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6 Material Assets: Traffic and Transport

6.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) has been prepared by AECOM consulting engineers with input from the project team. The report was written by Aoife Mannion, (Consultant - B.Eng (Hons), M.Eng, MIEI), checked by Shaun Grima (Principal Consultant - MTCP MRTPI) and approved by Cormac O'Brien (Director - C.Eng, MIEI).

The chapter describes the transportation impacts of the proposed development in accordance with the requirements of the relevant EIA legislation and guidance on preparation and content of EIAR. To accompany this chapter, a Traffic and Transport Assessment (TTA) has been prepared by AECOM consulting engineers. The TTA presents a comprehensive review of the traffic and transportation impacts associated with the development proposals, which have informed the production of this EIAR Transport chapter. The TTA should be read in conjunction with this EIAR chapter.

This chapter sets out the existing receiving environment in terms of road conditions, traffic activity and transportation accessibility, the proposed developments in terms of construction traffic activity and post development operational traffic and any necessary mitigation and monitoring measures. The site currently comprises of a vacant brownfield site accessed via an existing staggered junction off Coolock Drive / Adare Road.

6.1.1 Structure of this chapter

The remainder of this chapter is divided into the following sections;

- **Proposed Development** – this section describes the proposed development;
- **Methodology** – this section sets out the methodology in terms of impact significance and magnitude of effects;
- **Baseline Scenario** – a description of the existing conditions including road network, transport, walking and cycling infrastructure;
- **Do Nothing Scenario** – the do nothing scenario will discuss the environment as it would be in the future if no development or management measures were to be adopted;
- **Impact Assessment** – this section identifies the difficulties encountered and potential impacts associated with the proposed development; based on the development proposals, the construction and operational traffic flows have been assigned to the surrounding road network having regard to the existing traffic patterns. This section will demonstrate the results of the junction modelling analysis as a cumulative assessment of both the construction and operational phase;
- **Mitigation** - The impact of the development traffic including any traffic management measures or alterations to the public road necessitated by the development outside of the application site is addressed;
- **Monitoring** – the committed monitoring procedures for the proposed development has been outlined;
- **Residual** – consideration of the residual impact of construction and operation traffic flows when appropriate mitigation measures have been identified.
- **References and Sources** – a list of sources of information consulted for use in this chapter has been provided.

6.2 Proposed Development

The proposal consists of the demolition of existing buildings and redeveloping it for 495 Build to Rent residential units, which are proposed to be split into 4 no. proposed blocks (Blocks A1, A2 each with two 10 storey elements, and Blocks B & C ranging from 3no. to 7no. storeys and associated residential services and facilities, as well as courtyard spaces. In addition, the scheme includes for a service building comprising of a crèche (300 sq. m), café (34 sq. m) and gym (412 sq. m), as well as streets, public realm amenity and green open space.

It is also proposed to provide a total of 396 car parking spaces on site, 391 no. spaces dedicated to the 495 no. residential units and 5 no. spaces dedicated to the service building for the proposed crèche. Dedicated car parking provision is proposed for disabled parking (5% of the total spaces, i.e. 23 no. spaces), electric vehicle spaces (6% of the total spaces, i.e. 24 spaces) and motorcycle parking (4% of the total spaces, i.e. 16 no. spaces) as per the Dublin City Council (DCC) Development Plan requirements. It is also proposed to provide 10 no. car club spaces and 14 no. visitor spaces for the proposed residential development.

6.3 Methodology

6.3.1 Desktop and Site Audit Assessment

AECOM's Transport team has undertaken both a desktop and onsite assessment to identify the policy and legislation that is relevant to traffic and transport, to describe the baseline traffic conditions, and to identify the potential impacts associated with the proposed development upon the surrounding road network.

6.3.2 Significance of Impacts Methodology

Potential impacts of the proposed development (both positive and negative) are predicted for all significant transportation impacts. In accordance with the EPA (2017) guidelines, potential impacts are characterised by considering parameters shown in Table 6.1.

Impact parameter	Description
'Quality' of Effects (i.e. positive vs negative)	**Positive potential impact** – a change that improves the quality of the environment or slows an existing decline in the quality of the environment. **Neutral Effects** – no effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error. **Negative potential impact** – a change which reduces the quality of the environment e.g. destruction of habitat, removal of species foraging habitat.
Significance of Effects	**Imperceptible** – an effect capable of measurement but without significant consequences; **Not Significant** – An effect which causes noticeable changes in the character of environment but without significant consequences; **Slight Effects** – an effect which causes noticeable changes in the character of the environment but without significant consequences **Slight Effects** - An effect which causes noticeable changes in the character of the environment but without affecting its sensitives

Impact parameter	Description
	Moderate Effect – an effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends; **Significant Effects** – an effect which, but its character, magnitude, duration or insanity alters a sensitive aspect of the environment. **Very Significant** – An effect which, by its character, magnitude, duration or intensity alters most of a sensitive aspect of the environment **Profound Effects** – An effect which obliterates sensitive characteristics.
Extent and Context of Effects	**Extent** - The size of the area, number of sites, proportion of a population, or other measurable unit significantly impacted by an effect. **Context** – describing whether the extent, duration or frequency will conform or contrast with established baseline conditions;
Probability	Draft EPA Guidance (2017) categorises potential effects as either likely or not likely. Only likely (and significant) impacts are assessed in this Chapter.
Frequency and timing	Frequency refers to how often the effect will occur. (e.g. once, rarely, occasionally, frequently, hourly, daily or constantly).

TABLE 6.1 POTENTIAL IMPACT PARAMETERS

A qualitative approach was used in this evaluation, generally following the significance classification in Table 6.1 and through professional judgment. The significance of a predicted impact is based on a combination of the sensitivity or importance of the attribute and the predicted magnitude of any effect.

The effects are identified as beneficial, adverse or negligible, temporary or permanent and their significance as major, moderate, minor or not significant (negligible).

6.4 Baseline Scenario

This section sets out the environment within the study area and the existing of the receiving environment. The receiving environment has been categorised into the following headings:

- Road Network;
- Walking Infrastructure;
- Cycling Infrastructure;
- Bus / Rail Transport; and
- Road Safety.

6.4.1 Road Network

This section presents a review of the existing road network within the study area. Figure 6.1 below provides an overview of the existing road network within the study area.

