15.0 TRAFFIC AND TRANSPORTATION

15.1 INTRODUCTION

The objective of this chapter is to assess the impact of the proposed power plant on the existing road network. This report will calculate the expected volume of traffic that will be generated by the proposed power plant and assesses the impact that this traffic will have on the operational capacity of the local road network. This chapter is summary of a more comprehensive Traffic and Transportation Assessment (TTA) which is included in Appendix 15.1.

15.2 METHODOLOGY

15.2.1 POLICY AND GUIDELINES CONTEXT

In preparing the TTA, the following reference tools were consulted:

- South Dublin County Development Plan 2016–2022;
- TII PE-PDV-02045 Traffic and Transport Assessment Guidelines (May 2014); and
- TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3: Travel Demand Projections (May 2019)

15.2.2 SCOPING CONSULTATION WITH SOUTH DUBLIN COUNTY COUNCIL

In order to ensure the scope of this assessment was to the satisfaction of South Dublin County Council, a scoping document was issued on the 23rd of February 2021 to South Dublin County Council Roads Department. This document outlined the proposed approach that the TTA would take and identified the junctions which would be included in the analysis.

15.2.3 JUNCTION ANALYSIS

The junctions to be analysed as part of this report are the following:

- Junction 1: The priority junction R134/Profile Park/Kilcarbery Park (Roundabout);
- Junction 2: Internal Roundabout Profile Park; and
- Junction 3: Site Access.

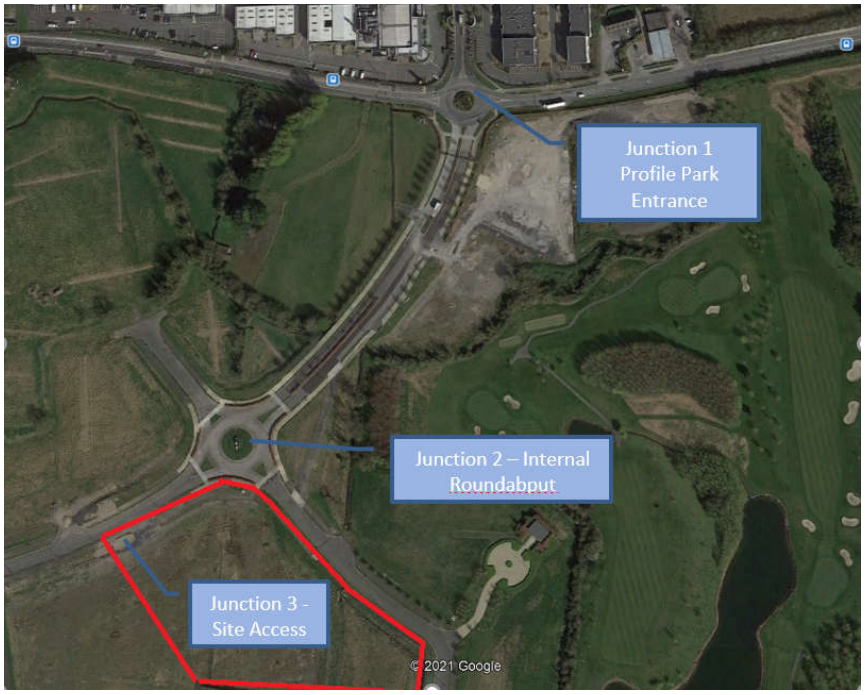

Figure 15-1: Junction Locations

The proposed site access T-junction (Junction 3), the internal Profile Park roundabout junction to the Northeast of the Proposed Site Access (Junction 2) and the R134 New Nangor Road / Kilcarbery Park / Profile Park Roundabout to the northeast of the proposed development (Junction 1) have been analysed using the Transport Research Laboratory (TRL) computer program JUNCTION 9 PICADY and ARCADY, widely accepted tools used for the analysis of priority junctions and roundabouts.

The key parameters examined in the results of the analysis are the Ratio of Flow to Capacity Value (RFC value – desirable value for PICADY and ARCADY should be no greater than 0.85 – values over 1.00 indicate the approach arm is over capacity), the maximum queue length on any approach to the junctions and the average delay for each vehicle passing through the junction during the modelled period.

PICADY and ARCADY requires the following input data:

- Basic modelling parameters (usually peak hour traffic counts synthesised over a 90-minute model period)
- Geometric parameters (including lane numbers & widths, visibility, storage provision etc)
- Traffic demand data (usually peak hour origin/destination table with composition of heavy goods vehicles input*)

For the purpose of the TTA, the varying vehicle types have been segregated into light vehicles (LV) and Heavy Vehicles (HV) prior to input. Traffic volumes input into PICADY and ARCADY were in vehicles and, accordingly, commercial vehicle composition was set to the percentage of that arm.

The performance of the junction has been analysed for the critical AM peak and PM peak hours. This analysis was carried out for the year of construction commencing coinciding with peak construction volumes, 2023 and for the completion of the Construction Phase 2025

The results of the PICADY and ARCADY analysis are presented in Section 15.5.

15.2.4 TRAFFIC SURVEY

In order to determine the magnitude of the existing traffic flows, the results of a manual classified junction turning count was carried out by Nationwide Data Collection on Tuesday 23rd March between the hours 07:00 and 19:00. As shown in Figure 15-2 the count information was obtained for the following junctions:

- Site 1: R134 New Nangor Road – Kilcarbery Park – Profile Park Roundabout
- Site 2: Profile Park Internal Roundabout

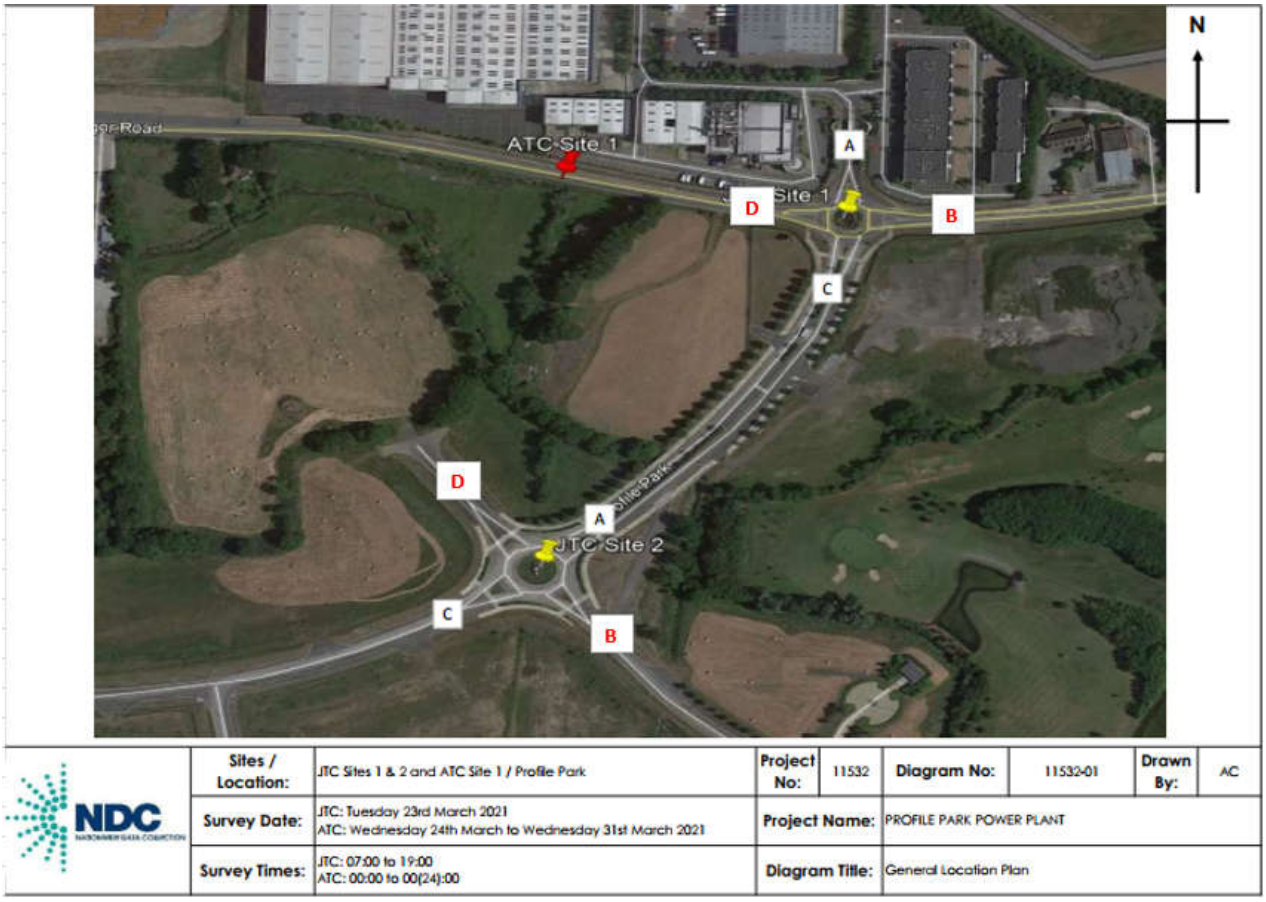

Figure 15-2: Traffic Count Locations

This survey distinguished between light good vehicles and heavy good vehicles. The results of this survey indicated that the peak traffic levels through these junctions occurred between the hours of 08:30 and 09:30, and between three various PM peaks (17:00 and 18:00).

