along the route providing additional cycle facilities throughout the Northwood area. For the Proposed Cycle Network (**Figure 4**), it is noted that much of the alignment for the Santry River Greenway is already in place throughout the Northwood area.

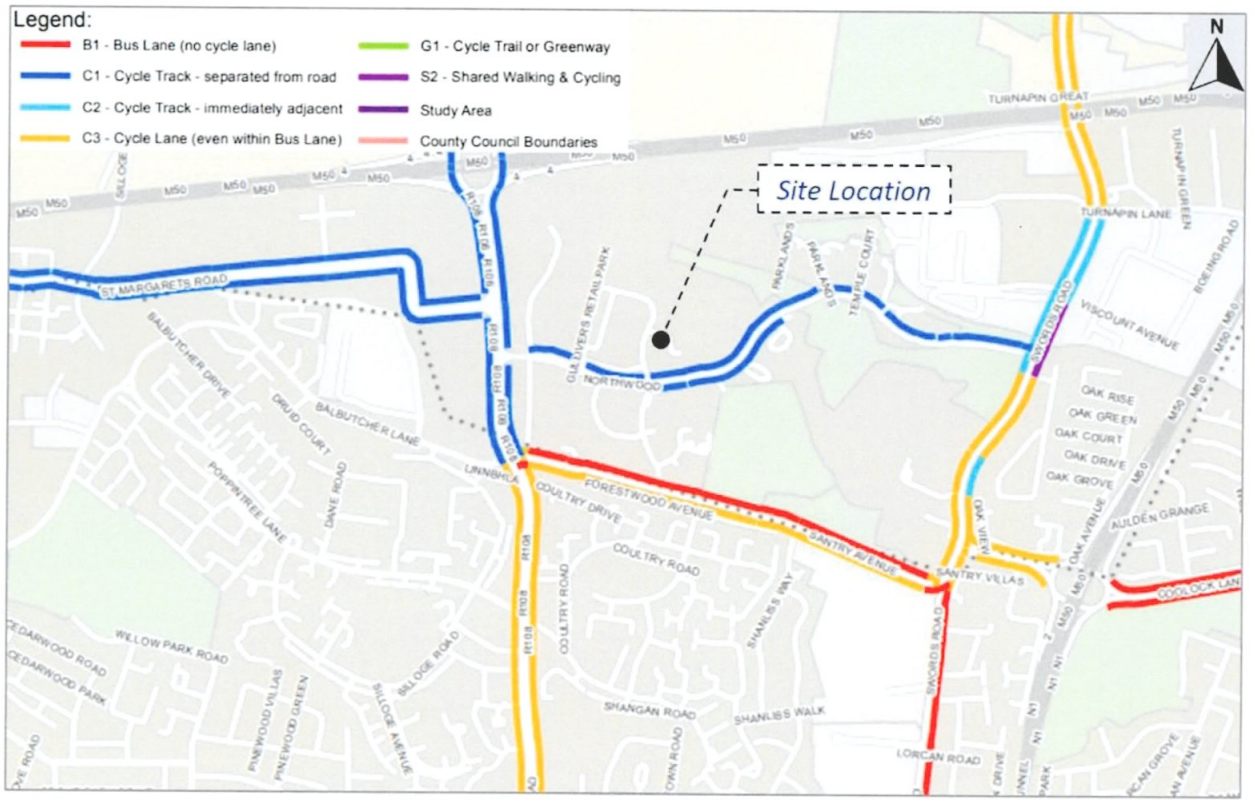



**Figure 3: Existing Cycle Facilities - Greater Dublin Area Cycle Network Plan**
***(Source: Greater Dublin Area Cycle Network Plan (2013))***

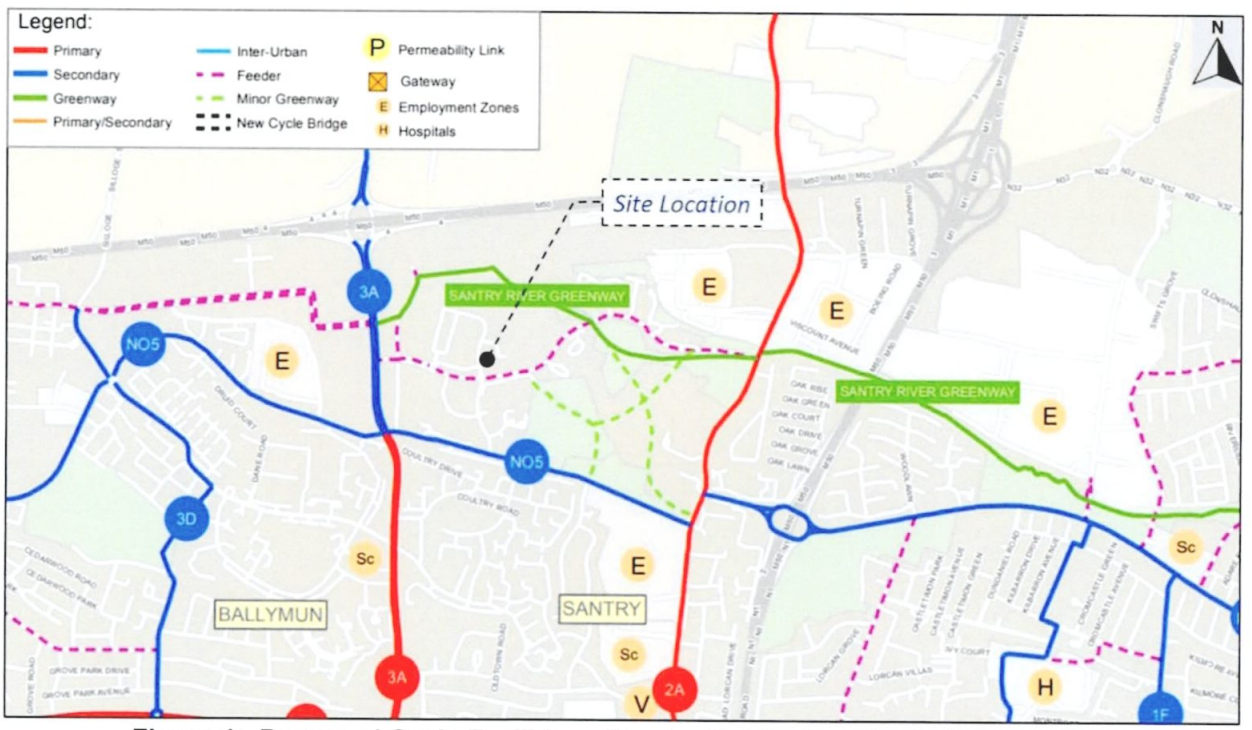



**Figure 4: Proposed Cycle Facilities - Greater Dublin Area Cycle Network Plan**
***(Source: Greater Dublin Area Cycle Network Plan (2013))***

## Existing Public Transport

### Bus Services

The Site is ideally situated to benefit from a comprehensive range of Dublin Bus and Transport for Ireland (TFI) Go Ahead bus connections. Furthermore, the range and proximity of a number of emerging public transport interchanges further enhances the sustainability characteristics of the Site.

Dublin Bus and TFI operate numerous routes along Swords Road, Ballymun Road and Santry Avenue. These Dublin Bus operated bus services operate on a daily basis and offer relatively frequent schedules as summarised in **Table 1** below.

**Table 1: Dublin Bus Service Frequency* - No. of Services (www.dublinbus.ie)**

| Route No. | Route | Mon - Fri | Sat | Sun | Stop Location |
|---|---|---|---|---|---|
| 16 | *Dublin Airport to Ballinteer* | 87 | 81 | 63 | Swords Road |
| 27b | *Eden Quay to Harristown* | 53 | 51 | 31 | Swords Road |
| 33 *(TFI)* | *Lower Abbey St. to Balbriggan* | 21 | 14 | 12 | Swords Road |
| 41 | *Lwr. Abbey St. to Swords Manor* | 50 | 44 | 29 | Swords Road |
| 41b | *Lwr. Abbey St. to Rolestown* | 5 | 4 | 3 | Swords Road |
| 41c | *Lwr. Abbey St. to Swords Manor* | 45 | 41 | 28 | Swords Road |
| 4 | *Harristown to Monkstown Avenue* | 80 | 64 | 47 | R108 |
| 155 | *Ikea (Ballymun) to Bray Rail Station* | 5 | 53 | 47 | R108 |
| 13 | *Harristown to Grange Castle* | 75 | 63 | 46 | R108 |
| 42d | *DCU to Portmarnock* | 1 | No service | No service | R108 |
| N6 | *Naomh Barrog GAA – Fingles Village* | 107 | 93 | 57 | Santry Avenue (R104) |
| 17a *(TFI)* | *Kilbarrack to Blanchardstown* | 57 | 52 | 42 | Santry Avenue (R104) |

** Bus frequencies may vary during Covid-19 restrictions and lockdowns.*

### Train Services

The closest train station to the proposed development is Drumcondra Station which is located approx. 6km away from the development. The train services provided at Drumcondra Station are shown in **Table 2** below:

**Table 2: Train Service (www.irishrail.ie)**

| Train Serviced* | Timetable** | | |
|---|---|---|---|
| | Mon - Fri | Sat | Sun |
| Dublin (Connolly) - Sligo | 06:55 – 20:55 | 09:05 – 19:15 | 09:05 – 19:05 |
| Dublin (Connolly / Grand Canal Dock) – M3 Parkway – Lonford | 05:25 – 23:22 | 05:58 – 23:16 | 08:45 – 23:00 |
| Dublin (Grand Canal Dock) – Kildare - Portlaoise | 07:26 – 23:22 | 07:26 – 23:22 | - |

** The rail fares and tickets details can be referred to https://www.irishrail.ie/en-ie/rail-fares-and-tickets/fares-info/dart-and-short-hop-zone.*
*** The train timeable can be referred to https://www.irishrail.ie/en-ie/station/drumcondra.*

### Taxi Services

Taxi is also a common form of transport in Ireland. Currently, passengers can order / book taxi services in advance via online / phone / apps (i.e. Free Now, Lynk, Taxy, etc.). By using these software, the passengers can order their nearest taxi so as to reduce the waiting time.

### Car Clubs and Car Sharing

Car clubs or car sharing is a model of car rental where people rent cars for short periods of time, often by the hour. It differs from traditional car rental in that the owners of the cars are often private individuals themselves, and the carsharing facilitator is generally distinct from the car owners. Carsharing is part of a larger trend of shared mobility.

## Emerging Transport Developments

### BusConnects

BusConnects proposes 16 No. Core Bus Corridors extending radially from Dublin City Centre to the surrounding suburbs. Dublin BusConnects proposes to introduce numerous new bus routes in close proximity to the development. **Figure 5** taken from the latest BusConnects proposal illustrates proposed new routes in the vicinity of the proposed development such as the "E1 and E2 Bus Routes", which are the Ballymun to City Centre Core Bus Corridor. The "E Spine" Core Bus Corridor will operate every 5 minutes or better. It would travel from the city centre along the R108/Ballymun Road and would split into branches, the E1 continuing north along the R108, terminating to the west of the development and the E2 would travel west towards Charlestown Shopping Centre. Each branch would operate every 10 minutes. The E1 would also operate to Bray and the E2 to Dun Laoghaire. Additionally, the A2 branch of the A Core Bus Corridor from the Airport to Tallaght, and the A4 Branch of the A Core Bus Corridor between Swords to Rathfarnham will all be frequent services. The N6 of the N Core Bus Corridor from Charlestown Shopping Centre to Howth Junction passes to the south of the proposed development on Santry Avenue. This route became operational on 29th May 2022 and operates at a frequency of 10 minutes on weekdays and Saturdays, and 15-20 minutes on Sundays.


**Figure 5: Proposed BusConnects Routes beside Northwood *(Source: www.busconnects.ie)***

### MetroLink

An objective of the MetroLink project is to provide a sustainable, safe, efficient, integrated and accessible public transport service between Swords, Dublin Airport and Dublin City Centre. MetroLink will comprise a high-capacity, high-frequency, modern and efficient metro railway between Estuary Station and the Park

and Ride Facility, north of Swords, via Dublin Airport to Charlemont Station which lies south of Dublin City Centre. The proposed MetroLink will be approximately 18.8 kilometres in length.

The Northwood Station of the proposed MetroLink, which is approximately 450 metres away the proposed development, is currently proposed under the carriageway of the Ballymun Road (R108) with access from the east and west side of the carriageway. The surrounding area includes a range of commercial, residential and retail uses including Gulliver's Retail Park, Musgraves head offices and Ikea. The development will benefit from connectivity to a new pedestrian walkway through Gulliver's Retail Par, which is being constructed with the ongoing Blackwood Square development and is designed to provide direct access to the MetroLink stop. See **Figure 6** and **Figure 7** illustrate the location and image gallery of the Northwood Station on the Ballymun Road (R108).


