

# **Chapter 9.0**

## **Part B**

### **Material Assets – Traffic and Transport**

## 9B.0 Introduction

This Material Assets (Traffic and Transport) Chapter has been prepared by Ken Manley, BE CEng, MIEI, RConsEI HDip Envrm Eng. Ken is a company director and founding member of MHL and Associates Ltd. He is a member of the Institute of Engineers Ireland (IEI) and the Association of Consulting Engineers of Ireland (ACEI).

This chapter assesses how the proposed development will impact the surrounding roads network. It will consider appropriate access arrangements and the transport choices available to future users of the application site and how the existing/proposed transport infrastructure surrounding the site will influence that choice. The impact of traffic demand generated by the proposals will be considered and quantified (note: Traffic modelling has been carried out for a 755-unit development).

The aim of this Traffic and Transport Assessment (TTA) is to identify the characteristics of the application site and surrounding area, examine the likely transport implications, ensure sustainable accessibility is maximised and appropriate infrastructure provided. The key issues that need to be addressed within this TTA, with reference to the size and location of the development proposal, are as follows:

- Review of the site location, composition and local roads network.
- Analysis of Road Safety data for the most recent five-year period available.
- Accessibility critique reviewing pedestrian, cycle and public transport access to the site, plus any infrastructure currently available to promote travel by sustainable means.
- A review of the relevant planning and transport policy.
- Description of the development proposal.
- Description and justification for the proposed access arrangement, internal layout, parking provision, public transport provision, fire tender/service/delivery access, including all necessary swept-path assessments and visibility splays.
- Forecast multi-modal trip rates and trip generation as agreed with the Local Authority.
- Modal split assumptions used in the trip generation process.
- The use of appropriate and agreed traffic modelling software for the assessment of individual junctions.
- Provide With/Without Development assessment for each of the critical junctions taking account of phased delivery.
- Assess significance of development generated traffic upon the surrounding transport infrastructure and identify any necessary mitigation.

## 9B.1 Methodology

This Traffic and Transport Assessment was prepared based on Transport Infrastructure Irelands traffic and Transportation Assessment Guidelines 2014. Other relevant documents consulted include:

- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, EPA, August 2017
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment August 2018
- Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licensing Systems – Key Issues Consultation Paper, Department of Housing, Planning, Community and Local Government, 2017

- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report, European Commission, 2017

The assessment was developed using data from commissioned traffic counts. The scope of this study has been agreed with Cork City Council's Traffic & Transportation Department. Technical Notes have been produced to agree the key parameters relating to the traffic modelling carried out including, junctions to be assessed, trip generation, modal shift targets, trip distribution, assessment years and the presentation of results.

Notwithstanding ongoing consultation with the Traffic & Transportation Department of Cork City Council and through public engagement events, the Design Team, have engaged with An Bord Pleanála, The Department of Education & Skills, Bus Eireann, various departments within Cork City Council and local area residents with a view to consider the respective issues raised as part of the design process of the scheme.

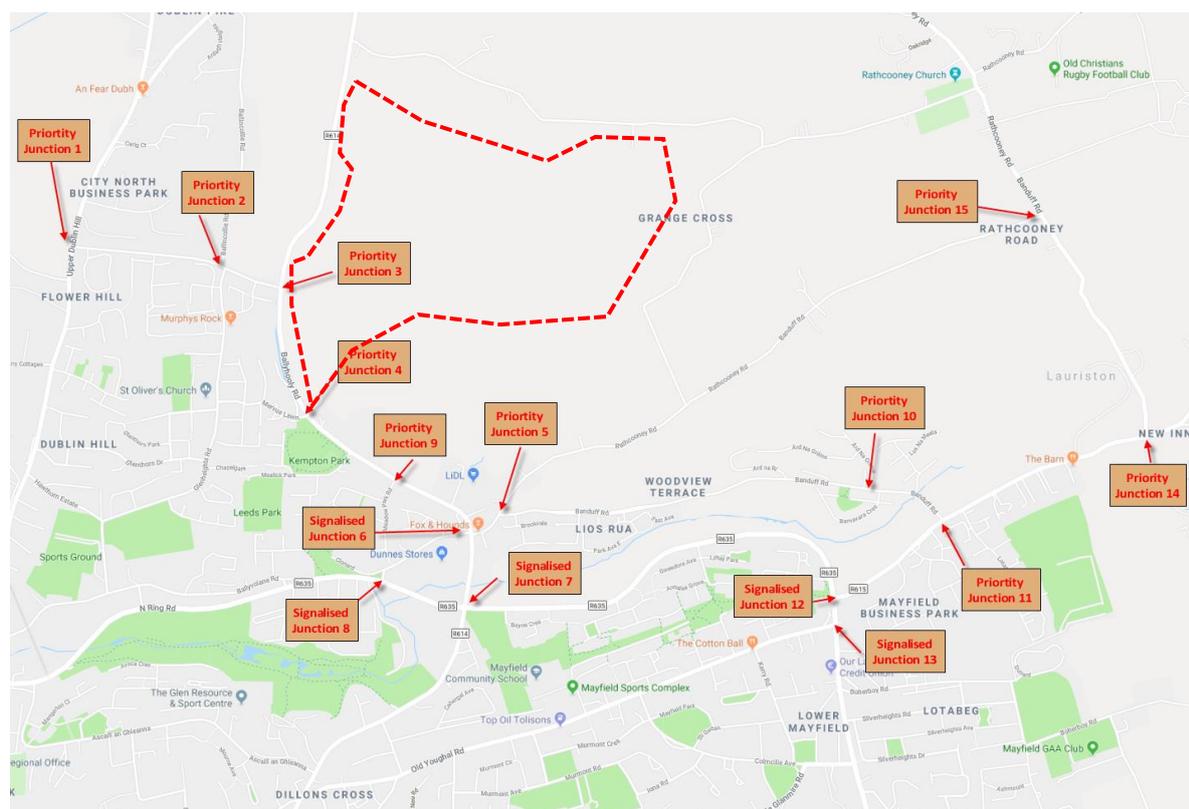
These engagements have informed the final layout of the scheme including access arrangements for vehicular, pedestrian and cycle modes of transport. Access to the north of the site, has been provided to a local road which connects the R614 Ballyhooly Road to the Rathcooney Road. This access has been provided following pre application consultations with ABP; local residents having requested that it not be included. As part of the pre-application process the extent of data collection and the critical links and junctions was agreed with the Local Authority.

A variety of different data sources have been used, including:

- 12-hour classified turning counts (15 sites, refer Figure 9B.1, (note junction labels differ from Fig. 9B.2.));
- Background OS Mapping and aerial photography;
- On-site junction measurements including saturation flows, link speeds, queue length measurements, pedestrian movements at signalled crossings and geometric data for each of the modelled junctions;
- Traffic Signal plan data.

A total of 15 turning count surveys were undertaken as part of the study on Thursday 11<sup>th</sup> April 2019, as outlined in the following figure. These surveys were carried out simultaneously using video cameras at each of the junctions for a 12-hour period. Queue length surveys were carried out at the identified critical junctions (Ref. Fig 9B.2) for the peak hour periods to be modelled, 08:00-09:00 and 17:00-18:00.

On-site measurements including lane widths, junction turning radii, lane lengths and saturation flows were undertaken by MHL at various times in the intervening months. Further site-specific queue length, pedestrian crossing frequency and traffic signal timing surveys were undertaken as part of the calibration of the constructed models. These surveys were carried out when school and college traffic had resumed after the summer period.

**Figure 9B.1** Traffic Count Survey Locations

### *Trip Attraction and Distribution*

This section describes the methodology used in the distribution of development specific traffic onto the modelled network. Figure 9B.1 outlines the location of each of the junctions where turning count movements were recorded over a 12-hour timeframe. This 'snapshot' of existing traffic movements provides a basis for determining desire lines which can be used to assign development traffic at each of the modelled junctions. Given the location of the development site, an assumption was made that a higher percentage of development traffic will travel towards the city during the morning peak than would be the case if the percentage of current two-way flow on Ballyhooley Road fronting the proposed access was used (assumed that 80% of traffic will travel towards the city). This assumption is justified based on the location of schools, shopping, employment centres and access to the wider roads network in the direction of the city.

The resulting distribution matrix can be compared with link flows derived from the NTA SWRM (South West Regional Model) however in the absence of alternative routes (such as the CMATS Northern Orbital Route scheduled to be in place in 2031) the recorded flows will provide a much more accurate picture of current and future year route impacts up to 2031.

With the completion of the Northern Orbital Route as outlined in The Cork Metropolitan Areas Transport Strategy (CMATS), existing travel patterns at each of the modelled junctions are expected to change. It has been assumed that the impact of these changes has been assessed using the South West Regional Model SWRM as part of CMATS and will include the development of zoned lands (such as the Longview Site). The constructed CMATS traffic model will also have included for improvements to bus frequency on dedicated bus corridors as well as specific junction improvement works proposed.

When developing the traffic models of the six critical junctions identified in this chapter, as part of this traffic and transport assessment, future year scenarios after 2023 include for proposed junction improvement works (Ballyhooly Transport Corridor Scheme) at Junction 2: The Fox & Hounds Junction and Junction 3: North Ring Road / Ballyhooly Road as described below.

Traffic flow matrices have been developed for each phase of the development for the following scenarios:

- 2019 Current Year Flows AM/PM
- 2022 AM/PM With/Without Dev
- 2023 AM/PM With/Without Dev
- 2024 AM/PM With/Without Dev
- 2025 AM/PM With/Without Dev
- 2026 AM/PM With/Without Dev
- 2027 AM/PM With/Without Dev
- 2029 AM/PM With/Without Dev

These flow matrices are included in Appendix 9B.1.

## 9B.2 Existing Environment

This section describes the base data used to develop the junction models, the critical links and junctions as agreed with the Local Authority, committed transport proposals to the area and other surrounding proposed development.

### 9B2.1 Planning Background

The lands at Ballyvolane have been earmarked for significant population growth since the Cork Area Strategic Plan Update 2008 and the Cork County Development Plan 2009. The previous LAP, the Blarney Electoral Area Local Area Plan 2011 and 2015 Update, designated the lands as a Special Policy Area (X-01) noting that a masterplan should be prepared to inform the future development of these lands. This Masterplan was not prepared, and the objective has been superseded by the creation of a traditional zoning framework in the 2014 Cork County Local Area Plans (in this case the Cobh MD LAP).

The lands are zoned for development in the current Cobh Municipal District Local Area Plan 2017 as follows:

- NE-R-08 and NE-R-09 for Medium B residential development;
- NE-C-01 for proposed primary and secondary school;
- NE-O-04 for open space for public recreation as an urban park. The amenity parkland should provide passive amenity for residents of the North Eastern suburbs and the site. It should also contain the necessary walkways and cycle--ways for accessibility between residential, business, retail and community uses.

The NE-O-04 for open space for public recreation / passive amenity is also bounded by a road's objective, NE-U-03 for a service road within Ballyvolane and NE-U-06, the Mayfield Kilbarry Link Road. Isochrone mapping demonstrating the location of the site within the context of local services and amenities is included in Section 6.0 of this report. A master plan

is included which highlights the advantages the site location has in terms of promoting sustainable transport solutions.

The proposed development of these lands for residential development is in accordance with the Core Strategy of the Cork County Development Plan which sees the North Environs as part of the main engine of population and employment growth for the region. At a regional level the importance of the Ballyvolane Urban Expansion Area is also evident in the draft Regional Spatial and Economic Strategy for the Southern Region and the draft Cork Metropolitan Area Transport Strategy (CMATS).

The lands are being actively promoted for significant residential development at local and regional planning policy levels. On this basis the proposed development in this planning application is a plan led development that is entirely suitable at this location.

### *9B2.2 Site Location*

The application site is located on land adjacent to the R614 Ballyhooly Road, to the south of the R616 regional road which connects to the R639 which connects onwards to the M8 south of Watergrasshill, and north of the junction of the R614/Kilbarry Link Road, which provides an alternative to the North Ring Road when connecting to the N20 Cork Limerick National Route. The site currently comprises agricultural open land and is bound to the north by a local road (L-2976-0) linking the Ballyhooly Road to Rathcooney Village. This northern road is rural in nature with a narrow carriageway and reduced forward visibility at bends.

The site is currently served by a number of existing field gate accesses off the Ballyhooly Road and the L-2976-0. The site at present generates little or no traffic other than for farm related activities.

### *9B2.3 Existing Road Network*

The key junctions in the area surrounding the proposed development are shown in Figure 9B.2 and are as follows:

- Junction 1. Kilbarry Link Road / Ballyhooly Road
- Junction 2. The Fox & Hounds Junction
- Junction 3. North Ring Road / Ballyhooly Road
- Junction 4. Kilbarry Link Road / Upper Dublin Hill
- Junction 5. Banduff Road / Rathcooney Road
- Junction 6. North Ring Road / Clonard Road

**Figure 9B.2 Junction Locations**

#### *R614 Ballyhooley Road to the Fox & Hound Junction:*

The Ballyhooley Road is a single carriageway, two-way road, characterised by two distinct sections, a section which currently fronts the site with no pedestrian footpath (posted speed limit of 80km/hr) and to the south of the site an area (posted speed limit 50 km/hr) which kicks in just north of the Kilbarry Link Road and which develops a footpath approximately 500m south of the site at the entrance to the residential estate, Mervue lawn. From this junction south there is footpath provision to The Fox & Hounds Junction, approximately 800m.

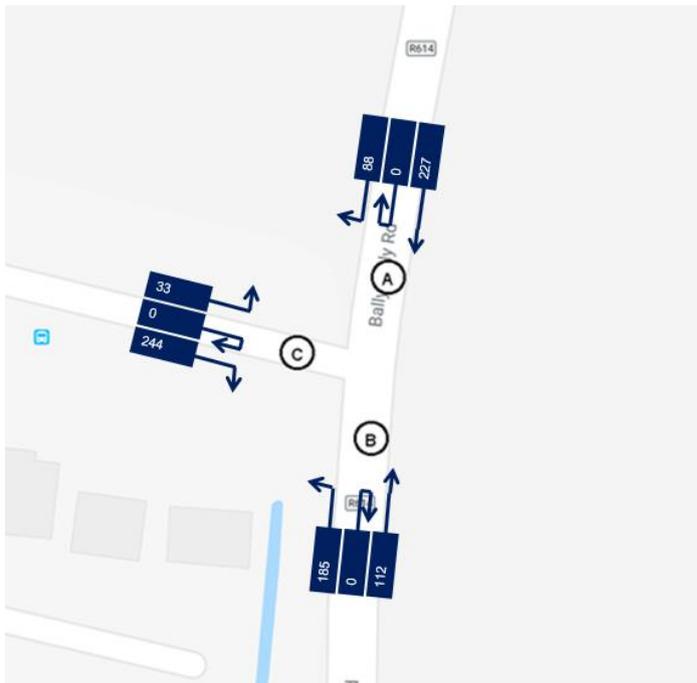
The measured AADT (Annual Average Daily Traffic) on the R614 as it passes the site is, 4,105.

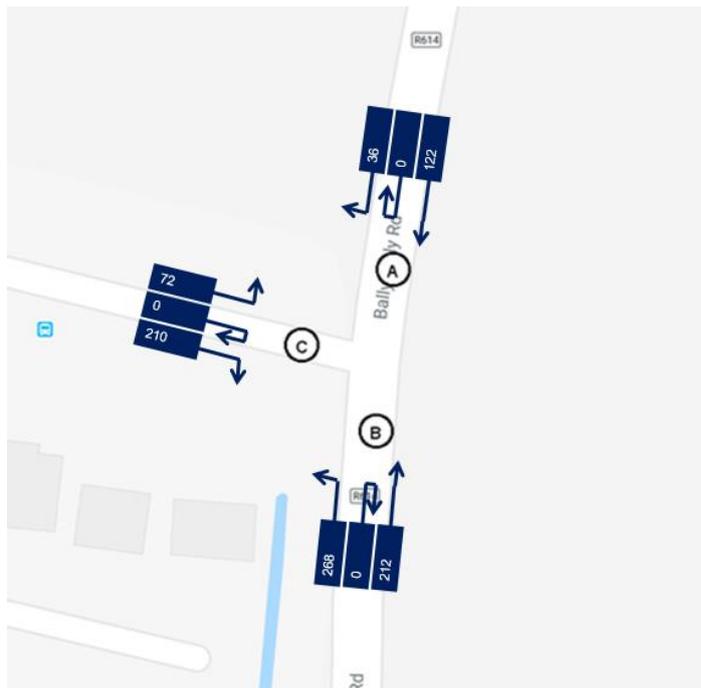
The R614 forms a priority 'T' junction with the Kilbarry Link Road as demonstrated in Figures 9B.3 and 9B.4. Traffic count data shows a significant number of right turners exiting the Kilbarry Link Road onto the Ballyhooley Road over the 12-hour survey period.

