10.0 TRAFFIC AND TRANSPORT

10.1 Introduction

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

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

10.2 Assessment Methodology

The following methodology has been adopted for this assessment:

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

10.3 The Receiving Environment

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

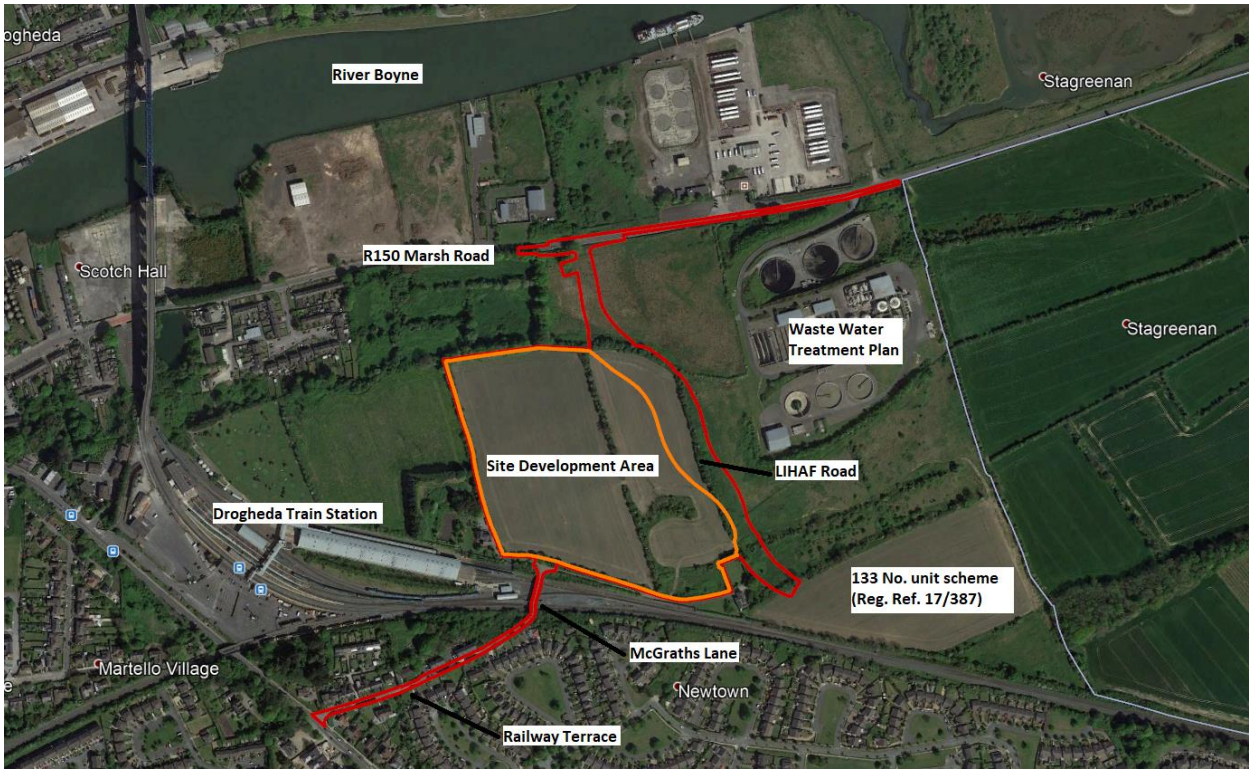
10.3.1 Site location

The site is located off the Marsh Road in the townland of Newtown, Drogheda, Co. Louth. The site is situated approximately 1.7 km east of Drogheda town centre as indicated in Figure 1 below.

The subject site area, including the LIHAF Road and the proposed improvements on McGraths Lane, Railway Terrace and Marsh Road (construction of surface water outfall) is approximately 9.68 hectares and is bounded by the Dublin Belfast Railway line which runs along the southern boundary of the site, the Drogheda Waste Water Treatment Plant to the east, and zoned lands to the north and west.

The lands on the opposite side of the proposed access road to the south-east of the subject site have planning permission for 133 No. residential units (reg. ref. 17/387) which will also be accessed from the LIHAF Road.

Figure 1: Location of subject site.



10.3.2 Local road network

The site is located circa 1.7 km south-east of Drogheda town centre and is in close proximity regional routes including the R150 (Marsh Road) and R132 (Dublin Road) which serve an area which has residential, commercial, industrial, educational and retail functions and a large hinterland catchment area.

R150 (Marsh Road)

The R150 is a single carriageway road approximately 7.0 m wide. Footpaths with approximately 1.0m width are available on both sides of the R150 where the proposed LIHAF road junction will be located.

To the west of the site the R150 provides access to the Drogheda town centre via the South Quay which has a signal-controlled junction with Shop Street. The M1, at Junction 9, can be accessed via the R132 (John Street) and Donore Road L1601 or at Junction 8 via Platin Road R152.

To the east of the site the R150 provides access to the Drogheda Grammar School. Traffic travelling eastwards can also use this road to provide an alternative access to the M1 (Junction 7) south of Drogheda via local roads and the R132.

This road is currently assigned an 80 km/h speed limit to the north of the subject site; however, this reduces to 50 km/h on approach to the existing residential areas on the R150 (Marsh Road) to the west of the site.

R132 (Dublin Road)

The R132 is a single carriageway road approximately 7.0 m wide. There are footpaths on both sides of the Dublin Road east of the junction with Railway Terrace and a footpath along the north side of the R132 west of this junction providing pedestrians with direct access to the Drogheda Train Station and town centre of Drogheda. The speed limit on this section of the R132 is 50km/h. There is no vehicular connection from the application site to the R132.

The R132 provides access to the M1 at Junction 7 to the south.

10.3.3 Baseline traffic data

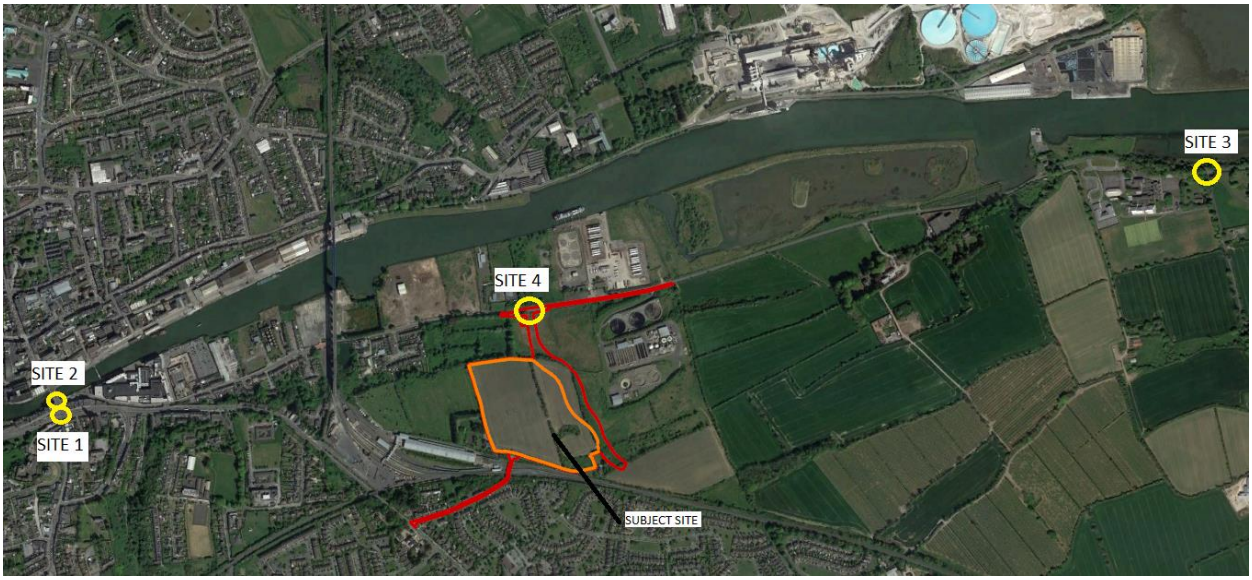
In order to quantify the volumes of traffic movements at key points on the road network adjacent to the site, a set of classified turning movement traffic counts were commissioned.

