CHAPTER 11
Material Assets: Roads, Traffic and Transportation

11.0 MATERIAL ASSETS: ROADS, TRAFFIC AND TRANSPORT

11.1 INTRODUCTION

This section of the report assesses and evaluates the likely impact of the proposed development on the existing transportation system in the vicinity of the site, as well as identifying proposed mitigation measures to minimise any identified impacts arising from the proposed LDA SHD residential development at Hackettstown, Skerries, Co. Dublin.
The material assets considered in the traffic section include pedestrian, bicycle, public transport (bus, light and heavy rail) infrastructure, potential impacts of the construction works, the remedial & mitigation measures being provided in addition to the local road network and associated junction impacts.

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11.2 STUDY METHODOLOGY

In respective of EIA Directive 2014 (EIA Directive 2014/52/EU) and EC *Guidance on the preparation of the Environmental Impact Assessment Report* (2017) the adopted methodology respects the EPA's publication *Guidelines On The Information To Be Contained In Environmental Impacts Report* (2017) whilst also referencing technical guidance pertaining to the environmental factor roads, traffic and transportation as introduced below.

With the objective of quantifying the potential effects that the proposed development is predicted to have upon the environment (in terms of Material Assets; Roads, Traffic and Transport) the assessment quantifies the existing transport environment and details the results of assessment work undertaken to identify the potential impact generated as a result of the proposed development as introduced in Chapter 2 of this report. This Chapter of the EIAR comprises of an assessment of the likely impact of the proposed development on roads, traffic and transport as well as identifying proposed mitigation measures to minimise any likely significant effects identified.

The scope of the assessment covers transport and sustainability issues including vehicular and pedestrian access, cyclist and public transport connectivity and capacity. The findings of the assessment contained within this report are based on existing and proposed road infrastructure layout arrangements (e.g. mitigation works that are to be implemented by the applicant), site visits, traffic observations and junction vehicle turning count data commissioned specifically for the purpose of this assessment.

The geographical scope of the assessment has been influenced by preplanning discussions undertaken with the local authority road's department. Accordingly, the extent of the assessment has been extended to include a number of off-site junctions beyond the immediate site access junctions at the specific request of the local roads authority. The adopted scope subsequently includes the key local junctions upon which a

material impact, as defined by best practice guidance, could potentially be generated by the subject development proposals.

Our technical methodology respects the best practice recommendations detailed in both Transport Infrastructure Ireland (TII) document entitled *Traffic & Transport Assessment Guidelines* (2014) and the Chartered Institution of Highways and Transportation (IHT) entitled *Guidelines for Traffic Impact Assessments*. The approach to the preparation of this assessment subsequently involves the use of relevant data and established analytical techniques such that the conclusions are sufficiently robust and supported by evidence.

In summary the assessment methodology incorporated a number of key inter-related stages, including;

- **Site Audit:** A site audit was undertaken to quantify (i) existing transport infrastructure characteristics, (ii) identify local traffic management arrangements, (iii) public transport network and interchange provision, (iv) establish the level of accessibility to the site in terms of walking, cycling and public transport, (iv) identify the level of retail, medical, service, educational, leisure and amenity provision currently available within a 15 minute travel duration to/from the subject Hacketstown site. An inventory of the local road network was also developed as this stage of the assessment.

- **Development Framework Review:** In addition to establishing site and land use specific development management requirements and planning policy objectives (as mobility focused infrastructure objectives including committed and planned) for the subject Hacketstown site and its immediate catchment, additional desktop assessments have been undertaken to quantify (i) the road safety record of the local network, (ii) the presence of any third party committed development in the immediate area to ensure the accumulative impacts of all such proposals are appropriate considered in the assessment, (iii) the level of public transport services (rail and bus) catchments and associated route frequency during the peak AM and PM weekday periods, and (iv) a review of the 2016 census data results for the local area to establish both car ownership levels and 'travel to work, school and colleague' travel characteristics.

- **Pre-planning Scoping and Technical Meetings:** A number of pre-planning meetings (and joint site visits) have been undertaken with officers of Fingal County Council including representatives of the Transport Planning Department. These discussions directly influenced the

    (i) geographical scope of the assessment including

    (ii) the number of off-site junctions that have been analysed in detailed as part of the assessment,

    (iii) the range of data to be collected and submitted with the assessment;

    (iv) the methodology to be adopted for the identification of development generated vehicles trips; in addition to

    (v) recommendations in regard to the design and extent of infrastructure-based mitigation works such as car and bicycle parking, pedestrian crossing facilities, design of footpath / cycle tracks and off-site junction works.

Figure 11.1: Geographical Scope of Active Travel Infrastructure Assessment (Source: Google Maps)

- **Traffic Counts:** A range of different data collection exercise have been undertaken including (i) classified junction turning counts (JTC's) at key nodes, (ii) Automatic Traffic Counts (ATC's) to establish vehicle types, volume and speeds, (iii) public transport surveys at local interchanges, and (iv) trip generation surveys at local residential donor sites. The analysis of the survey findings assist in establishing (i) local baseline traffic demand characteristics in the immediate area of the proposed residential development, and (ii) the potential level of trips that the proposed development could potentially generate.

- **Proposed Development:** The proposed residential developments key 'traffic and transportation' attributes are confirmed as influenced by its land use, size, unit type and size (bedrooms), street and footpath / cycle route layouts, car parking provision and management, bicycle parking and level of connectivity provided by the scheme proposals integration with the external transport networks and associated access to local and regional travel destinations.

- **Modal Split and Trip Generation:** A trip generation exercise has been carried out to establish the potential level of person trips that could potentially be generated by the proposed residential development. As agreed with the local roads authority a twofold methodology has been adopted with (i) the existing Ballygossan Phase 1 being adopted as a 'donor' site for the proposed developments 'house' units, and (ii) the industry standard TRICS database utilised to establish trip data for the developments 'apartment' and 'duplex' units which were subsequently modified (increased by 50% further to preplanning discussions with the local roads authority) with the objective of providing a robust appraisal. The exercise includes an analysis of accumulative impacts as influenced by key third party committed developments across the study area.

- **Vehicle Trip Generation, Distribution and Assignment:** Based upon existing traffic characteristics and anticipated travel patterns generated by the proposed development, a trip distribution exercise has been undertaken to assign site generated trips across the local road network.

- **Road Safety Assessment:** Further to the assessment of the receiving environments road safety record as part of an earlier stage of the assessment, the specific design of the LDA residential scheme proposals, and its connections with Gold Links Road corridor; have been subject to an independent Road Safety Audit (RSA) as per and in accordance with TII best practice guidance. The recommendations raised within the

RSA by the auditors have been incorporated into the revised scheme design now being presented for planning to ensure that all potential safety issues are addressed.

- **Network Impact & Assessment:** Considering the receiving environments characteristics, the proposed mitigation strategy and the additional scale of demand predicted to be generated by both the LDA residential scheme proposals and third party committed developments; it has been possible to undertake an assessment of the potential scale of impact significance across the local road networks key junctions. Accordingly, an analysis of junction capacity, including vehicle queue lengths and reserve capacity at base year, year of opening, year of opening plus 5 years and year of opening plus 15 years have been undertaken and reported.

- **Mitigation :** The assessment includes the analysis of alternative junction designs at critical off-site junctions as proposed to mitigate the additional demands being generated by the both the LDA residential scheme and local third party committed development.

The assessment of effects of the proposed development on material assets are assessed in terms of quality (positive, neutral or negative effects), significance (imperceptible, not significant, slight, moderate, significant, very significant or profound effects), extent, context, probability (likely, unlikely effects) and duration (temporary, short term, long term or permanent effects) in line with the criteria set out in Table 3.3 Description of Effects of the Environmental Protection Agency *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – Draft (August 2017)*.

11.3 THE EXISTING RECEIVING ENVIRONMENT (BASELINE SITUATION)

Site Location

The Hacketstown masterplan lands are located on Golf Links Road and lie approximately 1.6km south of Skerries Town Centre. Aligned in a north-south orientation, Golf Links Road provides access to the north connecting with the R128 Holmpatrick corridor in addition to both Miller's Lane and Shenick Rd which together form an east-west link between the R127 Skerries Rd and R128 Rush Rd corridors to the south of Skerries urban area. To the south of the masterplan lands, Golf Links Road continues but narrows after the rail overbridge continuing south-westwards meandering through the rural countryside until eventually adjoining the Ballaghstown Lane corridor.

It is noted that the Ballygossan Park Phase 1 (103 houses) residential development on the northern Noonan Construction plot of the Hacketstown masterplan lands is already completed / occupied as permitted by Fingal County Council under the planning conditions associated with application reference F11A/0309/E1. As illustrated in **Figure 11.2**, this completed scheme is named Ballygossan Park and benefits from a single vehicle access onto Golf Links Rd.

Strategically, the Hacketstown lands lie approximately 6km north-west of Rush (accessible via Shenick Rd and the R128 Rush Rd), criteria 7.8km north-east of Lusk (accessible via Millers Lane and R127 Skerries Rd), and approximately 7.6km south-east of Balbriggan (accessible via Millers Lane and the R127 corridor). The M1 Motorway is accessible via either Junction 5 (as located approx. 11 km west) or Junction 4 (as located approx. 14.3km) to the west and southwest respectively. Vehicle access to both of these M1 junctions is achieved by traveling via Millers Lane and the R127 Skerries Road corridor. The general site location is shown in **Figure 11.3A**.

Figure 11.3B demonstrates the sites proximity to local amenities including schools, shopping, health and leisure centres. Existing walking time isochrones from the development site, shown in **Figure 11.4**, illustrate the high levels of accessibility for pedestrians walking to/from the site.

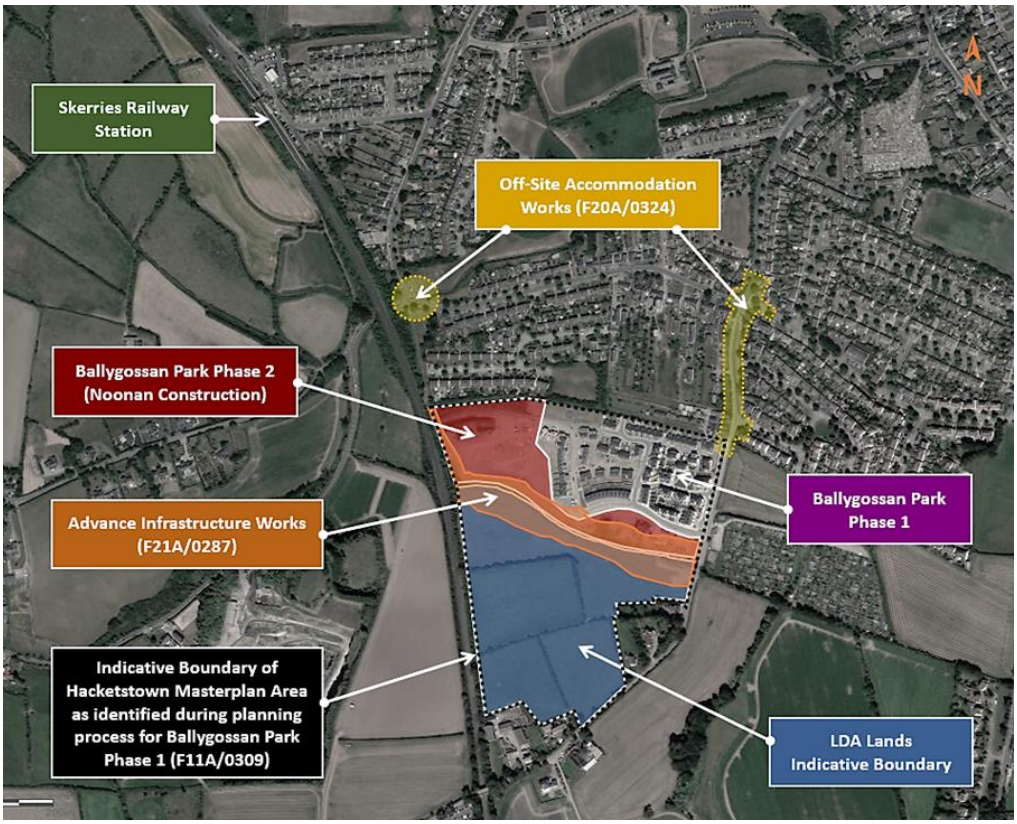

Figure 11.2: LDA Lands Location On Golf Links Road (Source: Google Maps)

Figure 11.2: Hacketstown Site Location and Strategic Road Network (Source: Google Maps)

