13 TRAFFIC

13.1 Introduction

This Chapter of the Environmental Impact Assessment Report (EIAR) assesses the impact of the Proposed Kilternan Village LRD Development at Wayside, Kilternan Dublin 18 on the surrounding traffic and transportation network and identifies the mitigation measures where required.

The site location and project description are detailed in Chapter 2 Description of Development of this EIAR. Key elements and transport related infrastructure are summarised below.

13.1.1 Quality Assurance and Competency of Experts

This Chapter was prepared by Peter Foley, a Senior Transport Consultant with AtkinsRéalis Transport Group. Peter has over 15 years' post graduate experience in his field. He graduated from Heriot Watt University with a Masters in Urban and Regional Planning in 2007. His area of expertise includes transport planning, assessing the transport impacts of developments projects and developing transport strategies. His experienced includes all project stages from planning through to implementation. He has worked with AtkinsRéalis since 2020.

This chapter has been reviewed by Kieran Boyle, a Technical Director with AtkinsRéalis. Kieran is a Technical Director with Atkins and Head of Transport Planning for Atkins in Ireland. He has over thirty years' experience in planning, transportation and structural and civil engineering. He is a Chartered Engineer through Engineers Ireland and the UK Institution of Structural Engineers. His work incorporates both project management and the detailed consultation, assessment and design development and delivery.

13.1.1.1 The Project

This Chapter sets out the impacts of the traffic and transportation proposals associated with the development at Wayside, Kilternan and includes consideration of cumulative impacts of other key development sites in the Kilternan Environs as well as assumed background growth in traffic.

The following are relevant to note in relation to the development proposal in terms of traffic and transport:

- The site forms part of the now expired Kilternan / Glenamuck Local Area Plan (LAP). To facilitate the development of the LAP lands DLRCC proposes the delivery of the Glenamuck District Roads Scheme (GDRS) to improve the area's multi-modal transport infrastructure. The GDRS was developed in collaboration with the National Transport Authority (NTA). A Traffic Modeling Report (2013) examined the capacity of the local transport network and identified the necessary infrastructure required to facilitate the sustainable development of the all the expired LAP lands, including the Liscove Lands. Therefore, it is important to note that the transport impact of the Proposed Development has been considered and accounted for at the macro level.

- The Proposed Development is for an LRD that includes residential, retail, commercial, restaurant and community facilities. The mixed-use nature of the Proposed Development and the design of the masterplan in accordance with Design Manual for Roads and Streets (DMURS) principles will help to encourage active travel and reduce the need to drive in accordance with the "15 Minute Neighbourhood Principles".

- There are reasonably good public transport facilities available adjacent to the site, including a number of bus services with linkages to the Luas at Carrickmines (Ballyogan Wood Luas Stop). Future public transport proposals including bus priority measures associated with the delivery of the GDRS will provide journey time improvements to bus journey, further enhancing the attractiveness of this mode for future residents, visitors and users of the development.

- A masterplan has been prepared for the lands at Wayside, Kilternan in control of the Applicant. The masterplan layout has been developed to comply with the Design Manual for Urban Roads and Streets (DMURS) principles that prioritise walking and cycling and to minimise any adverse impact of private car use.

- The development provides for a number of vehicular and multi-modal access points onto the existing and proposed road network including 3 no. access points to the west onto Enniskerry Road frontage, an access to the north through Rockville and another onto the Glenamuck Road, to the east onto Glenamuck Link Distributor Road (GLDR) that forms part of the GDRS and from the western site onto the GLDR. The distribution and number of access points will facilitate a dispersal of development related traffic and as well as providing an appropriate level of permeability.

- The development of the lands takes into account external connections to adjoining lands and transport facilities ensure that permeability and desire lines are accounted for.

- There is extensive internal walking and cycling infrastructure including a mixture of fully segregated pedestrian and cycle routes through the masterplan lands.

- Car and cycle parking provisions align with Dun Laoghaire Rathdown County Development Plan (DLRCC) Development Plan (2022-2028) and/ or Sustainable Residential Development and Compact Settlement Guidelines for Planning Authorities. The levels of car parking are appropriate for the site location and the level of public transport services available so as to strike an appropriate balance between car parking provision and encouraging sustainable travel by future residents and users.

- The mixed-use development will be delivered in a phased manner with a total of 5 phases proposed.

- The development including its transport planning infrastructure has been developed in a collaborative manner between the design team in liaison with other stakeholders including DLRCC and NTA;

- The National Remote Work Strategy lays out the long-term strategy to promote home and remote working for public sector and private sector employees. The strategy mandates

that 20% of the public sector workforce move to home and remote working in 2021. Furthermore, the strategy notes that more than 25% of the private sector workers in Ireland are capable of working remotely. Therefore, in addition to the significant opportunities to travel to work by active travel and public transport modes, residents of the Proposed Development may avail of the home and remote working opportunities, including flexible working opportunities, as promoted by the National Remote Work Strategy. This change in work practice will reduce overall work trips and optimise flexible working opportunities that will enable residents to avoid travel to work and to also facilitate residents to commute to their place of employment outside of the peak traffic and travel periods.

- In overall terms, the Proposed Development will be fully consistent with the National Planning Framework objective of compact growth in a location that will optimise the residents' opportunities to travel by active travel and public transport modes, fully consistent with the overall objectives of the NTA Greater Dublin Area Transport Strategy.

The development therefore presents as an exemplar of integrated land use and transportation planning that is fully consistent with the 'Avoid – Shift -Improve Model' as set out in the Dun Laoghaire Rathdown Development Plan (2022-2028) which is based on avoiding or reducing the need to travel, shifting to more environmentally friendly modes and improving the efficiency of motorised transport modes.

In this context, and in the more general context of rapidly changing lifestyles and work patterns it is anticipated that the impact of the proposed development on the existing road network will be modest and well within the carrying capacity of existing infrastructure.

13.2 Study Methodology

13.2.1 Assessment Methodology

The methodology for this Chapter was developed using recognised national assessment guidelines[1] and is outlined in the following sections. The assessment was undertaken using desktop research, policy review, geographical information systems (GIS) mapping, site visits, traffic surveys, traffic modelling, as well as consultation with relevant stakeholders including DLRCC.

13.2.2 Defining the Study Area

The study area for the traffic and transportation assessment has been established based on the likely areas of influences of the development on various travel modes—such as walking, cycling, public transport and vehicular traffic—and on key travel destinations:

- Walking – the focus is on the provision of walking facilities both within the development and on the pedestrian network adjacent to the site including connections onto and along the Glenamuck Link Distributor Road (GLDR), Glenamuck Road and Enniskerry Road.

[1] See reference Section 13.11

- Cycling – the focus is on the provision of cycle facilities both within the development and on the road network surrounding the site including connections onto and along the Glenamuck Link Distributor Road (GLDR), Glenamuck Road and Enniskerry Road;
- Public transport – the focus is on the provision of access to public transport facilities—including services and associated bus infrastructure such as local bus stops and bus priority measures—and any potential impact that traffic could have on public transport service reliability; and
- Vehicular traffic – the focus is on the impact of traffic flows both within the development and at several key junctions and road links surrounding the site and the impact that traffic could have on network performance.

13.2.2.1 Defining Significance

The 2022 Environmental Protection Agency (EPA) guidelines included in the Guidelines on the Information to be contained in Environmental Impact Assessment Reports, identify that significance of effects.

> *"Is usually understood to mean the importance of the outcome of effects (consequences of the change). Significance is determined by a combination of (objective) scientific and subjective (social) concerns". (Section 3 page 49)*

In general, impact significance is defined using a combination of sensitivity (e.g., high, medium and low) of the environmental feature and the magnitude of impact (e.g., major, moderate, slight and negligible).

The criteria for assessing sensitivity and magnitude level have been defined in Table 13-1 and Table 13-2. The overall significance of an impact, taking the relationship between sensitivity and the magnitude level into consideration, is set out in Table 13-3.

The significance level attributed to each effect has been assessed based on the magnitude of change due to the Proposed Development and the sensitivity of the affected receiving environment to change.

13.2.2.1.1 Receptor Sensitivity (or significance)

The criteria for assessing the traffic and transport sensitivity are defined according to the matrix as set out in Table 13-1.

Table 13-1 Sensitivity and Description of Impact

Sensitivity Description of Impacts	Criteria
High	Receptors of greatest sensitivity to change such as highly congested links or junctions, which have a low capacity to accommodate change without significant effect arising.
Medium	Links and junctions which have a moderate capacity to accommodate change without significant effects arising.
Low	Links and junctions which have a high capacity to accommodate change without significant effects arising

Negligible	Receptors with low sensitivity to traffic flows, those sufficiently distant from affected links and junctions and those that are very lightly used (relative to other modes within the study area) which have a very high capacity to accommodate change without significant effects arising.

13.2.2.1.2 Magnitude of Impact

The criteria used to assess the magnitude of change are set out in Table 13-2. These criteria were used to identify the magnitude of change for quantitative assessment and were supported by professional judgement to take full account of the specific context in the study area.

Table 13-2 Magnitude of Impacts Assessment Criteria

Magnitude of Impacts	Criteria
High / Major	Changes which are perceptible and would result in significant alterations to conditions.
Medium	Changes which are perceptible and would alter conditions which otherwise prevail.
Low / Small	Changes which are perceptible but would not alter conditions which otherwise prevail.
Negligible	Changes that is unlikely to be perceptible.

13.2.2.1.3 Significance of Impact and Typical Description

The 2022 EPA guidance on information to be contained in EIAR has been used to categorise the significance of impact as shown in Table 13-3.

Table 13-3 Significance of Effect Description

Significance of Effect	Description
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration and intensity significantly alters most of a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of sensitive aspects of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.
Neutral	No effect or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.

13.2.2.1.4 Traffic and Transport Impact Matrix

The significance of effects for the traffic and transport assessment of the Proposed Development was based on the receptor sensitivity and the magnitude of impact. This is defined in Table 13-4.

Table 13-4 Traffic and Transport Significance of Effect Matrix

Heading	Existing Environmental Significance / Sensitivity			
Magnitude of Impact	High	Medium	Low	Negligible
High	Profound	Very Significant	Moderate / Slight	Not Significant
Medium	Very Significant	Moderate	Moderate / Slight	Slight / Not Significant
Low	Significant / Moderate	Moderate / Slight	Slight / Not Significant	Not Significant
Negligible	Not Significant	Not Significant	Not Significant	Imperceptible

Effects are generally considered significant (and in need of mitigation) if they are profound, very significant, significant or moderate. Slight and imperceptible effects are not considered to be significant.

Effects have been described as:

- Beneficial, neutral or adverse.
- Permanent or temporary.
- Short (< 5years), medium (5-10 years) or long term (10+ years).

Temporary effects are those associated with the demolition and construction activity, while permanent effects are those associated with the operation of the development.

13.2.2.2 Baseline Transport Review

A baseline transport review was completed via a desktop review of current planning policies and objectives, existing public transport services, the walking and cycling network and existing road infrastructure. This also included a review of relevant committed developments in the vicinity of the Proposed Development site.

13.2.2.3 Traffic Surveys

As the part of the preliminary analysis, fully classified Junction Turning Counts (JCT) traffic survey was commissioned and undertaken by National data Company (NDC) on May 24, 2023. The key junctions included are listed below and shown in Figure 13-1.

- Enniskerry Road (R117) / Glenamuck Road Junction (also known as Golden Ball Junction)

- Enniskerry Road (R117) / Ballybetagh Road (R116) Junction (for the purpose of the report this junction is referred as Circle K junction)
- Enniskerry Road (R117) / Ballycorus Road (R116) Junction (for the purpose of the report this junction is referred as Ballycorus Road junction)

Based on the survey data, the following peak hours were identified:

- AM Peak (8 to 9 am)
- PM Peak (5 to 6 pm)

These vehicle counts have been converted to Passenger Carrier Units (PCU) using following factor:

- Car = 1.0 PCU
- LGV = 1.0 PCU
- OGV1 = 1.5 PCU
- OGV2 = 2.3 PCU
- PSV = 2.0 PCU
- M/C = 0.4 PCU
- P/C = 0.2 PCU

The traffic flow data (in PCU) for the peak hours for all the three junctions are summarised in Appendix A of the Traffic and Transport Assessment (AtkinsRéalis ref: 0086174DG0032) (Appendix 13-1).

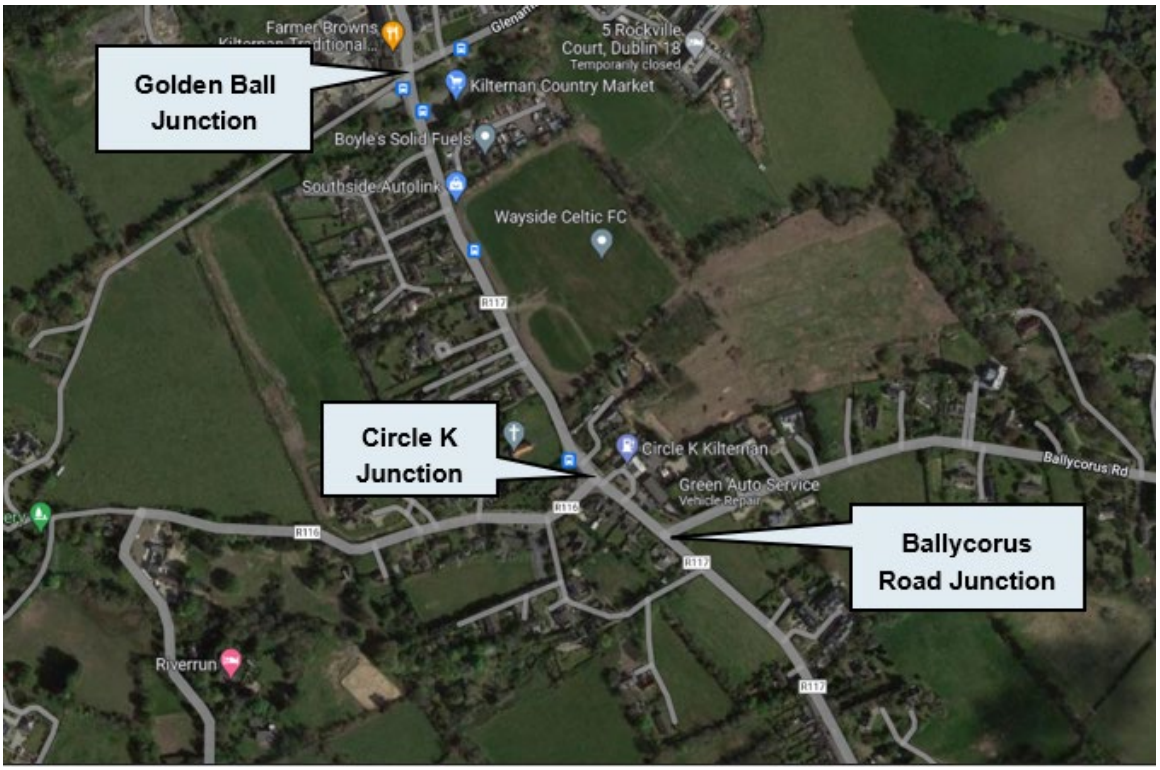


Figure 13-1 Location of key junctions for JTC Survey

13.2.2.4 AADT

The AADT figures have been calculated utilising the methodology outlined within TII PAG Unit 16.1 – Expansion Factors for Short Period Traffic Counts (PE-PAG-02039). Future traffic growth and Proposed Development traffic generation has also been taken account for the future design years.

13.2.2.5 Trip Rates and Trip Generation

The TRICS database was utilised to determine the multi-modal trip generation for the proposed mixed use residential and neighbourhood centre development for both AM and PM Peak.

13.2.2.6 Mode Share

The likely modal split was determined from the 2022 census data for areas in the vicinity using CSO data cross referenced with TRICS data.

13.2.2.7 Assessment of Road Impact

13.2.2.7.1 Construction Phase

Undertake an assessment of the potential traffic generation during the construction phase and assess the percentage traffic impact likely to occur and to identify any appropriate mitigation.

13.2.2.7.2 Operational Phase

An assessment of the impact of the development on key links and junctions was undertaken for base, opening year, opening year +5 and opening year +15 for with and without development scenarios in order to determine the future operation and any necessary mitigation measures required.

13.2.2.8 Traffic Modelling Impacts

An initial assessment was undertaken to quantify the additional traffic from the development that will be distributed onto the local road network and the potentially impacted junctions. In order to determine what level of increase is considered above threshold, reference is made to the TII Traffic and Transport Assessment Guidelines (May 2014). This document outlines the following thresholds:

- Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road; and,
- Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists, or the location is sensitive.

In the context of the urban road environment in the vicinity of the development the delivery of the GDRS will result in significant reduction in traffic on Enniskerry Road and Glenamuck Road. Therefore, junctions with a 10% increase in traffic were considered for further detailed junction assessment and modelling.

13.2.2.9 Accident Data

Due to on-going issues with data on the Road Safety Authority's web page[2] and historic nature of data available accident data was not considered.

13.2.2.10 Future Transport Infrastructure Review

This consisted of a review of current proposed future transport plans, strategies and infrastructure in the vicinity of the site in order to identify future short, medium and long terms transport proposals which may have a material impact on the travel behaviour associated with the Proposed Development.

13.2.2.11 Development Proposal Review

This review took account of the proposed development in terms of provision for access by walking, cycling, public transport and by vehicles including private car and service and emergency access.

13.3 The Existing and Receiving Environment (Baseline Situation)

The general site context and characteristics are described in Chapter 2, Description of Development, of this EIAR. The Proposed Development site is located towards the southern end of Glenamuck Road. The site is bounded to the north by the Glenamuck Road and an existing built area, to the west by the Enniskerry Road (R117) and to south by an existing residential dwelling. To the west the site is bounded by existing agricultural lands. The developable site area is approximately 14.2 hectares. The location of the site is shown in Figure 13-2.

[2] Road traffic collision data from the Road Safety Authority (rsa.ie)

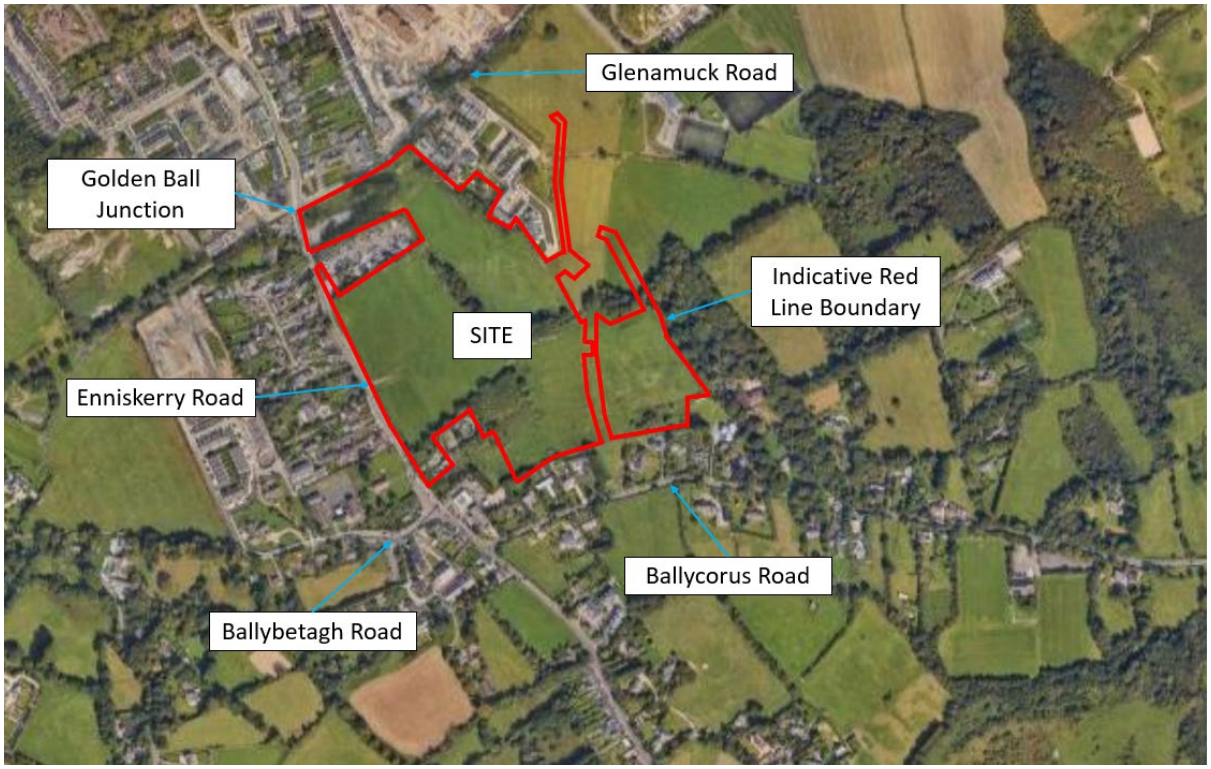


Figure 13-2: Site Location

13.3.1 Walking and Cycling Infrastructure

The existing walking and cycling infrastructure are detailed in the following sections.

13.3.1.1 Walking facilities

Footpath provision in general is adequate on surrounding roads with most offering footpaths of ample width on both sides of the carriageway. A footpath is provided on the south side of Glenamuck Road from Cromlech Close at its southwestern end to Carrickmines Manor at its northern end. Footways are provided on both sides of Glenamuck Road in the vicinity of its junction with the Enniskerry Road and from Carrickmines Manor to Ballyogan Road / Glenamuck Road North Roundabout.

Crossing facilities at the junction of Glenamuck Road and Enniskerry Road at the Golden Ball Pub are signal controlled pelican crossings. Crossings located at Glenamuck Road North Roundabout and the junction with Ballyogan Road to the north of Glenamuck Road are generally uncontrolled with dropped kerbs..

Footpaths are provided on both sides of the Enniskerry Road from its junction with the Glenamuck Road to its junction with the Ballycorus Road. An uncontrolled crossing is provided on Ballybetagh Road in vicinity of its junction with the Enniskerry Road, in addition to a signal-controlled pelican crossing on the Enniskerry Road also in close proximity. A signal-controlled pelican crossing is also provided on the Ballycorus Road as part of its junction with the Enniskerry Road.

Figure 13-3 illustrates walking times from the site radiating outwards in 5 minute isochrones that shows the range of facilities, services and amenities that are currently within easy walking distance of the site.

Figure 13-3: Walking Isochrones

13.3.1.2 Cycling Facilities

In general cycle facilities provision is provided on the road network shared with vehicles traffic (i.e. Not segregated). The existing cycling network has been assessed through the generation of cycling isochrones for a maximum cycling time of 15 minutes. Figure 13-4 illustrates cycling times from the site radiating outwards in 5 minute isochrones.

