Chapter 13:

Transportation

13.0 TRANSPORTATION

13.1 INTRODUCTION

This chapter has been produced to examine, assess and evaluate the likely impact of a proposed residential development on the local transportation network, as well as identifying proposed mitigation measures to minimise any identified impacts.

The proposed development comprises a residential development of 482 no. units (all apartments), along with ancillary residential amenities, and provision of a childcare facility, gym, and local shop. The proposed residential units comprise 31 no. studio units, 183 no. 1-bedroom units, 229 no. 2-bedroom units, and 39 no. 3-bedroom units (including 2 no. duplex type units).

Two basement levels are proposed, providing car parking spaces (299 no.), bin stores, plant rooms, bicycle parking (1,000 no. spaces), and circulation areas. A further 240 no. bicycle parking spaces and 4 no. car parking spaces are provided at ground level.

The proposed development includes landscaping, boundary treatments, public, private and communal open space (including roof terraces), two cycle / pedestrian crossings over the stream at the western side of the site, along with a new pedestrian and cycle crossing of Glenamuck Road South at the west of the site, cycle and pedestrian facilities, play facilities, and lighting. The proposed buildings include the provision of private open space in the form of balconies and winter gardens to all elevations of the proposed buildings. The development also includes vehicular, pedestrian, and cycle accesses, drop off areas, boundary treatments, services, and all associated ancillary and site development works.

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

13.2 STUDY METHODOLOGY

The approach to the assessment of likely significant impacts on traffic and transportation in this chapter accords with policy and guidance at EU, national and local level. Accordingly, the adopted methodology responds to best practices, current and emerging guidance, exemplified by a series of publications, all of which advocate this method of analysis. Key publications consulted include:

- “Guidance on the preparation of the Environmental Impact Assessment Report” (EC, 2017);
- Environmental Protection Agency (EPA) Guidelines on the information to be contained in the EIAR (2017);
- ‘Traffic and Transport Assessment Guidelines’ (May 2014) National Road Authority (now TII),
- ‘Traffic Management Guidelines’ Dublin Transportation Office & Department of the Environment and Local Government (May 2003);
- ‘Guidelines for Traffic Impact Assessments’ The Institution of Highways and Transportation;
- Dún Laoghaire Rathdown Council Development Plan 2016-2022;
- Ballyogan & Environs Local Area Plan 2019-2025;
- Review of the Glenamuck Local Area Plan – Traffic Modelling Report (June 2013) Dún Laoghaire Rathdown County Council and
- Cherrywood SDZ.

The methodology incorporated a number of key inter-related stages, including;

- **Background Review:** This important exercise incorporated three parallel tasks which included (a) an examination of the local regulatory and development management documentation; (b) an analysis of

previous 'transport' related, strategic and site specific studies of both development and transport infrastructure proposals across the Carrickmines area, and (c) a review of recent planning applications to establish the legal status of various third party development schemes which have emerged and received full planning permission since.

- **Site Audit:** A site audit was undertaken to quantify existing road network issues and identify local infrastructure characteristics, in addition to establishing the level of accessibility to the site in terms of walking, cycling and public transport. An inventory of the local road network was also developed during this stage of the assessment.

- **Traffic Counts:** Junction traffic counts in addition to vehicle queue length surveys were undertaken and analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed residential development.

- **Trip Generation:** A trip generation exercise has been carried out to establish the potential level of vehicle trips generated by the proposed residential development.

- **Trip Distribution:** Based upon both the existing traffic characteristics, a distribution exercise has been undertaken to assign site generated vehicle trips across the local road network.

- **Network Analysis:** Further to quantifying the predicted impact of vehicle movements across the local road network for the adopted optimum site access strategy more detailed computer simulations have been undertaken to assess the operational performance of key junctions in the post development 2023, 2028 and 2038 development scenarios.

13.3 EXISTING RECEIVING ENVIRONMENT

Land Use

The proposed development site is currently characterised as a brownfield site having previously accommodated a number of private dwelling houses. The subject lands are zoned "Objective A – To protect and-or improve residential amenity" within the Dún Laoghaire-Rathdown County Development Plan 2016-2022.

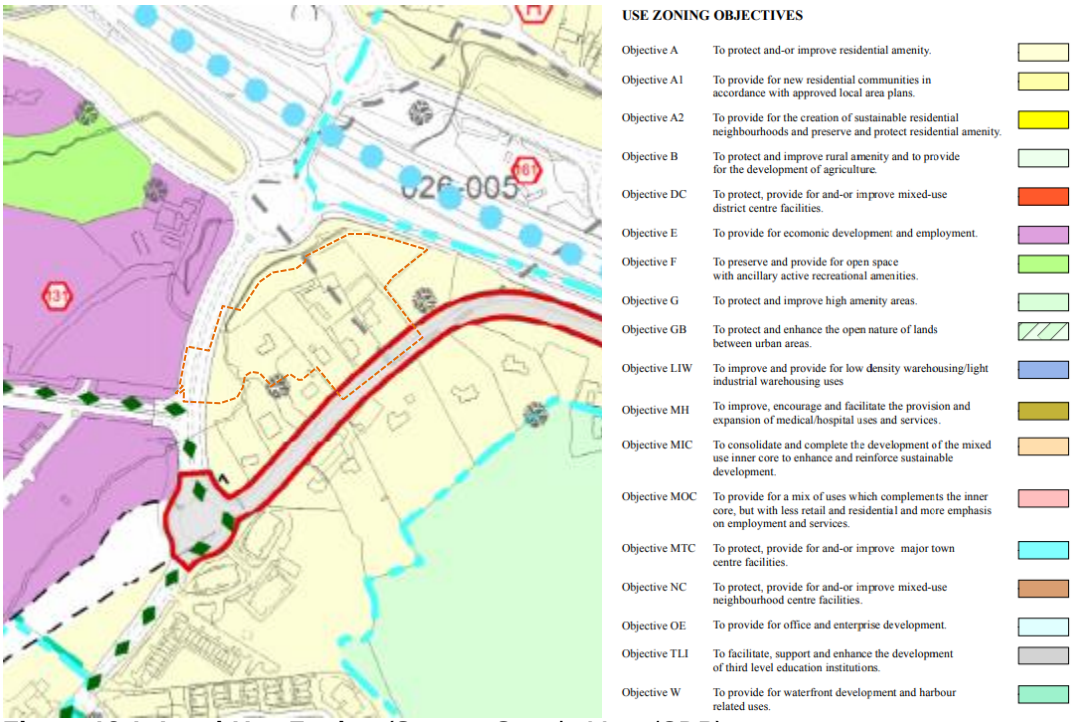

Figure 13.1: Land-Use Zoning (Source: Google Maps/CDP)

Furthermore, two recent planning applications have previously been submitted in respect of development proposed on the subject lands (Planning Ref. D06A-1157 for 125 residential dwellings and Planning Ref. D08A-0590 for 90 residential dwellings). The previously permitted planning permission for these two applications have since lapsed.

Location

The site has an area of c. 2.56 hectares and is bound to the north by the M50 motorway, to the east by Golf Lane, to the west by Glenamuck Road, and to the south by existing residential development.". The development fronts onto Golf Lane corridor which currently forms a cul de sac road used for access to existing local dwellings along Golf Lane and Carrickmines Golf Course.

The general location of the subject site in relation to the surrounding road network is illustrated in Figure 13.2 below whilst Figure 13.3 indicatively shows the extent of the subject site lands.

Figure 13.2: Site Location (Source: Google Maps)

Figure 13.3: Indicative Site Boundary (Source: Google Maps)

The subject development site is situated approximately 15km south of Dublin City Centre and 11km west of Dún Laoghaire. The high employment area of Sandyford is located approximately 4.5km northwest of the subject site whilst Dundrum Shopping Centre is approximately 8km to the northwest.

Located on Golf Lane, the subject site is accessed via the existing Golf Lane Roundabout which is located to the south of the M50/ Glenamuck Road/ Ballyogan Road junction. The lands are encompassed within the Ballyogan & Environs Local Area Plan 2019-2025 and situatedBallyogan Lands LAP on a parcel of lands positioned between the Cherrywood SDZ and Kiltiernan LAP as illustrated in Figure 13.4 below.

Golf Lane, which is located immediately to the south / west of the site is located within the Cherrywood SDZ, and is to be upgraded in the future to become the link road connecting Glenamuck Road (and J15 M50) with the western portion of the SDZ lands via a new M50 overpass.

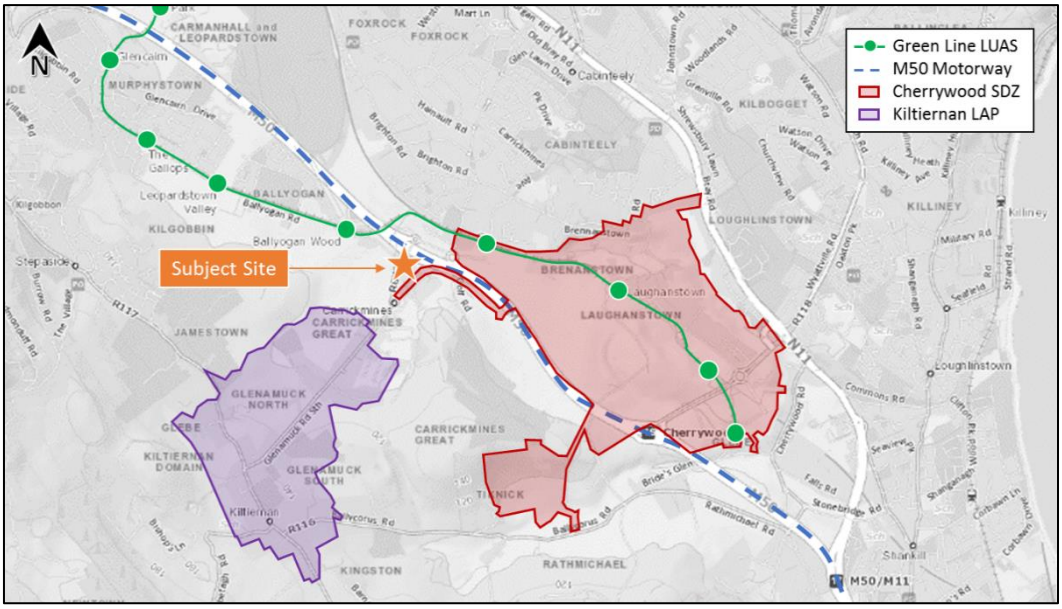

Figure 13.4: Location of Site within Greater Carrickmines Context (Source: GeoHive)

Existing Transportation Environment

Road Network

The subject development site fronts onto the Golf Lane corridor. Travelling eastbound from the site provides access to Carrickmines Golf Club whilst travelling westbound from the site provides access to the Glenamuck Road corridor. Travelling northbound on Glenamuck Road provides access to Cornelscourt/ Cabinteely/ N11, Sandyford (4.5km) and Dundrum (8km) in addition to access to the strategic M50 Motorway (via Junction 15). Travelling in a southbound direction along Glenamuck Road leads to Kilternan (approx. 2km) and Enniskerry Road. Glenamuck Road is subject to a speed limit of 50kph.

Pedestrians and Cyclists

Pedestrians benefit from existing footway and street lighting provision on both sides of the Glenamuck Road North corridor (as illustrated in Figure 13.5). The site of the proposed development benefits from relatively good quality cycle facilities across the general area which include the availability of cycle lanes along Glenamuck Road South corridor and on a number of links across the surrounding areas including Ballyogan Road. To the south of the Golf Lane roundabout junction, pedestrians benefit from the provision of a footway and street lighting on only one side (eastern side) of the Glenamuck Road South carriageway. There are currently no dedicated cycle facilities along this section of the corridor (Figure 13.5). Pedestrians also benefit from the provision of a footway and street lighting on the southern side of the Golf Lane corridor. Currently cyclists share the Golf Lane corridor with vehicular traffic.