FIGURE 6.1 LOCAL ROAD NETWORK WITH REFERENCE TO SITE LOCATION (SOURCE: GOOGLE MAPS)

6.4.1.1 Coolock Drive

Coolock Drive is a single carriageway, approx. 10.6m wide kerb-to-kerb, with a single lane in either direction. Coolock Drive will provide the access to the site and connects to Greencastle Road.

Existing footpaths are situated on both sides of the carriageway. The speed limit along Coolock Drive is 50 km/h in the vicinity of the development site. Figure 6.2 and 6.3 illustrate the exiting conditions of the road.

EXISTING ACCESS OFF COOLOCK DRIVE

6.4.1.2 Greencastle Road

Greencastle Road runs along the northern boundary of the proposed site, it is a single carriageway, approx. 8m wide kerb-to-kerb. The road is subject to a 60km/h speed limit with traffic calming road humps. Existing footpaths are situated on both sides of the carriageway. There is a mini roundabout connecting Greencastle Road to Greencastle Avenue Figures 6.4 and 6.5 illustrate the exiting conditions of the road.

FIGURE 6.2 GREENCASTLE ROAD FACING EAST SHOWING JUNCTION WITH COOLOCK DRIVE

FIGURE 6.3 GREENCASTLE ROAD FACING WEST SHOWING MINI ROUNDABOUT WITH GREENCASTLE AVE

6.4.1.3 Oscar Traynor Road

Oscar Traynor Road runs along the southern boundary of the proposed site, it is subject to a 60km/h speed limit and connects to Coolock Drive via a signalised T-Junction in the west and Regional Road 107 in the east via a signalised crossroads.

The road is a single carriageway road with an approx. width of 8.5m, the road widens to two lanes when heading eastbound at the approach to the T-junction with Coolock Drive. Signalised pedestrian crossings are provided at both junctions at either end of Oscar Traynor Road. Figures 6.6 and 6.7 illustrate the existing conditions of the road.

FIGURE 6.4EXISTING PEDESTRIAN CROSSING ON OSCAR TRAYNOR ROAD

FIGURE 6.5 OTR FACING EAST AT THE JUNCTION WITH COOLOCK DRIVE

6.4.2 Existing Site Access

Vehicular access into the site is available off Coolock Drive as illustrated in Figure 6.8. The access is a staggered junction with Adare Road, as shown in Figure 6.9.

FIGURE 6.6 EXISTING VEHICULAR SITE ACCESS

FIGURE 6.7 ADARE ROAD STAGGERED JUNCTION ARM

6.3.3 Walking Infrastructure

At present, there are well-established footpaths linking Coolock Drive with Greencastle Road and on to Malahide Road. The total footpath length along these three links is 1.6 km approximately.

Footpaths are situated on either side of all carriageways surrounding the proposed development, i.e. Coolock Drive, Greencastle Road which are both immediately adjacent to the site and Malahide Road (approx. 500m to the east) and Oscar Traynor Road (approx. 500m to the southwest). The footpaths along all roads are approx. 3m in width, accommodating two way pedestrian flows.

A controlled crossing facility is situated at the Coolock Drive / Oscar Traynor Road signalised junction. Tactile paving has recently been installed at the eastern arm of the Oscar Traynor Road junction. Signalised pedestrian crossing facilities are also available at the Greencastle Road / Malahide Road junction and the Oscar Traynor Road / Malahide Road junction in the form of tactile paving, dropped kerbs and 'Look Left / Right' markings, to further support pedestrian movements.

6.4.3 Cycling Infrastructure

Advanced cycle stop markings have been implemented on the Oscar Traynor Road / Coolock Drive signalised junction. There are also shared bus / cycle lanes along Greencastle Road.

There is a cycle track on the Regional Malahide Road in both directions which runs along the western boundary of the proposed site. This cycle track provides a link to Dublin City Centre approx. 6 km in length.

Furthermore, there is currently a proposal with DCC to open the Santry River Greenway which will run along Greenside Road connecting to Coolock Drive and Greencastle Road.

6.4.4 Dublin Bus

The site is ideally located to benefit from local bus services. Bus stops for both northbound and southbound services are located on Coolock Drive, within 60m of the site entrance.

Further bus stops are also available at Greencastle Road, situated approximately 130m west of the site boundary and two on Malahide Road within 400m on the eastern boundary. Table 6.2 illustrates the services available from the Coolock Drive and Greencastle Road bus stops including the available routes, destinations and typical frequencies.

Service Number / Bus Stop Location	Route / Destination	Proximity to / from the Site	Mon – Fri Peak Hour Frequency	Saturday Frequency (approx.)	Sunday Frequency (approx.)
43 – Malahide Rd	Artane roundabout towards Swords Business Park	500m from northeastern boundary	Every 15 Minutes	Every Hour	Every Hour
15 – Malahide Rd	Clongriffin to Ballycullen Road	540m from northeastern boundary	Every 12 Minutes	Half Hourly	Every 20 Minutes
17– Malahide Rd	Clare Hall to Jobstown	430m from the southwestern pedestrian access	Every 10 Minutes	Every 10 Minutes	Every 15 Minutes
42– Malahide Rd	Talbot St to Sands Hotl	500m from northeastern boundary	Every 30 Minutes	Every 30 Minutes	Every 30 Minutes
27 – Greencastle Rd, Coolock Drive, Malahide Rd	Clare Hall to Jobstown	190m from northeastern boundary	Every 10 Minutes	Every 10 Minutes	Every 15 Minutes

TABLE 6.2 BUS SERVICE FREQUENCY

Table 6.2 shows that regular bus services are available, connecting the site to Dublin City Centre during the typical weekday peak hour periods. Bus services will therefore provide a viable alternative to private car travel from the proposed site to Dublin City Centre.

The figure overleaf provides an overview of the available Dublin Bus infrastructure and land marks within a 1km walking catchment of the site.

FIGURE 6.8 ACCESSIBILITY OF THE SITE TO EXISTING BUS SERVICES

6.4.5 Bus Connects

The NTA has established Bus Connects, which comprises a strategy to develop continuous bus lanes along a series of bus corridors. This initiative is proposed along the Malahide Road and the NTA envisages that the benefits will include improved bus service frequency and reliability. The figure below illustrates the NTA's plans for upgrading Malahide Road, approximately 500m from the subject site, via Greencastle Road.