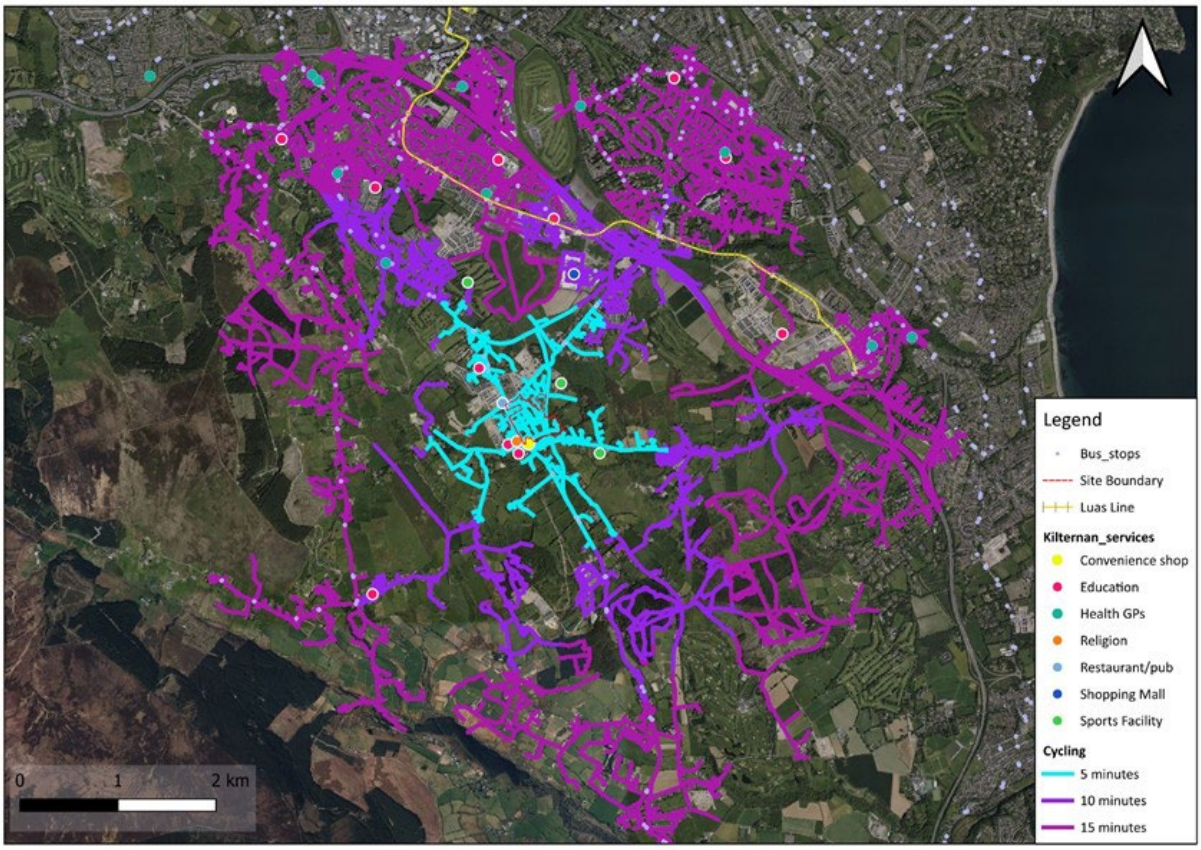


Figure 13-4: Cycling Isochrones

13.3.2 Public Transport

The following section outlines the existing public transport facilities in the vicinity of the site. Figure 13-5 shows the location of existing bus and Luas services in relation to the Proposed Development site.

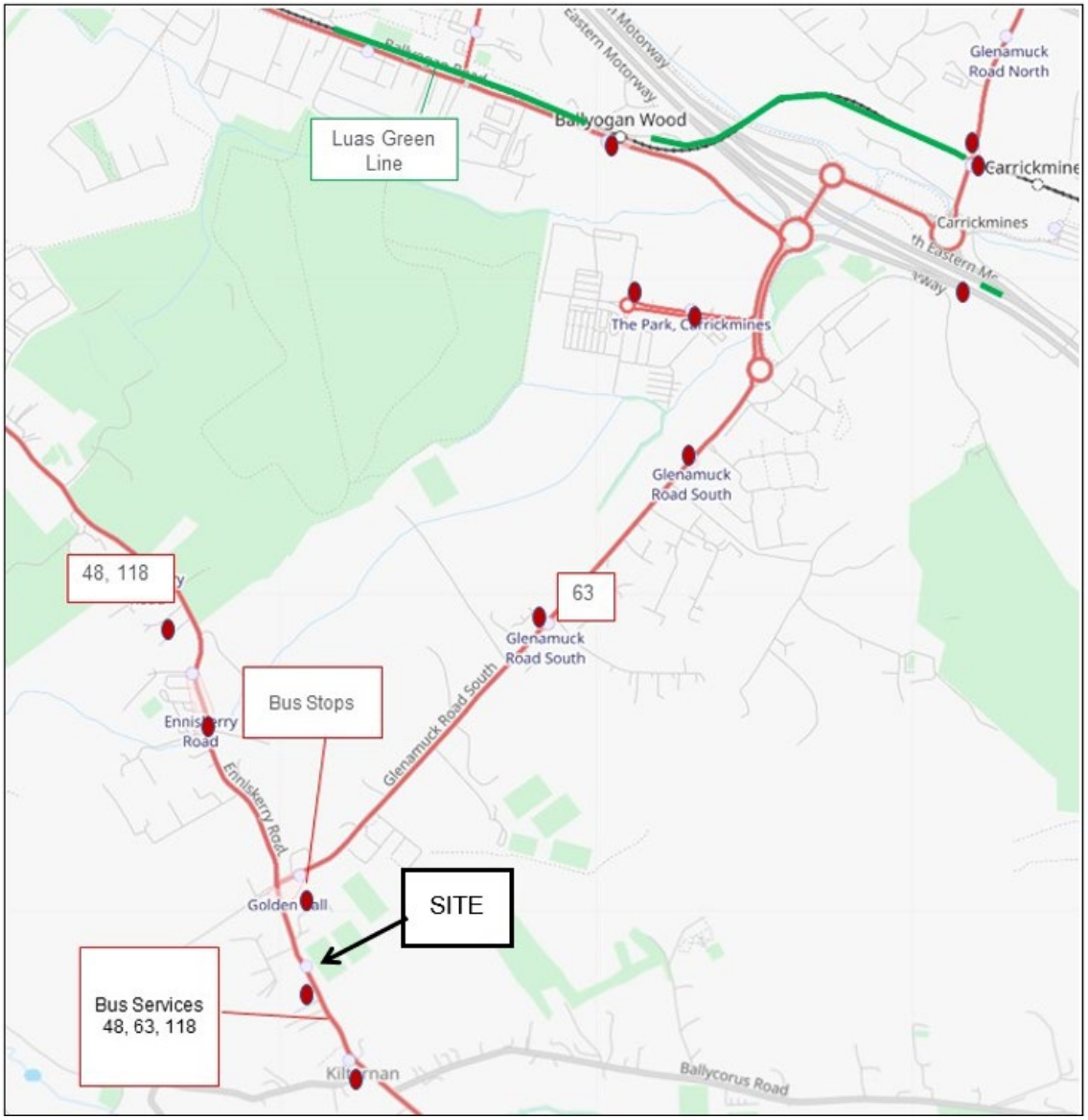


Figure 13-5 Existing Public Transport Facilities in the Vicinity of the Site

13.3.2.1 Bus Services

The following bus services, shown in Table 13-5, operate adjacent to the site and within the optimal 400m of all areas of the proposed development. Of the Proposed Development site. Table 13-5 outlines the specific operational details associated with each service.

- The 63 Dun Laoghaire to Kilternan.
- The 44 Townsend Street to Enniskerry.

- The 118 D'Olier Street to Kilternan.

Table 13-5 Existing Bus Services

Bus Stops	Route			Services Per Day		
	Number	Start	Destination	Mon-Fri	Sat	Sun
3279 (Glenamuck Road) 3284 (Kilternan Road) 3478 (Kilternan Road)	63/63A	Dun Laoghaire	Kilternan	34	34	30
		Kilternan	Dun Laoghaire	35	34	30
3284 (Kilternan Road) 3478 (Kilternan Road)	44	DCU	Enniskerry	19	16	14
		Enniskerry	DCU	18	17	15
	118	Kilternan	D'Olier Street	1	0	0
		D'Olier Street	Kilternan	0	0	0

13.3.2.2 Luas Services

The Luas green line operates from the City Centre to Carrickmines and provides a high-quality public transport linkage with key stops at Dundrum and Sandyford. The Ballyogan Wood stop is within 2km distance from the Proposed Development site. This stop is within cycling and walking distance of the site and is served by the 63 bus service. Weekday peak hour tram frequencies range from 4 to 14 minutes while Saturday and Sunday frequencies range between 6 and 27-minute intervals. The approximate number of daily services are shown in Table 13-6.

Table 13-6 Existing LUAS Services

Northbound			Southbound		
Mon-Fri	Saturday	Sunday	Mon-Fri	Saturday	Sunday
91	72	73	103	76	78

Another Luas station at Carrickmines is located adjacent to Junction 15 of the M50 and is within 2.5km of the Proposed Development and consists of a park and ride facility with capacity for over 350 cars.

13.3.3 Local Road Network

The existing local road network is described below. In the context of cycling, cyclists are facilitated on road. As the development of the LAP continues and, in particular, following the completion of construction of the planned GDRS the local roads described below will be changed fundamentally in terms of through traffic volumes and will form key local routes on which cyclists can continue to cycle on road but in the context of reduced traffic volumes and speeds. Figure 13-6 shows the location of the key local road network in the vicinity of the site.

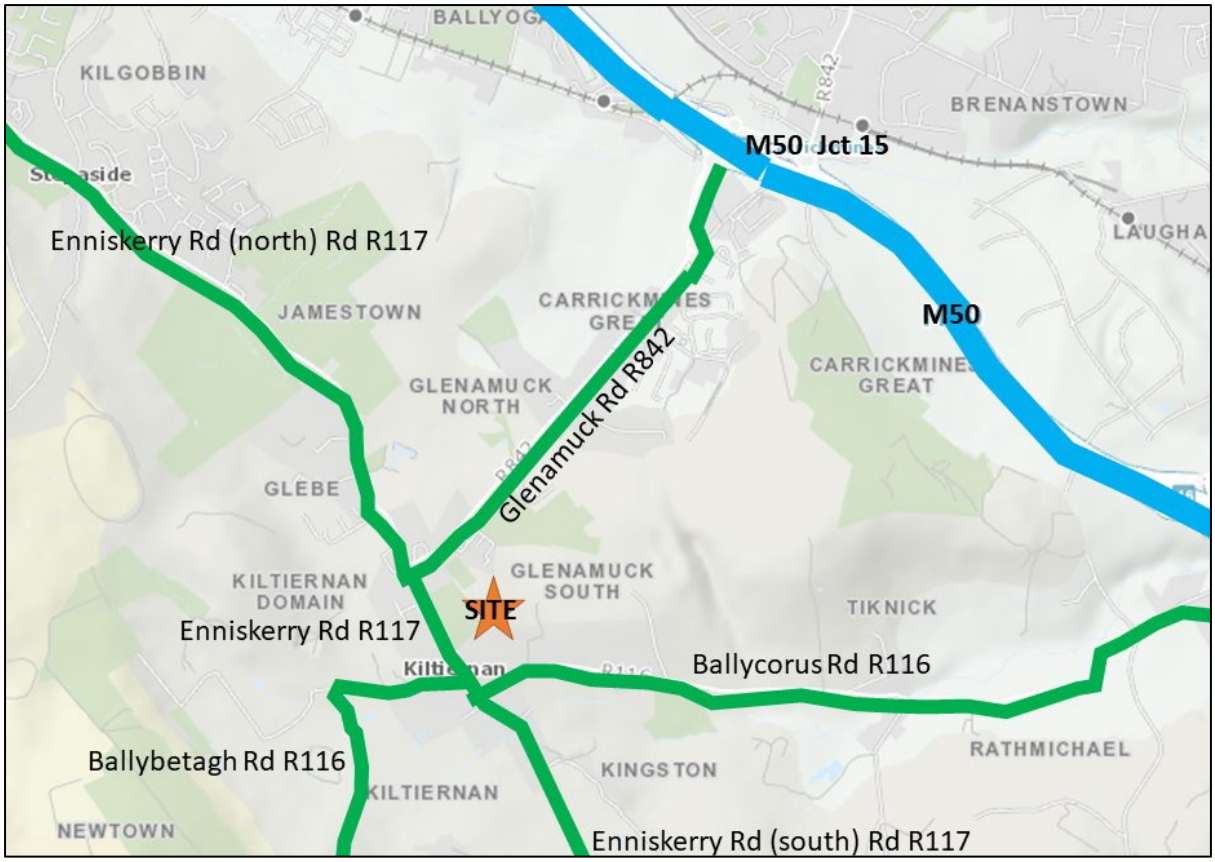


Figure 13-6 Strategic Road Network Serving the Site

13.3.3.1 Glenamuck Road (R842)

The Glenamuck Road is a classified road (R842) with two traffic lanes (one in each direction) and a 50Kmh speed limit. The road extends for approximately 2km from its intersection with the Enniskerry Road (known as the 'Golden Ball' Junction) at its southwestern extents to the southern roundabout of the Carrickmines Interchange to the northeast. The cross-section of this road varies but is predominantly 6.0m in width. There is a footpath along the southern side of the road, the width of which is varies along its length. There is no footpath along the northern side, however there is a verge of circa 1m width, but again overgrown hedges restrict this width. The development site fronts onto Glenamuck Road from the Golden Balls junction for approximately 100metres. A typical cross section of the Glenamuck Road is shown in Figure 13-7.

Figure 13-7 Glenamuck Road (source: Google Maps)

13.3.3.2 Enniskerry Road (R117)

The Enniskerry Road is a classified road (R117) with two traffic lanes (one in each direction) and a 50Kmh speed limit. The R117 extends from Enniskerry Village in the south to Stepaside Village to the north and intersects with the Glenamuck Road at the 'Golden Ball' Junction. The majority of the road is set in a rural context, with mature trees, hedgerows and stone walls located along the majority of the road. The cross section of the road varies but is predominantly 8.5 m in width in Kilternan. The development site has a long frontage onto the western side of Enniskerry road. A footpath is provided along both sides of the road. Within Kilternan there are a number of existing dwellings fronting both sides of the carriageway. A typical cross section is shown in Figure 13-8.

Figure 13-8 Enniskerry Road (source: Google Maps)

13.3.3.3 Ballycorus Road (R116)

Ballycorus Road is a classified road (R116) with two lanes (one in each direction) with a 50kph speed limit. The R116 extends from its signalised junction with the Enniskerry Road in Kilternan to Rathmichael. The majority of the road is set in a rural context with mature hedges trees etc. and a limited built-up frontage. The road has a pedestrian footpath running along its southern side. The cross section of the road varies but is predominantly 6.5 to 7m in width close to Kilternan. A typical cross section is shown in Figure 13-9.

Figure 13-9 Ballycorus Road R116 (source: Google Maps)

13.3.3.4 Ballybetagh Road (R116)

Ballybetagh Road is a classified road (R116) with two lanes (one in each direction) with a 50kph speed limit. The R116 extends from its priority junction with the Enniskerry Road in Kilternan to Glencullen. The majority of the road is set in a rural context with mature hedges trees etc. and a limited built-up frontage. The road has a pedestrian footpath on the road near Kilternan but there is no footpath once it goes beyond the built up area. The cross section of the road varies but is predominantly 5.5 to 6m in width close to Kilternan. A typical cross section is shown on Figure 13-10.

Figure 13-10: Ballybetagh Road R116 (source: Google Maps)

13.3.4 Local Road Junctions

The key junctions in the area of influence of the Proposed Development in terms of potential vehicular traffic impact are illustrated in Figure 13-11 and described in the following sections.

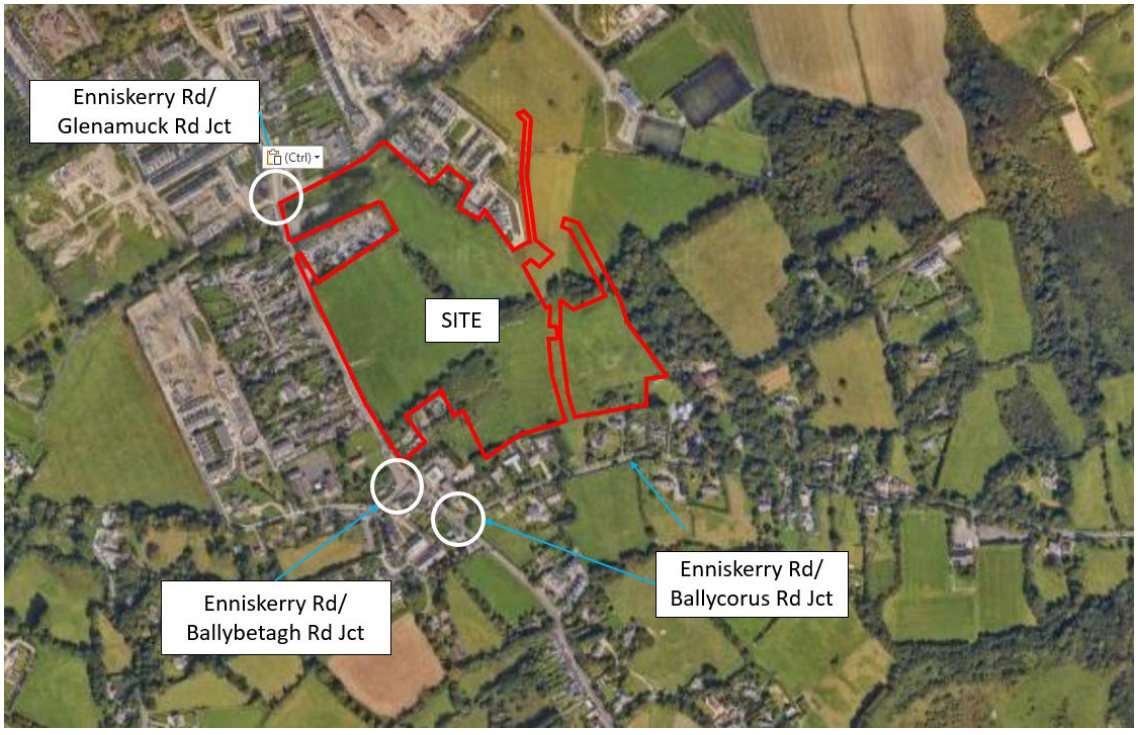


Figure 13-11: Local Road Junctions (source: Google Maps)

13.3.4.1 Enniskerry Road / Glenamuck Road Junction – Golden Ball Junction

The Enniskerry Road / Glenamuck Road Junction (also known as the Golden Ball Junction) operates under traffic signal control with one lane approaches on all arms. Pedestrian crossing facilities are provided on the Enniskerry Road southern arm and the Glenamuck Road arm.

The junction also includes an access to the Golden Ball pub carpark and future residential development. Access and egress from this junction onto the Golden Ball junction is via demand control linked to sensors in the signal junction. The existing junction configuration is shown in Figure 13-12.

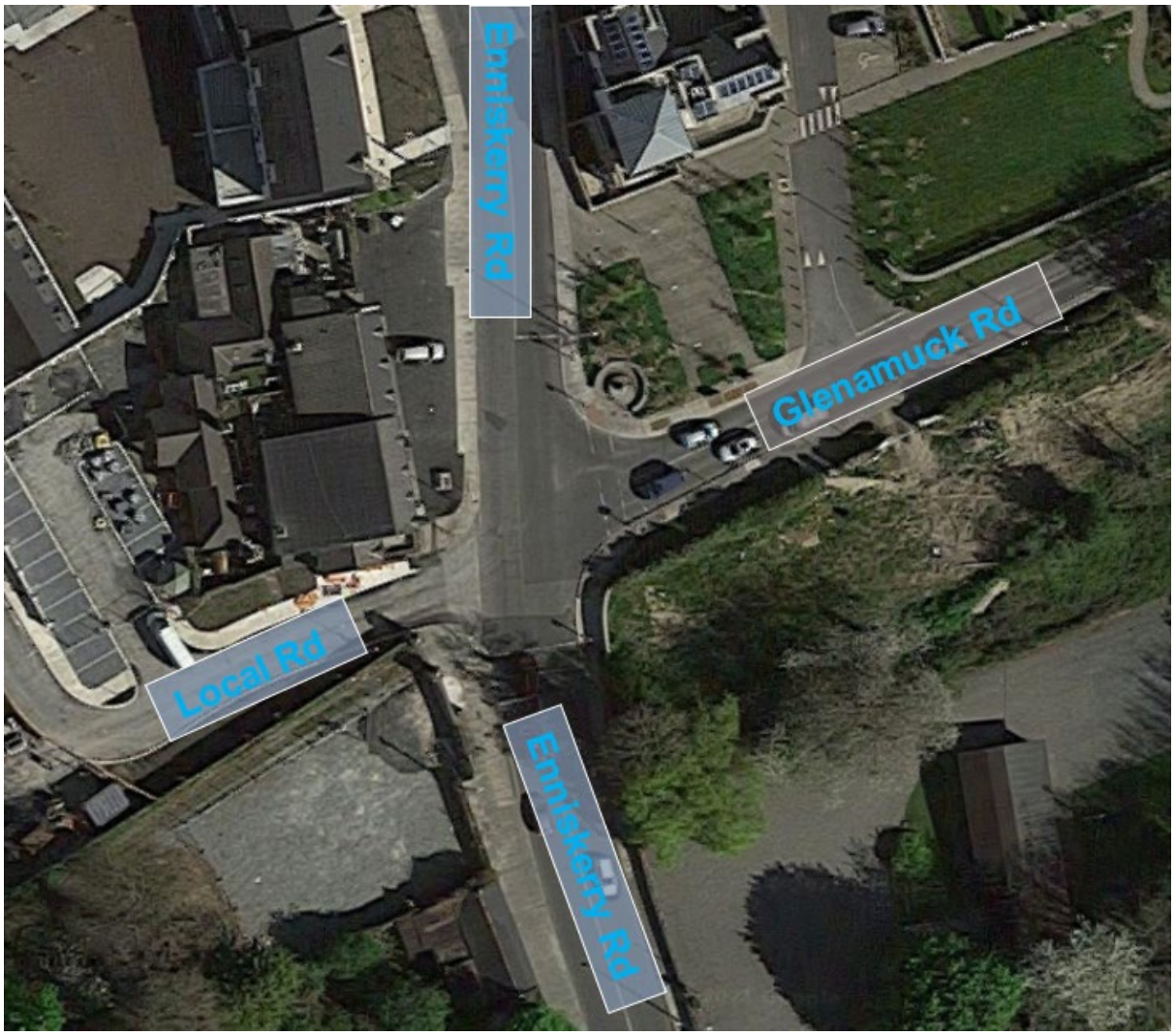


Figure 13-12: Enniskerry – Glenamuck (Golden Ball) Jct (source: Google Maps)

13.3.4.2 Enniskerry Road / Ballybetagh Road Junction

The Enniskerry Road / Ballybetagh Road junction operates as a priority junction. Traffic travelling on the Ballybetagh Road yields to traffic along the major arm of the Enniskerry Road. There are stop road markings and a stop sign in place from this approach. There is a south bound bus stop located along the Enniskerry Road situated directly opposite the Ballybetagh Road arm. A northbound bus stop is located immediately north of the junction also on the Enniskerry Road.
There is an uncontrolled pedestrian crossing located on the Ballybetagh Road arm whilst there is a signal-controlled pedestrian crossing located just south of the junction on the Enniskerry Road arm. Footpaths of nominal width are provided on all sides from all approaches. A petrol station and motor vehicle service centre are located in vicinity of the junction to the right-hand side of Enniskerry Road as one approaches from the south. These premises are served by two adjacent access points onto the Enniskerry Road. The junction is shown in Figure 13-13.

