15. MATERIAL ASSETS

15.1 Traffic and Transport

15.1.1 Introduction

The purpose of this chapter is to assess the potential impact of the Proposed Development on the existing local transport network and to review whether the proposed site access (and the existing junctions which fall within the scope of the study) will have adequate capacity to carry the development traffic and the future growth in existing road traffic to the design year and beyond and to also identify possible mitigation measures to reduce traffic impacts. An assessment of the accessibility of the site for cyclists, pedestrians and public transport users has also been made.

This section is written as a concise summary of the Traffic and Transportation Assessment, submitted with the planning application. Rather than repeat the detailed traffic assessments carried out within this Traffic and Transport Assessment, it is referred to throughout this chapter, with the impact assessment findings discussed below.

15.1.2 Statement of Authority

This chapter was written by Micheál Geraghty of TOBIN. Micheál Geraghty is an Associate Director with TOBIN and has a Bachelor of Science (Hons) in Construction Project Management. He was worked in Civil and Traffic Engineering for over 25 years with extensive experience in the preparation of Traffic and Transportation Assessments (TTA's), Mobility Management Plans and EIAR chapters for various residential, commercial, business, retail and leisure developments.

TOBIN has been in operation for over 70 years and have carried out numerous Traffic and Transportation Assessments (TTA's) for various residential, commercial, business, retail and leisure developments. TOBIN has also Traffic Chapters for a number of EIAR's for various project types. The drafting of TTAs and Traffic Chapters involves the followings tasks:

- Liaising with Local Authorities, TII, clients and other key stakeholders,
- Analysis of the suitability of haul routes,
- Design and analysis of access points to all types of developments,
- Access and site layout arrangements using AutoTRACK, swept path analysis software,
- Junction analysis on uncontrolled, signalised and roundabout junctions.

15.1.3 Proposed Development

The Proposed Development will consist of 362 residential units and a childcare facility, and a full description of the development can be found in Chapter 4 of the Environmental Impact Assessment Report (EIAR). The Proposed Development is a component of a larger residential development project (Proposed Project). The Proposed Project involves the construction of more than 500 residential units, and the development will require separate, individual planning applications for each part of the project.

The development will deliver a residential neighbourhood within proximity of Galway City Centre. The site will have vehicle access onto the Western Distributor Road via an internal link road.

Site access for the Proposed Development will be gained along the Altan Road via the southern arm of the Bothar Stiofain roundabout on the Western Distributor Road. The granted Planning Permission reference 24/60370 contains proposals to amend the Altan road such that the road priority is given to

the proposed site and a new priority T-junction is provided for the Knocknacarra school. This proposed road layout design also incorporates footpaths and cycle lanes on both sides of the road. The Proposed Development will be constructed in 2 no. phases as outlined in Appendix 4-1. The internal roads and footpath layouts of the development have been designed in accordance with the Design Manual for Urban Roads and Streets Version 1.1 (Department of Transport, 2013) (DMURS).

15.1.3.1 Parking Provision

The maximum parking provisions at the site have been calculated in accordance with the parking Guidelines set out in the following:

- Galway City Council Development Plan (GCCDP) 2023 – 2029

The required and provided car parking breakdown for the Proposed Development (362 units) is illustrated in the Table below.

Table 15-1 Car Parking Requirements

Car Parking	Requirement	Units	Calculated Maximum	Parking Provided
Residential	11.3.1 (g) – 1 on-site space per dwelling and 1 grouped visitor space per 3 dwellings	362	362 / 120	313
Creche	Table 11.6 – Childcare Facilities – 1 space per 20m^2 of operational space	440 m^2	22	
Totals			**504**	**313**

A total of 313 no. car parking spaces will be provided onsite. The parking provision is below the maximum parking requirement for a residential development in Galway City.

15.1.3.2 Road Safety Audit

A Stage 1 Road Safety Audit has been carried out by CST Group Chartered Consulting Engineers independently from the design team on the Proposed Development. The Audit identified a number of items which were reviewed by the Design Team and the design was amended where necessary. The recommended measures and proposals were agreed and signed off by the Designers, Client and Auditors. The final site layout provides a roads network throughout the development which incorporates measures (such as curved alignments, surface materials to differentiate pedestrian and vehicle routes etc.) that ultimately provide a high level of safety for both the pedestrian and the driver without comprising the overall quality of the development. Swept path analysis has also been carried out to ensure vehicles can operate safely within the site.

Please refer to the CST Road Safety Audit included as part of this application for further details.

15.1.3.3 Existing Traffic Flows on the Local Network and the Traffic Impact of the Proposed Development

In the absence of any specific local traffic growth information, it was assumed that baseline traffic will continue to grow at the levels recommended by TII in the Project Appraisal Guidelines (PAG) – Unit

5.3 'Travel Demand Projections' publication (PE-PAG-02017) – latest revision dated October 2021. The Project Appraisal Guidelines describe three levels of transport model functionality. The simple model, which reflects traffic volumes on the basis of link flows, is best suited to the Proposed Development. Such models do not attempt any route assignment, and hence are applicable for networks where no change in traffic flows will result from a proposed scheme. Growth rates recommended in PAG – Unit 5.3 have been used to determine future traffic flows on the road network within the vicinity of the development. Growth Rates for Galway Metropolitan Area were used in the analysis.

The year of opening of the scheme was assumed to be 2026. The central growth factors from the Project Appraisal Guidelines – Unit 5.3 publication were used and are detailed below: -

- TII Link Based Growth Rates: Annual Growth Factor for 2016-2030 = 1.0169 (LVs) and 1.0217 (HVs);
- TII Link Based Growth Rates: Annual Growth Factor for 2030-2040 = 1.0097 (LVs) and 1.0182 (HVs):
- TII Link Based Growth Rates: Annual Growth Factor for 2040-2050 = 1.0095 (LVs) and 1.0220 (HVs).

The annual growth factors for Light Vehicles (LVs) and Heavy Vehicles (HV) were applied to surveyed values of vehicles counted.

With regards to the volume of traffic using the road, the passenger car is adopted as the standard unit and other vehicles are assessed in terms of passenger car units (PCU's). Cars and Light Goods Vehicles are grouped together as LV. All other Goods Vehicles, Buses and Coaches are defined as HV.

The classification of vehicles in PCU's is shown below:

Table 15-2 Classification of Passenger car Units

Vehicle	PCU
Car	1
Light Goods Vehicle	1
Other Goods Vehicle (2 -3 axle)	1.5
Other Goods Vehicle (4 -5 axle)	2.3
Bus	2
Cycle	0.4

One of the main objectives for the site will be to reduce the number of car trips and in cases where there is no other option but to travel by car, to increase the number of people carpooling and travelling as passengers.

15.1.4 Methodology

The approach to the assessment of likely significant impacts on traffic and transportation in this chapter accords with policy and guidance at National, Regional and Local level. The methodology responds to best practices, current and emerging guidance, all of which advocate this method of analysis. Key publications consulted include:

- Environmental Protection Agency (EPA) Guidelines on the information to be contained in the EIAR (2022);
- TII 'Traffic and Transport Assessment Guidelines' (May 2014);
- TII Project Appraisal Guidelines for National Roads Unit 5.3: Travel Demand Projections;
- Design Manual for Urban Roads and Streets Version 1.1 (Department of Transport, 2013);
- Galway City Council Development Plan (GCCDP) 2023 – 2029;

A Traffic and Transport Assessment (TTA) has been prepared in accordance with the TII's 2014 publication 'Traffic and Transport Assessment Guidelines' and the 'Guidelines for Traffic Impact Assessments' as published by the Institution of Highways and Transportation U.K. in 1994 and is submitted with the planning application. The scope and extent of the TTA was discussed and agreed with Galway City Council Roads and Transportation Department, Active Travel Departments and the Recreation and Parks Department (as outlined further in Section 15.1.5).

Key parameters relating to the traffic modelling carried out included: junctions to be assessed, trip generation, modal shift targets, trip distribution and assessment years. The traffic and transport impact of the Proposed Development is discussed as part of the assessment. The traffic and transport significance levels and criteria definitions are outlined in the Table 15-3 below.