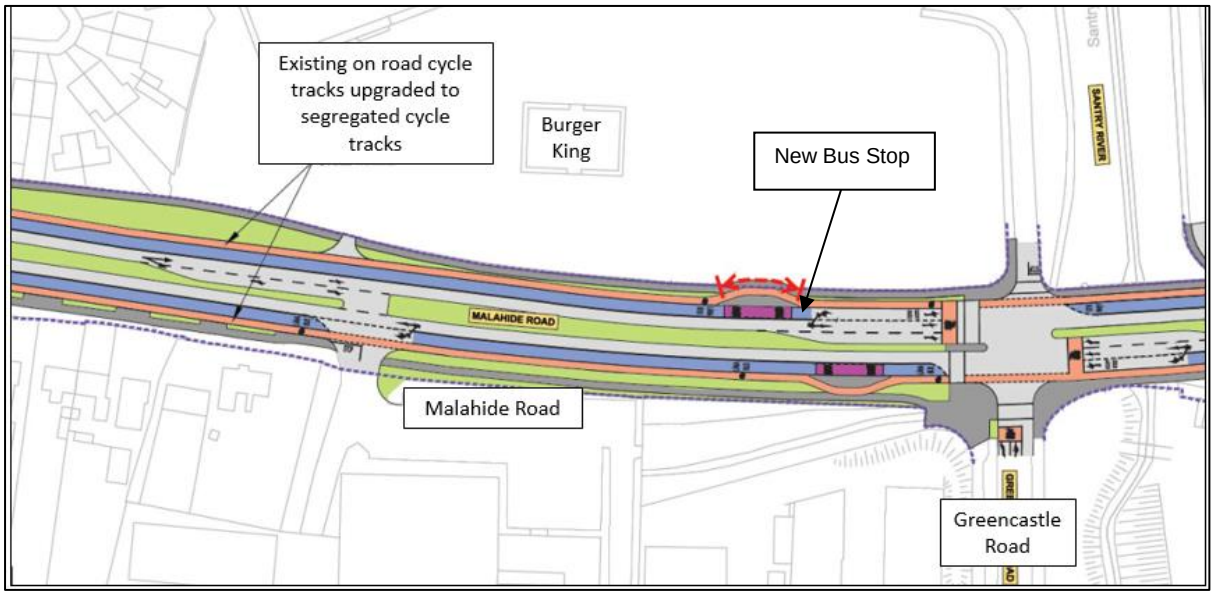

FIGURE 6.9 BUS CONNECTS MALAHIDE ROAD

6.4.6 Rail

The Harmanston DART station is within 1.9km of the propose site. Table 6.3 illustrates the available services and typical frequencies available from this stop.

Route / Destination	Peak Hour Frequency	Saturday Frequency	Sunday Frequency
Dublin – Bray – Greystones	Every 15 Mins	Every hour	Every Hour

TABLE 6. 3 RAIL SERVICE FREQUENCIES

6.4.7 Traffic Surveys

During pre-planning scoping discussions with DCC, it was confirmed that traffic surveys would be required to establish existing traffic conditions of the adjacent road network. Junction Turning Count (JTC) traffic surveys were undertaken on 14th September 2017 from 07:00hrs – 19:00hrs. The figure below illustrates the count locations in the context of the development site.

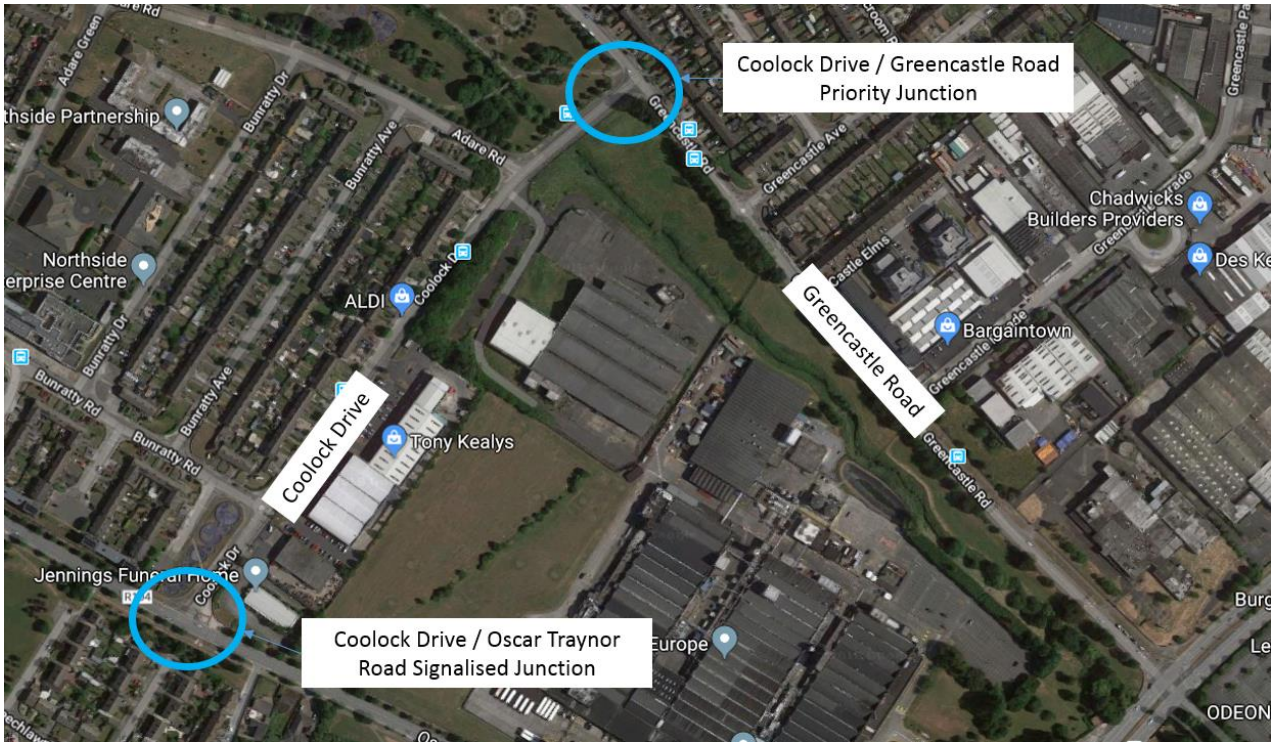

FIGURE 6.10 JUNCTION SURVEY LOCATIONS

The surveys indicated that the weekday morning peak occurred between 08:00 and 09:00 with the evening peak occurring between 16:00 and 17:00 – these were observed to be the busiest. The following analysis is based on these peak periods. Please refer to the TTA report for further details on the traffic survey results.

