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## **Greater Dublin Drainage Project**

Irish Water

**Environmental Impact Assessment Report: Volume 3 Part A of 6**

**Chapter 13 Traffic and Transport**

June 2018

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## 13. Traffic and Transport

This Chapter of the Environmental Impact Assessment Report identifies and assesses the potential environmental impacts associated with traffic during the Construction Phase and Operational Phase of the proposed Greater Dublin Drainage Project (hereafter referred to as the Proposed Project).

The construction of the Proposed Project is planned to commence at different intervals, and as such, there will be five phases of construction as outlined in Section 13.2.4. The overlap of these phases has been considered in assessing the impacts on traffic. Phase 5 is the critical phase of construction in which all elements of the works occur at the same time. Therefore, the Proposed Project has been assessed for the traffic volumes generated for phase 5 of the Construction Phase (2024). Ten junctions have been assessed for the Construction Phase. Four of the 10 junctions are currently over capacity, and this will remain the case during construction. One junction will reach capacity in 2024 excluding the construction traffic and this will also remain the case during construction. The remaining five junctions (two of which are proposed junctions) do not have capacity issues at present and are expected to operate within capacity during the construction of the Proposed Project.

In order to minimise the impact of the Construction Phase on the surrounding road network, mitigation measures are included in the Construction Traffic Management Plan and are also described in Section 13.11. These include a detailed construction programme, the scheduling of deliveries of materials to site outside of peak times, visual monitoring of any roads used by construction traffic and the management of site entrances to omit the risk of Heavy Goods Vehicles queuing onto the public road network.

The Operational Phase traffic was also taken into consideration and is expected to consist of regular staff and fleet carrying sludge volumes to and from the proposed Wastewater Treatment Plant. The expected year of opening (2025) and design years of 2030 and 2040 were assessed. The traffic volumes have been seasonally adjusted up to, and including, the design years. Whilst the generated traffic for the Proposed Project was calculated, a number of assumptions were made in this report regarding trip generation and trip distribution as outlined in Section 13.7.1 and Section 13.7.2.

A total of four junctions were assessed for the Operational Phase. One of the four junctions is observed to be over capacity, and this will remain the case during the Operational Phase. The remaining three (two of which are proposed junctions) do not have capacity issues at present and are expected to operate within capacity during the Operational Phase.

### 13.1 Introduction

This Chapter assesses the traffic impacts of the Greater Dublin Drainage Project (hereafter referred to as the Proposed Project) during the Construction Phase and Operational Phase. This assessment takes into account the capacity of the existing road network and junctions within the study area. Proposed network improvements have also been taken into account. This analysis will calculate the expected volume of traffic that will be generated by the Proposed Project and assesses the net impact that this traffic will have on the capacity, delay and queuing of the road network, both in the vicinity of the Proposed Project and on the wider city road network.

The Proposed Project will form a significant component of a wider strategy to meet future wastewater treatment requirements within the Greater Dublin Area as identified in a number of national, regional and local

planning policy documents. The plant, equipment, buildings and systems associated with the Proposed Project will be designed, equipped, operated and maintained in such a manner to ensure a high level of energy performance and energy efficiency.

The table below includes a summary of the Proposed Project elements. A full description of the Proposed Project is detailed within Volume 2 Part A, Chapter 4 Description of the Proposed Project of this Environmental Impact Assessment Report (EIAR).

Proposed Project Element	Outline Description of Proposed Project Element
Proposed Wastewater Treatment Plant (WwTP)	<ul style="list-style-type: none"> <li>WwTP to be located on a 29.8 hectare (ha) site in the townland of Clonshagh (Clonshaugh) in Fingal.</li> <li>500,000 population equivalent wastewater treatment capacity.</li> <li>Maximum building height of 18m.</li> <li>Sludge Hub Centre (SHC) to be co-located on the same site as the WwTP with a sludge handling and treatment capacity of 18,500 tonnes of dry solids per annum.</li> <li>SHC will provide sustainable treatment of municipal wastewater sludge and domestic septic tank sludges generated in Fingal to produce a biosolid end-product.</li> <li>Biogas produced during the sludge treatment process will be utilised as an energy source.</li> <li>Access road from the R139 Road, approximately 400m to the southern boundary of the site.</li> <li>Egress road, approximately 230m from the western boundary of the site, to Clonshaugh Road.</li> <li>A proposed temporary construction compound to be located within the site boundary.</li> </ul>
Proposed Abbotstown pumping station	<ul style="list-style-type: none"> <li>Abbotstown pumping station to be located on a 0.4ha site in the grounds of the National Sports Campus at Abbotstown.</li> <li>Abbotstown pumping station will consist of a single 2-storey building with a ground level floor area of 305m<sup>2</sup> and maximum height of 10m and a below ground basement 17m in depth with floor area of 524m<sup>2</sup> incorporating the wet/dry wells.</li> <li>The plan area of the above ground structure will be 305m<sup>2</sup> and this will have a maximum height of 10m.</li> <li>A proposed temporary construction compound to be located adjacent to the Abbotstown pumping station site.</li> </ul>
Proposed orbital sewer route	<ul style="list-style-type: none"> <li>The orbital sewer route will intercept an existing sewer at Blanchardstown and will divert it from this point to the WwTP at Clonshagh.</li> <li>Constructed within the boundary of a temporary construction corridor.</li> <li>13.7km in length; 5.2km of a 1.4m diameter rising main and 8.5km of a 1.8m diameter gravity sewer.</li> <li>Manholes/service shafts/vents along the route.</li> <li>Odour Control Unit at the rising main/gravity sewer interface.</li> <li>Proposed temporary construction compounds at Abbotstown, Cappoge, east of Silloge, Dardistown and west of Collinstown Cross to be located within the proposed construction corridor.</li> </ul>
Proposed North Fringe Sewer (NFS) diversion sewer	<ul style="list-style-type: none"> <li>The NFS will be intercepted in the vicinity of the junction of the access road to the WwTP with the R139 Road in lands within the administrative area of Dublin City Council.</li> <li>NFS diversion sewer will divert flows in the NFS upstream of the point of interception to the WwTP.</li> <li>600m in length and 1.5m in diameter.</li> <li>Operate as a gravity sewer between the point of interception and the WwTP site.</li> </ul>
Proposed outfall pipeline route (land based section)	<ul style="list-style-type: none"> <li>Outfall pipeline route (land based section) will commence from the northern boundary of the WwTP and will run to the R106 Coast Road.</li> <li>5.4km in length and 1.8m in diameter.</li> <li>Pressurised gravity sewer.</li> <li>Manholes/service shafts/vents along the route.</li> <li>Proposed temporary construction compounds (east of R107 Malahide Road and east of Saintdoolaghs) located within the proposed construction corridor.</li> </ul>
Proposed outfall pipeline route (marine section)	<ul style="list-style-type: none"> <li>Outfall pipeline route (marine section) will commence at the R106 Coast Road and will terminate at a discharge location approximately 1km north-east of Ireland's Eye.</li> <li>5.9km in length and 2m in diameter.</li> <li>Pressurised gravity tunnel/subsea (dredged) pipeline.</li> <li>Multiport marine diffuser to be located on the final section.</li> <li>Proposed temporary construction compounds (west and east of Baldoyle Bay) to be located within the proposed construction corridor.</li> </ul>
Proposed Regional Biosolids Storage Facility	<ul style="list-style-type: none"> <li>Located on an 11ha site at Newtown, Dublin 11.</li> <li>Maximum building height of 15m.</li> <li>Further details and full impact assessment are provided in Volume 4 Part A of this EIAR.</li> </ul>

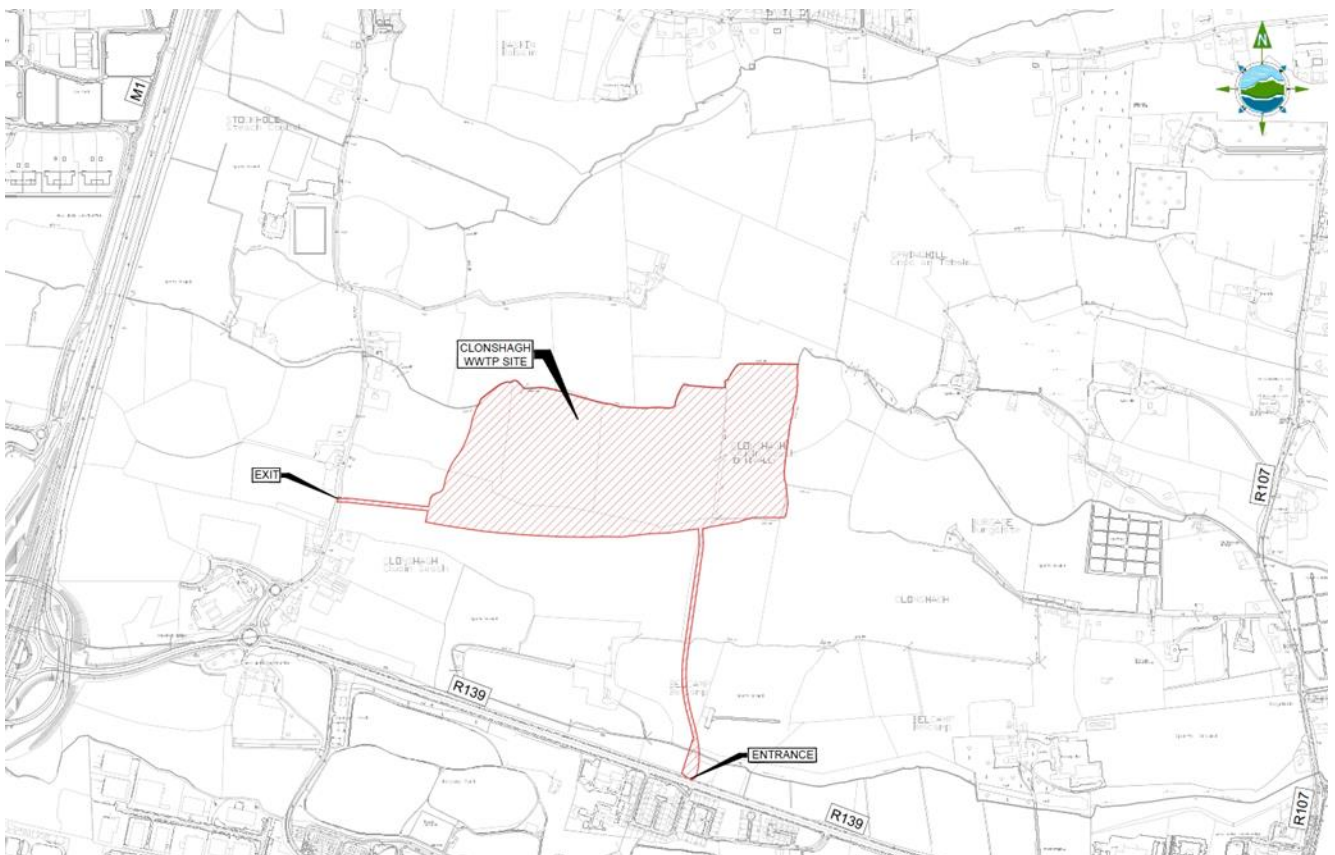
The total Construction Phase will be approximately 48 months, including a 12-month commissioning period to the final Operational Phase. The Proposed Project will serve the projected wastewater treatment requirements of existing and future drainage catchments in the north and north-west of the Dublin agglomeration, up to the Proposed Project's 2050 design horizon.

During the Construction Phase of the Proposed Project, there will be a number of proposed temporary construction compounds and proposed access routes for the delivery of plant and materials to and from the Proposed Project. These are indicated on Figure 13.2 Proposed Construction Corridor, Access Routes, Compounds & Crossings.

Please note that the traffic impact assessment of the proposed Regional Biosolids Storage Facility aspect of the Proposed Project is addressed in Chapter 13 Traffic in Volume 4, Part A of this EIAR.

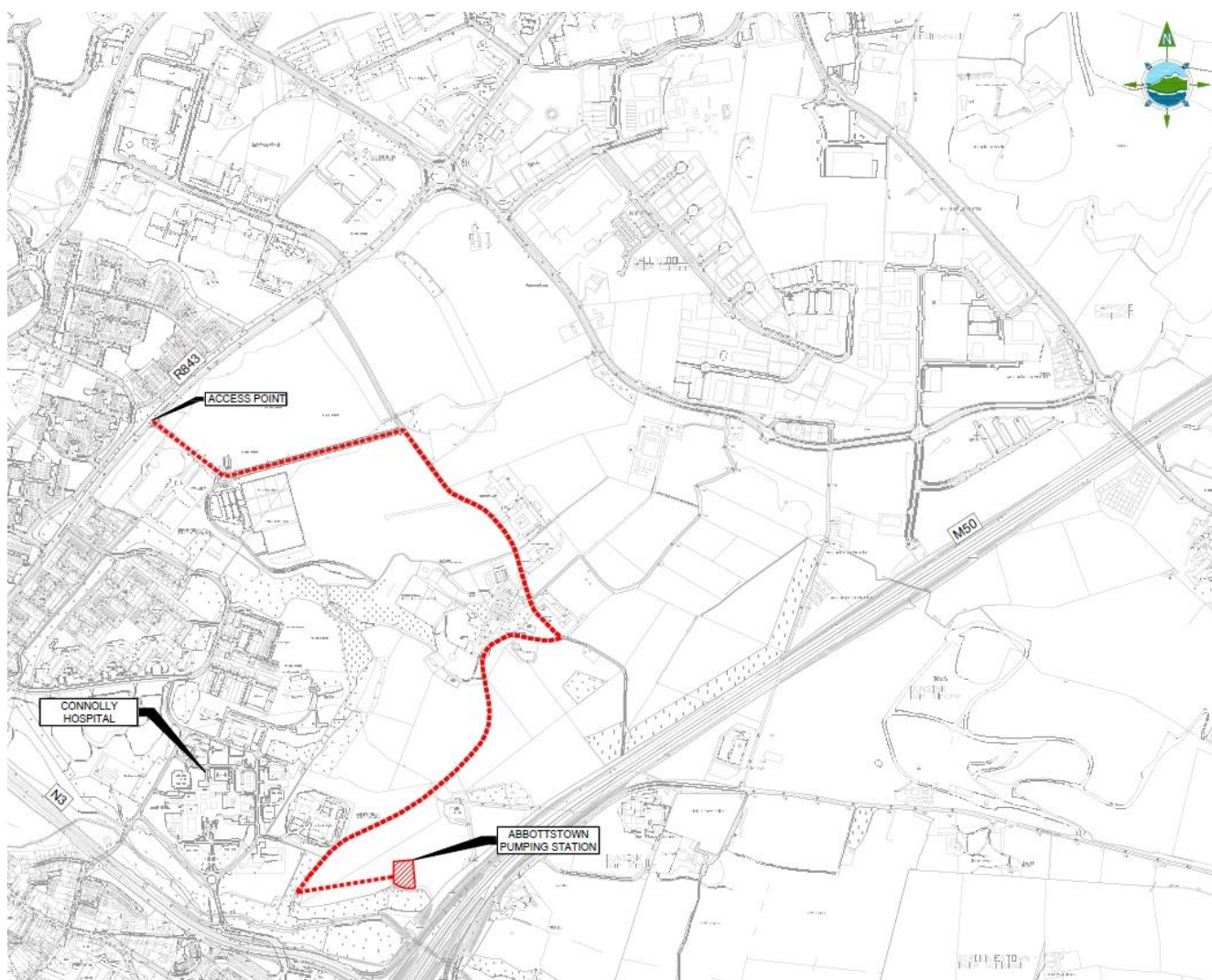
### Site Locations

The proposed WwTP will be located north of the R139 Road, in Clonshagh, north Dublin, as shown on Diagram 13.1.