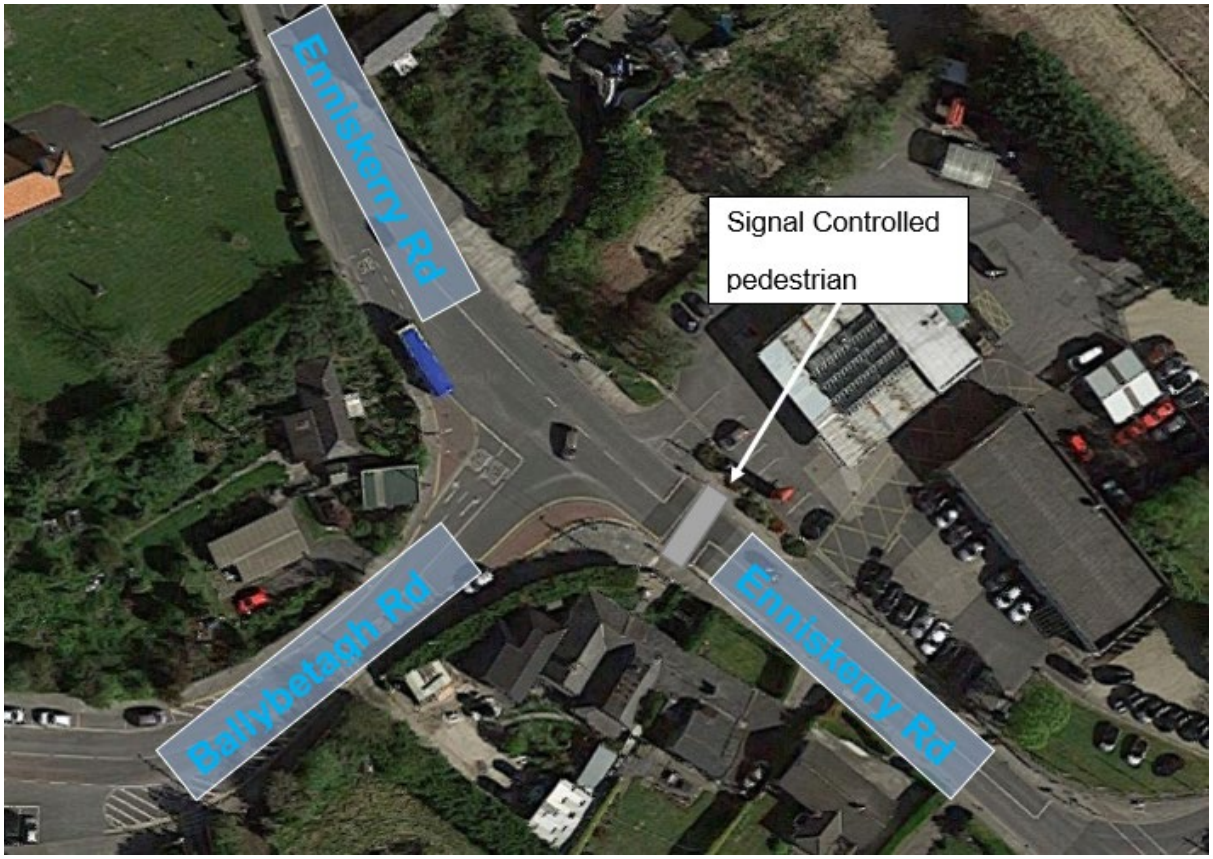


Figure 13-13: Enniskerry- Ballybetagh Jct (source: Google Maps)

13.3.4.3 Enniskerry Road / Ballycorus Road Junction

The Enniskerry Road / Ballycorus Road junction operates under the control of traffic signals. All arms are single lane approaches. A signal-controlled pedestrian crossing is located on the Ballycorus Road arm with dropped kerbs and tactile paving in place. There are no crossing facilities on either of the Enniskerry Road arms. Footpaths of nominal width are provided on all sides from all approaches. The junction is shown in Figure 13-14.

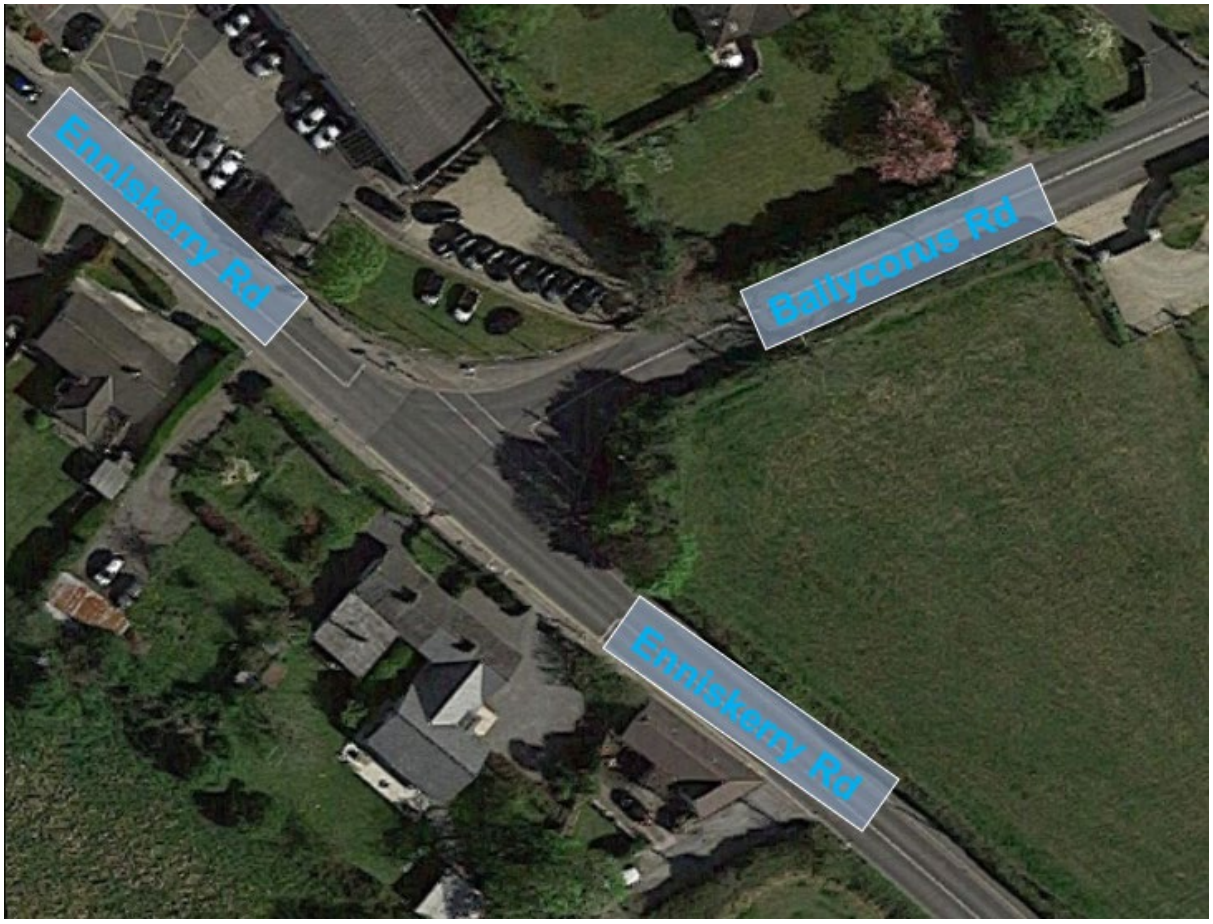


Figure 13-14: Enniskerry Ballycorus Jct (source: Google Maps)

13.3.5 Future Transport Proposals

The following sections outline planned transport infrastructure improvements that will be delivered in the vicinity of the site that will improve access opportunities for future residents and visitors to the site.

13.3.5.1 The Glenamuck District Roads Scheme (GDRS)

Dun Laoghaire Rathdown County Council submitted a planning application under section 51(2) of the Roads Act 1993 (as amended by section 9(1)I(i) of the Roads Act 2007) for the Glenamuck District Roads Scheme (GDRS) with an associated Environmental Impact Assessment Report (EIAR) to An Bord Pleanála (ABP) in 2019. The Scheme was granted permission by ABP in December 2019 (ABP Ref. ABP-303945-19).

The GDRS Is made up of the Glenamuck District Distributor Road (GDDR) and the Glenamuck Link Distributor Road (GLDR). The Glenamuck District Distributor Road (GDDR) connects from the Enniskerry Road adjacent to De La Salle Palmerstown Rugby Club to a tie in at the Glenamuck Road East/Golf Lane Roundabout. The Glenamuck Link Distributor Road (GLDR) connects from the approximate midpoint of the GDDR to the Enniskerry Road south of Kilternan and will connect the new distributor road with the existing Glenamuck Road, Ballycorus Road and Barnaslingan Lane providing an alternative to the Enniskerry Road for north-south travel. The GDRS scheme is shown in Figure 13-15.

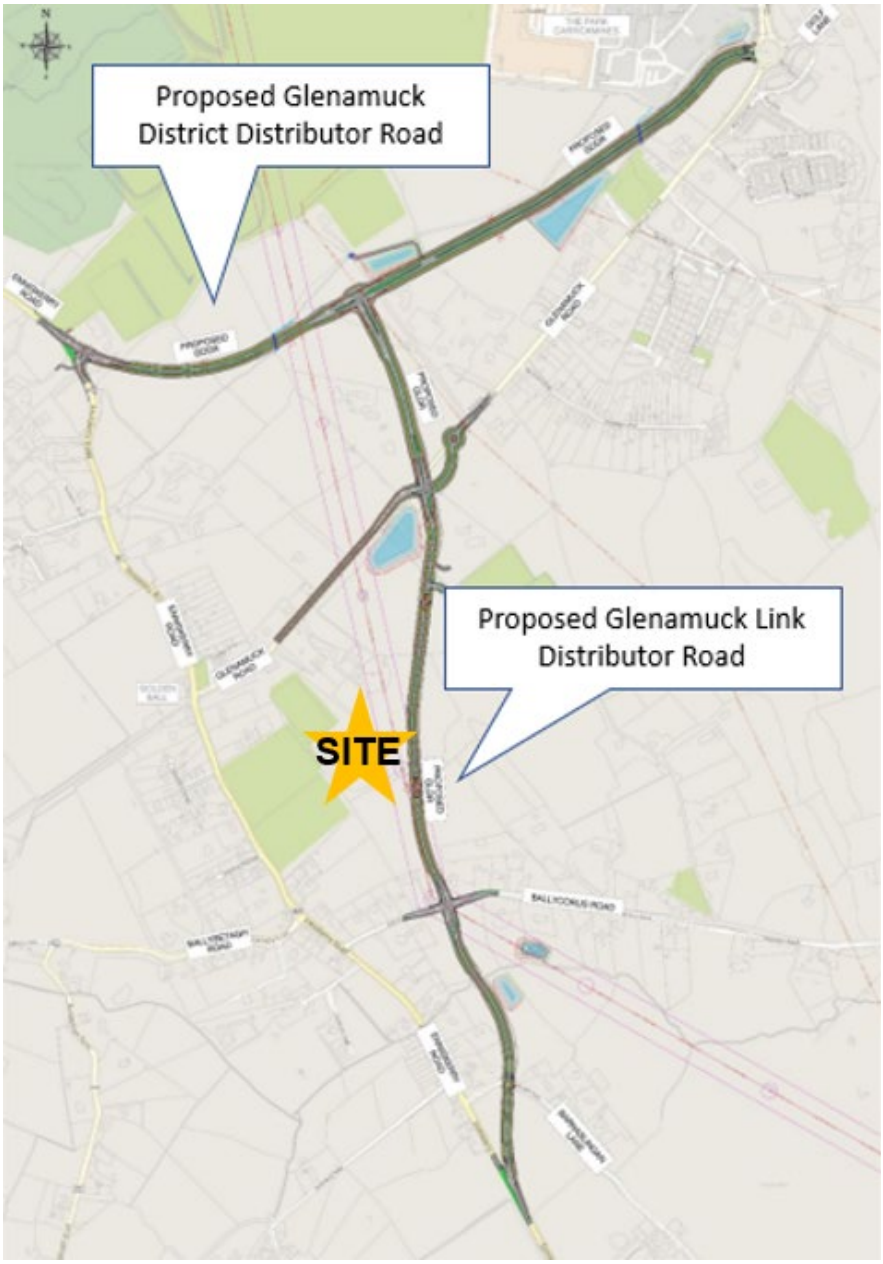


Figure 13-15: GDRS Scheme in a Wider Context

The GDRS has been designed with DMURS principles as link streets and a design speed of 50kph. The scheme provides excellent facilities for pedestrian and cyclists throughout its length with generous paths and segregated cycle facilities to encourage active travel. Junctions across the scheme have been designed in accordance with the National Cycle Manual to ensure cyclist safety is maintained across the scheme.

Bus priority measures including the provision of bus only lanes and bus gates have been incorporated to improve bus journey time reliability at both a local and larger scale as shown in Figure 13-16. The two bus gates located at the GLDR/ Enniskerry Road junction and on the eastern arm of the GLDR/ Glenamuck Road.

Figure 13-16: GD–S–- Wider Bus Priority Measures

The two bus gates located at the GLDR/ Enniskerry Road junction and on the eastern arm of the GLDR/ Glenamuck Road as shown on the left and right of Figure 13-17.

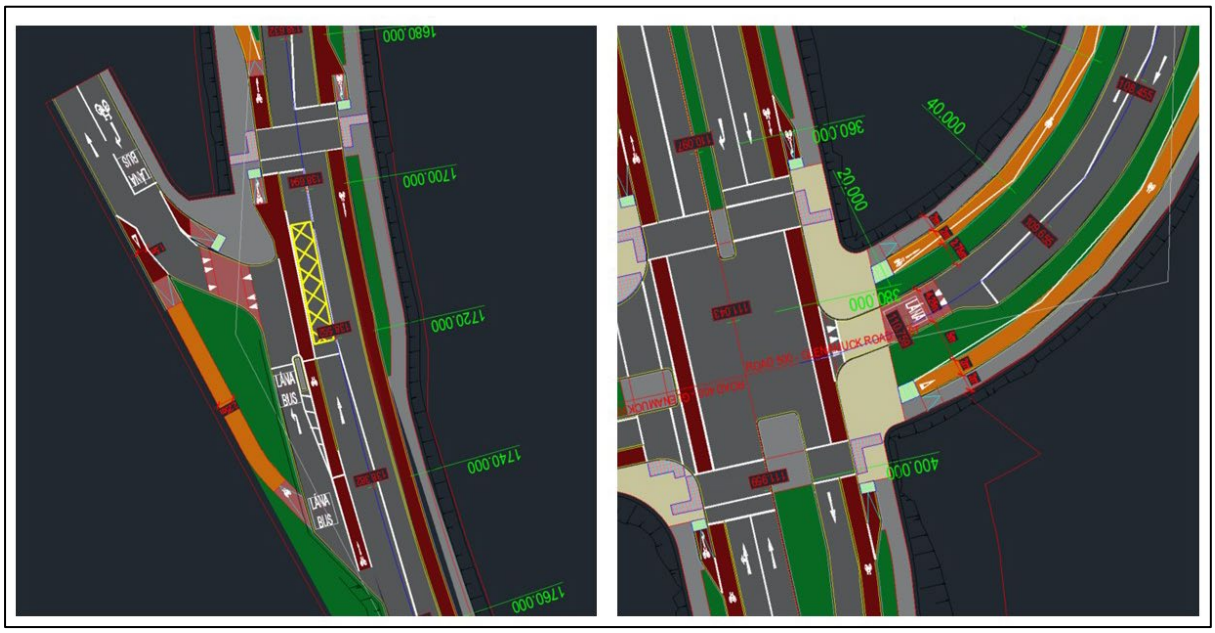


Figure 13-17: Bus Gates on the GDRS

13.3.5.2 Glenamuck Road / Enniskerry Road Junction Upgrade Scheme – Golden Ball Junction

The upgrade of the Enniskerry Road / Glenamuck Road Junction Upgrade Scheme was approved by Dún Laoghaire-Rathdown County Council under Part 8 (DLRCC R–f–- PC/IC/01/17) of the Planning and Development Regulations[3].

The approved Part 8 scheme incorporates the following:

- Glenamuck Road approach to junction: provision of left and right turning lanes.
- Enniskerry Road–- southern approach to junction – provision of new right turning lane.
- Improved pedestrian crossings incorporated within signalised junction including new crossings on the northern and western sides of Enniskerry Road.
- Cycle lanes / cycle tracks on Glenamuck Road.
- General upgrading of the junction to provide improved pedestrian and cycle facilities.
- Removal of the pinch-point on Glenamuck Road adjacent to Cromlech Close.
- Upgraded public lighting.

An extract of the approved Part 8 scheme is shown in Figure 13-18.

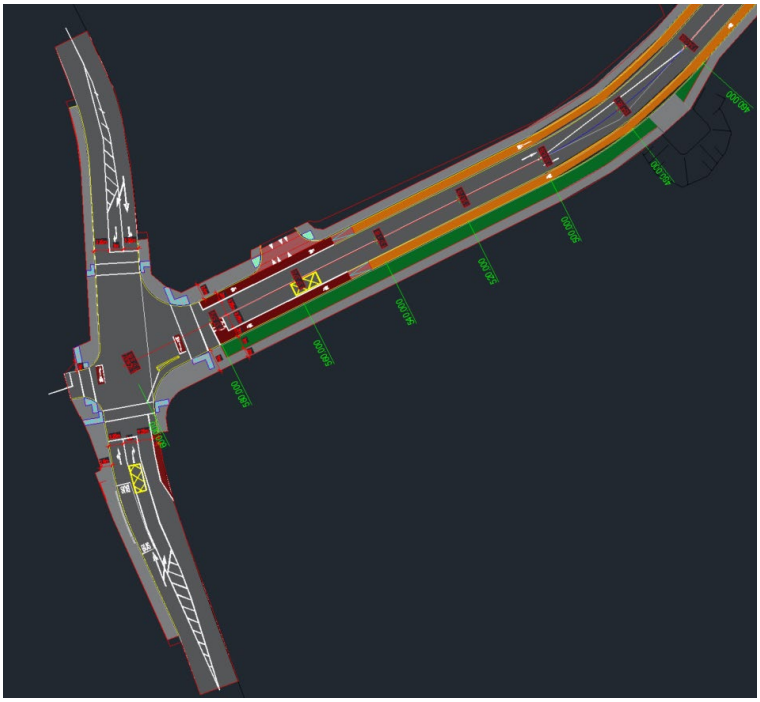


Figure 13-18: Enniskerry/ Glenamuck Part 8 Scheme

[3] https://www.pleanala.ie/anbordpleanala/media/abp/cases/orders/300/d300731.pdf

Figure 13-19 is an extract from the Kilternan Local Area Plan, illustrates the alignment of these roads and the position of the development lands.

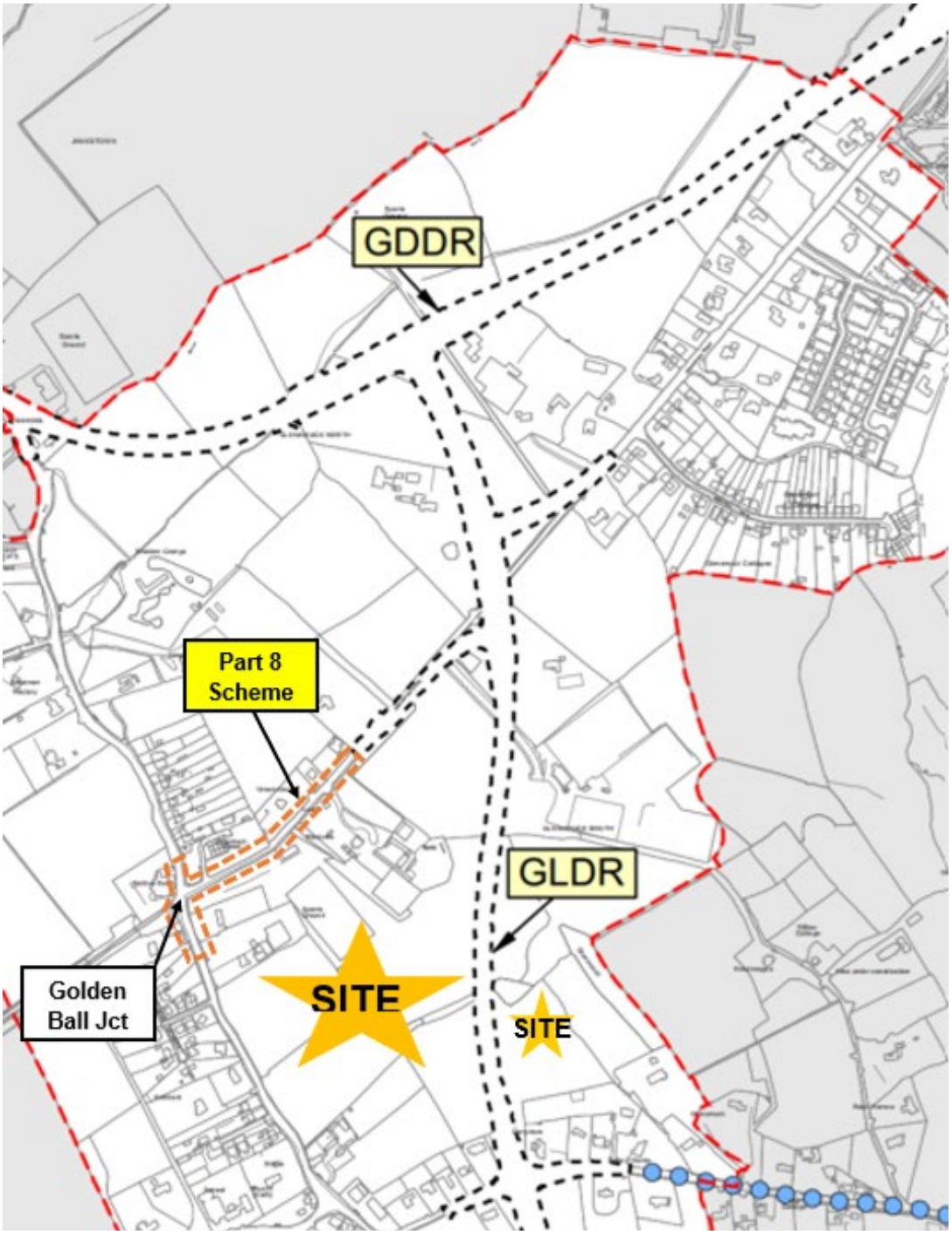


Figure 13-19: GDRS Scheme in the context of the Proposed Development

The completion of the Distributor Roads will result in a significant reduction in traffic along Enniskerry Road and Glenamuck Road. Specific proposals including bus gates on Enniskerry Road and Glenamuck Road will copper fasten this reduction in traffic which will result in these roads become more conducive to pedestrian and cycle movement. In particular the provision of footpaths and cycle tracks along the full extent of Glenamuck Road as far as the Link Distributor

Road and the upgrading of Enniskerry Road as a traffic calmed street, incorporating widened footpaths, to facilitate local pedestrian, cycle, bus and other vehicular movements will result in a significant change in the function and form of these roads and the reduction in volume and speed of traffic travelling on these roads.