Link-based growth rates (high sensitivity growth rates) were applied to the 2019 traffic flows to determine background traffic flows for the future assessment years.

In addition to the manual traffic counts, Nationwide Data Collection also carried out Automated Traffic Counts Eastbound and Westbound along the R134. In connection with historical traffic count data purchased from IDASO Ltd, TOBIN obtained this ATC data to generate COVID-19 adjusted traffic flows by establishing a base traffic flow and applying an adjustment factor accordingly.

15.3 BASELINE ENVIRONMENT

15.3.1 EXISTING ROAD NETWORK

The proposed power plant is located within Profile Park Business Park which is to be accessed from the R134 New Nangor Road. The access to Profile Park situated within an 60km/h default urban speed zone. The R134 New Nangor Road has a carriageway width of approximately 7.3m in the vicinity of the access to Profile Park. The R134 also provides a fully segregated two-way cycle facility on the EB side along 2.25m width footpath. Tactile paving crossing points and street lighting are present at the junction along with roadside bus stops.

15.3.2 PROPOSED NETWORK IMPROVEMENTS

Currently, there are no proposed improvements to the road network in the region.

15.3.3 PROPOSED SITE ACCESS JUNCTION

The existing site access from one of the main arteries within Profile Park will be used, this is a T-junction.

15.3.4 TRIP GENERATION AND DISTRIBUTION

15.3.4.1 COVID-19 Adjustment

In order to undertake an analysis of the key junctions in relation to this assessment in the current climate of COVID-19 and with travel restrictions in place, it was necessary to apply a correction factor. This correction factor is to take the traffic count data recorded onsite and adjust the traffic flows to take account of the significant reduction in traffic volumes currently being experienced. A comparison was undertaken between historical traffic count data along the R134 New Nangor Road from Jan 2018 (Pre-COVID-19) and the TII traffic count information for the day of the survey in March 2021. An analysis of both data sets was carried out and as was expected, the traffic count on the day of the survey was significantly lower than the traffic count data from January 2018.

An adjustment factor was applied to the traffic count data by applying high sensitivity TII growth rates to the 2018 data and comparing the expected 5 day AADT for 2021 against the Surveyed 5 day AADT.

15.3.4.2 Opening and Future Year Flows

The proposed power plant will be constructed in one phase with the development planned for opening in 2025. The operational power plant will have minimal daily staff (less than 10 vehicle movements per day typically once operational), this Traffic Assessment has focused on the

construction elements and the traffic volumes associated over the course of the construction period (2023-2025).

The opening year of Construction of 2023 was utilised for the purpose of the traffic assessment having been identified as a period of peak construction. In addition to the opening year, the close out and commissioning period of the construction works (2025) is being utilised for the traffic assessment to ensure that any impacts associated with the traffic element of the construction have adequately been assessed.

The link-based annual growth rates were updated in 2019 by the TII, with annual growth rates shown for each county. Those for Dublin are shown in Table 15-1.The derived growth factors were applied to 2021 traffic flows to determine background traffic flows for the assessment years. The assessment is split into light vehicles and heavy vehicles.

Table 15-1:Growth Factors for light vehicle (LV) and heavy vehicles (HV)

	2016-2030
LV	1.0211
HV	1.0348

15.3.5 TRIP GENERATION

The volume of traffic expected to be generated during the AM and PM peak hours for the construction phase of the proposed power plant were established from detailed information provided by Greener Ideas Limited. These figures include details of peak construction staff numbers and mass haul movements to identify peak times of construction activity.

15.4 ASSESSMENT OF SIGNIFICANT EFFECTS

15.4.1 TRIP GENERATION

Trip Rates for the various uses within the development have been determined for weekdays, Monday to Friday, to coincide with the maximum levels of existing traffic on the adjacent road network. The volume of traffic expected to be generated by the proposed construction phase of the development during the AM and PM peak hours are shown below in Table 15-2 and Table 15-3. This is expected to be consistent across the 20 month construction period.

Table 15-2: Expected Trip Generation for Proposed Development for AM Peak Hour

EXPECTED TRIP GENERATION FOR PROPOSED DEVELOPMENT (AM PEAK HOUR)		
	Arrivals	*Departures*
Personal Car Units (PCU's) and Light Goods Vehicles (LGV)	40	
Daily Delivery Heavy Goods Vehicles (HGVs)	5	5
Total	**45**	**5**

Table 15-3: Expected Trip Generation for Proposed Development for PM Peak Hour

EXPECTED TRIP GENERATION FOR PROPOSED DEVELOPMENT (AM PEAK HOUR)		
	Arrivals	*Departures*
Personal Car Units (PCU's) and Light Goods Vehicles (LGV)		40
Daily Delivery Heavy Goods Vehicles (HGVs)	5	5
Total	**5**	**45**

Significant volumes of material will be required to be imported as part of the mass haul element to the value of 8,000m^3 of material to the site over the initial month. For this period, this will increase the HGV Arrivals and Departures during the peak hours. This additional volume is identified In Tables 15-4 and 15-5 below.

Table 15-4: Expected Trip Generation for Proposed Development for AM Peak Hour (During 1st Month of Construction)

EXPECTED TRIP GENERATION FOR PROPOSED DEVELOPMENT (AM PEAK HOUR)		
	Arrivals	**Departures**
Personal Car Units (PCU's) and Light Goods Vehicles (LGV)	40	
Daily Delivery Heavy Goods Vehicles (HGVs)	7	7
Total	**47**	**7**

Table 15-5: Expected Trip Generation for Proposed Development for PM Peak Hour

EXPECTED TRIP GENERATION FOR PROPOSED DEVELOPMENT (AM PEAK HOUR)		
	Arrivals	**Departures**
Personal Car Units (PCU's) and Light Goods Vehicles (LGV)		40
Daily Delivery Heavy Goods Vehicles (HGVs)	7	7
Total	**7**	**47**

15.4.2 TRIP DISTRIBUTION OF PROPOSED POWER PLANT

It Is envisaged the proposed traffic distribution matches the existing traffic distribution at each of the junctions, with the exception of the site access, Junction 3. The passing traffic shall be utilised for the proposed traffic distribution at Junction 3 as the junction although constructed is not in use / occupied by a development generating traffic.