**Image 9B.1** Junction of Kilbarry Link Road/R614 Ballyhooly Road



**Figure 9B.3** Junction of Kilbarry Link Road/R614 Ballyhooly Road – AM Peak Hour Flows



**Figure 9B.4** Junction of Kilbarry Link Road/R614 Ballyhooly Road – PM Peak Hour Flows**L-7094 Kilbarry Link Road:**

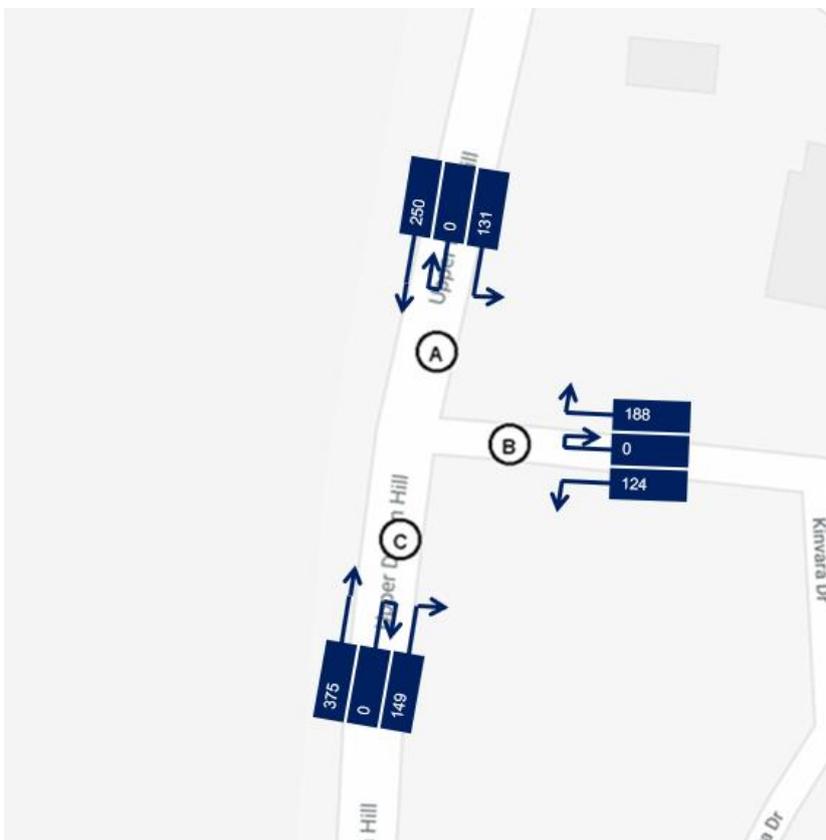
The Kilbarry Link Road is a single carriageway (7.0m), two-way road with a posted speed limit of 50kph. This road links the R614 Ballyhooly Road to Upper Dublin Hill and provides local access to the residential estates of Brookwood, Kinvara Close, Kinvara Avenue and Kinvara Drive via priority 'T' junctions. Upper Dublin Hill serves as an alternative route for traffic heading to or coming from the M8 to the N20 Limerick Road via Blackpool.

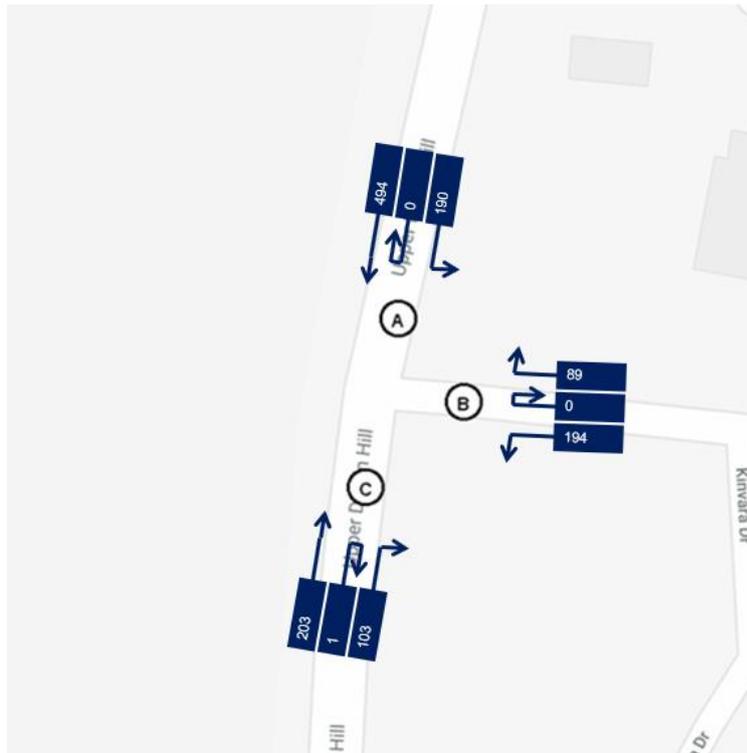
A 2.0m footpath runs the length of the road on the southern side with a 1.0m grass verge separating the carriageway, evident in Image 9B.2 below. The 207 Bus service has two stops, the nearest stop being 300m from the main entrance to the proposed development lands and 50m from the proposed cycle way/footpaths on the eastern side of the Ballyhooly Road. This city-wide service connects Ballyvolane, via the city centre to the southern suburb of Douglas.

**Image 9B.2** Junction of Kilbarry Link Road/Upper Dublin Hill



**Figure 9B.5** Junction of Kilbarry Link Road/Upper Dublin Hill – AM Peak Hour Flows



**Figure 9B.6** Junction of Kilbarry Link Road/Upper Dublin Hill – PM Peak Hour Flows*R614 Ballyhooly Road south of the Fox & Hounds:*

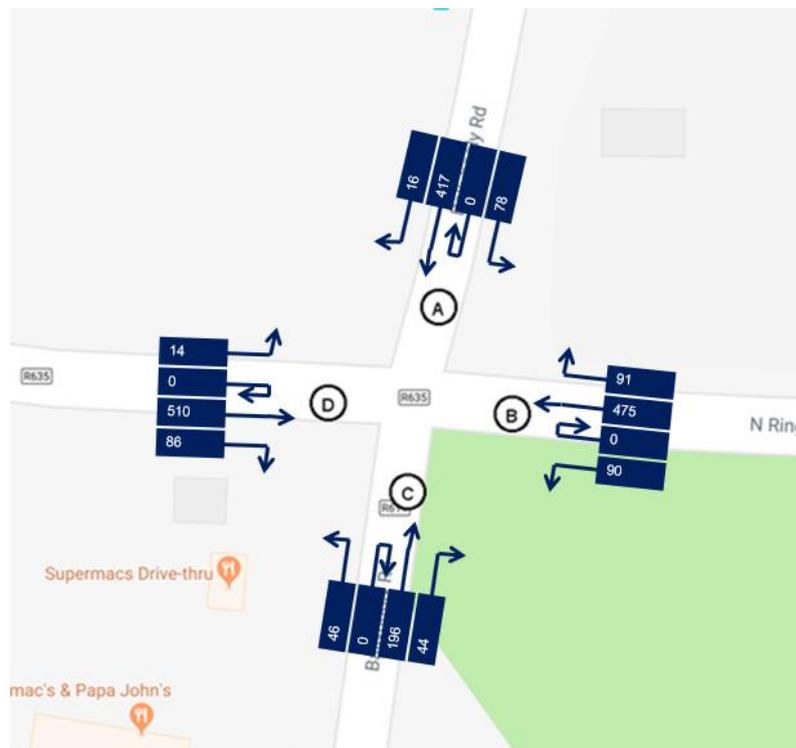
The R614 south of the Fox & Hounds Junction is an urban commuter link which intersects the R635 North Ring Road junction via a traffic-signal controlled junction and continues via Dillons Cross and St. Luke's Cross to Patrick's Quay in the city centre. The route from the city centre to Dillons Cross is a major bus route with the following services: 207, 207A, 208 and 209. Upgrade works as part of Phase I of the Ballyvolane Strategic Transport Corridor (BSTC) have been carried out which provides bus and cycle facilities from the junction of Gordon's Hill to the North Ring Road. Image 9B.3 shows the junction of North Ring Road with the recently upgraded R614 Ballyhooly Road.

**Image 9B.3** Junction of R614 Ballyhooly Road/North Ring Road*R635 North Ring Road:*

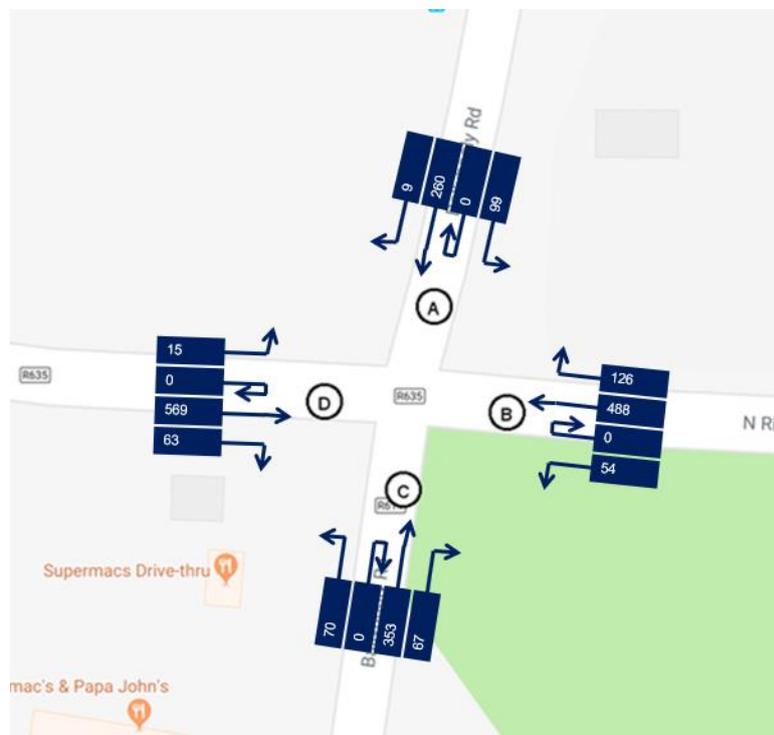
The R635 North Ring Road serves as the main northern orbital route of Cork City, linking the N8 at the Tivoli Junction with the N20 at Blackpool. In addition to bypass traffic it also caters for significant commuter traffic from outlying areas via the Ballyhooly Road and the Old Youghal Road. The posted speed limit on this route is 50kph and it serves an AADT of 15,541. The carriageway cross-section varies considerably.

**Image 9B.4** R635 North Ring Road

**Figure 9B.7** Junction of R614 Ballyhooly Road/North Ring Road – AM Peak Hour Flows



**Figure 9B.8** Junction of R614 Ballyhooly Road/North Ring Road – PM Peak Hour Flows



*R614 Fox & Hounds Junction:*

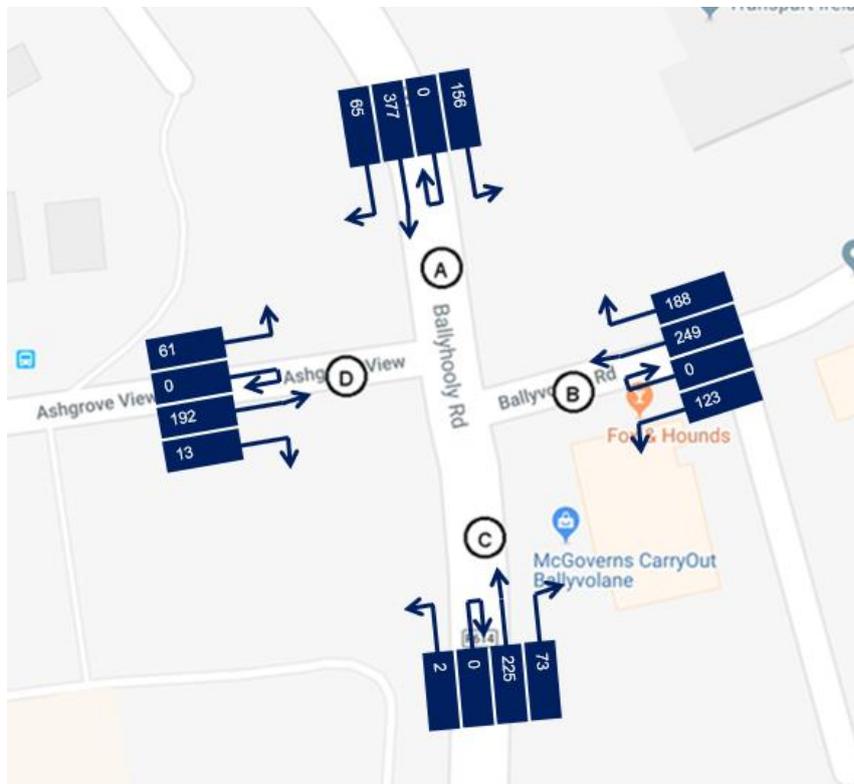
The Fox Hounds Junction is a traffic-signal-controlled staggered cross-roads junction at the intersection of the R614 Ballyhooly Road/Ashgrove View Road and the Banduff/Rathcooney

Road. The Banduff Road acts as a 'rat-run' for Glanmire traffic during peak periods via the 'Old Youghal Road'.

**Image 9B.5** The Fox & Hounds Junction



**Figure 9B.9** The Fox & Hounds – AM Peak Hour Flows



**Figure 9B.10** The Fox & Hounds – PM Peak Hour Flows

#### 9B2.4 Existing Public Transport and Pedestrian/ Cycle Facilities

The closest public bus route serving the site is the 207, the terminus of which is approximately 300m from the site entrance (5mins walk). Route 207 runs from Ballyvolane to Donnybrook via Cork City centre with terminus at Glenheights Park, Glenheights Road in Ballyvolane on the North of the City and at Scairt Cross, Donnybrook on the South side. The route services Glen Rovers Hurling Club, Ballyvolane Business Park, Ballyvolane Shopping Centre, Cork City Centre and Douglas via the main Douglas Road in the south side. Services depart from Glenheights Park every 30 minutes from 0710 hours to 2300 hours on Mondays to Saturdays. Sunday services are every thirty minutes from 0930 to 2300 hours.

The outbound route runs from Donnybrook to Ballyvolane through Patrick Street with the same frequency as the inbound route. The inbound route commences at Glenheights Park in the north side of the city near Glen Rovers GAA Club, travels past Ballyvolane Business Park, then east along the North Ring Road, northeast along Ballyvolane Road past Ballyvolane Shopping Centre, then south along Ballyhooly Road through Dillon's Cross, St. Luke's Cross and down Summerhill North, through Brian Boru Street and crossing the River Lee at Brian Boru Bridge to the Bus Station at Parnell Place before continuing on its southbound path through the city centre.

The outbound/northbound route differs from the southbound path, as it follows the inbound path along the Ballyhooly Road from the City Centre to Ballyvolane Shopping Centre, where it continues northward along Ballyhooly Road as far as Ballyhooly New Road, passing Brookwood, Upper Kinvara Road and emerging onto Dublin Hill Upper in the vicinity of City North Business Park, Kilbarry Business Park and Industrial Estate in Blackpool. From here the route heads south again along Dublin Hill Middle and turns eastward through Glenthorne Drive to the terminus at Glenheights.





9B2.5 Existing Traffic Conditions

As noted traffic count surveys were carried out at the locations identified above on 11<sup>th</sup> April. The following figures present the recorded 12-hour traffic profile, percentage of classified vehicles and turning movements for each of the modelled junctions carried out on Thursday 11<sup>th</sup> April 2019:

Figure 9B.13 Junction 1 Ballyhooly Road/Kilbarry Link Road

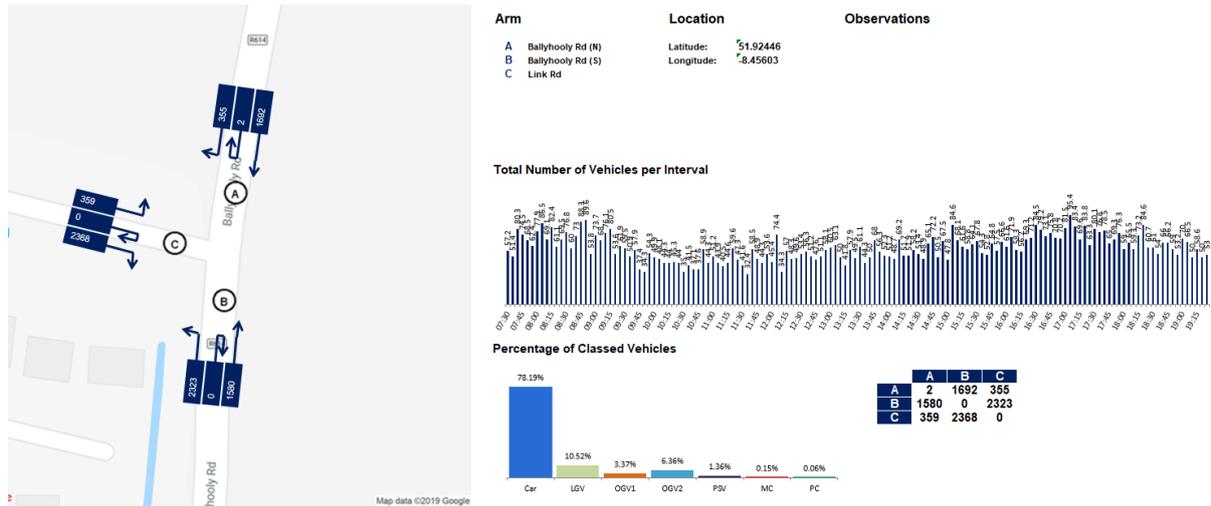
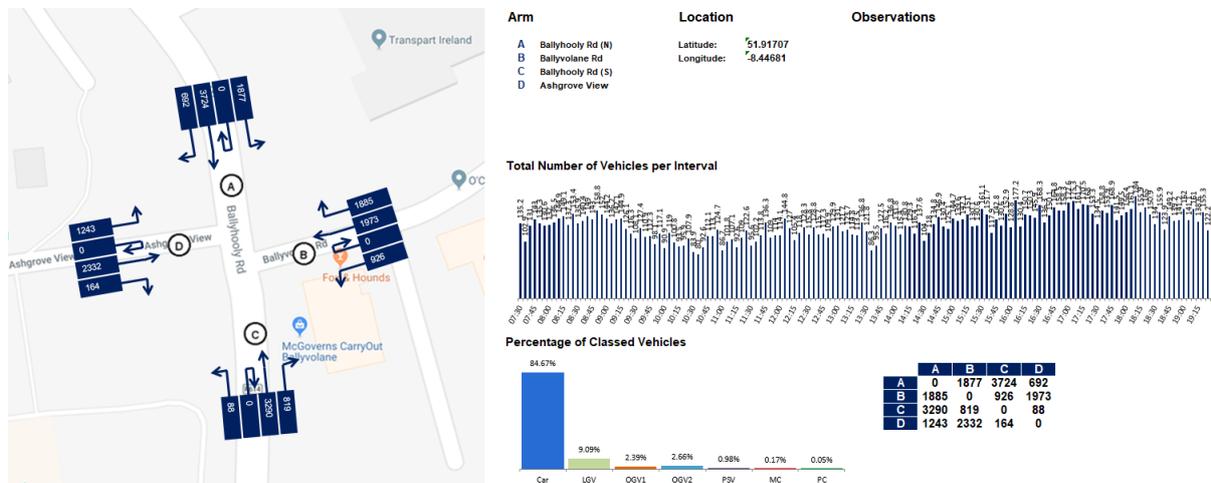
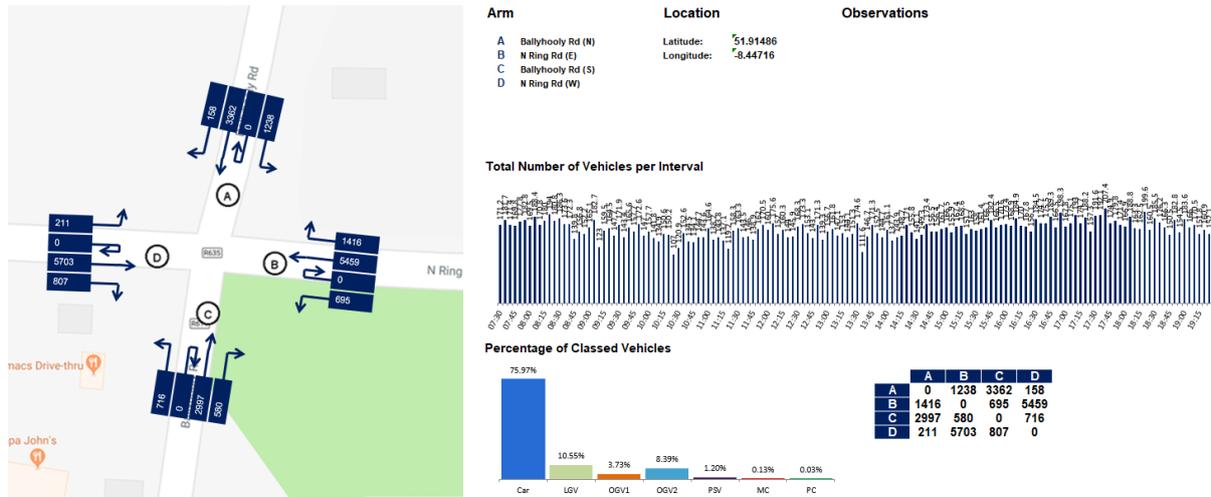