The current status of the GDRS is that contractors have moved on site and works have commenced. The expected completion date for the project is Q1 2026. The DLRCC Roads design office has been made aware of the Proposed Development and can confirm the development is aligned with the GLDR road scheme.

13.3.5.3 Pedestrian and Cycle Network

Sitting within the heart of the expired LAP lands, the site will benefit from the development of the wider walking and cycling network in accordance with the relevant objectives set out in the County Development Plan and the LAP through the delivery of the GDRS as outlined previously. The GDRS will provide a very high level of service to encourage and facilitate walking and cycling. As displayed in the 2022 Greater Dublin Area Cycle Network Plan, the site is located along designated inter urban routes found on the Ballycorus Road and the Enniskerry Road. The Glenamuck Road is designated as a feeder route and the GDRS is labelled as secondary route as shown in Figure 13-20.

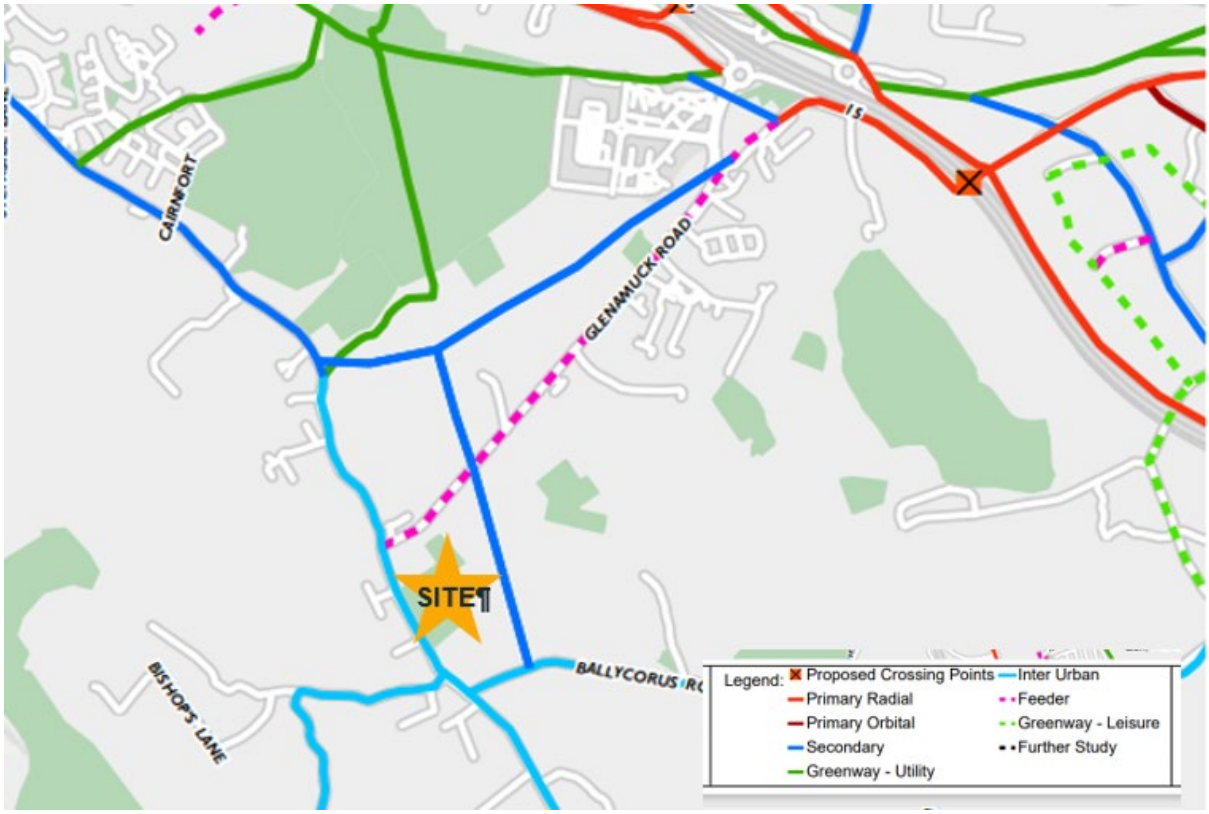


Figure 13-20: Greater Dublin Area Cycle Network

On the completion of the Glenamuck District Roads Scheme (GDRS) the proposed development site will be directly connected to these improvements and the wider footpath and cycle track improvements along the distributor roads. In overall terms therefore the site is centrally located within the LAP lands so as to be fully integrated into the comprehensive walking and cycling network that will link the development to local amenities and to the wider amenities, services and public transport provision.

13.3.5.4 Public Transport

At a regional level the National Transport Authority (NTA) the 'Transport Strategy for the Greater Dublin Area 2022– 2040 provides the overall strategy for the sustainable development of the GDA region. This strategy sets out the transport objectives for the region in terms of bus, rail, walking, cycling and roads objectives.

13.3.5.4.1 Bus Routes

The New Dublin Area Bus network was published by the NTA in September 2020 with implementation of the network commencing in 2021. Under this new network there are a number of proposed routes that pertain to the proposed development. They are listed below:

- L13: Kilternan–- Ringsend Bus garage – weekday frequency every 60 minutes
- L26: Kilternan – Blackrock – weekday frequency every 30 minutes
- P13: Kilternan – UCD – 2 trips in both AM (07:00-09:00) and PM (16:00-18:00) peak hours
- 88: Enniskerry–- Mountjoy Square–- weekday frequency every 60 minutes

The proposed local bus network under the New Dublin Area Bus network is shown in Figure 13-21.

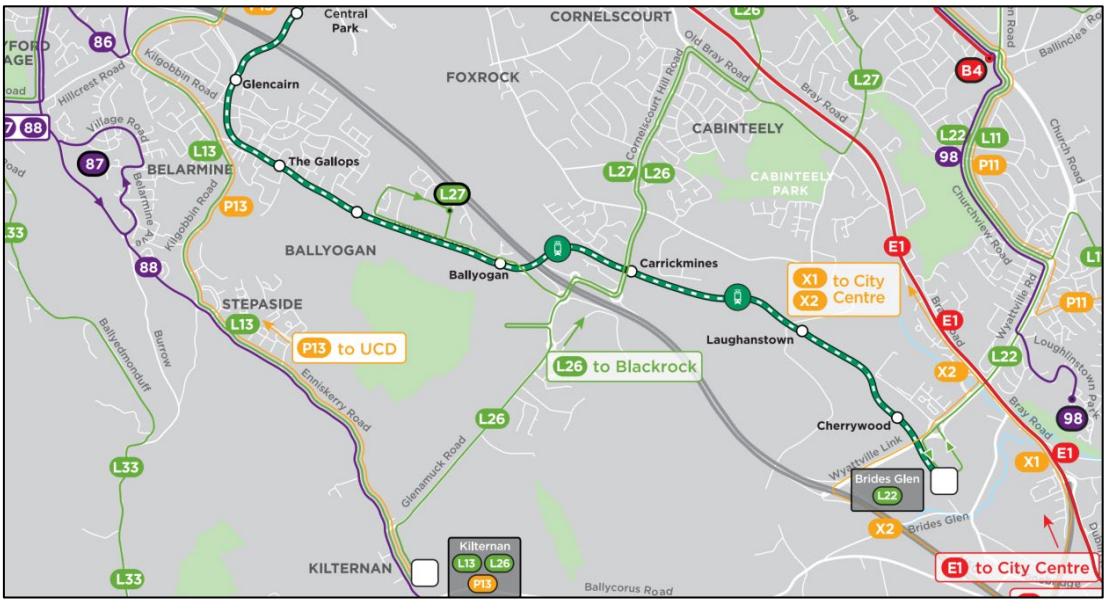


Figure 13-21: Proposed Local Bus Network under the New Greater Dublin Area Bus Network

13.3.5.4.2 LUAS and Metro

The current NTA approach for the upgrading of the existing Luas Green Line to MetroLink involves a three-stage proposal as outlined below:

- First stage: This would comprise the development of MetroLink from Swords to Charlemont without connecting to the Green Line but continuing the required tunnel boring works to allow the future connection to the existing Luas line.

- Second stage: Incremental improvements to the Green Line to increase its capacity up to 30 trams per hour (55 metres long).

- Third stage: the connection made from the MetroLink tunnel termination point onto the Green Line.

13.3.5.5 Summary of Future Transport Proposal

As set out in the above section the delivery of the above transport infrastructure in the Kilternan area will radically transform the way people move about by providing significantly enhanced active and sustainable travel opportunities that has the potential to reduce single occupancy car journey with positive implications for mode share and the environment.

13.4 Characteristics of the Proposed Development

Chapter 2 of this EIAR includes a detailed description of the Proposed Development. The development will principally consist of the provision of a mixed-use development consisting of 487 No. residential units with associated commercial, retail, restaurant and community facilities providing 6,125sqm of gross floor area.

The development will provide 3 accesses to the Enniskerry Road, 1 access to the Glenamuck road, an eastern and a western access to the proposed GLDR, and a connection to the existing Rockville development. The development provides car parking spaces and bicycle parking, bin storage and boundary treatments. The LRD is to be delivered in 5 Phases with Phase 1 commencing in 2025 and Phase 5 concluding in 2030 (depending on the date of a future grant of permission). The phasing plan can be seen in Figure 13-22.

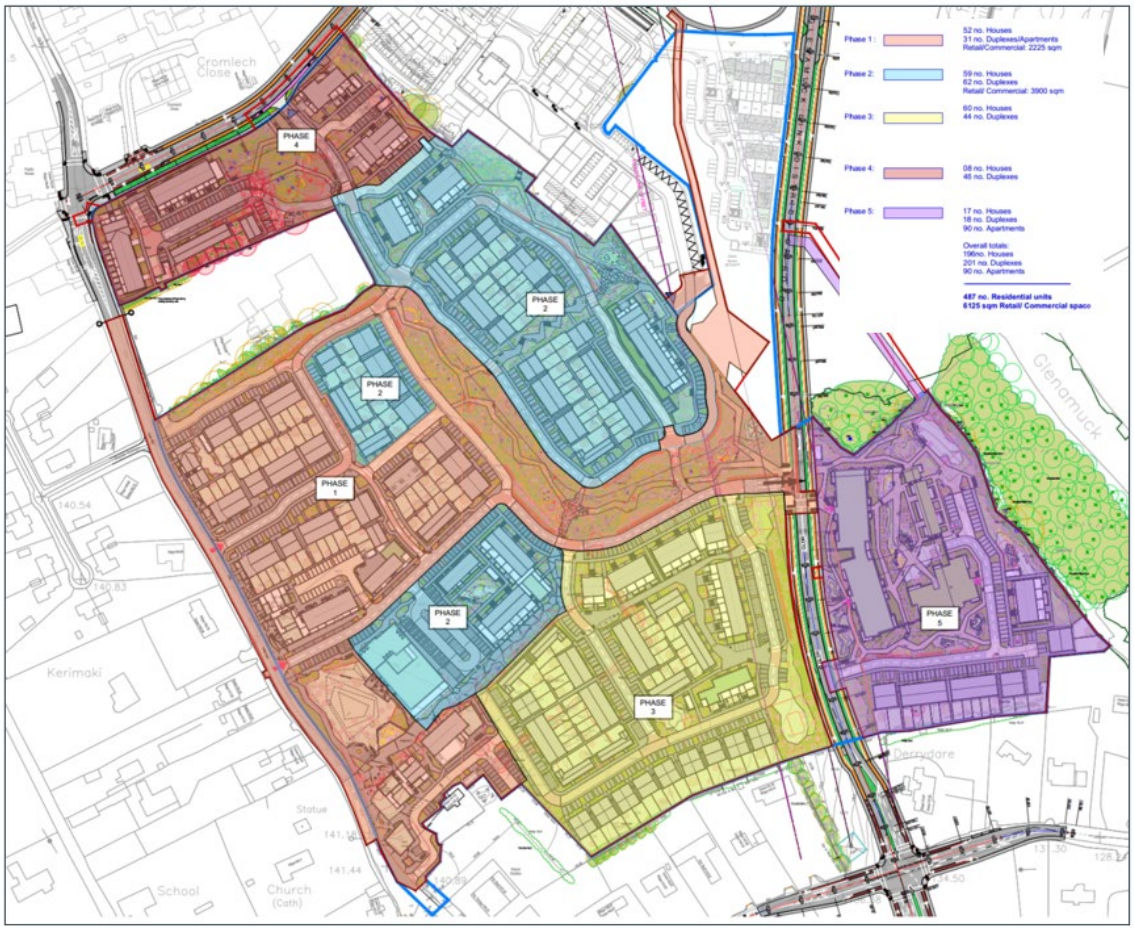


Figure 13-22: Kilternan Phasing Plan

13.4.1 DMURS

DMURS is the appropriate design guidance to be applied to urban environments such as cities, towns villages and urban developments such as residential estates. A DMURS statement is provided as part of the LRD planning application (AtkinsRéalis Ref: 0086174DG0034). The development has been designed in compliance with DMURS guidance and principles.

The street layouts have been developed to deliver a high place function wherein the streets and public spaces form part of the social fabric of the development. Achievement of this function can be greatly facilitated by developing a self-regulating street environment wherein vehicular movement function should be limited to, as much as is practicable and a desirable, a maximum design speed of 20kph-30kph. The DMURS statement shows how key elements of the development have been developed to create a safe environment that reduces vehicular impacts and encourages walking and cycling. This includes:

- Horizontal and vertical alignment to achieve a 20km–h - 30km/h design speed.
- Carriageway widths in line with DMURS requirement for street type.
- Constrained junction radii in line with DMURS requirement.
- Raised table entry treatments at access junctions.
- Provision of raised tables at internal Junctions.

The above DMURS approach together with a highly permeable network of streets will help maximise and facilitate active travel as the main mode for short to medium trips for future residents and visitors to the masterplan lands. Please refer to the DMURS Statement (AtkinsRéalis Ref: 0086174DG0034) for further details.

13.4.2 Promotion of Active Travel and 10-Minute Neighbourhood Principles

The 10 Minute Neighbourhood concept seeks to have all community facilities and services accessible within a 10-minute walk or cycle from homes or are accessible by public transport services connecting people to larger scaled settlements.

The proposed development offers to create a vibrant, interconnected community that fosters sustainability, accessibility, and well-being for all residents. The mixed-use nature of the development ensures that there is a range of facilities within easy walking distance of the entire masterplan land, provided for within the Neighbourhood Centre. The Neighbourhood Centre provides a range of services including retail, commercial and community facilities that is designed to cater for the day to day needs of residents helping to reduce trips or that those trips can be undertaken by active means. External to the site there are a range of services including a convenience shop/ petrol station, a church, an adult education centre, a pub/ restaurant and sports pitches.

13.4.3 Road Hierarchy

The entire proposed development has been holistically designed to incorporate self-regulating streets within which the design speed range of 50km/h to 20km/h. The street layout for the development essentially consists of three types of street typology, Avenues, Local Street and Home Zone Street.

- **Local Link Street**-. This is the main traffic distributor road through the development connecting Enniskerry Road to the GLDR.
- **Local Street:** These are the streets that provide access within communities and to the Link street. These streets carry low volumes of traffic than the local link street.

- **Home-zone Street:** The Home Zones are designed as shared space streets environments wherein the shared space will become central to the social fabric of the area as an informal space wherein children can play and the community can congregate, directly adjacent their residence. Landscaping extrudes into the street to create local pinch points that reinforces low speed environment and adds to the attractiveness of the street.

13.4.4 Walking and Cycling Facilities

The provision of high-quality pedestrian and cyclist facilities within the development is central to the design principles adopted in relation to the development proposals. Pedestrian linkages through and around the proposed development have been considered in the context of desire lines and onwards towards existing and proposed amenities. The masterplan layout has been developed to accommodate these desire lines and linkages. The Neighbourhood Centre has a high place function and is a nexus of cycle and pedestrian routes for the overall development.

The use of raised pedestrian table crossing points will have the benefit of providing both a convenient crossing point and a traffic calming effect. The raised table pedestrian crossing design is based on the recommendations in DMURS and the Traffic Management Guidelines. Raised pedestrian crossing are provided at junctions and along desire lines to reinforce pedestrian priority and slow vehicle speeds.

The range of facilities proposed ties into external areas providing connections to adjoining lands and walking and cycling facilities including the Dingle Way, GLDR and Glenamuck Road walking and cycling infrastructure and to the permitted Rockville development at the hammerhead. Figure 13-23 shows the range of walking and cycling infrastructure and external connections.

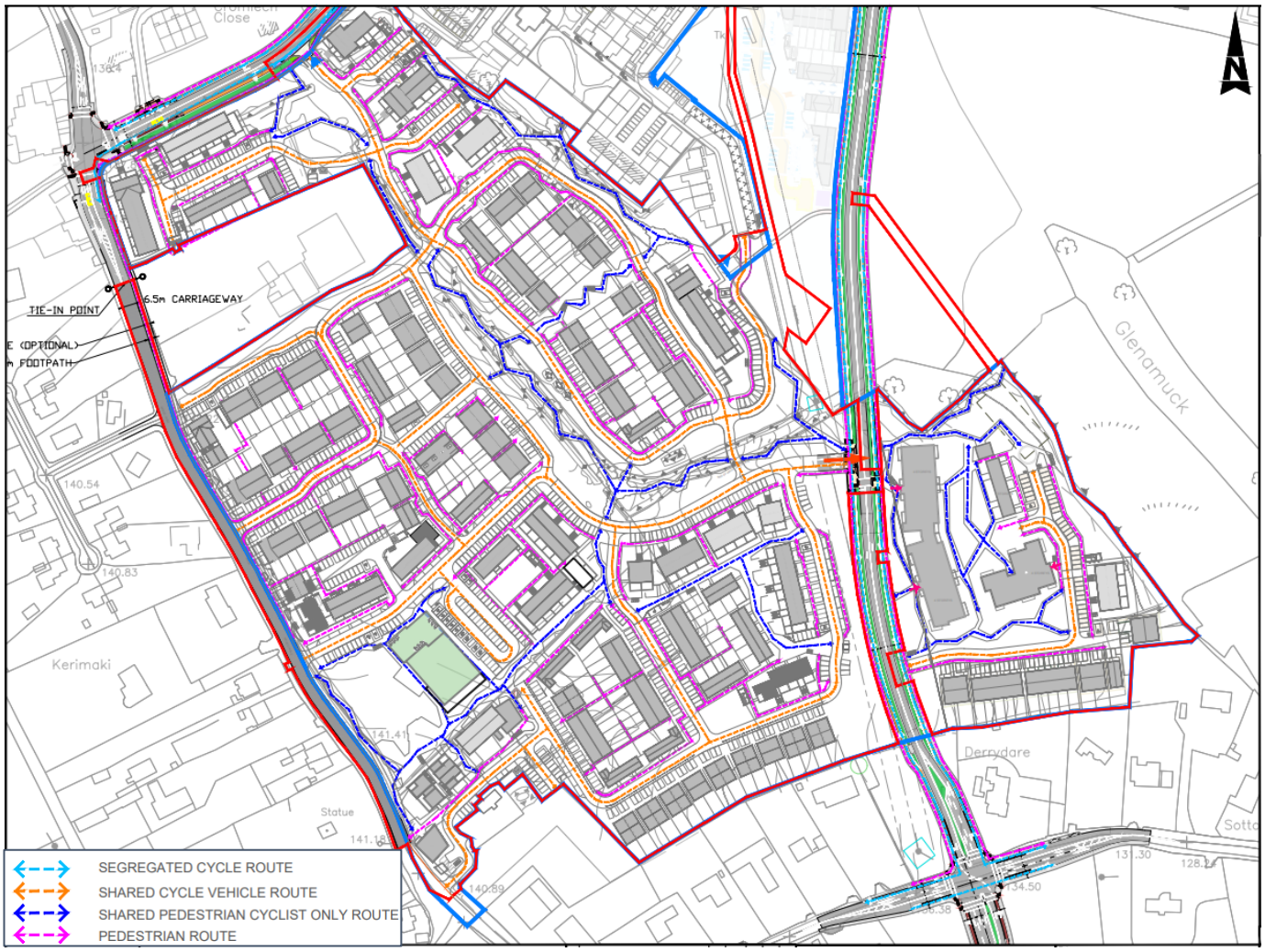


Figure 13-23: Walking and Cycling Facilities

13.4.5 Car Parking

The subject scheme proposes car parking as set out in

Table 13-7: Development Car Parking

Unit Type	Car Parking	Visitor Parking	Total
House	354	N/A	354
Apartment Blocks	129	9	138
Duplex Blocks	255	20	275
Crèche	7	N/A	7
Commercial/ Retail	71	N/A	71
Community	6	N/A	6
Café/ Restaurant	3	N/A	3
Total	825	29	854

A total of 854 car parking spaces will be provided across the development, therefore the development is compliant with the limits set by both DLRCC (933) and the Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities (974).

