Table 10.6.1.7 Summary Assessment of Construction Phase Works

Noise Sensitive Receptor	Highest Predicted Construction Noise Level dB $L_{AEq, 1hr}$	Compliance with Assessment Criteria 70dB $L_{Aeq\ 1hr}$
NSR1	70	Yes
NSR2	70	Yes
NSR3	51	Yes
NSR4	70	Yes

The results indicate that the predicted construction noise levels associated with site works will not exceed the assessment criteria for construction works of 70dB LAeq,1hr for the works assessed. There is potential for the assessment criteria to be exceeded at the nearest NSR locations when construction works are occurring at the closest boundary point so a conventional construction screening barrier at the boundary of the works site is provided for in the assessment.

It should be noted however, that in reality it is anticipated that noise levels as a result of construction works will be much lower than the predicted worst-case levels for the vast majority of the construction works. This is because all the items of machinery modelled will not typically be in operation simultaneously and they will not be located at the nearest boundary point but for the most part will be much further removed from the NSR locations. The implementation of the mitigation measures presented in Section 10.6 will ensure that the proposed noise criteria are satisfied for all construction works.

It should be noted that the construction noise levels are short-term impacts and are transient in nature and therefore the likely noise impact is considered to vary from Imperceptible to Moderate.

10.6.1.2 Predicted Impact of Construction Traffic

The traffic information in Chapter 11 of this EIAR calculates that during peak construction activity, it is assumed that site works will generate the following traffic movements which represent the cumulative movements associated with construction of both the SHD and Commercial schemes:

- At most 4 (No.) Heavy Goods Vehicle (HGV) trips will be made to the site each hour (one HGV arrival and one HGV departure every 15 minutes).
- 6 (No.) LGV arrivals and 6 (No.) Light Goods Vehicle (LGV) departures will occur in each of the background peak hours.
- 25 (No.) construction staff car trips will be made to the site during the AM peak hour, and 25 (No.) such trips made from the site during the PM peak hour.

HGV construction traffic to and from the site shall be associated mostly with the breaking up and removal of existing hardstanding on the development site. No significant excavation or reprofiling works will be required and preliminary earthworks will therefore be minimal. Similar rates of HGV trip generation may also occur during concrete pouring, though at a later stage in construction. HGV trips for material delivery,

heavy plant transfer, etc. will be sporadic in nature and generally will not occur at the same time as more HGV-intensive activities. Periodic deliveries of materials shall be made by Light Goods Vehicles. LGV trips are however unlikely to occur in significant numbers at the same time as HGV trips take place.

A doubling of road traffic volume would typically result in an approximate 3dB increase in noise level at adjacent properties. The additional traffic generated as a result of the construction phase of the proposed development results in a very small increase in peak hour traffic. Therefore, the noise contribution from site traffic during the construction phase will not be perceptible and can be classified as "not significant" and it will be short term in duration.

10.6.1.3 Predicted Impact of Construction Vibration

The only construction activities with the potential to generate appreciable vibration levels will be the movement of loaded HGVs moving into and out of the site, and the piling for the foundations. There is no blasting required and it is also envisaged that there will be no rock-breaking required during site clearance works. The Noise Sensitive Receptors identified in Section 10.6.1 are the closest sensitive receptors for which vibration impacts are assessed; NSR4 represents the protected RHK boundary wall.

The piling activity will occur over a period of approximately 2 months and will utilise a CFA (Continuous Flight Auger) or Screw Piling technique. CFA drilling or Continuous Flight Auger piling is ideal for alluvial soils and clay and can also be used in sandy or gravel-based ground conditions. The piling rig uses circular hollow galvanised steel pile shafts with one or more steel helices attached, these are screwed into the ground much like a screw is fastened into wood. The CFA piles are filled with concrete then reinforced with a welded steel rebar cage that is pushed down into the unset concrete.

CFA (Continuous Flight Auger) rigs minimise the spoil created by installation and are an especially quiet method of piling in suitable ground conditions such as those at the development site. The technique also gives rise to minimum vibration levels.

Therefore, considering the distance to the nearest off-site sensitive buildings / structures, notably the protected boundary wall of the RHK, vibration levels at the closest structures are expected to be significantly lower than those presented in Table 10.4.3.2 above, thus ensuring no cosmetic damage to buildings / structures will occur. Vibration levels are also expected to be below a level that would give rise to complaint from building occupants as per Table 10.4.3.2.

Due to the low level of vibration associated with the CFA piling technique and the favourable underlying ground conditions, vibration impacts will not cause significant nuisance and will not lead to any type of damage at the closest receptors. This includes any sensitive structures in the neighbouring Royal Hospital grounds and its perimeter boundary wall which forms the common western boundary with the subject site. No specific mitigation is required for this aspect of the proposed works.

10.6.2 Operational Phase

Detailed traffic assessments have been undertaken by CS Engineering, as presented in Chapter 11 of this EIAR. Information from this chapter has been used to determine the predicted change in noise levels in the vicinity of the roads and junctions that pass the entrance to the subject site.

For the purposes of assessing potential noise impact, the relative increase in noise level associated with

traffic movements in the immediate vicinity of the site with and without the development is considered. The traffic figures used in the assessment are taken from the Traffic and Transportation Assessment (Chapter 11 of the EIAR). Table 10.4.2.2 offers guidance as to the likely impact associated with any particular change in traffic noise level. The predicted increase in traffic noise associated with the proposed development is less than 1dB, which is not perceptible and associated with a negligible magnitude of impact.

Overall, the noise climate in the area would be expected to remain very similar to the present situation as currently the predominant source of noise is passing traffic on the surrounding roads. There is no significant change in traffic patterns predicted for the area and overall traffic volumes are predicted to increase slightly from current levels hence there is no observable change to the noise climate predicted.

In summary, the predicted change in noise levels associated with vehicles is neutral, long term and not significant. There is no observable source of vibration associated with the operational phase of the proposed development and consequently there is no vibration impact predicted for the operational phase.

The recommended internal noise targets for the proposed development which are derived from BS 8233 (2014). The assessment has shown that the design internal noise goals for the proposed development can easily be achieved.

The potential impact of increased traffic associated with the related Commercial development proposed for the site is also assessed as negligible. Chapter 11 provides details of the additional traffic movements associated with that proposed development and the cumulative noise impact of traffic associated with both developments should they proceed is negligible.

10.6 Do Nothing Scenario

In order to provide a qualitative assessment of the proposed development, this section considers the proposed development in the context of the likely impacts upon the receiving environment should the proposed development not take place.

In the case where the proposed development does not proceed, and the adjoining SHD development does not proceed, then the noise climate in the area will remain essentially unchanged from the current situation. Traffic is projected to increase at rates of up to 29% in 2039 without the development and this level of change will lead to a change in noise levels in the area. When the new technologies that are being utilised for transport are considered it is expected that traffic noise levels will decrease in the area in line with the requirements of the Nosie Action Plan.

It is considered that there will be no observable difference between the noise climate of the area now and the operational phase of the proposed development. Consequently, the do-nothing impact and the operational phase impact are thought to be practically the same with no observable difference between the two.

10.7 Mitigation Measures

Whilst the construction phase can proceed in compliance with the proposed limits, the guidance on the control of noise and vibration from demolition and construction activities presented in BS 5228 will be followed in accordance with best practice and in order to minimise any noise and vibration impacts associated with the proposed development. These measures are presented in Table 10.7.1. There are no adverse noise or vibration impacts associated with the operational phase of the development and consequently there are no mitigation measures proposed.

Specific mitigation measures that are recommended for specific activities are specified in Table 10.7.2. These measures are included as best practice measures that will minimize the impact of the proposed development works on noise sensitive receptors.

Table 10.7.1 Table of Mitigation Measures

Character of potential impact	Mitigation measure
Construction Phase	
Traffic and plant noise	Avoid unnecessary revving of engines and switch off equipment when not required;
Traffic noise	Keep internal haul routes well maintained and avoid steep gradients;
Impact noise	Use rubber linings in chutes and dumpers to reduce impact noise;
Impact noise	Minimise drop height of materials;
Traffic and plant noise	Start-up plant and vehicles sequentially rather than all together;
Traffic and plant noise	In accordance with best practicable means, plant and activities to be employed on site will be reviewed to ensure that they are the quietest available for the required purpose;
Traffic and plant noise	Where required, improved sound reduction methods, e.g. enclosures should be used;
Plant noise	Site equipment should be located away from noise sensitive areas, as much as is feasible;
Traffic and plant noise	Regular and effective maintenance by trained personnel should be carried out to reduce noise and/or vibration from plant and machinery;
Traffic and plant noise	Limit noisy construction works to 8am to 6pm weekdays with Saturday working from 8am to 1pm unless otherwise agreed with the local authority. Relatively quiet construction activities could be carried out outside these hours, subject to controls in place;
General site noise	Maintain ongoing contact with local residents to ensure any complaints relating to construction phase noise for the project from local residents can be addressed. Also, prior to any particularly noisy activities, local residents should be contacted in order to minimise the perceived noise impact;
Traffic and plant noise	The contractor shall erect construction site hoarding along noise sensitive boundaries, particularly where no existing screening such as boundary walls are in place at the nearest NSRs.
General site noise	The contractor should appoint a community relations officer who will deal

	on a one-to-one basis with local stakeholders and will notify them before the commencement of any works forecast to generate appreciable levels of noise or vibration, explaining the nature and duration of the works. The community relations officer shall also distribute information circulars informing people of the progress of works and any likely periods of significant noise and vibration.
General site noise	The contractor should prepare a Noise and Vibration Management Plan (NVMP) which will deal specifically with on-site activities in a strategic manner to remove or reduce significant noise and vibration impacts associated with the construction works.

Table 10.7.2 Table of Site specific Mitigation Measures

Character of potential impact	Mitigation measure
Construction Phase	
Construction noise	The contractor shall ensure that when work is undertaken on the rising floors that an acoustic synthetic barrier shall be employed along the external facade to minimise noise transmission to the surrounding environment.
Generators	Generators should be located as far as possible from sensitive boundaries especially the residential buildings.
Concrete breaking	Concrete breaking is one of the activities forecast to have the highest potential noise impact. During concrete breaking, the activity shall be screened with localised temporary barriers in order to break line of sight to the sensitive receptors. This may give up to a 10 dB reduction in noise levels which would ensure compliance with the required limits even when other activities are underway.
Foundation Works	Although CFA Piling is virtually vibration free and is the lowest noise level technique for piling routinely available, there are associated activities with potential to cause disturbance. The cutting of steel for the piles will give rise to significant noise levels when carried out in close proximity to residential receptors. It is therefore proposed that this activity shall be carried out at locations removed from the boundary of the site wherever possible to minimise noise impact. Where this is not feasible, an acoustic shroud / barrier shall be employed to minimise noise impact.
Monitoring	It is proposed to undertake vibration monitoring when the demolition works are underway and during the installation of piles. Although CFA piling is virtually vibration free, it is proposed that monitoring shall be undertaken to ensure that there is (a) no nuisance as a result of this activity, and / or (b) no structural damage to nearby protected structures. Noise monitoring will also be undertaken throughout the construction phase in accordance with Dublin City Council Good Practice Guide as

	follows. Carry out regular on site observation monitoring and checks/audits to ensure that Best Practicable Means (BPM) is being used at all times. Such checks shall include; • Hours of work • Presence of mitigation measures • Number and type of plant • Construction methods Monitor noise and vibration continuously during demolition, piling, excavation and sub and superstructure works at agreed locations and report to DCC at agreed intervals and in an agreed format.

10.8 Cumulative Impact Assessment

The cumulative impacts of the proposed commercial development in conjunction with current and future developments in the vicinity of the subject site are considered in this section. Guidance published by the European Commission (1999, Guidelines for the Assessment of Indirect and Cumulative Effects as well as Impact Interactions) was considered in carrying out this element of the assessment.

A review of other existing and / or approved projects in the vicinity of the site was carried out as reported in Appendix 1A of the EIAR and these projects were considered to determine whether any of these existing / approved projects will likely have significant cumulative effects in combination with the proposed project. The assessment also considers whether all of the existing / approved projects if they all occurred simultaneously will likely have significant cumulative effects in combination with the proposed development.

The potential for cumulative impacts to arise is greatest for those developments closest to the proposed development site, which in this instance is the adjoining permitted residential development immediately to the south (ABP SHD Planning Ref. TA29S.311591). This associated permitted development is likely to be constructed simultaneously with the subject development as a single construction project and thereby extending the estimated construction period from 2 years to circa 4 years. Given the close proximity and potential scale of the development, this proposed development presents the greatest potential for cumulative impacts to arise. To facilitate as robust and conservative an assessment of cumulative impacts as possible, the proposed development on the adjoining site was considered. For a development of the type being considered for the adjoining site, the type of activities that would be required, the general types of construction activities that would be undertaken and the magnitude of potential noise and vibration emissions associated with such a proposed development are predicted to be very similar to those predicted for the subject site. The assessment for the subject site has concluded that the predicted impacts will be within the prescribed levels as set out by Dublin County Council in their guidelines even when a worst-case assessment scenario is applied. The quantitative assessment has determined that the zone of potentially significant cumulative impacts is 20m from the site boundary for construction works and therefore there is the potential for cumulative impacts to arise. The layout of the site and the potential impact on receptors was considered and it was deemed that provided the mitigation measures proposed are applied that there is no risk of a significant adverse cumulative impact if both developments proceed simultaneously. There might be a requirement to phase some limited amount of works in close proximity

to each other at some times but this is readily managed as part of the overall Construction Environmental Management Plan for the site.

In the event that the construction phase of the proposed development coincides with the construction of any other permitted developments within the zone of influence of the subject site there is the potential for cumulative noise impacts to the nearby sensitive receptors. While the zone of potential influence extends to 350m for the purpose of the overall assessment, the magnitude and significance of any impacts decreases with distance from the site with the maximum impacts observed within 20m of the site boundaries. The mitigation measures outlined above should be applied throughout the construction phase of the proposed development, and with similar mitigation measures applied for other permitted developments in accordance with both best practice guidance and Dublin City Council requirements then this will prevent any significant cumulative impacts on receptors. With appropriate mitigation measures in place, the predicted cumulative impacts associated with the construction phase of the proposed development are deemed short-term.

Construction phase and operational phase traffic impacts are deemed to be imperceptible due to the relatively low level of traffic associated with the proposed development. Consequently there is no scope for cumulative impacts to lead to a significant adverse impact.

10.9 Summary of Residual Impacts

During the construction phase of the proposed development there will be some noise impacts experienced at the nearest receptors to the subject site. It is predicted that the mitigation measures proposed will ensure that noise and vibration impacts are kept to a minimum. The predicted noise and vibration impacts on the receiving environment during the construction phase are considered to be negative, moderate and temporary and will occur over a relatively short time-period. The assessment has concluded that there will be no significant residual impacts.

The potential for noise generation during the operational phase of the proposed development is limited to additional vehicles on the surrounding road network. The change in vehicle numbers predicted is not significant in an overall context. The predicted noise and vibration impacts on the receiving environment during the operational phase are considered to be not significant and long-term. The assessment has concluded that there will be no significant residual impacts.

10.10 Interactions Arising

The main interactions with noise are in relation to human beings, biodiversity, Land, Soil & Geology, Material Assets: Traffic & Transport and Architectural Heritage.

The impact of noise on human beings living in the area of the proposed development has been addressed above for both the construction and operational phase of the proposed development. The impact assessment shows that the noise impacts that will be experienced by human beings in the vicinity of the proposed development are all within the prescribed criteria. This interaction is described as negative for

the construction phase and neutral for the operational phase and is quantified as Not Significant for the construction phase and Not Significant for the operation phase. The principal interactions with vibration relate to Architectural Heritage and the potential impact of vibration on protected structures. Due to distance and the nature of the works that will be undertaken, vibration impacts have been assessed as Not Significant for the construction phase and imperceptible for the Operation Phase.

