

14 MATERIAL ASSETS (TRANSPORTATION)

14.1 Introduction

This section of the Environmental Impact Assessment Report (EIAR) has been prepared by Waterman Moylan. This Chapter of the EIAR assesses the likely traffic and transportation impacts on the receiving environment during the construction and operational phases of the proposed development. The existing and proposed transport infrastructure in the area is described, and an assessment of the current and the future traffic environment is made. The impact of the development in terms of public transportation, pedestrian and cycle was also assessed.

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The section 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 predicted impact of the proposal examining the effects of the proposed development on the surrounding road network; the remedial or reductive measures required to prevent, reduce or offset any significant adverse effects; and the monitoring.

14.2 Assessment Methodology

The following methodology has been adopted for this assessment: -

- Review of Meath County Development Plan 2013 – 2019.
- Site visit to gain an understanding of the site and observe the existing traffic situation.
- Existing junction surveys to obtain base traffic counts.
- Detailed estimation of the transport demand that will be generated by the proposed and cumulative developments. The morning and evening peak times were addressed as well as the construction stage traffic.
- Assessment of the effects of traffic on local junctions, car parking requirements and accessibility of the site by sustainable modes including walking, cycling and public transport.

14.3 Receiving Environment

14.3.1 Proposed Development

Study Area

The proposed development is the second phase of an overall development located adjacent to R125 Dunshaughlin Link Road approximately 1.0km west of Dunshaughlin Town Centre, west of the GAA Sports Grounds.

The Phase 1 residential development was approved by Meath County Council (MCC) in April 2013 under Reg. Ref DA/120987, ABP Ref. PL17.241988 and is currently under construction nearing completion.

The Phase 2 residential development, subject to this planning application, is proposed to be delivered in two distinct areas, one to the north of L2208 (Drumree Road) and west of R125 (North Site) and the other to the south of the approved Phase 1 and east of R125 (South Site).

The North Site is bounded to the north and west by agricultural lands, to the south by the L2208 (Drumree Road) and to the east by the R125 Dunshaughlin Link Road. The North Site also borders on two side of an existing residential property in the south eastern corner of the site.

The South Site is bounded to the north by the under-construction development of Phase 1 (Reg. Ref. DA/120987, ABP Ref. PL17.241988), to the west by the R125, to the east by the Dunshaughlin Community College and The Elms Residential development and to the south by agricultural lands.

The location of the subject Phase 2 North and South development sites is illustrated in Figure 14.1 below.

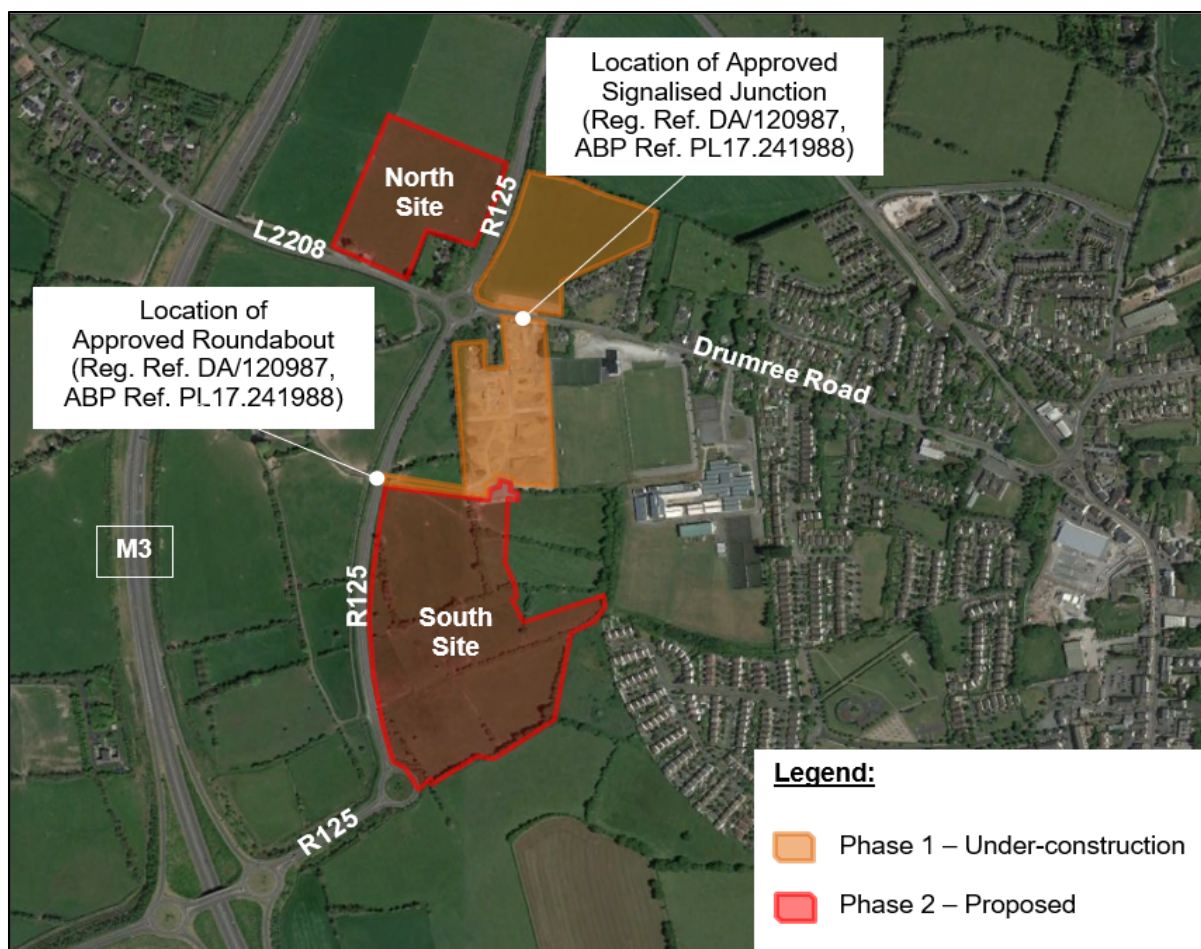


Figure 14.1: Location of Proposed (Phase 2) and Under-Construction (Phase 1) Developments.

The North Site will comprise of a total of 149no. residential units (95no. houses, 20no. duplexes and 34no. apartments). Vehicular access to the North Site is proposed off L2208 via a new priority-controlled T-junction.

The South Site will comprise of 266no. residential units (159no. houses, 35no. duplexes and 72no. apartments) and a childcare facility. Three vehicular accesses are proposed to the South Site. One will be provided off R125 Dunshaughlin Link Road, via the roundabout approved under Phase 1 development (Reg. Ref. DA/120987, ABP Ref. PL17.241988), a second will be via the existing two-armed roundabout at the southwestern edge of the site. The existing two armed roundabout is proposed to be updated to a three-armed roundabout with the site access road forming the eastern arm. A third access to the South Site will be provided from Drumree Road via the under-construction Phase 1 development. The South site has been developed with a preferred Option 1 that provides a link Road within the development across F1 Zoned lands, but has also been assessed as an Option 2 without the link Road across the F1 Zoned lands.

Roads and Junctions

Dunshaughlin is well served by a number of regional roads as well as being directly east of the M3 motorway. The M3 is the main regional road linking Dublin to Cavan. Access from the proposed development sites to the M3 can be achieved via the R125 Dunshaughlin Link Road without the need to pass through Dunshaughlin Town Centre. The southern site is 350m from the M3 Junction 6 on ramps and the northern site is 1.27 km from the same.

The existing roads which provide direct access to the proposed development sites are R125 Dunshaughlin Link Road, L2208 and Drumree Road.

R125 is a regional road running for approximately 45km linking Kilcock on County Meath/County Kildare border to Swords in County Dublin via Dunshaughlin and Ratoath towns. The speed limit along the R125 adjacent to the proposed development sites (North and South sites) is 80kph. This road is approximately 1.4km in length from the roundabout immediately southwest of the proposed South Site through to a roundabout with R147. Along this section, R125 comprises a carriageway of 7.5m wide with hard shoulders, but with no footpaths or cycle lanes provided.

L2208 is a local road running for approximately 2.8km from Killeen Road to the west crossing over the M3 through to a roundabout with R125 and Drumree Road. The speed limit along the L2208 adjacent to the proposed North Site is 80kph. Along this section, L2208 comprises a carriageway of 7.5m with footpaths running along both sides and no cycle lanes provided.