**Diagram 13.1: Proposed WwTP Site Location**

The proposed Abbotstown pumping station will be located in Blanchardstown, north-east of the N3 National Road (identified as Abbotstown), as shown on Diagram 13.2 below.



**Diagram 13.2: Location of the Proposed Abbotstown Pumping Station**

In addition to the proposed WwTP and the proposed Abbotstown pumping station temporary construction compounds, eight additional proposed temporary construction compounds will be required for the construction of the Proposed Project, which are shown in Figure 13.2 Proposed Construction Corridor, Access Routes, Compounds & Crossings.

These will be utilised by the appointed contractor(s) during the Construction Phase.

## 13.2 Methodology

### 13.2.1 Scoping Process

In order to ensure that the traffic and transport assessment has taken account of all relevant transportation issues, the Proposed Project team have liaised with Fingal County Council (FCC) and DCC, the Roads Authorities for the Proposed Project area. This has included meetings and correspondence in order to agree a number of fundamental assumptions, such as assessment years, number of junctions to be assessed, yearly growth factors and other committed schemes to be accounted for in the analysis. This report has also considered the issues raised by FCC and DCC during these discussions. Scoping documentation and correspondence is contained in Appendix A13.1 in Volume 3 Part B of this EIAR.

A meeting was held in June 2017 with Transport Infrastructure Ireland (TII) at which TII advised that a letter of support would be provided in regard to road crossings, but that these documents would not be signed/sealed until planning permission has been granted. Formal applications to TII have been made for the crossings of the N2 National Road and M1 Motorway as requested and in accordance with Section 53 of the Roads Act 1993.

Public consultations have taken place since 2011. In summary, the traffic concerns raised related to current congestion, the volume of traffic generated during the Operational Phase and the proposed route for the construction traffic. These concerns have been taken into consideration in this assessment.

### 13.2.2 Guidelines

The following guidelines were considered in undertaking this assessment of traffic and transport impacts:

- The *Fingal Development Plan 2017-2023* (FCC 2017);
- *Transport Strategy for the Greater Dublin Area 2016-2035* (National Transport Authority (NTA) 2016);
- The *Traffic and Transport Assessment Guidelines*, as published by TII (formerly National Roads Authority (NRA)) (NRA 2014); and
- The *Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections* (PE-PAG-02017) (TII 2016).

### 13.2.3 Methodology

Estimates of the volume of traffic expected during the Construction Phase and Operational Phase are presented in this Chapter.

Projections of Heavy Goods Vehicle (HGV) traffic generated during the Construction Phase are based on the likely number of deliveries of construction materials and removal of waste materials from the Proposed Project.

Estimates of the amount of HGV traffic to be generated during the Operational Phase of the Proposed Project are based on the likely quantities of waste materials (e.g. sludge, chemicals, grit, fats, oils and grease) that will be removed from or delivered to the proposed WwTP site during the Operational Phase.

The arrival and departure of workers/staff during the Construction Phase and the Operational Phase have also been considered in this assessment.

Following scoping of the assessment with FCC, it was agreed that an assessment of eight existing junctions together with the proposed entrance (Junction B) and exit (Junction A) to the proposed WwTP would be carried out.

The existing junctions requested to be assessed are:

- Junction 1: Clonshaugh Road four arm roundabout;
- Junction 2: R139 Road/Clonshaugh Road four arm roundabout;
- Junction 5: R139 Road/R107 Malahide Road signalised crossroads;
- Junction 8: R106 Coast Road/R123 Moyne Road priority junction;
- Junction 9: R106 Coast Road/Golf Links Road priority junction;
- Junction 10: R106 Coast Road/Station Road three arm mini-roundabout;
- Junction 11: R843 Snugborough Road/National Aquatic Centre (NAC) signalised priority junction; and
- Junction 12: R843 Snugborough Road/Gated Entrance priority junction

The proposed junctions requested to be assessed are:



- Junction A: Proposed exit onto the Clonshaugh Road (north of Junction 1); and
- Junction B: Proposed entrance on the R139 Road (east of Junction 2).

To facilitate the junction assessments, Junction Turning Count surveys were carried out at eight locations on the surrounding road network of the Proposed Project. These flows were then adjusted to take account of seasonal variation and yearly traffic growth to determine the background traffic flows for each year analysed.

The generated traffic was then distributed onto the road network where it was combined with the background traffic flows and subsequently analysed using proprietary computer software.

The junctions have been analysed using the Transport Research Laboratory (TRL) computer program JUNCTION 9 (i.e. PICADY and ARCADY) and OSCADY, which are widely accepted tools used for the capacity and delay analysis of priority, roundabout and signalised junctions.

The key parameters examined in the analysis of priority and roundabout junctions are:

- The Ratio of Flow to Capacity Value (RFC):
  - An RFC value of less than 0.85 indicates that the approach arm to which it relates is operating well within capacity;
  - An RFC value of greater than 0.85 and less than 1.00 indicates that the approach arm to which it relates is operating close to the desired value of 0.85, but is approaching capacity;
  - RFC values over 1.00 indicate that the approach arm to which it relates is operating over capacity;
- The maximum queue length on any approach to the junction; and
- The average delay for each vehicle passing through the junction during the modelled period.

JUNCTION 9 requires the following input data:

- Basic modelling parameters: traffic profile, data matrix and time style, thresholds, etc.;
- Geometric parameters: lane numbers & widths, turning radius, average effective flare lengths, visibility, storage provision, etc.; and
- Forecasted traffic demand data: peak hour origin/destination table with composition of HGVs input for all years of analysis.

The key parameters examined in the results of the analysis of signalised junctions are:

- the Degree of Saturation (DOS):
  - A DOS value of less than 0.90 indicates that the approach arm to which it relates is operating well within capacity;
  - A DOS value of greater than 0.90 and less than 1.00 indicates that the approach arm to which it relates is operating close to the desired value of 0.90, but is approaching capacity;
  - A DOS value over 1.00 indicates that the approach arm to which it relates is operating over capacity.
- maximum queue length on any approach to the junction; and
- the average delay for each vehicle passing through the junction during the modelled period.

OSCADY requires similar input data to JUNCTION 9 but also requires signal phasing information.

The results of the JUNCTION 9 and OSCADY analysis are presented within this section. Appendix A13.2 in Volume 3 Part B of this EIAR provides the origin/destination traffic demand tables for the analysed junctions.

#### **13.2.4 Phasing of the Proposed Project**

For the purpose of analysing the impact of the Proposed Project on the existing road network during the Construction Phase, the Proposed Project has been divided into five stages in accordance with the

construction programme as detailed in Appendix A13.3 in Volume 3 Part B of this EIAR. It is anticipated that peak traffic will occur for phase 1 and phase 2 in 2022, phase 3 and phase 4 in 2023 and phase 5 in 2024. The overall peak traffic will occur in phase 5 for the Proposed Project and, as such, has been assessed in Section 13.5.5.

The Construction Phase of the Proposed Project comprises:

#### Phase 1

- Construction of the proposed WwTP; and
- Construction of the proposed NFS diversion sewer.

#### Phase 2

- Construction of the proposed WwTP;
- Construction of the proposed outfall pipeline route (land based section); and
- Construction of the proposed outfall pipeline route (marine section) – access shaft.

#### Phase 3

- Construction of the proposed WwTP;
- Construction of the proposed outfall pipeline route (land based section);
- Construction of the proposed orbital sewer route from the proposed Abbotstown pumping station to the proposed WwTP;
- Construction of the proposed outfall pipeline route (marine section) – tunnel; and
- Construction of the proposed outfall pipeline route (marine section) – subsea.

#### Phase 4

- Construction of the proposed WwTP;
- Construction of the proposed outfall pipeline route (land based section);
- Construction of the proposed orbital sewer route from the proposed Abbotstown pumping station to the proposed WwTP;
- Construction of the proposed outfall pipeline route (marine section) – tunnel;
- Construction of the proposed outfall pipeline route (marine section) – subsea; and
- Construction of the proposed Abbotstown pumping station.

#### Phase 5

- Construction of the proposed WwTP;
- Construction of the proposed outfall pipeline route (land based section);
- Construction of the proposed orbital sewer route from the proposed Abbotstown pumping station to the proposed WwTP;
- Construction of the proposed outfall pipeline route (marine section) – subsea; and
- Construction of the proposed Abbotstown pumping station.

A number of consented projects have been identified in the vicinity of the Proposed Project that have the potential to impact the road network and thus are relevant in terms of potential cumulative impacts with the Proposed Project. These are identified in Table 13.1.

**Table 13.1: Consented Developments**

Project	Stage of Development	Details
<b>Dublin Airport North Runway</b>	Indication is that construction work will commence in 2017 with commissioning through 2019 into 2020.	<ul style="list-style-type: none"> <li>The Dublin Airport North Runway is likely to be completed before construction of the Proposed Project commences, and as such, there will not be any potential for cumulative impacts during the Construction Phases</li> </ul>
<b>Aviation fuel pipeline from Dublin Airport to Dublin Port</b>	Currently under appeal	<ul style="list-style-type: none"> <li>While the timing of the aviation fuel line to Dublin Airport is not known pending an appeal, the scale of the works resulting from this project is not likely to generate significant traffic in the vicinity of the Proposed Project.</li> </ul>
<b>NSC</b>	Campus is currently under development. Developments which are consented but, construction has not started, are the velodrome and the athlete's accommodation.	<ul style="list-style-type: none"> <li>The majority of the construction of the NSC will have been completed before commencement of construction of the Proposed Project.</li> </ul>
<b>Connolly Hospital – Proposed Developments</b>	The timing of the National Children's Hospital Satellite Unit in Connolly Hospital commenced in 2017 with completion programmed for the 28 February 2019.	<ul style="list-style-type: none"> <li>It is expected that construction of this project will be completed in advance of commencement of construction of the Proposed Project, and as such, it is considered not likely that there will be any crossover with the Proposed Project;</li> </ul>
<b>Bus Rapid Transit Project from Clongriffin to Tallaght</b>	Currently out for tender.	<ul style="list-style-type: none"> <li>There is no certainty in relation to the timing of the Bus Rapid Transit Project, and as a result, it is not possible to determine if there will be any cumulative impacts.</li> </ul>
<b>Metro Link</b>	The design and route for Metro Link has been announced and is under public consultation.	<ul style="list-style-type: none"> <li>According to the Department of Public Expenditure and Reform (2015) document <i>Building on Recovery: Infrastructure and Capital Investment 2016-2021</i>, the Metro Link (previously Metro North) will commence construction in 2021 with completion expected in 2027. However, at this stage there is no information available with respect to proposed construction methodologies, so it is not possible to determine if there will be any cumulative impacts.</li> </ul>
<b>Metro West</b>	Not currently progressing	<ul style="list-style-type: none"> <li>The most recently available information suggests that the Metro West will not be progressing in the short- to medium-term, and therefore cumulative impacts are not anticipated.</li> </ul>
<b>Ringsend WwTP Upgrade Project</b>	Public consultation for preferred route	<ul style="list-style-type: none"> <li>The Ringsend WwTP is likely to commence development at a similar time to the Proposed Project. However, it is not expected that there will be significant potential for cumulative impacts, as the Ringsend Project is based on a single site at least 10km from the Proposed Project area.</li> </ul>
<b>Airport – Clongriffin DART link</b>	Not currently progressing	<ul style="list-style-type: none"> <li>The most recently available information suggests that the Airport to Clongriffin DART Link will not progress in the short- to medium-term, and cumulative impacts are not anticipated.</li> </ul>
<b>Malahide Road Realignment Scheme</b>	Refer to Section 13.2.5	<ul style="list-style-type: none"> <li>While the Malahide Road Realignment Scheme is still a stated objective of FCC, it is not currently being actively progressed and FCC have no indications when it may proceed.</li> </ul>

In general, minimal potential cumulative impacts on traffic capacity are anticipated because of these projects. The natures of these projects are consistent with development in the Fingal area, and any construction related impacts will be temporary in nature.

Therefore, it has been assumed that any increase in traffic over the time period considered in this EIAR will be accounted for in background traffic growth factors.