**Figure 6: Proposed Alignment of MetroLink and Location of Northwood Station**
***(Source: [www.metrolink.ie](http://www.metrolink.ie), annotation by J.B. Barry & Partners)***

**Figure 7: Image Gallery of Proposed Northwood Station on Ballymun Road (R108)**
***(Source www.metrolink.ie)***

### Junction Upgrades

During consultation with FCC on a previous application in the area, it is noted that Fingal plan to upgrade Junction 2) Ballymun Road (R108) / Northwood Avenue. Additionally, it is noted that Fingal plan to upgrade Junction 3) Northwood Avenue / Old Ballymun Road to incorporate SCATS. Upgrading this junction to SCATS will allow the junction to control the traffic arriving from Northwood to the Ballymun Road. The above-mentioned junction upgrading works will bring benefits to junction performance.

## 2.4 Car Ownership Levels

Census 2016 Small Area Population Statistics were analysed in order to determine existing car ownership levels for households in the Northwood area. For the purposes of this analysis, 13 No. locations, which are characterised as being predominately apartment complexes were utilised. These locations mirror closely the proposed development and are illustrated in **Figure 8** below. Small Area populations which comprised mainly office blocks, hotels or industrial areas were excluded from this analysis.


**Figure 8: Census 2016 Data Locations *(Source: Central Statistics Office)***

**Table 3** outlines the total car ownership levels per household of all these areas. Additionally, the table demonstrates the number of car parking spaces required if the proposed development followed the same pattern of car ownership per household as the surrounding area.

**Table 3: Car Ownership Summary**

| No. of Motor Cars | No. of Households | % | Spaces Required in the proposed development *(@ 192 apartments)* |
|---|---|---|---|
| **No motor car** | 307 | 24.1% | 0 |
| **One motor car** | 770 | 60.4% | 116 |
| **Two motor cars** | 182 | 14.3% | 55 |
| **Three motor cars** | 12 | 0.9% | 5 |
| **Four or more motor cars** | 3 | 0.2% | 2 |
| ***(Not stated)*** | (141) | | |
| **Total** | 1407 | | 178<br>**~ 1 space per household** |

**Table 3** demonstrates that the average car ownership is just under one car per household. Utilising the same car ownership patterns for the proposed development, it is estimated that approximately 178 residential car parking spaces would be required to satisfy demand. This equates to a provision rate of 0.93 spaces per residential unit, which is greater than the recommended car parking supply of 0.5 spaces per one & two bedroom units (i.e. 96 car parking spaces) as required in the Fingal Development Plan 2023-2029.

# SECTION 3: BASE YEAR 2022 – TRAFFIC VOLUMES & CAPACITY

## 3.1 Traffic Survey

To determine current traffic behaviour in the vicinity of the subject Site, a vehicle turning movement survey was obtained at seven junctions around Northwood (See **Figure 9**). To provide a robust assessment, FCC were informed that historical traffic counts were obtained for each junction. The historical traffic counts were taken in 2019 from a previous application for Blackwood Square, a development located c.100m west of the subject Site;

- Site 1- Junction 1) Ballymun Road (R108) / St. Margaret's Road;
- Site 2- Junction 2) Ballymun Road (R108) / Northwood Avenue;
- Site 3- Junction 3) Northwood Avenue / Old Ballymun Road;
- Site 4- Junction 4) Northwood Avenue / Access Road to Gulliver's Retail Park;
- Site 5- Junction 5) Northwood Avenue / Northwood Road;
- Site 6- Junction 6) Santry Avenue / Northwood Road; and
- Site 7- Junction 7) Northwood Avenue / Swords Road (R138).


**Figure 9 - Traffic Survey Locations 2019** ***(Source: IDASO Traffic Surveys and Data Collection)***

The counts captured all turning movements at these junctions. The vehicle turning movement surveys were undertaken on Tuesday 12th February 2019. The counts were carried out over the 12-hour period 07:00 hours to 19:00 hours including both the morning and evening peak periods.

The morning peak hour was identified as 08:00-09:00 for all junctions. The evening peak hour was identified as 17:00-18:00 for all junctions. Data was collected in 15-minute intervals. A full transcription of the 2019 turning movement survey is included in **Appendix 1** herein.

The 2019 traffic survey at all junctions were factored up to 2022 figures to ensure consistency across all junctions. Traffic flows were factored up in accordance with Table 6.1 of Transport Infrastructure Ireland Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections. The medium growth rate factors were used.

The evening peak hour of 17:00 to 18:00 hours was observed to be marginally more intense than the morning peak hour. However, in order to carry out a robust traffic analysis of the surrounding road network, the traffic modelling exercise following herein will be based on traffic flows recorded for both the weekday morning and evening peak hours for each junction.

A summary of the 2022 factored vehicle turning movement surveys for the morning and evening peak hour periods is shown in **Figure 10** and **Figure 11** below.

In order to determine the effect of the development on the adjoining road network, the estimated trip generation (as detailed in the **Section 5** below), was applied to the traffic counts at each junction. It was assumed the trips generated by the development will mirror the existing trip distribution.

It was determined that Junction 2) Ballymun Road (R108) / Northwood Avenue, Junction 6) Santry Avenue / Northwood Road and Junction 7) Northwood Avenue / Swords Road (R138) were the key junctions to be modelled, as they provide access to/from the public road network. Junction 5) Northwood Avenue / Northwood Road, whilst fully contained within the private area of Northwood, would experience an increase from trips generated by the development and therefore would also be modelled.

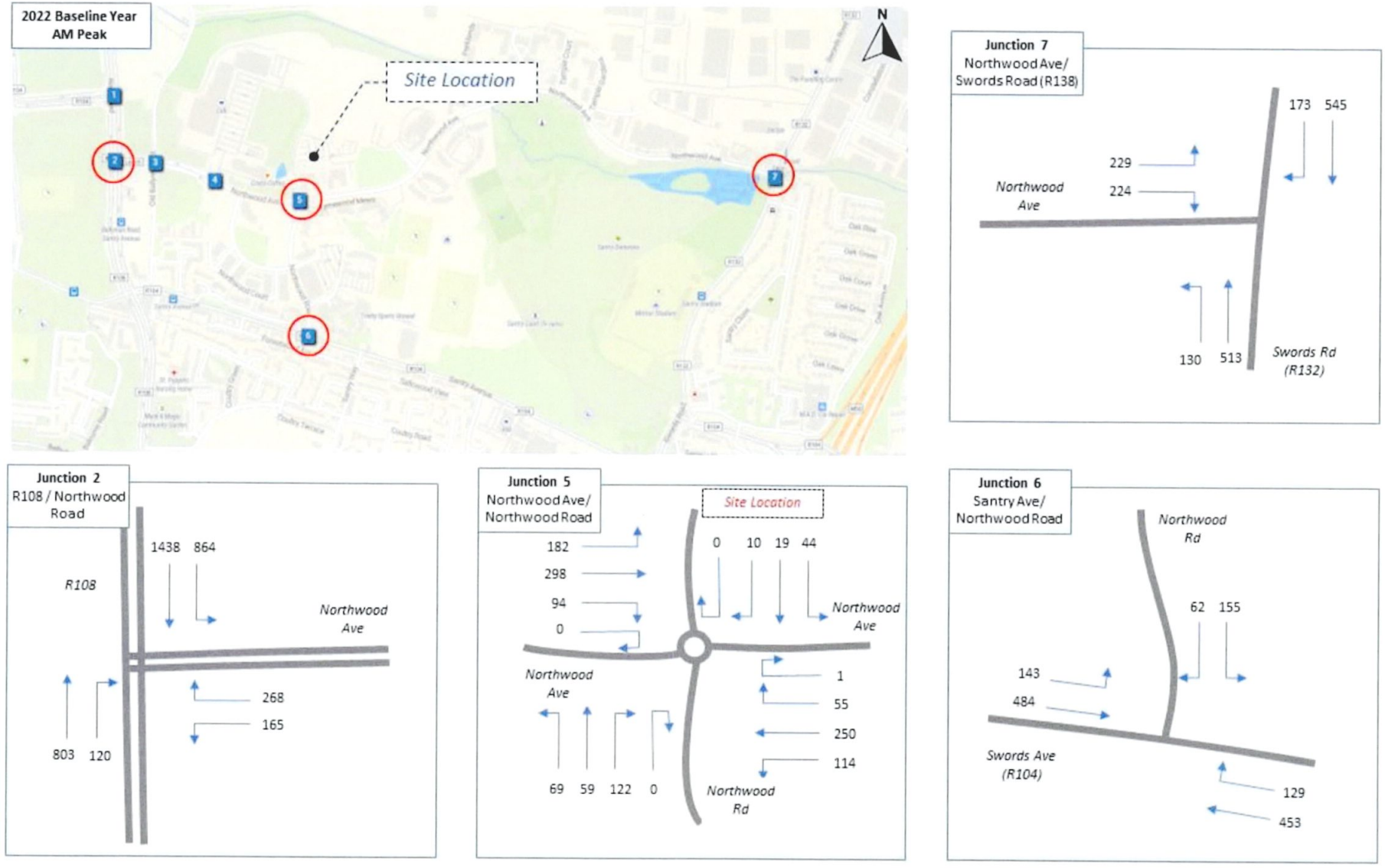



**Figure 10: Traffic Flow 2022 Baseline Year - Morning Peak Hour (08:00 – 09:00)**


**Figure 11: Traffic Flow 2022 Baseline Year - Evening Peak Hour (17:00 – 18:00)**

## 3.2 Junction Capacity Assessment for Base Year 2022

A traffic capacity assessment of the four key junctions in the vicinity the subject Site was undertaken utilising the surveyed results shown in **Figure 10** and **Figure 11** above and TRL's Optimised Signal Capacity and Delay (OSCADY) (for Junctions 2, 6 and 7) & Assessment of Roundabout Capacity and Delay (ARCADY) (for Junction 5) traffic modelling software.

A summary of the results of the analysis of Junction 2) Ballymun Road (R108) / Northwood Avenue, Junction 5) Northwood Avenue / Northwood Road, Junction 6) Santry Avenue / Northwood Road and Junction 7) Northwood Avenue / Swords Road (R138) for the morning and evening peak hours is shown in **Table 4** to **Table 7** following.

### Junction 2) Ballymun Road (R108) / Northwood Avenue

**Table 4: 2022 Baseline Year Junction Capacity Analysis for Junction 2**

| Approach Arm | Max. DOS | | Max. Queue (PCU[1]) | |
|---|---|---|---|---|
| | AM | PM | AM | AM |
| **Ballymun Road (R108) North** | 0.91 | 0.57 | 40 | 34 |
| **Northwood Avenue** | 0.76 | 0.82 | 14 | 26 |
| **Ballymun Road (R108) South** | 0.32 | 0.76 | 10 | 34 |

The normal design threshold for the degree of saturation (DOS) is 0.9 for a signalized junction. The results shown in **Table 4** demonstrate that Junction 2) Ballymun Road (R108) / Northwood Avenue is operating within the normal design threshold in the evening peak hour under 2022 baseline scenario. The Northwood Avenue arm on this junction during the evening peak hour is beginning to approach the design threshold with minor queues and delays for motorists. However, the Ballymun Road (R108) North arm on this junction during the morning peak hour under 2022 baseline scenario is operating slightly exceeding the normal design threshold (but still less than its theoretical capacity of 1.0) with queues and delays for motorists evident. Once a junction is nearing or at capacity, any slight increase, whether it is background traffic growth or a new development, will have a noticeable increase in queues/ delays.

It concurs with observations made pre Covid restrictions that at peak traffic times (pre Covid restrictions), traffic occasionally queues from the Ballymun Road signalised junction along Northwood Avenue in both traffic lanes through the Old Ballymun Road junction and into the Northwood area. Traffic is not observed to keep the junction clear during such instances and blocks entry and exit movements into and out of Old Ballymun Road.

[1] *PCU means Passenger Car Unit. A passenger car equivalent is essentially the impact that a mode of transport has on traffic variables (such as headway, speed, density) compared to a single car. For example, 1 private car is equal to 1 pcu and 1 Public Service Vehicle is equal to 2 pcu*

### Junction 5) Northwood Avenue / Northwood Road

**Table 5: 2022 Baseline Year Junction Capacity Analysis for Junction 5**

| Approach Arm | Max. RFC | | Max. Queue (PCU) | | Average Delay (Seconds) | |
|---|---|---|---|---|---|---|
| | AM | PM | AM | PM | AM | PM |
| Local Access Road to the West of the Site | 0.05 | 0.19 | 0 | 0 | 3 | 3 |
| Northwood Avenue East | 0.26 | 0.30 | 0 | 0 | 3 | 3 |
| Northwood Road | 0.15 | 0.21 | 0 | 0 | 3 | 3 |
| Northwood Avenue West | 0.35 | 0.31 | 1 | 0 | 3 | 3 |

The normal design threshold for the ratio of flow to capacity (RFC) is 0.85 for a roundabout junction. The results shown in **Table 5** demonstrate that Junction 5) Northwood Avenue / Northwood Road is operating within the normal design threshold in the morning and evening peak hours under 2022 baseline scenario.

