November 2024

Environmental Impact Assessment ('EIAR') Volume 3 – Appendix 13

Part 1

Continuance of Use & Extension to Ballyburn Pit

On behalf of

Dan Morrissey & Co. (Plazamount Ltd)

Ballyburn Upper, Gorteenvacan, Knockbane, Castledermot, Co. Kildare

MALONE O'REGAN ENVIRONMENTAL

QUALITY
I.S. EN ISO 9001:2015
NSAI Certified

Form ES - 04

MALONE O'REGAN ENVIRONMENTAL

Ground Floor – Unit 3
Bracken Business Park
Bracken Road, Sandyford
Dublin 18, D18 V32Y
Tel: +353- 1- 567 76 55
Email: enviro@mores.ie

Title: Environmental Impact Assessment ('EIAR') Volume 3 – Appendix 13 Part 1, Continuance of Use & Extension to Ballyburn Pit, Dan Morrissey & Co. (Plazamount Ltd), Ballyburn Upper, Gorteenvacan, Knockbane, Castledermot, Co. Kildare

Job Number: E2122

Prepared By: Caoimhe Fox **Signed:** _____

Checked By: David Dwyer **Signed:** _____

Approved By: Kenneth Goodwin **Signed:** _____

Revision Record

Issue No.	Date	Description	Remark	Prepared	Checked	Approved
01	13/11/24	Report	FINAL	CF	DD	KG

Environmental Impact Assessment ('EIAR') Volume 3 – Appendix 13 Part 1

Continuance of Use & Extension to Ballyburn Pit

Dan Morrissey & Co. (Plazamount Ltd)

Ballyburn Upper, Gorteenvacan, Knockbane, Castledermot, Co. Kildare

APPENDICES

APPENDIX 13

Appendix 13-1: Traffic and Transport Assessment

APPENDIX 13

APPENDIX 13-1

Malone O'Regan Environmental Services Ltd.

Proposed Development at Ballyburn Pit, Ballyburn Upper, Castledermot, Co. Kildare

Traffic and Transport Assessment

P·M·C·E

November 2024

Malone O'Regan Environmental Services Ltd.

Proposed Development at Ballyburn Pit, Ballyburn Upper, Castledermot, Co. Kildare

Traffic and Transport Assessment

Document Ref:	P23054-PMCE-XX-00-RP-TR-TR-3_00_01

Rev	Prepared By	Reviewed By	Approved By	Issue Date	Reason for Revision
4.0	AP	TAG	TAG	12th November 2024	Final
3.0	AP	TAG	TAG	4th November 2024	Revised Draft Report
2.0	AP	AOR	TAG	22nd January 2024	Revised Draft Report
1.0	RF/XY	AP/AOR	TAG	22nd June 2023	Draft Report

P·M·C·E

T +353 (1) 464 3041
F +353 (1) 459 1836
info@pmceconsultants.com
www.pmceconsultants.com

Unit 17, Greenmount House
Greenmount Office Park
Harold's Cross, Dublin 6W
D6W VX78, Ireland

Executive Summary

This report assesses the traffic related impacts associated with the Proposed Development at the Ballyburn Site, Ballyburn Upper, Castledermot, Co. Kildare.

The site will continue to be accessed from the existing access on the L4012 Local Road which, in the vicinity of the site, runs in a southwest to northeast direction. The development currently has an annual extraction rate 500,000 tonnes, depending on demand. and it is not proposed to intensify these current extraction rates. The proposed development, the subject of this application, is located to the south of the existing Site void. The proposed development will also include the importation of 1,125,000 tonnes of inert soil and stone by-product (virgin greenfield soils and stone) to enhance the restoration of the Site. The proposed development will include the transport of a maximum of 500,000 tonnes of materials (imported and exported) annually, therefore, and it is not proposed to intensify the current rates of materials transported to/from the site.

Twelve-hour classified vehicle turning counts were carried out on the 4th of May 2023 at four junctions in the surrounding road network, including the existing site access, Prumplestown Cross (R448/L4012 junction) and each roundabout junction at the dumbbell interchange at Junction 4 of the M9 Motorway.

The daily trips associated with site operations accounts for a maximum of 184 trips daily, 168 of which relate to HGVs (91.33%). This number of trips is conservative and allows for periods where the Site operations occur in concentrated peaks (i.e. worst-case scenario).

Link capacity analysis was carried out on the L4012 and it was determined that the L4012 will continue to operate within capacity for each of the assessment years 2024, 2029, and 2039. The traffic generated by the development would represent between 15.90% and 18.91% of total traffic on the L4012 between 2024 and 2039.

Junction capacity analysis was undertaken where the traffic increase exceeded 10% of the background traffic, as per the Traffic and Transport Assessment Guidelines, which included the Site Access Junction and Prumplestown Cross. The results of the Junction Capacity Analysis indicate that each junction assessed will continue to operate within capacity for each of the assessment years 2024, 2029, and 2039.

Sightlines in both directions at the access to the Sand & Gravel Site have been assessed in accordance with Section 5.6.3 of TII Publications document DN-GEO-03060. The available visibility to the northwest is in excess of the 160m requirement, as noted during the site visit. The required visibility to the southeast is, however, not available. The available visibility to the southeast is approximately 70m, which is limited by a combination of both the vertical and horizontal alignment on the L4012 at this location. However, low volumes of traffic were recorded approaching from the southeast. Also, the road layout and high demand road alignment to the southeast, results in vehicles travelling at speeds less than 80kph. As such, the existing sightlines at the access are not expected to give rise to any safety concerns. It should be noted that this is an existing access, which has been operating safely for several years.

The site currently contains capacity for 15 parking spaces and it is not proposed to revise this provision. The parking provision is considered sufficient to accommodate the number of staff working on site, as well as any visitors to the site, when required.

This Traffic and Transport Assessment concludes that the links and junctions within the surrounding road network will continue to operate within capacity for each of the assessment years 2024, 2029, and 2039 and that the proposed development will have an imperceptible impact on the operation of the existing road network.

Glossary of Terms

Road Network: The existing and proposed public and private roads within the study area.

Traffic Growth: The normal expected growth in traffic over time.

Trip: One movement, in or out of the study area by foot, cycle or vehicle.