6.4.8 Road Safety

A review of the Road Safety Authority (RSA) traffic collision database has been undertaken for the road network in the vicinity of the proposed site to identify any collision trends. This review will assist to identify any potential safety concerns in relation to the existing road network.

Traffic collision data was obtained for the period 2005 – 2014, which is the most recent data available from the RSA website. The incidents are categorised into class of severity, which includes minor, serious or fatal collisions. The analysis is shown in Figure 6.13.

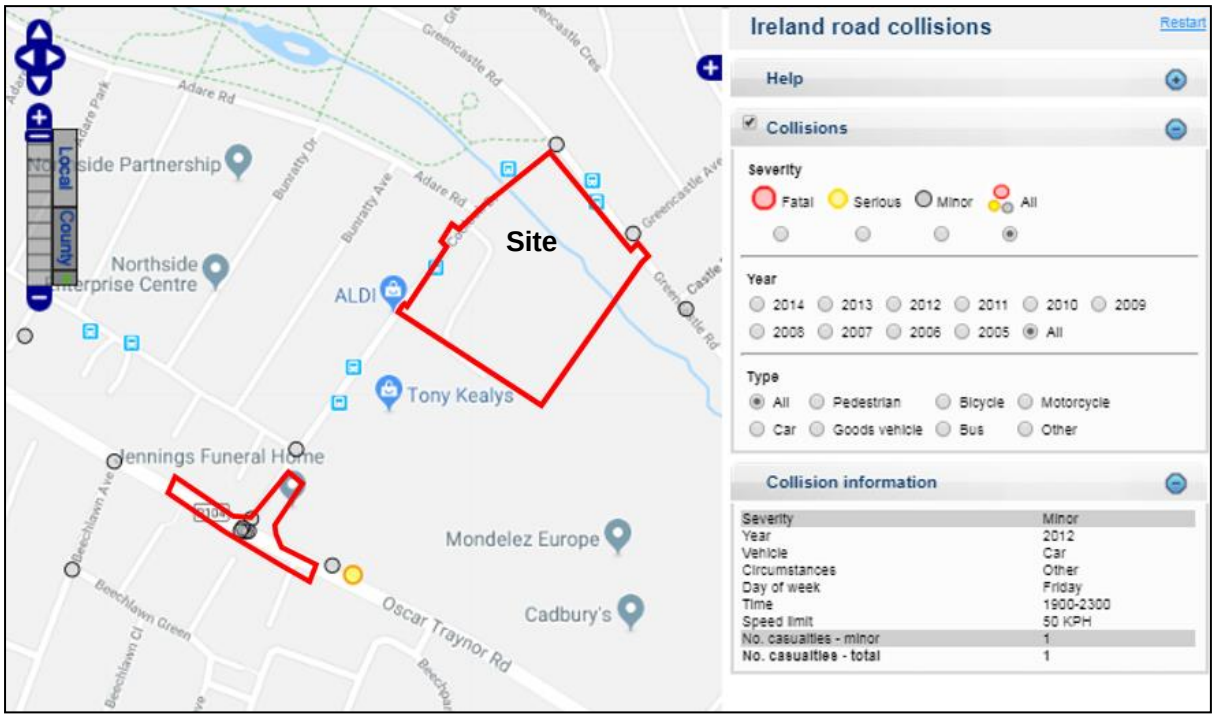

FIGURE 6.11 ROAD COLLISION STATISTICS (SOURCE: RSA WEBSITE)

Figure 6.13 shows that no collisions occurred in the vicinity of the site access junction over the surveyed 10 year period. Highway safety is therefore not considered to warrant further investigation.

A small number of minor collisions and one serious collision occurred along Oscar Traynor Road, to the south of the site. The proposed upgrade to the Oscar Traynor Road/ Coolock Drive signalised road will enhance the road safety at this location.

6.5 Do Nothing Scenario

Should the proposed development not take place, the surrounding road network will remain in the current conditions i.e. the development will continue to generate no vehicular traffic to the site as a derelict factory. Background traffic growth is however, anticipated on the surrounding road network at a rate of 1.34% per annum, as indicated with the TII Travel Demand Projections (Unit 5.3) for Region 1 (Dublin).

The respective site is zoned as 'Z1– To protect, provide and improve residential amenities' and Z9 – 'To preserve, provide and improve recreational amenity and open space and green networks', as stated by Dublin City Council. The site is therefore likely to be subject to increased development trips arising from a large scale residential use on the respective site in the future.

It should also be noted that the proposed application consists of the upgrade of the Oscar Traynor Road / Coolock Drive signalised junction to include additional approaching lanes and pedestrian crossing facilities along the northern arm (Coolock Drive) and the western arm (Oscar Traynor Road).

AECOM has therefore undertaken analysis to determine the traffic conditions of the junction during the Do Nothing Scenario (i.e. with the existing junction arrangement and no development traffic generation).

6.6 Impact Assessment

6.6.1 Construction Phase

To minimise construction impacts upon the surrounding road network, it is recommended that a 'left in / right out vehicular access arrangement is in operation at the site entrance. This will minimise the effect of the construction traffic, impacting less than 115m of carriageway along Coolock Drive.

Whilst it is noted that there is a vehicle weight restriction of 3.5 tonnes along Coolock Drive, it has been determined that the existing vehicular access is the most appropriate location for construction traffic given the larger width of the carriageway and heightened visibility for oncoming traffic.

FIGURE 6.12CONSTRUCTION ROUTE FOR HGV VEHICLES

Hours of Construction

Site development and building works shall be carried out between the hours of operation recommended by DCC to safeguard the residential amenities of properties in the vicinity. The typical hours of operation are as follows:

- 08:00 – 19:00 hrs Mondays – Friday inclusive, 08:00 – 14:00 on Saturdays and not at all on Sundays & Public Holidays.

