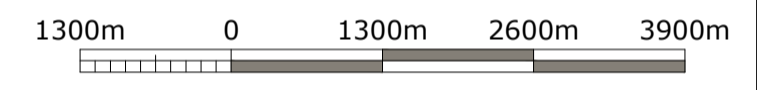


- GENERAL LEGEND**
- BORD NA MONA OWNERSHIP BOUNDARY
 - APPLICATION BOUNDARY
 - NATIONAL MOTORWAY NETWORK M4/M7/M9
 - APPROVED HAUL ROUTES
 - LOCAL HAUL ROUTES
 - APPROVED HAUL ROUTES (HGV Restricted)
 - R4## REGIONAL ROAD
 - PROPORTION OF HGV TRAFFIC (160 Trips per day)
 - PROPORTION OF LGV TRAFFIC (76 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:
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** A

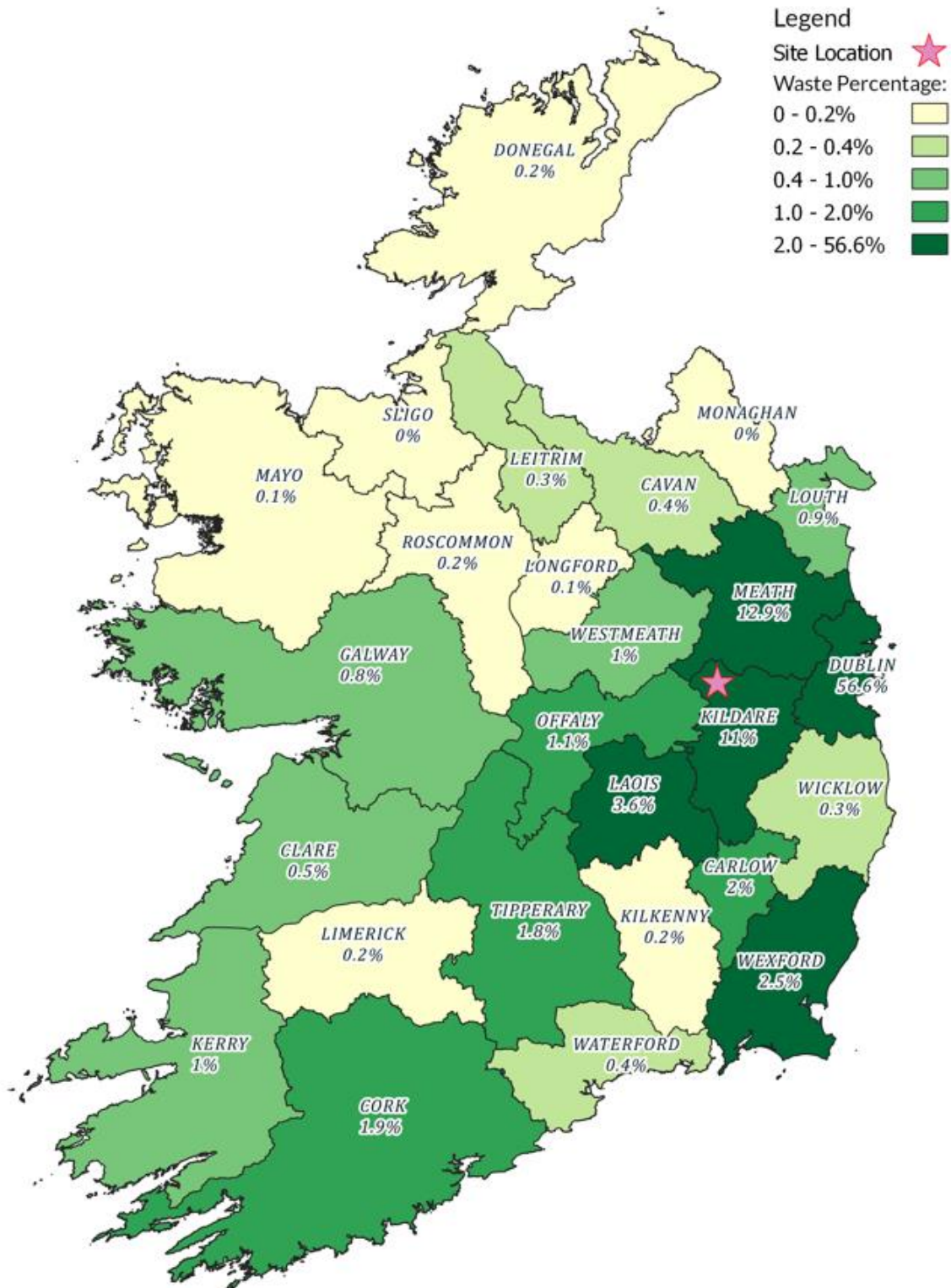
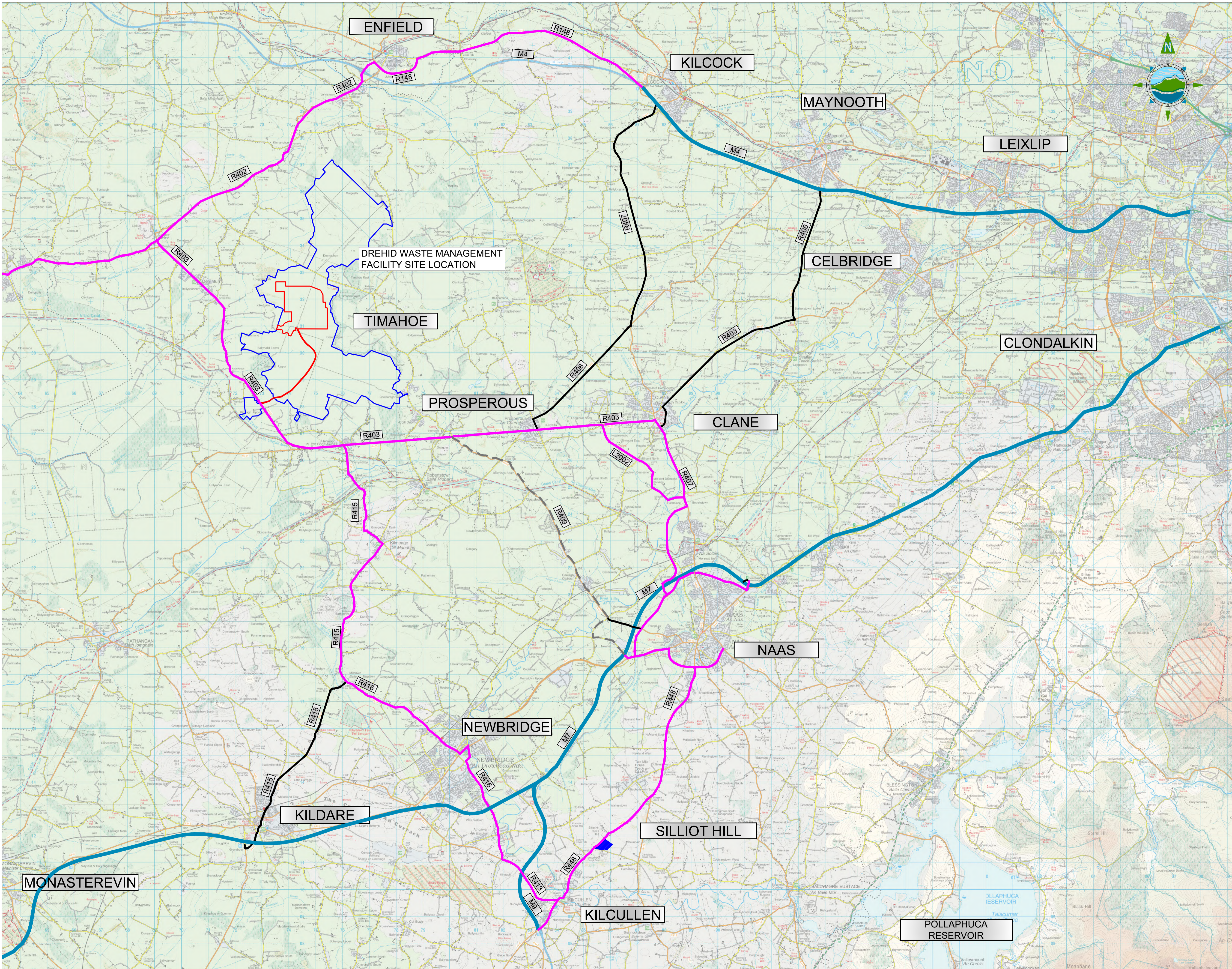


