

14.0 MATERIAL ASSETS - TRAFFIC & TRANSPORTATION

14.1 Introduction

O'Connor Sutton Cronin (OCSC) were engaged by the applicant, Sandyford GP Ltd. to prepare a Traffic and Transport Assessment as part of an Environmental Impact Assessment Report (EIAR) for a proposed residential development and associated facilities on a site of c. 1.54 hectares located within Sandyford Business Park adjacent the Stillorgan Luas stop.

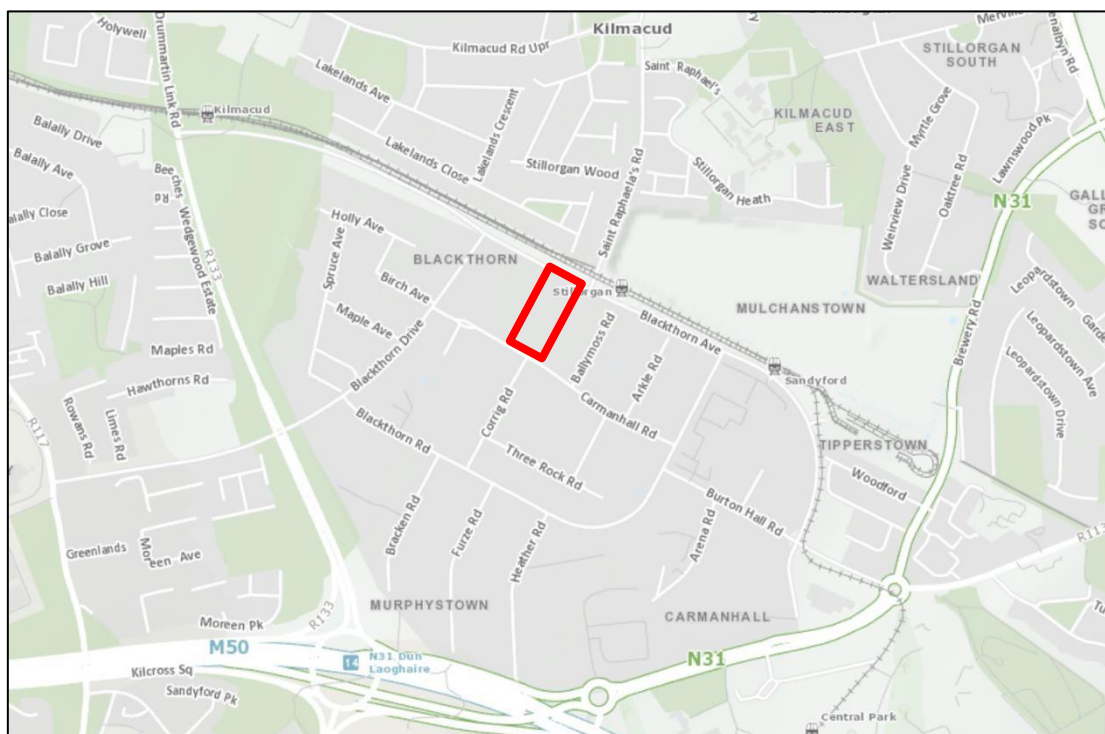


Figure 14.1: Site Location Map.

This Chapter of the EIAR assesses any likely or significant impacts associated with traffic and transportation issues arising from the proposed development. In doing so, this chapter has assessed both the operational and construction stages of the development while also considering the Do Nothing Scenario, the cumulative impact of unrelated third party developments, mitigation measures required and residual impacts.

This assessment has been prepared by Patrick Raggett (B.E. CEng MIEI, MCIHT), Associate with O'Connor Sutton Cronin Multidisciplinary Consulting Engineers, a Chartered Civil Engineer with over 11 years' experience and with specific expertise in traffic & transport engineering, having been involved in the successful planning, design and completion of a wide range of projects in Ireland and the UK, ranging from a mix of commercial, residential, healthcare and leisure developments to major road and civil infrastructural schemes. Works completed included detailed traffic & transportation assessments, road and scheme design, mobility management planning and peer review. Patrick's experience with respect to the preparation of EIAR chapters includes the Belgard Gardens residential and student accommodation development (PL29S.303358), the Corballis East infrastructure application (F18A/o618) and the Connolly Quarter development consisting of a large scale Build to Rent residential development in Dublin City Centre (ABP-304248-19).

This assessment is based on the Traffic Impact Assessment prepared and submitted under separate cover as part of this planning application. The associated appendices from this report that should be referenced in conjunction with this assessment are also appended to this chapter and include:

- Appendix 14.1 Traffic Surveys
- Appendix 14.2 Traffic Flow Diagrams
- Appendix 14.3 Model Calibration Summary
- Appendix 14.4 Model Output Files

14.2 Methodology

This assessment has been carried out in accordance with relevant guidelines including:

- Traffic & Transport Assessment Guidelines (2014) as published by the former National Roads Authority (NRA) now Transport Infrastructure Ireland (TII);
- Guidelines for Traffic Impact Assessment (1997) as published by the Chartered Institute of Highways & Transportation;
- Dun Laoghaire-Rathdown County Development Plan 2016-2022.

OCSC met with Ms. Claire Casey and Mr. Sean Manton of Dun Laoghaire-Rathdown County Council (DLRCC) Transportation Planning Department on Tuesday 21st May 2019 to discuss the proposed development and agree the overall strategy and methodology for this assessment.

The assessment was based on a series of bespoke traffic surveys including junction turning counts, queue length surveys and pedestrian crossing surveys. These were undertaken Thursday 11th April 2019 & Thursday 23rd May 2019 between the hours of 07:00 – 10:00 and 16:00 – 19:00, at locations agreed with DLRCC. These survey locations are shown in Figure 14.2 below.