Two manual classified traffic two-way flow surveys were carried out by IDASO Ltd. on Tuesday 20th February 2018 at R150 (Marsh Road) and by TRACSIS on Tuesday 19th June 2018 at 2 No. signalised junctions and 1 No. priority junction during the peak hours of 07:00 – 10:00 and 16:00 – 19:00. The junctions surveyed were:

- Site 01: Dublin Road (R132)/Shop Street (Signalised);
- Site 02: South Quay (R150)/Shop Street (Signalised);
- Site 03: Marsh Road (R150)/Mill Road (Priority) and
- Site 04: R150 Marsh Road two-way flows.

The location of the surveyed junctions is shown below in Figure 2.

Figure 2: Location of Junctions Surveyed.



The results of this survey indicated that the peak traffic levels through the junctions occurred between the hours of 08:00 – 09:00 in the AM and 17:00 – 18:00 during the PM. Full traffic surveys are presented in the Traffic and Transport Assessment by Waterman Moylan Consulting Engineers submitted under separate cover.

The locations of the surveys are pertinent to the proposal as they are at key nodes in the road network that would be affected by traffic assignment and distribution of flows associated with the development site.

A summary of the survey results and the two-way flow expected by the development plus committed development are presented below in Table 1 for Site 1, Table 2 for Site 2, Table 3 for Site 3 and Table 4 for Site 4.

Table 1: Site 1 - Dublin Road (R132)/Shop Street (Signalised)

Description	Total Junction Two Way Flow (Veh)	Development + Committed Two Way Flow (Veh)	% Traffic increase
AM Peak Hour (08:00 - 09:00)	2,100	180	8.57%
PM Peak Hour (17:00 - 18:00)	2,2236	249	11.14%

Table 2: Site 2 - South Quay (R150)/Shop Street (Signalised)

Description	Total Junction Two Way Flow (Veh)	Development + Committed Two Way Flow (Veh)	% Traffic increase
AM Peak Hour (08:00 - 09:00)	1,522	222	14.59%
PM Peak Hour (17:00 - 18:00)	1,590	307	19.31%

Table 3: Site 3 - Marsh Road (R150)/Mill Road (Priority)

Description	Total Junction Two Way Flow (Veh)	Development + Committed Two Way Flow (Veh)	% Traffic increase
AM Peak Hour (08:00 - 09:00)	460	56	12.17%
PM Peak Hour (17:00 - 18:00)	451	77	17.03%

Table 4: Site 4 - R150 Marsh Road two-way flows

Description	Total Junction Two Way Flow (Veh)	Development + Committed Two Way Flow (Veh)	% Traffic increase
AM Peak Hour (08:00 - 09:00)	501	278	55.49%
PM Peak Hour (17:00 - 18:00)	396	384	96.96%

As recommended in the TII Publication, 'Project Appraisal Guidelines Unit 16.1: Expansion Factors for Short Period Traffic Counts (October 2016)', the traffic count data has been converted to Annual Average Daily Traffic (AADT) data in order to provide a dataset representative of the annual traffic flow profile for the road network surrounding the proposed development.

The General Expansion Factor Method, as outlined in the TII Publication, was used to convert the surveyed flows for the 4 No. sites into the Annual Average Daily Traffic (AADT). The corresponding factors for the Border - East Region were used. The AADT flows are shown below in Tables 5, 6, 7 and 8.

Table 5: AADT Calculations – Site 1 Dublin Road (R132)/Shop Street (Signalised)

Hour Ending	Proportion of Daily Traffic Flow	Surveyed Traffic Flows through Site 1 (vehicles)
08:00	0.049	1,523
09:00	0.078	2,101
10:00	0.063	2,004
17:00	0.078	2,099
18:00	0.091	2,249
19:00	0.075	2,170
Total	0.434	12,146

24 Hour Estimate = 12,146 ÷ 0.434 = 27,986 vehicles

Weekly Average Day Traffic (WADT) = 27,986 x 0.99 = 27,706 vehicles

Annual Average Daily Traffic (AADT) = 27,706 x 0.97 = **26,875 vehicles**

Table 6: AADT Calculations – Site 2 South Quay (R150)/Shop Street (Signalised)

Hour Ending	Proportion of Daily Traffic Flow	Surveyed Traffic Flows through Site 2 (vehicles)
08:00	0.049	1,089
09:00	0.078	1,522
10:00	0.063	1,381
17:00	0.078	1,447
18:00	0.091	1,590
19:00	0.075	1,526
Total	0.434	8,555

24 Hour Estimate = 8,555 ÷ 0.434 = 19,712 vehicles

Weekly Average Day Traffic (WADT) = 19,712 x 0.99 = 19,515 vehicles

Annual Average Daily Traffic (AADT) = 19,515 x 0.97 = **18,929 vehicles**

Table 7: AADT Calculations – Site 3 Marsh Road (R150)/Mill Road (Priority)

Hour Ending	Proportion of Daily Traffic Flow	Surveyed Traffic Flows through Site 3 (vehicles)
08:00	0.049	209
09:00	0.078	460
10:00	0.063	587
17:00	0.078	413
18:00	0.091	451
19:00	0.075	390
Total	0.434	2,510

24 Hour Estimate = 2,510 ÷ 0.434 = 5,783 vehicles

Weekly Average Day Traffic (WADT) = 5,783 x 0.99 = 5,726 vehicles

Annual Average Daily Traffic (AADT) = 5,726 x 0.97 = **5,554 vehicles**

Table 8: AADT Calculations – Site 4 R150 Marsh Road two-way flows

Hour Ending	Proportion of Daily Traffic Flow	Surveyed Traffic Flows through Site 4 (vehicles)
08:00	0.049	205
09:00	0.078	501
10:00	0.063	369
17:00	0.078	426
18:00	0.091	396
19:00	0.075	346
Total	0.434	2,243

24 Hour Estimate = 2,243 ÷ 0.434 = 5,168 vehicles

Weekly Average Day Traffic (WADT) = 5,168 x 0.99 = 5,117 vehicles

Annual Average Daily Traffic (AADT) = 5,117 x 0.97 = **4,963 vehicles**

10.3.4 Pedestrian and cycling facilities

The site is well located to provide non-car access for residents and visitors of the proposed development with good local walk-in access from the local catchment.

There is an existing pedestrian network in the vicinity of the subject site which provides access to major public transport services and the Drogheda Town Centre. Pedestrian facilities to the north of the site consists of footpaths along the R150 (Marsh Road) which provide access to Drogheda Town Centre. Pedestrian facilities to the south of the site consist of a laneway (McGraths Lane) and a footpath on Railway Terrace which provides access to the R132 (Dublin Road) from which the Drogheda Train Station is accessed.

10.3.5 Public transport accessibility

Train

The Drogheda Train Station, which is on the Dublin – Belfast Railway Line, is located approximately 650m (c. 8 minutes-walk) from the civic centre towards the southern part of the site and approximately 750m (c.10 minute-walk) from the centre of the site.