### **13.2.5 Further Road Improvements**

FCC has identified a possible upgrade of roads near the proposed WwTP site. This proposed upgrade, the 'Malahide Road Realignment Scheme', will involve the improvement of the junction between the R139 Road and the R107 Malahide Road. This scheme also includes the construction of a link road connecting the R107 Malahide Road and the Clonshaugh Road and a further road linking it to the R139 Road.

There has been no date established for the R107 Malahide Road Realignment Scheme. Even though the scheme is not currently progressing, the design of the Proposed Project has taken account of the scheme realignment, and the proposed WwTP site has been located such that it will not prevent development of the realignment scheme in the future.

## **13.3 Baseline Environment**

During the Construction Phase and Operational Phase, the existing road network will be utilised for delivery of personnel, plant and materials to and from the various parts of the Proposed Project. Figure 13.2 Proposed Construction Corridor, Access Routes, Compounds & Crossings identifies the proposed temporary access routes, the permanent elements of the Proposed Project (proposed pipeline routes, Abbotstown pumping station and WwTP) and proposed temporary construction compounds.

### **13.3.1 Traffic Surveys**

In order to determine the magnitude of the existing traffic flows, classified Junction Turning Count surveys were carried out at the eight junctions described below. These traffic surveys were carried out by Nationwide Data Collection on Wednesday 13 April 2016 between 07:00 and 19:00. Figure 13.1 Traffic Assessment Locations shows the locations of the surveys (please note that in this Figure, Site 7 is Junction 9):

Junction Turning Counts:

- Junction 1: Clonshaugh Road four arm roundabout;
- Junction 2: R139 Road/Clonshaugh Road four arm roundabout;
- Junction 5: R139 Road/R107 Malahide Road signalised crossroads;
- Junction 8: R106 Coast Road/R123 Moyne Road priority junction;
- Junction 9: R106 Coast Road/Golf Links Road priority junction;
- Junction 10: R106 Coast Road/Station Road three arm mini-roundabout;
- Junction 11: R843 Snugborough Road/NAC signalised priority junction; and
- Junction 12: R843 Snugborough Road/Gated Entrance priority junction.

Three two-way counts were also undertaken at three locations, situated along existing roads between junctions to inform the two-way traffic movements. These included:

- Site 3: Clonshaugh Road;
- Site 4: R139 Road; and
- Site 7: R106 Coast Road.

The vehicles were classified as Cars, Light Goods Vehicles, Public Services Vehicles (Buses) and HGVs. The traffic count data is included in Appendix A13.4 in Volume 3 Part B of this EIAR.

In order to undertake an analysis of the junction performance, the raw traffic survey data, which consisted of cars and heavy vehicles, was converted into a common index known as Passenger Car Units (PCUs). This took account of the composition of the different types of vehicles by applying a factor to all surveyed traffic types. This factoring calculation assumes 1 car/light vehicle = 1 PCU, 1 heavy vehicle (type OGV1) = 1.5 PCUs, 1 heavy vehicle (type OGV2) = 2.3 PCUs, and 1 bus = 2 PCUs in accordance with 'The prediction of saturation flows for single road junctions controlled by traffic signals' (TRL 1986).

### 13.3.2 Description of Existing Junctions

#### Junction 1: Clonshaugh Road Four Arm Roundabout

Junction 1 is a four arm roundabout on Clonshaugh Road near the R139 Road. Clonshaugh Road (east) is a single-lane approach, whereas Clonshaugh Road (south) is a two-lane road with two entry lanes reaching the circulatory carriageway. The northern approach from the Topaz Service Station is currently a single-lane and the western access from the Clayton Hotel Dublin Airport is a two-lane approach to the roundabout. Uncontrolled pedestrian crossing facilities are provided on each arm of the roundabout.

#### Junction 2: R139 Road/Clonshaugh Road Four Arm Roundabout

Junction 2 is a four arm roundabout on the R139 Road and Clonshaugh Road. The approach from Clonshaugh Road on the northern side is a two-lane approach which continues to a two-lane entry to the roundabout. The R139 Road (east) and R139 Road (west) approaches are also two-lane approaches, which continue to a two-lane entry to the roundabout. The fourth arm is a gated private access which is a single-lane approach to the roundabout. Uncontrolled pedestrian crossing facilities are provided on the R139 Road (east) arm of the roundabout.

#### Junction 5: R139 Road/R107 Malahide Road Signalised Crossroads

Junction 5 is a four arm signalised junction between the R139 Road and R107 Malahide Road. The approach from the R107 Malahide Road (north) is a two-lane road with segregated right- and left-turning lanes at the approach of the junction. The approach from the R107 Malahide Road (south) is a bus plus two-lane road, with right- and left-turning segregated lanes at the approach to the junction. The R139 Road (east) approach is a bus plus one-lane road, with right- and left-turning segregated lanes on approach. The R139 Road (west) is a two-lane road, with a right- and left-turning segregated lanes on approach. Advance stop lines with cycle symbols are provided on all arms of the junction, while pedestrian refuge islands and signal controlled pedestrian crossings are provided on all arms. Street lighting is provided at this junction.

#### Junction 8: R106 Coast Road/R123 Moyne Road Priority Junction

Junction 8 is a three arm priority junction between the R106 Coast Road and R123 Moyne Road. The R106 Coast Road is a two-lane single carriageway and is a major road<sup>1</sup>. It has both north and south approaches which are single lane at the junction. The R123 Moyne Road is a two-lane single carriageway and is considered a minor<sup>2</sup> road, giving way to traffic travelling on the R106 Coast Road.

#### Junction 9: R106 Coast Road/Golf Links Road Priority Junction

Junction 9 is a three arm priority junction between the R106 Coast Road and Golf Links Road. The R106 Coast Road is the major<sup>1</sup> road and the Golf Links Road is the minor<sup>2</sup> road. All approaches from all roads are

<sup>1</sup> As per TII's (2017) *Geometric Design of Junctions* (DN-GEO-03060) **Mainline/Major Road**: The carriageway carrying the main flow of traffic (generally traffic passing through a junction or interchange).

<sup>2</sup> As per TII's (2017) *Geometric Design of Junctions* (DN-GEO-03060) **Minor road**: A minor road is a road which has to give priority to the major road.

single lane. A signal controlled pedestrian crossing is provided on the R106 Coast Road (north) and uncontrolled dropped kerbs on the Golf Links Road.

#### Junction 10: R106 Coast Road/Station Road Three Arm Mini-Roundabout

Junction 10 is a three arm mini-roundabout and subject to a 50km/h speed limit. The approach from the R106 Coast Road (north), R106 Coast Road (south) and Station Road are all single lane with slight flares.

#### Junction 11: R843 Snugborough Road/National Aquatic Centre Signalised Junction

Junction 11 is a three arm, traffic signal controlled junction between R843 Snugborough Road and the NAC access road. R843 Snugborough Road (north) is a bus plus one-lane road, with the bus lane terminating 45m before the junction, facilitating a left-turn at the stop line. The R843 Snugborough Road (south) has two lanes, with the far side lane being a right-turning lane. The NAC access road has two separate left- and right-turning approach lanes onto the R843 Snugborough Road. The R843 Snugborough Road has signal controlled pedestrian crossings on both north and south approaches with dropped kerbs on all arms of the junction.

#### Junction 12: R843 Snugborough Road/Gated Entrance Priority Junction

Junction 12 is a three arm priority junction between the R843 Snugborough Road and the gated entrance to the Sport Ireland indoor arena. The R843 Snugborough Road (north) approach is a bus plus one lane, with the bus lane terminating 25m before the junction. The R843 Snugborough Road (south) approach is a bus plus one lane, and the gated entrance approach is a single lane that flares towards the stop line.

### **13.3.3 Description of Proposed Access and Egress at the Proposed Wastewater Treatment Plant**

A left-turn-only access into the proposed WwTP site is proposed from the R139 Road (Junction B) as shown in Figure 13.3 Proposed Left-Turn Site Access Junction on R139 Road. The speed limit on the R139 Road is 60km/hr, resulting in a desired stopping sight distance of 59m. A left-turn lane is proposed, therefore omitting a section of the bus lane.

An egress-only road from the proposed WwTP site is proposed onto Clonshaugh Road (Junction A) as shown in Figure 13.4 Proposed Left-Turn Site Exit on Clonshaugh Road.

### **13.3.4 Description of Access to the Proposed Abbotstown Pumping Station**

Access to the proposed Abbotstown pumping station will be from an existing signalised junction on the R843 Snugborough Road (Junction 11). Accident data made available by the Road Safety Authority (RSA) website (RSA 2018) has been reviewed and no accident cluster is recorded along the R843 Snugborough Road near the existing access.

## **13.4 Do Nothing Impact**

It should be noted that the Do Nothing scenario is equivalent to the baseline environment. The assessment of the existing environment/Do Nothing Scenario, without the Proposed Project, has been included for the Construction Phase and Operational Phase assessments, as summarised in Table 13.6 to Table 13.20.

## **13.5 Construction Phase Traffic Assessment**

During the Construction Phase, access will be required to the proposed WwTP, Abbotstown pumping station and to various other locations along the proposed orbital sewer route and outfall pipeline route (land based section and marine section). Access will primarily be required for the delivery and removal of materials, plant and personnel from the various locations of the Proposed Project.

### 13.5.1 Trip Generation for the Construction Phase

Traffic generated by the construction of the Proposed Project primarily consists of traffic related to either delivery of construction materials or removal of excavated material from the site for disposal. Construction staff will also generate trips to and from the construction sites.

The total construction traffic estimated to be generated over the three-year Construction Phase (excluding commissioning) is shown in Table 13.2. These values are the maximum adverse scenario projections in order to analyse the surrounding junctions. Assumptions have been made in relation to modal split between car, car-sharing and public transport. In relation to the proposed WwTP, the number of construction staff working on-site will be more than the site can accommodate in terms of parking, and as such, it is anticipated that in addition to the cars indicated in Table 13.2, staff will also arrive via mini buses organised by the appointed contractor(s).

**Table 13.2: Trip Generation for the Proposed Project**

Proposed Element of Proposed Project	Entire Construction Traffic (Two-Way Vehicle Movements)		Weekly Construction Traffic (Two-Way Vehicle Movements) for Phase 5	
	Cars	HGV	Cars	HGV
Proposed WwTP	341,000	54,301	2,750	438
Proposed NFS diversion sewer	3,300	1,952	330	196
Proposed outfall pipeline route (land based section)	33,000	19,261	330	193
Proposed orbital sewer from Abbotstown pumping station to proposed WwTP	25,410	34,614	330	450
Access shaft (section of proposed outfall pipeline route (marine section))	42,840	3,838	2,520	226
Tunnel (section of proposed outfall pipeline route (marine section))	36,960	2,313	840	53
Subsea (section of proposed outfall pipeline route (marine section))	29,040	1,049	330	12
Proposed Abbotstown pumping station	10,560	2,392	220	50

With respect to the Construction Phase staff, the assessment includes for 60 PCU arrivals and 60 PCU departures at the proposed WwTP, as shown in Table 13.4. These 60 PCUs are predicted to comprise cars and the buses outlined above, which are to be organised by the appointed contractor(s). It shall be noted that the PCU equivalence of a Bus is 2 PCUs and 1 Car is equivalent to 1 PCU. For Junction assessments, this results in 2 Cars being equivalent to 1 Bus in terms of capacity. However, the ability of a bus to cater for 16 people, and remove 16 PCUs means that, for 60 Cars, only 4 Buses would be required to cater for the same volume of staff. As such, the assessment has been undertaken for the maximum adverse scenario, assuming that 60 cars (PCUs) would be catered for. This figure has been arrived at by determining the PCU equivalence of a Car and a Bus. Table 13.3 below details this equivalence.

**Table 13.3: PCU Equivalence of a Car and a Bus**

	Requirement for 100 PCUs	Comments
1 Car = 1 PCU	100 Cars	100 Cars caters for 200 people based on car sharing
1 Bus = 2 PCUs	50 Buses	50 Buses cater for 800 people based on mini bus of 16 seats

As it is unlikely that the appointed contractor(s) will be in a position to organise a bus to facilitate all staff due to their origin locations, it has been assumed that 6 buses will be organised. It is also expected that each of

these buses will not be fully occupied. As such, it is assumed that 6 Buses catering for 16 people each (a 90% occupancy) is most likely. These 6 Buses equate to 12 PCUs, with the remaining 120 staff utilising car sharing and public transport, as outlined below (equivalent to 48 PCUs). This results in a total PCU requirement of 60 PCUs.

The following assumptions have been made based on experience on other projects and data provided in the *Transport Strategy for the Greater Dublin Area 2016-2035* (NTA 2016) regarding the modal split for construction workers travelling to various work site locations.

For construction of the proposed WwTP, Abbotstown pumping station and outfall pipeline route (including tunnelling and access shaft):

- 30% will utilise public transport;
- 10% will travel by car in single occupancy; and
- 60% will travel by car share (two people per vehicle).

For construction of the proposed NFS diversion sewer, outfall pipeline route (land based section) and orbital sewer route from Blanchardstown to the proposed WwTP at Clonshagh:

- 10% will travel by car in single occupancy; and
- 90% will travel by car share (two people per vehicle).

**Table 13.4: AM and PM Peak Construction Trip Generation for Phase 5**

Proposed Element of Proposed Project	AM Peak (PCU)				PM Peak (PCU)			
	Arrival		Departure		Arrival		Departure	
	Cars	HGV	Cars	HGV	Cars	HGV	Cars	HGV
Proposed WwTP	60	11	0	11	0	11	60	11
Proposed outfall pipeline route (land based section)	17	6	0	6	0	6	17	6
Proposed NFS diversion sewer	17	5	0	5	0	5	17	5
Proposed orbital sewer route from proposed Abbotstown pumping station to proposed WwTP	17	12	0	12	0	12	17	12
Access shaft (section of proposed outfall pipeline route (marine section))	24	2	0	2	0	2	24	2
Tunnel (section of proposed outfall pipeline route (marine section))	8	1	0	1	0	1	8	1
Subsea (section of proposed outfall pipeline route (marine section))	12	1	0	1	0	1	12	1
Proposed Abbotstown pumping station	8	1	0	1	0	1	8	1

It is anticipated that the normal working hours for the Construction Phase will be:

- weekdays from 07:00 to 18:00; and
- weekends and Bank Holidays from 08:00 to 14:00.