Figure 13.5: Existing Pedestrian / Cycle Facilities on the Surrounding Road Network

Public transport – bus

Go-Ahead operates a bus service in the vicinity of the subject site. Go-Ahead Bus Route 63 operates services between Kilternan and Dún Laoghaire. As presented on Figure 13.6 below, the nearest Go Ahead Route 63 southbound bus stop (Bus Stop Number 7360) is located approximately 450m west of the subject site access whilst the nearest northbound bus stop for Go-Ahead Bus Route 63 (Bus Stop Number 7324) is located approximately 400m southwest of the subject site access.

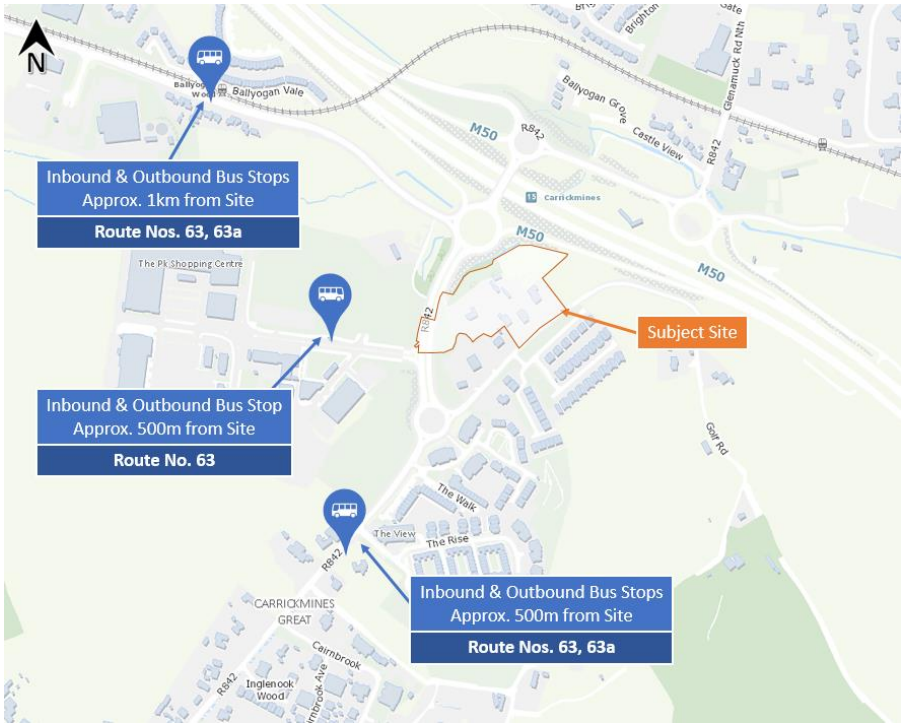

Figure 13.6: Existing Go-Ahead Bus Interchanges (Source: GeoHive)

The Go-Ahead operated bus service operates on a daily basis seven days a week and offers frequent schedules as summarised in **Table 13.1** below.

Route No.	Route	Mon – Fri	Sat	Sun
63	Dún Laoghaire – Kilternan	34	34	30
	Kilternan - Dún Laoghaire	33	34	30

Table 13.1: Go-Ahead Bus Service Quantity (Source: TFI)

Public transport – LUAS

The closest LUAS Green Line interchanges (Ballyogan Wood and Carrickmines) are both located approximately 850m and within (approx. 11-minute) walking distance to the northwest and northeast of the subject site respectively, via the Ballyogan Road and Glenamuck Road North. The LUAS Greenline currently provides access to Sandyford, Dundrum and the City Centre to the north in addition to intermediate destinations along its route (**Figure 13.7**). **Table 13.2** below summarises the frequency with which the Luas Green Line service operates.

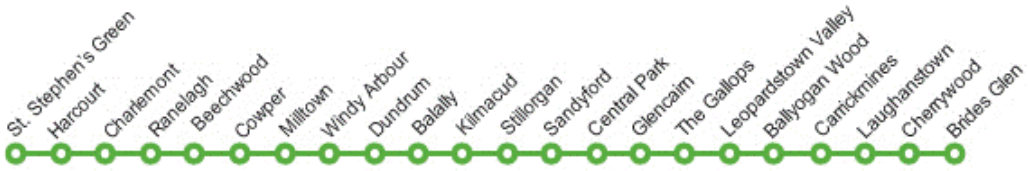

FIGURE 13.7: Luas Greenline Destinations (Source: LUAS)

Time	Monday – Friday	Saturday	Sunday
Peak	4-10	13-15	11-12
Off Peak	10-15	15	12-15

Table 13.2: LUAS Service Frequency (minutes)

Figure 13.8: Existing Public Transport Services

Public transport – Heavy Rail

Killiney Train Station is located approximately 4.5km east of the subject site whilst Dún Laoghaire Station is 5.5km to the northeast. Both of these interchanges provide access to DART and regional Commuter rail services.

Future Transportation Environment

Cycle Network Proposals

(1) GREATER DUBLIN AREA CYCLE NETWORK PLAN

In December 2013, the NTA published the report entitled Greater Dublin Area Cycle Network Plan. The report summarises the findings of a comprehensive body of work detailing a proposed Cycle Network incorporating Urban, Inter-urban and Greenroute networks covering the six county council areas that together form the defined Greater Dublin Area (GDA).

The subject site is located within the GDA Cycle Network sector designated as the "Dublin South East Sector". In the vicinity of the subject site the following route additions are proposed as indicated in **Figure 13.9**:

- Route 11C: south from Goatstown Cross on Drummartin Link Road/ Kilgobbin Road/ Ballyogan Road to Carrickmines,
- A new feeder route linking the Inter-Urban cycle route (D1) with a proposed Secondary cycle route along Glenamuck Road (11C), and
- New and extended Greenway route from Shanganagh to Sandyford along the Carrickmines Stream and Ballyogan.

FIGURE 13.9: Proposed Cycle Network (Source: Sheet N8 GDA Cycle Network Plan)

(2) BALLYOGAN & ENVIRONS LOCAL AREA PLAN (BELAP) 2019-2025

Figure 4.11 and Table 4.6 of the BELAP outline the new linkages in the LAP area. The pedestrian / cycle links proposed in the immediate vicinity of the subject development site include;

- **Link No. 1** Glenamuck Road to Kilgobbin Road Greenway

  "this dedicated Greenway Spine traversing the Plan area from east to west, would provide safe and dedicated cycling/walking linkages through the central landholdings connecting Glenamuck Road and Kilgobbin Road and continuing on the existing Greenway in Stepaside North to Enniskerry Road".

- **Link No. 27** – Golf Lane Link

  "Would link the Ballyogan Stream greenway spine (Link 1) through to the Kiltiernan Link Road".

- **Link No. 20** – The Park Carrickmines to Glenamuck Road

  "This Link would connect the main 'crossroads' in The Park Carrickmines to the new Glenamuck District Distributor Road, and onward to Glenamuck Road, providing a route from Kiltiernan to The Park Carrickmines".

Link No. 27 described above is indicatively shown to travel through the subject proposed development site. Accordingly, a dedicated cycle / pedestrian link has been incorporated into the subject scheme proposals as will be discussed in greater detail later in this chapter.

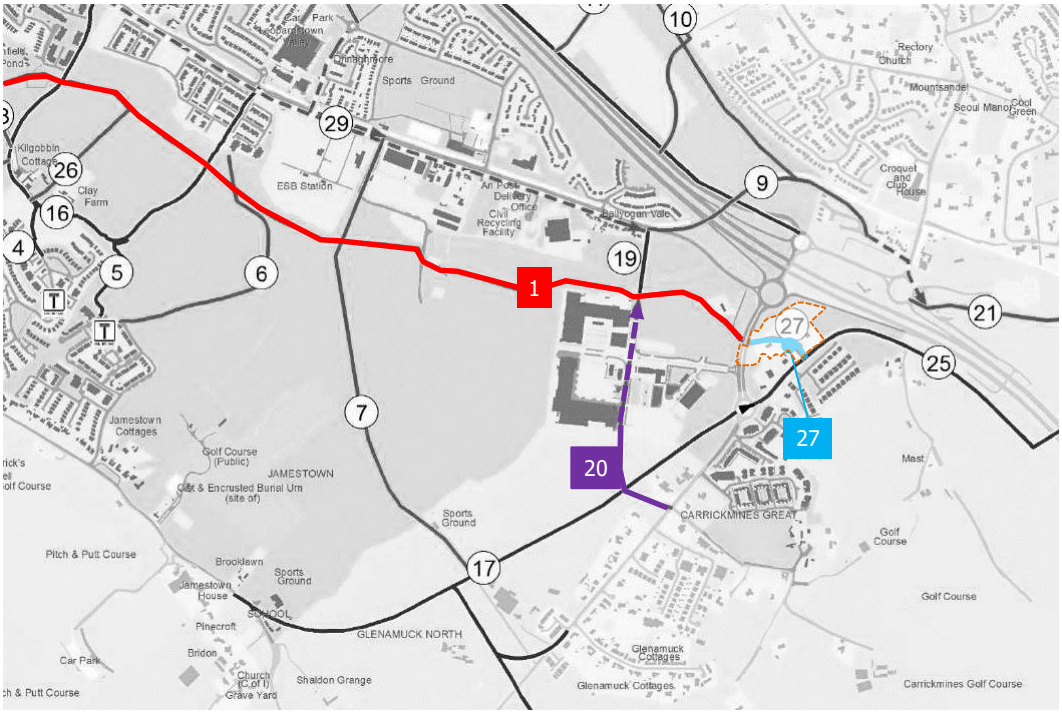

FIGURE 13.11: Future Cycle Infrastructure Proposals

Public transport Proposals – Bus Connects

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

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

- Increasing the overall amount of bus services. Providing new and frequent orbital services connecting more outer parts of the city together;
- Simplifying the bus services on the key radial into “spines” where all buses will operate under a common letter system and buses will run very frequently and be more evenly spaced;
- Increasing the number of routes where buses will come every 15 minutes or less all day;
- The frequent network would become a web-shaped grid, with many interchange opportunities to reach more destinations. Everywhere that two frequent routes cross, a fast interchange is possible; and
- Additional service would be provided at peak hours to limit overcrowding.

In relation to the subject site, following this redesign of the bus network, the proposed development will be located in close proximity to the new BusConnects route L26 which will replace the existing Go-Ahead Bus route 63. This bus service will operate every 30 minutes on a daily basis.

Figure 13.12 illustrates bus service proposals in the area and the frequency available for each route on a neutral weekday as detailed in the BusConnects redesign (which was the subject of a third round of public consultation, which closed on 16 December 2020).

The Bus Network Redesign is the first step in a series of transformative changes to Dublin's bus network over the coming years. However, the next steps in this initiative are the improvements to the infrastructure and operation of the proposed Bus network which include:

- building a network of "next generation" bus corridors on the busiest bus lines to make bus journeys faster, predictable and reliable;
- developing a state-of-the-art ticketing system using credit and debit cards or mobile phones to link with payment accounts and making payment much more convenient;
- implementing a cashless payment system to vastly speed up passenger boarding times;
- a simpler fare structure, allowing seamless movement between different bus services without financial penalty;
- new bus stops with better signage and information and increasing the provision of additional bus shelters; and
- transitioning to a new bus fleet using low-emission vehicle technologies.