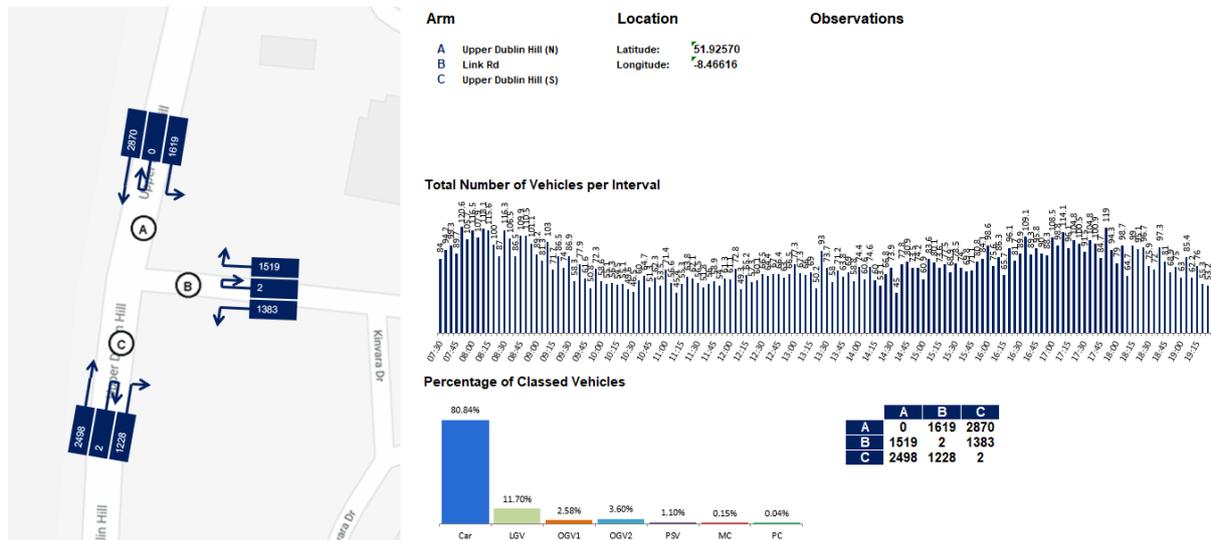
Figure 9B.14 Junction 2: Fox & Hounds Junction



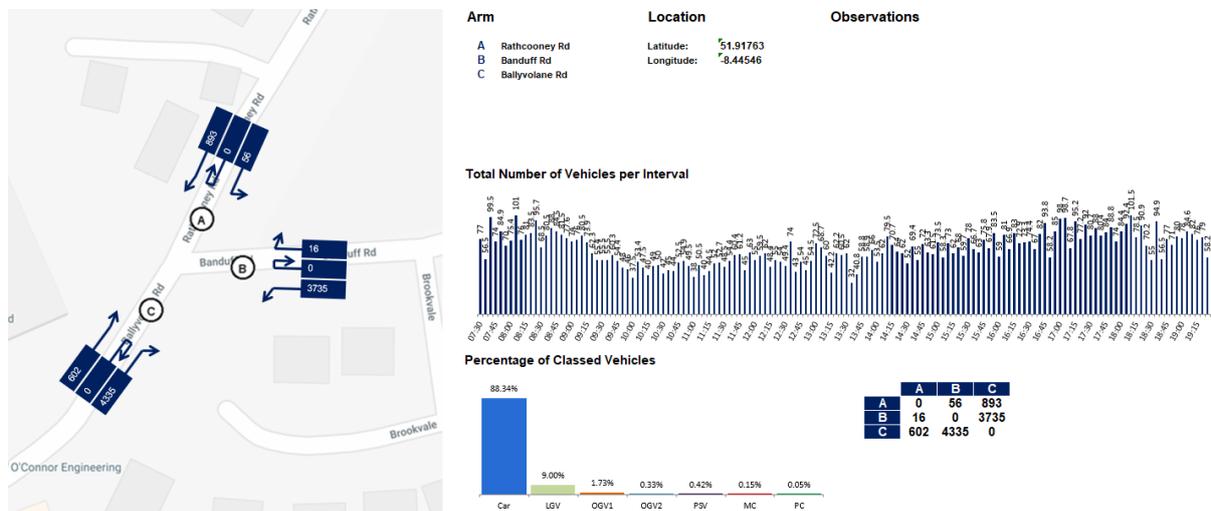
**Figure 9B.15** Junction 3: R635, North Ring Road/ R614 Ballyhooly Road Junction



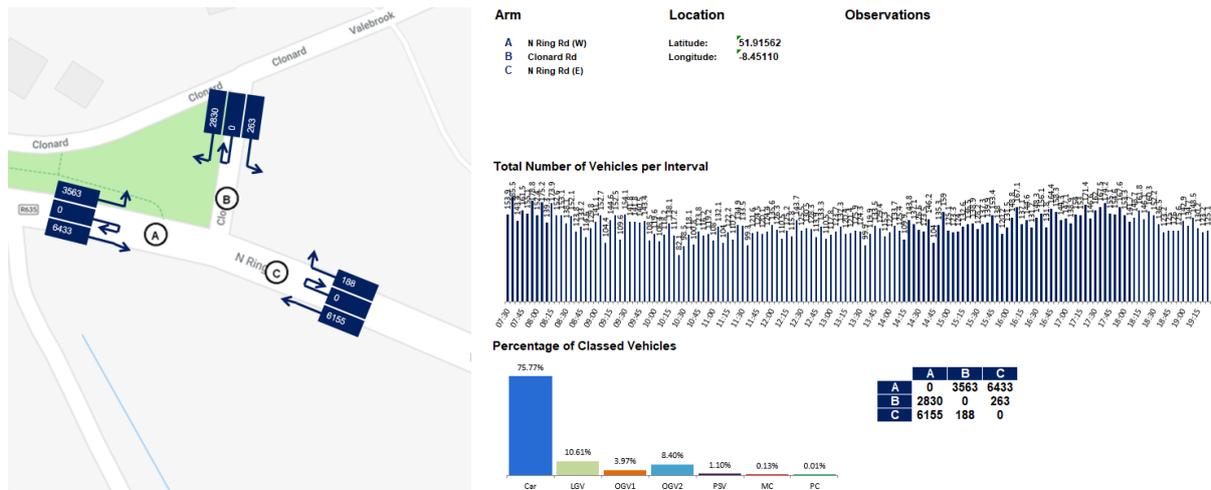
**Figure 9B.16** Junction 4: Kilbarry Link Road/ Upper Dublin Hill Junction



**Figure 9B.17** Junction 5: Rathcooney Road/Banduff Road Junction



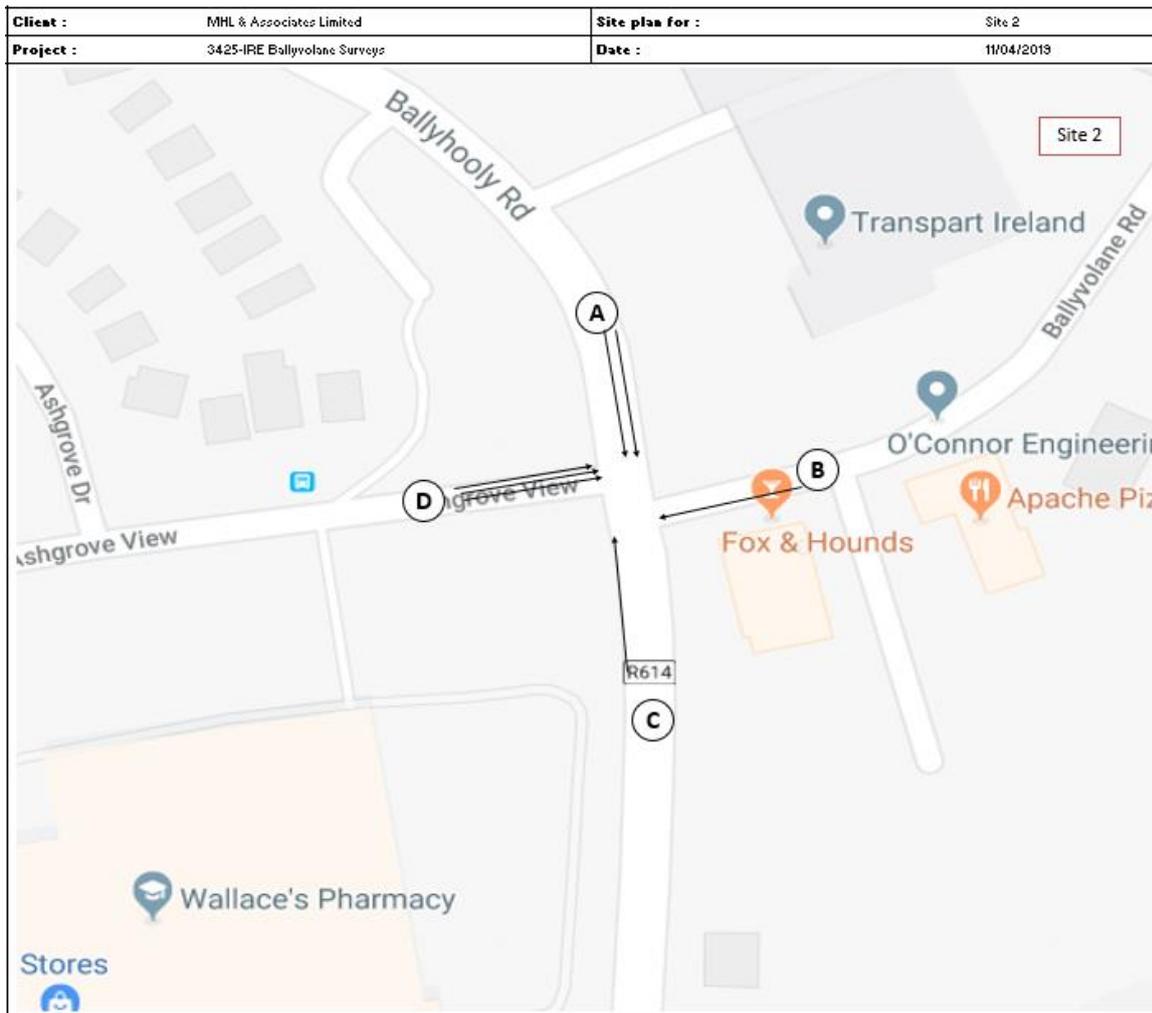
**Figure 9B.18** Junction 6: R635, North Ring Road/Clonard Road Junction



The data presented in the above figures clearly shows the peak hour traffic periods for both morning and evening, 08:00-09:00 and 17:00-18:00 respectively. It is noted that for the major routes such as the R635 the peak is less defined and extends beyond the time-period modelled but definitely coincides with the minor road peaks.

The percentage of classified vehicles was used within the generated traffic models to accurately reflect existing conditions. The following Junction Location Diagrams and associated Tables present the average recorded queue lengths (measured in metres) for each of the approaches at specific junctions for the critical time periods. This data has been used to calibrate the 2019 current year traffic models

**Figure 9B.19** Junction 2: Fox & Hounds Junction – Queue Length Survey Site Plan



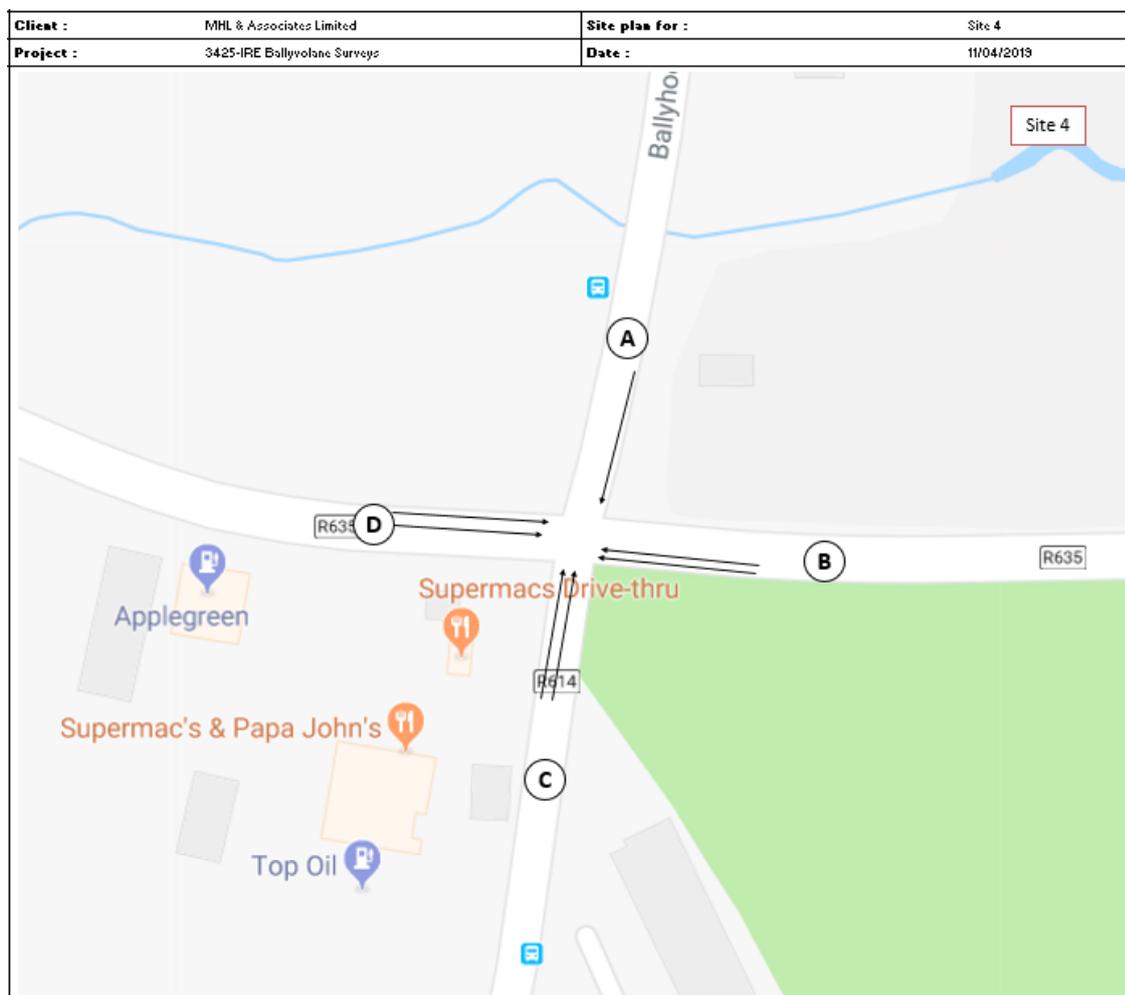
**Table 9B.1** Junction 2: Fox & Hounds Junction – AM Queue Length Survey