Drumree Road is a single carriageway road running east-west for approximately 850m from the signalised junction with R147 Navan Road through to the roundabout with R125 and L2208. This road, which provides the main access to the under-construction Phase 1 development, currently comprises a carriageway of approximately 7.30m with a continuous footpaths running along the northern side of the road, a segmented footpath along the southern side of the road and no cycle lanes provided. Currently there is no footpath provided along the GAA boundary to the east of Phase 1 for approx. 200m. Short sections of cycle path are permitted and under construction along the interface with Phase 1. The road layout in the area surrounding the proposed development sites is illustrated in Figure 14.2.

Access Junctions

The existing surrounding road network junctions which currently provide access to the proposed Phase 2 development sites are as follows: -

- Junction A (Existing Four-armed Roundabout): R125 / Drumree Road / L2208.
- Junction B (Existing Two-armed Roundabout): R125.
- Junction C (Existing Signalised Crossroads); Drumree Road / R147 / R125.

The location of each existing access junction in relation to the proposed Phase 2 development sites is illustrated in Figure 14.2 below.



Figure 14.2: Existing Road Network and Main Junctions.

Existing Public Transport

An assessment of the existing public transport service provision in the area has been carried out. This includes detailed analysis of the modes of transport available, ease of access and frequency of service currently available.

Bus

The proposed development site is currently served by Bus Eireann service routes 109, 109A and 109B which serve public bus stops located in Dunshaughlin Town Centre, approximately 1km east of the subject site. These routes connect Dunshaughlin to Dublin Airport, Dublin City Centre and Dublin Busaras Terminal. In the opposite direction, these routes connect Dunshaughlin to Navan, Kells and Trim.

A summary of the peak hour frequencies of these Bus Eireann Routes is presented in Table 14.1.

Route No.	Bus Eireann Service Route	Peak Hours Frequency
109	Dublin – Dunshaughlin – Navan - Kells	30 minutes
109A	Dublin Airport / City Centre – Ashbourne – Ratoath – Dunshaughlin – Navan – Kells	Hourly
109B	Dublin – Dunshaughlin – Kilmessan – Trim	Every Two Hours

Table 14.1: Bus Eireann Service Routes.

Access from the proposed development sites to the subject bus stops in Dunshaughlin Town Centre is via Drumree Road. A second link is under discussion to extend the cycle/pedestrian route along the River Skane to link to College Park and Greenane to the east, subject to agreement with MCC. The location of the subject bus stops in relation to the proposed development sites is illustrated in Figure 14.3 below.

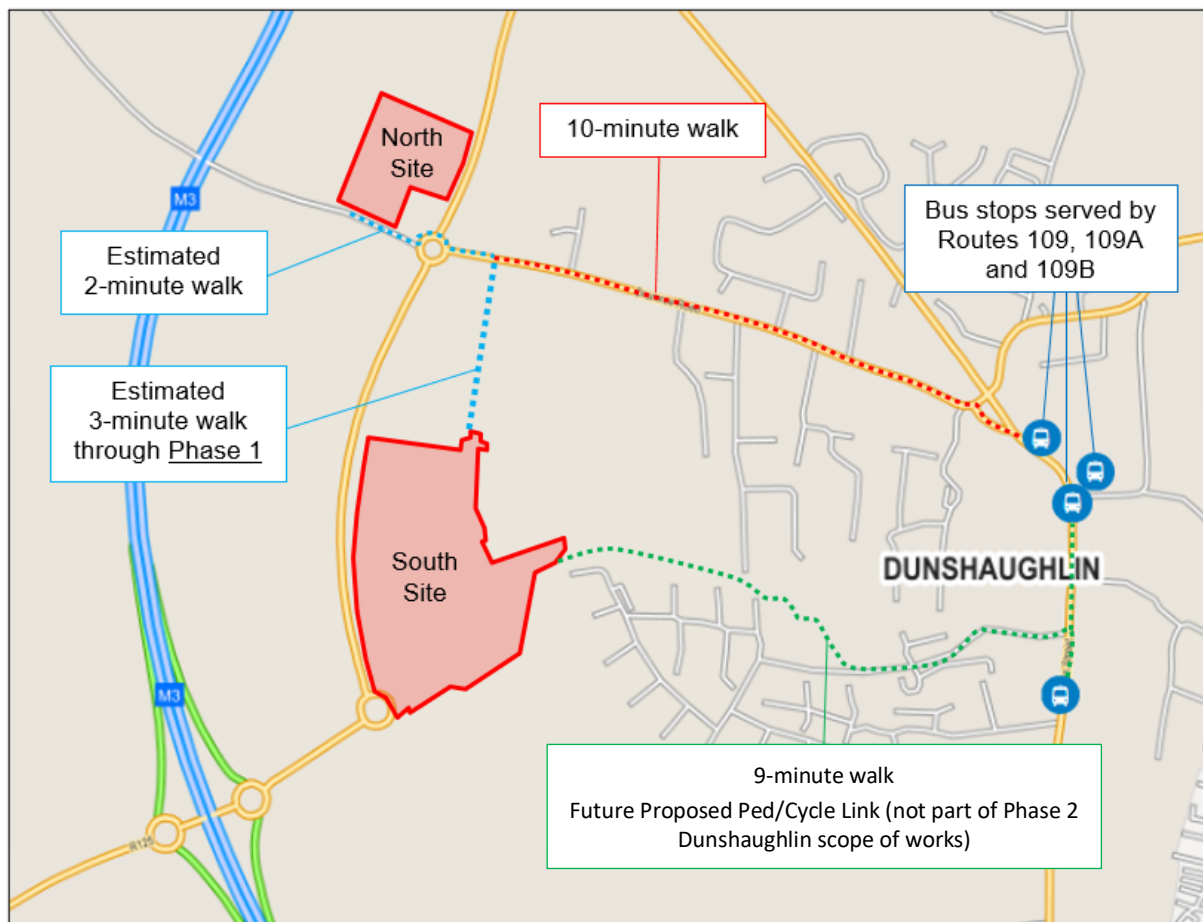


Figure 14.3: Bus Stops Location.

Travel time from the subject bus stops in Dunshaughlin Town Centre to Dublin Airport is approximately 52 minutes and to Busaras Terminal is approximately 55 minutes. In the opposite direction, the travel time from the subject bus stops in Dunshaughlin to Navan is approximately 20 minutes, to Kells it is approximately 40 minutes, and to Trim it is approximately 32 minutes.

The proposed development has been designed to the Design Manual for Roads and Street (DMURS) to maximise pedestrian linkages both within and to the surrounding urban environment. Minor roads have been designed with low traffic speeds to prioritise pedestrians and cyclists, whilst incorporating a number of dedicated pedestrian and cycle routes.

Rail

The proposed development site is located approximately 12.5km north of the closest train station - M3 Parkway, which is the terminus of the Docklands to M3 Parkway Western Commuter service.

The Commuter Rail service through M3 Parkway Station serves all stations from Docklands to M3 Parkway. The service operates at 3 – 4 services per hour on weekdays.

The M3 Parkway Station comprises c. 1,200 no. free park and ride spaces. These spaces currently provide the opportunity for those living in the surrounding villages and towns to commute by a car-train combined travel and to shift away from car-based travels to Dublin City.

Primary vehicular access to the M3 Parkway Station is via the M3 (10-minute drive) with an alternative parallel route via the R147 (15-minute).

Existing Cycle Infrastructure

There are no existing cycle lanes provided in Dunshaughlin town. As part of the Phase 1 development approved under Reg. Ref. DA/120987, ABP Ref. PL17.241988 a network of off-road cycle lanes are under construction running south-north along both sides of the Phase 1 spine road and east west along the Phase 1 interface with the Drumree Road. These nearly completed cycle lanes across Phase 1 will link the propose Phase 2 development to Drumree Road.

Existing Pedestrian Facilities

To the south of the subject North Site, along the L2208, pedestrians can benefit from the provision of footpaths directly adjacent to the road along both sides of the carriageway leading to the R125 / Drumree Road / L2208 roundabout.

Two east/west pedestrian crossings on the northern and southern approaches of the R125 / Drumree Road / L2208 roundabout are currently provided. These existing pedestrian crossings, which currently facilitate pedestrian progression from the subject North Site towards Drumree Road and the town centre, include dropped kerbs and tactile paving facilities. However, due to notable traffic speeds at the subject roundabout, MCC recognises that *“the current footpath provision and crossings points are not to an acceptable level to cater for the future pedestrian and cycle demand that the proposed development may generate”*. Discussions have taking place with MCC Roads section and proposed upgrades have been included in the current SHD application to link to the upgrade works incorporated by Phase 1, which is under construction. In additional MCC are currently installing a footpath past the GGA grounds interface with Drumree Road to the east of Phase 1.

Along the South Site western frontage, the R125 has a posted speed limit of 80kph with no footpaths provided. However, it has been noted that cyclists, pedestrians/joggers and horseback riders make use of the hard shoulder from time to time.