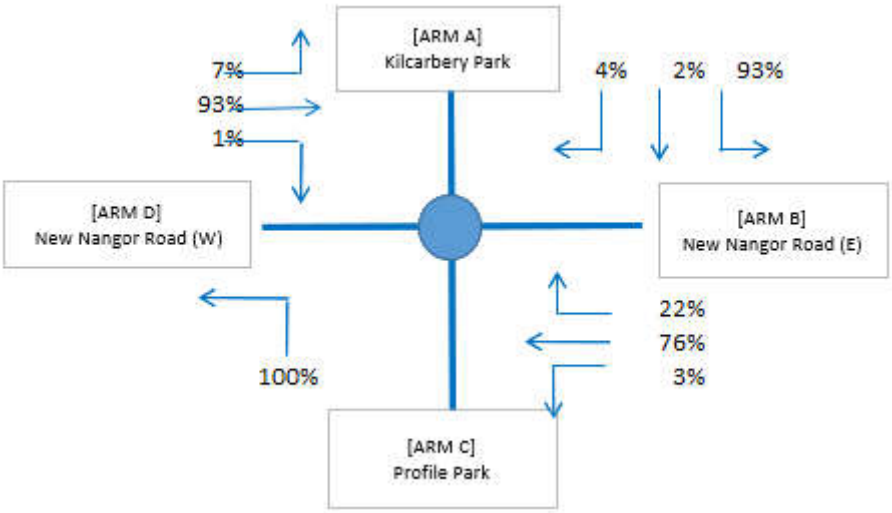

Figure 15-3: Traffic Distribution for AM Peak Hour at Junction 1

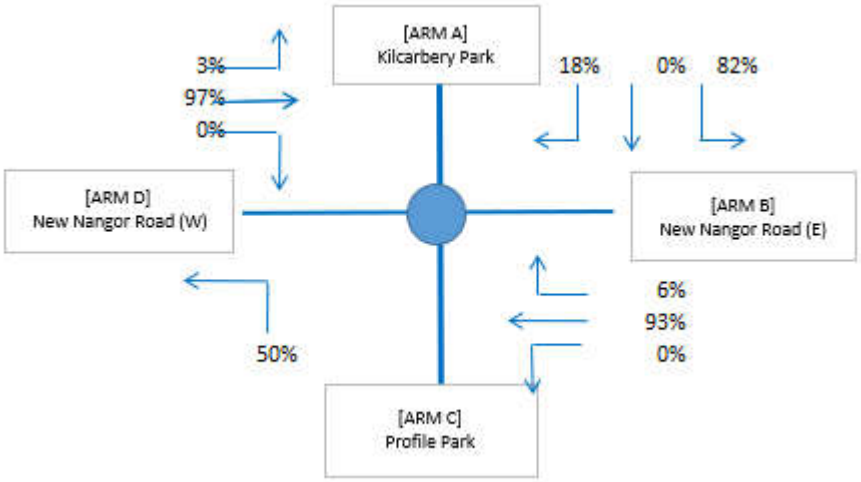

Figure 15-4: Traffic Distribution for PM Peak Hour at Junction 1

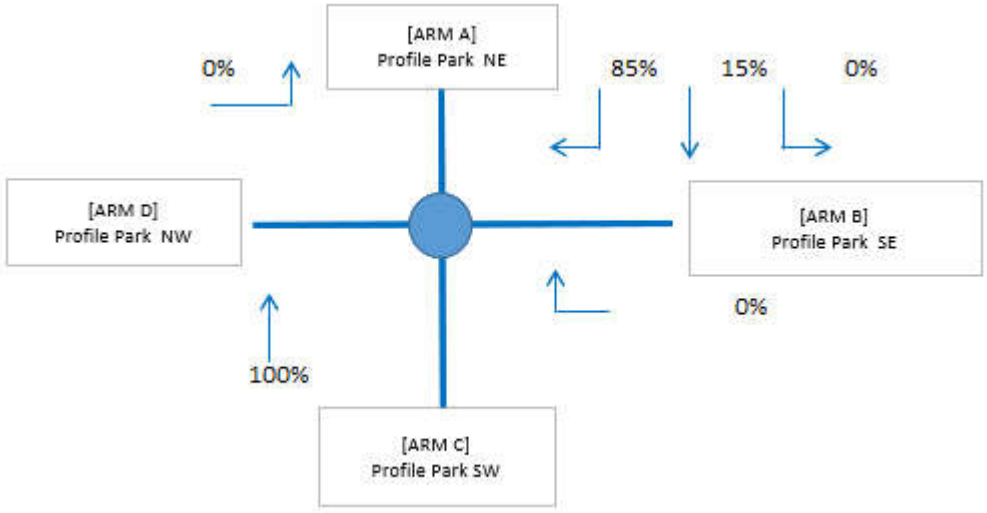

Figure 15-5: Traffic Distribution for AM Peak Hour at Junction 2

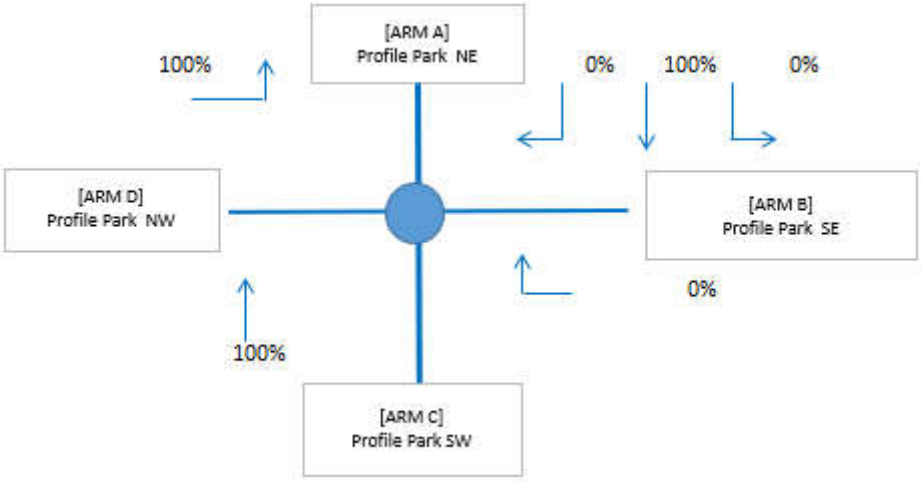

Figure 15-6: Traffic Distribution for PM Peak Hour at Junction 2

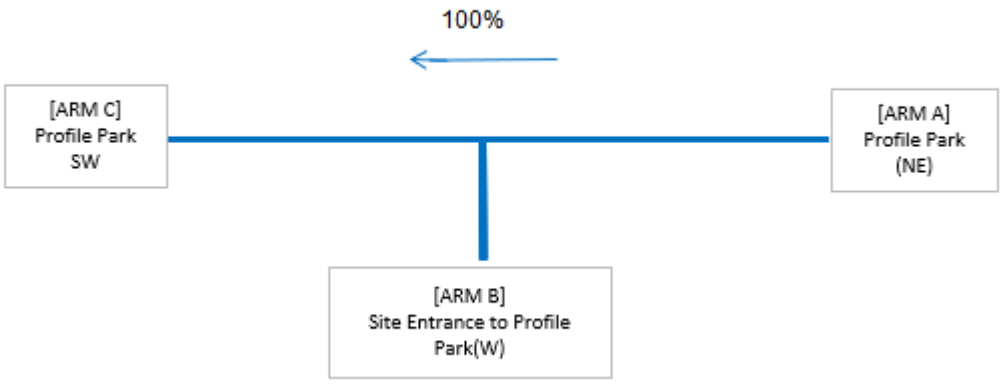

Figure 15-7: Traffic Distribution for AM Peak Hour at Junction 3 (Site Access)

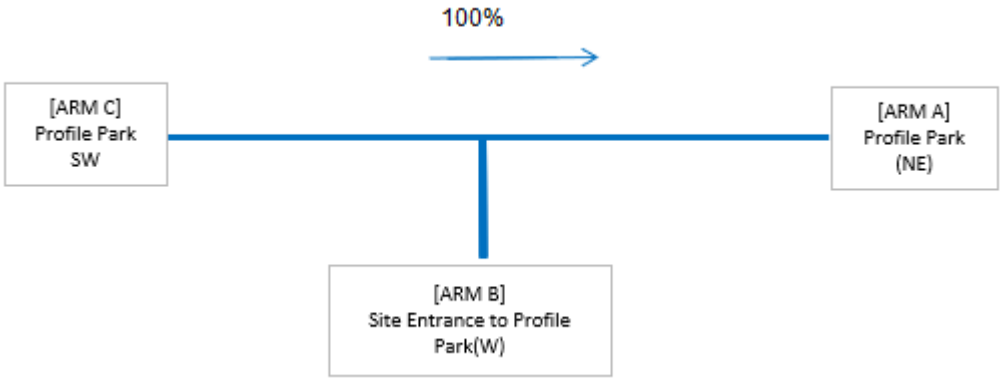

Figure 15-8: Traffic Distribution for PM Peak Hour at Junction 3 (Site Access)

15.4.3 TRIP DISTRIBUTION OF BASEFLOW PLUS GENERATED TRAFFIC

The baseline plus generated traffic for the year of opening of Construction 2023 and the Completion of Construction, 2025, for both the AM and PM peak hours are shown in the Figures below.

