
14.0 TRAFFIC AND TRANSPORT

14.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report (EIAR) incorporates a Traffic Impact Assessment (TIA) and provides detailed assessments of the traffic characteristics of the existing development and of the proposed development at the Drehid Waste Management Facility (WMF), Killinagh Upper, Carbury, Co. Kildare. This chapter provides a comprehensive review of the current development and of the potential significant traffic effects of the proposed development which considers all project phases.

The development site is occupied by the existing Drehid WMF which was granted planning permission under Reg. Ref. 04/371 (PL09.212059) and is currently operational. The existing facility is located approximately 4.4 km north of Allenwood Village and approximately 8 km to the south of Carbury village.

The site is accessed via a 4.8 km private access road which connects directly to the northern carriageway of R403 regional road at a purpose-built access junction approved under planning permission Reg. Ref. 04/371 (PL09.212059). The detailed design and construction of the existing access was agreed in writing with the planning authority in compliance with Condition No. 15 of Planning Reg. Ref. 04/371 (PL09.212059).

Figure 14-1 shows the general location of the existing development site in the context of the receiving regional and national road network.



Figure 14-1: Site Location

This assessment is underpinned by detailed and comprehensive calculations that support verifiable forecasts of the proposed development traffic generation and provides a basis for identifying traffic volumes on the approved primary regional haul routes and local haul routes proposed to be used by the proposed development generated HGV traffic. The assessment evaluates the potential effects of existing and forecast proposed development generated traffic flows. In addition to detailed technical analysis, the forecast traffic flows are presented together with historic and current traffic generation data recorded at the Drehid WMF with the objective of providing a practical basis for direct non-technical comparison to assist in understanding of these potential effects.

This chapter of the EIAR generally accords with the EPA: *'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'* (2022) and is structured in accordance with Transport Infrastructure Ireland (TII) Publication PE-PDV-02045: *'Traffic and Transport Assessment Guidelines'* (2014).

This chapter describes the receiving roads environment and reports upon recent past, present and forecast future traffic arising at the site and the characteristics of that traffic on the receiving road network. The quantum of traffic generated by the Drehid WMF has been reviewed together with traffic turning count survey data, automatic traffic counter (ATC) data and recent weighbridge data which in combination provide a baseline upon which to set out the current traffic characteristics of the site and from which to forecast the future traffic characteristics arising from the continued generation of development traffic on the receiving road network.

14.2 EXPERTISE AND QUALIFICATIONS

'TOBIN Consulting Engineers' (TOBIN) have completed this chapter. TOBIN Traffic Engineers are familiar with the characteristics of traffic at the Drehid WMF and have worked on many similar industrial and commercial development projects and have prepared EIAR for same. This chapter has been prepared by Maria Rooney of TOBIN Consulting Engineers in association with Julian Keenan of Transportation Planning Consultants 'Trafficwise Limited' who has acted chiefly in a consultative capacity with regard to assessment methodology.

Maria Rooney (TOBIN Senior Engineer: Roads and Traffic) is a Chartered Engineer and has a Bachelor of Engineering in Civil Engineering and Master of Engineering in Roads and Transport Engineering. She has over nine year's work experience in roads and transport engineering. Maria has undertaken many Traffic and Transportation Assessments (TTA) and EIAR Traffic Chapters for various developments including environmental projects, waste management facilities, energy projects, and extractive industry projects for example:

- P21/38 Ardnehue 10 MW Solar Farm, Co.Carlow
- P17/669 Ballyragget Solar Farm, Co Kilkenny
- P21/74 Kellys of Fantane Quarry, Thurles, Co. Tipperary
- P03/17900 McGrath Limestone Works Westport, Co. Mayo
- P20/205 Booths Precast Concrete, Portlaoise, Co. Laois
- P19/197 Rhyne Rock Ltd, Co. Longford

Julian Keenan holds the degree of Bachelor of Engineering (Hons.) in civil engineering conferred by University College, Galway, in 1990. Mr Keenan is a member of the Institution of Engineers of Ireland and a member of the Chartered Institution of Highways and Transportation. Mr

Keenan has over 32 years engineering experience, including approximately seven years in local government in the United Kingdom and over 25 years of private engineering consultancy services in Ireland, of which 20 years are with Trafficwise Limited. He has specialised in roads design and traffic and transportation planning for approximately 27 years. Consultancy experience includes advising clients in relation to road schemes, residential, commercial, industrial and leisure developments for which the key work involves provision of professional services in the design and appraisal of schemes, including the preparation of planning applications and appeals. Mr Keenan has represented clients at An Bord Pleanála oral hearings for commercial development, strategic infrastructure development and represented landowners and stakeholders in relation to various road schemes and infrastructural works. He has given sworn evidence before the Property Arbitrator, including in relation to road schemes, and has provided expert witness testimony to the High Court.

Julian Keenan has carried out Traffic and Transport Assessments and has been involved in the preparation of Environmental Impact Assessment Reports for similar projects of which the following is a selection of those having similar traffic characteristics to both the existing development and the proposed development:

- PL17.220331 (NA/60336) Knockharley Landfill, Navan, Co. Meath
- ABP-303211-18 Knockharley Landfill, Tuiterrath, Flemington, Navan, Co. Meath
- PL27.131213 Engineered Residual Landfill, Ballynagran, Coolbeg, Co. Wicklow
- PL07.205181 (02/3811) East Galway Residual Landfill, Ballinasloe, Co. Galway
- PL09.131620 Residual Landfill, USK Quarry, Kilcullen, Co. Kildare
- PL04.222987 Residual Landfill, Ballyguyroe North, Mallow, Co. Cork
- ABP-309991-21 Ballinclare Quarry, Kilbride, Co. Wicklow

14.3 RELEVANT PLANNING HISTORY

14.3.1 MECHANICAL BIOLOGICAL TREATMENT (PL09.PA0027)

Bord na Móna was granted planning permission by An Bord Pleanála in 2013 under Case Ref. PL09.PA0027. The permission was for a Mechanical Biological Treatment (MBT) Facility at the subject site. It should be noted Bord na Móna has since decided not to proceed with the MBT facility.

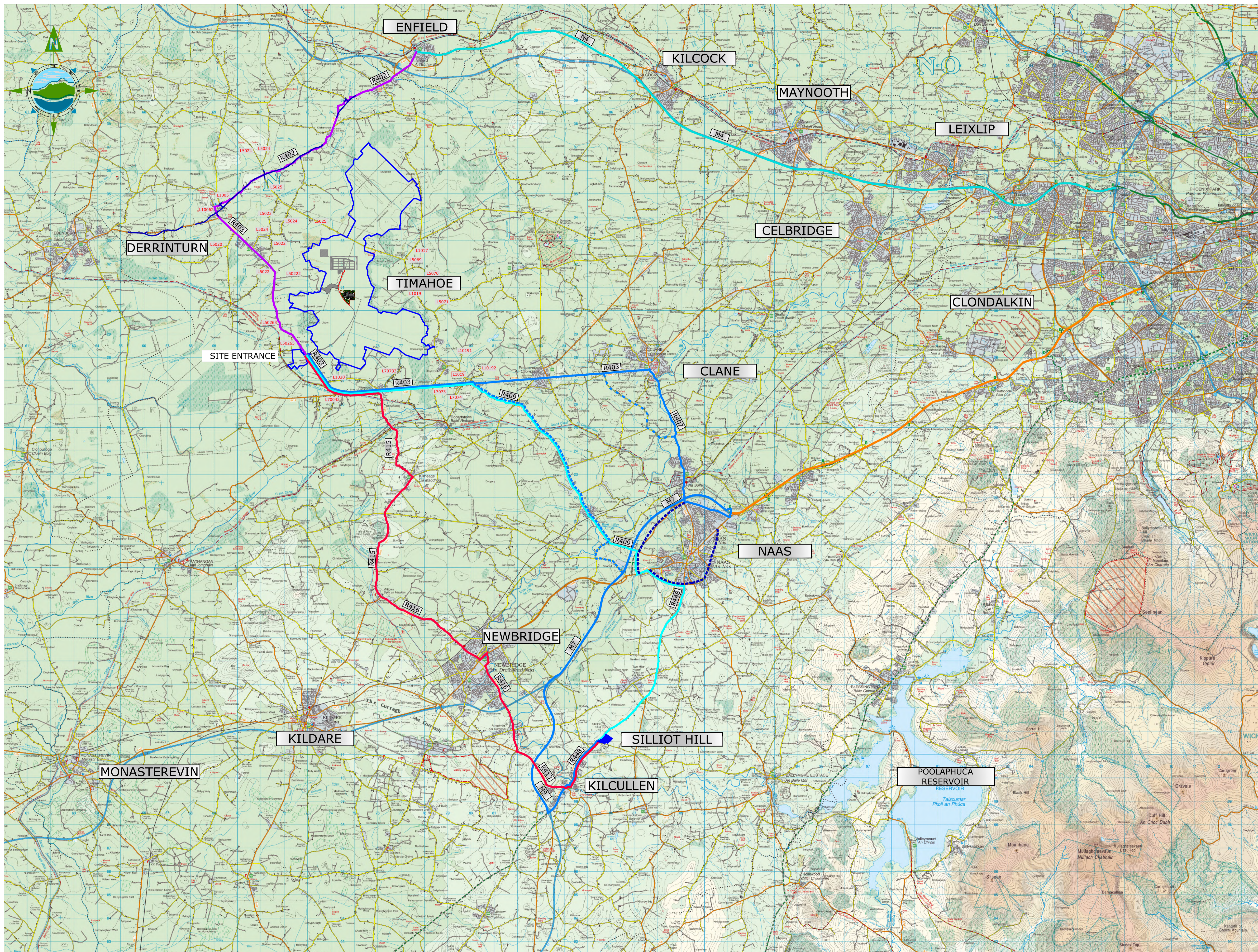
In order to inform this assessment, a review of this planning application was undertaken to determine the previously granted haul routes, to determine the volume of traffic potentially generated by that facility and to revisit the Planning Authority determination of the application and the resultant grant of permission and conditions of planning.

The permitted MBT was designed to accept and process primarily municipal solid waste (MSW) with an overall capacity of 250,000 tonnes per annum. The proposed location of the permitted facility was within the overall Bord na Móna landholding immediately to the south of the proposed development planning boundary. The permission was for a period of 10 years which is due to expire in 2023. For various reasons Bord na Móna have decided not to act upon the grant of permission and the MBT will not be developed. The permitted MBT development was to be co-located at the Drehid WMF site. Transportation related matters arising from the determination of that application are set out here.

The schedule appended to the grant of permission included conditions of planning related to the agreement of financial contributions with the planning authority and also included a condition related to the transport of materials via identified haul routes. That condition made provision for those identified haul routes to be reviewed and agreed with the appropriate authority throughout the operational period of the MBT development. The relevant Conditions 15, 16 and 17 are transcribed herein:

15. All materials being transported to the site, either in the construction or operational phases, shall be transported via the haul routes as identified in Figure 11.1 of the environmental impact statement. After a period of three years of the operational phase of the facility and at regular three year intervals, a review of the impact of the heavy goods vehicle movements generated on the local road network shall be carried out by the developer in conjunction with the planning authority. Any revisions to the routes allowed to and from the site shall be agreed and implemented within six months of the review.

For ease of reference a copy of Figure 11.1 of the environmental impact statement for the MBT facility is provided.



GENERAL LEGEND

BORD NA MONA OWNERSHIP BOUNDARY	SITE ACTIVITY BOUNDARY
HAUL ROUTE No.1	HAUL ROUTE No.3
HAUL ROUTE No.1.1	HAUL ROUTE No.4
HAUL ROUTE No.1.2	COMPLETED NAAS ROAD IMPROVEMENTS
HAUL ROUTE No.2	
HAUL ROUTE FROM M50 TO REGIONAL ROAD NETWORK VIA M7/N7	
HAUL ROUTE FROM M50 TO REGIONAL ROAD NETWORK VIA M4/N4	
L7074 LOCAL ROAD	

- NOTES**
- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 - ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 - ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 - ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD
 - 6" OS SHEET NO'S: KILDARE 3, 4, 8, 9 & 13



Rev	Date	Description	By	Chkd.
A	08.06.21	ISSUED FOR REPORT	MN	DG

Client: **BORD NA MÓNA**
Naturally Driven

Project: **DREHID MECHANICAL BIOLOGICAL TREATMENT (MBT) FACILITY**

Title: **HAUL ROUTES**

Scale @ A1:	1:37,500
Prepared by:	M. Nolan
Checked:	D. Grehan
Project Director:	S. Tinnelly
Drawing Status:	Final

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Drawing No.: **Figure 11.1** A

16. The developer shall pay a sum of money to the planning authority, either annually or in such manner as may be agreed, towards the cost of the provision of environmental improvement and recreational or community amenities in the locality. The identification of such projects shall be decided by the planning authority in consultation with the local community. The amount of the contribution and the arrangements for payment shall be agreed between the developer and the planning authority or, in default of agreement shall be referred to the An Bord Pleanála for determination. The amount shall be index linked in the case of phased payments.

17. The developer shall pay to the planning authority a financial contribution in respect of public infrastructure and facilities benefiting development in the area of the planning authority that is provided or intended to be provided by or on behalf of the authority in accordance with the terms of the Development Contribution Scheme made under section 48 of the Planning and Development Act 2000, as amended. The contribution shall be paid prior to commencement of the development or in such phased payments as the planning authority may facilitate and shall be the subject of any specified Indexation provisions of the Scheme which shall be applied from the date of making of the Scheme. Details of the application of the terms of the Scheme shall be agreed between the planning authority and the developer or, in default of such agreement, the matter shall be referred to the An Bord Pleanála to determine the proper application of the terms of the Scheme.

At the time of determining the permitted MBT facility it was expected that it would operate conjunctively with the existing permitted Drehid WMF so the assessment of traffic impact in the environmental impact statement considered the cumulative traffic generation arising. The haul routes identified for the MBT facility are also those associated with road haulage to and from the Drehid WMF and are similarly identified for the continued use as haul routes for the proposed development. In the context of the identified haul routes, the MBT environmental impact statement forecast that the facility had the potential to generate approximately 60 no. one-way HGV trips (40 no. movements inbound and 20 no. movements outbound – one-way) (120 total HGV trips daily) during the operational phase. For ease of reference, the figures provided in the environmental impact statement for the MBT are set out in Table 14-1 together with the assumptions underlying their derivation.

Table 14-1: Mechanical Biological Treatment Facility – Forecast Traffic Generation

	Volume (tonnes/annum)	HGVs per year ¹	HGVs (ine-way) per day ²
MBT Plant / Incoming	250,000 t/a	12,500 no.	40 ³ no.
MBT Plant / Outgoing	118,841 t/a	6,107 no.	20 ³ no.
Σ	368,841	18,607	60 no.

(1) Bulk Haulage Vehicles – 20 tonne payloads assumed.

(2) 312 working days assumed based on 52 weeks per year and 6 days per week.

(3) Combined two-way flow 80 no. HGV per day.

Inherent in the grant of permission for the MBT facility is an acknowledgement that the identified haul routes were determined to be suitable to accommodate the cumulative traffic arising from the MBT and the existing Drehid WMF. Although some minor site enabling works had started for the permitted MBT facility, Bord na Móna has now decided not to proceed with this development. The traffic effects of the MBT facility will accordingly not now be realised on the identified haul routes.

14.3.2 PREVIOUS DEVELOPMENT PROPOSAL

In 2017 Bord na Móna submitted an application to develop the existing permitted Drehid WMF under ABP Case Reference ABP-300506-17. The proposed development was ultimately refused planning permission. The highlight features of that proposal included the following:

- Changes to the volume and types of waste accepted for disposal;
- Development of additional non-hazardous and new hazardous landfill capacity;
- Pre-treatment/processing of certain waste streams prior to landfill;
- Increasing the volume of waste to be accepted at the composting facility, and the removal of the restriction on the operating life of the composting facility contained in Condition 2(2) of An Bord Pleanála Case No. PL.09.212059;
- On-site treatment of leachate; and
- Development of associated buildings, plant, infrastructure and landscaping.

In the traffic assessment accompanying the planning application, traffic generated by the proposed extension to the WMF facility was expected to populate the haul route network conjunctively with the traffic arising from the permitted MBT facility. Therefore, the traffic impact in the assessment considered the cumulative traffic generation arising from the MBT and proposed Drehid WMF development.

The haul routes identified for the proposed extension are also those associated with road haulage to and from the MBT facility. It was forecast under Scenario 1; Existing Facility with the Proposed Development and the permitted MBT Facility (2019 – 2027) had the potential to generate up to 157 no. daily one-way HGV trips (127 no. movements inbound and 30 no. movements outbound – one way) during the operational phase. For ease of reference, the figures provided in the Traffic Chapter are set out in Table 14-2 together with the assumptions underlying their derivation.

Table 14-2: Previous Planning Submission Scenario 1 – Forecast Traffic Generation

	Volume (tonnes/annum)	Deliveries per year ⁴	Daily (one way)
Scenario 1 – Incoming HGV's; Existing Facility with the Proposed Development and the permitted MBT Facility			
Existing Facility / Landfill, Composting Facility & Engineering Materials	199,680 t/a	9,984 no.	33 no.
MBT Plant	250,000 t/a	12,500 no.	40 ⁶ no.
Proposed Non-Hazardous Facility	250,000 t/a	12,500 no.	40 no.
Proposed Hazardous Facility	95,680	4,784	14 no.
∑ Incoming			127 no.

Scenario 1 – Outgoing HGV's; Existing Facility with the Proposed Development and the permitted MBT Facility			
Leachate	42,640 t/a	2,132 no.	7 no.
Proposed Non-Hazardous Facility / Recyclables	14,560 t/a	728 no.	3 no.
MBT Plant / Recyclables & SRF	126,880 t/a	6,344 no.	20 no.
Σ Outgoing			30 no.
Σ Incoming + Outgoing			157 no.

(4) Bulk Haulage Vehicles – 20 tonne payloads assumed.

(5) 312 working days assumed based on 52 weeks per year and 6 days per week.

(6) Combined two-way flow 80 no. HGV per day.

Submissions from Kildare County Council and the assessment of the An Bord Pleanála Inspector set out a number of concerns relevant to traffic and transportation matters arising with respect to the 2017 proposed Drehid WMF development and the conjunctive operation of the MBT facility and these underpin the reasons for the refusal.

Matters considered by An Bord Pleanála and in particular those matters set out in the An Bord Pleanála Inspectors Report have been referenced to inform this chapter especially with respect to the calculation of traffic generation arising at the site. The Board Inspector had referenced a degree of uncertainty, in that no consensus was reached between Kildare County Council and the Applicant as to the forecast traffic generation of that proposed development. The 2017 application had provided various sensitivity analyses and various theoretical and hypothetical scenarios which may have contributed to such uncertainty. Various assumptions need to be made throughout traffic assessments and importantly these are specifically set out and clearly detailed in this EIAR. The traffic forecasting in this Chapter is based upon in depth analysis of available historical site records for the existing Drehid WMF extending for 5 no. years and is sufficiently detailed to avoid insofar as practicable uncertainty with respect to the data origins, analysis and the derivation of statistics upon which the forecast of traffic generation arising at the proposed development rely.

In the absence of the MBT facility, there is less complexity to the forecasting of traffic volumes on the agreed haul routes. The traffic assessment in this Chapter clearly details and compares the key traffic generating characteristics of the existing permitted Drehid WMF and the proposed development and in this way ultimately confirms the traffic characterisation of the proposed development as continuance of the permitted Drehid WMF.

The previous roads and traffic related reasons for refusal of the application considered under Case Reference ABP-300506-17 were grounded on the expectation of a significant increase in the volume of traffic generated by the site. The Bord Inspector's report recounts that a submission on behalf of Kildare County Council suggested that the site might generate as much as 424 no. HGV two-way movements whilst the Applicant forecast was 254 no. HGV two-way movements. The Board Inspector agreed with one particular alternative scenario presented by Kildare County Council and considered a figure of 310 no. HGV two-way movements a more realistic worst-case scenario. It is not clear how this figure of 310 no. HGV was supported but upon reading the Board Inspector's report it is reasonable to assume that the Board Inspector's recommendations in respect of traffic impacts have regard to it, and perhaps rely upon it. It is

also reasonable to assume that the cumulative traffic impact would have factored in the effect of the proposed development operating in tandem with the permitted MBT facility. The figure of 310 no. HGV two-way without the MBT facility would undoubtedly have constituted a 'significant' increase in traffic generation and it is this 'significant' increase that underpins the reasons for refusal.

Inherent in the grant of permission for the MBT facility is a determination that the existing haul routes are suitable for the existing or current volume of traffic generated by the Drehid WMF and the MBT facility combined. In refusing permission, the development previously proposed in 2017 had been adjudged to have the potential to significantly increase HGV traffic perhaps by as much as double that considered in the MBT Facility application as arising from the MBT and existing WMF operating in tandem.

Based upon the analyses provided in this Chapter, it will be clearly shown that the likely traffic generation of the proposed development will be less than or similar to that currently generated by the operation of the existing Drehid WMF and is approximately half the lower figure of 310 no. HGV relied upon in the Board Inspectors previous recommendations. The proposed development will not give rise to a 'significant' increase in HGV traffic and could, in terms of traffic generation alone more accurately be characterised as a continuance of existing and historic HGV traffic generation at the existing Drehid WMF facility.

The proposed principal haul routes are the same haul routes used by the existing WMF and the haul routes previously determined suitable to serve the proposed development of the MBT facility in conjunction with the Drehid WMF. Permission for the development of the MBT facility was granted under An Bord Pleanála Case Ref. 09.PA0027, Condition No.18 required a special contribution under Section 48(2)(c) of the Planning and Development Act 2000 as amended in respect of road improvements to the permitted haul routes. Prior to the Applicant's decision not to develop the MBT facility, the Applicant had complied with Condition 18 to the satisfaction of Kildare County Council. In agreeing matters relating to Condition 18, the Applicant and Kildare County Council would have anticipated the MBT Facility and existing WMF operating conjunctively. These considerations are a reasonable indicator that, in contrast to the 2017 application, Kildare County Council as the Roads Authority responsible for the management and maintenance of roads under the Roads Act 1993, is satisfied that the proposed haul routes can accommodate traffic of the type and volume generated by the current proposed development. As will be clearly shown in the chapter, the proposed Drehid WMF development will generate less HGV traffic than Kildare County Council anticipated would arise from the operation of the existing WMF and MBT facility.

14.4 EXISTING DREHID WMF DEVELOPMENT

Chapter 2 outlines the project description in detail. In brief, the existing Drehid WMF is permitted to accept the following materials:

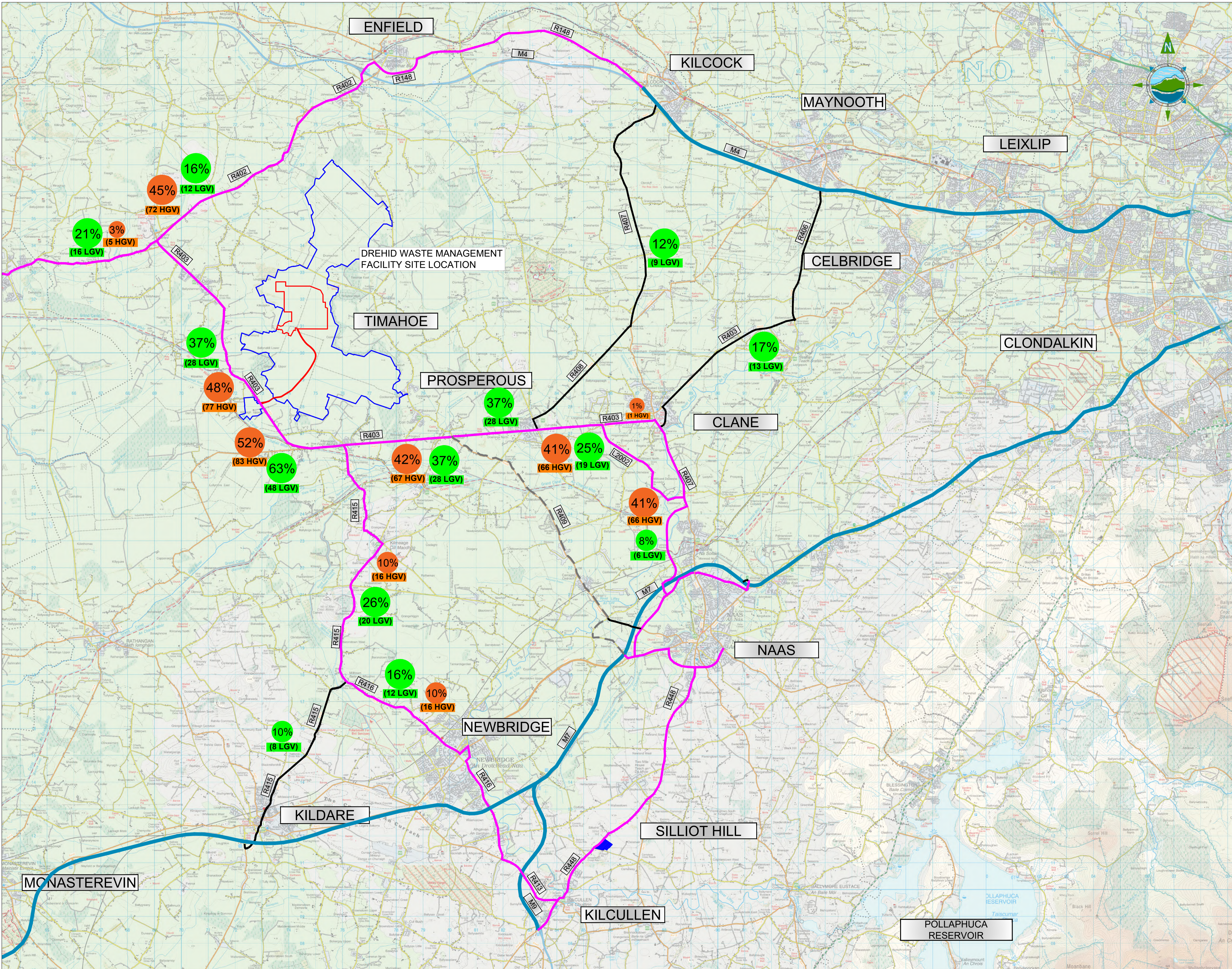
- Landfilling of Non-Hazardous Municipal, Commercial & Industrial wastes waste up to 120,000 TPA;
- Composting facility accepting up to 25,000 TPA; and
- Inert waste (where used in landfill engineering) No limit- EPA Waste Licence W0201-03).