Figure 14-3: Geographical Distribution of HGV Traffic (2018-2022)

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.

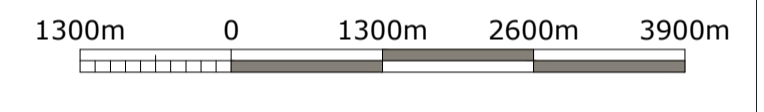
In the interest of a comprehensive assessment Figure 14-4 also shows previously identified haul routes that, based upon review with Kildare County Council are currently not in general use by HGV generated to Drehid WMF due to various access restrictions which include weight restrictions and width restrictions 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



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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** Revision: **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 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 Dredhid 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.

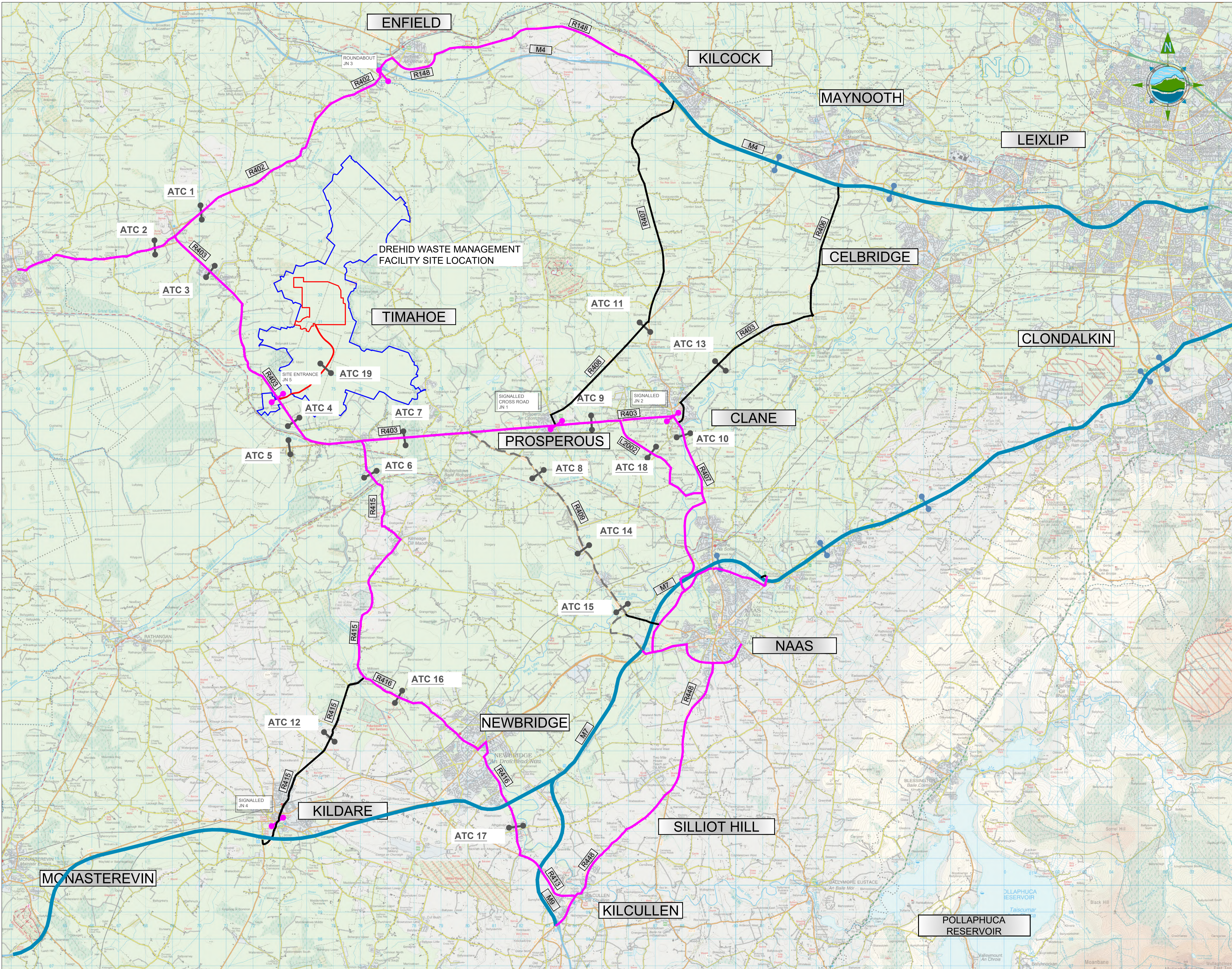
The ATC data was collected in accordance with TII publication PE-PAG-02016 Project Appraisal Guidelines for National Roads Unit 5.2 – ‘Data Collection’. In order to ensure an unbiased sample, all data collection was carried out during a neutral or representative month, avoiding national and local holiday 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.