### Junction 6) Santry Avenue / Northwood Road

**Table 6: 2022 Baseline Year Junction Capacity Analysis for Junction 6**

| Approach Arm | Max. DOS | | Max. Queue (PCU) | |
|---|---|---|---|---|
| | AM | PM | AM | PM |
| Santry Avenue West | 0.68 | 0.67 | 10 | 10 |
| Northwood Road | 0.38 | 0.65 | 4 | 7 |
| Santry Avenue East | 0.58 | 0.81 | 6 | 10 |

The normal design threshold for the degree of saturation (DOS) is 0.9 for a signalized junction. The results shown in **Table 6** demonstrate that Junction 6) Santry Avenue / Northwood Road is operating within the normal design threshold in the morning and evening peak hours under 2022 baseline scenario. The Santry Avenue East arm on this junction during the evening peak hour is beginning to approach the design threshold with minor queues and delays for motorists.

### Junction 7) Northwood Avenue / Swords Road (R138)

**Table 7: 2022 Baseline Year Junction Capacity Analysis for Junction 7**

| Approach Arm | Max. DOS | | Max. Queue (PCU) | |
|---|---|---|---|---|
| | AM | PM | AM | PM |
| Swords Road (R138) South | 0.70 | 0.64 | 11 | 14 |
| Northwood Avenue | 0.77 | 0.91 | 11 | 19 |
| Swords Road (R138) North | 0.72 | 0.89 | 9 | 16 |

The normal design threshold for the degree of saturation (DOS) is 0.9 for a signalized junction. The results shown in **Table 7** demonstrate that Junction 7) Northwood Avenue / Swords Road (R138) is operating within the normal design threshold in the morning peak hour under 2022 baseline scenario. However, the Northwood Avenue arm on this junction during the evening peak hour under 2022 baseline scenario is operating slightly exceeding the normal design threshold (but still less than its theoretical capacity of 1.0) with queues and delays for motorists evident. Also, the Swords Road (R138) arm on this junction during the evening peak hour is beginning to approach the design threshold with minor queues and delays for motorists. Once a junction is nearing or at capacity, any slight increase, whether it is background traffic growth or a new development, will have a noticeable increase in queues/ delays.

# SECTION 4: CHARACTERISTICS OF THE PROPOSED SCHEME & ACCESS

## 4.1 Overview

The proposed development will consist of the following:

- Site clearance, including the removal of all structures on site part of existing surface car parking;
- Relocation of existing surface car parking spaces catering for Swift Square Office Park personnel to the new basement accessible via a new ramp off the local road from Northwood Avenue, and the new undercroft parking area with access at street level off the local road to the north of the site;
- Construction of 3 no. apartment blocks (1, 2 and 3) over a partially shared podium structure, with heights ranging from 4 to 9 storeys, comprising 192 no. apartment units (4 no. 1-bedroom units and 188 no. 2-bedroom units), ancillary residential uses and associated car and bicycle parking; and
- Provision of public and communal open spaces, public realm, boundary treatments, landscaping and lighting; refuse storage, associated drainage, attenuation and services; temporary car parking area, construction access, and basement access route and ramp; and all associated site development works.

The 254 existing surface car parking spaces catering for Swift Square Office Park personnel will be relocated to the undercroft car park area (i.e. 40 car parking spaces) and basement car park area (i.e. 214 car parking spaces) of the proposed development.

## 4.2 Site Access

Access to the proposed development will be provided from two locations. One vehicular access will connect between the local access road to the west of the proposed development and the basement car park area. Another vehicular and cyclist access will connect between Cedarview and undercroft car park area. See **Figure 12** for a sketch illustrating the proposed access points to the Site.

The local access road to the west of the proposed development and Cedarview are private roads which have a 30kph speed limit. Sightlines in excess of 23 metres are provided in accordance with the Design Manual for Urban Roads and Streets for 30kph speed limit roads at the vehicular accesses to the basement car park area and the undercroft car park area on both the local access road to the west of proposed development and Cedarview.

**Figure 12** illustrates five pedestrian accesses which will be provided to the proposed development as following:-

- West side of the proposed development connecting to local access road;
- North side of the proposed development connecting to Cedarview;
- North-east side of the proposed development connecting to Cedarview;
- South-east side of the proposed development connecting to Northwood Avenue; and
- South side of the proposed development connecting to Northwood Avenue.

To give priority to pedestrian and cyclist, appropriate measures (i.e. road markings, signages, ramp, courtesy crossing, etc.) will be considered in later detailed design stage to ensure safety of road users.

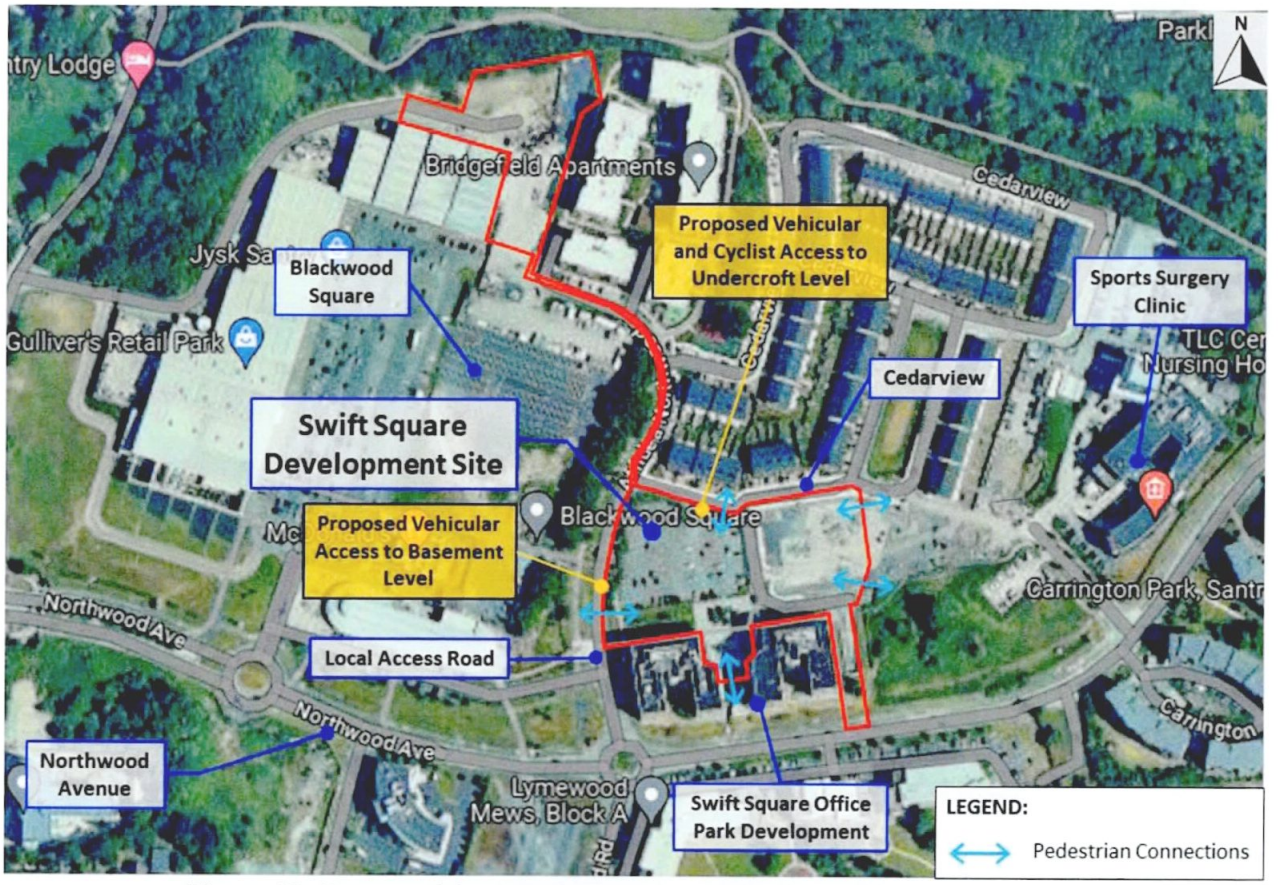



**Figure 12: Proposed Access Arrangement Side Road Northwood Avenue**
***(indicative subject Site outline in red)***
***(Source: Google Maps, annotation by J.B. Barry & Partners)***

## 4.3 Road Safety Assessment

The Road Safety Authority (RSA) database of road collision information was interrogated to establish if the surrounding road network in the vicinity of the proposed development access holds records relating to historical collision occurrence (**Figure 13** below). Collisions from 2005 to 2016 only are available.

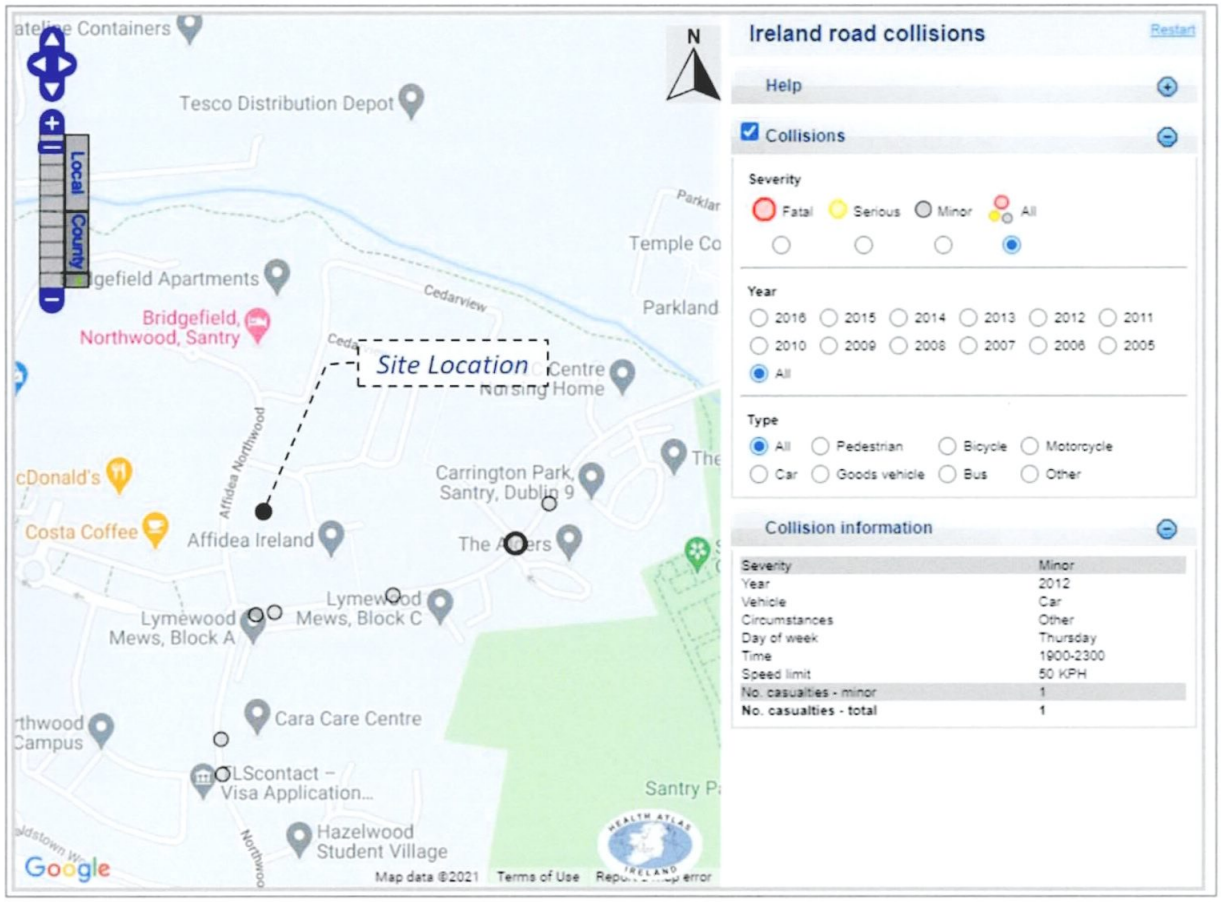



**Figure 13: Historic Collisions 2005 – 2016**
***(Source: RSA Database, annotation by J.B. Barry & Partners)***

This exercise revealed that there has been one minor collision at the entry of the Site on Northwood Avenue, in 2012. Four minor collisions have also taken place on the Northwood Avenue. One single vehicle collision, two vehicle collisions with a pedestrian and one vehicle collision with a bicycle. Due to the isolated nature and low frequency of these collisions a pattern of collisions is not identifiable. It is not considered that the proposed develop would result in any traffic safety implications.