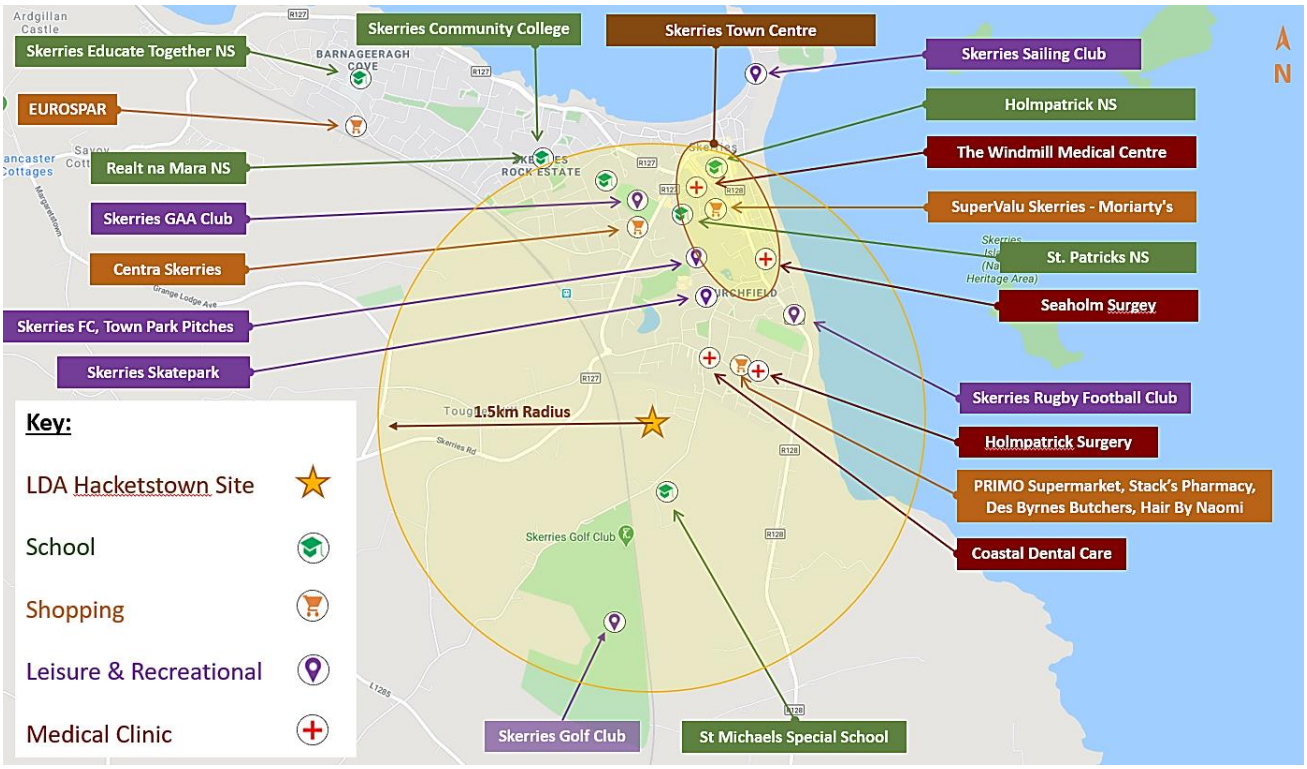

Figure 11.3: Local Amenities Surrounding the Hacketstown Site

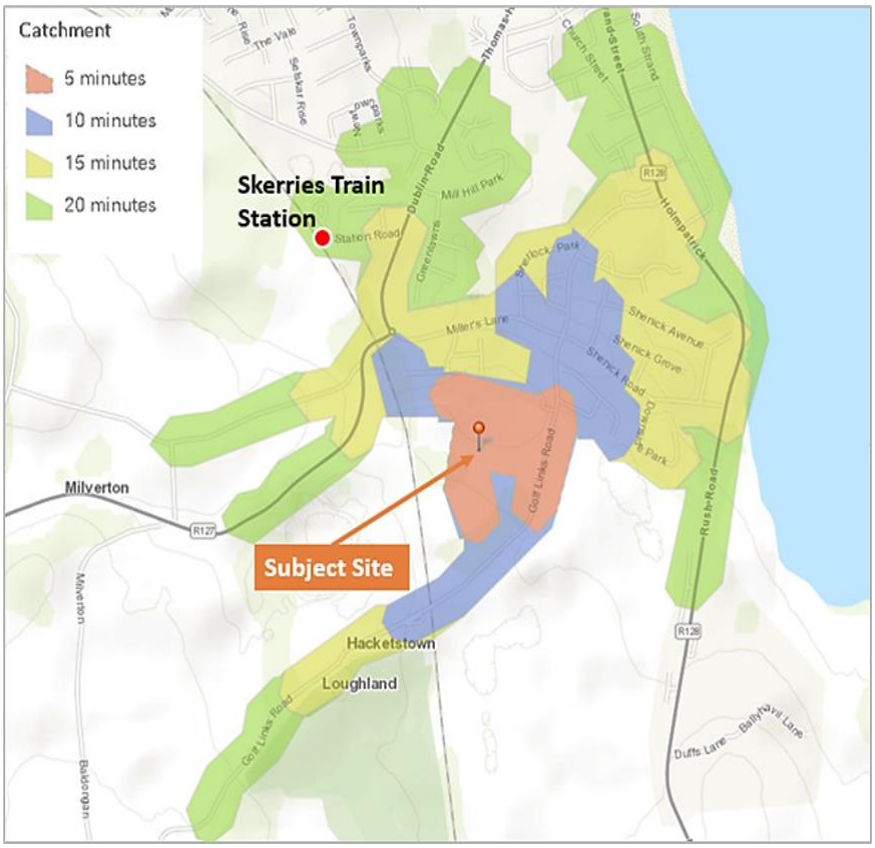

Figure 11.4: Walking Isochrones from the Subject Development Site

Existing Transportation Infrastructure

The subject LDA site is situated within the larger Hacketstown masterplan lands and is located between the two main arterial roads i.e., R128 Rush Road approximately 500m east of the proposed development site and R127 Skerries Road approximately 200m northwest of the site. The proposed development site gains vehicular access by Golf Link Road, via a two-way single lane carriageway with a 50kph speed limit. This local road runs in a north-south direction to the east and south of the subject site. Golf Links Rd adjacent to the subject site access contains road markings and continues northbound towards the Golf Links Rd / Miller's Ln / Shenick Rd staggered junction, and southbound towards Baldongan. The southbound route narrows after the road bridge structure close to Skerries Golf Club which is built over the railway line. South-west wards, Golf Link Road continues until the Baldongan Close / Ballaghstown Lane priority junction.

The R127 Skerries Rd / Miller's Ln / R127 Dublin Rd junction is located to the southwest of Skerries Town Centre. Its layout currently incorporates a three arm roundabout (approximately 28m ICD) configuration. On all three arms of the junction the approach lanes benefit from the provision of flared approach with two lanes provided at the circulation carriageway yield line. The circulation carriageway around the central landscaped island incorporates a very wide single circulation lane.

Golf Links Rd runs in north-south alignment through its slightly staggered (east-west) crossroad junction arrangement with both Millers Lane (western arm) and Shenick Rd (eastern arm) being the minor arms of the junction configuration. With the exception of Gold Links Road South, the other three arms benefit from the provision of pedestrian footpaths along both sides of the streets (**Figure 11.5**).

In the immediate vicinity of the site, pedestrians and cyclists can benefit from the shared pedestrian-bicycle 'greenway' located to the northwest of the subject Hackettstown Masterplan lands. The greenway runs parallel to the railway line connecting the subject site, via Ballygossan Park (Phase 1) to R127 Dublin Rd / Skerries Rd roundabout junction. The greenway provides a shorter and convenient route to Skerries Railway Station as accessed via Dublin Road. Accordingly, it is predicted that the subject development on the masterplan lands will result in an increase in pedestrian / cyclist traffic using this existing active travel connection.

Figure 11.5: Golf Links Rd/Miller's Ln/Shenick Rd Staggered Junction

The main Dublin-Belfast rail corridor is located to the west of the Skerries Rd / Dublin Rd /Miller's Ln three-Arm roundabout junction on an elevated embankment (**Figure 11.6**). The southwestern arm (R127 Skerries Rd) of the existing roundabout junction is aligned through this rail embankment and facilitated by way of a road underbridge beneath the rail line. Incorporating a stone arched bridge this underbridge (3.44m height restriction) is a protected structure in the Fingal County Development Plan (2017-2023).

Figure 11.6: Skerries Rd/Dublin Rd/Miller's Ln Three-Arm Roundabout

Travelling northbound on Dublin Rd (R127) takes vehicles towards Skerries Town while Balbriggan St. off Thomas Hand St. (R127) can be used to travel to Balbriggan. Skerries Rd (R127) travels towards Lusk in a south-westerly direction off Skerries Rd/Dublin Rd/Miller's Ln three-arm roundabout. Travelling southbound along R127 Skerries Rd can also be used to access the M1 Motorway (J1 M1) which provides convenient access to Dublin City Centre to the south and the M50 which provides strategic network access across the Greater Dublin Area. Destinations such as Drogheda and Dundalk can be accessed via the M1 to the north. To the east of the railway corridor the local road network benefits from streetlighting and is subject to 50kph vehicle speeds regulations. Whilst a narrow defensible strip is provided for those pedestrians that need to walk through the rail underbridge, both the R127 Dublin Road arm (northern arm) and the Miller's Lane arm (south-eastern arm) benefit from the provision of pedestrian footpaths on both sides of the street corridors. **Figure 11.7** below illustrates the location of the subject advanced infrastructure application site within the context of the existing road network.

The analysis of the existing road networks operational performance is reported in the 'Do-Nothing' traffic scenarios summarised in section 11.1.5 of this report.

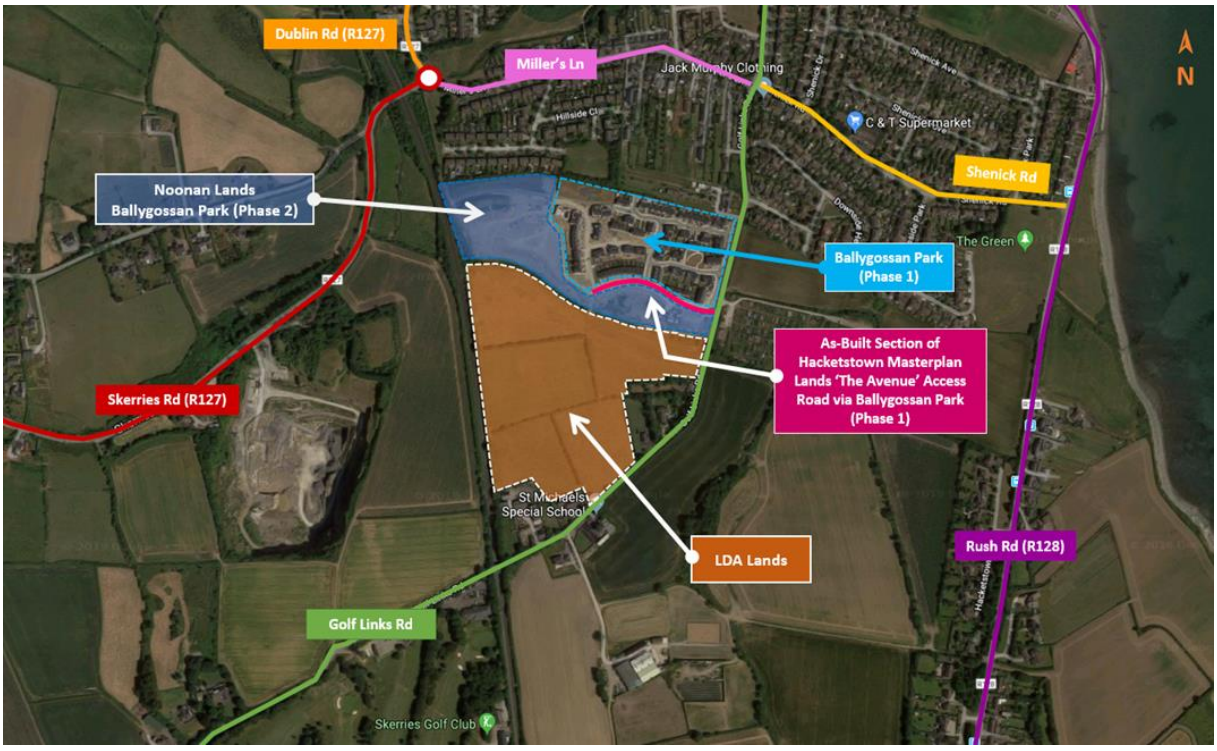

Figure 11.7: Existing Road Network (Source: Google Maps)

Existing Pedestrian and Cycling Facilities

Golf Links Rd corridor, which runs along sections of the LDA lands eastern and south-eastern boundary, currently contains a narrow footpath between Shenick Road and Downside Heights. A newly built footpath begins at Cabra Hill on Golf Links Rd linking Downside Heights with Ballygossan Park (Phase 1). Pedestrian and cycling facilities are provided within Ballygossan Park (Phase 1) including (i) internally along the eastern boundary where dedicated footpaths and a segregated two-way cycle track is provided parallel to Gold Links Road, and (ii) along the southern side of the masterplan lands as-built 'The Avenue' access road which forms the southern boundary of Ballygossan Park (Phase 1).