Figure 13.12: Proposed Bus Network (Source: BusConnects)

Public transport Proposals – Bus Priority

A Bus priority network is proposed within Map No. T2 of the DLRCC Development Plan 2016-2022 as presented in Figure 13.13 below. The proposals include for a bus priority scheme along Glenamuck Road and continuing through to the R117 Enniskerry Road South of the Enniskerry Road / Glenamuck Road junction.

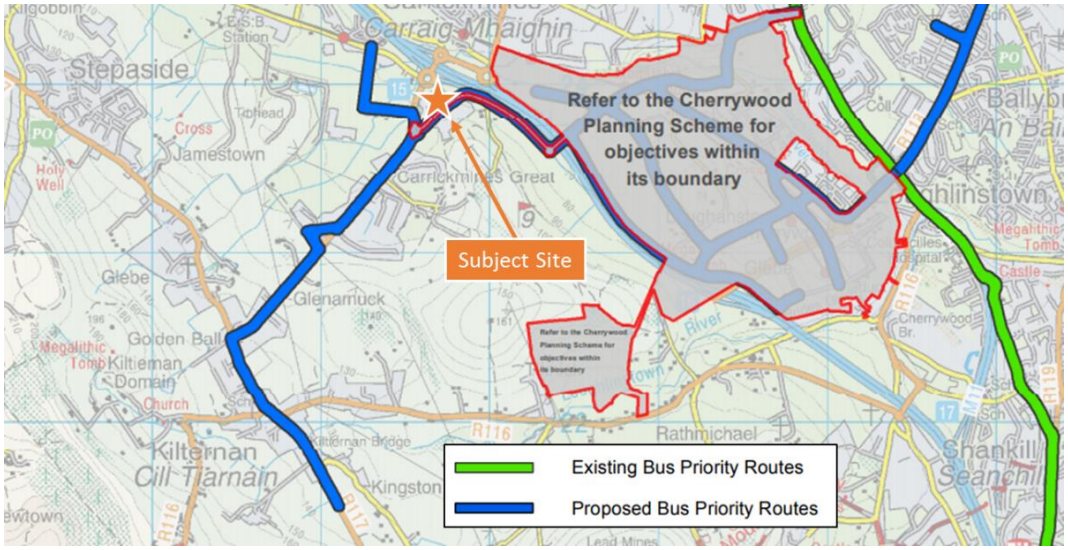

Figure 13.13: Proposed Bus Priority Network (Source: Extract from Map No. T2 DLRCC Development Plan 2016-2022)

Public transport Proposals – Luas & Metro

According to current proposals by the NTA & TII, the proposed MetroLink will operate from Charlemont, immediately south of the Grand Canal, and will provide links to City Centre locations and Dublin Airport, terminating in Swords.

Residents of the proposed development will be able to avail of the proposed Metro Line through the Luas Green Line services accessible at the, Ballyogan Wood or Carrickmines Luas interchanges.

Other proposed extensions to the Luas network include a Lucan Line operating from the City Centre to Lucan and the extension of the Green Line south from Brides Glen to Bray. Figure 13.14 below shows the existing Luas network with the proposed service extensions and Metro Line.

Figure 13.14: Proposed Light Rail Network (Source: NTA)

Public transport Proposals – Roads Proposals

Map No. T3 of the Dún Laoghaire Rathdown County Development Plan 2016-2022 presents the roads proposals within the plan area to be completed within the lifetime of the plan (Figure 13.15).

Key road objectives in the general area of the subject site include;

- Glenamuck District Distributor Road (GDDR)
- Glenamuck Local Distributor Road (GLDR)
- The Park to Ballyogan Link Road
- Golf Lane M50 Overpass to Cherrywood SDZ
- M50 3rd Lane (Sandyford to M11)

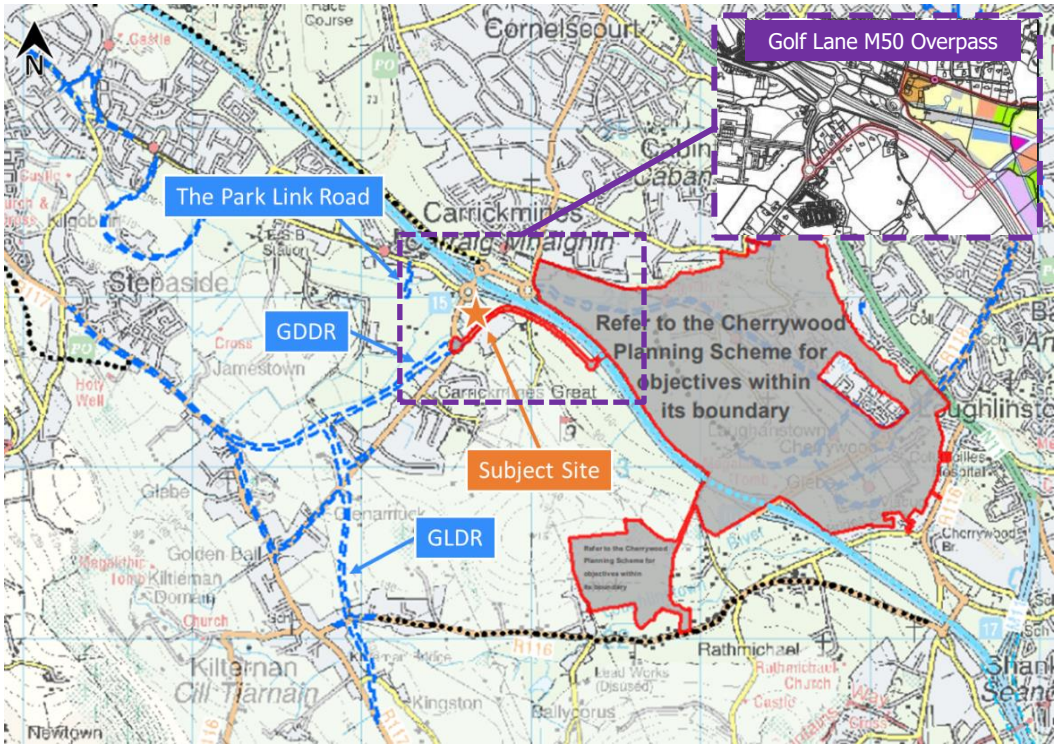

Figure 13.15: Road Proposals Map (Source: Map T3 - Dún Laoghaire Rathdown County Development Plan 2016-2022)

By reference to the County Development Plan, the following implementation timescales for these DLRCC roads have been adopted within this chapter of the EIAR:

- Glenamuck District Distributor Road (GDDR) – after 2023 but before 2028
- Glenamuck Local Distributor Road (GLDR) – after 2023 but before 2028
- The Park to Ballyogan Link Road – after 2023 but before 2028
- Golf Lane M50 Overpass to Cherrywood SDZ – after 2038
- M50 3rd Lane (Sandyford to M11) – after 2038

Glenamuck District Distributor Road and The Glenamuck Link Distributor Road

It is noted that, as part of the GDDR scheme proposals, it is proposed that a new 'fourth' arm will be provided at the Golf Lane / Glenamuck Road Roundabout as located on Glenamuck Road South.

Within the Kiltiernan / Glenamuck LAP 2013, these road proposals are identified as the Glenamuck District Distributor Road (GDDR) and the Glenamuck Link Distributor Road (GLDR).

As part of the Kiltiernan / Glenamuck LAP 2013, a traffic modelling study was commissioned by DLRCC's transport planning section and carried out by RPS Consulting Engineers in order to ascertain as to whether the aforementioned road infrastructure proposals, which were originally proposed as part of the previous LAP, remain appropriate. The study consisted of an update of previous traffic modelling work carried out by the NTA which was used to demonstrate the level of transport infrastructure necessary if all lands within the LAP where developed.

The DLRCC commissioned traffic modelling study assumed a 2022 design year and predicted that all LAP lands will be fully developed by that year. However, the study also acknowledged that this is highly unlikely and that it may be decades before the entirety of the lands designated in the LAP would be developed.

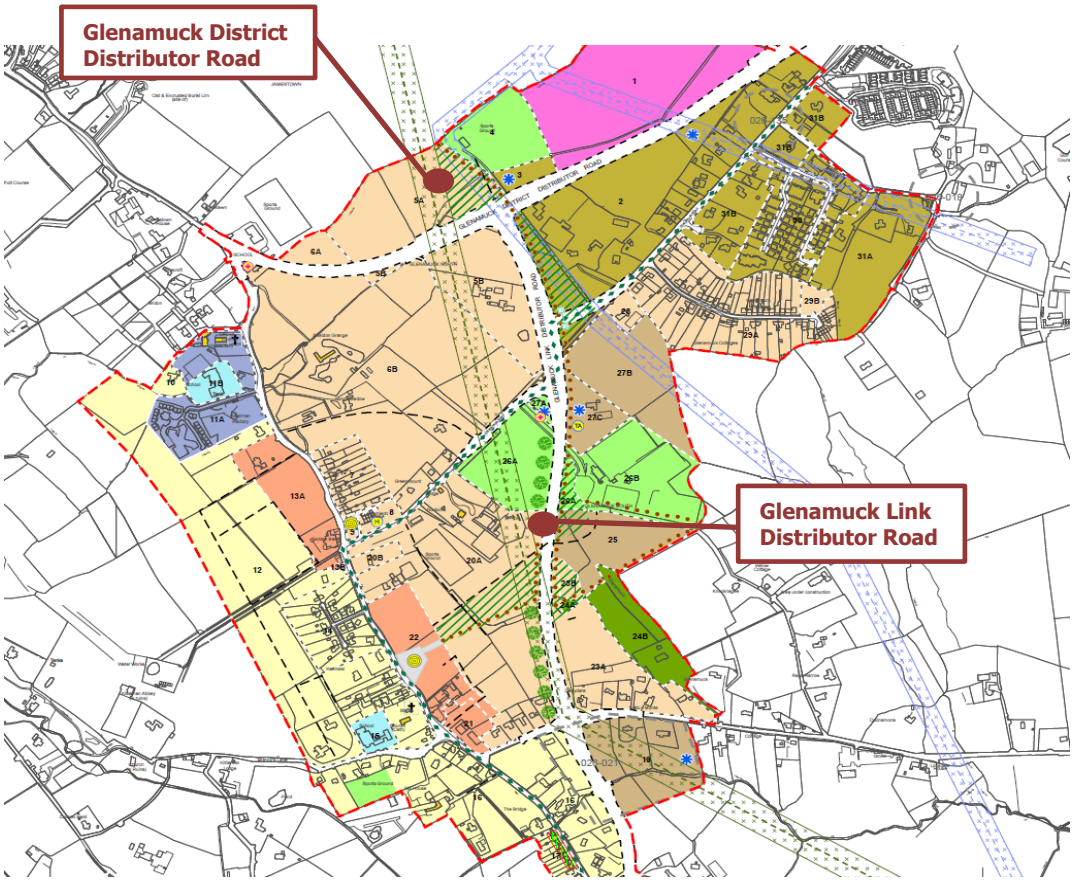

FIGURE 13.16: Kiltiernan / Glenamuck Local Area Plan 2013

The DLRCC commissioned traffic modelling study recommends that a phased approach is taken with regard to the implementation of the road proposals and thereby proposes "Minimum Essential (Core) Roads Infrastructure" will "need to be provided for lands to be developed in a sensible and sustainable manner". The proposed minimum essential (core) level of road infrastructure is proposed as follows;

A. "GDDR (Glenamuck District Distributor Road - (primary link road)) - single carriageway from Enniskerry Road to Southern Roundabout at Carrickmines

B. GLDR (Glenamuck Link Distributor Road – (primary link road)) - single carriageway from Enniskerry Road to GDDR

C. Junction of GDDR and GLDR

D. Staggered junction between GLDR and the existing Glenamuck Road

E. Junction of GLDR and Ballycorus Road

F. Junction of Enniskerry Road and GDDR"

Figure 13.17 below presents the proposed minimum essential (core) level of road infrastructure.