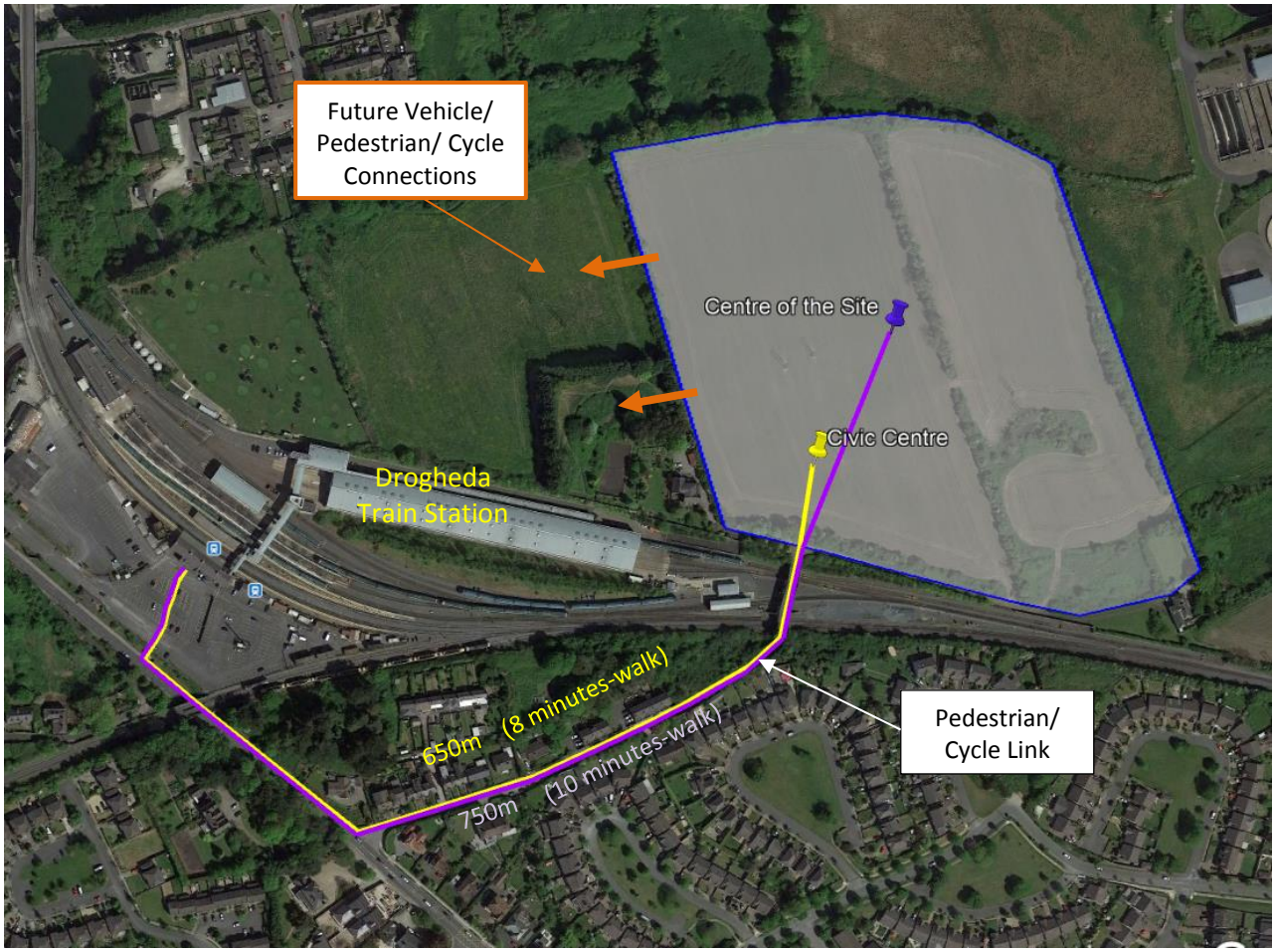
The Drogheda Train Station is serviced by the following train services:

- Bray - Dublin – Dundalk
- Dublin Connolly – Belfast Central
- Irish Rail Commuter

The above services result in a train frequency of c. 10 -30 minutes to and from Dublin in the AM and PM peak periods. The travel time from the Drogheda Train Station to Dublin Connolly is approximately 60 minutes. The position of the proposed development in combination with the proposed pedestrian link provide a high-quality public transport option for commuters to Dublin.

The location of the Drogheda Train Station in relation to the site and the proposed pedestrian/cycle only link is shown in Figure 3. The proposed development is laid out and designed in such a manner as to facilitate vehicular / pedestrians / cycle connections though the site in a westerly direction to the train station where the lands west of the application site are developed.

Figure 3: Trains Services



Bus Eireann Drogheda Town Service Bus

The subject site is located c. 1.8 km (24 min walk) to the east of the Drogheda Bus station on the corner of the R132 and Donore Road, which provides a high number of local and national bus routes.

A summary of the Bus Eireann routes that service the Drogheda Bus Station are shown below in Table 9.

Table 9: Bus Routes

Drogheda Bus Station		
Service	Bus Eireann Service Route	Frequency
70	Galway – Athlone – Mullingar - Dundalk	Daily
100	Drogheda – Dunleer – Castlebellingham - Dundalk	Hourly
100X	Dundalk to Dublin Express	Hourly
101	Drogheda – Balbriggan – Dublin Airport - Dublin	20 – 30 min
101X	Termon Abbey – Drogheda – Wilton Terrace (Dublin)	5 times per day
105	Drogheda – Ashbourne – Ratoath – Blanchardstown	Hourly
163	Drogheda - Donore	Twice a day
182/182A	Drogheda – Ardee – Monaghan	Hourly
189	Drogheda – Baltray – Termonfeckin – Grangebellew	6 times per day
190	Drogheda – Navan – Trim	Hourly
D1	Drogheda – Bettystown – Laytown	30 min

Further to the above, there is a bus stop located at the junction of Mary Street and Dublin Road which provides the bus route service No. 173. This is an hourly service (between 09:00am and 07:30pm) connecting areas surrounding Drogheda to the town centre.

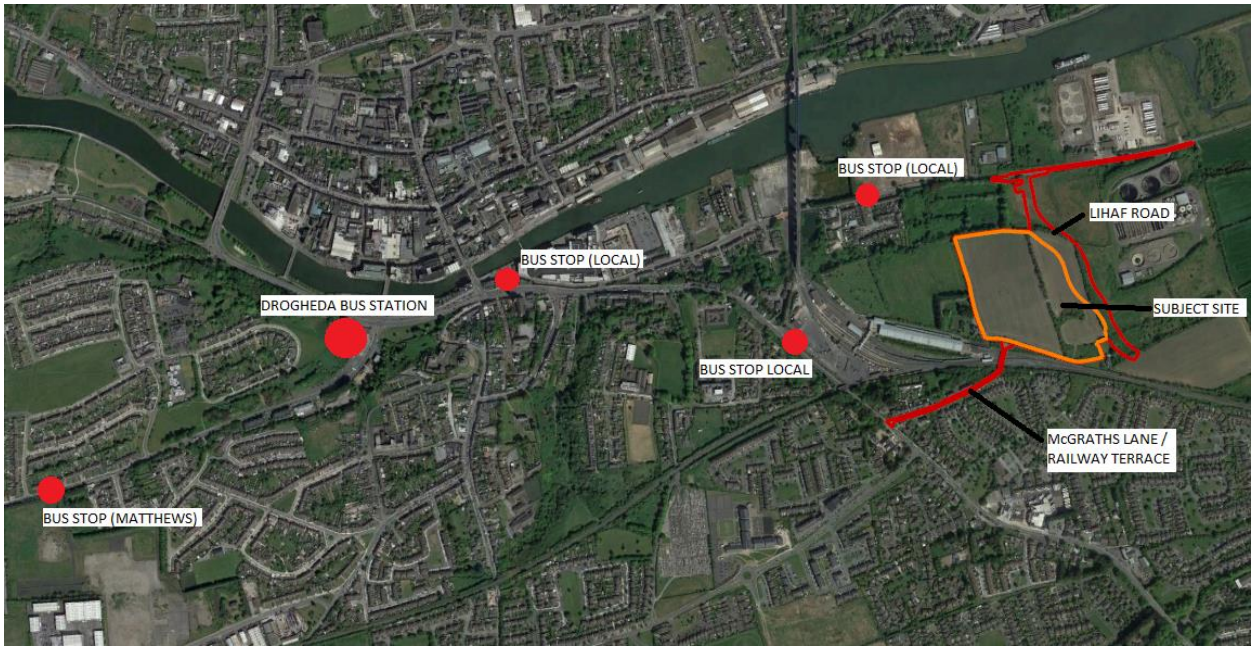
There is a local bus stop located on the R150 Marsh Road adjacent the Weirhope residential estate, which is serviced by the Bus Eireann, Drogheda – Bettystown – Laytown service approximately every 15 minutes.