An existing shared pedestrian/bicycle 'greenway' connects (**Figure 11.8**) the R127 / Millers Lane roundabout junction to both Hillside Gardens and Ballygossan Park (Phase 1) via a temporary connection through the yet to be development Ballygossan Park Phase 2 lands (Noonan Lands). This greenway begins at Ballygossan Park and proceeds northwards for approximately 350m in length. The photo on the left (below) shows the existing temporary greenway infrastructure beginning at Ballygossan Park (Phase 1) and preceding eastwards through the proposed Ballygossan Park Phase 2 lands until meeting the rail corridor for where the greenway turn 90 degrees and continues northwards parallel to the railway line. The photo on the right (below) shows the greenway infrastructure path terminating at the off-site R127 Dublin Rd roundabout junction.

Figure 11.8: Existing Pedestrian / Cycle Connection between Ballygossan Park and R127 Skerries Rd

This existing pedestrian / cycle link (**Figure 11.8 & 11.9**) proves particularly attractive for existing Ballygossan Pk (Phase 1) residents based upon DBFL's on-site observations. Similarly future residents of the Hacketstown development lands are also predicted to utilise this active travel connection as it offers a shorter more convenient traffic free route to Skerries Railway Station compared to the alternative route via Gold Links Road. Accordingly, it is predicted that any future development on the Hacketstown lands including the proposed development and the emerging Ballygossan Park Phase 2 scheme will result in an increase in pedestrian / cyclist traffic (See Section 11.1.5.2) using this existing link as it provides the shortest most direct and safe connection to/from Skerries Railway Station which experience reveals is the dominate parameter influencing route choice for pedestrian and cyclists.

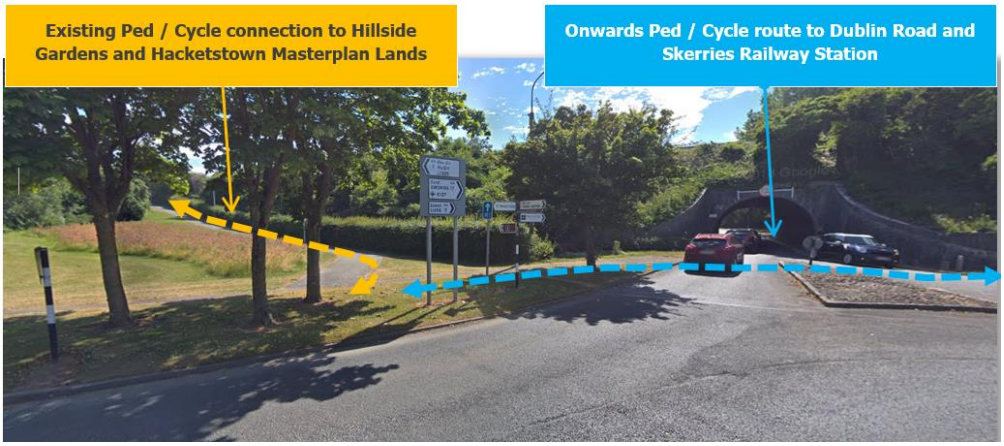

Figure 11.9: Existing Greenway Connection Skerries/Miller/Dublin Rd Junction (Source: Google Maps)

Pedestrian and cycling facilities are already provided within Ballygossan Park Phase 1 along, (i) the east of the development (north-south) at Cabra Hill (**Figure 11.10**) and (ii) at the main vehicular site access of Ballygossan Park (east-west) into the masterplan lands (**Figure 11.11**). In addition, a short length of footpath is also provided immediately adjacent the vehicle to the allotments (as located to the east of Golf links Road) and then begins to narrow before ending opposite the existing Ballygossan Park vehicle access junction.

Figure 11.10: Pedestrian and Cycling Facilities at Ballygossan Park (Cabra Hill Entrance)

Figure 11.11: Pedestrian and Cycling Facilities At Ballygossan Park Site Access

The external Golf Links Rd / Miller's Ln / Shenick Rd staggered junction currently benefits from tactile paving but no formal pedestrian crossing is provided. Miller's Lane heading west and Golf Links Rd heading north from this junction both contain footpaths on both sides of the road in addition to street lighting.

The footpath on Miller's Ln continues towards the three-arm Skerries Rd / Dublin Rd / Miller's Ln roundabout and onto the R127 Dublin Rd corridor (**Figure 11.12**). Footpaths are also provided on both sides of the Shenick Rd corridor eastwards as far as the Shenick Rd / Holmpatrick Rd / Rush Rd (R128) priority junction.

Figure 11.12: Pedestrian Facilities on Miller's Lane (Towards Skerries Rd/Dublin Rd/Miller's Ln Roundabout)

Pedestrian facilities are also provided on both sides of Dublin Road corridor northwards Station Road. Station Rd leading towards Skerries Railway Station contains a footpath on both sides (**Figure 11.13**). Shenick Rd also benefits from having a footpath on both sides of the road and terminates at the three-arm junction with Rush Rd (R128).

Figure 11.13: Pedestrian Facilities Station on Station Rd (Towards Skerries Railway Station)

Skerries Town currently has limited dedicated cycling facilities but has enormous potential to become a cycling town due to its size and topographical characteristics. The NTA's Greater Dublin Area Cycle Network Plan currently proposes a number of cycle route networks within Skerries Town. These include a primary / secondary route, an inter-urban route, a feeder route and a greenway to be delivered in the medium term as detailed later in the chapter. In short term however new bicycle infrastructure being implemented by the applicant as part (i) the permitted off-site infrastructure accommodations works (reference section 11.1.4); the (ii) Advanced Infrastructure Application Works (reference section 11.1.4) and (iii) the subject residential scheme; enhances the attractiveness of cycling for local journeys due in part to the dedicated bicycle infrastructure being provided

(segregated from motorised traffic) and the level of permeability being delivered by the integrated design approach to the above three schemes.

Public Transport – Bus

The site is highly accessible by Dublin Bus which operates the 33, 33e, 33n and 33x GoAhead 33a bus routes along Holmpatrick Rd (R128) with the closest bus stop is situated approx. 850m east of the site. These bus routes provide frequent services in the order of 5 weekday services per hour on average (reference Chapter 2 of the applications Traffic & Transportation Assessment Report) connecting the subject site to Balbriggan to the north and Rush and Dublin City Centre to the south.

Route 33e is a north/south service that departs from Abbey St Lower, Dublin and terminates in Mourne View, Skerries. Route 33n continues northbound towards Balbriggan via Skerries departing from Westmoreland St. in Dublin City Centre. This route is a *Nitelink* route which exclusively operates up to midnight on Saturdays and Sundays. Route 33x provides a two-way connection from Custom House Quay to Skerries.

Go-Ahead also operates route number 33 and 33a in conjunction with Dublin Bus. Route 33 provides a connection from Balbriggan to Dublin City Centre via Skerries. Route 33a provides a link from Skerries to Dublin Airport via Rush Rd (R128) interchanges which are a 850m walk from the subject site.

In addition, Fingal Express operated by Sword Express operates route 533 and which connects Skerries to UCD via Dublin City Centre. This route travels on Holmpatrick and Rush Rd and serves stop no. 3824 approximately 850m east of the subject site.

Figure 11.14: Existing Bus Service in vicinity of the subject site

Dublin Bus 33 and Go-Ahead 33a both operate daily and offer frequent services (i.e., every 15-20 minutes at peak times) as summarised in **Table 2.1.** Additional areas that can be accessed via route 33 with connections to/from Rush, Lusk, Swords, Santry and Drumcondra.

Dublin Bus 33e provides a single one-way service and commences at 07:00 from Abbey St. Lower to Skerries. Route 33n operates every two hours from 00:00 to 04:00 on weekends as mentioned above.

The proposed development site is also accessible by heavy rail with the closest station being Skerries Railway Station approximately 700m (walking distance) north of the subject site. Skerries has an established rail infrastructure that provides linkages to Dublin in the south, and Drogheda to the north (15 services daily on average) from where further onwards connections can be made to other regional and strategic destinations.

In reference to the baseline surveys introduced below, the findings summarised in Figure 11.7B and Section 2.9 of the applications *Traffic and Transportation Assessment Report*, the above bus services as operated by Dublin Bus and GoAhead have been established as providing an AM peak period two-way capacity of criteria 2196 passenger spaces with a reserve capacity in the region of 80% being available during this period in 2022. In the corresponding PM peak period a two-way capacity of criteria 2356 passenger spaces has been established as being available based upon February 2022 timetable of bus services.

Public Transport – Heavy Rail

The subject development site is located approximately 650m (830m walking distance) to the south-east of Skerries Railway Station. Skerries has an established rail infrastructure that provides linkages to Dublin in the south, and Drogheda to the north from where further onwards connections can be made to other regional and strategic destinations. Irish Rail also includes other local intermediate destinations as part of its Regional and Dublin commuter services.

In reference to Section 2.9 of the applications Traffic and Transportation Assessment Report, the train services calling at Skerries Railway Station have been established as providing an AM peak period two-way capacity of criteria 5821 passenger spaces with a reserve capacity in the region of 37% being available during this period in 2022. In the corresponding PM peak period two-way capacity of criteria 6260 passenger spaces is available base upon February 2022 timetabled services and an estimated reserve capacity in the region of 36%.

Baseline Traffic Characteristics

With the objective of quantifying the existing traffic movements across the local road network a number of local traffic surveys were commissioned. In response to the scoping exercise undertaken with the local road's authority during preplanning discussion and further to best practice TII guidance a range of traffic data collection exercises have been undertaken by independent specialist survey firms. These surveys included both twelve-hour and three-hour Classified Junction Turning Counts (JTC) and a seven-day Automated Traffic Counts (ATC) surveys conducted on 24th September 2019 at the following junctions:

12-Hour JTC: 07:00 AM -19:00 PM

- **Junction 1:** JTC 1- Dublin Rd (R127)/Miller's Lane/Skerries Road (R127) three-arm roundabout
- **Junction 2**: Golf Links Road / Miller's Ln/ Shenick Rd staggered junction

3-Hour JTC: 07:00 AM -10:00 AM and 16:00-19:00 PM

- **Junction 3:** JTC 3 - Site access at Ballygossan Park

7- Day ATC: 20th to 26th September 2019

- **ATC Survey Site:** Hacketstown Developments' Southern site access/Golf Links Road

The traffic surveys established that the local AM and PM peak hours (in terms of the number of vehicle flows traveling across the local road network and associated key junctions) across the adopted study area are generated between 08:15 – 09:15 and 1715 - 1815 respectively.

Additional surveys were undertaken on 2nd February 2022 with the objective of establishing the capacity of both the existing Rail and Bus networks currently serving the proposed development site via local interchange opportunities in Skerries. The results of the above surveys have provided the evidence base upon which this assessment is based, are considered in section 11.5.1 below and detailed further within the applications *Traffic and Transportation Assessment Report*.

Emerging Transportation Infrastructure

GDA Cycle Network Plan

Enhancements to the cycling network in the vicinity of the development site are proposed as part of the Greater Dublin Area (GDA) Cycle Network Plan as indicated on **Figure 11.15** below, including:

- Primary Route SK1: Newtown Parks / St. Patrick's Close / R127 Dublin Road / Miller's Lane / Shenick Road / R128 Rush Road.
- Primary Route SK2: R127 Dublin Road to the harbour.
- Inter-Urban Route F4: Lusk to Skerries via a local road east of the busy R127 regional road.
- Greenway Route SK3: Central Greenway in Skerries through housing estates near the railway line. Also, FG1/N5 greenway/national route will run along the harbour.
- The Feeder route: the feeder and primary cycle routes will also provide linkages to the SK3 and FG1/N5 greenways.