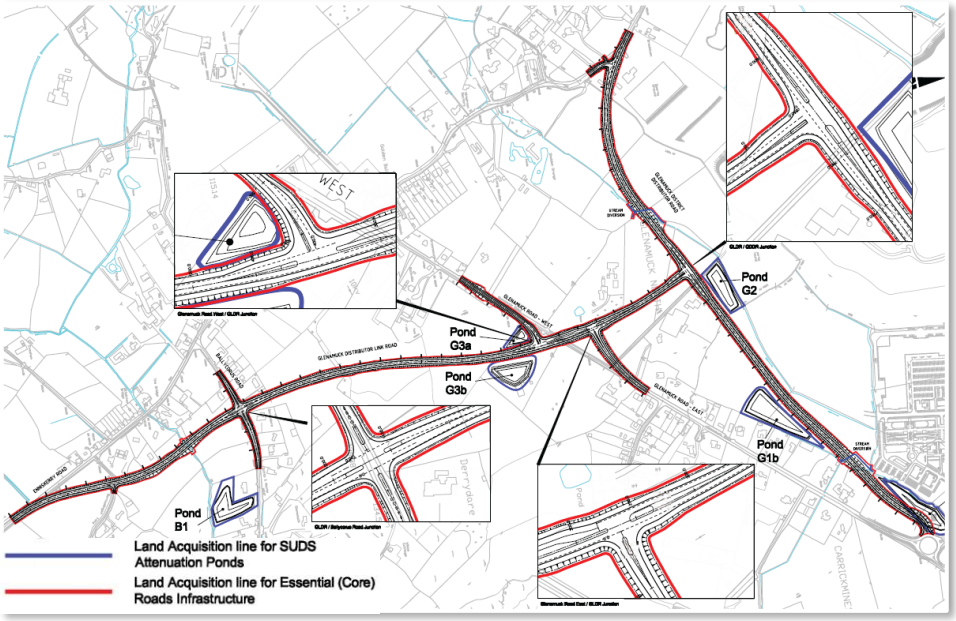

Figure 13.17: Minimum Essential (Core) Road Infrastructure (Source: Extract from RPS Dr. No. PA0003 Minimum (Core) Infrastructure Proposals at Glenamuck-Kilternan)

The DLRCC commissioned traffic modelling study states that;

> *"As time passes and the development of the LAP lands and other areas in the wider environs takes place, it is likely that other road infrastructure improvements, both within and outside of the LAP area boundary may become necessary. Within the LAP area, the core infrastructure would require upgrading. These improvements would include junction upgrades to multi-lane facilities"*

Therefore, whilst the aforementioned Minimum (Core) Infrastructure Proposals will be implemented in the interim period, it is recommended in the DLRCC commissioned traffic modelling study that lands are protected from development in order to cater for the potential future traffic demand arising from the fully developed LAP. **Figure 13.18** below illustrates the extent of the lands required for the implementation of the future road infrastructure upgrade identified by RPS.

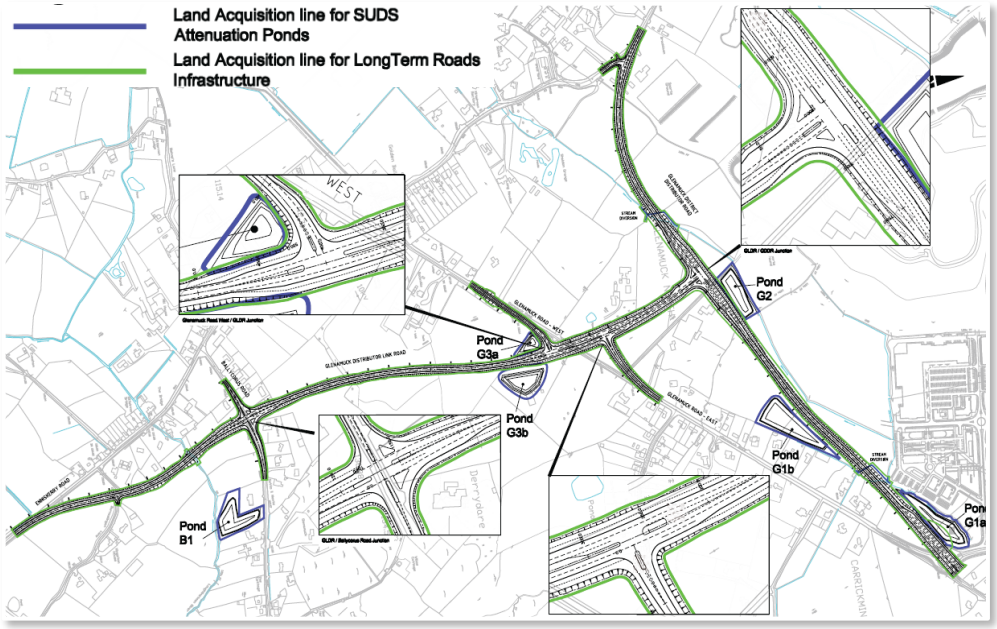

Figure 13.18: Long Term Road Infrastructure (Source: Extract from RPS Dr. No. PA0004 Long Term Infrastructure Proposals at Glenamuck-Kilternan)

In 2017, DLRCC appointed DBFL Consulting Engineers to update the earlier RPS traffic analysis and undertake the detailed design of the GDDR and GLDR schemes. An application for approval in respect of the updated road scheme has been submitted by DLRCC to An Bord Pleanála. Approval for the Glenamuck District Roads Scheme and confirmation of the Dun Laoghaire-Rathdown County Council Compulsory Purchase (Glenamuck District Roads Scheme) Order 2019 was granted on 18 December 2019 (Ref. Nos. ABP-303945-19 / ABP-304174-19).

The updated traffic analysis by DBFL submitted in respect of the approved Glenamuck District Roads Scheme includes all zoned lands within the LAP at a density of 45 units per Ha. Accordingly, the strategic area–wide appraisal of the local road network following the implementation of development on lands zoned for residential development (including the subject site) has been considered within the DLRCC commissioned analysis. This strategic appraisal is based upon the delivery of housing and implementation of GDDR and GLDR infrastructure by the end of 2020.

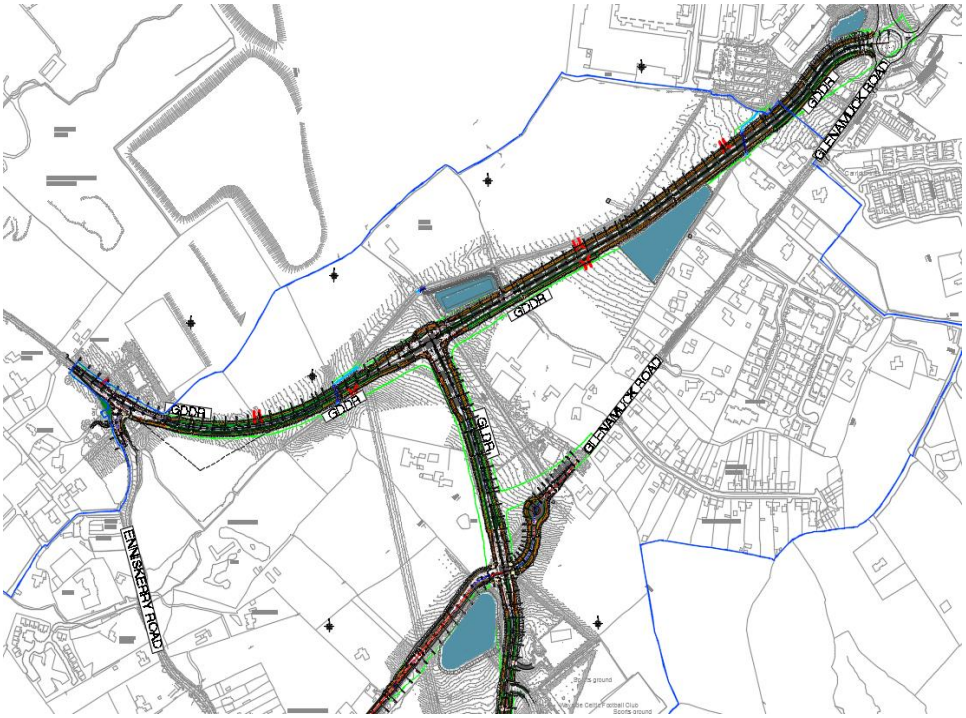

Figure 13.19: DBFL GDDR / GLDR Detailed Design (Extract from DBFL Dr. No. 170172-DBFL-01-XX-DR-C-2000)

13.4 DESCRIPTION OF THE PROPOSED DEVELOPMENT

Proposed Development

The proposed development comprises a residential development of 482 no. units (all apartments), along with ancillary residential amenities, and provision of a childcare facility, gym, and local shop. The proposed residential units comprise 31 no. studio units, 183 no. 1-bedroom units, 229 no. 2-bedroom units, and 39 no. 3-bedroom units (including 2 no. duplex type units).

Two basement levels are proposed, providing car parking spaces (299 no.), bin stores, plant rooms, bicycle parking (1000 no. spaces), and circulation areas. A further 240 no. bicycle parking spaces and 4 no. car parking spaces are provided at ground level.

The proposed development includes landscaping, boundary treatments, public, private and communal open space, two cycle / pedestrian crossings over the stream at the western side of the site, along with a new pedestrian and cycle crossing of Glenamuck Road South at the west of the site, cycle and pedestrian facilities, play facilities, and lighting. The proposed buildings include the provision of private open space in the form of balconies and winter gardens to all elevations of the proposed buildings.

The development also includes vehicular, pedestrian, and cycle accesses, drop off areas, boundary treatments, services, and all associated ancillary and site development works.

FIGURE 13.20: Proposed Site Layout

Further details of the above proposals in regard to the proposed residential development are illustrated in Henry J Lyons Architects scheme drawings as submitted with this planning application.

Site Access Arrangements

Vehicular Access

The subject site will benefit from a single vehicle access which will be provided on Golf Lane as shown in Figure 4.2 below. It will be located approximately 255m northwest of the Glenamuck Road Roundabout.

The majority of vehicles entering the site (i.e. residents) will be directed down a short ramp and into the basement car park. Other vehicles (such as deliveries, set down, visitors) will be accommodated at 'podium'/ ground level near Blocks B and D pedestrian access points. A turning facility is proposed at podium level allowing for drop off / collection purposes.

The overall development site has been set back to accommodate the future implementation of the DLRCC proposed Golf Lane M50 Overpass to Cherrywood SDZ. The proposed set back and Golf Lane upgrade corridor is presented in Figure 13.21 below.

Pedestrian & Cyclist Accessibility

In addition to the subject site's main access (as located on Golf Lane) which accommodates access to the subject development site by all modes as indicated in Figure 13.21 below, pedestrians/cyclists will be provided with additional convenient dedicated access/egress locations along Glenamuck Road South and Golf Lane.