It is noted that certain activities may have to take place outside these hours, and on these occasions, the Local Authorities (LAs) will be notified in advance. It is also anticipated that there will be a requirement for 24-hour working during tunnelling works. This will be facilitated by two 12-hour work shifts. Other activities, such as the proposed outfall pipeline route (marine section), are expected to be carried out by teams working in shift patterns which may fall outside of these periods.

For the purpose of this assessment, it has been assumed that no construction activities will be undertaken during lunchtime, and during the AM and PM peak hours. This assumption results in a reduction from 11



hours to 8 hours for traffic related activities, providing an hourly generated traffic flow that is more robust than the distribution of traffic over an 11-hour day.

In order to assess the maximum adverse scenario, the construction traffic outlined in Table 13.4 has been applied to the existing AM and PM peak hours for each junction.

### 13.5.2 Trip Distribution for Construction

In total, 17 temporary access points will be required to access the proposed pipeline routes and the 10 proposed temporary construction compounds, including a temporary construction compound at the proposed Abbotstown pumping station and the proposed WwTP during the Construction Phase. It shall be noted that a total of 19 temporary access points have been identified, with three options outlined for Access Point AP1B as shown on the Figure 13.2 Proposed Construction Corridor, Access Routes, Compounds & Crossings (Sheet 1 of 3)<sup>3</sup>. However, in order to maintain the maximum adverse scenario approach, the assessment of construction traffic associated with access point AP1B has been assessed for the NSC (Junction 11) as a maximum adverse scenario. This junction is deemed the maximum adverse scenario following a review of the existing traffic volumes at Junction 11 and Junction 12 on the R843 Snugborough Road. Existing traffic volumes at Junction 11 were higher than those at Junction 12 (as this junction is the main public access to the NAC and NSC). Access point AP1B along the L3090 is a gated entrance which is currently used sporadically for large events at the NSC as an overflow exit.

In terms of the haulage routes, Table 13.5 should be read in conjunction with Figure 13.2 Proposed Construction Corridor, Access Routes, Compounds & Crossings.

**Table 13.5: Proposed Routing of Vehicles for Access and Egress to the Various Proposed Project Construction Elements**

Access Point	Section of Proposed Project	Route of Vehicle to Access Point
Access Point 1A (AP1A)	Access to start of the proposed orbital sewer route	<ul style="list-style-type: none"> <li>Exit Junction 6 of the M50 Motorway onto the N3 National Road;</li> <li>Exit Junction 2 of the N3 National Road onto R843 Snugborough Road; and</li> <li>Exit the mini-roundabout onto Waterville Road AP1A.</li> </ul>
Access Point 1B (AP1B)	Access to proposed Abbotstown pumping station and proposed temporary construction compound no. 1	<ul style="list-style-type: none"> <li>Exit Junction 6 of the M50 Motorway onto the N3 National Road;</li> <li>Exit Junction 2 of the N3 National Road onto R843 Snugborough Road;</li> <li>Right-turn at traffic signals (Junction 11); and</li> <li>Access the proposed Abbotstown pumping station and temporary construction compound no. 1 from second exit at the roundabout</li> </ul>
Access Point 2 (AP2)	Access to section of the proposed orbital sewer route between the proposed Abbotstown pumping station and temporary construction compound no. 1	<ul style="list-style-type: none"> <li>As per AP1, vehicles will exit Junction 2 of the N3 National Road onto the R843 Snugborough Road; however, vehicles will continue straight through Junction 12 along the R843 Snugborough Road;</li> <li>Right-turn at the roundabout junction on the R843 Snugborough Road onto the L3090 (Rosemount Business Park/Ballycoolin Road); and</li> <li>Right-turn at Premier Business Park signalised junction.</li> </ul>

<sup>3</sup> The worst case scenario of the three options outlined for Access Point AP1B was assessed.

Access Point	Section of Proposed Project	Route of Vehicle to Access Point
Access Point 3 (AP3)	Access to proposed temporary construction compound no. 2 and the following section of the proposed orbital sewer route	<ul style="list-style-type: none"> <li>As per AP2, vehicles will exit Junction 2 of the N3 National Road onto the R843 Snugborough Road, right-turn at the roundabout junction on the R843 Snugborough Road and continue onto the L3090; and</li> <li>Vehicles will continue through the Premier Business Park signalised junction and take the second exit at the roundabout with Cappagh Road.</li> </ul>
Access Point 4 (AP4)	Access to the succeeding section of the proposed orbital sewer route from the N2 National Road crossing	<ul style="list-style-type: none"> <li>Vehicles will exit from Junction 5 of the M50 Motorway onto the N2 National Road;</li> <li>From the N2 National Road, the vehicles will exit at the Coldwinters slip; and</li> <li>Left-turn at the priority junction with the R135 Finglas Road.</li> </ul>
Access Point 5 (AP5)	Access to the succeeding section of the proposed orbital sewer route from the N2 National Road crossing	<ul style="list-style-type: none"> <li>Vehicles will exit Junction 5 of the M50 Motorway onto R135 Finglas Road and turn right at the next signalised junction, turning right for Charlestown Shopping Centre;</li> <li>Continuing to the signalised junction with the R104 St Margaret's Road and taking left-turn along the R104 Road; and</li> <li>At the roundabout with the R122 Road and Lanesborough Crescent, exiting onto the first exit to crossover the M50 Motorway to AP5.</li> </ul>
Access Point 6 (AP6)	Access to the succeeding section of the proposed orbital sewer route from the Silloge Park Golf Club crossing	<ul style="list-style-type: none"> <li>Vehicles will exit Junction 4 of the M50 Motorway onto the R108 Road in the southbound direction towards Ballymun/City Centre;</li> <li>Right-turn at the signalised junction onto St Margaret's Road (also access to IKEA); and</li> <li>After IKEAs signalised junction, taking right-turn into the gated access across from Hampton Wood Drive.</li> </ul>
Access Point 7A (AP7A)	Access from Silloge Golf Course crossing to proposed temporary construction compound no.3	<ul style="list-style-type: none"> <li>Vehicles will exit Junction 4 of the M50 Motorway onto the R108 Road northbound to Naul; and</li> <li>Left-turn at signalised junction into proposed temporary construction compound no. 3 on Silloge Green Road.</li> </ul>
Access Point 7B (AP7B)	Access to the succeeding section of the proposed orbital sewer route from watercourse crossing no. 12	<ul style="list-style-type: none"> <li>Similar to AP7A, vehicles will exit Junction 4 of the M50 Motorway for the R108 Road northbound to Naul; however, they will continue through the signalised junction; and</li> <li>Right-turn directly across from the entrance to Silloge Golf Course.</li> </ul>
Access Point 8B (AP8B)	Access to the succeeding section of the proposed orbital sewer route from watercourse crossing no. 12 to the crossing with R132 Swords Road.	<ul style="list-style-type: none"> <li>Similar to AP7A and AP7B, vehicles will exit Junction 4 of the M50 Motorway for the R108 Road northbound to Naul; however, they will continue to the signalised junction with the Old Airport Road;</li> <li>Right-turn onto the Old Airport Road continuing to AP8B.</li> </ul>

Access Point	Section of Proposed Project	Route of Vehicle to Access Point
Access Point 8A (AP8A)	Access to temporary construction compound no. 4 and temporary construction compound no. 5 and succeeding section of the proposed orbital sewer route from the crossing with the M1 Motorway	<ul style="list-style-type: none"> <li>Vehicles will exit Junction 3 of the M50 Motorway onto the M1 Motorway and will exit at Junction 2 of the M1 Motorway;</li> <li>From Junction 2 of the M1 Motorway continuing to the airport roundabout and taking the first exit onto R132 Swords Road; and</li> <li>Right-turn at the signalised junction turn onto the Old Airport Road to AP8A.</li> </ul>
Access Point 9 (AP9)	Access to succeeding section of the proposed orbital sewer route from the crossing with the M1 Motorway to Clonshaugh Road	<ul style="list-style-type: none"> <li>Vehicles will exit Junction 3 of the M50 Motorway onto R139 Road at the roundabout (Junction 2), exiting onto the first exit; and</li> <li>At next roundabout (Junction 1), exiting to Clonshaugh Road where AP9 is proposed across from the proposed egress from the proposed WwTP.</li> </ul>
Access Point 10 (AP10)	Access to the proposed WwTP and proposed temporary construction compound no .6 with the proposed NFS diversion sewer	<ul style="list-style-type: none"> <li>AP10 will be utilised as an entry only during construction; and</li> <li>Vehicles will exit Junction 3 of the M50 Motorway onto R139 Road, continue through the roundabout (Junction 2) onto the R139 Road and turn left at the proposed entry only, AP10.</li> </ul>
Access Point 11A/11B (AP11A/11B)	Access to the commencement of the proposed outfall pipeline route (land based section)	<ul style="list-style-type: none"> <li>Similar to AP10, vehicles will exit Junction 3 of the M50 Motorway onto R139 Road, continue through the roundabout (Junction 2) onto the R139 Road;</li> <li>Left-turn at the signalised Junction (Junction 5) between R139 Road and R107 Malahide Road; and</li> <li>AP11A/AP11B will be situated at the R107 Malahide Road crossing.</li> </ul>
Access Point 12 (AP12)	Access to succeeding section of the proposed outfall pipeline route (land based section) and proposed temporary construction compound no. 8	<ul style="list-style-type: none"> <li>Similar to AP10 and AP11A/11B, vehicles will exit Junction 3 of the M50 Motorway onto R139 Road, continue through the roundabout (Junction 2) onto the R139 Road;</li> <li>Left-turn at the signalised junction (Junction 5); however, they will turn right at the signalised junction with R123 Moyne Road onto the R123 Moyne Road;</li> <li>Left into an existing gateway to AP12 on the R123 Moyne Road; and</li> <li>Due to a low bridge on the R123 Moyne Road, it has been assumed all HGVS travelling east of the AP12 will go through AP12.</li> </ul>
Access Point 13 (AP13)	Access to succeeding section of the proposed outfall pipeline route (land based section) and proposed temporary construction compound no. 9	<ul style="list-style-type: none"> <li>Similar to AP10 and AP11, vehicles will exit Junction 3 of the M50 Motorway onto R139 Road, continue through the roundabout (Junction 2) onto the R139 Road;</li> <li>Left-turn at the signalised junction (Junction 5); however, they will turn right at the signalised junction with R123 Moyne Road onto the R123 Moyne Road; and</li> <li>Under the railway bridge to AP13.</li> </ul>

Access Point	Section of Proposed Project	Route of Vehicle to Access Point
Access Point 14 (AP14)	Access to commencement of proposed outfall pipeline route (marine section) and proposed temporary construction compound no. 10	<ul style="list-style-type: none"> <li>• Similar to AP13, vehicles will exit Junction 3 of the M50 Motorway onto R139 Road, continue through the roundabout (Junction 2) onto the R139 Road;</li> <li>• Left-turn at the signalised junction (Junction 5) and turn right at the signalised junction with R123 Moyne Road onto the R123 Moyne Road;</li> <li>• As previously mentioned, due to a low bridge on the R123 Moyne Road, it has been assumed all HGVs travelling east of the AP12 will go through AP12;</li> <li>• Cars will continue to the junction with the R106 Coast Road (Junction 8), turning north to roundabout junction with Station Road and R106 Coast Road (Junction 10); and</li> <li>• Turn right along the R106 Coast Road at the junction with Golf Links Road (Junction 9) to AP14.</li> </ul>

### 13.5.3 Seasonal Adjustment

In undertaking the analysis of the peak traffic flow at the junctions, it was necessary to apply a correction factor to convert the surveyed PCU values into seasonally adjusted traffic flows to take account of the seasonal variation that is experienced with traffic surveys.

These seasonally adjusted conversion factors were calculated using data taken from a fixed automatic traffic counter located on the R139 Road (Old N32 National Road) between the M50 Motorway and Clarehall, Clonshagh, over a 12-month period from April 2015 to March 2016.

It was found that traffic volumes for both the AM and PM peak flows in April were above the average peak traffic flows during the other months of that year. In order to provide a robust analysis, no seasonal adjustment was undertaken to the April surveyed traffic. The results of the traffic count for the AM and PM peak hours are shown in Appendix A13.2 in Volume 3 Part B of this EIAR.

### 13.5.4 Traffic Growth

The background traffic growth factors used in the analysis in this report were established from TII's *Project Appraisal Guidelines* (PE-PAG-02017) (TII 2016). The Guidelines defines Light Vehicles (LV) as cars and light goods vehicles and Heavy Vehicles (HV) as ordinary goods vehicles. It was considered appropriate to use the High Growth scenario for the GDA in the analysis.

The applicable growth rates from these guidelines for the Construction Phase are as follows:

- 1.093 growth factor from 2016 to 2022 for LV;
- 1.154 growth factor from 2016 to 2022 for HV;
- 1.109 growth factor from 2016 to 2023 for LV;
- 1.182 growth factor from 2016 to 2023 for HV;
- 1.126 growth factor from 2016 to 2024 for LV; and
- 1.211 growth factor from 2016 to 2024 for HV.

### 13.5.5 Construction Phase Assessment

The eight existing junctions mentioned in Section 13.3.2 and the two proposed junctions at the proposed WwTP have been analysed for the Construction Phase.

#### Assessment Years

The performance of the junctions has been analysed for the critical AM and PM peak hours as determined from the surveyed traffic. The Proposed Project will be broken down into five phases, in terms of assessing construction traffic, with phases 1, 2 and 3 commencing in 2022; phase 4 commencing in 2023; and phase 5 commencing in 2024. The proposed WwTP will be commissioned, post-construction and pre-operation, in 2025. Phase 5 (2024) has been assessed for this traffic assessment as this will be the peak phase of construction activity.