As part of the approved Phase 1 development, a network of footpaths with dedicated pedestrian crossings at various points is currently under construction (nearing completion) within the development site such that unimpeded and safe pedestrian movement is facilitated. This nearly complete network of footpaths is a key element to facilitate pedestrian progression from the proposed South Site (Phase 2) towards Drumree Road.

The existing pedestrian facilities along Drumree Road comprise a network of footpaths linking the various neighbourhoods to each other, to the existing schools and to the existing bus stops in town centre.

Figure 14.4 below shows the extend of the existing cycle infrastructure and pedestrian facilities within the vicinity of the Phase 2 development.

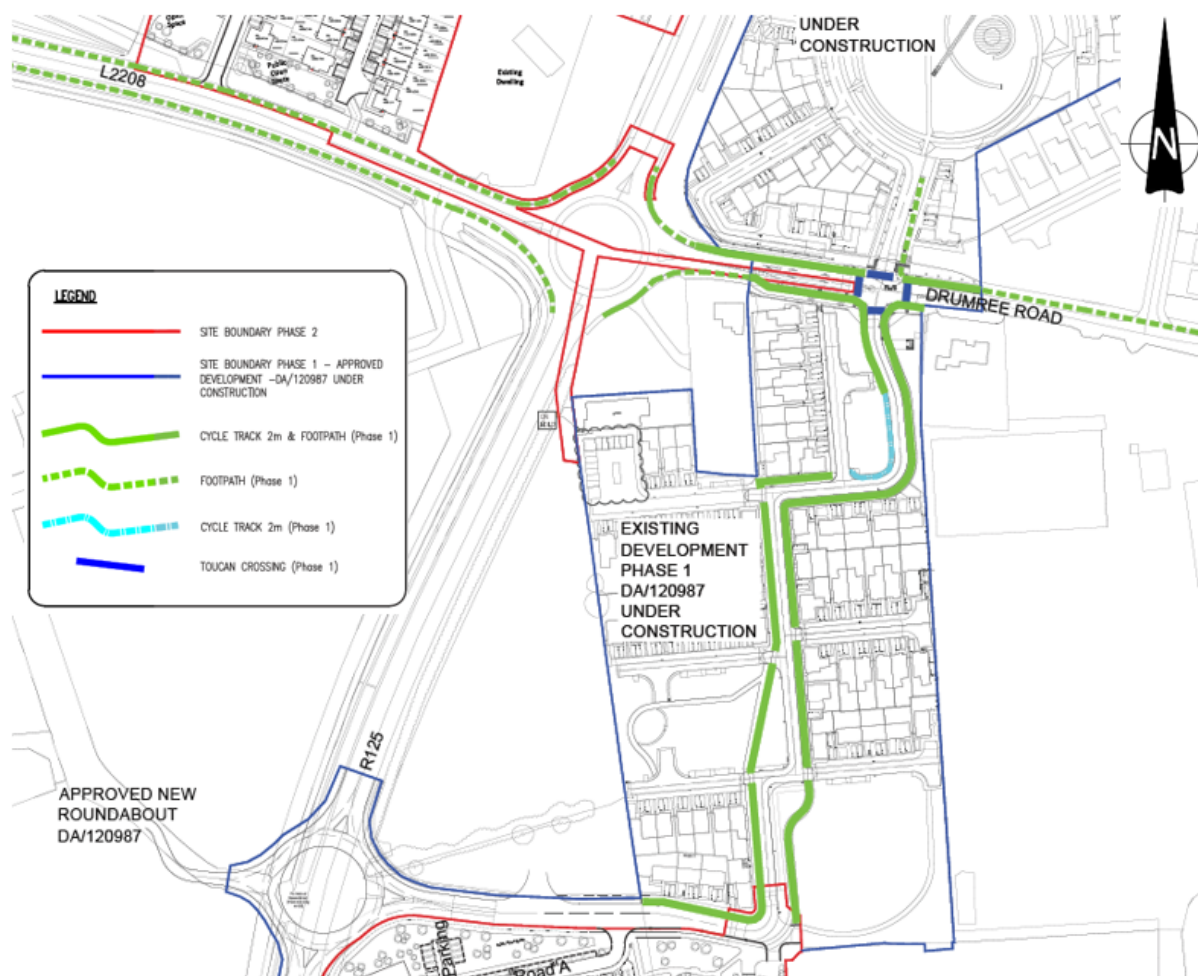


Figure 14.4: Existing cycle infrastructure and pedestrian facilities.

Baseline Traffic Volumes and Traffic Survey

In order to identify the volumes of traffic movements at the key junctions on the road network surrounding the subject sites, a set of classified turning movement traffic counts was commissioned.

A manual classified traffic survey was carried out by 'IDASO' on Tuesday 25th February 2020 at one signalised crossroads, one priority-controlled crossroads and one roundabout over a period of 24 hours. The junctions surveyed were: -

- Junction 1 (Signalised Crossroads): R147 Navan Road / R125 / Drumree Road.
- Junction 2 (Priority-controlled Crossroads): R147 Navan Road / Lagore Road.
- Junction 3 (Priority-controlled Roundabout): R125 / L2208 / Drumree Road.

The location of the surveyed junctions in relation to the proposed development sites is illustrated in Figure 14.5 below.

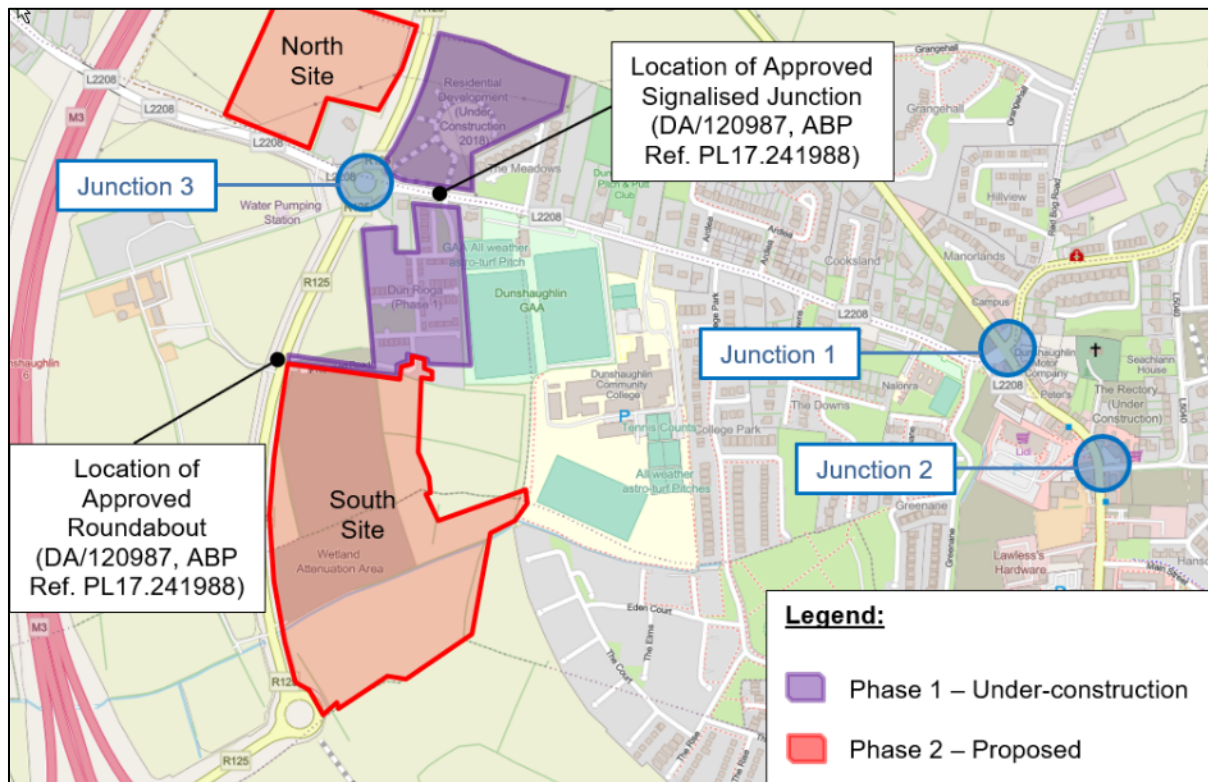


Figure 14.5: Location of Surveyed Junctions.

The survey identified the AM peak hour as 08h00 - 09h00 and the PM peak hour as 17h00 – 18h00 for all junctions. The analysis results in Table 14.2 indicate that the surveyed junctions are currently operating within capacity during both AM and PM peak hours.

Location	DOS or RFC AM Peak Hour	DOS or RFC PM Peak Hour
Junction 1	68%	73%
Junction 2	0.41	0.43
Junction 3	0.29	0.27

Table 14.2: Existing surveyed junctions performance.