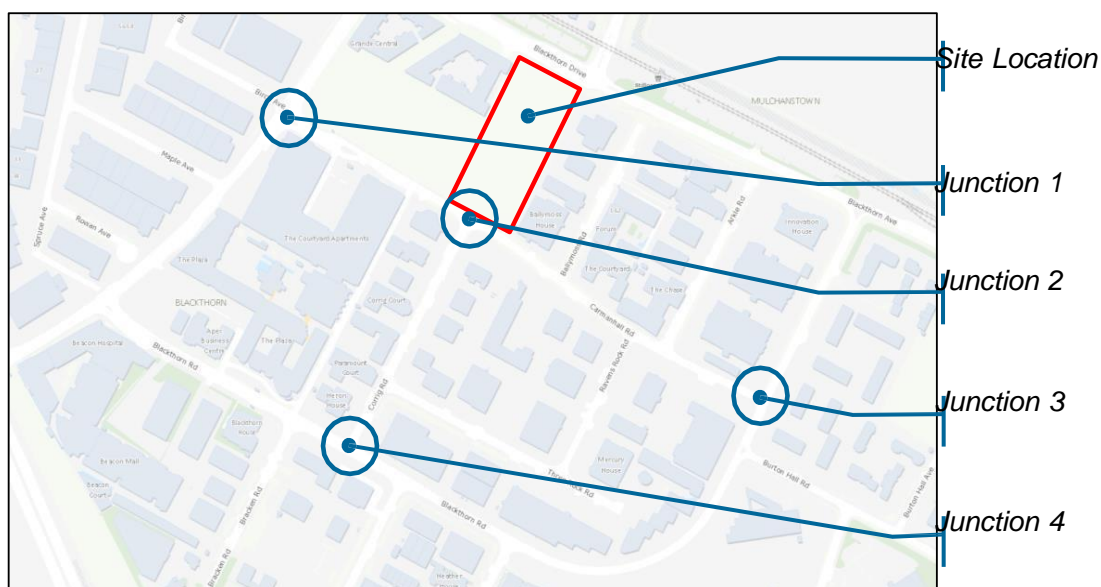


Figure 14.2: Traffic Survey Locations.

The survey data was projected to future year levels to allow for natural traffic growth and adjacent development based on growth factors developed by TII and contained within their Project Appraisal Guidelines as per current best practice.

Construction traffic was assessed based on estimates for construction traffic generation and expected associated travel patterns.

The estimated additional traffic was assigned to the local road network and its impact on the operation of the local links and junctions was assessed using guidance from TII, CIHT, the Design Manual for Roads and Bridges (DMRB) and TRANSYT 15/Junctions 9 traffic modelling software. The assessment considered a number of scenarios to allow the true impact of the proposed development along with the cumulative impact of third party developments to be considered. These scenarios are summarised as follows:

- Do-Nothing – no development taking place in the local area and only allowance for natural background traffic growth;
- Do-Something – natural background traffic growth and the additional traffic estimated to be generated by the proposed development;
- Do-Maximum – natural background traffic growth, the additional traffic estimated to be generated by the proposed development and relevant but unrelated third party developments either approved or lodged for planning within the local area.

Based on a review of the planning history in the study area and the associated trip generation potential of the respective development, the unrelated third party development selected for inclusion in the Do-Maximum assessment are as follows:

- RB Central – Carmanhall Road (Planning Reference: ABP304405-19);
- Sandyford Student Accommodation – Carmanhall Road (Planning Reference: PL06D.303467);
- Beacon South Quarter Development – Junction of Blackthorn Drive and Blackthorn Road (Planning Reference D18A/0785);
- Modifications to Permitted Office Development – Arkle Road (Planning Reference: D18A/0212);
- Amendments to Approved Office Development – Blackthorn Avenue (Planning Reference: D17A/0496);
- Proposed Office Development – Burton Hall Road (Planning Reference: D16A/0076);
- Proposed Temporary School – Ballymoss Road (Planning Reference D18A/1210).

Each scenario was assessed for the assumed Year of Opening (2023) and Design Year (2038).

14.3 Proposed Development

A comprehensive description of the proposed development is presented in Chapter 3 of this EIAR. In summary, the development, which will have a Gross Floor Area of 49,342 sq m, will principally consist of: the demolition of the existing structures on site and the provision of a Build-to-Rent residential development comprising 564 No. apartments (46 No. studio apartments, 205 No. one bed apartments, 295 No. two bed apartments and 18 No. three bed apartments) in 6 No. blocks as follows: Block A (144 No. apartments); Block B (68 No. apartments); Block C (33 No. apartments); Block D (103 No. apartments); Block E (48 No. apartments); and Block F (168 No. apartments).

The development provides resident amenity spaces (1,095 sq m) in Blocks A, C and D including concierge, gymnasium, lounges, games room and a panoramic function room at Roof Level of Block D; a creche (354 sq m); café (141 sq m); a pedestrian thoroughfare from Carmanhall Road to Blackthorn Drive also connecting into the boulevard at Rockbrook to the west; principal vehicular access off Carmanhall Road with servicing and bicycle access also provided off Blackthorn Drive; 285 No. car parking spaces (254 No. at basement level and 31 No. at ground level); 21 No. motorcycle spaces; set-down areas; bicycle parking; bin storage; boundary treatments; hard and soft landscaping; lighting; plant; ESB substations and switchrooms; sedum roofs; and all other associated site works above and below ground.

In terms of transportation, the key features of the proposed development are as follows:

- The site is bounded by Carmanhall Road to the south, Blackthorn Drive to the north and unrelated third party lands to the east and west;
- Car parking is proposed in accordance with the Guidelines for Planning Authorities, Design Standards for New Apartments (March 2018) from the Department of Housing, Planning and Local Government. This takes into consideration the build to rent nature of the development, the existing demand for car parking and car usage locally based on data from the 2016 Census combined with existing and proposed public transport, cycle and pedestrian infrastructure locally and a series of comprehensive parking management proposals for the development;
- It is proposed to dedicate a minimum of 10 No. vehicles to use by a car club facility such as GoCar which will be available for use by residents at the development as part of the overall parking management strategy, ensuring access to a vehicle for non-commuting purposes without the need to own a car;
- The majority of car parking (254 No. spaces) is to be provided under-development at Level 0 which will be accessed via an entrance point on Carmanhall Road, in the southeast corner of the site and replacing the existing site entrance;
- Some additional parking (31 No. spaces) is to be provided at Level 1 which will be accessed by an additional entrance on Carmanhall Road, just west of its junction with Corrig Road;
- Both vehicular entrances will operate under a simple uncontrolled layout designed in accordance with the Design Manual for Urban Roads and Streets (DMURS);
- A total of 30 No. electric vehicle parking spaces are proposed with provision made for the upgrade of all spaces to facilitate electric vehicle charging in the future;
- Cycle parking is also being provided in accordance with the Guidelines for Planning Authorities, Design Standards for New Apartments. A total of 1,178 spaces are proposed at a rate of 1 space per bedroom for residents and 1 space per 2 units for visitors;
- A dedicated cycle parking access route to the Level 0 parking area is provided on Blackthorn Drive. This will also facilitate infrequent servicing access requirements including the movement of bins during collections periods. The Level 0 ramp access from Carmanhall Road also includes a segregated 2.0m wide cycle access ramp at a shallower 1:14 gradient. A raised ramp will be provided to ensure pedestrian priority across the proposed pedestrian entrance on Carmanhall Road;
- 21 No. motorcycle parking spaces are proposed in accordance with the DLRCC Development Plan standards;
- All car parking is to be dedicated for use by residents with none proposed to serve the creche facility. This is based on the expectation that users of the creche will be based within the development site or the local area and that the accessible nature of the site is more than sufficient to serve the travel needs of staff;

- Apartment rental prices will be quoted without parking. Should a perspective occupier require parking this will be provided at an additional cost on a first come, first served basis;
- Set down and servicing parking areas are proposed on both Carmanhall Road and Blackthorn Drive which will facilitate activities such as creche drop off/collection, waste collection and other servicing needs. It is stressed that these areas are not proposed to serve as visitor parking or any long term parking usage;
- Pedestrian access is provided through the site via a north-south link providing a direct route to the Luas. Due to the topography of the site, stairs are provided at the northern end along with an internal lift which will be open to public use. Cyclists may also use this route through the site with manoeuvring of the steps facilitated by a bike channel;
- Access for fire tender and other emergency vehicles is also catered for via the north- south link with a swept path analysis having been carried out for such vehicles.