Construction noise is temporary in nature and will be experienced to different degrees by different receptors as construction progresses across the proposed development site. Measures to ensure that acceptable noise levels are not exceeded during the construction works are set out in this chapter. With these mitigation measures in place, effects on human health from noise arising during the construction phase will be imperceptible.

Operational phase noise is predicted to be not significant and there are no operational phase vibration impacts predicted. Therefore no adverse effects on human health as a result of the operational phase of the proposed development are anticipated.

Chapter 6 of this EIAR indicates that there is potential for interactions between Biodiversity and Noise and Vibration. Section 6.9.4 of this EIAR states that interactions between noise and sensitive fauna, including birds, can occur and arise from increased noise levels during the construction and operational stages. This interaction has the potential to result in significant negative impacts. However, as the site does not support sensitive species of fauna, impacts to fauna from noise interactions are not predicted to be significant during the construction or operational phase.

Chapter 7 of this EIAR indicates that there is potential for interactions between Land, Soil & Geology and Noise & Vibration during the construction phase due to ground-breaking, boring and excavation of concrete and subsoils as part of the construction works. The implementation of mitigation measures will ensure that this interaction is not significant.

Chapter 11 of the EIAR found that there is a potential interaction between Material Assets: Traffic & Transport and Noise & Vibration. The assessments in Section 10.6.1 found that this interaction during the construction and operational phase is not significant.

Chapter 14 of the EIAR found that there is potential for interaction between Architectural Heritage and Noise & Vibration during construction works. The implementation of all mitigation measures will ensure that this interaction is not significant.

10.11 Monitoring

On-site noise and vibration monitoring during the actual construction works will be carried out as a key part in the mitigation programme for the proposed works. Monitoring of the noise levels at sensitive receptor locations for comparison with limits and background levels during the construction works will be completed and the measurement results will be passed onto the Site Manager and will be used to assist the scheduling of works to ensure that the noise emissions from the various works are kept within the limits.

In addition the appointed contractor will prepare a Noise and Vibration Management Plan (NVMP) which will deal specifically with on-site activities in a strategic manner to remove or reduce significant noise and vibration impacts associated with the construction works. The NVMP will be a live document and should specify the specific noise and vibration monitoring and reporting that will be carried out ensuring that all potential NSRs are covered in the monitoring programme.

10.13 Accidents or Unplanned Events

There are no accidents or unplanned events as a result of the proposed project that could occur that will have an adverse or significant impact on noise and vibration that have not already been considered in this chapter.

10.14 References

British Standards Institution (1993). BS 7385-2 – Evaluation and Measurement for Vibration in Buildings: Guide to Damage Levels Arising from Groundborne Vibration.

British Standards Institution (2014a). BS 5228-1:2009+A1:2014 – Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1: Noise.

British Standards Institution (2014b). BS 5228-2:2009+A1:2014 – Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 2: Vibration.

Dublin City Council Air Quality Monitoring and Noise Control Unit's Good Practice Guide for Construction and Demolition

Environmental Protection Agency (2016). Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4).

Environmental Protection Agency (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

Highways Agency (2011). Design Manual for Roads and Bridges. Volume 11, Section 3, Part 7.

Institute of Acoustics (2002). Guideline for Noise Impacts Assessment.

International Organization for Standardization (1996). ISO 9613-2:1996 – Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation.

11. MATERIAL ASSETS: TRAFFIC & TRANSPORT

11.1 Introduction

This chapter of the EIAR assesses and evaluates the likely impact of a proposed office and hotel development at Heuston South Quarter on the operation of the surrounding road network, in respect of both the construction phase and the operational phase, as well as identifying proposed mitigation measures to minimise any identified impacts.

This chapter has been prepared by Gordon Finn, Roads and Traffic Engineer with Cronin & Sutton Consulting Engineers (CS Consulting). Gordon holds BA/BAI and MAI degrees in Civil, Structural, and Environmental Engineering from the University of Dublin, and is a member of the Institute of Engineers of Ireland. His relevant professional experience includes the preparation of Traffic and Transport Assessments, Travel Plans, and Environmental Impact Assessment Report chapters for a broad range of residential, commercial, and institutional developments.

This chapter presents an analysis of the proposed development's traffic impact, which is also presented in the Traffic and Transport Assessment (TTA) report submitted separately in support of this planning application. While the content of this chapter is common to both documents, the TTA provides a more exhaustive range of junction assessment scenarios, as well as examining certain further aspects of the proposed development (e.g. internal layout) that are not pertinent to an EIAR.

11.2 Characteristics of the Proposed Development

A full description of the proposed development is provided in Chapter 3 of this EIAR.

Briefly summarised, the development will comprise a 5-storey hotel (238no. bedrooms) and a 12-storey office block (both over lower ground and basement levels), providing 15,474sq.m of office floorspace (NIFA). A retail/café unit with a floor area of 208sq.m also forms part of the proposed development. The application site extends to approximately 0.62ha.

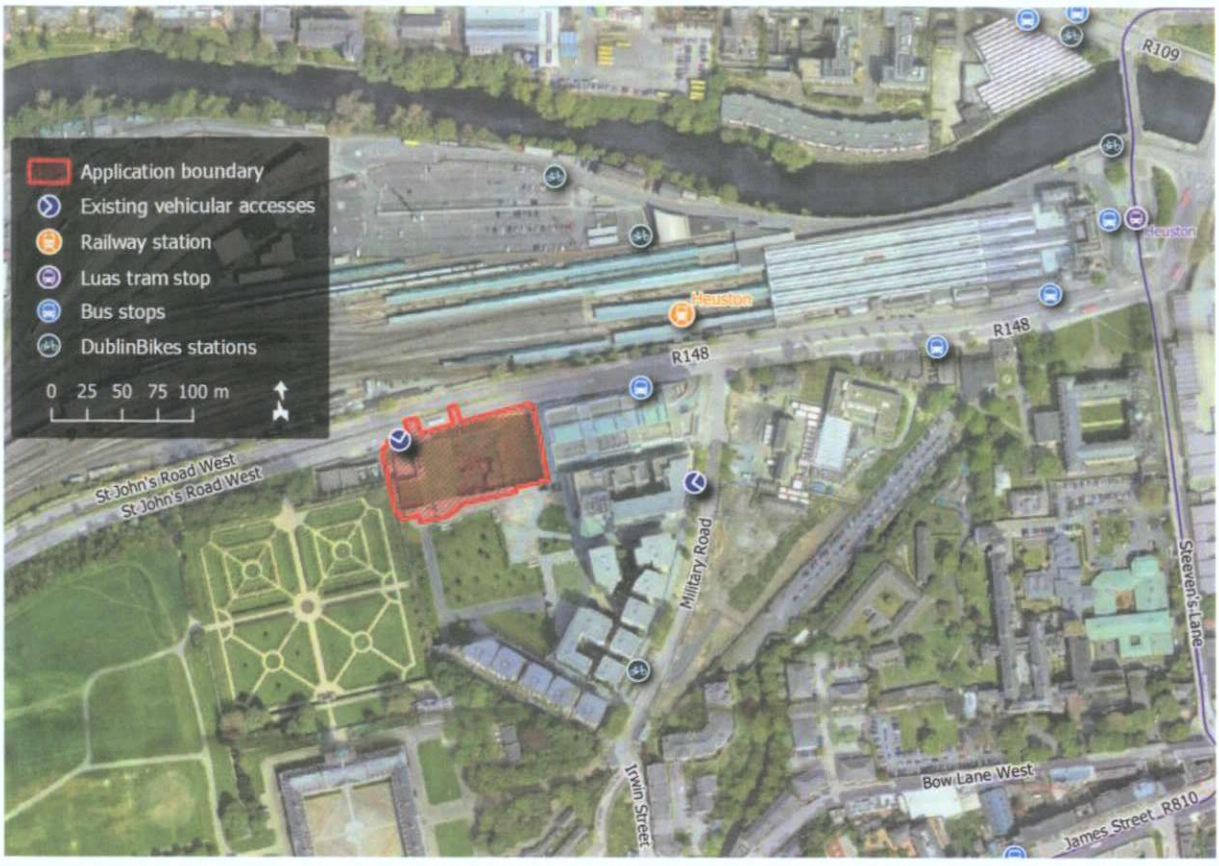
Car parking to serve the proposed development will be provided at basement level. A total of 54no. car parking spaces are proposed to serve the proposed development (30no. spaces to serve the offices and 24no. spaces to serve the hotel). Secure bicycle storage for the office element is provided at basement and lower ground floor levels in the form of 316no. cycle spaces in double-stacked racks. An additional 15 no. Sheffield type bicycle stands are provided at podium level to provide 30no. cycle parking spaces for the hotel and retail/café unit. Provision is also made within the basement car parks for 4no. dedicated motorcycle parking spaces.

All car parking will be located at basement level within the development, and vehicular servicing will also be carried out internally at basement level. Vehicular access to the subject site will be via the 2no. existing access junctions of the Heuston South Quarter (HSQ) complex (see Figure 11.2.1), located on Military Road and on St. John's Road West (R148). Existing ramps from both access junctions bring vehicular traffic down from street level to basement level.

During the development's construction phase, it is proposed to temporarily restrict use of the existing

northern HSQ access junction (on St. John's Road West) to construction traffic and heavy servicing vehicles. All other vehicular traffic entering or exiting the HSQ complex will be required to use its eastern access junction on Military Road.

Figure 11.2.1 Site Extents and Environs



11.3 Assessment Methodology

The assessment of the proposed development's potential traffic impact has been carried out in accordance with the following guidance and established best practice:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency, May 2022)
- Transport Infrastructure Ireland (TII) Traffic and Transport Assessment Guidelines 2014
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines 2011

Reference has also been made to:

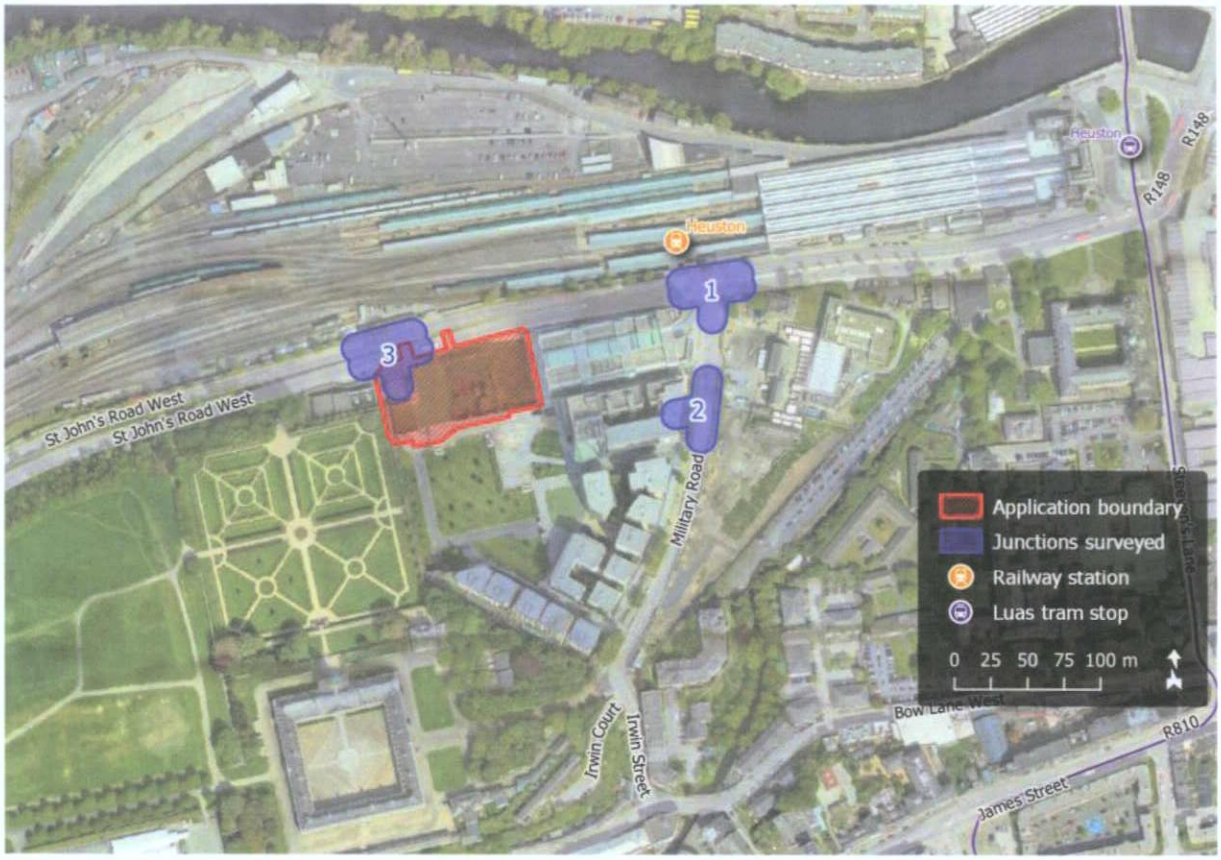
- the Dublin City Development Plan 2016–2022
- the Trip Rate Information Computer System (TRICS) database
- CSO 2016 Census data

11.3.1 Traffic Impact Assessment Methodology

The assessment methodology adopted to assess traffic impacts is summarised as follows:

- Traffic flow data – Morning and evening classified vehicular traffic counts were undertaken on Tuesday the 19th of September 2017 by CS Consulting. These were conducted between 07:00 and 09:30, and between 16:30 and 18:30, at 3no. junctions on the surrounding road network. These traffic flow data were scaled up to 2022 baseline levels using TII growth factors (given in Section 11.5.2). As described in Section 11.5.1, COVID-related disruption to typical travel patterns precluded the use of a contemporary traffic survey.
- Trip generation – A development trip generation assessment has been carried out using data extracted from the Trip Rate Information Computer System (TRICS) database of traffic surveys, to determine the potential vehicular trips to and from the proposed development site during peak hours. The TRICS database is maintained by a consortium of English County Councils but covers the entirety of Great Britain and Ireland. The potential trip generation of associated intended future development on an adjacent site has also been established, as has that of a nearby committed development on Military Road.
- Trip distribution – Based upon existing traffic characteristics and the surrounding road network, an appropriate distribution has been assigned to site development vehicular trips across the road network.
- Existing junction assessment – A spreadsheet model was created which contains the baseline year do-nothing traffic count data described above. The traffic count data were used to develop a computer model (using industry-standard TRANSYT software) of 3no. key junctions on St. John's Road West and on Military Road, including the subject site's 2no. existing vehicular accesses. The performance of these modelled junctions was then assessed for the baseline year 2022.
- Future junction operation assessments – Future year traffic forecasts were derived from TII growth factors and development trip generation figures. These traffic flows were applied to the TRANSYT model. The performance of the modelled junctions was assessed for the development's proposed year of opening (2026), 5 years after opening (2031), and 15 years after opening (2041; the Design Year assessment).

Figure 11.3.1.1 Junctions Surveyed and Assessed



11.3.2 Methodology for Assessing Public Transport and Pedestrian/Cyclist Infrastructure

The methodology adopted to evaluate existing public transport services and pedestrian/cyclist facilities – as well as the development's potential impacts on these – is summarised as follows:

- Existing pedestrian and cyclist facilities – Existing pedestrian footpaths, cycle tracks, and cycle lanes on the street network surrounding the development site have been noted.

