MWP

Environmental Impact Assessment Report (EIAR)

Chapter 12 Material Assets – Traffic and Transport

Dernacart Wind Farm
110kV Substation and Grid Connection

Statkraft Ireland

October 2024

Contents

Tables

Figures

Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Status
23268	6011	A	01/10/2024	S Quigley	C Fox	S. Quigley	Final

MWP, Engineering and Environmental Consultants
Address: Park House, Bessboro Road, Blackrock, Cork, T12 X251, Ireland
www.mwp.ie

12. Material Assets – Traffic and Transport

12.1 Introduction

This chapter considers the potential effects on traffic and transport material assets arising from the proposed development. A full description of the proposed development, development lands and all associated project elements is provided in Chapter 2 Description of the Proposed Development of this EIAR. The nature and probability of effects on traffic and transport arising from the overall project have been assessed.

12.1.1 Scope of Assessment

The scope of the assessment in this chapter includes the following:

- Existing and expected future road and transport network;
- Existing and predicted future baseline traffic volumes on the surrounding local road network;
- Predicted proposed development construction, operational and decommissioning traffic volumes and likely impacts; and
- Proposed mitigation measures.

12.2 Methodology and References

This chapter has been prepared in the context of the following:

- Laois County Council's Laois County Development Plan 2021-2027;
- Offaly County Council's Offaly County Development Plan 2021-2027;
- The Laois County Council & Offaly County Council Portarlington Joint Local Area Plan 2018-2024;
- The permitted Dernacart Wind Farm (Laois County Council planning reference 20/78, An Bord Pleanála planning reference ABP-310312-21) Environmental Impact Assessment Report (EIAR) December 2019;
- The permitted Bracklone 110kV Substation (Laois County Council planning reference 20/638) applicant's response to Laois County Council's request for further information (RFI), in respect of traffic flow and volumes, dated 16th September 2021;
- The Transport Infrastructure Ireland (TII) Traffic and Transport Assessment (TTA) Guidelines PE-PDV-02045 May 2014;
- TII's Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections PE-PAG-02017 October 2021;
- TII's Rural Road Link Design DN-GEO-03031 May 2023;
- The UK Traffic Capacity of Urban Roads TA79/99; and
- The Environmental Protection Agency Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports May 2022 (EPA EIAR Guidelines).

12.2.1 Assessment Criteria

Existing baseline traffic volumes on the surrounding local road network have been established on the basis of on-site traffic surveys by MWP, and automatic traffic counter data from TII's online database for national roads.

The significance and duration of predicted impacts have been defined in accordance with the EPA EIAR Guidelines.

12.2.2 Statement of Limitations and Difficulties Encountered

There were no limitations and difficulties encountered during the preparation of this Assessment.

12.2.3 Competency of Assessor

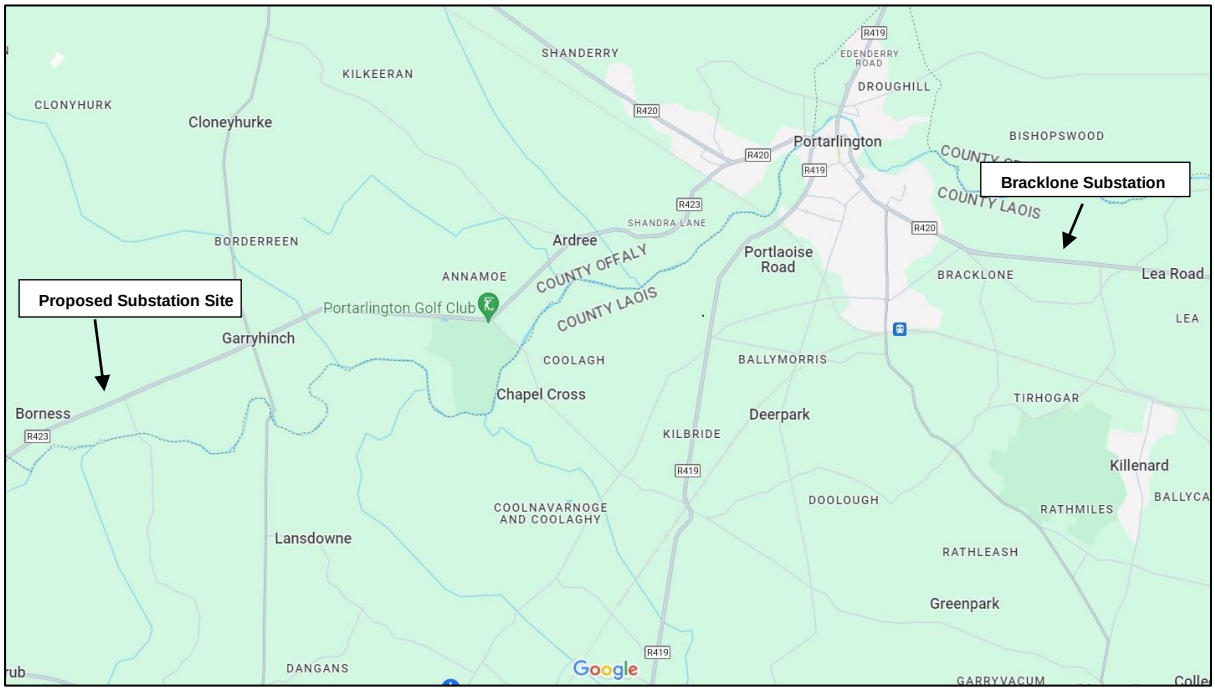
This chapter assessment has been prepared by Seamus Quigley BE CEng MIEI MCIHT of MWP. Seamus Quigley has 33 years' experience in transport planning and traffic engineering projects, including EIS/EIAR traffic and transportation chapters, traffic impact assessments, traffic management studies, mobility management plans, traffic modelling studies, feasibility studies and road safety audits. He is a Chartered Engineer with Engineers Ireland, and also a member of the Chartered Institution of Highways and Transportation. He joined MWP in 2007, having spent over sixteen years with Atkins.