It is noted that the development site has an existing permission for a similar residential development with a lower number of units but considerably higher level of car parking provision. The proposed development has adopted a number of the positive features in transportation terms from the approved development including the overall access strategy for vehicles, cyclists and pedestrians along with the dedicated set down areas on Carmanhall Road and Blackthorn Drive.

In terms of traffic generation, the primary trip generator is expected to be the residential element of the development. The ancillary creche and amenity elements are expected to serve residents at the development or, in the case of the former, those in the local area who will be already be on the local transport network as part of their daily commute. As a result, they are not expected to be independent trip generators.

The adjacent site to the west has recently been granted planning permission for a residential development, known as Rockbrook Central, comprising 428 No. units along with 862m² local/neighbourhood retail units and additional residential amenity elements. The EIAR associated with this application included a comprehensive Traffic & Transportation section which set out predicted traffic flows for the proposed apartments based on bespoke surveys carried out at the existing apartments on the Rockbrook site.

The existing Rockbrook development provides a level of car parking notably in excess of what is proposed at the Sandyford Central development (1.1 spaces per unit and 0.51 spaces per unit respectively). As a result, the use of the Rockbrook trip rates when estimating the trip generation potential for the Sandyford Central development is considered to be a conservative and appropriate approach to ensure a robust assessment. Nevertheless, it should be noted that, in practice, the trip generation of the Sandyford Central project is likely to be lower than that estimated here as a result of this reduced parking provision.

Thus, the conservatively estimated trip rates per unit of the proposed development are set out in Table 14.1 below and the estimated peak hour trips are shown in Table 14.2.

Time Period	Arrivals	Departures
A.M. Peak Hour	0.050	0.138
P.M. Peak Hour	0.091	0.041

Table 14.1: Apartment Trip Rates.

Time Period	Arrivals	Departures
A.M. Peak Hour	28	77
P.M. Peak Hour	34	23

Table 14.2: Sandyford Central Estimated Trip Generation.

With respect to the extant planning permission at the site, the estimated trip generation in the respective Traffic & Transport Impact Assessment for the approved development is set out following.

Time Period	Arrivals	Departures
A.M. Peak Hour	27	77
P.M. Peak Hour	73	37

Table 14.3: Previously Approved Development Estimated Trip Generation.

When comparing the proposed and approved development, it can be seen that the estimated trip generation for the proposed development is effectively equal with the A.M. peak estimates for the approved development but notably lower for the P.M. peak hour estimates

14.4 Receiving Environment

The receiving environment is urban in nature. The main transportation arteries in the study area are Carmanhall Road, Blackthorn Road and Blackthorn Drive/Avenue which ultimately link to the major transport arteries outside of the study area including:

- The M50 to the south, with eastbound traffic accessing the site via Junction 13 at Dundrum and westbound traffic via Junction 14. Traffic exiting the district accesses the motorway at Junction 14;
- R133 Drummartin Link Road linking to the M50 to the south and Goatstown to the north;
- N31/R113 Leopardstown Road which facilitates a link to the M50 and Murphystown to the south and Dun Laoghaire and Blackrock to the north.

Outside of the study area, development generated traffic will dissipate and so is expected to have a negligible impact on the operation of the wider network. While there is likely to be substantial variation in the type of traffic travelling on the links locally, during the peak travel hours they would be expected to mainly carry commuter traffic.

As noted previously, base traffic levels have been surveyed on the local network in 2019. By combining these base flows with the traffic generation estimates for the proposed development, the following peaks were identified:

- A.M. Peak Hour: 08:00 – 09:00;
- P.M. Peak Hour: 16:15 – 17:15.

The base year traffic flows, along with those for all scenarios being assessed, can be seen in the diagrams appended to this chapter. Any apparent discrepancy in flows between sites may be attributed to vehicles accessing developments and minor roads between surveyed junctions.

TA 79/99 "Traffic Capacity of Urban Roads" from the DMRB provides information on the capacity of urban roads based on classification and width. Table 14.4 following shows the capacities of various road types based on this manual and using a 60:40 split in flow.

2 Way Single Carriageway – Busiest Direction of Flow (60/40 split)									
	<i>Total Number of lanes</i>								
<i>Carriageway Width (m)</i>	2				2-3	3	3-4	4	4+
		6.10	6.75	7.30	9.0	10.0		12.3	13.5

<i>Road Type</i>	UM	<i>Not Applicable</i>								
	UAP1	1020	1320	1590	1860	2010	2550	2800	3050	3300
	UAP2	1020	1260	1470	1550	1650	1700	1900	2100	2700
	UAP3	900	1110	1300	1530	1620	*	*	*	*
	UAP4	750	900	1140	1320	1410	*	*	*	*

Table 14.4: Urban Road Capacities.

The local links have been classified based on the associated definitions in the DMRB. Using the previous table, link capacities have been calculated and current Ratio of Flow to Capacity (RFC) values have been assessed for the key links bordering the site. These are shown for the base year peak hours in Table 14.5.

It should be noted that given the variation in width across the links in question, an average figure for each has been used which is rounded down to the nearest value shown in the above table, thus ensuring a conservative assessment of link capacity.

Link	Width (m)	Link Capacity (veh/hr)	A.M. Peak (veh/hr)	RFC (%)	P.M. Peak (veh/h)	RFC (%)
Blackthorn Road	9.0	1,860	810	43.5	1,179	63.4
Carmanhall Road	6.1	1,020	478	46.9	558	54.7
Blackthorn Drive	10.0	2,010	600	29.9	635	31.6

Table 14.5: Base Year Link RFC Values for Local Network.

As can be seen, all links are shown to be operating well within capacity in the base case.

The Dún Laoghaire-Rathdown Development Plan 2016-2022, which incorporates the Sandyford Urban Framework Plan, includes a number of objectives with respect to sustainable transport. In this regard, it is noted that the site is located directly adjacent a number of public transport options including rail and bus. To put this in context, the proximity of the site to both the Luas and Dublin Bus stops is highlighted following figure.