	<b>* reaches next junction</b>			Arm B	Arm C	Arm D		
	Arm A		NS			Middle	OS	
	NS	OS						
08:00	5	0	25	20	5	0	0	
08:05	60	5	80	0	0	0	0	
08:10	105+	0	50	25	0	15	0	
08:15	30	15	125+	10	0	0	0	
08:20	75	0	130+	15	0	20	0	
08:25	35	5	90	0	0	5	0	
08:30	40	0	40+	50	10	5	5	
08:35	47.5	0	25	5	5	30	0	
08:40	20	0	90	10	5	45	0	
08:45	55	10	85	65	5	5	0	
08:50	52.5	0	75	5	10	20	5	
08:55	45	10	27.5	50	0	5	0	
09:00	20	0	60	5	10	0	0	

**Table 9B.2** Junction 2: Fox & Hounds Junction – PM Queue Length Survey

	<b>* reaches next junction</b>			Arm B	Arm C	Arm D		
	Arm A		NS			Middle	OS	
	NS	OS						
17:00	40	0	70+	90	5	25	0	
17:05	40	5	70+	10	10	30	0	
17:10	30	10	50+	20	15	70	0	
17:15	85	0	100+	70	10	30	15	
17:20	40	0	65	65	5	10	0	
17:25	15	10	75+	60	10	60	5	
17:30	25	5	100+	40	5	22.5	0	
17:35	30	0	60+	10	5	40	0	
17:40	35	0	100+	115	5	30	0	
17:45	45	0	50+	140	5	10	15	
17:50	10	0	105+	40	0	10	0	
17:55	20	0	60+	145	20	20	0	
18:00	20	5	60+	100	20	45	5	

**Figure 9B.20** Junction 3: R635, North Ring Road/ R614 Ballyhooly Road – Queue Length Survey Site Plan



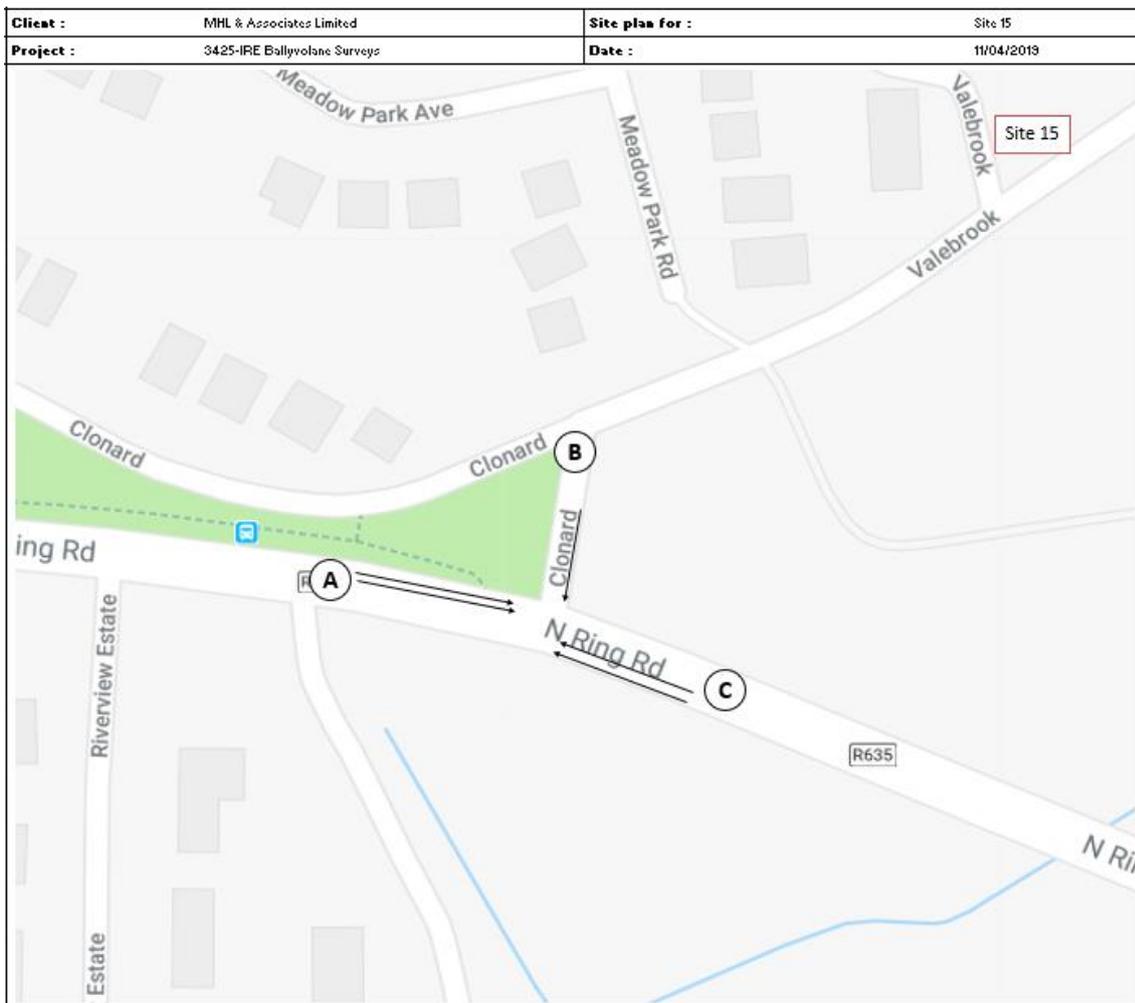
**Table 9B.3** Junction 3: R635, North Ring Road/ R614 Ballyhooly Road – AM Queue Length Survey

	* reaches next junction							
	Arm A	Arm B		Arm C		Arm D		
		NS	OS	NS	OS	NS	OS	
08:00	135	175	10	40	15	100	5	
08:05	172.5*	165	0	15	5	55	0	
08:10	87.5	115+	10	5	5	90	5	
08:15	110	100	0	35	15	75	25	
08:20	90	95	10	5	10	30	5	
08:25	80	35	30	40	5	35	10	
08:30	70	125	10	45	10	30	10	
08:35	80	100	15	20	5	60	5	
08:40	25	90	5	35	20	55	5	
08:45	40	25	5	5	10	55	30	
08:50	50	95	15	25	5	30	5	
08:55	60	60	0	40	5	40	0	
09:00	30	120	5	45	10	10	2.5	

**Table 9B.4** Junction 3: R635, North Ring Road/ R614 Ballyhooly Road – PM Queue Length Survey

	* reaches next junction							
	Arm A	Arm B		Arm C		Arm D		
		NS	OS	NS	OS	NS	OS	
17:00	25	110+	35	65	5	55	0	
17:05	40	100	10	75	10	105	10	
17:10	40	80	40	50	10	55	10	
17:15	55	32.5	10	75	5	105	10	
17:20	70	105	5	30	20	40	5	
17:25	55	95	5	40	20	110	10	
17:30	55	110	0	32.5	15	75	10	
17:35	65	105	15	95+	5	75	10	
17:40	30	55	5	30	10	45	5	
17:45	45	60	30	50	20	30	0	
17:50	20	105	10	45	20	35	0	
17:55	10	15	20	25	15	70	10	
18:00	95	45	10	90	0	155	10	

**Figure 9B.21** Junction 6: R635, North Ring Road/Clonard Road Junction – Queue Length Survey Site Plan



**Table 9B.5** Junction 3: R635, North Ring Road/ R614 Ballyhooly Road – AM Queue Length Survey

	Arm A			Arm B		Arm C	
	NS	OS				NS	OS
08:00	5	0		55		25	0
08:05	35	0		95		10	0
08:10	5	0		115		5	0
08:15	25	5		60		35	0
08:20	25	5		30		0	0
08:25	5	10		30		25	0
08:30	0	5		60		0	0
08:35	25	0		10		95	0
08:40	0	0		15		5	5
08:45	0	0		20		0	0
08:50	20	0		15		0	0
08:55	5	0		30		5	0
09:00	0	0		30		15	0

**Table 9B.6** Junction 3: R635, North Ring Road/ R614 Ballyhooly Road – PM Queue Length Survey

	Arm A			Arm B		Arm C	
	NS	OS				NS	OS
17:00	10	0		10		10	0
17:05	5	0		10		0	0
17:10	10	5		10		25	10
17:15	5	0		27.5		25	5
17:20	65	0		40		15	0
17:25	45	5		40		30	0
17:30	15	5		0		20	0
17:35	15	0		25		15	5
17:40	35	5		15		0	0
17:45	5	0		40		40	0
17:50	70	5		30		110	0
17:55	55	10		25		60	0
18:00	35	10		25		75	5

### 9B2.6 Committed Transport Proposals

Cork City Council in association with the National Transport Authority have recently appointed a design team to design and deliver Phase II of the Ballyvolane Strategic Transport Corridor Project: North Ring Road to Ballincolly (BSTC).

The BSTC project objective is to deliver:

- Enhanced facilities for all road users but with particular benefits for pedestrians, cyclists and public transport users while providing, in as much as possible, for the

efficient movement of vehicular traffic within the study area, refer Figure 9B.22

- To deliver the preliminary design drawings, including drawings required for a public consultation and potential Part VIII planning application process; and
- To facilitate the appointment of a Contractor through a tender process to deliver the works within a specified timeframe (2023).

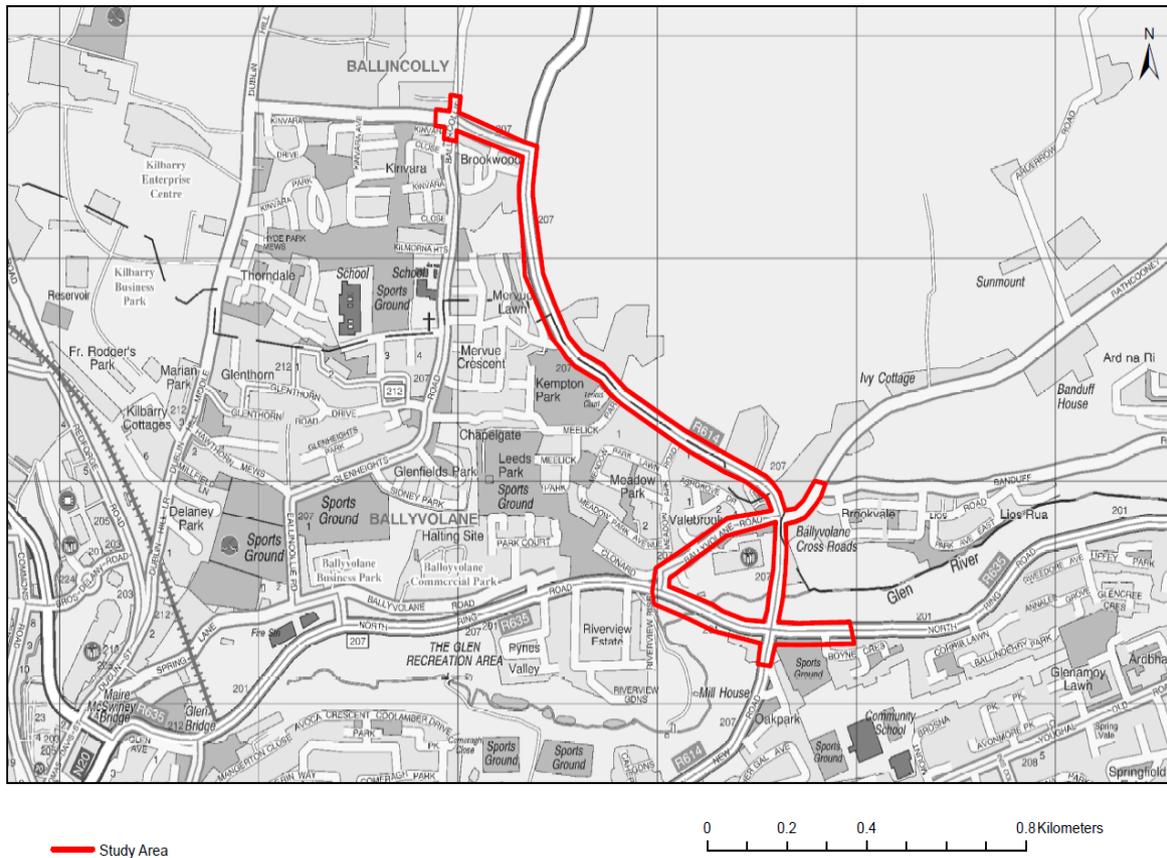
The BSTC study area includes all of the junctions and links being assessed as part of this application. The Project is based on a previous study that looked at individual junctions on this route (The Northern Corridors Study) which provided proposed junction upgrades to prioritise public transport and to reduce journey times to the city centre. This office was involved in the previous study and has most recently been appointed to deliver Phase II, Figure 9B.22.

Future year modelling as set out in this report has included the delivery of junction upgrade works as outlined in the original study. This is based on the assumption that the previously identified works will be provided as a minimum as part of the new scheme. Part VIII approval has already been issued for the upgrade of the Ballyhooly Rd North Ring Road junction upgrade.

The improvement works that have been included in future year traffic models from 2023 onwards for the BSTC, based on the findings of the previous Northern Corridors Transport Study, include;

- Right turn lane at Fox and Hounds Junction from Banduff Road
- Dedicated off road bus shelters
- Cycle lanes
- New Junction layout to North Ring Road / Ballyhooly Road as per approved Part VIII
- Pedestrian Crossings

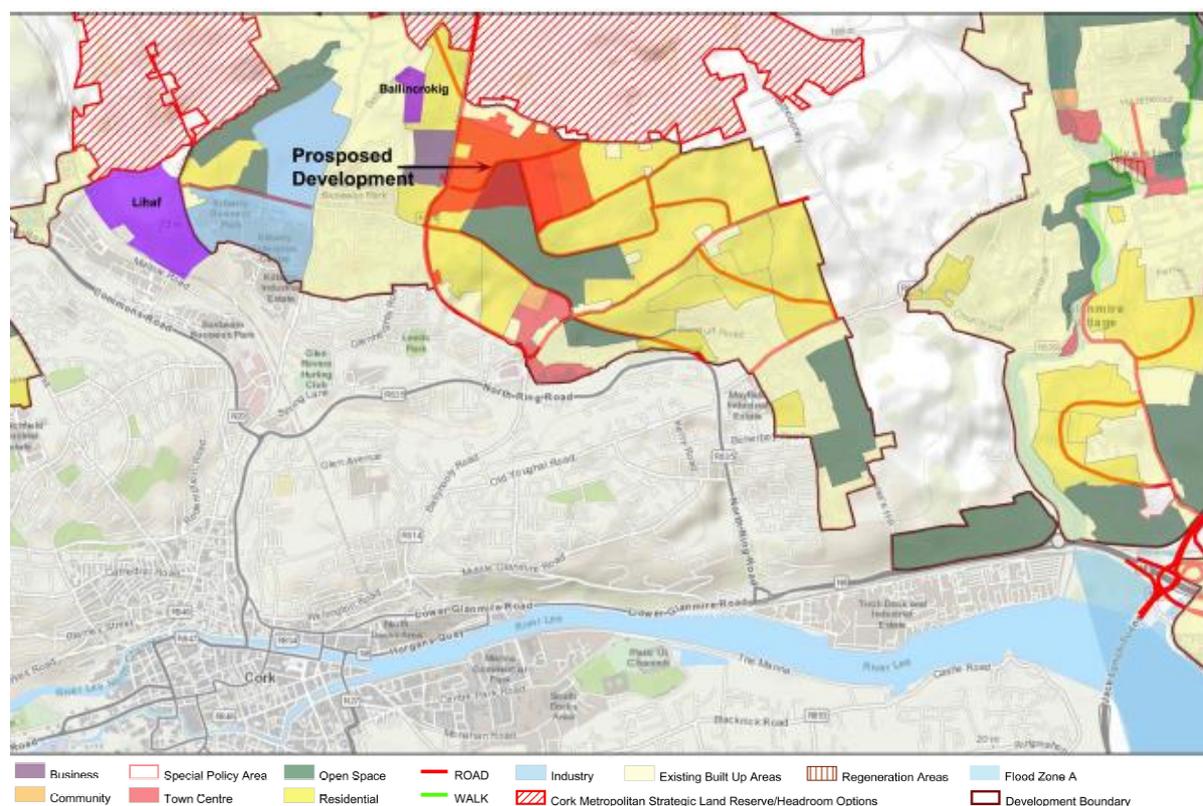
**Figure 9B.22 BSTC – Study Area**



As outlined in the current LAP for the area comprising the development lands, the overall Urban Expansion Area (UEA), considers the provision of a number of Distributor Roads (NE-U-01 to NE-U-10) throughout the zoned lands as indicated below. The proposed main access road serving the development, NE-U-03, has been agreed with the Local Authority in terms of geometric requirements and will ultimately serve as the template for the provision of the remaining routes in this area for cross section, carriageway widths, bus and cycle provision.

Evident from Figure 9B.23 is the critical nature of NE-U-03 and the role it will play in facilitating access to the various zonings, ultimately serving as an alternative route for public transport provision and local commuter traffic in the area. The provision of NE-U-03 as part of this application and its linkage to the Ballyhooly Road is a significant first step in the delivery of the Local Area Plan Objective in this area. While the linkage to the local access road (L-2976-0) linking the Ballyhooly Road to Rathcooney Village is provided the alignment proposed for NE-U-03 has been rerouted to incorporate and provide a portion of the NE-U-04 route and linkage to the NE-U-02. This design proposal creates less distributor road overall in the northern areas of the UEA.