14.3.2 Cumulative Development

Drumree Road / Phase 1 Site Access Roads (Signalised Junction)

As part of the approved Phase 1 development works (Reg. Ref. DA/120987, ABP Ref. PL17.241988), a signalised junction on Drumree Road (approximately 80m east of the existing roundabout with R125 and L2208) is currently under construction, with the access roads to Phase 1 forming the northern and southern arms of the junction.

The under-construction scheme comprises: -

- New northern and southern approaches of the junction to provide controlled access to the under-construction Phase 1 development.
- Installation of a new traffic signal infrastructure with 4 normal traffic stages and 1 pedestrian stage.

- Dedicated signalised pedestrian crossings (toucan) with tactile paving on all approaches and dropped kerbs on the north, east & west approaches and a raised crossing on the southern approach.
- A dedicated right-turning pocket lane on the Drumree Road Western approach.
- Improvements to the existing footpaths on both sides of Drumree Road along the Phase 1 site frontage.

The under-construction scheme also includes widening the Drumree Road along the Phase 1 site frontage to provide enough space for off road cycle lanes on both side of the carriageway. Provision of cycle lanes on Drumree Road is part of the overall cycle network scheme proposed for Dunshaughlin under GDA Cycle Network Plan (See Table 14.3).

It is anticipated that the proposed South Site development of Phase 2 will be interconnect with the under-construction Phase 1. Therefore, the subject signalised junction will also provide access to the proposed South Site development of Phase 2.

The location of the under-construction junction in relation to the proposed Phase 2 development sites is illustrated in Figure 14.5 above.

R125 Dunshaughlin Link Road / Phase 1 Site Access Road (Roundabout)

The overall proposal of the approved development of Phase 1 (DA/120987, ABP Ref. PL17.241988) also includes the construction of a four-armed roundabout on to the R125 (approximately 260m south of the existing roundabout with L2208 and Drumree Road) with the access road to Phase 1 forming the eastern arm of the roundabout. This access road will comprise off road cycle lanes along both sides and will also provide access to the South Site of the proposed Phase 2 development.

The location of the approved roundabout in relation to the proposed Phase 2 development sites is illustrated in Figure 14.5 above.

Potential Neighbourhood Centre

Immediately west of the approved South Site of Phase 1 development, a portion of land is zoned for a Neighbourhood Centre (See Figure 14.6 below for an extracted from Dunshaughlin Land Use Zoning Objectives Map within Meath County Development Plan 2013 – 2019).

The quantum of development assumed for the Neighbourhood Centre was based on a previous TIA prepared for the site (approved under Reg. Ref. DA/803422) and is summarised as follows: -

- Offices – 3,248 sqm of area
- Retail Enterprise Units – 1,930 sqm of area
- Café – 250 sqm of area
- Medical Centre – 577 sqm of area
- Leisure Facilities – 1,773 sqm of area

This planning permission has withered and was not acted upon. To take a conservative approach to this impact assessment process, it has been assumed that similar flows would arise from these lands in the future were they to be developed.

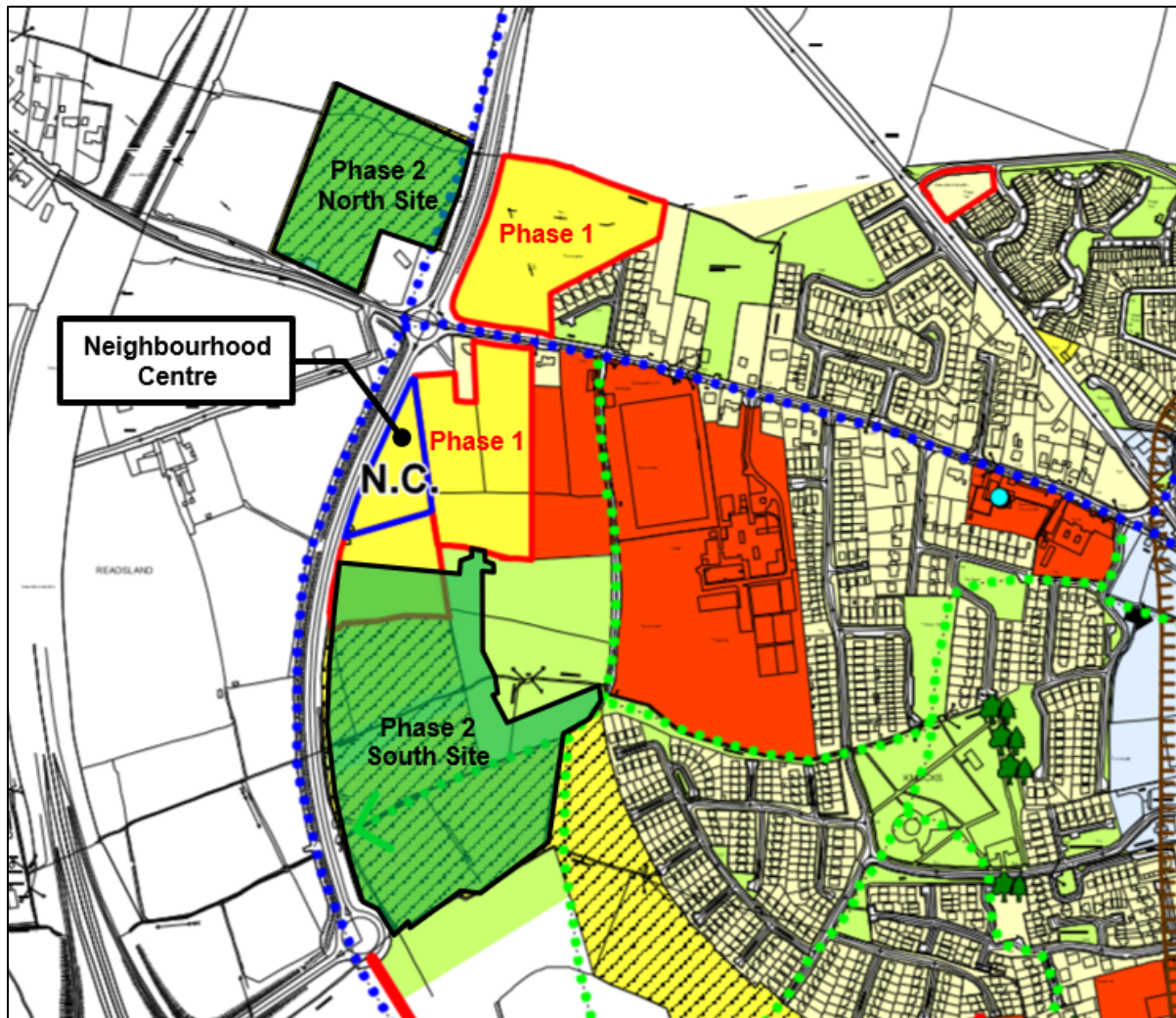


Figure 14.6: Location of Neighbourhood Centre.

14.4 Characteristics of the Development

14.4.1 Proposed Development

In summary, the proposed Strategic Housing Development broadly comprises: -

- 415no. residential units (254no. houses, 55no. duplex and 106no. apartments) in buildings ranging in height from 2 to 5-storeys.
- 1no. childcare facility (c. 409 sq. m gross floor area).
- Provision of access from Drumree Road (Character Area 6) and Dunshaughlin Link Road – R125 (Character Areas 3 & 4) and provision of internal road network including pedestrian and cycle links.
- Provision of public open space including facilitation of planned pedestrian and cyclist connection along River Skane Greenway toward Dunshaughlin Town Centre.
- Provision of wastewater infrastructure including connections to main sewers on Drumree Road and to foul networks in permitted Phase 1 development and provision of SuDS infrastructure.
- All associated and ancillary site development and infrastructural works, hard and soft landscaping and boundary treatment works.

Proposed Site Access Junctions

North Site

Vehicular access to the North Site is proposed from L2208 via a new priority-controlled T-junction. The visibility splay requirements for this junction are based on the 50kph design speed limit. The sightline requirements for a new priority junction on a 50kph road are identified within the Design Manual for Urban Roads and Streets (DMURS) which recommends a visibility splay of 45m x 2.4m. Approximately 35 metres east of this proposed vehicular entrance, a pedestrian only access point will also be provided on L2208.

Further details can be seen on Waterman Moylan drawings accompanying the documentation package.

