

13 Traffic and Transport

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13.1 Introduction

This chapter has been prepared by Waterman Moylan Consulting Engineers.

This chapter of the Environmental Impact Assessment Report assesses the likely effects of the proposed development in terms of vehicular, pedestrian and cycle access during the construction and operational phases of the proposed development.

The chapter describes: the methodology; the receiving environment at the application site and surroundings; the characteristics of the proposal in terms of physical infrastructure; the potential impact that proposals of this kind would be likely to produce; the predicted impact of the proposal examining the effects of the proposed development on the local road network; and the remedial or reductive measures required to prevent, reduce or offset any significant adverse effects.

13.2 Study Methodology

The following methodology has been adopted for this assessment:

- Review of relevant available information including where available Development Plans, existing traffic information and other relevant studies;
- Site visit to gain an understanding of the site access and observe the existing traffic situation;
- Consultations with Dún Laoghaire-Rathdown County Council to agree the site access arrangements and determine the scope of the traffic analysis required to accompany a planning application;
- Detailed estimation of the transport demand that will be generated by the development. The morning and evening peak times will be addressed as well as an estimation of the construction stage traffic; and
- Assessment of the percentage impact of traffic on local junctions, car parking requirements and accessibility of the site by sustainable modes including walking, cycling and public transport.

13.3 The Existing Receiving Environment (Baseline)

This section considers the baseline conditions, providing background information for the site in order to determine the significance of any traffic implications. This section also considers the existing accessibility of the site by sustainable modes of transport.

Site Location



Figure 13.1 – Site Location

The site is in Stillorgan, Co. Dublin. It is bounded to the north by Brewery Road, to the east by Stillorgan Road, to the southwest by the Leopardstown Tennis Club and to the southeast by existing residential developments. The proposed development is approximately 2.5km from the coastline at Blackrock and 440m north of Mulchanstown Reservoir. Refer to Figure 13.1 for the location of the proposed development.

Existing Road Network

The site is located directly adjacent to the junction of N11 Stillorgan Road with N31 Brewery Road. The speed limits along Stillorgan Road in proximity to the site, at the junction with Brewery Road and Farmleigh Avenue, is 60kph. There are cycle lanes along both sides of N11 and controlled pedestrian crossings at southern, western and eastern approaches of the junction.

The N31 Brewery Road is a single carriageway road which is subject to a speed limit of 50kmph with cycle lanes and footpaths along both sides and a carriageway width of 9.0m for the majority of its length. Travelling in a south westerly direction from the subject site, approximately 1.1km, the Brewery Road terminates at a 4-arm signal-controlled junction with R113 Burton Hall Road/ Leopardstown Road and N31 Leopardstown Road. The N31 Leopardstown Road to the southwest links to the M50 at Junction 13.

As part of the Traffic and Transport Assessment, three junctions in the vicinity of the site have been analysed in order to calculate the expected volume of traffic and assess the impact that traffic will have on the operation capacity of the junctions. The existing junctions that have been analysed are the following:

- Junction 1 - N11 Stillorgan Road/Brewery Road/Farmleigh Ave;
- Junction 2 - N31 Brewery Road/St. Brigid's Church Road;
- Junction 3 - N31 Brewery Road/Site Access.



Figure 13.1 Location of Junctions Surveyed

The results of this survey indicated that the peak traffic levels through the junctions occurred between the hours of 07:45 – 08:45 in the morning and 17:15 – 18:15 during the evening. These traffic levels can be seen in Figure 13.3.

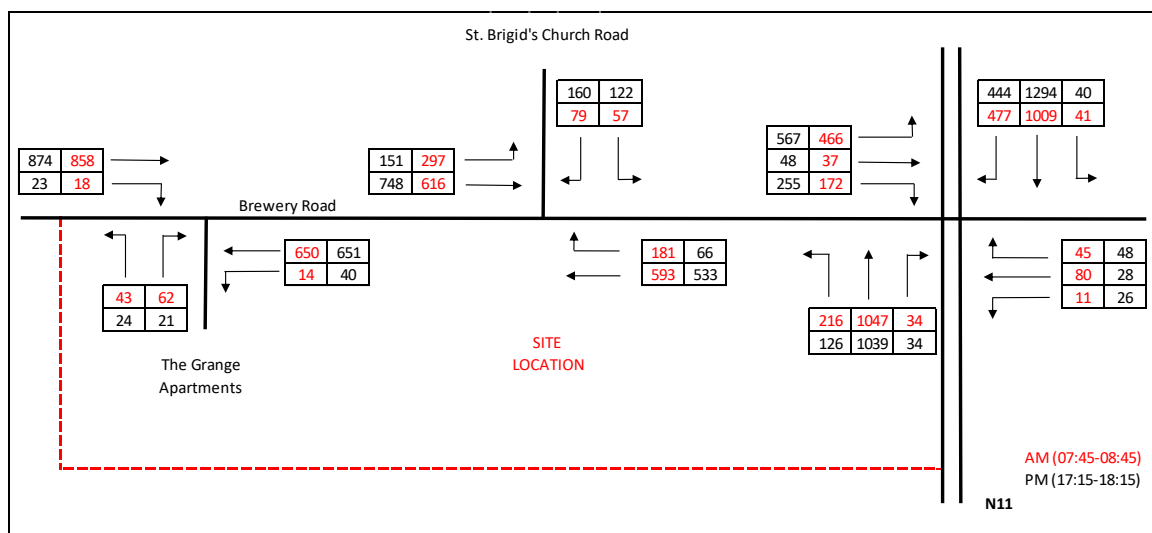


Figure 13.2 Surveyed Flows (2018)

Pedestrian and Cycling Facilities

N31 Brewery Road is subject to a speed limit of 50kmph with street lighting on both sides of the road. In the vicinity of the subject site, pedestrians can benefit from a good standard of provision of

footpaths on both sides of the carriageway. These footpaths are separated from the carriageway by a cycle path and a grass verge for the majority of its length.