The above waste activities are authorised at the facility until 2028 under the current planning permission Planning Reg. Ref. 04/371 (PL09.212059) and IE Licence. Condition No.1.5 of the current EPA licence W0201-03 issued in March 2010. This sets out the permitted hours for waste acceptance for disposal at the landfill as 08:00 to 18:30 hrs Mondays to Saturday.

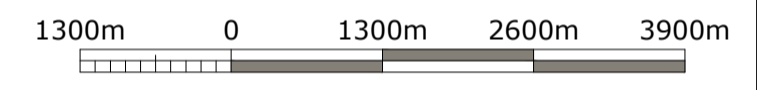
All HGV importing materials to the existing Drehid WMF are required to use existing haul routes previously identified in the planning process and agreed with the Roads Authority in compliance with Reg. Ref. 04/371 (PL09.212059) Condition 13. Subsequently, the existing primary haul routes shown in Figure 14-4 of EIAR were also identified and agreed with Kildare County Council in compliance with the grant of permission for the MBT Facility. The haul routes principally include: M4 Motorway to the north via the R403 and R402; and M7 Motorway to the south via the R415 & R416 and R403, L2002 & R407 and Sallins Bypass.

Examination of detailed weighbridge records for the 5 no. year period of operations between 2018-2022 show that historical HGV traffic movements generated by the operation of the existing Drehid WMF distribute approximately 48% to/from the north via the M4 and 52% to/from the south via the M7 as shown in Figure 14-2 . It is self-evident that the greatest concentration of development traffic is at the development access. Generally speaking, the concentration of traffic reduces inversely to distance from the site and this is what ultimately defines the study area or area of influence of development traffic arising at the existing and proposed Drehid WMF.

Waste material is imported principally in articulated and rigid trucks Figure 14-2 is based upon detailed examination and collation of waste origins as recoded by the existing Drehid WMF facility weighbridge for the most recent 5 no. years for which 12 months of data is available which includes the years 2018, 2019, 2020, 2021 and 2022. Figure 14-3 shows geographically the county of origin of wastes received by the existing Drehid WMF over the 5 no. year period. The proportion of all waste received over that period is annotated for each county.



- GENERAL LEGEND**
- BORD NA MONA OWNERSHIP BOUNDARY** (Blue line)
 - APPLICATION BOUNDARY** (Red line)
 - NATIONAL MOTORWAY NETWORK** (Blue line)
 - M4/M7/M9** (Blue line)
 - APPROVED HAUL ROUTES** (Pink line)
 - LOCAL HAUL ROUTES** (Black line)
 - APPROVED HAUL ROUTES (HGV Restricted)** (Black line)
 - R4##** (Regional Road)
 - PROPORTION OF HGV TRAFFIC (160 Trips per day)** (Orange circle)
 - PROPORTION OF LGV TRAFFIC (76 Trips per day)** (Green circle)



Rev	Date	Description	By	Chkd.
A	18.05.23	PLANNING ISSUE	MN	MR

Client:
Bord na Móna

Project:
DREHID WASTE MANAGEMENT FACILITY FURTHER DEVELOPMENT

Title:
EXISTING DISTRIBUTION (2018 - 2022)

Scale @ A1: 1:65,000
 Prepared by: E. Beggs
 Checked: M. Rooney
 Date: February 2023
 Project Director: D. Grehan
 Drawing Status: Planning

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 Drawing No.: **Figure 14.2** Revision: **A**

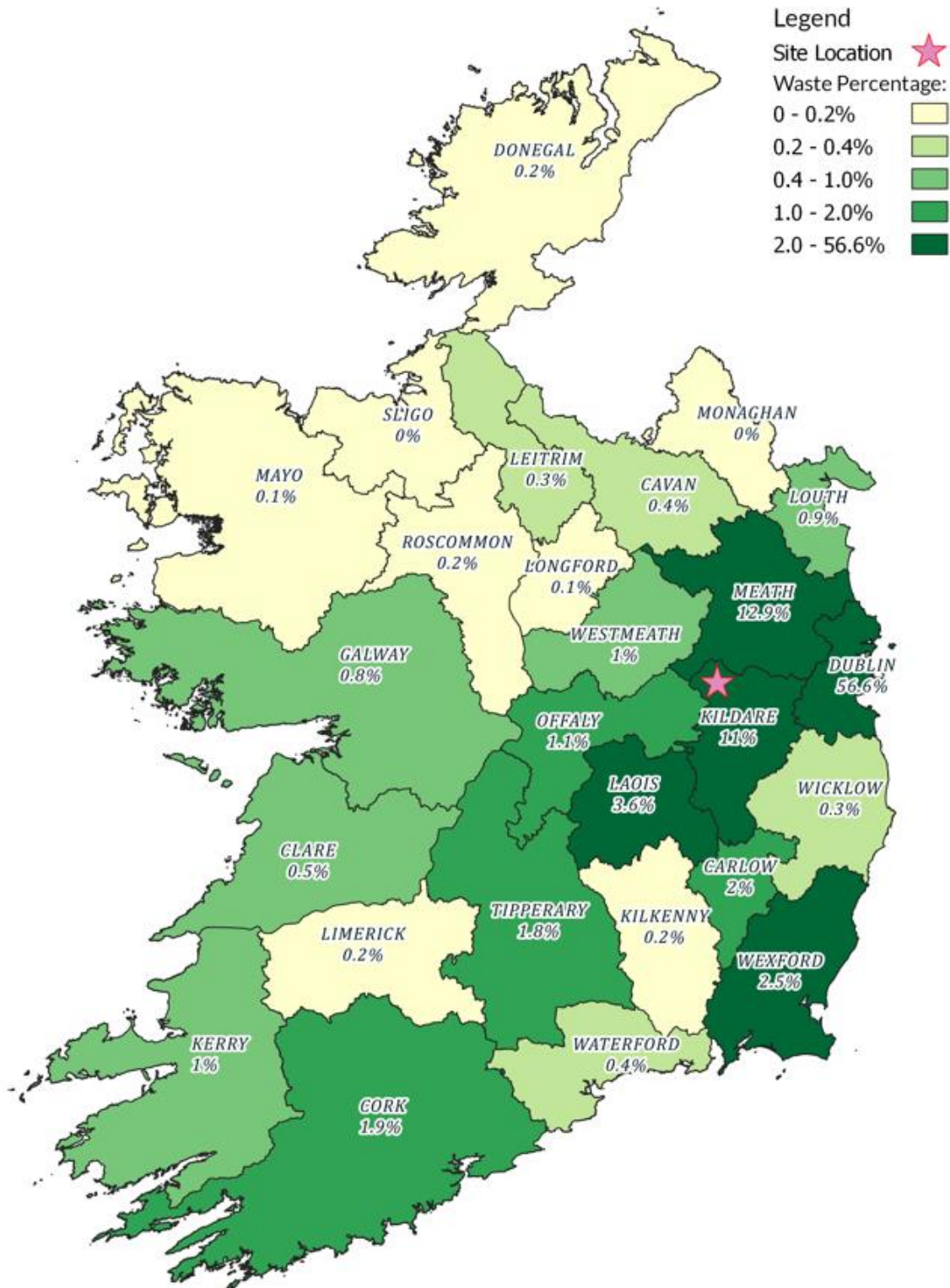
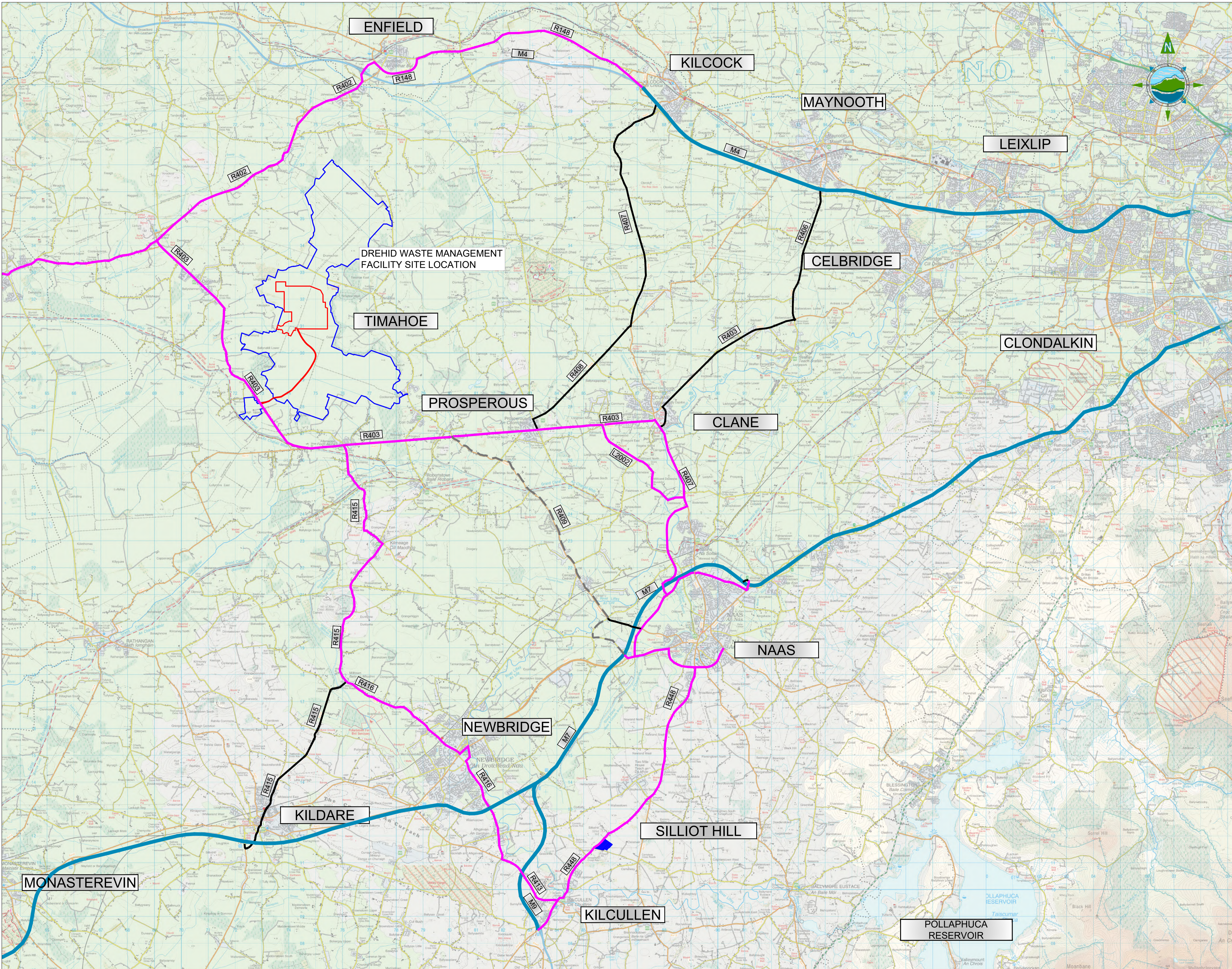


Figure 14-3: Geographical Distribution of HGV Traffic (2018-2022)

The existing haul routes used by the Drehid WMF are identified in Figure 14-4 . Primary Haul Routes are those that include the National Road network and those that provide access to the National Road network. They are identified by the magenta coloured Regional Roads and blue National Roads north and south of the existing development access. The Primary Haul Route to the north uses the N4 National Road and M4 Motorway via the Regional Roads R403 and R402. To the south the Primary Haul Route is the M7 Motorway via the Regional Roads R415 & R416 and R403 & R407. Within the geographical area encompassed by or around the Primary Haul Routes there are waste arisings from sources not contiguous with the Primary Haul Routes. Waste transportation vehicles accessing the Primary Haul Routes travel along Local Haul Routes which carry significantly less traffic when compared to the primary routes. The most heavily trafficked Local Haul Routes are identified in Figure 14-4 by various black solid or dashed lines. The local routes are not associated with longer distance haulage of materials and have been identified as those routes along which there are local arisings either from existing waste related operations or from local collections.

By way of explanation for instance, the Regional Road R408 / R407 between Prosperous and Kilcock is highlighted as a Local Haul Route. This Local Haul Route is not identified as a shorter route or alternative route for haulage of material being transported along the N4/M4. This Local Haulage Route is identified as associated with local waste arisings. The logistics are such that waste arising closer to Kilcock and in Kilcock accesses the N4/M4 Primary Haul Route whilst waste arising closer to Prosperous joins the M7 Haul Route which includes the Regional Road R403 at Prosperous.

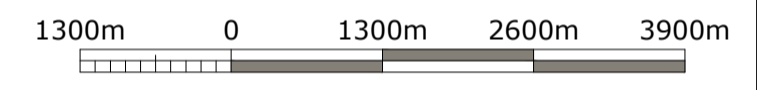
In the interest of a comprehensive assessment Figure 14-4 also shows previously identified haul routes that, based upon review with Kildare County Council are currently not in general use by HGV generated to Drehid WMF due to various access restrictions which include weight restrictions and width restrictions on bridges. For instance, the R409 is not in use due to a 3.5 t weight restriction and 2.15 m width restriction at Carragh Bridge which carries traffic over the River Liffey approximately 700 m south of the Carragh village centre. Figure 14-2 shows the distribution of existing Drehid WMF HGV traffic which has been calculated based upon the origin of each waste stream or material type received at the site over the 5 no. year period 2018-2022. In brief, the split at the development access is 52% to/from the south and 48% to/from the north. The various proportions of the total HGV traffic of the existing Drehid WMF are annotated on each of the identified existing haul routes. Also shown in Figure 14-2 is the distribution of Drehid WMF light vehicle traffic. The split of light vehicle traffic has been determined from classified turning count surveys at the existing site access. As is typical practice and recommended by the Chartered Institution of Highways and Transportation this traffic is distributed on the adjoining highway in accordance with the proportions of current traffic turning flows recorded in traffic surveys. For the purposes of this assessment it is assumed that the general distribution of existing and future light vehicle traffic on the greater road network will be the same as the distribution of all light traffic as recorded in the 2022 traffic surveys detailed in the chapter.



GENERAL LEGEND

BORD NA MONA OWNERSHIP BOUNDARY APPLICATION BOUNDARY

- NATIONAL MOTORWAY NETWORK M4/M7/M9
- APPROVED HAUL ROUTES
- LOCAL HAUL ROUTES
- APPROVED HAUL ROUTES (HGV Restricted)
- R4## REGIONAL ROAD



Rev	Date	Description	By	Chkd.
A	23.02.23	PLANNING ISSUE	MN	MR

Client:
Bord na Móna

Project:
DREHID WASTE MANAGEMENT FACILITY FURTHER DEVELOPMENT

Title:
EXISTING DREHID WMF HAUL ROUTES

Scale @ A1: 1:65,000
 Prepared by: E. Beggs
 Checked: M. Rooney
 Date: February 2023
 Project Director: D. Grehan
 Drawing Status: Planning

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Drawing No.: **Figure 14.4** A

14.5 PROPOSED DEVELOPMENT

The development will consist of an extension of the existing Drehid WMF to provide for the acceptance of up to 440,000 TPA of non-hazardous waste material.

As per the existing scenario, it is proposed that vehicles transporting materials to and from the site will continue to use the primary Haul Routes as identified in Figure 14-4. These are the haul routes currently in use and agreed with Kildare County Council under the terms of Condition 13 of the permission granted under Planning Reg. Ref. 04/371 (PL09.212059). The existing Haul Route network has been revised into its current format through agreements with Kildare County Council in parallel with its responsibility for the management and maintenance of roads under the Roads Act 1993. The existing haul route map comprises roads which are satisfactory by reference to the current agreements with the Roads Authority for the permitted existing Drehid WMF development. Notwithstanding the abandonment of the development of the permitted MBT Facility, inherent in the grant of permission for the MBT facility is an acknowledgement that the identified haul routes, which are the current and proposed haul routes were determined suitable to accommodate the cumulative traffic arising from the previously approved MBT and the existing Drehid WMF. It follows as self-evident that the haul routes are suitable to accommodate the volume of traffic generated by the Drehid WMF alone, or indeed a lesser volume as might arise from the proposed development of the Drehid WMF.

One of the core objectives in formulating the current proposal has been to limit daily HGV traffic generation at the proposed Drehid WMF to a value equal to or less than the current permitted Drehid WMF operation. The materials brought to the site can be identified by various waste streams. Each waste stream or waste type has different characteristics where some are more dense and are transported in heavier loads and others less dense, requiring a greater number of vehicle movements for an equivalent tonnage. The current proposed development is less complex than the previous development considered under Case Reference ABP-300506-17. The proposed development includes changes in the proportions of the various waste streams and materials transported to the site including changes in the volumes of material in each waste stream or material. The result of the changes is such that from the perspective of total daily HGV traffic generation the proposed development might reasonably be considered akin to continuance of the existing development. The methodology underpinning the assessment of traffic generation is clearly set out and detailed and the resulting forecasts confirm that the day-to-day traffic generation arising at the proposed development will be comparable in number to that which has prevailed under the current permission both during the operational phases and during the intermittent periods of landfill cell construction which are a characteristic of landfill development in general and have been a characteristic of Drehid WMF since its opening.

In the context of estimating the trip attraction of a proposed development there are a variety of assessment methodologies in general use. The 'Frist Principles' method involves using simple assumptions about the development, its users and their behaviour. This method can lead to inaccuracies and is usually only used where there is no other alternative. The 'Comparison' method involves comparing the proposed development with a similar existing development and applying survey information from that site to the proposed development. This method can often be cross referred to a trip attraction database such as TRICS which often provides a larger number of sample sites. In the case of the proposed development there are no relevant survey sites in the TRICS database. Drehid WMF already operates and from the perspective of traffic generation the proposed development will generate vehicles with the same characteristics albeit transporting different proportions of materials. The existing and proposed Drehid WMF site are one and the same with the same demographics and the same haul routes and principally the same or similar sources of materials. The current proposal seeks to rely on the existing haul

routes and existing site access, and it is not proposed to construct new road infrastructure. It is self-evident and follows that the existing traffic characteristics of the Drehid WMF site, including vehicle carrying capacity, vehicle loading, vehicle distribution and assignment are likely to represent the best basis of comparison from which to derive an accurate model of the traffic generating characteristics of proposed development. So the trip attraction model for the proposed development is based upon detailed examination of a large sample of historical traffic data for the existing Drehid WMF.

The forecasts of future traffic volumes and assessment of their effects upon the receiving road network are based upon detailed examination of Drehid WMF site records extending over a period of 5 no. years which is considered a statistically significant period.

14.5.1 ASPECTS RELEVANT TO THIS ASSESSMENT

14.5.2 DEVELOPMENT SITE ACCESS

Access is provided into the Drehid Waste Management Facility from the R403 via a previously permitted site access junction and a dedicated 4.8 km private access road. The speed limit on the R403 at the site entrance junction is 80 km/h. The existing site access junction is a ghost island priority junction. In compliance with Condition 15 of Planning Reg. Ref. 04/371 (PL09.212059) the detailed design and construction of the existing access junction serving the Drehid WMF to the R403 has been carried out in accordance with the detailed requirements of the planning authority for such works. The existing development access comprises a ghost island priority junction incorporating a right turn lane. A recessed gate is provided at a setback of 80 m from the R403. Advance warning signs and regulatory roads signs indicate the presence of the existing access junction.

14.6 METHODOLOGY

This assessment has been carried out in accordance with relevant local government policy and in accordance with national guidelines and standards of best practice. In completing this assessment reference has been made to the following publications:

- TII Publication PE-PDV-02045 '*Traffic and Transport Assessment Guidelines*', (May 2014);
- TII Publication PE-PAG-02017 '*Project Appraisal Guidelines for National Roads Unit 5.3: Travel Demand Projections*' (Oct 2021);
- TII Publication PE-PAG-02039 '*Project Appraisal Guidelines for National Roads Unit 16.1: Expansion Factors for Short Period Traffic Counts*' (Oct 2016);
- TII Publication PE-PAG-02016 '*Project Appraisal Guidelines for National Roads Unit 5.2 - Data Collection*' (Oct 2016);
- Kildare County Development Plan 2023-2029;
- Clane Local Area Plan 2017-2023;
- Kilcullen Local Area Plan 2014-2020;
- Newbridge Local Area Plan 2013-2019;
- Kildare Town Local Area Plan 2019-2025;
- Naas Town Development Plan 2021-2027; and

- Naas, Northwest Quadrat Masterplan 2009

This Chapter is a comprehensive traffic assessment undertaken in accordance with Traffic Infrastructure Ireland (TII) Publication PE-PDV02045 'Traffic and Transport Assessment Guidelines' (May 2014) and includes traffic assessment, traffic flow analysis together with the assessment of potential impacts and cumulative impacts. The detail provided in this Chapter is informed by a review of the determination of the previous application under An Bord Pleanála Case Ref. ABP-300506-17 with particular regard to the submissions of Kildare County Council and the Assessment set out in the Inspector's Report. Where assumptions are needed these are specifically set out and detailed and the level of detail included within this Chapter is sufficient to enable the Board, Kildare County Council and third parties to be able to follow all stages and end up with a similar set of results. The study area for this Chapter includes the same wide geographical area previously considered in the traffic assessment carried out for Case Reference ABP-300506-17. The study area was confirmed for that study as satisfactory by TII and Kildare County Council. TII and Kildare County Council have confirmed at the pre-planning stages that the same study area is appropriate for this Chapter. This Chapter notes traffic volumes attending the site and traffic on the routes to/from the site, with reference to impacts on the national road network, regional road network and lower category roads. The 'Traffic and Transport Assessment Guidelines' (2014) have been referenced in relation to proposed development with regard to potential impacts on the national road network and receiving regional road network.

There are three key objectives that underpin the traffic assessment reported in this Chapter which included: (1) Clearly identifying the study scope and proposed haul routes to be used. (2) Clearly set out the methodology, assessment approach and basis of forecasting traffic generation which can be broadly set out as being based on detailed analysis of historic traffic records and weighbridge data for the existing Drehid WMF. (3) Forecast potential traffic impact on the receiving road network together with corresponding mitigation measures where warranted.

The study area for the traffic assessment in this Chapter includes traffic surveys at the same locations agreed with Kildare County Council in the preparation of the traffic study undertaken for ABP Case Ref. ABP-300506-17. This includes 17 no. automatic traffic counter sites that recorded 2 weeks of continuous data and 5 no. classified junction turning count surveys each of 1 no. days duration. Figure 14-5 identifies the various survey locations. In addition to the traffic surveys this study includes detailed and comprehensive pavement condition surveys along the primary haul routes between the development access and the National Road Network (N4/M4 and N7/M7). These repeat the pavement condition surveys completed in 2016 which were submitted to Kildare County Council for the previous development considered under ABP Case Ref. ABP-300506-17. The two comparable sets of detailed traffic flow data and road condition survey data provide a basis to assist Kildare County Council in its capacity as Roads Authority and under its responsibility for management and maintenance of the road network to assess the rate of wear and identifying appropriate road improvement and maintenance works. To assist Kildare County Council in examining the traffic survey and road condition survey data, to facilitate their assessment of road maintenance, the Applicant has provided to Kildare County Council a digital copy of all baseline traffic surveys and road condition surveys.

The proposed principal haul routes are those currently in use and agreed with Kildare County Council under the terms of Condition 13 of the permission granted under Planning Reg. Ref. 04/371 (PL09.212059). The existing Haul Route network has been revised into its current

format through agreements with Kildare County Council in parallel with its responsibility for the management and maintenance of roads under the Roads Act 1993.

A critical factor in the determination of the previous development proposed under ABP Case Ref. ABP-300506-17 was the lack of consensus with regard to the forecasting of potential development traffic generation. The various scenarios presented by the Applicant and by Kildare County Council were all based upon calculations akin to the 'First Principles' method. The differing assumptions of the respective scenarios, such as an average weight for all vehicles in all waste streams and carrying all materials comprised inherent inaccuracies which gave rise to wildly differing forecasts of traffic generation ranging from 234 no. two-way HGV movements forecast by the Applicant to as much as 424 no. two-way HGV movements as reported by Kildare County Council's traffic consultant.

In the interest of clarity the more precise 'Comparison Method' of traffic forecasting has been adopted in the preparation of the traffic assessment of this Chapter. Forecasts of traffic generation and the distribution of traffic to the haul route are based upon detailed analysis of the 5 no. most recent full years of site records and weighbridge data. Since each type of waste and each type of material brought to the existing Drehid WMF typically has differing densities and different tonnages per vehicle this assessment considers in detail the proposed change in the relative proportions of waste streams and materials received at the site. Traffic generation forecasts are based upon the average tonnage per vehicle in each waste stream and for each material transported which is self-evidently a more accurate basis of calculating potential HGV traffic arising than the use of a general average weight per HGV as applied in the previous case. Since the weighbridge at the Drehid WMF also records the origin/destination of all loads by waste stream, the assignment and distribution of HGV traffic is similarly derived from examination of weighbridge data spanning the 5 no. year period 2018-2022 inclusive. The distribution of existing Drehid WMF HGV traffic is based on the origin of each waste stream or material type received at the site. The distribution of proposed development HGV traffic is similarly derived from the proportional assignment of the proposed volumes based upon waste stream or material type.