### 13.6 Impact of the Proposed Project – Construction Phase

A summary of the results for the roundabout between Clonshaugh Road and the Clayton Hotel Access Roundabout (Junction 1), for the AM peak hour (08:15 to 09:15) and PM peak hour (16:15 to 17:15) during the Construction Phase is provided in Table 13.6. These peak hours are based on the traffic survey data collected at this junction. A complete set of outputs from JUNCTION 9 are included in Appendix A13.5 in Volume 3 Part B of this EIAR.

**Table 13.6: JUNCTION 9 Results for Junction 1, Clonshaugh Road – Clayton Hotel Access Roundabout During Construction Phase 5**

Junction 1: Clonshaugh Road – Clayton Hotel Access Roundabout									
Year & Time	Arm A – Topaz Service Station		Arm B – Clonshaugh Road (N)		Arm C – Clonshaugh Road (S)		Arm D – Hotel Access		Max Delay (s)
	RFC Value	Max Queue Length (PCU)	RFC Value	Max Queue Length (PCU)	RFC Value	Max Queue Length (PCU)	RFC Value	Max Queue Length (PCU)	
Existing AM	0.152	1	0.301	1	0.170	1	0.052	1	4.263
Existing PM	0.163	1	0.238	1	0.232	1	0.046	1	4.641
2024 AM No Construction	0.214	1	0.412	1	0.230	1	0.074	1	4.467
2024 PM No Construction	0.234	1	0.327	1	0.311	1	0.065	1	5.388
2024 AM With Construction (Phase 5)	0.214	1	0.424	1	0.230	1	0.074	1	5.066
2024 PM With Construction (Phase 5)	0.234	1	0.395	1	0.311	1	0.065	1	5.388

The summary of performance analysis shown in Table 13.6 indicates that Junction 1 will be operating with marginally higher queues and delays in peak hours in 2024, during the final phase of construction.

A summary of the results for the existing roundabout between Clonshaugh Road and the R139 Road (Junction 2) for the AM peak (07:45 to 08:45) and PM peak (16:15 to 17:15) hours during construction are provided below in Table 13.7. The complete set of outputs from JUNCTION 9 is included in Appendix A13.5 in Volume 3 Part B of this EIAR.

**Table 13.7: JUNCTION 9 Results for Junction 2, R139 Road – Clonshaugh Road Roundabout During the Construction Phase 5**

Junction 2: R139 Road – Clonshaugh Road Roundabout									
Year & Time	Arm A – Clonshaugh Road		Arm B – R139 Road (E)		Arm C – Gated Access Road		Arm D – R139 Road (W)		Max Delay (s)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
Existing AM	0.514	2	1.150	169	0.000	0	0.983	27	230.358
Existing PM	0.425	1	1.242	283	0.000	0	1.005	39	478.863
2024 AM No Construction	0.732	3	1.614	814	0.000	0	1.336	488	1,183
2024 PM No Construction	0.591	2	1.728	1,037	0.000	0	1.360	513	1,491
2024 AM With Construction (Phase 5)	0.752	4	1.624	827	0.000	0	1.383	571	1,207
2024 PM With Construction (Phase 5)	0.679	3	1.788	1,109	0.000	0	1.365	524	1,642

The summary of performance analysis indicates that Junction 2 is currently over capacity on Arms B and D. Arm C is a private entrance and only used sporadically. During the final stage of construction, there will be a maximum temporary increase of 0.088 RFC in 2024 on Arm A in the PM peak.

A summary of the results for the proposed exit only on the Clonshaugh Road (Junction A) for the AM peak (08:00 to 09:00) and PM peak (16:00 to 17:00) hours during the Construction Phase are provided below in Table 13.8.

**Table 13.8: JUNCTION 9 Results for Proposed Junction A, Clonshaugh Road – Proposed WwTP Priority Junction During Construction Phase 5**

Proposed Junction A (Exit Only): Clonshaugh Road – Proposed WwTP Priority Junction							
Year & Time	Arm A – Clonshaugh Road (N)		Arm B – WwTP Exit		Arm C – Clonshaugh Road (S)		Max Delay (s)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
Existing AM	-	-	0	0	0	0	0
Existing PM	-	-	0	0	0	0	0
2024 AM No Construction	-	-	0	0	0	0	0
2024 PM No Construction	-	-	0	0	0	0	0
2024 AM With Construction (Phase 5)	-	-	0.027	1	0	0	14.057
2024 PM With Construction (Phase 5)	-	-	0.0284	1	0	0	19.164

The summary of performance analysis indicates that proposed Junction A will be operating with small queues and delays during the peak hours in 2024, during phase 5 of construction. These delays are expected to occur on the proposed WwTP exit only. There are no expected delays on Clonshaugh Road as vehicles exiting the proposed WwTP wait for gaps in the traffic.

A summary of the results for the proposed entry only on the R139 Road (Junction B) for the AM peak (08:00 to 09:00) and PM peak (17:00 to 18:00) hours during construction are provided below in Table 13.9.

**Table 13.9: JUNCTION 9 Results for Proposed Junction B, R139 Road – Proposed WwTP Priority Junction During Construction Phase 5**

Proposed Junction B (Entry Only): R139 Road – Proposed WwTP Priority Junction							
Year & Time	Arm A – R139 Road (W)		Arm B – WwTP Entry		Arm C – R139 Road (E)		Max Delay (s)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
Existing AM	-	-	0	0	0	0	0
Existing PM	-	-	0	0	0	0	0
2024 AM No Construction	-	-	0	0	0	0	0
2024 PM No Construction	-	-	0	0	0	0	0
2024 AM With Construction (Phase 5)	-	-	0	0	0	0	0
2024 PM With Construction (Phase 5)	-	-	0	0	0	0	0

This is an entry to the proposed WwTP from the R139 Road. Vehicles will only be allowed to turn left into the proposed WwTP from the R139 Road (right-turn in from the R139 Road will be banned). This means that no delays to traffic at this location are expected.

A summary of the results for the existing signalised crossroads between the R139 Road and the R107 Malahide Road (Junction 5) for the AM peak (07:45 to 08:45) and PM peak (16:15 to 17:15) hours during the Construction Phase are provided below in Table 13.10.

Table 13.10: OSCADY Results for Junction 5, R139 Road – R107 Malahide Road Signalised Junction During Construction Phase 5

Junction 5: R139 Road – R107 Malahide Road Signalised Priority Junction																													
Year & Time	Arm A – R107 Malahide Road (N)						Arm B – R139 Road (E)						Arm C – R107 Malahide Road (S)								Arm D – R139 Road (W)								Avg Delay (min/veh)
	DOS Value			Max Queue Length			DOS Value			Max Queue Length			DOS Value				Max Queue Length				DOS Value				Max Queue Length				
	Lane 1 (A-B) & (A-C)	Lane 2 (A-C)	Lane 3 (A-D)	Lane 1 (A-B) & (A-C)	Lane 2 (A-C)	Lane 3 (A-D)	Lane 1 (B-C) & (B-D)	Lane 2 (B-D)	Lane 3 (B-A)	Lane 1 (B-C) & (B-D)	Lane 2 (B-D)	Lane 3 (B-A)	Lane 1 (C-D)	Lane 2 (C-A)	Lane 3 (C-A)	Lane 4 (C-B)	Lane 1 (C-D)	Lane 2 (C-A)	Lane 3 (C-A)	Lane 4 (C-B)	Lane 1 (D-A)	Lane 2 (D-B)	Lane 3 (D-B) & (D-C)	Lane 4 (D-C)	Lane 1 (D-A)	Lane 2 (D-B)	Lane 3 (D-B) & (D-C)	Lane 4 (D-C)	
Existing AM	0.722	0.722	1.563	5	5	80	2.812	2.812	0.445	324	324	2	1.394	0.363	0.363	1.358	116	3	3	47	1.536	1.822	1.822	1.822	69	136	136	136	22.65
Existing PM	0.524	0.524	1.497	4	4	70	2.521	2.521	0.376	269	269	1	1.632	0.577	0.577	2.435	202	4	4	219	1.450	1.788	1.788	1.788	57	130	130	130	22.59
2024 AM No Construction	0.978	0.978	1.579	12	12	83	3.854	3.854	0.604	523	523	2	1.913	0.494	0.494	1.853	309	3	3	123	2.124	2.486	2.486	2.486	157	265	265	265	41.85
2024 PM No Construction	0.709	0.709	2.045	5	5	162	3.443	3.443	0.507	447	447	2	2.215	0.779	0.779	3.315	428	6	6	364	1.989	2.430	2.430	2.430	135	255	255	255	42.44
2024 AM With Construction (Phase 5)	0.978	0.978	2.281	12	12	203	3.854	3.854	0.604	523	523	2	1.913	0.494	0.494	1.562	372	3	3	147	2.154	2.486	2.486	2.486	162	265	265	265	42.99
2024 PM With Construction (Phase 5)	0.709	0.709	2.073	5	5	167	3.443	3.443	0.507	447	447	2	2.215	0.779	0.779	3.315	427	6	6	365	2.160	2.430	2.430	2.430	163	255	255	255	42.77



The summary of performance analysis shown in Table 13.10 indicates that Junction 5 is currently over capacity on all arms. During phase 5 of construction, there will be a potential temporary maximum increase in the PM peak of approximately 0.171 DOS on Arm D.

A summary of the results for the existing priority junction between the R123 Moyne Road and R106 Coast Road (Junction 8) for the AM peak (08:15 to 09:15) and PM peak (17:15 to 18:15) hours during the Construction Phase is provided below in Table 13.11. The complete set of outputs is included in Appendix A13.5 in Volume 3 Part B of this EIAR.

**Table 13.11: JUNCTION 9 Results for Junction 8, R123 Moyne Road – R106 Coast Road Priority Junction During Construction Phase 5**

Junction 8: R123 Moyne Road – R106 Coast Road Priority Junction							
Year & Time	Arm A – R106 Coast Road (S)		Arm B – R123 Moyne Road		Arm C – R106 Coast Road (N)		Max Delay (s)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
Existing AM	-	-	0.775	4	0.563	3	57.005
Existing PM	-	-	0.562	2	0.243	1	22.345
2024 AM No Construction	-	-	1.774	73	0.022	38	968
2024 PM No Construction	-	-	0.958	10	0.412	2	7.008
2024 AM With Construction (Phase 5)	-	-	1.809	79	0.025	39	1,012
2024 PM With Construction (Phase 5)	-	-	0.976	11	0.457	2	136

The summary of performance analysis shown in the Table 13.11 indicates that Junction 8 is expected to be over capacity on Arm B in the AM peak in 2024. During phase 5 of construction, there will be a temporary increase of approximately 0.035 RFC in 2024 on Arm B in the AM peak. All other arms are expected to operate within capacity with and without construction traffic.

A summary of the results for the existing priority junction between the R106 Coast Road and Golf Links Road (Junction 9) for the AM peak (08:15 to 09:15) and PM peak (17:30 to 18:30) hours during the Construction Phase is provided below in Table 13.12. The complete set of outputs is included in Appendix A13.5 in Volume 3 Part B of this EIAR.

**Table 13.12: JUNCTION 9 Results for Junction 9, R106 Coast Road – Golf Links Road Priority Junction During Construction Phase 5**

Junction 9: R106 Coast Road – Golf Links Road Priority Junction							
Year & Time	Arm A – R106 Coast Road (S)		Arm B – Golf Links Road		Arm C – R106 Coast Road (N)		Max Delay (s)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
Existing AM	-	-	0.108	1	0.114	1	12.148
Existing PM	-	-	0.230	1	0.167	1	11.925
2024 AM No Construction	-	-	0.200	1	0.225	1	18.581
2024 PM No Construction	-	-	0.401	1	0.330	2	19.454
2024 AM With Construction (Phase 5)	-	-	0.203	1	0.288	2	18.873
2024 PM With Construction (Phase 5)	-	-	0.432	1	0.335	2	20.201

The summary of performance analysis shown in the Table 13.12 indicates that Junction 9 will be operating well within capacity, with small queues and delays during the peak hours in 2024, during phase 5 of construction.

A summary of the results for the existing mini-roundabout between the R106 Coast Road and Station Road (Junction 10) for the AM peak (08:00 to 09:00) and PM peak (17:30 to 18:30) hours during the Construction Phase is provided below in Table 13.13. The full set of outputs is included in Appendix A13.5 in Volume 3 Part B of this EIAR.

**Table 13.13: JUNCTION 9 Results for Junction 10, R106 Coast Road – Station Road Mini-Roundabout During Construction Phase 5**

Junction 10: R106 Coast Road – Station Road Mini-Roundabout Junction							
Year & Time	Arm A – R106 Coast Road(S)		Arm B – Station Road		Arm C – R106 Coast Road (N)		Max Delay (s)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
Existing AM	0.907	8	1.141	40	0.908	9	2.031
Existing PM	0.914	8	1.179	64	0.851	5	4.359
2024 AM No Construction	0.906	8	1.142	41	0.908	10	2.045
2024 PM No Construction	0.910	8	1.178	63	0.850	5	4.299
2024 AM with Construction (Phase 5)	0.905	8	1.142	41	0.908	10	2.042
2024 PM with Construction (Phase 5)	0.911	8	1.179	64	0.851	5	4.343

The summary of performance analysis shown in Table 13.13 indicates that Junction 10 is currently over capacity on all arms of the junction. The maximum impact would be a potential temporary increase of 0.001 RFC in 2024 on Arm A, Arm B and Arm C during the PM peak.

A summary of the results for the existing signalised junction between the R843 Snugborough Road and the NAC (Junction 11) for the AM peak (07:45 to 08:45) and PM peak (17:00 to 18:00) hours during the Construction Phase is provided below in Table 13.14. The complete set of outputs is included in Appendix A13.5 in Volume 3 Part B of this EIAR.