Any deviation of the above times would be subject to written agreement from DCC.

Construction Traffic Generation

In order to inform the overall traffic generation for the construction phase of the proposed development, AECOM obtained the anticipated volumes of demolition and excavation of the site from CORA Consulting Engineers. For the purpose of this assessment, the following assumptions have been applied:

- The main construction works (i.e. enabling works, demolition, excavation and construction) will take place over an approximate 36 month period within which the majority of truck movements will occur.
- The demolition and excavation stages will produce the greatest number of HGV movements in and out of the site.
- The demolition stage will produce a total of 200 no. HGV trips to and from the site.
- During the excavation stage approximately 62,500 sq. m of topsoil / material will be exported from the subject site to an appropriate and suitably approved facility.
- A bulking factor of 10% has been applied to the excavation volume figures in order to assess a worst case scenario.
- The combined demolition and excavation phases will occur over a short period of time (4 months) within the overall 36 month construction period.

AECOM has assessed the traffic impacts of the proposed development for the most onerous phase of development (i.e. the combined demolition and excavation stage). The assessment has been undertaken in terms of HGV traffic and site operative traffic, as outlined below.

Daily Traffic Flows during Demolition / Excavation Stage

Using the assumption that a HGV carries up to 30 tonnes in weight and that there are 20 working days in each month, the key traffic flows per day, during the peak stage of construction (i.e. the demolition / excavation stage) are as follows:

- 2-way HGV movements per day: 84; and
- 2-way cars / site operative movements per day: 20.

Daily Traffic Flows during Construction Stage

The construction phase will generate 100 site operatives. It has been assumed that 25% of staff will access the site via public transport, walking or cycling. The remainder will comprise of site operatives travelling to and from the site via car and van. It has been assumed that vehicle occupancy for the construction staff is typically 2 persons per vehicle. During the construction phase the key traffic flows per day are as follows:

- 2-way HGV movements per day: 30; and
- 2-way cars / site operative movements per day: 76.

Hourly Profile of Arrivals and Departures

In order to quantify the number of traffic flows accessing the site during the peak traffic periods, typical construction site arrival and departure profiles have been applied for site operatives and HGV traffic, which are outlined within the following sections. The profiles have been quantified against the peak daily number of site operative and HGV traffic i.e. 84 no. 2-way movements for HGV traffic and 76 no. site operative traffic for site operatives. Exact times will be contained within the Contractor's Construction Traffic Management Plan.

Site Operative Traffic: The following arrivals and departures information has been assumed: Arrivals, considerable proportion of site operatives will commence work at 08:00hrs.

Departures, approximately 30% of departures between 16:00 and 17:00, 20% between 17:00 – 18:00hrs and 10% between18:00 – 19:00hrs and 40% between 19:00 and 20:00hrs.

The majority of site operatives will be arriving into the proposed construction site prior to the morning peak hour (08:00 – 09:00hrs) on the surrounding road network and in the evening peak hour, 80% of site operatives are projected to depart outside of the evening peak hour (16:00 – 17:00) on the surrounding road network. This will assist to minimise the impacts on the peak hours on the surrounding road network. The table below illustrates the projected site operative traffic flows per day.

Peak Hour	Car / Van Arrivals	Car / Van Departures	Total Car / Van Movements
AM Period			
07:00 - 08:00	20	0	20
08:00 - 09:00	**18**	**0**	**18**
PM Period			
16:00 - 17:00	**0**	**11**	**11**
17:00 - 18:00	0	8	8
18:00 - 19:00	0	4	4
19:00 – 20:00	0	15	15
	38	38	**76**

TABLE 6.4 DAILY CAR / VAN TRIPS FOR CONSTRUCTION PHASE

Table 6.4 demonstrates that during the peak period for site operatives, approximately 18 no. vehicle movements will occur during the peak AM period and 11 no. HGV movement will occur during the peak PM period.

HGV Traffic: To understand the predicted hourly arrival and departure profile of HGVs accessing and exiting the construction site during the peak excavation period, AECOM has interrogated traffic survey results of the construction phase from a similar development. The below figure identifies the anticipated times that HGVs will arrive and exit the construction site.

Peak Hour	HGV Arrivals	HGV Departures	Total HGV Movements
07:00 - 08:00	3	3	6
08:00 - 09:00	**5**	**5**	**10**
09:00 - 10:00	3	4	7
10:00 - 11:00	6	5	11
11:00 - 12:00	4	3	7
12:00 - 13:00	5	5	9
13:00 - 14:00	5	6	11
14:00 - 15:00	5	4	9
15:00 - 16:00	5	4	9
16:00 - 17:00	**3**	**3**	**6**

17:00 - 18:00	0	1	1
18:00 - 19:00	0	0	0
	42	**42**	**84**

TABLE 6.5 ANTICIPATED HOURLY PROFILE OF HGV MOVEMENTS DURING THE DAY

Table 6.5 demonstrates that during the peak period for HGV movements approximately 10 no. HGV movements will occur during the peak AM period and 6 no. HGV movement will occur during the peak PM period.

Percentage Impacts of Peak Construction Traffic

AECOM has reviewed the above average figures with the baseline flows on the local road network and the resulting percentage impact is shown in the table below.

Junction	Peak Period	Opening Year	Peak Site Operative Traffic	Peak HGV Traffic	Total Two Way Flow	Percentage Impact
Junction 1: Coolock Drive / Greencastle Road T-Junction	AM (08:00 – 09:00)	869	18	10	28	3.22%
	PM (16:00 – 17:00)	1241	11	6	17	1.37%

TABLE 6.6 PERCENTAGE IMPACT DURING THE CONSTRUCTION PHASE OF DEVELOPMENT

Table 6.6 demonstrates that the increase in traffic volumes at the site access is below 5% during the AM peak hour and PM peak hours. Therefore it is considered appropriate to define the impacts of the construction phase upon the local environment to be short term.

It should be noted that the above figures take the peak figures from both the demolition / excavation stage and the construction stage, to assess a worst case scenario. In reality, when the HGV flows are at their peak, the site operative traffic will be lower and visa versa.

Further detail will be contained within the appointed Contractor's Construction Traffic Management Plan.