**Figure 9B.23** Local Area Plan: Development site comprises NE-R-08, NE-R-09, NE-C-01 and NE-O-04

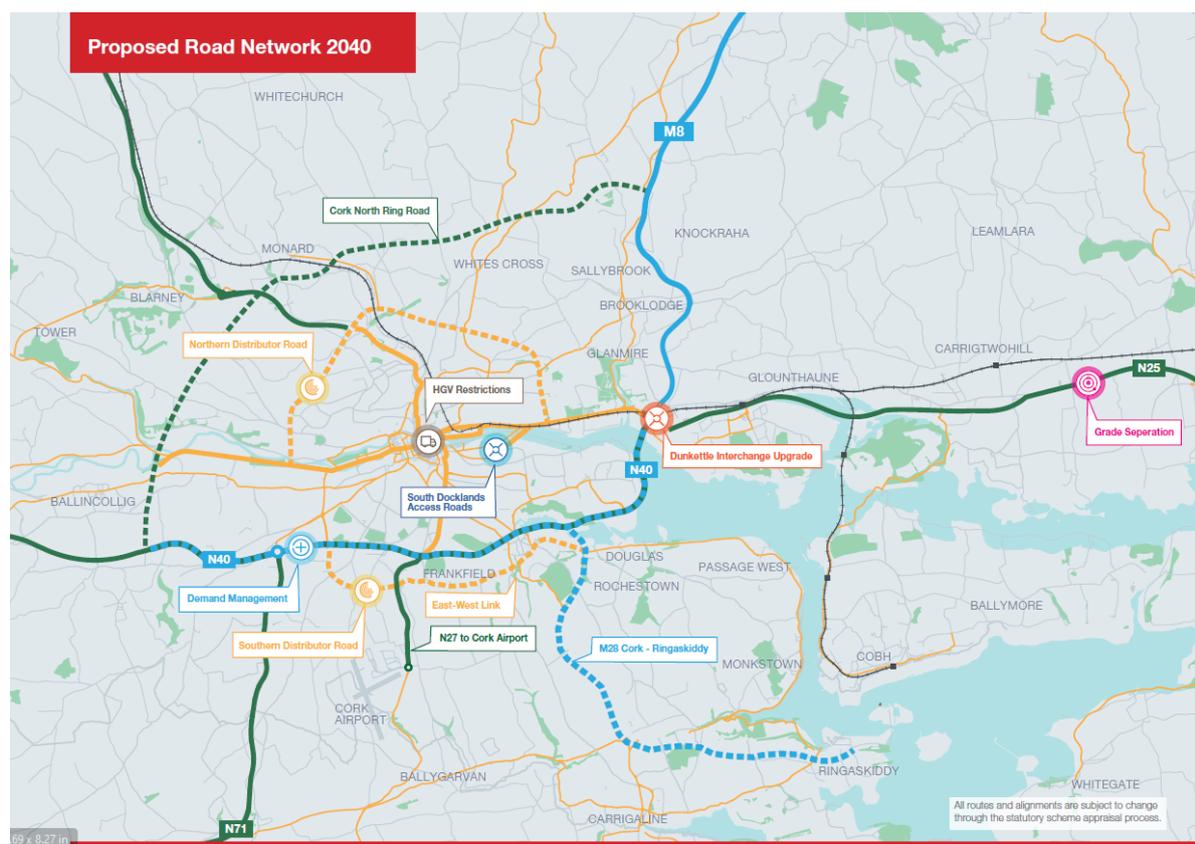


The recent publication of the Cork Metropolitan Area Transport Strategy 2040 (CMATS), currently at public consultation stage, has identified the importance of the Ballyvolane UEA in the delivery of the projected growth in population for Cork City into the future. In order to support this growth in terms of transportation, the strategy proposes a Northern Distributor Road (NDR), an indicative route for which is shown in Figure 9B.24, which coincides with NE-U-06 in the LAP; this is the Mayfield Kilbarry Link Road.

As previously identified the timescale for the delivery of this route is 2031, which will lead to a fundamental change in traffic flow patterns in the area when it is in place. The proposal is not dependent on the delivery of the Mayfield Kilbarry Link Road. It is anticipated that the most pronounced change will be to the existing R635, North Ring Road, as the NDR will fulfil the function of a bypass for N25/M28/N20 bound traffic.

As part of the development of the CMATS document, significant traffic modelling has been carried out using the NTA SWRM (South Western Regional Model) model which, it is understood, has accounted for the completion of the entire Ballyvolane UEA, including the proposed development site. This modelling has included for additional public transport provision as well as improved splits in terms of pedestrian/cycle modes of travel. It has also accounted for the aforementioned change in traffic distribution.

Based on this understanding it has been agreed with the Local Authority that assessing individual junctions beyond the 2029 period is not a requirement of this Traffic & Transportation Assessment. It is assumed that the proposed junction upgrades, provided as part of the BSTC scheme, will be compatible with the requirements of CMATS and will facilitate the delivery of zoned lands in advance of the NDR being in place.

**Figure 9B.24** Extract from Published CMATS document, Northern Distributor Road

### 9B2.7 Surrounding Proposed Development – Cumulative Assessment

The LAP as shown in Figure 9B.23 identifies the zonings in the vicinity of the lands the subject of this application. A number of smaller planning applications have been made within the area that have either been granted or are under consideration. These applications, on surrounding zoned lands, do not deliver on the infrastructural requirements needed to 'open-up' the urban expansion area, nor do they provide the level of residential and other development needed to generate the financial investment in critical services such as Foul Services provision so as to serve the expansion of the planned expansion of the City.

In order to account for traffic generation from adjoining sites, it has been agreed with the Local Authority, that TII Medium Growth Rate factors should be applied to existing background traffic when determining future year scenarios. As an additional factor-of-safety the resulting figures have not been reduced in accordance with an anticipated increase in modal shift with the delivery of the BSTC Scheme.

The future year modelling carried out as part of Draft Cork Metropolitan Area Transport Strategy (CMATS) using the South West Regional Model (SWRM) has included for the complete development of the Ballyvolane urban expansion area which includes all current zoned lands. The mitigation as proposed by this strategy is assumed to be sufficient to cater for all future traffic flows, including the proposed development site, and should give the Local Authority comfort in terms of implementing the Local Area Plan.

### 9B2.8 Road Safety

The R614 Ballyhooly Road adjoining the proposed site operates at an 80kph speed limit. At present this section of road is rural in nature with no pedestrian/cycle facilities and no public lighting. Observed speed was at, or marginally above the posted speed limit in the in-bound direction.

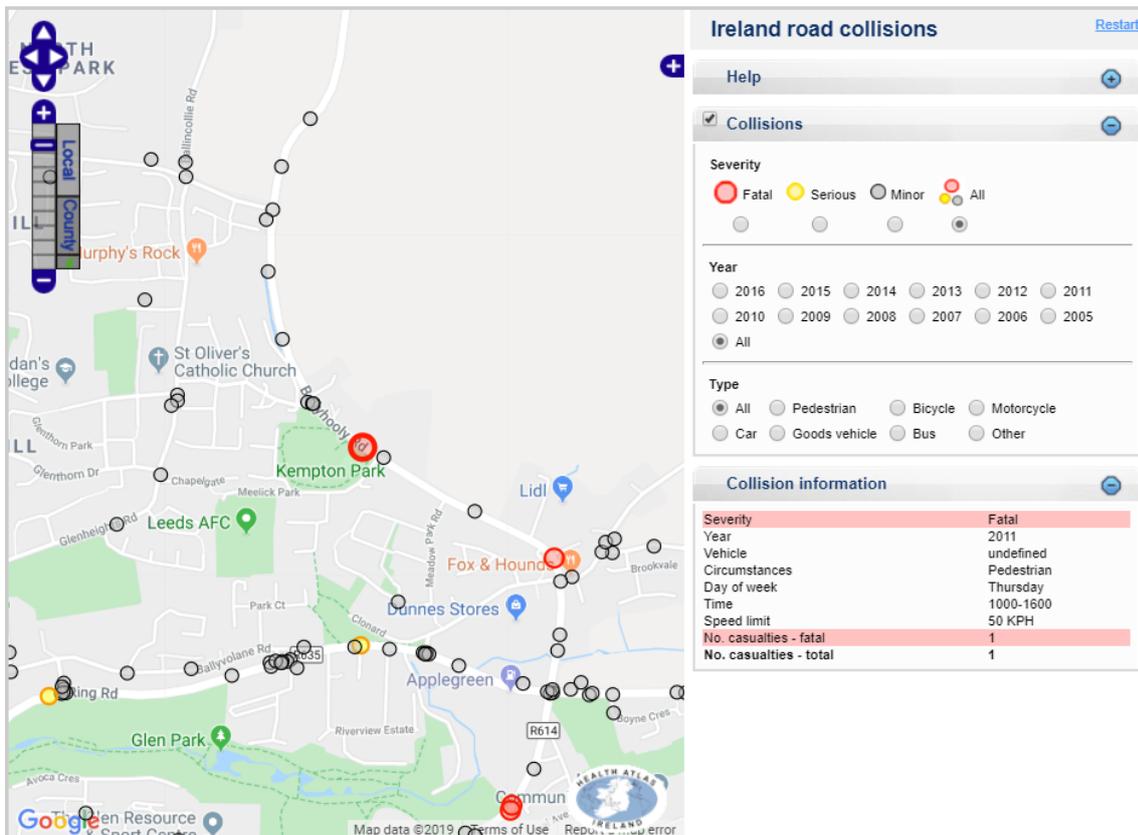
South of the Kilbarry Road Junction (Junction 1 of the modelled network) the R614 gradually becomes more urban with footpaths and public lighting on the approaches to the Fox & Hounds Junction (Junction 2). This traffic signal-controlled junction includes a full all-red pedestrian phase and provides good connectivity to this Local Shopping Area.

The R614/R635 North Ring Road Junction (Junction 3) is another traffic signal-controlled junction with an on-demand pedestrian phase. This junction provides one of the few controlled pedestrian crossings of the North Ring Road with bus stops located on either side. A significant volume of traffic passes through this junction on a daily basis. Upgrade works at this junction have been recently completed, funded by the NTA (National Transport Authority) as part of the development of the Ballyvolane Strategic Transport Corridor. As previously outlined a Phase II of these works will extend north to the Kilbarry Link Road, the Ballyvolane Transport Corridor Scheme currently underway by Cork City Council.

Road Collision Database

A review of the road collision database for the area shows a number of accidents occurring over an 11-year period with two fatal accidents occurring on the R614, refer to Figure 9B.25. One of these fatal accidents involved a pedestrian.

Figure 9B.25 Accident Statistics for Roads in the vicinity of the site



### 9B.3 Description of the Proposed Development

The proposed development on our Client's site is consistent with the zoning which is comprised mainly of NE-R-08 and NE-R-09 for Medium B residential development, zoning NE-C-01 for proposed primary and secondary school campus with playing pitches and NE-O-04 for public recreation as an urban park. The overall vision for the Cork City North Environs is to re-invigorate the northern suburbs of the city as a significant location for future residential development.

Following consultation with the Department of Education & Skills as outlined in Chapter 1 of this EIAR the development of the school campus is not required at this point in time. Current school provision in the area is sufficient for the foreseeable future. The proposed school sites will service the local area and population generated. The Department of Education has advised that there are no plans for schools in the area for the foreseeable future.

As part of this application the NE-O-04 public recreation park will be partially delivered in agreement with the Parks Department of Cork City Council. It is anticipated that up to 753 residential units, crèche and a local neighbourhood centre will be provided as part of this application.

The proposed primary accesses to the site are from Ballyhooly Road (Regional Road R614) by means of two 'Priority 'T' Junctions'. The main spine road access will serve as part of a network of Distributor Roads throughout the Urban Expansion Area and has been developed in consultation with the Local Authorities Traffic & Transportation Department and Strategic Planning Section. This road has been designed in accordance with 'DMURS' and will serve the future school campus site as well as the surrounding residential zoned lands. Ultimately this distributor road will serve as an orbital public transport corridor encompassing the entire expansion area from the Ballyhooly Road to the R615 'Old Youghal Road' and the North Ring Road.

The following Figure 9B.26 presents the scheme layout, the subject of this application.

**Figure 9B.26** Proposed Site Layout



*Phasing*

This section describes the proposed phasing of the scheme in terms of the number of units expected to be completed on an annual basis commencing in 2021.

The following Table 9B.7 presents the anticipated delivery of units over a 10-year period and includes a column referencing 'Modal Shift'. For an explanation of these percentages please refer to Section 9B4.2 of this chapter.

**Table 9B.7** Proposed Phasing of Scheme<sup>1</sup>

Neighbourhoods		N1	N 2	N 3	N 4	N 5	N 6	
<b>Note</b> (Exact Nos subject to final phasing & consent)		75 Units	218 Units (Incl 27 Apts)	63 Units	93 Units	178 Units	126 Units	
<b>Phases</b>	<b>Site Work</b>	<b>Phase 1 –</b>	<b>Phase 2 / 3–</b>	<b>Phase 2 / 3–</b>	<b>Phase 4–</b>	<b>Phase 5–</b>	<b>Phase 6 -</b>	<b>Phase 6- Mid 2027 – 2029</b>

<sup>1</sup> Delivery of all units subject to Multi phase Connection Agreement with Irish Water

		End 2021	End 2022	End 2023	End 2024	End 2025	End 2026	
<b>Indicative House &amp; delivery Programme</b>	Q2 2020 Early 2021	75 units <sup>2</sup>	100 units <sup>3</sup>	100 Units <sup>4</sup>	100 Units <sup>5</sup>	100 Units <sup>6</sup>	125 Units <sup>7</sup>	153 <sup>8</sup> Units (Incl Apts in N2 & N6)
<b>Indicative Cumulative Delivery</b>	0	75	175	275	375	475	600	753
<b>Modal Shift</b>		13% <sup>9</sup>	25%	35%	40%	45%	45%	45%

Traffic generation from the development will commence on the occupancy of the completed units as shown in the above table.

In order to provide a robust assessment of the traffic impact from the development on the existing roads network it was decided to adopt the following measures:

- Incrementally increase the modal shift rate over a number of years (2022-2025; with cycle, pedestrian and bus infrastructure provided in the proposed development and completion of the BTCS)
- Not to apply the increase in modal shift to background traffic flows (which would result in a reduction in junction flows)

The proposed development includes the provision of off-road bus stops on the Distributor Road, bus turning areas adjacent to the school campus, shared cycle/footpaths, pedestrian/cycle permeability throughout the site on designated off-road routes and speed control measures where appropriate. The development of a portion of the adjoining parkland has facilitated the delivery of linear park including cycleways, walkways, exercise and play areas.

Parking is provided in accordance with the Cork County Development Plan standards and is suitably located on site in residential properties, in shared parking areas and in apartment areas including under croft parking in neighbourhood 6. Parking is also provided on the distributor road in parallel bays so as to serve local residential areas. With respect to cycle parking, 580+ dedicated cycle parking provision spaces are proposed as part of the proposed development.

The proposed development has been designed in accordance with the principles of DMURS (Design Manual for Urban Roads and Streets) with all internal roads in housing areas having a gradient of not greater than 5% and good pedestrian connectivity throughout. The main access road will serve as a distributor road that progresses through the entire UEA (Urban Expansion Area) providing for future public transport routes. This has a gradient that exceeds 5% in short rising sections in order to manage topographical changes but is

<sup>2</sup> All Neighbourhood 1

<sup>3</sup> 100 Units from Phase 2

<sup>4</sup> Remainder 91 Units from Neighbourhood 2 and 9 from Neighbourhood 3

<sup>5</sup> 54 Units from Neighbourhood 3 and 46 from Neighbourhood 4

<sup>6</sup> Balance of 47 Units from Neighbourhood 4 and 53 from Neighbourhood 5

<sup>7</sup> Residual Houses in Neighbourhood 5

<sup>8</sup> Balance of Neighbourhood 5 and Neighbourhood 6

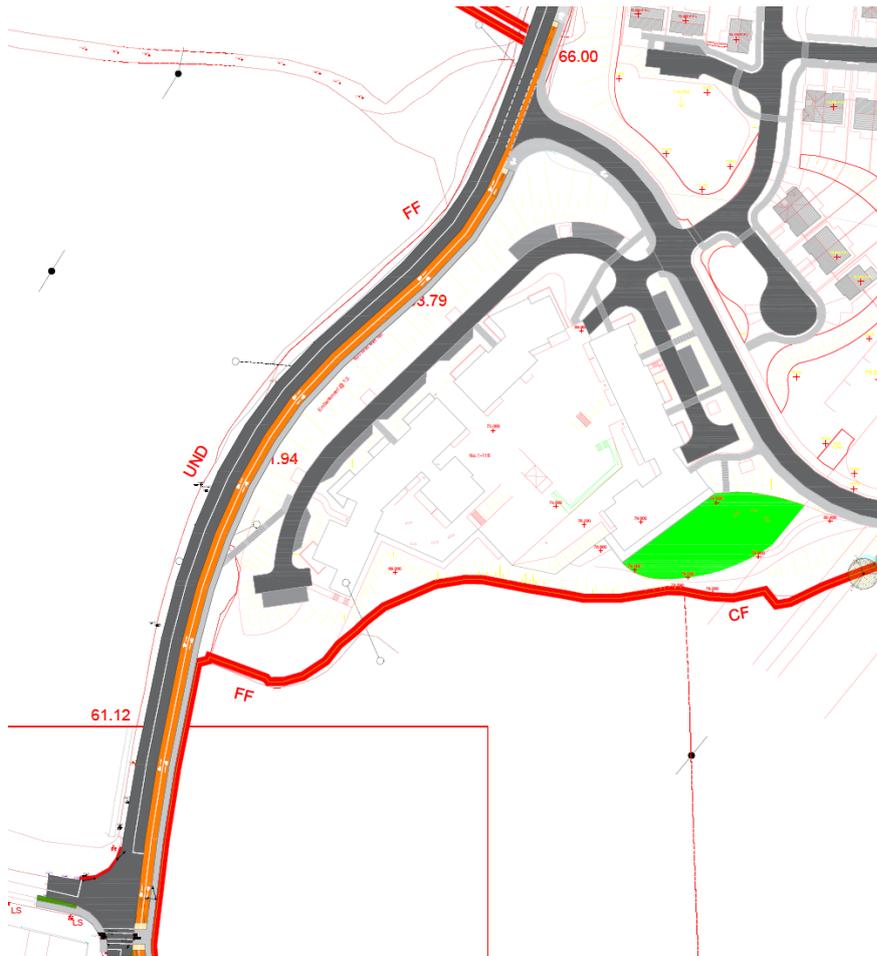
<sup>9</sup> Public Transport and Non-Vehicle use in area currently at 13%

consistent with DMRB in this respect and DMURS where residential units and parking faces this road.