12.3 Baseline Environment

12.3.1 Existing Roads and Transport Network

The proposed development substation and permitted Bracklone substation locations are shown in **Figure 12.1**. The proposed substation site is located on the west side of Portarlington and the permitted Bracklone substation site is located on the south east side of Portarlington.

Figure 12.1 Proposed Development Location Map



The proposed underground grid connection route from the permitted Dernacart Windfarm site extends to the proposed substation from north west of the proposed substation and an existing forestry road (Lower Forestry Road), off road, traversing through commercial forestry plantation, scrub and peatland. The proposed underground grid connection route extends from the proposed substation site to the permitted Bracklone substation site along the existing R423, L50183, L71762, L3153, R419, L3158 and R420 public roads.

The proposed substation site is located on the north side of the R423 Regional Road, as shown in Figure 12.2. The R423 has a typical rural carriageway width of 5.6 metres at, and east of, the proposed substation location, with an 80 km/hour rural speed limit. A 50 km/hour urban speed limit is provided on the R423 at Garryhinch, including at its L1015 Local Road crossroads junction, with traffic calming transverse road markings. A footway is provided locally along the south side of the R423 on the east side of Garryhinch to the Garryhinch Forest recreation area access. East of Garryhinch, the R423 has a Stop controlled T-junction with the L50183 Local Road on its south side, within the rural 80 km/hour speed limit zone.

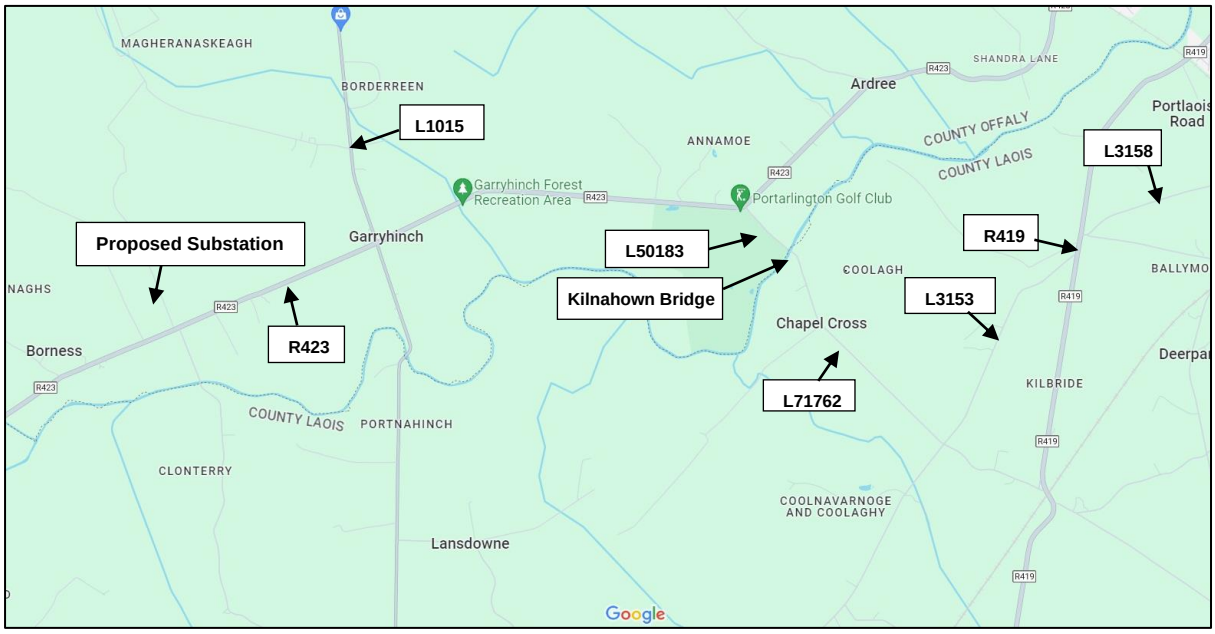


Figure 12.2: Proposed Development Local Road Network Map (Western Section)

The L50183 has a typical rural road carriageway width of 4.4 metres, including at its Klinahown Bridge on the River Barrow, where it links with the L71762. L71762 forms a rural crossroads junction with the L3153 Local Road, with Slow white on red traffic calming road markings provided on the junction approaches. North of its L71762 rural crossroads junction, the L3153 has a typical road carriageway width of 5.3 metres and forms a rural Stop controlled T-junction at its north end on the west side of the R419 Regional Road, within the 80 km/hour rural speed limit zone.

The R419 has a typical rural road carriageway width of 5.7 metres. Approximately 110 metres north of its L3153 junction, the R419 has a Stop controlled rural T-junction with the L3158 Local Road (Canal Road) on its east side, as shown in Figure 12.3. The L3158 has a typical rural road carriageway width of 5.7 metres.