This Chapter is based upon the specific guidance on the evaluation of impact set out in the TII Publication PE-PDV-02045 *Traffic and Transport Assessment Guidelines* (2014) and this is the primary reference for the assessment of the magnitude and significance of the forecast traffic impact of the proposed development on the receiving transport network. In order to assess the traffic effects associated with the proposed development, the following approach has been adopted and is broadly set out in the following step by step process:

- A desktop study was undertaken that consisted of a detailed review of 5 no. years of weighbridge data from 2018-2022 to determine the existing Drehid WMF volume of operational traffic, to determine the average tonnage per vehicle categorised by waste/material type and to determine the current assignment and distribution of HGV to the receiving road network. This included the following steps:
 - The waste types recorded by the weighbridge were separated into the following categories generally corresponding to the codes used in the European Waste Code:
 - Construction & Demolition (C&D) fines and C&D rubble;
 - Non-hazardous soils and stones;
 - Municipal Solid Waste (MSW);
 - Incinerator Bottom Ash (IBA);
 - Bio-stabilised waste;
 - Inert waste (soil & stone) for engineering purposes; and
 - Waste to Compost Plant

- The average load per vehicle was calculated for each type of waste and type of material transported. The volume of daily HGV movements has been calculated using the average tonnage for each waste category and the actual number of operational days per annum counted from the weighbridge data over the period.
- The origins of materials transported are identified by load in the weighbridge records and these were separated by county and area of county for Kildare to establish the distribution of regional HGV traffic. Those materials with origins within County Kildare were used to determine local HGV traffic distribution. The haul route for each material was determined at both regional and local level by reviewing waste origin, journey time and speaking to the hauliers and assigning the incoming waste to existing approved haul routes.
- The traffic arising by waste stream or material type was assigned to the haul routes and the existing distribution of HGV traffic was determined by aggregating the individual waste streams and materials by haul route.
- Undertake a scoping exercise with the local authority to confirm the study area and the type and extent of traffic data and road survey information appropriate for the detailed assessment of the effects of development generated traffic. This has included detailed road condition surveys together with extensive traffic survey data collection across the study area. Kildare County Council also confirmed that the traffic assessment should be based upon TII Publication PE-PDV-02045 '*Traffic and Transport Assessment Guidelines*' (2014);
- Assessment of existing and forecast traffic volumes on receiving road network:
 - Map and collate all traffic survey information gathered at the data collection stage to establish the existing traffic flows on the existing haul routes. The existing traffic flow data is presented in the standard format of a total traffic flow qualified by the recorded proportion of HGV;
 - Calculate a 'Baseline' for the traffic assessment. The Baseline is a hypothetical scenario in which landfill generated traffic is removed and it is assumed that the existing Drehid WMF is not operational. Notwithstanding that the existing Drehid WMF is permitted to operate until 2028 this 'Landfill traffic removed' scenario is progressed in the interest of comparable future year assessments. The existing volume of Drehid WMF traffic on the network was determined from the detailed weighbridge assessments. The baseline is derived from traffic surveys carried out over two weeks in March 2022 from which the existing Drehid WMF HGV traffic recorded over that two week period has been subtracted. A series of baseline scenarios were calculated for the opening year and various future assessment years;
 - For the assessment of traffic effects in the initial Construction Phase forecasts of the short-term uplift in traffic volumes were derived from a combination of 'First Principles' method compared generally with the construction of similar buildings. Traffic generation during the periodic construction of landfill cells has been based upon records of the applicants experience of previous comparable landfill cell construction periods associated with the development of the existing Drehid WMF facility;
 - Determine the potential traffic volumes likely to be generated on haul routes in the study area and cumulatively by other committed developments during their respective construction and operational phases. This, combined with the

- application of traffic growth factors, forms the basis of a cumulative assessment;
 - Forecast the traffic volumes generated by the proposed development during the Operational Phase. This element was informed by detailed examination of weighbridge data recorded at the existing facility over a period of 5 no. years;
 - The forecast traffic generation of the proposed development was assigned and distributed to the receiving roads and haul routes in the proportions derived from the examination of existing Drehid WMF traffic. The proportional difference in traffic flows on the receiving roads network was determined against the Baseline scenarios for the various assessment years and assessment scenarios which include the Operational Phase and Construction Phases;
 - Determine which junctions require detailed computer modelling analysis of capacity, delay and operational performance in accordance with the standard threshold methodology set out in TII PE-PDV-02045 '*Traffic and Transport Assessment Guidelines*'.
- Assessment of Effects
 - Determination of Significance of Effects on road network in accordance with EPA guidelines; and,
 - Assessment of effects particular to parameters such as road safety, vulnerable road users and public transport.
- Identification of Mitigation and Monitoring Measures.
- Confirmation of residual effects.

14.7 CONSULTATION

In preparing this Chapter a number of statutory meetings have been held separately between the Applicant and An Bord Pleanála and the Applicant and Kildare County Council. An additional meeting was held with Kildare County Council Road, Transportation and Public Safety Department (KCC Transportation). Other follow-up correspondence and off-line discussions with KCC Transportation aided in confirming the scope, baseline data collection, reference methodology and clarified various technical requirements. The dates of the formal meetings are listed in chronological order in Table 14-3 with meeting minutes and records shown in Section 1.7 of the EIAR.

Table 14-3: Meeting Dates

Consultation Meetings	Dates
An Bord Pleanála	16-03-2022
Kildare County Council	15-06-2022
An Bord Pleanála	05-07-2022
Kildare County Council	17-11-2022
Kildare County Council	07-12-2022
An Bord Pleanála	08-12-2022

14.8 DIFFICULTIES ENCOUNTERED

No difficulties were encountered in preparing this Chapter.

14.9 BASELINE ENVIRONMENT

14.9.1 SITE LOCATION

The proposed development is located within the townlands of Killinagh Upper, Killinagh Lower, Drummond and Kilkeaskin, Loughnacush, and Parsonstown at Carbury County Kildare within an overall landholding which in the ownership of Bord na Móna.

Chapter 2 'Description', Figure 2-1 shows the location of the existing permitted and operational Drehid WMF within this Bord na Móna landholding. The site is accessible via a network of regional routes which in turn link with the National Primary Road / Motorway network. Access to the site will be provided by the existing ghost island priority access junction on Regional Road R403. The R403 lies south, southwest and west of the site. It joins the R402 at Carbury to the northwest of the site which in turn intersects the M4 Motorway at Junction 9 'Enfield'. Regional Road R403 connects to the R415/R416 at Allenwood, the L2002 at Firmount and the R407 at Clane connecting south via Sallins Bypass to the M7 Motorway Junction 9a.

14.9.2 HAUL ROUTES

As per the existing scenario, it is proposed that vehicles transporting materials to and from the site will continue to use the primary Haul Routes as identified in Figure 14-4. These are the haul routes currently in use and agreed with Kildare County Council under the terms of Condition 13 of the permission granted under Planning Reg. Ref. 04/371 (PL09.212059).

All construction contractors, and all contractors delivering waste to the proposed development, will be required to attend an induction briefing and will be issued with a map of the permitted haul routes such that all materials imported to or exported from the proposed development are transported via one of the identified haul routes.

The following provides a brief account of the study area receiving roads network and includes an overview of roads that comprise the existing and proposed haul routes and includes some of those roads from which existing Drehid WMF traffic is restricted.

M7 Motorway

The M7 Motorway is a standard dual carriageway motorway comprising two lanes and a hard shoulder in each direction, with each direction of travel separated by a median barrier. In some areas, there are three lanes in each direction, and the speed limit is generally 120 kilometres per hour. It is a significant transportation route in Ireland, linking Dublin and Limerick and carrying a high volume of traffic. Spanning approximately 200 kilometres, the motorway stretches from the outskirts of Naas in County Kildare to Rossbrien on the outskirts of Limerick City.

The M7 serves as a vital part of the national transportation network and is one of the busiest roads in the country. Notably, the M7 underwent major upgrades and improvements in recent years, including the widening of some sections and the construction of new interchanges and service areas. The motorway bypassing Naas, an 8 km stretch, was the first section of motorway to open in Ireland in 1983.

The M7 plays a crucial role in connecting communities and facilitating economic growth and development in the country. It is part of the Dublin to Limerick N7 national primary road and replaced all of the old single-carriageway N7 route by the end of 2010, which is now reclassified as Regional Road R445.

According to TII Traffic Counter Site M07 030.0 W (Between Jn. 10 Naas South and Jn. 11 M7/M9 Lewinstown), the estimated Annual Average Daily Traffic flow (AADT) for 2023 is 50,030 (14.9% HGV). The M7 motorway has street lighting present at motorway junctions but does not extend to cover the full length of the associated diverge and merge lanes.

Overall, the M7 Motorway is a critical component of Ireland's transportation infrastructure, facilitating the movement of goods and services between the east and west coasts and connecting communities along its route.



Plate 14-1: M7 Motorway Westbound between J10-J11 Source: Google Street View Jul 2022

N7 National Primary Road

The N7 National Primary Road is an important part of the national transportation network in Ireland, and it plays a vital role in connecting communities and facilitating economic growth and development in County Kildare. Starting from the M50 in the east, the N7 travels southwest from the Red Cow interchange where it comprises three lanes of traffic in each way and stretches approximately 15 km southwest towards Naas. The three lane construction to Naas was completed on 14 August 2006, having originally been dual carriageway. In 2014, a flyover was constructed at Newlands Cross to replace the at-grade signal-controlled junction. The three-lane section had ended at Junction 9 but has since been continued past Naas and marries with the M7 Motorway. The N7 between Naas and the M50 Motorway remains designated as a national primary road since it is not a motorway standard road. Minor roads and access to homes, farms, and businesses have direct access to the road by means of left-in/left-out access. TII Traffic Counter Site N07 015.0 W (Between Jn. 5 Athgoe and Jn. 6 Castlewarden) indicates an estimated AADT for 2023 in the order of 85,678 (8.1% HGV).



Plate 14-2: N7 National Road Westbound between J5-J6 Source: Google Street View Nov 2022

M4 Motorway

The M4 motorway connects Dublin and Galway. It is a key transportation route for both commuters and commercial traffic between the east and west coasts of Ireland, and it provides access to several major towns and cities along the route. The motorway begins at Leixlip, Co. Kildare where it continues from the N4 national primary road. From there, it continues west through County Kildare and County Meath. At Kinnegad, in County Westmeath the M4 continues northwest toward Mullingar reducing to N4 national primary road south of Mullingar thereafter continuing to Sligo town. The M6 Motorway to the west commences near Kinnegad at M4 Junction 11. The M6 Motorway terminates on the outskirts of Galway city.

The M4 motorway is a dual carriageway for most of its length, with two lanes in each direction. There are several interchanges and service areas along the route. The speed limit on the motorway is generally 120 kilometres per hour. The M4 motorway passes by several major towns and cities, including Maynooth, Kilcock, Enfield and Kinnegad. There are also several major junctions and interchanges which include the M4/M6 interchange at Junction 11.

The M4 motorway has undergone several major upgrades and improvements in recent years, including the construction of new interchanges and service areas, and the widening of some sections. It is a vital part of the national transportation network in Ireland and County Kildare and it plays an important role in connecting communities and facilitating economic growth and development.

TII Traffic Counter Site M04 030.0 E (Between Jn. 8 Kilcock and Jn. 9 Enfield) indicates an estimated AADT for 2023 in the order of 28,258 (12.6% HGV).



Plate 14-3: M4 Motorway Westbound between J8-J9 Source: Google Street View Jul 2021

N4 National Primary Road

The M4 Motorway becomes the N4 National Primary Road approximately 5 km to the northwest of Kinnegad at Junction 11. From there the road continues heading northwest as a high quality dual carriageway. After the road bypasses Mullingar it reduces to a wide single carriageway with hard shoulders as far as Edgeworthstown after which it continues as a single carriageway with hard shoulders until it reaches Carrick-on-Shannon. To the west of the River Shannon into County Roscommon the N4 is a high-quality single carriageway incorporating sections with alternating overtaking lanes until it reaches Castlebaldwin. The N4 road is near-motorway standard dual carriageway as it approaches Sligo town.

TII Traffic Counter Site N04 090.0 E (Between Edgeworthstown and Mullingar) indicates an estimated AADT for 2023 in the order of 12,911 (10.1% HGV).



Plate 14-4: N4 National Road Westbound Nr. Edgeworthstown Source: Google Street View Aug 2021

R402 Regional Road

The R402 is a regional road that runs from the town of Enfield in County Meath and terminates at the R420 (outside the village of Ballinagar) which passes through the town of Tullamore in County Offaly. It is approximately 66 kilometres long and passes through a mix of rural and urban areas, providing access to a number of towns and villages along its route.

Starting in Enfield, the R402 heads west, passing through Johnstown Bridge, Carbury, Edenderry, Daingean and Ballinagar and terminates at the R420 which passes through Tullamore in County Offaly.

The road is a mix of single and dual carriageway, with some sections having two lanes in each direction. It is an important route for commuters traveling between the towns along its route and for commercial traffic.

The R402 is an important regional road providing access to a variety of towns, villages, and historical sites along its route. It serves as an important link between the counties of Meath, Kildare and Offaly and is a significant transportation artery for both commuters and commercial traffic in the region.

The R402 is a regional road of Type 1 single carriageway cross section and provides access from the M4 Motorway to the site via the R403. The R402 for the majority of the route has a carriageway width of 7.5 m with hard shoulders either side. There are road markings and signage along this route.

Based upon traffic survey data collected in 2022 in the preparation of this study the estimated 2022 AADT traffic flows on R402 are calculated to be in the order of 5,958 (6% HGV) to the east of Carbury and 7,820 (5% HGV) to the west.

The R402 is part of the primary haul route system currently in use and agreed with Kildare County Council under the terms of Condition 13 of the permission granted under Planning Reg. Ref. 04/371 (PL09.212059).



Plate 14-5: R402 Southbound at R402/R403 Junction Source: Google Street View Aug 2021

R403 Regional Road

The R403 is a regional road that runs from the town of Lucan in County Dublin to the village of Carbury in County Kildare. The R403 crosses the M4 Motorway to the east of Leixlip and passes Weston Airport. It follows the Dublin Road to Celbridge where it crosses the Liffey and heads southwest to Clane. It heads west via Prosperous, Allenwood and Derrinturn to Carbury, where it terminates at a roundabout intersection with R402. It is approximately 40 kilometres long and passes through a mix of urban and rural areas, providing access to a number of towns and villages along its route. The road is single carriageway and is an important route for commuters traveling between the towns along its route and for commercial traffic, including agricultural vehicles transporting goods to and from local farms.

Overall, the R403 is an important regional road in Ireland, providing access to a variety of towns, villages, and historical sites along its route. It serves as a regional link between the counties of Kildare and Offaly and is an important transportation artery for both commuters and commercial traffic in the region.

The R403 is a regional road approx. 6.5 m in width with grass verge in each direction. The R403 is a primary haul route with provides a central spine to a number of the neighbouring local spur routes. There are road markings and signage along this route.

Traffic flows vary along the R403, generally reducing in volume to the east. Based upon traffic survey data collected in 2022 in the preparation of this study the estimated 2,022 AADT traffic flows on R403 are calculated to be in the order of 5692 (5% HGV) near Carbury and 8,518 (6% HGV) to the east of Prosperous.

The R403 is part of the primary haul route system currently in use and agreed with Kildare County Council under the terms of Condition 13 of the permission granted Drehid WMF under Planning Reg. Ref. 04/371 (PL09.212059).



Plate 14-6: R403 Westbound Approach to Drehid WMF Source: Google Street View Aug 2021

R407 Regional Road

The Drehid WMF site is currently accessed directly from the R403. The R407 is a Regional Road, which connects the M7 Junction 9a via Sallins Bypass to the R403 in Clane where the R403 and R407 intersect at a traffic signal controlled junction to the south of the town centre. The carriageway width of the R407 varies between approximately 6.0 m and 7.0 m.

Based upon traffic survey data collected in 2022 in the preparation of this study, the estimated 2022 AADT traffic flow on R407 to the south of Clane is calculated to be in the order of 14,689 (4% HGV).

The R407 is part of the primary haul route system currently in use and agreed with Kildare County Council under the terms of Condition 13 of the permission granted Drehid WMF under Planning Reg. Ref. 04/371 (PL09.212059).



Plate 14-7: R407 Northbound to North of Sallins Bypass Source: Google Street View Aug 2022

R408 Regional Road

The R408 is a regional road in County Kildare. It runs for approximately 16 kilometres from the town centre of Maynooth to the village of Prosperous. The road passes through a mixture of rural and suburban landscapes, providing access to a number of residential areas, farmland, and small villages. Starting in Maynooth, the R408 heads southeast, passing through the villages of Rathcoffey, before reaching its terminus in Prosperous at traffic signal controlled junction with R403. The road is single carriageway. It is an important route for commuters traveling between the towns along its route and for commercial traffic. The R408 is an important regional road providing access to a variety of towns, villages, and historical sites along its route and is an important transportation artery for both commuters and commercial traffic in the region. The R408 runs north to south and provides a local access link to the Drehid WMF primary haul routes for waste and materials arising between Prosperous and Maynooth. The R408 is a Regional Road approx. 6.5 m in width with grass verge in each direction.

Based upon traffic survey data collected in 2022 in the preparation of this study the estimated 2022 AADT traffic flow on R408 to the north of Prosperous is calculated to be in the order of 3037 (3% HGV).



Plate 14-8: R408 Northbound 3km Northeast of Prosperous Source: Google Street View May 2019

R409 Regional Road

The R409 Regional Road provides access from the M7 Naas Bypass to the R403. The R409 starts in Naas and travels northwest through Carragh village, passes Mondello Park motor circuit and ends at the intersection with the R403 road. The route is 13 km long and it is a single carriageway and varies in width from approximately 5.2 m to 6.4 m. The junction between the R409 and the R403 is a priority crossroads with the fourth arm being a local road. Visibility at this location is restricted for cars by the horizontal and vertical geometry of the R403, however visibility is available for HGV traffic. Although this haul route is currently permitted, it is not currently used by facility traffic due to a weight restriction which has been applied by Kildare County to the bridge over the River Liffey at Carragh.

Based upon traffic survey data collected in 2022 in the preparation of this study the estimated 2022 AADT traffic flow on R409 to the north of Carragh is calculated to be in the order of 5,130 (2% HGV).

Due principally to weight and width restrictions at Carragh Bridge the R409 does not form part of the local haul route system currently in use to serve Dredge WMF. The restriction of the haul route system to exclude Carragh Bridge is agreed with Kildare County Council under the terms of Condition 13 of the permission granted under Planning Reg. Ref. 04/371 (PL09.212059).



Plate 14-9: R409 Northbound at Main Access to Mondello Park Source: Google Street View Sept 2021

R415 Regional Road

The R415 regional road runs north-south from its junction with the R403 in Allenwood to the R448 (formerly the N9) at Crookstown, passing through Kilmeague, Kildare town and Nurney and crossing the R418. The route is entirely within County Kildare and is approximately 40 km long. The R415 provides local access to Kildare town and to Kildare Village Retail Outlet.

Based upon traffic survey data collected in 2022 in the preparation of this study the estimated 2022 AADT traffic flow on R415 to the north of Kildare Town is calculated to be in the order of 3,170 (4% HGV).

The R415 linking the R416 is part of the approved haul route system currently in use and agreed with Kildare County Council under the terms of Condition 13 of the permission granted Drehid WMF under Planning Reg. Ref. 04/371 (PL09.212059).

The R415 from Milltown through Kildare town is acknowledged to carry only local waste arisings and its agreed use is not intended as a direct link between the M7 Motorway and the Drehid WMF.



Plate 14-10: R415 Northbound at Allen Cross South of Allen Source: Google Street View Oct 2021

R416 Regional Road

The R416 is a regional road that runs through County Kildare, connecting from R416 south of Newbridge. Continuing through the town of Newbridge the R416 intersects the R415 at Milltown to the northwest. The total length of the R416 is approximately 10 kilometres. Connecting to the R415 and R403 to the north the R416 Regional Road provides local access from the direction of the M7 Motorway. There are two bridges along this route at which the road width is restricted to approximately 5.3 m.

The R416 is part of the haul route system currently in use and agreed with Kildare County Council under the terms of Condition 13 of the permission granted Drehid WMF under Planning Reg. Ref. 04/371 (PL09.212059).

Based upon traffic survey data collected in 2022 in the preparation of this study the estimated 2022 AADT traffic flow on R416 to the north of Newbridge Town is calculated to be in the order of 4,735 (3% HGV).



Plate 14-11: R416 Northbound 1km South of Milltown Source: Google Street View May 2019

L2002 Local Road

Local Road L2002 known as Millicent Road is approximately 3.5 kilometres long. The L2002 begins at a ghost island priority junction on the R407 regional road to the south of the town of Clane. From this junction which is approximately 350 m north of the Sallins Bypass L2002 heads northwest terminating at its intersection to R403 to the west of Clane (Firmount Junction). The L2002 is a two-lane road with some sections that are locally wider and others that are narrower but permit the passage of HGVs. The L2002 is an important local road providing access to a variety of amenities and services in the area. It serves as an important transportation route bypassing the centre of Clane. The route between R407 and R403 includes a bridge over the River Liffey on the southern section of the route.

Based upon traffic survey data collected in 2022 in the preparation of this study the estimated 2022 AADT traffic flow on L2002 is calculated to be in the order of 4,448 (7.1% HGV). The estimated AADT for a baseline scenario in which existing Drehid WMF traffic is removed from the network is 4,625 (5.4% HGV) so it can be concluded that the L2002 is well used by HGV traffic in the absence of the existing development.

L2002 is part of the primary haul route system currently in use and agreed with Kildare County Council under the terms of Condition 13 of the permission granted Drehid WMF under Planning Reg. Ref. 04/371 (PL09.212059). This route is used in preference to HGV traffic routing through the R407/R403 traffic signal controlled junction and the difficult left turn for HGV traffic in the centre of Clane.



Plate 14-12: L2002 Northbound Approx. 1 km North of R407 Source: Google Street View May 2019

14.9.3 ROAD NETWORK SURVEYED TRAFFIC FLOWS

To establish a baseline and to evaluate existing traffic flow characteristics for the receiving road environment, Automatic Traffic Counter (ATC) surveys were carried out by Traffinomics (formerly Abacus Transportation Surveys).

ATC equipment was installed at 17 no. locations across the study area which is shown in Figure 14-5 and principally includes the R402, R403, R407, R408, R409, R414, R415 and R416. The locations are the same as those used in the traffic assessments prepared for the 2017 application under ABP Case Reference ABP-300506-17.

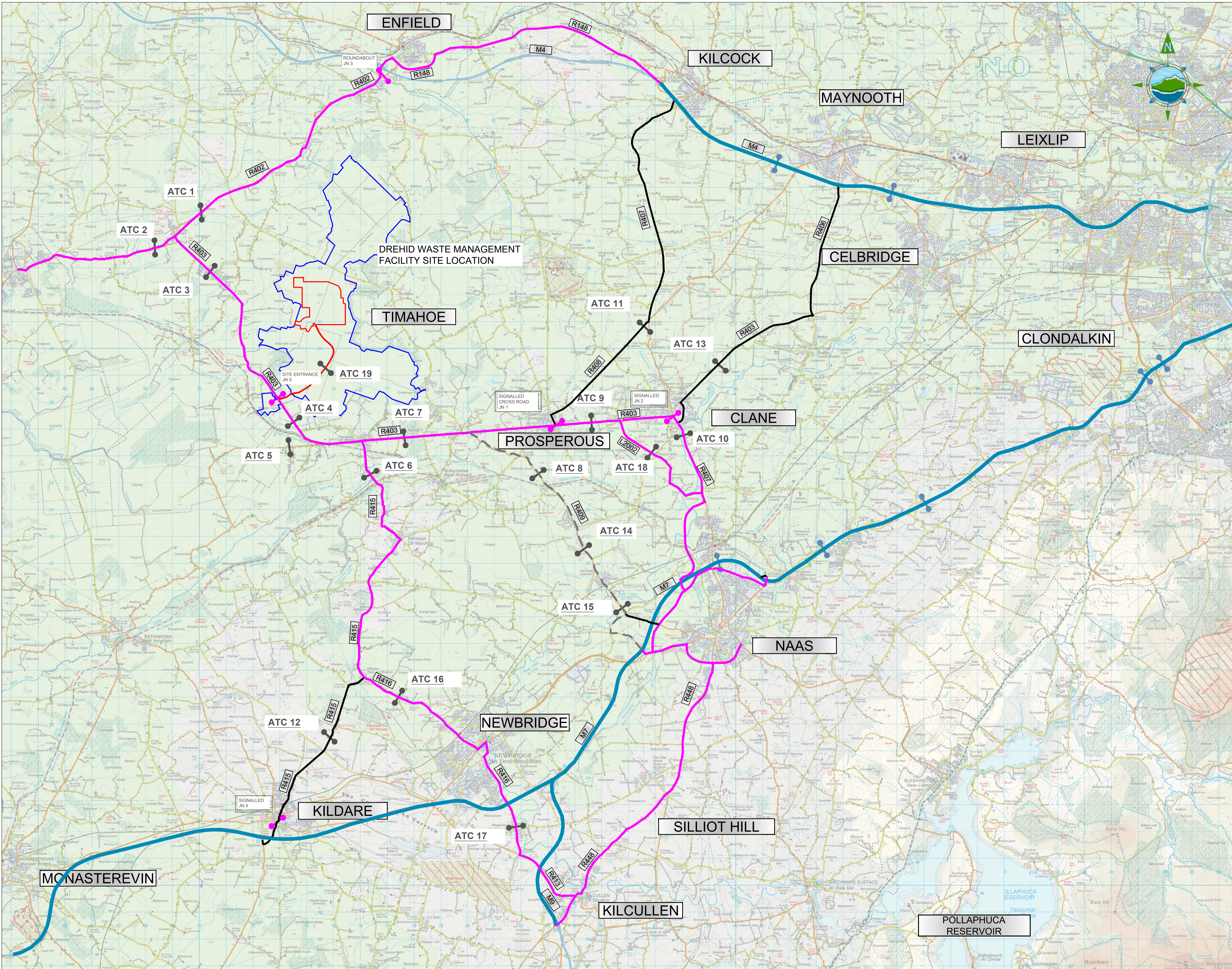
The ATC data was collected in accordance with TII publication PE-PAG-02016 Project Appraisal Guidelines for National Roads Unit 5.2 – ‘Data Collection’. In order to ensure an unbiased sample, all data collection was carried out during a neutral or representative month, avoiding national and local holiday periods, local school holidays, mid-terms and any other abnormal traffic periods. There were no major local festivals or unusual events, which may have influenced traffic at a local level and there were no occurrences of severe weather during the traffic surveys.

The ATC recorded traffic data for a two week period starting at midnight on Monday 28th February 2022 and ending at midnight on Monday 14th March 2022. The ATC surveys provide a continuous record of hourly traffic flows classified into vehicle types including motorcycles, cars, light goods vehicles (LV), heavy goods vehicles (HGV) and buses. As set out in TII publication PE-PAG-02016 it is normal practice for ATC surveys to be conducted for at least two full weeks since a period of two weeks will typically capture day to day variability.

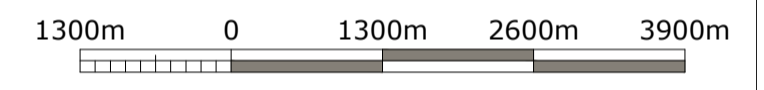
In addition to the ATC link counts classified turning count surveys were undertaken at the existing site access and at a number of junctions on the identified haul routes. These turning count surveys were undertaken in March 2022 and cover the period 07:00-19:00 hrs.