Thresholds: Minimum intervention levels at which Transport and Traffic Assessments are to be conducted.

Generated Trips: Additional trips made as a result of the presence of a development.

Peak Time: Time of day at which the transport demands from a development are greatest.

Capacity Calculations: Standardised methods of estimating traffic capacity on links and at junctions.

Trip Distribution: The estimated directional distribution of the estimated traffic at each junction in the study area.

Trip Assignment: The final estimated flows of traffic for each direction of travel at each junction and along each link within the study area.

TRICS: A database containing empirically obtained trip generation data for a wide range of different types of developments.

AADT: Annual Average Daily Traffic – The mean daily traffic volume over the course of a year on a particular route.

Level of Service: Level of Service (LOS) is a measure of the capacity of a road related to the average vehicular speed and level of congestion on the road. It is ranges from LOS A to LOS F, with A representing free flow and F representing stop/start traffic. LOS C represents stable flow conditions

Table of Contents

Table of Figures

Index of Tables

1 Introduction

1.1 General

PMCE Ltd were commissioned by Malone O' Regan Environmental Services Ltd. to undertake an assessment of the traffic impacts associated with a Proposed Development at the Ballyburn Pit, Ballyburn Upper, Castledermot, Co. Kildare.

1.2 Information Reviewed

In preparing this report reference has been made to the following documents:

- Transport Infrastructure Ireland (TII) Publications document PE-PDV-02045, "Traffic and Transport Assessment Guidelines" (May 2014), published by TII.
- TII Publications document PE-PAG-02017, "Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections" (October 2021), published by TII.
- TII Publications document PE-PAG-02039, "Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts" (October 2016), published by TII.
- Kildare County Development Plan (2023-2029).
- Traffic Count Survey Data, collected by Traffinomics.
- TII Publications document DN-GEO-03031, "Rural Road Link Design" (June 2017), published by TII.
- TII Publications document DN-GEO-03060, "Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade-separated and compact grade-separated junctions)" (May 2023), published by TII.

1.3 Scope

The objective of this report is to examine the traffic implications associated with the Proposed Development in terms of its integration with existing traffic in the area. The report determines and quantifies the extent of existing and/or additional trips generated by the Proposed Development, and the impact on operational performance of such trips on the local road network.

1.4 Methodology

The methodology adopted for this appraisal and report involved, in brief:-

- **Site Visit:** A Site visit on Wednesday the 31st May 2023, at which time the weather was dry and the ground surface was dry.
- **Trip Generation and Trip Assignment** – This is used to derive trip rates for a 12-hour period and to assign such trips to the surrounding road network according to which direction of travel vehicles will travel to/from the site in Ballyburn, Co. Kildare.
- **Link Capacity Assessment** - To obtain an AADT value for the main road linking the Proposed Development to the surrounding network.
- **Junction Capacity Assessment** – The traffic count data was used to develop Junctions 9 models for the assessed junctions.
- **Future Year Assessments** – The estimated future year volumes on the study area network, as a result of the increase in background traffic and any development related traffic, was used to assess the future operational performance of all junctions and surrounding road network for 2024 (assumed year of opening) and at two future assessment years, the opening year +5 (2029) and the opening year +15 (2039).

1.5 Location plan

Figure 1.1 shows the location of the Ballyburn Pit, Ballyburn Upper, Castledermot, Co. Kildare and the surrounding road network.