6.6.2 Operational Phase

Operational Traffic Generation

The Trip Rate Information Computer System (TRICS) has been interrogated to calculate the quantum of vehicle trips likely to be generated by a development of the scale and type proposed. Trip generation data was calculated for the morning and evening peak hours (08:00 – 09:00 and 16:00 – 17:00 respectively), so as to determine the maximum impact of the proposed development on the surrounding road network. The full TRICS outputs are shown in the TTA, whilst the proposed trip rates for the AM and PM peaks can be found in Table 6.7.

TRICS Land Use	Rate	AM Peak Hour		PM Peak Hour	
		Arrivals	Departures	Arrivals	Departures
Residential - Apartment	Per Dwelling	0.054	0.212	0.191	0.069
Crèche	Per Child	0.27	0.205	0.187	0.221

TABLE 6.7 PROPOSED TRIP RATE

When the above trip rates are used in conjunction with the schedule of accommodation of the proposed development, the resulting trip generations are shown in Table 6.8.

Proposed Land Use	Quantum	AM Peak Hour		PM Peak Hour	
		Arrivals	Departures	Arrivals	Departures
Apartments (units)	495	27	105	95	34
Crèche	81	22	17	15	18
Two Way Trips		171		162	

TABLE 6.8 TRIP GENERATIONS

The estimated total two-way movements generated by the proposed development during the morning and evening peak hour is 171 and 162 trips respectively.

Trip Distribution

To understand the potential distribution of trips arriving and departing the site, the base traffic survey results have been interrogated. In the evening peak, the trend is reversed, with trips predominately travelling northbound exiting the city centre. The proposed development distribution is illustrated in Table 6.9 below.

Peak Period	Arm	Access		Egress	
		From North	From South	To North	To South
AM	Main Access	60%	40%	40%	60%
PM	Main Access	57%	43%	43%	57%

TABLE 6.9 TRIP DISTRIBUTION

Proposed Development Impacts

The Transport Infrastructure Ireland (TII) '*Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (October 2016*)' provides guidance on the preparation of future travel demand projects for use in scheme modelling and appraisal. The guidelines presents in Table 5.3.2 Growth Rates based on an annual factor per region.

The guidelines have been interrogated by AECOM to determine a suitable growth factor for the proposed opening year (assumed 2022) and the horizon assessment years, which are the Opening Year + 5 Years (2027) and + 15 Years (2037) as per the TII Traffic Assessment Guidelines.

Given the site is located within Region 1 'Dublin' it is proposed to apply a Central Growth Annual Factor to the base traffic flows (2018). It is proposed to apply the 'LV' (light vehicles) growth factor given the characteristics of the surrounding road network which typically serves car and light vehicular traffic associated with residential and commuting journeys.

The Central Growth Rate for the Dublin Region is projected as 1.0134 (1.34%) growth per annum from 2013 – 2030, and 1.0038 (0.3%) per annum from 2030 – 2050. The applied growth rates to the base traffic surveys are summarised as follows:

- 2022 Opening Year, Growth Rate: 1.069;
- 2027 Horizon Year, Growth Rate: 1.142;
- 2037 Horizon Year, Growth Rate: 1.216.

The growth factors have been applied to the base traffic flows, and the submitted TTA presents the Network Flow Diagrams for the future base years (2022, 2027 and 2037).

The TII Guidelines for Transport Assessments state that the thresholds for junction analysis in Transport Assessments are as follows:

"Traffic to and from the development exceeds 10% of the existing two-way traffic flow on the adjoining highway."

"Traffic to and from the development exceeds 5% of the existing two-way traffic flow on the adjoining highway, where traffic congestion exists or will exist within the assessment period or in other sensitive locations".

Junction	Peak Period	Base Two Way Flow 2018 Survey	Additional Development Two Way Flow	Percentage Impact
Junction 1: Coolock Drive / Greencastle Road T-Junction	AM (8:00 – 9:00)	1027	77	7%
	PM (16:00 – 18:00)	1241	77	6%
Junction 2: Coolock Drive / Oscar Traynor Road 3arm signalised junction	AM (8:00 – 9:00)	1561	92	6%
	PM (16:00 – 18:00)	1673	85	5%

TABLE 6.10 PERCENTAGE IMPACTS

The percentage impact of the proposed development flows upon the 2018 base movements, as shown in Table 6.10 identifies a maximum of 7% impact upon the morning base on Junction 1. Whilst in the PM peak hour, the max percentage impact is 6% upon the existing base. For robustness, AECOM has undertaken junction analysis of the development impacts upon the weekday morning and evening peak hours the Oscar Traynor Road signalised junction as it is proposed to upgrade the signals arrangement.

Junction Impact Modelling

The results of the LinSig analysis of the Oscar Traynor Road / Coolock Drive signalised junction for the AM and PM peak hours with and without the development are displayed in Table 6.11 and Table 6.12.

AECOM obtained SCATS traffic control data from the DCC Transport Modelling team to understand the existing operations of the junction. A basic 4-phase signal cycle is in place at the junction, as observed within the September 2017 survey, configured as follows:

- Phase 1 - All north-westbound and south-eastbound traffic (Arms A and C) along the Oscar Traynor Road approaches have priority (right-turners from Arm C opposed) whilst the traffic at Coolock Drive is stopped.
- Phase 2 - All north-westbound traffic exiting Oscar Traynor Road South-East (Arm C) has priority (right-turners unopposed), whilst all other approaches are stopped.
- Phase 3 - All traffic exiting Coolock Drive has priority whilst Oscar Traynor Road traffic is stopped.
- Phase 4 - Pedestrian priority phase. All vehicular traffic is stopped.

The above signal arrangement is consistent with the existing SCATS data obtained from the DCC ITS division, as illustrated in the below figure.