Comprehensive summaries and analyses of the survey data are presented in this Chapter and a full copy of the base traffic survey data is provided in Appendix 14-1 which includes figures showing the junction count locations and the location of ATC counter sites each identified by Google Map co-ordinates.

The traffic count types, locations and dates are summarised below. The survey locations are identified in the context of the haul routes in Figure 14-5 and replicated below for ease of reference.



- GENERAL LEGEND**
- BORD NA MONA OWNERSHIP BOUNDARY
 - APPLICATION BOUNDARY
 - NATIONAL MOTORWAY NETWORK M4/M7/M9
 - APPROVED HAUL ROUTES
 - LOCAL HAUL ROUTES
 - APPROVED HAUL ROUTES (HGV Restricted)
 - R4## REGIONAL ROAD
 - AUTOMATIC TRAFFIC COUNT (2 Way)
 - JUNCTION COUNT
 - TII TRAFFIC DATA SITE



Rev	Date	Description	By	Chkd.
A	23.02.23	PLANNING ISSUE	MN	MR

Client:
Bord na Móna

Project:
DREHID WASTE MANAGEMENT FACILITY FURTHER DEVELOPMENT

Title:
TRAFFIC COUNT LOCATIONS

Scale @ A1: 1:65,000
 Prepared by: E. Beggs
 Checked: M. Rooney
 Date: February 2023
 Project Director: D. Grehan
 Drawing Status: Planning

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 Drawing No.: **Figure 14.5** Revision: **A**

Junction Turning Count Sites:

- Junction 1: R408 and R403 signalised crossroads, Prosperous
- Junction 2: R407 and R403 signalised priority junction, Clane
- Junction 3: Johnstown Road and R402 roundabout, Enfield
- Junction 4: R445 and R415 signalised crossroads, Kildare
- Junction 5: Existing Drehid Facility site entrance on R403

Automated Traffic Counter Sites:

- ATC 1 R402 East of Carbury
- ATC 2 R402 West of Carbury
- ATC 3 R403 South of Carbury
- ATC 4 R403 North of Canal
- ATC 5 R414 West of Canal
- ATC 6 R415 South of Allenwood
- ATC 7 R403 East of Allenwood
- ATC 8 R409 North of Goatstown
- ATC 9 R403 East of Prosperous
- ATC 10 R407 South of Clane
- ATC 11 R408 North-east of Prosperous
- ATC 12 R415 North-east of Kildare
- ATC 13 R403 North-east of Clane
- ATC 14 R409 North-west of Carragh
- ATC 15 R409 South-east of Carragh
- ATC 16 R416 North-west of Newbridge
- ATC 17 R416 South-east of Newbridge
- ATC 18 L2002 Millicent Road
- ATC 19 Existing Drehid WMF Access Road

The ATC equipment has been used over the course of a two week period in the interest of acquiring a representative sample size and to provide a profile of weekly traffic flows to compliment the one day classified junction turning count data.

In relation to the records of vehicle speeds, automatic traffic counter data was gathered in accordance with guidance provided in the TII Publication PE-PAG-02016 'Project Appraisal Guidelines for National Roads Unit 5.2 - Data Collection' (Oct 2016). The surveys categorised traffic into cars/vans, buses and heavy goods vehicles. Details of the results of these surveys are provided in Appendix 14.1 and the data is summarised in Table 14-4.

Table 14-4: Surveyed March 2022 Traffic Volumes

Existing 2022 Surveyed Traffic Flows				
Label	Location	Average Daily LV	Average Daily HGV	Average Daily Traffic
ATC 1	R402 East of Carbury (R402E)	5604	354	5958
ATC 2	R402 West of Carbury (R402W)	7536	384	7920
ATC 3	R403 South of Carbury (R403S)	5414	278	5692
ATC 4	R403 North of Canal (R403N)	4115	323	4438
ATC 6	R415 South of Allenwood (R415S)	4091	156	4247
ATC 7	R403 East of Allenwood (R402E)	5946	407	6353
ATC 8	R409 North of Goatstown (R409N)	2381	69	2449
ATC 9	R403 East of Prosperous (R402E)	8012	506	8518
ATC 10	R407 South of Clane (R407S)	14074	615	14689
ATC 11	R408 North-East of Prosperous (R408NE)	2940	97	3037
ATC 12	R415 North-East of Kildare (R415E)	3028	142	3170
ATC 13	R403 North-East of Clane(R403NE)	12386	473	12859
ATC 14	R409 North-West of Carragh (R409NW)	5029	101	5130
ATC 15	R409 South-East of Carragh (R409SE)	183	2	186
ATC 16	R416 North-West of Newbridge (R416NW)	4612	123	4735
ATC 17	R416 South-East of Newbridge (R416SE)	6880	88	6968
ATC 18	L2002 Local Road Bypassing Clane (L2002)	4134	314	4448

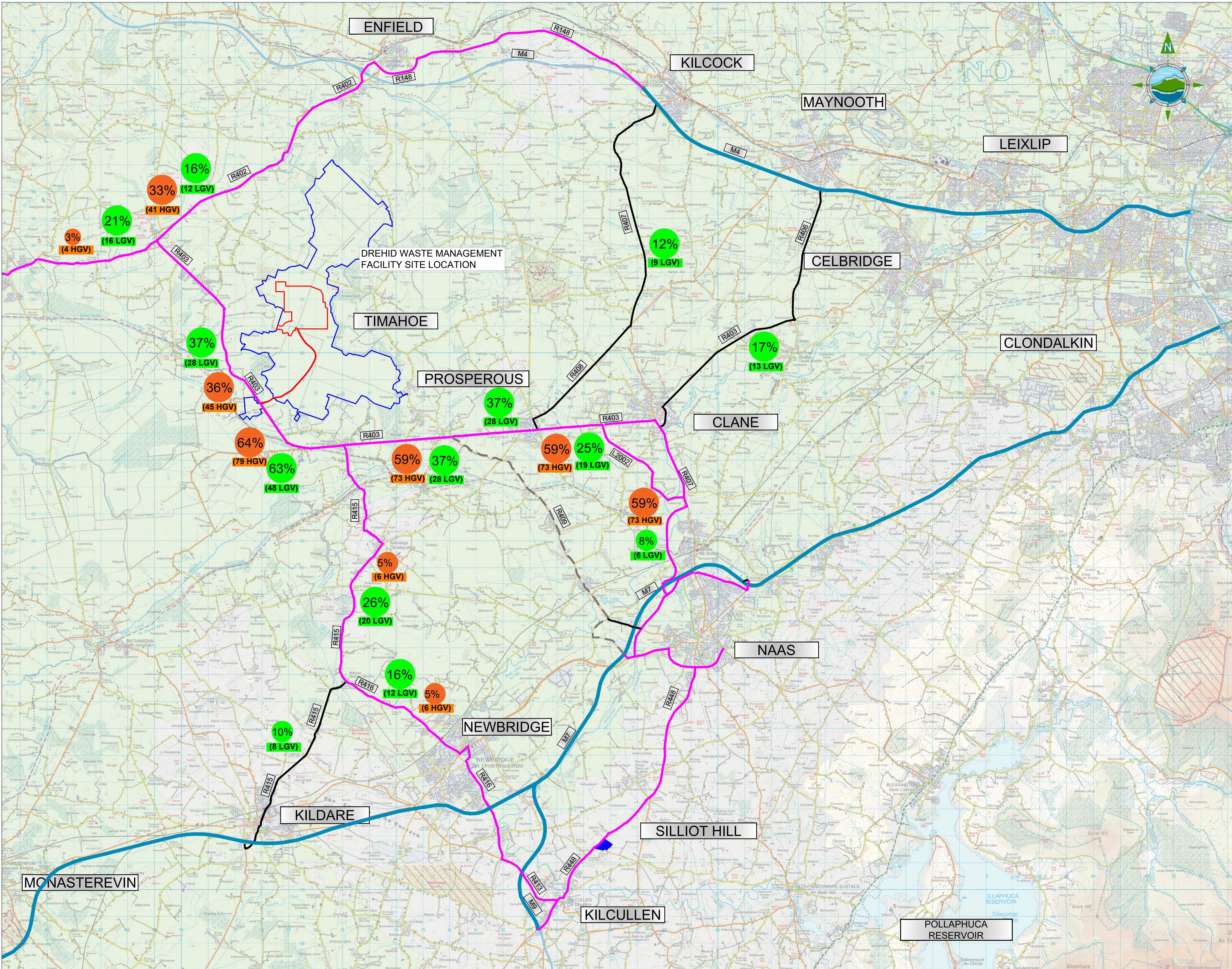
14.9.4 BASELINE NETWORK TRAFFIC FLOW MODEL

A baseline network traffic flow model for the 2022 survey year has been developed as a basis of forecasting network traffic flows at the year of opening and subsequent assessment years. The purpose of the common baseline is to facilitate comparison between the various traffic flow scenarios. Since the common variable is the traffic generated by the Drehid WMF, the first step in developing the 2022 baseline network traffic flow model has been to remove all the existing Drehid WMF traffic generated during the ATC surveys.

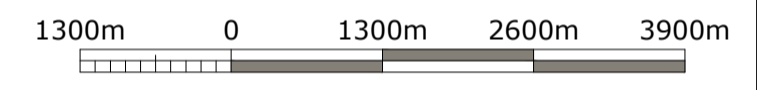
The traffic at the Drehid WMF entrance was counted by ATC 19. That traffic has been assigned to the study area and distributed to the haul routes in the proportions derived from the examination of weighbridge data for the 2 no. week period of the traffic surveys in March. The distribution of existing Drehid WMF traffic specific to the two week traffic survey period in March 2022 is shown in Figure 14-6.

The existing Drehid WMF is permitted to operate under licence until 2028 so the common network traffic flow baseline in which all existing landfill traffic has been removed is a hypothetical scenario equivalent to the Drehid WMF being closed or at least not generating any traffic.

The derivation of the baseline network traffic flow model is shown in Table 14-5 with the resultant 2022 baseline traffic flows set out under the final heading 'landfill traffic removed' which in the interest of a comprehensive understanding of the traffic flows and traffic flow composition not only includes AADT values but also the component volume of light vehicles (LV) and heavy commercial vehicles (HGV).



- GENERAL LEGEND**
- BORD NA MONA OWNERSHIP BOUNDARY
 - APPLICATION BOUNDARY
 - NATIONAL MOTORWAY NETWORK M4/M7/M9
 - APPROVED HAUL ROUTES
 - LOCAL HAUL ROUTES
 - APPROVED HAUL ROUTES (HGV Restricted)
 - R4## REGIONAL ROAD
 - PROPORTION OF HGV TRAFFIC (124 Trips per day)
 - PROPORTION OF LGV TRAFFIC (76 Trips per day)



Rev	Date	Description	By	Chkd.
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Client:
Bord na Móna

Project:
DREHID WASTE MANAGEMENT FACILITY FURTHER DEVELOPMENT

Title:
MARCH 2022 OPERTAION DISTRIBUTION

Scale @ A1: 1:65,000
 Prepared by: E. Beggs
 Checked: M. Rooney
 Date: February 2023
 Project Director: D. Grehan
 Drawing Status: Planning

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 Drawing No.: **Figure 14.6** Revision: **A**

14.9.5 ESTIMATE OF AADT FROM NETWORK TRAFFIC SURVEYS

TII publication PE-PAG-02039 'Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts provides indices that can be applied to short term traffic counts to estimate AADT. The existing Drehid WMF is located between the M7 Motorway and M4 Motorway and it is clear that these are the primary roads serving the general traffic study area and the existing site. There are permanent traffic counters located on both motorways which have been used to examine the specific two week period of the traffic surveys against the TII traffic counter records for the whole of 2022.

The seasonal variation recorded at the TII traffic counters is represented graphically in Figure 14-7. Records at TII Counter M07 031.0 W (Between M7 Jn. 10 Naas South and Jn. 11 M7/M9, Lewinstown, Co. Kildare) indicate that in 2022 for the period of the March traffic surveys traffic flows were approximately 5% lower than the estimated 2022 AADT value for that location. Records at TII Counter M04 030.0 E (between M4 Jn 08 Kilcock and Jn 09 Enfield) show that traffic flows during the surveys in March 2022 were lower than the estimated AADT for that location and were lower by approximately 7%. Based upon this long term traffic counter data spanning 2022 the baseline network traffic flow model values for AADT have been derived directly from the March 2022 traffic surveys by applying a seasonal adjustment factor of +6%. This factor has been applied to the network flows only after the removal of the existing Drehid WMF traffic. The resultant baseline network traffic model 2022 AADT values are set out in the last column of Table 14.5

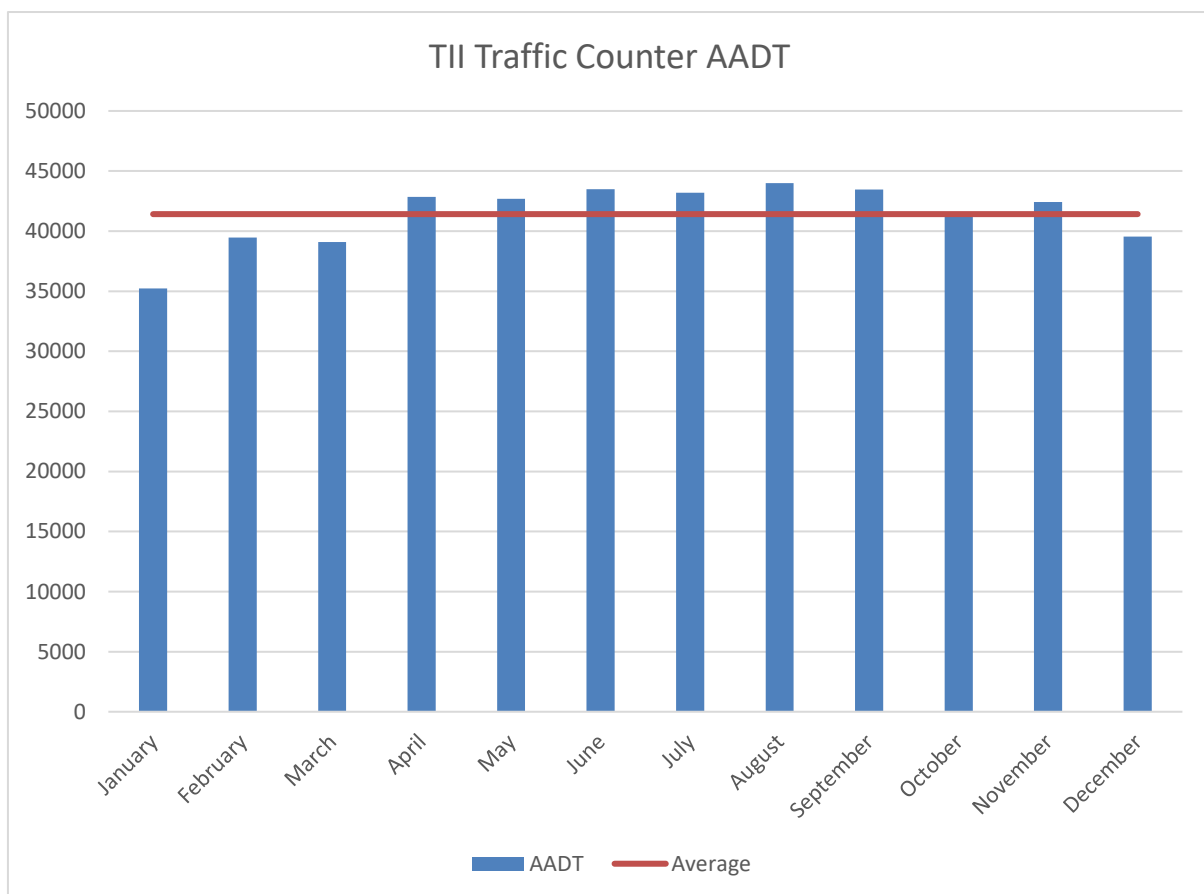


Figure 14-7: M4 and M7 2022 AADT

Table 14-5: 2022 Survey Data and Baseline Network Traffic Model

Count Site Road Link Label	Surveyed Daily Traffic (Averaged over 2 no. weeks)			Drehid WMF Traffic March 2022 (ATC 19)		Surveyed Daily Traffic (Landfill Traffic Removed)			2022 Baseline Network Traffic Model		
	LV	HGV	Total (%HGV)	LV	HGV	LV	HGV	Total (%HGV)	LV	HGV	AADT (%HGV)
ATC 1 (R402E)	5604	354	5958 (5.9%)	9	42	5594	313	5907 (5.3%)	5930	331	6261 (5.3%)
ATC 2 (R402W)	7536	384	7920 (4.9%)	12	3	7523	381	7904 (4.8%)	7975	404	8378 (4.8%)
ATC 3 (R403S)	5414	278	5692 (4.9%)	22	45	5393	233	5625 (4.1%)	5716	247	5963 (4.1%)
ATC 4 (R403N)	4115	323	4438 (7.3%)	37	82	4078	241	4319 (5.6%)	4322	256	4578 (5.6%)
ATC 6 (R415S)	4091	156	4247 (3.7%)	15	7	4076	149	4229 (3.6%)	4320	158	4483 (3.6%)
ATC 7 (R403E)	5946	407	6353 (6.4%)	22	75	5924	332	6252 (5.2%)	6280	352	6627 (5.2%)
ATC 8 (R409N)	2381	69	2449 (2.8%)	0	0	2381	69	2449 (2.8%)	2523	73	2596 (2.8%)
ATC 9 (R402E)	8012	506	8518 (5.9%)	15	75	7997	430	8423 (5.1%)	8477	456	8929 (5.1%)
ATC10 (R407S)	14074	615	14689 (4.2%)	0	0	14074	615	14689 (4.2%)	14918	651	15570 (4.2%)
ATC 11 (R408NE)	2940	97	3037 (3.2%)	7	0	2933	97	3030 (3.2%)	3109	103	3212 (3.2%)
ATC 12 (R415E)	3028	142	3170 (4.5%)	6	0	3022	142	3164 (4.5%)	3203	151	3354 (4.5%)
ATC 13 (R403NE)	12386	473	12859 (3.7%)	10	0	12376	473	12849 (3.7%)	13118	501	13619 (3.7%)
ATC 14 R409NW)	5029	101	5130 (2.0%)	0	0	5029	101	5130 (2.0%)	5331	107	5438 (2.0%)
ATC 15 (R409SE)	183	2	186 (1.3%)	0	0	183	2	186 (1.3%)	194	3	197 (1.3%)
ATC 16 R416NW)	4612	123	4735 (2.6%)	9	7	4603	116	4723 (2.5%)	4879	123	5006 (2.5%)
ATC 17 (R416SE)	6880	88	6968 (1.3%)	9	0	6871	88	6959 (1.3%)	7283	93	7376 (1.3%)
ATC 18 (L2002)	4134	314	4448 (7.1%)	5	75	4129	239	4364 (5.4%)	4377	253	4625 (5.4%)

Network Traffic Growth and Baseline Network Flows

Table 14-5 summarises the traffic flows on the receiving road network for 2022 both with and without the traffic generated by the existing Drehid WMF and provides a baseline network traffic model.

The baseline network traffic flow models for future year assessments are derived from Table 14-5 by applying the appropriate traffic growth factors published in TII PE-PAG-02017 *Project Appraisal Guidelines (PAG) for National Roads Unit 5.3 – Travel Demand Projections*, October 2021. The guidelines provide for low, central and high sensitivity growth scenarios for County Kildare with factors provided for the periods 2016-2030, 2030-2040 and from 2040-2050.

Growth factors are provided for cars and vans (Light Vehicles - LV) and heavy commercial vehicles (HGV) and have been applied to the baseline traffic survey data to forecast future baseline network traffic flows in accordance with current practice. The published central growth factors are shown in Table 14-6.

As set out in TII PE-PDV-02045 the assessment incorporates an analysis of the road network traffic flows for the base year, opening year and forecast scenarios. The standard modelling scenarios include:

- 2022 Base Year.
- 2024 Opening Year (With / Without Development).
- 2029 Opening Year + 5 Year Forecast (With / Without Development).
- 2039 Opening Year + 15 Year Forecast (With / Without Development).

Growth rates have been applied to the 2022 baseline network traffic flow model to forecast baseline traffic flow scenarios for the future year assessments. Application of the growth rates accounts for general traffic growth within the area arising from economic growth and development.

An opening year coinciding with an anticipated grant of permission in 2024 has been assumed. In addition to the standard assessment years the year 2049 or Opening Year + 25 years is also included as a horizon year assessment since it extends over the lifetime of proposed development.

The TII growth factors applied to the 2022 baseline network traffic model to determine the baseline (no landfill generated traffic) network traffic models for the various future year assessments are set out in Table 14-7.

Table 14-6: Published Annual Growth Factors

Central Growth Factor – Kildare			
Period	2016-2030	2030-2040	2040-2050
LV	1.0197	1.0062	1.0053
HGV	1.0378	1.0155	1.0187

Table 14-7: Future Assessment Year Growth Factors

Period	2022-2024	2022-2029	2022-2039	2022-2049
LV	1.040	1.102	1.173	1.236
HGV	1.077	1.204	1.404	1.690

The forecast future year baseline network traffic models are summarised in the following Table 14-8 which provides traffic network flows at each of the ATC survey locations identified in Figure 14-5. Each of the baseline network traffic models excludes the consideration of any traffic generated by the Drehid WMF either existing or proposed.

The existing Drehid WMF is permitted to operate under licence up to and including 2028 so it can be appreciated that the 2022 baseline network traffic model and the model for 2024 are hypothetical models. These models are prepared in the interest of facilitating direct comparison between the current traffic conditions under the existing Drehid WMF operations with the various future year scenarios.

Table 14-8: Survey Data (Landfill Traffic Removed)

Count Site Road Link Label	2024 Baseline Network Traffic Model			2029 Baseline Network Traffic Model			2039 Baseline Network Traffic Model			2049 Baseline Network Traffic Model		
	LV	HGV	AADT (%HGV)	LV	HGV	AADT (%HGV)	LV	HGV	AADT (%HGV)	LV	HGV	AADT (%HGV)
ATC 1 (R402E)	6166	357	6523 (5.5%)	6538	399	6937 (5.8%)	6954	465	7420 (6.3%)	7332	560	7892 (7.1%)
ATC 2 (R402W)	8292	435	8727 (5.0%)	8792	486	9278 (5.2%)	9352	567	9919 (5.7%)	9860	682	10542 (6.5%)
ATC 3 (R403S)	5944	266	6209 (4.3%)	6302	297	6599 (4.5%)	6704	346	7050 (4.9%)	7067	417	7484 (5.6%)
ATC 4 (R403N)	4494	276	4770 (5.8%)	4765	308	5073 (6.1%)	5069	359	5428 (6.6%)	5344	433	5777 (7.5%)
ATC 6 (R415S)	4492	170	4663 (3.7%)	4763	190	4953 (3.8%)	5067	222	5289 (4.2%)	5342	267	5606 (4.8%)
ATC 7 (R403E)	6530	379	6909 (5.5%)	6923	423	7347 (5.8%)	7365	494	7858 (6.3%)	7765	594	8359 (7.1%)
ATC 8 (R409N)	2624	79	2702 (2.9%)	2782	88	2870 (3.1%)	2959	103	3062 (3.4%)	3120	123	3243 (3.8%)
ATC 9 (R402E)	8814	491	9306 (5.3%)	9346	549	9895 (5.5%)	9942	640	10582 (6.1%)	10481	771	11252 (6.8%)
ATC 10 (R407S)	15512	702	16214 (4.3%)	16447	784	17231 (4.6%)	17496	915	18410 (5.0%)	18445	1101	19546 (5.6%)
ATC 11 (R408NE)	3232	111	3343 (3.3%)	3427	124	3551 (3.5%)	3646	144	3790 (3.8%)	3844	174	4017 (4.3%)
ATC 12 (R415E)	3331	162	3493 (4.6%)	3532	181	3713 (4.9%)	3757	211	3968 (5.3%)	3961	254	4215 (6.0%)
ATC 13 (R403NE)	13640	540	14180 (3.8%)	14462	603	15066 (4.0%)	15384	704	16088 (4.4%)	16220	847	17066 (5.0%)
ATC 14 (R409NW)	5543	115	5658 (2.0%)	5877	129	6006 (2.1%)	6251	151	6402 (2.4%)	6591	181	6772 (2.7%)
ATC 15 (R409SE)	202	3	205 (1.4%)	214	3	217 (1.4%)	228	4	232 (1.6%)	240	4	245 (1.8%)
ATC 16 (R416NW)	5073	132	5205 (2.5%)	5379	148	5527 (2.7%)	5722	173	5901 (2.9%)	6032	208	6240 (3.3%)
ATC 17 (R416SE)	7573	100	7673 (1.3%)	8029	112	8142 (1.4%)	8541	131	8672 (1.5%)	9005	157	9162 (1.7%)
ATC 18 (L2002)	4551	273	4824 (5.7%)	4825	305	5130 (5.9%)	5133	356	5488 (6.5%)	5411	428	5839 (7.3%)

14.9.6 FUTURE INFRASTRUCTURAL IMPROVEMENT

Kildare Development Plan 2023-2029 recognises that key road improvements are required to facilitate movement of goods and people throughout the county and to ensure ease of access, especially for major areas of new employment. Kildare Development Plan 2023-2029 sets out these key projects and improvements in Table 5.4 and Table 5.5 of the Plan. Those improvements considered to have a potential influence in the context of the proposed development have been extracted and for ease of reference are summarised in Table 14-9 and Table 14-10 and the locations shown in Figure 14-8.

