14.0 MATERIAL ASSETS - TRAFFIC AND TRANSPORT

14.1 Introduction

This chapter was prepared by Jane Hennaghan (BEng (Hons) CEng MIEI), Traffic and Transport Engineer with DBFL Consulting Engineers. Jane is a Chartered Professional Engineer and has 7 No. years of post-qualification experience.

This chapter has been produced to assess and evaluate the likely impact of the proposed residential development on the local transportation network, as well as identifying proposed mitigation measures to minimise any identified impacts.

In summary, the proposed development ("the site") comprises of the demolition of all existing structures on site and construction of 590 No. residential dwellings (480 No. Build-to-Rent Apartments and 110 No. Build-to-Sell Duplexes) on a 6.05 Ha site.

The development will also consist of the provision of an ancillary amenity block (Block D1), including gymnasium, lobby, kitchenette and lounge at ground floor level and lounge at first floor level in addition to a roof terrace (to serve the Build-to-Rent residents only); a two storey retail/café/restaurant building (Block D2); a creche located within Block C2 at ground floor level; and a management suite and café/restaurant within Block C3 at ground floor level.

The proposed development will also include the following associated engineering infrastructure:

- Upgrade of existing traffic signals on Scholarstown Road to facilitate the primary vehicle access to the site (including provision of formal signalised crossings for the benefit of both pedestrians and cyclists).
- Upgrading existing pedestrian and cycle facilities along Scholarstown Road.
- Provision of internal site roads including associated footpaths.
- Provision of surface water drainage, foul drainage and water supply infrastructure.

Traffic surveys were commissioned specifically for this assessment with the objective of providing background information relating to the existing traffic movement patterns across the local road network.

The purpose of this chapter is to quantify the existing transport environment and to detail the results of assessment work undertaken to identify the potential level of any transport impact generated as a result of the proposed residential development. The scope of the assessment covers transport and related sustainability issues including means of vehicular access, pedestrians, cyclists and local public transport connections.

14.2 Methodology

This assessment is being carried out in accordance with the following guidance and established best practice:

- Environmental Protection Agency (EPA) Guidelines on the information to be contained in the EIAR;
- Transport Infrastructure Ireland (TII) Traffic and Transportation Assessment Guidelines.

Reference has also been made to the South Dublin County Development Plan 2016 – 2022.

The approach to the study accords with policy and guidance at EU, National and Local Level. Accordingly, the adopted methodology responds to best practices, current and emerging guidance, exemplified by a series of publications, all of which advocate this method of analysis. Key publications consulted include:

- '*Traffic and Transport Assessment Guidelines*' (May 2014) National Road Authority;
- '*Traffic Management Guidelines'* Dublin Transportation Office & Department of the Environment and Local Government (May 2003);
- *'Guidelines for Traffic Impact Assessments',* The Institution of Highways and Transportation (1994); and
- *'South Dublin County Development Plan 2016 - 2022'.*

Our Methodology incorporated a number of key inter-related stages, including;

- **Site Audit:** A site audit was undertaken to quantify the existing road network and the identify the local infrastructure characteristics, in addition to establishing the level of accessibility to the site in terms of walking, cycling and public transport.
- **Traffic Counts:** Junction Turning Counts (JTCs) and Automated Traffic Counts (ATCs) were undertaken and analysed with the objective of establishing the local traffic characteristics in the immediate area of the proposed residential development.
- **Trip Generation:** A trip generation exercise has been carried out to establish the potential level of vehicle trips generated by the proposed residential development.
- **Trip Distribution:** A distribution exercise has been undertaken for generated development traffic onto the local road network. The development traffic has, where available, been distributed based on the junction turning count survey distributions at the various junctions.
- **Network Assessment:** A number of key junctions within the vicinity of the proposed development were assessed in terms of the level of impact from the generated trips. The level of impact threshold was referenced from the Institution of Highways and Transportation document 'Guidelines for Traffic Impact Assessments'.
- **Network Analysis:** Further to quantifying the predicted impact of vehicle movements across the local road and junction network, more detailed analysis simulations have been undertaken at the junctions exceeding the impact threshold to assess the operational performance of these junctions in the post development future scenarios.