South Site

The proposed South Site development will benefit from a number of access points. To the north, the South Site will link directly to the under-construction Phase 1 (Reg. Ref. DA/120987) which currently benefits from two access points, one off Drumree Road via a new signalised junction and one off the R125 via a new as yet unconstructed roundabout. One further access point will be provided via the existing two-armed roundabout on R125 - at the southwestern edge of the site, which is proposed to be updated to a three-armed roundabout with the site access road forming the eastern arm. An allowance for future traffic and pedestrian links has also been proposed to facilitate a connection between the South Site and any potential future development to the east and south of the subject South Site. The South Site has been developed with a preferred Option 1 that provides a link Road within the development across F1 Zoned lands, but has also been assessed as an Option 2 without the link Road across the F1 Zoned lands (See Drawing P171).

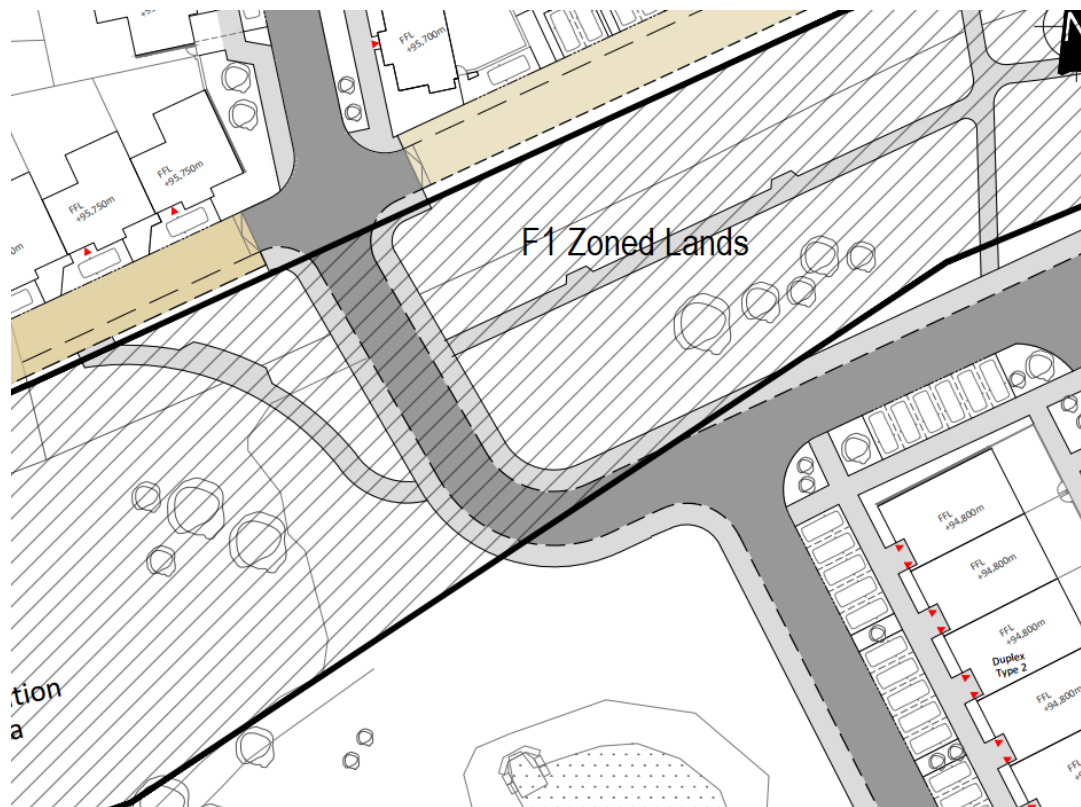


Figure 14.7: Option 1 – Link Road Across F1 Zoned Land.

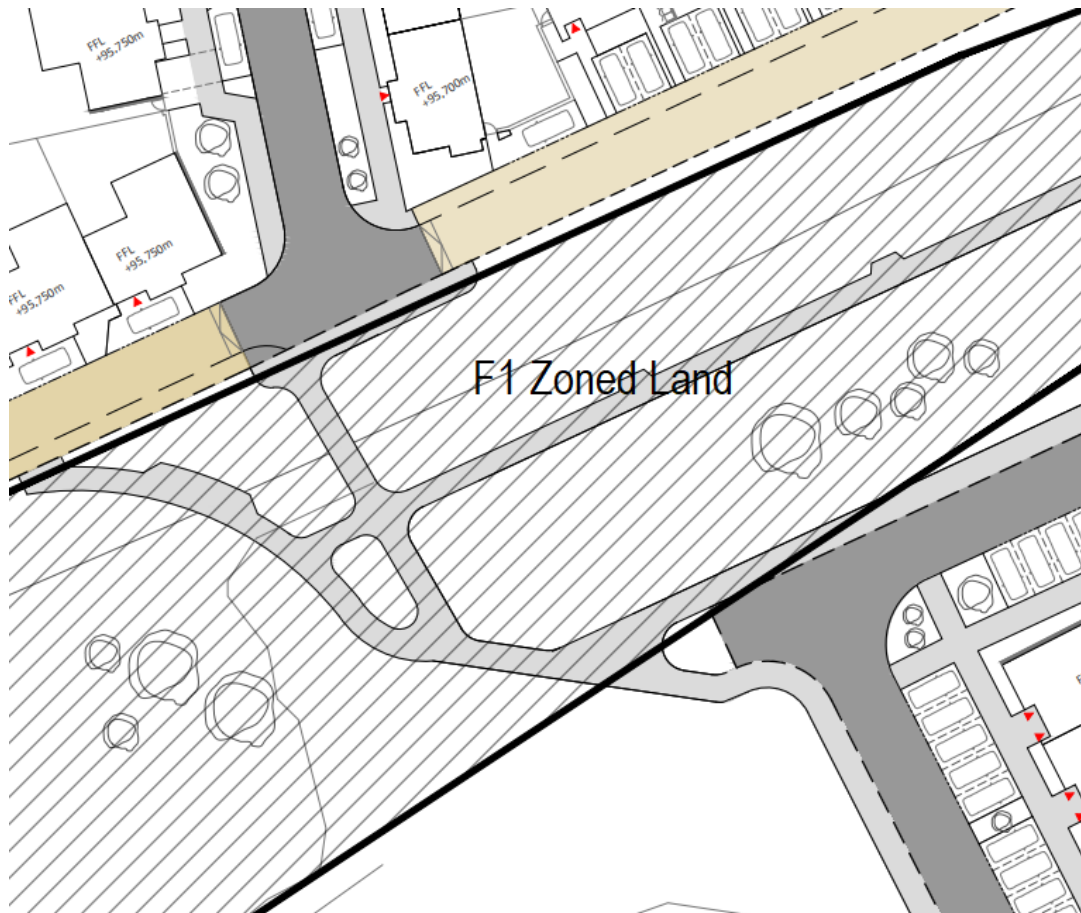


Figure 14.8: Option 2 – Link Road Omitted Across F1 Zoned Land.

Further details can be seen on Waterman Moylan drawings accompanying the documentation package.

Internal Layout

All internal roads in the proposed development (North and South Sites) are designed for a speed limit of 30kph with typically 5.0m wide carriageways and 2.2m footpaths along both sides. Some Home Zone/Shared surface roads are proposed which has a typical 4.5m width and parallel 1.5m buffer zone. All intersections within the development itself will be priority junctions with raised tables where appropriate. The low design speeds and traffic calming measures will ensure the desirable operation of these junctions and a safe/secure environment for pedestrians and cyclists.

Proposed Pedestrian and Cyclist Infrastructure

All footpaths proposed for the subject development (North and South Sites) will be provided in accordance with the DMURS. All the proposed cycle tracks are designed in accordance with the National Cycle Manual. These proposed pedestrian/cycle facilities will connect to the existing/under-construction facilities in the vicinity of the sites and will provide a good quality and safe/secure network for pedestrians and cyclists.

North Site

As part of the North Site development works, it is proposed to renovate the existing pedestrian facilities along the L2208 from the vehicular access point to the North Site up until the pedestrian facilities currently under construction on Drumree Road as part of the Phase 1 development works. This proposed renovation includes a 3m wide shared cycle/pedestrian facility along the North Site frontage onto L2208 and a new pedestrian crossing with dropped kerbs and tactile paving on the northern arm of the Drumree Road / R125 / L2208 roundabout as discussed and agreed with MCC Roads Department, and will provide safe pedestrian and cyclist progression from the North Site towards Drumree Road, the local schools and GAA grounds.

South Site

The pedestrian/cyclist infrastructure proposed for the South Site consist of two north-south spines running along the western and eastern sides of the site and one west-east spine running along the north side of the Skane River. All proposed spines will be interconnected internally and externally with Phase 1, with some dedicated cycle lanes and pedestrian routes and some shared surfaces to ensure that a safe/secure and attractive environment is provided for residents traveling in or outside the proposed development.