Table 15-3 Significance Criteria for Impacts on Traffic or Transportation

Significance Level	Criteria
Profound	Profound impacts occurs where there is permanent disruption to transport network.
Significant	Significant impact occurs where there is sever disruption to traffic and/or transport.
Moderate	Moderate impact occurs where there is medium term disruption to the network or significant increase of traffic flow.
Slight	Slight impact occurs where there is noticeable description or an increase in wait times.
Imperceptible	Imperceptible impact occurs where there is temporary distribution or no quantifiable increase in traffic.

15.1.5 Consultation/Scoping

The Proposed Development and any potential traffic impacts were discussed at a number of meetings with Galway City Council Roads and Transportation Department, Active Travel Departments and the Recreation and Parks Department. There were a number of items discussed during these meetings, including a change to the priority of the Altan school access road, Bothar Stiofain Active Travel Scheme, the future Kingston Road junction upgrade works and the potential future cycling scheme located along the Western Distributor Road. Galway City Council (GCC) requested that the analysis be carried out at the following junctions:

1. *Junction 1 – Bothar Stiofain / Western Distributor Road / Altan*
2. *Junction 2 – Gort Na Bro / Western Distributor Road / An Logan*

The potential future Western Distributor Road (WDR) Active Travel scheme was also discussed with GCC's Transportation and Active Travel Departments. This proposed scheme aims to develop new

and upgraded cycling infrastructure along the WDR. During this consultation it was agreed that the analysis would review the potential future geometric changes to the Bothar Stiofain / Western Distributor Road / Altan Roundabout (Junction 1) and include it as part of the Traffic and Transport Assessment. For this LRD application, traffic surveys were conducted on the 7th November 2023 (Junction 1 & Junction 2) at the junction locations below.

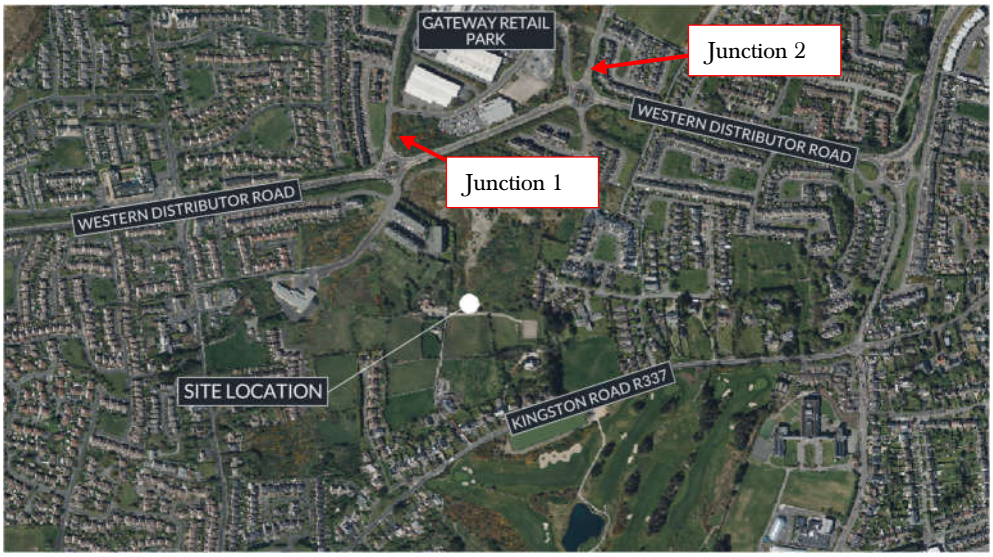

Figure 15-1 Junction Locations

As part of the current LRD application, the Proposed Development was discussed during the S247 pre-planning meeting on April 23rd, 2024, and the S32B pre-planning meeting on March 26th, 2025. These consultations included detailed discussions with the Roads Department and Active Travel Department of GCC.

15.1.6 Traffic Counts

In order to determine the magnitude of the existing traffic flows, the results of a manual classified junction turning counts was used. These traffic surveys were carried out at the following junctions and dates:

- Junction 1: Roundabout Junction – Bothair Stiofain / Western Distributor Road / Altan (IDASO Survey 7th November 2023)
- Junction 2: Roundabout Junction - Gort Na Bro / Western Distributor Road / An Logan (IDASO Survey 7th November 2023)

This survey distinguished between light good vehicles and heavy good vehicles. The results of this survey indicated that the peak traffic levels through the junction occurred between the hours of 08:00 and 09:00 and between 16:30 and 17:30.

15.1.7 Difficulties Encountered

There were no difficulties encountered preparing this chapter.

15.1.8 Existing Receiving Environment

15.1.8.1 Location and Network Summary

Land Use

The site is located approximately 6km west of Galway City Centre and is an existing 8.74 ha greenfield / brownfield site at Kingston, Knocknacarra, Galway. Vehicular access is proposed via a priority T-junction off the Altan arm of the WDR / Bothar Stiofain / Altan roundabout.

Existing Road Network

The layout of the local road network is presented in the Figure below. The Proposed Development is bounded to the South by the Kingston Road. To the North of the site the land abuts the Western Distributor Road, with high-density residential developments bounding the site to the east, and greenfield sites and dwellings to the west.

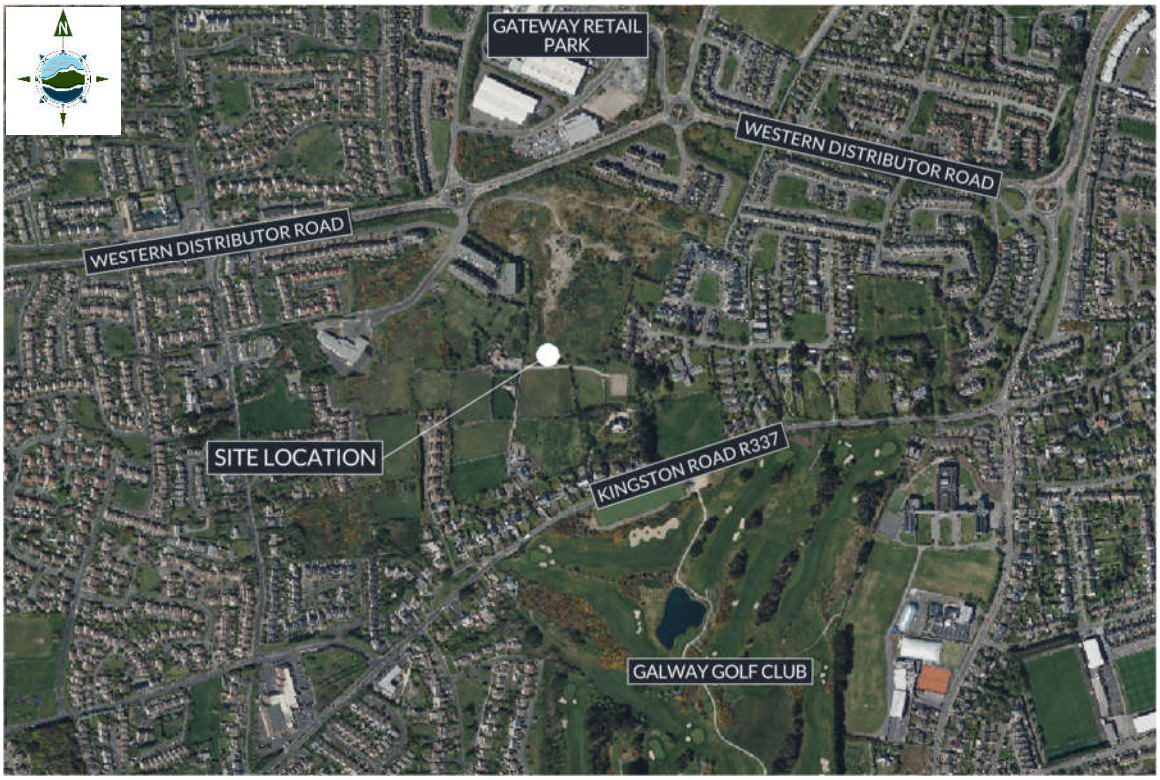

Figure 15-2 Site Location and Surrounding Road Network

A brief description of the local road network and associated junctions is provided as follows:

Western Distributor Road

The WDR is a single carriageway road (one lane in each direction) with cycle lanes (approximately 1.5m wide) and footpaths located along both sides. The WDR serves as a key arterial route in the western suburbs of Galway City, particularly through the Knocknacarra area. It connects the Seamus Quirke Road (R338) to the Cappagh Road, facilitating access between residential zones, schools, and commercial areas. The WDR intersects with several local roads via roundabouts, including the Clybaun Road and Bóthar Stiofáin, and is served by multiple City Direct bus routes, such as the 412 and 411, linking it to Eyre Square and other parts of the city.