**Table 13.14: OSCADY Results for Junction 11, R843 Snugborough Road – National Aquatic Centre Signalised Priority Junction During Construction Phase 5**

Junction 11: R843 (Snugborough Road) – National Aquatic Centre Signalised Priority Junction													
Year & Time	Arm A – R843 Snugborough Road (N)				Arm B – National Aquatic Centre				Arm C – R843 Snugborough Road (S)				Avg Delay (min/veh)
	DOS Value		Max Queue Length		DOS Value		Max Queue Length		DOS Value		Max Queue Length		
	Lane 1 (A-B)	Lane 2 (A-C)	Lane 1 (A-B)	Lane 2 (A-C)	Lane 1 (B-C)	Lane 2 (B-A)	Lane 1 (B-C)	Lane 2 (B-A)	Lane 1 (C-A)	Lane 2 (C-B)	Lane 1 (C-A)	Lane 2 (C-B)	
Existing AM	0.101	0.725	1	7	0.052	0.076	0	0	0.902	0.265	11	2	0.54
Existing PM	0.150	1.077	2	42	0.274	0.158	4	3	0.318	0.386	6	4	1.27
2024 AM No Construction	0.119	0.858	2	19	0.063	0.089	1	2	1.073	0.316	45	3	1.27
2024 PM No Construction	0.177	1.280	3	154	0.328	0.189	5	3	0.376	0.461	7	5	3.33
2024 AM With Construction (Phase 5)	0.119	0.861	2	19	0.064	0.089	1	2	1.078	0.351	70	4	1.31
2024 PM With Construction (Phase 5)	0.177	1.287	3	157	0.341	0.189	5	3	0.378	0.468	7	5	3.40

The summary of performance analysis shown in Table 13.14 indicates that Junction 11 is currently over capacity on Arm A. Arm C is currently above the desirable DOS of 0.90 in the AM peak and will reach capacity in 2024 without construction of the Proposed Project. During phase 5 of construction, a temporary increase of 0.007 DOS in 2024 on Arm A in the PM peak and 0.005 on Arm C in the AM peak is expected.

A summary of the results for the existing junction between the R843 Snugborough Road and existing gateway into the NAC (Junction 12) for the AM peak (08:00 to 09:00) and PM peak (16:00 to 17:00) hours during construction are provided below in Table 13.15. The complete set of outputs is included in Appendix A13.5 in Volume 3 Part B of this EIAR.

**Table 13.15: JUNCTION 9 Results for Junction 12, R843 Snugborough Road – Existing Gateway Priority Junction During Construction Phase 5**

Junction 12: R843 Snugborough Road – Existing Gateway Priority Junction							
Year & Time	Arm A – R843 Snugborough Road (N)		Arm B – Existing Gateway		Arm C – R843 Snugborough Road (S)		Max Delay (s)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
Existing AM	-	-	0.0	0	0.0	0	0
Existing PM	-	-	0.0	0	0.0	0	0
2024 AM No Construction	-	-	0.0	0	0.0	0	0
2024 PM No Construction	-	-	0.0	0	0.0	0	0
2024 AM With Construction (Phase 5)	-	-	0.0	0	0.0	0	0
2024 PM With Construction (Phase 5)	-	-	0.0	0	0.0	0	0

This existing junction is an existing gateway. There are currently no delays on any of the arms. It is anticipated that the construction traffic will remain on the R843 Snugborough Road and there will be no movements into the existing gateway.

### 13.6.1 Conclusion

- The existing Clonshaugh Road/Commercial Access Roundabout (Junction 1) will operate below capacity during the peak Construction Phase;
- The existing R139 Road/Clonshaugh Road Roundabout (Junction 2) is currently operating over capacity. In terms of phase 5 of construction, a potential temporary maximum increase of 0.088 RFC is expected;
- The proposed Clonshaugh Road exit only (Junction A) is expected to operate below capacity during the Construction Phase;
- The proposed R139 Road entrance only (Junction B) is expected to operate below capacity during the Construction Phase;
- The existing R139 Road/R107 Malahide Road (Junction 5) is currently operating over capacity;
- The existing R123 Moyne Road/R106 Coast Road (Junction 8) is expected to be operating over capacity in 2024 with no construction traffic. It is also expected this will remain the case during phase 5 of construction, with a maximum temporary increase in RFC of 0.035 expected;

- The existing R106 Coast Road/Golf Links Road (Junction 9) is expected to operate below capacity during the Construction Phase;
- The existing R106 Coast Road/Station Road mini-roundabout (Junction 10) is currently operating over capacity. It is expected this will remain the case during phase 5 of construction with a maximum temporary increase in RFC of 0.001 expected;
- The existing R843 Snugborough Road/NAC (Junction 11) is currently operating over capacity. It is expected this will remain the case during phase 5 of construction, with a maximum temporary increase in DOS of 0.007 expected; and
- The R843 Snugborough Road/existing gateway (Junction 12) is expected to operate below capacity during the Construction Phase.

### 13.7 Operational Phase Traffic Assessment

#### 13.7.1 Trip Generation for Operational Phase

After completion of the construction works, the traffic generated during the Operational Phase of the Proposed Project will be related to the fleet of trucks removing sludge from the proposed WwTP to the proposed RBSF and the staff travelling to and from the proposed WwTP and proposed Abbotstown pumping station. The proposed WwTP workforce will comprise a maximum of 40 persons (including external subcontractors, etc.). The workforce will operate in three shifts, 08:00 to 16:00, 16:00 to 00:00 and 00:00 to 08:00, with 25 members of staff in the first shift, 10 staff in the second shift and five staff in the third shift.

The *Transport Strategy for the Greater Dublin Area 2016-2035* (NTA 2016) states that 71% to 75% trips, of all available transport modes, are by car within the proposed WwTP area. Therefore, it is predicted that 30% of the proposed WwTP staff will utilise public transport in the morning shift only, with the other 70% travelling by car in single occupancy. As such, a reduction factor to account for these modal patterns has been applied to the total number of staff to determine the number of employee trips by private vehicle.

The proposed WwTP will be accessed via a proposed left-turn-only access from the R139 Road (Junction B) with a proposed left-turn only egress onto Clonshaugh Road (Junction A).

The proposed Abbotstown pumping station will have two staff per day for general maintenance. Due to the relatively low operational traffic for the proposed Abbotstown pumping station, it is expected that the impacts of the proposed Abbotstown pumping station will be negligible when compared to the existing background traffic. These staff will use existing entrances/exits to access the proposed Abbotstown pumping station.

The AM and PM peak operational trip generation for the Operational Phase is detailed in Table 13.16.

**Table 13.16: AM and PM Peak Operational Trip Generation**

Section of Proposed Project	AM Peak (PCU)				PM Peak (PCU)			
	Arrival		Departure		Arrival		Departure	
	Cars	HGV	Cars	HGV	Cars	HGV	Cars	HGV
Proposed WwTP	18	5	5	5	10	5	25	5

#### 13.7.2 Trip Distribution for Operational Phase

It has been assumed that the staff and HGVs for the proposed WwTP will travel from the R123 Moyne Road/Clonshaugh Road roundabout (Junction 2) to the proposed access at Junction B.

Vehicles exiting the proposed WwTP will be utilising the proposed exit only junction on Clonshaugh Road (Junction A). The vehicles will travel through Clonshaugh Road roundabout (Junction 1) and onto the R139 Road/Clonshaugh Road roundabout (Junction 2), turn right onto the R139 Road to Junction 3 on the M50 Motorway/Junction 1 on the M1 Motorway.

The proposed Abbotstown pumping station will be accessed through the R843 Snugborough Road/NAC signalised junction (Junction 11). The traffic impact during operation of the proposed Abbotstown pumping station will not be assessed, as only two staff members are expected to travel to the proposed Abbotstown pumping station each day, causing a negligible impact.

The Operational Phase generated traffic flows through the assessed junctions are shown in Appendix A13.2 in Volume 3 Part B of this EIAR.

### 13.7.3 Seasonal Adjustment

As per Section 13.5.3, no seasonal adjustment is required for the traffic flows. See Appendix A13.2 in Volume 3 Part B of this EIAR for the AM and PM peak hour flows.

### 13.7.4 Traffic Growth

The background traffic growth factors used in the analysis have been established from the TII's *Project Appraisal Guidelines* (PE-PAG-02017) (TII 2016). It was considered appropriate to use the High Growth scenario for the Dublin Region in the analysis.

The applicable growth rates from these Guidelines for the Operational Phase are:

- 1.142 growth factor from 2016 to 2025 (expected year of opening) for LV;
- 1.240 growth factor from 2016 to 2025 (expected year of opening) for HV;
- 1.230 growth factor from 2016 to 2030 (five years beyond year of opening) for LV;
- 1.398 growth factor from 2016 to 2030 (five years beyond year of opening) for HV;
- 1.298 growth factor from 2016 to 2040 (15 years beyond year of opening) for LV; and
- 1.696 growth factor from 2016 to 2040 (15 years beyond year of opening) for HV.

The baseline scenario, plus generated traffic for all of the above years of construction and operation for the AM and PM peak hours are shown in Appendix A13.2 in Volume 3 Part B of this EIAR.

### 13.7.5 Operational Phase Assessment

The impacted junctions have been analysed using the TRL computer program JUNCTION 9. This software has been used to analyse the two existing junctions mentioned in Section 13.3.2 and the two proposed junctions at the proposed WwTP.

The performance of the junctions has been analysed for the critical AM and PM peak hours for the baseline year of 2016. The assessment for the Operational Phase was also carried out in accordance with the *Traffic and Transport Assessment Guidelines* (NRA 2014) for the expected year of opening, 2025; five years after year of opening, 2030; and the design year 2040, 15 years beyond the year of opening.

Assessment Years

The assessment years are in accordance to the *Traffic and Transport Guidelines* and are the expected year of opening, 2025; five years after year of opening, 2030; and the design year 2040, 15 years beyond the year of opening.

**13.8 Impact of the Proposed Project – Operational Phase**

A summary of the results for the existing roundabout between Clonshaugh Road and the Clayton Hotel Access (Junction 1) for the AM peak (08:15 to 09:15) and PM peak (16:15 to 17:15) hours during the Operational Phase is provided below in Table 13.17. The complete set of outputs is included in Appendix A13.5 in Volume 3 Part B of this EIAR.

**Table 13.17: JUNCTION 9 Results for Junction 1, Clonshaugh Road – Hotel Access Roundabout During the Operational Phase**

Junction 1: Clonshaugh Road – Hotel Access Roundabout									
Year & Time	Arm A – Topaz Service Station		Arm B – Clonshaugh Road (N)		Arm C – Clonshaugh Road (S)		Arm D – Hotel Access		Max Delay (s)
	RFC Value	Max Queue Length (PCU)	RFC Value	Max Queue Length (PCU)	RFC Value	Max Queue Length (PCU)	RFC Value	Max Queue Length (PCU)	
Existing AM	0.152	1	0.301	1	0.170	1	0.052	1	4.263
Existing PM	0.163	1	0.238	1	0.232	1	0.046	1	4.641
2025 AM No Dev	0.167	1	0.346	1	0.195	1	0.061	1	4.447
2025 PM No Dev	0.192	1	0.275	1	0.265	1	0.055	1	4.857
2025 AM With Dev	0.177	1	0.355	1	0.195	1	0.061	1	4.493
2025 PM With Dev	0.192	1	0.299	1	0.265	1	0.055	1	4.857
2030 AM No Dev	0.194	1	0.376	1	0.212	1	0.068	1	4.677
2030 PM No Dev	0.211	1	0.298	1	0.287	1	0.060	1	5.099
2030 AM With Dev	0.194	1	0.385	1	0.212	1	0.068	1	4.681
2030 PM With Dev	0.211	1	0.324	1	0.287	1	0.060	1	5.099
2040 AM No Dev	0.211	1	0.402	1	0.228	1	0.073	1	4.898
2040 PM No Dev	0.229	1	0.317	1	0.304	1	0.064	1	5.352
2040 AM With Dev	0.211	1	0.410	1	0.228	1	0.073	1	4.898
2040 PM With Dev	0.229	1	0.343	1	0.304	1	0.064	1	5.352

The summary of performance analysis shown in Table 13.17 indicates that Junction 1 will be operating with queues of only 1 PCU and a max delay of just over 5 seconds during the peak hours in 2040, 15 years after completion of the Proposed Project. It is estimated Junction 1 will operate within capacity with and without development.

A summary of the results for the existing roundabout between Clonshaugh Road and the R139 Road (Junction 2) for the AM peak (07:45 to 08:45) and PM peak (16:15 to 17:15) hours during the Operational Phase is provided below in Table 13.18. The complete set of outputs is included in Appendix A13.5 in Volume 3 Part B of this EIAR.



**Table 13.18: JUNCTION 9 Results for Junction 2, R139 Road – Clonshaugh Road Roundabout During the Operational Phase**

Junction 2: R139 Road – Clonshaugh Road Roundabout									
Year & Time	Arm A – Clonshaugh Road		Arm B – R139 Road (E)		Arm C – Gated Access Road		Arm D – R139 Road (W)		Max Delay (s)
	RFC Value	Max Queue Length (PCU)	RFC Value	Max Queue Length (PCU)	RFC Value	Max Queue Length (PCU)	RFC Value	Max Queue Length (PCU)	
Existing AM	0.514	2	1.150	169	0.000	0	0.983	27	230.358
Existing PM	0.425	1	1.242	283	0.000	0	1.005	39	478.863
2025 AM No Dev	0.733	3	1.337	397	0.000	0	1.128	172	546.962
2025 PM No Dev	0.495	1	1.439	558	0.000	0	1.151	196	766.287
2025 AM With Dev	0.628	2	1.341	401	0.000	0	1.138	185	554.550
2025 PM With Dev	0.531	2	1.442	574	0.000	0	1.157	204	794.499
2030 AM No Dev	0.666	3	1.455	795	0.000	0	1.218	295	334.647
2030 PM No Dev	0.540	2	1.564	759	0.000	0	1.242	321	1,058.922
2030 AM With Dev	0.678	3	1.459	572	0.000	0	1.228	313	804.831
2030 PM With Dev	0.571	2	1.579	774	0.000	0	1.248	330	1,091.054
2040 AM No Dev	0.713	3	1.565	736	0.000	0	1.298	422	1,049.018
2040 PM No Dev	0.575	2	1.674	945	0.000	0	1.319	526	1,351.054
2040 AM With Dev	0.725	3	1.570	741	0.000	0	1.308	438	1,060.090
2040 PM With Dev	0.611	2	1.691	962	0.000	0	1.324	454	1,390.16

The summary of performance analysis shown in Table 13.18 indicates that Junction 2 is currently over capacity on Arms B and D, which is the R139 Road east and west. There are no delays on Arm C as this is a private gated access with minimal flow. The maximum increase in RFC is expected to be 0.017 on Arm B in the PM peak in 2040. This equates to an additional 40 seconds delay onto the existing delay of 22 minutes and 30 seconds delay without the Proposed Project in 2040.