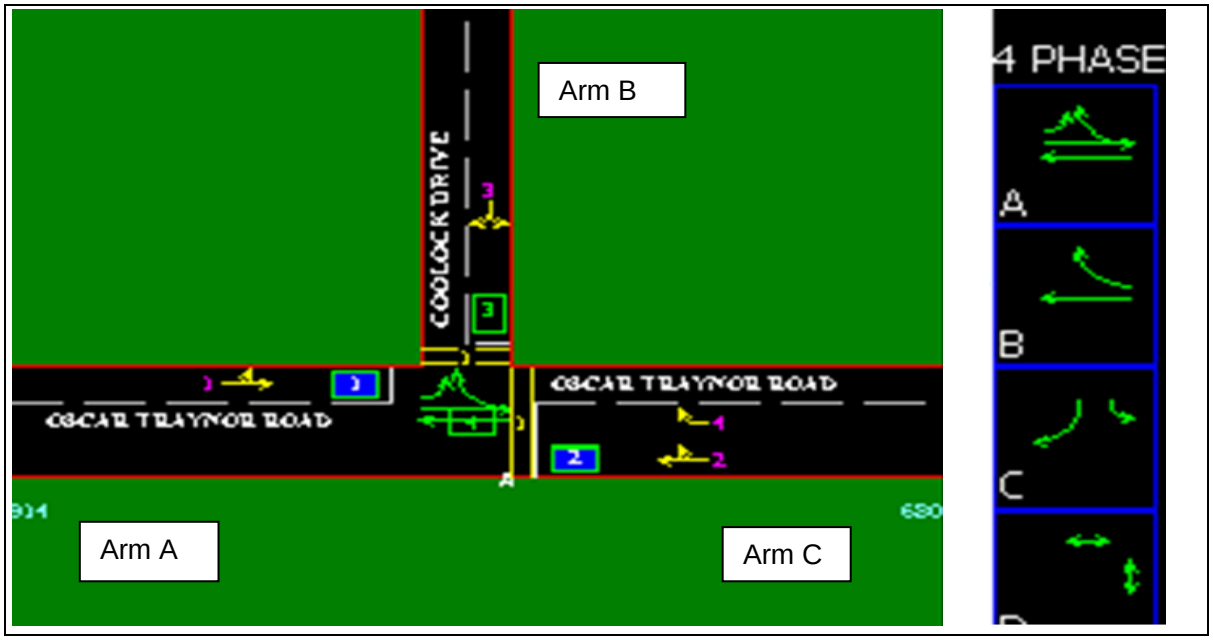

FIGURE 6.13 SCATS DATA (SOURCE: DCC ITS TEAM)

Year	Arm of Junction	Base AM without Development		Base with Development AM	
		Degree of Saturation	Max Queue Length (vehicles)	Degree of Saturation	Max Queue Length (vehicles)
2022	Oscar Traynor Nth, Ahead left-turn	58%	10	62%	11
	Coolock Drive Right Left	69%	5	75%	6
	OTR (Southeastern Arm) Ahead Right	72%	13	78%	15
2027	OTR Nth, Ahead left-turn	62%	11	65%	12
	Coolock Drive Right Left	73%	6	83%	8
	OTR (Southeastern Arm) Ahead Right	77%	15	81%	17
2037	OTR Nth, Ahead left-turn	66%	12	69%	13
	Coolock Drive Right Left	78 %	6	87%	9

Year	Arm of Junction	Base AM without Development		Base with Development AM	
		Degree of Saturation	Max Queue Length (vehicles)	Degree of Saturation	Max Queue Length (vehicles)
	OTR (Southeastern Arm) Ahead Right	82%	17	86%	19

TABLE 6.11 MODELLING RESULTS – OSCAR TRAYNOR ROAD / COOLOCK DRIVE SIGNALISED JUNCTION (AM PEAK)

It can be seen that the DoS on all arms is less than 90% for the 2022, 2027 and 2037 development scenarios for the morning peak hour. The max DoS during the AM 2037 Base + Operational scenario will be 0.871 (87%) on the Oscar Traynor Road Southeastern Arm. The maximum queue is 21 vehicles. It should be acknowledged that this is a negligible increase from the base scenario and is likely due to the high proportion of existing traffic travelling along the Oscar Traynor Road travelling to and from Malahide Road.

Year	Arm of Junction	Base PM without Development		Base with Development PM	
		Degree of Saturation	Max Queue Length (vehicles)	Degree of Saturation	Max Queue Length (vehicles)
2022	Oscar Traynor Nth, Ahead left-turn	60%	10	62%	10
	Coolock Drive Right Left	71%	5	76%	6
	OTR (Southeastern Arm) Ahead Right	71%	12	74%	12
2027	Oscar Traynor Nth, Ahead left-turn	65%	11	66%	11
	Coolock Drive Right Left	75%	6	80%	7
	OTR (Southeastern Arm) Ahead Right	76%	13	79%	14
2037	Oscar Traynor Nth, Ahead left-turn	69%	12	70%	13
	Coolock Drive Right Left	80%	7	85%	8
	OTR (Southeastern Arm) Ahead Right	81%	16	84%	17

TABLE 6.12 MODELLING RESULTS – OSCAR TRAYNOR ROAD / COOLOCK DRIVE SIGNALISED JUNCTION (PM PEAK)

It can be seen from Table 6.12 that the degree of saturation (DoS) on all arms is at 85% for the PM scenarios. The highest DoS value will be 85% (17 max queue) during the 2037 PM peak hour. This however is for a limited period during the PM peak, outside of the peak hour the traffic volumes reduce significantly. DMURS (Section 3.4.2) notes that junctions in urban areas may have to operate at saturation levels for short periods.

Furthermore, the TII High Traffic Growth rates have been applied to the 2018 base flows to identify a 2022, 2027 and 2037 future base. Given the existing high traffic volumes along the Oscar Traynor Road, it could be argued that the application of traffic growth factors is robust, as the Oscar Traynor Road has a finite amount of capacity. The application of traffic growth rates therefore assumes a worst case for the future year scenarios.

AECOM is therefore satisfied that the modelling assessment indicates a worst case scenario and the modelling analysis results demonstrate that the proposed signalised junction will operate with sufficient practical reserve capacity during all assessed scenarios.

6.7 Mitigation

6.7.1 Construction Phase – Traffic

A Preliminary Construction Traffic Management Plan has been prepared as part of the Transport Assessment, which outlines a number of mitigation measures to minimise the impacts of the construction phase of the development. A detailed Construction Traffic Management Plan will subsequently be prepared by the appointed contractor, prior to construction. The plan will be agreed by DCC and will include measures to minimise the impacts associated with the construction phase upon the peak periods on the surrounding road network.