Pedestrians can also benefit from dedicated pedestrian crossings at the southern, western, and eastern approaches of N11 Stillorgán Road/N31 Brewery Road signalised junction. These pedestrian crossings include dropped kerbs and tactile paving facilities.

Access from the subject site to the primary bus stops on the Stillorgán QBC is via N31 Brewery Road.

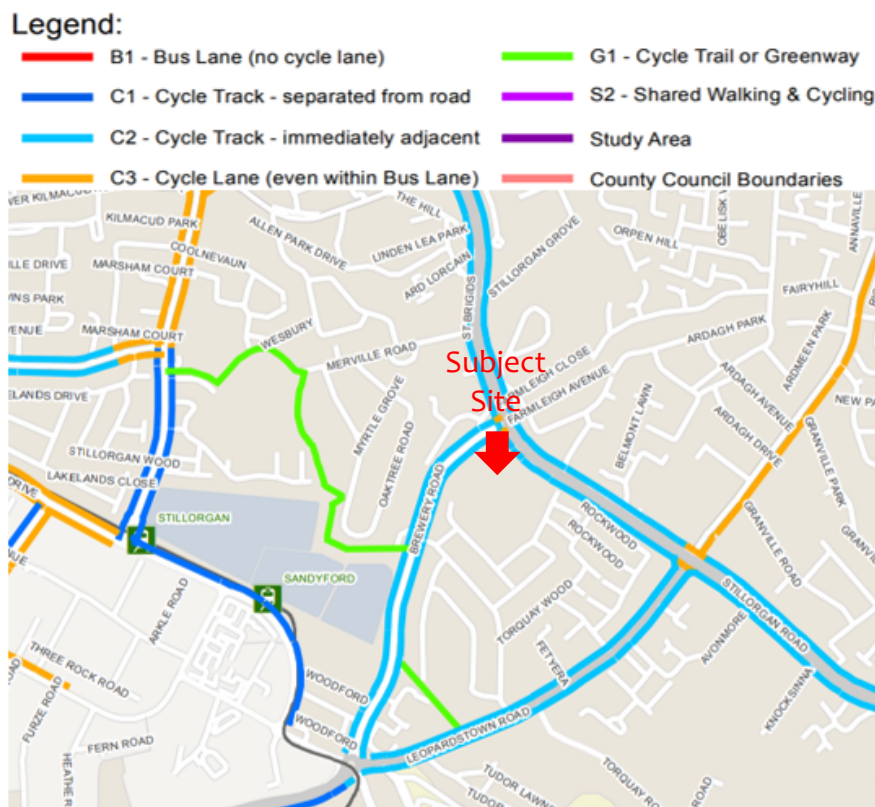


Figure 13.4 - Local Cycle Infrastructure

Regarding cycle facilities, Figure 13.4 following shows the local cycle track and lane network as taken from the National Transport Authority’s (NTA) Greater Dublin Area Cycle Network Plan.

As can be seen above, cyclists can benefit from the provision of cycle tracks immediately adjacent to the bus lanes (south-north bound) on N11 Stillorgán Road. To the west of N11 Stillorgán Road/N31 Brewery Road junction, cycle tracks immediately adjacent to the carriageway are provided along both sides of N31 Brewery Road.

All the existing pedestrian and cycle facilities make the subject site highly accessible by a wide variety of transportation options which will facilitate a modal shift away from private vehicle usage.

Existing Public Transport Accessibility

Dublin Bus

Dublin Bus operates several staged services connecting Stillorgán to a number of areas of interest or with access to further public transport such as the LUAS, DART, and Irish Rail. Those areas easily accessible include the City Centre, Blackrock (Irish Rail/ (DART)), Heuston (Irish Rail/ (LUAS)), Dún Laoghaire (Irish Rail/ (DART)) and Bray (Irish Rail/ (DART)).

The site is located directly adjacent to a major public transport corridor being the Stillorgán Quality Bus Corridor (QBC). The Stillorgán QBC has high frequency bus services direct to the City Centre. Access from the subject site to the primary bus stops on the Stillorgán QBC is via N31 Brewery Road (3 to 4-minute walk).

A summary of Dublin Bus routes and location of bus stops served by these routes are presented below.