A summary of the results for the proposed ‘exit only’ junction on Clonshaugh Road (Junction A) for the AM peak (08:00 to 09:00) and PM peak (16:00 to 17:00) hours, during the Operational Phase is provided below in Table 13.19. The complete set of outputs is included in Appendix A13.5 in Volume 3 Part B of this EIAR.

**Table 13.19: JUNCTION 9 Results for Proposed Junction A, Clonshaugh Road – Proposed WwTP Priority Junction During the Operational Phase**

Proposed Junction A (Exit Only): Clonshaugh Road – Proposed WwTP Priority Junction							
Year & Time	Arm A – Clonshaugh Road (N)		Arm B – Proposed WwTP Exit		Arm C – Clonshaugh Road (S)		Max Delay (s)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
Existing AM	-	-	0	0	0	0	0
Existing PM	-	-	0	0	0	0	0
2025 AM No Dev	-	-	0	0	0	0	0
2025 PM No Dev	-	-	0	0	0	0	0
2025 AM With Dev	-	-	0	0	0	0	0
2025 PM With Dev	-	-	0	0	0	0	0
2030 AM No Dev	-	-	0	0	0	0	0
2030 PM No Dev	-	-	0	0	0	0	0
2030 AM With Dev	-	-	0	0	0	0	0
2030 PM With Dev	-	-	0	0	0	0	0
2040 AM No Dev	-	-	0	0	0	0	0
2040 PM No Dev	-	-	0	0	0	0	0
2040 AM With Dev	-	-	0	0	0	0	0
2040 PM With Dev	-	-	0	0	0	0	0

The summary of performance analysis shown in Table 13.19 indicates that the proposed Junction A will operate without any queues or delays during the peak hours in 2040. This is an exit only junction from the proposed WwTP, and owing to very low traffic exiting during peak hours, there are no delays as the vehicles will wait for gaps in the traffic.

A summary of the results for the proposed ‘entry only’ on the R139 Road (Junction B) for the AM peak (08:00 to 09:00) and PM peak (17:00 to 18:00) hours during the Operational Phase is provided below in Table 13.20.

**Table 13.20: JUNCTION 9 Results for Proposed Junction B, R139 Road – Proposed WwTP Priority Junction During the Operational Phase**

Proposed Junction B (Entry Only): R139 Road – Proposed WwTP Priority Junction							
Year & Time	Arm A – R139 Road (W)		Arm B – Proposed WwTP Entry		Arm C – R139 Road (E)		Max Delay (s)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
Existing AM	-	-	0	0	0	0	0
Existing PM	-	-	0	0	0	0	0
2025 AM No Dev	-	-	0	0	0	0	0
2025 PM No Dev	-	-	0	0	0	0	0
2025 AM With Dev	-	-	0	0	0	0	0
2025 PM With Dev	-	-	0	0	0	0	0
2030 AM No Dev	-	-	0	0	0	0	0
2030 PM No Dev	-	-	0	0	0	0	0
2030 AM With Dev	-	-	0	0	0	0	0
2030 PM With Dev	-	-	0	0	0	0	0
2040 AM No Dev	-	-	0	0	0	0	0
2040 PM No Dev	-	-	0	0	0	0	0
2040 AM With Dev	-	-	0	0	0	0	0
2040 PM With Dev	-	-	0	0	0	0	0

The summary of performance analysis shown in Table 13.20 indicates that the proposed Junction B will operate without any queues or delays during the peak hours in 2040. This is an ‘entry only’ junction towards the proposed WwTP from the R139 Road, and as a result, vehicles are only allowed to turn left in from the R139 Road (right-turn in from the R139 Road will be banned). This arrangement is expected to reduce any delays as reflected in the modelling analysis.

**13.8.1 Conclusion**

- The existing Clonshaugh Road/Commercial Access Roundabout (Junction 1) is expected to operate below capacity during the Operational Phase;
- The existing R139 Road/Clonshaugh Road Roundabout (Junction 2) is currently operating over capacity and expected to remain so in the design year of 2040, with a maximum increase of 0.017 in RFC expected during the Operational Phase;
- The proposed Clonshaugh Road exit only (Junction A) is expected to operate below capacity during the Operational Phase; and
- The proposed R139 Road entrance only (Junction B) is expected to operate below capacity during the Operational Phase.

**13.9 Do Nothing Scenario**

The analysis provided in Section 13.5 and Section presents the impact of the Proposed Project on each junction analysed. It reflects on the capacity of the junctions, with and without any development, for the complete design

horizon. It is observed that Junctions 2, 5, 10 and 11 are currently operating over capacity. As traffic grows, these junctions will experience further capacity issues, with or without the development of the Proposed Project.

All existing junctions that are operating within capacity at present are expected to continue to operate within capacity during both the Construction Phase and Operational Phase of the Proposed Project. The maximum impact is expected during the Construction Phase. However, these impacts will be temporary. During the Operational Phase, an additional 35 vehicles are expected to be added to the flow on the R139 Road in the PM peak. This traffic will pass through Junction 2 (Clonshaugh Roundabout), which is over capacity. The delays experienced at this junction during the peak hour are expected to be increased by 40 seconds as a result of the Proposed Project.

### 13.10 Assessment of the Significance of Traffic Impacts

The *Traffic and Transportation Assessment Guidelines 2014* (TII 2014), Table 2.1 Traffic Management Guidelines Thresholds for Transport Assessments outlines the thresholds under which the preparation of a Traffic and Transportation Assessment is recommended. These include where:

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

The Guidelines do not outline the thresholds under which the significance and quality of traffic impacts can be measured.

In order to determine and apply thresholds for the significance and quality of traffic impacts, it is necessary to revert to the requirements of the draft Environmental Protection Agency (EPA) *Guidelines on Information to be Contained in Environmental Impact Assessment Reports* (EPA 2017), in conjunction with the UK Institute of Environmental Management and Assessment's (IEMA's) *Guidelines for the Environmental Assessment of Road Traffic* (IEMA 1993). The requirements of the draft EPA Guidelines and the IEMA Guidelines are shown in Table 13.21.

**Table 13.21: Application of EPA Draft Guidelines Significance Criteria to IEMA Significance Criteria for Traffic Volume Increases**

Draft EPA Guidelines Significance Criteria	IEMA Assessment Guidelines Significance Criteria	Increase in Traffic Flow
Profound Effect	Major	Above 100%
Very Significant Effect		Between 90% and 100%
Significant Effect	Moderate	Between 60% and 90%
Moderate Effect	Minor	Between 30% and 60%
Slight Effect	Negligible	Between 10% and 30%
Not Significant Effect		Between 5% and 10%
Imperceptible		Less than 5%

#### 13.10.1 Construction Phase

The analysis outlined in Section 13.7 has been reviewed in accordance with the EPA Significance Criteria as shown in Table 13.22.

**Table 13.22: Significance of Construction Traffic**

Junction	Maximum Increase in Temporary Traffic Flow	Quality and Significance	Probability of Effects	Duration and Frequency
1	Maximum temporary increase in RFC in 2024 is in the PM peak at 21%	Slight Negative Effect	Likely to increase delay and journey times.	Short-term as Peak Operations are for one year
2	Maximum temporary increase in RFC in 2024 is in the PM peak at 15%	Slight Negative Effect	Likely to increase delay and journey times.	Short-term as Peak Operations are for one year
5	Maximum temporary increase in DOS in 2024 is in the PM peak at 9%	Not Significant Negative Effect	Likely to increase delay and journey times.	Short-term as Peak Operations are for one year
8	Maximum temporary increase in RFC in 2024 is in the AM peak at 20%	Slight Negative Effect	Likely to increase delay and journey times.	Short-term as Peak Operations are for one year
9	Maximum temporary increase in RFC in 2024 is in the PM peak at 28%	Not Significant Negative Effect	Likely to increase delay and journey times.	Short-term as Peak Operations are for one year
10	Maximum temporary increase in RFC in 2024 is in the PM peak at 1%	Imperceptible Neutral Effect		Short-term as Peak Operations are for one year
11	Maximum temporary increase in DOS in 2024 is in the AM peak at 11%	Slight Negative Effect	Likely to increase delay and journey times beyond normal traffic growth and patterns.	Short-term as Peak Operations are for one year
12	No increase in capacity.	Imperceptible Neutral Effect		Short-term as Peak Operations are for one year
A	Maximum temporary increase in 2024 is in the PM peak at 6%	Not Significant Negative Effect	Likely to increase delay and journey times.	Short-term as Peak Operations are for one year
B	No increase in capacity as entry only.	Imperceptible Neutral Effect		Short-term as Peak Operations are for one year

**13.10.2 Operational Phase**

The analysis outlined in Section 13.7 has been reviewed and reviewed in accordance with the EPA Significance Criteria as shown in Table 13.23.

**Table 13.23: Significance of Operation Traffic**

Junction	Maximum Increase in Traffic Flow	Quality and Significance	Probability of Effects	Duration and Frequency
1	Maximum increase in RFC in 2040 is in the PM peak at 9%	Not Significant Negative Effect	Likely to increase delay and journey times.	Long-term
2	Maximum increase in RFC in 2040 is in the PM peak at 1%	Imperceptible Neutral Effect		Long-term
A	No increase in capacity as exit only.	Imperceptible Neutral Effect		Long-term
B	No increase in capacity as entry only.	Imperceptible Neutral Effect		Long-term

## 13.11 Mitigation Measures

### 13.11.1 Construction Phase Mitigation Measures

An Outline Construction Traffic Management Plan has been prepared for the Proposed Project and includes the following mitigation measures:

- A detailed construction programme shall be developed that gives consideration to traffic flows and aims to avoid coincidentally high volumes of traffic using the same roads where possible;
- Deliveries to site will be scheduled outside of the peak traffic hours;
- In the vicinity of school locations, restrictions on construction activities during the drop off and peak collection times shall be implemented in order to minimise disruption;
- A wheel wash will be installed and utilised by vehicles at the entrance to the proposed WwTP site;
- Roads used by construction traffic will be monitored visually for loose material and a road sweeper will be used to remove debris from construction routes when required;
- Materials leaving site will be assessed and covered where necessary to reduce dust impacts;
- The local communities and relevant stakeholders (such as An Garda Síochána) will be informed of construction activities and the scheduling of construction works in their area by leaflet drop by the appointed contractor(s). This is particularly relevant for the construction of the proposed pipeline routes. Cognisance will be taken of any feedback with regard to conflicts with local events and construction activities will be scheduled to minimise such conflicts where possible;
- Construction site entrances will be signposted appropriately in accordance with Chapter 8 of the *Traffic Signs Manual* (Department of Transport 2010). All entrances will be designed and managed such that HGVs do not queue on the public road network; and
- It shall be noted that the Outline Construction Traffic Management Plan will be required to be further developed by the appointed contractor(s) following appointment and prior to commencement of construction.

### 13.11.2 Operational Phase Mitigation Measures

The following mitigation measures will be implemented to minimise the impacts of the Proposed Project:

- Sufficient car parking spaces will be provided within the development to ensure that parking associated with the proposed WwTP does not occur along the public road network;
- Sufficient space will be provided along the proposed access road to accommodate three HGVs in advance of any proposed barrier (installed to restrict access into the proposed WwTP site) to prevent queuing on the public road network;
- Stop markings and signage in accordance with the *Traffic Signs Manual* will be provided at the exits from the proposed WwTP and proposed Abbotstown pumping station sites;
- Pedestrian and cycling facilities will be provided within the proposed WwTP. Pedestrian and cycling routes will tie into existing facilities on the public road network where possible;
- Measures encouraging the use of sustainable modes of transport to access the proposed WwTP will be implemented where possible. Such measures may include:
  - tax saver commuter tickets;
  - car sharing options; and

- the scheduling of shifts such that start and end times do not coincide with peak traffic flows on the network;
- Appropriate visibility splays will be provided at entrances to the proposed WwTP site and proposed Abbotstown pumping station; and
- A Stage 2 Road Safety Audit will be carried out at the detail design stage.

### 13.11.3 Other Road Issues

#### Road Safety

As discussed, an entrance to the proposed WwTP is proposed from the R139 Road (Previously, the N32 National Road). This junction will operate as a left-turn entry-only priority junction to minimise conflicts caused by traffic attempting to turn right across the R139 Road. It is recommended that this junction be omitted should the remainder of the Malahide Road Realignment Scheme be constructed. The proposed exit will be an exit-only priority junction onto Clonshaugh Road. It is recommended that visibility splays of 120m from a set-back of 3m are provided in accordance with the TII's *Geometric Design of Junctions* (DN-GEO-03060) (TII 2017).

A review of the road collision data available on the RSA Database, within the period 2005 to 2014, recorded two minor collisions near the proposed WwTP egress onto Clonshaugh Road and three minor collisions near the proposed WwTP access.

Minor Collision 2005 was a rear-end collision, and Minor Collision 2012 was a single vehicle only collision.