In addition, allowances for future pedestrian/cycle links has also been provided between the South Site and any potential future development to the east and south. These east and south extensions of these pedestrian/cycle facilities are in line with the 'Dunshaughlin Land Use Zoning Objectives Map' within the Meath County Council Development Plan 2013 – 2019, as varied and will provide a future enhanced network for pedestrians and cyclist traveling east towards the town centre and south outside the South Site area.

Further details on proposed cycle and pedestrian facilities can be seen on enclosed Waterman Moylan Drawing. No. 12-081A-P160.

Car Parking

The number of car parking spaces projected to serve the proposed North and South Sites of Phase 2 development are presented below. The development's car parking proposals include the provision of a total 664no. car parking spaces which will all be provided on surface within the development.

Allocation of the proposed parking spaces for the overall Phase 2 development is outlined below: -

- **Residential (254 Houses):** 442no. car parking spaces, which equates to a ratio of approximately 1.7 car parking spaces per house unit.
- **Residential (161 Apartments & Duplexes):** 161no. car parking spaces, which equates to a ratio of 1.0 car parking space per apartment/duplex unit.
- **Residential (Visitor – Apartments & Duplexes):** 47no. car parking spaces.
- **Disable Parking:** 6no. car parking spaces.
- **Childcare Facility:** 8no. car parking spaces (Staff parking).

Bicycle Parking

The number of bicycle parking spaces projected to serve the proposed North and South Sites of Phase 2 development are presented below. The development's bicycle parking proposals include the provision of a total 568 No. bicycle parking spaces which will be provided within the communal rear gardens where appropriate, bike stores and within the curtilage of the property for houses.

Allocation of the proposed bicycle parking spaces for the overall Phase 2 development is outlined below: -

- **Allocated Parking – Apartments:** 188no. bicycle parking spaces, which equates to a ratio of 1.0 bicycle parking space per bedroom. Secure stores are located at ground floor level of the apartment blocks.
- **Short Term Parking – Apartments:** 58no. bicycle parking spaces, which equates to a ratio of 1.0 bicycle parking space per 2 apartment units. Parking spaces are located externally adjacent to the blocks.
- **Allocated Parking – Duplex: -**
 - **Communal Rear Garden/Patio Access:** 78 No. bicycle parking spaces.
 - **Within Bike Stores:** 63no. bicycle parking spaces located adjacent duplex blocks.
 - **Total:** 141no. bicycle parking spaces, which equates to a ratio of 1.0 bicycle parking space per bedroom, dedicated bicycle parking spaces are provided for the duplexes.
- **Short Term Parking – Duplex:** 28no. bicycle parking spaces, which equates to a ratio of 1.0 bicycle parking space per 2 duplex units is also provided.
- **Allocated Parking – Mid-Terrace Houses: -**
 - Within Bike Stores: 101no. bicycle parking spaces.
 - Total: 101no. bicycle parking spaces have been provided, for houses with direct access to gardens, bicycle parking can be readily accommodated within the rear curtilage of the property.
- **Short Term Parking – Houses:** 52no. bicycle parking spaces, which equates to a ratio of 1.0 bicycle parking space per 5 house units.

14.4.1.1 Construction Stage

The proposed development will be constructed in 3 stages/phases with an estimated construction timeframe 24-36 months. During the construction phase of the proposed development, some construction traffic movements will be undertaken by heavy goods vehicles, though there will also be vehicle movements associated with the appointed contractors and their staff. This will be similar to that of Phase 1 and it is envisaged that all Phase 1 activities will be complete by the time this application is granted.

An estimate of the day to day traffic movements associated with the construction activities, based on experience of similar sites, considered that the number of constructions related heavy goods vehicle movements to and from the application site will be approximately 3 arrivals/departures per hour. With majority of trips undertaken outside the AM and PM peak hours.

The general workforce is likely reach 200 in number. It was estimated that c. 50% of the workforce will travel to/from the site by a vehicle and will carpool on average 2 workers per vehicle. As a result, the site will attract around 50 number of vehicles per day with majority of the trips being undertaken outside the AM and PM peak hours.

The number of construction vehicle movements will be significantly low compared to the number of vehicular trips to be generated by the proposed development during the operational phase. The majority of such trips will be undertaken outside of the traditional AM and PM peak hours. Therefore, it is not considered that this level of construction traffic would result in any operational problem. In this regard, no junction assessment for the construction phase was undertaken.

A construction car park will be created at the start of works by the laying of a temporary surface for vehicles.

14.4.1.2 Operational Stage

Predicted Trip Generation Rates

In order to assess the likely impact of the traffic generation arising from the proposed Phase 2 development, TRICS software has been consulted. TRICS is the national standard of trip generation and analysis in Ireland. It is a database system which allows users to identify representative trip rates and to establish potential levels of trip generation for a wide variety of developments.

Trip rates for each proposed land use, which were sourced from the TRICS version 7.7.1, have been provided in Table 14.3 below.

Land Use	AM Peak Hour		PM Peak Hour	
	Trip Rate IN	Trip Rate OUT	Trip Rate IN	Trip Rate OUT
Houses / Duplexes	per dwelling	0.295	0.674	0.432
Apartments	per dwelling	0.046	0.241	0.212
Childcare Facility	per 100sqm	5.946	3.271	3.766

Table 14.3: TRICS Trip Rates – AM and PM Peak Hours

Trips Generated by the Proposed DevelopmentNorth Site

The proposed North Site will consist of 95no. Houses, 20no. Duplexes and 34no. Apartments. The estimated car trip generation for the proposed North Site is shown in Table 14.4 below.

Land Use	No. Units	AM Peak Hour (08h00 to 09h00)		PM Peak Hour (17h00 to 18h00)	
		Arr.	Dep.	Arr.	Dep.
Houses / Duplexes	115no. units	34	78	50	29
Apartments	34no. units	2	8	7	2
Total	149no. units	36	86	57	31

Table 14.4: AM and PM Peak Hours - Car Trip Generation – North Site of Proposed Development

As can be seen from the above, the proposed North Site is expected to generate a total of 122 vehicle movements in the AM peak hour (36 arrivals and 86 departures) and a total of 88 vehicle movements in the PM peak hour (57 arrivals and 31 departures).

South Site

The proposed South Site will consist of 159no. Houses, 35no. Duplexes, 72no. Apartments and a childcare facility with 409 sq. m gross floor area. The estimated trip generation for the proposed South Site is shown in Table 14.5 below.

Land Use	No. Units / Floor Area	AM Peak Hour (08h00 to 09h00)		PM Peak Hour (17h00 to 18h00)	
		Arr.	Dep.	Arr.	Dep.
Houses / Duplexes	194no. units	57	131	84	49
Apartments	72no. units	3	17	15	4
Childcare Facility	409 sq. m	25	14	16	21
Total	266no. units	85	162	115	74

Table 14.5: AM and PM Peak Hours - Car Trip Generation – South Site of Proposed Development

14.4.2 Cumulative Development

14.4.2.1 Construction Stage

During the construction stage of the development no cumulative impact on the traffic is envisaged as the number of trips generated by the construction stage is low in comparison to the operational stage and added to this, the trip generation occurs outside the AM and PM Peak Hours.

14.4.2.2 Operational Stage

Under-Construction Phase 1 development approved by MCC in April 2013 under Reg. Ref. DA/120987, ABP Ref. PL17.241988

In order to provide a robust assessment of the transportation network in the local area, as per TII guidelines, the under-construction Phase 1 development approved by MCC in April 2013 under Reg. Ref. DA/120987 was also analysed with regards to trip generation and distribution. The permission provided for the construction of 142 of the 160no. residential units proposed, together with a childcare facility. As the remaining 18no. residential units (on the southeast corner of Phase 1) are expected to be permitted in the future under a new planning application, for the purpose of this assessment, and in order to undertake a conservative assessment, the 160no. residential units + creche have been assessed under Phase 1 development.

The AM and PM peak hour trip rates and the generated traffic from the under-construction Phase 1 development have been extracted from the Traffic Impact Assessment approved as part of the planning application for the site and are presented in Table 14.6 and Table 14.7, respectively.

Land Use	No. Units / Floor Area	AM Peak Hour (08h00 to 09h00)		PM Peak Hour (17h00 to 18h00)	
		Arr.	Dep.	Arr.	Dep.
Residential	Per Dwelling	0.20	0.41	0.42	0.26
Childcare Facility	Per 100 sq. m	5.163	3.890	1.287	2.907

Table 14.6: RICS Trip Rates – AM and PM Peak Hours – extracted from Approved Phase 1 TIA.