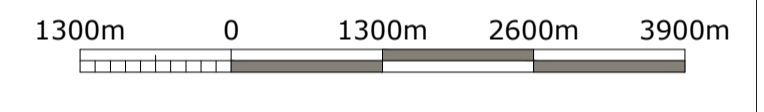


GENERAL LEGEND

BORD NA MONA OWNERSHIP BOUNDARY (Blue line)

APPLICATION BOUNDARY (Red line)

- NATIONAL MOTORWAY NETWORK (M4/M7/M9) (Thick blue line)
- APPROVED HAUL ROUTES (Pink line)
- LOCAL HAUL ROUTES (Thin black line)
- APPROVED HAUL ROUTES (HGV Restricted) (Dashed black line)
- REGIONAL ROAD (R4##) (Thin black line)
- AUTOMATIC TRAFFIC COUNT (2 Way) (Black dot)
- JUNCTION COUNT (Pink dot)
- TII TRAFFIC DATA SITE (Blue dot)



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

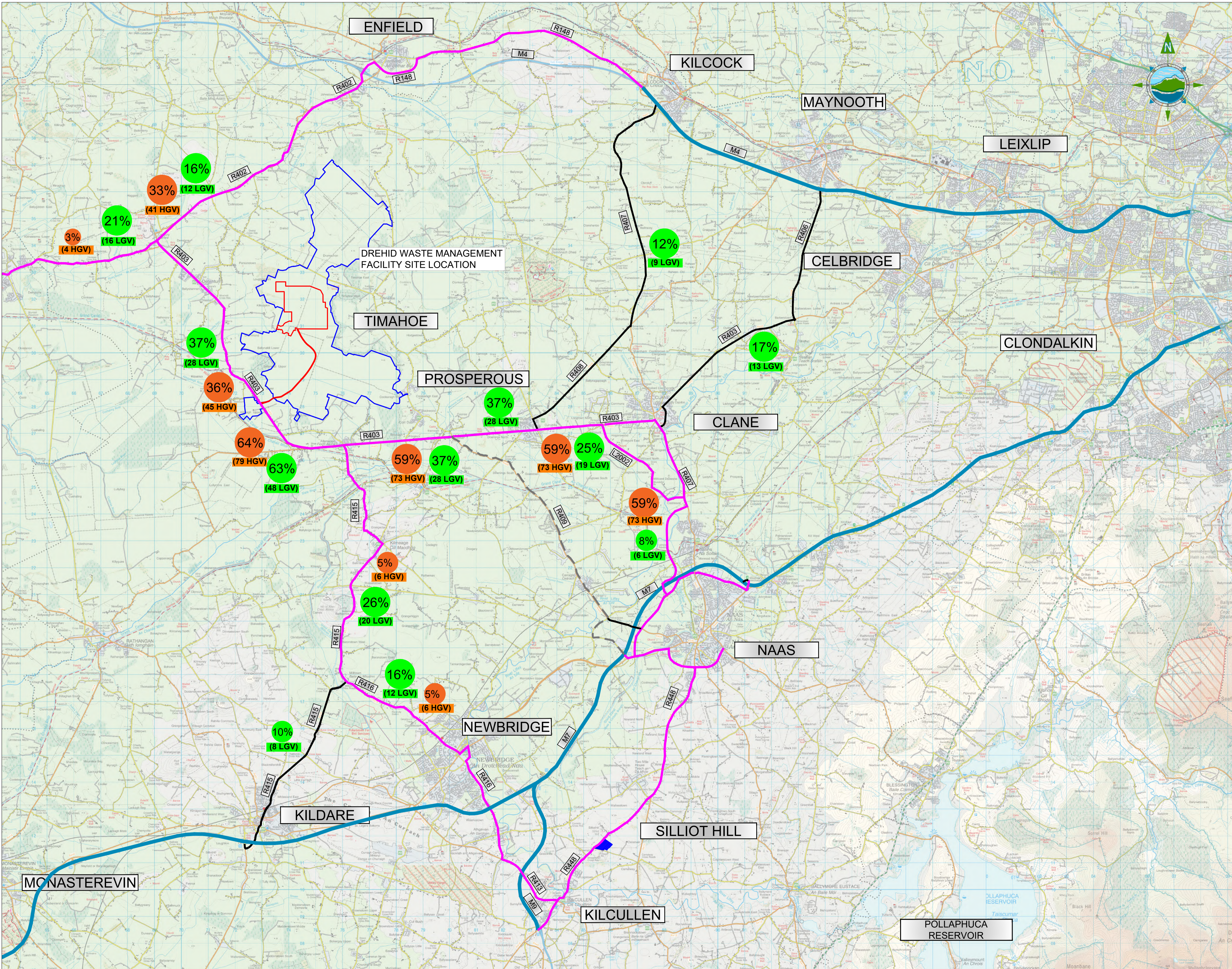
14.9.4 BASELINE NETWORK TRAFFIC FLOW MODEL

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.

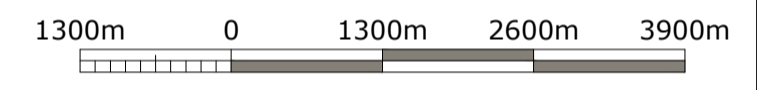
The traffic at the Drehid WMF entrance was counted by ATC 19. That traffic has been assigned to the study area and distributed to the haul routes in the proportions derived from the examination of weighbridge data for the 2 no. week period of the traffic surveys in March. The distribution of existing 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.
A	18.05.23	PLANNING ISSUE	MN	MR