The L3158 Canal Road has an urban crossroads junction with Ballymorris Road within the Portarlington 50 km/hour urban speed limit zone. Raised Zebra pedestrian crossings are provided on Canal Road approximately 85 metres and 340 metres, respectively, east of its Ballymorris Road junction, with a north side footway between the crossings.

Farther east, the Canal Road/Station Road junction is an urban roundabout with pedestrian crossing facilities, and footways on both sides of urban streets. Canal Road has widened urban road carriageway widths in the vicinity of its Station Road roundabout junction, of circa 8.0 metres on its west side and circa 10.0 metres on its east side, with local no parking restrictions.

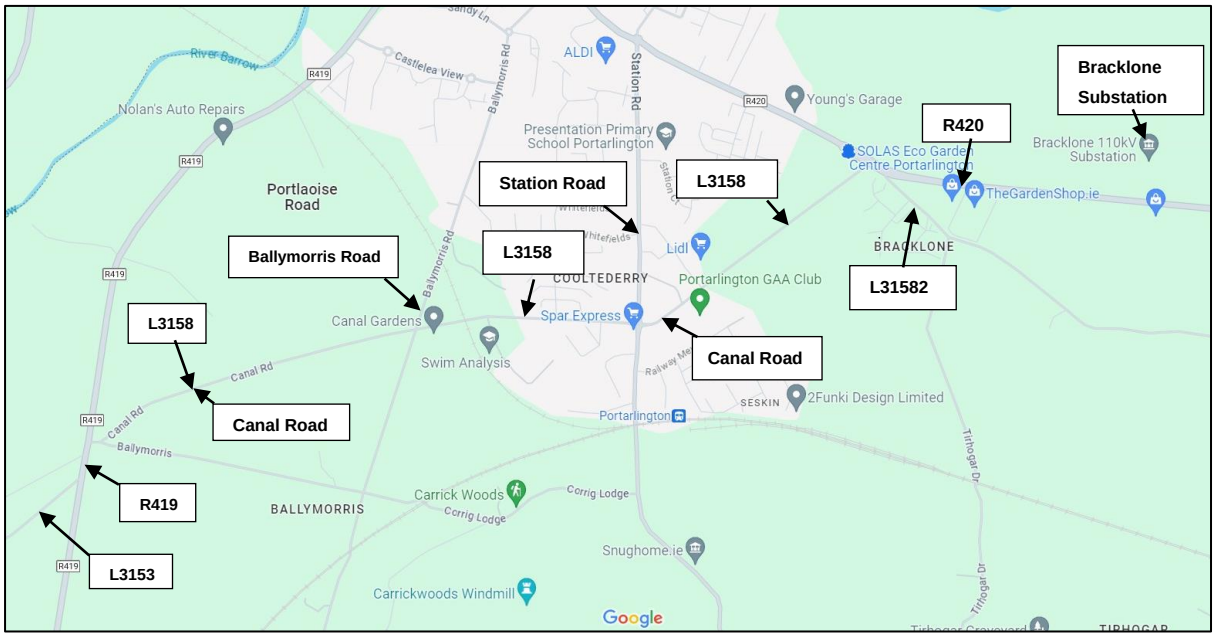


Figure 12.3 : Proposed Development Local Road Network Map (Eastern Section)

East of its Station Road roundabout junction, Canal Road has an urban right-turn lane at the south side school entrance junction at Scoil Phadraig Cúil an tSúdaire. Raised Zebra pedestrian crossings are provided on Canal Road immediately east of the school entrance junction and immediately west of the school exit junction. A two-way off-carriageway cycle facility is provided along the north (school) side of Canal Road, between the school and the east end of Canal Road at its R423 junction, together with footways along both sides.

The L3158 Canal Road forms an urban Stop T-junction with the R420 Regional Road at its east end. The R420 also has an urban Stop T-junction with the L31582 on it west side, approximately 55 metres south east of it L3158 Canal Road junction. Urban left and right-turn lanes are provided on the R423 at both junctions, within the 50 km/hour urban speed limit zone, with a total road carriageway lanes' width of circa 12.5 metres.

The Portarlington 60 km/hour suburban speed limit zone on the R420 is located immediately south east of its L31582 junction. The R423 has a typical suburban traffic lane widths of 3.0 metres in each direction, with a 0.8 metres wide central median road marking and an east side footway.

A suburban right-turn lane is provided on the R420 at the Jamestown access junction, located approximately 0.7 kms south east of its L31582 junction.

The existing access road junction to the permitted Bracklone substation site is located on north side of the R420, approximately 0.9 kms metres south east of its L3158 Canal Road junction, and immediately adjacent to the end of the 60 km/hour suburban speed limit zone. The existing access road has a road carriageway width of 8.0 metres outside (south of) its internal gates, and also provides access for the Portarlington Wastewater Treatment Plant.

As shown in **Figure 12.4**, the R419 links with the R445 Regional Road, approximately 9.4 kms south of it L3158 Canal Road junction. The R445 links with the M7 Motorway Junction 16 approximately 1.9 kms south west of its R419 junction. The R419 also links, via the M7 Junction 15, via the R422 Regional Road and R445, approximately 9.1 kms south of it L3158 Canal Road junction.