- Existing public transport services – Walking times (isochrones) from the development site have been mapped and the existing bus stops, tram stops, and railways stations within these isochrones have been noted. The existing bus, rail, and tram routes serving these stops have been noted.

- Public transport, pedestrian, and bicycle trip generation – Based upon the maximum potential population of the proposed development and the modal split targets recommended for its Workplace Travel Plan (in turn derived from CSO census data), the development's maximum potential peak hour generation of public transport users, pedestrians, and cyclists have been estimated.

11.4 Receiving Environment (Baseline Scenario)

11.4.1 Baseline Traffic Scenario

TRANSYT assessment of the 3no. modelled junctions indicates that the junctions shown in Figure 11.3.1.1 currently operate within effective capacity on all approaches during both the AM peak hour and the PM peak hour. Junctions J1 and J3, which are located on the R148 (St. John's Road West) have higher degrees of saturation than junction J2 (the eastern access to the HSQ complex), due to the significant mainline traffic flows along the R148. The baseline scenario TRANSYT modelling results are summarised in Tables 11.4.1.1 to 11.4.1.3. Vehicle queue lengths are given in Passenger Car Units (PCU).

The traffic flows employed in these assessments are those surveyed in 2017, conditioned through the removal and reassignment of illegal right-turn manoeuvres at junctions J1 and J3, and scaled up to 2022 levels using standard TII growth factors.

Table 11.4.1.1 2022 Baseline Assessment Results – Junction 1

Junction Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean End of Red Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	**Stream**[1]	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
R148 East	S / L	40	73	6	16	4	10	8	21	124	23
	S	31	62	4	12	3	8	5	14	192	46
Military Rd	L	52	74	2	8	2	7	60	53	72	21
	R	72	41	3	4	3	3	80	39	25	118
R148 West	S	84	63	15	12	10	8	13	15	7	43

Table 11.4.1.2 2022 Baseline Assessment Results – Junction 2

Junction Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean End of Red Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	**Stream**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Military Rd South	S / L	2	4	0	0	n/a	n/a	0	0	5072	2133
HSQ Access	L / R	9	11	0	0	n/a	n/a	1	1	892	699
Military Rd North	S	3	2	0	0	n/a	n/a	0	0	3076	3667
	R	6	3	0	0	n/a	n/a	0	0	1381	2546

Table 11.4.1.3 2022 Baseline Assessment Results – Junction 3

Junction Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean End of Red Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	**Stream**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**

1 S = straight ahead, L = left turn, R = right turn

R148 East	S	38	72	11	19	9	15	9	11	137	25
	L	1	2	0	0	n/a	n/a	0	0	7663	5665
HSQ Access	L	12	41	1	3	1	2	46	51	648	118
R148 West	S	73	46	13	5	6	3	6	3	23	97
	R	49	15	2	1	2	1	54	44	85	508

Under these baseline conditions, Junction 1 experiences:

- mean maximum vehicle queues of at most 15 PCU during the AM peak hour and at most 16 PCU during the PM peak hour;
- mean delays per vehicle of at most 80 seconds during the AM peak hour and at most 53 seconds during the PM peak hour.

Under these baseline conditions, Junction 2 experiences:

- no discernible vehicle queueing on average during either the AM peak or the PM peak hour;
- mean delays per vehicle of at most 1 second during both the AM peak hour and the PM peak hour.

Under these baseline conditions, Junction 3 experiences:

- mean maximum vehicle queues of at most 13 PCU during the AM peak hour and at most 19 PCU during the PM peak hour;
- mean delays per vehicle of at most 54 seconds during the AM peak hour and at most 51 seconds during the PM peak hour.

In summary, the 3no. modelled junctions operate efficiently and within their design limits under the baseline traffic scenario.

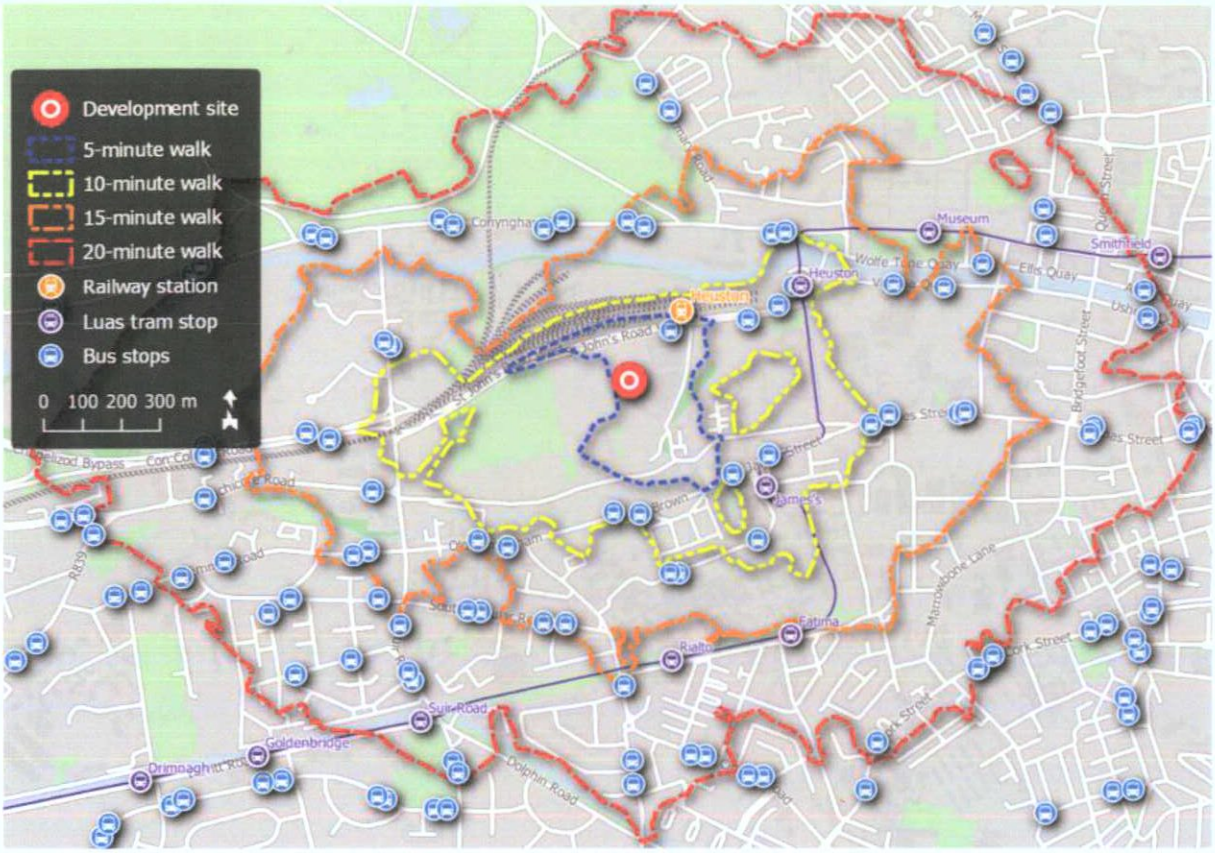
11.4.2 Baseline Transport Scenario

The development site benefits from proximity to good quality public transport services. As shown in Figure 11.4.2.1, the development site is situated within a 5-minute walk of Heuston Station and within a 10-minute walk of the Heuston and James's stops on the Luas Red Line, which is served by frequent trams to and from Dublin city centre, as well as to/from Saggart and Tallaght in the south-west. These walking times have been calculated on the basis of an average walking speed of 5.1km/h.

Bus stop no. 2638, located on St. John's Road West within a 5-minute walk of the site, is served by a total of 3no. Dublin Bus routes (nos. 51d, 79, 79a). Of these, one route (no. 79, between Aston Quay and Spiddal Park/Parkwest) operates at intervals of less than 10 minutes at peak times. A further 39no. bus routes serve stops within a 10-minute walk of the subject site.

Existing pedestrian facilities on the site's surrounding street network are generally of a good standard, including the provision of public lighting. An advisory cycle lane is in place on St. John's Road West on the northern boundary of the development site. No existing cycle facilities are in place on Military Road.

Figure 11.4.2.1 Walking Times and Public Transport Service Points



11.5 Traffic Impact Assessment

11.5.1 Traffic Counts

Full turning movement classified traffic counts were carried out by CS Consulting on Tuesday the 19th of September 2017, at the following 3no. junctions (see Figure 11.5.1.1):

- Junction 1: St. John's Road West (R148) / Military Road
  (3-arm signal-controlled junction)
- Junction 2: Military Road / Heuston South Quarter (East Access)
  (3-arm priority-controlled junction)
- Junction 3: St. John's Road West (R148) / Heuston South Quarter (North Access)

(3-arm signal-controlled junction)These traffic counts were conducted between 07:00 and 09:30 in the morning, and between 16:30 and 18:30 in the evening. The peak hour traffic flows across all three surveyed junctions were found to occur between 07:30 and 08:30 (AM peak period) and between 16:30 and 17:30 (PM peak period).

Recent travel restrictions and varying working patterns resulting from the current COVID-19 public health emergency precluded conducting a contemporary traffic survey, as data obtained through such a survey would not be representative of typical traffic patterns.

The 2017 traffic movements at each of the surveyed junctions during the peak hours have therefore been isolated from the count data and have been scaled up to baseline levels for the year 2022 using standard TII growth factors. These total survey year and baseline year peak hour flows at the survey junctions are given in Tables 11.5.1.1 and 11.5.1.2.

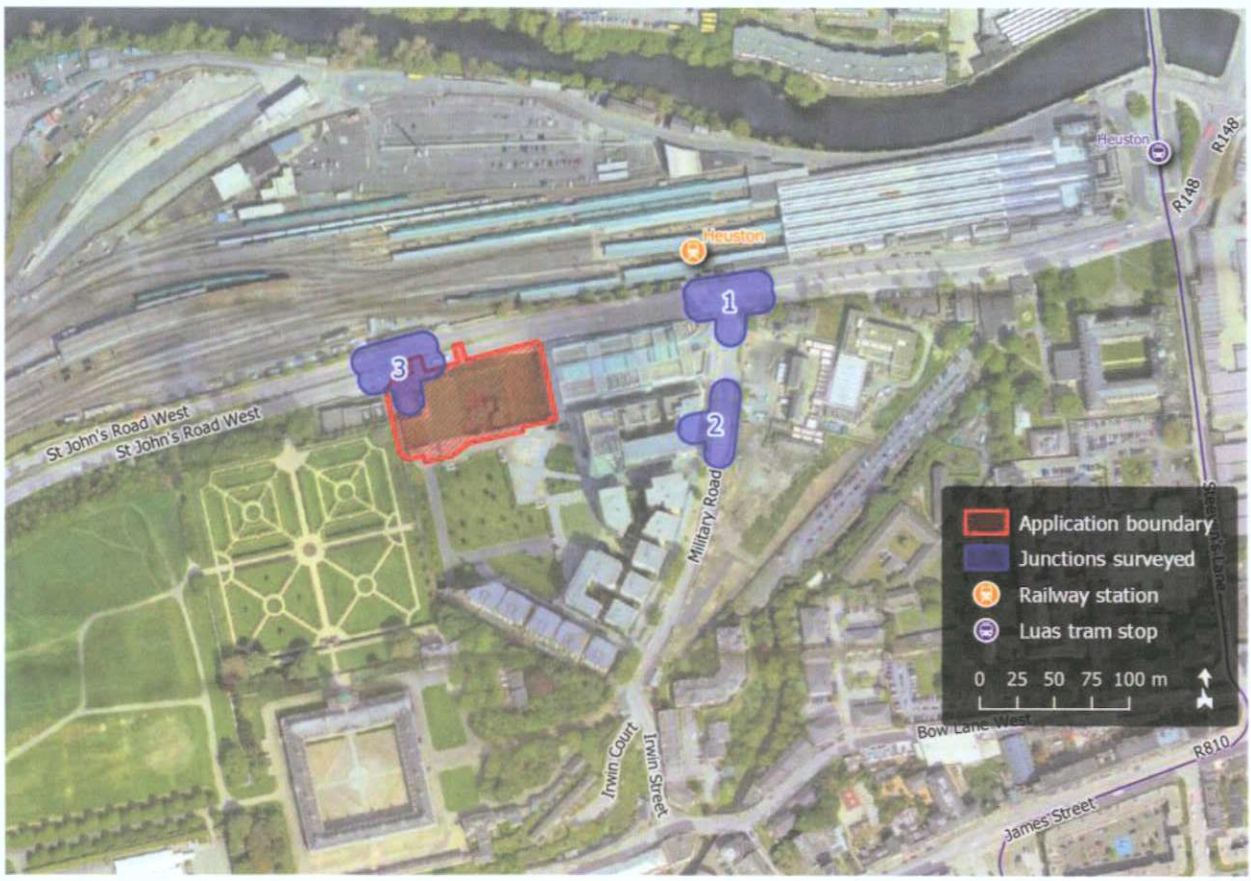
Table 11.5.1.1 Total Peak Hour Traffic Flows at Surveyed Junctions – Survey Year 2017

Time Period	Total Surveyed Junction Traffic Movements (PCU)		
	J1	J2	J3
AM Peak (07:30-08:30)	2018	284	1943
PM Peak (16:30-17:30)	2339	477	2286

Table 11.5.1.2 Total Peak Hour Traffic Flows at Surveyed Junctions – Baseline Year 2022

Time Period	Total Surveyed Junction Traffic Movements (PCU)		
	J1	J2	J3
AM Peak (07:30-08:30)	2187	307	2105
PM Peak (16:30-17:30)	2534	517	2478

Figure 11.5.1.1 Surveyed Road Junctions



11.5.2 Background Traffic Growth

The operational impact of traffic on the road network within the proposed development's area of influence has been assessed for the following years:

- 2022 Baseline year
- 2026 Proposed opening year
- 2031 5 years after opening
- 2041 Design year (15 years after opening)

Unit 5.3 of the TII *Project Appraisal Guidelines* (PE-PAG-02017 *Travel Demand Projections*) has been used to apply growth factors to the existing surveyed background traffic flows for the future year junction assessments. The TII annual growth rates applied are given in Table 11.5.2.1 and the resultant cumulative growth in background traffic for each assessment year is given in Table 11.5.2.2.

Table 11.5.2.1 TII Central Growth Rates (Light Vehicles)

Geographic Area	Background Traffic Growth per Year		
	2016-2030	2030-2040	2040-2050
Dublin Metropolitan Area	+ 1.62%	+ 0.51%	+ 0.44%

Table 11.5.2.2 Predicted Background Traffic Growth (cumulative increases over 2017 traffic levels)

2022 Baseline year	2026 Year of opening	2031 Opening year +5	2041 Opening year +15
+ 8.4%	+ 15.6%	+ 23.9%	+ 30.2%

11.5.3 Proposed Development Trip Generation – Operational Phase

Trip generation factors from the TRICS database have been used to predict the trip generation to and from the proposed development in its operational phase, for both the AM and PM peak hour periods. Full details of the TRICS information used in the assessments are in Appendix 11A.

The proposed development comprises an office building with a total gross floor area of 19,474m^2 (excluding basement) and a 238-bedroom hotel. The proposed development also includes a small retail/café unit with a floor area of 208m^2, located at podium level within the office building. This is considered ancillary to the office space and will not independently generate any significant vehicular traffic. For trip generation purposes, the floor area of this retail/café unit has therefore been included in that of the office space.

TRICS trip rates for the proposed development have been selected from the sub-categories '02 Employment / A – Office' and '06 Hotel, Food & Drink / A – Hotels', restricted insofar as possible to similar edge-of-city-centre locations, and further refined with reference to 2016 CSO census data. The trip rates selected are given in Table 11.5.3.1 and the resultant proposed development trip generation figures obtained are given in Table 11.5.3.2.