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

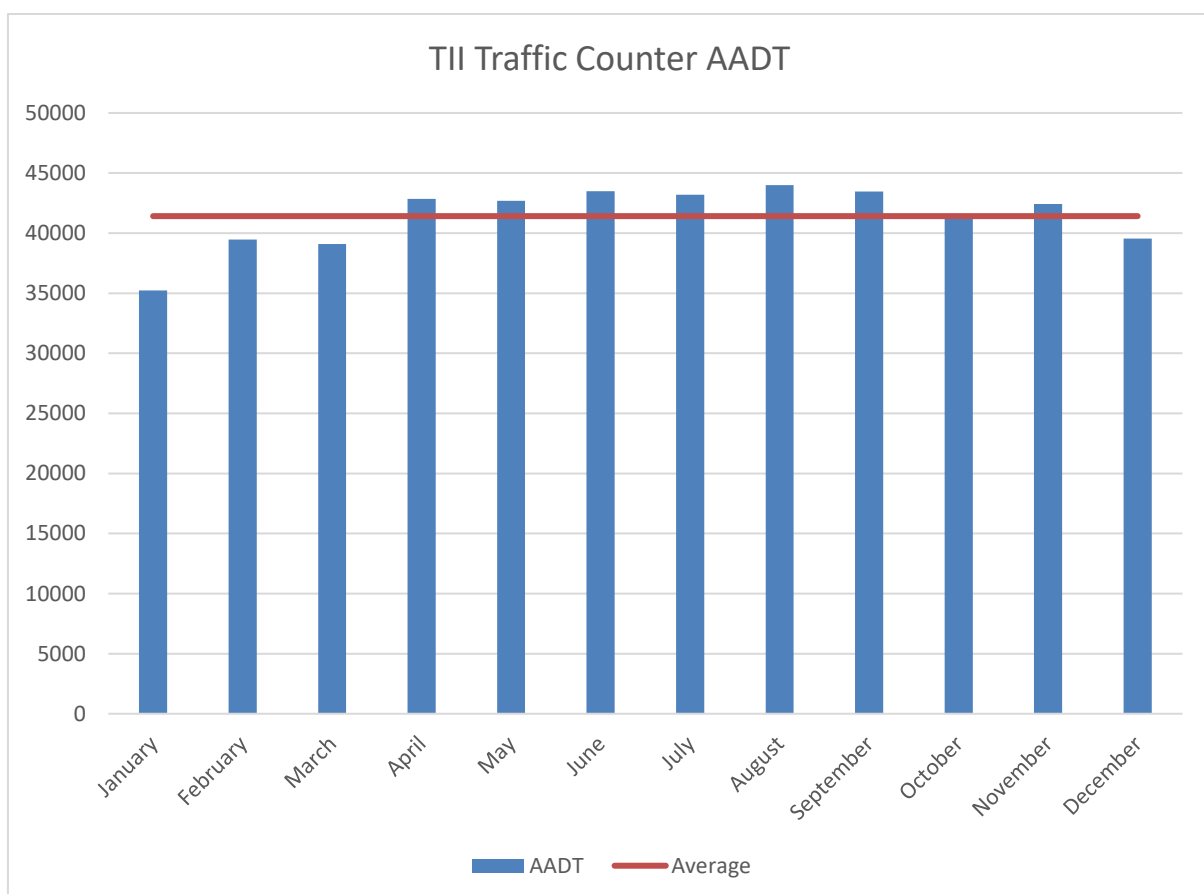


Figure 14-7: M4 and M7 2022 AADT

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

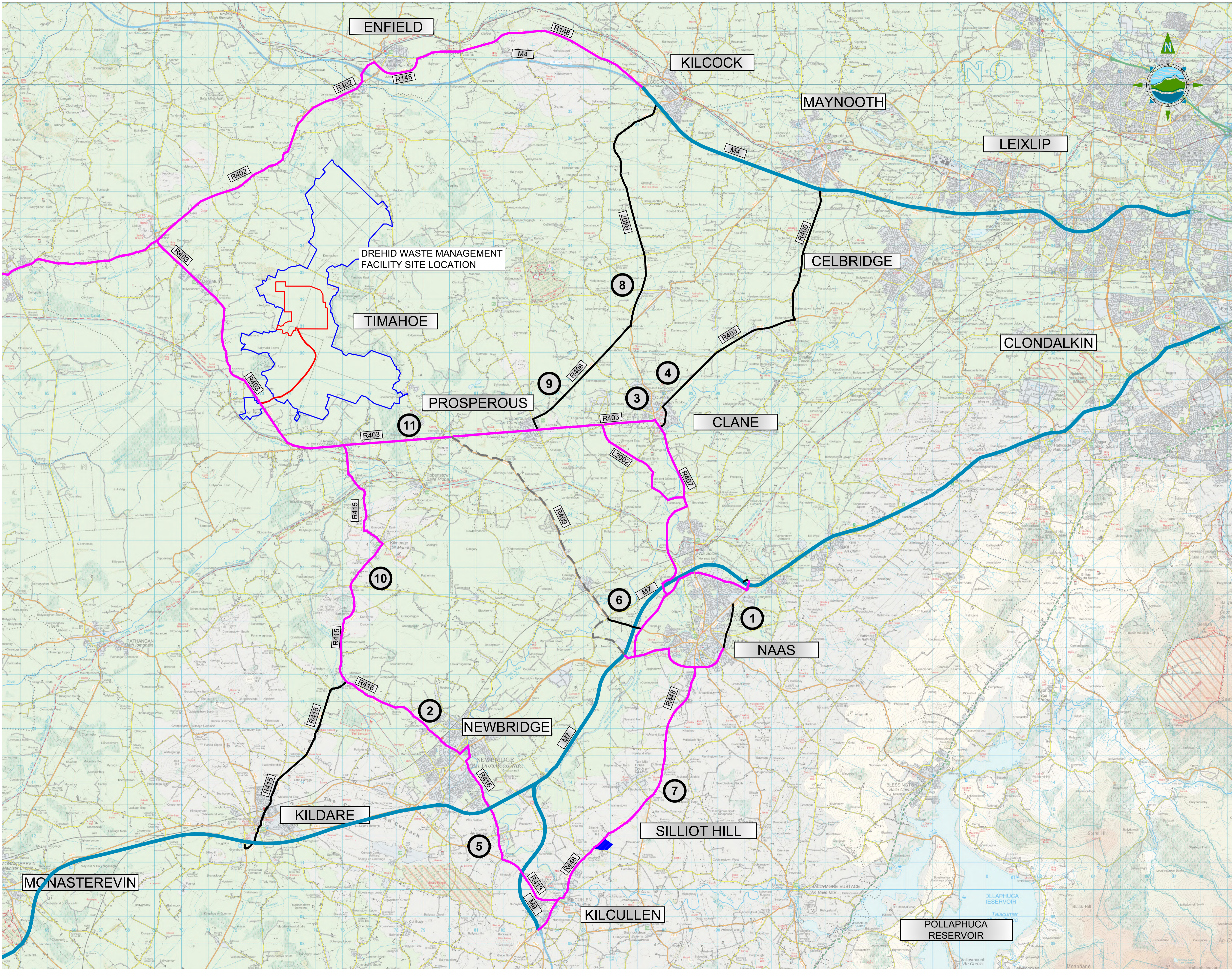
Table 14-10: Regional Roads Identified for Improvements

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

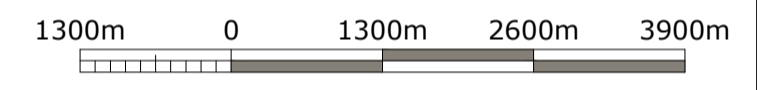
The above LAP's and Town Development Plans were reviewed in conjunction with the Kildare County Development Plan 2023-2029 in the context of the traffic and transport characteristics of the proposed development. Road improvements benefit the efficient movement of people and goods generally. The existing 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)