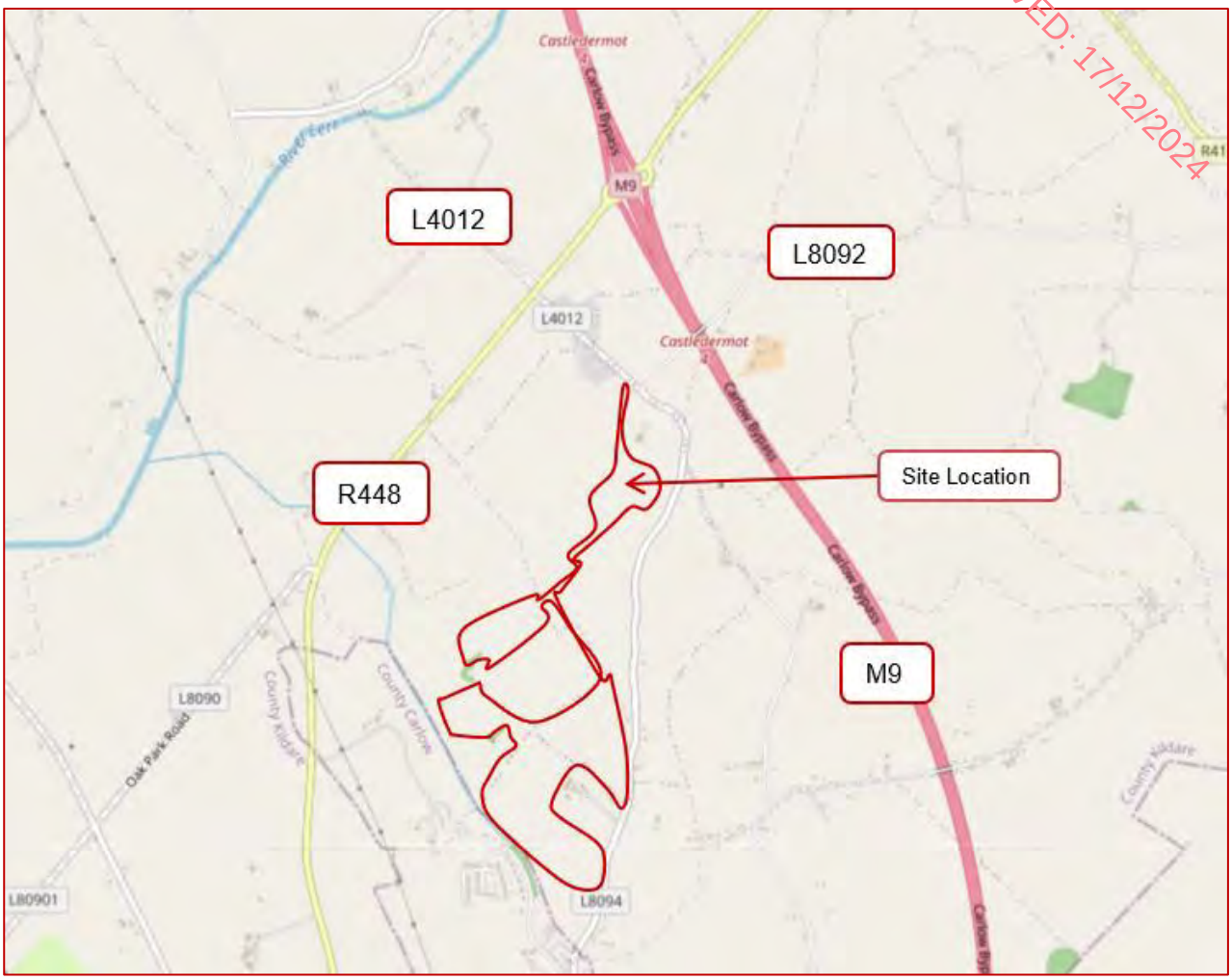

FIGURE 1.1: LOCATION PLAN (SOURCE: WWW.OPENSTREETMAP.ORG**)**

2 Existing Conditions

2.1 The Site

The existing Site is located approximately 7km northeast of Carlow Town and 3.5km southwest of Castledermot. The Site is bounded by the L4012 to the north and agricultural lands to the south, east and west. The existing Site comprises an area of ca. 36ha. and the Proposed Development, the subject of this application, is located to the south of the existing Site of ca. 28.6ha. All Site related traffic will enter the site via the existing Site entrance on the L4012 to the north.

The surrounding area is rural greenfield, with land uses in the surrounding area primarily comprising agricultural uses and single house residential units located north of the site access.

2.2 Existing Road Network

2.2.1 L4012 Local Road

The L4012 Local Road is a two-way single carriageway road running in a northwest-southeast direction over a length of approximately 6.2km, extending from its junction with the L4009 in the north to its junction with the L8094 in the south. The L4012 is approximately 6m wide in the vicinity of the Site access and has a posted speed limit of 80kph.

Footpaths are provided intermittently on both sides of the L4012. On the northern side the footpath commences downstream of the junction with the R448 Regional Road and extends for approximately 230m before terminating at the last residential property on this side of the road. At this location the footpath on the southern side of the road commences, extending as far as the Site access. Public lighting is provided throughout the length of both sections of footpath on the L4012.

FIGURE 2.1: L4012 LOCAL ROAD LOOKING NORTHWARDS

2.2.2 R448 Regional Road

The R448 Regional Road is a two-way single carriageway road running in a northeast-southwest direction providing a connection to the N80 and Carlow Town in the west and to Castledermot and Naas, in Co. Kildare, to the east. The road width varies along its length but is approximately 9m wide in the vicinity of its junction with the L4012 and has a posted speed limit of 100kph.

In the vicinity of the junction with the L4012, there are no footpaths or cycle facilities provided and public lighting is provided on its eastern side.

FIGURE 2.2: R448 REGIONAL ROAD LOOKING SOUTHWARDS

2.3 Traffic Volumes

12-hour classified Junction Turning Counts (JTCs) were carried out on Thursday 4th May 2023 at the following locations:

- The L4012 crossroads junction with the site access.
- The L4012/R448 Staggered Junction (Prumplestown Cross).

- The dumbbell interchange at Junction 4 of the M9 Motorway.

Each of the traffic counts were carried out between 7:00am and 7:00pm, with this time period including the peak hours on the adjacent road network. Surveyed vehicles were broken down into five categories as follows:

1. Cars;
2. LGV's (Light Goods Vehicles);
3. OGV1 (Two and three axle goods vehicles);
4. OGV2 (Four and five axle goods vehicles); and
5. Buses.

The detailed results of the traffic survey are summarised in Appendix B. The morning and evening peak hours have been established as follows:

- **4-Arm Crossroads Junction of the Site Access and the L4012** (referred to as the 'Site Access Junction' in this report) – 08:00 to 09:00 (AM Peak) and 16:15 to 17:15 (PM Peak)
- **4-Arm Staggered Junction of the L4012 and R448** (referred to as 'Prumplestown Cross' in this report) – 08:00 to 09:00 (AM Peak) and 17:00 to 18:00 (PM Peak)
- **Western Roundabout at Junction 4 of the M9** (referred to as the 'M9 Western Roundabout' in this report – 08:00 to 09:00 (AM Peak) and 17:00 to 18:00 (PM Peak)
- **Eastern Roundabout at Junction 4 of the M9** (referred to as the 'M9 Eastern Roundabout' in this report – 08:00 to 09:00 (AM Peak) and 17:00 to 18:00 (PM Peak)

The count data for each site has been converted to Annual Average Daily Traffic (AADT) values using the methodology described in "Expansion Factors for Short Period Traffic Counts" (Unit 16.1 NRA Project Appraisal Guidelines, October 2016). Appendices A to C of the above document were used in the expansion of traffic counts to AADTs.

A combined factor of 0.775 was arrived at by combining the individual hourly factors for the count duration. This factor was then used to determine the 24-hour traffic flow. This was then converted to Weekly Average Daily Traffic (WADT) using an index of 0.94 for the Thursday traffic count. Finally, this was converted to AADT using an index of 0.98 for the month of May. These factors were used to calculate the AADT for each of the four junctions.

The resulting AADT figures at each junction are provided in Appendix C.

3 Proposed Development

3.1 General

From a high-level, the Proposed Development will consist of the following components:

- The continuance of use of existing site infrastructure, including all processing equipment, machinery, entrance, office/welfare facilities, carpark, wheel wash, weighbridge, haul routes and other ancillary infrastructure;
- The extension of the Site to known quality reserves in the south (ca. 28.3ha). The extraction of this extension area will result in a pit floor at ca. 71m OD, which is above the winter water table. The applicant intends to extract ca. 1.7million m3 of aggregates or ca. 3,060, 000t over the lifetime of the project; and,
- The importation of 1,125,000t of clean, uncontaminated soil and stone by-product materials to complement overburden originating from the Site during the restoration process (which will be restored to between 73/74m OD).