# SECTION 5: TRIP GENERATION AND ASSIGNMENT

## 5.1 Trip Generation

The Trip Rate Information Computer System (TRICS) database was interrogated to derive the potential development trip generation rates. Utilising data supplied by the TRICS database, **Table 8** details the estimated trip generation for the proposed residential units during the morning and evening peak hours being considered for this study. The TRICS morning and evening peak hours were 08:00 to 09:00 and 17:00 to 18:00 respectively. The trips generated during these times were applied to the morning and evening peak hours for the road network.

As the residential element of the proposed development includes 1 and 2 bedroom apartments, the trip rates were calculated "per bedroom" in order to produce a more robust result. The private gym contained within the development will be for private residential use only and therefore will not generate any vehicle trips. The full TRICS output files are contained in **Appendix 2**.

TRICS is the UK and Ireland's national system of trip generation analysis. It contains over 7,150 directional transport surveys at over 110 types of development in both the UK and Ireland. Transport surveys from the Greater London area were excluded from the database used as this tends to skew results because of London's greater reliance on public transport. A development type matching the proposed development was used.

**Table 8: Trip Generation for the Proposed Development**

| | Time | Factor | TRICS Arrival Rate | TRICS Departure Rate | Hourly Trips | |
|---|---|---|---|---|---|---|
| | | | | | Trips In | Trips Out |
| **Residential Development 192 Units** | Morning Peak Hour | 380 Bedrooms | 0.034 *(per bedroom)* | 0.099 *(per bedroom)* | **13** | **38** |
| | Evening Peak Hour | | 0.091 *(per bedroom)* | 0.048 *(per bedroom)* | **35** | **18** |

## 5.2 Modal Choice

When estimating trip generation for a residential development using TRICS, the trip rate for car drivers generally accounts for a 65%-70% modal split of total trips coming in and out of a residential development. In order to produce a robust and conservative assessment of the traffic impact of the proposed development, this study will continue to utilise the modal split from TRICS for car trips, with no TRIP attenuation applied. Also, this study assumes that all of the trips generated by the development will be by car. In reality, this modal split will be smaller as a number of residents will choose to take the Dublin Bus service in the vicinity of the development and MetroLink in the future. Additionally, the parking strategy has been developed to encourage less of a reliance on private cars and a greater focus on sustainable transport such as cycling.

## 5.3 Trip Distribution and Assessment Years

It was assumed for the purposes of this study that the future development traffic will mirror 2019 travel flows when exiting and entering the development. The 2019 traffic from the entire Northwood development was analysed in the morning and evening peak hours. Currently during the morning peak, 41% of vehicles departing the Northwood area travel east towards the Swords Road, 20% travel south towards Santry Avenue, while the remaining 39% travel west towards the Ballymun Road. During the evening peak hour,

30% travel east towards the Swords Road, 24% travel south towards Santry Avenue and 46% travel west towards the Ballymun Road. The future development traffic distribution at the surrounding junctions will mirror existing traffic patterns i.e. development generated flows will be split through the junctions proportionally to existing flows.

Assuming planning permission is granted for the development in 2023 and allowing for a 2-3 year construction period, it is estimated that the proposed development will be fully operational by the end of 2025. For the purpose of this study, 2025 is assumed as the Year of Opening. Therefore, traffic analysis associated with this study will focus on the following future development operational scenarios:

- Residential Development Year of Opening – 2025; and
- 15 Year Design Horizon – 2040.

The projected 2025 and 2040 design year traffic flows have been calculated by factoring up the 2019 recorded traffic flows in accordance with the TII Publications Project Appraisal Guidelines for National Roads document 'Unit 5.3 Travel Demand Projections, Table 6.1: Link-Based Growth Rates: Metropolitan Area Annual Growth Rates to develop a "without" development scenario. The medium growth rate factors have been utilised. Additional traffic flows due to the proposed development has been then applied to these future year flows to develop the "**with**" development scenario.

**Figure 14** and **Figure 15** illustrate the 2025 Year of Opening for the "without" and "**with**" development scenarios for morning and evening peaks. **Figure 16** and **Figure 17** illustrate the 2040 Design Year Horizon for the "without" and "**with**" development scenarios for morning and evening peaks.


**Figure 14: Traffic Flow 2025 Opening Year – Morning Peak Hour (08:00 – 09:00)**


**Figure 15: Traffic Flow 2025 Opening Year – Evening Peak Hour (17:00 – 18:00)**


**Figure 16: Traffic Flow 2040 Design Year – Morning Peak Hour (08:00 – 09:00)**


**Figure 17: Traffic Flow 2040 Design Year – Evening Peak Hour (17:00 – 18:00)**

# SECTION 6: TRAFFIC IMPACT

## 6.1 Background

In order to assess the future traffic impact of the proposed development, capacity assessments were undertaken using TRL's OSCADY and ARCADY traffic modelling software on the following junctions;

- Site 2- Junction 2) Ballymun Road (R108) / Northwood Avenue - OSCADY;
- Site 5- Junction 5) Northwood Avenue / Northwood Road - ARCADY;
- Site 6- Junction 6) Santry Avenue / Northwood Road - OSCADY; and
- Site 7- Junction 7) Northwood Avenue / Swords Road (R138) - OSCADY.

The junctions were modelled for the 2025 year of Opening and the 2040 Year Design Horizon (year of Opening plus 15 years) for the morning and evening peak hour periods using the flow diagrams shown in **Figure 14** to **Figure 17** in the previous section herein.

To demonstrate the direct traffic impact associated with the proposed development on the key junction being considered, the traffic modelling exercise was carried out for the "without" development and "**with**" development scenarios.

During consultation with FCC on a previous application in the area, it is noted that Fingal plan to upgrade Junction 2) Ballymun Road (R108) / Northwood Avenue, this upgrade has not been accounted for in the modelling as the exact designs are still unknown. Additionally, Junction 3) Northwood Avenue / Old Ballymun Road will be improved to incorporate SCATS. Upgrading this junction to SCATS will allow the junction to control the traffic arriving from Northwood to the Ballymun Road. The junctions will better calculate and adapt the timing of traffic signals in the network allowing the junction to operate efficiently, creating an overall positive impact.

## 6.2 Operational Phase 2025 Traffic Impact

A traffic capacity assessment of the four junctions in the vicinity the subject Site was undertaken utilising the surveyed results shown in **Figure 14** and **Figure 15** above and TRL's OSCADY (for junctions 2, 6 and 7) & ARCADY (for junction 5) traffic modelling software.

A summary of the results of the analysis of Junction 2) Ballymun Road (R108) / Northwood Avenue, Junction 5) Northwood Avenue / Northwood Road, Junction 6) Santry Avenue / Northwood Road and Junction 7) Northwood Avenue / Swords Road (R138) both "without" and "**with**" the development for the morning and evening peak hours is shown in **Table 9 to Table 12** following.

### Junction 2) Ballymun Road (R108) / Northwood Avenue

**Table 9: 2025 Opening Year Junction Capacity Analysis for Junction 2**

| Approach Arm | Scenario | Max. DOS | | Max. Queue (PCU) | |
|---|---|---|---|---|---|
| | | AM | PM | AM | PM |
| Ballymun Road (R108) North | Without Development | 0.95 | 0.60 | 46 | 36 |
| | With Development | 0.96 | 0.61 | 47 | 36 |
| Northwood Avenue | Without Development | 0.81 | 0.87 | 15 | 28 |
| | With Development | 0.83 | 0.88 | 16 | 29 |
| Bally Road (R108) South | Without Development | 0.34 | 0.80 | 10 | 36 |
| | With Development | 0.34 | 0.80 | 10 | 36 |

The normal design threshold for the degree of saturation (DOS) is 0.9 for a signalised junction. **Table 9** demonstrates that Junction 2) Ballymun Road (R108) / Northwood Avenue will operate within the normal design threshold in the evening peak hour under 2025 "without" and "**with**" development scenarios. The Northwood Avenue and Ballymun Road (R108) South arms on this junction during the evening peak hour under 2025 "without" and "**with**" development scenarios will begin to approach the design threshold with minor queues and delays for motorists. However, the Ballymun road (R108) North arm on this junction during the morning peak hour under "without" and "**with**" development scenarios will slightly exceed the normal design threshold (but still less than its theoretical capacity of 1.0) with queues and delays for motorists evident. Once a junction is nearing or at capacity, any slight increase, whether it is background traffic growth or a new development, will have a noticeable increase in queues/ delays. However, the analysis indicates that traffic from the proposed development will not have significant impact on this junction.

### Junction 5) Northwood Avenue / Northwood Road

**Table 10: 2025 Opening Year Junction Capacity Analysis for Junction 5**

| Approach Arm | Scenario | Max. RFC | | Max. Queue (PCU) | | Average Delay (Seconds) | |
|---|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | AM | PM |
| Local Access Road to the West of the Site | Without Development | 0.05 | 0.20 | 0 | 0 | 3 | 3 |
| | With Development | 0.08 | 0.22 | 0 | 0 | 3 | 3 |
| Northwood Avenue East | Without Development | 0.27 | 0.32 | 0 | 1 | 3 | 3 |
| | With Development | 0.28 | 0.33 | 0 | 1 | 3 | 3 |
| Northwood Road | Without Development | 0.16 | 0.22 | 0 | 0 | 3 | 3 |
| | With Development | 0.16 | 0.23 | 0 | 0 | 3 | 3 |
| Northwood Avenue West | Without Development | 0.37 | 0.32 | 1 | 1 | 3 | 3 |
| | With Development | 0.37 | 0.34 | 1 | 1 | 4 | 3 |

The normal design threshold for the ratio of flow to capacity (RFC) is 0.85 for a roundabout junction. **Table 10** demonstrates that the Junction 5) Northwood Avenue / Northwood Road roundabout will operate within the normal design threshold during the morning and evening peak hours under 2025 "without" and "**with**" development scenarios. The analysis indicates that despite an increase in traffic on the local road to the west of the Site arm, as the junction is considerably within capacity, the development will have an insignificant impact on the operation of the roundabout.

### Junction 6) Santry Avenue / Northwood Road

**Table 11: 2025 Opening Year Junction Capacity Analysis for Junction 6**

| Approach Arm | Scenario | Max. DOS | | Max. Queue (PCU) | |
|---|---|---|---|---|---|
| | | AM | PM | AM | PM |
| Santry Avenue West | Without Development | 0.71 | 0.70 | 11 | 11 |
| | With Development | 0.72 | 0.71 | 11 | 11 |
| Northwood Road | Without Development | 0.40 | 0.68 | 4 | 8 |
| | With Development | 0.41 | 0.68 | 4 | 8 |
| Santry Avenue East | Without Development | 0.61 | 0.86 | 6 | 11 |
| | With Development | 0.62 | 0.87 | 6 | 11 |

The normal design threshold for the degree of saturation (DOS) is 0.9 for a signalised junction. **Table 11** demonstrates that Junction 6) Santry Avenue / Northwood Road will operate within the normal design threshold during the morning and evening peak hours under 2025 "without" and "**with**" development scenarios. The Santry Avenue East arm on this junction during the evening peak hour under 2025 "without" and "**with**" development scenarios will begin to approach the design threshold with minor queues and delays for motorists. However, the analysis indicates that traffic from the proposed development will not have significant impact on this junction.

### Junction 7) Northwood Avenue / Swords Road (R138)

**Table 12: 2025 Opening Year Junction Capacity Analysis for Junction 7**

| Approach Arm | Scenario | Max. DOS | | Max. Queue (PCU) | |
|---|---|---|---|---|---|
| | | AM | PM | AM | PM |
| Swords Road (R138) South | Without Development | 0.74 | 0.67 | 12 | 15 |
| | With Development | 0.74 | 0.67 | 12 | 15 |
| Northwood Avenue | Without Development | 0.81 | 0.96 | 12 | 22 |
| | With Development | 0.84 | 0.97 | 13 | 24 |
| Swords Road (R138) North | Without Development | 0.79 | 0.95 | 10 | 20 |
| | With Development | 0.80 | 0.96 | 11 | 22 |

The normal design threshold for the degree of saturation (DOS) is 0.9 for a signalised junction. **Table 12** demonstrates that Junction 7) Northwood Avenue / Swords Road (R138) will operate within the normal design threshold in the morning peak hour under 2025 "without" and "**with**" development scenarios. The Northwood Avenue arm on this junction during the morning peak hour under 2025 "without" and "**with**" development scenarios will begin to approach the design threshold with minor queues and delays for motorists. However, the Northwood Avenue and Swords Road (R138) North arms on this junction during the evening peak hour under "without" and "**with**" development scenarios will slightly exceed the normal design threshold (but still less than its theoretical capacity of 1.0) with queues and delays for motorists evident. Once a junction is nearing or at capacity, any slight increase, whether it is background traffic growth or a new development, will have a noticeable increase in queues/ delays. However, the analysis indicates that traffic from the proposed development will not have significant impact on this junction.