R337 Kingston Road

The R337 Kingston Road is a single carriageway road with one lane in each direction and a footpath located on the northern side of the Kingston Road on the approach to the development site. The Kingston Road is a key suburban route in the western part of Galway City, linking the Seamus Quirke Road (R338) to the Shangort Road and further west toward Knocknacarra. It serves as a connector between residential areas such as Kingston, Seacrest, and Shantalla, and provides access to local amenities including schools, shops, and sports facilities. The road is served by Bus Éireann Route 402, making it a vital corridor for commuters and students alike.

The walking network in Galway City is comprised of existing footpaths adjoining public roads. The main approaches to the City Centre have footpaths for pedestrian use only. The WDR has footways and cycle lanes each side of the road leading to the proposed site. Otherwise, cyclists utilise the existing roadway.

There is a pedestrian footway provided along the Kingston Road which connects to the Proposed Development with pedestrian infrastructure to the east (Galway City Centre).

Public Transport

The Proposed Development is served by a number of regional and local bus routes, namely the 402 and 405 Bus Eireann routes and the 410, 411, and 412 City Direct bus routes.

Galway City is also served by a number of train services which is located approximately 4.5km from the Proposed Development. Iarnród Eireann operate a number of services from this station of which include Dublin Heuston – Galway, Galway – Limerick, and Waterford – Clonmel – Limerick Junction.

Future Transportation Environment

The extension of the current local link bus route to serve the Proposed Development can be considered. BusConnects is a programme of public transport investment in Ireland's major urban centres including Galway City. Similarly additional cyclist linkages within Galway City are also being proposed as part of CycleConnects for Galway's Urban Area network.

15.1.9 Potential Impact of the Proposed Development

The following section outlines the Traffic and Transportation Assessment undertaken in accordance with the TII Traffic and Transportation Assessment Guidelines – August 2014 publication (PE-PDV-02045).

The predicted impact, the mitigation measure required, and the residual impacts are considered under the following headings:

- Do Nothing Scenario
- Construction Phase
- Operational Phase
- Cumulative Impacts

15.1.10 Do Nothing Scenario

In the absence of the Proposed Development, the overall operational performance of the existing junctions on the surrounding road network will be affected by the impact caused by the forecast background network traffic growth (should that growth arise).

15.1.10.1 Worst Case Scenario

The Proposed Development will impact on the surrounding roads network during construction and operational stages. It is broadly accepted that operational stage traffic will exceed that of construction stage traffic and will be potentially less manageable in terms of avoiding peak hour traffic periods. Therefore, traffic models of the Proposed Development access junctions as well as the existing junctions 1 and 2 have been developed with operational phase traffic presenting a worst-case scenario.

The analysis carried out represents a worst-case appraisal of typical weekday and weekend peak periods focused upon the busiest periods of the day (i.e. AM, Interpeak, PM peak and Weekend peak hours). On weekdays outside of these peak hours of the day, traffic flows are predicted to be notably lower resulting in the network operating with additional reserve capacity to that forecast for the peak hour periods.

Similarly, over the weekend period both the site generated traffic and the external road network traffic flows have been assessed for the peak hour on a Saturday. Outside of this time, traffic flows are lower resulting in the network operating with additional reserve capacity to that forecast during the peak hour.

15.1.10.2 Assessment Periods

15.1.10.2.1 *Assessment Year*

TII Traffic and Transportation Assessment Guidelines[1] sets out the required assessment years and time periods to be assessed. In accordance with this guideline document, the following sections detail those proposed in this assessment.

15.1.10.2.2 *Construction Phase*

The assessment years typically include for the Construction Phase and Operational Phase. It is broadly accepted that the operation stage traffic will exceed the construction stage traffic hence no Construction Phase has been assessed within the TTA. However, the impact of the Construction Stage has been addressed within the TTA and is summarised in Section 15.1.10.6.

15.1.10.2.3 *Operational Phase*

For this application, the Operational Phases as per TII Traffic and Transportation Assessment Guidelines (PE-PAV-02045) are:

- Operational Phase
  - 2026 – Envisaged Year of Opening;
  - 2031 – Year of Opening plus 5 years;
  - 2041 – Year of Opening plus 15 years.

15.1.10.3 Traffic Growth

Annual growth indices were updated in 2019 by the TII, with annual indices and cumulative growth forecasts shown for Galway Metropolitan Area in the Table below. The derived growth factors were applied to the flows to determine background traffic flows for the assessment years. The assessment is

[1] *Traffic and Transport Assessment Guidelines PE-PDV-02045 (Transport Infrastructure Ireland, May 2014).*

split into light vehicles and heavy vehicles. These growth factors were applied to the traffic volumes measured during the traffic survey.

Table 15-4: Growth Factors for light vehicle (LV) and heavy vehicles (HV) - 2023

	2026	2031	2041
LV	1.047	1.122	1.212
HV	1.062	1.167	1.379

15.1.10.4 Do Nothing Scenario

It shall be noted that the Do-Nothing scenario is equivalent to the baseline environment. The assessment of the existing environment/Do Nothing Scenario, would be a scenario where there is no change to the environment. (i.e., if the development does not proceed).

15.1.10.5 Baseline Traffic

Traffic count data have been utilised in accordance with the Transport Infrastructure Irelands (TII) Project Appraisal Guidelines (PAG) - Unit 16 in order to estimate the Annual Average Daily Traffic (AADT) two-way traffic flow on the associated road network. This method is an industry standard as it takes account of seasonal variations that is typically experienced during national public holidays and tourist seasons. In turn, this allows for an informed and representative basis for comparison of project related impacts.

15.1.10.6 Construction Phase

Construction traffic travelling to the Proposed Development site will use the Western Distributor Road. A Traffic Management Plan (which will be completed by the Contractor appointed to the project) for the construction stage will identify haulage routes and restrictions as appropriate in discussion with the Local Authority. A Construction and Environmental Management Plan (CEMP) is included with the planning application which outlines the preliminary management plan and what will be expected of the Main Contractor's Management Plan at construction stage.

15.1.10.6.1 *Routing Of Construction Phase Traffic*

The proposed construction haul routes were identified based on review of existing local quarries, principal road networks (i.e., national, and regional) and consultation with the Local Authority. The haul routes utilise the national and regional road network as much as feasible, with only localised use of the local road network. Construction traffic will arrive to the proposed project site via the N6 and Western Distributor Road, with the most prevalent use of the regional road network to be the R336 to the west of the Proposed Development. Most materials will be delivered using maximum legal articulated lorries or smaller vehicles.

Project construction HGV traffic will be directed away from communities and sensitive receptors (i.e., schools, dense residential areas, urban centres) where possible to minimise the effect on these communities.

It is estimated a total of 8,220 no. 2 way heavy goods vehicles (HGV) delivery trips will be generated during the total construction stage of the development. It is also envisaged that during the busiest period onsite, namely the groundworks element of the works, an estimated 20 no. HGV's will deliver to the site on a daily basis for the duration of this work element. HGV deliveries are envisaged at other periods during the construction phase but these are expected to be at a lower frequency. It is estimated

that for a development of this size, 40 – 50 site operatives will be employed at the height of the construction works. This would equate to an approximately 40 PCU vehicle (Vans and Cars) trips to and from the site during the construction days.