3.2 Trip Generation

3.2.1 Site Operational Movements

The Ballyburn Pit currently extracts a maximum of 500,000 tonnes of sand and gravel annually, which is processed and removed from the Site.

The proposed development will include the continuation of export of sand and gravel and the import of soil and stone by-product for the purpose of site restoration. The proposed development will include the transport of a maximum of 500,000 tonnes of materials (imported and exported) annually, therefore, and it is not proposed to intensify the current rates of materials transported to/from the site.

In determining the daily traffic volumes associated with the Proposed Development an average of 84 loads per day from the site has been calculated based on the following assumptions:

- The facility will operate for 250 operational days per year.
- Material will be transported from the site in both 20 tonne and 30 tonne loads (24 tonnes/load average).
- The facility opening times will be 07:00 to 18:00 on Monday to Friday and 07:00 to 14:00 on Saturday, giving 5.5 days per week.

Table 3-1: Transported Material

Exported/Imported Quantities	
Quantity per annum	500,000
Quantity per Day (250 operational days / year)	2,000
Loads per Day (24 tonnes / load)	84

3.2.2 Staff Trips

The Site currently employs 8 staff members, and it is not anticipated that these numbers will increase. Staff movements will generate 16 peak hour trips, 8 inbound trips in the morning peak and 8 outbound trips in the evening peak. Staff car movements have been distributed in accordance with the existing light vehicle distribution at the Site access and surrounding junctions.

3.2.3 Derived Trip Rate

The total daily trips associated with the Site operation accounts for 184 movements daily, 168 of which relate to HGVs (91.33%). These numbers are arrived at by summing the following components:

- 168 daily truck movements enter and exit the site exporting material.
- 16 staff trips daily (8 Inbound and 8 Outbound).

3.2.4 Trip Distribution & Composition

Appendix A contains extracts from the TRICS database giving the forecast arrival and departure distribution for Site sites. By inspection it can be seen that the pattern of arrivals/departures is consistent with a short turn around within the sites, e.g. that vehicles generally arrive and depart within a short time period, likely to be less than an hour.

The distribution of the development traffic on the adjacent road network is based on an assessment of the existing traffic flows at the site access derived from the traffic count data. Table 3-2 details the trip distribution that has been applied to the development traffic as part of the junction capacity analysis.

TABLE 3-2: SUMMARY OF PREDICTED DAILY TRIPS IN OPENING YEAR AND BEYOND

Development	Type of Traffic	Daily Trips	
		Arrivals	Departures
Site	Export of Extracted Material & Import of Inert Soil and Stone (HGVs)	80	80
	Staff (LVs)	8	8
Total		92	92

3.3 Trip Assignment

The assignment of the proposed development traffic onto the adjacent road network is based on the existing traffic flow distribution at each junction as derived from the traffic counts and projected routes. This is illustrated in Figure 3.1.