The majority of site operatives are anticipated to arrive into site prior to 07:30am, therefore avoiding the morning peak hour on the local road network (08:00 – 09:00). Furthermore, in the evening peak hour, approximately 50% of site operatives will depart outside of the evening peak hour, thus minimising the impacts on the surrounding road network.

HGV trips are anticipated to arrive and depart the site at a uniform rate throughout the day, to avoid pressure on the morning and evening peak hour periods. The applicant has also set out a routing methodology for HGVs arriving to the site, to minimise the impact on existing residential dwellings in the vicinity of the site.

6.7.2 Operational Phase - Traffic

The proposed upgrade of the Oscar Traynor Road / Coolock Drive signalised junction will assist to reduce traffic speeds by reducing the widths of the individual approaching lanes of the northern and western arms. The reduced widths will act as a traffic calming measure by increasing driver caution at this location.

Introduction of pelican pedestrian crossing features along Coolock Drive and Greencastle Road will provide a more pedestrian friendly environment, and hence reduce traffic speeds of oncoming traffic.

Furthermore, the internal roads layout has been designed as per the Design Manual for Urban Roads and Streets, to reduce traffic speeds. For example:

- A reduced carriageway width of 5.5m has been achieved for the internal estate road;
- A minimum 1.8m footpath on both sides of the carriageway to provide pedestrian priority;
- Provision of internal pedestrian crossing facilities such as raised tables and tactile paving at priority junctions has been made in order to enhance the pedestrian priority within the site; and
- Corner radii of between 3.5 – 6m have been achieved for all junctions off the carriageway as per DMURS.

It should also be noted that a Mobility Management Plan has been prepared as part of this application, which has outlined a series of measures to reduce the reliance on private vehicular modes of transport for future residents.

6.7.3 Operational Phase – Public Transport

Section 11 of the Traffic and Transport Assessment submitted as part of this application, includes an assessment of the estimated number of public transport users (two-way) generated by the proposed development. The estimated demand during the morning and evening peak hours is 85 and 68 trips respectively. This demand can be facilitated through the existing public transport facilities within the area. The proposed development is situated within an ideal location and currently benefits from existing sustainable travel facilities such as Dublin Bus (immediately adjacent to the site) and the DART (19 minute walk).

Dublin Bus caters for approximately 1,200 passengers per hour, through the existing 4 bus routes whilst the DART caters for at least 1,200 passengers per hour.

From onsite observation the existing public transport services immediately adjacent to the site are currently well utilised and benefit from residual capacity during the peak hours of the day.

It should also be noted that the NTA's proposed Bus Connects stops on Malahide Road will help facilitate additional demand for public transport in the local vicinity of the site.

6.7.4 Operational Phase – Walking & Cycling

The proposed development significantly improves the existing pedestrian facilities in the vicinity of the site, whilst also provides new direct pedestrian links from the site towards the Malahide Road QBC.

The development proposals comprise of an upgrade to the Oscar Traynor Road / Coolock Drive signalised junction. This will include the construction of new pedestrian links on all arms to tie in to the existing footpath. The proposal also includes the following pedestrian crossings:

- Provision of a signalised pedestrian crossing to the south of the site entrance on Coolock Drive; and
- Provision of a signalised pedestrian crossing at the proposed pedestrian entrance to the park off Greencastle Road.

New pedestrian links are proposed for the north eastern side of the development via the park area, in order to improve the connectivity of the site.

6.8 Monitoring

The Mobility Management Plan will require regular travel surveys to be undertaken by the mobility manager for review by the planning authority.

These surveys will monitor the use of all modes by residents at the proposed development, along with assessing the level of usage of the car club spaces, which can be increased in number if required.

6.9 Residual Impacts

This chapter describes the residual impacts of the proposed development in two different elements as follows:

- Construction Traffic
- Operational Traffic

6.9.1 Proposed Development Impacts

Mode	*Effects*	*Impact*	*Mitigation*	*Residual Impact*	*Impact Rating*	*Duration of Impact*
Construction Phase						
Traffic	Construction Traffic Flows	Significant	Construction Traffic Management Plan	Moderate	Negative	Short Term
Operational Phase						
Car Parking	Potential overspill of on street car parking along Coolock Drive	Significant	The proposed development comprises of double yellow lines along the site access of the development; Ample visitor / car club parking provision on ground floor of site	Slight	Neutral	Long Term
Traffic	Traffic flows upon the junctions	Moderate	Oscar Traynor Road signalised junction upgrade; Improvements to the pedestrian facilities of the local road network; Ample cycle parking on site	Slight	Neutral	Long Term
Public Transport	Increase person flows to and from the site	Moderate	Existing public transport can facilitate additional passengers; Bus connects; Once operational will facilitate additional demand for public transport	Slight	Positive	Long Term
Walking	Increased pedestrian movements on Coolock Road, Greencastle Road, OTR	Slight	New pedestrian links and connectivity of the site to public road network;	Slight	Positive	Long Term

Mode	Effects	Impact	Mitigation	Residual Impact	Impact Rating	Duration of Impact
Cycling	Increased cycle movements on local road network	Slight	Dedicated pelican crossings; Cycle facilities on upgraded OTR junction Future upgraded BusConnects cycle lanes	Slight	Positive	Long Term

TABLE 6.13 DEVELOPMENT IMPACTS

6.10 References

This assessment has been prepared from both a desktop review of existing information on the site and a site specific investigation. The following is a list of sources of information consulted for use in this chapter;

- Dublin City Council Development Plan 2016 – 2022;
- DMURS (Design Manual for Urban Roads and Streets), March 2013 (Dept of Transport, Tourism and Sport/Dept. of Environment, Community & Local Govt);
- The Traffic Management Guidelines 2003 (jointly published by the DOELG, DTO, DOT);
- The National Planning Framework (Project Ireland 2040);
- TII (Transport Infrastructure Ireland) Traffic and Transport Assessment Guidelines May 2014;
- Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (October 2016);
- Traffic Signs Manual Chapter 8 Temporary Traffic Measures and Sign Roadworks (2008);
- Addendum Transport Chapter 8, Temporary Traffic Measures and Sign Roadworks (2008);
- The NTA (National Transport Authority) Greater Dublin Area Cycle Plan (December 2013); and
- Design Recommendations for Multi-storey and underground car parks (4th Edition) March 2011.