Figure 14.3: Local Public Transport Infrastructure.

Rail

The development site is located directly adjacent the Luas Green Line Stillorgan stop, which is c. 100m walk away. This stop provides access to regular rail services between Bride's Glen and Broombridge with intermediate stops including key locations such as Dundrum, St. Stephen's Green and O'Connell Street. The latter provides linkage with the Luas Red Line which in turn provides rail services between Tallaght/Saggart and the Point Village and includes stops at key transportation hubs including Houston Station, Connolly Station and Busáras.

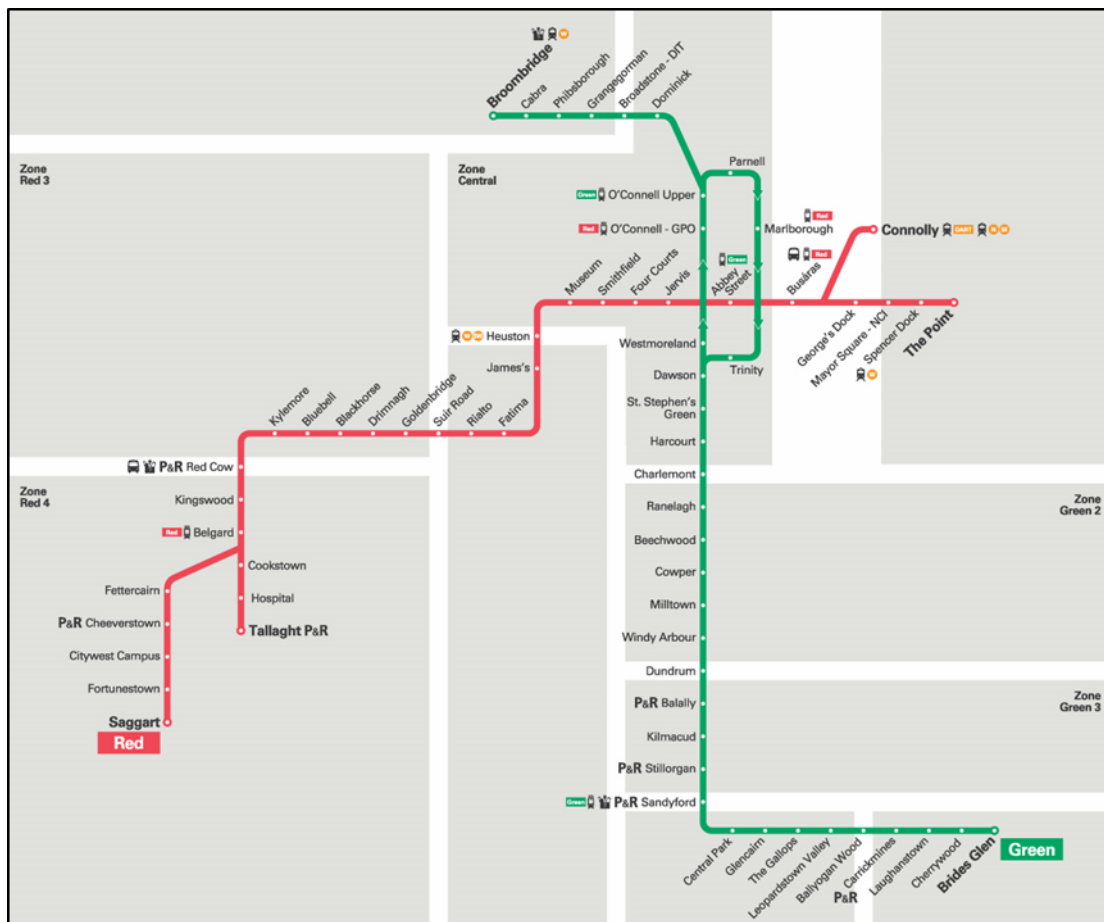


Figure 14.4: Luas Network Map.

The Luas has an average peak frequency of every 4-5 minutes and operates from 05:30 – 00:18 on weekdays. The journey time between the Sandyford stop and St. Stephen’s Green is estimated at approximately 25 minutes at peak times.

Bus

There are 3 no. Dublin Bus services operating within a 10 minute walking distance of the development site, with the closest stops located approximately 100m from the development site boundary. These services are summarised following.

Route No.	Description	Peak Frequency	Off-Peak Frequency
11	Wadelai Park – Sandyford Business District	10-20 mins	30 mins
47	Poolbeg Street – Belarmine	30 mins	Hourly
116	Parnell Square – Whitechurch	-	Daily

Table 14.6: Local Bus Services.

It is also noted that the Dun Laoghaire Rathdown Development Plan proposes a new Quality Bus/Bus Priority Route along Blackthorn Avenue, directly adjacent the development site as per the below extract from the associated mapping.

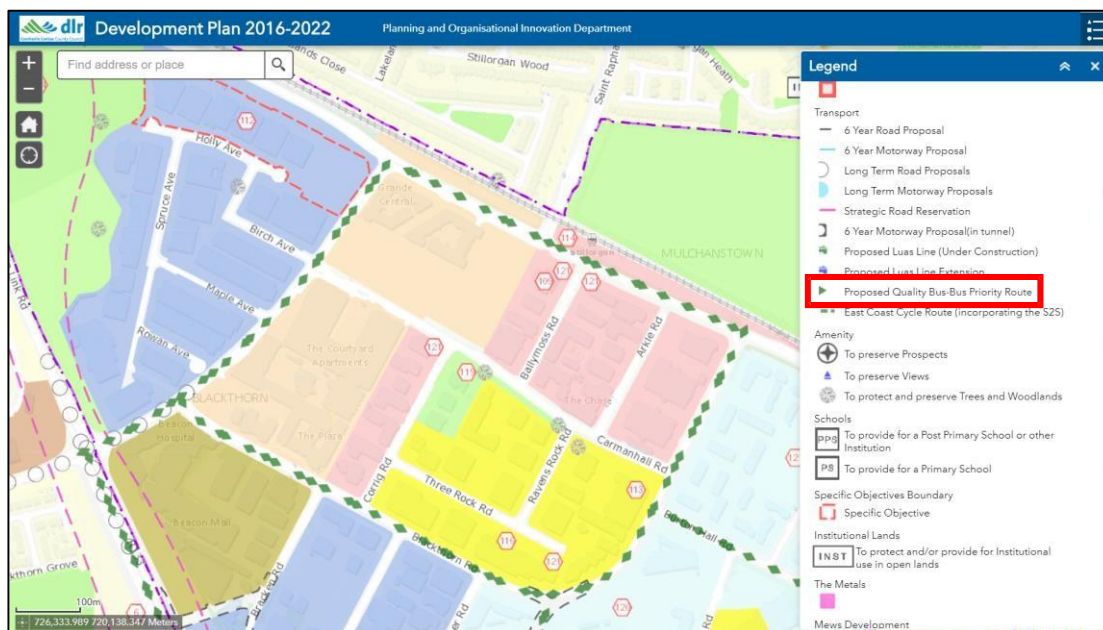


Figure 14.5: Development Plan Map Extract Highlighting Proposed Quality Bus-Bus Priority Route.