Matthews also run the following services with a bus stop located on Donore Road, Drogheda.

- Route No. 900 and 901, Dundalk to Drogheda (Hourly)
- Route No. 904, Dundalk – Drogheda – UCD College (Twice Daily)

The position of the bus stops outlined above in relation to the site is shown on Figure 4.

Figure 4: Bus Stations and Stops



10.4 Characteristics of the Proposal

10.4.1 Introduction

The proposed development consists of 450 No. residential Units, neighbourhood uses, an office block, a crèche, and all associated infrastructure necessary to service them.

The schedule of accommodation for the proposed development is outlined in Table 10.

Table 10: Schedule of Accommodation for Site Proposals

Land-Use	No. of Units/Floor Area
Dwellings (Duplexes/Houses)	105 Units
Apartments (Flats)	345 Units
Offices	1,902.8 m²
Neighbourhood uses	1,277.8 m²
Crèche	919.8 m²

10.4.2 Physical infrastructure

Internal Road Layout

The proposed road layout incorporates a road hierarchy including link roads, side streets and homezones. Generally, the internal link and side streets are 6.0 m wide and footpaths are 2.0 m wide. Various traffic calming measures such as the avoidance of long straight sections, raised tables, pedestrian friendly crossings, on-street parking, and homezone areas, have been introduced to ensure a design speed of 30 km/h. Pedestrian crossing points are located at various points within the development such that unimpeded pedestrian movement is facilitated. A network of off-road cycle paths (2.0m wide) has been provided along key links throughout the development. On low speed / low traffic volume roads such as local estate streets and homezones, cyclists will be kept on-road.

LIHAF Access Road

Access to the proposed development will be via a new local access road connecting the subject site to Marsh Road via a priority-controlled junction. This road has received funding from the Local Infrastructure Housing Activation Fund (LIHAF) in recognition of the strategic importance of the lands in the delivery of much needed housing in the Drogheda area. Furthermore, the road received planning permission under reg. ref. 17/387.

The access road will be 7.3 m wide single carriageway road with footpath and a 2-way cycle path on one side and a footpath and grass verge on the other side. The access road will be assigned a 50 km/h speed limit and connect to Marsh Road via a priority junction.

The LIHAF Access Road received planning under reg. ref. 17/387 and is proposed to provide access to the subject site at two locations through the provision of priority junctions as indicated in Figure 5 below. The LIHAF road will also provide access to lands located south-east of the subject site which has planning permission for 133 No. residential units (reg. ref. 17/387)

Further to the above, the LIHAF Access Road has been designed to cater for future development on the zoned lands surrounding the subject site at Newtown.

Internal Pedestrian and Cyclist Facilities

Footpaths within the proposed development will be provided in accordance with Section 4.3.1 of The Design Manual for Urban Roads and Streets (DMURS) which suggests that a minimum 1.8m footpath should be provided on all footways. Crossing points are located at various points within the development such that unimpeded pedestrian movement is facilitated. Accordingly, the proposed development is consistent with the principles outlined in DMURS. A separate statement in respect of DMURS has been prepared and accompanies this application under separate cover. Cycle paths have been designed in accordance with the National Cycle Manual.

An allowance for traffic and pedestrian links has also been provided to facilitate a connection between the proposed development and potential future developments on the agricultural lands to the west of the subject site.

The access arrangements are shown in Figure 5.

The proposed development will provide a total of 853 No. cycle spaces, which exceeds the recommendations contained within the development plan and complies with the Apartment Design Guidelines. 460 of these spaces are provided at surface level with 393 spaces provided within the basement levels of the office block. Please refer to Architectural Drawing No. PL-06 "Parking and Bicycle Parking Details" for the location of these spaces within the proposed development. Cycle parking for the dwellings will be provided privately within each house.

Figure 5: Site Access Arrangements

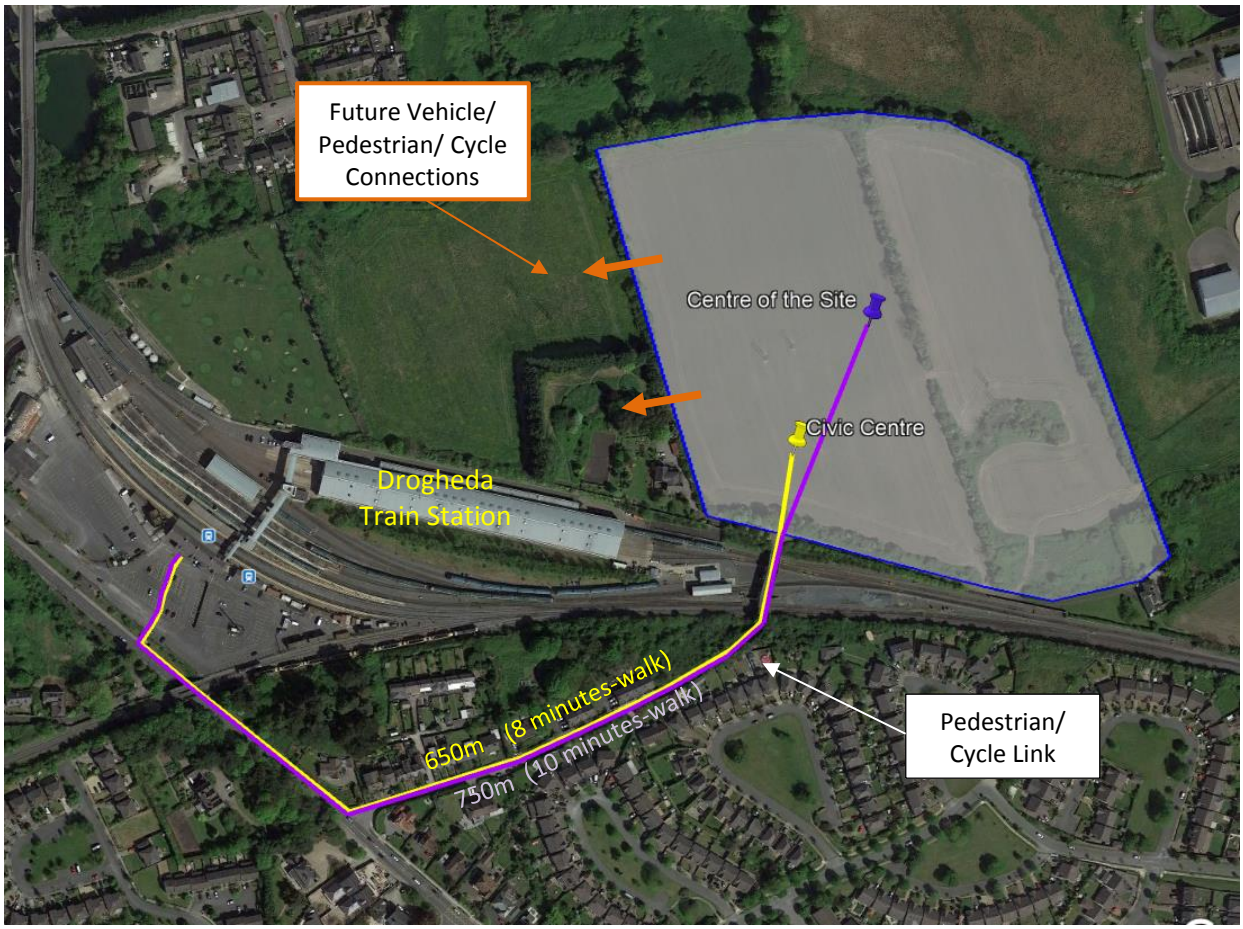
Pedestrian Linkages to Surrounding Lands

Public transport services are available adjacent to the site, or within reasonable walking distance for commuter related trips. In order to connect the proposed development with the Drogheda Train Station on the R132 (Dublin Road) it is proposed to provide a pedestrian link along McGraths Lane and Railway Terrace to the south of the site. This will provide direct access to the Drogheda Train Station via the existing railway bridge and Railway Terrace. The train station is located approximately 650m (c. 8 minutes walk) from the civic centre towards the southern part of the development and approximately 750m (c.10 minute-walk) from the centre of the site.