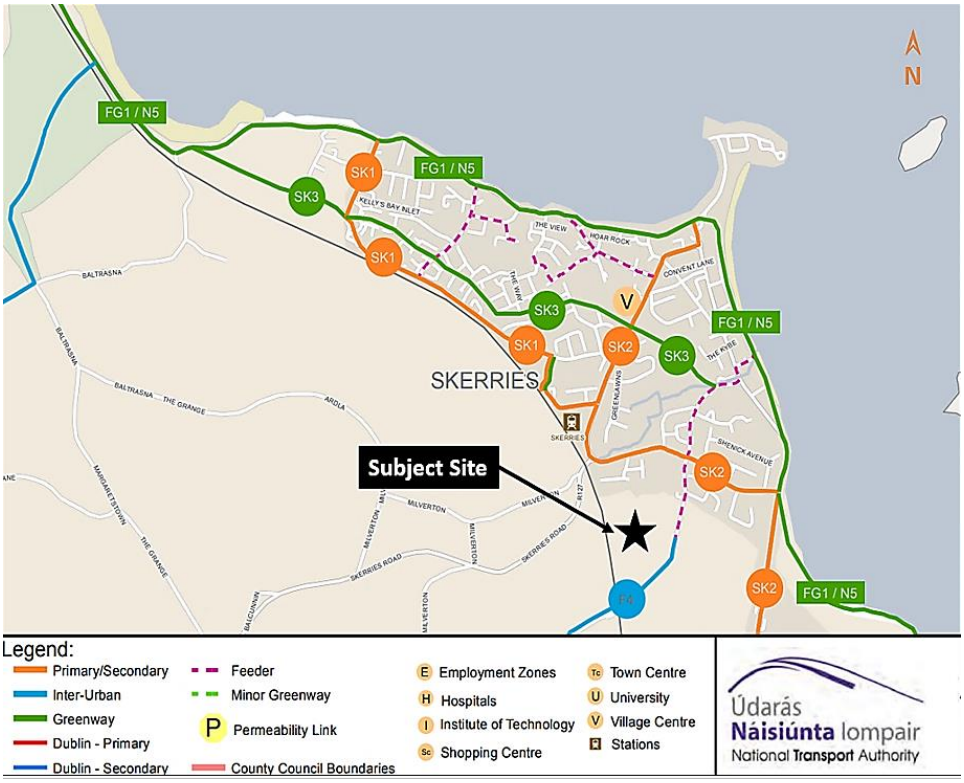

Figure 11.15A: Proposed GDA Cycle Routes in Skerries (Extract: Sheet N11 GDA Cycle Network Plan 2013)

It must be noted that the NTA is currently in the process of updating the GDA Cycle Network Plan and anticipates that the Plan will be published at a later date. An updated draft route within the Skerries area was published by the NTA in 2021 and is shown below in **Figure 11.15B**.

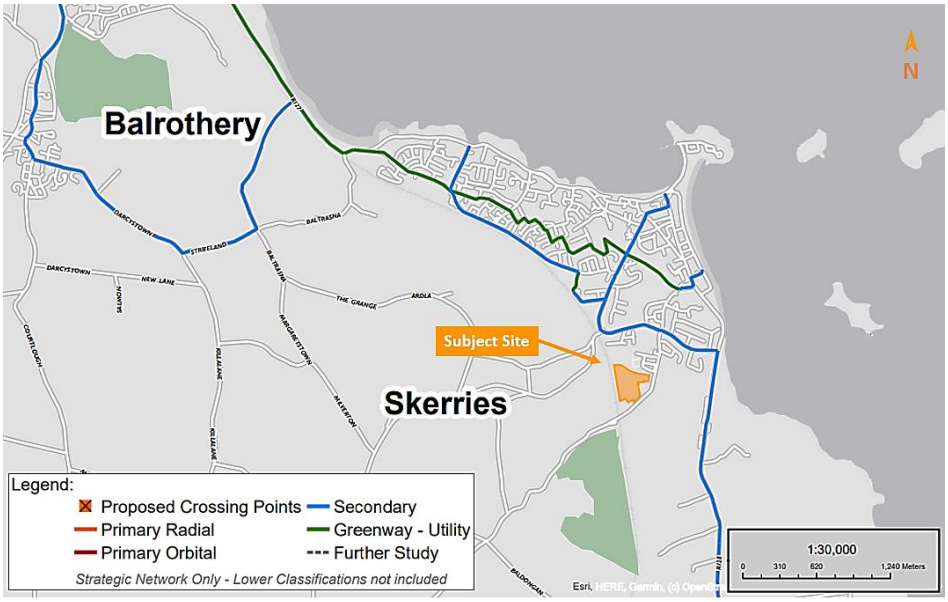

Figure 11.15B: Proposed GDA Cycle Routes in Skerries (Extract: GDA Cycle Network Plan 2021)

BusConnects

The subject development site is located approximately 850m west of the proposed BusConnects services which will run along the Rush Road (R128). These routes will be delivered as part of the National Transport Authority's (NTA) Bus Connects initiative, which will transform the current bus system by redesigning routes to offer fast, predictable and reliable journeys. The subject site will therefore benefit greatly from enhanced accessibility and mobility levels delivered by BusConnects. Under the BusConnects proposals, the new routes which will replace the current Dublin Bus and GoAhead operated services; will serve Skerries as well as the subject site and are shown below in **Figure 10.16**:

- Route L85: Balbriggan - Skerries - Rush/Lusk - Swords – Dublin Airport
- Route X76: Skerries - Rush - Lusk - City Centre - UCD

Local Route L85, proposed under BusConnects, will run every 30 minutes on weekdays and weekends from Balbriggan to Dublin Airport via Skerries, Rush, Lusk and on to Swords. It is proposed to operate along Rush Rd and Holmpatrick Rd approximately 800m east of the subject site.

Express Route X76 is exclusively a peak time route which will run from Skerries to University College Dublin (UCD) via Rush and Lusk. This route is proposed with 5 southbound AM trips from Skerries between 6:00 and 8:00, and 5 northbound PM trips from UCD starting between 16:00 and 18:00. Once again, this route are proposed to operate along Rush Rd and Holmpatrick Rd approximately 800m east of the subject site.

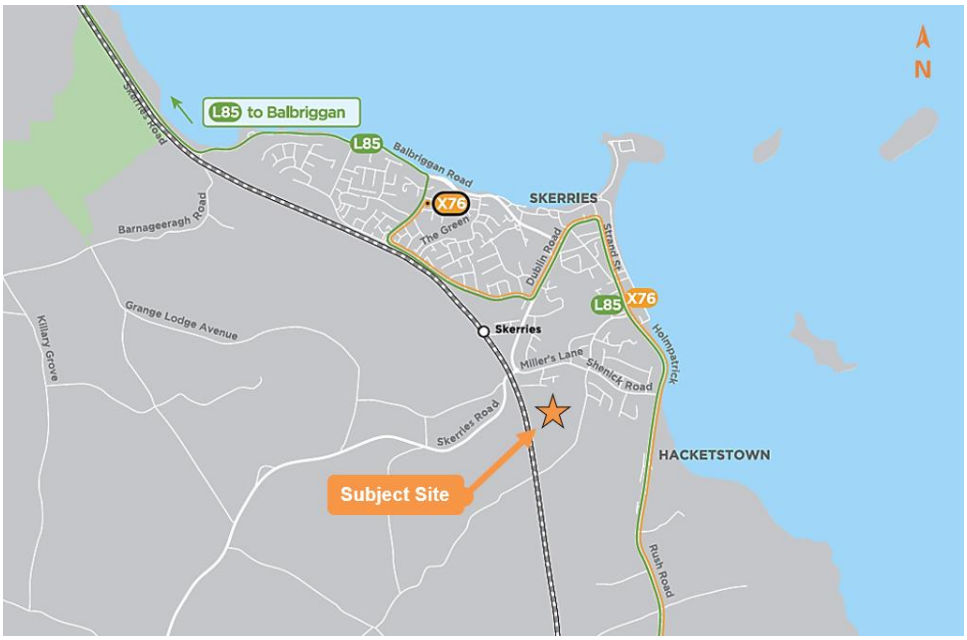

Figure 11.16: Proposed BusConnects Routes in Skerries (Source: www.busconnects.ie)

Dublin Area Rapid Transit Expansion Programme

The Dublin Area Rapid Transit (DART+) Programme aims to modernise and improve the existing rail network, which radiates from Dublin City Centre. It will provide a sustainable, electrified, faster, reliable and user friendly rail system, which increases train frequencies and customer carrying capacity. It intends to increase the length of DART network from the currently 50km to 150km railway corridor through the electrification and upgrade of existing lines transforming commuter train travel in the Greater Dublin Area (GDA). The DART+ Programme also includes the purchase of new train fleet.

The DART+ Programme will deliver frequent, modern, electrified services within the GDA and improve connectivity to regional routes as part of the following projects:

- DART+ West - Maynooth and M3 Parkway to the City Centre
- DART+ South West - Hazelhatch & Celbridge to the City Centre
- DART+ Coastal North - Drogheda to the City Centre Greystones
- DART+ Coastal South - Greystones to the City Centre

This proposed DART+ Coastal North project (for which public consultation commenced in Q1 of 2022) will further increase the accessibility of Skerries and its environs. The timeline for the delivery of the Dart Expansion is unclear however the Strategy states that the strategic transport infrastructure is proposed to be delivered within the lifetime of the Strategy (i.e., 2035).

The delivery of the DART+ Coastal North project will form the third infrastructural project of the DART+ Programme in addition to DART+ West and DART+ South West. DART+ Coastal North is seeking to extend the existing electrified rail network from Malahide to Drogheda as well as increasing rail capacity on the Northern Line between Dublin City Centre and Drogheda MacBride Station, including the Howth Branch (Ref. **Figure 11.17A**).

Figure 11.17B below shows the Greater Dublin Area Heavy Rail Network (Commuter Rail and DART Services) in 2035. **Figure 11.17C** illustrates the planned increase in train frequency and passenger capacity for the 3-hour AM peak period for inbound/southbound services towards Dublin City Centre. Between the Drogheda and Malahide services, the number of trains will increase from 11 to 24 while passengers number will potentially increase from 12,500 to 26,600.

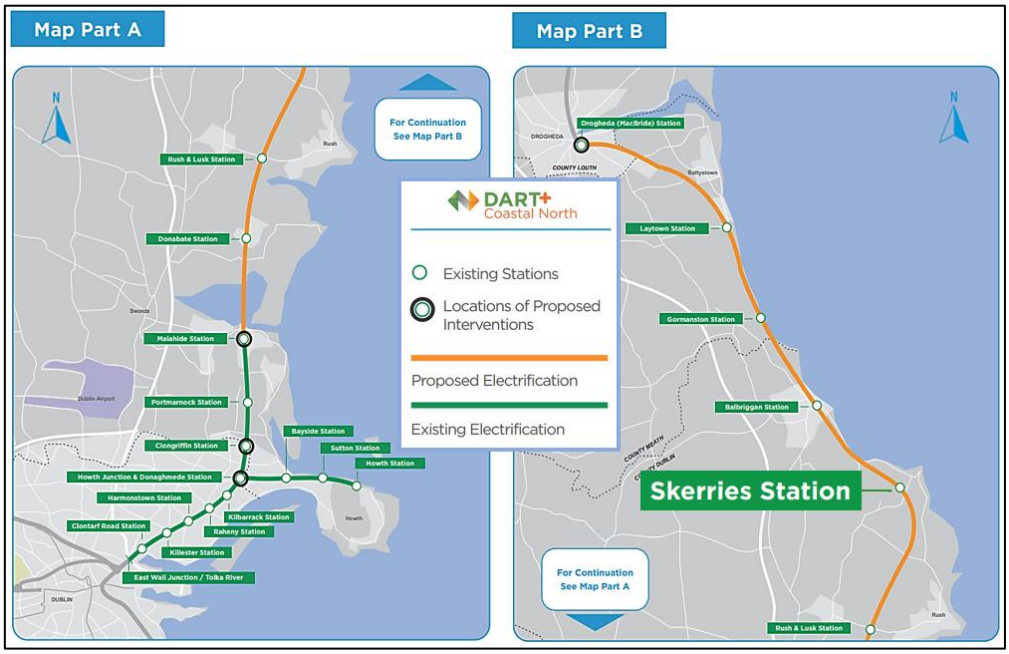

Figure 11.17A: DART+ Coastal North Programme (Source: National Transport Authority & Irish Rail)

Figure 11.17B: DART+ Programme (Source: National Transport Authority & Irish Rail)