Cycle

The local cycle network includes a mixture of segregated and on-road facilities on the primary links adjacent the development site. This is indicated in the below extract from the existing facilities mapping taken from the National Transport Authority’s Greater Dublin Area Cycle Network Plan, with the development site highlighted in red.



Figure 14.6: GDA Cycle Network Plan Map of Existing Cycle Facilities.

Further improvements to this network are proposed under the Greater Dublin Area Cycle Network Plan, as highlighted in the following extract from the Plan’s “proposed” mapping, with the development site again highlighted in red.

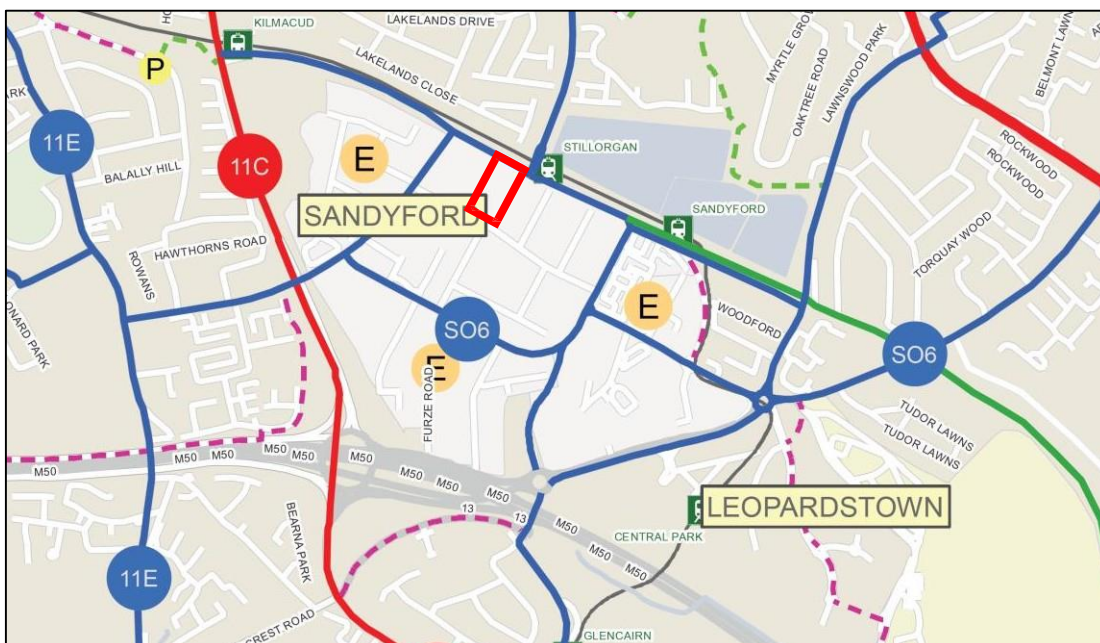


Figure 14.7: GDA Cycle Network Plan Map of Proposed Cycle Facilities.

Pedestrian

Pedestrian infrastructure locally is of a high quality and includes dedicated crossing facilities at all major junctions locally including on Blackthorn Drive, providing direct access to the Luas and Bus services as outlined previously.

14.5 Do-Nothing Scenario

The do-nothing scenario would involve leaving the subject site in its current undeveloped state. This would have a negative impact in terms of the development of the area while simultaneously showing no real benefit in transportation terms. In particular, local permeability and linkage to the Luas and bus services would not be improved through the provision of the north-south link through the site

14.6 Difficulties Encountered

There were no difficulties encountered in the preparation of this assessment for the proposed development.

14.7 Impact Assessment

It should be noted that the assessment presented below considers both the direct impact of the proposed development and the cumulative impact of unrelated third party developments in the study area that have either been approved for planning permission or have recently been lodged. Unplanned events have been considered throughout this chapter. The description of the development impact is based on the Environmental Protection Agency's Draft Guidelines for Environmental Impact Assessment Reports.

14.7.1 Construction Phase

Relative to the operation stage, the construction period will be temporary in nature. Construction traffic is expected to consist of the following categories:

- Vehicles owned and driven by site construction staff, by full time site supervisory staff and occasional professional supervisory staff i.e. design team members and supervisory staff from utility companies;
- Materials delivery and removal vehicles.

It is difficult to assess the exact quantum of traffic that will be generated during the construction period. However, a number of preliminary estimates have been made based on the extent of excavation, type of development and estimated construction phasing. These are summarised as follows:

- 30 No. private vehicles per day from staff and site visitors i.e. 60 No. vehicle movements;
- 25 No. light goods vehicles per day from subcontract staff i.e. 50 No. vehicle movements;

- 60 No. heavy goods vehicles per day allowing for material removal and delivery i.e. 120 No. vehicle movements.
 - When estimating the potential impact of the construction stage, a number of factors have been taken into consideration as follows:
 - The peak traffic hours have been defined as 08:00-09:00 and 16:15-17:15. The normal permitted construction working hours are 08:00 to 19:00 on a weekday. As a result, staff travelling in private vehicles will arrive and depart the site outside of the peak traffic hours;
 - An appropriately limited amount of on-site parking will be provided to encourage staff to car share and to travel by the numerous public transport options serving the locality. However, the provision will be adequate to prevent overspill parking in the local area;
 - Heavy vehicles will facilitate the movement of materials to and from the site including excavated material and deliveries. Given the current topography and proposed design, the amount of excavation will be relatively limited and the duration of such works will be very short term in nature. Furthermore, heavy vehicles travelling to and from the site will be spread across the course of the working day with efforts made to limit the number of arrivals and departures during the peak traffic hours where possible. However, for the purposes of this assessment a worst case scenario is assumed where no such restrictions are in place and 6 No. HGVs (12 HGV movements) are allowed for during the peak hours;
 - The majority of contractor vehicles are expected to arrive and depart just before and after the site opening and closing hours respectively, with a small number spread across the course of the day. However, in the interest of a conservative assessment, all have been assumed to arrive in the A.M. peak hour and depart in the P.M. peak hour.