Footpaths and cycle tracks will also be provided along the extents of the LIHAF Access Road which will link the proposed development to the existing facilities in the area. The proposed layout allows for future connectivity to lands west of the development area.

The location of the Drogheda Train Station in relation to the site and the proposed pedestrian link is shown in Figure 6.

Figure 6: Pedestrian Linkage to Drogheda Train Station



The position of the proposed development in combination with the proposed pedestrian link provide a high-quality public transport option for commuters to Dublin.

10.4.3 Car Parking Provision

The car parking spaces provided with the proposed development area are set out in Table 11 below.

Table 11: Car Parking Spaces Required and Provided

Land Use / Dwelling Type	No. of Units / Floor Area	Car Parking Provided	Total Car Parking Spaces
Dwellings	81 units	2 per unit and 1 for every 8 units provided for visitors	162 on-curtilage & 11 on-street for visitors
Duplex Units	24 units	1 per unit and 1 for every 8 units provided for visitors	27 on-street
Apartment Units	345 units	1 per unit and 1 for every 8 units provided for visitors	204 on-street & 187 at basement level. 33 additional spaces provided at basement level for visitors
Retail (Commercial)	1,278 m^2 GFA	1 per 29 m^2	44 on-street
Office Block	1,903 m^2 GFA	1 per 48 m^2	40 at basement level
Crèche	120 Children	1 per 5.5 children (exc. Drop-off spaces)	10 on-street drop-off zone and 22 at basement level
Total			740

10.4.4 Trip generation

The proposed development consists of 450 No. residential Units, neighbourhood uses, an office block, a crèche, and all associated infrastructure necessary to service them.

The traffic generation potential of the proposed development has been derived using trip rates from the TRICS Database Version 7.5.1. These trip rates are summarised in Table 12.

Table 12: Summary of Peak Hour Trip Generation

Usage	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrivals	Departures	Two Way	Arrivals	Departures	Two Way
Apartments	0.050	0.158	0.208	0.215	0.096	0.311
Duplexes / houses	0.123	0.430	0.553	0.441	0.255	0.696
Office *(per 100 m^2 GFA)*	0.845	0.085	0.930	0.044	0.689	0.733
Retail *(per 100 m^2 GFA)*	2.177	1.945	4.122	3.284	3.980	7.264
Crèche	-	-	-	-	-	-

It is assumed that all trips to/from the Crèche will be by residents dropping/collecting children while traveling to/from their place of work or those who work in the office block/neighbourhood units who have children attending Crèche. Therefore, no additional trips have been considered for the Crèche.

These trip rates are used in conjunction with the proposed schedule of accommodation (outlined in Table 10 above) to determine the resultant total trips generated by the proposed development, as shown in Table 13.

Table 13: Trips Generated by Proposed Development

Usage	AM Peak (08:00-09:00)			PM Peak (17:00-18:00)		
	Arrivals	Departures	Two Way	Arrivals	Departures	Two Way
Apartments	17	55	72	74	33	107
Duplexes / houses	14	48	62	49	28	77
Office	16	2	18	1	13	14
Retail	28	25	53	42	51	93
Total	**75**	**130**	**205**	**166**	**125**	**291**

It can be seen from the above that the total vehicle movements generated by the proposed development will be 75 arrivals and 130 departures in the AM peak (two-way total of 205). The total number of vehicle movements in the PM peak hour will be 166 arrivals and 125 departures (two-way total of 291).

10.4.5 Traffic distribution

It was assumed that 80% of the generated traffic would travel westwards towards the Drogheda town centre, and that 20% of the traffic would travel eastwards along the R150 (Marsh Road). Trip distribution percentages for the remaining junctions were generally calculated using the base surveyed flows and associated turning movements.

The distribution for the AM and PM peak hour generated traffic is detailed in Figure 7 and the corresponding AM & PM peak hour traffic flows, based on the assumed distribution, are shown in Figure 8.