14.3 Receiving Environment

14.3.1 Existing Road Network

The existing subject development site is located immediately north of the Scholarstown Road. Scholarstown Road, in the vicinity of the subject site, is subject to a 50kph speed limit and has a wide two - way single lane carriageway.

The M50 Motorway is located approximately 550m west of the proposed site. The M50 provides excellent connections to both north and south of Dublin.

14.3.2 Existing Pedestrian & Cycle Network

There are pedestrian footpaths and segregated cycle tracks on both sides of the Scholarstown Road in the vicinity of the proposed development site which is separated from the road carriageway with grass verges. These facilities are shown below in **Figure 14.1**.

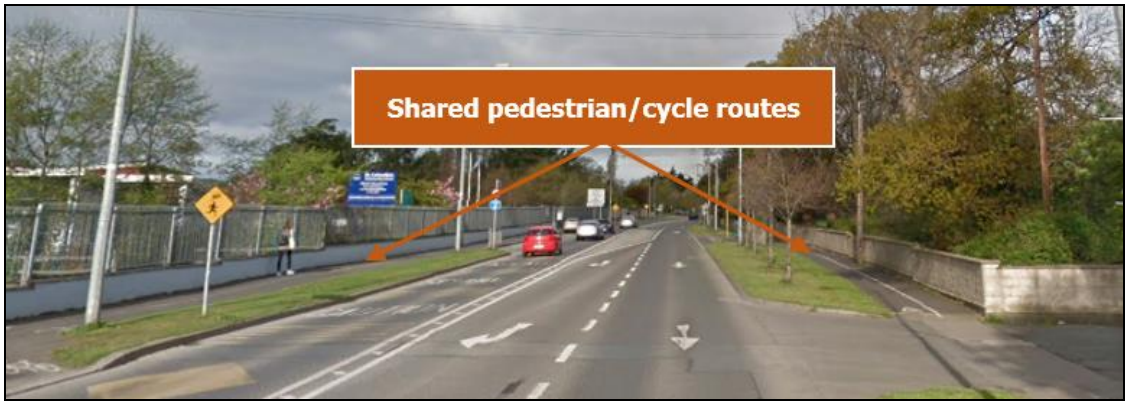

Figure 14.1: Existing Pedestrian & Cycle Facilities along Scholarstown Road

As well as the cycle tracks outlined in the vicinity of the proposed site, there a number of routes within the surrounding area that provide cycle facilities; these are illustrated within the GDA Cycle Network Plan, an extract shown in **Figure 14.2** below.