The increase in traffic volumes, as a result of construction vehicles visiting the site, is not considered to be excessive and will be spread out over a three year period. The development has also been designed to minimize excavation works, where practical throughout the site, in keeping the proposed finish floor levels of the units and the proposed road levels as close to the existing ground levels as possible. As a result the trip generation associated with the exporting and importing of excavated material and fill material to site is minimised. For further detail on the excavation works see Appendix 4-1 or Chapter 7 Land, Soils & Geology Chapter of this EIAR.

Due to the designated access point off the WDR, allowing delivery vehicles to use the access road into the site, there will be no significant disruption on the traffic flows on the WDR as a result of the construction of the development. It is recommended that all delivery drivers and haulage companies serving the Proposed Development are provided with instructions / directions on accessing the site from the WDR and the surrounding local road network. Overall, there will be a short-term slight negative impact to local traffic during the construction phase.

15.1.10.7 Operational Phase

The Operational Phase of the development has the potential to have the largest impact. TOBIN have procured Trip Rate Information Computer System (TRICS) data for similar sized residential developments in order to inform the trip rate associated with such a development. The estimated total number of vehicular trips generated by the Proposed Development is shown in the Table below which details the generated traffic for the AM and PM peak hours.

The Table demonstrates the expected AM/PM traffic generation figures from the various uses of the scheme and a total of 172 trip movements in the AM peak and a total of 167 trip movements in the PM peak are expected to result from the Proposed Development.

It is estimated that creche trips will predominately be self-contained within the development, with most of the creche users walking from within the development site.

It was envisaged the Proposed Development trip distribution matches the existing traffic distribution observed during the traffic surveys conducted at each of the junctions.

Table 15-5 Proposed Development Traffic Generation via Junction 1

Vehicles	Arrivals	Departures
AM	53	119
PM	103	64

15.1.10.8 Proposed Project

The potential for the Proposed Development to result in significant cumulative or in combination effects when assessed with the Proposed Project, was considered. The Proposed Project involves the lands adjacent to the Proposed Development that make up a part of a larger masterplan. An allowance for a remaining residential zoned lands, the potential retail development and granted aquatic centre facility has been allocated in the traffic volumes for the development of the masterplan. The traffic volumes for the Proposed Project were established from the TRICS database as shown in the Table below.

Table 15-6 Proposed Development + Masterplan Traffic Generation via Junction 1

Vehicles	Arrivals	Departures
AM	274	275
PM	433	401

The JUNCTION 10 (ARCADY) assessment of each junction is illustrated below. A complete set of outputs from JUNCTION 10 are included in the TTA submitted with the application.

Existing Roundabout Junction 1

Table 15-7 Existing Roundabout Junction 1

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2023 Existing									
Arm 1	D1	0.4	4.13	0.31	A	D2	0.4	3.64	0.30	A
Arm 2		0.3	3.91	0.24	A		0.8	5.19	0.44	A
Arm 3		0.2	3.91	0.18	A		0.1	4.35	0.08	A
Arm 4		1.8	7.56	0.64	A		1.0	5.18	0.50	A
	2026 Base									
Arm 1	D3	0.5	4.30	0.33	A	D4	0.5	3.75	0.31	A
Arm 2		0.3	4.01	0.26	A		0.9	5.48	0.46	A
Arm 3		0.2	4.02	0.19	A		0.1	4.54	0.09	A
Arm 4		2.1	8.39	0.68	A		1.1	5.47	0.53	A
	2026 Base + Comm & Prop									
Arm 1	D5	0.6	4.83	0.37	A	D6	0.5	4.02	0.35	A
Arm 2		0.4	4.17	0.28	A		1.2	6.52	0.54	A
Arm 3		0.3	4.31	0.23	A		0.1	5.14	0.12	A
Arm 4		3.2	11.59	0.76	B		1.3	6.04	0.57	A
	2041 Base									
Arm 1	D7	0.7	5.01	0.40	A	D8	0.6	4.21	0.37	A
Arm 2		0.5	4.45	0.31	A		1.2	6.79	0.55	A
Arm 3		0.3	4.38	0.23	A		0.1	5.38	0.12	A
Arm 4		3.5	12.46	0.78	B		1.6	6.80	0.61	A
	2041 Base + Comm									
Arm 1	D9	0.8	5.71	0.44	A	D10	0.7	4.48	0.40	A
Arm 2		0.5	4.58	0.32	A		1.6	8.00	0.61	A
Arm 3		0.3	4.64	0.25	A		0.2	6.18	0.13	A
Arm 4		6.4	21.33	0.87	C		1.8	7.55	0.65	A
	2041 Base + Comm & Prop									
Arm 1	D11	0.8	5.85	0.45	A	D12	0.7	4.56	0.41	A
Arm 2		0.5	4.64	0.33	A		1.7	8.45	0.63	A
Arm 3		0.4	4.86	0.28	A		0.2	6.41	0.16	A
Arm 4		7.2	24.03	0.89	C		1.9	7.76	0.66	A
	2041 Base + Comm & Masterplan									
Arm 1	D13	1.3	8.19	0.56	A	D14	1.2	6.93	0.55	A
Arm 2		0.8	6.17	0.44	A		11.9	46.50	0.94	E
Arm 3		1.2	7.87	0.55	A		9.2	65.79	0.94	F
Arm 4		60.2	154.48	1.08	F		4.3	15.84	0.82	C

The summary of performance analysis indicates that during the Operational Phase Junction 1 (existing roundabout junction) will operate with negligible queues and delays pre and post the development during the morning and evening peak hours.

The inclusion of the masterplan development (commercial development and aquatic centre facility) is projected to increase RFC and queue lengths for both the morning and evening peak, with Arm 4 in the AM exceeding capacity.

Existing Roundabout Junction 1.1

It is also estimated that a proportion of the proposed and masterplan trip generation will be pass through trips of the existing Western Distributor Road. Although a reduction factor could be applied to the proposed trip rates, it has not been applied as part of a conservative analysis.

Table 15-8 Active Travel Layout Roundabout Junction 1.1

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2026 Base									
Arm 1	D1	0.7	6.38	0.42	A	D2	0.6	5.31	0.39	A
Arm 2		0.4	4.57	0.28	A		1.0	6.60	0.51	A
Arm 3		0.3	4.40	0.20	A		0.1	5.02	0.09	A
Arm 4		2.1	8.65	0.68	A		1.1	5.56	0.53	A
	2026 Base + Comm									
Arm 1	D3	0.9	7.30	0.47	A	D4	0.7	5.72	0.43	A
Arm 2		0.4	4.71	0.30	A		1.3	7.75	0.57	A
Arm 3		0.3	4.56	0.22	A		0.1	5.57	0.11	A
Arm 4		3.1	11.32	0.76	B		1.3	6.02	0.56	A
	2026 Base + Comm & Prop									
Arm 1	D5	0.9	7.53	0.48	A	D6	0.8	5.85	0.43	A
Arm 2		0.4	4.78	0.30	A		1.5	8.15	0.59	A
Arm 3		0.3	4.75	0.25	A		0.2	5.75	0.13	A
Arm 4		3.3	12.10	0.77	B		1.3	6.16	0.57	A
	2041 Base incl. Est. Active Travel Reduction									
Arm 1	D7	0.8	6.70	0.44	A	D8	0.7	5.53	0.41	A
Arm 2		0.4	4.72	0.30	A		1.1	7.03	0.53	A
Arm 3		0.3	4.48	0.21	A		0.1	5.25	0.10	A
Arm 4		2.4	9.21	0.71	A		1.2	5.87	0.55	A
	2041 Base + Comm incl. Est. Active Travel Reduction									
Arm 1	D9	0.9	7.58	0.48	A	D10	0.8	5.92	0.44	A
Arm 2		0.5	4.85	0.31	A		1.5	8.17	0.59	A
Arm 3		0.3	4.61	0.23	A		0.1	5.80	0.12	A
Arm 4		3.3	11.79	0.77	B		1.4	6.33	0.58	A
	2041 Base + Comm & Prop incl. Est. Active Travel Reduction									
Arm 1	D11	1.0	7.94	0.50	A	D12	0.8	6.06	0.45	A
Arm 2		0.5	4.91	0.32	A		1.6	8.58	0.61	A
Arm 3		0.3	4.87	0.26	A		0.2	6.01	0.14	A
Arm 4		3.8	13.51	0.80	B		1.4	6.47	0.59	A
	2041 Base + Comm & Masterplan incl. Est. Active Travel Reduction									
Arm 1	D13	1.8	13.25	0.65	B	D14	1.6	10.03	0.62	B
Arm 2		0.8	6.51	0.43	A		8.2	35.89	0.91	E