Dedicated cycle access ramps are proposed between surface level and upper basement level located adjacent to the vehicular access and another located south of the tower accessed off the proposed cycle / ped facility operating along the northern and north eastern site boundary. In addition, pedestrians may also access podium level via an adjacent parallel dedicated pedestrian link from as presented in Figure 13.21 below.

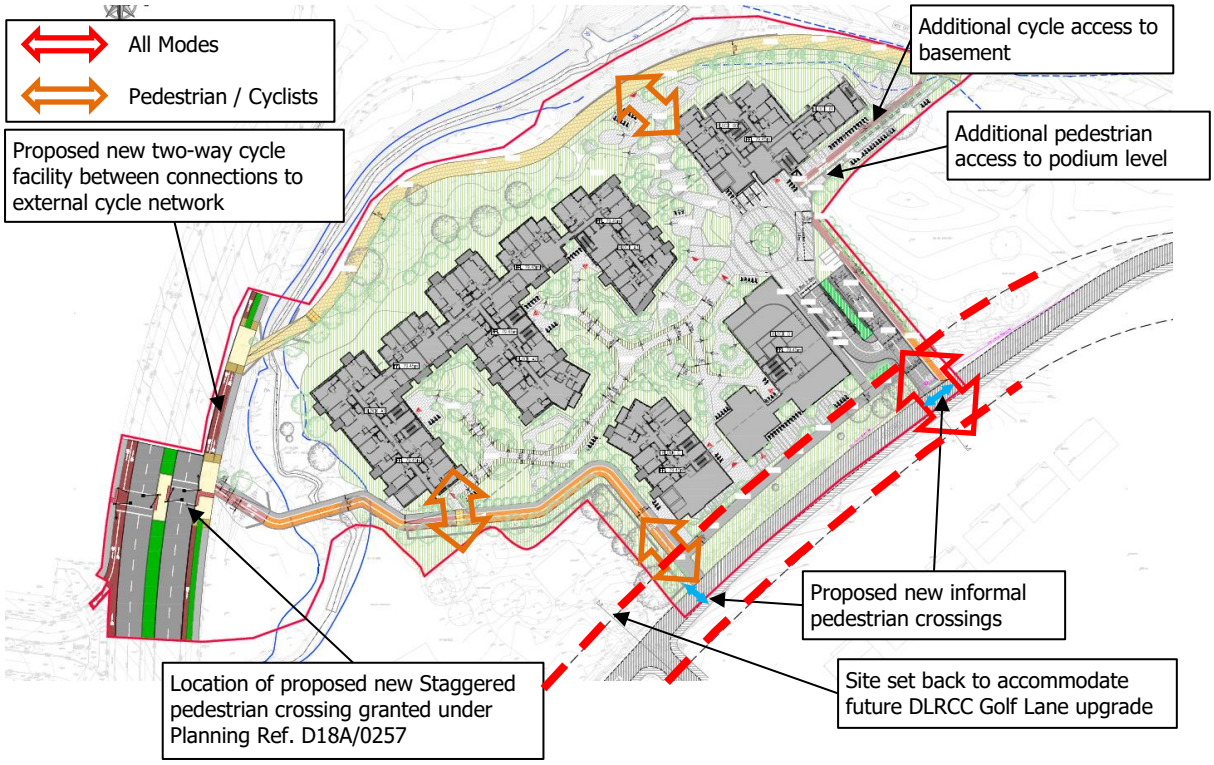

Figure: 13.21: Proposed Site Accessibility

As introduced previously, the Ballyogan and Environs LAP proposes a new pedestrian link between Glenamuck Road South and Golf Lane. Accordingly, the subject scheme proposals incorporate a new dedicated cycle / pedestrian link between Glenamuck Road South and Golf Lane via the southwestern boundary of the subject site. This new non-vehicular link connects with Golf Lane in the vicinity of the proposed new pedestrian crossing on Glenamuck Road South granted as part of Planning Ref. D18A/0257. The proposed new footpath within the subject site boundary has been set back from the existing Golf Lane corridor so that it can be retained as the footpath along the future Golf Lane upgraded layout.

This new cycle / pedestrian facility will enhance accessibility to The Park retail development as well as the neighbouring LUAS interchange on Ballyogan Road and bus stops on Glenamuck Road and at The Park.

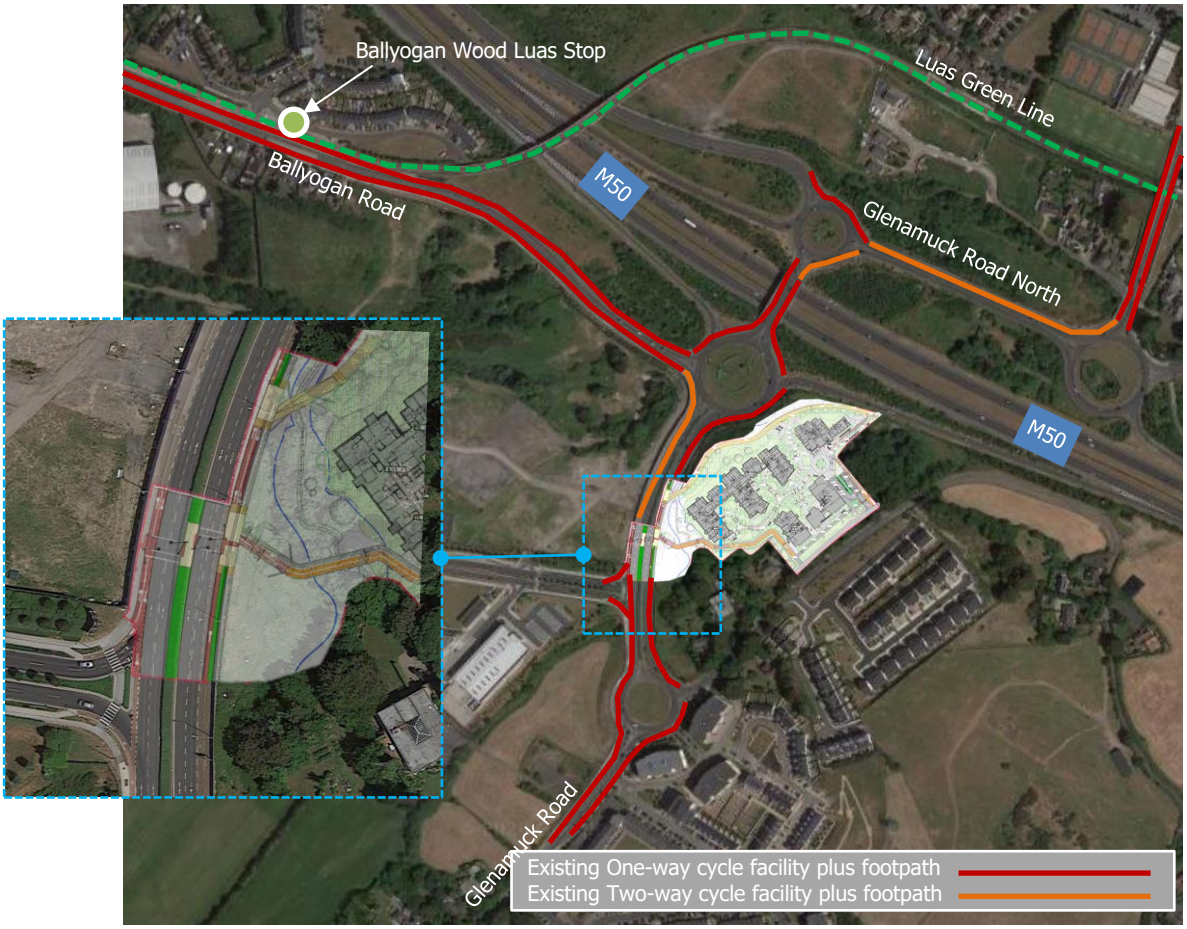

Figure 13.22: Pedestrian / Cycle Connectivity

Parking

The subject scheme proposals include for a total of 303 no. car parking spaces comprising 202 at upper basement level, 97 at lower basement level and 4 no. at surface level. Of the 303 on-site car parking spaces, 10 no. have been assigned to the Creche / amenity / café / retail land uses. The surface level car parking spaces comprise 3 no. visitor car parking spaces an 1 no. set down visitor space. A total of 289 no. basement car parking spaces are dedicated to the residential units whilst the remaining 10 no. spaces are for the non-residential uses.

This residential car parking provision is lower than the maximum development plan standards (632 spaces) and equates to a ratio of 0.6 spaces per apartment unit. This sustainable approach is justified in circumstances of where: i) the site's close proximity to the frequent Luas services and bus stops, ii) the high level of cycle parking provision proposed and iii) the policy of the DHPLG for new developments at such locations is for car parking provision to be 'minimised, substantially reduced or wholly eliminated in certain circumstances'. The opportunity exists for a reduced quantum of dedicated residential car parking spaces to be provided for a development on the subject site. In addition to the aforementioned basement level car parking spaces, 3 no. taxi / set down space is proposed at podium level.

The non-residential on-site land uses (creche, gym / café, residential amenity) will predominantly cater for the needs arising from the onsite residential development and, therefore, will not generate a significant number of vehicular trips to and from the proposed development site. Accordingly, as introduced previously, a total of 10 no. car parking spaces have been allocated to non-residential land uses to facilitate staff associated with these land uses travelling to the site by car. For childcare services, Table 8.2.4 of the development plan requires the provision of a maximum of 1 car parking space per staff member (includes set down spaces). Accordingly, assuming a total of 15 no. crèche staff, a maximum of 15 no. crèche car parking spaces are required as part of

the subject scheme proposals. It is noted that the crèche car parking requirement is inclusive of set down spaces.

Accordingly, the opportunity exists for a sustainable reduction in the provision of crèche dedicated car parking spaces as the subject facility is expected to predominantly serve the subject residential apartments. Therefore, the vast majority of trips to the proposed crèche facility are expected to comprise walking trips to / from the proposed residential apartments. The subject scheme proposes 6 no. dedicated crèche car parking spaces. The remaining 4 no. non-residential car parking spaces have been assigned for staff at the retail, gym / café, and amenity units. A summary of the car parking allocation is summarised in Table 13.3 below.

Land Use	Standard	Disabled	Car Share	Electric	Setdown/Visitor at Surface	Motorcycle
Residential	222	11	7	49	4	12
Crèche	5	1	-	-		
Non-residential	4	-	-	-		
Sub-Total	231	12	7	49	4	12
Total	299					

Table 13.3: Car / Motorcycle Parking Provision

Car Share

The subject scheme proposes the provision of 7 no. car share spaces located at basement level (included within the 289 no. residential car parking spaces introduced above). Research has shown that 1 car share vehicle can replace up to 15 private cars (Source: Transit Co-operative Research Programme – Report 108 'Car Sharing: Where and How it Succeeds').

Disabled Car Parking Provision

The development plan requires the provision of disabled car parking spaces at a rate of 4% of car parking provision. Accordingly, a total of 12 no. disabled car parking spaces are required as part of the subject proposals. The subject scheme proposes 12 no. disabled car parking spaces located within the upper basement level and is therefore compliant with the development plan requirement.

Electric Vehicle Parking Provision

The development plan requires the provision of parking spaces capable of accommodating electric vehicles at a rate of 1 car parking space per 10 residential units. Accordingly, a total of 49 no. electric vehicle compatible parking spaces are proposed as part of the subject scheme (i.e. 10% of apartments).

Motorcycle Parking Provision

The subject scheme proposals accommodate 12 no. motorcycle spaces which is compliant with the development plan standard which requires 4 no. motorcycle spaces per 100 car parking spaces.