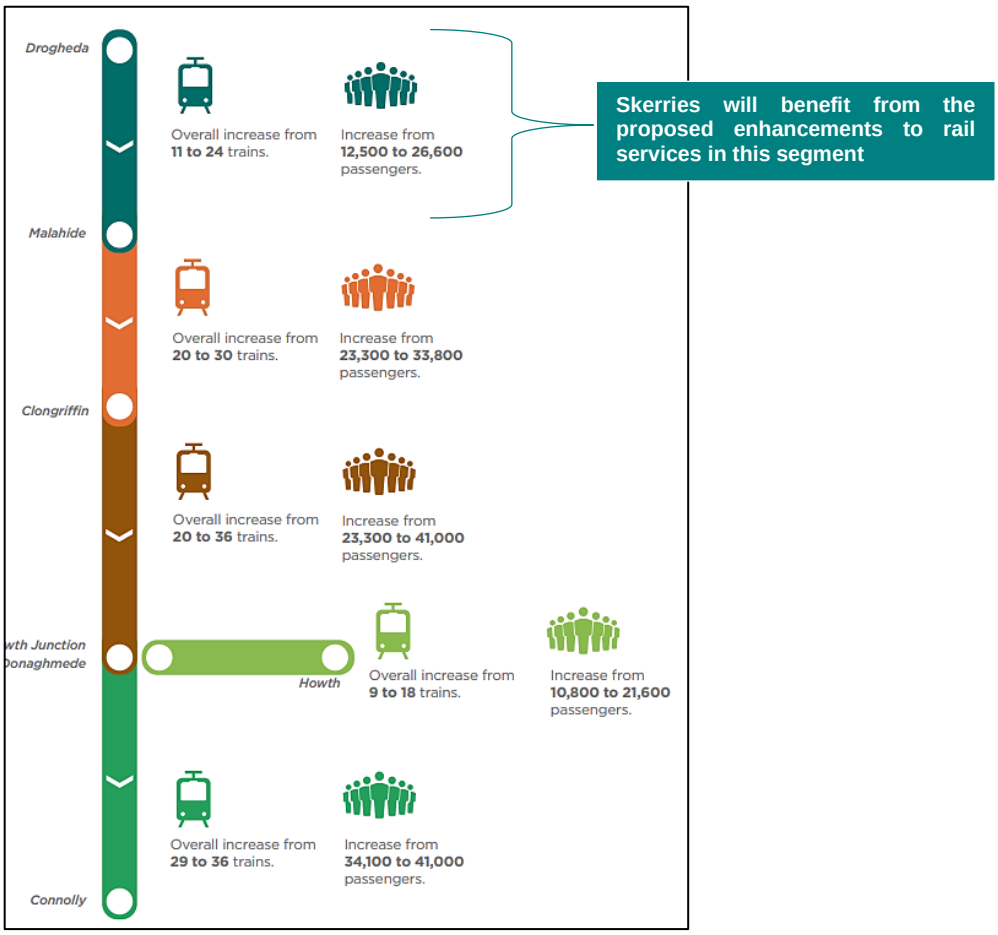

Figure 11.17C: Planned Increase In Train Frequency And Passenger Capacity (Source: NTA & Irish Rail)

11.4 CHARACTERISTICS OF PROPOSALS

This EIAR addresses the impacts of the project which entails the following three inter-connected applications;

- The off-site accommodation works application (FCC Planning Ref. F20A/0324) as granted planning permission by An Bord Pleanála (ABP) in July 2021
- The advance infrastructure works which are the subject of a Section 34 application to Fingal County Council (FCC Reg. Ref F21A/0287) and which is now under appeal to An Bord Pleanála (ABP Reg. Ref. 312189) and
- the 'Proposed Development' (subject of this SHD application);

Context – Off-Site Accommodation Works Application

Further to preplanning discussions with the local authority in regards to the emerging SHD proposals on the LAP's zoned residential lands, it has been identified that off-site junction infrastructure enhancements would be required to facilitate any further residential development on the Hacketstown masterplan lands beyond the completed Phase 1 scheme (Ballygossan Park).

The enhancement works are considered necessary by the local authority to;

1) address existing operational and safety concerns,

2) mitigate any potential impact arising from the additional demands generated as a result of new development on the masterplan lands, and

3) to respect the zoning objectives applied to the masterplan lands in regard to the provision of the necessary physical infrastructure.

Discussions with the local road authority established that junction enhancement works would be required at the following two off-site junctions, as illustrate in **Figure 11.1**, to facilitate new development proposals on the Hacketstown masterplan lands;

- Junction A - Miller's Lane / Shenick Road / Golf Links Road Junction, and

- Junction B – R127 Skerries Road / Miller's Lane / Dublin Road Roundabout.

Preliminary analysis revealed that the cumulative impact associated with the development of both the remaining northern (Noonan Construction Co. Ltd. Lands) and southern plots (LDA lands) within the Hacketstown masterplan lands has the potential to generate additional pedestrian, bicycle and motorised vehicle movements through both of these two off-site junctions on Miller's Lane, Skerries.

Accordingly, with the purpose of addressing the concerns expressed by the local planning authority and ensuring that the necessary physical infrastructure is implemented at these two specific junctions prior to the occupation of the next phase of residential development on the subject masterplan lands the LDA have already applied to FCC (Ref. F20A/0324) for planning permission to undertake the requested junction improvement works.

Further to the submission of Additional Information and Clarification of Additional Information to Fingal County Council, planning permission was granted for the proposed off-site works (subject to 4 no. conditions) on 15th of January 2021 (FCC Ref. F20A/0324). On the 16th of February 2021, the applicant was notified that a third-party appeal has been submitted to An Bord Pleanála (ABP). Following the submission of a formal response by the applicant, a decision to grant permission was made by ABP on 19th of July 2021 (ABP Ref No. 309409-21).

Context – Noonan Construction Ballygossan Park Phase 2 Proposals

The applicant is aware that a new planning application for the development of the remaining (Phase 2) on the undeveloped parcels of the Hacketstown masterplans northern development plot (Ballygossan Park) is imminent. Architects working on behalf of Noonan Construction have developed a scheme that could accommodate 144 no. residential dwellings and creche of 355.4m^2 on this part of the masterplan lands.

These Noonan Construction proposals will be subject to a separate planning application and do not form part of the subject LDA proposals. The emerging proposals are likely to utilise the 'Advance Infrastructure Application' road link (via the subject SHD Lands) as one of the two access routes leading to/from the LAP's northern zoned development plot. As outlined later in the report, the Noonan Construction proposal has been considered as 'Pending Development' within the scope of this assessment. Accordingly with the objective of providing a robust worst case appraisal of the network's future operational performance it has been assumed in this assessment that both the subject LDA residential scheme AND the emerging Noonan Construction residential scheme will be in place and subsequently generate a larger cumulative loading onto the local transport networks.

Proposed Advance Infrastructure Application Works

This scheme consists of advance infrastructure works by the applicant (in partnership with Noonan Construction Ltd) on a 2.5 hectare site at Hacketstown, Skerries as located in between the northern extents of the subject LDA residential scheme and the southern extents of Ballygossan Park (Phase 1) and adjoining Noonan Construction lands. These infrastructural works include:

- Construction of 66m of a new Link Road, crossing the Regional Drainage Facility and providing access to the future Land Development Agency (LDA) SHD Scheme to the south from the existing Ballygossan Park to the north;

- Construction of Regional Drainage Facility (RDF) for the surface water management of the Hacketstown LAP Lands;

- Services to facilitate both the emerging Ballygossan Park (Phase 2) by Noonan Construction and the subject LDA SHD Schemes (new surface water outlet structures, new foul sewer pipeline and manholes to connect to the existing foul sewer network and new watermain pipeline and associated valves and fittings to connect to the existing water network);

- Landscaping, Public Lighting and ESB Overhead Power Lines.

The proposed advanced infrastructure works are to be undertaken across lands under the control of (i) the applicant LDA (as located to the south of the Hacketstown LAP lands east-west Open Space Lands drainage facility), and (ii) Noonan Construction Co. Ltd. (as located to the north of the Hacketstown LAP lands east-west Open Space Lands drainage facility).

Permission was granted by Fingal County Council on this application on 15th of November 2021 (FCC Ref. F21A/0287). Subsequently, an appeal was lodged on the 13th of December 2021 with the application now under consideration by ABP (ABP-312189-21).

Context – LDA Residential Scheme Proposals (Subject Development)

The subject LDA development site at Hacketstown, Skerries, which occupies the southern plot of the larger Hacketstown zoned development lands; comprises an area of circa 6.6 hectares (total net developable area). The LDA scheme proposals incorporating private housing and a creche (377.6m^2) comprises a total of 345 no. residential units. The LDA proposals also include the following:

- Public Open Space of c.18,630sqm (28% of net developable area) is proposed including the parkland and main public square,;
- 414 car parking spaces in total are proposed including 369 no. residents' spaces comprising 308 no. standard residential bays, 19 no. disabled bays (6 of which are provided with EV charge points), 42 no. standard sized bays with EV charge points, 5 no. creche parking spaces (which can also be used as additional visitor parking at times when the creche is closed e.g., night time and weekends) and 1 no. Dedicated Car Share (GoCar) bay
- A total of 802 no. bicycle parking spaces are proposed on site comprising 674 no. 'long-term' (residents) spaces and 128 no. 'short-term' (visitor spaces)
- Childcare and community facility of c.377 sqm. located in Block C;
- One main vehicular access off the Golf Links Road is to be provided to the southeast of the subject site;
- Upgrades to the Golf Links Road including new pedestrian and cycle infrastructure with frontage on Golf Links Road;

- Construction of a new internal link road to provide access to the adjacent lands to the north, for which a separate planning application has been made to Fingal County Council under Reg. Ref. F21A/0287;

The proposed layout will create a sense of place through the creation of new spaces while respecting the context of the site and responding to future changes. The scheme creates people friendly streets and spaces through legible public open spaces that connect the distinct character areas within a sequence of interconnected shared courtyards provide secondary 'outdoor rooms' leading to the riparian strip green link to the north.

The design of the internal streets within the proposed development, including the principal North-South 'local' classified street (The Avenue) between the northern and southern site access points have in reference to DMURS sought to (i) achieve a balance between the difference movement and place functions, (ii) accommodate all road user requirements, (iii) minimise the use of long straight sections of road carriageway with geometric initiatives introduced at appropriate spacings to actively manage and self-enforce appropriate internal vehicle speeds whilst retaining a legible street network, and (iii) to provide a positive advantage in terms of travel distance for active modes of travel.

11.5 POTENTIAL IMPACT OF THE PROJECT

11.5.1.1 Construction Phase

Management of Construction Activities

All construction activities on-site will be governed by a Construction Traffic Management Plan (CTMP), the details of which will be agreed in full with Fingal County Council prior to the commencement of construction activities on site.

The principal objective of the CTMP is to ensure that the impacts of all building activities generated during the construction of the proposed development upon both the public (off-site) and internal (on-site) workers environments, are fully considered and proactively managed / programmed respecting key stakeholders thereby ensuring that both the public's and construction workers safety is maintained at all time, disruptions minimised and undertaken within a controlled hazard free / minimised environment. The impact of the construction period will be temporary in nature being over approximately a 24-30 months period if construction in a single uninterrupted stage.

Construction Traffic

Construction traffic will only be generated on weekdays (0700-1900 subject to planning conditions) and will consist of the following two principal categories:

- Private vehicles owned and driven by site construction staff and by full time supervisory staff.

- Excavation plant, dumper trucks and delivery vehicles 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.

On-site employees will generally arrive before 08:00, thus avoiding the majority of the morning peak traffic period. These employees will generally depart after 16:00. It is noted that a proportion of construction workers are anticipated to arrive in shared transport based upon construction activities at similar residential developments and as encouraged by the proposed developments construction traffic management plan. Deliveries will be influenced by both the type of development (residential house / duplex units) and associated

construction rates and subsequently will arrive at a dispersed rate throughout the course of the working day and enforced by the CTMP.

Based upon the experience of similar house / duplex based residential developments, it is estimated that a development of this type, scale the rate of development would at a maximum necessitate approximately 46-60 staff on site at any one time, subsequently generating no more than 32-40 two-way vehicle trips during the local road networks morning and evening peak hour periods over the duration of the phased construction works.

It is anticipated that the proposed development would be constructed over a period of approximately 24 months. Following the completion of the initial site clearance works, the generation of HGV movements during the build period will be evenly spread throughout the day and as such will not impact significantly during the peak traffic periods. This process will be enforced and managed through the CTMP. Based upon the experience, and considering the scale and phased nature of the proposed development, we do not expect HGV vehicle movements to exceed 4 one-way vehicle movements per hour in each direction on average during the busiest period of construction '*build*' works.