As outlined in this chapter the development of the Ballyvolane zoned area will need to encourage and promote the use of sustainable transport solutions. The inclusion of a school campus site and a Local Retail Centre site in the overall plan for the expansion area, in conjunction with the continued development of the Strategic Transport Corridors, should result in a reduction of trips generated by the scheme helping to achieve the target modal split as set out by the Government.

**Figure 9B.27** Proposed Development Access Junctions



**Figure 9B.28** Proposed Upgrade works to R614 Ballyhooly Road from Entrance 1

### *Accessibility and Integration*

A desktop assessment of existing permeability for cyclists and pedestrians from the site was carried out. Presented in the following isochrone maps are the range of distances, for both pedestrians and cyclists, based on travel time.





### *Access for People with Disabilities*

Details of the internal road geometry for the proposed development are included in the Engineering Design Report showing full compliance with DMURS. Access to individual housing units fully complies with Part M of the building regulations. At-grade pedestrian crossings on the Main Distributor Road will be provided, linking the development to the 'Park' and further afield with minimal interaction with trafficked roads. All junctions and pedestrian crossings will be constructed to include tactile paving. Gradients for pedestrian and cyclist movement have been maintained at 1 in 20, where connectivity is critical; i.e. the Park and Neighbourhood Centre areas in particular.

All proposed new bus stops will include accessible kerbs which allow ease of access for wheelchair users. They are to be located on level sections of the Distributor Road and the Ballyhooly Road and will be connected by footpath from each of the Neighbourhoods.

## **9B.4 Potential Impact of the Proposed Development**

### *9B.4.1 Construction Phase*

The construction stage of the proposed development will be phased as described above. As noted in the Construction Environmental Management Plan (CEMP) that accompanies this planning application the Construction Access to the site will be from the R614 Ballyhooly Road via the proposed main Distributor Road serving the site.

Having regard to the scope of the site works and processes, a detailed scheme of works is described in the CEMP in the following sub-sections.

### **Pre-commencement Activities**

Before works commences a number of preparatory activities will be carried out. The following key works will be undertaken as part of the site preparation and pre-development activities:

#### **Pre-Commencement Surveys:**

- Prior to any commencement of any physical works, a professional land surveyor shall be appointed to carry out demarcation works and establish bench-marks on site. Upon obtaining all the necessary survey data, a joint survey to check existing ground levels shall be carried out with the consulting engineers.
- Any detailed ground investigations required to support the site regrading process will be carried out and finalized.
- Any pre-commencement archaeological survey.
- Pre- commencement noise survey.
- Pre- commencement dust survey.

#### **Enabling Works:**

- The initial enabling works, to be carried out in accordance with the Project specific CEMP (Traffic Management, control of surface water, storage of materials etc.), will

be in developing the main access road off the R614 Ballyhooly Road to facilitate construction access to the site. These works will involve the excavation of the main distributor road facilitating access to N1 and N6.

- This will be followed by bulk excavation works in the area designated for the compound. These works will create a level platform, accessible from the main distributor road, upon which the site compound and materials storage area will be constructed.

The following processes will be repeated for each phase of development and will be carried out in accordance with the requirements of the adopted CEMP.

#### **Bulk Excavation:**

- Following the topsoil strip of N1, the main access road serving this neighbourhood will be constructed to formation level followed by the excavation of the housing platforms to the right of this road. Suitable structural fill material arising from these works will be used to fill the housing platforms to the left and excess suitable fill material will be stored locally to be used in the continuation of the main distributor road.
- Having established the desired site levels during the early works, the next phase of construction will involve the digging of the foundations for each of the buildings. The civil and structural design for each building will determine the location and extent of foundations that are required to support each of the buildings. The foundations for each building will be excavated to the desired size and depth in preparation for the pouring of concrete.

#### **Civil Works:**

- The initial civil concrete works will involve the pouring of the foundations for each of the prepared buildings in this phase. Once the foundations are poured and have cured it will allow the building envelope to be erected.
- It is envisaged that a timber frame construction process will be used which will imply the delivery of pre-formed timber walls and trusses to site followed by external finishing material such as blockwork, brickwork, plaster and roof tiles.
- Construction materials will be sourced locally where possible. This will be based on the necessary constraints of performance, durability and cost.
- External Services including water mains, foul sewers, storm sewers, roads, footpaths and public lighting will be carried out in conjunction with the completion of the units.
- All buildings will be constructed in accordance with current building regulations and certified by an appropriated qualified engineer during and after construction.

#### **Landscaping:**

- In tandem with the other construction activities being carried out on the buildings, elements of the sites landscaping plan will be progressed. The formation of landscape features will take place in parallel to the early works, utilising material

excavated during the cut and fill exercise. As the site build progresses the landscape works will begin to focus on the soft landscaping aspects such as establishment of green zones and walkways, as well as planting of trees and shrubs in designated areas.

The successful Contractor will develop a Construction Stage Temporary Traffic Management Plan including the identified haulage routes in compliance with the Preliminary Temporary Traffic Management Plan developed in consultation with Cork City Council Roads & Transportation Department.

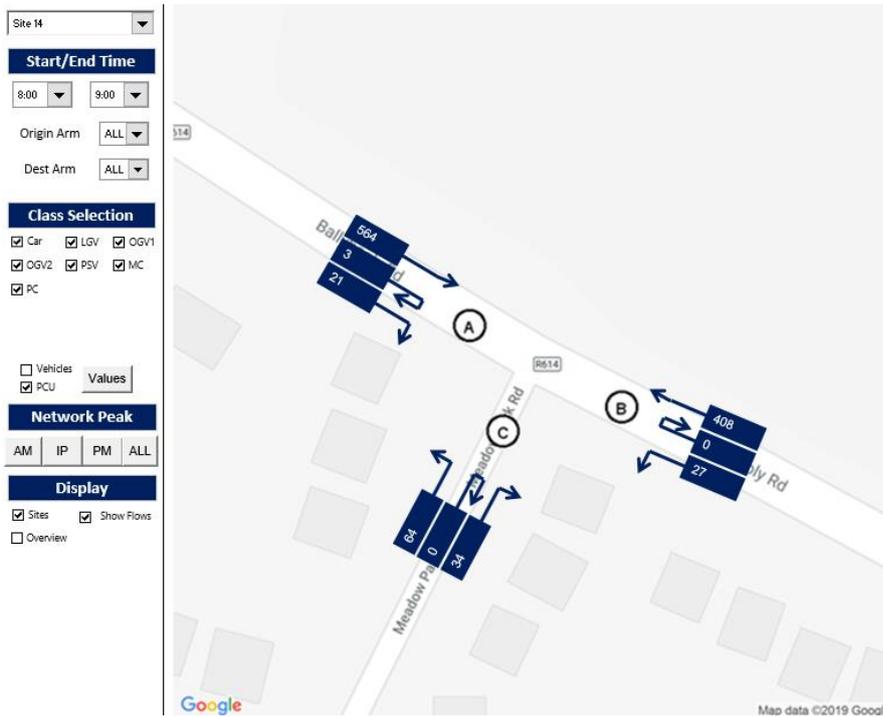
The surrounding road network is suitable to accommodate the construction traffic associated with the proposed development and the Construction Traffic Management Plan will include a range of mitigating measures as identified in the CEMP to ensure the safety of the workforce on the site and accessing the site, and the public on the surrounding roads and to minimise construction traffic generation and disruption on the surrounding road network.

#### *9B4.2 Operational Phase*

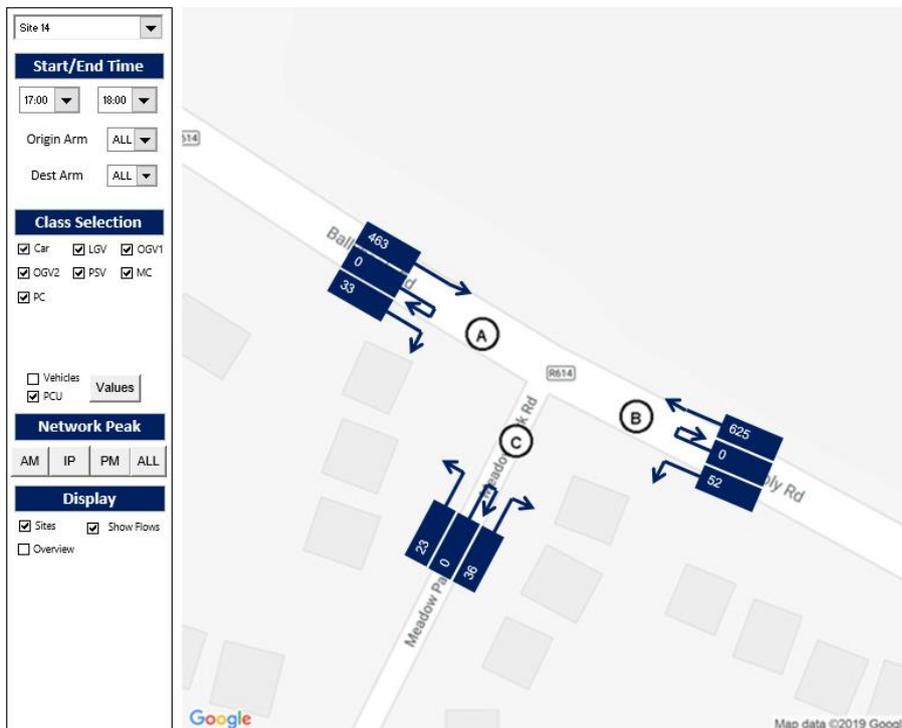
##### *Traffic Generation*

This section describes the traffic generation from the development and is based on recorded traffic generation from an existing residential development, 'Meadow Park', which has a direct vehicular access onto Ballyhooly Road. Traffic counts were undertaken at this junction as part of the overall data collection process.

**Figure 9B.31** 08:00-09:00 AM Peak Hour Traffic Flows (Meadow Park)



**Figure 9B.32** 17:00-18:00 PM Peak Hour Traffic Flows (Meadow Park)



The Meadow Park Residential Development comprises 212 semi-detached units with parking provision for two vehicles per unit. This unit mix is conservative in terms of the proposed Longview Estate Development, as is the car parking provision and hence its use

will ensure a robust assessment of traffic impact from the proposed scheme will occur. Using the above data, traffic generation from the development will be as follows:

**Table 9B.8** Trip Generation Per Unit (Meadow Park)

Site 14: Meadow Park Junction		Traffic Generation Factor (per unit)	
		IN	OUT
2019	AM	0.22	0.46
	PM	0.4	0.28

In order to carry out a sense check of the trip rates presented above, the TRICS database was used. Sites included the Greater Dublin Area, Cavan and Monaghan. Evident from the highlighted figures below, the rates used as per Table 9B.9 are in general more conservative and reflect higher car dependency (a factor of safety in terms of trips generated).

**Table 9B.9** Trip Generation Per Residential Unit (TRICS)

Time Range	ARRIVALS				DEPARTURES				TOTALS			
	No. Days	Ave. DWELLS	Trip Rate	Estimated Trip Rate	No. Days	Ave. DWELLS	Trip Rate	Estimated Trip Rate	No. Days	Ave. DWELLS	Trip Rate	Estimated Trip Rate
00:00 - 01:00												
01:00 - 02:00												
02:00 - 03:00												
03:00 - 04:00												
04:00 - 05:00												
05:00 - 06:00												
06:00 - 07:00												
07:00 - 08:00	3	30	0.066	0.000	3	30	0.187	0.000	3	30	0.253	0.000
08:00 - 09:00	3	30	0.242	0.000	3	30	0.385	0.000	3	30	0.627	0.000
09:00 - 10:00	3	30	0.154	0.000	3	30	0.231	0.000	3	30	0.385	0.000
10:00 - 11:00	3	30	0.143	0.000	3	30	0.110	0.000	3	30	0.253	0.000
11:00 - 12:00	3	30	0.121	0.000	3	30	0.088	0.000	3	30	0.209	0.000
12:00 - 13:00	3	30	0.143	0.000	3	30	0.121	0.000	3	30	0.264	0.000
13:00 - 14:00	3	30	0.121	0.000	3	30	0.220	0.000	3	30	0.341	0.000
14:00 - 15:00	3	30	0.209	0.000	3	30	0.121	0.000	3	30	0.330	0.000
15:00 - 16:00	3	30	0.253	0.000	3	30	0.264	0.000	3	30	0.517	0.000
16:00 - 17:00	3	30	0.264	0.000	3	30	0.176	0.000	3	30	0.440	0.000
17:00 - 18:00	3	30	0.264	0.000	3	30	0.132	0.000	3	30	0.396	0.000
18:00 - 19:00	3	30	0.220	0.000	3	30	0.187	0.000	3	30	0.407	0.000
19:00 - 20:00												
20:00 - 21:00												
21:00 - 22:00												
22:00 - 23:00												
23:00 - 24:00												
Total Rates:			2.200	0.000			2.222	0.000			4.422	0.000

Reference is made to the current (2016) Modal Shift by means of travel to work, school or college and is based on 2016 Census Data, referenced below. This current year figure implies 12% of persons in this area use sustainable means of travel.

Trip Generation from the proposed 103 pupil crèche was derived using the TRICS database. The following table presents the peak hour trip rates for a standalone crèche.

In this instance it is assumed that the crèche will serve the proposed scheme and in the future will serve the wider expansion area (with the completion of the Distributor Road Network). In the interim it is anticipated that the crèche will not add to traffic entering the development during the morning/evening peak hours over and above 'pass-by' traffic (traffic already accounted for on the network (living within the estate)).

**Table 9B.10** Trip Generation Per Pupil – Crèche (TRICS)

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	1	52	0.038	1	52	0.019	1	52	0.057
08:00 - 09:00	1	52	0.519	1	52	0.385	1	52	0.904
09:00 - 10:00	1	52	0.673	1	52	0.673	1	52	1.346
10:00 - 11:00	1	52	0.038	1	52	0.058	1	52	0.096
11:00 - 12:00	1	52	0.192	1	52	0.058	1	52	0.250
12:00 - 13:00	1	52	0.231	1	52	0.346	1	52	0.577
13:00 - 14:00	1	52	0.058	1	52	0.115	1	52	0.173
14:00 - 15:00	1	52	0.077	1	52	0.038	1	52	0.115
15:00 - 16:00	1	52	0.135	1	52	0.154	1	52	0.289
16:00 - 17:00	1	52	0.250	1	52	0.269	1	52	0.519
17:00 - 18:00	1	52	0.423	1	52	0.500	1	52	0.923
18:00 - 19:00	1	52	0.000	1	52	0.096	1	52	0.096
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
<b>Total Rates:</b>			2.634			2.711			5.345

The Local Retail Area in Neighbourhood 2 is expected to generate trips locally within the scheme and it is assumed that it will not become a trip attractor from outside of the scheme. In terms of assessing the public road junctions this retail area will have negligible effect.

#### Modal Split

This section describes the application of modal shift (the use of sustainable modes of travel) using an evidence-based approach as agreed with the Local Authority when generating development traffic.

The 2016 Census online SAP data was used to assess current modal shift patterns in the Ballyvolane area, specifically the electoral division of Rathcooney which encompasses the site. 12% of people in this area said they were commuting on foot, bike or using public transport.

**Table 9B.11** 2016 Modal Shift by means of travel to work, school or college. (Electoral Division of Rathcooney)

Means of Travel	Work	School or College	Total
On foot	111	126	237
Bicycle	33	7	40
Bus, minibus or coach	151	280	431
Train, DART or LUAS	2	1	3
Motorcycle or scooter	12	5	17
Car driver	2,728	100	2,828
Car passenger	205	1,468	1,673
Van	215	2	217
Other (incl. lorry)	23	0	23
Work mainly at or from home	113	0	113
Not stated	78	68	146
<b>Total</b>	<b>3,671</b>	<b>2,057</b>	<b>5,728</b>

Following discussions with the Cork City Council Transportation Department it was suggested that a location in Dublin, that would have a similar population mix in terms of employment and house ownership, but with an improved sustainable transport network (including cycle facilities and dedicated public transport corridors) could be used to derive future modal shift targets that would reflect committed NTA upgrade works currently being undertaken by Cork City Council on the Ballyhooly Transport Corridor Scheme (BTCS). The Blanchardstown area of Dublin was identified as having similar characteristics to the study area. A breakdown of the data shows up to 45% of people in this area use sustainable transport options at present.

**Table 9B.12** 2016 Modal Shift by means of travel to work, school or college (Electoral Division of Blanchardstown-Coolmine)

<input type="button" value="PDF"/> <input type="button" value="Excel"/> <input type="button" value="Print"/>			
Population aged 5 years and over by means of travel to work, school or college			
Means of Travel	Work	School or College	Total
On foot	467	1,299	1,766
Bicycle	176	79	255
Bus, minibus or coach	662	375	1,037
Train, DART or LUAS	239	64	303
Motorcycle or scooter	32	4	36
Car driver	2,274	83	2,357
Car passenger	206	689	895
Van	173	1	174
Other (incl. lorry)	9	0	9
Work mainly at or from home	56	1	57
Not stated	375	200	575
<b>Total</b>	<b>4,669</b>	<b>2,795</b>	<b>7,464</b>

On completion of the Ballyhooly Transport Corridor works, scheduled for the first quarter of 2023, an increase in modal shift of 33% would be expected to be delivered for the area. This increase in modal shift has not been applied to existing traffic numbers when developing future year traffic models but was used in developing traffic generation from the site.