Figure 7: Distribution of Generated Traffic

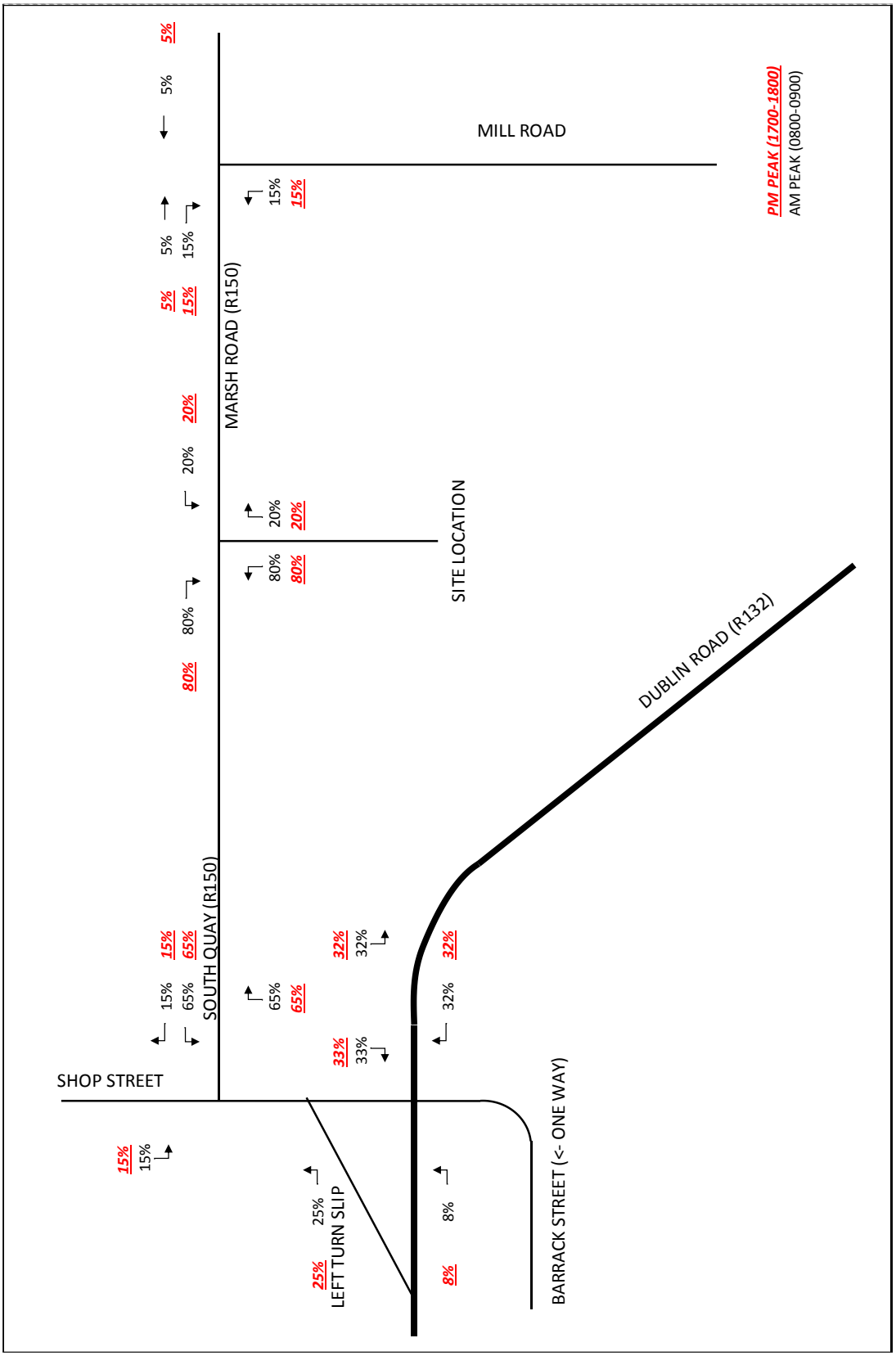
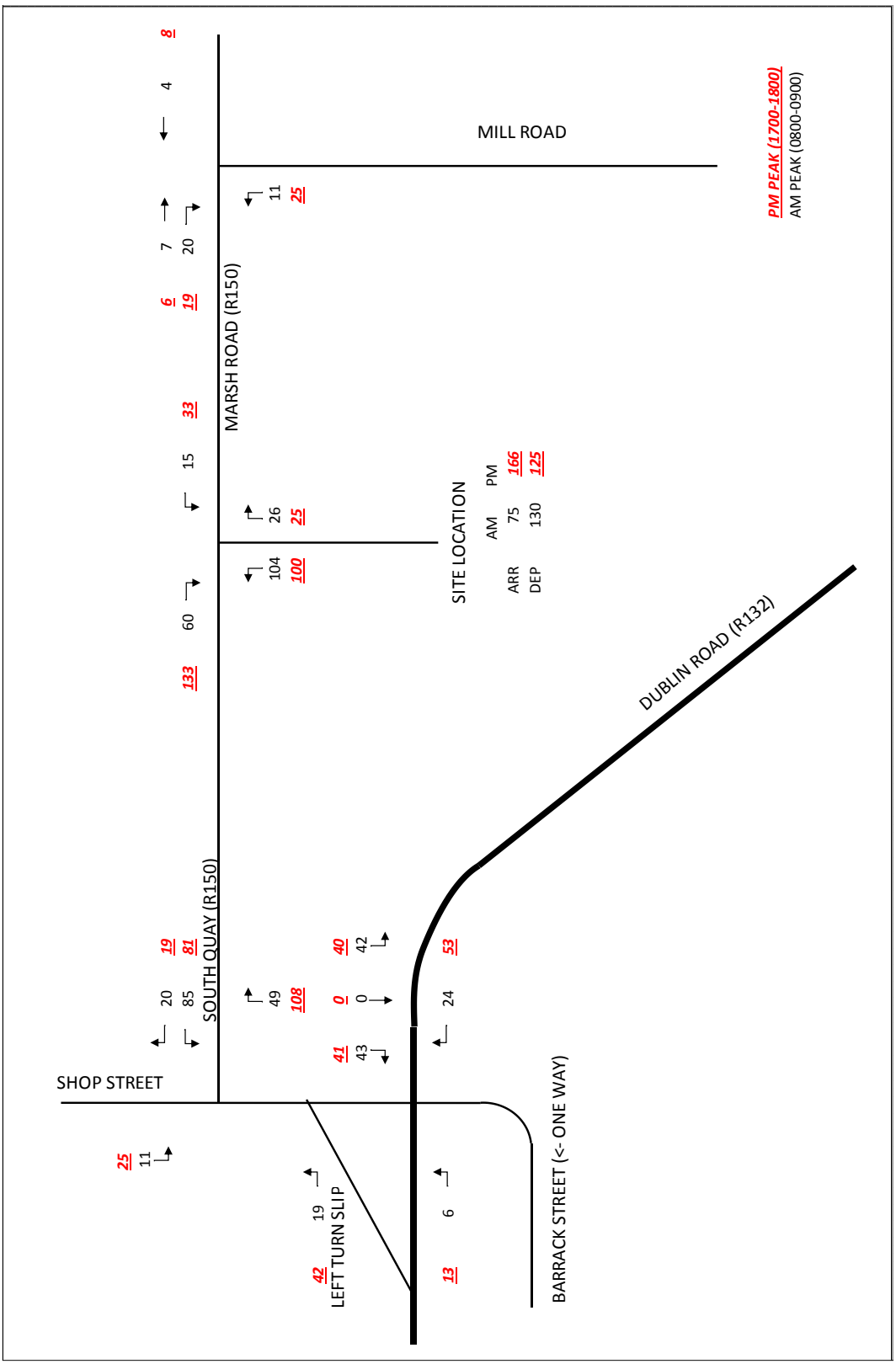


Figure 8: Site Generated Traffic Flows.


PM PEAK (1700-1800)
AM PEAK (0800-0900)
MILL ROAD
MARSH ROAD (R150)
SOUTH QUAY (R150)
SHOP STREET
SITE LOCATION
AM PM
ARR 75 166
DEP 130 125
DUBLIN ROAD (R132)
LEFT TURN SLIP
BARRACK STREET (<- ONE WAY)

10.5 Potential Impact of the Proposal

10.5.1 Introduction

The potential impacts of the proposed development from a traffic and transport perspective at both construction and operational stage are outlined in the following sections.

10.5.2 Traffic impact

Construction traffic

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

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

Operation Traffic

The proposed development will generate a number of trips by various modes of travel including vehicular, pedestrian, cycle and public transport. These trips may have an impact on the surrounding road network and could contribute to increased congestion.

10.5.3 Walking and cycling infrastructure

There is a potential for of conflict between construction traffic and pedestrians / cyclists using the existing facilities on Marsh Road. There is also potential for conflicts and disruption to vehicular access, pedestrians and cyclists during the upgrade works on McGraths Lane and Railway Terrace.

10.5.4 Do-nothing scenario

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

10.6 Mitigating Measures

10.6.1 Introduction

This section of the report will discuss mitigation measures to reduce the impact the proposed development on the surrounding area during the construction phase and operational phase.

Traffic

10.6.2 Construction phase

A preliminary construction management plan is submitted under separate cover. It is considered that a detailed Construction Management Plan (CMP) would be prepared by the appointed contractor in order to minimise the potential impact of the construction phase of the proposed development on the safety and amenity of other users of the public road. The CMP will consider the following aspects:

- dust and dirt control measures.
- noise assessment and control measures
- routes to be used by vehicles;
- working hours of the site;
- details of construction traffic forecasts;
- times when vehicle movements and deliveries will be made to site;
- facilities for loading and unloading; and
- facilities for parking cars and other vehicles

Further to the above, a detailed traffic management plan (TMP) will be prepared by the main contractor. This document will outline proposals in relation to construction traffic and associated construction activities that impact on the surrounding roads network. The document will be prepared in coordination and agreed with the Local Authority.

Care will be taken to ensure existing pedestrian and cycling routes are suitably maintained or appropriately diverted as necessary during the construction period, and temporary car parking is provided within the site for contractor's vehicles. It is likely that construction will have an imperceptible impact on pedestrian and cycle infrastructure.

Through the implementation of the CMP and TMP, it is anticipated that the effect of traffic during the construction phase will have a slight effect on the surrounding road network for a short-term period.