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
Arm 3		1.0	7.42	0.51	A		3.0	23.46	0.76	C
Arm 4		15.3	50.66	0.96	F		2.7	10.69	0.73	B
	2041 Base + Comm & Masterplan & GCRR									
Arm 1	D17	1.1	8.47	0.51	A	D18	1.0	7.23	0.51	A
Arm 2		0.5	5.46	0.33	A		2.1	11.43	0.68	B
Arm 3		1.0	6.65	0.51	A		1.5	10.39	0.61	B
Arm 4		3.1	12.61	0.76	B		1.3	6.59	0.56	A

The summary of performance analysis indicates that during the Operational Phase Junction 1.1 (proposed Active Travel roundabout layout) will operate with negligible queues and delays pre and post the development during the morning and evening peak hours.

Existing Roundabout Junction 2

Table 15-9 Existing Roundabout Junction 2

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2023									
Arm 1	D1	1.4	8.83	0.59	A	D2	0.7	6.36	0.40	A
Arm 2		0.2	4.93	0.19	A		0.3	4.47	0.23	A
Arm 3		0.2	3.94	0.18	A		0.1	3.15	0.06	A
Arm 4		0.4	4.16	0.31	A		1.3	6.63	0.56	A
Arm 5		0.0	4.15	0.03	A		0.0	5.14	0.02	A
	2026 Base									
Arm 1	D3	1.6	9.57	0.62	A	D4	0.7	6.64	0.42	A
Arm 2		0.3	5.11	0.20	A		0.3	4.58	0.24	A
Arm 3		0.2	4.07	0.19	A		0.1	3.20	0.06	A
Arm 4		0.5	4.26	0.32	A		1.4	7.07	0.59	A
Arm 5		0.0	4.21	0.03	A		0.0	5.29	0.02	A
	2026 Base + Comm & Prop									
Arm 1	D5	3.1	15.62	0.76	C	D6	0.9	7.52	0.48	A
Arm 2		0.3	5.97	0.25	A		0.4	4.85	0.26	A
Arm 3		0.3	4.39	0.23	A		0.2	3.71	0.18	A
Arm 4		0.6	4.54	0.36	A		1.9	8.73	0.65	A
Arm 5		0.0	4.39	0.04	A		0.0	5.88	0.02	A
	2041 Base									
Arm 1	D7	2.6	13.54	0.73	B	D8	1.0	7.87	0.50	A
Arm 2		0.3	5.75	0.25	A		0.4	5.04	0.29	A
Arm 3		0.3	4.60	0.24	A		0.1	3.39	0.07	A
Arm 4		0.6	4.64	0.38	A		2.2	9.36	0.68	A
Arm 5		0.0	4.43	0.03	A		0.0	5.89	0.02	A
	2041 Base + Comm									
Arm 1	D9	5.6	26.17	0.86	D	D10	1.2	8.97	0.56	A
Arm 2		0.4	6.79	0.30	A		0.4	5.32	0.30	A
Arm 3		0.4	4.96	0.28	A		0.2	3.94	0.20	A
Arm 4		0.7	4.95	0.41	A		2.9	11.92	0.74	B
Arm 5		0.0	4.61	0.04	A		0.0	6.54	0.03	A
	2041 Base + Comm & Prop									
Arm 1	D11	6.2	28.43	0.87	D	D12	1.3	9.12	0.56	A

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
Arm 2		0.4	6.87	0.31	A		0.4	5.35	0.31	A
Arm 3		0.4	5.01	0.28	A		0.2	3.96	0.20	A
Arm 4		0.7	4.97	0.42	A		3.0	12.46	0.76	B
Arm 5		0.0	4.62	0.04	A		0.0	6.63	0.03	A
	2041 Base + Comm & Prop & Masterplan									
Arm 1		17.4	69.58	0.98	F		2.7	15.04	0.74	C
Arm 2		0.5	7.59	0.33	A		0.6	6.27	0.36	A
Arm 3	D13	0.4	5.49	0.31	A	D14	0.3	4.45	0.22	A
Arm 4		0.9	5.58	0.48	A		12.1	42.03	0.94	E
Arm 5		0.0	4.92	0.04	A		0.0	8.62	0.04	A

The summary of performance analysis indicates that during the Operational Phase Junction 2 (existing roundabout junction) will operate with negligible queues and delays pre and post the development during the morning and evening peak hours.

The existing and proposed junctions are projected to operate within capacity, other than with the additional of the masterplan at Junction 1 during the 2041 Design Year, as demonstrated in the tables above; therefore, the Proposed Development will have a slight effect on the road network during operations. The Table below summaries the impact of the Proposed Development on the surrounding transport network and users.

Table 15-10 Summary of Impact Assessment

Vehicles	Arrivals	Departures
Construction Stage		
Traffic	Increased construction traffic flows onto existing roads network	Short-Term Slight Negative
Walking	Increased construction traffic flows resulting in an increased risk to existing pedestrian movements	Short-Term Imperceptible Negative
Cycling	Construction Traffic Flows resulting in an increased risk on the existing cycle network	Short-Term Imperceptible Negative
Operational Stage		
Traffic	Development-Generated Traffic added onto surrounding Road Network	Long-Term Slight Negative
Walking	An increase in pedestrian traffic to local schools, shop amenity and sports facilities, and to Galway City Centre	Long-Term Slight Positive
Cycling	An increase in cycle activity utilising existing network	Long-Term Slight Positive

15.1.10.9 Cumulative Assessment

The cumulative assessment considered all committed developments within the vicinity of the site and those which will have an impact on the junctions as identified previously. This includes sites which have previously been granted planning permission, but which are yet to become operational. Based on these projects, some potential cumulative impacts are discussed below.

There are five major developments adjacent to the proposed site. This consists of:

- Construction of 3 no. offices blocks (GFA: 14,650 sqm) and all associated site development works as follows: Block 1: 8 storey office building providing offices, stair and lift cores and plant rooms (GFA: 7,330 sqm). Block 2: 6 storey office building providing offices, stair and lift cores and plant rooms (GFA: 4,445 sqm). Block 3: 4 storey office building providing offices, stair and lift cores and plant rooms (GFA: 2,875 sqm). This development was granted planning permission in 2022. The development will be accessed via the Rahoon Road to the north of the site (Planning Ref: 2460021).
- Construction of 277 No. residential apartments in 7 blocks. The development will be accessed via a new priority junction along the Gort Na Bró Road to the north of the site (Planning Ref: 233).
- Construction of 29 No. residential apartments in 2 blocks. The development will be accessed via a new priority junction along the Clybaun Road to the northwest of the site (Planning Ref: 23157).
- Construction of 58 No. residential units. The development will be accessed via a new priority junction along the Clybaun Road to the northwest of the site (Planning Ref: 20327).
- Construction of 91 No. residential units. The development will be accessed via a new priority junction along the Ballymoneen Road to the west of the site (Planning Ref: 1730).

An allowance was made in the Traffic and Transport Assessment for the trip generation from the above committed development sites based on best predictions using all available information and in keeping with recognised standards. The analysis found that the committed developments will result in an increase in the traffic on the WDR, approximately 270 trips predicted in the AM peak hour and 280 trips in the PM peak hour. The analysis indicated that traffic generated from the committed and Proposed Development will have a minimal effect on the existing traffic volumes on the network.