Land Use	No. Units / Floor Area	AM Peak Hour (08h00 to 09h00)		PM Peak Hour (17h00 to 18h00)	
		Arr.	Dep.	Arr.	Dep.
Residential (North)	78no. units	16	32	33	21
Residential (South)	82no. units	16	34	34	21
Creche (South)	c. 200 sq. m	10	8	3	6
Total	160 units c. 200 sq. m	42	74	70	48

Table 14.7: AM and PM Peak Hours – Car Trip Generation – Under-construction Phase 1.

As can be seen from the above, based on the approved TIA (Reg. Ref. DA/120987), the under-construction Phase 1 development (including both north and south sites) is estimated to generate a total of 116 vehicle movements in the AM peak hour (42 arrivals and 74 departures) and a total of 118 vehicle movements in the PM peak hour (70 arrivals and 48 departures).

Potential Neighbourhood Centre Reg. Ref. DA/803422

The AM and PM peak hour trip rates and trip generation estimated for the potential Neighbourhood Centre have also been extracted from the TIA prepared for Phase 1 and are presented in Table 14.8 and Table 14.9, respectively.

Land Use	Calculation Factor	AM Peak Hour (08h00 to 09h00)		PM Peak Hour (17h00 to 18h00)	
		Arr.	Dep.	Arr.	Dep.
Office	per 100 sq. m	3.042	0.430	0.225	2.378
Retail	per 100 sq. m	1.953	1.420	3.521	3.363
Cafe	per 100 sq. m	3.399	2.935	4.274	5.458
Medical Centre	per 100 sq. m	2.140	0.873	3.910	4.650
Leisure Facilities	per 100 sq. m	0.200	0.410	0.420	0.260

Table 14.8: TRICS Trip Rates – AM and PM Peak Hours – extracted from Approved Phase 1 TIA.

Land Use	Floor Area	AM Peak Hour (08h00 to 09h00)		PM Peak Hour (17h00 to 18h00)	
		Arr.	Dep.	Arr.	Dep.
Office	3,248	99	14	7	77
Retail	1,930	38	27	68	65
Cafe	250	8	7	11	14
Medical Centre	577	12	5	6	11
Leisure Facilities	1,773	9	8	30	23
Total	7,778	166	61	122	190

Table 14.9: AM and PM Peak Hours – Car Trip Generation – Potential Neighbourhood Centre.

As can be seen from the above, as per the trip rates and the floor areas assumed in the TIA prepared for Phase 1, the potential Neighbourhood Centre is estimated to generate a total of 227 vehicle movements in the AM peak hour (166 arrivals and 61 departures) and a total of 312 vehicle movements in the PM peak hour (122 arrivals and 190 departures).

Further to the information above, the peak hour modal splits for the electoral division of “Dunshaughlin” were extracted from Census 2016 data and can be seen in Table 14.10 below: -

Mode of Transport	Percentage Split
Private Car	68%
Cycle	1%
Train	3%
Pedestrian	18%
Bus	10%

Table 14.10: Model Split – Potential Neighbourhood Centre.

For the purpose of this Traffic and Transport Assessment, it is assumed that the potential Neighbourhood Centre will be fully developed and operational by 2029 if granted permission under the current development plan. Within the new proposed Development Plan for Dunshaughlin, the Neighbourhood Centre is proposed to be scaled back significantly. Therefore, the above projected figures are an absolute worst-case scenario in terms of project traffic movements.

14.5 Potential Impact of the Proposed Development

14.5.1 Construction Stage

The number of construction vehicle movements generated by the proposed development is low compared to the number of vehicular trips to be generated by the proposed development during the operational phase. Further, it is predicted that the majority of traffic generated by the construction activities will take place outside of the AM and PM peak periods and therefore no significant adverse impact on traffic is predicted.

Care will be taken to ensure that the existing pedestrian and cycling routes are suitably maintained or appropriately diverted if and where necessary during the construction period. It is likely that construction will have a slight temporary effect on pedestrian and cycle infrastructure.

14.5.2 Operational Stage

Assessed Junctions

The junctions that have been assessed within this TTA are the following: -

- Junction 1 (Existing Signalised Crossroads): R147 Navan Road / R125 / Drumree Road.
- Junction 2 (Existing Priority-controlled Crossroads): R147 Navan Road / Lagore Road.
- Junction 3 (Existing Priority-controlled Roundabout): R125 / L2208 / Drumree Road.
- Junction 4 (Approved Signalised Crossroads): Drumree Road / Access Roads to Phase 1.
- Junction 5 (Approved Priority-controlled Roundabout): R125 / Access Road to Phase 1.
- Junction 6 (Proposed Priority-controlled T-junction): L2208 / Access Road to Phase 2 North Site.
- Junction 7 (Proposed Upgraded Roundabout): R125 / Access Road to Phase 2 South Site.

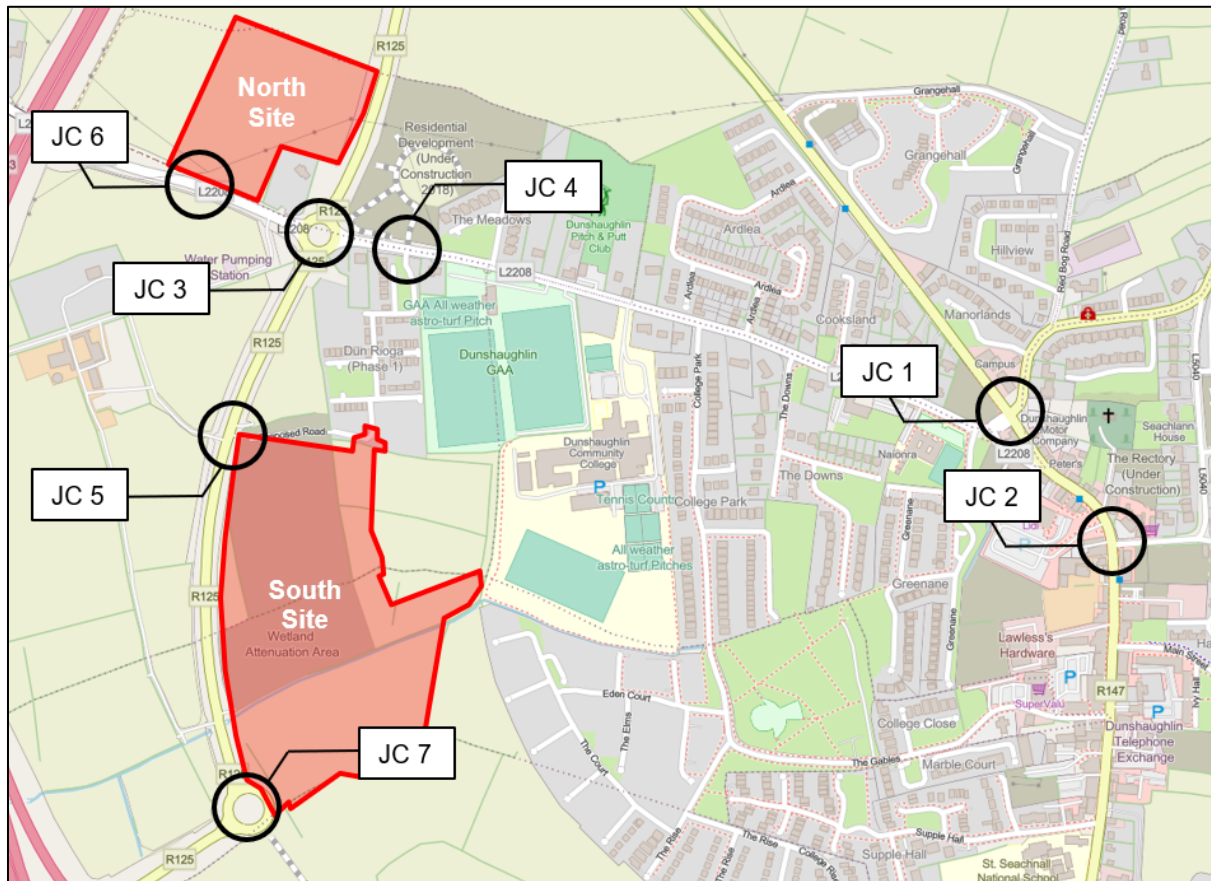


Figure 14.9: Assessed Junctions Location Map.

Junction Capacity Assessment

This section of the report provides the results of the detailed traffic capacity assessments that have been undertaken at the seven junctions previously defined. The assessments have been undertaken using the computer programmes ARCADY, PICADY and TRANSYT, which are the 'industry standard' traffic modelling software used for assessment of capacity on junction and roundabouts.

ARCADY is a software for modelling roundabouts. This programme utilises roundabout's geometry and traffic flows input by the user to determine Ratio of Flow to Capacity (RFC) and queue length for each link on the roundabout.