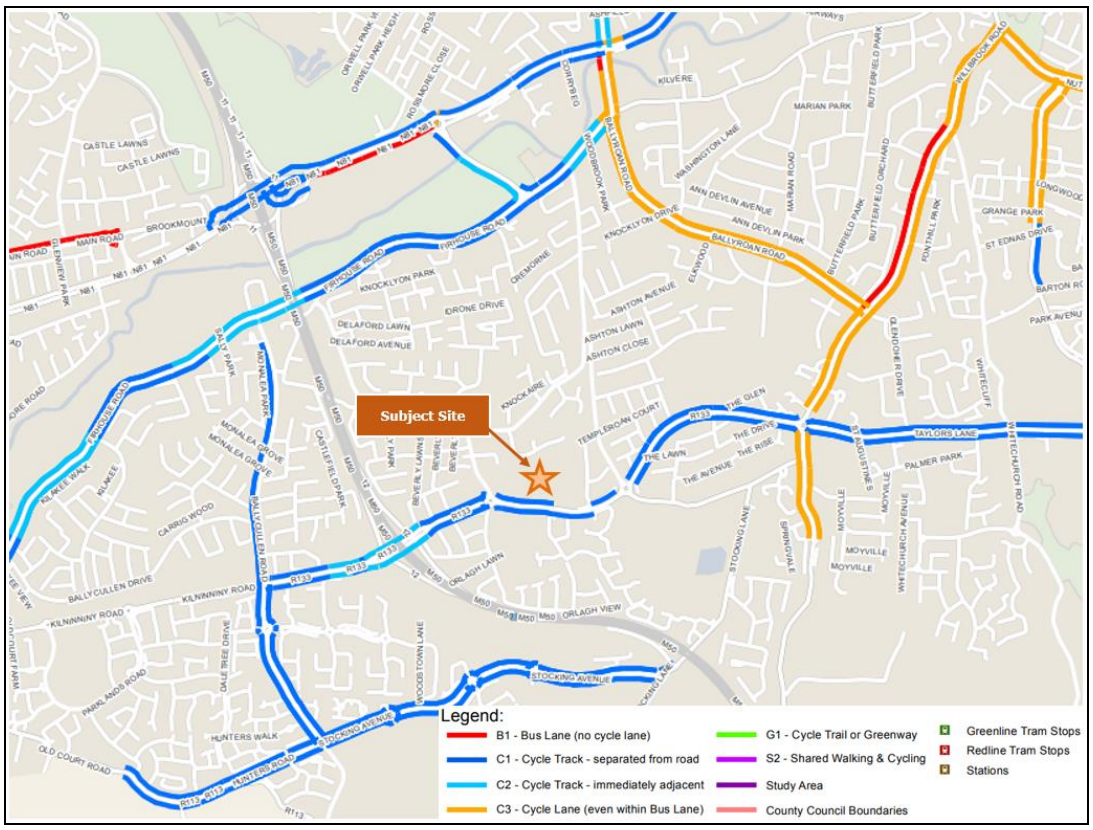

Figure 14.2: GDA Cycle Network Plan – Existing Cycle Facilities

14.3.3 Existing Public Transport Network

Dublin Bus operates service number 15 along the Scholarstown Road corridor with the closest bus stop located approximately 300m west of the development site. Route 15 provides access to and from Dublin City Centre via Terenure and Rathmines, before terminating at Clongriffin in north Dublin.

Dublin Bus also operates the number 15B along the Ballyboden Way, with the closest stop located approximately 500m west of the proposed development. The 15B provides access to Dublin City Centre, and travels through a range of intermediate destinations including Rathfarnham and Rathgar, before terminating at Ringsend.

Go Ahead Ireland operates service number 175 along the Scholarstown Road corridor adjacent to the subject site with bus stops for this service located within 100 – 150m distance west of the site. This service travels between Citywest, Tallaght and Dundrum before terminating at UCD.

14.4 Characteristics of Proposed Development

The proposed development comprises of 590 No. residential dwellings (480 No. Build-to-Rent Apartments and 110 No. Build-to-Sell Duplexes) on a 5.35 Ha site.

The development will also consist of the provision of an ancillary amenity block (Block D1), including gymnasium, lobby, kitchenette and lounge at ground floor level and lounge at first floor level in addition to a roof terrace (to serve the Build-to-Rent residents only); a two storey retail/café/restaurant building (Block D2); a creche located within Block C2 at ground floor level; and a management suite and café/restaurant within Block C3 at ground floor level.

The proposed development will also include the following associated engineering infrastructure:

- Upgrade of existing traffic signals on Scholarstown Road to facilitate the primary vehicle access to the site (including provision of formal signalised crossings for the benefit of both pedestrians and cyclists).
- Upgrading existing pedestrian and cycle facilities along Scholarstown Road.
- Provision of internal site roads including associated footpaths.
- Provision of surface water drainage, foul drainage and water supply infrastructure.

The development proposes a total of 800 bicycle parking spaces within the development. Of these, 320 are proposed as long term stay and are located in the basement. The remaining spaces, 480, will be allocated as both long term stay and short term visitor spaces on the surface.

With regard to car parking provision within the development, it is proposed to provide a total of 124 car parking spaces for the 110 Build to Sell units within the development. These are based on the SDCC Development Plan standards. The car parking provision for the Build to Rent units is proposed to be based on the recent guidance from the Department of Housing, Planning and Local Government – 'Sustainable Urban Housing: Design Standards for New Apartments March 2018'. The document highlights that for new developments such as the proposed site, the document states that 'the Planning Authority must consider a reduced overall car parking standard'.

It is therefore proposed to provide a reduced number of car parking spaces for the Build to Rent apartments at a ratio of 0.60 spaces per unit. This equates to a total provision for the 480 units of 288 car parking spaces.