In-line with the 2016 Census Data the existing modal shift rate of 12% has been assumed to remain stagnant up to the end of 2021. Thereafter, with the completion of the Ballyhooly Strategic Transport Corridor Scheme, this modal shift rate is expected to increase with the aim of achieving a rate of 45% (2016 rate for Blanchardstown-Coolmine in Dublin) by the end of 2025. Refer to Table 9B.7 for details of modal shift being applied in-line with the phasing of the development.

#### *Traffic Generation/ Forecasting*

This section describes the traffic generation from the development and is based on recorded traffic generation from an existing residential development, 'Meadow Park', which has a direct vehicular access onto Ballyhooly Road.

Based on the above trip generation rates and incorporating the expected percentage increase in modal shift for future year, the following table presents development specific traffic for future years. This traffic has been added to existing background flows and

distributed through the network to model each of the identified junctions. The results are presented below under Network Modelling Results.

**Table 9B.13** Proposed Development Traffic

Year (No. of units)			
		IN	OUT
2022 (65 units)	AM	14	30
	PM	26	18
2023 (175 units)	AM	34	71
	PM	61	43
2024 (275 units)	AM	47	98
	PM	85	67
2025 (375 units)	AM	60	125
	PM	108	76
2026 (475 units)	AM	70	147
	PM	127	89
2027 (601 units)	AM	88	185
	PM	161	113
2029 (755 units)	AM	111	233
	PM	202	141

As the proposed development site currently generates little or no traffic no reduction has been applied to account for pass-by trips, transfer trips or combined/dual trips. It is assumed that the crèche will be used primarily for the proposed development and will not become a trip attractor in itself.

In addition to development traffic recorded background traffic was factored using TII (Transport Infrastructure Ireland) Project Appraisal Guidelines (PE-PAG-02017) for use in future year scenarios. The following table presents the factors used on recorded pcu's based on Link Based Growth Rates (Central Growth) for the Southwest Region. The percentage HV content is based on that recorded on the Ballyhooly Road (5%).

**Table 9B.14** Background Traffic Growth Rates

Year	LV 95%	HV 5%	Combined
2019-2022	1.0309	1.0728	1.0329
2022-2023	1.0102	1.0237	1.0108
2023-2024	1.0102	1.0237	1.0108
2024-2025	1.0102	1.0237	1.0108
2025-2026	1.0102	1.0237	1.0108
2026-2027	1.0102	1.0237	1.0108
2027-2029	1.0205	1.0479	1.0218

### Network Modelling Results

This section presents the results of the traffic modelling of the six identified junctions presented both with/without development in place for the current year 2019, and for each phase of the proposed development as it becomes occupied. Traffic Signal controlled junctions are analysed using LinSig Version 3.3 and priority-controlled junctions are analysed using Junctions 9 Software (PICADY). The complete results sheets as well as digital copies for all of the generated models are provided as an appendix (9B.2).

The LinSig modelling software produces a PRC % (Practical Reserve Capacity) and a Delay figure which are used to compare the effects the development will have on the junction being modelled. A PRC of 10% implies that the junction has reached capacity but is still operational with delay incurred. The delay figure produced (pcuHr) is a measure of the overall delay incurred on all arms of the junction and is based on the Demand Flow per arm multiplied by the Average Delay per PCU.

The Junctions 9: PICADY modelling software produces an RFC % (Ratio of Flow to Capacity), a Delay figure measured in seconds and a LOS (Level of Service) which are used to compare the effects the development will have on the junction being modelled. An RFC of 85% on a priority-controlled junction implies that the junction has reached capacity but is still operational with delay incurred. The following table describes the different LOS and the implications for the junction being assessed.

**Table 9B.15** Level of Service

Level of Service A	Free-Flow
Level of Service B	Reasonably Free-Flow (no delay incurred)
Level of Service C	Stable Operation (busy but operational with acceptable delay incurred)
Level of Service D	Borderline Unstable (Junctions reaching capacity – but still operational- delay incurred)
Level of Service E	Extremely Unstable (Junctions at capacity or over, any incident will cause a grid-lock situation- significant delay incurred)
Level of Service F	Breakdown (Junctions over capacity, unacceptable delay traffic at a standstill)

#### Junction 1: Kilbarry Link Road / Ballyhooly Road

The Kilbarry Link Road/Ballyhooly Road Junction is a priority-controlled junction and has been analysed as such for the current year 2019. As part of the proposed development and independent of the Ballyhooly Transport Corridor Scheme, it is proposed to upgrade this junction to signal controlled as part of Phase I of the Longview Development. This proposed change is to facilitate pedestrian/cycle/public transport connectivity from the site to schools, retail offerings and employment provision in the area.

**Table 9B.16** Junction 1: Kilbarry Link Road/Ballyhooly Road

Site 1: Kilbarry Link Road Junction		No Development		With Development	
		PRC %	Delay (pcuHr)	PRC %	Delay (pcuHr)
2019	AM	35	21.79	N/A	N/A
	PM	45	18.62	N/A	N/A
2022*	AM	35.9	10.49	29.2	11.2
	PM	29	10.42	24.6	11.44
2023	AM	34.5	10.68	22.3	12.3
	PM	27.7	10.62	22.8	11.77
2024	AM	32.7	10.9	17.8	13.33
	PM	26.2	10.86	19.9	12.65
2025	AM	31.8	11.05	14.6	14.5
	PM	25	11.05	16.9	13.36
2026	AM	30	11.3	12.1	15.6
	PM	23.5	11.31	12.1	14.18
2027	AM	28.7	11.51	9.3	17.58
	PM	22.3	11.5	12.5	15.43
2029	AM	25.8	11.99	4.7	20.83
	PM	19.8	12.02	7.4	17.59

\* From 2022 onwards it is assumed that the junction has been signalised as part of Phase I of the development

As outlined in Table 9B.16 the assumption is that the junction has been signalised as part of the completion of Phase I of the development. The signalised junction includes for a pedestrian phase each cycle which, in reality will be demand activated. Future year results inclusive of development (right hand column) show that the junction operates within capacity up to and including 2029.

### Junction 2: Fox & Hounds

The Fox Hounds Junction is a traffic-signal-controlled junction at the intersection of the R614 Ballyhooly Road/Ashgrove View Road and the Banduff/Rathcooney Road. The junction includes a demand activated pedestrian cycle.

**Table 9B.17** Junction 2: Fox & Hounds Junction

Site 2: Fox & Hounds Junction		No Development		With Development	
		PRC %	Delay (pcuHr)	PRC %	Delay (pcuHr)
2019	AM	11.6	19.25	N/A	N/A
	PM	22.4	20.86	N/A	N/A
2022	AM	7.1	21.03	5.2	22.06
	PM	17	22.42	14.7	23.29
2023	AM	6	21.63	0.6	24.44
	PM	15.7	23.02	13.4	24.1
2024*	AM	13	19.7	8.7	21.64
	PM	13.2	22.93	10.3	24.6
2025	AM	11.8	20.18	6	22.84
	PM	14.7	23.88	8.5	25.85
2026	AM	10.7	20.65	4.5	24.07
	PM	10.8	24.08	4	26.77
2027	AM	9.6	21.16	1.2	26.02
	PM	9.7	24.8	6.2	29.03
2029	AM	7.2	22.28	-2.6	29.8
	PM	7.4	26.12	1	32.76

\* From 2024 onwards it is assumed that the Ballyhooly Road upgrade works have been complete

As outlined in Table 9B.17 future year modelling from 2023 onwards assumes that certain upgrades to the junction have been completed as part of the Ballyhooly Transport Scheme.

The results of the future year modelling show that the junction will operate within capacity up to and including 2027. With the final completion of the development in 2029 the junction is seen to exceed capacity by 2.6% during the AM peak period. Putting this future year result in context most junctions within large urban areas exceed capacity during peak hour traffic. The resulting increase in delay does not imply that the junction is at a gridlock more so that a vehicle arriving at the back of a formed queue on an approach will not get through the junction during one cycle of the lights. In many instances the resulting queue reaches a maximum before diminishing back to normal levels once the 'peak-peak' has passed.

### Junction 3: North Ring Road/ Ballyhooly Road

The North Ring Road Ballyhooly Road Junction is a traffic-signal-controlled cross-roads junction at the intersection of the R614 Ballyhooly Road and the R635 North Ring Road. The North Ring Road is the main arterial link serving the north side of the city and links the M8 and the N25 to the N20 Limerick Road. This junction has recently been upgraded as part of Phase I of the Ballyhooly Transport Corridor Scheme which has seen the inclusion of a right turn lane on the city approach in addition to bus and cycle/pedestrian facilities.

**Table 9B.18** Junction 3: North Ring Road/Ballyhooly Road

Site 4: North Ring Road Ballyhooly Road Junction		No Development		With Development	
		PRC %	Delay (pcuHr)	PRC %	Delay (pcuHr)
2019	AM	6.4	26.91	N/A	N/A
	PM	14.8	27.44	N/A	N/A
2022	AM	2.8	29.19	2	29.96
	PM	11.1	29.28	10.8	29.77
2023	AM	2	29.93	0	31.77
	PM	10	29.97	9.5	30.55
2024*	AM	13.3	26.26	11.1	27.67
	PM	10	28.65	9.7	29.42
2025	AM	12	26.77	9.6	28.67
	PM	8.9	29.32	8.3	30.33
2026	AM	10.9	27.35	7.1	29.6
	PM	7.9	29.96	7.1	31.17
2027	AM	9.9	27.88	5.4	30.92
	PM	6.7	30.66	5.1	32.25
2029	AM	7.4	29.15	2	33.39
	PM	4.3	32.27	2	34.49

\* From 2024 onwards it is assumed that the Ballyhooly Road upgrade works have been complete.

As this junction is also on the Ballyhooly Transport Corridor Scheme (BTCS) the 2024 results operate on the basis that upgrades have been put in place. These upgrades would include additional lanes on all approaches including the lengthening of the right turn lane on the eastern approach.

The results show that the junction currently operates within capacity for both the morning and evening peak periods. With the addition of development-traffic the junction capacity for the morning peak reduces to zero in 2023. Thereafter with proposed upgrades in place the junction will continue to operate within capacity up to 2029 with the development fully in place.

As outlined earlier in this chapter the development of a Northern Orbital Route (2031), as proposed in the CMATS study, will see a significant change in travel patterns for this junction. A completed outer orbital route will mean an alternative route will exist for N20/M8/N25 bound traffic. This will result in significant spare capacity at this junction for future years beyond 2031.

#### **Junction 4: Kilbarry Link Road Upper Dublin Hill**

This junction is a priority-controlled junction with uncontrolled pedestrian facilities. The junction has been analysed using the PICADY traffic modelling package.

**Table 9B.19** Junction 4: Kilbarry Link Road/ Upper Dublin Hill

Site 12: Kilbarry Link/Upper Dublin Hill		No Development			With Development		
		Delay (s)	RFC (%)	LOS	Delay (s)	RFC (%)	LOS
2019	AM	33.2	0.81	D	N/A	N/A	N/A
	PM	32.9	0.66	D	N/A	N/A	N/A
2022	AM	27.86	0.44	D	28.73	0.45	D
	PM	38.47	0.7	E	40.35	0.71	E
2023	AM	29.12	0.45	D	31.41	0.47	D
	PM	40.94	0.72	E	43.55	0.73	E
2024	AM	30.24	0.47	D	33.76	0.49	D
	PM	43.61	0.73	E	48.26	0.75	E
2025	AM	31.54	0.48	D	36.87	0.52	E
	PM	47.41	0.75	E	54.07	0.78	F
2026	AM	32.93	0.49	D	39.73	0.54	E
	PM	51.33	0.77	F	61	0.81	F
2027	AM	34.37	0.51	D	44.41	0.57	E
	PM	55.17	0.79	F	67.6	0.83	F
2029	AM	38.49	0.54	E	57.34	0.64	F
	PM	66.55	0.83	F	94.59	0.9	F

The results presented are based on the minor arm (Kilbarry Link Road) accessing onto the major arm (Upper Dublin Hill). The right turn movement on this leg is incurring significant delay.

The results indicate that the junction operates within capacity (RFC less than 85%) however the Level of Service (LOS) D is a result of delay being incurred by traffic exiting from the minor arm (Kilbarry Link Road) onto Upper Dublin Hill.

In order to improve the operational characteristics of this junction the option of providing traffic signals was investigated. The following LinSig generated results show that the junction operates within capacity, including with the addition of a pedestrian phase each cycle, up to and including the completion of the full development in 2029.

**Table 9B.20** Junction 4: Kilbarry Link Road/ Upper Dublin Hill (Signalised)

Site 12: Kilbarry Link/Upper Dublin Hill		No Development		With Development	
		PRC %	Delay (pcuHr)	PRC %	Delay (pcuHr)
2019	AM	22.6	9.88	N/A	N/A
	PM	44.1	9.08	N/A	N/A
2022	AM	18.7	10.52	18.7	10.52
	PM	39.6	9.54	39.6	9.54
2023	AM	17.4	10.8	17.4	11.07
	PM	37.8	9.72	36.4	9.91
2024	AM	16.1	11.05	16.1	11.42
	PM	36.6	9.89	33.6	10.18
2025	AM	14.8	11.31	14.2	11.85
	PM	35.1	10.08	31.3	10.33
2026	AM	13.6	11.58	12.8	12.2
	PM	33.7	10.26	29	10.59
2027	AM	12.5	11.85	10.7	12.65
	PM	32.3	10.44	26.5	10.9
2029	AM	10	12.52	7.6	13.61
	PM	29.3	10.83	22.4	11.59

Junction Signal Controlled with Pedestrian Crossing and 90sec cycle time.

It should be noted that this junction will form part of the Northern Orbital Route as proposed in CMATS and will take on a different form once this route is completed. Signalisation can be provided by way of mitigation if required by condition.

### Junction 5: Banduff Road/Rathcooney Road Junction

This junction is a priority-controlled junction with uncontrolled pedestrian facilities. The junction has been analysed using the PICADY traffic modelling package for current year flows.

**Table 9B.21** Junction 5: Banduff Road/Rathcooney Road

Site 3: Banduff Rathcooney Road Junction		No Development			With Development		
		Delay (s)	RFC (%)	LOS	Delay (s)	RFC (%)	LOS
2019	AM	25.26	0.41	D	N/A	N/A	N/A
	PM	86.56	0.98	F	N/A	N/A	N/A
2022	AM	39.07	0.84	E	41.62	0.86	E
	PM	113.22	1.02	F	119.27	1.02	F
2023	AM	41.25	0.85	E	46.67	0.88	E
	PM	123.69	1.03	F	135.29	1.04	F
2024	AM	44.14	0.87	E	53.32	0.9	F
	PM	135.87	1.04	F	155.01	1.06	F
2025	AM	46.81	0.88	E	59.54	0.91	F
	PM	147.75	1.05	F	172.41	1.07	F
2026	AM	50.72	0.89	F	69.05	0.93	F
	PM	161.31	1.07	F	191.44	1.09	F
2027	AM	54.19	0.9	F	81.29	0.96	F
	PM	174.45	1.08	F	217.4	1.11	F
2029	AM	62.76	0.92	F	105.04	0.99	F
	PM	205.81	1.1	F	287.52	1.14	F

The results presented are based on traffic flows from Arm C to the minor Arm B (Banduff Road). The option of changing the priority on this junction would result in a significant improvement.

Evident from Table 9B.21 is that the junction currently operates above capacity at a Level of Service F which results in notable queueing. The addition of development traffic adds to the delay incurred but not significantly. Based on recorded traffic flows changing the priorities at this junction could result in significant improvements. Table 9B.22 presents the results of this priority change with the Rathcooney Road becoming the minor leg approach.

**Table 9B.22** Junction 5: Banduff Road/Rathcooney Road (Priority Layout Change)

Site 3: Banduff Rathcooney Road Junction		No Development			With Development		
		Delay (s)	RFC (%)	LOS	Delay (s)	RFC (%)	LOS
2019	AM	29.63	0.71	C	N/A	N/A	N/A
	PM	17.43	0.42	C	N/A	N/A	N/A
2022	AM	33.9	0.74	D	29.63	0.71	D
	PM	18.54	0.45	C	35.2	0.75	E
2023	AM	35.52	0.75	E	38.39	0.77	E
	PM	18.89	0.45	C	19.38	0.46	C
2024	AM	37.12	0.76	E	41.88	0.79	E
	PM	19.37	0.46	C	20.14	0.48	C
2025	AM	39.05	0.77	E	45.39	0.81	E
	PM	19.75	0.47	C	20.79	0.49	C
2026	AM	41.79	0.79	E	51.32	0.83	F
	PM	20.27	0.48	C	21.47	0.5	C
2027	AM	44.34	0.8	E	57.26	0.85	F
	PM	20.68	0.49	C	22.42	0.52	C
2029	AM	50.23	0.83	F	70.95	0.89	F
	PM	21.88	0.51	C	24.3	0.55	C

The results for the revised junction, which are based on the worst performing arm, The Rathcooney Approach, show significant improvement in terms of overall capacity at the junction. The delay incurred on Rathcooney Road will result in queues forming specifically during the morning peak hour. In 2029 with development traffic included this queue would

comprise on average 6 vehicles. The 2022 LOS D is based on the delay experienced by a queue of 0.8 vehicles.

Evident is that development generated traffic contributes just 3% on average to the RFC. This junction will form part of the BTCS and is likely to be realigned as part of these works.

### Junction 6: North Ring Road / Clonard Road Junction

This junction is a traffic signal-controlled junction with controlled pedestrian facilities. The junction has been analysed using the LinSig traffic modelling package for current year flows.