Table 14-9: Priority Road and Bridge Projects

Number	Name	Route
1	Inner Relief, Naas Town LAP road objectives RP04	R410 to R445 c.1.5km of Blessington Road to Dublin Road
	Inner Relief Road, Newbridge.	L2028 to R416 Between Great Connell Road and Athgarvan Road (Liffey Hall Junction) with bridge crossing over River Liffey.
2	To examine the feasibility of developing a ring road on the north and north-east of Newbridge to connect with the orbital relief road and to link with the M7 south-west of the town.	North and north-east of Newbridge.
3	Inner Relief Road, Clane	R403 to R407 Capdoo, Celbridge Road to Kilcock Road
4	Examine options for a link road from the R407 to the R403 including a new Liffey Crossing east of Clane.	N/A
5	R416 Athgarvan road improvement works on approach roads into the village.	R416 into Athgarvan, c. 1km
6	Examine options for road improvements on the R409 from Halverstown Cross Roads to Blackwood Cross Roads	R409

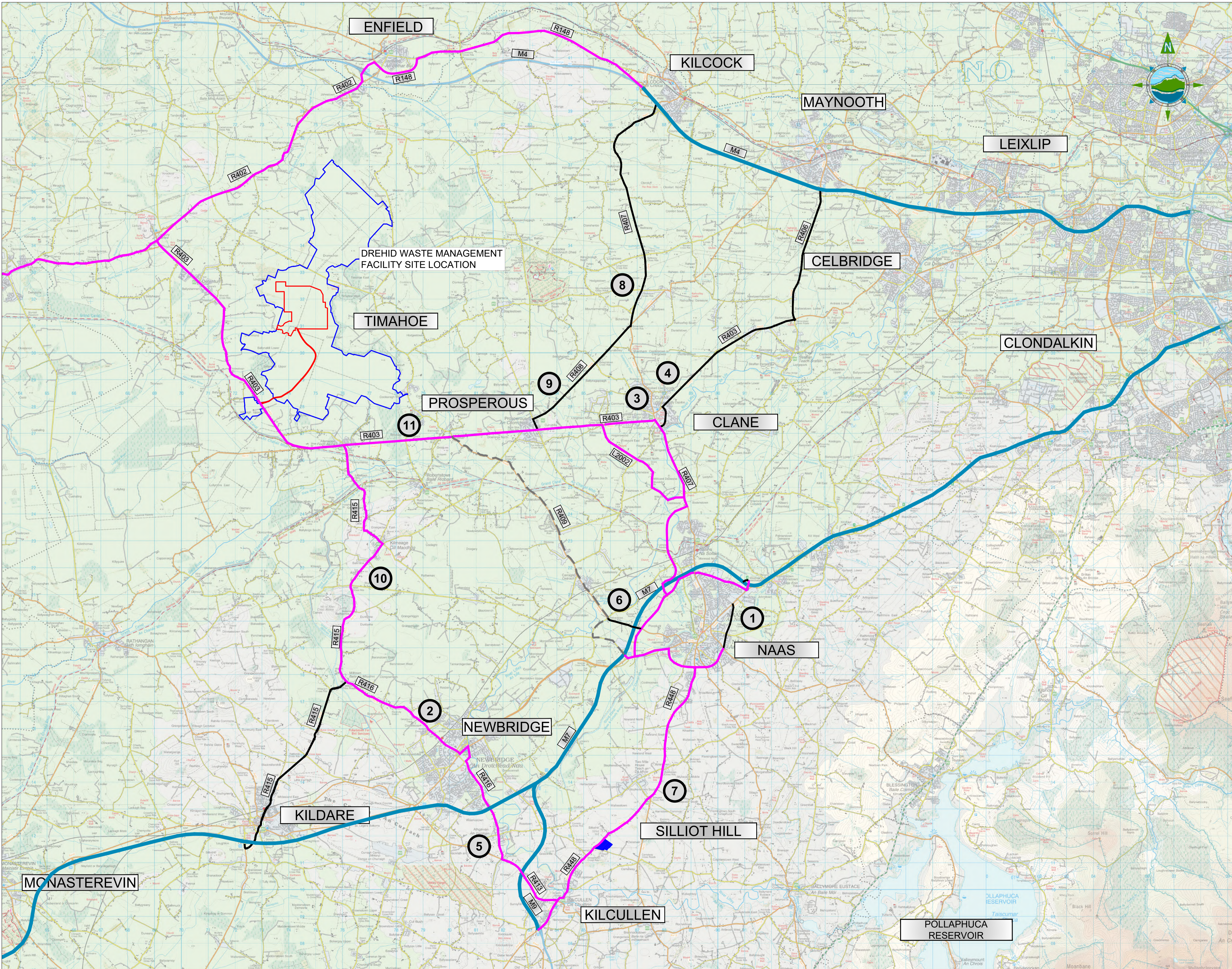
Table 14-10: Regional Roads Identified for Improvements

Number	Road No.	Location
7	R448	Naas to Kilcullen and junction with M9.
8	R407	Kilcock to Naas via Clane Inner Relief Road.
9	R408	Prosperous to Maynooth.
10	R415	Allenwood to Kildare via Kilmeague.
11	R403	Clane to Junction with R402 via Prosperous, Allenwood & Derrinturn.
12	R413	Brannockstown to Ballymany via Kilcullen.
13	R409	Naas to Junction of R403 at Blackwood.
	General	To continue to improve regional roads to the appropriate standards consistent with predicted traffic flow and in accordance with Government policy and the Roads Programme adopted by the Council. New and existing road space will be allocated to provide for bus, cycle and pedestrian facilities.

Local Area Plans (LAP) set out Local Authority objectives for specific areas. The LAP's and Town Development Plans were reviewed that are likely to have an effect on the existing and proposed haul routes :

- Clane Local Area Plan 2017-2023;
 - Table 8.1: Roads and Transportation Projects lists improvement works for Millicent Road (L2002) including a Pedestrian Bridge

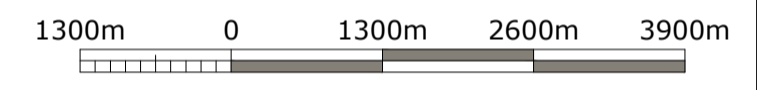
The above LAP's and Town Development Plans were reviewed in conjunction with the Kildare County Development Plan 2023-2029 in the context of the traffic and transport characteristics of the proposed development. Road improvements benefit the efficient movement of people and goods generally. The existing Drehid WMF has operated without the benefit of these listed works and although neither the existing nor the proposed Drehid WMF development is reliant, either directly or indirectly on any of this infrastructure improvement, it is likely that some or all of the projects will benefit the movement of development generated traffic along some of the identified haul routes.



GENERAL LEGEND

BORD NA MONA OWNERSHIP BOUNDARY **APPLICATION BOUNDARY**

- NATIONAL MOTORWAY NETWORK M4/M7/M9
- APPROVED HAUL ROUTES
- LOCAL HAUL ROUTES
- APPROVED HAUL ROUTES (HGV Restricted)
- R4##** REGIONAL ROAD



Rev	Date	Description	By	Chkd.
A	18.05.23	PLANNING ISSUE	MN	MR

Client:
Bord na Móna

Project:
DREHID WASTE MANAGEMENT FACILITY FURTHER DEVELOPMENT

Title:
KILDARE COUNTY COUNCIL IMPROVEMENT SCHEMES

Scale @ A1: **1:65,000**

Prepared by: **E. Beggs** Checked: **M. Rooney** Date: **February 2023**

Project Director: **D. Grehan**

Drawing Status: **Planning**

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Drawing No.: **Figure 14.8** Revision: **A**

14.10 POTENTIAL SIGNIFICANT EFFECTS

14.10.1 CONSTRUCTION PHASE

Trip Generation

Traffic generated during periods of construction of the proposed development will arise principally from the delivery of construction materials and the travel demands of construction staff. Notwithstanding the potential for organised transport of construction staff by mini-bus etc., in the interest of a robust assessment it is assumed that each member of construction staff will travel in their own car alone. There are several measures that can be implemented to reduce the traffic impact of construction staff during the building project including; encouraging workers to carpool or share vehicles to and from the job site to reduce the number of vehicles on the road. Works hours can be scheduled to start and end shifts at different times to spread out the traffic flow. Workers can be encouraged to use alternative forms of transportation such as public transportation, biking, or walking. Off-site parking can be provided for workers and a shuttle provided to bring them to and from the job site to reduce the number of vehicles on the road. It is also typical to collaborate with local authorities, usually under condition of planning, to develop a detailed traffic management plan for the construction project that considers the impact on the surrounding community and provides solutions and mitigation measures.

Estimates for the volume of construction related traffic generation have been informed by reference to EIAR Chapter 2 and to Section 2.7 in particular. The traffic assessment considers construction stage traffic generation as shown in As shown in Table 14-13 and Table 14-14 the traffic assessment also considers traffic generation arising from the following:

- Periodic Landfill Cell Construction
 - Bentonite Enhanced Soil - Host Material (sand). Min 500 mm depth
 - Bentonite Enhanced Soil - Bentonite, typically 5% of host material volume
 - 16-32 mm rounded non-calcerous stone (min. 500 mm depth)
- As has been the case for the existing Drehid WMF during its lifetime, landfill cell construction will occur on a phased basis throughout the lifetime of the proposed landfill development with each construction period typically lasting for 4 months and occurring every 2 to 2.5 years. As a worst case scenario in the intial 2024 assessments it was assumed that the construction of the new buildings would coincide with a phased construction of the landfill and this will progress alongside normal operational activities.
- Daily HGV traffic generation calculations are based upon an average of 5.5 days per working week over the course of the construction.

The traffic distribution associated with the combination of the construction of the site infrastructure and the landfill cell construction which will occur only in 2024 is shown in Figure 14-9.

The traffic distribution of the landfill cell construction which will happen periodically over the lifetime of the proposed development is shown in Figure 14-10.

Table 14-11 and Table 14-12 arising from the following:

- Proposed New Development Infrastructure;
 - Construction of the MSW Processing and Composting Building;
 - Construction of the Maintenance Building; and
 - Construction of the C&D Processing Building.

- The construction of infrastructure consisting of these three buildings listed above is expected to last for approx. 12 months starting in 2024. Further detail in relation to the construction programme is outlined in Section 3.1 of the Construction Environmental Management Plan (CEMP) provided in EIAR Appendix 2.5.
- Daily HGV traffic generation calculations are based upon an average of 5.5 days per working week over the course of the construction.

As shown in Table 14-13 and Table 14-14 the traffic assessment also considers traffic generation arising from the following:

- Periodic Landfill Cell Construction
 - Bentonite Enhanced Soil - Host Material (sand). Min 500 mm depth
 - Bentonite Enhanced Soil - Bentonite, typically 5% of host material volume
 - 16-32 mm rounded non-calcerous stone (min. 500 mm depth)
- As has been the case for the existing Drehid WMF during its lifetime, landfill cell construction will occur on a phased basis throughout the lifetime of the proposed landfill development with each construction period typically lasting for 4 months and occurring every 2 to 2.5 years. As a worst case scenario in the initial 2024 assessments it was assumed that the construction of the new buildings would coincide with a phased construction of the landfill and this will progress alongside normal operational activities.
- Daily HGV traffic generation calculations are based upon an average of 5.5 days per working week over the course of the construction.

The traffic distribution associated with the combination of the construction of the site infrastructure and the landfill cell construction which will occur only in 2024 is shown in Figure 14-9.

The traffic distribution of the landfill cell construction which will happen periodically over the lifetime of the proposed development is shown in Figure 14-10.

Table 14-11: Proposed Construction of Infrastructure HGV Traffic (Trips)

Buildings	Total HGVs	Construction Period	Daily HGV Trips
MSW Processing and Composting Building	340	10 months (216 Working Days)	6
Maintenance Building	42	7 months (152 Working Days)	1
C&D Processing Building	42	7 months (152 Working Days)	1
HGV Traffic 2024 Opening Year Only	424	NA	8 Per Day

Table 14-12: Construction of Infrastructure LV Traffic (Trips)

	Construction Staff No.	LV Trips
--	------------------------	----------

MSW Processing and Composting Building	11	22
Maintenance Building	10	20
C&D Processing Building	10	20
LV Traffic 2024 Opening Year Only	31	62 Per Day

Table 14-13: Proposed Construction of Landfill Cells HGV Traffic (Trips)

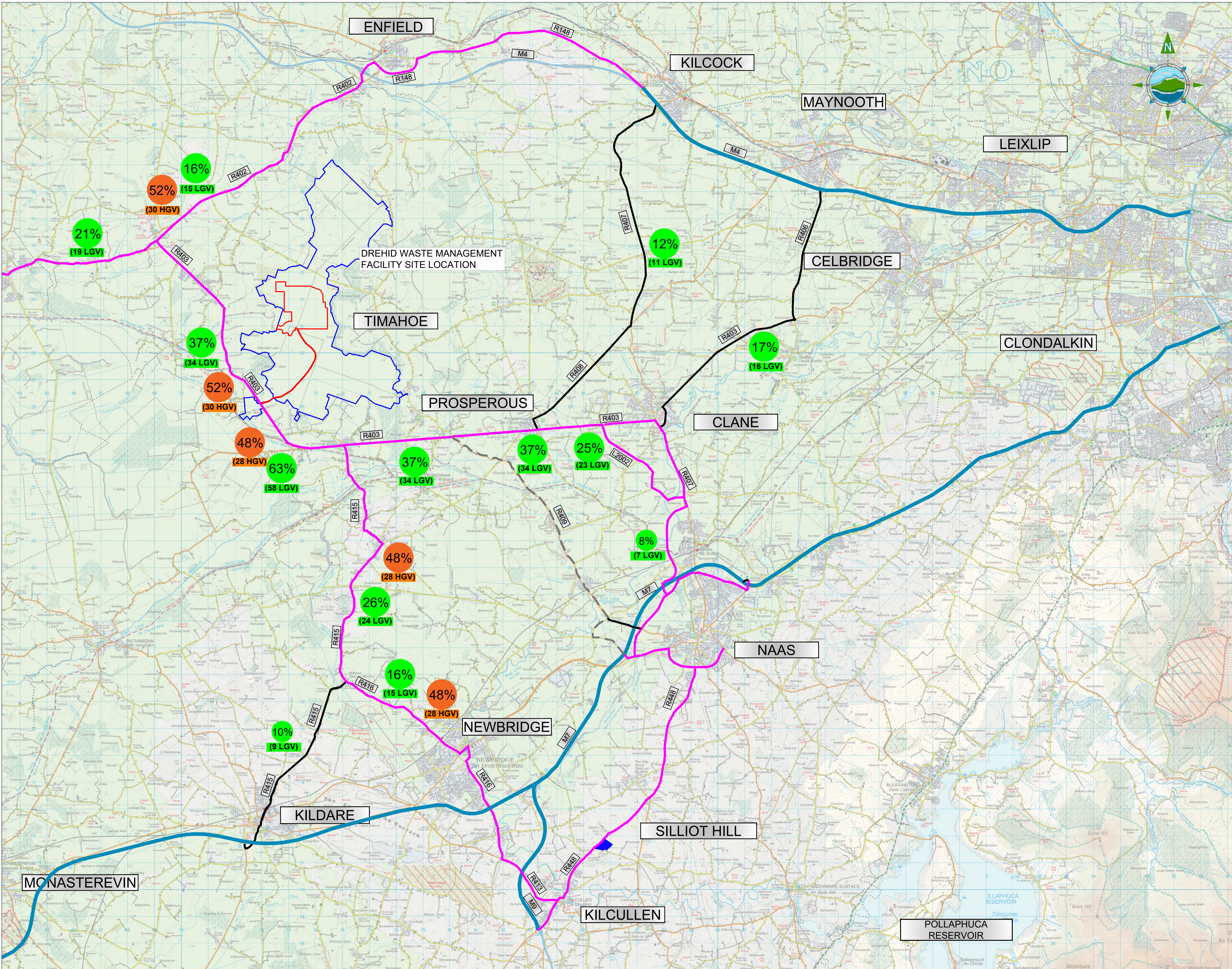
Landfill Construction	Tonnes/phase	Truck Size (m ³)	HGV Trips
Bentonite Enhanced Soil - Host Material (sand). Min 500mm depth	13,225	14	945
Bentonite Enhanced Soil - Bentonite, typically 5% of host material volume	696	22	32
16-32mm rounded non-calcareous stone (min. 500mm depth)	12,728	14	909
Total Trips for 4 Months	26,650		1,885
HGV Traffic			21 Per Day

Table 14-14: Proposed Construction of Landfill Cells LV Traffic (Trips)

	Construction Staff No.	LV Trips
New Phase Landfill Construction	15	30
Daily HGV Traffic	15	30 Per Day

Construction Trip Distribution

During past landfill cell construction periods the material outlined in Table 14-11 which includes Bentonite Enhanced Soil (BES) Host Sand, BES Bentonite and Leachate Stone (16-32mm rounded non-calcareous stone) currently have been sourced from a specific suppliers of such high grade material which include Roadstone Moyne in Longford, Dublin Port and also Dempseys Sand & Gravel. It has been assumed for the purposes of this traffic assessment that the future construction of landfill cells will also use the same sources. It was assumed as a worst case scenario in 2024 that HGV construction traffic arising from the development of site infrastructure consisting of buildings will distribute via the same routes. Light vehicle traffic will be generated during all construction activities. It is assumed for the purposes of the assessment and in the interest of simplicity that light construction traffic will distribute to the road network similarly to the distribution of Dredge WMF staff. The distribution of construction related traffic is set out Figure 14-9 and Figure 14-10.



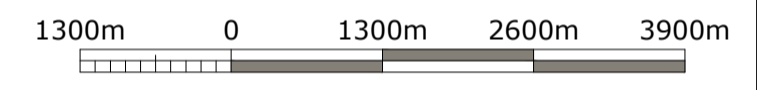
GENERAL LEGEND

BORD NA MONA OWNERSHIP BOUNDARY (Blue line)
APPLICATION BOUNDARY (Red line)

NATIONAL MOTORWAY NETWORK (M4/M7/M9) (Thick blue line)
 APPROVED HAUL ROUTES (Pink line)
 LOCAL HAUL ROUTES (Black line)
 APPROVED HAUL ROUTES (HGV Restricted) (Thin black line)

R4## REGIONAL ROAD (Thin grey line)

PROPORTION OF HGV TRAFFIC (58 Trips per day) (Orange circle)
 PROPORTION OF LGV TRAFFIC (92 Trips per day) (Green circle)



Rev	Date	Description	By	Chkd.
A	18.05.23	PLANNING ISSUE	MN	MR

Client:
Bord na Móna

Project:
 DREHID WASTE MANAGEMENT FACILITY FURTHER DEVELOPMENT

Title:
 TOTAL CONSTRUCTION TRAFFIC DISTRIBUTION

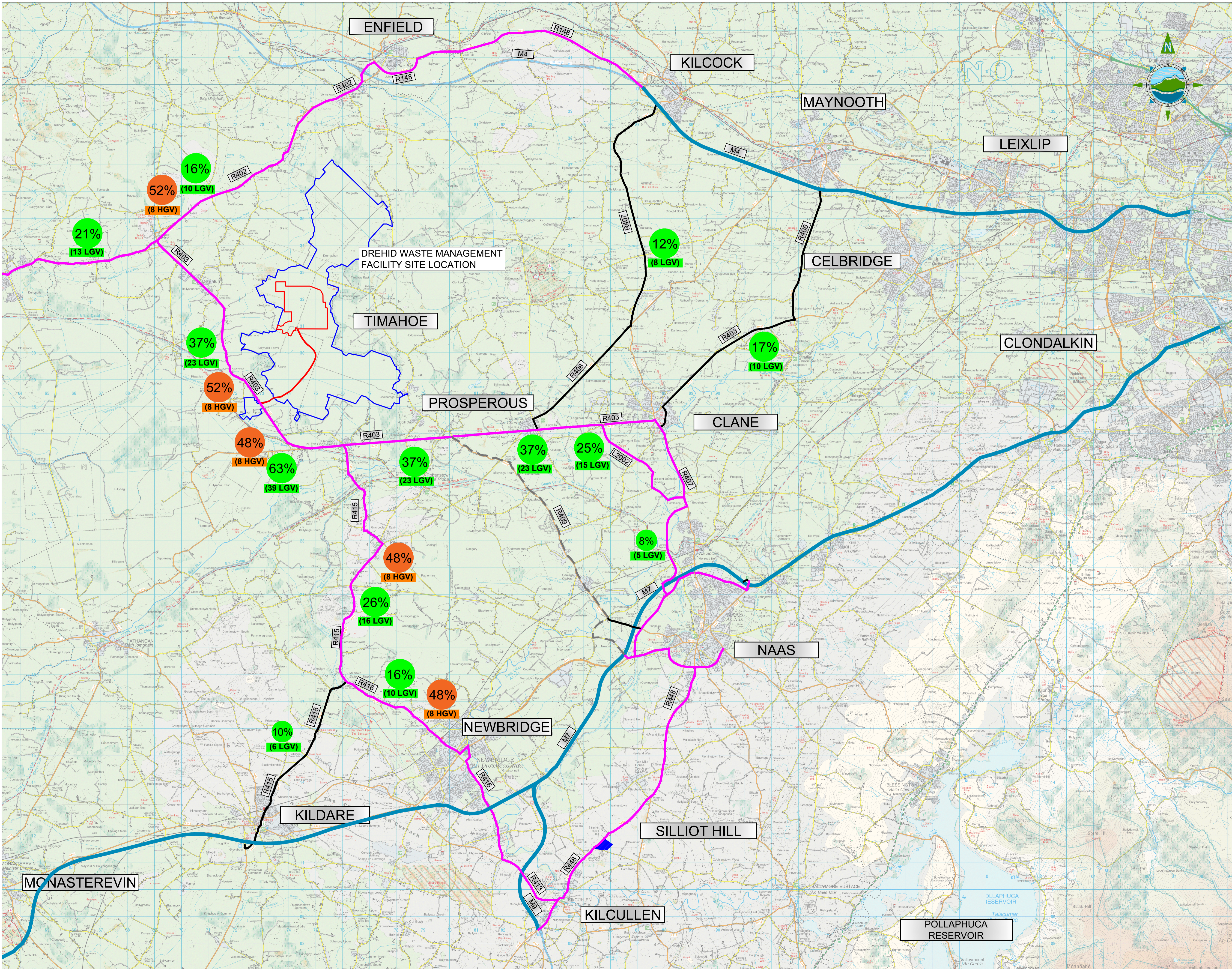
Scale @ A1: 1:65,000
 Prepared by: E. Beggs
 Checked: M. Rooney
 Date: February 2023
 Project Director: D. Grehan
 Drawing Status: Planning

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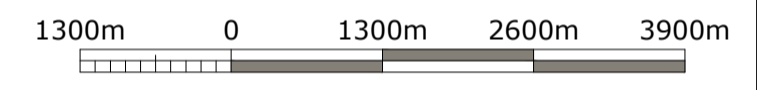
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Drawing No.: **Figure 14.9** Revision: **A**



- GENERAL LEGEND**
- BORD NA MONA OWNERSHIP BOUNDARY
 - APPLICATION BOUNDARY
 - NATIONAL MOTORWAY NETWORK M4/M7/M9
 - APPROVED HAUL ROUTES
 - LOCAL HAUL ROUTES
 - APPROVED HAUL ROUTES (HGV Restricted)
 - R4## REGIONAL ROAD
 - % PROPORTION OF HGV TRAFFIC (16 Trips per day)
 - % PROPORTION OF LGV TRAFFIC (62 Trips per day)



Rev	Date	Description	By	Chkd.
A	02.06.23	PLANNING ISSUE	EB	MR

Client:
Bord na Móna

Project:
DREHID WASTE MANAGEMENT FACILITY FURTHER DEVELOPMENT

Title:
LANDFILL CONSTRUCTION TRAFFIC DISTRIBUTION

Scale @ A1: 1:65,000
 Prepared by: E. Beggs Checked: M. Rooney Date: June 23
 Project Director: D. Grehan
 Drawing Status: Planning

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 Drawing No.: **Figure 14.10** Revision: **A**

14.10.2 OPERATIONAL PHASE

A comprehensive description of the existing site, proposed development and construction methodology is provided within EIAR Chapter 2 'Description'.

Trip Generation

The type and volume of waste proposed to be accepted at the development are summarised in Table 14-15 which is based upon the anticipated breakdown of waste types which is set out in more detail in Chapter 2 'Description'.

Table 14-15: Type and Volume of Material to be received at Proposed development

Type of Waste	Volume of Waste
Municipal solid waste (MSW) - Disposal	85,000
Biostabilised waste - Disposal	0
Other Non-MSW Waste- Disposal	1,000
Incinerator bottom ash (IBA) - Recovery	5,000
Non-hazardous soils and stones - Recovery	50,000
C&D fines and C&D rubble	109,000
Inert waste as engineering materials - Recovery	70,000
Waste to Existing Compost Plant	35,000
New MSW Processing Facility - Incoming - RCV	15,000
Municipal solid waste (MSW) - Incoming - Bulk	40,000
New MSW Processing Facility - Outgoing (RDF & Recyclables)	20,000
Leachate* - Outgoing	30,141*

*Annual leachate quantities will vary over the lifetime of the facility (2024 value shown)

A critical factor in the determination of the previous development proposed under ABP Case Ref. ABP-300506-17 was the lack of consensus with regard to the forecasting of potential development traffic generation. The various scenarios presented by the Applicant and by Kildare County Council were all based upon calculations akin to the 'First Principles' method. The differing assumptions of the respective scenarios, such as an average weight for all vehicles in all waste streams and carrying all materials comprised inherent inaccuracies which gave rise to wildly differing forecasts of traffic generation ranging from 234 no. two-way HGV

movements forecast by the Applicant to as much as 424 no. two-way HGV movements. In the interest of clarity the more precise 'Comparison Method' of traffic forecasting has been adopted in the preparation of the traffic assessment of this Chapter. Forecasts of traffic generation and the distribution of traffic to the haul route are based upon detailed analysis of the 5 no. most recent full years of site records and weighbridge data. Since each type of waste and each type of material brought to the Drehid WMF typically has differing densities and difference tonnages per vehicle this assessment considers in detail the proposed change in the relative proportions of waste streams and materials received at the site. Traffic generation forecasts are based upon the average tonnage per vehicle in each waste stream and for each material transported which is self-evidently a more accurate basis of calculating potential HGV traffic arising than the use of a general average weight per HGV as applied in the previous case. Since the weighbridge at the Drehid WMF also records the origin/destination of all loads the assignment and distribution of HGV traffic is similarly derived from examination of weighbridge data spanning the 5 no. year period 2018-2022 inclusive. TII PE-PDV-02045 sets out the importance of scoping discussions with the Planning Authority noting that such discussion facilitates early identification of not only the relevant road condition surveys and traffic survey data to be collected, but also identifies the area of analysis and the methodology to be adopted. In scoping discussions Kildare County Council had referenced the previous application and highlighted that the detailed methodology for estimating the traffic generation characteristics of the proposed development was a key consideration.

The methodology adopted in this study has been agreed with Kildare County Council and is based upon traffic generation statistics derived from the examination of 5 no. full years of weighbridge data which has both informed the estimates of development traffic generation and confirmed the distribution of development traffic to the identified haul route network. Table 14-16 summarises the headline statistics for each of the waste streams received at the existing Drehid WMF over the past 5 no. years and includes various parameters such as the total tonnage, average nett weight, average daily traffic generation.