Taking the above into consideration, the estimated construction vehicle movements relative to the operational vehicle movements, as set out previously, are summarised below. Please note that vehicle movements are a summation of arrivals and departures e.g. 10 No. vehicles arriving and 5 No. vehicles departing equates to 15 No. vehicle movements.:

Time Period	Construction Stage	Operational Stage
08:00 – 09:00	37	105
16:15 – 17:15	37	57

Table 14.7: Construction vs. Operational Vehicle Movements

As can be seen, the peak hour vehicle movements for the construction phase are notably lower than that predicted for the operational stage, despite the conservative estimates for the latter. Thus, taking into consideration, along with the temporary nature of construction activity and the detailed analysis of the operational stage in the following section, bespoke detailed analysis of the construction stage has not been deemed necessary.

14.7.2 Operational Phase

To assess the actual impact of the operational phase of the development on the local road network, a number of different time periods have been analysed. These are summarised as follows:

- Base Year (2019) – The current performance of the local road network was initially assessed along with the impact of the proposed development to establish which junctions require more detailed analysis and develop calibrated traffic models as appropriate;
- Year of Opening (2023) – The performance of the local road network was then assessed for both peak hours at the assumed year of opening in order to show the true impact of the proposed development;
- Design Year (2038) – The local road network was re-assessed for design year, 15 years after the assumed year of opening to establish the potential impact into the future.

The future year impact assessments have considered the following scenarios to ensure the impact of the proposed development and the cumulative impact of unrelated third party developments is considered:

- Do-Nothing – no development taking place in the local area and only allowance for natural background traffic growth;
- Do-Something – Natural background traffic growth and the additional traffic estimated to be generated by the proposed development;
- Do-Maximum – Natural background traffic growth, the additional traffic estimated to be generated by the proposed development and relevant but unrelated 3rd party developments either approved or lodged for planning within the local area.

Base Year

In order to establish which junctions, require more detailed analysis, the impact of the proposed development relative to the existing traffic flows has been assessed. The criteria used for this scoping exercise is based on the guidance set out in the TII Traffic & Transport Assessment Guidelines (2014) which states that an assessment is required when:

“Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road”

Or

“Traffic to and from the Development exceeds 5% of the traffic flow on the adjoining road where congestion exists, or the location is sensitive”

With regard to the scope of the assessment, the guidelines state:

“In general, the study area should include all road links and associated junctions where traffic to and from the development may be expected to exceed 10% of the existing traffic movements, or 5% in congested or other sensitive locations, including junctions with national roads. Where two or more of the supplementary criteria as indicated in Table 2.3 apply in relation to any of the adjoining links or junctions, then those links and junctions should also be considered for inclusion in the study area”.

The referenced Table 2.3 contains a series of sub-thresholds for when a Traffic & Transport Assessment should take place. These are summarised as follows:

- The character and total number of trips in / out combined per day are such that as to cause concern;
- The site is not consistent with national guidance or local plan policy or accessibility criteria contained in the Development Plan;
- The development is part of incremental development that will have significant transport implications;
- The development may generate traffic at peak times in a heavily trafficked/ congested area or near a junction with a main traffic route;
- The development may generate traffic, particularly heavy vehicles in a residential area;
- There are concerns over the development's potential effects on road safety;
- The development is in a tourist area with potential to cause congestion;
- The planning authority considers that the proposal will result in a material change in trip patterns or raises other significant transport implications.

Given the nature and estimated traffic generation potential of the proposed development, it is determined that it does not meet any of the above thresholds which typically would indicate that the impact of the development is considered to be negligible and further detailed analysis is not required. However, in order to consider the cumulative impact of the proposed development and the unrelated third party developments proposed in the local area, it is considered appropriate to include all junctions in the detailed analysis.

Year of Opening

Prior to the analysis of the individual junctions, the main links in the network have been assessed for the Year of Opening Do-Something and Do-Maximum scenarios, with the results shown following:

Link	Width (m)	Link Capacity (veh/hr)	A.M. Peak (veh/hr)	RFC (%)	P.M. Peak (veh/hr)	RFC (%)
Blackthorn Road	9.0	1,860	881	47.4	1254	67.4
Carmanhall Road	6.1	1,020	515	50.5	599	58.7
Blackthorn Drive	10.0	2,010	652	32.4	675	33.6

Table 14.8: 2023 Link RFC Values for Local Network – Do Something.

Link	Width (m)	Link Capacity (veh/hr)	A.M. Peak (veh/hr)	RFC (%)	P.M. Peak (veh/hr)	RFC (%)
Blackthorn Road	9.0	1,860	951	51.1	1632	87.8
Carmanhall Road	6.1	1,020	691	67.7	813	79.7
Blackthorn Drive	10.0	2,010	678	33.7	785	39.1

Table 14.9: 2023 Link RFC Values for Local Network – Do Maximum.

Prior to the analysis of the individual junctions, the main links in the network have been assessed for the Year of Opening Do-Something and Do-Maximum scenarios, with the results shown following:

Junction	A.M. Peak Hour (RFC Values)			P.M. Peak Hour (RFC Values)		
	Do Nothing	Do Something	Do Maximum	Do Nothing	Do Something	Do Maximum
Junction 1	40	42	47	67	67	110
Junction 2	23	24	30	30	30	31
Junction 3	40	47	58	86	89	194
Junction 4	31	31	31	21	22	22
Junction 5	-	16	17	-	4	4

Table 14.10: 2023 Junction Analysis Results Summary.

The Do Nothing analysis shows that all junctions operate within capacity. However, Junction 3 is operating above the preferred capacity limit of 85% for this type of junction, in the P.M. peak hour.

The Do-Something Scenario shows minor impacts to the operation of the junctions, with RFC values increasing by between 0 – 7%. Junction 3 again operates above the normal capacity limit of 85% but shows only a minor impact relative to the Do-Nothing scenario, with the max RFC increasing by just 3%.

The Do Maximum scenario shows larger impacts to RFC values relative to the Do-Nothing scenario, with increases ranging from 0 – 108%. The most significant increases occur at Junctions 1 & 3 during the P.M. peak hour and are a direct result of both junctions operating above capacity. As noted above, Junction 3 is seen to operate above normal capacity limits regardless of any development taking place.

Junction 1 is a signalised junction and has been modelled on the basis of the existing signal plan in operation at the junction. It is expected that, through the normal operation of the junction and as traffic volumes grow and change as predicted, the signal plan will adapt accordingly as is permitted by the control system and infrastructure i.e. induction loops, already in place at the junction. In other words, the signal plan is expected to self-optimize in the future depending on traffic demand. However, the above assessment has not allowed for this and has instead maintained the existing signal plan for all scenarios and time periods assessed. In order to simulate this optimisation process, the assessment software has been allowed to optimise the signal plan for Junction 1 for the 2023 Do-Maximum P.M. peak hour. The results are shown following.