Bicycle Parking Provision

The subject development proposals include for a total of 1240 bicycle parking spaces comprising 240 short term bicycle spaces located at podium level and 1000 long term bicycle spaces within the upper basement level.

This level of overall cycle parking provision (1240) is more than double the DLRCC requirements (602) and exceeds the DHPLG requirement (1052).

Trip Generation

Proposed Development

With the objective of examining the demand that could potentially be generated at the proposed residential development, the following Donor site exercise has been undertaken to identify, survey and analyse existing developments, which exhibit similar land-use (residential apartments) and operational characteristics to those of the proposed development;

Following an analysis of existing residential developments which are located in close proximity to both the Luas Green Line and a range of retail / leisure facilities; the following three sites have been adopted by DBFL as representing appropriate 'donor' sites in terms of trip generation (i.e. all apartments) and public transport accessibility (i.e. close proximity to LUAS services) characteristics. As such the three selected sites are as follows (Figure 13.23):

A. Shanagarry Residential Development, Milltown Road, Dublin 6;
B. Elmfield Residential Development, Ballyogan Road, Leopardstown, Dublin 18; and
C. Tully Vale Residential Development, Cherrywood, Dublin 18

The trip rates presented in Table 13.4 below represents the corresponding 'average' trip rates calculated from the three adopted donor sites during the local road networks AM and PM peak hour periods.

Figure 13.23: Donor Sites Locations

AM Peak Hour			PM Peak Hour		
Arr	Dep	2-way	Arr	Dep	2-way
0.051	0.223	0.275	0.159	0.060	0.220

Table 13.4: Peak Hour Average Apartments Unit Vehicle Trip Rate

Based on the above trip rates, the potential peak hour traffic generation is calculated based on 482 apartments. Table 13.5 summarises the predicted peak hour AM and PM traffic generated by the proposed development.

Units	AM Peak Hour			PM Peak Hour		
	Arr	Dep	2-way	Arr	Dep	2-way
482	25	107	132	77	29	106

Table 13.5: Proposed Residential Development - Vehicle Generation

The proposed community focused childcare facility will predominantly generate residents 'walk in' trips (and a small number of staff trips) and therefore has not been included as part of the trip generation assessment. Similarly, the gym / retail element of the development has not been included in the trip generation exercise as this facility will cater for residents use only.

13.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

Construction Phase

During the general excavation of the foundations there will be additional HGV movements to / from the site. Utilising typical construction rates, it is predicted that, during the excavation stage, there could be 2 no. truckloads per hour equating to 4 no. two-way HGV movements per hour. Accordingly, assuming a 12 hour working day, this equates to 48 no. two-way HGV movements per day on the local road network.

All suitable material will be used for construction and fill activities where possible and appropriate. All spoil material will be removed to a registered landfill site which will be agreed in full with the Local Authority.

In addition to the traffic generated by the disposal of surplus subsoil from the site, there will be traffic generated from deliveries of construction materials and equipment. It should be pointed out that construction traffic generated during the development works tends to be outside of peak hours. Such trips would generally be spread out over the full working day and will not be higher than the peak hour predicted volumes for the operational stage.

Construction traffic will consist of the following categories:

- Private vehicles owned and driven by site construction staff and by full time supervisory staff. On-site employees will generally arrive before 08:00, thus avoiding the morning peak hour traffic. These employees will generally depart after 18:00.
- Excavation plant and dumper trucks involved in site development works and material delivery vehicles for the following: granular fill materials, concrete pipes, manholes, reinforcement steel, ready-mix concrete and mortar, concrete blocks, miscellaneous building materials, etc. Deliveries would arrive at a dispersed rate during the course of the day.

The potential construction phase effects are characterised as being '*direct*' and '*negative*' but '*imperceptible*' as the vehicle generation during the construction stage have been calculated as resulting in just a percentage increase of approximately 1% compared to the base traffic scenario. These effects are '*likely*' to occur however they will be '*temporary*' in nature only lasting for the duration of the construction stage.

Operational Phase

Network Impact

The Institution of Highways and Transportation document 'Guidelines for Traffic Impact Assessments' states that the impact of a proposed development upon the local road network is considered material when the level of traffic it generates surpasses 10% and 5% on normal and congested networks respectively. When such levels of impact are generated a more detailed assessment should be undertaken to ascertain the specific impact upon the networks operational performance. These same thresholds are reproduced in the NRA document entitled 'Traffic and Transport Assessment Guidelines (2014)'.

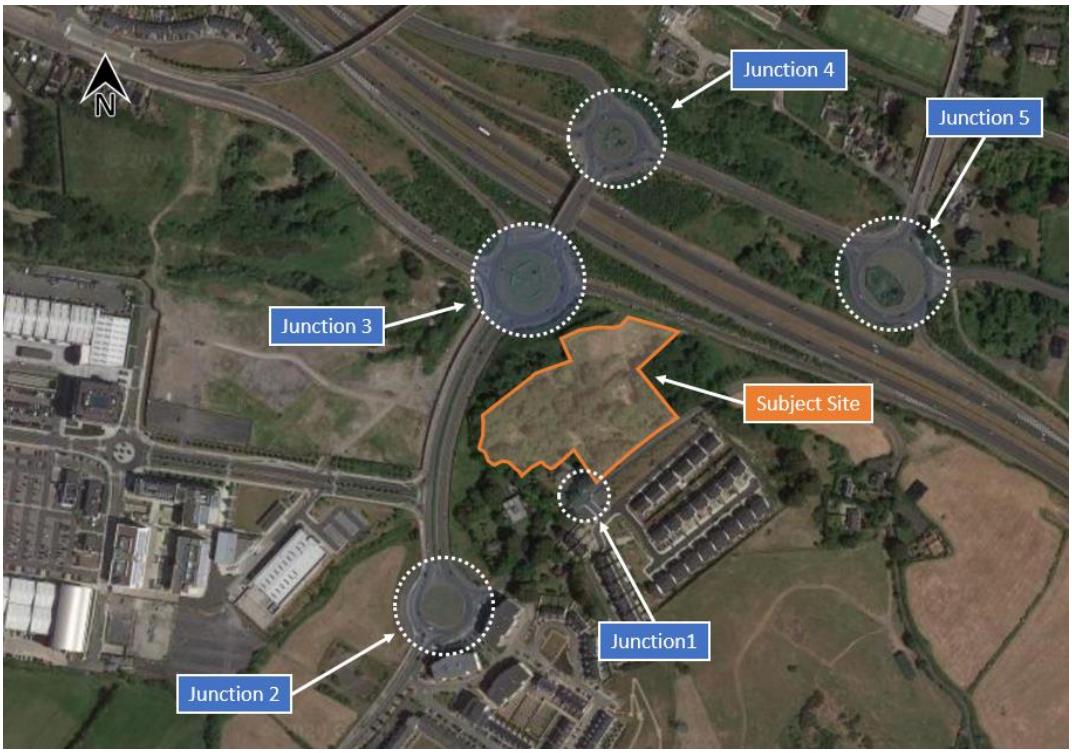

Figure 13.24: Junction Locations (Network Impact)

In accordance with the IHT and NRA (TII) guidelines we have undertaken an assessment to establish the potential level of impact upon the key junctions of the local road network. To enable this calculation to be undertaken we have based the analysis upon the 2038 Future Design Year.

Ref	Junction Location	AM Peak	PM Peak
1	Site Access/ Golf Lane 3-arm priority	-	-
2	Glenamuck Road South/ Golf Lane roundabout	6.26%	4.60%
3	Glenamuck Road/ Ballyogan Road/ M50 slip road	2.46%	1.89%
4	Glenamuck Road North/ Ballyogan Grove/ M50 slip road	1.46%	1.54%
5	Glenamuck Road North/ Carrickmines P&R/ M50 slip road	1.35%	1.21%

Table 13.6: Proposed Development's Network Impact

The analysis demonstrates that the proposals will generate a subthreshold impact upon Junctions 2, 3, 4 and 5 as detailed in Table 13.6 above. Nevertheless, the impact at Junction 2 is recorded as being slightly over the 5% threshold (for congested networks) in the AM peak hour assessment. Accordingly, the operational performance of Junctions 1 (site access junction) and key off-site Junction 2 (Glenamuck Road South /Golf Lane Roundabout), has been subject to more detailed assessment using specialised junction modelling software.

Figure 13.25 below details the amount of two-way vehicle trips to/from the proposed development site that will travel through the Glenamuck Road / Golf Lane Roundabout Junction in the 2038 design year as result of the proposed 482-unit residential development. The resulting percentage increase in traffic flows as a result of the traffic generated by the proposed development is established as being below the 10% threshold at all key off-site junctions however is predicted to be over the 5% threshold at Junction 2 in the AM peak hour. The following scenarios have been considered in the network impact assessment;

Do Nothing:

- A1 – 2023 Base Flows + Committed Developments;
- A2 – 2028 Base Flows + Committed Developments; and
- A3 – 2038 Base Flows + Committed Developments.

Do Something:

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

For the key off-site junctions, it can be seen that the proposed development (482 units) would result in the following increases in the 2038 Future Design Year:

- **Junction 2** (Glenamuck Road/ Golf Lane roundabout): an increase of 6.26% (132 New Vehicle Trips) in the AM peak period and 4.60% (106 New Vehicle Trips) in the PM peak period;
- **Junction 3** (Glenamuck Road/ Ballyogan Road/ M50 slip road roundabout): an increase of 2.46% (99 New Vehicle Trips) in the AM peak period and 1.89% (74 New Vehicle Trips) in the PM peak period;
- **Junction 4** (Glenamuck Road North/ Ballyogan Grove/ M50 slip road roundabout): an increase of 1.46% (51 New Vehicle Trips) in the AM peak period and 1.54% (46 New Vehicle Trips) in the PM peak period;
- **Junction 5** (Glenamuck Road North/ Carrickmine R&R/ M50 slip road roundabout): an increase of 1.35% (30 New Vehicle Trips) in the AM peak period and 1.21% (28 New Vehicle Trips) in the PM peak period.