Based on a preliminary review of the existing survey data and proposed site levels we estimate that approximately 31,088m^3 of material will require excavation consisting of 10,702m3 stripped topsoil and 20,386m3 excavated subsoil as part of the scheme proposals in regard to works associated with the swale, road construction and residential buildings. Whilst all the stripped topsoil and 10,523m3 of excavated subsoil will be re-used as part of the developments permanent landscaped works.

Therefore, it is estimated that 9,863m^3 of subsoil material may have to be transferred from the subject site during the initial work stages if constructed as part of a single construction stage. It is estimated that this equates to approximately 963 truckloads depending upon vehicle characteristics over a 6-9 month period. At 24 loads transferred per day this equates to 40 days of earthmoving works to clear the entire site in one single activity.

In addition to the aforementioned removal of excavated materials, it is estimated that criteria 4,481m^3 of materials will be required to be imported to the subject site following the excavation works. It is estimated this equates to between 438 truckloads depending upon vehicle characteristics over a 12–18 month period. At 12 loads arriving per day this equates to between 36 and 37 days of arriving materials as part of the adopted worst-case assessment (assuming that the proposed development is constructed in one single stage) to import the estimated quantum of materials.

Further to the requirements of the local road's authority an appropriate control and routing strategy for HGVs can also be implemented for the duration of site works as part of the CTMP. The CTMP will require that any roads with weight/height restrictions are not utilised as part of the routing of HGVs during the construction phase which will be agreed in advance of the commencement of works with the local planning authority. Golf Links Road located to the east of the site is connected via a priority controlled junction (Miller's Lane / Golf Links Road / Shenick Road). All construction traffic including HGV's will be directed to use the proposed temporary construction access point located approximately 90m south of the existing Ballygossan Park / Golf Links Rd junction (Ref. **Figure 11.18**) when accessing / egressing the site from the wider strategic network.

A significant benefit of the subject development site's characteristics is that all construction traffic vehicle parking demands can be accommodated on-site thereby minimising the impact upon the operational performance and safety levels of the adjacent public road network.

Considering the site's proximity to the strategic road network and following the implementation of an appropriately detailed CTMP, it is concluded that construction traffic will not give rise to any significant traffic concerns or impede the operational performance of the local road network and its surrounding junctions. The level of significance of the above findings are categorised in Section 11.1.7.

Figure 11.18: Golf Links Road – Existing Gated Access to Subject Work Area

11.5.1.2 Operational Phase

Proposed Development Trip Generation

A trip generation exercise has been undertaken to establish the potential level of vehicle trips that the proposed residential development could potentially generate. To estimate the potential level of vehicle trips that could be generated by the proposed residential development, reference has been made to (i) the TRICS database (for apartments) as well as (ii) utilizing trip rates from an existing 'donor site' (Ballygossan Park Phase 1) for house units.

TRICS provides trip rate information for a variety of different land uses and development types, which can be applied to the subject development. TRICS data was originally primarily UK based, however the number of Irish sites in the database has grown significantly recently. Notwithstanding the above, internal research undertaken by TRICS has shown that there is no direct evidence of trip rate variation by country or region. The use of English, Scottish or Welsh data can be equally applicable to Ireland if users take into account important site selection filtering factors such as levels of population, location type, local public transport provision, and development size and car ownership level, amongst others.

Data supplied for inclusion in TRICS undergoes a procedure of validation testing, and there is no evidence from this procedure suggesting that data from Ireland bears any significant fundamental differences to that from the other countries included. Consequently, the application of the TRICS database represents the industry standard methodology for predicting a developments level of traffic generation. Accordingly, the TRICS database has been adopted in this assessment to predict the level of traffic that proposed 'apartment / duplex' elements of the residential development could potentially generate.

During pre-planning discussions, the local roads officers raised the potential limitations of depending solely upon the TRICS database in regard to reciprocating potential values of vehicular traffic travelling to / from apartment / duplex type of development specifically for the Skerries area (considering its unique characteristics as a commuter town in regard to travel to work locations) particularly in the absence of comparable existing local 'donor' apartment / duplex based developments to demonstrate the robustness of the TRICS data. As a result, with the objective of providing the necessary robust and even worst-case scenario, DBFL agreed with the authority's approval to increase the apartment trip rates as derived from TRICS by an additional 50%. Accordingly, the following assessment potentially overestimates the number of trips predicted to be generated by the proposed development apartment / duplex units.

With the objective of investigating the actual demand that could potentially be generated by the proposed residential 'house' units within the proposed development, Ballygossan Park (Phase 1) has been used as a

suitable 'donor' site which is subject to similar land uses and public transport accessibility to that being proposed as part of the subject SHD application.

Table 11.1A presents the predicted trip generation and the estimated traffic flows arriving and departing the proposed development during the morning and evening peak hour periods. **Table 11.2** summarises the potential AM and PM peak hour traffic generated by the LDA development.

Period	AM Peak Hour			PM Peak Hour		
Land Use	In	Out	Two-way	In	Out	Two-way
Houses	0.175	0.359	0.534	0.359	0.146	0.505
Apartments/Duplexes	0.084	0.299	0.384	0.306	0.108	0.414
Crèche [1]	3.735	2.823	6.557	2.125	2.836	4.961

[1] Crèche trip rates discounted by 75%.

Table 11.1A: Proposed Development Peak Hour Vehicle Trip Rates

The subject crèche unit is predicted to largely serve the nearby residential development. Therefore, it is anticipated that a proportion of the trips arriving to / departing from the crèche will already be occurring on the network. Therefore, in order to avoid the double counting of trips, DBFL has assumed that 25% of trips generated by the crèche will be 'new' trips, whilst the other 75% will be trips generated from either within the development or by the existing dwellings within walking distance of the subject site.

Based on the above vehicle trip rates, the potential peak hour vehicle trips has been calculated for the proposed development. **Table 11.2A** summarises the predicted AM and PM peak hour vehicle movements that are predicted to be generated by the proposed development. **Table 11.2B** details the predicted person trips predicted to be generated by sustainable mode of travel based upon the local areas recorded 'travel to work, school and college' modal split as part of the 2016 Census.

Units	AM (08:15 - 09:15)			PM (17:15 - 18:15)		
	Arrival	Departure	Total	Arrival	Departure	Total
345 Units (Incl. Crèche)	36	108	144	110	41	151

Table 11.2A: Potential LDA Development Vehicle Trips

Hour Period	PT Rail Trips	PT Bus Trips	Cycling	Walking
AM (08:00-09:00)	82	16	12	59
PM (1700-1800)	89	17	13	64

Table 11.2B: Potential LDA Development Person Trips by Sustainable Modes of Travel

Committed Developments

With the objective of providing a robust appraisal, DBFL have established the extent of two number third party developments, as located within the area of influence of the subject LDA Development site. DBFL have subsequently included the following third-party scheme proposals as committed developments within this assessment.

- Committed Development 1: Noonan Development Plot located north of the LDA subject site and is included within the i boundary of the Hacketstown Masterplan Lands. The development proposes a total of 144 no. units comprising 95 no. apartments, 16 no. duplexes and 33 no. houses.

- Committed Development 2: A potential development located west of Skerries Railway Station on lands zoned Objectives GE – General Employment under the FCC Development Plan. Two recent third-party applications have been refused by FCC the latter of which (F21A/0388) is currently under appeal to ABP (ABP Ref. 311566-21) and with a decision reportingly due on or before 12th April 2022. Accordingly, with the objective of providing a robust assessment we have assumed for the purposes of this analysis that development comprising 4,500m² GFA light industrial facility on this site.

Figure 11.19: Potential LDA Development Vehicle Trips

Committed Developments Trip Generation

In order to establish the potential quantum of vehicle traffic generated by the two identified committed developments, trip rates for Committed Development 2 were obtained from TRICS under the land use 'Employment' and its corresponding category 'Industrial Estate'. Trip rates assigned for the Noonan Development (Committed Development 1) were also obtained from TRICS and is comparable to the rates used by the LDA Development.

Table 11.3 presents the trips rates for the committed developments, for both arrivals and departures during the morning and evening peak hour periods. Table 11.4 summarises the total number of trips generated by the committed development in the AM and PM period.

Land Use	Unit/GFA	AM Peak Hour		PM Peak Hour	
		Arr	Dep	Arr	Dep
Residential (Noonan Construction Plot)	144	LDA House / Apartment Trip Rates (Ref. Table 11.1A)			
Light Industry	4,500 Sqm.	0.221	0.108	0.069	0.191

Table 11.3: Committed Development Peak Hour Vehicle Trip Rates

Based on the above trip rates, the corresponding forecast peak hour trip generation for both of the committed developments is presented in Table 11.4 for the AM and PM peak hour arrivals and departures.

Land Use	AM Peak Hour (0815-0915)			PM Peak Hour (1715-1815)		
	Arr	Dep	Two-way	Arr	Dep	Two-way
Residential (Noonan Plot)	18	48	66	48	19	67
Light Industry	10	5	15	3	9	12

Table 11.4: Adopted Committed Development Potential Peak Hour Vehicle Trips

In order to analyse and assess the impact of the proposed development on the surrounding road network, a traffic generation and distribution model (excel based) of the above key junctions was created and the following traffic scenarios investigated in accordance with TII best practice:

- 2024 Opening Year without/with development;
- 2029 Interim Year without/with development;
- 2039 Future Design Year without/with development.

Traffic Growth

To ensure a robust analysis of traffic upon the local road network, growth rates using the National Roads Authority (NRA) Project Appraisal Guideline projections were adopted. Table 5.5.1 within the TII Project Appraisal Guidelines provides Annual National Traffic Growth Factors for the different regions within Ireland. The subject site lies within '*County – Dublin*'. Applying the annual factors (medium growth) for the adopted Opening Year of 2024 the following growth rates have been adopted to establish corresponding 2024, 2029 and 2039 baseline network flows:

- 2019 to 2024 – 1.0933 (or 9.3%);
- 2019 to 2029 – 1.1953 (or 19.5%); and
- 2022 to 2039 – 1.2715 (or 27.15%).

Assessment Scenarios & Network Impact

It is anticipated that the earliest any part of the proposed scheme could be built and occupied would be some time in 2024. Accordingly, in response to TII best practice (*Guidelines for Traffic and Transport Assessments*); 2024, 2029 and 2039 (e.g., TII requirement being Opening Year plus 5 &15 years) have been adopted as the Opening Year, Interim Year and Future Design Years, respectively. Two different traffic scenarios have been assessed, namely (a) the 'Base' (Do-Nothing) traffic characteristics and (b) the 'Post Development' (Do-Something) traffic characteristics. The 'Base' traffic scenario takes into account the existing vehicles travelling across the local road network (as established by traffic surveys undertaken in 2019 and summarised in the applications Traffic and Transport Assessment Report) and local key committed third party developments. The proposed development traffic is then added to the network's 'Base' traffic flows to establish the 'Post Development' traffic flows. In summary, the following scenarios have been investigated:

Base	2019 - Base Traffic Flows
Do-Nothing	2024 – 'Do Nothing' Scenario
	2029 – 'Do Nothing' Scenario
	2039 – 'Do Nothing' Scenario
Do-Something	2024 – 'Do Something' Scenario
	2029 – 'Do Something' Scenario
	2039 – 'Do Something' Scenario

Table 11.5: Assessment Traffic Scenarios

The best practice guidance document '*Guidelines for Traffic Impact Assessments*' as published by the Chartered Institution of Highways and Transportation; states that the impact of any specific 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 network's operational performance.

An assessment has therefore been undertaken upon the key local junctions as located at or closest to the LDA site. Based upon experience these key junctions were identified during preplanning scoping discussions with the local roads authority and represent the nodes of the local road network were the latest scape of impact, in terms of additional vehicle movements generated by the proposed development, are predicted to be recorded in reference to the forecast predevelopment traffic conditions.

The continued dispersal of site generated vehicles through and beyond these key junctions and subsequently across the wider road network to additional junctions located further afield results in lower levels of development generated traffic flows being recorded at the nodes located some distance from the subject LDA site. Accordingly, the impact generated by the proposed development upon the wider road network is predicted to be minimal and below both the CIHT / TII thresholds and the daily variation in traffic volumes experienced at nodes located a greater distance from the LDA site to those considered in **Table 11.6** below.