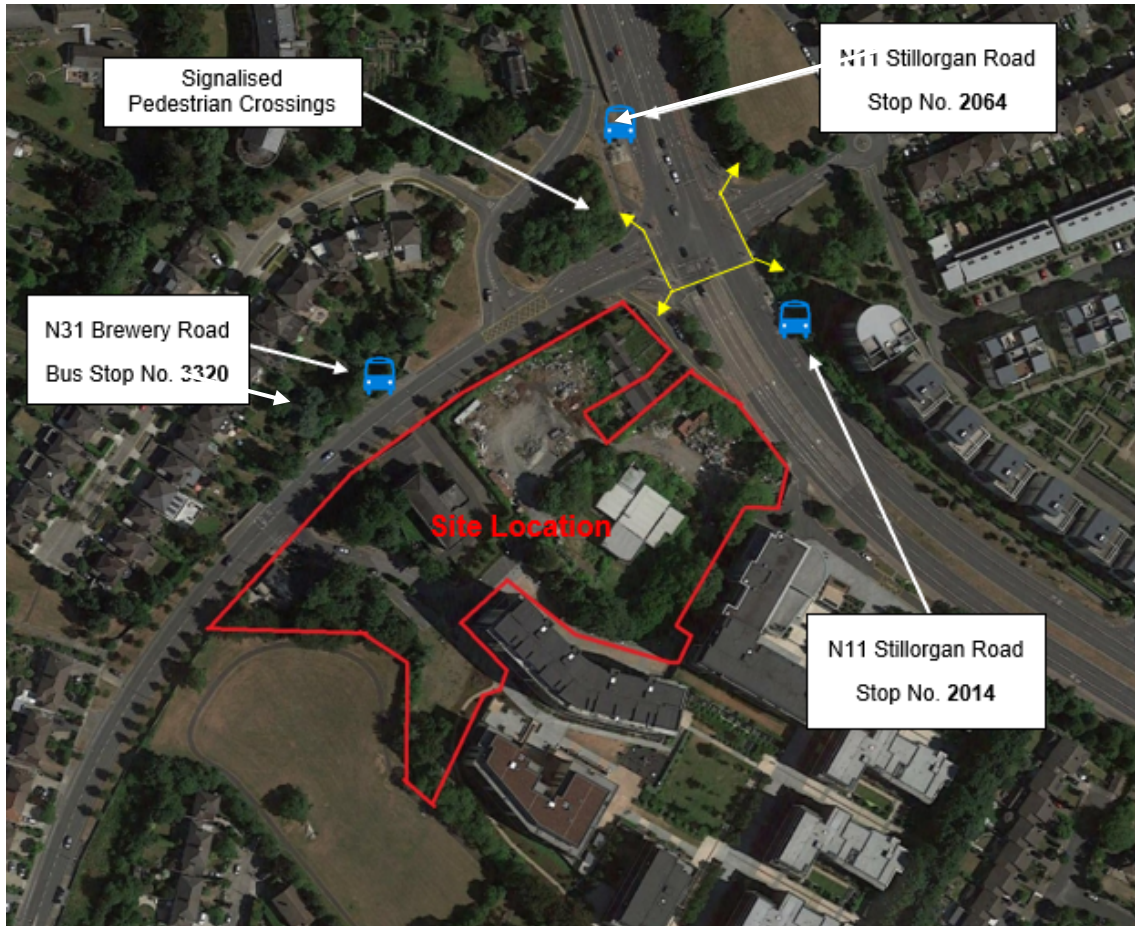


Figure 13.3 - Location of Public Transport Facilities

| Route No | From | To | Weekday Frequency (Rush hour) |
|----------|----------------------|---------------|-------------------------------|
| 46a | Phoenix Park | Dún Laoghaire | 8 minutes |
| 84x | Hawkins St. | Kilcoole | 10-20 minutes |
| 145 | Heuston Rail Station | Ballywaltrim | 10 minutes |

Table 13.1 - Bus Stop No. 2014 - Stillorgán Road

| Route No | From | To | Weekday Frequency (Rush hour) |
|----------|--------------------|----------------------|-------------------------------|
| 145 | Ballywaltrim | Heuston Rail Station | 10 minutes |
| 46a | Dún Laoghaire | Phoenix Park | 8 minutes |
| 84X | Newcastle/Kilcoole | Hawkins St. | 10 minutes |
| 118 | Kilternan | Eden Quay | 2 per day |

Table 13.2 - Bus Stop No. 2064 - Stillorgan Road

| Route No | From | Towards | Weekday Frequency (Rush hour) |
|----------|-----------|-----------|-------------------------------|
| 118 | Kilternan | Eden Quay | 2 per day |

Table 13.3 - Bus Stop No. 3320 - Brewery Road

Aircoach Links (Dublin Airport)

Aircoach operates a 24-hour service, Route 702: Greystones to Dublin Airport, travels through Stillorgan to Dublin Airport. Services on Aircoach Route 702 to and from the terminus in Greystones operate every hour during the day. The advised journey time from Stillorgan to Dublin Airport is 50-55 minutes.

Luas

The site is not directly served by LUAS services, though the closest LUAS station is the Sandyford stop (LUAS Greenline), approximately 1.1km (14-minute walk or 4-minute cycling) southeast of the site access through the N31 Brewery Road. The LUAS Greenline provides a high frequency service to the City Centre.

A network of footpaths and cycle paths are provided on both sides of the entirety of N31 Brewery Road.

Other Services

Go-Ahead Ireland – Go-Ahead Ireland operates a 20-hour service through Stillorgan, linking Dún Laoghaire DART Station with Tallaght Business Area. Routes 75 and 75a run every 30 minutes during the morning and evening peak hours. Journeys numbered 75a are via Sandyford Business Park. Figures 13.6 and 13.7 and details the routes of these services in the vicinity of the proposed site.

Bus Connects – Bus Connects is a programme of investment in the greater Dublin area bus network which aims to overhaul the current bus system in Dublin through a 10-year programme to deliver a more efficient, reliable and better bus system. The Bray to Dublin City Centre branch of, runs along the N11 Stillorgan Road and as part of the upgrade works along the N11, the Brewery Road junction will be upgraded to improve the cycle paths in this location. It is estimated that the Bus Connects will improve current journey times to the city centre by 40% - 50% and mitigate against any future increase in journey times. The improved journey time to the city centre will encourage a greater modal shift towards the bus and bike.



Figure 13.4 - Route 75 - Dún Laoghaire DART Station to Tallaght (two-ways).



Figure 13.5 - Route 75a – Tallaght to Dún Laoghaire DART Station, through Sandyford Business Park (two-ways).

Rail Services – Stillorgan is not currently served by rail transportation. Dublin Bus Routes 46a and Go-Ahead Route 75 and 75a link Stillorgan with the DART line at Dún Laoghaire DART Station. The DART is a rail service that operates at 15 minutes intervals during the morning and evening peak hours and 30 minutes intervals off peak. It operates routes from/to north as Malahide or Howth and south to Greystones.