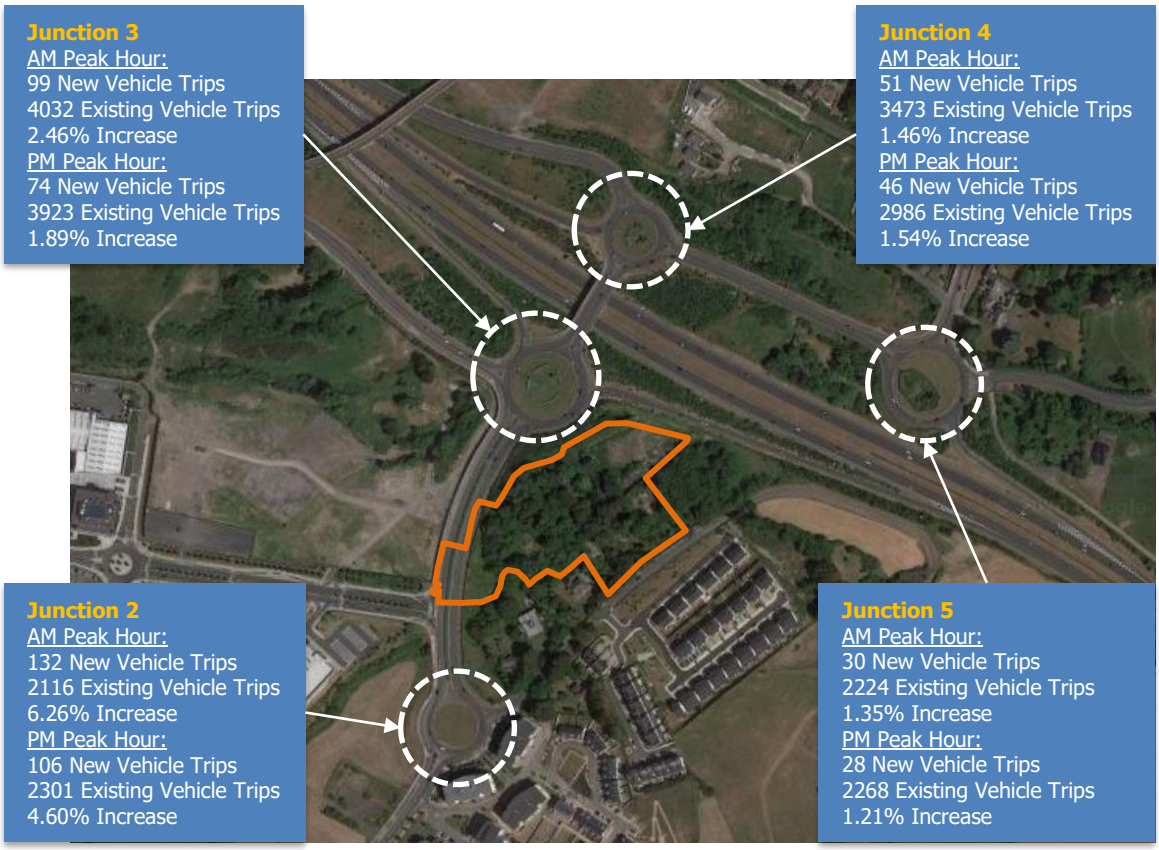

Figure 13.25: Increase in Vehicle Trips Generated Through Key Of-Site Junction in 2038 – 482 Units

Network Analysis

The operational assessment of the local road network has been undertaken using the Transport Research Laboratory (TRL) computer packages ARCADY for roundabout junctions and PICADY for priority controlled junctions.

When considering roundabout and priority controlled junctions, a Ratio of Flow to Capacity (RFC) greater than 85% (0.85) would indicate a junction to be approaching capacity, as operation above this RFC value is poor and deteriorates quickly.

A 90-minute AM and PM period has been simulated, from 08:00 to 09:30 and 17:00 to 18:30. Traffic flows were entered using an Origin-Destination table for the peak hours.

In order to determine if the proposed site access junction and key off-site junction will cater for the predicted level of traffic generation, a traffic model of the site access junction was analysed for the scheme's 2023 Opening Year and subsequent 2028 and 2038 Future Design Years.

Junction 1: Site Access/ Golf Lane

The results of the operational assessment of this three-arm priority controlled junction during the weekday morning and evening peaks are summarised in Table 13.7 below. The site access has been assessed in the worst case 2038 Future Design Year only. The arms were labelled as follows within the PICADY model:

Arm A: Golf Lane (West)
Arm B: Site Access
Arm C: Golf Lane (East)

The 2038 "Do Something" scenario assumes that the 482 residential dwellings are built and occupied (in addition to committed development traffic). The 2038 AM peak hour PICADY results (Table 13.7) indicate that the Site Access / Golf Lane three arm priority junction will operate well within capacity with a maximum RFC value of only 0.23 with a corresponding queue of 0.3 pcus being recorded.

Scenario	Arm	RFC	Queue (pcu)	Delay (s)
AM Peak	B-AC	0.23	0.3	8.88
	C-AB	0.00	0.0	0.00
PM Peak	B-AC	0.06	0.1	7.41
	C-AB	0.00	0.0	0.00

Table 13.7: 2038 PICADY Do-Something Analysis

The 2038 "Do Something" PM peak hour PICADY results also indicates that the junction will operate with a significant amount of reserve capacity with a maximum RFC of 0.06 and a corresponding queue of 0.1 pcus being recorded.

Junction 2: Glenamuck Road South/ Golf Lane

The results of the operational assessment of this three-arm roundabout junction during the weekday morning and evening peaks are summarised in Tables 13.8 to 13.13 below. The arms were labelled as follows within the ARCADY model:

Arm A: Glenamuck Road
Arm B: Golf Lane
Arm C: Glenamuck Road South

2023 AM Peak

The ARCADY results (Table 13.8) indicate that the junction will operate within capacity for the 2023 "Do Nothing" AM peak hour with a maximum RFC value of only 0.69 and a corresponding queue of 2.2 pcu's being recorded.

With the inclusion of the proposed development, the ARCADY results reveal that during the 2023 "Do Something" AM period the junction will continue to operate within capacity with a maximum RFC value of 0.72 and a corresponding queue of 2.5 pcus recorded.

Scenario	Arm	RFC	Queue (pcu)	Delay (s)
Do Nothing	1	0.34	0.5	2.05
	2	0.04	0.0	5.24
	3	0.69	2.2	8.41
Do Something	1	0.35	0.5	2.07
	2	0.20	0.2	6.21
	3	0.72	2.5	9.44

Table 13.8: 2023 AM Peak ARCADY Analysis

2023 PM Peak

The results of the ARCADY based assessment (Table 13.9) demonstrate that the junction will operate within capacity for the 2023 "Do Nothing" PM peak hour with a maximum RFC value of only 0.52 and a corresponding queue of 1.1 pcus being recorded.

With the inclusion of the proposed development, the junction simulation results suggest that during the 2023 "Do Something" PM period the junction will continue to operate within capacity with a maximum RFC value of 0.55 and a corresponding queue of 1.2 pcus recorded.

Scenario	Arm	RFC	Queue (pcu)	Delay (s)
Do Nothing	1	0.52	1.1	2.79
	2	0.04	0.0	7.39
	3	0.43	0.7	4.40
Do Something	1	0.55	1.2	2.95
	2	0.10	0.1	7.85
	3	0.44	0.8	4.56

Table 13.9: 2023 PM Peak ARCADY Analysis

2028 AM Peak

It is assumed that the Glenamuck District Distributor Road will be in place during the 2028 Future Design Year. This will result in the existing three arm roundabout upgraded to a four-arm roundabout. The arms were labelled as follows within the ARCADY model for the enhanced four-arm roundabout:

Arm A: Glenamuck Road
Arm B: Golf Lane
Arm C: Glenamuck Road South
Arm D: Glenamuck District Distributor Road

The ARCADY results (Table 13.10) indicate that the junction will operate within capacity for the 2028 "Do Nothing" AM peak hour with a maximum RFC value of 0.71 and a corresponding queue of 2.4 pcus being recorded.

With the inclusion of the proposed development, the ARCADY results reveal that during the 2028 "Do Something" AM period the junction will continue to operate within capacity with a maximum RFC value of 0.74 and a corresponding queue of 2.7 pcus recorded.

Scenario	Arm	RFC	Queue (pcu)	Delay (s)
Do Nothing	1	0.32	0.5	1.96
	2	0.04	0.0	4.92
	3	0.10	0.1	3.37
	4	0.71	2.4	8.46
Do Something	1	0.33	0.5	1.99
	2	0.18	0.2	5.76
	3	0.10	0.1	3.55
	4	0.74	2.7	9.49

Table 13.10: 2028 AM Peak ARCADY Analysis

2028 PM Peak

The results of the ARCADY based assessment (Table 13.11) demonstrate that the junction will operate within capacity for the 2028 "Do Nothing" PM peak hour with a maximum RFC value of only 0.53 and a corresponding queue of 1.1 pcus being recorded.

With the inclusion of the proposed development, the junction simulation results suggest that during the 2028 "Do Something" PM period the junction will continue to operate within capacity with a maximum RFC value of 0.55 and a corresponding queue of 1.2 pcus recorded.

Scenario	Arm	RFC	Queue (pcu)	Delay (s)
Do Nothing	1	0.53	1.1	2.80
	2	0.05	0.0	7.46
	3	0.08	0.1	3.94
	4	0.45	0.8	4.39
Do Something	1	0.55	1.2	2.96
	2	0.10	0.1	7.92
	3	0.08	0.1	4.01
	4	0.47	0.9	4.57

Table 13.11: 2028 PM Peak ARCADY Analysis

2038 AM Peak

The ARCADY results (Table 13.12) indicate that the junction will be operating within capacity for the 2038 "Do Nothing" AM peak hour with a maximum RFC value of 0.76 and a corresponding queue of 3.0 pcus being recorded.

Scenario	Arm	RFC	Queue (pcu)	Delay (s)
Do Nothing	1	0.34	0.5	2.02
	2	0.04	0.0	5.08
	3	0.10	0.1	3.45
	4	0.76	3.0	10.14
Do Something	1	0.35	0.5	2.04
	2	0.19	0.2	5.98
	3	0.11	0.1	3.65
	4	0.79	3.5	11.60

Table 13.12: 2038 AM Peak ARCADY Analysis

With the inclusion of the proposed development, the ARCADY results reveal that during the 2038 "Do Something" AM period the junction will continue to operate within capacity with a maximum RFC value of 0.79 and a corresponding queue of 3.5 pcus recorded.

2038 PM Peak

The results of the ARCADY based assessment (Table 13.13) demonstrate that the junction will operate within capacity for the 2038 "Do Nothing" PM peak hour with a maximum RFC value of 0.56 and a corresponding queue of 1.2 pcus being recorded.

With the inclusion of the proposed development, the junction simulation results suggest that during the 2038 "Do Something" PM period the junction will continue to operate within capacity with a maximum RFC value of 0.58 and a corresponding queue of 1.4 pcus recorded.

Scenario	Arm	RFC	Queue (pcu)	Delay (s)
Do Nothing	1	0.56	1.2	2.98
	2	0.05	0.1	8.05
	3	0.08	0.1	4.11
	4	0.48	0.9	4.64
Do Something	1	0.58	1.4	3.16
	2	0.11	0.1	8.60
	3	0.09	0.1	4.19
	4	0.50	1.0	4.85

Table 13.13: 2038 PM Peak ARCADY Analysis

In summary, the introduction of additional traffic as a result of the operational phase of the proposed development is predicted to result in effects that can be characterised as '*not significant'* on the operational performance of both the site access junction and the key off-site Golf Lane / Gllenamuck Road roundabout junction. The predicted '*not significant*' effect on the local road network is characterised as '*direct*' and '*negative*'. Nevertheless, this duration of effect is predicted to be 'short-term' as once the mobility management plan (as submitted as part of this planning application) objectives are implemented, it is predicted that fewer vehicle trips than those considered within the subject assessment will be generated thereby reducing the potential impact further.

13.6 DO NOTHING IMPACT

In the absence of the proposed development, the overall operational performance of the existing junctions on the surrounding road network will be affected by the impact caused by committed development and forecast background network traffic growth (should that growth arise).

Although traffic growth may not increase at the rates once predicted, to ensure a robust analysis of the impact of traffic upon the local road network we have adopted growth rates using the Transport Infrastructure Ireland (TII) traffic projections. Table 6.1 (Unit 5.3 – Travel Demand Projections) within the TII Project Appraisal Guidelines provides Annual Growth Factors for the different regions within Ireland. The subject site lies within the 'Dublin' metropolitan area with the growth factors as outlined within **Table 13.14** below.

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

Table 13.14: National Traffic Growth Forecasts: Annual Growth Factors (Source: Extract from Table 6.1 PAG)

Applying the annual factors as outlined in **Table 6.3** above for the adopted Opening Year of 2023 and Future Horizon Years of 2028 (Opening Year +5 years) and 2038 (Opening Year +15 years), the following growth rates have been adopted to establish corresponding 2023, 2028 and 2038 baseline network flows.