Table 11.5.3.1 TRICS Commercial Trip Generation Rates

Time Period	Offices		Hotel	
	Arrivals per hour/100m²	Departures per hour/100m²	Arrivals per hour/bedroom	Departures per hour/bedroom
AM Peak	0.060	0.024	0.055	0.114
PM Peak	0.042	0.083	0.058	0.039

Table 11.5.3.2 Proposed Development Trip Generation from TRICS

Time Period	Arrivals	Departures	Total Trips
AM Peak (07:30-08:30)	25	32	57
PM Peak (16:30-17:30)	22	25	47

11.5.4 Proposed Development Trip Distribution – Operational Phase

It has been assumed that all vehicular traffic to and from the proposed development, once complete, shall be distributed across the surrounding road network in the same manner as the existing traffic arriving to and departing from the existing Heuston South Quarter (HSQ) complex.

The 2017 traffic survey encompassed both existing vehicular access junctions of the Heuston South Quarter (HSQ) complex. From these survey data, it was possible to determine the distribution of existing HSQ traffic between its access junctions on Military Road (to the east) and on St. John's Road (to the north). Across the surrounding wider street network, trips to and from the existing HSQ complex may arrive or depart via the following points:

- from/to the east along St. John's Road (R148);
- from/to the south along Military Road; or
- from/to the west along St. John's Road (R148).

A distribution of existing HSQ traffic across these 3no. origin/destination points was derived from the balance of traffic between the complex's 2no. access junctions, with the following specific assumptions made:

- all traffic departing via the northern access must turn left and head westward on St. John's Road.
- traffic departing via the eastern access is split north/south along Military Road in accordance with the directional splits surveyed at that junction.
- all traffic departing northward along Military Road shall then head eastward on St. John's Road.
- traffic arriving via the northern access is split east/west along St. John's Road in accordance with the directional splits surveyed at that junction.
- traffic arriving via the eastern access is split north/south along Military Road in accordance with the directional splits surveyed at that junction.
- all traffic arriving from the north along Military Road has arrived from the east along St. John's Road.

- no traffic arriving to the northern access from the east (along St. John's Road) has travelled via Military Road.

The resultant distribution of existing HSQ traffic across the surrounding network is given in Tables 11.5.4.1 and 11.5.4.2 and is illustrated in Figures 11.5.4.1 and 11.5.4.2.

Table 11.5.4.1 Network Origin Splits of Existing HSQ Traffic

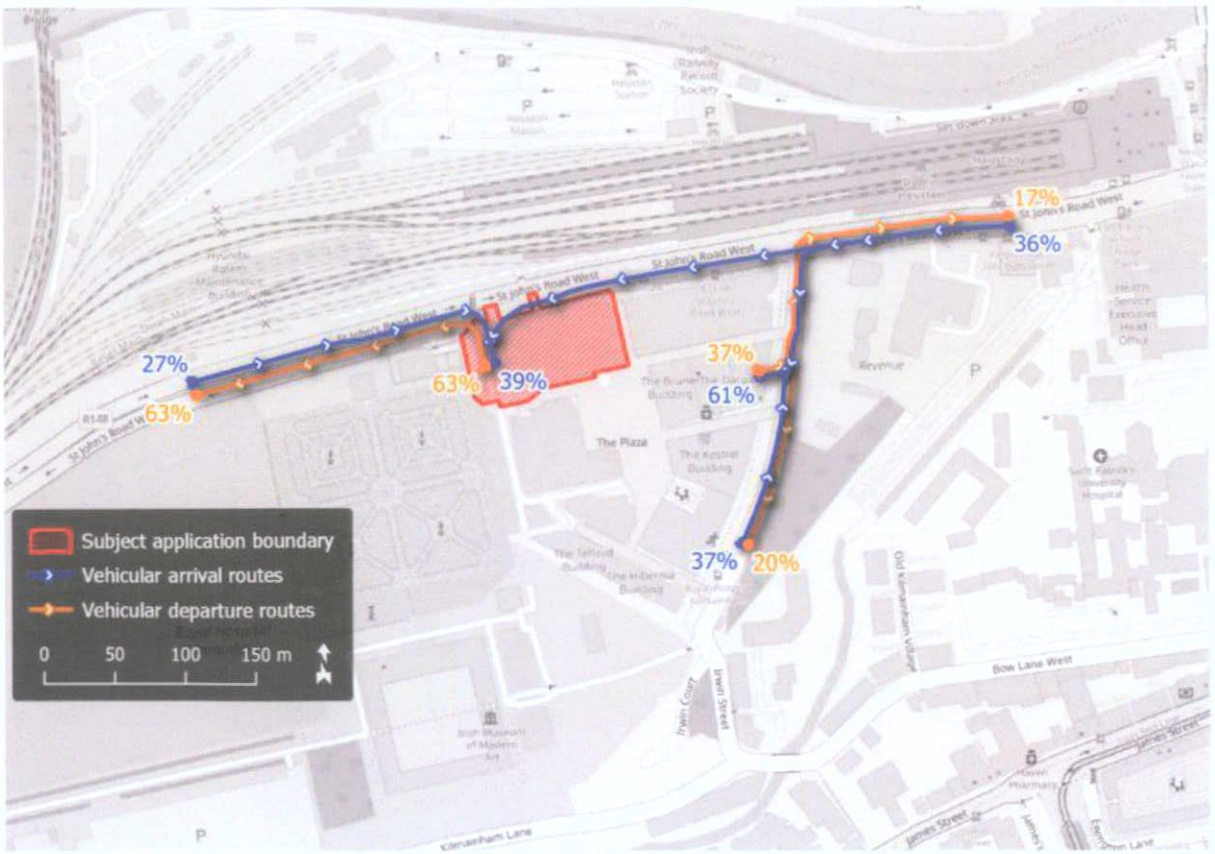
Time Period	Arrivals From			TOTAL
	R148 St. John's Rd (East)	Military Road (South)	R148 St. John's Rd (West)	
AM Peak	29%	20%	51%	100%
PM Peak	36%	37%	27%	100%

Table 11.5.4.2 Network Destination Splits of Existing HSQ Traffic

Time Period	Departures To			TOTAL
	R148 St. John's Rd (East)	Military Road (South)	R148 St. John's Rd (West)	
AM Peak	19%	43%	38%	100%
PM Peak	17%	20%	64%	100%

Figure 11.5.4.1 HSQ vehicular trip origin/destination proportions – AM peak

Figure 11.5.4.2 HSQ vehicular trip origin/destination proportions – PM peak



11.5.5 Proposed Development Vehicle Trip Generation – Construction Phase

Heavy Goods Vehicle (HGV) construction traffic to and from the site shall reach a peak during the breaking up and removal of existing reinforced concrete structures and hardstanding on the development site. As the subject site has already been partially developed and the ground level reduced, only limited excavation works will be required. These are expected to be conducted in tandem with demolition/clearance works, and are likely to involve similar HGV movement frequencies. Similar rates of HGV trip generation may also occur during concrete pouring, though at a later stage in construction. Other construction activities requiring HGV trips to and from the site include material delivery and heavy plant transfer; these will be sporadic in nature and also will not occur at the same time as more HGV-intensive activities. The final programming and scheduling of all construction activities shall be determined by the lead contractor appointed to the project.

As a 'worst-case' scenario, therefore, it is assumed that at most 4no. HGV trips may be made to the site each hour (one HGV arrival and one HGV departure every 15 minutes). This would equate to total traffic movements of 18 PCU in each of the background peak hours.

In addition to HGV traffic, periodic deliveries of materials to site shall be made by Light Goods Vehicles. To the extent possible, these shall be scheduled to take place outside of the background peak traffic hours. Such trips are also unlikely to occur frequently during the stages of construction that require frequent GHV trips; LGV trips are therefore unlikely to occur in significant numbers at the same time as HGV trips take place. For the purposes of estimating a worst-case construction traffic generation scenario, however, 6no. LGV arrivals and 6no. LGV departures (total traffic movements of 12 PCU) are assumed in each of the background peak hours.

Limited car parking for construction personnel is likely to be provided on site during construction works. Some additional vehicular trips shall therefore be made to and from the site each day by construction personnel commuting to and from work. The majority of these trips are expected to fall outside the background traffic peak hours. In the worst-case scenario, it is assumed that 25no. such light vehicle trips may be made to the site during the AM peak hour, and 25no. such trips may be made from the site during the PM peak hour.

The anticipated worst-case scenario vehicular trip generation of the subject site during construction is summarised in Table 11.5.5.1.

Table 11.5.5.1 Maximum Peak Hour Construction Traffic Generation

Time Period	Arrivals	Departures	Total Trips
AM Peak (07:30-08:30)	40	15	55
PM Peak (16:30-17:30)	15	40	55

11.5.6 Proposed Development Vehicle Trip Distribution – Construction Phase

It is proposed to employ the existing northern HSQ access on St. John's Road West (R148) as the sole vehicular access to the subject site during construction. All HGV construction traffic will be required to follow a designated access route to and from the west along the R148, which continues as a dual carriageway as far as the M50 motorway.

Light vehicle construction traffic (cars and vans) exiting the site shall likewise be obliged to turn left onto the R148 westbound, as this is an existing restriction at this access junction. In the case of light vehicles entering the construction site, however, it is assumed that a proportion will arrive from the east along the R148. This proportion is assumed to be equivalent to the share of existing inbound trips to the HSQ complex currently accommodated by its eastern access on Military Road, as given in Table 11.5.5.2.

Table 11.5.6.1 Access Origin Splits of Existing HSQ Traffic

Time Period	Arrivals Via		TOTAL
	Eastern Access (Military Road)	Northern Access (St. John's Road West)	
AM Peak	44%	56%	100%
PM Peak	61%	39%	100%

At the existing junction of the R148 with Military Road, it is assumed that all inbound light vehicle construction traffic passing through this junction will be distributed in accordance with the existing directional splits observed at this location. These are given in Table 11.5.5.3.

Table 11.5.6.2 Surveyed Arrival Splits to R148 West at Junction with Military Road

Time Period	Arrivals From		TOTAL
	R148 St. John's Rd (East)	**Military Road** (South)	
AM Peak	93%	7%	100%
PM Peak	84%	16%	100%

11.5.7 Reallocation of Existing HSQ Vehicular Traffic during Construction

As it is proposed to employ the existing northern HSQ access on St. John's Road West (R148) as a construction access, it shall be necessary to temporarily restrict the use of this junction. With the exceptions of longer or taller vehicles (e.g. articulated trucks), all operational traffic currently using the northern HSQ access would be required to instead travel via the eastern HSQ access on Military Road for the duration of construction activity.

To account for this proposed temporary restriction, the following adjustments to background traffic flows have been made as part of the construction phase assessment:

- All vehicular trips currently made via the northern HSQ access are removed from the local road network.
- These trips are reassigned via the eastern HSQ access, being distributed in accordance with the observed network origin/destination splits of existing traffic travelling via the northern HSQ access (given in Tables 11.5.7.1 and 11.5.7.2).

Table 11.5.7.1 Network Origin Splits of Existing HSQ North Access Traffic

Time Period	Arrivals From			TOTAL
	R148 St. John's Rd (East)	**Military Road** (South)	**R148 St. John's Rd** (West)	
AM Peak	8%	0%	92%	100%
PM Peak	32%	0%	68%	100%

Table 11.5.7.2 Network Destination Splits of Existing HSQ North Access Traffic

Time Period	Departures To			TOTAL
	R148 St. John's Rd (East)	**Military Road** (South)	**R148 St. John's Rd** (West)	
AM Peak	0%	0%	100%	100%
PM Peak	0%	0%	100%	100%

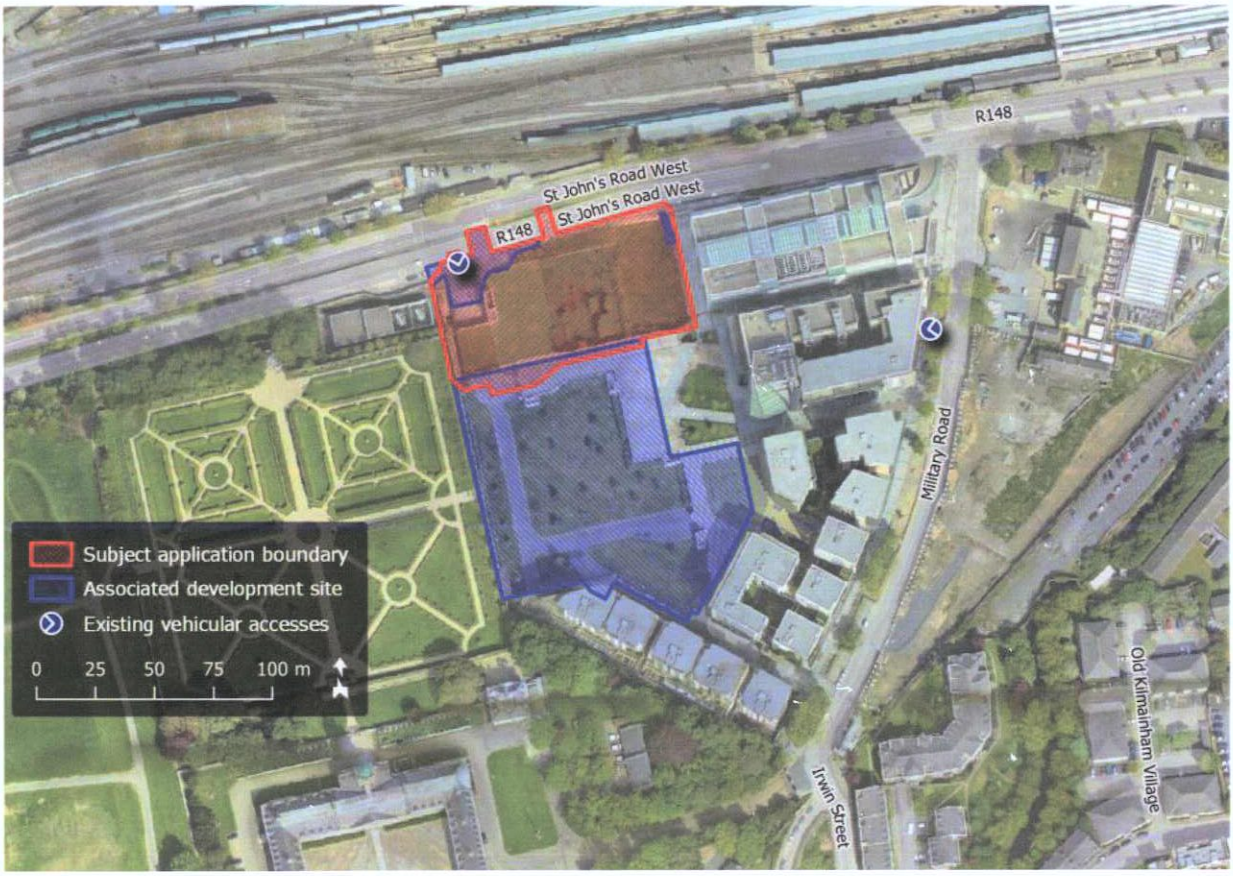
11.5.8 Permitted Strategic Housing Development: Vehicle Trip Generation and Distribution

The subject site forms the northern part of the applicant's landholding in the existing Heuston South Quarter (HSQ) complex. Planning permission has been sought for a Strategic Housing Development (SHD) comprising 399no. residential apartment units with 80no. ancillary car parking spaces at

basement level immediately to the south of the proposed hotel and office basement level car parks and sharing the internal basement circulation lanes / roads. An Bord Pleanála issued an order on the 31st of March 2022 granting permission for this development, subject to conditions that include a slight reduction in the number of residential units (from 399no. units to 359no. units).