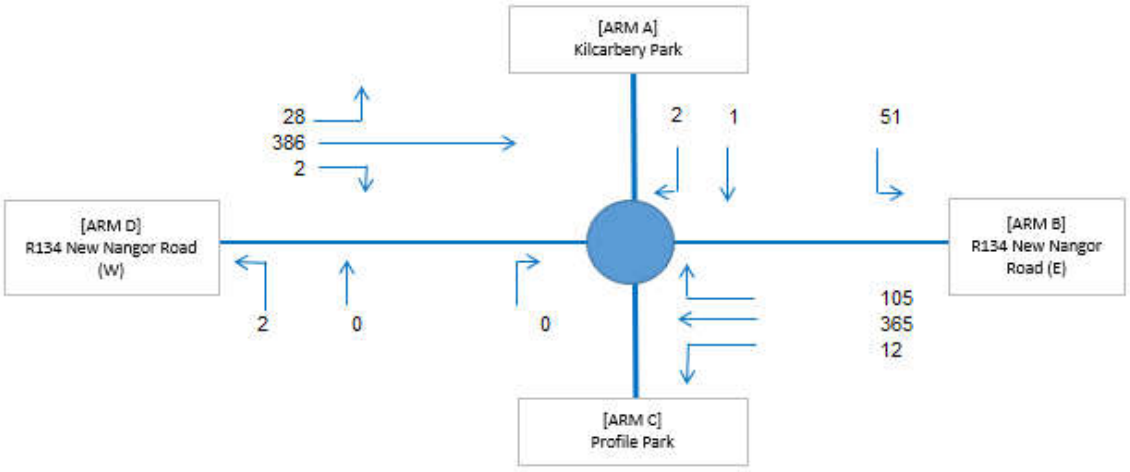

Figure 15-9: Baseflow Traffic 2021 AM Peak – Junction 1

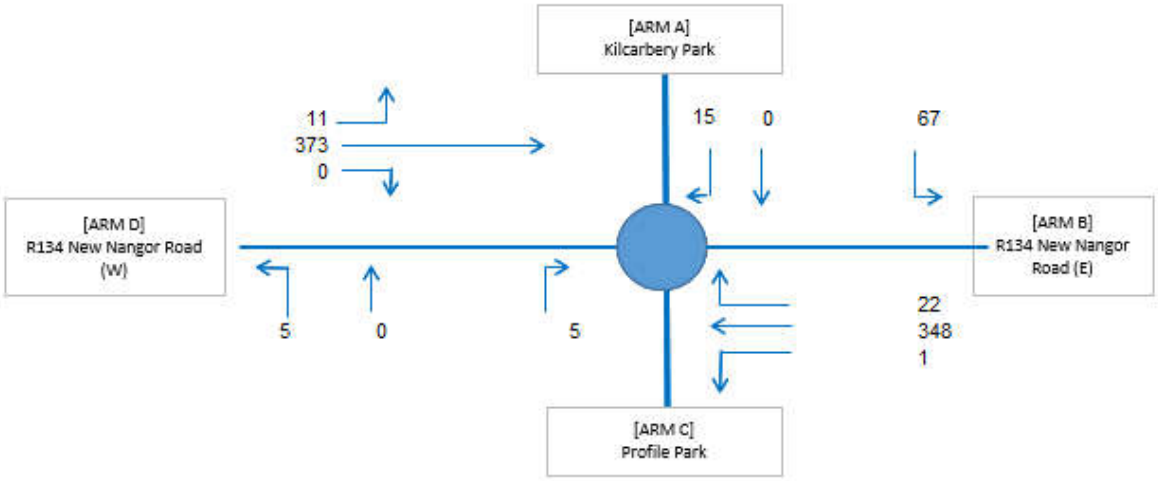

Figure 15-10: Baseflow Traffic 2021 PM Peak – Junction 1

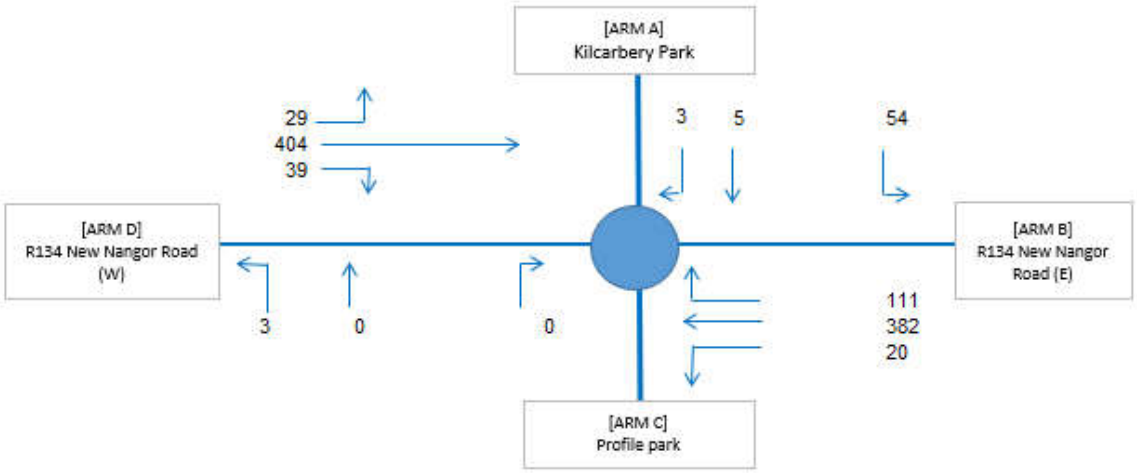

Figure 15-11: Baseflow Plus Generated Traffic 2023 AM Peak (1 month into Construction)– Junction 1

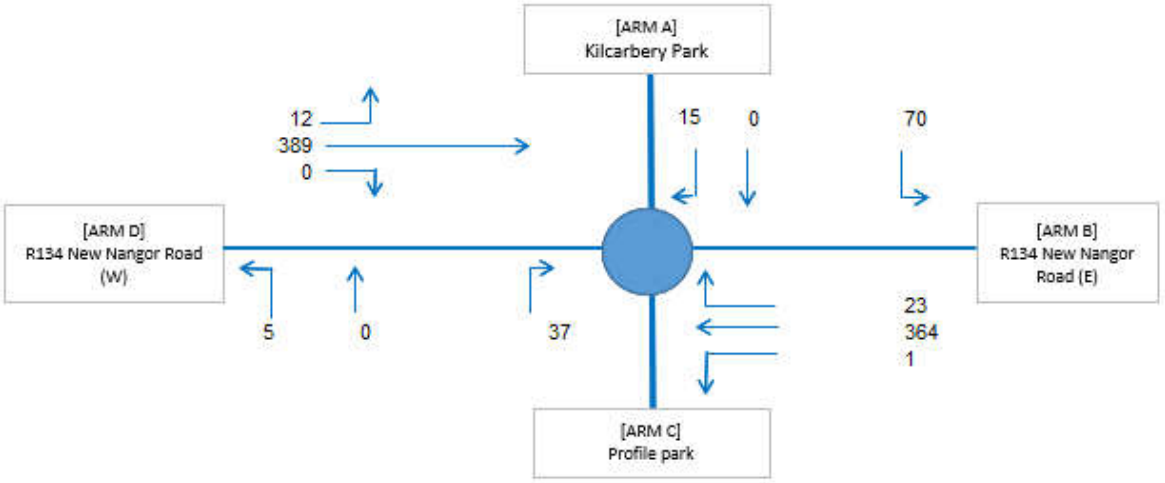

Figure 15-12: Baseflow Plus Generated Traffic 2023 PM Peak (1 month into Construction) – Junction 1

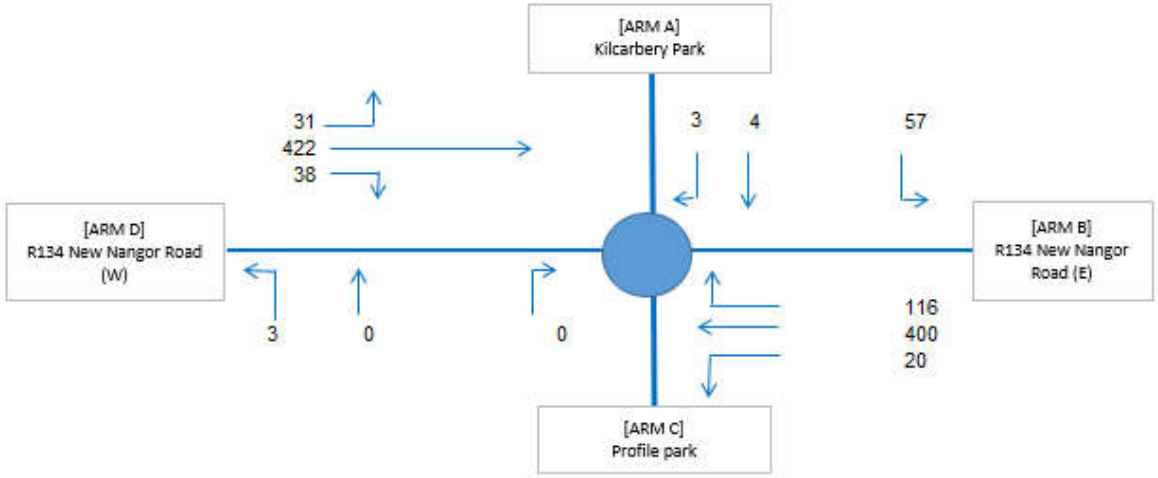

Figure 15-13: Baseflow Plus Generated Traffic 2025 AM Peak (Completion of Construction) – Junction 1