13.4 Characteristics of the Proposed Development

Overview

The proposed development consists of a Strategic Housing Development on residential zoned lands c. 2.5 km from the coastline at Blackrock. It is proposed to construct 287 No. residential units with the associated tenant amenities over a double level basement carpark. The proposals also include the construction of a new Crèche to accommodate 23 staff and 115 children on site.

In summary, the project provides for the demolition (total c.1,398 sq m GFA) of:

- The Grange Select Marketing Suite' (1 storey)
- 'Oaktree Business Centre' (2 storeys)
- 'The Lodge' (2 storeys)

and the construction of a new 'Build to Rent' residential scheme of 287 residential apartment units; residential tenant amenity space of 961.5 sq m; a crèche facility of 658 sq m; and a substation of 96.5 sq m in the form of 6 new blocks (Blocks H, J, M, N, P and Q) ranging in height from 1 - 11 storeys. The residential element of the scheme provides for the following development mix:

- 19 x Studio Units (6.6%)
- 125 x 1 Bedroom Units (43.6%)
- 143 x 2 Bedroom Units (49.8%)

A total of 100 no. car parking spaces, 596 no. cycle spaces and 5 no. motorcycle spaces are also proposed together with all associated site development works.

The developer will construct all associated infrastructure to service the development including a network of foul water and surface water drains, watermain and a realigned access road and footpaths.

Physical Infrastructure

The subject site will be accessed via the existing access road to The Grange off Brewery Road. It is proposed to re-configure the alignment of this access road to improve the junction layout and forward visibility. The site access from Brewery Road is a 50 km/h zone. A 2.4m x 49m sightline, which follows the requirements of the Department of Transport 'Design Manual for Urban Roads and Streets' (DMURS) recommendation for a road of design speed of 50 km/h, is currently provided at the access road junction onto Brewery Road. No development works will infringe upon this existing sightline provision.

The access will be utilised by all modes of transport travelling to/from the proposed development. Footpaths will be provided in accordance with Section 4.3.1 of DMURS which suggests that a minimum 1.8m footpath should be provided on all footways. The proposed development has been designed as a DMURS compliant scheme. A separate Statement of Consistency with DMURS is included under a separate cover. Cycle paths have been designed in accordance with the National Cycle Manual.

The majority of the carparking onsite will be accessed from a ramp off the main site access road. There is a total of 92 No. parking spaces at basement level and 8 surface level parking spaces, 560 No. bicycle parking spaces and 7 No. Motorcycle Spaces provided. Pedestrian access will be provided along the building elevation facing onto Brewery Road and from the footway provided on both sides of the vehicular entrance road. Pedestrian access will also be provided to basement level via a pedestrian access ramp next to the vehicular access.

The design and layout of the proposed development have been prepared to fully comply with the rigorous design standards and specifications applicable to this form of development. The applicant has drawn upon considerable experience in the design and implementation of such proposals.

13.5 Potential Impact of the Proposed Development During Construction Stage

There is a potential for construction traffic to impact from a noise and dust perspective in relation to the surrounding road network. Construction deliveries to and from the site by heavy good vehicles will impact on noise levels, whilst dust may result from vehicles travelling along site roads and from general earthwork activities. There is also potential for traffic congestion, due to increased heavy good vehicles on the road network which may also perform turning movements, unloading, etc., in areas that impact on traffic. There is a potential for inappropriate parking, particularly along Brewery Road whilst vehicles are waiting to access the site. There is also potential for workers to park in the surroundings residential roads.

There is a potential for conflict between construction traffic and pedestrians/cyclists using the existing facilities on Brewery road. There is also potential for conflicts and disruption to pedestrians and

cyclists on Stillorgan road. There is potential for construction traffic to have a moderate effect on the surrounding environment. However, the duration of this impact will be short-term (i.e. one to four years).

13.6 Potential Impact of the Proposed Development During Operational Stage

In order to assess the potential impact of the proposed development a detailed traffic and transport assessment has been prepared and is included with this application. Details of the assessment are set out below:

Trip Generation

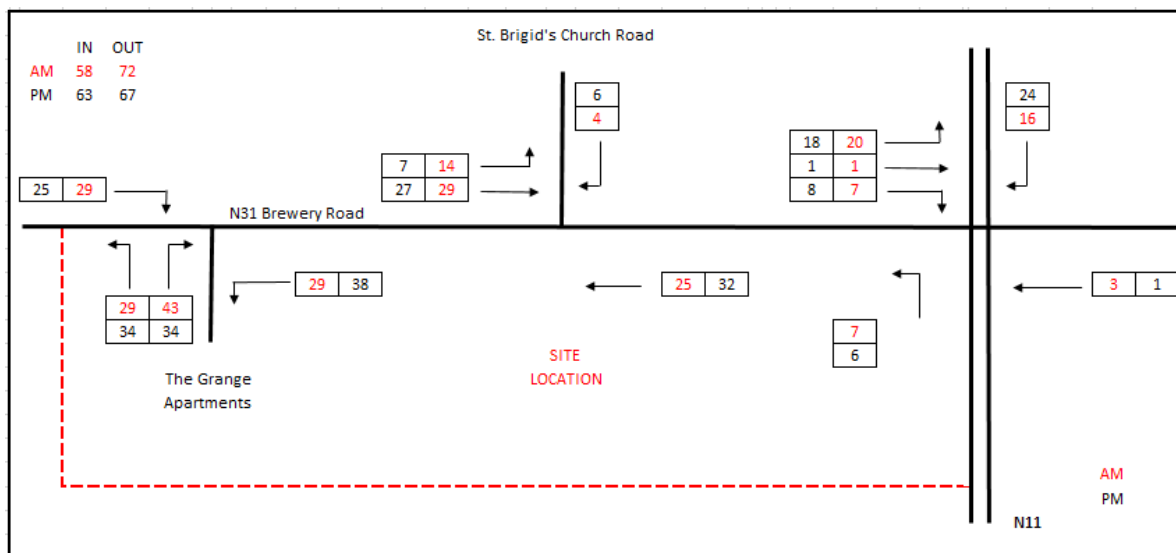
The traffic generation potential of the proposed development has been estimated using the TRICS software modelling database. The peak morning hour for the crèche is in fact 09:00-10:00, however TRICS rates for the hour 08:00-09:00 have been used as this is the peak morning hour for the overall development. The peak evening hour is 17:00 – 18:00 for both the Crèche and residential units. These trip rates are summarised in Table 13.4.