The above figures include:

- 28 Disabled car parking spaces
- 100 EV spaces
- 2no. car sharing spaces.
- 24 motorcycle spaces

All of these figures are compliant with DLRCC parking standards and with the Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities

13.4.6 Cycle Parking

For Residential House dwellings in-curtilage cycle parking facilities are provided. For other residential units (apartments and duplex) and non-residential uses dedicated cycle parking has been provided. The development proposes to provide a total of 841No. cycle spaces. This exceeds the minimum ratio in the DLR Cycle Standards (448No.).

Cycle parking facilities have been designed and located in accordance with the Section 6.2. Design Principles of the Cycle Design Manual published in September 2023. The five core principles for designing cycle infrastructure mentioned within the Cycle Design Manual are as follows:

1. ***Safe*** *– cycle parking should be secure for the cycle and users should feel safe from the risk of personal crime.*
2. ***Direct*** *– cycle parking should be near to the cycle route and/or as close as possible to the final destination.*
3. ***Coherent*** *– cycle parking should be well-connected to routes and buildings, well-signed and easy to find.*
4. ***Attractive*** *– cycle parking areas should be of good quality design and well-maintained; and*
5. ***Comfortable*** *– cycle parking should be easy to use and accessible to all.*

The design and location of both long stay and short stay cycle parking for the proposed developments are based on the following considerations which are also in accordance with the above stated design principles and the SPPR 4 – Cycle Parking and Storage section of the Sustainable residential Development and Compact Settlements Guidelines for Planning Authorities.

- All long stay cycle parking will be located in accessible safe, secure, well light and sheltered locations.
- Short stay cycle parking is located in highly visible areas with good passive surveillance, which are easy to access and well light and in close proximity to their destination entry points.
- Where required, end of trip facilities including shower and change facilities are provided.
- A range of cycle parking solutions are provided including Sheffield stand type facilities and stacked cycle solutions.
- The cycle parking layouts cater for oversized cycles including cargo bike and accessible bike formats.

All visitor parking spaces across the development will be Sheffield stands. Private/ long stay parking will be stacked and in some cases, double stacked. This approach of mixed cycle parking equipment's/ facilities is in accordance with Section 6.5 (Types of Equipment and Layout) of the Cycle Design Manual published in September 2023.

13.5 Potential Impact of the Proposed Development

13.5.1 Construction Phase

The traffic that would be generated during construction of the development is predicted on the basis of an outline construction programme and activity schedule for the Proposed Development as set out below.

Further details of construction activity are set out in the Construction Environmental Management Plan (CEMP) and Outline Construction Management Plan that are submitted in support of this EIAR.

The transport effects of the Proposed Development during the demolition and construction phases are considered through the following key transportation issues:

- Vehicle routing.
- Demolition and construction traffic impacts.
- Pedestrian and cycle impacts; and
- Public transport impacts.

It is assumed that all demolition and construction vehicles will remain on the strategic road network for as long as possible and that the "last mile" will be undertaken on local roads (i.e.: that all construction traffic will approach the site from the M50 corridor). During the demolition and construction of the Proposed Development there is the potential for temporary local disruption to pedestrian, cycle and vehicular traffic users because of demolition and construction traffic. The likely traffic impact of the construction works will be short-term in nature.

Once a contractor has been appointed the details set out below will be reviewed and updated to reflect contractor advise and requirements in line with best practice safety and environmental practices.

13.5.1.1 Construction Phasing and Programme

The construction of the development is anticipated to run for five years between February 2025 and January 2030 covering five phases of development.

13.5.1.2 Site Compound

A construction site compound will be established at the site and the working area fenced off to provide a secure site. Due to the scale of development and the phased approach to development this compound will move positions throughout the construction period. An indicative construction site compound strategy is shown in Figure 13-24.

The construction compound will accommodate a site office and staff welfare facilities (including a canteen, drying room, toilets and first aid) as well as storage areas for materials, waste areas and plant and machinery. All surplus plant and materials shall be stored in this location when not in use and will be secured here at night when the site is not operational.

Outside of the main construction compound locations, there may be a number of smaller local work compounds throughout the site which may be used by the Contractor for staff welfare facilities, to store materials for short term use and for plant to park overnight.

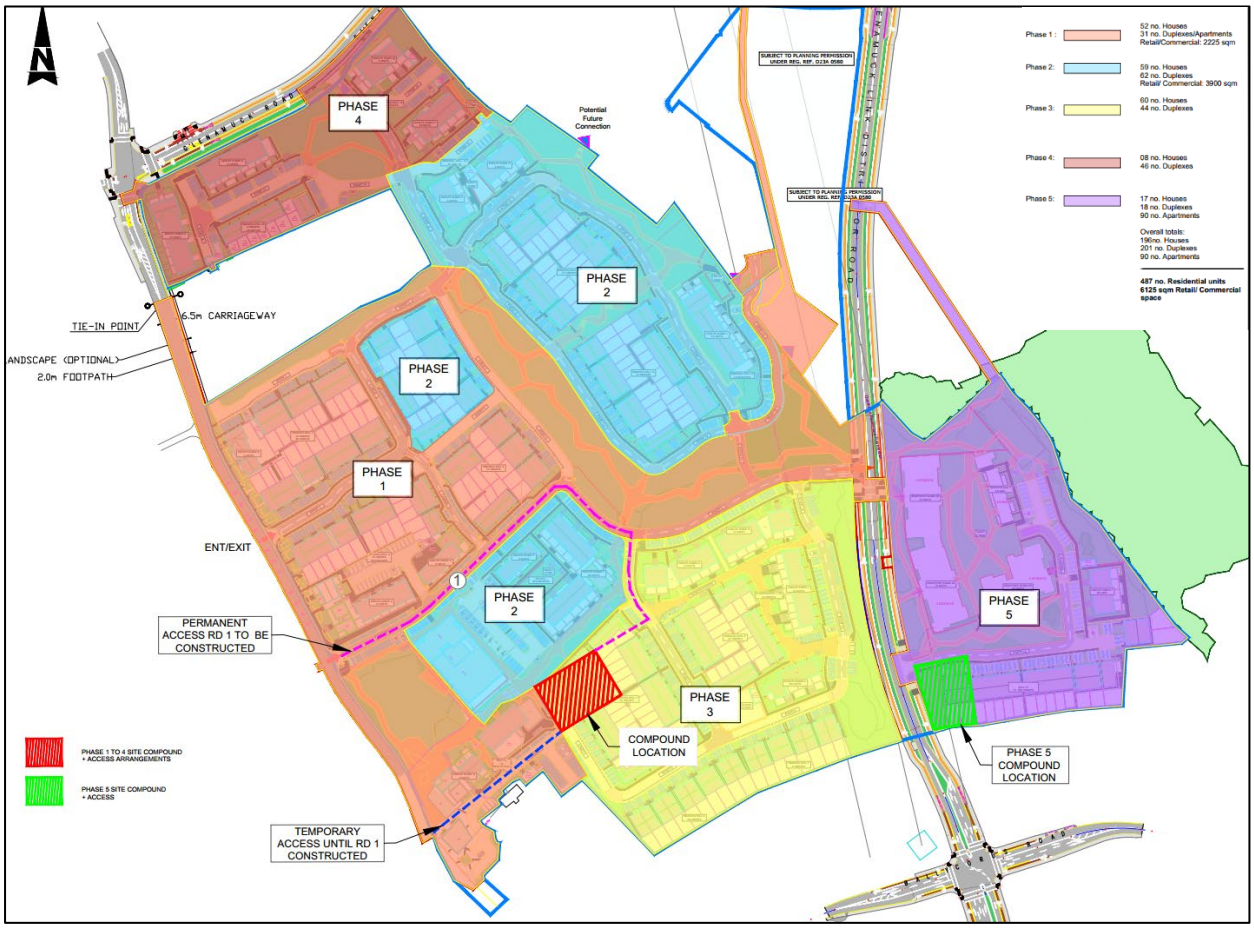


Figure 13-24: Indicative Construction Site Compound

13.5.1.3 Construction Hours

Typically, construction working hours adjacent to residential areas or sensitive noise receptors will be limited to:

- 7am - 7pm, Monday to Friday; and
- 7am - 2 pm, Saturday
- Sunday – no working
- Bank and Public Holidays – no working

There may be times when it is necessary to make certain deliveries outside these times, for example where large loads are limited to road usage outside these times. Should this occur the construction manager will contact the local authority and other relevant bodies.

13.5.1.4 Construction Haul Routes

All demolition and construction vehicles will remain on the strategic road network for as long as possible and with the “last mile” being undertaken on local roads (i.e.: that all construction traffic will approach the site from the N50 corridor). During the demolition and construction of the proposed development there is the potential for temporary local disruption to pedestrian, cycle and vehicular traffic users because of demolition and construction traffic. The likely traffic impact of the construction works will be short-term in nature. Figure 13-25 shows an outline of the construction

traffic routing plan. For phase 1 it has been assumed that the Glenamuck District Roads Scheme (GDRS) is not available and construction traffic will follow the following route:

- M50 J15 – Glenamuck Road (R842)– Enniskerry Road (R117) – Site

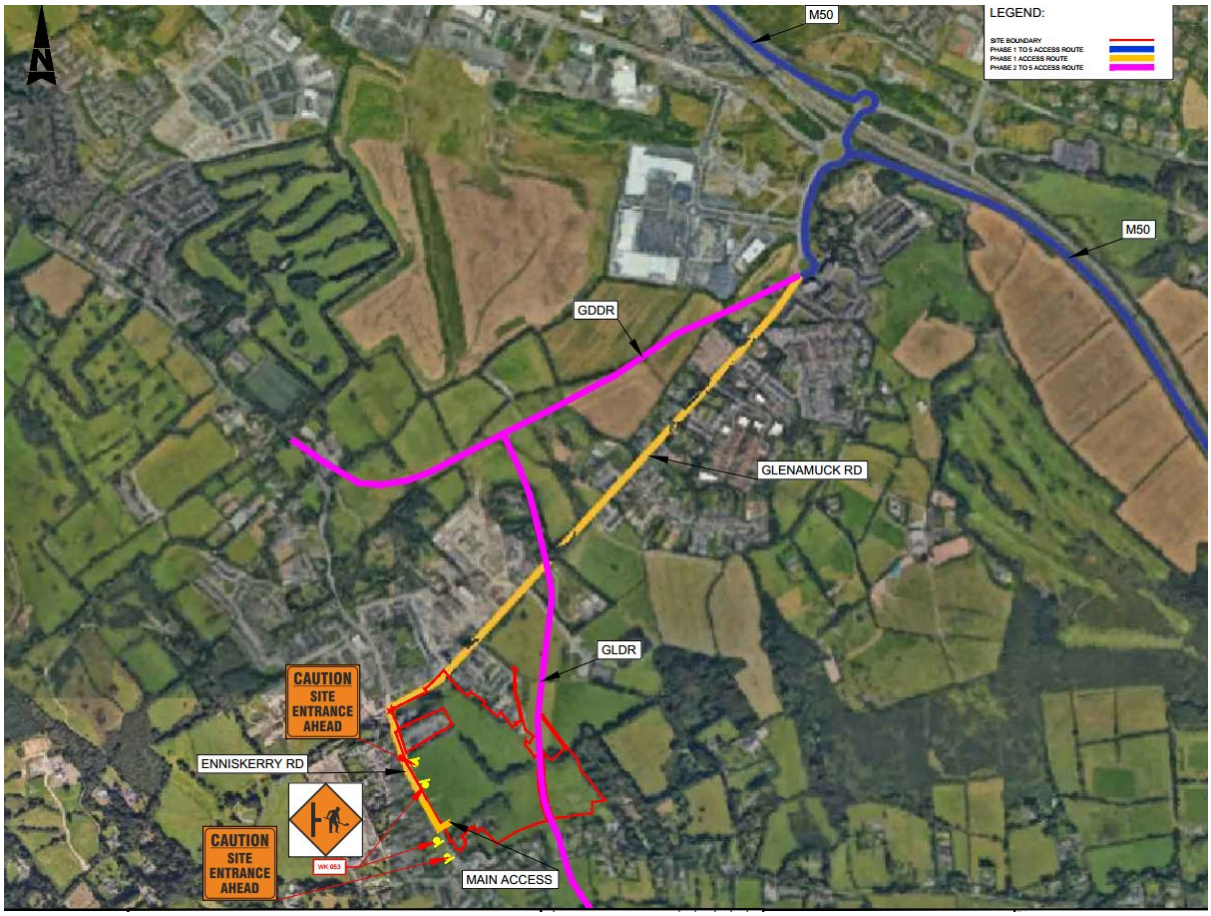
HGV's leaving the site are likely to utilise the same route in reverse.

For Phase 2 to, once the GDRS scheme is available (anticipated in Q1 2026) construction traffic will take the following route:

- M50 J50 – GDDR – GLDR – Site

HGV's leaving the site are likely to utilise the same route in reverse.

Figure 13-25: Outline Construction Traffic Routing Plan



13.5.1.5 Anticipated Construction Traffic

Material delivered by HGV in significant quantities throughout a project would include stone fill, steel reinforcement, blocks and bricks, mortar, precast concrete floors and balconies, timber and roof trusses, windows and cladding, roof tiles/slates, paving and drainage materials. Materials for general internal finishes would tend to be in smaller vehicles but some of the bulkier items would include timber, plaster slabs, kitchens and wardrobes, bathrooms and plumbing supplies. However, these vehicle movements will be spread out over the entire duration of the programme, currently anticipated at 5 years.

A total of 67,729 cubic metres of material will be required to exported off site and 77,720 cubic metres required to construct building up to finished floor level (grey slab). A breakdown of total volume by scheme and phase are shown in Table 13-8.

Table 13-8: Construction Volumes

Scheme Totals	Volumes Cubic meters	Phase	Exported	Fill
Total soil Excavation	95211	1	24,665	25,117
Topsoil	28833	2	7,923	16736
Exported soil material	66378	3	7,022	14,197
Demolition	1351	4	6,745	6,575
Total material exported	67729	5	21,374	15,095
Fill material (grey slab)	77,720	Total	67,729	77,720

Anticipated HGV movements associated with this volume have been estimated based following steps:

1. Total volumes divided by
    - Average number of construction days per month – 20 days
    - Construction time period of phase
2. This provides average volume moved per day.
3. Average truck capacity is 25 tons with soil density of 1.9kg/m3 provide a cubic capacity of 13 cubic metres per truck.
4. Assumed all trips will be two-way there both an inward and outward trip will be required.

Based on this the HGV movements per phase are set out in Table 13-9.

Table 13-9: HGV Daily Two-Way Movements Associated with Export and Import of Material.

Phase	IN	Out	Total
1	12	12	24
2	5	5	10
3	5	5	10
4	6	6	12
5	8	8	16
Total	36	36	72

Other materials delivered by HGV in significant quantities throughout a project would include stone fill, steel reinforcement, blocks and bricks, mortar, precast concrete floors and balconies, timber and roof trusses, windows and cladding, roof tiles/slates, paving and drainage materials. Materials for general internal finishes would tend to be in smaller vehicles but some of the bulkier items would include timber, plaster slabs, kitchens and wardrobes, bathrooms and plumbing supplies. However, these vehicle movements will be spread out over the entire duration of the programme (five years) with vehicle numbers not anticipated to be as numerous or as prolonged as the two scenarios outlined above. As an estimate, it is assumed that there would be circa 10 two-way vehicle movements over a typical construction day. It is anticipated that these vehicle movements would occur outside peak times of avoid delays on the road network and minimise lost time and costs.
In terms of construction personnel, it is anticipated that ca. 100 people would be employed on site during peak periods. Table 13-10 outlines these movements.

Table 13-10: Construction Personnel Movements

Number of Construction Staff	**100**
Average Car Occupancy	3
Percentage Arriving by Public Transport	10%
Daily Number of Public Transport Trips (for construction)	100
Percentage Arriving by Public Car	90%
Daily Number of Car Trips (for construction)	30
Arrival Profile	
0700-0800	80%
0800-0900	20%
Departure Profile	
1600-1700	10%
1700-1800	10%
1800-1900	80%

Looking at the Phase 1 construction period[4], The daily total construction traffic movement for Phase1, representing the largest construction traffic movements, is shown in Table 13-11.

Table 13-11: Phase 1 Construction Traffic Movements

Vehicle Type	HGV – two ways	Car – two ways	PCU
HGV	24		48
Other construction vehicles	10		20
Construction workers		60	60
Total	34	60	128

[4] representing the largest construction traffic movements

13.5.1.6 Construction Traffic Impacts

For phase1 based on the routing plan shown in Figure 13-25 key links impacts will be Glenamuck Road (east) and Enniskerry Road (south) Based on the construction traffic flows shown above, the construction traffic is shown in Table 13-12.

Table 13-12: Impact of Phase 1 Construction Traffic

Road Name	Existing AADT (2025)	With Construction Traffic PCU	% Impact
Enniskerry Road (south)	2792	2920	5%
Glenamuck Road (east)	9089	9217	1%

As shown in Table 13-12 the construction traffic impact on the Glenamuck / Enniskerry Road (Golden Ball) junction is negligible with a maximum increase of 5% of AADT experienced on Enniskerry Road.

For Phase 2 through to Phase5 the GDRS is expected to be available and as such construction traffic will utilise the GLDR to access the site. Based on that routing the impact of construction traffic on the GLDR is shown in Table 13-13. Note Phase2 and 3 run concurrently so are included as one impact.

Table 13-13: Impact of Phase 2 to 5 Construction Traffic

Road Name	Phase	Existing AADT as per construction year	With Construction Traffic PCU	% Impact
GLDR	2 & 3	12679	12879	2%
GLDR	4	12842	12946	1%
GLDR	5	13017	13129	1%

The potential traffic impact from the development is below the thresholds set out in TII's Transport Assessment Guidelines Table 2.1 Traffic Management Guidelines Thresholds for Transport Assessments that states that assessment is required if:

- Traffic to and from the development exceeds 10 percent of the traffic flow on the adjoining road; and
- Traffic to and from the development exceeds 5 percent of the traffic flow on the adjoining road where congestion exists of the location is sensitive.

Based on this threshold the construction impacts on the local road network are considered to be negligible.

13.5.2 Operational Phase

This section outlines the transport and traffic impact from the Proposed Development on the transport network within the study area as defined in Section 13.2.2.

13.5.2.1 Background Traffic Growth

To ensure a robust analysis of the impact of traffic upon the local road network we have adopted growth rates using the Transport Infrastructure Ireland (TII) "Travel Demand Projections". Table 9.1 within the TII Project Appraisal Guidelines Units 5.3 – Travel Demand Projections (October 2021) provides Link-Based Annual Traffic Growth Factors for the Alternative Future Demand Sensitivity Scenario for the different metropolitan areas within Ireland. The proposed development site lies within the Dublin Metropolitan area with the growth factors as outlined within Table 13-14.

Table 13-14: Link Based Growth Rates: Dublin Metropolitan Area: Alternative Demand Scenario

Dublin Metropolitan Area	2016-2030		2030-2040		2040-2050	
	LV	HV	LV	HV	LV	HV
Alternate Future Demand Sensitivity Scenario	1.0136	1.0295	1.0051	1.0136	1.0044	1.0162

The alternative future demand sensitivity scenario was applied to take into consideration the potential mode shifts to active travel, Work from Home or a Hybrid Option as the new normal.

Applying the growth factors to the adopted design year scenarios the following growth rates have been established for the baseline network flows as outlined in Table 13-15.

Table 13-15: Growth factors for design years

Dublin Metropolitan Area	2016-2030		2030-2040		2040-2050	
	LV	HV	LV	HV	LV	HV
Combined Factors	1.041	1.091	1.105	1.242	1.161	1.426

13.5.2.2 Modelled Scenarios

The model was run for following scenarios for both AM and PM peak:

- Opening Year (2026) – Background Growth + Committed Development with GDRS
- Opening Year (2031) – Background Growth + All Development with GDRS
- Opening Year+5 (2031) – Background Growth + Committed Development with GDRS
- Opening Year+5 (2031) – Background Growth + All Development with GDRS
- Opening Year+15 (2041) – Background Growth + Committed Development with GDRS

- Opening Year+15 (2041) – Background Growth + All Development with GDRS

The committed development scenarios include the developments that have been granted planning permission in the vicinity of the proposed development that will result in additional traffic at key junctions. The All Development scenarios consist of the traffic associated with the proposed mixed-use development and trips associated with the committed development. It is important to note that as stated in Section 9 of the Environment & Modelling Report accompanying the GDRS Part 8 Scheme the impact of the full build out of the Glenamuck / Enniskerry LAP on the surrounding and strategic road network was modelled. The Part 8 Scheme modelling report accounted for some 1050 units within the LAP lands. This includes the Kilternan Village LRD lands quantum of development. The provision of the GDRS road network will therefore provide sufficient capacity on the road network for all the LAP lands including this proposed development. It is anticipated that the GDRS scheme will be delivered and operational for all the design year scenarios. The details about the developments (committed and proposed development) are summarised in the following sections.

13.5.2.3 Proposed Mixed Use Development at Kilternan

The mixed-use development consists of 5 phases. By the opening year scenarios, Phase 1 developments are supposed to be developed. By other design year scenarios (Opening+5 and Opening+15), all the Phase 1 to 5 developments are supposed to be developed. The schedule of accommodation for the development can be found in Table 13-16.

Table 13-16: Schedule of Accommodation for Mixed Use Development

Phase	Developments	Units/Area
Opening Year (2026)		
Phase 1	Apartments	0 Units
	Duplexes	31 Units
	Houses	52 Units
	Retail (Convenience)	693 sqm.
	Restaurant & Café	509 sqm.
	Creche	691 sqm.
	Community Centre	332 sqm.
Opening Year + 5 (2031) and Opening Year + 15 (2041)		
Phase 1 to 5	Apartments	90 Units
	Duplexes	201 Units

	Houses	196 Units
	Retail (Convenience)	1310 sqm.
	Commercial/ Retail	3284 sqm.
	Creche	691 sqm.
	Restaurant & Café	509 sqm.
	Community Centre	332 sqm.

13.5.2.4 Committed Development

Committed developments are the additional developments that have been granted planning permission in the vicinity of the proposed development that will result in additional traffic at key junctions along the Enniskerry Road. These developments are summarised in the Figure 8-1 below with their planning references and detailed below.

- **Site 1: ABP30984621** – It consists of 203-unit residential development and a 380m^2 neighbourhood focussed creche at Enniskerry Road, Kilternan, Co. Dublin.

- **Site 2: ABP30616019** – It consists of residential development of 197 residential units comprising 62 no. housing units and 135 no. apartment units.