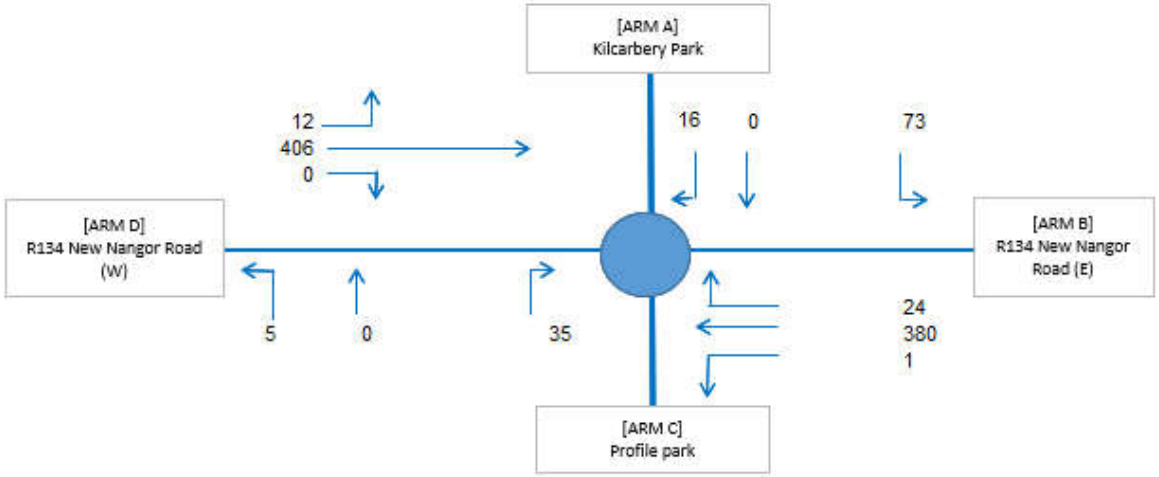

Figure 15-14: Baseflow Plus Generated Traffic 2025 PM Peak (Completion of Construction) – Junction 1