It can be seen from table 13.4 that the total vehicle movements generated by the proposed development fully constructed will be 58 arrivals and 72 departures in the AM peak (two-way total of 130). The total number of vehicle movements in the PM peak hour will be 63 arrivals and 67 departures (two-way total of 130). Although the Crèche has been included in the above figures to provide a robust assessment, it is assumed that all the trips to/from the Crèche will be internalised.

| Usage | Time | Units | TRICS Arrival Rate (per unit/pupil) | TRICS Departures Rate (per unit/pupil) | Peak Hour Trips | |
|-------------------------|-------------------------------|-----------------------------|--|---|-----------------|-----|
| | | | | | IN | OUT |
| Residential Development | AM Peak Hour (08:00-09:00) | 287 | 0.048 | 0.153 | 14 | 44 |
| | PM Peak Hour (17:00-18:00) | | 0.118 | 0.108 | 34 | 31 |
| Crèche | AM Peak Hour (08:00-09:00) | 115 children | 0.383 | 0.243 | 44 | 28 |
| | PM Peak Hour (17:00-18:00) | | 0.248 | 0.311 | 29 | 36 |
| TOTAL | AM Peak Hour (08:00-09:00) | 287 units + 115 children | - | - | 58 | 72 |
| | PM Peak Hour (17:00-18:00) | | - | - | 63 | 67 |

Table 13.4 - Trip Generation - Residential units and Creche - AM and PM Peak Hour

Trip Distribution



The distribution for the AM and PM peak hour generated traffic, based on the surveyed flows and associated turning movements, is detailed in Figure 13.8 and the corresponding AM & PM peak hour traffic flows, based on the assumed distribution, are shown in Figure 13.9.

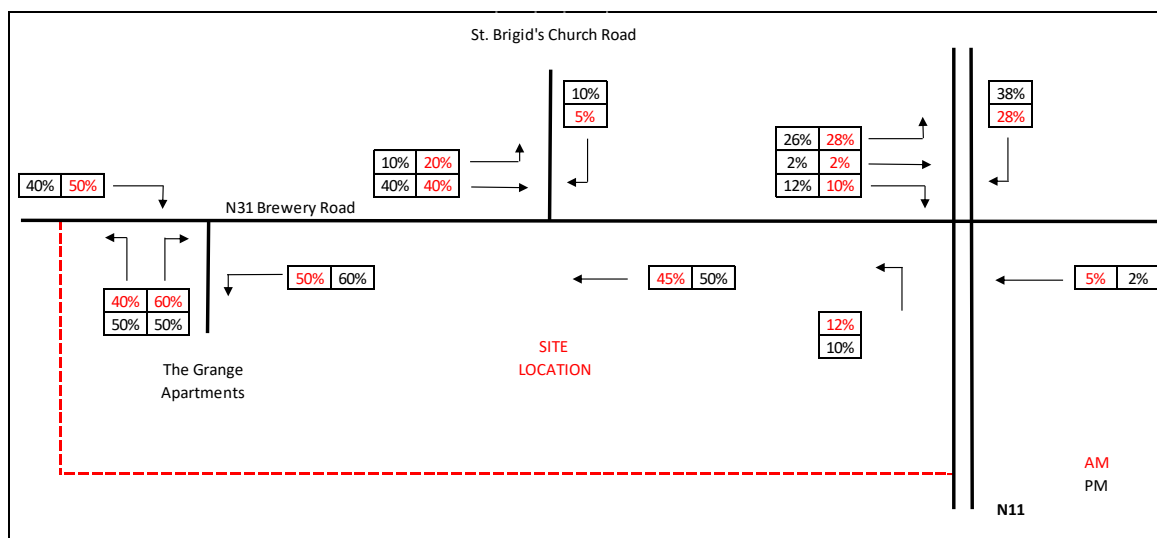


Figure 13.8 - Distribution of Generated Traffic

Figure 13.9 – Generated Traffic Flows

Traffic Growth and Assessment Periods

It has been assumed within the Traffic and Transportation Assessment for the subject site that the development will be constructed over a period of approximately 4 years. Therefore, the assumed year of opening is 2023. The junctions were also assessed for the future design years of 2028 and 2038. The background traffic growths used in the analysis are in accordance with the National Traffic Growth Forecasts: Annual Growth Factors within the NRA Project Appraisal Guidelines for National Roads - Unit 5.3 Travel Demand Projections Link-Based Growth Rate; Annual Growth Factors. These are:

- 1.069 (Medium Growth) growth factor from 2018 to 2023
- 1.142 (Medium Growth) growth factor from 2018 to 2028
- 1.205 (Medium Growth) growth factor from 2018 to 2038