**Table 9B.23** Junction 6: North Ring Road / Clonard Road Junction

Site 15: North Ring Road/Clonard Road		No Development		With Development	
		PRC %	Delay (pcuHr)	PRC %	Delay (pcuHr)
2019	AM	26.6	13.23	N/A	N/A
	PM	37.2	11.92	N/A	N/A
2022	AM	22.6	13.98	22.6	13.98
	PM	32.8	12.58	32.8	12.58
2023	AM	21.2	14.28	21.2	14.39
	PM	31.4	12.83	31.1	12.94
2024	AM	16.1	11.05	16.1	11.42
	PM	36.6	9.89	33.6	10.18
2025	AM	14.8	11.31	14.2	11.85
	PM	35.1	10.08	31.3	10.33
2026	AM	13.6	11.58	12.8	12.2
	PM	33.7	10.26	29	10.59
2027	AM	12.5	11.85	10.7	12.65
	PM	32.3	10.44	26.5	10.9
2029	AM	10	12.52	7.6	13.61
	PM	29.3	10.83	22.4	11.59

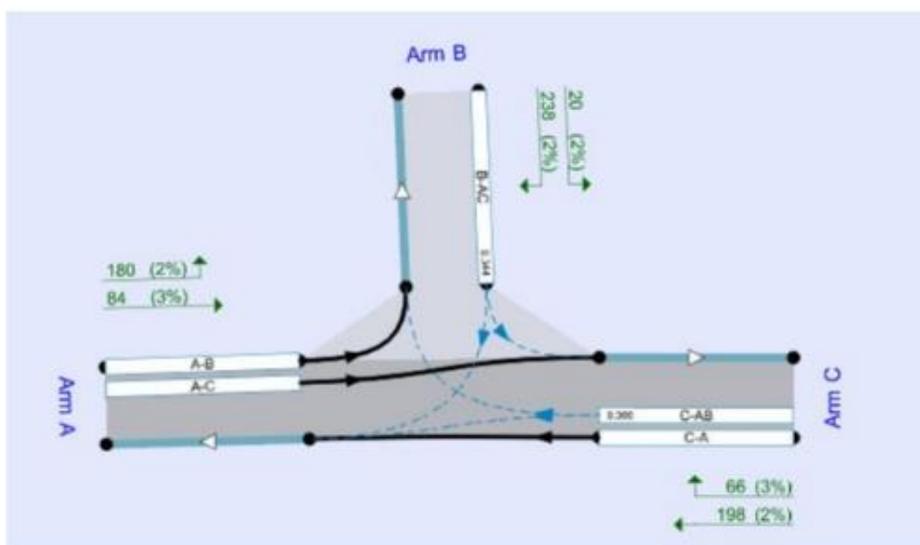
Junction Signal Controlled with Pedestrian Crossing and 90sec cycle time

This junction operates within capacity up to and including the completion of the development in 2029. Development generated traffic is seen to have little impact on Delay incurred.

### Junction 7: Proposed Development Access/R614 Ballyhooly Road (Entrance 1)

This junction will be a priority-controlled junction. The junction has been analysed using the Junction 9 traffic modelling package for current and future year flows.

**Figure 9B.33** Junction 7: Proposed Access Road (Arm B) /R614 Ballyhooly Road



**Table 9B.24** Junction 7: Proposed Access Road (Arm B) /R614 Ballyhooly Road - Results

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
<b>2019</b>								
Stream B-AC	0.0	0.00	0.00	A	0.0	0.00	0.00	A
Stream C-AB	0.0	0.00	0.00	A	0.0	0.00	0.00	A
<b>2021</b>								
Stream B-AC	0.0	6.11	0.04	A	0.0	5.89	0.02	A
Stream C-AB	0.0	5.52	0.01	A	0.0	4.90	0.02	A
<b>2022</b>								
Stream B-AC	0.1	6.75	0.12	A	0.1	6.24	0.06	A
Stream C-AB	0.0	5.66	0.03	A	0.1	5.08	0.08	A
<b>2023</b>								
Stream B-AC	0.3	7.54	0.21	A	0.1	6.60	0.10	A
Stream C-AB	0.1	5.82	0.06	A	0.2	5.29	0.13	A
<b>2024</b>								
Stream B-AC	0.4	8.51	0.30	A	0.2	7.01	0.14	A
Stream C-AB	0.1	5.96	0.08	A	0.3	5.64	0.18	A
<b>2025</b>								
Stream B-AC	0.6	9.78	0.38	A	0.2	7.48	0.18	A
Stream C-AB	0.1	6.15	0.11	A	0.4	6.05	0.23	A
<b>2026</b>								
Stream B-AC	0.9	11.48	0.47	B	0.3	8.02	0.22	A
Stream C-AB	0.2	6.33	0.13	A	0.5	6.54	0.29	A
<b>2027</b>								
Stream B-AC	1.3	13.89	0.56	B	0.4	8.64	0.27	A
Stream C-AB	0.2	6.52	0.15	A	0.7	7.14	0.34	A
<b>2028</b>								
Stream B-AC	1.8	17.65	0.65	C	0.5	9.42	0.32	A
Stream C-AB	0.3	6.74	0.18	A	0.9	7.80	0.40	A

This junction operates within capacity up to and including the completion of the development in 2029 with a maximum RFC of 65% and a maximum queue forming of 2 vehicles during the morning peak.

As this junction serves the main portion of the development and is seen to work with significant spare capacity, it is logical to assume that Entrance 2 will operate with similar type results.

### **9B.5 Cumulative Impacts**

As outlined in this chapter, industry standard growth rates have been applied to background traffic for future year assessments (to account for further development within the area). These growth rates make allowance for modal shift targets as set by national policy but do not take account of site-specific measures that may be implemented to mitigate against traffic generation from a particular development. In this instance the development of strategic transport corridors in-line with national and local policy should allow for the development of the Ballyvolane Zoned Area using lower traffic generation.

A full network of new distributor roads is proposed within this area facilitating better distribution of traffic and allowing for the development of public transport solutions based on demand.

Upgrade works to specific junctions, namely Junction 2 and Junction 3 are proposed as part of the NSTC Study. The Ballyvolane Transport Corridor Scheme will facilitate the delivery of these upgrade works as outlined and deliver LAP objectives for road public transport provision / enhancement in the area

As previously discussed the Northern Distributor Road as outlined in CMATS will be designed as a Quality Bus Corridor (QBC) and ultimately will allow for high frequency bus services to orbit the city. This 'Orbital' Route will have arterial links, such as the Ballyhooly Transport Corridor, facilitating direct access to the city centre. In practice these routes also include cycle provision such as secure bicycle parking, cycle lanes and other inducements to reduce reliance on the car for travel. In order to function properly and to justify their provision a certain density of population is required. The proposed development is one such scheme that has the necessary scale to change existing travel patterns.

The development of an outer North Ring Road linking the M8 to the N20 (M20) via the proposed new town of Monard and ultimately to the M22 at Ballincollig, will result in significant changes to existing travel patterns, resulting in capacity increases within the modelled network. The status of this route is unknown, but an indicative route is shown in CMATS.

### **9B.6 Mitigation Measures**

#### *9B6.1 Construction Phase*

The construction stage of the scheme proposes to re-use / relocate the bulk of the excavation within the site implying that there will be a significant reduction in construction traffic generated to and from the site over and above a site where importation or exportation of earthworks is required. This will minimise the impact the development will have on the existing roads network during this period.

Construction based traffic will include site workers, deliveries of materials relating to house construction, roads construction and sales related traffic. This traffic will be mitigated by means of a traffic management plan developed as part of the Construction Management Plan (CMP). Mitigation measures such as start/finishing times outside of the identified peak periods, strict delivery times for raw materials and other measures are proposed. These include:

- Deliveries will be co-ordinated to prevent queuing of vehicles adversely affecting traffic flow and to minimise disruption to local traffic. They will be timed and coordinated to avoid conflict with collection of waste, other deliveries (particularly adjoining land-owners) and rush hour traffic (AM & PM peak hours as identified in the Traffic & Transportation report). Large deliveries will be scheduled outside peak hours to minimise disruption but will require the approval of the Employer's Representative.
- The Contractor will consider out of hours deliveries and collections to facilitate the smooth continuation of works and minimise disruption.
- In order to mitigate from a significant impact during peak traffic hours, the majority of staff will either arrive on-site before or after the peak morning traffic (8:00-09:00) and finish work before or after the evening peak traffic hours (17:00-18:00).
- The condition of the public road will be monitored on an on-going basis and a road sweeper provided to clean the public road if required.
- There will be no parking of any vehicles on the public road near the site entrance.
- Adequate parking will be provided on site for both employees and visitors.
- The condition of the site entrances will be monitored on an on-going basis and a road sweeper provided to clean the public road if required.

The construction-based traffic impact will not exceed the impact of the completed scheme on the surrounding roads network.

#### *9B6.2 Operational Phase*

As outlined significant effort has been put in to delivering connectivity from the site to local services and public transport options. A 'Mobility Management Plan/Travel Plan' is a strategy for managing multi-modal access to a site or development, focusing on promoting access by sustainable modes. The objective of national and local policy is to reduce reliance on the car for travel. Inducements and encouragement should be applied in order to influence change and this can be achieved through the delivery of 'Mobility Management Plans'.

A mobility management plan relating to a residential development would form part of the sales/promotion package presented to would be purchasers and would highlight the proximity of local services, public transport provision, schools and walking/cycle distances to same. The proposed 'hard measures' that will facilitate safer pedestrian, cycle and public bus access will be provided as part of the application and will be further complimented by scheduled Local Authority Works (BSTC).

An overview of the sustainable infrastructure proposed in this development is as follows:

- Some 2.3km of upgraded or new footway/cycleway provision both within the site and on approaches to the site on Ballyhooly Road.
- The proposed upgrading of the Kilbarry Link Road/ Ballyhooly Road to include a Toucan Crossing as well as a full pedestrian phase.
- The provision of a new bus-stop on Ballyhooly Road to be provided as part of Phase I of the Scheme. This new bus-stop will facilitate the re-routing of the existing service or the provision of additional services in the area. This proposal is compatible with the BSTC Project.

- Proposed off-road bus stops on the main Distributor Road within the development which will facilitate future bus routes serving the entire UEA.
- Interim Bus-turning areas adjacent to the lands reserved for school campus to facilitate the provision of a bus service (to be provided when warranted based on density of population served) in the absence of the adjoining UEA lands not being developed.
- The provision of a combined footway/cycleway on Ballyhooly Road to serve the site which will result in the urbanisation of this section of the Ballyhooly Road encouraging walking and cycling as a safe option in what should become a lower speed area.
- The development of a portion of the 'Park' with its associated walkways and cycle ways providing amenity to both existing residential developments in the area in addition to the proposed development.

The proposed development will include a number of measures that are deemed necessary to improve road safety in the area. These measures include:

- The provision of an off-road cycle path and footpath on the Ballyhooly Road which will provide a safe link to the residential estate of Mervue Lawn and Kempton Recreation Park on the R614, where existing footpaths are located. These works are proposed to be carried out as part of the first phase of development and are expected to be in advance of the BTCS Project.
- The proposed signalisation of Junction 1: Ballyhooly Road/Kilbarry Link Road to include an all-red pedestrian phase on demand. This will facilitate and encourage to the use of public transport offerings on the Kilbarry Link Road.
- A newly constructed off-road bus stop on the R614 will again encourage the use of sustainable transport, thereby reducing the numbers of private cars in use. Less traffic generally results in reduced traffic related accidents.
- The Distributor Road within the development has been designed to include a shared 3.0m wide continuous footpath/cycleway facilitating safe access to schools, public transport, shops and sports grounds in the wider area.

It has been clearly demonstrated that the proposed scheme falls within the category of development where the use of sustainable transport solutions will be a real option. This premise is further supported by the Local Authority and the National Transport Authority's commitment to the delivery of the Ballyvolane Strategic Transport Corridors Project. This scheme has received funding with works to be completed on the ground in 2023. The proposed upgrade works will include junction improvements on the R614 Ballyhooly Road that have been assessed as part of the traffic modelling exercise carried out for the proposed development.

The traffic modelling of the 6 no. junctions, included as part of this study have concluded that Phase I of the scheme to be completed and occupied by 2022, requires no change to the existing roads network. It is proposed as part of this first phase of works to provide a traffic signal-controlled junction at the junction of the Kilbarry Link Road and the R614 Ballyhooly Road. The purpose of this intervention is to provide a pedestrian/ cycle crossing of the Ballyhooly Road which has the added benefit of controlling the inbound flow of traffic to the Fox & Hounds Junction. Modelling was carried out on the basis that an incremental increase in the modal shift rate over a number of years (2022-2025) was applied to development traffic only and that there was no associated application of the increase in modal shift to background traffic flows (which would result in a reduction in junction flows).

Future year models for each phase of development have been carried out on the premise that upgrade works provided as part of the BSTC Project are in place from 2023 onwards.

This modelling concludes that these proposed upgrade works are sufficient to ensure that the critical junctions remain operational for future years up to and including the completion date of the final phase in 2029. Thereafter additional infrastructure as outlined in CMATS will be in the process of being delivered.

As identified previously there will be improvements on the existing roads network associated with funded Local Authority Plans. In addition to this, the CMATS document has identified the need for additional infrastructure to be provided as part of the future public transport solution to support the expansion of Cork City. The Northern Distributor Road, when completed in 2031, will provide an orbital route of Cork City, encompassing the Ballyvolane UEA. The proposal, the subject of this application, is fully compatible with CMATS

### **9B.7 Conclusion**

This Traffic and Transport Assessment for the proposed development has been prepared in support of an application through the Strategic Housing Development (SHD) process for the development of 753 residential units, a large crèche and a local centre suitable for a local convenience store such as a pharmacy, hairdresser, café. A GP's facility is also included along with a community room. The local centre is proposed in Neighbourhood 2.

The TTA methodology has been agreed with the Local Authority which has taken place as part of the pre-application process.

The TTA has demonstrated the following:

- (i) The proposed residential development is in accordance with the Local Area Plan and forms an important first part in the delivery of planned growth in the area.
- (ii) A review of the existing roads network and collision data in the vicinity of the site indicates that there are no significant problems in relation to the current operation or safety of the identified junctions. Existing traffic congestion on the R635 North Ring Road during peak periods has already been reduced as a result of Phase I of the BSTC project being implemented. The future year traffic modelling carried out as part of this assessment demonstrates that with further junction improvements proposed as part of the next phase of public works, additional capacity at junctions is generated.
- (iii) The proposed site layout is permeable to the roads network and is connected to existing pedestrian linkages to public transport offerings, schools, retail and amenity destinations.
- (iv) The proposed new access arrangements are safe and suitable and are in accordance with the Design Manual for Roads & Bridges (DMRB) and the Design Manual for Urban Roads & Streets (DMURS).
- (v) The site benefits from being in close proximity to regular transport provision, within walking distance of the site, which enables journeys throughout Cork City.
- (vi) Junction mitigation measures proposed as part of this application include the signalisation of Junction 1: Ballyhooly Road/Kilbarry Link Road incorporating a toucan crossing to facilitate pedestrian/cycle connectivity to local bus stops, schools, church, sports grounds (soccer and GAA) and existing residential areas. The traffic modelling of this junction using LinSig

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software has demonstrated that the junction operates with spare capacity up to and including the completion of the development in 2029. The junction has been assessed to include for a pedestrian phase each and every cycle. The safety implication of this proposal is positive as the junction and its approaches will be traffic calmed and in addition the signalisation will regularise traffic flow entering the urban environment.

- (vii) As part of the development proposal the inclusion of an off-road cycle and pedestrian facility from the development entrance to a proposed crossing of the Ballyhooly Road at Mervue Lawn, south of the site, is to be delivered. This will facilitate and encourage modal shift towards more sustainable modes of travel.
- (viii) The cumulative impact of the development, inclusive of future growth background traffic and with proposed junction upgrades to be delivered as part of the BSTC project being in place from 2023 onwards, has been tested on the identified critical junctions, indicating that the proposed development can be accommodated without the need for alternative routes (for example the Northern Orbital Route) as outlined in CMATS, being in place.
- (ix) The completion of the aforementioned Northern Orbital Route (NOR), which will link from 'Tinker's Cross' (Junction of the R635 & North Ring Road) on the R635, North Ring Road, to the N20 will provide an alternative route for traffic currently using the R635 to bypass the city centre. This route is indicated to pass to the south of the development site, incorporating the 'Kilbarry Link Road' and will serve as a high-quality bus corridor (QBC) orbiting the city. Arterial links to the city centre, such as the Ballyvolane Strategic Transport Corridor, will provide connectivity inwards from this route. The NOR is identified in CMATS (Cork Metropolitan Area Transport Study) with an expected delivery date by 2031. On its completion traffic and travel patterns in this area will undergo significant change which has been included in the SWRM (NTA South West Regional Model) future year scenarios. Consequently, this TTA does not look beyond a 2029 Design Year.
- (x) The proposed development is to be accessed via two priority junctions onto the R614 Ballyhooly Road as shown in the following Figure. These junctions have been assessed for development traffic and background traffic flows on the Ballyhooly Road and found to operate within capacity up to and beyond the design year.

The TTA concludes that the proposed development, in traffic and transportation terms is acceptable, and there are no traffic and transportation reasons that should prevent the Planning Authority from recommending approval of this application.

### 9B.8 References

National Roads Authority (May 2014) Traffic and Transport Assessment Guidelines NRA, Dublin

Institution of Highways & Transportation (1994) Guidelines for Traffic Impact Assessment IHT, London

National Roads Authority (2000) Road Geometry Handbook NRA, Dublin

National Roads Authority (revised 2003) Design Manual For Roads and Bridges NRA, Dublin

National Roads Authority (November 2004) Draft Traffic and Transport Assessment Guidelines NRA, Dublin

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<http://www.rsa.ie/RSA/Road-Safety/Our-Research/Ireland-Road-Collisions/>