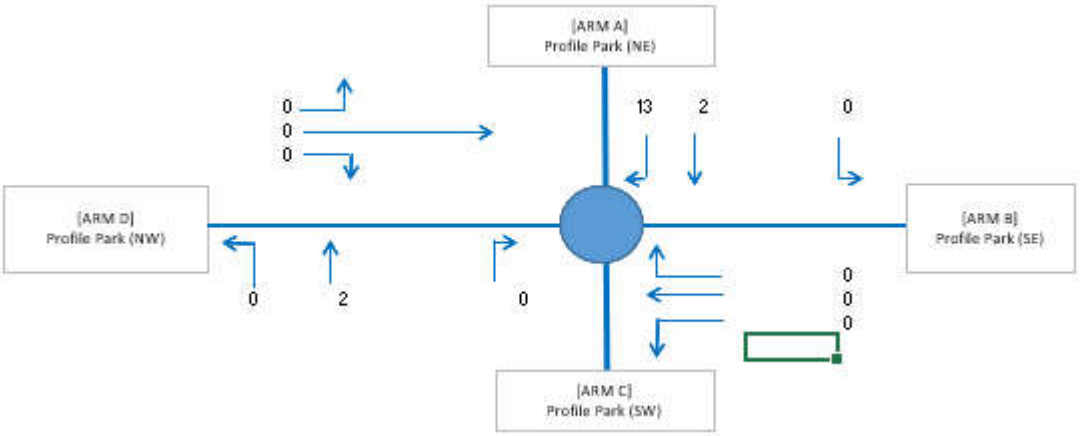

Figure 15-15: Baseflow Traffic 2021 AM Peak – Junction 2

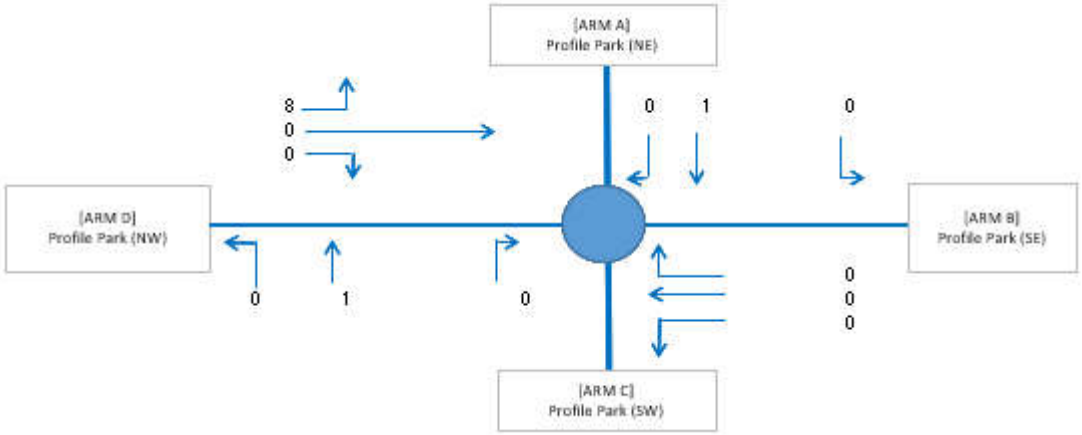

Figure 15-16: Baseflow Traffic 2021 PM Peak – Junction 2

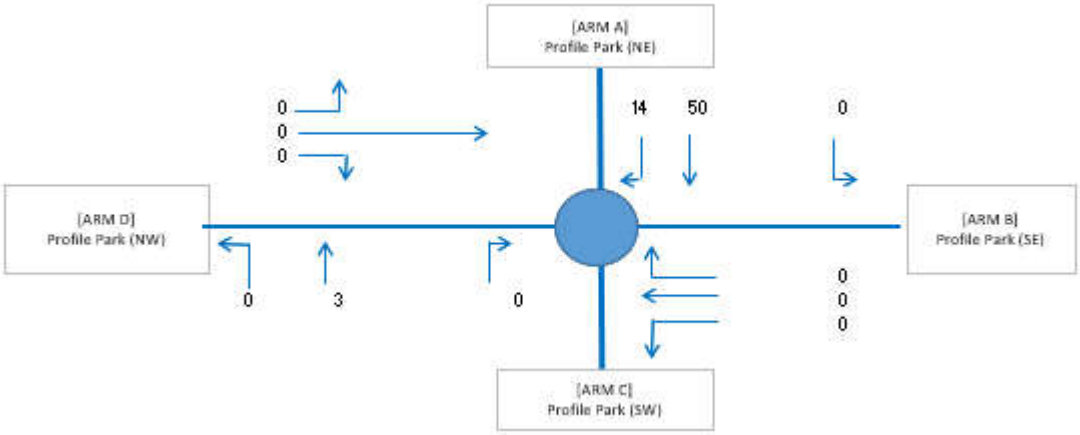

Figure 15-17: Baseflow Plus Generated Traffic 2023 AM Peak – Junction 2

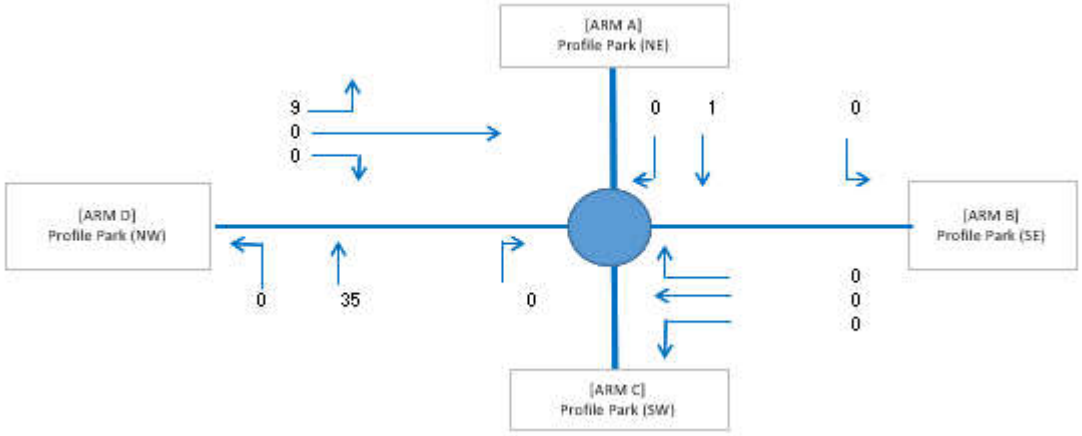

Figure 15-18: Baseflow Plus Generated Traffic 2023 PM Peak – Junction 2

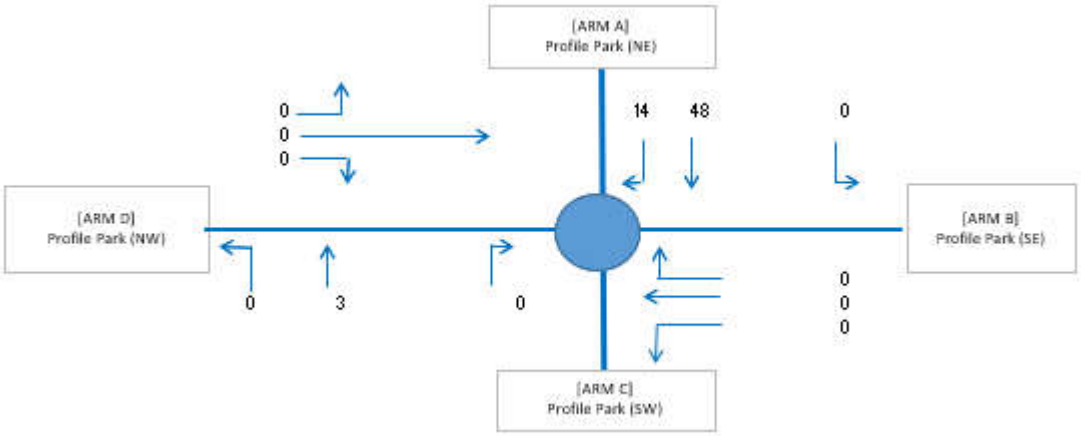

Figure 15-19: Baseflow Plus Generated Traffic 2025 AM Peak – Junction 2

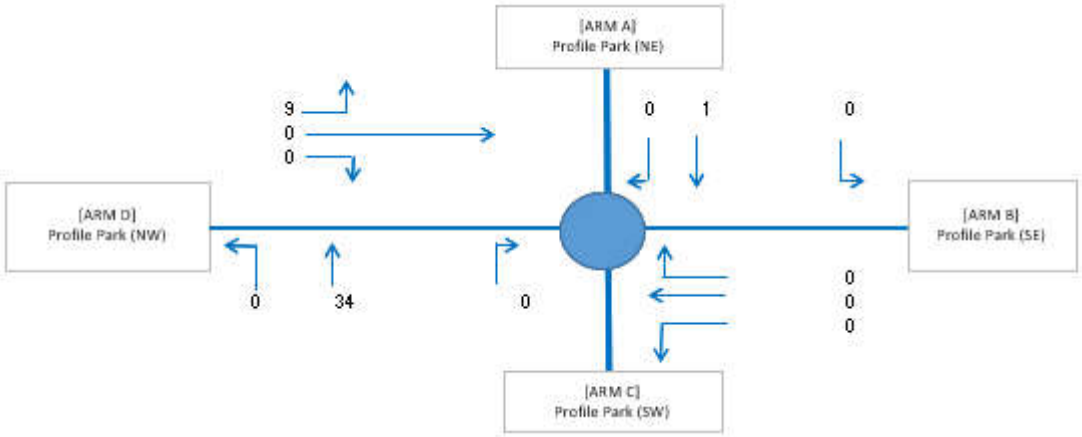

Figure 15-20: Baseflow Plus Generated Traffic 2025 PM Peak – Junction 2

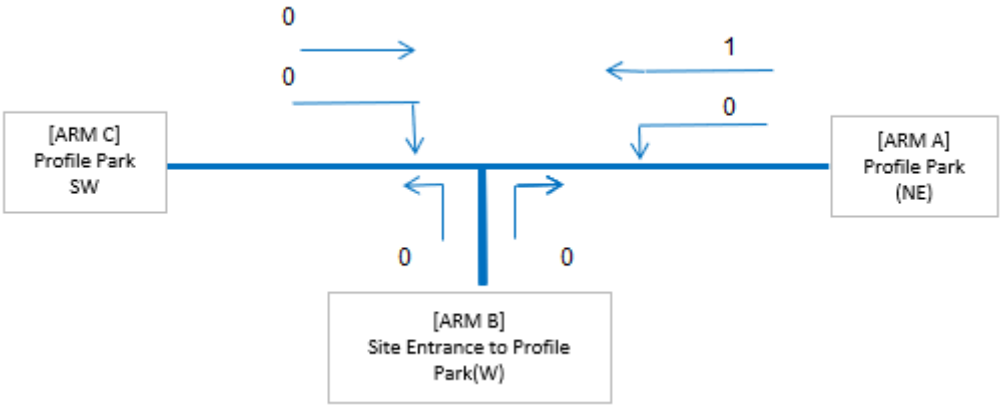

Figure 15-21: Baseflow Traffic 2021 AM Peak – Junction 3

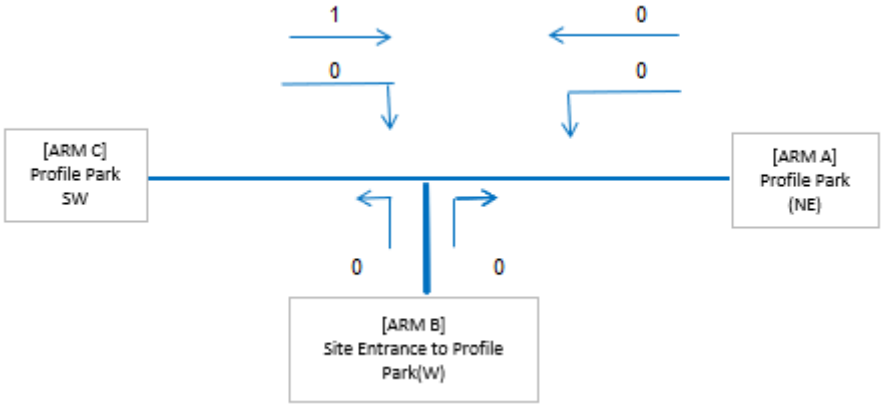

Figure 15-22: Baseflow Traffic 2021 PM Peak – Junction 3

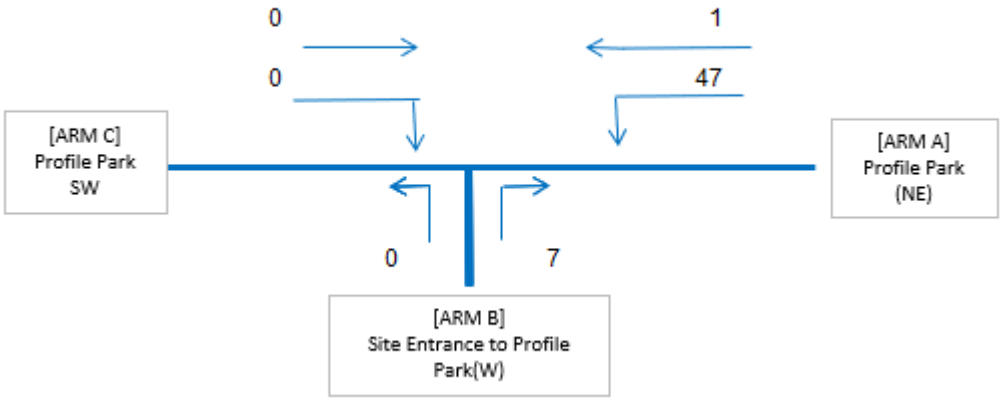

Figure 15-23: Baseflow Plus Generated Traffic 2023 AM Peak – Junction 3

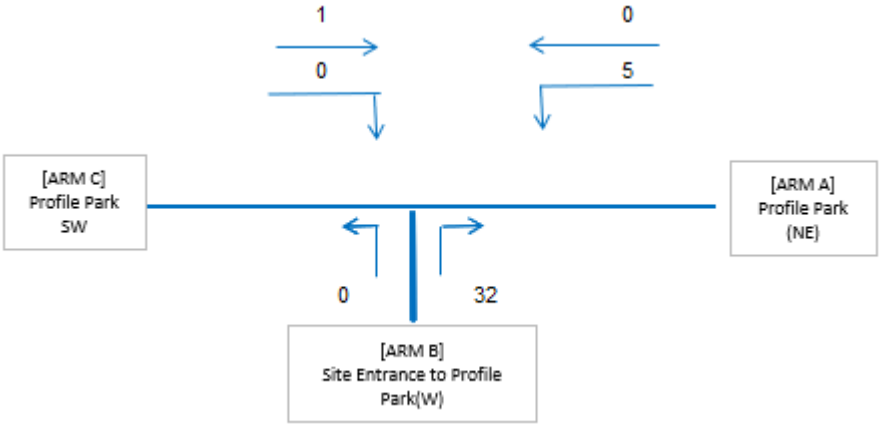

Figure 15-24: Baseflow Plus Generated Traffic 2023 PM Peak – Junction 3

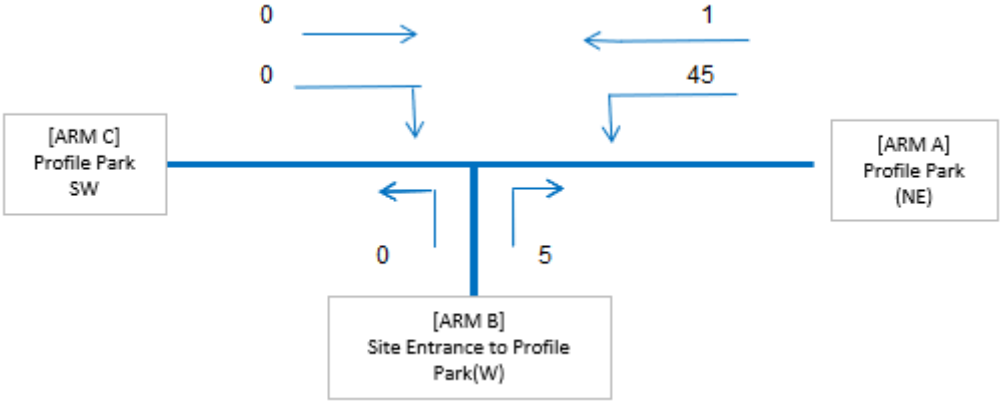

Figure 15-25: Baseflow Plus Generated Traffic 2025 AM Peak – Junction 3

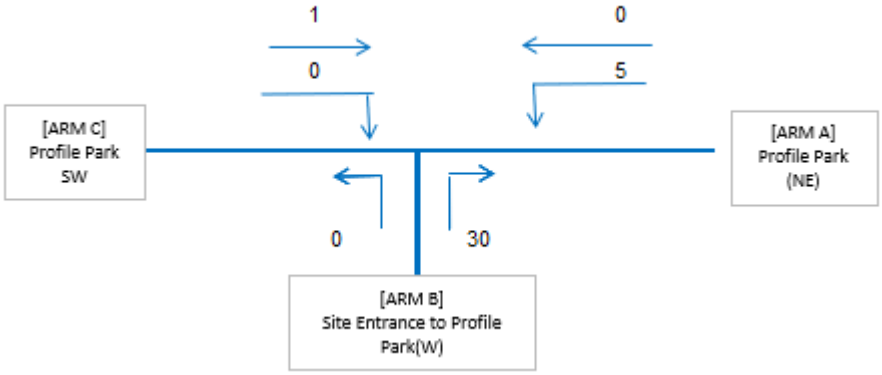

Figure 15-26: Baseflow Plus Generated Traffic 2025 PM Peak – Junction 3

15.5 ASSESSMENT OF SIGNIFICANT EFFECTS

15.5.1 ASSESSMENT TIME AND YEARS

The performance of the junction has been analysed for the critical AM peak and PM peak hours. This analysis was carried out for the year of construction commencing coinciding with peak construction volumes, 2023 and for the completion and commencement of the options of the power plant in 2025

15.5.2 JUNCTION 1 – R134 NEW NANGOR ROAD / KILCARBERY PARK / PROFILE PARK - ROUNDABOUT

A summary of the analysis results for the R134 New Nangor Road / Kilcarbery Park / Profile park Roundabout for the AM and PM peak hours are provided below in Table 15-6. Full outputs from JUNCTION 9 ARCADY are included in Appendix 15.1.

Table 15-6: Junction 1 Results: R134 New Nangor Road / Kilcarbery Park / Profile Park AM & PM Peak Hours

	AM					PM			
	95% Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	95% Queue (Veh)	Delay (s)	RFC	LOS
	2019 Baseflows								
Arm 1	0.5	5.16	0.08	A	0.1	0.5	3.53	0.08	A
Arm 2	2.1	5.63	0.45	A	0.4	1.8	4.19	0.3	A
Arm 3	~1	0	0	A	0	~1	0	0	A
Arm 4	2.7	5.21	0.4	A	0.4	1.8	4.16	0.31	A
	2023 No Construction								
Arm 1	0.5	5.29	0.09	A	0.1	0.5	3.6	0.09	A
Arm 2	1.8	5.91	0.48	A	0.5	2	4.29	0.32	A
Arm 3	~1	0	0	A	0	~1	0	0	A
Arm 4	2.6	5.42	0.42	A	0.5	2.1	4.26	0.32	A
	2023 With Construction								
Arm 1	0.5	5.37	0.09	A	0.1	0.5	4.05	0.1	A
Arm 2	1.7	6.23	0.49	A	0.5	2.5	4.45	0.35	A