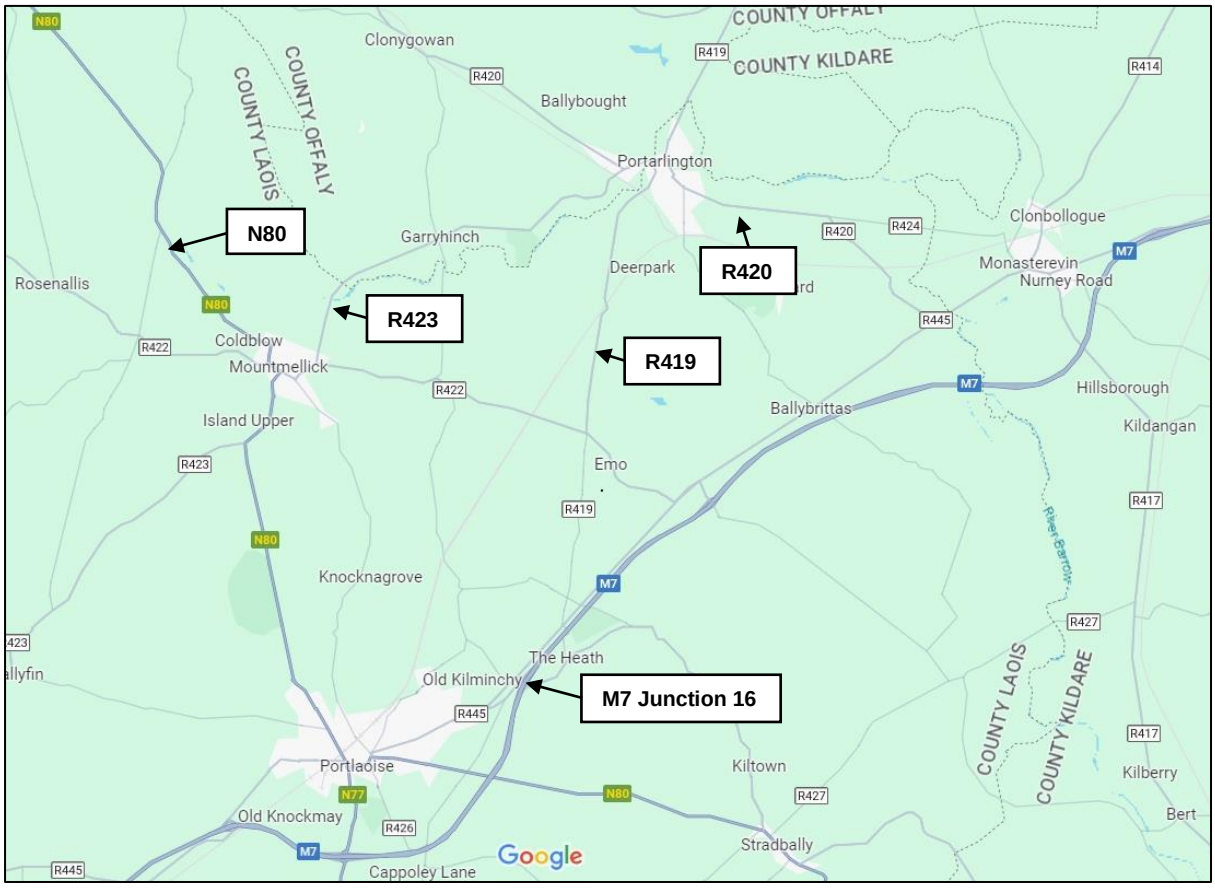


Figure 12.4: National and Regional Road Network Map

The R420 extends south east to the R424 Regional Road, which links with Monasterevin approximately 8.0 kms south east of the R420/ L3158 Canal Road junction. The M7 Junction 14 is located immediately east of Monasterevin.

The R423 links with Mountmellick approximately 3.2 kms south east of the proposed development substation site. Mountmellick is located on the N80 National Secondary Road which links with Tullamore in the north and with Portlaoise in the south. Portlaoise is located adjacent to the M7 Junctions 17 and 18.

12.3.2 Existing Traffic Volumes

On-site peak traffic hours' classified road traffic volumes were recorded by MWP on Wednesday 7th February 2024, on the existing local and regional public roads along the proposed underground grid connection route. The recorded peak traffic hour at each location occurred between the hours 4.00 p.m. to 6.00 p.m. The peak hour traffic volumes were factored on the basis of TII's automatic traffic counter data, for the nearby N80, to establish typical Annual Average Daily Traffic (AADT) volumes for the latest full year, 2023, on the local road network. The existing baseline traffic volumes are provided in Table 12.1. These are total two-way vehicles at the road locations identified. The volumes of peak hour Heavy Goods Vehicles (HGVs) and the proportions (%) of AADT HGVs are also provided.

Table 12.1: Existing Traffic Volumes

Road Location on Proposed Grid Connection Route	Total Vehicles (HGVs)	
	2024 Peak Hour	2023 AADT (% HGVs)
R423	234 (2)	2,300 (1.4%)
L50183	65 (0)	640 (0.3%)
L3153	121 (2)	1,190 (1.7%)
R419	482 (13)	4,740 (4.3%)
L3158 @ R419	201 (6)	1,975 (3.0%)
L3158 @ R420	246 (7)	2,420 (2.9%)
R420	732 (28)	7,195 (6.2%)

The rural road link capacity of the regional roads within its 80 km/hour rural speed limit zone, estimated on the basis of the TII Rural Road Link Design DN-GEO-03031 May 2023, for a typical road carriageway width of 6.0 metres, is provided in Table 12.2. The TII rural road link capacity is an AADT capacity.