- 2017 to 2023 – 1.1012 (or 10.12%);
- 2017 to 2028 – 1.1933 (or 19.34%); and
- 2017 to 2038 – 1.2695 (or 26.95%).

13.7 POTENTIAL CUMULATIVE IMPACTS

The analysis detailed above under Section 13.5 (Operational Stage) represents an appraisal in terms of potential cumulative impacts for a typical weekday as it is focused upon the key two busiest periods of the day (i.e. AM and PM peak hours). During the other 22 hours of the day, traffic flows are predicted to be significantly lower resulting in the network operating with additional reserve capacity to that forecast for the peak hour periods.

In addition, the following third party committed developments have been included in the network analysis detailed within Section 13.5 (Operational Stage) are located within the area of influence of the subject site and have been considered as part of the assessment of the development proposals:

- **Site 1 (Carrickmines Green Site D16A/0483):** Planning permission granted for modifications to the residential development under Planning Ref. D11A/0312, D12A/0262 and D14A/0338 in October 2016 by Dún Laoghaire Rathdown County Council. The development will consist of the construction of a block of 3 no. 3-storey terraced houses in lieu of 5 units which were omitted under condition 5 of Planning Ref. D11A/0312. The parent planning permission reference is D04A/0327 which was for 227 residential units.

- **Site 2 (The Park, Carrickmines Site):** The Park, Carrickmines has been subject to 3 significant planning applications. Phase 1 comprised mainly of retail warehousing and office accommodation (Planning Ref. D02A/0558) and related to the southwest and southeast quadrants. Phase 2 comprised of retail warehousing, comparison retailing office and hotel accommodation (Planning Ref. D03A/1239) and related to the northwest and northeast quadrants. Permission was granted in April 2008 (Planning Ref. D07A/0936) for amendments to previously permitted development Reg. Ref. D03A/1239). A planning application on the site (Planning Ref. D12A/0163) was refused planning permission in June 2012 by the Planning Authority for a mixed-use District Centre development with a GFA of 58,863m^2.

- **Site 3A (Clay Farm Phase 1 - D15A/0247):** Phase 1 of the Clay Farm masterplan lands (a two-phase development) was granted a seven-year planning permission (Planning Ref: D15A/0247) for 425 residential units by Dún Laoghaire Rathdown County Council on 19th April 2016.

- **Site 3B (Clay Farm Phase 1C - ABP30428819):** The application site relates to the westernmost part of Phase 1C of the permitted Phase 1 Clay Farm development (ABP Ref: PL06D.246601 / DLRCC Reg. Ref.: D15A/0247). The proposed development relates to the provision of 192 no. apartments in two no. blocks and was granted planning permission by ABP in July 2019.

- **Site 3C (Clay Farm Phase 2 - ABP30152218):** Application to An Bord Pleanála for a ten year permission for a strategic housing development consisting of 927 no. residential units, a neighbourhood centre containing a childcare facility with a GFA of c. 604 sqm and 2 no. retail units each and was granted planning permission by ABP in August 2018.

- **Site 4 (Aged Care Facility D16A/0452):** Permission was granted in August 2016 by Dún Laoghaire Rathdown County Council for the construction of a part four storey, part five storey Aged Care Facility to accommodate 224 no. bedrooms and ancillary resident and staff facilities, with a GFA of 12,580m^2 over a single level basement with a GFA of 2,020 m^2.

The locations of the committed developments that are of relevance to the subject site are illustrated in Figure 13.26 below.

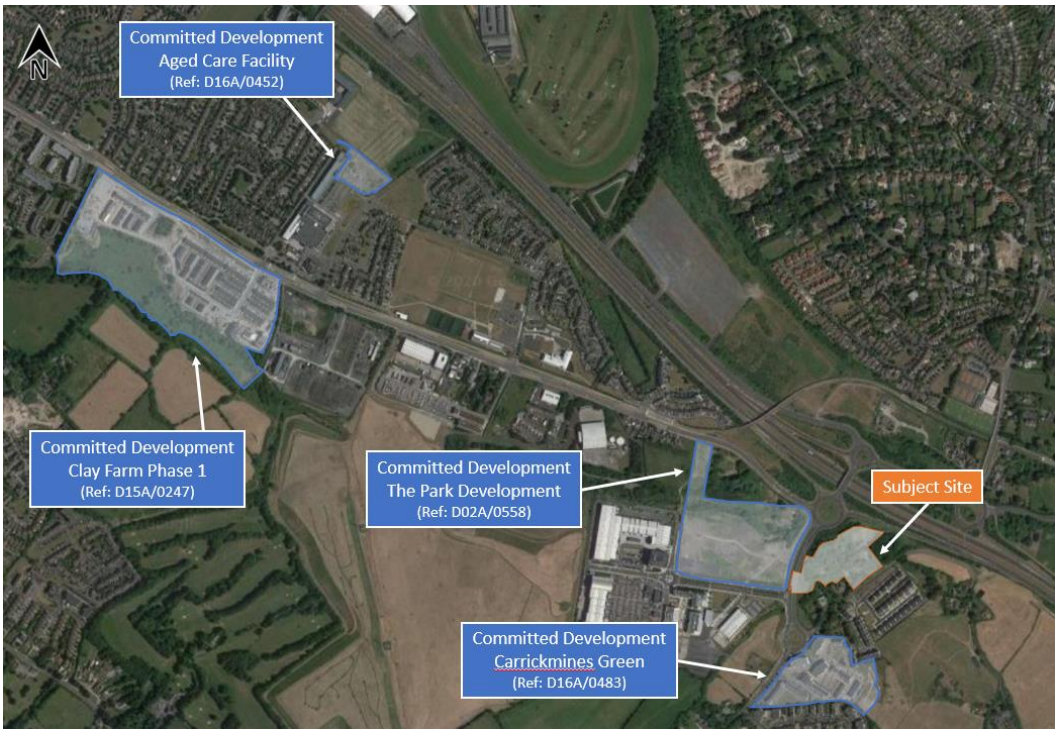

Figure 13.26: Location of Committed Developments

Committed Development Trip Generation

In order to establish the potential quantum of traffic generated by the four no. third party development trips, the Dún Laoghaire Rathdown County Council's online planning system has been referenced and each third-party scheme's corresponding Traffic & Transport Assessment report was obtained and reviewed. The vehicle trips derived from this exercise have been incorporated as committed developments within the Excel based network traffic assignment model developed by DBFL for the subject development proposals.

Committed Development Trip Distribution

The potential of committed development traffic generated has been distributed as per that approved under each individual development planning application. It has been assumed that the Glenamuck District Distributor Road will not be in place before the adopted 2023 Opening Year 2023 but will be in the subsequent adopted 2028 & 2038 Future Design Years. Accordingly, the committed development trips have been redistributed in the 2028 and 2038 Future Design Year scenarios to reflect the new routing options that are made available following the implementation of this proposed infrastructure proposal.

13.8 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

Construction Phase Mitigation Strategy

TRANS CONST 1: The Preliminary Construction & Environmental Management Plan incorporates a range of integrated control measures and associated management initiatives with the objective of mitigating the impact of the proposed development's on-site construction activities.

In order to ensure satisfactory operation of the construction phase, the following construction phase traffic mitigation measures are proposed:

- Consolidation of delivery loads to / from the site and management of large deliveries on site to occur outside of peak periods;
- Use of precast / prefabricated materials where possible;
- "Cut" materials generated by the construction works to be re-used onsite where possible, through various works;
- Adequate storage space on site to be provided;
- The design of the works has involved an element of minimising the quantity of material to be removed from site by way of cut and fill balance;
- Scheduling of movements to outside peak traffic times and school pick-up / drop-off times.
- Finally, truck wheel washes will be installed at construction entrances and any specific recommendations with regard to construction traffic management made by the Local Authority will be adhered to.

Operational Phase Mitigation Strategy

TRANS OPER 1: A package of integrated measures has been identified to both manage and off-set the additional local demand that the proposed residential development on the subject zoned lands could potentially generate as a result of the forecast increase in vehicle movements by residents of the scheme. The identified measures are summarised below.

- Management – A Mobility Management Plan (MMP) (which has been submitted as apart of this planning application) with the aim of guiding the delivery and management of coordinated initiatives by the scheme promotor. The MMP ultimately seeks to encourage sustainable travel practises for all journeys to and from the proposed development.
- Infrastructure – The provision of an appropriate number of cycle parking facilities to encourage the uptake of cycling by residents
- Infrastructure – New formal road crossing facilities on Glenamuck Road South as part of approved Planning Ref. D18A/0257 which will encourage walking, cycling and public transport use by residents.

13.9 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

Construction Phase Mitigation Strategy

Implementation of the measures outlined in Section 13.8 will ensure that the potential impacts of the proposed development on the local transport network are minimised during the construction phase and that any residual impacts will be short term.

Operational Phase Mitigation Strategy

Implementation of the measures outlined in Section 13.8 will ensure that the potential impacts of the proposed development on the local transport network are minimised during the operational phase.

13.10 MONITORING

Construction Phase Monitoring Strategy

During the construction stage, the following monitoring exercises are proposed;

- Compliance with construction vehicle routing practices;
- Compliance with construction vehicle parking practices;
- Internal and External road conditions; and
- Timings of construction activities in terms of start / finish times.

Operational Phase Mitigation Strategy

As part of the MMP process (a MMP has been submitted as part of this planning application), bi-annual post development travel surveys are recommended to be carried out by the appointed mobility manager in order to determine the success of the measures and initiatives as set out in the proposed MMP document. The surveys should be circulated among residents. The information obtained from the monitoring surveys will be used to identify ways in which the MMP measures and initiatives should be taken forward in order to maintain and further encourage sustainable travel characteristics.

13.11 REINSTATEMENT

Reinstatement is not applicable to this chapter.

13.12 INTERACTIONS

Noise and Vibration

The projected increase in heavy vehicle traffic during the construction stage (as quantified in Section 13.5) may lead to a slight increase in noise and vibration levels along the adopted construction haul route. However, such effects will be temporary and slight in nature.

The projected increase in vehicle traffic during the operational stage may potentially lead to a slight increase in noise levels during peak trip generation periods however, implementation of the mitigation measures described will prevent and minimise the potential impacts of this interaction.

Air Quality and Climate

Dust generation can also occur during extended dry weather periods as a result of construction traffic (as quantified in Section 13.5). However, such effects will be temporary and slight in nature.

During operational stage, there is predicted to be a slight increase in vehicle emissions as a result of increased vehicle movements on the surrounding road network. However, due to the predicted modest increase in vehicle trips, the effect of additional vehicle related emissions is predicted to be imperceptible.

13.13 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no material difficulties encountered in compiling and assessing the data for this EIAR chapter sufficient to prevent modelling of the likely transportation effects of the proposed development.

13.14 REFERENCES

TII (NRA) Traffic & Transportation Assessment Guidelines; (May 2014)
TII Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (PE-PAG-02017); TII (May 2019)
'Traffic Management Guidelines' Dublin Transportation Office & Department of the Environment and Local Government (May 2003)
DLRCC Development Plan 2016-2022
Ballyogan & Environs Local Area Plan 2019-2025
Bus Eireann Website; www.buseireann.ie
Irish Rail Website; www.irishrail.ie
Bus Connects; https://busconnects.ie/
Luas Website; www.Luas.ie
Transport Infrastructure Ireland; www.tii.ie
Transport for Ireland; www.transportforireland.ie
Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports Draft August 2017; Environmental Protection Agency