For the purposes of the present assessment, it has been assumed that the future development of this associated residential development site (in the applicant's ownership) shall proceed and shall be completed by the year 2026 (the projected opening year of the proposed development).

Figure 11.5.8.1 Associated Development Site



As for the proposed development, the predicted vehicular trip generation of the associated permitted SHD has been calculated using trip generation factors sourced from the TRICS database. In this case, the TRICS sub-category category '03 Residential / C – Flats Privately Owned' has been employed. The trip rates selected are given in Table 11.5.8.1 and the resultant trip generation figures obtained are given in Table 11.5.8.2. To ensure a robust assessment, trip generation for this associated permitted development has been calculated on the basis of its comprising 399no. residential apartment units (notwithstanding the conditions attached to the grant of permission, which shall result in a slight reduction in the number of residential units).

Table 11.5.8.1 TRICS Apartment Trip Generation Rates

Time Period	Arrivals per hour per unit	Departures per hour per unit
AM Peak (07:30-08:30)	0.031	0.089

PM Peak (16:30-17:30)	0.127	0.092

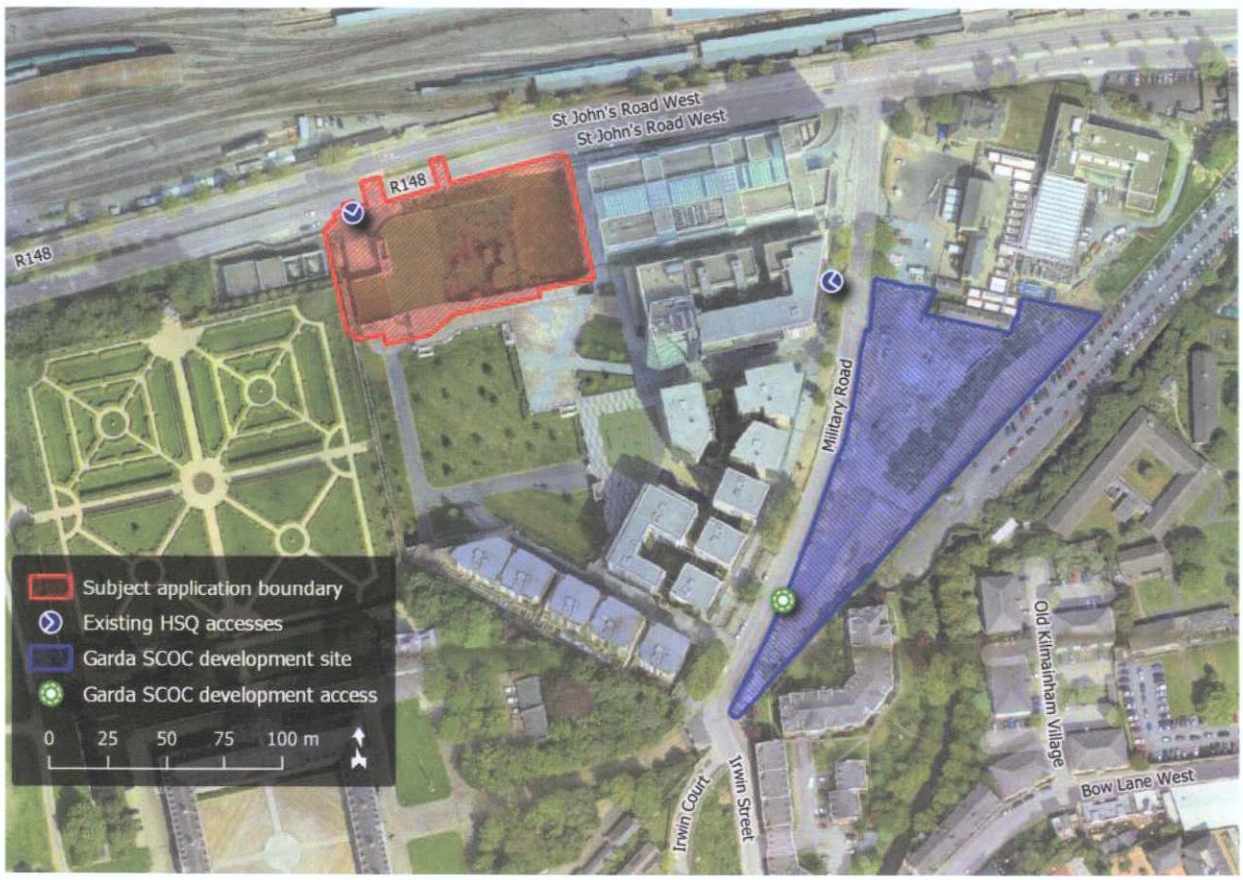
Table 11.5.8.2 Associated Development Trip Generation from TRICS

Time Period	Arrivals	Departures	Total Trips
AM Peak (07:30-08:30)	12	36	48
PM Peak (16:30-17:30)	51	37	88

All vehicular trips to and from this associated future SHD have been distributed across the surrounding street network in the same manner as the trips to be generated by the proposed development. These additional traffic flows to and from the HSQ complex have been included in all future year junction assessments.

11.5.9 Committed Development: Vehicle Trip Generation and Distribution

Figure 11.5.9.1 Nearby Committed Development Site



The Commissioners for the Public Works in Ireland have granted permission under Part 9 of the Planning and Development Regulations 2001 (as amended) for the construction of a new Garda Security and Crime Operations Centre (Garda SCOC) on a site to the east of Military Road, facing the existing HSQ complex. This development is understood to comprise a new four- to six-storey office building with a total office Gross Floor Area of 10,060m^2, over a two-storey basement car park, with vehicular access to/from Military Road (see Figure 11.5.9.1).

For the purposes of the present assessment, it has been assumed that this committed development

shall be completed and operational by the year 2024 (the projected opening year of the proposed development). The predicted vehicular trip generation of this development has been calculated using the TRICS trip generation factors for offices given in Table 11.5.8.1; the resultant trip generation figures are given in Table 11.5.9.1.

A full schedule of existing and permitted developments in the vicinity of the subject development site is given in Appendix 1A to this EIAR, for the purposes of determining cumulative impacts of the proposed development in conjunction with other relevant developments. With regard to traffic and transport, the Garda SCOC development is the only permitted development relevant to cumulative impact assessment.

Table 11.5.9.1 Committed Development Trip Generation from TRICS

Time Period	Arrivals	Departures	Total Trips
AM Peak (07:30-08:30)	6	2	8
PM Peak (16:30-17:30)	4	8	12

The committed development's vehicular access junction shall be located on Military Road, approx. 140m south of the existing HSQ eastern access. It is therefore assumed that vehicular traffic to and from this development shall be distributed north/south along Military Road in the same proportions as the existing traffic to and from the eastern HSQ access. These directional splits are given in Tables 11.5.9.2 and 11.5.9.3.

Table 11.5.9.2 Surveyed Arrival Splits to HSQ Eastern Access

Time Period	Arrivals From		TOTAL
	Military Road (North)	**Military Road** (South)	
AM Peak	56%	44%	100%
PM Peak	38%	62%	100%

Table 11.5.9.3 Surveyed Departure Splits from HSQ Eastern Access

Time Period	Departures To		TOTAL
	Military Road (North)	**Military Road** (South)	
AM Peak	26%	74%	100%
PM Peak	44%	56%	100%

At the existing junction of the R148 with Military Road, it is assumed that all Garda SCOC traffic passing through this junction will be distributed in accordance with the existing directional splits observed at this location. These are given in Tables 11.5.9.4 and 11.5.9.5.

Table 11.5.9.4 Surveyed Arrival Splits to Military Road at Junction with R148

Time Period	Arrivals From		TOTAL
	R148 St. John's Rd (East)	**R148 St. John's Rd** (West)	
AM Peak	100%	0%	100%

PM Peak	100%	0%	100%

Table 11.5.9.5 Surveyed Departure Splits from Military Road at Junction with R148

Time Period	Departures To		TOTAL
	R148 St. John's Rd (East)	**R148 St. John's Rd** (West)	
AM Peak	58%	42%	100%
PM Peak	36%	64%	100%

The vehicular traffic flows to and from the committed Garda SCOC development have been included in all future year assessment scenarios.

11.5.10 TRANSYT Modelling

Figure 11.5.10.1 Modelled Road Junctions

To determine the likely traffic impact of the proposed development, operational assessments of 3no. key junctions have been undertaken using the industry-standard TRL computer program TRANSYT, for both the weekday AM peak hour (07:30-08:30) and the weekday PM peak hour (16:30-17:30). The following junctions have been modelled and assessed (see Figure 11.5.10.1):

- Junction 1: St. John's Road West (R148) / Military Road
  (3-arm signal-controlled junction)
- Junction 2: Military Road / Heuston South Quarter (East Access)

(3-arm priority-controlled junction)

- Junction 3: St. John's Road West (R148) / Heuston South Quarter (North Access) (3-arm signal-controlled junction)

The performances of these junctions have been assessed under the following scenarios relating to the proposed development's operational phase:

- 2022 – existing baseline traffic conditions
- 2026 (planned year of opening) – with & without proposed development
- 2031 – with & without proposed development
- 2041 (design year) – with & without proposed development

The proposed development includes changes to the configuration of the existing HSQ access junction on St. John's Road West, including the removal of the left-turn slip from the east into the HSQ complex. TRANSYT modelling of this junction has been conducted under all 'without development' scenarios using the existing junction configuration; modelling under all 'with development' scenarios has been conducted using the proposed new configuration.

Figure 11.5.10.2 TRANSYT Model Structure

Junction performance is assessed based upon the five metrics defined in Table 11.5.10.1. Full TRANSYT outputs are provided in Appendix 11B.

Table 11.5.10.1 Junction Assessment Criteria

Criterion	Definition
Degree of Saturation	The ratio of current traffic flow to ultimate capacity (also known as RFC) on a link or traffic stream. Account is taken of the green time given to the link per cycle when calculating this value (for signalised junction approaches), as well as blocking effects and oversaturation effects.
Mean Maximum Queue	The highest estimated mean number of Passenger Car Units (PCU) queued in any lane of a junction approach, averaged over the entire analysis period.
Mean End of Red Queue	The mean length of queue in any lane of a signal-controlled junction approach link by the end of the red signal phase for that approach, measured in Passenger Car Units (PCU).
Mean Delay per Vehicle	The average delay incurred by a vehicle on a junction approach as a result of having to wait at a signal or give way at a priority-controlled junction.
Practical Reserve Capacity	The percentage by which the arriving traffic flow on a stream could increase before that junction approach would reach its effective capacity (i.e. 90% saturation).

In addition to the operational phase junction performance assessments, a supplementary assessment of junction J2 (the eastern access to the HSQ complex) has been conducted in order to establish the impact of temporarily rerouting all HSQ traffic via this access during construction of the proposed development.

11.5.11 Traffic Impacts: Construction Phase

Tables 11.5.11.1 to 11.5.11.3 give the TRANSYT modelling results for the 3no. assessed junctions under a worst-case scenario during the development's construction phase in the year 2026. The traffic flows employed in these assessments are those surveyed in 2017, conditioned through the removal and reassignment of illegal right-turn manoeuvres at junctions J1 and J3, scaled up to 2026 levels using standard TII growth factors, and with the addition of:

- operational phase vehicular trips generated by the associated and committed developments described in Sections 11.5.8 and 11.5.9;
- vehicular trips generated by the proposed development during its construction stage (see Sections 11.5.5 and 11.5.6); and
- the temporary reallocation of traffic currently travelling via the HSQ northern access (see Section 11.5.7).

Under this assessment scenario, all junctions are shown to operate within effective capacity on all approaches, in both peak hour periods.

Table 11.5.11.1 2026 Assessment Results – Construction Phase – Junction 1

Junction Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean End of Red Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	**Stream**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
R148 East	S / L	45	86	7	22	5	13	9	32	102	4
	S	33	70	4	15	3	9	6	19	171	28
Military Rd	L	71	88	4	13	3	11	73	65	27	2
	R	73	38	4	4	4	4	76	35	23	136
R148 West	S	91	72	30	14	12	10	20	19	-1	26

Table 11.5.11.2 2026 Assessment Results – Construction Phase – Junction 2

Junction Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean End of Red Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	**Stream**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Military Rd South	S / L	3	5	0	0	n/a	n/a	0	0	3184	1783
HSQ Access	L / R	20	33	0	0	n/a	n/a	1	3	344	176
Military Rd North	S	3	3	0	0	n/a	n/a	0	0	2742	3275
	R	21	12	0	0	n/a	n/a	1	1	321	655

Table 11.5.11.3 2026 Assessment Results – Construction Phase – Junction 3

Junction Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean End of Red Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	**Stream**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
R148 East	S	42	81	13	23	10	18	10	13	117	12
	L	2	2	0	0	n/a	n/a	0	0	4108	5181
HSQ Access	L	14	32	1	2	1	2	46	49	527	178
R148 West	S	83	50	20	6	7	3	10	3	8	79
	R	23	16	1	1	1	1	46	44	294	461

During its construction phase, the proposed development is predicted to result in a short-term slight adverse impact on the operation of junctions on the surrounding road network. This impact will be confined to the duration of construction activity on site and will therefore be entirely reversible.

It is noted that construction of the associated permitted HSQ SHD shall likely proceed in tandem with that of the proposed development. It is therefore unlikely that this associated development would be completed and operational while the proposed development is still under construction. It is also unlikely, however, that significant additional construction traffic would be generated by the associated

development, as construction activities and storage/parking facilities across the two sites would be coordinated to avoid this.

The inclusion within this construction phase assessment of operational phase traffic generated by the associated development is therefore intended simply to ensure that a robust 'worst-case' scenario is considered.

11.5.12 Traffic Impacts: Operational Phase/Cumulative Impacts

Tables 11.5.12.1 to 11.5.12.3 give the TRANSYT junction modelling results for the design year 2039, with the inclusion of vehicular traffic generated by the proposed development. The traffic flows employed in these assessments are those surveyed in 2017, conditioned through the removal and reassignment of illegal right-turn manoeuvres at junctions J1 and J3, scaled up to 2041 levels using standard TII growth factors, and with the addition of:

- operational phase vehicular trips generated by the proposed development (see Sections 11.5.3 and 11.5.4); and
- operational phase vehicular trips generated by the associated and committed developments described in Sections 11.5.8 and 11.5.9.

Under this assessment scenario:

- Junction J1 (that of Military Road with St. John's Road West) is predicted to reach ultimate capacity during the AM peak hour on approach from the west along St. John's Road West (R148) and to exceed effective capacity during the AM peak hour on the right-turning approach from Military Road.
- Junction J2 (the existing eastern access to the HSQ complex) shall continue to operate well within effective capacity on all approaches, in both peak hour periods.
- Junction J3 (the existing northern access to the HSQ complex) is predicted to slightly exceed effective capacity during the AM peak hour on approach from the west along St. John's Road West (R148) but shall remain within ultimate capacity on all approaches in both peak hour periods.

Table 11.5.12.1 2041 Do Something Assessment Results – Operational Phase – Junction 1

Junction Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean End of Red Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	**Stream**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
R148 East	S / L	49	90	8	27	6	15	9	34	83	0
	S	37	75	5	17	4	10	5	18	143	21
Military Rd	L	63	90	3	12	3	10	68	79	44	0
	R	98	53	8	5	8	4	181	42	-9	70
R148 West	S	101	75	59	16	32	10	69	19	-11	19

In the design year 2041, with the proposed development in place, Junction 1 is predicted to experience:

- mean maximum vehicle queues of up to 59 PCU during the AM peak hour and up to 27 PCU during the PM peak hour;
- mean delays per vehicle of up to 181 seconds during the AM peak hour and up to 79 seconds during the PM peak hour.

