated clause, with the specific space or spaces referenced with mapping provided to illustrate the relevant space.


### Car Share

5.6 A car club can provide residents with quick and easy access to a vehicle for short term hire. There are several providers active in the Greater Dublin Area, including Blackrock, and provide a really good alternative for circumstances such as this. For example, a recent survey undertaken by one service provider (*Go-Car*) indicated that the main uses of the service is for day-trips, family trips and weekly shopping trips. The survey also highlighted that the average use of a car was for 1 hour per day. A screen grab from the Go-Car website included below as *Figure 5.1* shows the availability of their cars adjacent the site at the time of writing of the report.



Figure 5.1 – Extract from Go-Car Map Car Locator (as an Example)



# 6.0 MANAGEMENT OF PARKING FACILITIES

#### **Introduction**

- 6.1 A key component in the effective operation of on-site car parking is an active and enforced parking management strategy. This strategy will be implemented by both the Developer and the Management Company. The Management Company will be charged with responsibility for the control of parking and access within the internal basement areas and at surface level.
- 6.2 It is intended that the proposed development will be actively marketed as 'Reduced Car Dependency'. Consequently, all marketing material for the development will make it clear that the apartments have reduced car parking availability and will also highlight the alternatives available.
- 6.3 Dedicated Clauses can and will be contained within Sales or Letting Agreements for all Residential Apartments, which specifically address Car Parking. In the event where a parking space is an entitlement as part of a Sale or Letting Agreement, this will be clearly enunciated by way of a dedicated clause, with the specific space or spaces referenced in Agreements, with mapping provided & referenced therein to identify the relevant space.
- 6.4 Accordingly, unless they are dedicated to individual Residential Apartments, on-site parking will otherwise remain in the control of the Management Company. A car parking management regime will be implemented by the Management Company to control and manage access to the car parking bays, thereby actively managing the availability of on-site car parking for each of the following user profiles;
  - Residents of the Apartments,
  - Staff based at the proposed development (Crèche, Management Company and Maintenance),
  - Visitors/Customers to the site,

#### Car Parking Allocation

- 6.5 As stated above, all residents will be advised that unless it is otherwise stated in the Lease or Sales Agreement, there will be very limited car parking available on the site.
- 6.6 In the event that a parking space is part of a Legal Agreement, the apartment resident will have a parking permit for the particular dedicated space to display in the vehicle window.



- 6.7 The Management Company will have a limited supply of Visitor Car Parking Permits for the site.
- 6.8 The Management Company will be responsible for the day-to-day management of car parking operations. Other than the dedicated spaces for Apartments, visitors who request a short term permit will be allocated on a 'first-come first-served' basis.
- 6.9 It is intended that a charge will be applied to obtain a visitor permit with the objective of covering the associated management costs, discouraging long term usage of the parking space, and encouraging more sustainable modes of travel.

#### Car Parking Access/Control

- 6.10 If necessary in the longer term, access to the basement parking areas can be controlled by a combination of barriers and shutters to ensure that only permitted vehicles can gain access. If required, such a barrier can be safely located at the ramps, set back sufficiently so as not to result in any hazard or obstruction.
- 6.11 Access to approved users can be facilitated by coded keypad entry/fob control or Automated Number Plate Recognition (ANPR) technology, which only permits registered permitted vehicles to enter.
- 6.12 A clamping enforcement regime will also be in place within the entire site to ensure that parking restrictions are adhered to.



## 7.0 CONCLUSION

Based on the information contained within this Parking Strategy Report, it is considered that the parking provision at the subject development is appropriate and sufficient. This is supported by a high number of bicycle parking spaces at the development, combined with controls that are to be put in place to manage use of the spaces, including a Working Mobility Management Plan, Legal Allocation of Spaces to Residents and the day-to-day management/clamping of parking being a role for the management company.