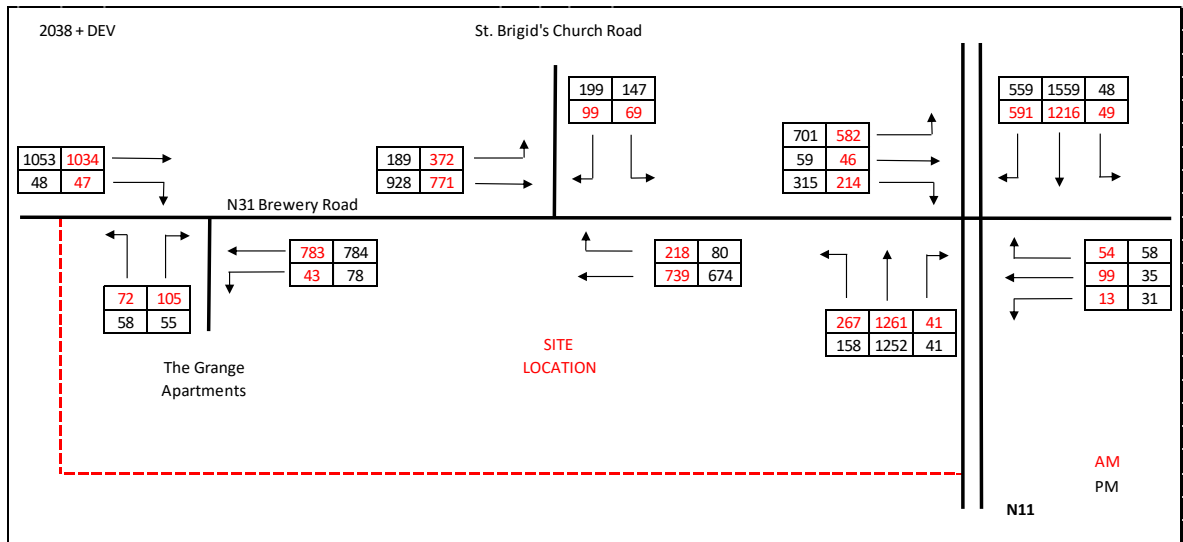


Figure 13.10 - 2038 Design Year Traffic Flows

Road Impact – Junction Analysis

The extent of traffic impact from the proposed development has been determined by checking where generated traffic would exceed 10% of the traffic flow on the adjoining road or 5% on the road where congestion exists, or the location is sensitive. A summary of the existing two-way traffic and the expected traffic increase at each studied junction is presented below.

| | Total Junction Flow - AM Peak Hour | Total Junction Flow - PM Peak Hour | Development Two-way Flow (AM) | Development Two-way Flow (PM) | % Expected Increase (AM) | % Expected Increase (PM) |
|------------|------------------------------------|------------------------------------|-------------------------------|-------------------------------|--------------------------|--------------------------|
| Junction 1 | 3,635 | 3,949 | 55 | 59 | 1.51% | 1.49% |
| Junction 2 | 1,823 | 1,780 | 72 | 71 | 3.95% | 4.00% |
| Junction 3 | 1,645 | 1,633 | 130 | 130 | 7.90% | 7.96% |

Table 13.5 - Existing and expected two-way flows

Where the above junctions do not exceed a 5% increase in traffic no further assessment is warranted. For the junction where the increase is more than 5% it has been analysed using PICADY software. PICADY is a software for modelling priority junctions. This programme utilises junction’s geometry input by the user to determine Ratio of Flow to Capacity (RFC) and queue length for each link on the junction.

Typically, a junction is said to be working satisfactorily when the RFC of each link does not exceed 90%. Acceptable RFC values are considered to be in the range of 0.8 to 1.0 with higher values indicating restrained movements.

The performance of the analysed junctions has been assessed for both the critical AM and PM peak hours (07:45 – 08:45 and 17:15 – 18:15), for year of opening, the 5-year scenario and the 15-year scenario.

Analysis Results

Junction 1 – N11 Stillorgan Road/N31 Brewery Road/Farmleigh Avenue

Junction No. 1 is an existing signal-controlled junction.

The two-way flows presented in Table 13.5 above, shows a 1.51% increase on the existing 3,635 trips at the AM peak hour and 1.49% increase on the existing 3,949 trips at the PM peak hour on the Junction 1. As the impact is less than 5%, no further assessment of this junction needs to be undertaken.

Junction 2 – N31 Brewery Road/St. Brigid's Church Road

Junction No. 2 is an existing 3-arm priority junction.

The two-way flows presented in Table 13.5 above, shows a 3.95% increase on the existing 1,823 trips at the AM peak hour and 4.00% increase on the existing 1,780 trips at the PM peak hour on the Junction 2. As the impact is less than 5%, no further assessment of this junction needs to be undertaken.

Junction 3 – N31 Brewery Road/Site Access

Junction No. 3 is an existing 3-arm priority junction.

The two-way flows presented in Table 13.5 above, shows a 7.90% increase on the existing 1,645 trips at the AM peak hour and 7.96% increase on the existing 1,633 trips at the PM peak hour on Junction 3. As the impact on this junction is more than 5%, and the location is considered to be sensitive, the junction had to be assessed. Figure 13.11 below shows the assumed label by PICADY for each arm of the junction.