- **Site 2: ABP30397819** – It consists of residential development of 203 residential units comprising 30 no. housing units and 173 no. apartment units.

- **Site 3: D18A/1133** – It consists of Mixed-Use Development including 61 no. residential units comprising 20 housing units and 41 no. apartment / duplex units including the partial demolition & reconfiguration of the existing Golden Tavern Public House to include 292.7sqm public house and 304sqm of office use. An extension of duration for permission has also been granted for this mixed-use development in November 2021 under planning application reference no. **D16A/0090/E.**

- **Site 4: D19A/0242** – It consists of Residential Development of 51 residential units comprising 39 no. housing units and 12 no. apartment units.

- **Site 4: D23A/0580** – This application is an amendment to the permitted Phase 2B residential development as granted permission under DLR Reg. Ref. D20A/0015, ABP-306999-20. It Consists of Residential Development of 28 residential units comprising 12 no. houses and 16 no. duplexes.

- **Site 5: ABP30704320** – It Consists of Residential Development of 116 residential units comprising 85 no. houses and 31 no. apartments. A modification under planning application ref no. LRD23A/0358 was granted in July 2023. As per the amendments the development will consist of 114 residential units comprising of 88 no. houses and 26 no. apartments.

- **Site 6: ABP31221421** – It consists of construction of 203 residential units (comprising 30 houses and 173 apartments, the provision of a creche/childcare facility, the provision of a retail unit, and the provision of a social/amenity facility).

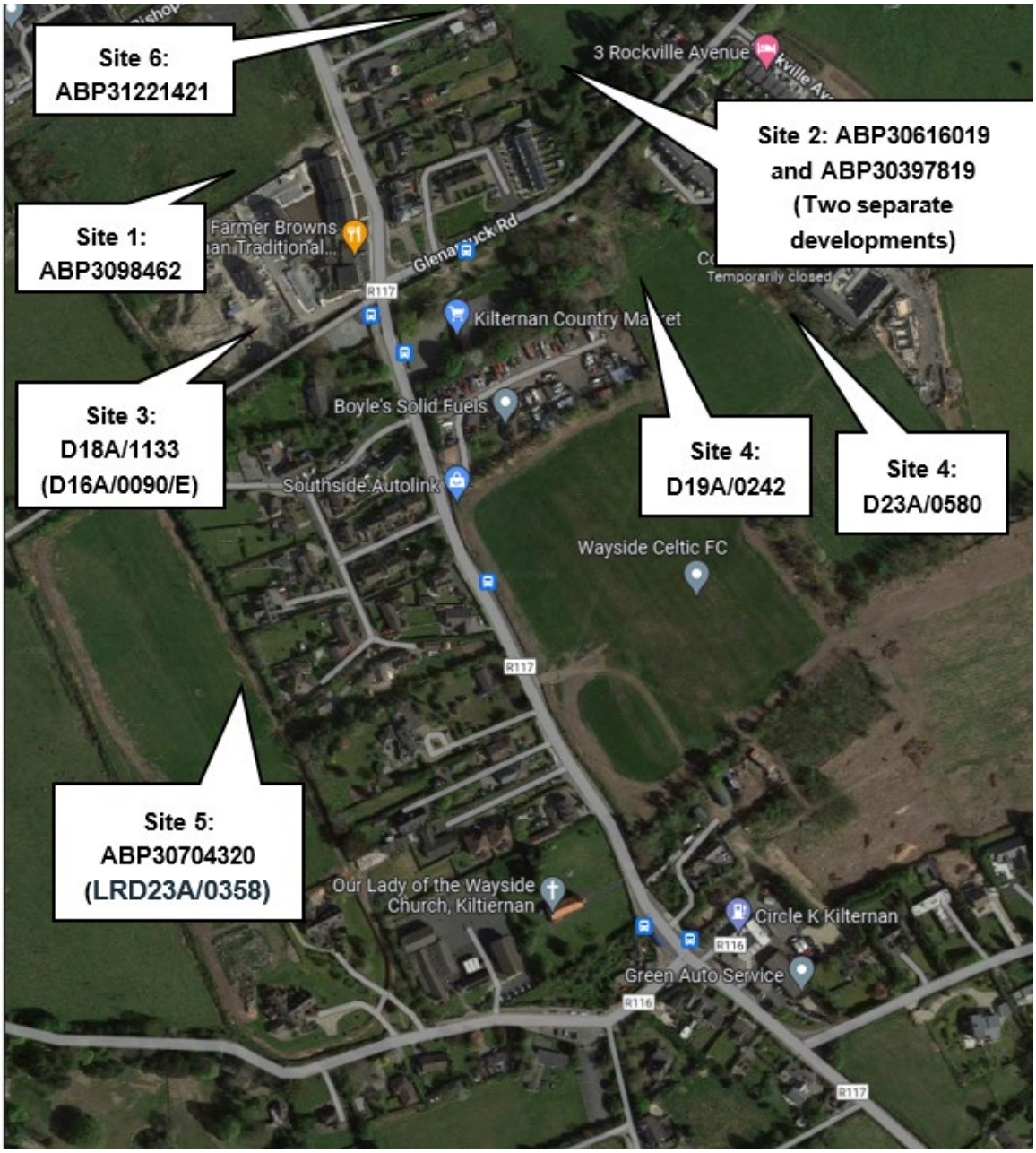


Figure 13-26: Location of Committed Developments Considered

13.5.2.5 Mode Share

The travel trends in the vicinity of the proposed development were examined using the Central Statistics Office's SAPMAP (Small Areas Population Map) data. The mode share for the proposed development site was derived from the 2022 Census 'Small Areas' data. The 'Small Areas' adjacent to the site were reviewed and combined to determine an appropriate mode share. These SA's were chosen based on the characteristics which is similar to the proposed development site as outlined below:

- Proximity to the site.
- Proximity to public transport.

- Parking characteristics.

The 'Small Areas' utilised are illustrated in Figure 13-27.

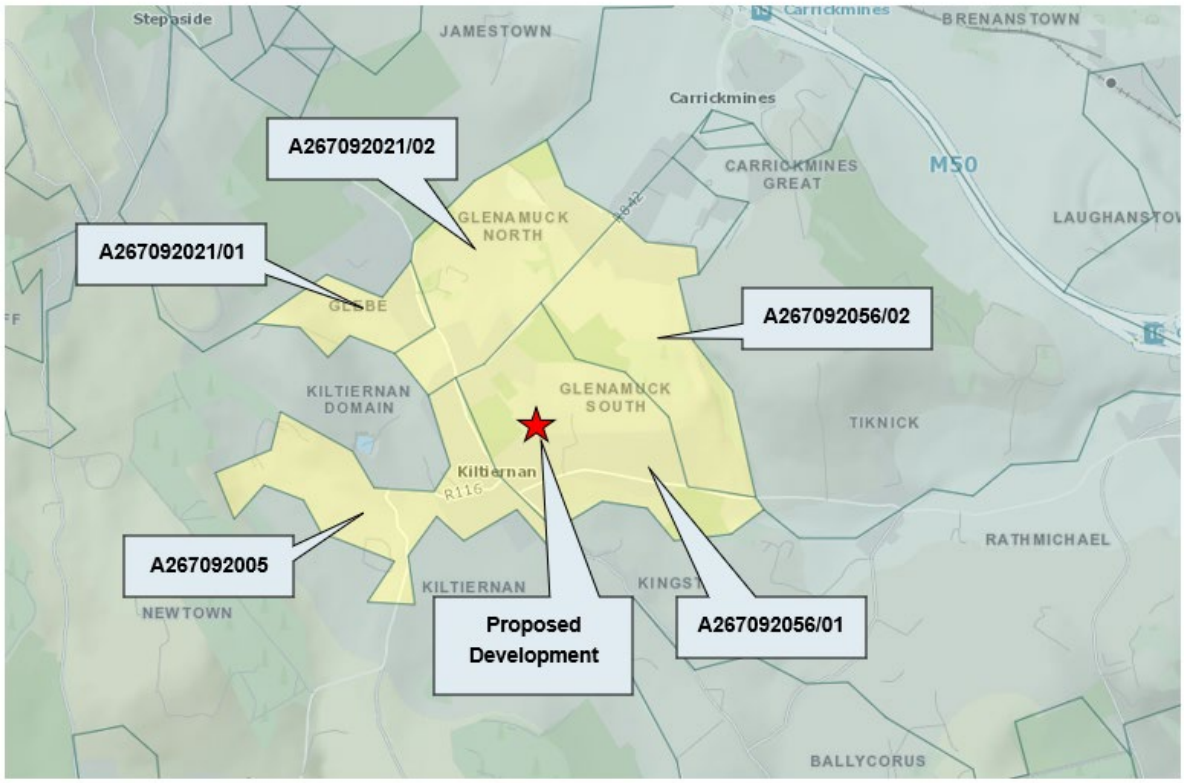


Figure 13-27: CSO Small Area Population Map

The 2022 Census data reveals the mode share for the proposed development area, which is calculated separately for work and combined work/school scenarios. The morning peak analysis uses the combined work/school mode share due to the influence of school trips, while the evening peak analysis focuses solely on the work mode share, reflecting a more commuter-based pattern. The data suggests that most people commute using private cars, either as drivers or passengers, with a notable portion of school trips made through active travel modes. It is anticipated that the car mode share will remain unchanged in the Opening Year and Opening Year +5 scenarios. Table 13-17 and Figure 13-28 both detail the mode share applied.

Table 13-17: SAP Mode Share Data

Mode	Work/School Combined	Work Only
Active Mode	10%	5%
Public Transport	14%	14%
Cars	35%	57%
Car Passenger	24%	1%
Others	17%	23%
Total	100%	100%

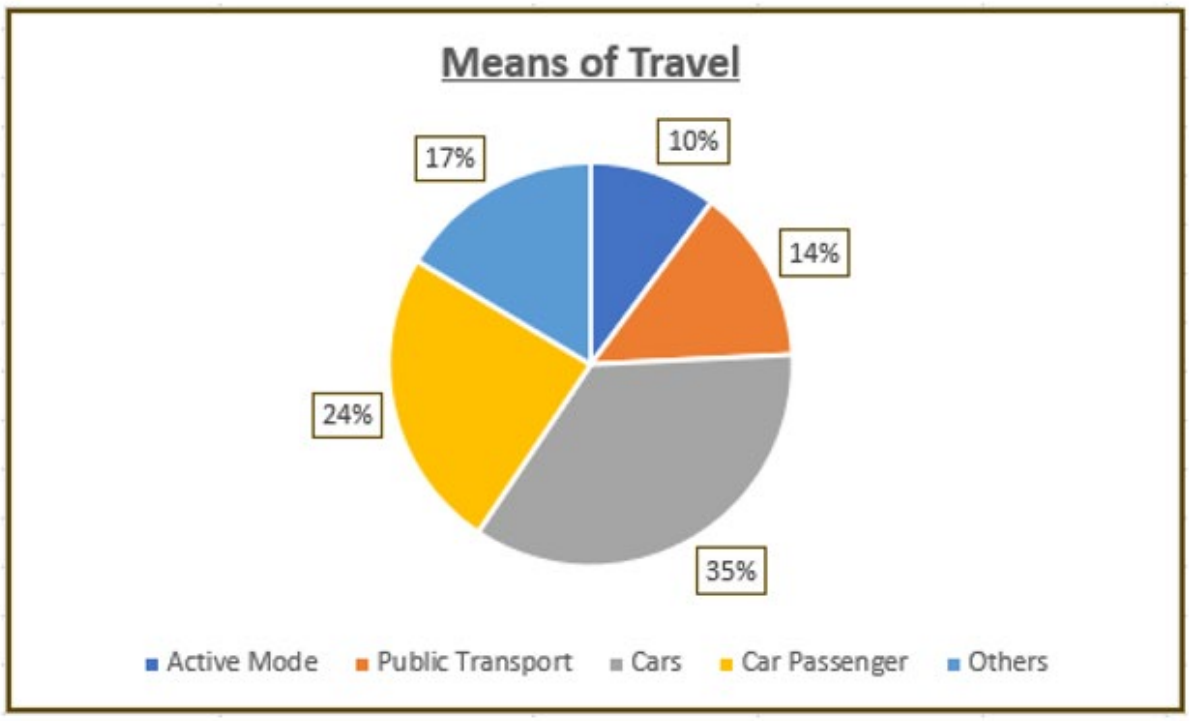


Figure 13-28: SAP Mode Share

13.5.2.5.1 Opening Year +15 Mode Share

The Transport Strategy for the Greater Dublin Area 2022-2042, Strategy Development and Modelling Report (November 2021) published by the NTA shows that car mode share will reduce over time as shown in the Figure 13-29.

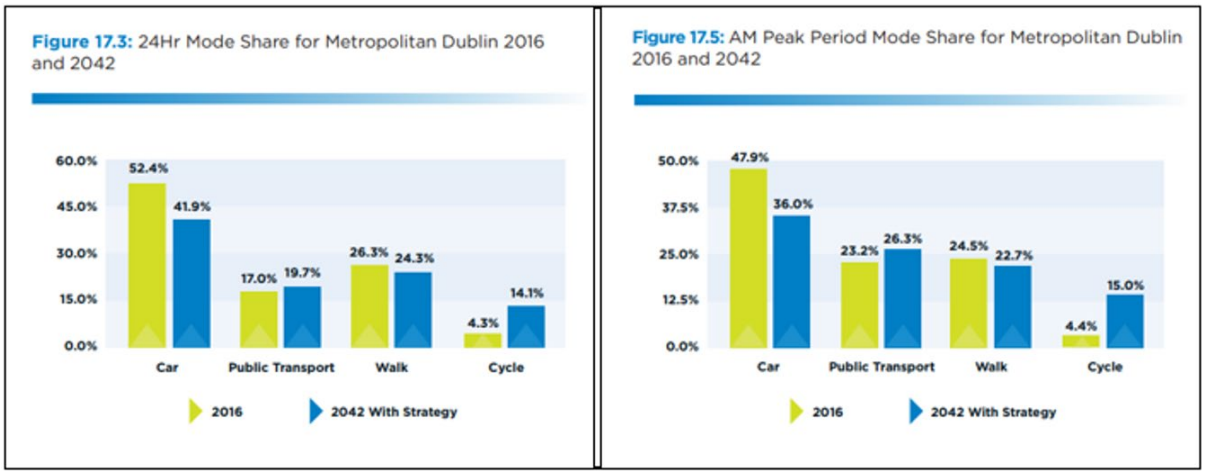


Figure 13-29: Proposed Mode Share for 2041

Noting that the proposed development lies within the Metropolitan area, and the car mode share in the AM peak for the year 2042 is recorded to be 36.0% which is more than the car mode share obtained from Census data 2022 for the Opening Year and Opening Year + 5, therefore, a reduction factor of 0.75 (derived from AM Peak Period Mode Share for Metropolitan Dublin 2016 and 2042) and 0.80 (derived from 24hr Mode Share for Metropolitan Dublin 2016 and 2042) have been applied to the car mode share obtained from the Census data 2022 to derive revised car

mode share for AM and PM peak periods for the Opening Year + 15 Design Year. In accordance with this, for the Opening Year +15 design year, the car mode share has been revised and summarised in Table 13-18.

Table 13-18: Overall Car Mode Share Applied for all the Design Years

Mode	Opening and Opening+5	Opening+15
AM Peak (Work/School Combined)		
Cars	35%	26%
PM Peak (Work Only)		
Cars	57%	46%

13.5.2.6 Residential Trip generation

The person trip rate for the residential developments was estimated using the TRICS (Trip Rate Information Computer System) database using the "Residential – Houses Privately Owned" and "Residential – Flats Privately Owned" subcategories respectively for Houses, Apartment and Duplex Units. The direct output from TRICS is included in Appendix B and summarised in Table 13-19 (Appendix 13-2).

Table 13-19: Trip Rate from TRICS: Residential Development

Land Use Type	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Apartments / Duplexes	0.099	0.376	0.317	0.109
Houses	0.236	0.792	0.579	0.295

13.5.2.6.1 Car Trip Rate

The projected vehicular trip rates for the proposed development are calculated by taking the multimodal trip rates determined with the help of the TRICS database and multiplying the percentage modal split estimated through CSO data for each design year as discussed above. The car trip rate for residential development is detailed in Table 13-20.

Table 13-20: Car Trip Rates for Residential Development

Land Use Type	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Opening Year and Opening Year + 5				
Apartments / Duplexes	0.035	0.132	0.181	0.062
Houses	0.083	0.279	0.331	0.169
Opening Year + 15				
Apartments / Duplexes	0.026	0.099	0.145	0.050
Houses	0.062	0.209	0.264	0.135

13.5.2.6.2 Car Trips Generation

Based on the Mode share discussed above, the cars trips are calculated and summarised in Table 13-21.

Table 13-21: Car Trips for Residential Development

Land Use Type	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Opening Year (2026)				
Apartments / Duplexes	1	4	6	2
Houses	6	19	22	11
Total	7	23	28	13
Opening Year + 5 (2031)				
Apartments / Duplexes	10	39	53	18
Houses	16	55	65	33
Total	26	94	118	51
Opening Year + 15 (2041)				
Apartments / Duplexes	8	29	42	14
Houses	12	41	52	26
Total	20	70	94	40

13.5.2.7 Non-Residential Trip Generation

TRICS database were again used to determine the vehicle trips rates for the non- residential developments. The categories used for estimating trips rate were:

- Retail – Convenience Store for convenience stores
- Commercial/Retail – Local Shops
- Food & Drink – Restaurant and Café

For Community development and Creche no trips were assumed as these trips will be internal. The vehicle trip rate associated with all these non-residential development lands is summarised in Table 13-22.

Table 13-22: Trip Rate from TRICS: Non-Residential Development

Land Use Type	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Retail (Convenience)	5.001	4.895	6.248	6.673
Office	1.346	0.126	0.16	1.241
Restaurant and Café	1.373	0.980	2.105	2.895

The vehicular trips calculated based on the trip rates discussed above are summarised in Table 13-23.

Table 13-23: Vehicular Trips for Non-Residential Development

Land Use Type	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Opening Year (2026)				
Retail (Convenience)	21	20	26	28
Restaurant and Café	4	3	7	9
Total	25	23	32	37
Opening Year + 5 (2031) and Opening Year + 15 (2041)				
Retail (Convenience)	40	38	49	52
Office	32	20	64	78
Restaurant and Café	4	3	7	9
Total	76	61	119	139

13.5.2.8 Internal Trips Assumptions

It is projected that of all the non-residential trips originating from the proposed development, 40% will be within the development itself, while the remaining 60% will be external, drawn by various land uses (as detailed in Section 13.5.2.3 above) for non-residential purposes. Furthermore, it is presumed that all trips to the Creche and Community Centre will be confined within the development.

13.5.2.9 Trip Distribution

The trips from the proposed developments are assigned to the modelled network cordons on the basis of the existing traffic patterns on the local road network. The percentage trip distribution to the different model cordons is summarised in Table 13-24.

Table 13-24: Percentage Trip Distribution

Zones	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
R117 Enniskerry North	39%	23%	33%	22%
Glenamuck Road to M50/M11	25%	36%	35%	17%
R116	9%	14%	5%	7%

Ballycorus Rd	12%	11%	10%	14%
R117 Enniskerry South	15%	16%	17%	40%

Based on the above trip distribution, total trips between these model cordons and proposed development site are summarised in Table 13-25.

Table 13-25: Trip Distribution to all the Model Cordons

Zones	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Opening Year (2026)				
R117 Enniskerry North	12	10	20	10
Glenamuck Road to M50/M11	8	16	21	8
R116	3	6	3	3
Ballycorus Rd	4	5	6	7
R117 Enniskerry South	4	8	10	20
Total	31	45	60	48
Opening Year + 5 (2031)				
R117 Enniskerry North	40	36	78	42
Glenamuck Road to M50/M11	26	56	82	32
R116	9	22	12	13
Ballycorus Rd	12	18	24	26
R117 Enniskerry South	16	24	40	76
Total	103	156	236	189
Opening Year + 15 (2041)				
R117 Enniskerry North	37	31	71	40
Glenamuck Road to M50/M11	24	48	74	30
R116	9	18	11	13
Ballycorus Rd	12	14	22	26
R117 Enniskerry South	15	20	36	72
Total	97	131	214	181

These trips were distributed to the different access junctions based on the destination of the journey as discussed in the following section. Additionally, the traffic distribution diagrams for all the assessment years have been provided within Appendix C of the TTA (Appendix 13-3).

13.5.2.10 Trip Distribution Among All Access Junctions

Three access points along Enniskerry road and two access points along Glenamuck Road (which includes connection to access junction of the Rockville Site) have been suggested. However, it's presumed that all traffic from the proposed development will enter and exit the site via one access point on Enniskerry road and one on Glenamuck road. This is because these junctions are prioritized. If a single priority junction can manage the site's total traffic capacity, then each individual junction should be able to do the same. Moreover, this arrangement simplifies representation. The distribution of development traffic arriving and departing between the Enniskerry Road access and the GDRS access has been assumed to correspond to existing traffic patterns on the local road network and allowing for redistribution of traffic directly onto the GDRS. It is assumed that GDRS is developed and operational for all the design years. Analysis was carried out based on the following scenarios as outlined below.

13.5.2.10.1 Opening Year

It is assumed that vehicle access points along Enniskerry Road (A1) and GLDR (A3) will be available. The access junction along Glenamuck Road (A2) is also assumed to be available. However, for the opening year this junction is expected to serve minor traffic flows entering and exiting the site. The access junction (A4) Is not expected to be operational during the opening year. The development trips were split among the access points based on the percentages shown in Table 13-26.

Table 13-26: Traffic Distribution for Access Points: Opening Year

Zone	A1 (Along Enniskerry Road)	A2 (Along Glenamuck Road)	A3 (West on GLDR)	A4 (East on GLDR)
R117 Enniskerry North	50.0%	2.0%	48.0%	0.0%
Glenamuck Road to M50/M11	0.0%	2.0%	98.0%	0.0%
R116	100.0%	0.0%	0.0%	0.0%
Ballycorus Rd	0.0%	0.0%	100.0%	0.0%
R117 Enniskerry South	50.0%	0.0%	50.0%	0.0%

Vehicles travelling between Enniskerry North will majority utilise access points A1 along Enniskerry road and A3 along new GDDR link. A small percentage of this traffic will utilise access point A2 along Glenamuck road. Majority vehicles travelling to/from M50-M11 will use Access Point A3 and only a minor percentage of traffic will utilise Access Point A2. All the vehicle travelling to/from R116 will be using Access Point A1 along Enniskerry Road while all the vehicles travelling from Ballycorus road will utilise Access Point A3. For vehicles travelling to/from Enniskerry Road South will be equally distributed between Access Point A1 along Enniskerry Road and A3 along proposed GLDR.