PICADY is a software for modelling priority-controlled junctions. This programme utilises junction's geometry and traffic flows input by the user to determine Ratio of Flow to Capacity (RFC) and queue length for each link on the junction. RFC value indicates the extent to which traffic flows on an intersection arm approach capacity. Typically, a priority intersection is said to be operating satisfactorily if all arms of the intersection operate within RFC values below 0.85.

TRANSYT (Traffic Network Study Tool) software is a widely accepted software for modelling signalled controlled junctions. This programme utilises the phases input by the user and optimises their timings over a cycle time. The outputs of a TRANSYT assessment include a Degree of Saturation percentage (DOS%) figure and queue length for each link on the road network.

Typically, a junction is said to be working satisfactorily when the Degree of Saturation (DOS) percentage figure of each link does not exceed 90%. Acceptable DOS values are considered to be in the range of 80% to 100% with higher values indicating restrained movements.

Assessment Scenarios

The performance of the junctions has been analysed for the critical AM Peak Hour and PM Peak Hour (08:00 – 09:00 and 17:00 – 18:00) for the following scenarios: -

- **DO NOTHING – 2024: -**
Approved junctions on the road network with 2020 baseline traffic flows factored up + traffic to/from under construction Phase 1 development. For this scenario only the surveyed and approved Junctions 1, 2, 3, 4 and 5 have been modelled.
- **DO NOTHING – 2029: -**
Approved junctions on the road network with 2020 baseline traffic flows factored up + traffic to/from the under-construction Phase 1 development + traffic to/from the potential Neighbourhood Centre. For this scenario only the surveyed and approved Junctions 1, 2, 3, 4 and 5 have been modelled.
- **DO NOTHING – 2039: -**
Approved junctions on the road network with 2020 baseline traffic flows factored up + traffic to/from the under-construction Phase 1 development + traffic to/from the potential Neighbourhood Centre. For this scenario only the surveyed and approved Junctions 1, 2, 3, 4 and 5 have been modelled.
- **DO SOMETHING – 2024 (Opening Year): -**
Proposed and approved junctions on the road network with 2020 baseline traffic flows factored up + traffic to/from the under-construction Phase 1 development + traffic to/from the proposed Phase 2 development. For this scenario, all junctions have been modelled.
- **DO SOMETHING – 2029 (Opening Year + 5 Years): -**
Proposed and approved junctions on the road network with 2020 baseline traffic flows factored up + traffic to/from the under-construction Phase 1 development + traffic to/from the potential Neighbourhood Centre + traffic to/from the proposed Phase 2 development. For this scenario all junctions have been modelled.
- **DO SOMETHING – 2039 (Opening Year + 15 Years): -**
Proposed and approved junctions on the road network with 2020 baseline traffic flows factored up + traffic to/from the under-construction Phase 1 development + traffic to/from the potential Neighbourhood Centre + traffic to/from the proposed Phase 2 development. For this scenario all junctions have been modelled.

Traffic Impact Assessment

Following is a summary traffic impact assessment of results for Assessment Year 2039. For a full Traffic Impact Assessment please refer to the Waterman Moylan's Traffic and Transport Assessment submitted with this planning application.

Design Year 2039

A summary of the results of the junction analysis for the Design Year 2039 Do nothing and 2039 Do something scenarios, morning and evening peak hours is shown in table below based on Option 1 of a link Road across the F1 Zoned land within the South Site. This is the preferred option, however an assessment has been carried at as Option 2 in the TIA which has considered the impact and adjustment to the above table based on the omission of the link Road across the F1 Zoned Lands.

	2039 DO NOTHING SCENARIO				2039 DO SOMETHING SCENARIO			
	AM		PM		AM		PM	
	Queue (veh)	DOS /RFC	Queue (veh)	DOS /RFC	Queue (veh)	DOS /RFC	Queue (veh)	DOS /RFC
Junction 1	20.9	89%	17.4	93%	16.4	96%	18.3	94%
Junction 2	1.4	0.59	2.1	0.68	1.5	0.61	2.3	0.70
Junction 3	0.7	0.41	0.6	0.37	0.8	0.44	0.7	0.40
Junction 4	16.2	78%	11.6	70%	17.6	85%	12.6	75%
Junction 5	0.5	0.31	0.5	0.31	0.5	0.35	0.6	0.36
Junction 6 (North Site Access)	N/A	N/A	N/A	N/A	0.2	0.15	0.2	0.10
Junction 7 (South Site Access)	N/A	N/A	N/A	N/A	0.8	0.44	0.7	0.43

Table 14.11: Junctions Capacity Analysis Design Year 2039.

The results of the assessment demonstrate that the assessed junctions 1 – 7 continues to operate below their capacity in design year 2039 with Phase 1 development + traffic to/from proposed Phase 2 development + traffic to/from potential Neighbourhood Centre. The impact of the proposed development on junctions assessed will be neutral.

Junction modelling results for the assessment years 2023, 2026 and 2031 DO NOTHING and DO SOMETHING scenarios are included in the Traffic Impact Assessment, which is appended to this document in Appendix 14.1

Further, the proposed development will have a positive impact on the pedestrian and cycle amenities in the area. As a result of the proposed development the existing pedestrian and cycle facilities will be upgraded along the L2088 road to join Phase 1 infrastructure upgrade works on Drumree Road. More, new high standard pedestrian and cycle facilities will be constructed to link future and existing neighbourhoods in the area.

14.6 Mitigation Measures (Ameliorative, Remedial or Reductive Measures)

14.6.1 Proposed Development

14.6.1.1 Construction Stage

A Construction Traffic Management Plan (CTMP) will be developed by the Contractor and presented to MCC for approval prior to commencement of the construction works. The CTMP will contain details of temporary traffic management for each construction stage.

Construction traffic will be limited to certain routes and times of day, with the aim of keeping disruption to existing traffic and residents to a minimum. To minimise disruption to the local areas, construction traffic volumes will be managed through the following measures: -

- During peak hours, ancillary, maintenance and other site vehicles movements will be discouraged.
- Use of properly designed access and egress points to minimise impact on both external traffic and amenity of residents.
- Daily construction programmes will be planned to minimise the number of disruptions to surrounding streets by staggering HGV movements to avoid site queues.
- Check on each departing vehicle at the exit from site to public road.
- Use of a banksman and/or traffic lights to control exit of construction vehicles onto public road.

- Issue of instructions and maps on how to travel to site to each sub-contractor to avoid 'lost' HGV's disrupting traffic.
- Establishment and maintenance of HGV holding areas within the site.
- Ongoing assessment of the most appropriate routes for construction traffic to and from the site.

The designated and operational on-site control measures, which will be established and maintained at this site, will include: -

- Designated hard routes through site.
- Each departing vehicle to be checked by a banksman.
- Wheel wash facility at egress point.
- Provision and facilities to cover lorry contents as deemed necessary.
- Controlled loading of excavated material to minimise risk of spillage of contents and overfilling.
- Spraying/damping down of excavated material on site by dedicated crews.
- Facility to clean local roads if mud or spillage occurs.

14.6.1.2 Operational Stage

During the operational phase, a number of measures will be adopted in order to minimise traffic impacts as follows: -

- Suitable levels of signage and pavement markings will be installed within the site in order to reduce any potential traffic hazards.
- Adequate lighting will be provided.
- Once operational, traffic signal timings will be re-examined based on observations made on site in order to ensure the most efficient operation of the junctions.

It is proposed that a Mobility Management Strategy for the proposed development will be implemented by the developers, in conjunction with MCC. This Mobility Management Strategy will take account of the provision of future cycle and pedestrian facilities, public transport services and provisions for the creation of enterprise to facilitate opportunities for employment in Dunshaughlin.

14.7 Residual Impact of the Proposed Development

14.7.1.1 Construction Stage

If the recommended remedial or reductive measures are implemented, the proposed development will not give rise to any significant residual adverse impact. Negative impacts during the construction phase will be temporary only.

14.7.1.2 Operational Stage

Provided that the mitigation measures proposed are implemented and the infrastructure upgrades proposed for Dunshaughlin are implemented when required by traffic demand, the impact of the increased traffic volumes that will be generated in the area following the construction of the development is not expected to lead to significant congestion.

14.8 Monitoring

14.8.1.1 Construction Stage

A Construction Traffic Management Plan (CTMP) will be developed by the Contractor and presented to MCC for approval prior to commencement of the construction works. The CTMP will include the monitoring requirements during the construction phase for each construction stage.

14.8.1.2 Operational Stage

Monitoring of the traffic following the completion of the development will be required. This is a standard procedure to respond to traffic demand patterns which may change over time.

No other additional monitoring is envisaged.

14.9 Reinstatement

Reinstatement is not applicable to this chapter of EIAR.

14.10 Difficulties Encountered

There were no difficulties encountered.