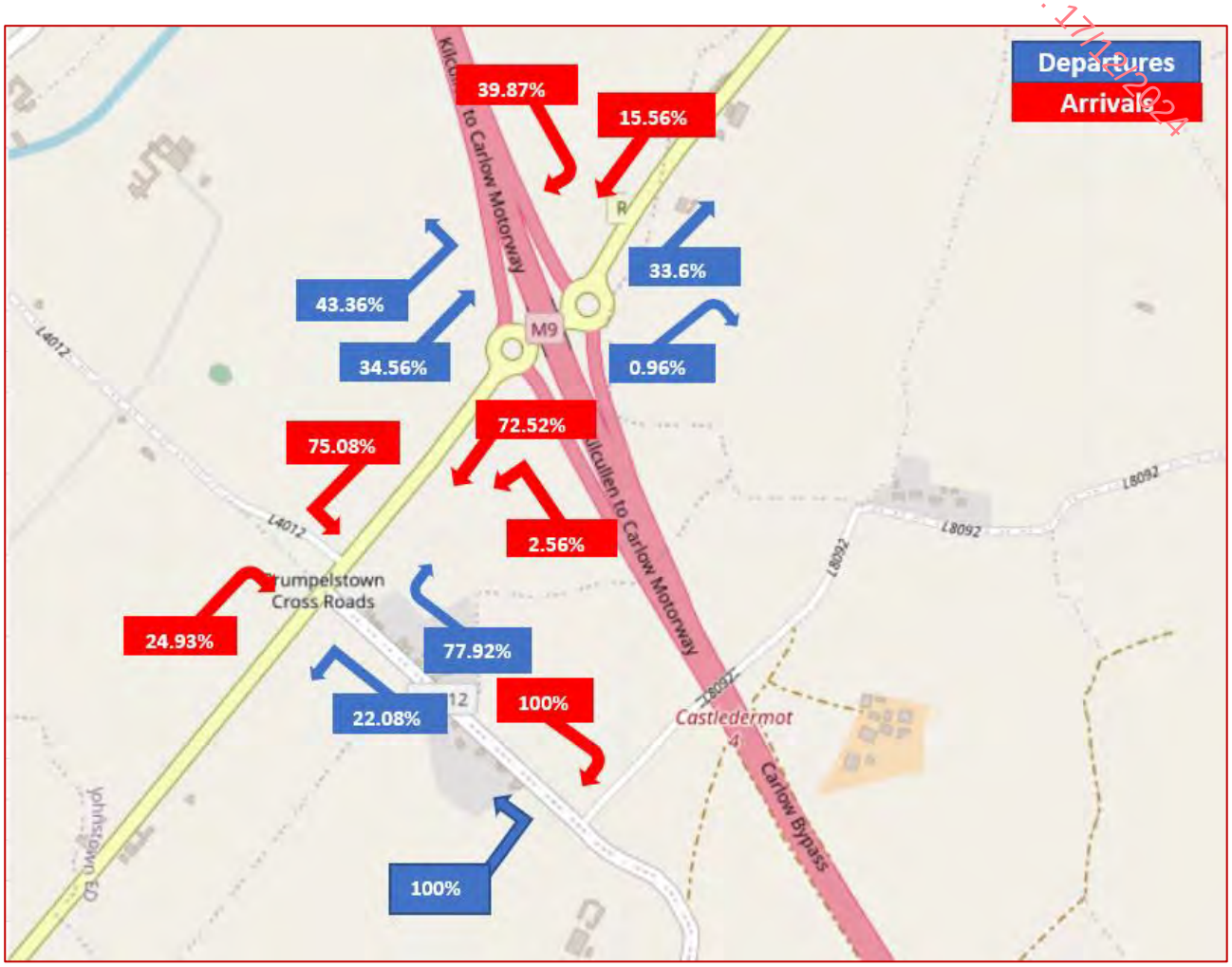

FIGURE 3.1: ASSIGNMENT OF DEVELOPMENT TRAFFIC THROUGHOUT THE ADJACENT ROAD NETWORK

3.4 Scope of Assessment

Section 2.1 of the "Traffic and Transport Assessment Guidelines," published by Transport Infrastructure Ireland recommends that in an urban or congested setting a traffic assessment should cover all of the roads and junctions where the Proposed Development traffic exceeds 5% of the existing or background traffic, or 10% of the background traffic when located in rural areas.

Figure 3.2 outlines the distributed proposed development traffic as a percentage of the background traffic on the adjacent road network.

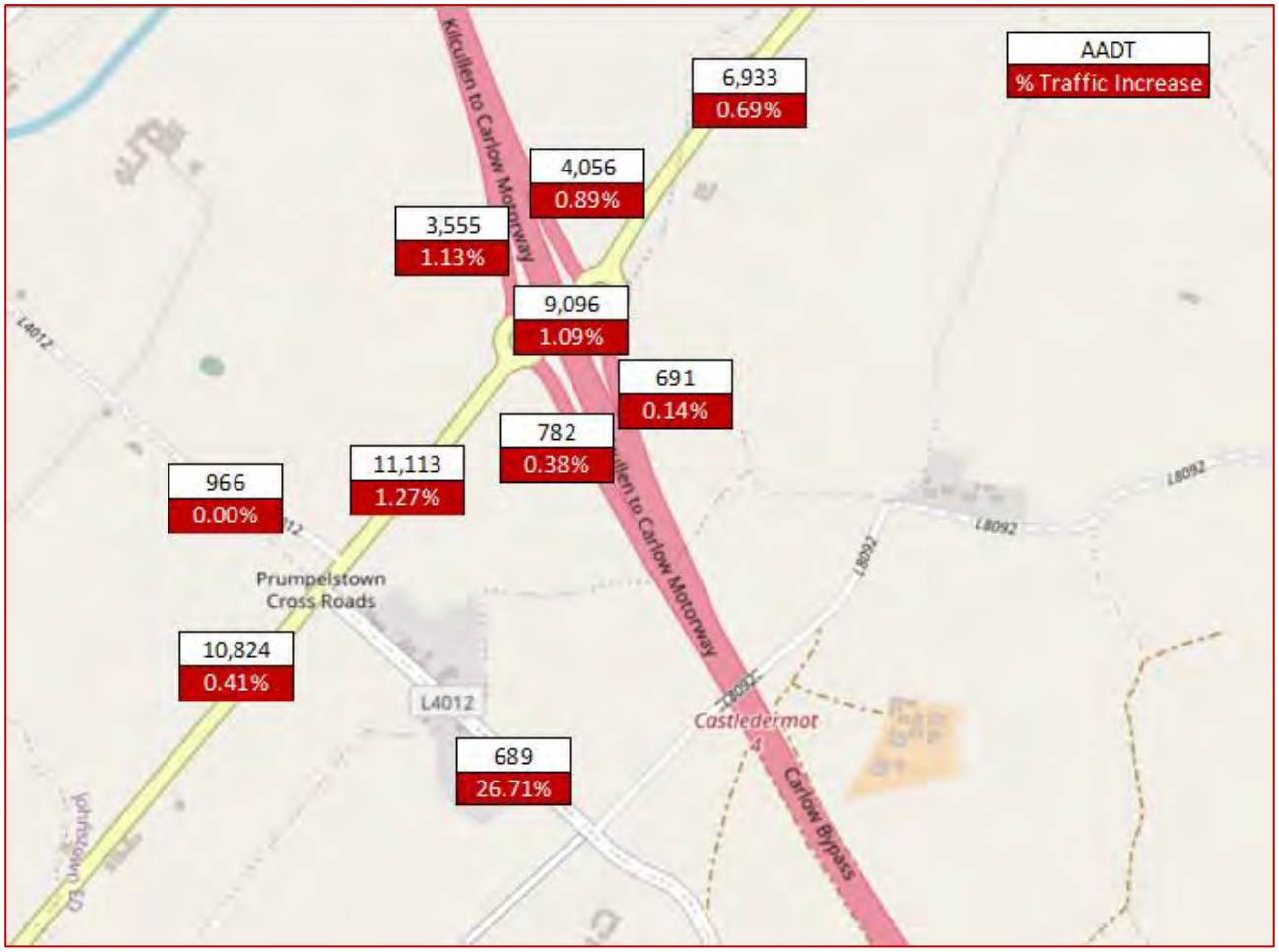

FIGURE 3.2: AADT AND DEVELOPMENT TRAFFIC AS A PERCENTAGE OF EXISTING TRAFFIC

The development traffic exceeds 5% of the background traffic on the following link roads:

- L4012 Local Road

Therefore, this Traffic and Transport Assessment shall undertake a capacity assessment at the following junctions:

- Site Access Junction; and
- Prumplestown Cross

4 Road Impacts

4.1 Assessment Years

The “Traffic and Transport Assessment Guidelines” published by Transport Infrastructure Ireland recommend the assessment of traffic in the Opening Year, for the Opening Year +5 years and the Opening Year +15 years.

The assessment years for the impact assessment are therefore 2024 for the Opening Year, 2029 and 2039 for the Future Assessment Years.

4.2 Traffic Growth

The "Project Appraisal Guidelines - Unit 5.3 – Travel Demand Projections (PE-PAG-02017)," published by TII in October 2021 has been used to determine future year traffic flows on the network from the 2023 traffic count.

Table 4-1 contains a summary of the traffic growth factors published in the "Project Appraisal Guidelines." For this assessment, a central growth scenario has been adopted (a ‘central’ growth scenario was assumed given the Site location and scale).