Figure 13.11 Junction 3 - N31 Brewery Road/Site Access

The PICADY analysis results for the N31 Brewery Road/Site Access 3-arm priority junction are presented in Table 13.6.

| | AM | | | PM | | |
|-------------|------|-----------------|-----------|------|-----------------|-----------|
| | RFC | Queue (Vehicle) | Delay (s) | RFC | Queue (Vehicle) | Delay (s) |
| 2018 | | | | | | |
| Stream B-C | 0.09 | 0.1 | 8.17 | 0.05 | 0.1 | 7.57 |
| Stream B-A | 0.22 | 0.3 | 16.61 | 0.08 | 0.1 | 14.35 |
| Stream C-AB | 0.08 | 0.1 | 3.58 | 0.10 | 0.2 | 3.65 |
| 2023 | | | | | | |
| Stream B-C | 0.09 | 0.1 | 8.39 | 0.05 | 0.1 | 7.74 |
| Stream B-A | 0.24 | 0.3 | 18.18 | 0.08 | 0.1 | 15.52 |
| Stream C-AB | 0.09 | 0.2 | 3.49 | 0.11 | 0.3 | 3.56 |
| 2023 + DEV | | | | | | |
| Stream B-C | 0.16 | 0.2 | 9.61 | 0.12 | 0.1 | 8.79 |
| Stream B-A | 0.42 | 0.7 | 25.04 | 0.23 | 0.3 | 19.27 |
| Stream C-AB | 0.23 | 0.9 | 4.13 | 0.24 | 1.0 | 4.17 |
| 2028 | | | | | | |
| Stream B-C | 0.09 | 0.1 | 8.65 | 0.05 | 0.1 | 7.94 |
| Stream B-A | 0.26 | 0.3 | 20.21 | 0.09 | 0.1 | 16.99 |
| Stream C-AB | 0.09 | 0.2 | 3.40 | 0.13 | 0.3 | 3.48 |
| 2028 + DEV | | | | | | |
| Stream B-C | 0.17 | 0.2 | 10.00 | 0.13 | 0.1 | 9.07 |
| Stream B-A | 0.46 | 0.8 | 29.03 | 0.25 | 0.3 | 21.59 |
| Stream C-AB | 0.25 | 1.1 | 4.11 | 0.27 | 1.2 | 4.16 |
| 2038 | | | | | | |
| Stream B-C | 0.10 | 0.1 | 8.88 | 0.05 | 0.1 | 8.12 |
| Stream B-A | 0.28 | 0.4 | 22.32 | 0.10 | 0.1 | 18.48 |
| Stream C-AB | 0.10 | 0.2 | 3.33 | 0.14 | 0.4 | 3.43 |
| 2038 + DEV | | | | | | |
| Stream B-C | 0.17 | 0.2 | 10.35 | 0.13 | 0.1 | 9.33 |
| Stream B-A | 0.50 | 1.0 | 33.52 | 0.27 | 0.4 | 24.04 |
| Stream C-AB | 0.28 | 1.3 | 4.12 | 0.29 | 1.4 | 4.19 |

Table 13.6 N31 Brewery Road/Site Access – PICADY Analysis Results

The results of PICADY analysis as summarised in Table 13.6 above, reveal that the junction, without the trips generated by the proposed development, will operate within capacity for the 2038 scenario with the highest Ratio of Flow to Capacity (RFC) at 0.28 and a corresponding queue at 0.4 vehicle during the AM peak period and 0.14 of RFC and a corresponding queue at 0.4 vehicle during the PM.

With the addition of the trips expected to be generated by the proposed development (2038 + DEV), the results indicate that the junction will continue to operate within capacity during both peak periods, with a maximum RFC value of 0.50 and a corresponding queue of 1.0 vehicle recorded for the AM peak and 0.29 RFC and corresponding queue of 1.4 vehicle for the PM peak.

From the traffic assessment it is determined that the traffic impact will be minimal.

13.7 Potential Cumulative Impacts

The traffic modelling undertaken includes growth in background traffic flows which accounts for other developments in the area.

Existing Grange Development

The increase in traffic volumes as a result of the proposed development will impact the existing Grange development as the traffic flows through access and egress from the site will increase. The transport assessment carried out indicates that the increase in traffic flows will not have a negative impact on the existing use of this junction and therefore the potential cumulative impacts are considered negligible.

Future Phase 2 Development

Evidently, the applicant does not control the entirety of remaining lands to provide consolidated development to the N11 frontage. This current application therefore relates to a Phase 1 development on lands that can deliver critically required residential units. OMP Architects have developed a phased Masterplan approach to provide an indicative future context for consideration by An Bord Pleanála, which is enclosed herewith. There has been a carefully considered design approach to development to ensure that the subject application can be delivered without compromising existing amenity or the future potential for development addressing the N11.

The Masterplan successfully integrates this new phase of development with the existing built fabric of The Grange. The approach has been to set the blocks around a central garden, which complements the existing scheme and delivers significant enhancements to the public realm.

Overall, it is estimated that there is potential for a further c. 250 units as part of a Phase 2 development.

Any future development will increase the traffic volumes on the surrounding road and therefore a full Traffic and Transport assessment will be prepared and appropriate mitigation measures implemented for any future phase 2 development.

13.8 Do Nothing Scenario

Should the proposed development not take place, the access roads and infrastructure will remain in their current state and there will be no change. Background traffic would be expected to grow over time. Given the location and zoning of the subject site, it is reasonable to assume that a similar development, with a potentially more intensive requirement for vehicular trips would be established on this site at some stage in the future.

13.9 Risks to Human Health

Construction Stage

A number of temporary risks to human health may occur during construction phase related to noise, dust, air quality and visual impacts which are addressed in other sections of this EIAR. Traffic impacts are considered to be negligible due to the implementation of mitigation measures identified in section 13.10.1.

Operational Stage

There will be a slight increase in traffic on the local road network.

13.10 Mitigation Measures

In order to eliminate or reduce the potential impacts described above, remedial and mitigation measures will be implemented as set out below and in the Construction Management Plan included under a separate cover with this application.