Arm 3	0.5	2.76	0	A	0	0.5	3.11	0.04	A
Arm 4	2.2	5.79	0.46	A	0.6	2.6	4.66	0.36	A
	2025 No Construction								
Arm 1	0.5	5.41	0.09	A	0.1	0.5	4.3	0.1	A
Arm 2	1.6	6.17	0.5	A	0.6	2.6	4.57	0.36	A
Arm 3	~1	0	0	A	0	0.5	2.61	0.01	A
Arm 4	2.4	5.64	0.44	A	0.6	2.6	4.64	0.37	A
	2025 With Construction								
Arm 1	0.5	5.46	0.1	A	0.1	0.5	4.14	0.1	A
Arm 2	1.5	6.58	0.52	A	0.6	2.6	4.57	0.36	A
Arm 3	~1	0	0	A	0	0.5	3.01	0.04	A
Arm 4	2	6	0.47	A	0.6	2.6	4.76	0.38	A

The above results indicate that the R134 New Nangor Road / Kilcarbery Park / Profile Park Roundabout will operate below the maximum desirable 0.85 RFC. The maximum RFC reaching 0.52 in the AM peak with the development. It is also noted the queue length does not exceed 2 vehicles and the maximum increase in delay is 6.58 seconds. Effects at this junction during construction are predicted to be short term, negative and not significant.

15.5.3 JUNCTION 2 – PROFILE PARK INTERNAL - ROUNDABOUT

A summary of the analysis results for the Internal Profile Park Roundabout for the AM peak and PM peak hours during construction are provided below in Table 15-7. Full outputs from JUNCTION 9 ARCADY are included in Appendix 15.1.

Table 15-7: Junction 2 Results – Internal Profile Park Roundabout AM & PM Peak Hours

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	2019 Baseflows							
Arm 1	0	5.23	0.02	A	0	0	0	A
Arm 2	0	0	0	A	0	0	0	A
Arm 3	0	0	0	A	0	0	0	A
Arm 4	0	0	0	A	0	4.84	0.01	A
	2023 No Construction							
Arm 1	0	5.36	0.03	A	0	0	0	A
Arm 2	0	0	0	A	0	0	0	A
Arm 3	0	0	0	A	0	0	0	A
Arm 4	0	0	0	A	0	4.85	0.01	A
	2023 With Construction							
Arm 1	0.1	6.15	0.13	A	0	0	0	A
Arm 2	0	0	0	A	0	0	0	A
Arm 3	0	4.9	0.01	A	0.1	6.18	0.06	A
Arm 4	0	0	0	A	0	4.98	0.01	A
	2025 No Construction							
Arm 1	0	5.36	0.03	A	0	0	0	A
Arm 2	0	0	0	A	0	0	0	A
Arm 3	0	0	0	A	0	0	0	A
Arm 4	0	0	0	A	0	4.85	0.01	A
	2025 With Construction							
Arm 1	0.1	6	0.12	A	0	0	0	A
Arm 2	0	0	0	A	0	0	0	A
Arm 3	0	4.9	0.01	A	0.1	5.95	0.06	A
Arm 4	0	0	0	A	0	4.97	0.01	A

The above results indicate that the Profile Park Internal Roundabout will operate below the maximum desirable 0.85 RFC. The maximum RFC reaching 0.13 in the AM peak with the development. It is also noted the queue length does not exceed 1 vehicle and the maximum increase in delay is 6.15 seconds. Effects at this junction during construction are predicted to be short term, negative and not significant.

15.5.4 JUNCTION 3 – PROPOSED SITE ACCESS - T JUNCTION

A summary of the analysis results for the Proposed Site Access - T Junction for the AM peak and PM peak hours during construction are provided below in Table 15-8. Full outputs from JUNCTION 9 PICADY are included in Appendix 15.1.