Junction	Junction Name	Design Year	Percentage Impact	
			AM	PM
1	Ballygossan Park Access off Golf Link Rd (North)	2024	30.16%	33.99%
		2029	65.91%	74.65%
		2039	63.14%	71.60%
2	Proposed Site Access off Golf Link Rd (South)	2024	0.00%	0.00%
		2029	82.86%	97.42%
		2039	78.11%	91.59%
3	Golf Links Rd/Miller's Ln/Shenick Rd Junction	2024	5.61%	5.45%
		2029	15.04%	15.02%
		2039	14.19%	14.18%
4	Skerries Rd / Miller's Ln / Dublin Rd Roundabout	2024	1.96%	1.22%
		2029	5.44%	3.45%
		2039	5.13%	3.25%

Table 11.6: Proposed Developments Recorded Scale of Impact at Key Network Junctions

It was determined that the percentage level of impact (additional vehicle volumes above predevelopment traffic conditions) generated by the proposed development traffic on the adjoining roads exceeded 10% in all scenarios for Junctions 1, 2 and 3. The recorded impact on Junction 4 is recorded as being below the TII 10% threshold (Uncongested network) but just above the 5% threshold (congested network) detailed in the best practice documentation entitled *Traffic and Transport Assessment Guidelines* (2014).

The potential impact generated by the subject LDA SHD development have previously been investigated at the two off-site junctions (Junction No. 3 and Junction No. 4 on Miller's Lane) as part of the off-site Advanced Accommodation Works application (FCC Ref. F20A/0324). However, to ensure a robust assessment, all four junctions are the focus of the detailed junction analysis reported in the following sections of this chapter.

Figure 11.20 and **Figure 11.21** below details the total amount of two-way vehicle trips that will pass through the key off-site junctions in the 2037 Future Design Year and the resulting percentage increase in traffic flows as a result of the traffic generated by the proposed development.

Figure 11.20: Increase in Vehicle Trips Generated Through Key Of-Site Junctions (DS 2039 AM Peak)

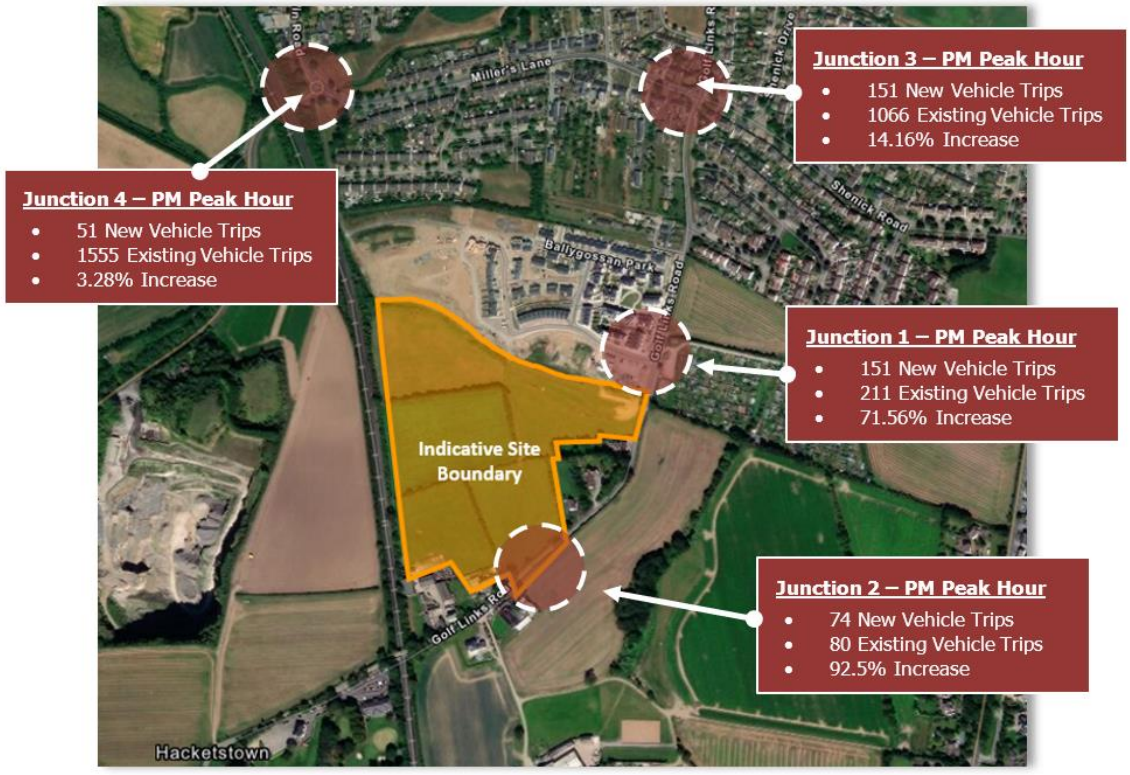

Figure 11.21: Increase in Vehicle Trips Generated Through Key Of-Site Junctions (DS 2039 PM Peak)

11.5.1.3 Potential Cumulative Impacts

The analysis detailed herein represents an appraisal in terms of potential cumulative impacts for a typical weekday as it considers;

- the key two busiest periods of the day (e.g., AM and PM peak hours) in each of the adopted design years. 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. Assessing future design years of 2024, 2029 and 2039 utilising TII growth rates as per best practice ensures that any additional demands upon the transport networks are fully considered.

- the additional site specific demands associated with the two key third party development proposals as introduced in section 11.1.5.2 above and Figure 11.19 under the title of committed development.

Potential cumulative impacts have been assessed in relation to the existing and permitted infrastructure schemes by the applicant such as the Off-Site Accommodation Works (FCC Ref F20A/0324) and the Advanced Infrastructure Application Works (FCC Ref F21A/0287). The permitted Off-Site Accommodation Works are being implemented by the applicant to mitigate the impact predicted to be generated by the proposed development. The site of the proposed development, positioned within the extended urban environment, is ideally positioned to maximise access to / from the site by sustainable forms of travel including walking, cycling and public transport particularly by the integrated connectivity being delivered by the applicant through the permeable linkages implemented as part of the Advanced Infrastructure Application Works.

Whilst the utilisation of TII growth rates introduced above in section 11.1.5.2 accounts for the growth in vehicle traffic associated with future development in the area, a desktop study has also conducted of recent planning applications in the vicinity of the subject LDA development site utilising the Fingal County Council planning database archive with the objective of identifying granted / committed or emerging applications in close proximity to the subject LDA development site. An emerging application by (i) Noonan Construction for a residential development to the north of the subject LDA site in Hacketstown and (ii) a light Industry / Commercial Development site on a site accessed from the R127 Skerries Road; have been established and subsequently both of these two third party scheme have been included within this assessment. Further details of these two third party schemes are included in section 11.1.5.2 above and within the planning applications Traffic and Transportation Assessment Report.

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 the forecast background network traffic growth (should that growth arise as per TII projections) and the two identified third party committed developments.

JUNCTION REFERENCE	Peak Hour Period	FUTURE DESIGN YEAR		
		2024	2029	2039
JUNTION 1 - Ballygossan Park Site Access	AM	0.04	0.14	0.14
	PM	0.08	0.14	0.15
JUNTION 2 - Proposed Site Access (Golf Link)	AM	-	-	-
	PM	-	-	-
JUNTION 3 - Golf Links Rd / Miller's Lane / Shenick Rd	AM	0.59	0.65	0.70
	PM	0.57	0.64	0.68
JUNTION 4 - Dublin Road/ Millers Lane / Skerries Rd	AM	0.32	0.35	0.38
	PM	0.60	0.66	0.71

Table 11.7A: Maximum Ratio of Flow to Capacity (RFC) at Local Key Nodes – Do Nothing Scenario

An operational analysis of the existing key local junctions has been undertaken for the Do Nothing scenario for each of the adopted future design years, namely 2024, 2029 and 2039 in accordance with TII best practice. Further to the details provided in the applications Traffic and Transport Assessment, Report, **Table 11.7A** above provides a summary (maximum recorded RFC value) of the key junction PICADY / ARCADY modelling output data in each of the networks AM and PM peak hour periods. The simulation results reveal that the three existing key local junctions are predicted to be operating within capacity (<0.90 RFC) in each future design year.

The capacity of the existing local public transport networks have also been quantified based upon surveys passenger surveys undertaken in February 2022. Whilst the Covid-19 travel restrictions had been lifted at the time the surveys it is generally accepted that 'normal' travel levels had not returned to pre Covid levels. Accordingly, reference has been made to the Central Statists Office (CSO) publication Transport Bulletin March 2022 to assist in identifying corresponding pre- Covid-19 patronage levels The analysis, as summarised in **Table 11.7B** below and expanded upon in the applications *Traffic and Transport Assessment Report*, demonstrates that the existing rail and bus networks benefit from having reserve capacity during the peak AM and PM travel periods.

Mode of Travel	AM Peak Period				PM Peak Period			
	No. of Services (Direction of Travel)	Network Passenger Capacity	Reserve Capacity (Feb 2022)	Reserve Capacity (Post Covid)	No. of Services	Network Passenger Capacity	Reserve Capacity (Feb 2022)	Reserve Capacity (Post Covid)
Rail	11 (S'bound)	4421	2854	1458	8 (S'bound)	2240	1827	1459
	5 (N'bound)	1400	1021	683	10 (N'bound)	4020	2314	790
	16 (Two-way)	**5821**	**3875**	**2141**	**18 (Two-way)**	**6260**	**4139**	**2249**
Bus	19 (S'bound)	1515	1405	1352	9 (S'bound)	720	628	584
	9 (N'bound)	681	597	557	21 (N'bound)	1636	1516	1458
	28 (Two-way)	**2196**	**2002**	**1908**	**30 (Two-way)**	**2356**	**2144**	**2042**
Total (Two-way)	**44 (Two-way)**	**8017**	**5877**	**4049**	**46 (Two-way)**	**8616**	**6283**	**4291**

Table 11.7B: Public Transport Network Capacity – Existing 2022 Baseline Scenario

11.6 REMEDIAL & MITIGATION MEASURES

11.6.1.1 Construction Phase

The Construction Management Plan will be prepared as part of the planning application with an associated Construction Traffic Management Plan (CTMP) which will incorporate a range of integrated control measures and associated management activities with the objective of minimising the construction activities associated with the development. The following initiatives, which will represent contractual obligations for the appointed contractor; will be implemented to avoid, minimise and/or mitigate against the anticipated construction impacts:

- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads;
- Appropriate on-site parking and compound area will be provided to prevent overflow onto the local network;
- It is likely that some numbers of the construction team will be brought to/from the site in vans/minibuses, which will serve to reduce the trip generation potential;
- Delivery vehicles to and from the site will be spread across the course of the working day, therefore, the number of HGVs travelling during the peak hours will be relatively low;

- Truck wheel washes will be installed at construction entrances and any specific recommendations with regard to construction traffic management made by Fingal County Council will be adhered to;
- Potential localised traffic disruptions during the construction phase will be mitigated through the implementation of industry standard traffic management measures. These traffic management measures shall be designed and implemented in accordance with the Department of Transport's Traffic Signs Manual "*Chapter 8 Temporary Traffic Measures and Signs for Roadworks*" and "*Guidance for the Control and Management of Traffic at Roads Works – 2nd Edition*" (2010); and
- Site entrance point/s from the public highway will be constructed with a bound, durable surface capable of withstanding heavy loads and with a sealed joint between the access and public highway. This durable bound surface will be constructed for a distance of 10m from the public highway.
- Material storage zone will be established in the compound area and will include material recycling areas and facilities;
- 'Way finding' signage will be provided to route staff / deliveries into the site and to designated compound / construction areas;
- Dedicated construction haul routes will be identified and agreed with Fingal County Council prior to commencement of activities on-site; and
- On completion of the works, all construction materials, debris, temporary hardstands etc. form the site compound will be removed off-site and the site compound area reinstated in full on completion of the works.

11.6.1.2 Operational Phase

A package of integrated mitigation measures has been identified to off-set the additional local demand that the proposed residential development at the subject site could potentially generate as a result of the forecast increase in vehicle movements by residents of the scheme. The identified measures and associated timescale for their implementation are summarised below.

- **Management** – A Mobility Management (MMP) is compiled with the aim of guiding the delivery and management of coordinated initiatives by the scheme promotor to be implemented upon occupation of the site. The MMP will ultimately seek to encourage sustainable travel practices for all journeys to and from the proposed development.

- **Infrastructure by Applicant** 2022/2023 – Off-site junction enhancements at Millers Lane junctions.

- **Infrastructure (By Others)** – The aspirations of the Fingal County Council Development Plan seeks the implementation of the Skerries Southern Relief Road (Local Objective No 10) which upon delivery will transform local traffic characteristics along Golf Links Road. Whilst the proposed off-site junction enhancements have been proved to fully mitigate the predicted impact from both the subject LDA development and the neighbouring Noonan plot and will provide further relief to the existing local road network.