## 6.3 Operational Phase 2040 Traffic Impact

A traffic capacity assessment of the four key junctions in the vicinity the subject Site was undertaken utilising the surveyed results shown in **Figure 16 and Figure 17** above and TRL's OSCADY (for Junctions 2, 6 and 7) and ARCADY (for Junction 5) traffic modelling software for all junctions.

A summary of the results of the analysis of Junction 2) Ballymun Road (R108) / Northwood Avenue, Junction 5) Northwood Avenue / Northwood Road, Junction 6) Santry Avenue / Northwood Road and Junction 7) Northwood Avenue / Swords Road (R138) both "without" and "**with**" the development for the morning and evening peak hours is shown in **Table 13** to **Table 16** following.

### Junction 2) Ballymun Road (R108) / Northwood Avenue

**Table 13: 2040 Design Year Junction Capacity Analysis for Junction 2**

| Approach Arm | Scenario | Max. DOS | | Max. Queue (PCU) | |
|---|---|---|---|---|---|
| | | AM | PM | AM | PM |
| Ballymun Road (R108) North | Without Development | 1.10 | 0.69 | 104 | 42 |
| | With Development | **1.11** | **0.71** | **108** | **42** |
| Northwood Avenue | Without Development | 0.96 | 1.01 | 22 | 44 |
| | With Development | **0.98** | **1.02** | **25** | **46** |
| Bally Road (R108) South | Without Development | 0.39 | 0.91 | 11 | 45 |
| | With Development | **0.39** | **0.91** | **11** | **45** |

The normal design threshold for the degree of saturation (DOS) is 0.9 for a signalised junction. **Table 13** demonstrates that the Ballymun Road (R108) North and Northwood Avenue arms on this junction during the morning peak hour under 2040 "without" and "**with**" development scenarios will exceed the normal design threshold with queues and delays for motorists evident. Also, the Northwood Avenue and Ballymun Road (R108) South arms on this junction during the evening peak hour under 2040 "without" and "**with**" development scenarios will exceed the normal design threshold with queues and delays for motorists evident. Once a junction is nearing or at capacity, any slight increase, whether it is background traffic growth or a new development, will have a noticeable increase in queues/ delays. However, the analysis indicates that traffic from the proposed development will not have significant impact on this junction. Additionally, the expected improvements in the public transport services in the surrounding area will have a positive impact on junction capacity.

### Junction 5 – Northwood Avenue / Northwood Road

**Table 14: 2040 Design Year Junction Capacity Analysis for Junction 5**

| Approach Arm | Scenario | Max. RFC | | Max. Queue (PCU) | | Average Delay (Seconds) | |
|---|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | AM | PM |
| Local Road to the West of the Site | Without Development | 0.06 | 0.24 | 0 | 0 | 3 | 3 |
| | With Development | 0.09 | 0.26 | 0 | 0 | 3 | 3 |
| Northwood Avenue East | Without Development | 0.31 | 0.37 | 1 | 1 | 3 | 4 |
| | With Development | 0.32 | 0.38 | 1 | 1 | 3 | 4 |
| Northwood Road | Without Development | 0.19 | 0.26 | 0 | 0 | 3 | 3 |
| | With Development | 0.19 | 0.27 | 0 | 0 | 3 | 3 |
| Northwood Avenue West | Without Development | 0.43 | 0.38 | 1 | 1 | 4 | 3 |
| | With Development | 0.43 | 0.39 | 1 | 1 | 4 | 3 |

The normal design threshold for the ratio of flow to capacity (RFC) is 0.85 for a roundabout junction. **Table 14** demonstrates that the Junction 5) Northwood Avenue / Northwood Road roundabout will operate within the normal design threshold during the morning and evening peak hours under 2040 "without" and "**with**" development scenarios. The analysis indicates that despite an increase in traffic on the local road to the west of the Site arm, as the junction is considerably within capacity, the development will have an insignificant impact on the operation of the roundabout.

### Junction 6 – Santry Avenue / Northwood Road

**Table 15: 2040 Design Year Junction Capacity Analysis for Junction 6**

| Approach Arm | Scenario | Max. DOS | | Max. Queue (PCU) | |
|---|---|---|---|---|---|
| | | AM | PM | AM | PM |
| Santry Avenue West | Without Development | 0.82 | 0.80 | 13 | 13 |
| | With Development | 0.82 | 0.81 | 13 | 13 |
| Northwood Road | Without Development | 0.46 | 0.78 | 5 | 10 |
| | With Development | 0.47 | 0.78 | 5 | 10 |
| Santry Avenue East | Without Development | 0.71 | 1.00 | 8 | 27 |
| | With Development | 0.71 | 1.02 | 8 | 31 |

The normal design threshold for the degree of saturation (DOS) is 0.9 for a signalised junction. **Table 15** demonstrates that Junction 6) Santry Avenue / Northwood Road will operate within the normal design threshold during the morning peak hour under 2040 "without" and "**with**" development scenarios. The Santry Avenue West arm on this junction during the morning peak hour under 2040 under 2040 "without" and "**with**" development scenarios will begin to approach the design threshold with minor queues and delays for motorists. However, the Santry Avenue East arm on this junction during the evening peak hour under 2040 "without" and "**with**" development scenarios will exceed the normal design threshold with queues and delays for motorists evident. Once a junction is nearing or at capacity, any slight increase, whether it is background traffic growth or a new development, will have a noticeable increase in queues/ delays. However, the analysis indicates that traffic from the proposed development will not have significant impact on this junction. Additionally, the expected improvements in the public transport services in the surrounding area will have a positive impact on junction capacity.

### Junction 7 – Northwood Avenue / Swords Road (R138)

**Table 16: 2040 Design Year Junction Capacity Analysis for Junction 7**

| Approach Arm | Scenario | Max. DOS | | Max. Queue (PCU) | |
|---|---|---|---|---|---|
| | | AM | PM | AM | PM |
| Swords Road (R138) South | Without Development | 0.86 | 0.77 | 15 | 18 |
| | With Development | 0.86 | 0.77 | 15 | 18 |
| Northwood Avenue | Without Development | 0.93 | 1.09 | 17 | 49 |
| | With Development | 0.95 | 1.10 | 20 | 52 |
| Swords Road (R138) North | Without Development | 1.06 | 1.12 | 44 | 77 |
| | With Development | 1.06 | 1.14 | 46 | 85 |

The normal design threshold for the degree of saturation (DOS) is 0.9 for a signalised junction. **Table 16** demonstrates that the Northwood Avenue and Swords Road (R138) North arms on this junction during the morning peak hour under 2040 "without" and "**with**" development scenarios will exceed the normal design threshold with queues and delays for motorists evident. Also, the Northwood Avenue and Swords Road (R138) North arms on this junction during the evening peak hour under 2040 "without" and "**with**" development scenarios will exceed the normal design threshold with queues and delays for motorists evident. Once a junction is nearing or at capacity, any slight increase, whether it is background traffic growth or a new development, will have a noticeable increase in queues/ delays. However, the analysis indicates that traffic from the proposed development will not have significant impact on this junction. Additionally, the expected improvements in the public transport services in the surrounding area will have a positive impact on junction capacity.

## 6.4 Summary

The traffic analysis, traffic/queue counts, and pre-Covid on-site observations all demonstrated that Junction 5) Northwood Avenue / Northwood Road and Junction 6) Santry Avenue / Northwood Road are currently operating within the normal design threshold in 2022 baseline year. However, Junction 2) Ballymun Road (R108) / Northwood Avenue and Junction 7) Northwood Avenue / Swords Road (R138), are slightly exceeding the normal design threshold (but still less than its theoretical capacity of 1.0) in 2022 baseline year. In the future, Junction 5) Northwood Avenue / Northwood Road will still operate within the normal design threshold. However, the other key junctions (Junction 2, 6 & 7) will not operate efficiently in either the "without" and "**with**" development scenarios. Any future traffic growth, irrespective of the subject development, will therefore result in an impact to the operation of the junction. However, the analysis indicates that traffic from the proposed development will not have significant impact on those junctions. The planned upgrade of the Junction 2) Ballymun Road (R108) / Northwood Avenue and Junction 3) Northwood Avenue / Old Ballymun Road will help control traffic reducing delays. It is noted that the 2040 analysis does not include the likely improvements in the public transport services (MetroLink and BusConnects).

## 6.5 Cumulative Impacts

As demonstrated above in the traffic analysis, Junctions 2, 6 and 7 will not operate efficiently in either the "without" and "**with**" the proposed development scenarios. As these junctions are at capacity, the cumulative effect of neighbouring developments will likely have a noticeable increase in queues/delays. This further emphasises the need for an improved public transport network such as MetroLink and BusConnects, regardless of the proposed development and neighbouring developments.

## 6.6 Traffic Impacts During Construction

During the construction works, there will be additional HGV movements to/from the Site. Traffic will be generated by the disposal of surplus subsoil from the Site, deliveries of construction materials and equipment and of course private vehicles owned and driven by construction workers and staff.

It should be noted that construction traffic generated during the Construction Phase tends to be outside of peak hours. (Staff and deliveries generally arrive before 07:00 and depart after 19:00). The traffic generated by the construction phase will not be higher than the peak hour predicted volumes for the Operational Phase. Any specific recommendations/requirements with regard to construction traffic management made by FCC will be adhered to during this phase.

All construction activities will be governed by a construction Traffic Management Plan (TMP) the details of which will be agreed with FCC's Roads Department prior to the commencement of the Construction Phase. The principal objective of the TMP is to ensure that the impacts of all building activities generated during the Construction Phase upon both the public (off-site) and internal (on Site) workers environments, are fully considered and proactively managed / programmed respecting key stakeholders' requirements.

Good construction management practices will be employed such as fencing the Site off from the public and neighbouring sites, adequate external/internal signage, secure internal site offices, dedicated construction access points all to ensure the safety construction staff and the public. Appropriate levels of staff parking and compounding will be provided to ensure no potential overflow or haphazard parking in the area. The Site will be able to accommodate employee and visitor parking throughout. Set construction traffic routes to and from the Site will be agreed with FCC prior to the commencement of constructions activities on Site. The time of day permittable for such routes will also be agreed upon and outside of the morning/evening peak hours. Wheel wash facilities will be provided on Site to ensure that construction debris will not have an impact on the quality of roads in the Northwood area.

To facilitate the construction works of the proposed development, a temporary carpark will be constructed in a designated area northeast of the adjacent Gulliver's Retail Park as shown in **Figure 18**.

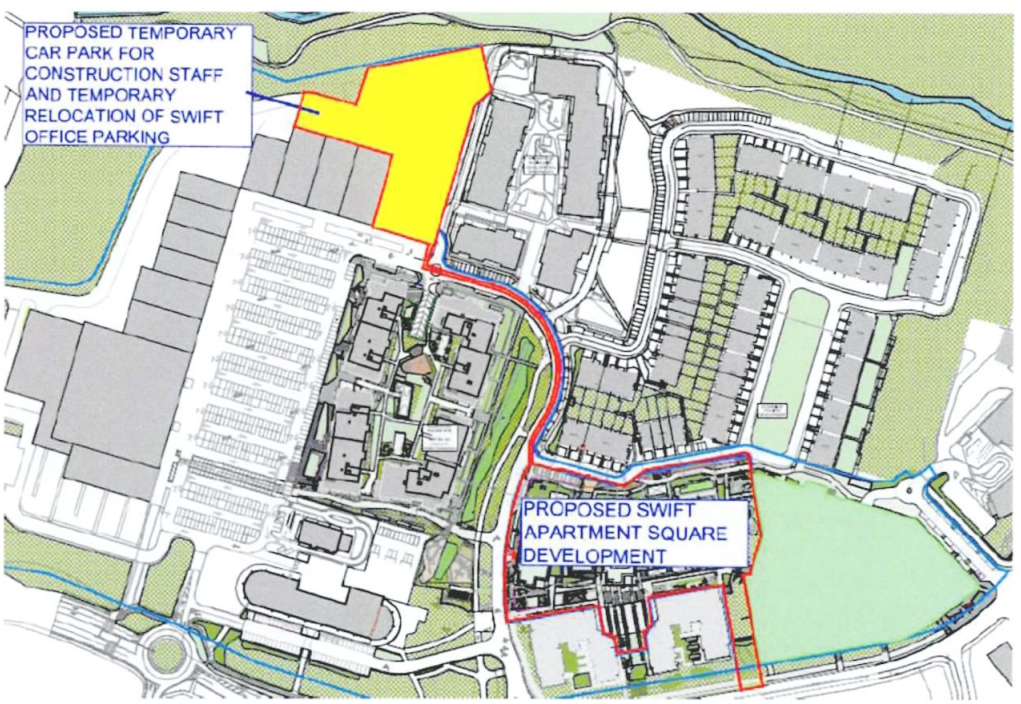



**Figure 18: Proposed Location for Temporary Car Parking for Swift Squares Office Park Personnel and Construction Staff (indicative subject Site outline in red)**

Following construction of this temporary carpark, all existing basement car parking catering for Swift Square Office Park personnel will be temporarily relocated to the new temporary carpark. After that, the existing vehicular ramp access to basement carpark will be removed and a new temporary ramp will be constructed to facilitate temporary access to the basement carpark from Northwood Avenue as shown in **Figure 19**.