The location of each of these accesses in relation to the site are shown in Figure 13-30. The trip distribution and assignment of vehicular traffic for the opening year is illustrated in Figure 13-31 and Figure 13-32.

Figure 13-30 Accesses to the Proposed Development

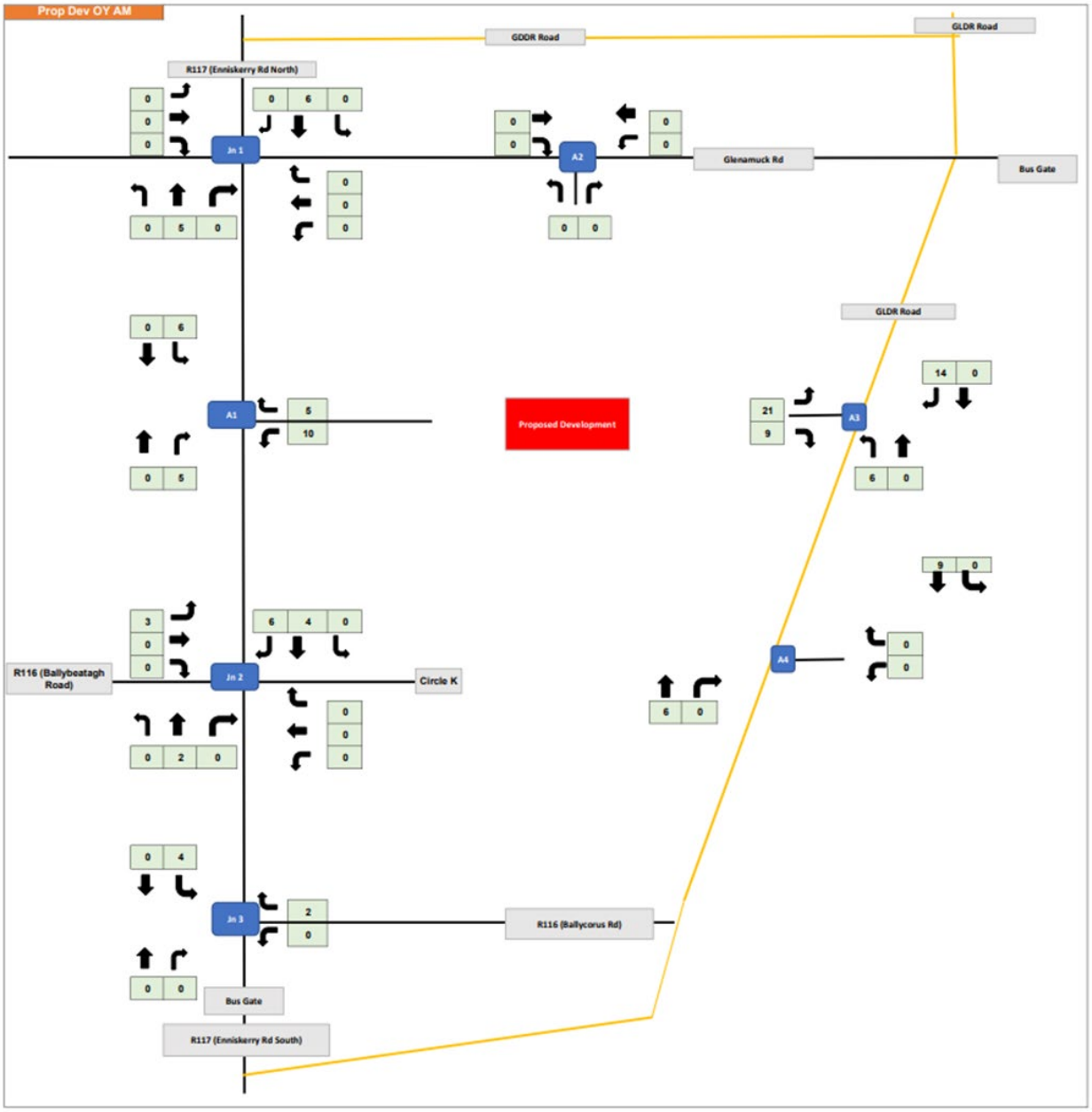


Figure 13-31: Trip Distribution of Development Traffic During Opening Year AM Peak

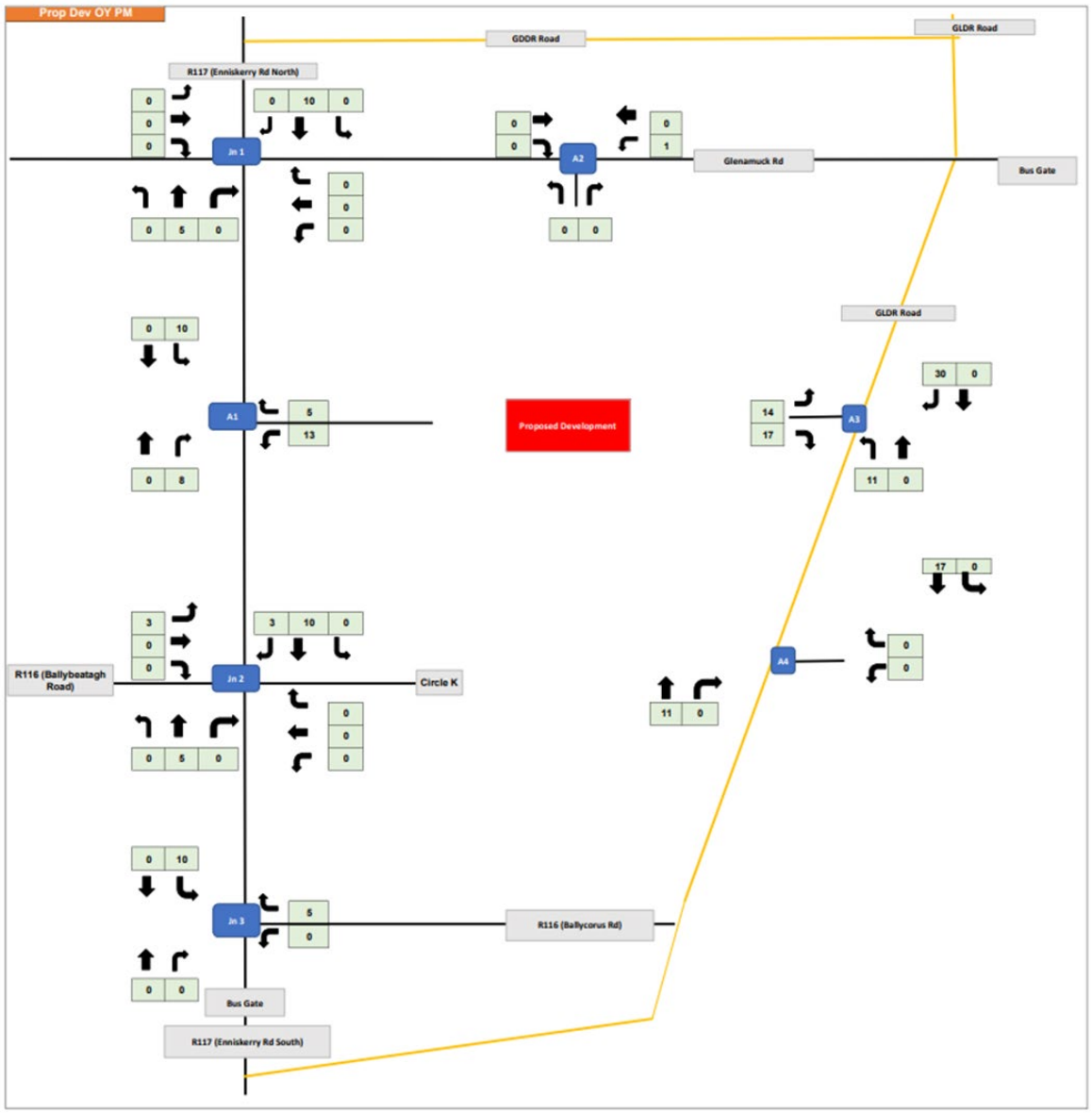


Figure 13-32: Trip Distribution of Development Traffic During Opening Year PM Peak

13.5.2.10.2 Opening Year +5 and +15

It is assumed that for these design years all vehicle access points along Enniskerry Road (A1), Glenamuck Road (A2), East on GLDR (A3), and West on GLDR (A4) will be available. The development trips were split among the access points based on the percentages shown in Table 13-27.

Table 13-27: Traffic Distribution for Access Points: Opening Year + 5 and + 15

Zone	A1 (Along Enniskerry Road)	A2 (Along Glenamuck Road)	A3 (West on GLDR)	A4 (East on GLDR)
R117 Enniskerry North	25.0%	10.0%	35.0%	30.0%
Glenamuck Road to M50/M11	0.0%	10.0%	50.0%	40.0%

R116	100.0%	0.0%	0.0%	0.0%
Ballycorus Rd	0.0%	0.0%	50.0%	50.0%
R117 Enniskerry South	50.0%	0.0%	25.0%	25.0%

Similar to Opening Year Scenario, vehicles travelling between Enniskerry North will utilise access points A1 along Enniskerry road, A3 and A4 along new GDDR link. It is expected that only 10% of this traffic will utilise access point A2 along Glenamuck road. Vehicles travelling to/from M50-M11 will use Access Point A2, A3 and A4. All the vehicle travelling to/from R116 will be using Access Point A1 along Enniskerry Road while all the vehicles travelling from Ballycorus road will utilise Access Point A3 and A4. For vehicles travelling to/from Enniskerry Road South will be distributed between Access Point A1 along Enniskerry Road, A3 and A4 along proposed GLDR. The trip distribution and assignment of vehicular traffic for the design year is illustrated in the Figure 13-33 and Figure 13-34.

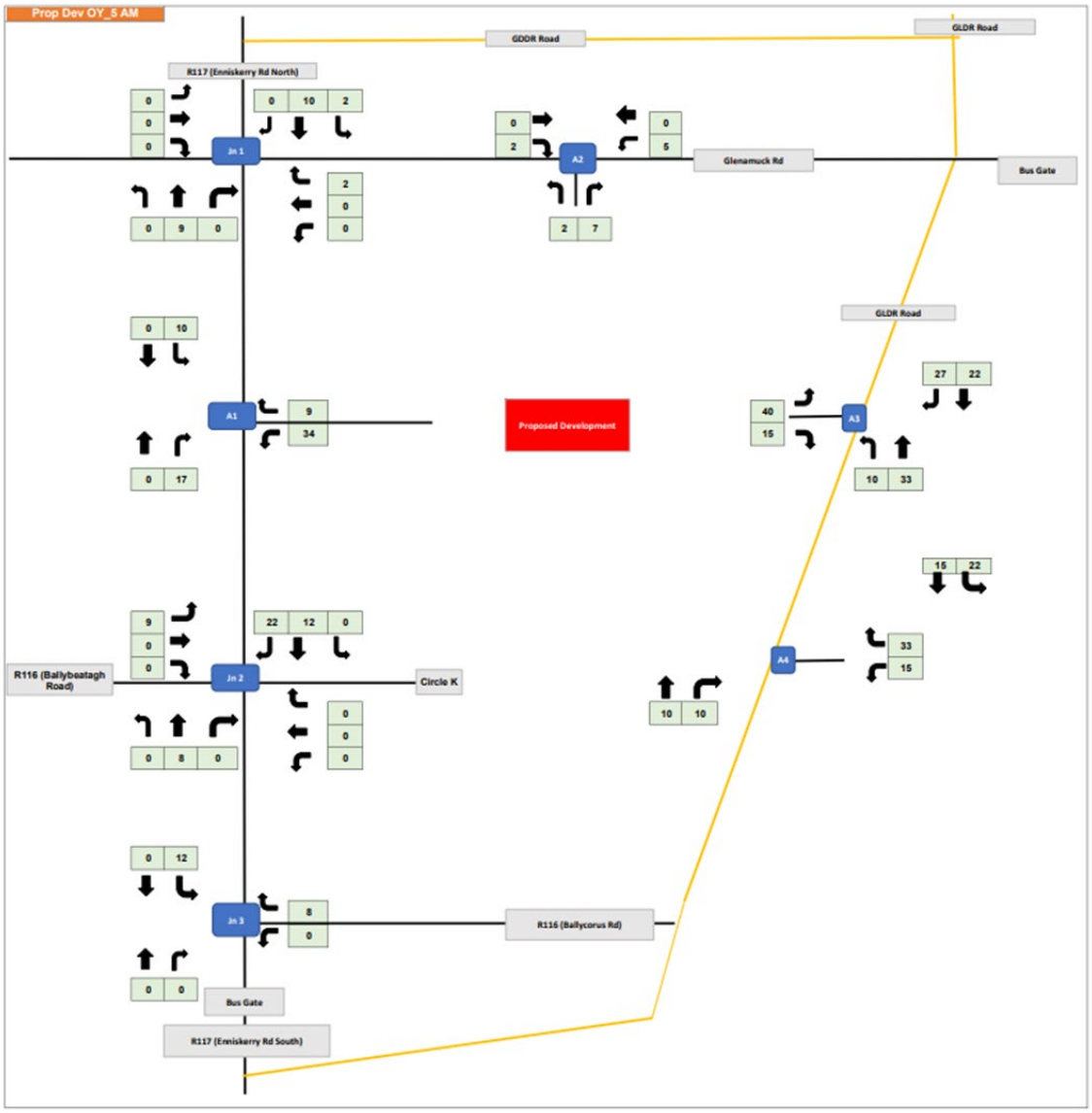


Figure 13-33: Trip Distribution of Development Traffic During Opening Year + 5 AM Peak

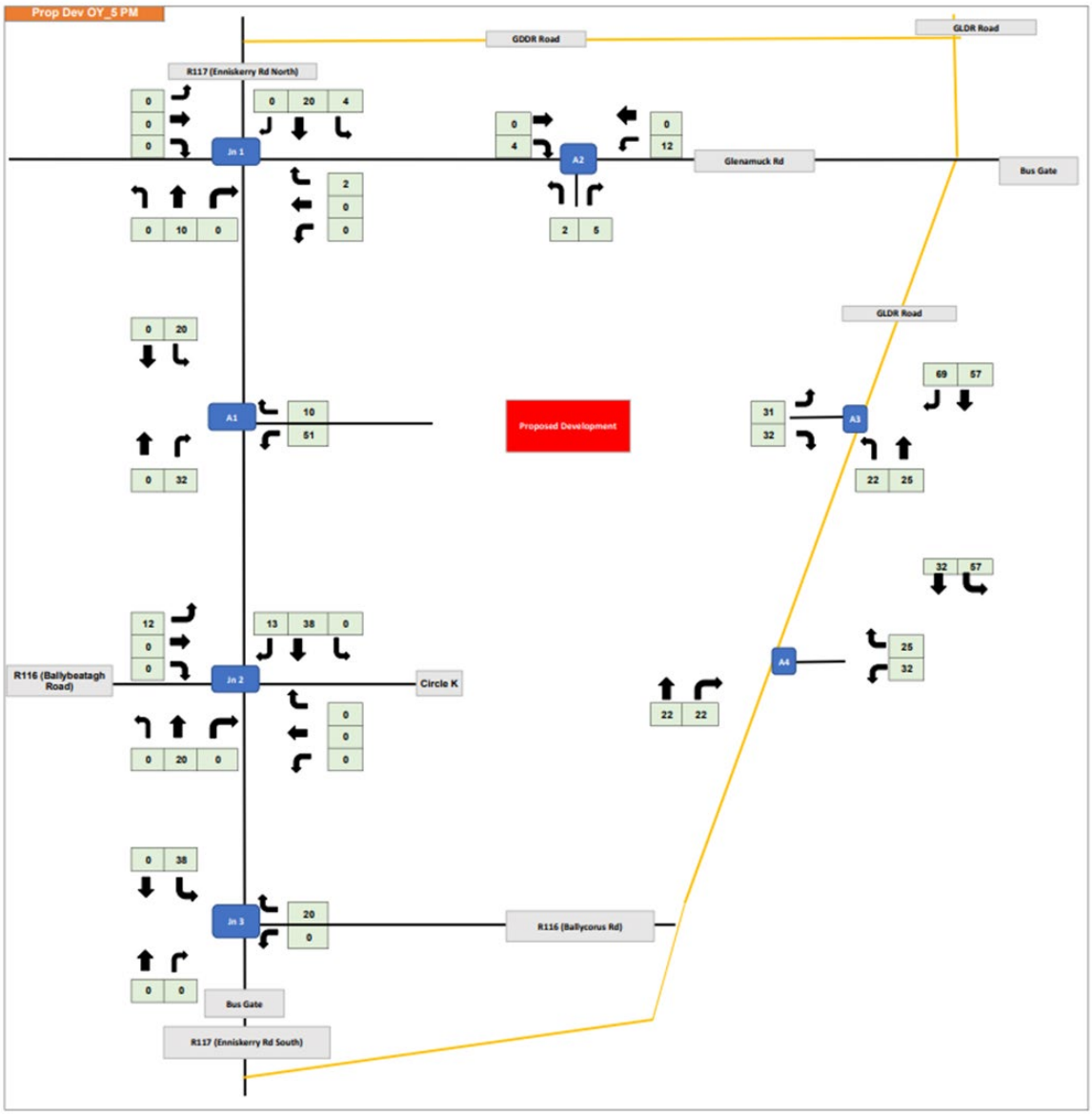


Figure 13-34: Trip Distribution of Development Traffic During Opening Year +5 PM Peak

13.5.2.10.3 Committed Development

For all the committed developments discussed in the previous section, trips for the peak hours were obtained from the respective planning applications. The trip distribution and assignment of Committed development traffic for the opening year scenario is illustrated in Figure 13-35 and Figure 13-36. Diagrams for all remaining years and scenarios can be found within Appendix C of the Traffic and Transport Assessment (Appendix 13-3).

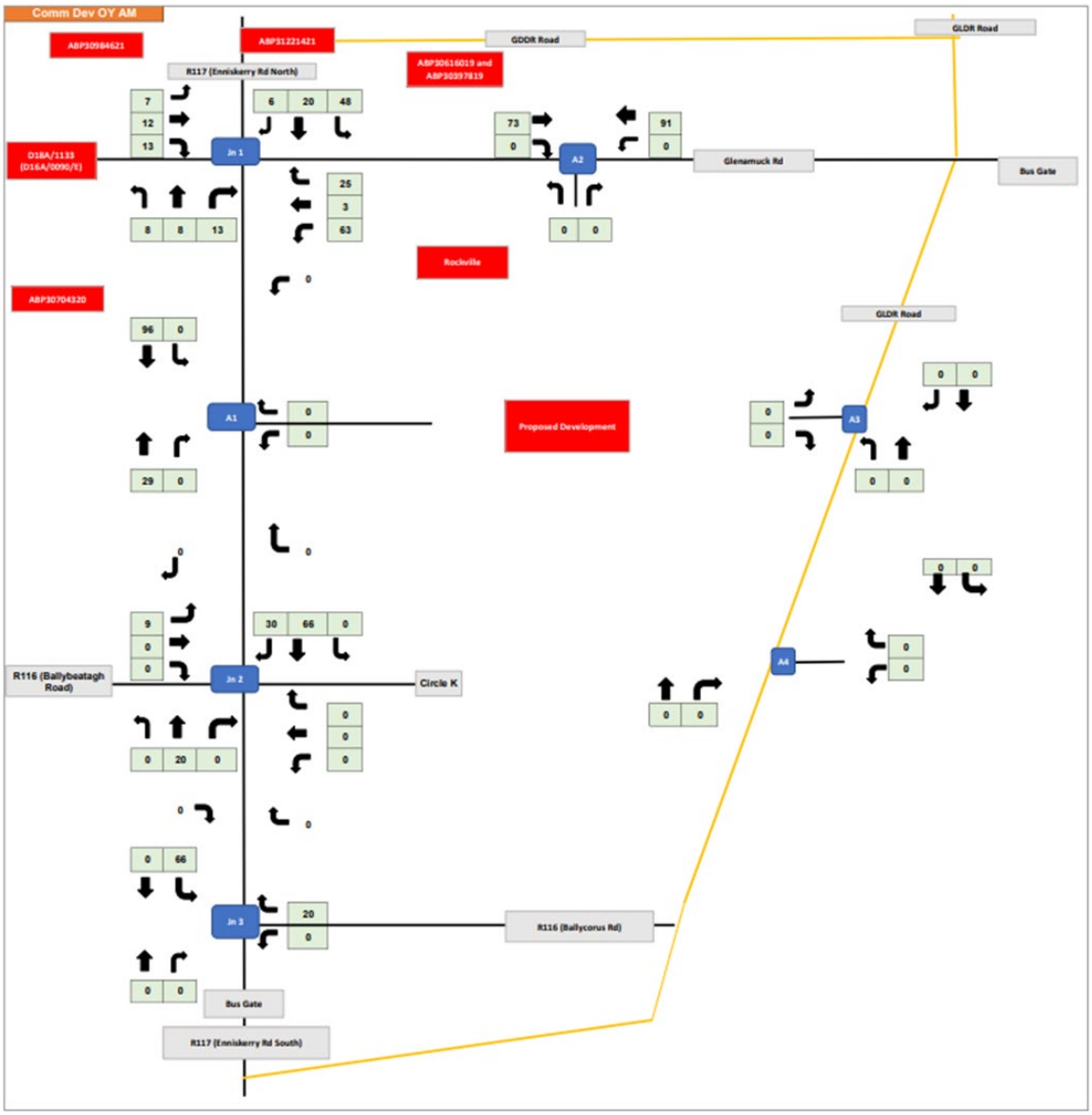


Figure 13-35: Trip Distribution of Committed Development Traffic During Opening Year AM Peak

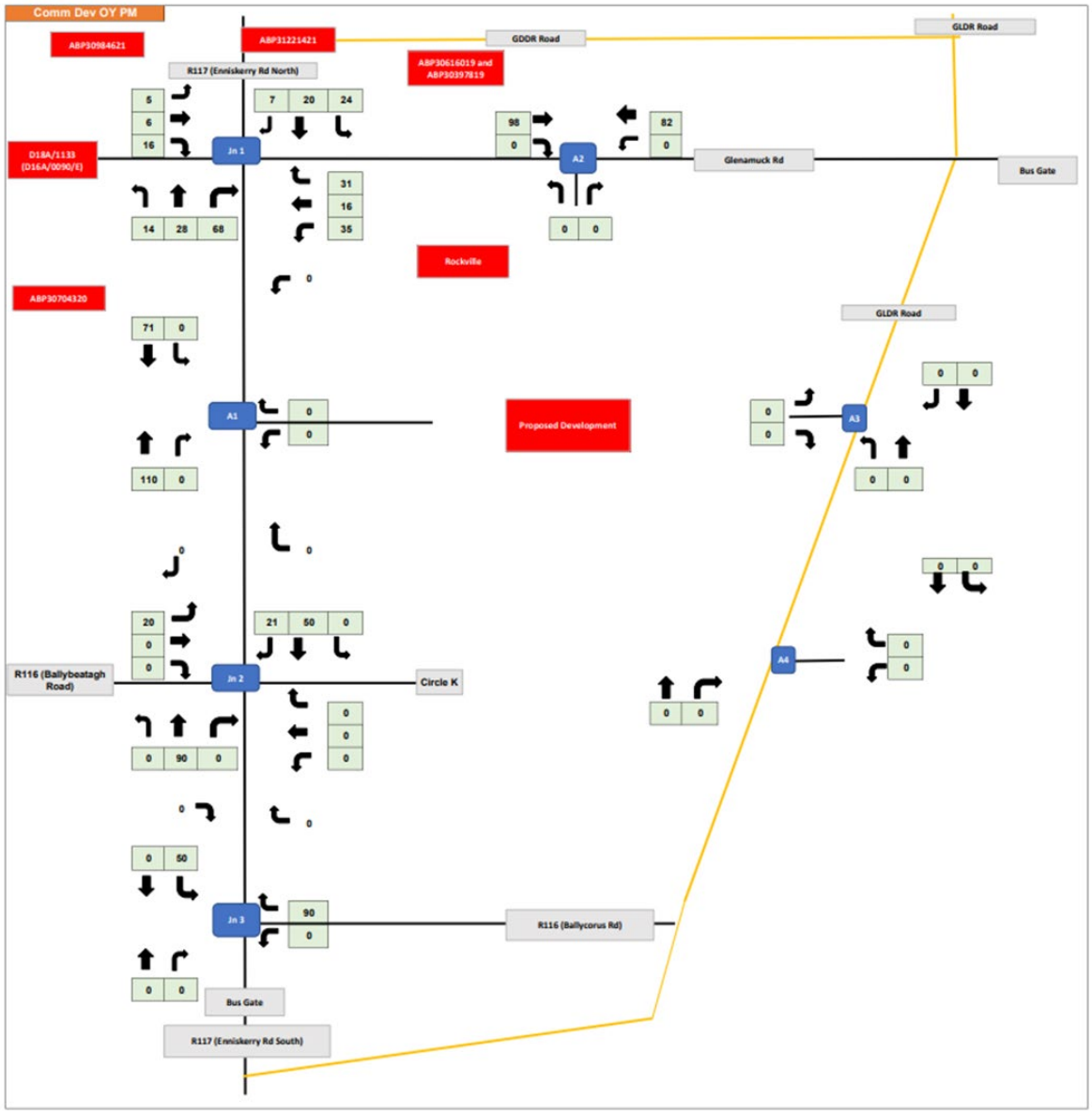


Figure 13-36: Trip Distribution of Committed Development Traffic During Opening Year PM Peak

13.5.2.11 Detailed Traffic Impact Analysis

13.5.2.11.1 Initial Screening Assessment Approach

An initial assessment was undertaken to quantify the additional traffic from the development that will be distributed onto the local road network and the potentially impacted junctions. In order to determine what level of increase is considered above threshold, reference is made to the TII Traffic and Transport Assessment Guidelines (May 2014). This document outlines the following thresholds:

- Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road; and
- Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists, or the location is sensitive.