This will result in a long term imperceptible negative cumulative impact on local traffic.

15.1.11 Mitigation Measures

15.1.11.1 Mitigation Measures During the Construction Phase

The construction stage of the Proposed Development will be complete in two phases and is scheduled to begin construction in 2026 with the construction phase lasting for three years. It is envisaged that working hours will be 08:00am to 18:00pm Monday to Friday (08:00am to 13:00pm for Saturday) for construction personnel through each phase of the development however working hours will be confirmed on grant of planning by Galway City Council. Generally, construction workers will travel to site before the measured peak hour of 08:00 to 09:00, to be on site for a 08:00 start-time. It is envisaged that a very limited number of construction employees are likely to travel to the site during peak hours.

It is anticipated that heavy goods vehicles, HGV's, will be restricted to movements on the local road network during the off-peak periods. It is estimated that truck movements and general deliveries would arrive/leave at a steady rate during the course of the day. It is envisaged that during the busiest period onsite, namely the groundworks element of the works, an estimated 20 no. HGV's will deliver to the

site on a daily basis for the duration of this work element. HGV deliveries are envisaged at other periods during the construction phase but these are expected to be at a lower frequency. An estimated total of 8,220 HGV trips are envisaged throughout the course of the construction phase of the works.

A number of mitigation measures are proposed during the construction phase to minimise the impact, the measures are as follows;

- A detailed haulage plan will be put in place to ensure minimal impact on the surrounding road network. Spoil removal from site will be kept to a minimum with a detailed site survey completed to ascertain where spoil can be distributed on the site.
- All deliveries and removals will be subject to stringent site rules governing the loading / off-loading times, location of loading / off loading, covering of loads and cleaning of vehicles exiting the site, etc.
- Delivery loads to and from the site and management of large deliveries on site to occur outside of peak periods.
- No vehicle will be allowed to stop or park on the access road to the Proposed Development site.
- Ample parking will be provided within the site to cater for the staff and visitors during the construction phases of the Proposed Development.
- Construction traffic will be managed and scheduled to ensure no queueing occurs on either the internal road system or the main approach roads. The provision of an on-site vehicle staging area will facilitate waiting vehicles.
- Routine sweeping/cleaning of the road and footpaths in front of the site; and
- No uncontrolled runoff to the public road from dewatering/pumping carried out during construction activity.

There will be on-going monitoring of the impact of construction traffic on the wider roads network to ensure prompt action is taken in the event of an issue arising.

15.1.11.2 Mitigation Measures During the Operational Phase

Mitigation measures proposed during the operational stage are as follows;

- Provision of “STOP” road markings at the access junctions in accordance with Figure 7.35 of the Traffic Signs Manual (TII, 2019).
- Suitable Lighting of all junctions with lighting columns being positioned at the back of the footways.
- It is proposed to provide advanced warning signs on the Altan Road as it approaches the site entrance. The signage will be in accordance with Chapter 6 of the Traffic Signs Manual (TSM) for road users travelling in the northern and southern direction towards the entrance to the development.
- The connection of the Proposed Development footpaths and cycle lane to the existing infrastructure on the Western Distributor Road. This will allow connectivity to the existing Bus Stops in Knocknacarra.
- The provision of bicycle stands and dedicated cycle routes through the development to encourage cycling.
- Charging points for electric vehicles are being provided

A package of integrated mitigation measures has been prepared to off-set the additional local demand that the proposed residential development at the subject site could potentially generate as a result of the forecast increase in vehicle movements by residents of the scheme. These measures and associated timescale for their implementation are described below.

Management – A Mobility Management Plan (MMP) has been compiled by Transport Insights with the aim of guiding the delivery and management of coordinated initiatives by the scheme developer to be implemented upon occupation of the site. The MMP sets out an Action Plan which ultimately seeks to

encourage sustainable travel practices for all journeys to and from the Proposed Development through mode specific measures including:

- ***Appointment of a part-time Travel Planning Coordinator to:***
  - *Set up a Travel Plan notice board (i.e. at community spaces within the Knocknacarra development)*
  - *Develop a residents' Sustainable Transport Information Pack for each residential unit/ dwelling Development of Marketing Plan to promote MMP to all residents & visitors, i.e. monthly bulletins/ events/ promotion of MMP*
  - *Monitor cycle parking facilities use and provide additional capacity and/or facilities for non-standard bikes, scooters, etc. when needed.*
  - *Promotion of car-pooling for residents through appropriate forum*
- ***Walking/cycling:***
  - Promote availability of Cycle to Work Scheme
  - Raise resident & visitor awareness of the health benefits of cycling through Noticeboard and Sustainable Transport Information Pack
- ***Public Transport:***
  - Provide residents with Sustainable Transport Information Packs detailing all sustainable travel options including accessible bus services and links to bus stops and the Public transport Tax Saver ticket promotion

Infrastructure – Measures to reduce reliance of private vehicles are the provision of ample secure cycle parking on site and ensuring a design which promotes permeability for pedestrians and cyclists to, through and from the development. The level of parking provision for the development (comprising 313 no. car parking spaces allocatable to residential units, equating to a car parking ratio of 0.86 spaces per unit) will also act as a powerful mobility management measure, ensuring against an overprovision of parking and a resultant over reliance on the private vehicle. The development also proposes provision of high-quality dedicated pedestrian footpaths and cycle paths throughout the development site and upgrades to crossing facilities along desire lines on the adjacent road network.

15.1.12 Residual Impact

15.1.12.1 Construction Phase

Following the implementation of the mitigation measures, the residual impact of construction related traffic on the local and national road network is expected to be short term in line with the construction phase duration.

Construction traffic will be distributed over a three-year period commencing in 2026 and delivered in two defined phases. The majority of construction worker trips will occur outside of the peak morning traffic period (08:00–09:00), thereby limiting their impact on peak hour congestion. Furthermore, HGV movements are planned to occur during off-peak periods, with the highest volume of activity, estimated at up to 20 HGVs per day, limited to the groundworks phase. Over the course of the construction programme, approximately 8,220 HGV trips are projected in total, which equates to a modest volume when dispersed over the full construction phase.

The implementation of a robust haulage plan, strict delivery scheduling, and the prohibition of on-road waiting or parking will ensure that the risk of localised congestion and disruption to the road network is minimal. Additional mitigation, including on-site vehicle staging areas, routine road cleaning, and the

prevention of uncontrolled runoff, further supports the containment of potential environmental and operational impacts.

Importantly, the construction programme includes ongoing monitoring of traffic effects to enable the early identification and resolution of any emerging issues. This adaptive management approach is expected to provide further assurance that no significant long-term or residual impacts on the local or national road network will occur as a result of construction activities.

In summary, with the mitigation measures in place and maintained throughout the construction phase, the residual impact on the road network is considered to be slight in significance, and strictly limited to the duration of the construction phase.

15.1.12.2 Operational Phase

As population grows throughout Ireland and in particular, in popular commuting hub areas like Knocknacarra, a continued increase in traffic volumes is not sustainable. The governments modal shift targets are outlined in the Smarter Travel: A Sustainable Transport Future. The key targets of Smarter Travel are to reduce work-related commuting by car to 45%, and increase other modes such as walking, cycling, public transport and carpooling to 55%. As a result, an ever-increasing approach by designers and planners to providing sustainable commuting alternatives is required. The use of public transport and promotion of walking and cycling will ultimately increase the overall quality of life for the people living in these fast paced, busy towns and villages located within commuter belts.

The Proposed Development has integrated a number of measures in line with the relevant standards and guidelines, such as DMURS 2019 and the Cycle Design Manual, which promotes the use of sustainable travel to and from the site. The Road Safety Audit carried out for the site allowed the design team to address any concerns initially flagged in the Road Safety Audit. A continued and collaborative approach with the road safety auditors meant that a desirable and safe site layout could be achieved without negatively impacting the overall quality of the development.

The use of the private car will still be maintained as a primary mode of transport for a number of the residents in the development. Trip generations to and from the Proposed Development are 231 in the morning peak and 227 in the evening peak as noted above. The internal roads on the development to be constructed have been suitable designed in accordance with the DMURS manual.