Junction	P.M. Peak Hour (RFC Values)
Junction 1	49

Table 14.11: 2038 Optimised Junction 1 P.M. Peak Hour Do Maximum Analysis Results Summary.

As can be seen, the optimisation of the signal plan allows the junction to operate well within normal capacity limits for the Do Maximum scenario.

Design Year

Prior to the analysis of the individual junctions, the main links in the network have again been assessed, this time for the Design Year Do-Something and Do-Maximum scenarios, with the results shown following.

Link	Width (m)	Link Capacity (veh/hr)	A.M. Peak (veh/hr)	RFC (%)	P.M. Peak (veh/hr)	RFC (%)
Blackthorn Road	9.0	1,860	1005	54.0	1427	76.7
Carmanhall Road	6.1	1,020	584	57.3	677	66.3
Blackthorn Drive	10.0	2,010	739	36.8	764	38.0

Table 14.12: 2038 Link RFC Values for Local Network – Do Something.

Link	Width (m)	Link Capacity (veh/hr)	A.M. Peak (veh/hr)	RFC (%)	P.M. Peak (veh/hr)	RFC (%)
Blackthorn Road	9.0	1,860	1075	57.8	1806	97.1
Carmanhall Road	6.1	1,020	759	74.4	891	87.3
Blackthorn Drive	10.0	2,010	765	38.0	875	43.5

Table 14.13: 2038 Link RFC Values for Local Network – Do Maximum.

As can be seen, the local links continue to operate below normal capacity limits for the Do-Something Scenario. The Blackthorn Road link continues to experience the highest RFC value during the Do-Maximum scenario, operating just below the maximum capacity limit.

The results of the detailed analysis for the junctions in the study area are summarised following, showing the highest RFC value experienced by each junction and considering all scenarios assessed. Full details of the results can be found in the Traffic Impact Assessment submitted as part of this application.

Junction	A.M. Peak Hour (RFC Values)			P.M. Peak Hour (RFC Values)		
	Do Nothing	Do Something	Do Maximum	Do Nothing	Do Something	Do Maximum
Junction 1	48	48	56	75	76	120
Junction 2	27	28	35	35	35	36

Junction 3	52	59	73	111	114	261
Junction 4	38	38	38	24	25	25
Junction 5	-	17	18	-	4	4

Table 14.14: 2038 Junction Analysis Results Summary.

The Do Nothing analysis shows that all junctions, with the exception of Junction 3 operate within capacity. Junction 3 is now seen to operate above capacity without any additional development in place.

The Do-Something scenario shows minor impacts to the operation of the junctions, with RFC values increasing by between 0 – 7%. Junction 3 continues to operate above capacity as would be expected, but shows only a minor impact relative to the Do-Nothing scenario with the max RFC increasing by just 3%.

The Do Maximum scenario continues to show larger impacts in RFC values relative to the Do- Nothing scenario, ranging from 0 – 150%. The significant increases occur at Junctions 1 & 3 during the P.M. peak hour and are again a direct result of both junctions operating above capacity. As noted above, Junction 3 is seen to operate above normal capacity limits regardless of any development taking place.

As with the Year of Opening assessment, the Junction 1 analysis above does not allow for optimisation of the signal plan which would, in reality, be expected to occur as facilitated by the current operating system and infrastructure of the junction. To reflect this, the assessment software has once again been allowed to optimise the signal plan for junction 1 for the 2038 Do-Maximum P.M. peak hour with the results are shown following.

Junction	P.M. Peak Hour (RFC Values)
Junction 1	49

Table 14.15: 2038 Optimised Junction 1 P.M. Peak Hour Do Maximum Analysis Results Summary.

As can be seen, the optimisation of the signal plan allows the junction to operate well within normal capacity limits for the Do Maximum scenario.

14.8 Interactions

Noise & Vibration

The construction phase of the development of the site will result in a short level increase of construction traffic related noise and vibration. It is considered that the impact of the operational phase on Traffic and Transport will be likely, neutral, slight and long-term.

Air Quality

Post construction development traffic will contribute to increased traffic volumes on the surrounding network which in turn will impact air quality.

Population

The scheme will be developed in line with the separately enclosed Preliminary Construction Management Plan (PCMP) to ensure any impacts on local traffic is minimised during the construction stage. A Mobility Management Plan is also enclosed as a separate document. The increased permeability of the site and the provision of high quality pedestrian and cycle facilities will result in increased numbers of cyclists which in turn will promote healthier living and a more active population.

Land and Soil

The construction phase and any import or export of material to the site (as part of excavation or infilling works) will have implications for traffic in the surrounding road network. As noted previously, the scheme will be developed in line with the separately enclosed Preliminary Construction Management Plan (PCMP) to ensure any impacts on local traffic is minimised during the construction stage.

14.8 Mitigation

14.8.1 Construction Phase Mitigation

The construction stage will be dealt with by the appointed contractor through the development and implementation of a Construction Management Plan. This plan will be agreed with the Local Authority prior to the commencement of construction and will ultimately include details on the following:

- Daily and weekly working hours;
- Agreed haul routes for incoming materials;
- Licensed hauliers to be used;
- Disposal sites, if necessary;
- Travel arrangements for construction personnel;
- Appropriate on-site parking arrangements for construction personnel to prevent overspill parking on the local road network;
- Temporary construction entrances to be provided;
- Wheel wash facilities if required;
- Road cleaning and sweeping measures to be put in place if required;
- Temporary construction signage to be put in place and maintained;
- Any proposed traffic management measures such as temporary traffic lights and signage on any public roads.

14.8.2 Operational Phase Mitigation

A series of mitigation measures have been incorporated into the design of the development with respect to traffic & transportation while others have been identified as

part of the detailed analysis of the local road network.

Car Parking

Car parking at the development has been reduced considerably from the DLRCC Development Plan standards based on the guidance set out in the Guidelines for Planning Authorities, Design Standards for New Apartments, particularly as a Build to Rent scheme which is specifically allowed for with the guidance.

These guidelines allow for “car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances”, particularly in “highly accessible areas such as in or adjoining city cores or at a confluence of public transport systems such rail and bus stations located in close proximity”. The site is highly accessible by different modes of transport other than car such as the Luas Green Line and 3 No. Dublin Bus routes all within 100 metres walk. It is also in close proximity to a number of core facilities including various retail and supermarkets, cafes, restaurants, banks, gyms etc.

A rate of 0.51 spaces per residential unit is proposed based on this guidance which will encourage residents to travel by more sustainable means. This measure will be supported by the implementation of a parking management plan which will include:

- Early and ongoing engagement with residents with respect to the availability of car parking;
- Provision of 10 No. parking spaces dedicated to use by a car club which will facilitate access to more sustainable, infrequent car usage that doesn't support commuting by car;
- Strict control of access to car parking including on-site monitoring of car parking usage with associated control measures e.g. clamping;
- Apartment rental prices will be quoted without parking. Should a perspective occupier require parking this will be provided at an additional cost on a first come, first served basis.