Table 12.2: Estimated Regional Rural Roads TII Road Link Capacity

Regional Rural Road	TII Rural Road Link		
	Type	Carriageway Width (m)	AADT Capacity (Vehicles)
R423 and R419 Rural Roads	Type 3 Single	6.0	5,000

The estimated existing rural road link AADT volume/capacity ratios for the R423 and R419 rural roads located along the proposed underground grid connection route are provided in Table 12.3, on the basis of the TII Rural Road Link Design, for the latest full year, 2023.

Table 12.3: Estimated TII Regional Rural Road Link 2023 AADT Volume/Capacity Ratios

80 km/hour Rural Road	2023 AADT Vehicles	AADT Capacity (Vehicles)	AADT Volume/Capacity Ratio
R423	2,300	5,000	46%
R419	4,740	5,000	95%

The R423 is operating well within its estimated rural road link AADT capacity, with a 2023 volume/capacity ratio of 46%. The R419 is operating within its estimated rural road link AADT capacity, with a 2023 volume/capacity ratio of 95%.

The urban road link capacity of the R420 along the proposed underground grid connection route, within its 50 km/hour urban and 60 km/hour suburban speed limit zones, estimated on the basis of the Traffic Capacity of Urban Roads TA79/99, is provided in Table 12.4. The capacity is per direction based on a 60/40 directional split.

Table 12.4: Estimated R420 Urban/Suburban Road Link Capacity

R420 Urban/Suburban Road	Urban/Suburban Road Link			
	Type	Lanes	Carriageway Width (m)	Capacity/Hour/Direction (Vehicles)
R420	UAP3	2	6.0	900

The estimated existing urban/suburban road link peak hour volume/capacity ratio for the R420, along the proposed underground grid connection route, is provided in Table 12.5, on the basis of the Traffic Capacity of Urban Roads TA 79/99.

Table 12.5: Estimated Existing R420 Urban/suburban Road Link Peak Hour Volume/Capacity Ratio

R420 Urban/Suburban Road	Highest Direction Peak Hour Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
R420	440	900	49%

The R420 is operating well within its estimated urban/suburban road link capacity, with a highest volume/capacity ratio during the peak hour of 49%.

12.3.3 Future Conditions

The roads and transportation objectives and policies of Laois County Council and Offaly County Council are set out in their Laois County Development Plan 2021-2027 and Offaly County Development Plan 2021-2027, respectively, and in their Portarlington Joint Local Area Plan 2018-2024.

The Laois County Development Plan identifies 17 Regional Roads as Strategic Regional Roads linking the main county towns to the national routes and M7 and M8 Motorways. These include the R419, R420 and R423. Offaly County Council has adopted a restrictive policy in relation to new development on certain regional routes in the interests of preserving the traffic capacity of these routes and in order to avoid the creation of traffic hazards. These include the R420. It is the Councils' objective to protect the capacity, efficiency and road safety of the foregoing Regional Roads.

The Councils' Development Plans' objectives include a relief road/bypass for the R420 at Portarlington.

The permitted Dernacart Wind Farm EIAR Traffic and Transportation Chapter assessment included the permitted substation and proposed underground grid connection to the Bracklone substation. Access for the permitted Dernacart Wind Farm is via the N80, north of Mountmellick, and the L2092 Local Road on the east side of the N80. The expected haul routes for construction materials for the permitted Dernacart Wind Farm identified in its EIAR are located west of the subject proposed substation and underground grid connection route, via the N80. The proposed turbine haul route is via the M6 Motorway, located to the north, and the N80. The permitted Dernacart Wind Farm EIAR identified increased traffic volumes during construction on the N80 and L2092 roads.

Subject to planning permission, it is envisaged that work would commence at the proposed development site by mid-2025, with a construction duration of approximately 16 months. Accordingly, the proposed development is scheduled to be fully complete and operational during late 2026.

The TII Traffic and Transport Assessment Guidelines recommend that the opening year of a development proposal and plan years, five and 15 years after the opening year, should be considered for assessing a development

proposal. In this case, the opening year is 2026 and the plan years are 2031 and 2041. The peak construction year is 2026.

TII in their Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections October 2021 envisage that car and light vehicle volumes on Laois national roads would increase by an annual factor of 1.0147 during the period to 2030, and by a factor of 1.0280 for heavy vehicles, based on their central growth rates. The equivalent factors for the periods 2030 to 2040 and 2040 to 2050 are 1.0047 and 1.0125, respectively, and 1.0036 and 1.0155, respectively. TII envisage that car and light vehicle volumes on Offaly national roads would increase by an annual factor of 1.0118 during the period to 2030, and by a factor of 1.0323 for heavy vehicles, based on their central growth rates. The equivalent factors for the periods 2030 to 2040 and 2040 to 2050 are 1.0042 and 1.0139, respectively, and 1.0033 and 1.0176, respectively.

The predicted peak hour and AADT volumes on the existing local and regional public roads along the proposed underground grid connection route and in the vicinity of the proposed development substation site, with the foregoing TII predicted traffic growth rates, are provided in Table 12.6.