Progressive and regular liaising with Galway City Council Roads and Transportation Department, Active Travel Departments and the Recreation and Parks Department in relation to the internal roads and the permitted link roads layouts contributed to the final road design for the development.

As noted previously, mitigation measures are to be implemented to promote and encourage more sustainable transport modes. The proximity of the Bus Stops will encourage pedestrians to utilise the higher frequency Public Transport options. Dedicated cycle routes and secure bicycle parking spaces are also provided throughout the development.

The Proposed Development is located close to a number of amenities such as local shops to the north of the Proposed Development, some 8 minutes walking distance (approx. 0.6km).

15.1.13 Significance of Effects

The junctions are predicted to operate below capacity without the development traffic in the future design years. The analysis predicts that the inclusion of the Proposed Development traffic will result in a slight increase in the degree of saturation for the junctions, with all junctions forecast to continue to operate below capacity.

The inclusion of the masterplan development (commercial development and aquatic centre facility) is projected to increase RFC and queue lengths for both the morning and evening peak, with Arm 4 in the AM exceeding capacity.

The analysis indicated that traffic generated from the Proposed Development will have a minimal effect on the existing traffic volumes on the network.

15.1.14 Summary

An assessment of the traffic impact of the Proposed Development at Kingston, Knocknacarra, Galway was undertaken. The Proposed Development is forecast to generate 172 vehicle movements in the morning peak and 167 movements during the PM peak times. The Proposed Project comprising of the overall Masterplan site is forecast to generate 549 vehicle movements in the morning peak and 834 movements during the PM peak times. The analysis indicates that the junctions are forecast to operate within capacity with the inclusion of the Active Travel measures currently being designed by Galway City Council.

A Stage 1 Road Safety Audit has been carried out for the Proposed Development during the planning stage and considered various aspects such as, junction design, provision for pedestrians, provisions for cyclists and road signage, marking and lighting. Recommendations noted from the independent company undertaking the road safety audit, CST Group Chartered Consulting Engineers, have been taken into account and the concerns raised have either been designed out or will be considered and suitable measures put in place during the detailed design stage.

The Proposed Development has integrated a number of measures in line with the relevant standards and guidelines, such as the Design Manual for Urban Roads and Streets and the Cycle Design Manual, which promotes the use of sustainable travel to and from the site.

15.1.15 Conclusion

Based on this assessment it is considered that in general, the traffic generated by the Proposed Development in Knocknacarra, Co. Galway will be adequately accommodated on the local highway network in the vicinity. The junctions are predicted to operate below capacity without the development traffic in the future design years. The analysis predicts that the inclusion of the Proposed Development traffic will result in a slight increase in the degree of saturation for the junctions, however all junctions are forecast to continue to operate below capacity.

The implementation of the Operational Phase mitigation measures including the measures identified in the accompanying Mobility Management Plan, such as the pedestrian, public transport and cycling measures, a shift in the modal spilt can be accomplished resulting in a reduction in the impact on the junction capacities.

15.2 Utilities, Water, and Other Services

15.2.1 Introduction

15.2.1.1 Chapter Scope

This section of the Material Assets chapter of this EIAR assesses the likely significant effects of the Proposed Development on water, electricity, telecommunications, and other material assets. Section 15.2 describes the receiving environment as it relates to material assets in the vicinity of the site and the potential for effects on those assets. Section 15.2.4 presents an assessment of the likely significant effects (and mitigation measures proposed). This section of the Material Assets chapter considers other utilities

or built services in the area such as electricity supply and transmission, water, gas and underground telecommunications.

15.2.1.2 Statement of Authority

This section of the EIAR has been prepared by Eileen Corley and reviewed by Eoin O Sullivan, both of MKO. Eileen joined MKO in September 2023 and holds a BSc in Environmental science where she focused her studies on environmental nature conservation and environmental legislation. Since taking up her position with MKO, Eileen has worked on Environmental Impact Assessment Screening Reports, Construction and Environmental Management Plan Reports, preparation of Environmental Impact Assessment Report Chapters, fee proposals for a wide range of projects and QGIS mapping for a range of projects such as wind energy, wastewater treatment plants, residential developments and quarries.

Eoin O'Sullivan is a Project Director at MKO with over 15 years of experience in the environmental assessment of a wide range of energy and infrastructure related projects and working in the fields of environmental and human health risk assessment, waste management, waste policy and permitting. Eoin has also experience in completing Environmental Impact Assessment Reports for renewable energy projects, quarries and a number of non-hazardous landfill sites and anaerobic digesters for both public and private clients. Eoin holds a BSc (Hons) in Environmental Science & Technology and an MSc in Environmental Engineering. Eoin's key strengths include project strategy advice for a wide range and scale of projects, project management and liaising with the relevant local authorities, Environmental Protection Agency (EPA) and statutory consultees as well as coordinating the project teams and sub-contractors. Eoin is a Chartered Member of the Chartered Institute of Water and Environmental Management and Chartered Environmentalist with the Society of Environment.

15.2.2 Methodology and Guidance

This section of the EIAR has been prepared in line with the guidance set out by:

- *Advice Notes for Preparing Environmental Impact Statements – Draft September 2015' (EPA, 2015).*
- *Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022).*

The assessment of likely significant effects on material assets uses the standard methodology and classification of effects, as presented in Section 1.7.2 of Chapter 1 Introduction. A full description of the Proposed Development is provided in Chapter 4 Description of the Proposed Development.

15.2.2.1 Difficulties Encountered

There were no technical difficulties encountered in relation to material assets when undertaking this assessment.

15.2.3 Scoping and Consultation

The relevant national and regional authorities and bodies listed in Chapter 2 Background to the Proposed Development were consulted to identify any potential impact on material assets. Those relevant to built services and waste management are presented in *Table 15-11* below.

Table 15-11 Built Services and Waste Management Scoping Responses

Consultee	Date Response Received	Response Detail
Uisce Eireann	20th May 2024	UE advised that they do not have the capacity to advise on individual projects and therefore provided a list of recommendations which should be considered during preparation of the EIAR. Relevant points in relation to built services have been addressed in this section.

15.2.4 Receiving Environment

The Proposed Development site comprises areas of greenfield and brownfield. The greenfield area is located in the southern portion of the site and these lands are currently being used for low intensity grazing for horses. The northern section of the site is comprised of areas of scrub and stockpiles of soils. Due to the existing land uses at the site, the possible presence of underground infrastructure is limited in extent. A development of this nature has the potential to impact the following types of utilities and services:

- Electricity Network
- Telecommunications Network (including phone and broadband)
- Gas Distribution Network
- Water Supply Network
- Wastewater Drainage (Sewage Network)
- Land Use
- Waste Management.

15.2.4.1 Electricity

There are overhead electricity cables on the site of the Proposed Development and in the vicinity of the site. Damage of overhead electricity cables during construction operations could potentially result in serious injury or death.

15.2.4.2 Water Services

There are currently 2 no. Uisce Eireann owned watermain networks near the proposed site boundary. A 315mm HDPE watermain runs along the Kingston Road at the southern boundary of the development and a 150mm watermain runs along the western boundary along the southern arm junction of the adjacent Western Distributor Road roundabout and Altan Road.

It is proposed to connect the watermain to supply the Proposed Development at the existing 315mm watermain on the Kingston Road as per Uisce Eireann confirmation of feasibility letter. The water supply will be via a 200mm 'arterial' watermain which will run through the development to cater for the demand. 150mm, where required, and a 100mm watermain will branch off this arterial watermain to service the housing blocks, apartments and cul-de-sacs.

The project has received a Confirmation of Feasibility for connection to Uisce Éireann assets. This confirmation of feasibility can be found in Appendix E of the Civil Works Design Report which has been prepared by Tobin's Consulting Engineers and is included in Appendix 4-3 of this EIAR.

15.2.4.3 Wastewater Services

All wastewater generated from the Proposed Development will outfall, via gravity, to an existing Uisce Eireann (UE) owned 225mm foul sewer line located west of the development along the southern arm junction of the adjacent roundabout and Altan Road.