10.6.3 Operational phase

In order to understand the traffic impact and to determine suitable mitigation measures a Traffic and Transport Assessment has been prepared and is included in this SHD application under separate cover. This assessment included detailed traffic modelling to assess impact and determine if any upgrade works were required on the surrounding road network to facilitate the proposed development.

The traffic modelling carried out as part of this TTA includes the analysis of 4 No. junctions of the surrounding road network as set out below;

- Junction 01: Dublin Road (R132)/Shop Street (Signalised),
- Junction 02: South Quay (R150)/Shop Street (Signalised),
- Junction 03: Marsh Road (150)/Mill Road (Priority) and
- Junction 04: R150 Marsh Road/LIHAF Access Road (Priority).

A summary of the results is provided below.

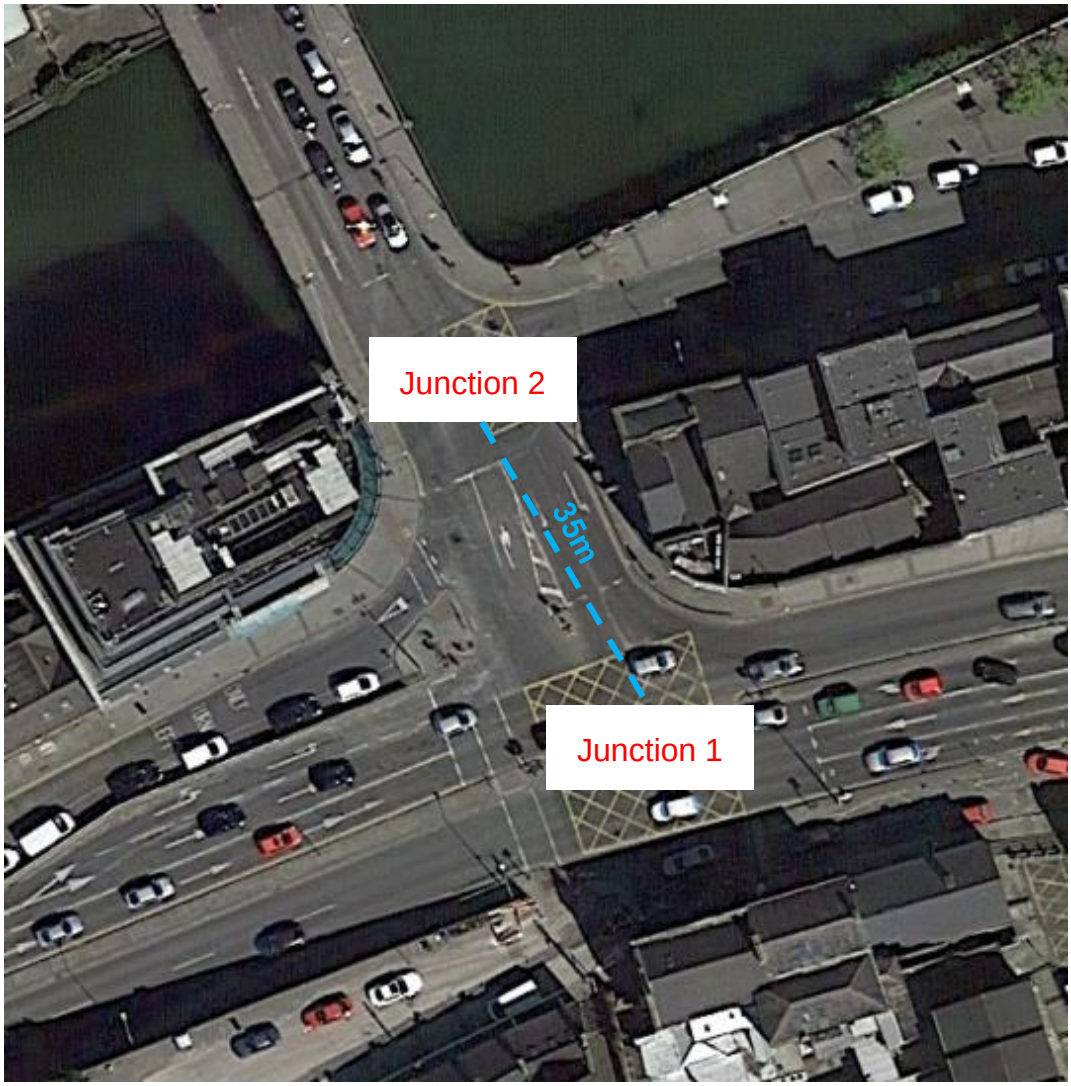
Junction Analysis Results

Junction 1 – Dublin Road (R132)/Shop Street – Four-arm signal-controlled junction

Junction 2 – South Quay (R150)/Shop Street – Three-arm signal-controlled junction

Junctions No. 1 and 2 are two existing signal-controlled junctions that are located approximately 35m from each other (Figure 9). In order to optimise the performance of Junction 1 and Junction 2, these have been modelled as a single junction with a synchronised controller stream.

Figure 9: proximity of Junctions 1 and 2



The TRANSYT analysis were undertaken applying a 5-phase signal cycle (4 traffic phases and 1 pedestrian phase) with the maximum cycle time set at 120 seconds and intergreen periods set at 5 seconds.

The TRANSYT analysis results for the signalised Junctions 1 and 2 are presented in Table 14.

Table 14: Dublin Road / Shop Street and Marsh Road / Shop Street TRANSYT Modelling Results

Year	Period	Junction 2		Junction 2		Junction 2		Junction 2		Junction 1		Junction 1		Junction 1		Junction 1		Junction 1	
		Shop Street (N)		South Quay (R150)		Shop Street (S)		Shop Street (S) to South Quay (R150)		Dublin Road (E)		Dublin Road (E) to Shop Street		Dublin Road (W) to Shop Street		Dublin Road (W)		Shop Street to Dublin Road (E)		Shop Street to Dublin Road (W)	
		DoS(%)	Max Queue (veh)	DoS(%)	Max Queue (veh)	DoS(%)	Max Queue (veh)	DoS(%)	Max Queue (veh)	DoS(%)	Max Queue (veh)	DoS(%)	Max Queue (veh)	DoS(%)	Max Queue (veh)	DoS(%)	Max Queue (veh)	DoS(%)	Max Queue (veh)	DoS(%)	Max Queue (veh)
2018	AM	66	20.36	75	8.48	56	9.20	11	0.68	35	10.32	76	11.09	16	2.64	46	9.53	41	0.85	36	0.73
	PM	68	21.09	67	7.52	62	10.02	15	1.22	36	10.59	64	8.33	24	4.08	56	11.83	38	0.94	38	0.94
2022	AM	69	21.82	78	9.16	59	10.09	12	0.73	37	10.80	80	12.06	18	2.81	48	10.00	43	0.92	38	0.80
	PM	71	22.38	70	8.03	65	10.89	16	1.28	38	11.26	67	8.87	25	4.28	58	12.54	39	1.02	39	1.03
2022 + DEV + COMM	AM	78	23.54	88	15.49	62	10.43	22	1.67	42	11.94	87	14.22	23	3.61	65	11.02	45	2.25	41	1.70
	PM	79	24.78	85	13.65	67	11.99	38	3.73	42	11.93	85	13.00	33	5.68	70	13.41	42	1.74	43	1.76
2027	AM	76	23.84	83	10.16	62	10.70	12	0.75	38	11.43	82	12.85	19	3.07	51	10.69	46	1.83	41	1.29
	PM	75	24.35	75	8.77	68	12.13	17	1.38	40	11.92	71	9.61	27	4.61	61	13.32	42	1.23	42	1.23
2027 + DEV + COMM	AM	82	25.51	91	17.11	66	11.54	23	1.74	44	12.82	92	16.35	24	3.81	69	11.86	47	2.78	43	1.75
	PM	83	27.12	89	15.04	71	13.23	39	3.86	44	12.80	89	14.53	35	5.98	74	14.48	44	1.87	45	1.88
2037	AM	80	25.81	88	11.52	66	11.81	13	0.82	40	12.23	86	14.23	20	3.23	54	11.41	48	2.38	43	1.74
	PM	79	26.13	78	9.55	72	13.47	17	1.47	43	12.74	75	10.37	28	4.85	65	14.25	44	1.70	44	1.70
2037 + DEV + COMM	AM	86	27.96	94	19.16	69	12.67	24	1.81	47	13.70	96	19.59	25	3.99	73	12.65	49	3.29	45	1.78
	PM	88	29.54	92	16.59	74	14.58	40	3.99	46	13.67	92	16.35	37	6.33	78	15.66	46	1.99	47	2.01

The results of TRANSYT analysis as summarised in Table 14, reveal that the junctions will operate within capacity for the 2037 scenario with the highest Degree of Saturation (DoS) at 88% and a corresponding queue at 11.52 vehicles during the AM peak period and 79% of DoS and a corresponding queue at 26.13 vehicles during the PM.