- **Infrastructure (Bicycle Facilities)** – The development proposals seek to encourage sustainable travel habits through the provision of a network of dedicated infrastructure connections for active modes of travel. This includes the implementation of (i) segregated bicycle tracks along the eastern side of the proposed developments main north-south 'link' street, (ii) the provision of a dedicated shared ped / cycle connection along the entire western boundary of the subject site which links into existing and emerging (Noonan Construction site) onwards connections subsequently providing an attractive and convenient route to/from the R127 Dublin Rd corridor, and (iii) internal traffic free pedestrian links that provide an attractive and positive advantage (e.g. shortest route) for pedestrians.

- **Infrastructure (Bicycle Facilities)** – With the objective of encouraging the local journeys to be undertaken by bicycle, the design of the LDA residential development includes the provision of a total of 802 bicycle parking opportunities including both long term (residents) and short term (visitors) bicycle

parking facilities. This overall quantum complies with development management standards. Furthermore, in accordance with best practice the dedicated long term (residents) bicycle parking all benefit from the provision of secure weather protection.

- **Infrastructure (Permeability)** – The design of the scheme proposals has sought to maximise the ability to provide attractive connections to the third-party lands surrounding the subject development site. The implementation of pedestrian / cycle infrastructure extending right up to the boundary of the site enables the planning authority, in consultation with third parties as appropriate; to deliver a network of permeable linkages between the subject development lands and both existing and future developments adjoining the subject site.

- **Car Sharing –** The applicant is in negotiations with GoCar, the leading car sharing service provided in Ireland; to locate and base a GoCar vehicle on-site within the subject development. The availability of car sharing on-site provide a viable alternative to residents owning private vehicles whilst still having access to a car when required.

11.6.1.3 'Worst Case' Scenario

As stated previously, the analysis carried out represents a worst-case appraisal of a typical weekday as it is focused upon the two busiest periods of the day (i.e., AM and PM peak hours). During the remaining 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. Similarly, over the weekend periods both the site generated traffic and the external road network traffic flows are generally lower compared to the weekday peak hour periods that have been assessed.

11.7 RESIDUAL IMPACTS

Construction Phase

Provided the above mitigation measures and management procedures are incorporated during the construction phase, the residual impact on the local receiving environment will be temporary in nature and neutral in terms of quality and effect.

The significance of each of the projected impacts are detailed in **Table 11.5** for the following key junctions:

- **Junction 1**: Ballygossan Park Site Access off Golf Links Road (North)
- **Junction 2:** Proposed Site Access of Golf Links Road (South)
- **Junction 3:** Golf Links Rd/Miller's Ln/Shenick Rd Junction
- **Junction 4:** Skerries Rd/Miller's Ln/Dublin Rd Roundabout

The significance of the impacts has been determined in accordance with the classifications stipulated within the Environmental Protection Agency *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports - Draft (August 2017).* The scale of the predicated construction impact, as summarised previously in section 11.1.5.1, has been considered in the specific context of the network's baseline capacity detailed in **Table 11.7** which enabled the scale and subsequent impact significance to be predicted.

Junction Ref	Environment Character	Quality / Scale of Impact	Impact Significance	Duration
1	Low-Medium Sensitivity	Negative - Medium	Moderate	Short Term
2	Low Sensitivity	Negative - Low	Slight	Temporary
3	Medium Sensitivity	Negative - Medium	Moderate	Short Term
4	Medium Sensitivity	Negative - Low	Slight	Short Term

Table 11.8A: Impact Significance at Local Nodes – Construction Phase

Operational Phase

Based upon February 2022 service timetables and recorded vehicle / carriage utilisation levels employed by the operators the capacity of the existing bus and rail networks has been quantified previously in section 11.1.5 and Figure 11.7B. The potential additional passenger demands predicted to be generated by both the proposed development and the neighbouring committed development (Noonan Construction) have been established (Ref section 11.1.5.2) which has enabled an assessment of the public transport networks capacity in the post development scenario to be undertaken. Table 11.8B below reveals that both the bus and rail networks have the capacity to accommodate the additional demands across the peak AM and PM travel periods.

Mode of Travel	Peak Period	Direction of Travel	Existing Network Total Passenger Capacity	Existing Reserve Capacity (Adjusted Post Covid)	Additional Forecast Passenger Demands per Development Proposal			Forecast Reserve Capacity (Post Development)	
					LDA	Noonan	Total	Passenger No's	%
Bus	AM	Southbound	1515	1352	47	20	67	1285	84.9%
		Northbound	681	556	0	0	0	556	81.6%
		Two-way	**2196**	**1908**	**47**	**20**	**67**	**1841**	**83.8%**
	PM	Southbound	720	584	0	0	0	584	81.0%
		Northbound	1636	1458	55	23	78	1380	84.3%
		Two-way	**2356**	**2042**	**55**	**23**	**78**	**1965**	**83.4%**
Rail	AM	Southbound	4421	1458	197	83	280	1178	26.6%
		Northbound	1400	683	48	20	68	615	43.9%
		Two-way	**5821**	**2141**	**245**	**103**	**348**	**1793**	**30.8%**
	PM	Southbound	2240	1459	55	23	78	1381	61.6%
		Northbound	4020	790	232	99	331	459	11.4%
		Two-way	**6260**	**2249**	**287**	**122**	**409**	**1840**	**29.3%**

Table 11.8B: Forecast Public Transport Capacity Based Upon Existing Service Levels

The implementation of the identified mitigation measures outlined above, including the MMP and the off-site advanced infrastructure works on Golfs Links Road and at the Skerries Rd / Miller's Ln / Dublin Rd junctions

and Miller's Ln / Golf Links Road / Shenick Rd junction, will ensure that the residual effect on the local receiving environments road network is both managed and minimised.

The traffic analysis predicts the scale of residual impact at the off-site Skerries Rd / Miller's Ln / Dublin Rd Roundabout, during the future 2024, 2029 and 2039 design years, as largely being well below 10% on the surrounding links. Larger impacts are predicted at the local roads networks nodes 1,2 and 3 as detailed in **Table 11.9** below however the recorded scale of operational traffic is very much influenced by the existing low levels of traffic movements along Golf Links Road, particularly at the locations of the masterplan lands two access junctions (e.g., nodes 1 and 2) on Gold Links Rod corridor.

Junction		Peak Hour	2024 Do Something	2029 Do Something	2039 Do Something
1	Ballygossan Park Site Access off Golf Links Road (North)	AM	30.16%	65.91%	63.14%
		PM	33.99%	74.65%	71.60%
2	Proposed Site Access of Golf Links Road (South)	AM	0.00%	82.86%	78.11%
		PM	0.00%	97.42%	91.59%
3	Golf Links Rd/Miller's Ln/Shenick Rd Junction	AM	5.61%	15.04%	14.19%
		PM	5.45%	15.02%	14.18%
4	Skerries Rd/Miller's Ln/Dublin Rd Roundabout	AM	1.96%	5.44%	5.13%
		PM	1.22%	3.45%	3.25%

Table 11.9: Predicted Impact (Additional Vehicles) at Key Nodes in each Do-Something Design Year

In reference to TII thresholds, the analysis for the future design years Do-Something traffic scenarios in 2024, 2029 and 2039 at the off-site Skerries Rd / Miller's Ln / Dublin Rd Roundabout demonstrates that the proposed residential development operational traffic will not generate an impact greater than 10% or 5% on normal or congested networks, respectively. As a result, the impact can be classified as sub threshold.

Junction Reference	Peak Hour Period	Future Design Year		
		2024	2029	2039
JUNTION 1 - Ballygossan Park Site Access	AM	0.13	0.22	0.23
	PM	0.13	0.23	0.24
JUNTION 2 - Proposed Site Access (Golf Link)	AM	0.10	0.10	0.10
	PM	0.01	0.09	0.09
JUNTION 3 - Golf Links Rd / Miller's Lane / Shenick Rd	AM	0.38	0.46	0.48
	PM	0.53	0.63	0.67
JUNTION 4 - Dublin Road/ Millers Lane / Skerries Rd	AM	0.37	0.42	0.45
	PM	0.54	0.61	0.66

Table 11.10: Maximum Ratio of Flow to Capacity (RFC) at Local Key Nodes – Do Something Scenario

The significance of each of the projected impacts (Table 11.9 and Table 11.10) at each of the key local nodes is detailed within the following tables for the worst case (e.g. peak hours) 2039 Future Design Year scenarios.

Ref	Environment Character	Quality / Scale of Impact	Impact Significance	Duration
1	Low-Medium Sensitivity	Negative – High	Moderate	Long Term
2	Low Sensitivity	Negative - Medium	Slight	Long Term

3	Medium Sensitivity	Negative - Medium	Moderate	Long Term
4	Medium Sensitivity	Negative - Negligible	Not Significant	Long Term

Table 11.11: Impact Significance – 2039 Design Year (AM Park Hour)

Ref	Environment Character	Quality / Scale of Impact	Impact Significance	Duration
1	Low-Medium Sensitivity	Negative – High	Moderate	Long Term
2	Low Sensitivity	Negative - Medium	Slight	Long Term
3	Medium Sensitivity	Negative - Medium	Moderate	Long Term
4	Medium Sensitivity	Negative - Negligible	Not Significant	Long Term

Table 11.12: Impact Significance – 2039 Design Year (PM Peak Hour)

11.8 MONITORING

11.8.1.1 Construction Phase

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
- Timing of construction activities.

11.8.1.2 Operational Phase

As part of the MMP process, bi-annual post occupancy surveys are to be carried out in order to determine the success of the measures and initiatives as set out in the proposed MMP document. 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.

11.9 REINSTATEMENT

11.9.1.1 Construction Phase

The construction works areas will be reinstated following completion of development with landscaped areas provided where proposed. The works will be restricted to the footprint of the site for the proposed development. Excavated topsoil and subsoil will be reused in reinstatement and landscaping where appropriate or dealt with in the appropriate manner i.e., sent for soil recovery as appropriate.

11.9.1.2 Operational Phase

No reinstatement requirements have been identified in relation to the operational phase of the proposed development.

11.10 INTERACTIONS

No impact interactions have been identified and it is considered that any minor impacts will be avoided through the implementation of best working practices as stipulated within the Construction Traffic Management Plan and Mobility Management Plan prepared in support of the proposed development.

11.11 DIFFICULTIES ENCOUNTERED IN COMPILING

There were no material difficulties encountered in compiling and assessing the data for this EIAR to prevent modelling of the likely transport effects of the proposed development. The traffic analysis reported within this chapter is based upon the traffic survey data specifically commissioned for this appraisal and undertaken in 2019 (Road Network) and 2022 (Public Transport Network). Accordingly, the survey data considers traffic conditions when there were no Covid-19 travel restriction imposed. The road traffic data collated in 2019 is within the industries three-year validation window as per best practice. The additional traffic surveys undertaken to establish public transport capacity at local interchange facilities were undertaken in February 2022 and as such during the current covid travel conditions (i.e. no travel restrictions but passenger levels have not yet returned fully to pre-covid levels). In order to convert this 2022 data to corresponding pre covid conditions reference has been made to the Central Statistics Office publication Transport Bulletin March 2022 which has enabled the recorded 2022 data to be converted to corresponding pre-covid passenger levels based upon the latest up to date information collected by the National Transport Authority and published by the CSO.

11.12 REFERENCES

- *Bus Connects* website (www.busconnects.ie)
- *Central Statistics Office* website (www.cso.ie)
- Department of Transport's *Traffic Signs Manual* (www.gov.ie/en/publication/f288e1-traffic-signs-manual)
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (EC, 2017)
- Department of Transport's "*Guidance for the Control and Management of Traffic at Roads Works – 2nd Edition*" (2010)
- Department of Transport's *Traffic Management Guidelines* (www.gov.ie/en/publication/e7f655-traffic-management-guidelines)
- Dublin Bus website (www.dublinbus.ie)
- Environmental Protection Agency *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – Draft (August 2017)*
- Fingal County Council Development Plan (2017-2023)
- Fingal County Council online planning portal (www.fingal.ie/view-or-search-planning-applications)
- *GoAhead Ireland* website (www.goaheadireland.ie)
- *Iarnród Éireann* (Irish Rail) website (www.irishrail.ie)
- National Transport Authority; Greater Dublin Area Cycle Network Plan (2013)
- National Road Authorities (NRA) '*Traffic and Transport Assessment Guidelines*' (2014)
- Ordnance Survey Ireland (www.osi.ie)
- The Institution of Highways and Transportation '*Guidelines for Traffic Impact Assessments*' (1994)
- *Traffic & Transportation Assessment* Report (March 2022) for the proposed development in Hacketstown, Skerries.
- Transport for Ireland (www.transportforireland.ie)
- Transport Infrastructure Ireland (www.tii.ie)