TABLE 4-1: FUTURE YEAR TRAFFIC GROWTH FIGURES (COUNTY KILDARE)

Year	Low Growth		Central Growth		High Growth	
	LV	HV	LV	HV	LV	HV
2016-2030	1.0180	1.0363	**1.0197**	**1.0378**	1.0229	1.0413
2030-2040	1.0044	1.0135	**1.0062**	**1.0155**	1.0098	1.0191

4.3 Link Capacity Assessment

4.3.1 L4012 Local Road

The TII Publications document reference DN-GEO-03031 provides guidance on recommended rural road layouts in its Table 6/1. It advises that the capacity of a Type 3 Single Carriageway road with 6.0m cross-section is 5,000 AADT for a Level of Service D. The L4012, adjacent to the Site, has an average cross-section width of approximately 6m with no hard shoulders present. Therefore, the L4012 is considered to be most similar to the Type 3 Single Carriageway cross-section in this document with a capacity of 5,000 AADT for Level of Service D.

The combined background and Site Traffic volumes, outlined in Table 4-2, in each of the assessment years is less than the LOS D capacity of 5,000 AADT for a Type 3 Single Carriageway. It is, therefore, considered that the L4012 will operate within capacity for each of the assessment years. Table 4-2 indicates that the traffic associated with the Proposed Development represents between 18.91% and 15.90% of the total traffic on the L4012 during the assessment years 2024 to 2039.

TABLE 4-2: COMBINED AADT FOR EACH ASSESSMENT YEAR (L4012)

	Assessment Year			
	Base Year	2024	2029	2039
Background Traffic	770	789	891	973
Additional Proposed Development	184	184	184	184
Combined Traffic (Background + Additional Dev. Traffic)	954	973	1,075	1,157
Additional Traffic as % of Combined Traffic	19.29%	18.91%	17.12%	15.90%

4.4 Junction Capacity Analysis

The capacity of the surveyed junctions was assessed using the Transport Research Laboratory's (TRL) Junctions 9 computer programme.

Junction performance is measured as a ratio between the flow and capacity (RFC). The capacity analysis has been carried out for a period of 12-hours, which corresponds to the operational hours of the Proposed Development works for each of the assessment years (2024, 2029, and 2039).

A rural junction with an RFC below 0.85 is considered to be operating within capacity, and an RFC of 0.85 indicates a junction operating at capacity.

The capacity of a stream or arm of a junction refers to the maximum flow of vehicles entering the junction, within a given time period and is based on the formula given in LR942 (Kimber, 1980). The formulae describing the theoretical capacity of a junction were derived empirically and have a ±15% confidence interval. Consequently, the standard approach to junction capacity analysis, for priority-controlled junctions, uses an RFC of 0.85 to describe the theoretical maximum capacity, however in reality there may be additional capacity above this level.

Where the flow on an arm, in a given time period, exceeds the theoretical capacity this will result in increased time to traverse the junction, leading to delays and queues forming. In normal operation queues forming at a junction will dissipate over time as the volume of vehicles arriving at the junction fall below the available capacity.

The capacity of a signalised junction can also be measured by its Level of Service (LOS). The LOS is denoted by a letter ranging from A – F. The following list describes the traffic conditions on a road network for each Level of Service:

- **LOS A:** Free-flow traffic with individual users virtually unaffected by the presence of others in the traffic stream (free-flow)
- **LOS B:** Stable traffic flow with a high degree of freedom to select speed and operating conditions but with some influence from other users (reasonably free flow)
- **LOS C:** Restricted flow that remains stable but with significant interactions with others in the traffic stream. The general level of comfort and convenience declines noticeably at this level (stable flow)
- **LOS D:** High-density flow in which speed and freedom to manoeuvre are severely restricted and comfort and convenience have declined even though flow remains stable (approaching unstable flow)
- **LOS E:** Unstable flow at, or near, capacity levels with poor levels of comfort and convenience (unstable flow)
- **LOS F:** Forced traffic flow in which the amount of traffic approaching a point exceeds the amount that can be served. This is characterised by stop-and-go waves, poor travel times and low comfort and convenience (forced or breakdown flow)

It is therefore considered that a junction operating at a LOS E is close to, or at, capacity and a junction operating at LOS F is considered to be above capacity.

The detailed junction capacity analysis outputs for the analysed junction, for each of the assessment years, are contained within Appendix D to this report.

4.4.1 Location 1: Site Access Junction

A summary of the junction capacity analysis results for this junction are shown in Table 4-3. The results indicate that the junction will continue to operate within capacity for each of the assessment years 2024, 2029 and 2039.

TABLE 4-3: SUMMARY OF JUNCTION CAPACITY ANALYSIS AT SITE ACCESS JUNCTION

	12 Hours (07:00 – 19:00)			
	Queue (Veh)	Delay (s)	RFC	LOS
Stream	**2024 Without Development**			
L8092 – L4012 (S) / Site Access	0.0	5.06	0.01	A
L8092 – L4012 (N) / Site Access	0.0	9.62	0.04	A
L4012 (N) – L8092 / L4012 (S) / Site Access	0.0	0.00	0.00	A
Site Access – L4012 (N) / L8092	0.0	0.00	0.00	A
Site Access – L8092 / L4012 (S)	0.0	0.00	0.00	A
L4012 (S) – L4012 (N) / L8092 / Site Access	0.0	5.1	0.01	A
Stream	**2024 With Development**			
L8092 – L4012 (S) / Site Access	0.0	5.06	0.01	A
L8092 – L4012 (N) / Site Access	0.0	9.80	0.04	A
L4012 (N) – L8092 / L4012 (S) / Site Access	0.0	11.76	0.04	B
Site Access – L4012 (N) / L8092	0.0	9.82	0.03	A
Site Access – L8092 / L4012 (S)	0.0	0.00	0.00	A
L4012 (S) – L4012 (N) / L8092 / Site Access	0.0	5.16	0.01	A
Stream	**2029 Without Development**			
L8092 – L4012 (S) / Site Access	0.0	5.08	0.01	A
L8092 – L4012 (N) / Site Access	0.0	9.79	0.04	A
L4012 (N) – L8092 / L4012 (S) / Site Access	0.0	0.00	0.00	A
Site Access – L4012 (N) / L8092	0.0	0.00	0.00	A
Site Access – L8092 / L4012 (S)	0.0	0.00	0.00	A
L4012 (S) – L4012 (N) / L8092 / Site Access	0.0	5.17	0.01	A
Stream	**2029 With Development**			
L8092 – L4012 (S) / Site Access	0.0	5.08	0.01	A
L8092 – L4012 (N) / Site Access	0.1	9.97	0.04	A
L4012 (N) – L8092 / L4012 (S) / Site Access	0.0	11.74	0.04	B
Site Access – L4012 (N) / L8092	0.0	9.84	0.03	A
Site Access – L8092 / L4012 (S)	0.0	0.00	0.00	A
L4012 (S) – L4012 (N) / L8092 / Site Access	0.0	5.18	0.01	A