Table 15-8: Junction 3 Results – Proposed Site Access – T Junction, AM & PM Peak Hours

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	2019 Baseflows							
Stream B-AC	0	0	0	A	0	0	0	A
Stream C-AB	0	0	0	A	0	0	0	A
	2023 No Construction							
Stream B-AC	0	0	0	A	0	0	0	A
Stream C-AB	0	0	0	A	0	0	0	A
	2023 With Construction							
Stream B-AC	0	5.78	0.01	A	0.1	7.36	0.07	A
Stream C-AB	0	0	0	A	0	0	0	A
	2025 No Construction							
Stream B-AC	0	0	0	A	0	0	0	A
Stream C-AB	0	0	0	A	0	0	0	A
	2025 With Construction							
Stream B-AC	0	11.49	0.02	B	0.1	6.97	0.06	A
Stream C-AB	0	0	0	A	0	0	0	A

The above results indicate that the Old Church Street - The Square T Junction will operate below the maximum desirable 0.85 RFC. The maximum RFC reaching 0.07 in the PM peak with the development. It is also noted the queue length does not exceed 1 vehicle and the maximum increase in delay is 11.49 seconds.

15.5.5 ROAD SAFETY

Entry to and from the proposed site within Profile Park does not raise any road safety concerns. Profile Park is well managed with no visibility restrictions and the entrance has been sited 50m away from the roundabout itself in accordance with TII standards with a 50m stagger provided between the proposed development and the next nearest site entry.

An investigation of road collision data from the Road Safety Authority website (source https://www.rsa.ie/RSA/Road-Safety/RSA-Statistics/Collision-Statistics/Ireland-Road-Collisions/ :) (see Figure 15-27 for map) indicates that there has been no serious collisions and seven minor collisions recorded in the vicinity between 2005 and 2016.

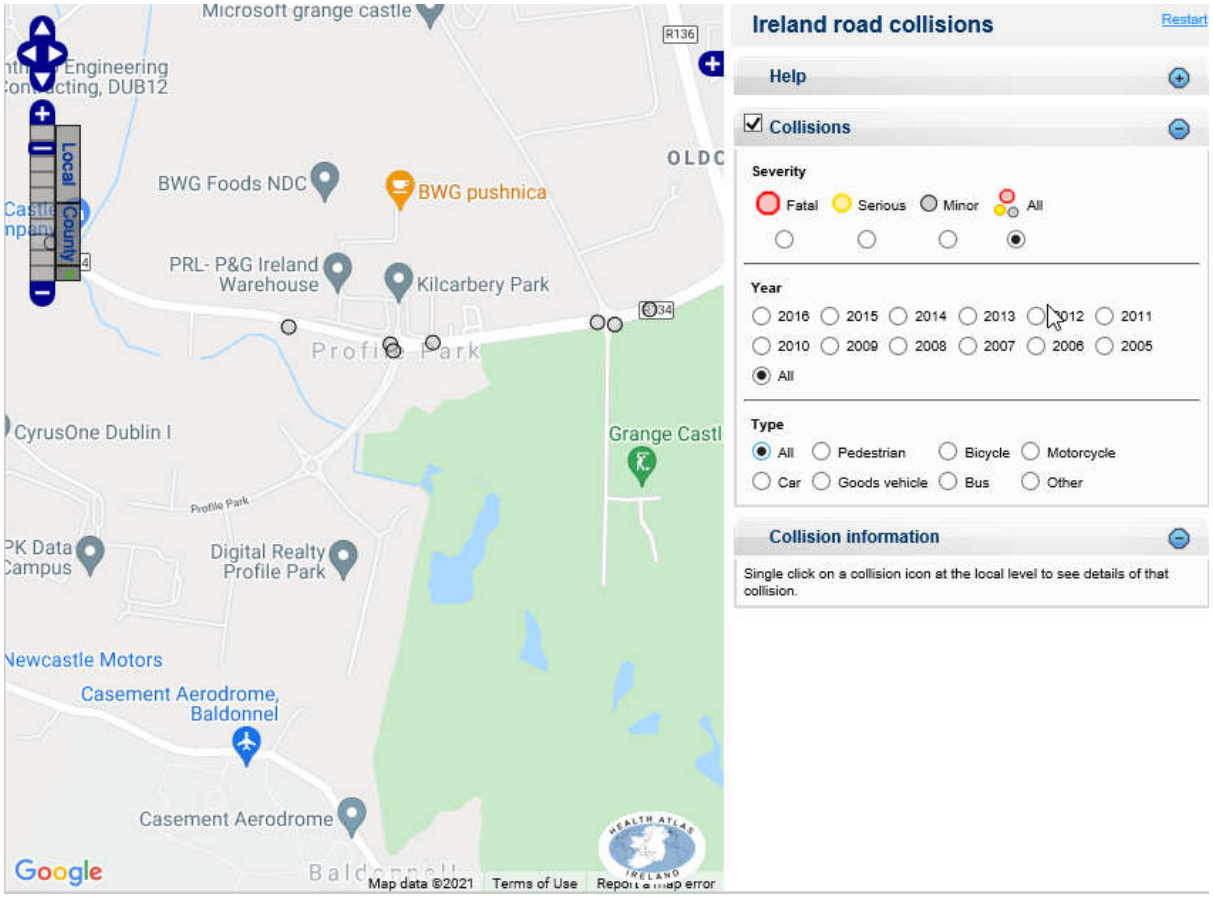

Figure 15-27: RSA Irish Road Collision Statistics

15.5.6 PARKING PROVISION

Parking requirements are in accordance with the Design Standards for New Apartments 1998 and South Dublin County Council Development Plan 2016-2022. The car parking provisions at the site have been proposed as follows;

- 8 spaces for Staff;
- 2 Un-abled user spaces.

Provision for 2 no. electrical charging points are also provided as part of the parking design.

15.5.7 SWEPT PATH ANALYSIS

Swept path analysis has been undertaken using AutoTURN at the site access from the Profile Park Main Internal Road to the site. The purpose of the Autotracks is to identify and resolve potential issues and conflict points during the design stage. The analyses were undertaken to include for the largest service vehicle, an articulated vehicle (16.5m long). Details of this analysis on the final layout is illustrated on Planning Drawing 11069-2005.

15.5.8 MOBILITY MANAGEMENT

15.5.8.1 Pedestrians & Cyclists

Segregated Pedestrian and Cycle access routes are provided in the Profile Park and along the R134 providing the main access route into Profile Park.

15.5.8.2 Public Transport

Dublin bus 68/a runs at regular intervals along the R134.

15.5.8.3 Access for People with Disabilities

As recommended dropped kerbing and tactile paving slabs will be installed at all crossing points, in accordance with "Guidance on the Use of Tactile Paving Slabs". It is further recommended that disabled parking spaces, in accordance with the South Dublin Development Plan, be provided and located in accordance with the National Disability Authorities "Building for Everyone". The requirement is for5% of the proposed parking provisions to be designated for disabled parking as per Building for Everyone. 20% disabled parking is provided.

15.6 MITIGATION AND MONITORING MEASURES

15.6.1 CONSTRUCTION PHASE

All construction impacts will be temporary in nature and will cease on completion of the works. Mitigation measures to reduce or eliminate construction phase impacts will be implemented as part of a Construction Traffic Management Plan (CTMP). An Outline CTMP has been prepared for planning application purposes and the final Site-Specific Construction Traffic Management Plan will be produced by the appointed Contractor and PSCS in conjunction with the PSDP for the project. The final TMP will address the following issues:

- Site Access & Egress;
- Traffic Management Signage;
- Routing of Construction Traffic / Road Closures;
- Timings of Material Deliveries to Site;
- Traffic Management Speed Limits;
- Road Cleaning;
- Road Condition;
- Road Closures;
- Enforcement of Traffic Management Plan
- Details of Working Hours and Days;

- Details of Emergency plan;
- Communication;
- Construction Methodologies; and
- Particular Construction Impacts.

The Outline CTMP is included in Appendix 15.2.

15.6.2 OPERATIONAL PHASE

It is not envisaged that there will be mitigation measures required for the operation phase of the proposed power plant due to the minimal impact of traffic during this phase. It is predicted that effects would be long term, neutral and imperceptible.

15.6.3 DECOMMISSIONING PHASE

Decommissioning phase impacts are predicted to be comparable to construction phase impact albeit traffic volumes will be lower. In the event that at the time of decommissioning baseline traffic is comparable to construction phase baseline, then it is predicted that effects would be short term, negative and not significant.

15.7 CUMULATIVE EFFECTS

Cumulative effects with existing developments have been identified in Section 15.4 and assessed in Section 15.5. In addition, consideration was given to other planned or consented projects identified in Chapter 6 Planning Policy where there may be potential for construction or operation phases to overlap. Effects during both phases of development are predicted to be not significant.

15.8 RESIDUAL EFFECTS

The junction assessments indicate that none of the junctions assessed are currently exceeding desirable capacity of 0.85. The maximum RFC of 0.52 was shown at the New Nangor Road / R134 Roundabout Junction of those assessed with a maximum RFC of 0.13 on the internal Profile Park Roundabout and 0.02 at the entrance to the proposed development. There will therefore be no significant residual effects associated with the construction, operational or decommissioning phases of the project.