Table 14-16 shows the proposed volume of material to be received in each waste category. The final three columns of Table 14-16 summarises the forecast average daily traffic generation per waste stream based upon the transportation parameters derived from the 5 no. years of weighbridge data analysis.

The forecast average daily HGV traffic generation of the proposed development during the operational phase is estimated to be 78 no. HGV trips per day. This figure is similar in value to the average HGV traffic generation recorded over the 5 no. year weighbridge data assessment period. Given that the HGV vehicle types will be the same as in the current operational scenario it follows as reasonable to characterise the resulting future traffic generation with the proposed development in place as a continuance of the current HGV traffic scenario.

Table 14-16: Existing and Proposed Operation HGV Traffic (One-way)

Nature of Waste	2018 @ 120 K	2019 @ 120 K	2020 @ 120 K	2021 @ 120 K	2022 @ 120 K	Proposed Development HGV Traffic Generation		
	T/A	T/A	T/A	T/A	T/A	T/A	Average Net Weight	HGV
Municipal solid waste (MSW) - Disposal	93,353	107,895	105,827	96,565	106,980	85,000	18.774	4528
Biostabilised waste - Disposal	8,330	675	9,111	10,753	9,727	0	26.97	0
Other Non-MSW Waste- Disposal	6,948	2,850	1,261	2,683	1,789	1,000	16.52	61
Incinerator bottom ash (IBA) - Recovery	4,235	5,321	3,792	887	595	5,000	26.77	187
Non-hazardous soils and stones - Recovery	7,136	3,238	0	18,393	871	50,000	29.37	1702
C&D fines and C&D rubble	incl. in engineering materials	incl. in engineering materials	incl. in engineering materials	incl. in engineering materials	incl. in engineering materials	109,000	27.12	4019
Inert waste as engineering materials - Recovery	230,132	428,821	316,627	312,528	189,244	70,000	25.52	2743
Waste to Existing Compost Plant	24,909	24,987	24,998	27,066	27,794	35,000	26.35	1328
New MSW Processing Facility - Incoming - RCV	N/A	N/A	N/A	N/A	N/A	15,000	8.2	1829
Municipal solid waste (MSW) - Incoming - Bulk	N/A	N/A	N/A	N/A	N/A	40,000	25	1600
New MSW Processing Facility - Outgoing (RDF & Recyclables)	N/A	N/A	N/A	N/A	N/A	20,000	22	909
Leachate*- Outgoing	52,780	49,686	51,253	29,332	25,163	30,141	31.86	946
Σ	427,824	623,473	512,869	498,206	362,163	460,141		19,852
HGV's Per Day	73	102	82	81	61	78		

*Leachate varies each year due to numerous factors including rainfall, anaerobic digestion and generally declining over time

The Chapter 2 Description, sets out more fully the details of the operational phase of the proposed development. When fully constructed and operational, it is expected that the staffing numbers as outlined in Table 14-17 will be required to operate and maintain the Drehid WMF. Staff numbers are intended as indicative full time equivalent personnel and estimates of staffing requirement for the proposed development are based upon reference to the current operational staffing requirement of Drehid WMF.

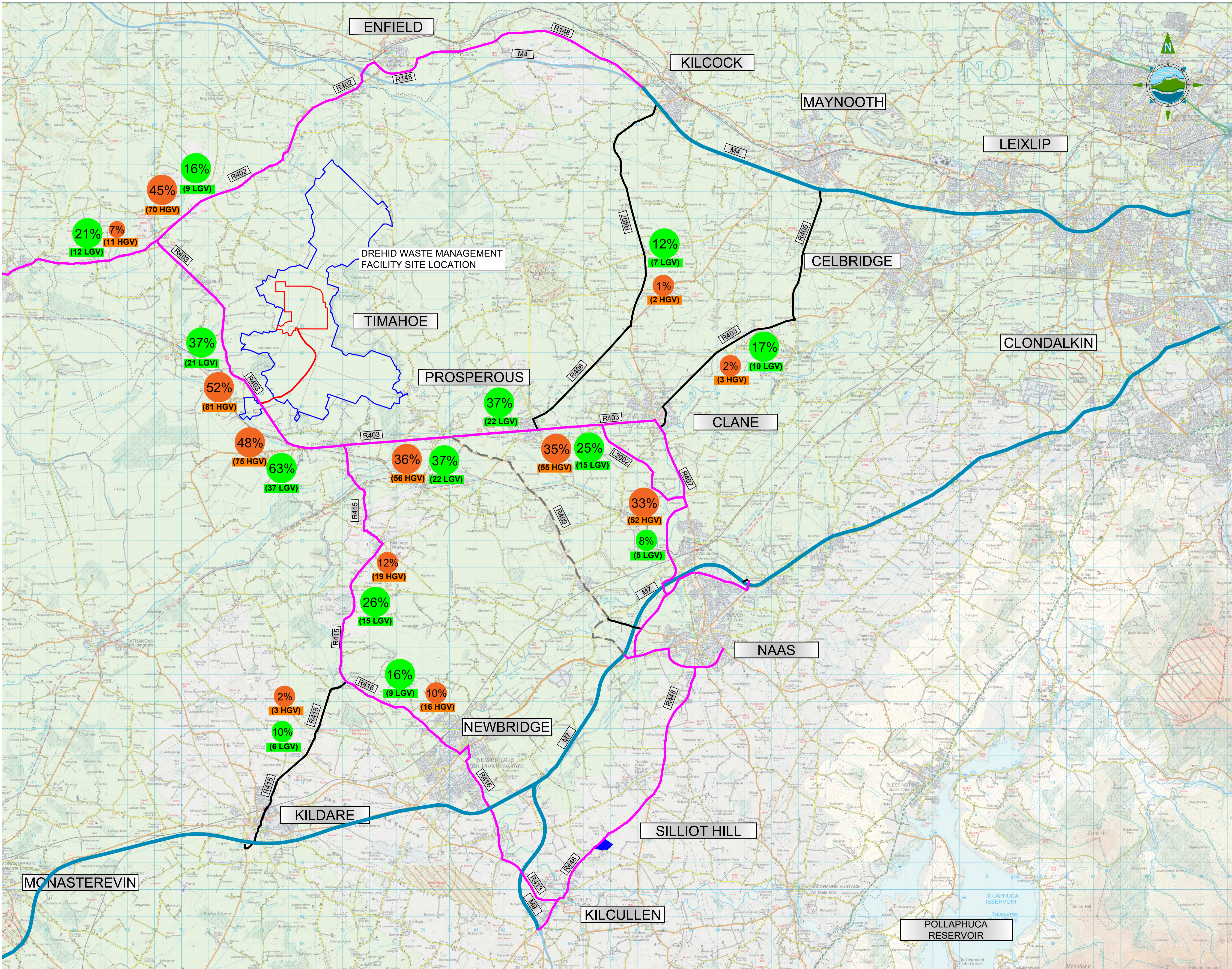
Table 14-17: Existing and Proposed Operation LV Traffic (One-way)

	Staff
Current Operational Staff at Drehid Landfill & Compost Facility	20
Future Operational Staff at Drehid Landfill, Compost Facility, MSW Processing and C&D Processing	29
LV's Per Day	29

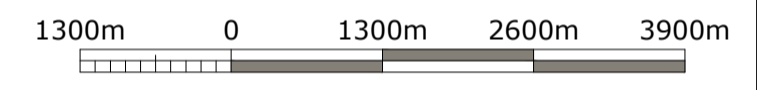
Operational Trip Distribution

The forecast distribution of development traffic for the operational phase is derived from the assessment of existing weighbridge data covering the 5 no. year period 2018-2022. Since the weighbridge at the Drehid WMF records the origin/destination of all loads by waste stream, the assignment and distribution of HGV traffic is derived from examination of weighbridge data spanning the 5 no. year period 2018-2022 inclusive. The distribution of existing Drehid WMF HGV traffic has been calculated based upon the origin of each waste stream or material type received at the site. The percentage distribution of existing Drehid WMF traffic is previously shown in Figure 14-2 which in brief shows the current split at the development access is 52% to/from the south and 48% to/from the north.

The distribution of proposed development HGV traffic is derived from the proportional assignment of the proposed volumes based upon waste stream or material type. Based upon these proposed waste materials volumes the forecast distribution is provided Figure 14-11 and shows a redistribution with 52% in favour of the haul route to the north via R403, R402, and 48% to/from the south. The various proportions of the total HGV traffic of the proposed development are annotated for each of the identified existing haul routes. As is typical practice LV traffic distribution it is assumed to be as per the existing proportions of light traffic recorded in the traffic surveys.



- GENERAL LEGEND**
- BORD NA MONA OWNERSHIP BOUNDARY
 - APPLICATION BOUNDARY
 - APPROVED HAUL ROUTES
 - LOCAL HAUL ROUTES
 - APPROVED HAUL ROUTES (HGV Restricted)
 - R4## REGIONAL ROAD
 - % PROPORTION OF HGV TRAFFIC (156 Trips per day)
 - % PROPORTION OF LGV TRAFFIC (58 Trips per day)



Rev	Date	Description	By	Chkd.
A	18.05.23	PLANNING ISSUE	MN	MR

Client:
Bord na Móna

Project:
DREHID WASTE MANAGEMENT FACILITY FURTHER DEVELOPMENT

Title:
PROPOSED OPERATION DISTRIBUTION

Scale @ A1: 1:65,000
 Prepared by: E. Beggs
 Checked: M. Rooney
 Date: February 2023
 Project Director: D. Grehan
 Drawing Status: Planning

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 Drawing No.: **Figure 14.11** A

Combined Operation and Construction Traffic Generation

Table 14-18 summarises the forecast total trip generation of the proposed development when operational and during periods of construction. As set out earlier the cumulative total for all three activities will only be manifest in 2024 when construction of infrastructure and landfill cell construction will be concurrent. Future year assessments from 2029 onward include scenarios with and without the proposed landfill and include for periods when landfill cells are under construction.

Table 14-18: Forecast Landfill Trip Generation

	2024		2029		2039		2049	
	HGV per day	LV per day	HGV per day	LV per day	HGV per day	LV per day	HGV per day	LV per day
Operational	77*	29	78*	29	78*	29	78*	29
Proposed Infrastructure Construction	8	31	-	-	-	-	-	-
Landfill Cell Construction	21	15	21	15	21	15	21	15
Σ	106	75	99	44	99	44	99	44

*Annual leachate quantities will vary over the lifetime of the facility

14.10.3 IMPACT ON THE ROAD NETWORK

14.10.4 ASSESSMENT CRITERIA

TII PE-PDV-02045 Traffic and Transportation Assessment Guidelines 2014, Table 2.1 'Traffic Management Guidelines Thresholds for Transport Assessments' sets out various threshold values and criteria that typically trigger that a TTA is required where national roads are affected by traffic arising from any proposed development. A general threshold value which is commonly used to identify whether a TTA including detailed junction capacity assessments is required is as follows:

- Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road

It should be noted the 10% flow is generally a prompt for whether or not a TTA is recommended, it is not typically used to determine the significance of effects. It is nonetheless commonly used in TTA to reference the scale of difference in traffic flows when assessing the forecast long-term operational traffic effects of proposed developments. As a measure of the potential magnitude of impact or effect on the receiving road network the following has regard to the percentage threshold values set out in the TII guidelines. The breakdown of the magnitude of impacts used in this assessment is based on the scale of development traffic expressed as a percentage of existing network traffic flows on the receiving road network.

Table 14-19: Definition of Terms Relating to Magnitude of Traffic Impact

Magnitude of Impact	Definition
High	Scale of additional traffic exceeds 25% of baseline traffic flow on the receiving road network
Medium	Scale of additional traffic is between 10% and 25% of baseline traffic flow on the receiving road network
Low	Scale of additional traffic is between 5% and 10% of baseline traffic flow on the receiving road network
Negligible	Scale of additional traffic is less than 5% of baseline traffic flow on the receiving road network

In addition to establishing the magnitude of effects on traffic it is considered worthwhile that the sensitivity of the receptors (receiving road network) should also factor in assessing the level of significance of the traffic effects arising from the continued generation of traffic from the development site. The general criteria defining sensitivity in this chapter is set out in Table 14-20.

Table 14-20: Definition of Terms Relating to Sensitivity of Traffic Receptor

Sensitivity	Definition
High	High Importance and rarity, national scale and limited potential for substitution
Medium	High or medium importance and rarity, regional scale, limited potential for substitution
Low	Low or medium importance and rarity, local scale
Negligible	Very low importance and rarity, local scale

The significance of the effect of the proposed development on traffic and transportation is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The matrix used in this assessment is presented in Table 14-21 where a range of significance of effects is presented the final assessment for each effect is based upon the application of the above assessment criteria. For the purposes of this assessment any effects with a significance level of slight or less are categorised as not significant in terms of EIA guidance.

Table 14-21: Matrix Assessment of Significance of Effect

	Magnitude of Impact				
		Negligible	Low	Medium	High
Sensitivity	Negligible	Imperceptible	Imperceptible or Slight	Imperceptible or Slight	Slight
	Low	Imperceptible or Slight	Imperceptible or Slight	Slight	Slight or Moderate
	Medium	Imperceptible or Slight	Slight	Moderate	Moderate or Major
	High	Slight	Slight or Moderate	Moderate or Major	Major or Profound

14.10.5 TRAFFIC ASSESSMENT

In order to assess the impact of the proposed development a number of scenarios (it varies from year to year) were reviewed for each assessment year. The scenarios with the relevant assessment year are listed below;

- **Scenario 1a:** 2024 Operational Traffic
- **Scenario 1b:** 2024 Operational Traffic + Construction of Infrastructure + Landfill Cells
- **Scenario 1c:** 2024 Operational Traffic + Construction of Landfill Cells
- **Scenario 2a:** 2029 Operational Traffic
- **Scenario 2b:** 2029 Operational Traffic + Construction of Landfill Cells
- **Scenario 3a:** 2039 Operational Traffic
- **Scenario 3b:** 2039 Operational Traffic + Construction of Landfill Cells
- **Scenario 4a:** 2049 Operational Traffic
- **Scenario 4b:** 2049 Operational Traffic + Construction of Landfill Cells

The results of the assessments for each of the separate scenarios is presented in Table 14-22 to Table 14-30 which show the following;

- Baseline network traffic (landfill traffic removed) for each design year as previously set out in Table 14-8
- Forecast traffic generation for each scenario
- Forecast percentage increase in LV and HGV and forecast increase in AADT

The percentage increase and the significance of the effect on the receiving road network for each scenario is evaluated against the assessment criteria set out in Table 14-19 and Table 14-20 and summarised in Table 14-21.

Scenario 1a: 2024 Operational Traffic

Scenario 1a includes only for operational traffic in 2024. The existing Drehid WMF is permitted to operate under licence up to and including 2028 so it can be appreciated that the 2024 baseline network traffic model and the model for Scenario 1a in 2024 are hypothetical models. By reference to Table 14-16 it can be appreciated that the operational traffic in Scenario 1a is similar to the exiting operational traffic. So in fact the impact of the proposed operational traffic over that currently permitted is likely to be nil. This Scenario 1a model has been prepared in the interest of facilitating direct comparison between the current traffic conditions under the existing Drehid WMF operations with the various future year scenarios. Scenario 1a can be used to qualify the results of Scenario 1b and Scenario 1c.

Under the first heading Table 14-22 provides the baseline network traffic flows on the receiving road network in the study area as set out in the previous Table 14-8. This baseline data shows network traffic from which all landfill traffic both LV and HGV flows have been removed. The second heading shows the traffic arising from the operation of the landfill as set out in Table 14-16 and Table 14-17 which by definition is the numerical difference between the baseline and total assessment traffic flow for the scenario. The third heading provides separately the forecast percentage increase in LV traffic, the forecast increase in HGV traffic together with a forecast increase in AADT expressed as the increase in total traffic and the incremental increase in the percentage HGV content.

Table 14-22: Scenario 1a - 2024 Operational Traffic

Label	2024 Baseline Network Traffic Model			2024 Operational Traffic			Increase in Traffic over 2024 Baseline			
	LV	HGV	AAADT (HGV)	LV	HGV	AAADT (HGV)	LV	HGV	AAADT	Proportion HGV
ATC 1 (R402E)	6166	357	6523 (5.5%)	1	69	6594 (6.5%)	0.0%	19.4%	1.1%	1.0%
ATC 2 (R402W)	8292	435	8727 (5.0%)	2	11	8740 (5.1%)	0.0%	2.5%	0.1%	0.1%
ATC 3 (R403S)	5944	266	6209 (4.3%)	3	80	6293 (5.5%)	0.1%	30.2%	1.3%	1.2%
ATC 4 (R403N)	4494	276	4770 (5.8%)	6	73	4849 (7.2%)	0.1%	26.6%	1.7%	1.4%
ATC 6 (R415S)	4492	170	4663 (3.7%)	2	19	4689 (4.1%)	0.1%	11.3%	0.5%	0.4%
ATC 7 (R402E)	6530	379	6909 (5.5%)	3	56	6963 (6.2%)	0.1%	14.7%	0.9%	0.8%
ATC 8 (R409N)	2624	79	2702 (2.9%)	0	0	2702 (2.9%)	0.0%	0.0%	0.0%	0.0%
ATC 9 (R402E)	8814	491	9306 (5.3%)	2	51	9354 (5.7%)	0.0%	10.4%	0.6%	0.5%
ATC 10 (R407S)	15512	702	16214 (4.3%)	0	0	16214 (4.3%)	0.0%	0.0%	0.0%	0.0%
ATC 11 (R408NE)	3232	111	3343 (3.3%)	1	2	3346 (3.4%)	0.0%	1.4%	0.1%	0.0%
ATC 12 (R415E)	3331	162	3493 (4.6%)	1	3	3497 (4.7%)	0.0%	1.9%	0.1%	0.1%
ATC 13 (R403NE)	13640	540	14180 (3.8%)	2	3	14185 (3.8%)	0.0%	0.6%	0.0%	0.0%
ATC 14 (R409NW)	5543	115	5658 (2.0%)	0	0	5658 (2.0%)	0.0%	0.0%	0.0%	0.0%
ATC 15 (R409SE)	202	3	205 (1.4%)	0	0	205 (1.4%)	0.0%	0.0%	0.0%	0.0%
ATC 16 (R416NW)	5073	132	5205 (2.5%)	1	16	5228 (2.9%)	0.0%	12.2%	0.3%	0.3%
ATC 17 (R416SE)	7573	100	7673 (1.3%)	1	16	7691 (1.5%)	0.0%	16.1%	0.2%	0.2%
ATC 18 (L2002)	4551	273	4824 (5.7%)	1	47	4866 (6.5%)	0.0%	17.1%	1.0%	0.9%

Considering Scenario 1a and operational traffic alone it can be appreciated that this analysis is a measure of the current impact arising from the operation of the existing Drehid WMF which up to 2028 is the true baseline for traffic impact on the surrounding road network.

Table 14-22 shows the highest concentration in development traffic is on the R403 close to the development entrance. In the case of R403 LV traffic equates to 0.1% of the network flow whilst landfill HGV traffic accounts for 30.2% of network HGV traffic. AADT is the value appropriate to road maintenance and road structural design. Table 14-22 shows that operational traffic accounts for 1.7% of the total traffic flow and elevates HGV content from 5.8% to 7.2% of the total. Operational traffic on R402 and L2002 accounts for less than 0.1% of light vehicle traffic and approximately 17-20% of HGV traffic. In terms of AADT operational traffic is approximately 1% of the overall flow and accounts for an elevation in HGV content from in the order of 1% from 5.5% to 6.5%. In general operational traffic accounts for less than 1.7% of existing traffic flows, where the average is less than 1%. Operational traffic in 2024 will be manifest on the road network in any case under the current permission so it can be appreciated that there is no nett impact arising from operational traffic in 2024.

Scenario 1b: 2024 Operational Traffic + Construction of Infrastructure + Construction of Landfill Cells

Scenario 1b includes for operational traffic in 2024 and includes for the traffic generated by the construction of proposed infrastructure and proposed landfill cells. The second heading in Table 14-23 shows the cumulative traffic arising in 2024 from the operation of the landfill as set out in in Table 14-16 and Table 14-17 combined with the traffic arising from the construction of the proposed buildings as set out in Table 14-11 and Table 14-12 and the construction of landfill cells set out in Table 14-13 and Table 14-14. The third heading provides separately the forecast percentage increase in LV traffic, the forecast increase in HGV traffic together with a forecast increase AADT. These are the increase over the baseline network traffic model which need to be qualified by the results of Scenario 1a for the reasons set out above and on the practical consideration that operational traffic will be on the network up to 2028 without the proposed development.

Table 14-23: Scenario 1b - 2024 Operational Traffic + Infrastructure Construction Traffic + Landfill Cell Construction Traffic

Label	2024 Baseline Network Traffic Model			2024 Operational Traffic + Infrastructure Construction Traffic + Landfill Cell Construction Traffic			Increase in Traffic over 2024 Baseline (adjustment for existing operational traffic in Scenario 1a)			
	LV	HGV	AADT (HGV)	LV	HGV	AADT(HGV)	LV	HGV	AADT	Proportion HGV
ATC 1 (R402E)	6166	357	6523 (5.5%)	16	96	6636 (6.8%)	0.3% (0.3%)	27.0% (7.6%)	1.7% (0.6%)	1.4% (0.4%)
ATC 2 (R402W)	8292	435	8727 (5.0%)	21	15	8763 (5.1%)	0.3% (0.3%)	3.5% (1.0%)	0.4% (0.3%)	0.2% (0.1%)
ATC 3 (R403S)	5944	266	6209 (4.3%)	37	111	6358 (5.9%)	0.6% (0.5%)	41.9% (11.7%)	2.4% (1.1%)	1.7% (0.5%)
ATC 4 (R403N)	4494	276	4770 (5.8%)	64	102	4936 (7.6%)	1.4% (1.3%)	37.0% (10.4%)	3.5% (1.8%)	1.9% (0.5%)
ATC 6 (R415S)	4492	170	4663 (3.7%)	26	27	4720 (4.3%)	0.6% (0.5%)	15.6% (4.3%)	1.1% (0.6%)	0.5% (0.1%)
ATC 7 (R402E)	6530	379	6909 (5.5%)	38	77	7019 (6.4%)	0.6% (0.5%)	20.4% (5.7%)	1.7% (0.8%)	1.0% (0.2%)
ATC 8 (R409N)	2624	79	2702 (2.9%)	0	0	2702 (2.9%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)
ATC 9 (R402E)	8814	491	9306 (5.3%)	25	71	9397 (5.9%)	0.3% (0.3%)	14.4% (4.0%)	1.0% (0.4%)	0.7% (0.2%)
ATC 10 (R407S)	15512	702	16214 (4.3%)	0	0	16214 (4.3%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)
ATC 11 (R408NE)	3232	111	3343 (3.3%)	12	2	3357 (3.4%)	0.4% (0.4%)	1.9% (0.5%)	0.4% (0.3%)	0.0% (0.0%)
ATC 12 (R415E)	3331	162	3493 (4.6%)	10	4	3507 (4.7%)	0.3% (0.3%)	2.6% (0.7%)	0.4% (0.3%)	0.1% (0.0%)
ATC 13 (R403NE)	13640	540	14180 (3.8%)	17	4	14201 (3.8%)	0.1% (0.1%)	0.8% (0.2%)	0.2% (0.2%)	0.0% (0.0%)
ATC 14 (R409NW)	5543	115	5658 (2.0%)	0	0	5658 (2.0%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)
ATC 15 (R409SE)	202	3	205 (1.4%)	0	0	205 (1.4%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)
ATC 16 (R416NW)	5073	132	5205 (2.5%)	16	22	5249 (3.0%)	0.3% (0.3%)	16.9% (4.7%)	0.7% (0.4%)	0.4% (0.1%)
ATC 17 (R416SE)	7573	100	7673 (1.3%)	16	22	7712 (1.6%)	0.2% (0.2%)	22.3% (6.2%)	0.5% (0.3%)	0.3% (0.1%)
ATC 18 (L2002)	4551	273	4824 (5.7%)	8	65	4891 (6.8%)	0.2% (0.2%)	23.7% (6.6%)	1.5% (0.5%)	1.2% (0.3%)

The highest concentration in development traffic is on the R403 close to the development entrance. In the case of R403 the forecast increase in LV traffic is 1.3%, the forecast increase in HGV traffic is 10.4% and the increase in the AADT is 1.8% with an elevation in HGV in the order of 0.5%. The increase in traffic on the R402 and L2002 are in the order of 0.2% for light traffic and 6.6% for HGV with an increase in AADT of 0.5% with an elevation in HGV content in the order of 0.3%. These are the figures in brackets that are adjusted to account for existing operational traffic arising under the current permission and presented under Scenario 1a.

The direct impact under Scenario 1b on many of the roads is of lower order and generally less than 0.5% of total traffic flow. The forecast increase in HGV alone is less than 12% in all cases. Based upon the evaluation criteria set out in Table 14-21 the forecast impact of the proposed development under Scenario 1b which accounts for the increases in traffic associated with the construction of proposed development infrastructure and the construction of proposed landfill cells can reasonably be categorised as 'imperceptible' generally or perhaps rising to be categorised as 'slight' where the section of the receiving road network might be considered to be a sensitive location.

Scenario 1c: 2024 Operational Traffic + Landfill Cell Construction

Scenario 1c includes for operational traffic in 2024 and includes for the traffic generated by the construction of proposed landfill cells. The second heading shows the cumulative traffic arising in 2024 from the operation of the landfill as set out in in Table 14-16 and Table 14-17 combined with the traffic arising from the construction of landfill cells set out in Table 14-13 and Table 14-14. The third heading provides separately the forecast percentage increase in LV traffic, the forecast increase in HGV traffic together with a forecast increase AADT. These are the increase over the baseline network traffic model which need to be qualified by the results of Scenario 1a for the reasons set out above and on the practical consideration that operational traffic will be on the network up to 2028 without the proposed development.