Table 11.5.12.2 2041 Do Something Assessment Results – Operational Phase – Junction 2

Junction Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean End of Red Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	Stream	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Military Rd South	S / L	2	5	0	0	n/a	n/a	0	0	4047	1647
HSQ Access	L / R	21	20	0	0	n/a	n/a	2	2	337	358
Military Rd North	S	4	3	0	0	n/a	n/a	0	0	2431	2900
	R	9	7	0	0	n/a	n/a	0	0	915	1164

In the design year 2041, with the proposed development in place, Junction 2 is predicted to experience:

- no discernible vehicle queueing on average during either the AM peak or the PM peak hour;
- mean delays per vehicle of at most 2 seconds in either peak hour.

Table 11.5.12.3 2041 Do Something Assessment Results – Operational Phase – Junction 3

Junction Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean End of Red Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	Stream	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
R148 East	S/L	47	82	7	10	5	9	10	13	93	10
	S	43	76	6	9	5	7	8	9	110	19
HSQ Access	L	14	68	1	5	1	5	41	63	525	32
R148 West	S	88	55	25	7	9	4	13	4	2	64
	R	58	45	3	1	3	1	54	59	56	98

In the design year 2041, with the proposed development in place, Junction 3 is predicted to experience:

- mean maximum vehicle queues of up to 25 PCU during the AM peak hour and up to 10 PCU during the PM peak hour;
- mean delays per vehicle of up to 54 seconds during the AM peak hour and up to 63 seconds during the PM peak hour.

The impact of the proposed development on the operation of the three assessed road junctions in the design year 2041 may be represented quantitatively by the differences in TRANSYT modelling results between the Do Nothing and Do Something assessment scenarios for that year. These comparisons are given in Tables 11.5.12.4 to 11.5.12.6.

Table 11.5.12.4 2041 Proposed Development Influence – Operational Phase – Junction 1

Junction Approach Arm and Traffic Stream		Change in Degree of Saturation (%)		Change in Mean Maximum Queue (PCU)		Change in Mean End of Red Queue (PCU)		Change in Mean Delay per Vehicle (seconds)		Change in Practical Reserve Capacity (%)	
Arm	**Stream**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
R148 East	S / L	+1	0	0	+1	0	0	+1	+1	-4	0
	S	0	+1	0	0	0	0	0	0	-3	0
Military Rd	L	-10	0	0	0	0	0	-19	0	+21	0
	R	-11	+1	-3	0	-3	0	-106	0	+9	-4
R148 West	S	+1	0	+4	-3	+6	-1	+14	-3	-1	0

At Junction 1 in the design year 2041, the inclusion of traffic generated by the proposed development is predicted to result in:

- increases in mean vehicle queue lengths of at most 6 PCU during the AM peak hour and at most 1 PCU during the PM peak hour;
- increases in mean delays per vehicle of at most 14 seconds during the AM peak hour and at most 1 second during the PM peak hour.

Table 11.5.12.5 2041 Proposed Development Influence – Operational Phase – Junction 2

Military Rd South	S / L	0	0	0	0	n/a	n/a	0	0	-98	-28
HSQ Access	L / R	+5	+3	0	0	n/a	n/a	0	0	-119	-58
Military Rd North	S	0	0	0	0	n/a	n/a	0	0	0	0
	R	+1	+1	0	0	n/a	n/a	0	0	-124	-185

At Junction 2 in the design year 2041, the inclusion of traffic generated by the proposed development

is predicted to result in no discernible increase in either average vehicle queue length or mean delay per vehicle, in either the AM peak hour or the PM peak hour.

Table 11.5.12.6 2041 Proposed Development Influence – Operational Phase – Junction 3

Junction Approach Arm and Traffic Stream		Change in Degree of Saturation (%)		Change in Mean Maximum Queue (PCU)		Change in Mean End of Red Queue (PCU)		Change in Mean Delay per Vehicle (seconds)		Change in Practical Reserve Capacity (%)	
Arm	**Stream**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
R148 East	S	+1	-5	-8	-17	-6	-7	0	+1	-4	+6
	L	+42	+73	+6	+9	n/a	n/a	+8	+9	-5951	-3029
HSQ Access	L	-7	+7	0	+1	0	+1	-6	+5	+193	-16
R148 West	S	0	0	0	0	0	0	0	0	0	0
	R	-4	+18	0	0	0	0	-7	+13	+12	-141

At Junction 3 in the design year 2041, the inclusion of traffic generated by the proposed development is predicted to result in:

- increases in mean maximum vehicle queues of at most 6 PCU during the AM peak hour and at most 9 PCU during the PM peak hour;
- increases in mean delays per vehicle of at most 8 seconds during the AM peak hour and at most 13 seconds during the PM peak hour.

It is apparent that the inclusion of traffic generated by the proposed development is likely to result in decreased vehicle queue lengths and delays on certain junction approaches, due primarily to the redistribution of traffic signal green time between approaches.

During its operational phase, the proposed development is therefore predicted to result overall in a long-term slight adverse impact on the operation of junctions on the surrounding road network. This impact should be considered reversible to a degree, as any future measures that reduce local vehicular traffic volumes (e.g. improvements in public transport or cycling infrastructure, junction redesign, or changes in general traffic flow restrictions) have the potential to improve local traffic flows generally, as well as to reduce vehicle trips to/from the proposed development.

11.6 Potential Significant Impacts

11.6.1 Construction Phase Impacts

The proposed development will generate vehicular trips to and from site during the construction phase, as detailed in Sections 11.5.5 and 11.5.6. Temporary access restrictions will also be required during construction, resulting in the diversion of some light vehicle traffic that currently uses the northern access junction of the HSQ complex. The most significant potential impact shall be upon the operation of the existing eastern HSQ access junction on Military Road, through which it is proposed to divert all

non-construction-related light vehicle traffic for the duration of construction works (see Section 11.5.7).

A supplementary assessment of junction performance under these conditions has therefore been conducted, as described in Section 11.5.11, and found that all junctions will operate within effective capacity on all approaches, in both peak hour periods. In this way, impacts arising from this aspect of the construction phase will be adverse in nature, short-term in duration, and slight in significance. These effects will be confined to the duration of construction activity on site and will therefore be entirely reversible.

It is also recognised that there is potential during the construction phase for construction-related activity to impact upon the surrounding road network in ways beyond the operational performance of the junctions assessed. These further impacts would potentially take the form of surrounding roads being temporarily obstructed by stopped/parked construction vehicles or by delivery/loading operations, or their condition being temporarily degraded by the presence of dirt/debris originating from the construction site. In the absence of mitigation measures, these impacts will be adverse in nature, short-term in duration, and significant.

The construction phase mitigation measures detailed in Section 11.7 are intended to prevent and minimise these impacts, and these measures will be strictly adhered to.

Given the high capacity of nearby public transport services and the fact that most construction personnel will travel outside of background peak hours, the adverse effects of construction personnel using public transport for travel to and from the site will be imperceptible and short-term.

11.6.2 Operational Phase Impacts

In its operational phase, the proposed development shall generate regular vehicular trips on the surrounding road network, increasing traffic flows at nearby existing junctions. Should the resultant total traffic flows at these junctions become too high (particularly at peak times), the junctions may become oversaturated and cease to function efficiently. The purpose of the present assessment is therefore to quantify the trip generation of the proposed development, establish the distribution of these trips and the resultant total traffic flows at nearby junctions, and to assess the operational performance of these junctions with the proposed development in place.

This assessment found that the addition of vehicular traffic generated by the proposed development will increase vehicle queue lengths at any junction by a maximum of 9 PCU, and increase mean vehicle delay by a maximum of 14 seconds at any junction (in comparison with the Do Nothing scenario for the design year 2041). In this way, impacts arising from this aspect of the operational phase will be adverse in nature, long-term in duration, and slight in significance. These effects should be considered reversible to a degree, as any future measures that reduce local vehicular traffic volumes (e.g. improvements in public transport or cycling infrastructure, junction redesign, or changes in general traffic flow restrictions) have the potential to improve local traffic flows generally, as well as to reduce vehicle trips to/from the proposed development.

In its operational phase, the development also has the potential to affect the operation of adjacent public transport services, pedestrian and cyclist facilities. Table 11.6.2.1 shows both the assumed starting modal splits for the proposed development and the suggested initial target modal splits, as

given in the accompanying Workplace Travel Plan (submitted under separate cover). These have been informed by CSO census data from the year 2016, as well as by the proposed car parking provision within the proposed development.

Table 11.6.2.1 Initial Target Modal Splits for Development Occupants

Transport Mode	Assumed Starting Proportion of Trips	Suggested Initial WTP Targets
Driving a Car	2%	1%
Passenger in a Car	3%	1%
Bicycle	17%	18%
Motorcycle	3%	3%
Bus	25%	26%
Train or Tram	33%	34%
Walking	17%	17%

As detailed in the Workplace Travel Plan, the development is predicted to have a total employee population of 1,665no. people (1,570no. office staff and 95no. hotel staff). Applying the initial modal split targets given in Table 11.6.2.1, the development may therefore be expected to generate the following maximum possible numbers of public transport users, pedestrians, and cyclists during each weekday peak hour:

- 566no. Luas/train passengers
- 433no. bus passengers
- 283no. pedestrians
- 299no. cyclists

As is the case in respect of vehicular trip generation (see Section 11.5.3), the development's small retail/café unit is not considered likely to generate any additional public transport, pedestrian, or bicycle trips to and from the development.

Given the high capacity of public transport services within easy reach of the subject site (including the Luas Red Line, mainline rail services, and numerous bus services), the proposed development is likely to have a long-term imperceptible adverse effect on the operation of these services. The proposed development is also likely to have a long-term imperceptible adverse effect upon the operation of adjacent pedestrian and cyclist facilities.

Table 11.6.2.2 Maximum Peak Hour Non-Motorised Trip Generation

Transport Mode	Number of Users
Bicycle	299
Bus	433
Train or Tram	566
Walking	283

11.6.3 Cumulative Impacts

The cumulative impact of the proposed development in conjunction with both the adjacent permitted residential development and the nearby committed Garda SCOC development has been considered in all future year junction assessments. The cumulative impacts on traffic as a result of the proposed development and nearby planned/committed schemes are therefore equivalent to the operational phase impacts previously described in Section 11.6.2. These effects will be adverse in nature, long-term in duration, and slight in significance

Cumulative impacts have not been considered in respect of transport modes other than motor vehicle traffic, as data on the expected occupancy and modal splits of the nearby committed Garda SCOC development are not available.

11.7 Mitigation Measures

11.7.1 Construction Phase

The lead contractor appointed for the construction of the development will be required to prepare a site-specific Construction Management Plan (CMP), including a plan for the scheduling and management of construction traffic, which will outline measures to be taken to mitigate the effects of construction traffic on the surrounding road network. A Designated Community Liaison Officer (DCLO) will be nominated for the proposed development, who will work with DCLOs on other active sites to coordinate construction activities. The DCLO will also act as a point of contact for local residents, Dublin City Council, and An Garda Síochána.

The final site-specific CMP will be based upon the outline CMP prepared by CS Consulting provided in Appendix 6A. This includes (inter alia) the following measures for minimising construction traffic and mitigating its effects:

- routing all heavy construction traffic to/from the west along the R148, via the existing northern HSQ access junction, avoiding the junction of Military Road with the R148;
- conducting all loading and unloading operations within the site, away from the public road;
- scheduling deliveries outside of peak hour periods to avoid disturbance to surrounding pedestrian and vehicular traffic;
- staggering HGV movements to/from site to avoid site queues;
- preventing haulage vehicles travelling in convoys of more than two vehicles at any time and spacing haulage vehicles by a minimum of 250m at all times;
- installation of a wheel wash at exit from the site to prevent any dirt being carried out into the public road; and
- deployment of a road sweeper as necessary to keep the public roads around the site clean.

Construction personnel will be encouraged to make use of the available high-quality public transport links to the area and/or to commute by bicycle, to minimise private car trips to and from the site. To avoid problems of parking overspill on surrounding streets, however, limited essential staff parking

shall be provided within the site. In parallel with this, parking restrictions and management measures on surrounding streets will be reviewed and implemented as necessary in agreement with local residents and Dublin City Council.

The impact of construction personnel using public transport for travel to and from the site will be minimal, given the high capacity of nearby public transport services and the fact that most construction personnel will travel outside of background peak hours. Nonetheless, as an additional mitigation measure, the lead contractor appointed to the project will be required to make provisions for the alternative group transport of construction personnel by:

- providing a charter bus service to/from suitable collection areas; and
- facilitating car sharing among construction personnel.

The above measures will be subject to public health guidance applicable at the time of construction.

Table 11.7.1.1 Table of Mitigation Measures – Construction Phase

Character of potential impact	Mitigation measures
Reduction of adjacent road junctions' operational performance due to vehicular trips to/from proposed development	Deliveries and material removal trips will be scheduled outside of peak hour periods
	HGV movements to and from the site will be staggered
	Haulage vehicles will be prevented from travelling in convoys of more than two vehicles at any time
	Haulage vehicles will be spaced by a minimum of 250m at all times
Obstruction of adjacent roadways by parked or queuing construction vehicles	All loading and unloading operations will be conducted within the site
	Limited essential parking for construction personnel and visitors will be provided within the site
	Construction personnel will be supported in making use of public transport and/or in cycling, when commuting to site
	Parking restrictions and parking management measures will be implemented on surrounding streets
Fouling of adjacent roadways by construction-related dirt/debris	All loading and unloading operations will be conducted within the site
	A vehicle wheel wash will be installed at the exit from the site
	A road sweeper will be deployed as necessary to keep surrounding streets clean
CMP	All mitigation measures in the Construction Management Plan will be implemented

11.7.2 Operational Phase

The development shall incorporate several design and management elements intended to mitigate the impact of the development on the surrounding road network during its operational phase. These include:

- a reduced car parking provision, which shall discourage excessive vehicular trips to the development (by both development occupants and visitors); and
- a high provision of secure bicycle parking, which shall serve to encourage bicycle journeys by both development occupants and visitors.

As described in the Workplace Travel Plan (WTP) framework document prepared in support of this planning application and attached as Appendix 11C, a Travel Plan Coordinator shall be appointed for the proposed development, with the remit to implement and oversee an ongoing WTP. This shall assist development occupants and visitors in making the most of sustainable transport opportunities and in avoiding single-occupant car journeys to and from the development site where possible.

Development occupants' use of sustainable travel modes (public transport, walking, and cycling) constitutes the primary means by which the development will avoid the excessive generation of motor vehicle trips. As described in Section 11.6.2, use of these travel modes will however have imperceptible effects on the operation of nearby public transport services and adjacent pedestrian and cyclist facilities. No mitigation measures are therefore required in this respect.

Table 11.7.2.1 Table of Mitigation Measures – Operational Phase

Character of potential impact	Mitigation measures
Reduction of adjacent road junctions' operational performance due to vehicular trips to/from proposed development	The development design includes a limited internal car parking provision
	The development design includes a high provision of internal bicycle parking
	A Workplace Travel Plan will be implemented
Workplace Travel Plan	A Travel Plan Coordinator will be appointed to implement the Workplace Travel Plan

11.8 Residual Impacts

11.8.1 Construction Phase

With full implementation of the above mitigation measures, the residual traffic-related impact of the proposed development during its construction phase will be limited to the effects of construction traffic on the operation of nearby road junctions. As previously noted, such adverse effects shall be short-term and slight in nature, and will be confined to the duration of construction activity on site.

Given the high capacity of nearby public transport services and the fact that most construction personnel will travel outside of background peak hours, the adverse effects of construction personnel using public transport for travel to and from the site will be imperceptible and short-term.