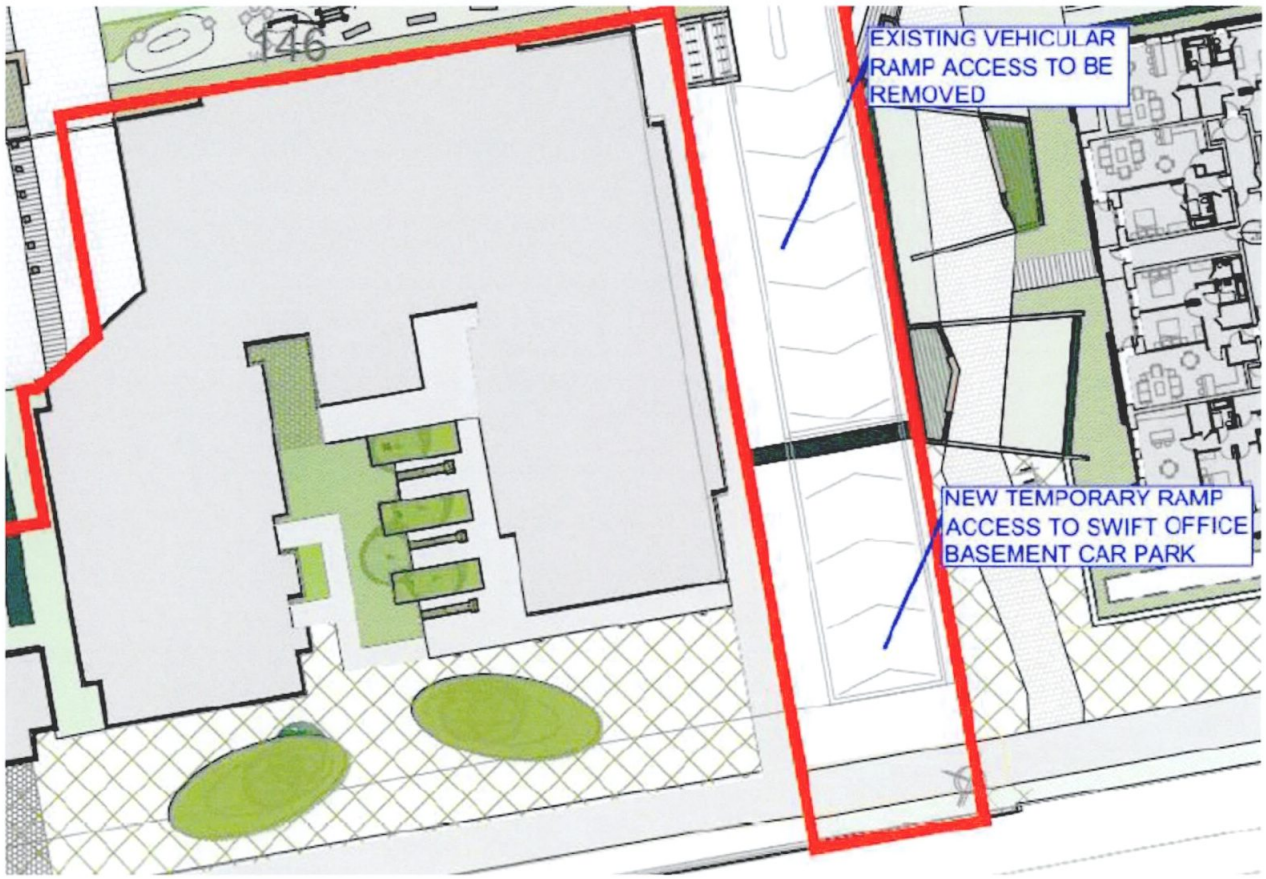



**Figure 19: Temporary Ramp Access to Existing Basement Carpark catering for Swift Squares Office Park Personnel from Northwood Avenue (indicative subject Site outline in red)**

Following completion of this new temporary ramp from Northwood Avenue, the existing basement carpark catering for Swift Square Office Park personnel will been restored and the new temporary carpark as shown in **Figure 18** will be used for the relocation of the existing surface car parking area catering for Swift Square Office Park personnel to facilitate the main excavation works. Additionally, temporary car parking spaces for construction staff will be also provided at the above-mentioned temporary carpark.

Following practical completion of the proposed Swift Apartment basement structure, a temporary access to the existing basement carpark catering for Swift Square Office Park personnel through a new basement ramp access will be constructed as shown in **Figure 20**.

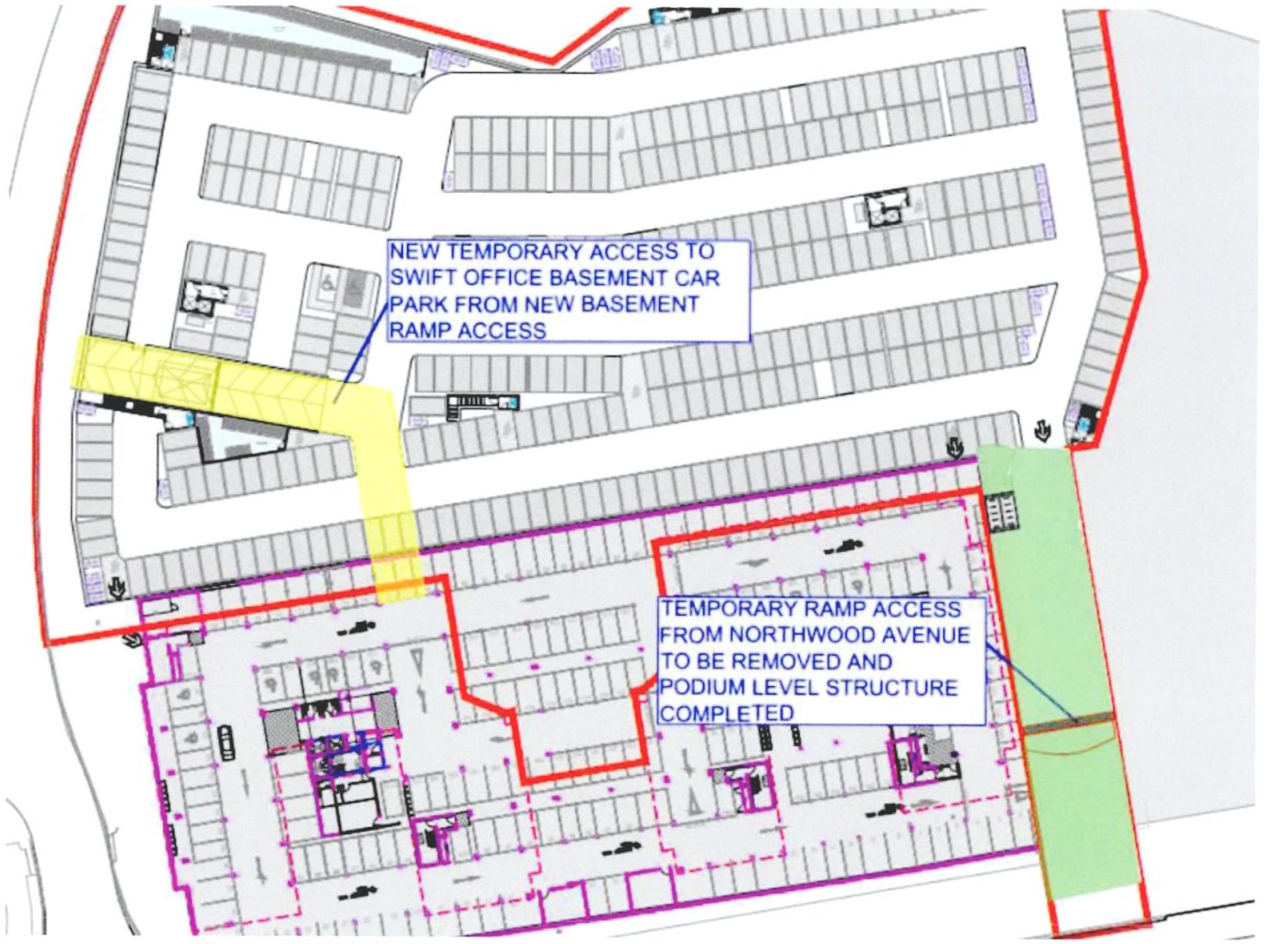



**Figure 20: A Ramp Access to Existing Basement Carpark catering for Swift Squares Office Park Personnel from the Local Access Road (indicative subject Site outline in red)**

At this stage, the temporary access from Northwood Avenue as shown in **Figure 19** will be decommissioned and the podium level structure and landscaping will be completed in this area. The new permanent access route to the basement carpark catering for Swift Square Office Park personnel through the new Swift Apartment basement will then be completed and commissioned as shown in **Figure 21**.

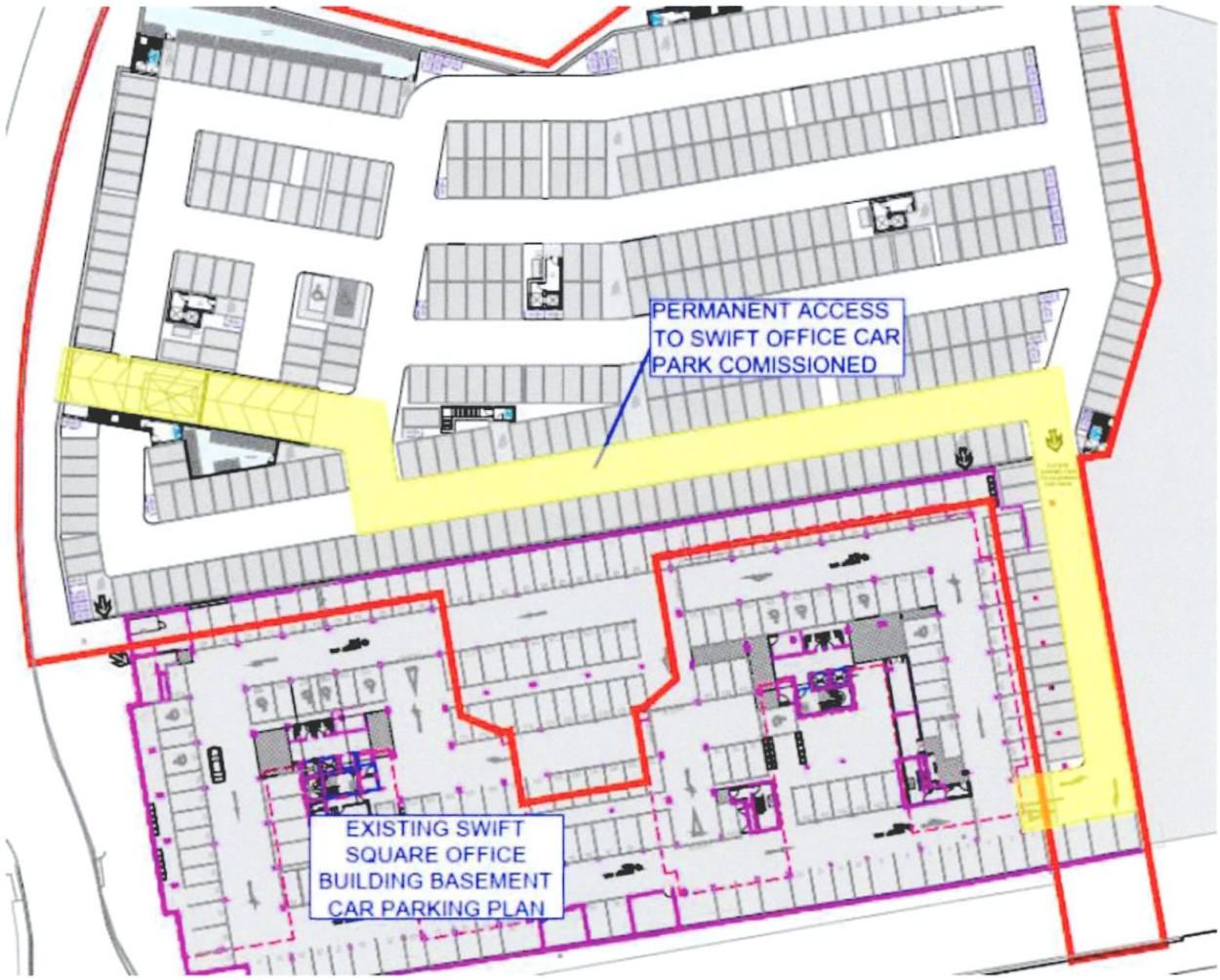



**Figure 21: Completion of Permanent Access to the Swift Square Office Park Buildings Basement Carpark with the Whitehaven SHD Development (indicative subject Site outline in red)**

If the estimated trips associated with the proposed development represents a tiny proportion of existing traffic flows on the surrounding road network and less than the thresholds for traffic impact assessment stated in the Table 2.1 of TII Traffic and Transport Assessment Guidelines (i.e. 10% of the traffic flow on the existing road network and 5% in sensitive environments or where congestion exists), a full traffic impact assessment is not required for the affected junctions. Following analysis of the surrounding area, it is anticipated that the above-mentioned construction works would not increase the traffic flows to the key junctions (i.e. Junction of Northwood Avenue / Northwood Road) in the vicinity of the subject Site in the peak hours during construction. Thus, it is not proposed to undertake any traffic capacity assessments of existing junctions in this study during construction phase.