The development also proposes a number of mobility impaired spaces as well as electric vehicle parking spaces.

The proposed site will have good accessibility for both pedestrians and cyclists with a number of access points proposed.

14.5 Identification of Likely Significant Impacts

14.5 Construction Phase

All construction activities will be governed by a Construction Traffic Management Plan (CTMP), the details of which will be agreed with the local roads authority prior to the commencement of construction activities on site. The principal objective of the CTMP is to ensure that the impacts of all building activities generated during the construction of the proposed development upon both the public (off-site) and internal (on-site) workers environments, are fully considered and proactively managed / programmed, respecting key stakeholders requirements thereby ensuring that both the public's and construction workers safety is maintained at all times, disruptions minimised and undertaken within a controlled hazard free / minimised environment.
The likely impact of the construction works will be short-term in nature. The number of staff on site will fluctuate over the implementation of the subject scheme. Nevertheless, based upon the experience of similar projects, it would be expected that approx. 30 - 40 staff will be on site at any one time, subsequently generating low levels of two-way vehicle trips during the peak AM and PM periods over the period of the construction works (construction workers will use shared transport). On-site employees will generally arrive before 08:00, thus avoiding the morning peak hour traffic. These employees will generally depart after 16:00.

Likely deliveries to the site would be expected to arrive at a steady rate during the course of the day, the majority of which would be lorries that will be brought onto the site over the entire duration of the construction stage of the development. The proposed haul routes for the lorries will enter and exit the site via the Scholarstown Road. It is envisaged that the main access route will be through the M50 Motorway.

The potential impact during the construction phase would have a short term effect on the surrounding road network and with the CTMP and deliveries managed accordingly, these mitigation measures will reduce the impact on the road network during this period.

14.5.2 Operational Phase

Once the subject development is fully complete and occupied, there are two distinct peak arrival and departure times that are expected during a typical weekday. Specifically, there is expected to be a morning peak between 07:15 – 08:15 when people are leaving for work or educational purposes, and an evening peak between 17:00 – 18:00 when people are returning from work or school.

Traffic surveys were carried out in 2018 at three junctions as outlined below. Updated traffic surveys were undertaken in 2019 at four junctions, as outlined below.

The development traffic will be accommodated through one main vehicular entrance off the Scholarstown Road, which is a regional road.

In order to assess and analyse the impact of the proposed development on the surrounding road network, a traffic generation and distribution model (excel based) of the following junctions was created, locations shown in **Figures 14.3 and Figure 14.4**:

2018 Survey

- **A** – Scholarstown Road/Orlagh Grove Roundabout;
- **B** – Scholarstown Road/Woodfield junction (proposed site access); and
- **C** – Scholarstown Road/Templeroan Road/Ballyboden Way Roundabout.

2019 Survey

- **1** – Scholarstown Road / M50 (Jnc 12) NB On Ramp;
- **2** – Scholarstown Road / M50 (Jnc 12) SB On Ramp;
- **3** – Scholarstown Road / Orlagh Grove Roundabout; and
- **4** – Scholarstown Road / Templeroan Road Roundabout

Figure 14.3: Junction Locations for 2018 Traffic Model

Figure 14.4: **Junction Locations for 2019 Traffic Model**

Once in operation, the proposed development is expected to establish permanent travel patterns and trip generation onto the surrounding road network. The traffic flows at the key junctions surrounding the development have been detailed within the Traffic and Transportation Assessment (TTA) report.

14.5.3 'Do Nothing' Scenario

In the absence of the proposed development, the operational performance of the existing junctions on the surrounding road network will remain relatively unchanged with the exception of the impact caused by the forecast network traffic growth.