Table 12.6: Predicted Traffic Volumes with TII Growth

Road Location	Year	Total Vehicles (HGVs)	
		Peak Hour	AADT (% HGVs)
R423	2026	240 (2)	2,384 (1.5%) 35
	2031	253 (3)	2,513 (1.6%) 41
	2041	264 (3)	2,623 (1.8%) 46
L50183	2026	67 (0)	663 (0.3%) 2
	2031	70 (0)	698 (0.4%) 3
	2041	73 (0)	728 (0.4%) 3
L3153	2026	125 (2)	1,245 (1.8%) 22
	2031	134 (3)	1,326 (1.9%) 25
	2041	138 (3)	1,376 (2.0%) 28
R419	2026	497 (14)	4,962 (4.5%) 222
	2031	530 (16)	5,295 (4.7%) 251
	2041	551 (18)	5,507 (5.1%) 281
L3158 @ R419	2026	207 (6)	2,066 (3.1%) 64
	2031	221 (7)	2,204 (3.3%) 73
	2041	230 (8)	2,288 (3.5%) 81
L3158 @ R420	2026	254 (8)	2,532 (3.0%) 76
	2031	271 (9)	2,699 (3.2%) 86
	2041	282 (10)	2,804 (3.5%) 97
R420	2026	755 (30)	7,537 (%) 484
	2031	806 (34)	8,053 (%) 548
	2041	838 (38)	8,390 (%) 615

The rural road link AADT volume/capacity ratios for the for the R423 and R419 rural roads, located along the proposed underground grid connection route and in the vicinity of the proposed development substation site, are provided in Table 12.7, on the basis of the TII Rural Road Link Design, for the predicted 2026, 2031 and 2041 AADT volumes, with the TII predicted traffic growth rates.

Table 12.7: Predicted TII Rural Regional Road Link AADT Volume/Capacity Ratios with TII Growth

80 km/hour Rural Road	Year	AADT Vehicles	AADT Capacity (Vehicles)	AADT Volume/Capacity Ratio
R423	2026	2,384	5,000	48%
	2031	2,513		50%
	2041	2,623		53%
R419	2026	4,962	5,000	99%
	2031	5,295		106%
	2041	5,507		110%

The R423 would continue to operate well within its estimated TII rural road link AADT capacity, for the predicted 2026, 2031 and 2041 AADT volumes, with the TII predicted traffic growth rates, with a highest volume/capacity ratio of 53%, in 2041. The highest volume/capacity ratio during the proposed development peak construction year, 2026, would be 48%.

The R419 would continue to operate within its estimated TII rural road link AADT capacity, for the predicted 2026 AADT volumes, with the TII predicted traffic growth rates, with a volume/capacity ratio of 99%. Post the proposed development construction, the R419 would operate in excess of its TII rural road link AADT capacity, for the predicted 2031 and 2041 AADT volumes. The TII predicted rural road ADDT capacity is for a Level of service D. Accordingly, the R419 would operate with a reduced Level of Service in 2031 and 2041, with the TII predicted traffic growth rates.

The predicted 2026, 2031 and 2041 urban/suburban road link peak hour volume/capacity ratios for the R420 located along the proposed underground grid connection route and in the vicinity of the proposed substation site, are provided in Table 12.8, on the basis of the Traffic Capacity of Urban Roads TA 79/99, with the TII predicted traffic growth rates.

Table 12.8: Predicted R420 Urban/Suburban Road Link Peak Hour Volume/Capacity Ratios with TII Growth

R420 Urban/Suburban Road	Year	Highest Direction Peak Hour Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
R420	2026	453	900	50%
	2031	484		54%
	2041	503		56%

The R420 would continue to operate well within its estimated urban/suburban road link capacity, with the predicted 2026, 2031 and 2041 peak hour traffic volumes on the basis of the TII predicted traffic growth rates, with a highest volume/capacity ratio during the peak hour of 56%, in 2041. The highest volume/capacity ratio during the proposed development peak construction year, 2026, would be 50%.

12.4 Assessment of Construction Phase Impacts and Effects

A detailed description of the proposed development construction is provided in Chapter 2 Description of the Proposed Development of this EIAR. Subject to planning permission, it is envisaged that work would commence at the proposed development site by 2025, with a construction duration of approximately 16 months. The proposed development is scheduled to be fully complete and operational during late 2026.

12.4.1 Temporary Construction Compound

A temporary construction compound will be provided at the proposed substation site, and will include materials' storage/laydown areas, parking and staff facilities.

Temporary construction materials' storage for the grid connection route along the public road network may be provided at existing site locations convenient to the works' locations, as the 10.85 kms route works progress, which would be subject to the pre-approval of the planning authority prior to the works.

12.4.2 Access

Construction access for the proposed temporary construction compound, windfarm collector cable, substation and the associated proposed access road/track between the proposed substation and Dernacart Wind Farm, is via the proposed substation access on the north side of the R423, location to the south of the substation site.

Access between the proposed construction compound and the underground grid connection route would be via the proposed substation access on the R423 and the public road network along the grid connection route.

12.4.3 Hours and Duration

The proposed construction hours are 7.00 a.m. to 7.00 p.m., Monday to Friday and 7.00 a.m. to 1.00 p.m. on Saturdays. On occasion, the working day may extend outside normal working hours when critical elements of the works need to be advanced.

The construction duration for the proposed windfarm collector cable, substation and the associated proposed access road/track between the proposed substation and Dernacart Wind Farm is 16 months.