Stream	2039 Without Development			
L8092 – L4012 (S) / Site Access	0.0	5.08	0.01	A
L8092 – L4012 (N) / Site Access	0.1	9.97	0.05	A
L4012 (N) – L8092 / L4012 (S) / Site Access	0.0	0.00	0.00	A
Site Access – L4012 (N) / L8092	0.0	0.00	0.00	A
Site Access – L8092 / L4012 (S)	0.0	0.00	0.00	A
L4012 (S) – L4012 (N) / L8092 / Site Access	0.0	5.19	0.01	A
Stream	**2039 With Development**			
L8092 – L4012 (S) / Site Access	0.0	5.08	0.01	A
L8092 – L4012 (N) / Site Access	0.1	10.16	0.05	B
L4012 (N) – L8092 / L4012 (S) / Site Access	0.0	11.73	0.04	B
Site Access – L4012 (N) / L8092	0.0	9.86	0.03	A
Site Access – L8092 / L4012 (S)	0.0	0.00	0.00	A
L4012 (S) – L4012 (N) / L8092 / Site Access	0.0	5.20	0.01	A

4.4.2 Location 2: Prumplestown Cross

A summary of the junction capacity analysis results for Prumplestown Cross are shown in Table 4-4. The results indicate that the junction will continue to operate within capacity for each of the assessment years 2024, 2029 and 2039.

TABLE 4-4: SUMMARY OF JUNCTION CAPACITY ANALYSIS AT PRUMPLESTOWN CROSS

	12 Hours (07:00 – 19:00)			
	Queue (Veh)	Delay (s)	RFC	LOS
Stream	**2024 Without Development**			
L4012 North – R448 East	0.1	10.02	0.12	B
L4012 North – R448 West / L4012 South	0.1	12.56	0.10	B
R448 West – L4012 North / R448 East / L4012 South	0.0	0.00	0.00	A
L4012 South – R448 West	0.0	11.62	0.03	B
L4012 South – L4012 North / R448 East	0.2	12.53	0.14	B
R448 East – R448 West / L4012 North / L4012 South	0.3	6.20	0.12	A
Stream	**2024 With Development**			
L4012 North – R448 East	0.1	10.07	0.12	B
L4012 North – R448 West / L4012 South	0.1	12.77	0.10	B
R448 West – L4012 North / R448 East / L4012 South	0.0	7.13	0.02	A
L4012 South – R448 West	0.0	12.00	0.03	B
L4012 South – L4012 North / R448 East	0.2	13.25	0.17	B
R448 East – R448 West / L4012 North / L4012 South	0.3	6.18	0.12	A
Stream	**2029 Without Development**			
L4012 North – R448 East	0.2	10.38	0.13	B
L4012 North – R448 West / L4012 South	0.1	13.86	0.11	B
R448 West – L4012 North / R448 East / L4012 South	0.0	0.00	0.00	A
L4012 South – R448 West	0.0	12.03	0.03	B
L4012 South – L4012 North / R448 East	0.2	13.69	0.17	B
R448 East – R448 West / L4012 North / L4012 South	0.4	6.76	0.15	A
Stream	**2029 With Development**			
L4012 North – R448 East	0.2	10.44	0.14	B
L4012 North – R448 West / L4012 South	0.1	14.11	0.12	B
R448 West – L4012 North / R448 East / L4012 South	0.0	6.90	0.02	A
L4012 South – R448 West	0.0	12.49	0.03	B
L4012 South – L4012 North / R448 East	0.2	14.43	0.20	B
R448 East – R448 West / L4012 North / L4012 South	0.4	6.74	0.15	A
Stream	**2039 Without Development**			
L4012 North – R448 East	0.2	10.72	0.15	B
L4012 North – R448 West / L4012 South	0.1	15.07	0.13	C

R448 West – L4012 North / R448 East / L4012 South	0.0	0.00	0.00	A
L4012 South – R448 West	0.0	12.38	0.03	B
L4012 South – L4012 North / R448 East	0.3	14.78	0.20	B
R448 East – R448 West / L4012 North / L4012 South	0.5	6.62	0.17	A
Stream	**2039 With Development**			
L4012 North – R448 East	0.2	10.78	0.15	B
L4012 North – R448 West / L4012 South	0.1	15.36	0.13	C
R448 West – L4012 North / R448 East / L4012 South	0.0	6.75	0.02	A
L4012 South – R448 West	0.1	12.92	0.04	B
L4012 South – L4012 North / R448 East	0.3	15.54	0.23	C
R448 East – R448 West / L4012 North / L4012 South	0.5	6.60	0.17	A

5 Road Safety

5.1 Sightlines

Sightlines in both directions at the access to the Sand & Gravel Site have been assessed in accordance with Section 5.6.3 of TII Publications document DN-GEO-03060, which requires 160m of unobstructed visibility (where the design speed is 85kph) at a point 3.0m back from the edge of the carriageway. The posted speed limit on the L4012 is 80kph.

The required visibility to the northwest is provided with sightlines in excess of 160m, as noted during the Site visit. The required visibility to the southeast is, however, not available. Visibility to the southeast was recorded as 70m (approx.), which is limited by a combination of both the vertical and horizontal alignment on the L4012 at this location.