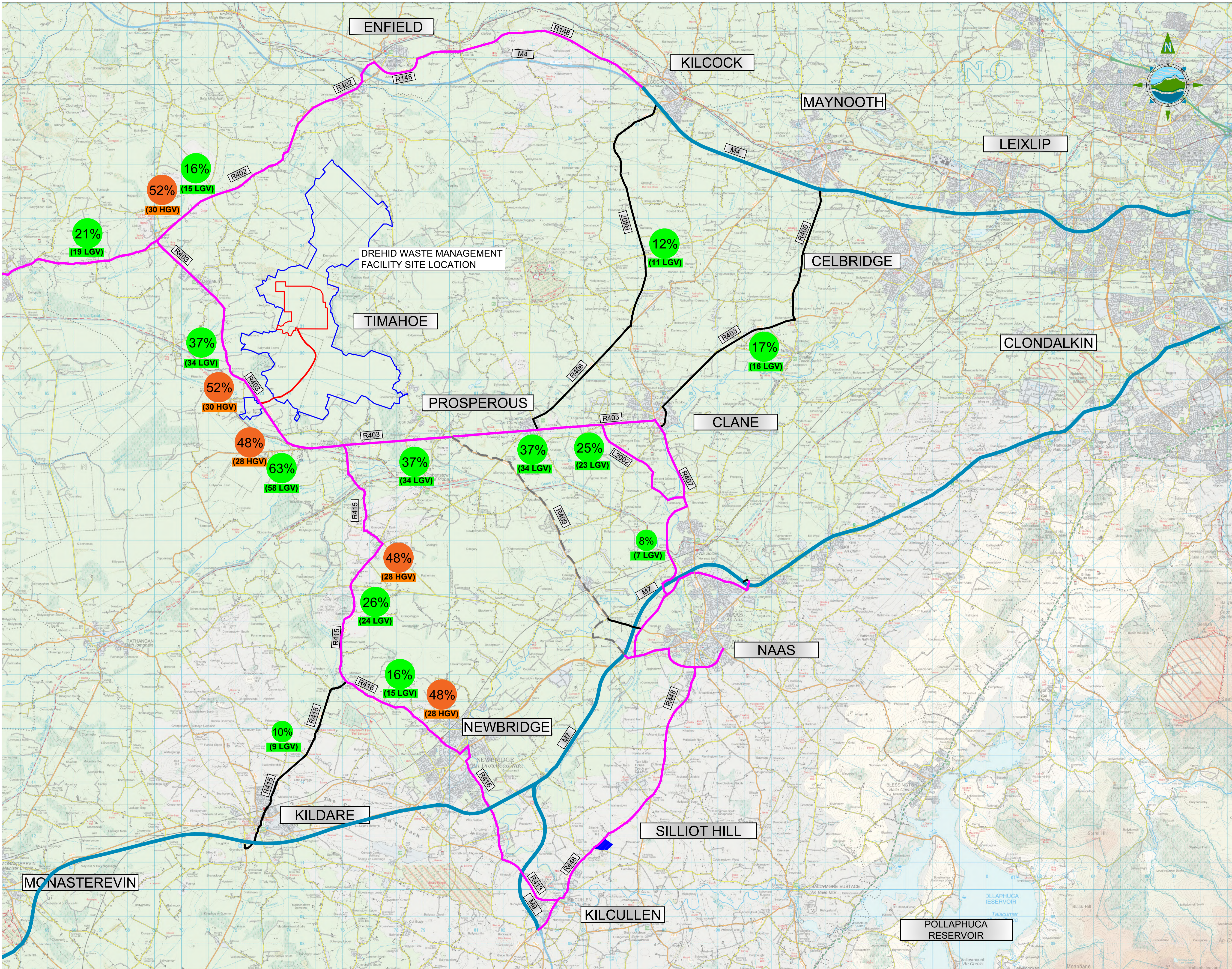
Landfill Construction	Tonnes/phase	Truck Size (m ³)	HGV Trips
Bentonite Enhanced Soil - Host Material (sand). Min 500mm depth	13,225	14	945
Bentonite Enhanced Soil - Bentonite, typically 5% of host material volume	696	22	32
16-32mm rounded non-calcareous stone (min. 500mm depth)	12,728	14	909
Total Trips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

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

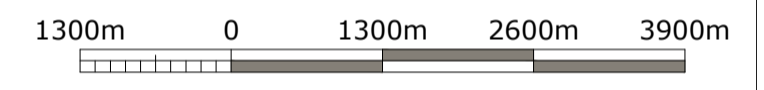
	Construction Staff No.	LV Trips
New Phase Landfill Construction	15	30
Daily HGV Traffic	15	30 Per Day

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
 - 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 (58 Trips per day)
 - PROPORTION OF LGV TRAFFIC (92 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:
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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 Drawing No.: **Figure 14.9** Revision: **A**