Construction Stage

- Adequate signposting will be located on site to ensure safety of all road users and construction workers.
- Due to the proximity of the proposed site along well serviced bus routes and being well served by cycle lanes, it is intended to limit construction staff parking and to encourage the use of public transport. A limited number of car parking spaces may be provided for senior construction managers within the development site. Suitable locations in the surrounding area may be identified where staff can park and link to public transportation.
- The main contractor as part of their site set up arrangements, shall appoint a Coordinator responsible for the implementation of a Construction Stage Mobility Management Plan and shall carry out the following tasks as part of their role:
 - Provide an extensive information service for public transport options and routes at a public location(s) within the development for construction workers
 - Update the public transport information adjacent to the development on on-going basis; and
 - Advise company staff of tax incentives for public transport and bicycles.
- For those wishing to cycle to and from the development, dedicated cycle parking will be provided for the duration of the works within the site. Shower facilities and lockers will also be provided.
- A dedicated “construction site” access/egress system will be implemented during the construction phases.
- Hoarding will be set up around the perimeter to prevent pedestrian access.
- Dedicated construction haul routes will be identified and agreed with the local authority prior to the commencement of construction activities onsite.
- A material storage zone will also be provided in the Construction Compound area. This storage zone will include material recycling areas and facilities.
- A detailed Construction and Traffic Management Plan will be prepared by the contractor and agreed with the Local Authority prior to commencing works on site.

Operational Stage

- To reduce traffic impact and to promote more sustainable modes of transport a Mobility Management Plan will be prepared for the development
- A management company will be appointed by the developer to manage the development. A senior member of staff from the management company who supports the philosophy of the Plan will be appointed as the Co-ordinator. The Co-ordinator will be responsible for:
 - Implementation and maintenance of the Plan;
 - Monitoring progress of the Plan
 - Liaison with public transport operators and officers of the Planning and Highway Authorities;
 - Production of information reports for the Developer, the occupier(s) and the Planning and Highway Authorities; and
 - Ongoing assessment of the objectives of the Plan.

- Up to date local bus timetables will be maintained within the tenant amenity area and other fixed points within the buildings on the site. Residents will be advised of their location. In addition, internet access to travel information will be provided. The developer will provide all new residents with a travel pack showing alternative modes of travel to the development. Where possible, the developer will advise visitors to the site of alternative modes of travel to that of the car.
- Secure parking facilities will be provided within the basement level -1 for residents and at surface level for visitors and Creche users. Local cycle route information will be provided in the tenant amenity area and at other fixed points within the development and residents will be advised of their location. Details of cycle parking provided is included in the Traffic and Transport assessment provided with the planning submission.
- 5 No go Car spaces will be initially provided and details of how to join the scheme will be provided to all residents when they move into their apartment. Information will also be displayed within the resident amenity area and updated when required.
- The Co-ordinator will be responsible for the management of inappropriate parking within the development. This parking management will ensure that spaces are reserved for those who have rented the space and will be accessible only to those users.

13.11 Predicted Impacts of the Proposed Development

Construction Stage

Due to the proposed mitigation measures outlined above, the impact of the proposed development will be temporary and minimised during the construction stage.

Operational Stage

- There will be a slight increase in the use of the road network by private vehicles. A mobility management plan will promote more sustainable forms of transport

There will be an increase in the number of pedestrians and cyclists in the surroundings of the development. However, footpaths and cycling paths are provided as part of the development, thus, impact should be minimal.

13.12 Monitoring

Construction Stage

Traffic management and deliveries will be carefully monitored during the construction stage as part of the Construction Management Plan. The appointed contractor will monitor their mobility management plan to ensure that is operating effectively. Local residents will be kept fully informed of construction activities through mail shots, email and site notices.

Operational Stage

During the operational stage the Mobility Management Plan will be monitored by the Co-ordinator. The travel survey will establish the initial modal split of travel by residents.

The Co-ordinator, in consultation with the Developer, the Occupiers, and the Local Authority or its agents, will agree annual targets, following completion and analysis of the travel survey, for increasing the percentage of non-car modes.

The Co-ordinator will:

- Meet with officers of the Local Authorities or its agents within a period of 6 months following occupation of the building(s) and thereafter every 12 months to assess and review progress of the Plan and agree objectives for the next 12 months, and
- Prepare and submit to senior management of the Developer, the Occupier(s) and the Local Authorities or its agents, an annual Monitoring Report.

13.13 Reinstatement

Reinstatement is not applicable to this chapter.

13.14 Interactions

Construction Stage

Temporary negative impacts to human health may be likely during the Construction Phase due to noise, dust, air quality and visual impacts which are discussed in the relevant chapters of this EIAR. In addition temporary traffic management will be required to facilitate connections to existing utilities in the existing roads.

The traffic impacts, which would also be temporary in duration are not considered to be significant due to the implementation of the mitigation measures identified in Section 13.10.1.

Operational Stage

Noise generated by increased traffic flows have been assessed in the Air and Noise Chapters of the EIAR.

13.15 Difficulties Encountered

There were no difficulties encountered.

13.16 References

In preparing this report, Waterman Moylan Consulting Engineers have referred to:

The Traffic Management Guidelines,

Guidance on Transport Assessment,

Design Manual for Urban Roads and Streets,

Dún Laoghaire-Rathdown County Development Plan 2016-2022,

Project Appraisal Guidelines for National Roads – Unit 5.3 Travel Demand Projections Link-Based Growth Rate; Annual Growth Factors,

Chartered Institute of Highways and Transportation “Traffic and Transportation Assessment Guidelines”,

Greater Dublin Area Cycle Network Plan – National Transport Authority (NTA),

Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for New Apartments – Department of Housing, Planning and Local Government – March 2018, and

“Standard for Cycle Parking and associated Cycling Facilities for New Developments” – Dún Laoghaire-Rathdown County Council.