The expected construction duration for the proposed grid connection works along the public road network, which will be carried out concurrently with the proposed substation works, is 30 weeks. The proposed grid connection works would be carried out on a linear basis, from the proposed substation to the permitted Bracklone substation, by a single construction crew.

12.4.4 Staff

The expected peak staff would be up to 40 construction personnel, which would generate approximately 30 car and van trips, both to and from the site each working day, on the basis of an average vehicle occupancy rate of 1.33 personnel per vehicle.

Canteen facilities for personnel would be provided on-site. Site personnel would travel to site prior to 8.00 a.m. and depart from site from 6.00 p.m., on weekdays, outside the peak traffic hours.

It is envisaged that the construction crew for the proposed grid connection works would include up to 10 construction personnel, which are included in the foregoing expected peak construction staff.

12.4.5 Delivery Vehicles

All construction excavated material for the proposed windfarm collector cable, substation and the associated proposed access road/track between the proposed substation and Dernacart Wind Farm would be retained on-site.

The 16 months construction would require the importation of a total of up to 11,584 loads of construction materials plus the removal of 814 loads from the grid connection works along the public road network to a licensed waste facility. All construction materials would be transported using standard heavy vehicle delivery trucks with capacities of 10 m^3 and 20 tonnes, and 8 m^3 for concrete trucks. The peak daily imported loads would occur during the six weeks' substation formation and access road/track works. The proposed construction works heavy vehicle loads are provided in Table 12.9.

Table 12.9: Proposed Construction Works Heavy Vehicle Loads

Works	Total Number of Heavy Vehicle Loads		
	Total Construction (16 months)	Peak Daily	Highest Hour
Substation, WF Collector Cable and Access Road/Track (16 months)	9,911	183 (1)	18 (1)
Grid Connection (30 weeks)	2,487	15	2
Total (16 months)	12,398	183 (1)	18 (1)

Note (1): During six weeks' substation formation and access road/track works.

12.4.6 Delivery Vehicle Routes

The potential material sources for the proposed development construction are detailed in Chapter 2 Description of the Proposed Development of this EIAR, and include suppliers located in the northeast, east, south, southwest and west of the proposed development site.

It is envisaged that the delivery of construction materials would be typically circa 50% via the R423 east of the proposed substation access, and circa 50% via the R423 west of the proposed substation access, but could be up to 100% via either direction during specific periods of construction.

12.4.7 Traffic Volumes

The predicted AADT volumes, peak daily traffic volumes and highest peak hour traffic volumes generated by the proposed development construction are provided in Table 12.10, including heavy vehicles (HVs).

Table 12.10: Proposed Construction Works Traffic Volumes

Total Two-Way Vehicles (HVs)		
AADT	Peak Daily (1)	Highest Peak Hour (1)
125 (65)	426 (366)	36 (36)

Note (1): During six weeks' substation formation and access road/track works.

The predicted 2026 AADT, peak daily and highest peak hour traffic volumes, on the existing local and regional public roads along the proposed underground grid connection route and in the vicinity of the proposed development substation site, with the proposed construction works' traffic volumes are provided in Tables 12.11 and 12.12, respectively,

Table 12.11: Predicted 2026 AADT Traffic Volumes with Proposed Construction

Road Location	Total Vehicles (HVs)	
	AADT	Change (%)
R423	2,447 (68)	+63 (33) (2.6%)
L50183	708 (32)	+45 (30) (1) (6.8%)
L3153	1,290 (52)	+45 (30) (1) (3.6%)
R419	5,007 (252)	+45 (30) (1) (0.9%)
L3158 @ R419	2,111 (94)	+45 (30) (1) (2.2%)
L3158 @ R420	2,577 (106)	+45 (30) (1) (1.8%)
R420	7,582 (514)	+45 (30) (1) (0.6%)

Note (1): On conservative basis that all construction HVs to and from the grid connection works along public roads arrive and depart in the same direction.

Table 12.12: Predicted 2026 Peak Traffic Volumes with Proposed Peak Construction

Road Location	Total Vehicles (HVs)			
	Peak Daily (1)	Change (%)	Peak Hour (1)	Change (%)
R423 (2)	2,780 (401)	+396 (366) (16.6%)	276 (38)	+36 (36) (15.0%)
L50183	708 (32)	+45 (30) (3) (6.8%)	71 (4)	+4 (4) (3) (6.0%)
L3153	1,290 (52)	+45 (30) (3) (3.6%)	129 (6)	+4 (4) (3) (3.2%)
R419	5,007 (252)	+45 (30) (3) (0.9%)	501 (18)	+4 (4) (3) (0.8%)
L3158 @ R419	2,111 (94)	+45 (30) (3) (2.2%)	211 (10)	+4 (4) (3) (1.9%)
L3158 @ R420	2,577 (106)	+45 (30) (3) (1.8%)	258 (12)	+4 (4) (3) (1.6%)
R420	7,582 (514)	+45 (30) (3) (0.6%)	759 (34)	+4 (4) (3) (0.5%)

Note (1): During six weeks' substation formation and access road/track works.

Note (2): On the conservative basis of 100% routing for HVs generated.

Note (3): On conservative basis that all construction HVs to and from the grid connection works along public roads arrive and depart in the same direction.