Three collisions near the proposed WwTP access were recorded on the R139 Road:

- Minor Collision 2013 involved a rear-end collision between two cars;
- Minor Collision 2008 involved a single vehicle only collision; and
- Minor Collision 2005 involved a collision between a car and a pedestrian.

A Road Safety Audit was prepared for the proposed new entrance and the internal road layout for the proposed WwTP as shown in Appendix A13.6 in Volume 3 Part B of this EIAR. This audit was undertaken by Road Safety Matters in November/December 2014. The main points that arose, and how these have been incorporated into the design, are summarised below:

- Drainage of the proposed WwTP will be fully designed at detailed design stage by the appointed contractor(s) with the responsibility for Design under the Design Build or Design Build Operate Contract;
- The proposed access junction to the proposed WwTP has been redesigned with a compound curve on the western edge of the access road to provide additional margins of safety for large articulated vehicles to safely turn. Refer to Figure 13.3 Proposed Left-Turn Site Access Junction on R139 Road and Figure 13.4 Proposed Left-Turn Site Exit on Clonshaugh Road. Anti-skid surfacing will be provided at both junctions and to be developed at detailed design stage by the appointed contractor(s). Detailed design development will include liaison with FCC with regards to the future operation of the bus lane along the R139 Road. Following these discussions, the detailed design of this junction will take account of FCCs plans for public transport in the area. It is further proposed that a Stage 2 Road Safety Audit will be undertaken of the junctions on completion of the detailed design;
- Boundary treatments and landscaping will be developed at detailed design to ensure that the required visibility splays are maintained;
- Gates will be provided at both the proposed access and egress junctions in order to restrict unauthorised access to the proposed WwTP. The location of the gates at the proposed access will be located to ensure

that vehicles waiting to access the proposed WwTP will not impact on the through movements along the R139 Road. Details of these gates will be developed at detailed design stage, with proposals to be included within the scope of the Stage 2 Road Safety Audit;

- Access to Craobh Chiaráin Gaelic Athletic Association Club will be maintained. Details will be developed at detailed design stage, with proposals to be included within the scope of the Stage 2 Road Safety Audit;
- Provisions for Vulnerable Road Users shall be developed at detailed design stage;
- Lighting provision for the proposed WwTP and Abbotstown pumping station will be developed at detailed design stage and will be subject to the Stage 2 Road Safety Audit; and
- A full review of existing signs and markings will be undertaken at detailed design stage. Additional signage and road markings will be provided at detailed design stage and will be included in the scope of the Stage 2 Road Safety Audit.

### Unplanned Events

In order to address unforeseen events, the following incidents have been considered:

- Incident along the proposed haul routes;
- Incident at the proposed access and egress to the proposed WwTP or the proposed Abbotstown pumping station; and
- Incident within the proposed WwTP.

The unplanned events that potentially could occur include road collisions, flooding and/or an oil spillage along a haul route. In such an event, competent personnel such as the LA, An Garda Síochána and other emergency services would be involved, setting up designated diversion routes to mitigate the unplanned event.

#### *Incident along Proposed Haul Routes*

In the event of an incident occurring along any of the haul routes, the emergency diversion routes provided by An Garda Síochána will be utilised. As shown in Figure 13.1 Traffic Assessment Locations, the haul routes provide alternative options for the vehicles travelling to/from the proposed WwTP and proposed Abbotstown pumping station.

#### *Incident at the Proposed Access and Egress into the Proposed Wastewater Treatment Plant or Abbotstown Pumping Station*

An incident at the proposed access or egress at the proposed WwTP or Abbotstown pumping station is similar to the occurrence of an incident along the haul routes. An Garda Síochána emergency diversion routes will be utilised and the facility operators will also contact the HGV drivers to inform them of the significance of the incident and the necessary protocol.

#### *Incident within the Proposed Wastewater Treatment Plant or Abbotstown Pumping Station*

Where an incident occurs within the proposed WwTP or Abbotstown pumping station, existing emergency protocols in place at both facilities will be enacted and on-site personnel will respond in accordance with these protocols.

In order to estimate the likelihood of the above mentioned incidents, a Preliminary Health and Safety Risk Assessment is required.



The following hazards have been determined which are included in the Preliminary Health and Safety Risk Assessment in Table 13.24:

**Table 13.24: Unplanned Events – Outline Risk Assessment**

Outline Risk Assessment			
Hazards and Risks	Personnel at Risk from the Significant Hazards	Risk Control	Responsible Persons
Road Collision	Public Drivers of vehicles travelling to/from facility Vulnerable Road Users (pedestrians and cyclist)	Maintain hedgerow to maintain optimum visibility Maintain road signage and add signage where necessary Maintain road surfacing and improve where necessary Maintain lighting along road and improve where necessary	LA and landowners
Road flooding	Public Drivers of vehicles travelling to/from facility Vulnerable Road Users (pedestrians and cyclist)	Maintain road drainage and improve where necessary	LA
Snow/frost on road	Public Drivers of vehicles travelling to/from facility Vulnerable Road Users (pedestrians and cyclist)	Maintain a stock of salt and chips and apply prior to snow/frost fall Apply temporary signage where needed to notify public of risk and/or road closures	LA
Injury within the site, e.g. slip/trip or fall	Employees of the facility Drivers of HGVs from external facilities	Adequate training provided to personnel Walkways to be maintained and kept clear	Irish Water
Collision within the site, e.g. vehicle or personnel struck by vehicle)	Employees of the facility Drivers of HGVs from external facilities	Personnel use internal walkways Personnel wear high-vis Supervision of HGVs to enforce safe procedures	Irish Water

[Fear, Intimidation and Pedestrian Amenity](#)

In order to assess fear and intimidation in regard to additional traffic from the Proposed Project, a review of the existing Vulnerable Road User’s amenities was carried out.

Footpaths are present along the R139 Road and cycle lanes are provided in places. Limited footpaths and cycle lanes are present along Clonsaugh Road; however, these are discontinuous and not present at the proposed exit from the proposed WwTP.

FCC aim to promote sustainable transport through the implementation of the Irish Government’s *Smarter Travel Policy. A New Transport Policy for Ireland 2009-2020* (Irish Government 2009). Due to its location on the fringe of

Dublin City and near Swords, it is possible that staff could access the proposed WwTP by public transport or by walking and cycling. A footway will be installed along the proposed access road, frontage to the site and internal roads within the proposed WwTP to facilitate Vulnerable Road Users. Therefore, fear and intimidation are considered Not Significant for the Proposed Project.

Severance

The *Guidelines for the Environmental Assessment of Road Traffic* (IEMA 1993) state that the measurement and prediction of severance is extremely difficult. Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery. The correlation between the extent of severance and the physical barrier of a road is not clear, and there are no predictive formulae which give simple relationships between traffic factors and levels of severance. In general, marginal changes in traffic flow are, by themselves, unlikely to create or remove severance.

The Proposed Project does not propose any change to the existing road network which has the potential to result in severance. The additional traffic during the Construction Phase will be short-term and mitigation measures outlined in Section 13.11 will ensure that any impacts are kept at a minimum. The Operational Phase traffic of the proposed WwTP will be distributed between the proposed access and egress and, therefore, will minimise the additional vehicles on the surrounding road network. As such, the severance is considered Imperceptible without significance consequences.

Parking Provision

The *Fingal Development Plan 2017-2023* (FCC 2017) lists standard provisions for car and bicycle parking. However, the requirements for a proposed WwTP are not listed. Therefore, the provision for light industry and industry were considered and are shown in Table 13.25 and Table 13.26, respectively.

**Table 13.25: Fingal Bicycle Parking Requirements**

Bicycle Parking Requirements			
Item	Requirements	Quantity	Spaces
Light industry, business and technology	1 space per 80m <sup>2</sup> Gross Floor Area (GFA)	16,047m <sup>2</sup>	201

**Table 13.26: Fingal Car Parking Requirements**

Car Parking Requirements			
Item	Requirements	Quantity	Spaces
Industry	1 space per 40m <sup>2</sup> GFA	16,047m <sup>2</sup>	402

The *Fingal Development Plan 2017-2023* (FCC 2017) states that ‘in the case of any use not specified above, the Planning Authority will determine the parking requirements on first principles’. Therefore, the car parking spaces required were assessed on the number of staff and movements in and out of the proposed WwTP site.

The proposed WwTP workforce will comprise a maximum of 40 persons (including external subcontractors, etc.) and the workforce will operate in three shifts. As such, the level of car parking required by the development plan is in excess of the needs of the proposed WwTP. The number of spaces provided has been determined in order to

accommodate the maximum number of staff that will be present on the proposed WwTP site at any one time (i.e. two shifts, to allow for crossover) and visitors to the facility. 66 car parking spaces will be provided. Covered cycle parking will also be provided to allow for a minimum of 10 bicycles.

### Public Transport

In terms of public transport options for the staff at the proposed WwTP, there are no bus stops along the Clonsaugh Road or the section of the R139 Road near the proposed entrance. There are a number of public bus services that run along the R107 Malahide Road. The bus route services closest to the proposed WwTP are 15, 27, 27X, 42 and 43. The bus stop closest to the proposed WwTP is approximately 2km from the proposed entrance on the R139 Road and 4km from the exit on the Clonsaugh Road. The 4km distance to the Clonsaugh Road, combined with a bus journey, would likely prove impractical for most people. The number of staff will not be sufficient to provide a feeder bus service to the proposed WwTP, as there would only be 25 staff at most during any one shift.

## **13.12 Residual Impacts**

The mitigation measures outlined in Section 13.11 will minimise any residual impacts. As construction traffic will be temporary in nature, traffic volumes will return to their existing condition, plus any increase in traffic associated with normal traffic growths and changes in traffic pattern that occur on road networks. The preparation of a Construction Traffic Management Plan will minimise traffic impacts during the Construction Phase and enforce the use of motorway, national and regional routes, which are established HGV routes in the City and County.

Operational traffic associated with routine maintenance of the proposed pipeline routes, and the operations of the proposed Abbotstown pumping station, will add to the background traffic. However, the volumes of traffic associated with maintenance will be small and of short duration.

Operational traffic associated with the proposed WwTP was assessed for four junctions (1, 2, A and B). Junctions 1, A and B are expected to operate within capacity in the design years. Junction 2 is currently over capacity in the base year. The increase in traffic flow associated with the operation of the proposed WwTP represents a 1% increase in the overall traffic flow through Junction 2.

### **13.12.1 Conclusion**

- The existing Clonsaugh Road/Commercial Access Roundabout (Junction 1) will operate below capacity during the Construction Phase and Operational Phase;
- The existing R139 Road/Clonsaugh Road Roundabout (Junction 2) is currently operating over capacity, and this will remain the case in the design year of 2040 with a maximum increase of 0.017 in RFC during the Operational Phase. During phase 5 of construction, the temporary maximum increase of RFC is expected to be 0.088;
- The proposed Clonsaugh Road exit only (Junction A) will operate below capacity during the Construction Phase and Operational Phase;
- The proposed R139 Road entrance only (Junction B) will operate below capacity during the Construction Phase and Operational Phase;
- The existing R139 Road/R107 Malahide Road (Junction 5) is currently operating over capacity, and this will remain the case during the construction of the Proposed Project;

- The existing R123 Moyne Road/R106 Coast Road (Junction 8) will operate over capacity in 2024 with no construction traffic, and will remain over capacity in the design year of 2040. During phase 5 of construction, the temporary maximum increase of RFC is expected to be 0.035;
- The existing R106 Coast Road/Golf Links Road (Junction 9) will operate below capacity during the construction of the Proposed Project;
- The existing R106 Coast Road/Station Road mini-roundabout (Junction 10) is currently operating over capacity, and this will remain over capacity in the design year of 2040. During phase 5 of construction, the temporary maximum increase of RFC is expected to be 0.001;
- The existing R843 Snugborough Road/NAC (Junction 11) is currently operating over capacity and will remain so with or without the Proposed Project. During phase 5 of construction, the temporary maximum increase of DOS is expected to be 0.007;
- The R843 Snugborough Road/Gateway (Junction 12) priority junction will operate below capacity during phase 5 of construction; and
- Sufficient parking will be provided to cater for the parking needs of staff and visitors of the Proposed Project.

### 13.13 Difficulties Encountered in Compiling Information

No difficulties were encountered when compiling information for this Chapter of this EIAR.

### 13.14 References

Department of Public Expenditure and Reform (2015). Building on Recovery: Infrastructure and Capital Investment 2016-2021.

Department of Transport (2010). Traffic Signs Manual [Online] Available from <http://trafficsigns.ie/current-tsm/> [Accessed April 2018]

Environmental Protection Agency (2017). Draft Guidelines on Information to be Contained in Environmental Impact Assessment Reports.

Fingal County Council (2017). Fingal Development Plan 2017-2023.

National Roads Authority (2014). Traffic and Transport Assessment Guidelines. Available from <http://www.tii.ie/tii-library/land-use-planning/Transport-Assessment-GuidelinesMay2014.pdf> [Accessed April 2018]

IEMA (1993). Guidelines for the Environmental Assessment of Road Traffic.

Irish Government (2009). Smarter Travel. A New Transport Policy for Ireland 2009-2020.

National Transport Authority (2016). Transport Strategy for the Greater Dublin Area 2016-2035.

Road Safety Authority (2018). Data. Available from <http://www.rsa.ie/>. [Accessed April 2018]

Transport Infrastructure Ireland (2016). Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (PE-PAG-02017). Available from <http://www.tiipublications.ie/library/PE-PAG-02017-01.pdf>. [Accessed April 2018]

Transport Infrastructure Ireland (2017). Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated and compact grade separated junctions) (DN-GEO-03060). Available from <http://www.tiipublications.ie/library/DN-GEO-03060-02.pdf>. [Accessed April 2018]

Transport Research Laboratory (1986). The prediction of saturation flows for single road junctions controlled by traffic signals.

#### Directives and Legislation

S.I. No. 14 of 1993. Roads Act.