14.6 Ameliorative, Remedial or Reductive Measures

14.6.1 Construction Phase

A Traffic Management Plan (TMP) will be prepared for the site works in accordance with the principles outlined below and shall comply at all times with the requirements of:

- Department of Transport Traffic Signs Manual 2010 – Chapter 8 Temporary Traffic Measures and Signs for Roadworks
- Department of Transport Guidance for the Control and Management of Traffic at Road Works (2010)
- Any additional requirements detailed in the Design Manual for Roads and Bridges (DMRB) & Design Manual for Urban Roads & Streets (DMURS)

All construction related parking will be provided on site. Construction traffic will consist of the following categories:

- Private vehicles owned and driven by site staff and management;
- Construction vehicles e.g. excavation plant, dump trucks (including trucks for delivery of imported fill to site;
- Materials delivery vehicles involved in site development works.

It is anticipated that the generation of HGVs during the construction period will be evenly spread throughout the day and as such will not impact significantly during the peak traffic periods.

Truck wheel washes will be installed at construction entrances and any specific recommendations with regard to construction traffic management made by South Dublin County Council will be adhered to.

Works are proposed along Scholarstown Road (formation of site access including upgrade of existing traffic signals and improvement to pedestrian and cycle facilities). The contractor shall prepare a detailed traffic management plan for works at these interfaces with the existing road network and obtain all required road opening licenses from South Dublin County Council.

14.6.2 Operational Phase

A number of walking and cycling connection points are proposed within the development; two of these are situated along Scholarstown Road, the third connection is a proposed walking and cycling route to the north east of the site that connects to Dargle Park. It is also proposed to upgrade the footpaths and cycle facilities along the Scholarstown Road, in the vicinity of the site. These upgraded facilities and convenient access points will provide safe and attractive routes for residents and will encourage the use of more sustainable modes of travel.

A Mobility Management Plan (MMP) has been prepared for both residents and staff within the development in order to guide the delivery and management of co-ordinated initiatives post construction. The MMP ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development.

A Parking Management Strategy has been prepared as part of this development. This document presents the rationale for the quantum of vehicular parking as well as cycle parking that is being proposed as part of this development. It sets out the management measures that will be deployed to allocate the use and control of parking provision at the proposed development.
There are a number of sustainable facilities provided within the development including the provision of 800 cycle spaces, good linkages to public transport, reduced parking for the Build-to-Rent apartments and the representation of GoCar within the development.

14.6.3 'Do Nothing' Scenario

No mitigation measures are proposed in relation to the transport environment if the development does not proceed.

14.7 Predicted Impact of the Proposed Development

14.7.1 Construction Phase

All construction activities will be governed by the Construction Traffic Management Plan (CTMP), the details of which will be agreed with the local authority prior to commencement of construction on site. The number of site staff will fluctuate over the construction period of the scheme, however, a development of this type and scale would on average necessitate approximately 30 - 40 staff on site at any one time, subsequently generating no more than 10 - 15 two-way vehicle trips during the peak AM and PM periods with construction workers using shared transport.

Deliveries would arrive at a steady rate during the course of the day. The number of deliveries per day is not yet known, however, basing this assessment on previous schemes, it can be assumed, as a conservative assessment, that there will be 3 loads per hour. With a 10 hour working day, this equates to 30 loads per day approximately. This results in 60 vehicular movements per day over a 10 hour period, which equates to 6 vehicle movements per hour. It is therefore considered that the effect on the local road network is low as a result of HGV vehicle deliveries.

In relation to the proposed haulage routes for the deliveries, it is envisaged that the majority of HGV's will access from the M50 Motorway to the west of the proposed site and access the site via the Scholarstown Road.

14.7.2 Operational Phase

14.7.2.1Trip Generation

With regard to generating trips for this development, the TRICS database was referenced as part of this assessment. TRICS data is primarily UK based, however, a number of Irish sites have been included within the last few years with these continuing to expand. The TRICS database provides a reasonable estimation of traffic generation from the proposed development based on previous similar development types of this nature.

A Donor Site 'The Grange' located within close proximity to the development was also referenced with regard to trip rates used for that development site in order to make a comparison between these and the trip rates from TRICS.
It was determined that the donor site was better suited with regard to the residential trips due to the close location of the donor site to the proposed development. TRICS was utilised for the creche and retail elements of the development.

The trip rates and traffic generation for the proposed development are outlined in **Table 14.1** below.