Table 14-24: Scenario 1c - 2024 Operational Traffic + Landfill Cell Construction Traffic

Label	2024 Baseline Network Traffic Model			2024 Operational Traffic + Landfill Cell Construction Traffic			Increase in Traffic over 2024 Baseline (adjustment for existing operational traffic in Scenario 1a)			
	LV	HGV	AADT (HGV)	LV	HGV	AADT(HGV)	LV	HGV	AADT	Proportion HGV
ATC 1 (R402E)	6166	357	6523 (5.5%)	6	89	6618 (6.7%)	0.1% (0.1%)	24.8% (5.4%)	1.5% (0.4%)	1.3% (0.3%)
ATC 2 (R402W)	8292	435	8727 (5.0%)	8	14	8749 (5.1%)	0.1% (0.1%)	3.2% (0.7%)	0.3% (0.2%)	0.1% (0.0%)
ATC 3 (R403S)	5944	266	6209 (4.3%)	14	103	6326 (5.8%)	0.2% (0.1%)	38.6% (8.4%)	1.9% (0.6%)	1.5% (0.3%)
ATC 4 (R403N)	4494	276	4770 (5.8%)	25	94	4888 (7.6%)	0.5% (0.4%)	34.1% (7.5%)	2.5% (0.8%)	1.8% (0.4%)
ATC 6 (R415S)	4492	170	4663 (3.7%)	10	25	4697 (4.1%)	0.2% (0.1%)	14.4% (3.1%)	0.7% (0.2%)	0.5% (0.1%)
ATC 7 (R402E)	6530	379	6909 (5.5%)	14	71	6994 (6.4%)	0.2% (0.1%)	18.8% (4.1%)	1.2% (0.3%)	1.0% (0.2%)
ATC 8 (R409N)	2624	79	2702 (2.9%)	0	0	2702 (2.9%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)
ATC 9 (R402E)	8814	491	9306 (5.3%)	10	65	9381 (5.9%)	0.1% (0.1%)	13.3% (2.9%)	0.8% (0.2%)	0.7% (0.2%)
ATC 10 (R407S)	15512	702	16214 (4.3%)	0	0	16214 (4.3%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)
ATC 11 (R408NE)	3232	111	3343 (3.3%)	5	2	3350 (3.4%)	0.1% (0.1%)	1.8% (0.4%)	0.2% (0.1%)	0.1% (0.1%)
ATC 12 (R415E)	3331	162	3493 (4.6%)	4	4	3501 (4.7%)	0.1% (0.1%)	2.4% (0.5%)	0.2% (0.1%)	0.1% (0.0%)
ATC 13 (R403NE)	13640	540	14180 (3.8%)	7	4	14191(3.8%)	0.0% (0.0%)	0.7% (0.1%)	0.1% (0.1%)	0.0% (0.0%)
ATC 14 (R409NW)	5543	115	5658 (2.0%)	0	0	5658 (2.0%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)
ATC 15 (R409SE)	202	3	205 (1.4%)	0	0	205 (1.4%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)	0.0% (0.0%)
ATC 16 (R416NW)	5073	132	5205 (2.5%)	6	21	5232 (2.9%)	0.1% (0.1%)	15.6% (3.4%)	0.5% (0.2%)	0.4% (0.1%)
ATC 17 (R416SE)	7573	100	7673 (1.3%)	6	21	7700 (1.6%)	0.1% (0.1%)	20.5% (4.4%)	0.4% (0.2%)	0.3% (0.1%)
ATC 18 (L2002)	4551	273	4824 (5.7%)	3	60	4886 (6.8%)	0.1% (0.1%)	21.8% (4.7%)	1.3% (0.3%)	1.1% (0.2%)

The highest concentration in development traffic is on the R403 close to the development entrance. In the case of R403 the forecast increase in LV traffic is 0.4%, the forecast increase in HGV traffic is 7.5% and the increase in the AADT is 0.8% with an elevation in HGV content in the order of 0.4%. The increase in traffic on R402 and L2002 are in the order of an increase in LV traffic by 0.1%, an increase in HGV traffic is 4.7% and an increase in the AADT of 0.3% with an elevation in HGV content of 0.2%. The direct impact on many of the roads is of lower order and generally less than 1% in terms of total traffic. The forecast increase in HGV traffic alone is less than 10% in all cases a generally less than 5%. By reference to the evaluation criteria set out in Table 14-21 the forecast impact of development generated traffic during the construction of landfill cells can reasonably be categorised as imperceptible or slight.

Scenario 2a: 2029 Operational Traffic

Scenario 2a includes for periods when only operational traffic is generated in 2029. The existing Drehid WMF is permitted to operate under licence up to and including 2028. As set out in Table 14-16 the volume of traffic generated by the proposed landfill will be similar in volume and composition to that of the existing Drehid WMF so traffic generation in 2029 might best be categorised as similar to a continuance of the existing operations. The operational traffic will nonetheless be new to the receiving road network and so gives rise to direct impact which is summarised in Table 14-25. Under the first heading Table 14-25 provides the baseline traffic flows on the receiving road network in the study area as set out in the previous Table 14-8. This baseline data shows network traffic from which all landfill traffic both LV and HGV flows have been removed. The second heading shows the traffic arising from the operation of the landfill as set out in in Table 14-16 and Table 14-17. The third heading provides separately the forecast percentage increase in LV traffic, the forecast increase in HGV traffic together with a forecast increase in AADT and the incremental increase in total flow and the incremental increase in the percentage HGV content.

Table 14-25: Scenario 2a – 2029 Operational Traffic

Label	Baseline 2029 (Landfill Traffic Removed)			2029 Operational Traffic			Increase in Traffic over 2029 Baseline			
	LV	HGV	AADT (HGV)	LV	HGV	AADT (HGV)	LV	HGV	AADT	Proportion HGV
ATC 1 (R402E)	6538	399	6937 (5.8%)	1	70	7008 (6.7%)	0.0%	17.5%	1.0%	0.9%
ATC 2 (R402W)	8792	486	9278 (5.2%)	2	11	9291 (5.3%)	0.0%	2.3%	0.1%	0.1%
ATC 3 (R403S)	6302	297	6599 (4.5%)	3	81	6683 (5.7%)	0.1%	27.3%	1.3%	1.2%
ATC 4 (R403N)	4765	308	5073 (6.1%)	6	74	5153 (7.4%)	0.1%	24.1%	1.6%	1.3%
ATC 6 (R415S)	4763	190	4953 (3.8%)	2	19	4975 (4.2%)	0.0%	10.2%	0.4%	0.4%
ATC 7 (R402E)	6923	423	7347 (5.8%)	3	56	7406 (6.5%)	0.0%	13.3%	0.8%	0.7%
ATC 8 (R409N)	2782	88	2870 (3.1%)	0	0	2870 (3.1%)	0.0%	0.0%	0.0%	0.0%
ATC 9 (R402E)	9346	549	9895 (5.5%)	2	52	9949 (6.0%)	0.0%	9.4%	0.5%	0.5%
ATC 10 (R407S)	16447	784	17231 (4.6%)	0	0	17231 (4.6%)	0.0%	0.0%	0.0%	0.0%
ATC 11 (R408NE)	3427	124	3551 (3.5%)	1	2	3554 (3.5%)	0.0%	1.3%	0.1%	0.0%
ATC 12 (R415E)	3532	181	3713 (4.9%)	1	3	3717 (5.0%)	0.0%	1.7%	0.1%	0.1%
ATC 13 (R403NE)	14462	603	15066 (4.0%)	2	3	15070 (4.0%)	0.0%	0.5%	0.0%	0.0%
ATC 14 (R409NW)	5877	129	6006 (2.1%)	0	0	6006 (2.1%)	0.0%	0.0%	0.0%	0.0%
ATC 15 (R409SE)	214	3	217 (1.4%)	0	0	217 (1.4%)	0.0%	0.0%	0.0%	0.0%
ATC 16 (R416NW)	5379	148	5527 (2.7%)	1	16	5545 (3.0%)	0.0%	11.0%	0.3%	0.3%
ATC 17 (R416SE)	8029	112	8142 (1.4%)	1	16	8159 (1.6%)	0.0%	14.5%	0.2%	0.2%
ATC 18 (L2002)	4825	305	5130 (5.9%)	1	47	5178 (6.8%)	0.0%	15.4%	0.9%	0.9%

The highest concentration in development traffic is again on the R403 close to the development entrance. In the case of R403 the forecast increase in LV traffic is 0.1%, the forecast increase in HGV traffic is 24-27.3% and the increase in the AADT is 1.3-1.6 % with an elevation in HGV content from 6.1% to 7.4%. The R402 and L2002 show increases in the order of 0.1 for LV traffic and an increase in HGV traffic of 15.4-17.5%. The increase in the total volume of traffic or AADT is 1.0% with an elevation in HGV content from 5.9% to 6.8%. The direct impact on many of the roads is of lower order and close to 1.0%. In all cases the forecast increase in traffic on the haul routes is less than 5% which by reference to the evaluation criteria set out in Table 14-21 can reasonably be categorised as imperceptible or slight where the section of the road link in the assessment is considered to be a sensitive location. The forecast impact of development traffic during the operational phases of the proposed development are comparable to that of the existing Drehid WMF as set out under Scenario 1a and summarised in Table 14-21 thus confirming that the forecast effect of the proposed development might for the application of practical judgement be considered akin to continuance of the existing operation beyond 2028.

Scenario 2b: 2029 Operational Traffic + Landfill Cell Construction

Scenario 2b includes for periods when the proposed Drehid WMF site is operational and landfill cell construction is ongoing in 2029. Under the first heading Table 14-26 provides the baseline traffic flows on the receiving road network in the study area as set out in the previous Table 14-8. The second heading shows the cumulative traffic arising from the operation of the landfill as set out in in Table 14-16 and Table 14-17 combined with the traffic arising from the construction of landfill cells also set out in Table 14-13 and Table 14-14. The third heading provides separately the forecast percentage increase in LV traffic, the forecast increase in HGV traffic together with a forecast increase in total traffic or AADT together with the incremental increase in the percentage HGV content of the total flow.

Table 14-26: Scenario 2b – 2029 Operational Traffic + Landfill Cell Construction Traffic

Label	Baseline 2029 (Landfill Traffic Removed)			2029 Operational Traffic + Landfill Cell Construction Traffic			Increase in Traffic over 2029 Baseline			
	LV	HGV	AADT (HGV)	LV	HGV	AADT (HGV)	LV	HGV	AADT	Proportion HGV
ATC 1 (R402E)	6538	399	6937 (5.8%)	6	89	7032 (6.9%)	0.1%	22.4%	1.4%	1.2%
ATC 2 (R402W)	8792	486	9278 (5.2%)	8	14	9300 (5.4%)	0.1%	2.9%	0.2%	0.1%
ATC 3 (R403S)	6302	297	6599 (4.5%)	14	103	6717 (5.0%)	0.2%	34.8%	1.8%	1.5%
ATC 4 (R403N)	4765	308	5073 (6.1%)	25	95	5193 (7.8%)	0.5%	30.7%	2.4%	1.7%
ATC 6 (R415S)	4763	190	4953 (3.8%)	10	25	4988 (4.3%)	0.2%	13.0%	0.7%	0.5%
ATC 7 (R402E)	6923	423	7347 (5.8%)	14	72	7433 (6.7%)	0.2%	17.0%	1.2%	0.9%
ATC 8 (R409N)	2782	88	2870 (3.1%)	0	0	2870 (2.1%)	0.0%	0.0%	0.0%	0.0%
ATC 9 (R402E)	9346	549	9895 (5.5%)	10	66	9970 (5.2%)	0.1%	12.0%	0.8%	0.6%
ATC 10 (R407S)	16447	784	17231 (4.6%)	0	0	17231 (4.6%)	0.0%	0.0%	0.0%	0.0%
ATC 11 (R408NE)	3427	124	3551 (3.5%)	5	2	3558 (3.5%)	0.1%	1.6%	0.2%	0.0%
ATC 12 (R415E)	3532	181	3713 (4.9%)	4	4	3721 (4.0%)	0.1%	2.2%	0.2%	0.1%
ATC 13 (R403NE)	14462	603	15066 (4.0%)	7	4	15076 (3.0%)	0.0%	0.7%	0.1%	0.0%
ATC 14 (R409NW)	5877	129	6006 (2.1%)	0	0	6006 (2.1%)	0.0%	0.0%	0.0%	0.0%
ATC 15 (R409SE)	214	3	217 (1.4%)	0	0	217 (1.4%)	0.0%	0.0%	0.0%	0.0%
ATC 16 (R416NW)	5379	148	5527 (2.7%)	6	21	5554 (2.0%)	0.1%	14.0%	0.5%	0.4%
ATC 17 (R416SE)	8029	112	8142 (1.4%)	6	21	8169 (1.6%)	0.1%	18.5%	0.3%	0.2%
ATC 18 (L2002)	4825	305	5130 (5.9%)	3	60	5193 (6.0%)	0.1%	19.7%	1.2%	1.1%

The highest concentration in development traffic is again on the R403 close to the development entrance. In the case of R403 the forecast increase in LV traffic is 0.2-0.5%, the forecast increase in HGV traffic is 30-35% and the increase in the AADT is 1.8-2.4% with an elevation in HGV content from 6.1% to 7.8%. The R402 and L2002 show increases in the order of 0.1 for LV traffic and an increase in HGV traffic of 19-22.4%. The increase in the total volume of traffic or AADT is 1.2-1.4% with an elevation in HGV content from 5.8% to 6.9%. The direct impact on many of the roads is of lower order and close to 2.0%. In all cases the forecast increase in traffic on the haul routes is less than 5% which by reference to the evaluation criteria set out in Table 14-21 can reasonably be categorised as imperceptible or slight where the section of the road link in the assessment is considered to be a sensitive location. The forecast impact of development traffic during the operational phase of the proposed development when landfill cells are being constructed are comparable to that of the existing Drehid WMF as set out under Scenario 1c and summarised in Table 14-22 thus confirming that the forecast effect of the proposed development might for the application of practical judgement be considered akin to continuance of the existing operation beyond 2028.

Scenario 3a: 2039 Operational Traffic

Scenario 3a includes for periods when only operational traffic is generated in 2039. The operational traffic is considered new to the receiving road network and so gives rise to direct impact which is summarised in Table 14-27. Under the first heading Table 14-25 provides the baseline traffic flows on the receiving road network in the study area as set out in the previous Table 14-8. This baseline data shows network traffic from which all landfill traffic both LV and HGV flows have been removed. The second heading shows the traffic arising from the operation of the landfill as set out in Table 14-16 and Table 14-17. The third heading provides separately the forecast percentage increase in LV traffic, the forecast increase in HGV traffic together with a forecast increase in AADT and the incremental increase in total flow and the incremental increase in the percentage HGV content.

Table 14-27: Scenario 3a – 2039 Operational Traffic

Label	Baseline 2039 (Landfill Traffic Removed)			2039 Operational Traffic			Increase in Traffic over 2039 Baseline			
	LV	HGV	AADT (HGV)	LV	HGV	AADT (HGV)	LV	HGV	AADT	Proportion HGV
ATC 1 (R402E)	6954	465	7420 (6.3%)	1	71	7492 (7.2%)	0.0%	15.1%	1.0%	0.9%
ATC 2 (R402W)	9352	567	9919 (5.7%)	2	11	9928 (5.8%)	0.0%	1.9%	0.1%	0.1%
ATC 3 (R403S)	6704	346	7050 (4.9%)	3	82	7083 (6.0%)	0.0%	23.5%	0.5%	1.1%
ATC 4 (R403N)	5069	359	5428 (6.6%)	6	75	5468 (7.9%)	0.1%	20.8%	0.7%	1.3%
ATC 6 (R415S)	5067	222	5289 (4.2%)	2	20	5302 (4.6%)	0.0%	8.8%	0.2%	0.4%
ATC 7 (R402E)	7365	494	7858 (6.3%)	3	57	7885 (7.0%)	0.0%	11.5%	0.3%	0.7%
ATC 8 (R409N)	2959	103	3062 (3.4%)	0	0	3062 (3.4%)	0.0%	0.0%	0.0%	0.0%
ATC 9 (R402E)	9942	640	10582 (6.1%)	2	52	10604 (6.5%)	0.0%	8.1%	0.2%	0.5%
ATC 10 (R407S)	17496	915	18410 (5.0%)	0	0	18410 (5.0%)	0.0%	0.0%	0.0%	0.0%
ATC 11 (R408NE)	3646	144	3790 (3.8%)	1	2	3794 (3.8%)	0.0%	1.1%	0.1%	0.0%
ATC 12 (R415E)	3757	211	3968 (5.3%)	1	3	3972 (5.4%)	0.0%	1.5%	0.1%	0.1%
ATC 13 (R403NE)	15384	704	16088 (4.4%)	2	3	16094 (4.4%)	0.0%	0.4%	0.0%	0.0%
ATC 14 (R409NW)	6251	151	6402 (2.4%)	0	0	6402 (2.4%)	0.0%	0.0%	0.0%	0.0%
ATC 15 (R409SE)	228	4	232 (1.6%)	0	0	232 (1.6%)	0.0%	0.0%	0.0%	0.0%
ATC 16 (R416NW)	5722	173	5901 (2.9%)	1	16	5904 (3.2%)	0.0%	9.5%	0.2%	0.3%
ATC 17 (R416SE)	8541	131	8672 (1.5%)	1	16	8681 (1.7%)	0.0%	12.5%	0.1%	0.2%
ATC 18 (L2002)	5133	356	5488 (6.5%)	1	47	5504 (7.3%)	0.0%	13.3%	0.3%	0.8%

The greatest concentration in development traffic is on R403 close to the development entrance. In the case of R403 the forecast increase in LV traffic is 0.1%, the forecast increase in HGV traffic is 20-23.5% and the increase in the AADT is 0.5-0.7 % with an elevation in HGV content from 6.6% to 7.9%. The increase in traffic on R402 and L2002 are in the order of an increase in LV traffic of less than 0.1%, an increase in HGV traffic is 13-15.1% and an increase total daily traffic flow or AADT of 0.3% with an elevation in HGV content from 6.5% to 7.3%. The direct impact on many of the roads is of lower order an close to 0.5%. In all cases the forecast increase in traffic on the haul routes is less than 5% which by reference to the evaluation criteria set out in Table 14-21 can reasonably be categorised as imperceptible or slight where the section of the road link in the assessment is considered to be a sensitive location.

Scenario 3b: 2039 Operational Traffic + Landfill Cell Construction Traffic

Scenario 3b includes for periods when the proposed Drehid WMF site is operational and landfill cell construction is ongoing in 2039. Under the first heading Table 14-26 provides the baseline traffic flows on the receiving road network in the study area as set out in the previous Table 14-8. The second heading shows the cumulative traffic arising from the operation of the landfill as set out in in Table 14-16 and Table 14-17 combined with the traffic arising from the construction of landfill cells also set out in Table 14-13 and Table 14-14. The third heading provides separately the forecast percentage increase in LV traffic, the forecast increase in HGV traffic together with a forecast increase in total traffic or AADT together with the incremental increase in the percentage HGV content of the total flow.

Table 14-28: Scenario 3b - 2039 Operational Traffic + Landfill Cell Construction Traffic

Label	Baseline 2039 (Landfill Traffic Removed)			2039 Operational Traffic + Landfill Cell Construction Traffic			Increase in Traffic over 2039 Baseline			
	LV	HGV	AADT (HGV)	LV	HGV	AADT (HGV)	LV	HGV	AADT	Proportion HGV
ATC 1 (R402E)	6954	465	7420 (6.3%)	6	90	7516 (7.4%)	0.1%	19.3%	1.3%	1.1%
ATC 2 (R402W)	9352	567	9919 (5.7%)	8	14	9941 (5.8%)	0.1%	2.5%	0.2%	0.1%
ATC 3 (R403S)	6704	346	7050 (4.9%)	14	104	7168 (6.3%)	0.2%	30.0%	1.7%	1.4%
ATC 4 (R403N)	5069	359	5428 (6.6%)	25	95	5548 (8.2%)	0.5%	26.5%	2.2%	1.6%
ATC 6 (R415S)	5067	222	5289 (4.2%)	10	25	5324 (4.6%)	0.2%	11.2%	0.7%	0.4%
ATC 7 (R402E)	7365	494	7858 (6.3%)	14	72	7945 (7.1%)	0.2%	14.6%	1.1%	0.8%
ATC 8 (R409N)	2959	103	3062 (3.4%)	0	0	3062 (3.4%)	0.0%	0.0%	0.0%	0.0%
ATC 9 (R402E)	9942	640	10582 (6.1%)	10	66	10658 (6.6%)	0.1%	10.3%	0.7%	0.6%
ATC 10 (R407S)	17496	915	18410 (5.0%)	0	0	18410 (5.0%)	0.0%	0.0%	0.0%	0.0%
ATC 11 (R408NE)	3646	144	3790 (3.8%)	5	2	3797 (3.9%)	0.1%	1.4%	0.2%	0.0%
ATC 12 (R415E)	3757	211	3968 (5.3%)	4	4	3976 (5.4%)	0.1%	1.9%	0.2%	0.1%
ATC 13 (R403NE)	15384	704	16088 (4.4%)	7	4	16099 (4.4%)	0.0%	0.6%	0.1%	0.0%
ATC 14 (R409NW)	6251	151	6402 (2.4%)	0	0	6402 (2.4%)	0.0%	0.0%	0.0%	0.0%
ATC 15 (R409SE)	228	4	232 (1.6%)	0	0	232 (1.6%)	0.0%	0.0%	0.0%	0.0%
ATC 16 (R416NW)	5722	173	5901 (2.9%)	6	21	5922 (3.3%)	0.1%	12.1%	0.5%	0.3%
ATC 17 (R416SE)	8541	131	8672 (1.5%)	6	21	8699 (1.7%)	0.1%	16.0%	0.3%	0.2%
ATC 18 (L2002)	5133	356	5488 (6.5%)	3	60	5552 (7.5%)	0.1%	17.0%	1.2%	1.0%

The highest concentration in development traffic is again on the R403 close to the development entrance. In the case of R403 the forecast increase in LV traffic is 0.2-0.5%, the forecast increase in HGV traffic is 26-30% and the increase in the AADT is 1.7-2.2% with an elevation in HGV content from 6.6% to 8.2%. The R402 and L2002 show increases in the order of 0.1 for LV traffic and an increase in HGV traffic of 17-19.3%. The increase in the total volume of traffic or AADT is 1.2-1.3% with an elevation in HGV content from 6.3% to 7.4%. The direct impact on many of the roads is of lower order and close to 2.0%. In all cases the forecast increase in traffic on the haul routes is less than 5% which by reference to the evaluation criteria set out in Table 14-21 can reasonably be categorised as imperceptible or slight where the section of the road link in the assessment is considered to be a sensitive location. The forecast impact of development traffic during the operational phase of the proposed development when landfill cells are being constructed are comparable to that of the existing Drehid WMF as set out under Scenario 1c and summarised in Table 14-22 thus confirming that the forecast effect of the proposed development might for the application of practical judgement be considered akin to continuance of the existing operation beyond 2028.

Scenario 4a: 2049 Operational Traffic

Scenario 4a includes for periods when only operational traffic is generated in 2049. The operational traffic is considered new to the receiving road network and so gives rise to direct impact which is summarised in Table 14-29. Under the first heading Table 14-25 provides the baseline traffic flows on the receiving road network in the study area as set out in the previous Table 14-8. This baseline data shows network traffic from which all landfill traffic both LV and HGV flows have been removed. The second heading shows the traffic arising from the operation of the landfill as set out in Table 14-16 and Table 14-17. The third heading provides separately the forecast percentage increase in LV traffic, the forecast increase in HGV traffic together with a forecast increase in AADT and the incremental increase in total flow and the incremental increase in the percentage HGV content.

Table 14-29: Scenario 4a – 2049 Operational Traffic

Label	Baseline 2049 (Landfill Traffic Removed)			2049 Operational Traffic + Landfill Cell Construction Traffic			Increase in Traffic over 2049 Baseline			
	LV	HGV	AAADT (HGV)	LV	HGV	AAADT (HGV)	LV	HGV	AAADT	Proportion HGV
ATC 1 (R402E)	7332	560	7892 (7.1%)	1	71	7964 (7.9%)	0.0%	12.6%	0.9%	0.8%
ATC 2 (R402W)	9860	682	10542 (6.5%)	2	11	10555 (6.6%)	0.0%	1.6%	0.1%	0.1%
ATC 3 (R403S)	7067	417	7484 (5.6%)	3	82	7570 (6.6%)	0.0%	19.7%	1.1%	1.0%
ATC 4 (R403N)	5344	433	5777 (7.5%)	6	75	5857 (8.7%)	0.1%	17.3%	1.4%	1.2%
ATC 6 (R415S)	5342	267	5606 (4.8%)	2	20	5631 (5.1%)	0.0%	7.3%	0.4%	0.3%
ATC 7 (R402E)	7765	594	8359 (7.1%)	3	57	8419 (7.7%)	0.0%	9.6%	0.7%	0.6%
ATC 8 (R409N)	3120	123	3243 (3.8%)	0	0	3243 (3.8%)	0.0%	0.0%	0.0%	0.0%
ATC 9 (R402E)	10481	771	11252 (6.8%)	2	52	11306 (7.3%)	0.0%	6.8%	0.5%	0.4%
ATC 10 (R407S)	18445	1101	19546 (5.6%)	0	0	19546 (5.6%)	0.0%	0.0%	0.0%	0.0%
ATC 11 (R408NE)	3844	174	4017 (4.3%)	1	2	4020 (4.4%)	0.0%	0.9%	0.1%	0.0%
ATC 12 (R415E)	3961	254	4215 (6.0%)	1	3	4219 (6.1%)	0.0%	1.2%	0.1%	0.1%
ATC 13 (R403NE)	16220	847	17066 (5.0%)	2	3	17071 (5.0%)	0.0%	0.4%	0.0%	0.0%
ATC 14 (R409NW)	6591	181	6772 (2.7%)	0	0	6772 (2.7%)	0.0%	0.0%	0.0%	0.0%
ATC 15 (R409SE)	240	4	245 (1.8%)	0	0	245 (1.8%)	0.0%	0.0%	0.0%	0.0%
ATC 16 (R416NW)	6032	208	6240 (3.3%)	1	16	6258 (3.6%)	0.0%	7.9%	0.3%	0.3%
ATC 17 (R416SE)	9005	157	9162 (1.7%)	1	16	9180 (1.9%)	0.0%	10.5%	0.2%	0.2%
ATC 18 (L2002)	5411	428	5839 (7.3%)	1	48	5888 (8.1%)	0.0%	11.1%	0.8%	0.7%

The greatest concentration in development traffic is on R403 close to the development entrance. In the case of R403 the forecast increase in LV traffic is 0.1%, the forecast increase in HGV traffic is 17-19.7% and the increase in the AADT is 1.1-1.4 % with an elevation in HGV content from 7.5% to 8.7%. The increase in traffic on R402 and L2002 are in the order of an increase in LV traffic of less than 0.1%, an increase in HGV traffic is 11-12.6% and an increase total daily traffic flow or AADT of 0.9% with an elevation in HGV content from 7.1% to 7.9%. The direct impact on many of the roads is of lower order an close to 0.5%. In all cases the forecast increase in traffic on the haul routes is less than 5% which by reference to the evaluation criteria set out in Table 14-21 can reasonably be categorised as imperceptible or slight where the section of the road link in the assessment is considered to be a sensitive location.