# SECTION 7: PARKING PROVISION & STRATEGY

## 7.1 Overview

A sustainable approach to parking would be incorporated into the development. The parking strategy utilised is derived from "Sustainable Urban Housing: Design Standards for New Apartments (2020)", which places a strong emphasis on bicycle parking. As per the standards, cycling is a:

> *"flexible, efficient and attractive transport option for urban living and these guidelines require that this transport mode is fully integrated into the design and operation of all new apartment development schemes."*

The proposed development is well situated next to high-quality off-road cycling infrastructure and there is an opportunity to maximise the benefit deriving from appropriate cycle parking provision. The proposed development is an integrated area adjacent to existing employment, retail and community facilities. The proposed development is also well situated next to high-quality existing public transport services, as well as planned future public transport upgrades. Additionally, the development is in a "Intermediate Urban Location" as per the "Sustainable Urban Housing: Design Standards for New Apartments (2020)" and therefore car parking should be reduced:

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

Due to the close proximity of the proposed development to high-quality off-road cycling infrastructure, as well as numerous existing and future high frequency and high capacity public transport services, the parking strategy for the proposed development is based upon the principles of "Sustainable Urban Housing: Design Standards for New Apartments (2020)" in order to further promote sustainable transport modes thus minimising the need for additional car parking.

## 7.2 Car Parking, including Electric Vehicle Charging

**Table 17** summarises the car parking and cycle parking provided within the development. The majority of car/cycle parking will be provided in the basement and undercroft level. The car parking strategy will also include relocation of 254 existing surface car spaces currently used by the Swift Square Office Park development to the newly constructed car parking spaces within the proposed development at basement and undercroft car park areas.

The proposed development will provide 446 car parking spaces, of which 74 car parking spaces located at undercroft car park area, 360 car parking spaces located at basement car park area and 12 car parking spaces located on-street, which are newly constructed by the proposed development. The 360 basement car parking spaces will comprise 214 relocated car parking spaces from the existing surface car parking area catering for Swift Square Office Park personnel and 146 car parking spaces for the residential units. The 74 undercroft car parking spaces will comprise 40 relocated car parking spaces from the existing surface car parking area catering for Swift Square Office Park personnel and 34 car parking spaces for the residential units. The 180 residential car parking spaces equates to 0.94 car parking space per residential unit, which is greater than the recommended car parking supply of 0.5 spaces per one & two bedroom units (i.e. 96 car parking spaces) as required in the Fingal Development Plan 2023-2029 and is considered commensurate with the car parking requirements estimated in **Section 2.4**. Additionally, visitors utilising the residential development will also be able to use the 12 on-street car parking spaces, which are newly constructed by the proposed development.

To satisfy the extra demand of car usage by residents, 2 car sharing spaces would be provided at on-street, which are newly constructed by the proposed development, for a private car sharing company. As such, residents can use the car, provided by a private car sharing company, to satisfy their travel needs by car. If any more car parking spaces were introduced, it may encourage an overreliance on single occupancy vehicles, resulting in a negative effect on traffic in the surrounding area. Furthermore, going forward it is projected that car ownership levels will not increase in the Northwood Area (and throughout the city) due to the increased investment in public transport infrastructure such as BusConnects and MetroLink.

**Table 17: Car Parking and Bicycle Parking**

| | Land Use | Parking Provided | Ratio |
|---|---|---|---|
| **Car Parking** | **Residential Units** | 180 Car Parking Spaces at Undercroft and Basement Car Park Areas *(of which 2 will be Disabled Parking Spaces)* | *~0.94 space per residential unit* |
| | | 33 Motorbike Parking Spaces at Undercroft and Basement Car Park Areas | *n/a* |
| | **Swift Square Office Park Buildings** | 254 Relocated Parking Spaces at Undercroft and Basement Car Park Areas | *n/a* |
| | **Visitor Spaces** | 12 On-street Car Parking Spaces *(of which 1 will be Disabled Parking Spaces and 2 will be Car Sharing Parking Spaces)* | *~1 space per 16 residential units* |
| **Cycle Parking** | **Residential Units** | 392 Cycle Parking Spaces at Undercroft Level | *~1.03 space per residential bedroom* |
| | | 100 Visitor Cycle Parking Spaces on surface, across the public areas | *~1 visitor space per 1.92 residential units* |
| | **Swift Square Office Park Buildings** | 30 Relocated Cycle Parking Spaces between the Swift Square Office Park buildings | *n/a* |

### Electric Vehicle (EV) Charging

A Multiple Occupancy Building Car Charging Strategy, prepared by M Elligott Consulting Engineers, has been submitted outlining that electric vehicle customers could register with 'Prepaygo' to avail of the charging points. Any resident that wishes to have a car charging point installed at their car parking space could apply for the Sustainable Energy Authority of Ireland (SEAI) grant which would be passed onto the management company who would install the charging point.

Provision will be made within development for the fitting of car charging points to all proposed car spaces (those in undercroft and basement car park areas). A minimum of 20% of the residential parking space should have EV charging points from completion of the proposed development with all ducting and services provided as part of the proposed development to facilitate non-disruptive retro fitting of EV charging points for all of the remaining residential parking spaces. The developer will provide 40 parking spaces with functioning EV charging points from completion of the proposed development, which is greater than the recommended EV charging points (i.e. 36 parking spaces) as required in the Fingal Development Plan 2023-2029.

## 7.3 Bicycle Parking

The cycle parking strategy equates to 1.03 bicycle parking space per bedroom, totally 392 spaces, all contained in communal locked cage enclosures in the undercroft level area. There will also be 100 visitor bicycle parking spaces, which can also be used by office staff, on surface, across the public areas.. No bicycle parking space will be provided at the basement level area. All bicycle parking stands will be "Sheffield" or of similar design in order to secure bicycles. Provision of electric bicycle parking will be considered in later detailed design stage. Additionally, 30 bicycle parking spaces will be provided between the Swift Square Office Park buildings for relocation of existing bicycle parking spaces catering for Swift Square Office Park personnel.

## 7.4 Motorcycle Parking

33 motorcycle parking spaces will be available in the undercroft car park area (with 28 spaces) and basement car park area (with 5 spaces).

## 7.5 Car Sharing Facility

Further to the car parking provision, an additional 2 no. car parking spaces will be assigned on-street for a car share facility. The benefits of such car sharing services include:

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

# SECTION 8: SUMMARY & CONCLUSION

This report has been designed to specifically address potential traffic issues associated with the proposed development. In doing so, it has considered:

- Trip generation rates to/from the proposed development;
- Existing and future road network capacity;
- Traffic impact of the proposal; and
- Proposed car and bicycle parking.

The proposed development will consist of the following:

- Site clearance, including the removal of all structures on site part of existing surface car parking;
- Relocation of existing surface car parking spaces catering for Swift Square Office Park personnel to the new basement accessible via a new ramp off the local road from Northwood Avenue, and the new undercroft parking area with access at street level off the local road to the north of the site;
- Construction of 3 no. apartment blocks (1, 2 and 3) over a partially shared podium structure, with heights ranging from 4 to 9 storeys, comprising 192 no. apartment units (4 no. 1-bedroom units and 188 no. 2-bedroom units), ancillary residential uses and associated car and bicycle parking; and
- Provision of public and communal open spaces, public realm, boundary treatments, landscaping and lighting; refuse storage, associated drainage, attenuation and services; temporary car parking area, construction access, and basement access route and ramp; and all associated site development works.

To determine current traffic behaviour in the vicinity of the subject Site, a vehicle turning movement survey was obtained at seven junctions around Northwood. To provide a robust assessment, FCC were informed that historical traffic counts were obtained for each junction. The historical traffic counts were undertaken on Tuesday 12th February 2019 for a previous application for Blackwood Square, a development located c. 100m west of the subject Site.

- Site 1- Junction 1) Ballymun Road (R108) / St. Margaret's Road;
- Site 2- Junction 2) Ballymun Road (R108) / Northwood Avenue;
- Site 3- Junction 3) Northwood Avenue / Old Ballymun Road;
- Site 4- Junction 4) Northwood Avenue / Access Road to Gulliver's Retail Park;
- Site 5- Junction 5) Northwood Avenue / Northwood Road;
- Site 6- Junction 6) Santry Avenue / Northwood Road; and
- Site 7- Junction 7) Northwood Avenue / Swords Road (R138).

The counts were carried out over the 12-hour period 07:00 hours to 19:00 hours including both the morning and evening peak periods. The morning peak hour was identified as 08:00-09:00 for all junctions. The evening peak hour was identified as 17:00-18:00 for all junctions. Data was collected in 15-minute intervals.

It was determined that Junction 2) Ballymun Road (R108) / Northwood Avenue, Junction 6) Santry Avenue / Northwood Road and Junction 7) Northwood Avenue / Swords Road (R138) were the key junctions to be modelled. Junction 5) Northwood Avenue / Northwood Road, whilst fully contained within the private area of Northwood, would experience an increase from trips generated by the development and therefore would also be modelled.

During consultation with FCC on a previous application in the area, it is noted that Fingal plan to upgrade Junction 2) Ballymun Road (R108) / Northwood Avenue, this upgrade has not been accounted for in the

modelling as the exact designs are still unknown. Additionally, it is noted that Fingal plan to upgrade Junction 3) Northwood Avenue / Old Ballymun Road to incorporate SCATS. Upgrading this junction to SCATS will allow the junction to control the traffic arriving from Northwood to the Ballymun Road. The junctions will better calculate and adapt the timing of traffic signals in the network allowing the junction to operate efficiently, creating an overall positive impact.

### 2022 Baseline Year

In 2022 baseline year, Junction 5) Northwood Avenue / Northwood Road and Junction 6) Santry Avenue / Northwood Road are operating within the normal design threshold during the morning and evening peak hours. However, the Ballymun Road (R108) North arm on Junction 2) Ballymun Road (R108) / Northwood Avenue during the morning peak hour and the Northwood Avenue arm on Junction 7) Northwood Avenue / Swords Road (R138) during the evening peak hour are slightly exceeding the normal design threshold (but less than its theoretical capacity of 1.0).

### 2025 Opening Year

In the year of opening 2025, Junction 5) Northwood Avenue / Northwood Road and Junction 6) Santry Avenue / Northwood Road will operate within the normal design threshold in the morning and evening peak hours under 2025 "without" and "**with**" development scenarios. However, the following junctions will slightly exceed the normal design threshold (but still less than its theoretical capacity of 1.0) with queues and delays for motorists evident:-

- Junction 2 (Ballymun Road (R108) North arm) - during the morning peak hour under 2025 "without" development and "**with**" development scenarios; and
- Junction 7 (Northwood Avenue and Swords Road (R138) North arms) - during the evening peak hour under 2025 "without" development and "**with**" development scenarios.

However, the analysis indicates that traffic from the proposed development will not have significant impact on these junctions.

### 2040 Design Year (Opening year plus 15 years)

In the design year 2040 (opening year plus 15 years), Junction 5) Northwood Avenue / Northwood Road will operate within the normal design threshold in the morning and evening peak hours under 2040 "without" and "**with**" development scenarios. However, the following junctions will exceed the normal design threshold with queues and delays for motorists evident:-

- Junction 2 (Ballymun Road (R108) North and Northwood Avenue arms) - during the morning peak hour under 2040 "without" development and "**with**" development scenarios;
- Junction 2 (Northwood Avenue and Ballymun Road (R108) South arms) – during the evening peak hour under under 2040 "without" development and "**with**" development scenarios;
- Junction 6 (Santry Avenue East arm) – during the evening peak hour under 2040 "without" development and "**with**" development scenarios; and
- Junction 7 (Northwood Avenue and Swords Road (R138) North arms) – during the morning and evening peak hours under 2040 "without" development and "**with**" development scenarios.