Table 14.1: Proposed Development Vehicle Trip Rates & Traffic Generation

Land Use	Period	Vehicle Trip Rates (per unit)/100 sqm GFA		Traffic Generation	
		Arr	Dep	Arr	Dep
(590 no.) Apartments/Duplexes	AM	0.051	0.21	30	124
	PM	0.17	0.106	100	63
Creche (430 sqm) *discounted by 40% to account for internal and pass-by traffic generation	AM	1.593	1.056	4	3
	PM	2.419	2.589	6	7
Retail – Convenience (892 sqm) *discounted by 40% to account for internal and pass-by traffic generation	AM	0.309	0.206	2	1
	PM	1.374	1.236	7	7
Total		**AM**		**36**	**128**
		PM		**114**	**76**

It is noted that the trips generated for the creche and the café/retail elements have been discounted by 50%. This is in order to account for the fact that the majority of trips to and from these units will either be internal trips from the development, pass-by trips that are already on the road network, or trips from the immediate residential estates.

Therefore it is envisaged that the retail and creche elements will not generate a significant amount of 'primary trips' on to the road network. In order to provide a conservative assessment, however, it was assumed that 50% of the trips to and from these units were classed as 'primary trips'.

A committed development within close proximity to the subject site (planning ref. SD15A/0017) was also assessed within this impact analysis and was taken into consideration within the traffic generation excel.

14.7.2.2Trip Distribution

The distribution of the subject development traffic is based on the surveyed traffic movements at the nearby key local junctions.

The distribution of the traffic generated from the committed development is as per the trip distribution contained with the TTA submitted with the planning application (Ref. SD15A/0017).

14.7.2.3Traffic Growth

An Opening Year of 2021 was assumed for this assessment. In accordance with TII (NRA) Guidance, Future Design years (+5 and +15 years) of 2026 and 2036 have also been adopted.

The TII Project Appraisal Guidelines (PAG) have been utilised to determine the traffic growth forecast rates. The traffic growth forecast rates within the PAG ensures local and regional variations and demographic patterns are accounted for.

Table 5.3.2 within the PAG provides Annual National Traffic Growth Factors for the different regions within Ireland. The subject site lies within 'Region 1 Dublin' with the growth factors as outlined within **Table 14.2** below.

Region	Name	Low Growth				Medium Growth				High Growth			
		2013-2030		2030-2050		2013-2030		2030-2050		2013-2030		2030-2050	
		LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
1	Dublin	1.0089	1.0221	1.0004	1.0135	1.0134	1.0237	1.0038	1.0176	1.0149	1.0242	1.0054	1.0195

Table 14.2: National Traffic Growth Forecasts: Annual Growth Factors (Extract from Table 5.3.2 PAG)

14.7.2.4 Assessment Scenarios

In Summary the following scenarios are considered:

Do Nothing
A1 – 2021 Base Flows + Committed Development
A2 – 2026 Base Flows + Committed Development
A3 – 2036 Base Flows + Committed Development

Do Something
B1 – 2021 Do Nothing (A1) + Proposed Development Flows (100 Units Complete)
B2 – 2026 Do Nothing (A2) + Proposed Development Flows (Fully Complete)
B3 – 2036 Do Nothing (A2) + Proposed Development Flows (Fully Complete)

The traffic flow diagrams for all scenarios are outlined within the Traffic and Transportation Assessment report.

14.7.2.5 Impact of Proposals

The Institution of Highways and Transportation document 'Guidelines for Traffic Impact Assessments' states that the impact of a proposed development upon the local road network is considered material when the level of traffic it generates surpasses 10% and 5% on normal and congested networks respectively. When such levels of impact are generated, a more detailed assessment should be undertaken to ascertain the specific impact upon the network's operational performance. These same thresholds are reproduced in the NRA/TII document entitled Traffic and Transport Assessment Guidelines (2014).
For the purposes of this study, a conservative impact threshold of 5% was used due to the congestion experienced along Scholarstown Road during peak periods.