Scenario 4b: 2049 Operational Traffic + Landfill Cell Construction Traffic

Scenario 4b includes for periods when the proposed Drehid WMF site is operational and landfill cell construction is ongoing in 2049. Under the first heading Table 14-26 provides the baseline traffic flows on the receiving road network in the study area as set out in the previous Table 14-8. The second heading shows the cumulative traffic arising from the operation of the landfill as set out in Table 14-16 and Table 14-17 combined with the traffic arising from the construction of landfill cells also set out in Table 14-13 and Table 14-14. The third heading provides separately the forecast percentage increase in LV traffic, the forecast increase in HGV traffic together with a forecast increase in total traffic or AADT together with the incremental increase in the percentage HGV content of the total flow.

Table 14-30: Scenario 4b 2049 Operational Traffic + Landfill Cell Construction Traffic

Label	Baseline 2049 (Landfill Traffic Removed)			2049 Operational Traffic + Landfill Cell Construction Traffic			Increase in Traffic over 2049 Baseline			
	LV	HGV	AADT (HGV)	LV	HGV	AADT (HGV)	LV	HGV	AADT	Proportion HGV
ATC 1 (R402E)	7332	560	7892 (7.1%)	6	90	7988 (8.1%)	0.1%	16.1%	1.2%	1.0%
ATC 2 (R402W)	9860	682	10542 (6.5%)	8	14	10564 (6.6%)	0.1%	2.1%	0.2%	0.1%
ATC 3 (R403S)	7067	417	7484 (5.6%)	14	104	7603 (6.9%)	0.2%	25.0%	1.6%	1.3%
ATC 4 (R403N)	5344	433	5777 (7.5%)	25	95	5897 (9.0%)	0.5%	22.1%	2.1%	1.5%
ATC 6 (R415S)	5342	267	5606 (4.8%)	10	25	5644 (5.2%)	0.2%	9.3%	0.6%	0.4%
ATC 7 (R402E)	7765	594	8359 (7.1%)	14	73	8446 (7.9%)	0.2%	12.2%	1.0%	0.8%
ATC 8 (R409N)	3120	123	3243 (3.8%)	0	0	3243 (3.8%)	0.0%	0.0%	0.0%	0.0%
ATC 9 (R402E)	10481	771	11252 (6.8%)	10	67	11328 (7.4%)	0.1%	8.6%	0.7%	0.5%
ATC 10 (R407S)	18445	1101	19546 (5.6%)	0	0	19546 (5.6%)	0.0%	0.0%	0.0%	0.0%
ATC 11 (R408NE)	3844	174	4017 (4.3%)	5	2	4024 (4.4%)	0.1%	1.2%	0.2%	0.0%
ATC 12 (R415E)	3961	254	4215 (6.0%)	4	4	4223 (6.1%)	0.1%	1.6%	0.2%	0.1%
ATC 13 (R403NE)	16220	847	17066 (5.0%)	7	4	17077 (5.0%)	0.0%	0.5%	0.1%	0.0%
ATC 14 (R409NW)	6591	181	6772 (2.7%)	0	0	6772 (2.7%)	0.0%	0.0%	0.0%	0.0%
ATC 15 (R409SE)	240	4	245 (1.8%)	0	0	245 (1.8%)	0.0%	0.0%	0.0%	0.0%
ATC 16 (R416NW)	6032	208	6240 (3.3%)	6	21	6267 (3.6%)	0.1%	10.1%	0.4%	0.3%
ATC 17 (R416SE)	9005	157	9162 (1.7%)	6	21	9190 (1.9%)	0.1%	13.3%	0.3%	0.2%
ATC 18 (L2002)	5411	428	5839 (7.3%)	3	61	5903 (8.3%)	0.1%	14.1%	1.1%	0.9%

The highest concentration in development traffic is again on the R403 close to the development entrance. In the case of R403 the forecast increase in LV traffic is 0.2-0.5%, the forecast increase in HGV traffic is 22-25% and the increase in the AADT is 1.6-2.1% with an elevation in HGV content from 7.5% to 9.0%. The R402 and L2002 show increases in the order of 0.1 for LV traffic and an increase in HGV traffic of 14-16.1%. The increase in the total volume of traffic or AADT is 1.1-1.2% with an elevation in HGV content from 7.1% to 8.1%. The direct impact on many of the roads is of lower order and close to 2.0%. In all cases the forecast increase in traffic on the haul routes is less than 5% which by reference to the evaluation criteria set out in Table 14-21 can reasonably be categorised as imperceptible or slight where the section of the road link in the assessment is considered to be a sensitive location. The forecast impact of development traffic during the operational phase of the proposed development when landfill cells are being constructed are comparable to that of the existing Drehid WMF as set out under Scenario 1c and summarised in Table 14-22 thus confirming that the forecast effect of the proposed development might for the application of practical judgement be considered akin to continuance of the existing operation beyond 2028.

14.10.6 DECOMMISSIONING AND REINSTATEMENT PHASE

Chapter 2 'Description' provides at Section 2.7 details relating to the decommissioning of the facility including long-term aftercare and in particular leachate and landfill gas management, and the removal of mobile plant and equipment off site.

Upon cessation of operations the site will be decommissioned in accordance with the current proposal. The traffic generation of the proposed development during the decommissioning phase will be a fraction of that generated during the operational and construction phases as set out in this Chapter. The volume of HGV traffic generation during the decommissioning phase is likely to be in the order of 8 no. trips or less which is approximately 10% of the traffic generated in the Operational Phase. On this basis it follows from the analyses provided herein that the traffic likely to be generated during the decommissioning of the site will not have a significant effect upon the capacity and operation of the receiving road network.

14.10.7 CUMULATIVE EFFECTS

Traffic and Transport Assessments review committed developments within the vicinity of the site that may have an effect on the same parts of the receiving road network as the proposed development. This includes sites which have previously been granted planning permission but which are yet to be constructed or to become operational. A search of the Kildare County Council online planning database in May 2023 provided a list of the following granted planning submission listed in Table 14-31.

Table 14-31: Committed Developments

Year	Administrative District	Planning Reference	Description
2015	Kildare	KCC15/1172	Solar PV Panel Array, Timahoe West
2016	Kildare	16/1265	25 MW Solar PV Farm, Dysart
2017	Kildare	17/1222	Extension to the Dysart Solar PV Farm (16/1265)
2018	Kildare	181514 (ABP-PL09.305953)	Timahoe North Solar Farm
2018	Kildare	181534 (PL09.306500)	Drehid Wind Farm
2020	Kildare	20/1529	Extension of duration of Planning Ref. No 151172
2021	Kildare	ABP-VC09.311394	110kV electrical substation, a 110kV loop in/loop out cable connection to the Kinnegad
2022	Kildare	22/1203	Collcarrigan Solar Farm

Planning Reference KCC15/1172

The Timahoe West Solar PV development is located adjacent 5.5km south-east of Clane. A review of the planning documentation, page 53-56 of 'Planning & Environmental Report' (Traffic and Transportation Chapter) for this application indicates an increase in HGV movements to the site of between 8 and 12 HGV per week during the construction phase. The Haul route outlined in the application states the vehicles will travel to/from the M4 via the R407. A construction programme was not included in the planning application.

The volume of construction HGV traffic is of low order and not likely to have a significant impact. The probability that both this project and the construction of the proposed development would occur during the same time period is low. Since the volume of traffic generated by this development is so low it was considered unlikely to have an effect upon the outcome of the traffic assessments and has therefore not been specifically included in a cumulative impact.

Planning Reference 16/1265

The Dysart Solar Farm is located in Johnstown, Co. Kildare. A review of the 'Construction Traffic Management Plan' (page 8) that accompanied the planning submission forecasts that the site will generate a maximum of 6 HGVs a day during the construction phase. The Haul route outlined in the application identifies construction traffic travelling to/from M4 via the R402 and L1004 (page 17). Our review of the planning document online provided no detail on the likely construction programme. Given the very low traffic generation of this development combined with the high capacity of the R402 and also considering the likely timeframe for construction it was not considered that cumulative impact over the short duration of construction would show any measurable impact and so no specific cumulative assessment was considered warranted or worthwhile.

Planning Reference 17/1222

This relates to an extension to the Dysart Solar Farm and is similar in nature to the original development permitted under Planning Reg. Ref. 16/1265. A review of the 'Construction Traffic Management Plan' (page 8) as part of the planning documentation states a peak of 6 HGVs a day during the construction phase. The proposed construction haul route to/from the M4 via the R402 and the L1004 (page 18) as identified in the previous proposal. These construction traffic generation volumes are very low and are temporary in nature. It was not thought necessary to include this traffic in a cumulative assessment. The likelihood that the both projects would occur during the same time period is understood to be low in any case.

Planning Reference 181514

Timahoe North Solar Farm is located 3km from Johnstown. An extract from the EIAR Chapter 13 section 13.1.6.1 identified the route for the traffic will be from the L5025 (Derrymahon Road) to the R402 continuing to the M4.

Bord na Mona are the developer of this project and have stated the project is currently under construction and will be completed prior to the start of the proposed development of Drehid WMF. The question of cumulative impact does not arise.

Planning Reference 181534

The Drehid Wind Farm is located on the L5025 (Derrymahon Road) north-east of the site. It was granted planning which was subject to judicial review. The decision to grant permission was ultimately quashed.

Planning Reference 20/1529

The 20/1529 relates to an applications for an extension of duration for the Timahoe West Solar PV development considered under Planning Ref. No 151172 above.

Planning Reference VC09.311394

The 110kV electrical substation and a 110kV loop in/loop out cable connection to the Kinnegad pre-application consultation request has yet to be concluded. Hence it has not considered as a cumulative effect in this application .

Planning Reference 22/1203

Construction of this development of Coolcarrigan Solar Farm is expected to occur over an 8-15 months (page 20 of the Environmental and Planning Report). The project commencement of construction date is set at Q3 2025 (FI Received ‘the report with appendices’). This date is a year after the commencement year outlined for the proposed development of Drehid WMF as set out in EIAR Chapter 2 ‘Description’. The haul routes will be from the L1019 to the R402 accessing the M4 (page 24 of the Environmental and Planning Report). Given the low traffic generation of this development combined with the high capacity of the R402 and also considering the likely timeframe for construction it was not considered that cumulative impact over the short duration of construction would show any measurable impact and so no specific cumulative assessment was considered warranted or worthwhile. The application of network traffic growth factors to regional roads is considered likely to include such traffic as arises from development in any case.

General Economic Development

The road network assessments do not include for specific local developments other than the proposed development. Other future development that may give rise to the generation of new traffic on the receiving roads network is included for by the application of TII published growth rates to existing surveyed traffic flows on the receiving road in the study area. The additional traffic generation arising on the receiving road network assumed in this Chapter through the application of the TII growth rates is as follows:

- 2022-2024 (Opening Year)+3.98% (LV).....+7.70% (HGV)
- 2022-2029 (Opening Year +5yrs).....+10.25% (LV)---+20.38% (HGV)
- 2022-2039 (Opening Year +15yrs).....+17.27% (LV)---+40.40% (HGV)
- 2022-2049 (Opening Year +25yrs).....+23.64% (LV)---+68.98% (HGV)

The cumulative traffic arising from future economic growth and development resulting in traffic growth on the receiving network are included for in both the with and without the Drehid WMF road network assessment scenarios. It is reasonable to expect that traffic arising from the proposed development would by definition be included, or at least included in part in the TII growth rates. This factor is disregarded in the traffic assessments which considers all future traffic to the proposed development as totally new to the road network for the proposed period of operation assumed to commence in 2024.

14.11 MITIGATION

14.11.1 CONSTRUCTION PHASE MITIGATION

The following are measures that will be implemented to mitigate the traffic and transportation effects of the proposed development:

- Photographic survey of haul roads again, immediately prior to commencement of construction;
- Continuous monitoring of haul roads throughout the construction phase; and
- All construction contractors will undergo an induction process and will ultimately be issued with a map of the permitted haul routes such that all materials imported into the site and exported out of the site are transported via the identified and agreed haul routes.

The Kildare County Council Roads, Transportation and Public Safety Department reviewed a scoping letter in relation to the proposed development submitted by Tobin Consulting Engineers dated 10th June 2016 (see Appendix 1-2 of the EIAR). The Roads Department responded to Kildare County Council Planning Section on the 11th July 2016. Within the Conclusion and Recommendation of this response was a request that a full structural assessment of the haul routes, to show pavement depths and subgrade, be undertaken. In compliance with this request, Pavement Management Systems were commissioned to undertake the following surveys (Appendix 14.2) on existing and proposed haul routes:

- 1) Falling Weight Deflectometer (FWD) testing.
- 2) Ground Penetrating Radar (GPR) and cores where required.
- 3) Road Condition Data (RCD) using Road Surface Profiler (RSP) including:
 - Digital Video (chainage and GPS referenced).
 - Visual condition survey from video survey using pavement condition index (PCI).
 - Ride quality survey using International Roughness Index (IRI).
 - Transverse profile for rut depth.

Surveys were carried out in June 2022. The surveys were undertaken in line with TII 'Guidelines for the use of the Falling Weight Deflectometer in Ireland'. As per the guidelines for two lane roads, the surveys were carried out in both traffic directions and at 50 m intervals with the tests being staggered in adjacent lanes.

The assessment did not include sections of the haul routes which were on motorway or national roads as these roads have been designed to cater for larger traffic volumes. The Reports for all of the testing mentioned above are shown in Appendix 14.2 and include drawings showing the haul routes and associated chainages.

The FWD level 1 survey covers the testing undertaken to assess the condition of the existing pavement layers and subgrade. The output from these are; D1 - overall pavement structural condition, surface curvature index (SCI) - the upper surface pavement condition, and D7 - the subgrade strength.

These detailed pavement condition surveys will underpin the determination of maintenance costs of the life of the scheme and will facilitate and assessment of pavement defects that may arise during the construction period. It is proposed that any direct impact of construction on

road structure during construction works will be identified to Kildare County Council and a schedule of maintenance agreed and carried out under the appropriate licences.

14.11.2 OPERATIONAL PHASE MITIGATION

The following are measures that will be implemented to mitigate the impact associated with the facility:

- Continuous monitoring of haul roads throughout operational phase;
- All contractors, delivering waste to the facility and removing outputs from the facility, and all construction contractors will undergo an induction process and will ultimately be issued with a map of the permitted haul routes such that all materials imported into the site and exported out of the site are transported via the identified and agreed haul routes. A penalty system will be operated by Bord na Móna to ensure haulage operators comply with these requirements;
- Use existing wheel wash facilities at the Waste Facility during both the construction and operational phase to reduce the potential for deposition of dirt or detritus on the public road. The existing 4.8 km private access road also aids in this regard;
- Maintenance of warning signage on the approach to the entrance;
- Monitoring of parking requirements during the operational phase with additional spaces to be provided if required;
- Maintenance of site entrance ensuring visibility splays remain unobstructed; and
- Monitoring of haul routes performance and continuing and ongoing review of haul routes with Kildare County Council.

14.11.3 DECOMMISSIONING AND REINSTATEMENT PHASE MITIGATION

As outlined in Section 3.7 of EIAR Chapter 2 'Description', decommissioning for the facility would relate to long-term aftercare, i.e., leachate and landfill gas management and the removal of all plant and equipment.

The potential effects of decommissioning the site on the capacity and operation of the receiving road network are not considered to be potentially significant effects. No specific mitigation is considered necessary.

14.12 RESIDUAL IMPACT ASSESSMENT

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

14.12.1 CONSTRUCTION PHASE

After the completion of the construction there will be no traffic therefore there will be no residual impact arising.

14.12.2 OPERATIONAL PHASE

Any residual impacts on traffic capacity on the receiving road network can be categorised as imperceptible or slight.

14.12.3 DECOMMISSIONING AND REINSTATEMENT PHASE

There will be no residual impact arising.

14.12.4 CUMULATIVE RESIDUAL EFFECTS

There will be no cumulative residual impact arising.

14.13 INTERACTIONS

14.13.1 NOISE AND VIBRATION

Traffic related noise and vibration is considered in Chapter 10 of this EIAR. The AADT along the Haul Routes has been provided to the Noise and Vibration specialist.

14.13.2 AIR QUALITY AND CLIMATE

Traffic related impacts on air quality and climate are considered in Chapter 12 of this EIAR. The AADT along the Haul Routes has been provided to the Air Quality and climate specialist.

14.14 MONITORING

14.14.1 CONSTRUCTION PHASE

Construction and Environmental Management Plan (CEMP) will be provided to the Main Contractor for implementation during the construction stages. It will be considered as a 'Live Document' and will be updated accordingly throughout the project as required.

14.14.2 OPERATIONAL PHASE

The implementation and performance of traffic management and haul route management measures and initiatives including any ongoing revisions or new initiatives will be monitored and evaluated throughout the Operational Phase.

14.15 SUMMARY OF MITIGATION AND MONITORING

The table below summarises the Construction Phase mitigation and monitoring measures.

Table 14-32: Summary of Construction Phase Mitigation and Monitoring

Likely Effect	Mitigation	Monitoring
Additional Construction Traffic	<ul style="list-style-type: none"> • A Construction Traffic Management Plan will minimise traffic effects during construction, as far as practicable. • The haul routes proposed are on national and regional roads, which are established HGVs routes which have been monitored and reviewed with Kildare County Council. It is proposed that the routes will continue to be monitored and reviewed for the life of the project. • Specific and exceptional works as may be identified from the detailed road condition surveys and assessments that may be determined as require to facilitate the proposed development will be funded through an expected special development contribution and a relevant condition of planning requiring agreement with Kildare County Council is respectfully invited in this regard. 	Construction Traffic Management

The table below summarises the Operational Phase mitigation and monitoring measures.

Table 14-33: Summary of Operational Phase Likely Effects in the absence of mitigation.

Likely Effect	Mitigation	Monitoring
Additional Operational Traffic	<p>Implementation of site operations traffic management plan.</p> <ul style="list-style-type: none"> • Opening hours allow staff to avoid morning and evening peak hour periods • Distribution of traffic approx. 50/50 east/west on identified haulage routes • Scheduling of traffic movements • Truck/Wheel washing on site • Parking provided on site • Advance warning signing on approach to access • HGV's sheeted • Specific and exceptional works as may be identified from the detailed road condition surveys and assessments that may be determined as require to facilitate the proposed development will be funded through an expected special development contribution and a relevant condition of planning requiring agreement with Kildare County Council is respectfully invited in this regard. 	Traffic management measures to be monitored and reviewed on an ongoing basis.

There are no mitigation measures required for the decommissioning and restoration phase of development.

14.16 CONCLUSION

This chapter of the EIAR has been prepared to assess the potential impacts of the proposed development in terms of traffic and transport. The chapter has detailed the local receiving environment and traffic characteristics of the proposed development. The Chapter reports upon detailed and robust assessments of the potential impact of the proposed development on the operation of the local receiving road network.

In order to model future Drehid WMF traffic characteristics the traffic at the existing Drehid WMF was studied by the examination of 5 no. years of weighbridge data and other site records for the period 2018-2022. The records aided in determining the existing Drehid WMF volume of operational traffic and the average tonnage per vehicle categorised by waste/material type. Existing weighbridge records include waste origins and so facilitated the construction of an assignment and distribution model for HGV traffic generated on the receiving road network.

Each line item on the weighbridge data recorded the waste types generally corresponding to the codes used in the European Waste Code. Therefore each line item was separated into the following categories;

- Construction & Demolition (C&D) fines and C&D rubble;
- Non-hazardous soils and stones;
- Municipal Solid Waste (MSW);
- Incinerator Bottom Ash (IBA);
- Bio-stabilised waste;
- Inert waste (soil & stone) for engineering purposes; and
- Waste to Compost Plant

The average load per vehicle was calculated for each type of waste and type of material transported. The volume of daily HGV movements has been calculated using the average tonnage for each waste category and average number of full days of operation counted from the weighbridge data over the period of 5 no. years.

The origins of materials transported are identified and these were separated by county to establish the distribution of regional HGV traffic. The haul route for each material was determined at both regional and local level by reviewing waste origin and journey time against the existing haul routes.

In preparing this Chapter a number of statutory meetings have been held separately between the Applicant and An Bord Pleanála and the Applicant and Kildare County Council. The information determined from the desktop study was discussed and the methodology for the traffic assessment was agreed.

This assessment covers both the short-term construction phase and long-term operational phase, including cumulative impacts, along with details of the mitigation measures addressing the effects of the development.

A baseline network traffic model for the traffic assessments was determined. The existing Drehid WMF is permitted to operate under licence to 2028 so, save for the year of opening in 2024 the baseline is the surveyed network traffic flows from which current landfill traffic has been removed. The existing volume of Drehid WMF traffic on the network was determined from the detailed weighbridge assessments for the two week period of the traffic counts. The baseline is derived from the 2022 traffic survey data from which the existing Drehid WMF HGV traffic has been subtracted. A series of future year baseline scenarios were calculated for the opening year and various future assessment years including 2024, 2029, 2039 and 2049.

The traffic generated during the construction phase was determined from a combination of 'first

principles' method and 'Comparison' method where the construction of proposed buildings is based upon comparison with the construction of similar buildings. The traffic generated during the periodic construction of landfill cells has been based upon records of the applicants experience of previous comparable constructions associated with the development of the existing Drehid WMF facility.

A review of committed developments within the vicinity of the site that may have an effect on the same parts of the receiving road network was undertaken. This includes sites which have previously been granted planning permission but which are yet to be constructed or to become operational. On the basis of the review no specific cumulative assessment was considered necessary, but inherent in the calculations is consideration of economic development of the surrounding area which is accounted for in the application of national traffic growth rates.

The proportional difference in traffic flows on the receiving roads network was determined against the Baseline for the various assessment years and assessment scenarios which include the Operational Phase and Construction Phase.

The peak year for traffic impact arising from construction is 2024 when the assessments consider the construction of proposed buildings and the construction of new landfill cells. Since the existing Drehid WMF is permitted to operate under licence to 2028 and since the proposed and existing developments generate similar volumes of traffic it follows that the true impact of the proposed development in 2024 is only the traffic arising from the construction. In the absence of construction, up to 2028 the impact of the proposed development will be the same as that of the permitted development. Operational traffic only starts to have an impact on the baseline in 2029 after the current permission expires. Each of the assessments years considers operational traffic and separately traffic during periodic construction of landfill cells. Review of the traffic generation figures for the 2029 in both the operational and construction phases confirms that the traffic generation of the proposed development might best be characterised as a continuance of the existing Drehid WMF operations. The impact of development traffic in the 2029 and other future year scenarios is measured against the baseline network traffic model where the existing Drehid Landfill is assumed to cease operating in 2028.

In total 9 no. separate traffic scenarios are considered in this chapter as follows

- **Scenario 1a:** 2024 Operational Traffic
- **Scenario 1b:** 2024 Operational Traffic + Construction of Infrastructure + Landfill Cells
- **Scenario 1c:** 2024 Operational Traffic + Construction of Landfill Cells
- **Scenario 2a:** 2029 Operational Traffic
- **Scenario 2b:** 2029 Operational Traffic + Construction of Landfill Cells
- **Scenario 3a:** 2039 Operational Traffic
- **Scenario 3b:** 2039 Operational Traffic + Construction of Landfill Cells
- **Scenario 4a:** 2049 Operational Traffic
- **Scenario 4b:** 2049 Operational Traffic + Construction of Landfill Cells

The assessments show that the greatest impact arises in the 2029 scenarios. In the further future year analyses the traffic generated by Drehid WMF remains at a constant level whilst network traffic grows in line with general economic development so it follows that the proportional impact of the development traffic diminishes over time.

The results of the 2029 operational phase assessment shows the highest concentration in development traffic is on the R403 close to the development entrance. The greatest increase in total traffic is at the site access on R403 and is in the order of 1.0% AADT with the proportional HGV content increasing from 6.1% to 7.4%. The increase in light traffic numbers is less than 1% whilst the increase in HGV is 24-27.3%. The level of impact dilutes with distance from the site entrance. The R402 and L2002 connecting to R403 show increases in the order of 0.1 for LV traffic and an increase in HGV traffic of 15.4-17.5%. The increase in the total volume of traffic or AADT is 1.0% with an elevation in HGV content of less than 1%.

The direct impact on all roads is of lower order and close to 1.0% of total traffic flow.

The results of the 2029 construction phase assessment shows the forecast increase in LV traffic on R403 at the site entrance is 0.2-0.5%, the forecast increase in HGV traffic is 30-35% and the increase in the AADT is 1.8-2.4% with an elevation in HGV content from 6.1% to 7.8%. The R402 and L2002 show increases in the order of 0.1 for LV traffic and an increase in HGV traffic of 19-22.4%. The increase in the total volume of traffic or AADT is 1.2-1.4% with an elevation in HGV content from 5.8% to 6.9%.

In all cases, both operational and construction phases the forecast increase in traffic on the haul routes is significantly less than 5% which by reference to the evaluation criteria is of a magnitude that is negligible with respect to road network capacity including links and junctions. By the assessment criteria the likely impact can be categorised as imperceptible or slight where the section of the road link in the assessment is considered to be a sensitive location. The results of the detailed assessments show that development traffic will not have a significant impact on the operation of junctions on the haul routes. Given the order of magnitude of traffic generation no detailed capacity modelling of junctions is required. The traffic arising from the proposed development is similar in volume and has similar characteristics to existing Drehid WMF traffic and is likely to have a similar effect on road network capacity.

The forecast impact of development traffic during the operational phase of the proposed development when landfill cells are being constructed are comparable to that of the existing Drehid WMF and confirm that the forecast effect of the proposed development might for the application of practical judgement be considered akin to continuance of the existing operation beyond 2028.

It is self-evident that Kildare County Council has previously determined that the existing receiving road network is suitable to cater for the volume of traffic generated by the existing Drehid WMF and have in fact considered it suitable to accommodate not only that volume of traffic but also the additional traffic that would have been conjunctively generated by the MBT facility. It follows as reasonable that the existing haul routes are suitable to accommodate the current proposed development.

14.17 REFERENCES AND SOURCES

- European Commission (2017). Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report.
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