11.8.2 Operational Phase

With full implementation of the above mitigation measures, the residual traffic-related impact of the proposed development during its operational phase will be those identified in Section 11.5.12

(Operational Phase/Cumulative Impacts). In this way, residual effects are considered to be adverse in nature, long-term in duration, but slight in significance.

As noted in Section 11.6.2, the proposed development is likely also to have a long-term imperceptible residual adverse effect on the operation of nearby public transport services and upon the operation of adjacent pedestrian and cyclist facilities.

11.9 Do Nothing Scenario

11.9.1 Traffic: Do Nothing Scenario

Tables 11.9.1.1 to 11.9.1.3 give the TRANSYT junction modelling results for the design year 2039, without the inclusion of vehicular traffic generated by the proposed development. The traffic flows employed in these assessments are those surveyed in 2017, conditioned through the removal and reassignment of illegal right-turn manoeuvres at junctions J1 and J3, scaled up to 2041 levels using standard TII growth factors, and with the addition of vehicular traffic to be generated by both the associated permitted development adjacent to the subject site and the nearby committed Garda SCOC development on Military Road.

Under this assessment scenario:

- Junction J1 (that of Military Road with St. John's Road West) is predicted to exceed ultimate capacity during the AM peak hour on the right-turning approach from Military Road, and to exceed effective capacity during the AM peak hour on approach from the west along St. John's Road West (R148).
- Junction J2 (the existing eastern access to the HSQ complex) shall continue to operate within effective capacity on all approaches, in both peak hour periods.
- Junction J3 (the existing northern access to the HSQ complex) shall continue to operate within effective capacity on all approaches, in both peak hour periods.

Table 11.9.1.1 2041 Do Nothing Assessment Results – Junction 1

Junction Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean End of Red Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	**Stream**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
R148 East	S / L	48	90	8	26	5	15	8	33	87	0
	S	37	74	5	17	4	10	5	18	146	21
Military Rd	L	73	90	3	12	3	10	87	79	23	0
	R	109	52	11	5	11	4	287	42	-18	74
R148 West	S	100	75	54	19	27	11	55	22	-10	19

In the design year 2041, without the inclusion of traffic generated by the proposed development, Junction 1 is predicted to experience:

- mean maximum vehicle queues of up to 54 PCU during the AM peak hour and up to 26 PCU during the PM peak hour;
- mean delays per vehicle of up to 287 seconds during the AM peak hour and up to 79 seconds during the PM peak hour.

Table 11.9.1.2 2041 Do Nothing Assessment Results – Junction 2

Junction Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean End of Red Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	**Stream**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
Military Rd South	S / L	2	5	0	0	n/a	n/a	0	0	4145	1675
HSQ Access	L / R	16	17	0	0	n/a	n/a	1	1	456	416
Military Rd North	S	4	3	0	0	n/a	n/a	0	0	2431	2900
	R	8	6	0	0	n/a	n/a	0	0	1039	1349

In the design year 2041, without the inclusion of traffic generated by the proposed development, Junction 2 is predicted to experience:

- no discernible vehicle queueing on average during either the AM peak or the PM peak hour;
- mean delays per vehicle of at most 1 second during both the AM peak hour and the PM peak hour.

Table 11.9.1.3 2041 Do Nothing Assessment Results – Junction 3

Junction Approach Arm and Traffic Stream		Degree of Saturation (%)		Mean Maximum Queue (PCU)		Mean End of Red Queue (PCU)		Mean Delay per Vehicle (seconds)		Practical Reserve Capacity (%)	
Arm	**Stream**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
R148 East	S	46	87	14	27	11	15	10	11	97	4
	L	1	3	0	0	n/a	n/a	0	0	6061	3048
HSQ Access	L	21	61	1	4	1	4	47	58	332	48
R148 West	S	88	55	25	7	9	4	13	4	2	64
	R	62	27	3	1	3	1	62	46	44	239

In the design year 2041, without the inclusion of traffic generated by the proposed development, Junction 3 is predicted to experience:

- mean maximum vehicle queues of up to 25 PCU during the AM peak hour and up to 27 PCU during the PM peak hour;
- mean delays per vehicle of up to 62 seconds during the AM peak hour and up to 58 seconds during the PM peak hour.

In summary, without improvement works to the existing junction of Military Road with St. John's Road West (R148) and without measures to reduce background traffic growth in the intervening period, this junction is predicted to cease functioning effectively before the design year of 2041. Both existing HSQ

access junctions will continue to operate effectively.

11.9.2 Transport: Do Nothing Scenario

Under a Do Nothing scenario, whereby the proposed development is not constructed, the operation of nearby public transport services and adjacent pedestrian/cyclist facilities will nevertheless be affected by prevailing trends in travel habits, changes in service provision and transport infrastructure, and the influence of other nearby developments. It is however not possible to quantify these effects over the medium or long term.

11.10 Interactions Arising

The vehicular traffic flows that shall be generated by the proposed development may contribute to changes in air quality and noise levels in the vicinity of the surrounding road network. The natures, extents, and consequences of these changes are examined in Chapters 9 and 10 of this EIAR.

11.11 Major Accidents

With respect to traffic and transport matters, the proposed development does not have the potential to result in any major accident or disaster within the meaning of the EIAR Guidelines. Given its proximity to the Camac and Liffey rivers, the development site has the potential to be affected by catastrophic fluvial flooding events, which could potentially obstruct access to the development. However, as described in Chapter 7, the development site is located in the lowest-risk zone for fluvial flooding, deemed likely to be affected by flood events occurring less frequently than once every 1,000 years.

11.12 Monitoring

11.12.1 Construction Phase Monitoring

The lead contractor appointed for the construction of the development will be required to prepare a site-specific Construction Management Plan (CMP) that shall include a plan for the scheduling and management of construction traffic. This CMP shall outline measures for monitoring the impact of construction traffic on the operation and condition of the surrounding street network, including remedial actions to be taken in the event of construction traffic causing damage to road infrastructure.

The lead contractor will also be required to monitor the travel habits of construction personnel and to tailor supports for public and shared transport use accordingly. Surrounding streets will be monitored to ensure that no nuisance parking associated with construction activity takes place.

11.12.2 Operational Phase Monitoring

Post-development monitoring of the surrounding street network's performance is not required or proposed in this case.

Within the scope of the Workplace Travel Plan (WTP) to be implemented for the development a Travel Plan Coordinator shall be responsible for monitoring the travel habits of development occupants and visitors. A WTP is a dynamic process whereby a package of measures and campaigns is identified, piloted, and then monitored on an ongoing basis. The WTP will identify specific targets against which the effectiveness of the plan can be assessed at each review; these will typically take the form of target modal splits for journeys to and from a site. The Travel Plan Coordinator shall gather data on travel patterns, for instance by conducting periodic travel surveys of development occupants.

11.13 References

- Environmental Protection Agency (EPA): Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2017)
- Transport Infrastructure Ireland (TII): Traffic and Transport Assessment Guidelines (2014)
- Transport Infrastructure Ireland (TII): Project Appraisal Guidelines (2011)
- Dublin City Council (DCC): Dublin City Development Plan 2016–2022 (2016)
- TRICS Consortium: Trip Rate Information Computer System (TRICS) database
- Central Statistics Office (CSO): 2016 Census data

12. MATERIAL ASSETS – WATER SUPPLY, DRAINAGE AND UTILITIES

12.1 Introduction

This chapter of the EIAR has been prepared by Cronin and Sutton Consulting and IN2 Engineering and describes the existing material assets for the foul drainage & potable water, Electrical, Gas and Telecoms Utilities aspects of the proposed development site (surface water has been assessed in Chapter 8). An assessment is made of the likely impact arising during the demolition, construction and operational phases of the development on these elements.

This chapter was prepared by Robert Fitzmaurice of CS Consulting. Robert is a Chartered Engineer with Engineers Ireland and has been practicing as a consulting engineer for over twenty years. Robert holds an undergraduate degree in Civil & Environmental Engineering, a postgraduate Diploma in Environmental Engineering, an advanced Diploma in Planning and Environmental Law and has a master's degree in Industrial Engineering.

The Electrical, Gas and Telecoms sections of this chapter were prepared by James Redmond of IN2 Engineering. James is a Chartered Engineer with Engineers Ireland, holds an honours degree in Mechanical Engineering and has been practicing as a consulting engineer for over twenty years.

12.2 Assessment Methodology & Legislative Background

This chapter has been set out with reference to the specific criteria set out in the Environmental Protection Agency guidelines:

- Dublin City Council Development Plan 2016 – 2022,
- EPA (2022), Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR);
- Conservation and Amenity Advice Service (CAAS) (2002), Guidelines on the Information to be contained in Environmental Impact statements.
- CAAS (2003), Advice Notes on Current Practice in the Preparation of Environmental Impact statements.
- Good Practice Guidelines on the control of water pollution from construction sites developed by the Construction Industry Research and Information Association (CIRIA, C532, 2001).
- The Greater Dublin Strategic Drainage Study, (GDSDS), 2005.
- Method outlined in Irish Water's Pre-Connection Enquiry Application,
- Method outlined in Irish Water's Code of Practice for Wastewater Infrastructure,
- Method outlined in Irish Water's Code of Practice for Water Infrastructure,

- Regional Code of Practice for Drainage Works - Version 6.

12.2.1 Legislative Background

The following legislation was referred to in compiling this chapter:

Water Framework Directive 2000/60/EC

The EU Water Framework Directive (WFD) 2000/60/EC came into force on 22nd December 2000, and enacted into Irish legislation through S.I. No. 722 of 2003 European Communities (Water Policy) Regulations 2003. This legislation and regulation is a significant piece of legislation for water policy, as it provides a co-ordinated approach across Europe for all water policies, establishing a management structure for future water policy. A few key objectives of the Directive are to:

- Protect all waters, including rivers, lakes, groundwater, transitional and coastal waters.
- Achieve "good status" in all waters by 2015 or at the latest 2027, and maintaining "high status" where the status already exists.
- Have water management based on River Basin Districts (RBD).

The strategies and objectives of the Water Framework Directive in Ireland have been influenced by a range of National and European Union legislation and regulation including:

- Local Government (Water Pollution) Acts 1977 – 1990.

In turn the implementation of the Water Framework Directive and its associated policies has necessitated the introduction of new regulations in Ireland including, the European Communities Environmental Objectives (Surface Waters) Regulations 2009, which are discussed further in the following section.

European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No.272 of 2009)

These regulations have been devised as a more complete and stringent set of surface water quality regulations which covers the requirements of the Water Framework Directive and the Dangerous Substances Directive. These regulations came into effect on 30th July 2009 and have been adopted by the Government. These regulations supersede previous water quality regulations (both EU and national). This project is cognisant of previous regulations as they form the basis for a wide range of impact assessment and monitoring methodologies. It is envisaged that a detailed construction management plan which will include the management or disposal of surface water runoff will be prepared in advance of construction commencing on site. The construction & demolition management plan will be cognisant to take into account these new regulations and apply them throughout the construction phase.

European Communities Priority Substances Directive 2008

These regulations have been devised to assign a chemical status assessment for water bodies. Directive 2008/105/EC provides environmental quality standards in the field of water policy.

Local Government (Water Pollution) Acts 1977 – 1990

The Act is the main legislation for the prevention and control of water pollution, including the general prohibition of polluting matter to waters. While this act has largely been superseded by the 2009 Regulations, current impact assessment and monitoring methodologies must still be cognisant of this legislation.

Water Quality Standards for Phosphorus Regulations 1998 (S.I. No. 258 of 1998)

As part of the Water Pollution Acts, these regulations require water quality be maintained or improved, with reference to the biological quality river rating system (Q Rating) as assigned by the Environmental Protection Agency between 1995 to 1997. While this act has also largely been superseded by the 2009 Regulations, current impact assessment and monitoring methodologies must still be cognisant of this legislation.

Pollution caused by certain dangerous substances discharged into the aquatic environment 2006 (Directive 2006/11/EC of the European Parliament And Of The Council)

Directive gives an indication of parameters which have to have their concentration values limited to ensure improvement of the aquatic environment.

European Union – Drinking Water Regulations 2017 (S.I. No. 464/2017)

Regulations pertain to the overall water quality & constituents allowable in potable water.

European Union – Environmental Objectives (groundwater) 2016 (S.I. No. 366/2016)

Regulations pertain to the overall water quality & constituents allowable in potable water.

12.2.2 Desktop & Site Study

A desktop study was carried out on the local and regional surface water and drainage network. Information was obtained from documents including the following sources:

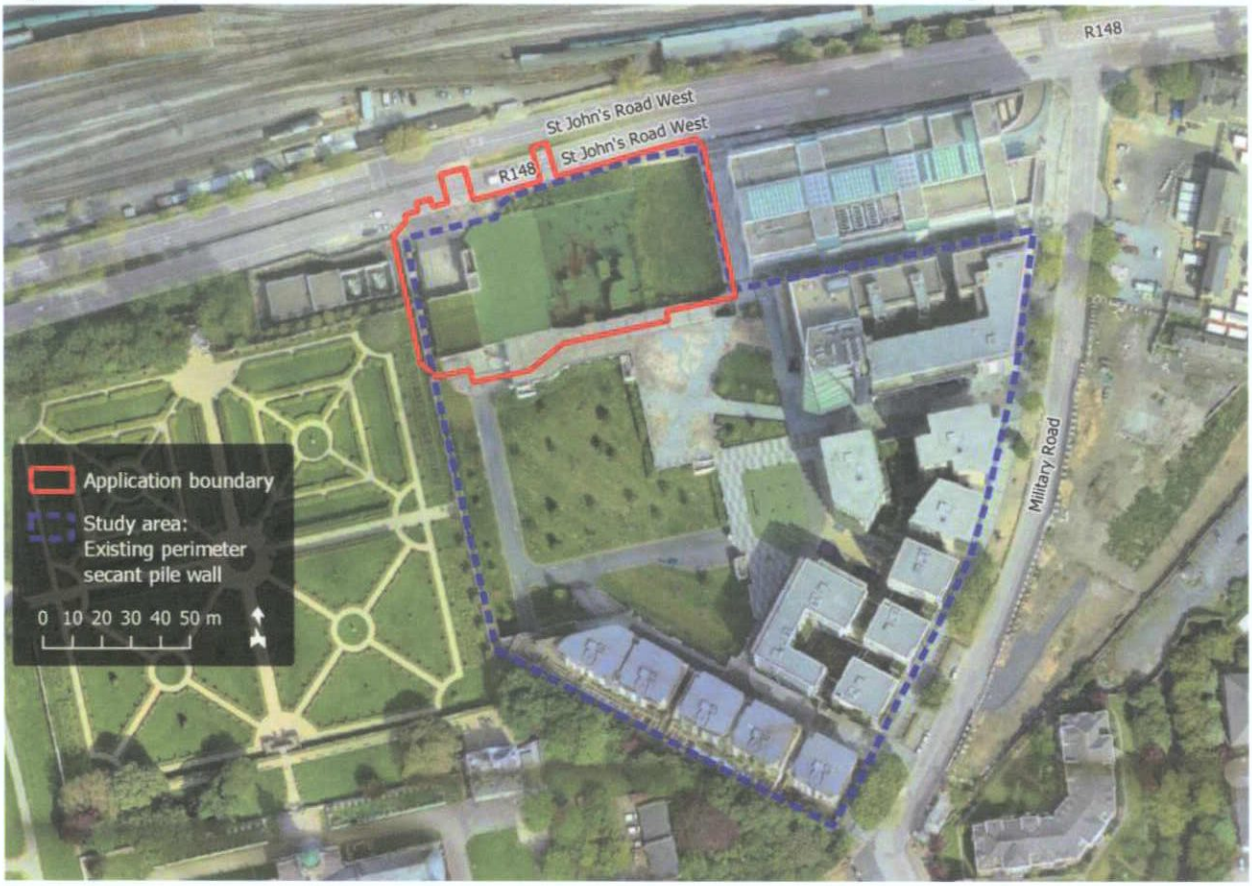
- Liaising with Irish Water;
- Dublin City Council Water and Drainage Department record drawings and discussions with Drainage Division Engineers;
- All available information concerning the development including development plans.
- Site visits were held on numerous occasions between May 2020 – 2021.