The following key junctions were assessed in terms of percentage impact resulting from the implementation of the proposed development (illustrated in Figure 14.4 above):

- **1** – Scholarstown Road / M50 (Jnc) NB On Ramp;
- **2** – Scholarstown Road / M50 (Jnc) SB On Ramp;
- **3** – Scholarstown Road / Orlagh Grove Roundabout;
- **4** – Scholarstown Road / Templeroan Road Roundabout; and
- **5** – Scholarstown Road / Development Site Access

The impact assessment, discussed in detail in the TTA report, showed that all junctions, with the exception of Junction 5, displayed a level of impact that was below the 5% threshold. Junction 5, the proposed site access junction, displayed a level of impact that exceeded the 5% threshold. Therefore this junction was subject to further analysis. A TRANSYT model was developed for this junction with all scenarios analysed in order to determine the capacity levels for Opening and Future year scenarios. The results showed that, as a standalone junction, the proposed signal controlled site access junction operates within capacity for all years assessed.

In response to Item 7 of the An Bord Pleanála Opinion, dated 28/06/19, as well as discussions held with South Dublin County Council, it was decided to assess Junction 3, Scholarstown Road/Orlagh Grove Roundabout in further detail. The roundabout has recently been redeveloped to deliver upgrades to the pedestrian and cyclist environment and to increase safety for all users. The redevelopment of the roundabout ensures that vehicular traffic speeds are reduced and provides a single lane approach and toucan/zebra crossings on all arms.

An ARCADY model was developed in order to gauge the performance of the roundabout. The results, which are provided in detail in the TTA report, conclude that the roundabout shows traffic capacity issues in the existing 2019 base year in both peak hour periods. With the growth in background traffic to 2021 Opening Year, 2025 and 2036 Design Years, as well as the inclusion of development trips on to the network, the roundabout further decreases in traffic capacity. The high demand of pedestrians and cyclists through the roundabout also reduces the traffic capacity of the roundabout. The National Transport Authority (NTA) have invested in the development of improved roundabouts that consider pedestrian and cycle safety as a priority rather than vehicular capacity.

14.7.3 'Do Nothing' Scenario

There are no predicted impacts should the proposed development not proceed.

14.8 Monitoring

During the construction stage the following monitoring exercises are likely to be required. The specific compliance exercises to be undertaken in regard to the range of measures detailed in the final construction management plan will be agreed with the planning authority.

- Compliance with construction vehicle routing practices,
- Compliance with construction vehicle parking practices,
- Internal and external road conditions and
- Timings of construction activities.

14.9 Reinstatement – Not Applicable for Traffic Section

14.10 Interactions and Potential Cumulative Impacts

14.10.1 Interactions

Noise & Vibration

The development of the site will result in a short level increase of construction traffic related noise and vibration. Once operational, the change to noise levels on the surrounding network associated with additional traffic is predicted to be imperceptible.

Air Quality

Post construction development traffic will contribute to increased traffic volumes on the surrounding network which in turn will impact air quality.

Population

The scheme will be developed in line with the separately enclosed Preliminary Construction Management Plan (PCMP) to ensure any impacts on local traffic is minimised during the construction stage. The promotion of sustainable modes of transport from the site during the operational stage will mitigate against any potential impacts that may arise on traffic in the area.

Land and Soil

Delivery of materials to site (e.g. aggregates for road construction, concrete for foundations, delivery of construction plant to site) will lead to potential impact on the surrounding road network. As noted previously, the scheme will be developed in line with the separately enclosed Preliminary Construction Management Plan (PCMP) to ensure any impacts on local traffic is minimised during the construction stage.

14.10.2 Potential Cumulative Impacts

Other developments currently under construction and other committed development in the vicinity of the site have been considered. The following committed development has been reviewed and included within the traffic analysis for this TTA:

- 10 Year permission for a residential development consisting of 317 dwelling units and 233sqm creche including two vehicular accesses from Scholarstown Road and one vehicular access from Stocking Lane, all associated site and infrastructural works including foul and surface water drainage, 599 car parking spaces, landscaping and public open space, boundary walls, fences, roads, cyclepaths and footpaths.

This application was granted in 2015 and has been incorporated into this TTA assessment as a 'committed development' with traffic generated from this proposed development applied to the base road network within the traffic excel model.

Any future development in the vicinity of the subject site would have to similarly undergo Traffic and Transport assessments to assess the potential cumulative impacts to the transport network.