However, the analysis indicates that traffic from the proposed development will not have significant impact on these junctions. Additionally, the expected improvements in the public transport services in the surrounding area will have a positive impact on junction capacity.

The parking strategy utilised is derived from "Sustainable Urban Housing: Design Standards for New Apartments (2020)", which places a strong emphasis on bicycle parking. The development car parking strategy equates to 0.94 car parking space per residential unit, summing up to 180 spaces. Provision will be made within development for the fitting of car charging points to all proposed car spaces (those in undercroft and basement car park areas). The developer will provide 40 parking spaces with functioning EV charging points from completion of the proposed development, which is greater than the recommended EV charging points (i.e. 36 parking spaces) as required in the Fingal Development Plan 2023-2029. Additionally, 33 motorcycle parking spaces will be available in the undercroft and basement car park areas. Visitors utilising the residential development will also be able to use the 12 on-street car parking spaces, which are newly constructed by the proposed development.

The 254 existing surface car parking spaces catering for Swift Square Office Park personnel will be relocated to the undercroft car park area (i.e. 40 car parking spaces) and basement car park area (i.e. 214 car parking spaces) of the proposed development. Additionally, 30 bicycle parking spaces will be provided between the Swift Square Office Park buildings for relocation of existing bicycle parking spaces catering for Swift Square Office Park personnel.

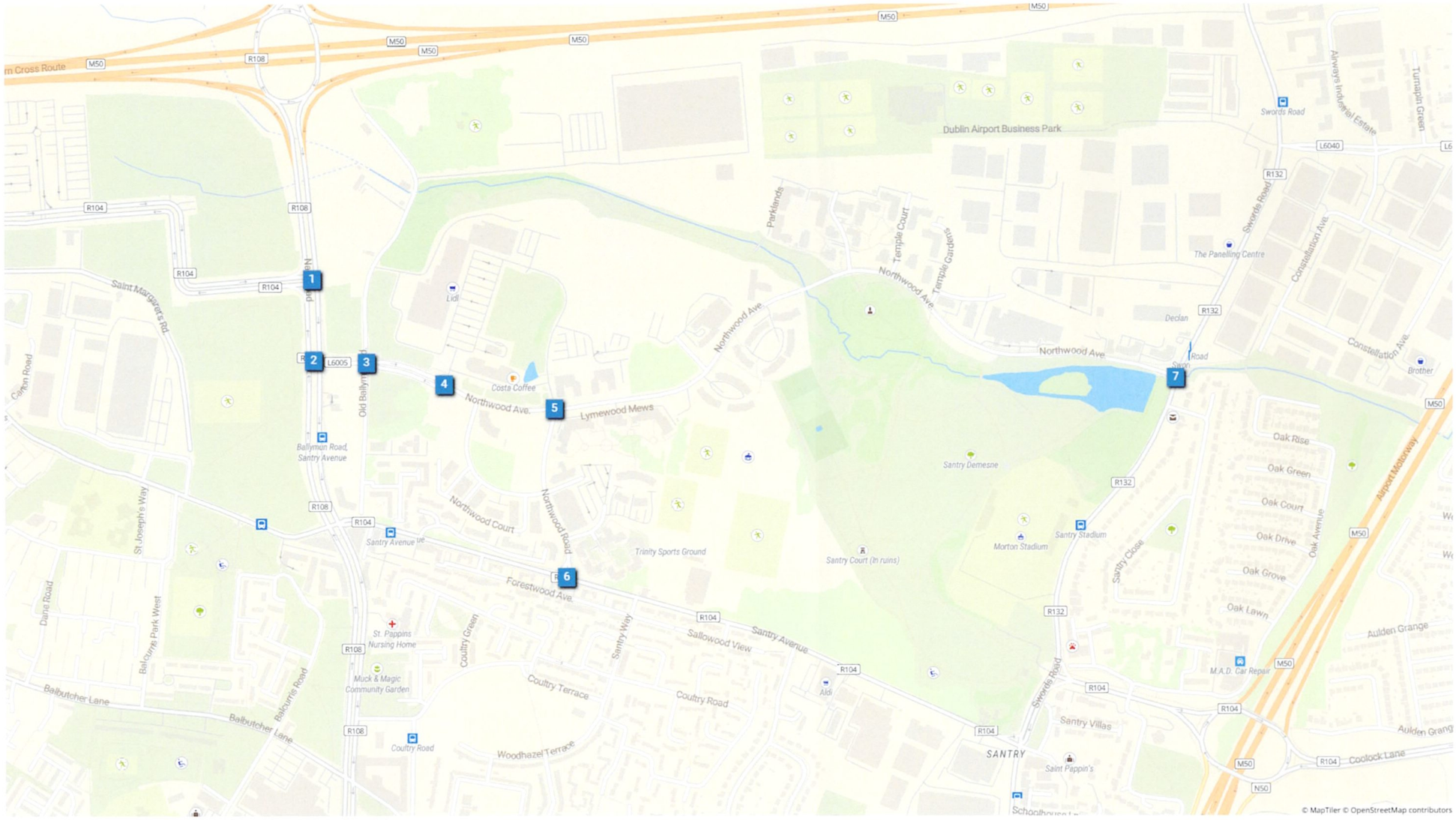
The development cycle parking strategy equates to 1.03 bicycle parking space per residential bedroom, totalling 392 spaces. There will also be 100 visitor bicycle parking spaces, which can also be used by office staff, on surface, across the public areas.

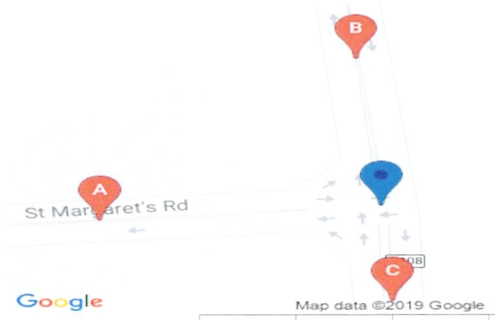
The study concludes that from a traffic and safety perspective, the proposed development as described herein, does not pose any significant residual impacts and on this basis, should be granted planning permission.

# Appendix 1- Traffic Count Data

IDASO

**Survey Name:** 029 19025 Northwood
**Date:** 12 Feb 2019






# IDASO

**Survey Name:** 029 19025 Northwood
**Site:** 1
**Location:** St Margaret's Rd
**Date:** 12-Feb-2019

| TIME | A1 | A2 | A3 | B1 | B2 | B3 | B4 | C1 | C2 | C3 |
|---|---|---|---|---|---|---|---|---|---|---|
| **07:00** | 5 | 25 | 25 | 200 | 120 | 25 | 10 | 5 | 35 | 30 |
| **07:15** | 10 | 25 | 25 | 180 | 130 | 20 | 25 | 10 | 50 | 45 |
| **07:30** | 5 | 25 | 25 | 220 | 200 | 25 | 20 | 5 | 65 | 50 |
| **07:45** | 5 | 35 | 30 | 170 | 160 | 55 | 35 | 15 | 90 | 70 |
| **08:00** | 5 | 40 | 35 | 300# | 300# | 35 | 50 | 5 | 125# | 90 |
| **08:15** | 15 | 35 | 35 | 300# | 300# | 45 | 15 | 5 | 80 | 55 |
| **08:30** | 5 | 40 | 30 | 300# | 300# | 40 | 35 | 5 | 85 | 50 |
| **08:45** | 5 | 45 | 30 | 200 | 240 | 40 | 25 | 0 | 125# | 70 |
| **09:00** | 5 | 30 | 25 | 300# | 300# | 30 | 20 | 0 | 125# | 100 |
| **09:15** | 0 | 25 | 25 | 180 | 120 | 15 | 15 | 10 | 115'# | 125# |
| **09:30** | 0 | 15 | 20 | 170 | 130 | 20 | 30 | 10 | 75 | 50 |
| **09:45** | 0 | 20 | 15 | 180 | 140 | 25 | 20 | 15 | 50 | 40 |
| **10:00** | 15 | 10 | 15 | 150 | 100 | 30 | 20 | 5 | 55 | 35 |
| **10:15** | 15 | 15 | 10 | 75 | 50 | 40 | 50 | 0 | 50 | 30 |
| **10:30** | 5 | 25 | 15 | 100 | 75 | 35 | 40 | 0 | 40 | 35 |
| **10:45** | 5 | 20 | 20 | 90 | 50 | 30 | 30 | 0 | 50 | 30 |
| **11:00** | 5 | 20 | 20 | 100 | 80 | 35 | 50 | 5 | 40 | 30 |
| **11:15** | 10 | 20 | 20 | 30 | 30 | 20 | 45 | 0 | 50 | 25 |
| **11:30** | 15 | 15 | 15 | 45 | 35 | 25 | 35 | 5 | 50 | 40 |
| **11:45** | 20 | 55 | 45 | 120 | 80 | 30 | 40 | 5 | 45 | 35 |
| **12:00** | 5 | 55 | 45 | 110 | 70 | 30 | 30 | 0 | 125# | 125# |
| **12:15** | 10 | 35 | 40 | 45 | 35 | 25 | 45 | 0 | 125# | 70 |
| **12:30** | 15 | 45 | 40 | 50 | 30 | 45 | 50 | 0 | 55 | 40 |
| **12:45** | 10 | 55 | 55 | 45 | 30 | 50 | 65 | 15 | 40 | 30 |

| TIME | A1 | A2 | A3 | B1 | B2 | B3 | B4 | C1 | C2 | C3 |
|---|---|---|---|---|---|---|---|---|---|---|
| **13:00** | 0 | 20 | 25 | 120 | 70 | 25 | 55 | 0 | 50 | 40 |
| **13:15** | 15 | 25 | 35 | 120 | 80 | 35 | 50 | 0 | 80 | 45 |
| **13:30** | 15 | 40 | 40 | 90 | 45 | 50 | 30 | 0 | 50 | 35 |
| **13:45** | 20 | 60 | 50 | 55 | 40 | 45 | 55 | 15 | 40 | 35 |
| **14:00** | 10 | 40 | 40 | 60 | 40 | 35 | 40 | 0 | 45 | 40 |
| **14:15** | 0 | 35 | 35 | 90 | 50 | 40 | 35 | 5 | 45 | 35 |
| **14:30** | 0 | 20 | 25 | 90 | 90 | 25 | 25 | 0 | 30 | 30 |
| **14:45** | 25 | 25 | 35 | 60 | 40 | 30 | 40 | 0 | 55 | 45 |
| **15:00** | 40 | 25 | 20 | 130 | 70 | 55 | 35 | 0 | 45 | 40 |
| **15:15** | 55 | 40 | 35 | 120 | 80 | 30 | 40 | 0 | 125# | 50 |
| **15:30** | 35 | 45 | 40 | 140 | 100 | 25 | 25 | 0 | 55 | 45 |
| **15:45** | 20 | 30 | 35 | 120 | 90 | 40 | 50 | 0 | 70 | 45 |
| **16:00** | 55 | 40 | 45 | 130 | 100 | 20 | 20 | 0 | 65 | 40 |
| **16:15** | 45 | 50 | 45 | 150 | 120 | 35 | 30 | 0 | 125# | 55 |
| **16:30** | 50 | 35 | 30 | 100 | 110 | 25 | 25 | 0 | 80 | 40 |
| **16:45** | 60 | 50 | 60 | 130 | 100 | 30 | 30 | 0 | 65 | 60 |
| **17:00** | 0 | 60 | 60 | 90 | 70 | 45 | 30 | 10 | 125# | 125# |
| **17:15** | 75 | 50 | 40 | 110 | 90 | 35 | 25 | 15 | 125# | 125# |
| **17:30** | 35 | 35 | 40 | 160 | 140 | 25 | 20 | 0 | 125# | 125# |
| **17:45** | 35 | 30 | 30 | 95 | 70 | 40 | 30 | 10 | 125# | 125# |
| **18:00** | 30 | 40 | 35 | 60 | 45 | 35 | 30 | 0 | 125# | 125# |
| **18:15** | 50 | 30 | 30 | 90 | 65 | 40 | 30 | 0 | 55 | 40 |
| **18:30** | 25 | 35 | 40 | 45 | 30 | 30 | 30 | 10 | 60 | 40 |
| **18:45** | 25 | 40 | 30 | 40 | 30 | 25 | 25 | 5 | 40 | 40 |

Queue's are measured in meters

Cannot be seen from camera
\+ Signifies queue stretches to a minimum length of x and beyond the view of the camera
\# Signifies queue stretches to the next significant junction
* Indicates an estimated queue length due to obscured vision.

*Queue lengths are compiled from CCTV observations and are therefore subject to the limitations of the camera view.*