A desktop study was carried out on the Electrical, Gas and Telecoms infrastructure based on the following documentation:

- ESB network utility plans
- Gas Networks Ireland utility plans

- OpenEir utility plans
- Virgin Media utility plans
- Field surveys of the Application Site carried out between April 2020 and May 2021
- Aerial maps of the area

Figure 12.2.2.1 Heuston South Quarter site (sources: OSM Contributors, Google)



12.2.3 Consultation

A Pre-Connection Enquiry has been submitted to Irish Water, based on the development's predicted foul effluent generation and predicted potable water demand, and Irish Water has issued a Confirmation of Feasibility in response. Copies of the submitted Pre-Connection Enquiry and the Irish Water response are included with this application.

IN2 Engineering met with the ESB to review the proposed installations at ESB Networks, South Lotts Road, Dublin 4. The existing site infrastructure was reviewed, and the proposed new infrastructure was discussed. The ESB noted a formal application was required in order to allow them fully assess the implications of the proposed development on the surrounding network. The ESB noted the original Phase 1 development included ESB ducts cast into the podium slab to facilitate future expansion on the site. This enabling infrastructure will facilitate the extension of the ESB ring to pick up new ESB sub-stations as required for the proposed commercial development and concurrent proposed SHD residential development, adjoining the application site to the south.

12.2.4 Policy

At a national level the National Planning Framework (Project Ireland 2040) includes Objective 60, a National Policy to *"Conserve and enhance the rich qualities of natural and cultural heritage of Ireland in a manner appropriate to their significance"*.

As the subject lands are within the administrative area of Dublin City Council. The current Dublin City Development Plan (2016–2022) is relevant as it contains policy guidance to be adhered to.

Specific policies relating to surface water quality within the 2016–2022 plan include:

- GI20: To seek continued improvement in water quality, bathing facilities and other recreational opportunities in the coastal, estuarine and surface waters in the city, having regard to the sensitivities of Dublin Bay and to protect the ecology and wildlife of Dublin Bay.
- GI21: To support initiatives to reduce marine pollution in Dublin Bay in partnership with other organisations and to raise awareness by Bay users and the general public and also to have regard to the Marine Strategy Framework Directive (2008/56/EC).
- SI1: Policy to support Irish Water: provision of high quality drinking water and waste water treatment facilities.
- SI2: Policy to support Irish Water in upgrading of wastewater infrastructure and Greater Dublin Regional Wastewater Treatment Plant, and Marine Outfall and orbital sewer.
- SI3: Policy to ensure development is permitted in tandem with available water supply and wastewater treatment.
- SI14: To protect the Dublin City coastline from flooding as far as reasonably practicable, by implementing the recommendations of the Dublin Coastal Flood Protection Project and the Dublin Safer Project.
- SI15: To minimise the risk of pluvial (intense rainfall) flooding in the city as far as is reasonably practicable and not to allow any development which would increase this risk.
- SI16: To minimise the flood risk in Dublin city from all other sources of flooding, including fluvial, reservoirs and dams and the piped water system.
- SI17: To require an environmental assessment of all proposed flood protection or flood alleviation works.
- SI18: To require the use of Sustainable Urban Drainage Systems in all new developments, where appropriate, as set out in the Greater Dublin Regional Code of Practice for Drainage Works. The following measures will apply:
    - The infiltration into the ground through the development of porous pavement such as permeable paving, swales, detention basins.
    - The holding of water in storage areas through the construction of green roofs, rainwater

harvesting, detention basins, ponds, wetlands.

- The slow down of the movement of water.

- SI10: To have regard to the Guidelines for Planning Authorities on the Planning System and Flood Risk Management, and Technical Appendices, November 2009, published by the Department of the Environment, Community, and Local Government as may be revised/ updated when assessing planning applications and in the preparation of plans both statutory and non-statutory.

12.2.5 Assessment of Electrical, Gas and Telecoms Utilities Infrastructure

The extent of existing Electrical, Gas and Telecoms utilities infrastructure to the site has been determined through reference to record drawings from each of the relevant Utilities authorities including ESB, Gas Networks, Eir and Virgin media.

IN2 Engineering have completed site surveys to verify the accuracy of the information received and have met with the ESB on site to review the electrical infrastructure and the proposed modifications required to facilitate the development.

The Electrical services installations have been assessed in accordance with:

- ETCI Wiring Regulations 5th Edition I.S. 10101:2020

The Gas Services installations have been assessed in accordance with:

- I.S. 820:2019 Non-domestic gas installations (Edition 3)
- I.S. 329: 2015+A1:2016 Gas distribution mains (Edition 3) and Amendment No. 1:2016
- S.R. 12007-5:2016 Guidance on the Application of I.S. EN 12007-5:2014, Gas Infrastructure - Pipelines for Maximum Operating Pressure up to and Including 16 Bar - Part 5: Service Lines - Specific Functional Requirements

Telecoms installations have been assessed in accordance with:

- Virgin Media New Build Handbook
- OpenEir Technical Handbook

A desktop study of the Electrical, Gas and Telecoms installations was carried out on the local utilities infrastructure. Information on existing services was determined from the following:

- ESB Networks record drawings
- Gas Networks record drawings
- Virgin Media record drawings
- OpenEir record drawings

- HSQ record drawings and phase 1 Safety File information
- Site inspections were carried out by IN2 to verify the accuracy of the received documentation

12.3 Location

The proposed development is located on St. John's Road West, at the Heuston South Quarter complex in Dublin 8. The site sits within the established communities of Kilmainham, between the Royal Hospital Kilmainham to the west and the Quays to the north. The site is located in the administrative jurisdiction of Dublin City Council and has a total area of approximately 0.62ha. The site is bounded to the west by the gardens of the Royal Hospital Kilmainham, to the north by St. John's Road West, to the east by the Eir Group headquarters building, and to the south by internal roads and landscaping within the remaining undeveloped portion of the HSQ complex. This undeveloped portion of the larger HSQ site is currently the subject of a SHD residential application to An Bord Pleanála under ABP Ref. TA29S.311591. The location of the proposed development site is shown in Figure 12.3.1; its indicative extents, as well as relevant elements of the surrounding road network, are shown in more detail in Figure 12.3.2. The extents of the adjacent SHD application are shown in Figure 12.3.3.

The subject site comprises part of the undeveloped area of the site that has been landscaped as an interim measure to improve the aesthetics of the site pending its complete redevelopment. Access to the site is available from a number of points with the principal vehicular access points being from the existing HSQ access junction on St. John's Road West, north of the development site, and the existing HSQ access junction on Military Road, east of the development site. The above access points are interconnected by the development's internal road network at basement level. This provides permeability and connectivity through the site for vehicular traffic, as well as for pedestrians and cyclists.

Figure 12.3.1 Location of proposed development site (sources: EPA, OSM Contributors, Google)

Figure 12.3.2 Site extents and environs (sources: NTA, OSi, DCC, OSM Contributors, Google)

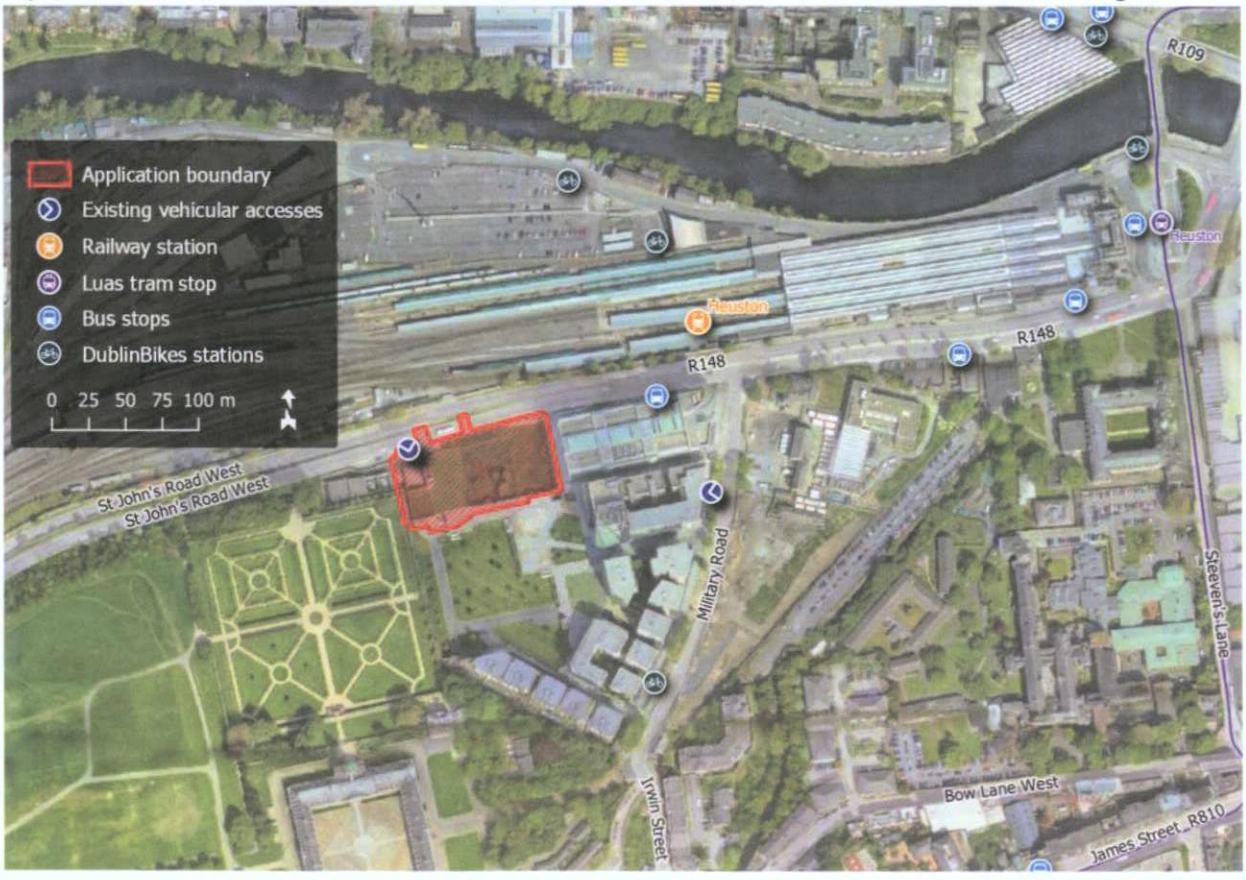
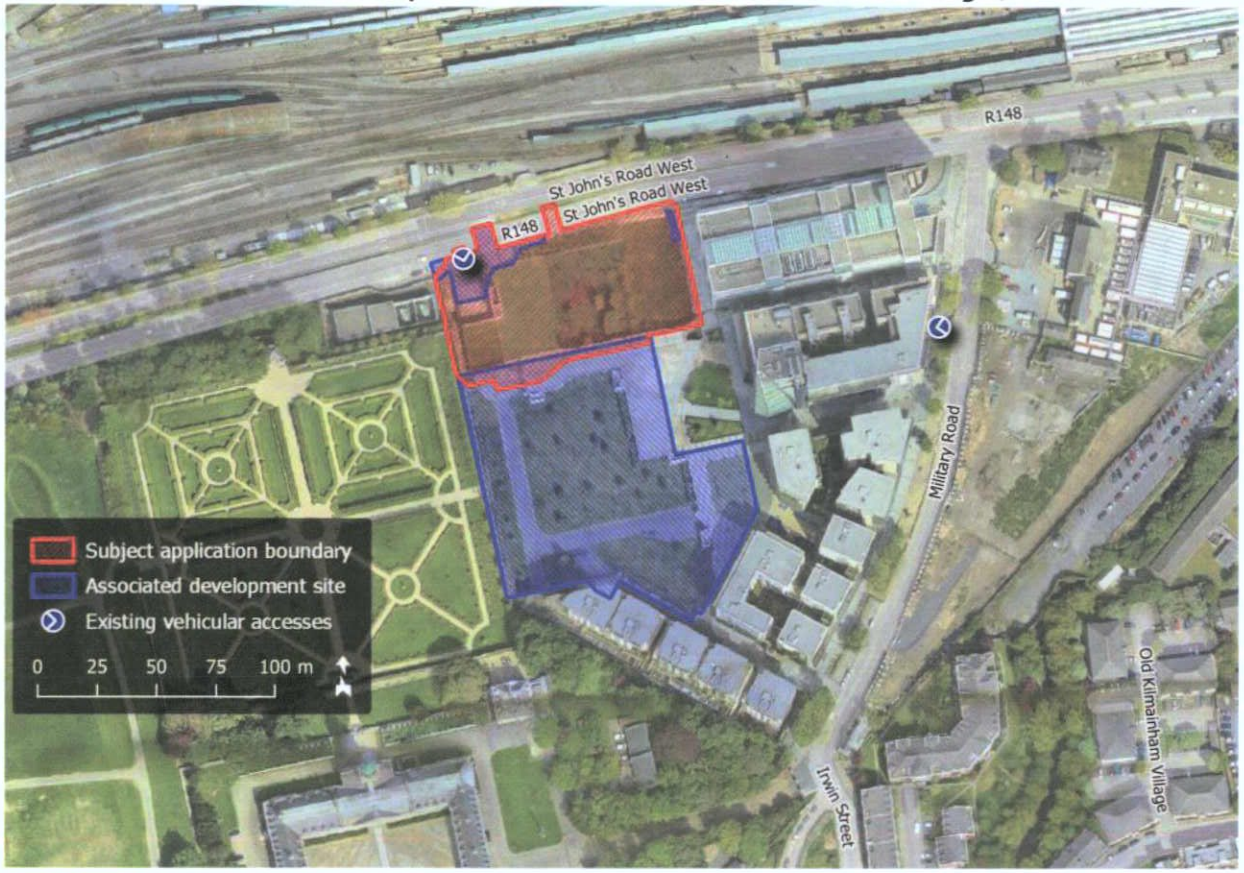


Figure 12.3.3 Associated development site (sources: OSM Contributors, Google)



12.4 Characteristics of the Proposed Development

12.4.1 Development Description

A full description of the development is provided in Chapter 3 of the EIAR.

Briefly summarised, the development will comprise the construction of a 5-storey hotel (over lower ground and basement level) and a 12-storey office block (over lower ground and basement level) within the undeveloped north-western portion of the HSQ development. The proposed development includes surface water, potable water and foul water infrastructure that is designed to minimise impacts on the surrounding environment. These have been described below.

The drainage network for the development will be in accordance with Part H of the Building Regulations and to the requirements and specifications of Irish Water.

The proposed drainage infrastructure and routing plan are shown on CS Consulting drawings HSQ-CSC-XX-XX-DR-C-0201 and HSQ-CSC-XX-XX-DR-C-0202 included at Appendix 8A. A *Pre-Connection Enquiry* has been submitted to Irish Water based on the predicted water demand. The proposal has been deemed feasible and a *Confirmation of Feasibility* response was issued by Irish Water. A copy of the Irish Water *Confirmation of Feasibility* response is included in Appendix 12A. See the Engineering Services Report which accompanies this submission for details of same.