FIGURE 5.1: VISIBILITY TO THE NORTHWEST (LEFT) AND SOUTHEAST (RIGHT) FROM THE SITE ACCESS

However, low volumes of traffic approaching from the southeast were observed at the time of the Site visit, with this supported by the traffic survey data which recorded a total of 158 vehicles (146 travelling past the access) approaching from this direction during the 12-hour survey period, approximately 13 vehicles per hour. Also, due to the road layout and high demand road alignment to the southeast, it is unlikely that vehicles would be approaching at speeds close to 80kph. It should be noted that this is an existing access, which has been operating safely for several years. As such, the existing sightlines at the access are not expected to give rise to any safety concerns.

5.2 Parking

The site currently contains capacity for 15 parking spaces and it is not proposed to revise this provision. The parking provision is considered sufficient to accommodate the number of staff working on site, as well as any visitors to the site, when required.

5.3 Public Transport

There are no existing public transport provisions in place in the vicinity of the Site.

5.4 Pedestrians & Cyclists

There are no existing pedestrian cycle facilities provided on either side of the L4012 in the immediate vicinity of the Site. Footpaths are provided intermittently on both sides of the L4012. On the northern side the footpath commences downstream of the junction with the R448 Regional Road and extends for approximately 230m before terminating at the last residential property on this side of the road. At this location the footpath on the southern side of the road commences, extending as far as the Site access. These footpaths primarily provide access to the residential properties on the L4012.

It is not envisaged that there is a desire line for pedestrians and cyclists to/from the Site.

6 Conclusions

This Traffic and Transport Assessment has determined the following conclusions:

1) Link capacity analysis was carried out on the L4012, and it was determined that it will continue to operate within capacity for each of the assessment years, 2024, 2029, and 2039.

2) Junction capacity analysis was carried out at the Site Access Junction and Prumplestown Cross, and it was determined that these junctions will operate within capacity for each of the assessment years, 2024, 2029, and 2039.

3) The assessment therefore indicates that the Proposed Development will have an imperceptible impact on traffic flows on the existing road network due to the low volumes of traffic being generated by the Proposed Development.

4) Sightlines in both directions at the access to the Sand & Gravel Site have been assessed in accordance with Section 5.6.3 of TII Publications document DN-GEO-03060, which requires 160m of visibility. Whilst this is achieved to the northwest, the required visibility to the southeast is not available.

   Visibility to the southeast was recorded as 70m (approx.), which is limited by a combination of both the vertical and horizontal alignment on the L4012 at this location. However, low volumes of traffic were recorded approaching from the southeast. Also, the road layout and high demand road alignment to the southeast, would result in vehicles travelling at speeds less than 80kph. It should be noted that this is an existing access, which has been operating safely for several years. As such, the existing sightlines at the access are not expected to give rise to any safety concerns

5) The parking provision at the Site is sufficient to meet the required demand.

Appendix A – TRICS Output

Appendix B – Traffic Survey Data

Appendix C – AADTs for the Surveyed Junctions

TABLE 6-1: AADTS AT JUNCTION 1 – (L4012/SITE ACCESS)

Hour Ending	L4012 (North)	L8092	L4012 (South)	Site Access
08:00	53	9	24	20
09:00	59	12	40	13
10:00	45	6	23	18
11:00	28	6	19	5
12:00	26	6	14	8
13:00	37	6	21	16
14:00	48	5	26	21
15:00	34	8	19	9
16:00	40	4	28	8
17:00	88	12	50	28
18:00	76	19	45	22
19:00	46	14	32	2
Period Total	**580**	**107**	**341**	**170**
Period Total HGVs	**167**	**6**	**25**	**144**
% HGVs	**29%**	**6%**	**7%**	**85%**
Total AADT	**689**	**127**	**405**	**202**

TABLE 6-2: AADTS AT JUNCTION 2 – (L4012/R448 STAGGERED JUNCTION – PRUMPLESTOWN CROSS)

Hour Ending	R448 (West)	L4012 (North)	R448 (East)	L4012 (South)
08:00	708	53	758	55
09:00	975	86	1,023	66
10:00	746	54	778	60
11:00	578	42	583	31
12:00	556	67	543	32
13:00	592	39	591	50
14:00	671	57	683	53
15:00	653	65	647	41
16:00	773	85	783	41
17:00	939	95	993	91
18:00	1,126	103	1,162	79
19:00	789	67	805	49
Period Total	**9,106**	**813**	**9,349**	**648**
Period Total HGVs	**513**	**66**	**634**	**167**
% HGVs	**6%**	**8%**	**7%**	**26%**
Total AADT	**10,824**	**966**	**11,113**	**770**

TABLE 6-3: AADTS AT JUNCTION 3 – (M9 JUNCTION 4 WESTERN ROUNDABOUT)

Hour Ending	R448 (West)	M9 On-Slip Northbound	M9 Overbridge	M9 Off-slip Northbound
08:00	758	460	475	43
09:00	1,023	412	791	74
10:00	778	269	614	43
11:00	583	179	501	41
12:00	543	188	430	33
13:00	591	177	474	32
14:00	683	171	609	47
15:00	647	181	550	50
16:00	783	225	662	56
17:00	993	270	820	75
18:00	1,162	302	983	85
19:00	805	157	743	79
Period Total	**9,349**	**2,991**	**7,652**	**658**
Period Total HGVs	**634**	**248**	**548**	**104**
% HGVs	**7%**	**8%**	**7%**	**16%**
Total AADT	**11,113**	**3,555**	**9,096**	**782**

TABLE 6-4: AADTS AT JUNCTION 4 – (M9 JUNCTION 4 EASTERN ROUNDABOUT)

Hour Ending	M9 Overbridge	M9 Off-slip Southbound	R448 (East)	M9 On-slip Southbound
08:00	475	197	361	57
09:00	791	330	593	86
10:00	614	238	470	56
11:00	501	199	390	40
12:00	430	152	360	34
13:00	474	171	402	33
14:00	609	268	462	37
15:00	550	210	451	35
16:00	662	302	518	52
17:00	820	405	634	61
18:00	983	527	693	47
19:00	743	413	499	43
Period Total	**7,652**	**3,412**	**5,833**	**581**
Period Total HGVs	**548**	**269**	**445**	**102**
% HGVs	**7%**	**8%**	**8%**	**18%**
Total AADT	**9,096**	**4,056**	**6,933**	**691**