Travel Plan

In addition to the above, a development specific Travel Plan will be implemented at the site which sets out a series of measures to facilitate and encourage a positive modal shift towards more sustainable modes of transport. These measures will be refined based on travel surveys conducted at the occupied development but typically include:

- Appointment of a site Mobility Manager to oversee the implementation of the plan;
- Ongoing liaison with relative bodies including public transport providers such as Dublin Bus and Irish Rail;
- Providing ongoing information with respect to existing, amended and proposed public transport, cycle and pedestrian infrastructure and services;
- Providing information with respect to technological advances which improve the use of public transport such as apps and integrated ticketing systems;
- Developing new or advising of existing databases to facilitate and promote car sharing, walking groups, cycle groups etc.;
- Organising learning opportunities which promote travel by sustainable means such as bike repair tutorials;
- Advising of and providing information with respect to available initiatives such as

tax saver tickets and the Cycle to Work scheme which may be of benefit to residents.

Further detail with respect to the car parking strategy at the development can be found in the Traffic Impact Assessment, submitted under separate cover as part of this application.

Cycle Parking

To ensure travel by bicycle continues to be facilitated and encouraged, cycle parking considerably in excess of Development Plan standards is proposed. The development plan sets out a minimum of 1 space per apartment and an additional space per 5 units for visitors. It is proposed to provide 1 space per bedroom at the development and 1 visitor space for every 2 units, in line with the Design Standards for New Apartments.

Segregated cycle parking access is also provided from both Carmanhall Road and Blackthorn Drive to provide safe and convenient access for cyclists.

Roads

A dedicated set down bay is proposed on both Carmanhall Road and Blackthorn Drive to facilitate general set down and servicing e.g. waste collection, taxi drop off etc. This will prevent any potential stopping of vehicles on the public road which could lead to a blockage of traffic and associated congestion.

The existing footpaths to the north and south of the site will also be widened significantly. On Carmanhall Road, this will see the footpath width increased from the current c. 1.9 – 4.0m to between c. 6.1 – 10.0m. Similarly, the Blackthorn Drive footpath will increase from the existing c. 2.6m to between c. 10.9 – 14.7m. This will considerably improve the space available to pedestrians both related and unrelated to the development.

The proposed north-south link through the site will also increase permeability in the local area and provide a more direct link to the Luas and bus stops. This will again increase accessibility to public transport services for residents at the development as well as those in the local area.

Junction Operation

The signal plan in operation at Junction 1 should be optimised to cater for the altered traffic flows in the future years, particularly the Do-Maximum scenario. This would be expected to occur naturally as part of the junction operation through the existing junction controller and on-site vehicle detection measures already present.

14.9 Residual Impact Assessment

The assessment which forms the basis of this chapter has been wholly conservative to ensure a worst case scenario is considered. This includes allowing for background traffic growth based on TII guidance and conservative trip generation estimates which do not fully take into consideration the full effect of the reduced car parking provision. On that basis, the assessment and the associated results are considered to represent the worst case scenario.

The impact of the construction stage is assessed as follows:

- Increased vehicles numbers are expected to be limited during peak hours meaning congestion impacts are expected to be negligible meaning associated health impacts will also be negligible;
- There will be increased vehicle and HGV movements, however, these will be routed to use the most appropriate routes to limit the associated impact and minimise potential interaction with vulnerable road users where possible;
- The urban nature of the local road infrastructure lends itself to lower speeds and the limited increase in vehicle numbers means there is expected to be no real increase in risk to other vulnerable road users.

The impact of the proposed development construction will be managed by the measures set out in the Construction Management Plan. Drawing from the above, it is considered that the impact of the construction phase on Traffic and Transport will be likely and adverse but moderate and short-term.

The increased traffic as a result of the proposed development has been shown to be minimal and will have a negligible impact in terms of traffic. The associated impact on human beings will be limited.

The increased permeability of the site and the provision of high quality pedestrian and cycle facilities will result in increased numbers of cyclists which in turn will promote healthier living and a more active population.

The potential for increased accidents is also considered low as a result of the relatively minor traffic increases associated with the development.

Thus, taking the above into consideration, the potential impact of the development operational stage (Do Something scenario) is summarised as follows:

- The link capacities for the study area road network will continue to operate within acceptable limits even by the design year;
- The impact on the junctions in the study area is considered to be negligible with relatively low increases in RFC values at each;
- Junction 3 is shown to operate above capacity, however, this is noted to occur irrespective of the proposed development and the relative impact of the proposed development is low;
- The inclusion of the north-south link through the site will increase pedestrian and cycle permeability through the local area and increase connectivity to the Luas and bus stops;
- The proposed development entrances have a negligible impact on the operation of the local road network;
- The increased traffic levels associated with the development are relatively low, particularly when compared to existing traffic flows locally meaning the associated impact in terms of road safety will be negligible.

Drawing from the above, it is considered that the impact of the operational phase on Traffic and Transport will be likely, neutral, slight and long-term.

Following from the above, the potential cumulative impact of development locally (Do Maximum scenario) is summarised as follows:

- The link capacities for the study area road network will continue to operate within acceptable limits even by the design year;
- The impact on the junctions in the study area is higher given the increased traffic flows but all, with the exception of Junction 3, operate within capacity;
- Junction 3 is shown to operate above capacity, however, this is noted to occur irrespective of any additional development. This junction should be monitored and upgrade as necessary irrespective of the proposed development;
- The high quality of the local road network in the context of the increased traffic flows means there is expected to be a negligible impact on road safety.

Drawing from the above, it is considered that the potential impact of the cumulative additional development on Traffic and Transport will be likely, neutral, moderate and long- term.

14.10 Monitoring

Monitoring will be required with respect to the parking management strategy at the development to ensure the appropriate usage of parking.

No further monitoring is required as a result of the proposed development. However, monitoring of the operation of Junction 3 is recommended as part of the Do Nothing scenario to identify if and when mitigation unrelated to the proposed development will be required in the future.

14.11 References

- Design Manual for Roads and Bridges (DMRB), February 1999;
- Design Manual for Urban Roads and Streets (DMURS), March 2013;
- Transport Infrastructure Ireland (TII) Traffic and Transport Assessment Guidelines, May 2014;
- Guidelines for Traffic Impact Assessment, Chartered Institute of Highways & Transportation 1997;
- Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections, TII October 2016;
- Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts, TII October 2016;
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines, August 2012;
- County Development Plan 2016-2022, Dun Laoghaire Rathdown;
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Draft), August 2017;
- RB Central EIAR, April 2019 (Planning Reference (ABP 30440519)).