The implementation of the GDRS will facilitate traffic redistribution from the R117 Enniskerry road. This will decrease the turning movements at the nearby junctions, thus reducing queues and the impact of the development traffic on them. As a result, the nearby junctions to the proposed development are considered to be not sensitive. Subsequently, any junctions expected to experience a traffic increase exceeding 10% due to development-related traffic are selected for further detailed assessment and modelling. The anticipated traffic increase from the proposed development is compared to the opening year traffic volumes at each junction, considering both scenarios: Without and With Committed Development Traffic. The percentage increases are presented in Table 13-28.

Table 13-28: Traffic Impact in Opening Year

Description	Period	Without Committed Development			With Committed Development		
		Do Nothing Traffic Redistributed	With All Development Traffic	% Increase	Do Nothing Traffic Redistributed	With All Development Traffic	% Increase
Enniskerry Rd / Glenamuck Rd Junction (Golden Ball Junction)	AM	677	688	1.6%	903	914	1.2%
	PM	642	657	2.3%	912	927	1.6%
Enniskerry Rd / R116 Junction	AM	445	460	3.4%	570	585	2.6%
	PM	368	389	5.7%	549	570	3.8%
Enniskerry Rd / Ballycorus Rd Junction	AM	117	123	5.1%	203	209	3.0%
	PM	173	188	8.7%	313	328	4.8%

From Table 13-28, it can be observed that, for all the junctions the percentage increase in traffic due to all the development trips were below 10%. Therefore, in accordance with the thresholds set out in TII's Traffic and Transport Guidelines, all the three junctions mentioned above do not require any further detailed assessment. Nevertheless, analysis was undertaken for all the access junctions.

13.5.2.11.2 Detailed Assessment Approach

The access junctions were modelled for all the scenarios discussed in the previous sections and are also summarised again below:

- Opening Year (2026) – Background Growth + Committed Development with GDRS
- Opening Year (2031) – Background Growth + All Development with GDRS
- Opening Year+5 (2031) – Background Growth + Committed Development with GDRS
- Opening Year+5 (2031) – Background Growth + All Development with GDRS
- Opening Year+15 (2041) – Background Growth + Committed Development with GDRS
- Opening Year+15 (2041) – Background Growth + All Development with GDRS

The junctions were analysed individually using TRL Junctions 9 modelling software.

Table 13-29: Junction Modelling Software Utilised

Modelling Software	Junction Type	Sites Modelled
TRL Junctions 9	Priority and Roundabout	All Access Junctions

The terminology used throughout the analysis associated with TRL Junction 9 software is explained below:

TRL Junctions 9

- **RFC:** This is the ratio of demand flow to capacity. The practical capacity threshold is normally approximately 0.85. An RFC below 0.85 represents a junction which is operating in an efficient and stable condition. An RFC of between 0.85 and 1 represents variable operation, and may be said to be operating adequately, if the queueing and delay are deemed acceptable. RFC values in excess of 1 represent an oversaturated condition.
- **Queue Length:** This represents the maximum of the average queue length in pcu per time segment.
- **Average Delay:** This shows the average amount of traffic delay at the junction per vehicle over the peak hour period.
- **Level of Service (LOS):** a qualitative measure to describe the operating conditions of a road based on factors such as speed, travel time, manoeuvrability, delay and safety. LOS ranges from A to F. Where A is free flowing, and F is forced or breakdown flow.

It is anticipated that the GDRS scheme will be delivered and operational for all the design year scenarios. The background traffic travelling from between northern and southern part of the model cordon were reassigned to use new GDDR/GLDR links. The following assumptions were taken to estimate the redistribution of traffic:

- It is assumed that the traffic travelling from Enniskerry to the southern part of the model cordon (Enniskerry South & Ballycorus Road) will split in 1:9 ratio. That means, 10% of these trips will continue to travel straight at Golden Ball Junction and then turn left at Enniskerry Road/Ballycorus Road junction going towards Enniskerry Road South and Ballycorus Road. For the remaining 90% trips, it was assumed that 50% will use new GDDR link while remaining will turn left at Golden Ball Junction onto Glenamuck road and then turn right onto the GLDR at proposed GDDR/GLDR junction. For the opposite direction, i.e., for vehicles travelling from the southern part of the model cordon (Enniskerry South and Ballycorus Road) towards Enniskerry Road North the same split at all the junctions are applied in the reverse order. 10% of the trips were assumed to be turning right from Ballycorus Road onto Enniskerry road and will continue straight at Golden Ball Junction. Remaining 90% will travel along GLDR. Out of them 50% will turn onto Glenamuck Road and then right onto Enniskerry Road at Golden Ball Junction. The remaining 50% will use GLDR to move to Enniskerry Road North.

- For the movement between M50-M11 and southern part of the model (Enniskerry Road South and Ballycorus Road), all the vehicles will be using the GLDR link rather than travelling along Enniskerry Road and Golden Ball Junction.

- It has been assumed that all the traffic from Enniskerry North and South, Ballycorus road and Glenamuck road travelling to R116/Enniskerry road junction will remain the same. However due to bus gate installed at south of Enniskerry Road/Ballycorus Road junction, all the vehicles travelling to/from Enniskerry South was assumed to be diverted onto Ballycorus Road. The traffic volume at all the junctions for all the modelled scenarios are

summarised in Appendix D of the Traffic and Transport Assessment (TTA) (Appendix 13-4).

13.5.2.12 Traffic Impact Results

As outlined in the previous section, each access junction was analysed individually using the Junction 9 software package. Data collected for comparison between scenarios included:

- Queue lengths in pcus;
- Average delays in seconds; and
- Capacity (where available).

The access junctions were modelled for all scenarios. However, only the results for the "All development Scenarios" are presented in the following sections as for the "Committed development Scenarios", no vehicles will be using the access junctions for travelling to/from the proposed development and therefore, there will be no conflict and the junction will have infinite capacity.

The direct output for each access junction for all modelled scenarios are included in Appendix D of the TTA (Appendix 13-4).

13.5.2.12.1 Development Access Junction A1

Junction A1 refers to internal road / Enniskerry Road Junction located on the western frontage of the site which will be available in all the modelled scenarios across all the design years. Modelling results are shown in Table 13-30.

Table 13-30: Development Access Junction A1 Modelling Results

Arm	AM Peak				PM Peak			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
Opening Year (2026)								
Access Road	0.0	8.57	0.04	A	0.0	7.87	0.04	A
R117 Enniskerry Road South	0.0	5.71	0.01	A	0.0	5.32	0.02	A
Opening Year + 5 (2031)								
Access Road	0.1	8.92	0.11	A	0.2	8.44	0.14	A
R117 Enniskerry Road South	0.1	5.81	0.04	A	0.1	5.50	0.07	A
Opening Year + 15 (2041)								
Access Road	0.1	8.91	0.09	A	0.1	8.46	0.13	A
R117 Enniskerry Road South	0.1	5.77	0.04	A	0.1	5.48	0.07	A

The maximum average delay across all the design years is observed to be under 10 seconds and maximum average queue was 0.2 pcu. The maximum RFC was 0.14 across all the scenarios. The LOS was recorded as A for both peak hours across all the modelled scenarios. Therefore, the above results suggest that the junction will be operating within capacity for all the design years. The model results indicate that the design of this junction as priority junction arrangement (as opposed to a signal junction) is appropriate and correct.

13.5.2.12.2 Development Access Junction A2

Junction A2 refers to internal road north / Glenamuck road junction located to the northern frontage of the site. For the opening year this junction will primarily serve minor traffic flows entering and exiting the site via the proposed access point of the Rockville Site (as discussed in the previous section). This junction is expected to become fully operational for the modelled scenarios (i.e., +5 and +15). This junction even at its full operational capacity is still expected to cater for minor traffic flows for all the design years. Modelling results are shown in Table 13-31.

Table 13-31: Development Access Junction A2 Modelling Results

Arm	AM Peak				PM Peak			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
Opening Year + 5 (2031)								
Access Road	0.0	9.86	0.03	A	0.0	9.69	0.02	A
Glenamuck Road Eastbound	0.0	5.36	0.01	A	0.0	5.07	0.01	A
Opening Year + 15 (2041)								
Access Road	0.0	9.88	0.02	A	0.0	9.84	0.02	A
Glenamuck Road Eastbound	0.0	5.33	0.01	A	0.0	5.04	0.01	A

The Junction will be used by the vehicles moving toward Enniskerry Road North and Glenamuck Road for going to/from M50-M11 motorway. Across all the scenarios, the maximum average queue was observed to be 0.0 pcu, with maximum average delay observed was under 10 seconds and maximum RFC was 0.03. The LOS was A across all the scenarios, suggesting that the junction was found to be operating well within the capacity across all the design year scenarios for both peaks.
The model results indicate that the design of this junction as priority junction arrangement (as opposed to a signal junction) is appropriate and correct.

13.5.2.12.3 Development Access Junction A3

Junction A3 refers to internal road / GLDR junction located to the east of the site and west to the GLDR. This junction will be available in all the modelled scenarios across all the design years. Modelling results are shown in Table 13-32.

Table 13-32: Development Access Junction A3 Modelling Results

Arm	AM Peak				PM Peak			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
Opening Year (2026)								
Access Arm Left	0.0	7.25	0.04	A	0.0	8.13	0.03	A
Access Arm Right	0.0	14.75	0.04	B	0.1	15.30	0.07	C
GLDR North	0.1	5.34	0.04	A	0.3	4.52	0.12	A
Opening Year + 5 (2031)								
Access Arm Left	0.1	7.87	0.09	A	0.1	8.84	0.08	A
Access Arm Right	0.1	17.26	0.07	C	0.2	21.21	0.17	C
GLDR North	0.2	5.38	0.09	A	1.2	5.02	0.31	A
Opening Year + 15 (2041)								

Access Arm Left	0.1	7.80	0.08	A	0.1	8.94	0.07	A
Access Arm Right	0.1	17.71	0.06	C	0.2	22.05	0.17	C
GLDR North	0.2	5.33	0.09	A	1.1	4.80	0.29	A

The maximum average delay across all the design years is observed to be around 22 seconds and maximum average queue was 1.2 pcu. The maximum RFC was 0.31 across all the scenarios. The LOS was recorded as A for both peak hours along access arm left and GLDR North for all design years scenarios. However, for access arm right LOS of B and C were recorded in the AM and PM peak during Opening Year and LOS of C was observed for both peak hours during Opening+5 and Opening+15 design years scenarios.

Therefore, the above results suggest that the junction will be operating within capacity for all the design years. The modelling outputs shows that this junction will perform within acceptable parameters with negligible impact on the main flows along the GLDR. The model results indicate that the design of this junction as priority junction arrangement as opposed to a signal junction is appropriate and correct for the level demand.

13.5.2.12.4 Development Access Junction A4

Junction A4 refers to internal road / GLDR junction located to the east of the site and east to the GLDR. This junction is not available in the opening year and only becomes operational in the modelled scenarios (i.e., +5 and +15). Modelling results are shown in Table 13-33.

Table 13-33: Development Access Junction A4 Modelling Results

Arm	AM Peak				PM Peak			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
Opening Year + 5 (2031)								
Access Arm	0.2	12.72	0.16	B	0.3	15.40	0.21	B
GLDR South	0.0	4.26	0.04	A	0.2	4.72	0.09	A
Opening Year + 15 (2041)								
Access Arm	0.2	12.76	0.14	B	0.3	16.05	0.21	C
GLDR South	0.0	4.19	0.03	A	0.2	4.63	0.09	A

The maximum average delay across all the design years is observed to be around 16 seconds and maximum average queue was 0.3 pcu. The maximum RFC was 0.21 across all the scenarios. The LOS was recorded as A for both peak hours along GLDR South for both the modelled scenarios (i.e., +5 and +15). However, for access arm LOS of B and C were observed in the AM and PM peak hours for both the modelled scenarios (i.e., +5 and +15).

Therefore, the above results suggest that the junction will be operating within capacity for all the design years. The modelling outputs shows that this junction will perform within acceptable parameters with negligible impact on the main flows along the GLDR. The model results indicate that the design of this junction as priority junction arrangement as opposed to a signal junction is appropriate and correct for the level demand.

13.5.2.12.5 Junction Impact Conclusion

The modelling was carried out for all the access junctions and TRL Junction 9 software was used for all these junctions. All the Access Junctions were found to be operating within capacity with

minimal impact on the Enniskerry, Glenamuck and GLDR links. The model results indicate that the design for all the junctions as priority junction arrangement (as opposed to a signal junction) is appropriate and correct. Additionally, there are additional access junctions along the GLDR link, such as the priority junction at Wayside Football Club, which share a similar layout configuration with the proposed development access junctions. This similarity serves to validate and reinforce the approach of implementing priority junctions along the GLDR.

13.5.3 Potential Cumulative Impacts

The modelling was carried out for all the access junctions and TRL Junction 9 software was used for all these junctions. All the Access Junctions were found to be operating within capacity with minimal impact on the Enniskerry, Glenamuck and GLDR links. The model results indicate that the design for all the junctions as priority junction arrangement (as opposed to a signal junction) is appropriate and correct. Additionally, there are additional access junctions along the GLDR link, such as the priority junction at Wayside Football Club, which share a similar layout configuration with the proposed development access junctions. This similarity serves to validate and reinforce the approach of implementing priority junctions along the GLDR.

13.5.4 Summary of Effects

Table 13-34 Summary of Likely Significant Effects

Activity	Receptor	Predicted Impact	Quality	Significance	Duration	Type	Mitigation Measures	Residual Effect
Construction Phase								
Construction related traffic	Local Road Network	128 PCU two way daily movements (phase1 being the largest impacts)	Negative	Imperceptible	Short term and temporary	Direct	Outline Construction Environmental Management Plan including Outline Construction traffic management plan	Short term temporary – no residual impacts
Operational Phase								
Operational phase related traffic	Local Road Network	Increased vehicles on the network	Negative	Not significant	Medium to long term	Direct	Car parking constraint, Mobility Management Plan	Slight
Operational Phase walking and cycling infrastructure	Local Road Network and within site	Increased walking and cycling connections and volumes	Positive	Imperceptible	Medium to long term	Direct	N/A	Long term positive impact

13.5.5 "Do Nothing" Impact

The traffic modelling presented in Section 13.5.2.12 includes the future year scenarios for opening year, opening year +5 and opening year +15 without development, i.e., the "do nothing" impact. The future year scenario with development has been compared to the future year do nothing scenario to understand and show the developments traffic impacts. In relation to public transport "do nothing" scenario demand for bus and Luas services from Kilternan would be consistent with demand from the hinterland without the development. In the "do nothing" scenario, the area would not benefit from the permeability enhancements brought by the Proposed Development.

13.6 Avoidance, Remedial and Mitigation Measures

13.6.1 Construction Phase

Based on the analysis undertaken in Section 13.5.1, the traffic impacts associated with construction of the Proposed Development are expected to be negligible. An outline Construction Management Plan provides details of measures proposed to further reduce the impact of construction activity. As the contractor to build the development has not been awarded and the construction programme and methodology may change a detailed construction management plan could be provided and agreed with the Planning Authority prior to work commencing on site.

13.6.2 Operational Phase

N/A

13.6.3 "Worst Case" Scenario

The assessment of impact set out in this Chapter such as trips rates and modal shift patterns are reflective of a worst-case scenario to show the impact of the development on the traffic and transport network. This accords with TII guidance on the Assessment of Traffic and Transport Assessments.

13.7 Residual Impacts

13.7.1 Construction Phase

During demolition and construction phase the Proposed Development will result in a temporary increase in traffic volumes along the construction route. However, as set out in Section 13.5.1.6 these increases will be negligible and temporary in nature.

As no significant adverse effects have been identified in the assessment of the demolition and construction phase of the development, no additional mitigation is necessary over and above the Construction Traffic Management Plan (CTMP) which forms part of the mitigation measures outlined in this Chapter.

13.7.2 Operational Phase

Once operational the Proposed Development will result in changes to traffic flows on several road links within the study area. However, as set out in Section 13.5.2.12 of this Chapter, these increases are in the range of moderate to slight and not significant.

The impact of the Proposed Development on pedestrians, cyclists and public transport users (buses and Luas) is predicted to be significant and beneficial. A wide range of permeable connections will be provided throughout the site.

The residual impacts in terms of traffic are considered further in Chapters 8, Air Quality, and Chapter 9, Noise and Vibration, which are the direct environmental impacts because of increased traffic.

13.8 Monitoring

Based on the result no monitoring is required.

13.8.1 Construction Phase

Based on the result no monitoring is required.

13.8.2 Operational Phase

A Mobility Management Plan (MMP) has been produced for the Proposed Development which sets out strategies and measures with the goal of encouraging the use of sustainable modes. It is important to the effectiveness of MMP initiatives through processes including travel surveys in order to determine appropriate changes that can be made to further facilitate sustainable travel.

13.8.3 Interactions

13.8.3.1 Population and Human Health

Construction activities will result in an increased number of HGV movements during the Construction Phase. The Proposed Development will also result in an increase in the population of the surrounding area and subsequently an increase in the number of vehicles. There is potential for impacts on population and human health in relation to the capacity and operation of the surrounding road network. However as discussed throughout Chapter 13 Traffic, the impact of development traffic is of the order of low in the case of the without GDRS to negligible when the GDRS is available.

13.8.3.2 Air Quality and Climate

There can be a significant interaction between air quality, climate and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed as negligible. Therefore, the impact of the interaction between air quality and climate and traffic is insignificant.

13.8.3.3 Noise and Vibrations

Traffic has the potential to increase noise impacts on nearby sensitive receptors. The Proposed Development will have no significant impact on overall traffic volumes and therefore traffic will not result in any significant increases of noise at sensitive receptors.

13.9 Difficulties Encountered When Compiling

No difficulties were encountered when compiling this Chapter.

13.10 References

The following is a list of sources of information consulted for use in this Chapter:

- European Union (Planning & Development) (Environmental Impact Assessment) Regulations 2018.
- Planning and Development Act 2000 (as amended).
- Planning and Development Regulations 2001-2021.
- Directive 2011/92/EU.
- Directive 2014/52/EU.
- Dún Laoghaire-Rathdown County Development Plan 2022-2028
- Standards for Cycle Parking & associated Cycling Facilities for New Developments (Dún Laoghaire-Rathdown County Council, 2018)
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems – Key Issues Consultation Paper (2017; DoHPCLG).
- Preparation of guidance documents for the implementation of EIA directive (Directive 2011/92/EU as amended by 2014/52/EU) – Annex I to the Final Report (COWI, Milieu; April 2017).
- Guidelines on the information to be contained in environmental impact assessment reports, EPA, (2022)
- Environmental Impact Assessment – Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018; DoHPLG).
- Guidance for Consent Authorities regarding Sub-threshold Development (2003; DoEHLG).
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU).
- Transport Infrastructure Ireland (TII) Transport Assessment Guidelines (TII, 2014).
- Department of Transport Tourism and Sport (DTTaS) The Traffic Signs Manual (2010).
- Department of Transport Tourism and Sport - The Design Manual for Roads and Bridges (DMRB).
- The Design Manual for Urban Roads and Streets (DMURS) (DTTAS, 2013).
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines (PAG) Unit 16.0 – Estimating AADT on National Roads.
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines (PAG) Unit 16.1 – Expansion Factors for Short Period Traffic Counts.

- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines (PAG) – Unit 5.5 Link Based Traffic Growth Forecasting.