The 225mm foul sewer outfalls to an existing Uisce Eireann 375mm foul network. It is envisaged that the 225mm sewer line will require upgrading to a 300mm sewer line to service the development as the number of units flowing through this network will exceed the maximum 330 units allowable for a 225mm pipe.

The pipework for the wastewater drainage system has been designed to provide for six times the dry weather flow in accordance with the Uisce Eireann's Code of Practice for Wastewater Infrastructure[2] and Wastewater Infrastructure Standard Details[3].

Wastewater will flow to Mutton Island Wastewater Treatment Plant (WwTP) for treatment prior to discharge.

15.2.4.4 Waste Management

A Waste Management Plan (WMP) has been prepared and forms part of the CEMP) in Appendix 4-1 of the EIAR.

The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Development. Disposal of waste will be a last resort.

All waste generated on site will be contained in waste skips at a waste storage area on site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein. A designated Waste Storage Area (WSA) will be maintained on site which will cater for segregation and recycling of various waste streams. Where recycling of waste is not possible, waste material will either be collected by or be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The facility will be local to the Proposed Development site to reduce the amount of emissions associated with vehicle movements. The nearest licensed waste facility to the site is Barna Waste Recycling facility, located approximately 9km to the northeast of the Proposed Development site.

Site personnel will be instructed at induction that under no circumstances can waste be brought to site for disposal in the on-site waste skips. It will also be made clear that the burning of waste material on site is forbidden. Further details on waste management are presented in the WMP.

15.2.5 Likely and Significant Effects and Associated Mitigation Measures

15.2.5.1 'Do-Nothing' Scenario

If the Proposed Development is not permitted, the site would remain largely unaltered as a result of the Do-Nothing Scenario. The potential for additional investment and employment in the area in relation to the Proposed Development would be lost.

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[2] *Uisce Eireann (July 2020) Code of Practice for Wastewater Infrastructure Connections and Development Services Design and Construction Requirements for Self-Lay Developments (Revision 2)*
[3] *Uisce Eireann (July 2020) Wastewater Infrastructure Standard Details Connections and Developer Services Design and Construction Requirements for Self-Lay Developments (Revision 4)*

15.2.5.2 Construction Phase

15.2.5.2.1 *Services*

There are existing underground and overhead electricity cables and other services present on the site of the Proposed Development and in the vicinity of the site, the damage of which has the potential to result in serious injury or death. This has a short-term potential significant negative effect.

Proposed Mitigation Measures

Specific measures are incorporated into the CEMP, included as Appendix 4-1 of this EIAR, to ensure that the construction of the Proposed Development will not have effect on underground electrical cables or other services. The mitigation measures include the following:

- Any area where excavations are planned will be surveyed and all existing services will be identified prior to commencement of any works.
- Liaison will be had with the relevant sections of the Local Authority including all the relevant area engineers to ensure all services are identified.
- Excavation permits will be completed, and all plant operators and general operatives will be inducted and informed as to the location of any services.
- The contractor must comply with and standard construction codes of practice in relation to working around electricity, gas, water, sewage and telecommunications networks.

Residual Effects

Following the implementation of the above mitigation measures, there will be a short-term slight negative residual effect during the construction phase of the Proposed Development.

Significance of Effects

Based on the assessment above there will be no significant effects.

15.2.5.2.2 *Waste Generation*

The construction phase will have the potential to produce municipal waste (site office, canteen) and construction/demolition waste (wood, rubble, metal, etc.) which will need to be processed at local waste processing facilities. These are largely composed of metal and other recyclable materials which would be brought to specialised facilities for processing/recycling such items.

Waste materials will be required to be temporarily stored on site pending collection by a waste contractor. Dedicated areas for waste skips and bins will be identified across the site. These areas will need to be easily accessible to waste collection vehicles. If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the site.

The Waste Management Act 1996 (Act) and its subsequent amendments provide for measures to improve performance in relation to waste management, recycling and recovery. The Act also provides a regulatory framework for meeting higher environmental standards set out by other national and EU legislation.

The Act requires that any waste related activity must have all necessary licenses and authorisations. It will be the duty of the Waste Manager on the site of the development to ensure that all contractors hired to remove waste from the site have valid Waste Collection Permits to ensure that the waste is delivered to a licensed or permitted waste facility. The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits and authorisations.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. Poor waste management has the potential to cause a short-term moderate negative effect.

Mitigation Measures

The following mitigation measures will be implemented:

- Extensive waste categorisation will be in place to ensure the highest possible quality of recycling of the respective categories and to prevent an accumulation of pollutants in the material cycle – it is anticipated that the following waste types, at a minimum, will be segregated:
    - Concrete rubble (including ceramics, tiles and bricks);
    - Lead Acid Batteries;
    - Electrical Waste
    - Plastics;
    - Oils;
    - Metals;
    - Glass; and
    - Timber.
- To minimise the generation of waste and waste disposed to landfill, wastes will be managed in accordance with the waste hierarchy and relevant regulatory controls.
- Waste will be clearly labelled and segregated on site. Measures will be taken to ensure that wastes cannot blow away.
- Housekeeping measures will be followed for the storage of materials to ensure that materials are protected as much as possible.
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site.
- Any hazardous wastes generated (such as chemicals, fuels and oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required).
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the decommissioning works.
- All staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal.
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained. As a minimum, the following waste management data will be provided:
    - Quantity of materials and waste removed from site by type in volume and weight.
    - Outcome of the materials and waste on and off site.
    - Waste transfer notes.
    - Hazardous waste consignment notes.

Residual Effects

Following implementation of the mitigation measures above, residual impacts of non-hazardous waste emissions for the construction and decommissioning phases will have a short-term, slight, negative effect.

Significance of Effects

Based on the assessment above there will be no significant effects.

15.2.5.3 Operational Phase

15.2.5.3.1 *Services*

Pre-Mitigation Impact

The potential operational phase impacts of the Proposed Development with regard to utilities and services include the following:

- Provision of new underground services;
- Requirement for additional resources, including electricity and potable water.
- The generation of operational phase waste, including wastewater;
- Changes to land-use.

In the absence of any control or mitigation measures, the generation of waste and the use of additional resources could give rise to a long-term moderate negative impact in terms of services and utilities.

Proposed Mitigation Measures

The below measures have been incorporated into the design of the Proposed Development and will be used to avoid any negative impacts on utilities or services during the operational phase of the Proposed Development:

- The Civil Works Design Report in Appendix 4-3 of this EIAR present the proposals for the Proposed Development with regard to Surface Water Drainage, Wastewater Drainage and Potable Water Supply. These elements have been taken into consideration throughout the design of the Proposed Development and will be implemented in line with all required legislation and relevant best-practice guidelines.

Residual Impact

There will be a long-term neutral imperceptible impact on services and utilities during the operational phase.

Significance of Effects

Based on the assessment above there will be no significant effects.

15.2.5.4 Cumulative Impact Assessment

The potential cumulative effect of the Proposed Development and other relevant developments has been carried out with the purpose of identifying what influence the Proposed Development will have on the surrounding environment when considered cumulatively and in combination with relevant approved, proposed, and existing projects in the vicinity of the Proposed Development site.

The potential for the Proposed Development to result in significant cumulative or in combination effects when assessed with the Proposed Project, was considered. The Proposed Project involves the construction of more than 500 residential units, and the development will require separate, individual planning applications for each part of the project. The individual planning applications will be subject to separate planning applications and EIARs. Each EIAR will include a cumulative assessment, which

combines the individual project's impacts with those from other past, present, and future projects to understand the cumulative effect of the Proposed Project.

On the basis of the assessment above, the Proposed Development will have no impact on built services and waste management. It is assumed also that all mitigation measures in relation to the other cumulative projects, as set out in Chapter 2: Background to the Proposed Development will also be implemented. It is on this basis that it can be concluded that there would be a short-term imperceptible cumulative impact on built services and waste management from the Proposed Development and other developments in the area.