With the inclusion of the proposed and committed developments (2037 + DEV + COMM), the results indicate that the junctions will operate close to their capacity during both peak periods, with a maximum DoS value of 96% and a corresponding queue of 19.59 vehicles recorded for the AM and 92% DoS and corresponding queue of 16.59 vehicles for the PM.

Louth County Council has advised that the existing junctions, during the AM and PM peak hours, are operating above capacity. In order to improve the traffic flow through the junctions and minimise queues and DoS, the timing of the signal phases was optimised within the TRANSYT model.

Added developments traffic, in addition to optimised phases, results in a DoS of 96% during the AM and 92% during the PM.

Junction 3 – Marsh Road (R159)/Mill Road – Priority Junction.

Junction No. 3 is an existing priority junction. The junction has been modelled utilising its current configuration of a priority junction. Details of the results of the modelling are set out in Table 15 below.

Table 15: Marsh Road (R15) / Mill Road PICADY Modelling Results

Year	Period	Mill Road to Marsh Road (W)		Mill Road to Marsh Road (E)		Marsh Road (W) to Mill Road	
		Queue	RFC	Queue	RFC	Queue	RFC
2018	AM	0.20	0.14	0.00	0.03	0.10	0.08
	PM	0.10	0.10	0.00	0.02	0.20	0.13
2022	AM	0.20	0.15	0.00	0.04	0.10	0.09
	PM	0.10	0.10	0.00	0.02	0.20	0.13
2022 + DEV + COMM	AM	0.20	0.17	0.00	0.04	0.20	0.15
	PM	0.20	0.16	0.00	0.03	0.30	0.19
2027	AM	0.20	0.16	0.00	0.04	0.10	0.09
	PM	0.10	0.11	0.00	0.03	0.20	0.14
2027 + DEV + COMM	AM	0.20	0.18	0.00	0.04	0.20	0.15
	PM	0.20	0.16	0.00	0.03	0.30	0.19
2037	AM	0.20	0.17	0.00	0.04	0.10	0.10
	PM	0.10	0.12	0.00	0.03	0.30	0.15
2037 + DEV + COMM	AM	0.20	0.19	0.00	0.04	0.20	0.16
	PM	0.20	0.17	0.00	0.03	0.40	0.21

The above results indicate that the junction will operate within capacity during the 2037 plus proposed plus committed developments scenario with the highest Ratio of Flow to Capacity (RFC) at 19% during the AM peak period and 21% during the PM peak period.

Junction 4 – Marsh Road (R150)/LIHAF Access Road – Proposed Priority Junction

Junction No 4 is a proposed priority junction which will provide access to the proposed development and adjacent approved scheme. The PICADY analysis results for the Marsh Road (R150)/LIHAF Access Road priority junction are presented in Table 16.

Table 16: Marsh Road (R150) / LIHAF Access Road PICADY Modelling Results

Year	Period	LIHAF to Marsh Road (W)		LIHAF to Marsh Road (E)		Marsh Road (W) to LIHAF	
		Queue	RFC	Queue	RFC	Queue	RFC
2022 + DEV + COMM	AM	0.30	0.25	0.10	0.08	0.10	0.12
	PM	0.20	0.20	0.10	0.07	0.40	0.28
2027 + DEV + COMM	AM	0.30	0.25	0.10	0.08	0.10	0.12
	PM	0.20	0.20	0.10	0.07	0.40	0.28
2037 + DEV + COMM	AM	0.30	0.25	0.10	0.08	0.10	0.12
	PM	0.30	0.20	0.10	0.07	0.40	0.28

The above results indicate that the proposed junction will operate well within capacity during the 2037 plus proposed plus committed developments scenario with the highest Ratio of Flow to Capacity (RFC) at 25% during the AM peak period and 28% during the PM peak period.

10.6.4 Walking, cycling and public transport

A Mobility Management Plan has been included in this application under separate cover. The Mobility Management Plan sets out methods to reduce the dependence on private car journeys and encourage both residents and office workers within the development to avail of sustainable forms of transport such as walking, cycling and public transport.

In this regard, the proposed development provides connectivity to existing facilities and public transport options, in particular the Drogheda Train Station. The proposed upgrade works on McGraths Land and Railway Terrace improve pedestrian and cyclist access between the Dublin Road and the development. The new footpaths and cycle-tracks on the LIHAF road will connect to the existing footpath along Marsh Road which provides access into the Drogheda Town Centre.

10.7 Predicted Impact of the Proposal

10.7.1 Traffic

The predicted impacts of the proposed development from a traffic and transport perspective at both construction and operational stage are outlined in the following sections.

10.7.2 Construction phase

Provided the above mitigation measures and management procedures outlined in the Construction Management Plan are incorporated during the Construction Phase, the residual impact upon the local receiving environment is predicted to be temporary in nature and slight in terms of effect.

10.7.3 Operational Phase

The analysis of road network surrounding the subject site has shown that the existing junctions will operate within capacity for the design year 2037 + Development + Committed Development with acceptable queue lengths. This has been achieved by updating the traffic control signals at Junction 1 and Junctions 2 so that they operate in tandem. Details of the signal phasing are provided in the Traffic and Transport Assessment Report.

Whilst the surrounding road network can cater for the proposed development, the increase in traffic over the baseline conditions will result in a moderate impact on the surrounding roads network.

The provision of linkages to public transport and adequate pedestrian and cyclist facilities as part of the proposed development, will result in a positive effect on sustainable transport modes.

The proposed development will have a positive impact in terms of sustainable transport options.

10.8 Monitoring and Reinstatement

10.8.1 Construction phase

During the Construction Phase the following monitoring is advised. The specific compliance exercises to be undertaken in relation to the range of measures detailed in the final construction management plan will be agreed with the planning authority.

- Construction vehicles routes and parking
- Internal and external road conditions
- Construction activities hours of work

10.8.2 Operational phase

The Mobility Management Plan for the proposed development will be monitored and updated at regular intervals. This will enable tracking in terms of a reduction in the dependence on private car journeys and a shift towards sustainable transport options such as walking, cycling and the use of public transport such as buses and trains.

10.9 Interactions

There may be temporary negative impacts to Human Health during the Construction Phase caused by noise, dust, air quality and visual impacts which are covered in other chapters of this EIAR (Chapter 8 Air Quality & Climate, Chapter 9 Noise & Vibration, and Chapter 14 Landscape). There may also be interaction with the surrounding water bodies through surface water runoff during topsoil stripping and earthworks which will be required to construct the roads (Chapter 6 & 7).

The effects of these will be mitigated through the implementation of the measures outlined in Section 10.6.2 and within the Construction Management Plan.

10.10 Difficulties in Compiling Information

There were no difficulties encountered in compiling the chapter.

10.11 References

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