During the proposed 16 months construction duration, the proposed construction works would increase AADT volumes on the R423 by 63 vehicles, including 33 heavy vehicles, which equates to an AADT increase of 2.3%. The proposed grid construction works along public roads would increase AADT volumes on those roads by up 45 vehicles, including 30 two-way heavy vehicles, on conservative basis that all construction HVs to and from the grid connection works along public roads arrive and depart in the same direction, which would equate to AADT increases of 6.8% on the L50183, 3.63% on the L3153, 0.9% on the R419, up to 2.2% on the L3158, and 0.6% on the R420.

During the six weeks peak construction heavy vehicle traffic generation, the peak daily increase in daily traffic volumes on the R423 generated by peak construction would be up to 396 vehicles, including up to 366 heavy vehicles, which equates to an increase of 16.6%, on the conservative assumption that 100% of all peak construction heavy vehicles are generated in one direction along the R423. The peak daily increase in traffic volumes generated by the proposed grid construction works along public roads would be of the same order as the predicted AADT increase generated by the proposed grid construction works on those roads, of up to 45 vehicles, including 30 two-way heavy vehicles, on conservative basis that all construction HVs to and from the grid connection works along public roads arrive and depart in the same direction.

12.4.8 TII TTA Assessment Thresholds

The predicted increases in AADT volumes on the existing R423, R419 and R420 Regional Roads, during the proposed development 16 months construction phase, are less than the volumetric threshold (5%) identified by TII in their TTA Assessment Guidelines for consideration of sensitive locations.

12.4.9 Volume/Capacity Ratios

The rural road link AADT volume/capacity ratios for the for the R423 and R419 rural roads, located along the proposed underground grid connection route and in the vicinity of the proposed development substation site, are provided in Table 12.13, on the basis of the TII Rural Road Link Design, for the predicted 2026 AADT volumes, with the TII predicted traffic growth plus the proposed development construction.

Table 12.13: Predicted TII Rural Regional Road Link AADT Volume/Capacity Ratios with TII Growth Plus Proposed Construction

80 km/hour Rural Road	Year	AADT Vehicles	AADT Capacity (Vehicles)	AADT Volume/Capacity Ratio
R423	2026	2,447	5,000	49%
R419	2026	5,007	5,000	100%

The R423 would continue to operate well within its estimated TII rural road link AADT capacity, for the predicted 2026 AADT volumes, with the TII predicted traffic growth plus the proposed development construction, with a volume/capacity ratio of 49%. This compares to ratios of 48%, without the proposed development construction.

The R419 would operate at its estimated TII rural road link AADT capacity, for the predicted 2026 AADT volumes, with the TII predicted traffic growth plus the proposed development construction, with a volume/capacity ratio of 100%, compared to a ratio of 99% without the proposed development construction. The TII predicted rural road ADDT capacity is for a Level of service D. A link volume/capacity ratio in excess of 100% is a reduced Level of Service. As detailed in Chapter 2 Description of Proposed Development of this EIAR and in Table 12.15 below, the expected construction duration for the grid connection works along the R419 is two to three days.

The predicted 2026 urban/suburban road link peak hour volume/capacity ratio for the R420 located along the proposed underground grid connection route and in the vicinity of the Bracklone substation site, is provided in Table 12.14, on the basis of the Traffic Capacity of Urban Roads TA 79/99, with the TII predicted traffic growth plus the proposed development construction.

Table 12.14: Predicted R420 Urban/Suburban Road Link Peak Hour Volume/Capacity Ratio with TII Growth Plus Proposed Construction

R420 Urban/Suburban Road	Year	Highest Direction Peak Hour Vehicles	Capacity/Hour/ Direction (Vehicles)	Volume/Capacity Ratio
R420	2026	456	900	51%

The R420 would continue to operate well within its estimated urban/suburban road link capacity, with the predicted 2026 peak hour traffic volumes on the basis of the TII predicted traffic growth plus the proposed development construction, with a highest volume/capacity ratio during the peak hour of 51%. This compares to a ratio of 50%, without the proposed development construction.

12.4.10 Temporary Traffic Management

A stop/go alternating direction temporary traffic management arrangement would be provided during grid connection works along the public road network, to facilitate the grid connection construction works. No public road closures and diversions are proposed for the grid connection works along public roads, and local access will be maintained.

The temporary construction traffic management arrangements would be provided in accordance with the DoT Traffic Signs Manual Chapter 8 Temporary Traffic Measures and Signs for Roadworks, with the prior approval of the planning authority.

The expected construction duration for the proposed grid connection works along the public road network, which will be carried out concurrently with the proposed substation works, is 30 weeks. The proposed grid connection works would be carried out on a linear basis, from the proposed substation to the permitted Bracklone substation, by a single construction crew. The grid route is approximately 10.85 kms long with an expected 75 metres of works to be completed each day.

The expected durations of the proposed grid connection construction works along the public road network are detailed in Chapter 2, and provided in Table 12.15.

Table 12.15: Proposed Grid Connection Route Construction Durations

Grid Connection Public Road Section	Construction Duration
Section within the R423 to L50183	8-10 Weeks
Section within the L50183 and 71762 to L3152	6 Weeks
Section within the L3152 to R419	3 Weeks
Section within the R419 to L3158	2-3 Days
Section within the L3158 to R420	8 Weeks
Section within the R420 to Bracklone Substation	3 Weeks
Total	**30 Weeks**

The temporary traffic management arrangements would increase journey times for users during the proposed construction working hours along the proposed grid connection route, for the predicted construction durations.

12.4.11 Road Pavements Monitoring

Heavy vehicle traffic volumes generated by the proposed development construction could result in damage to existing and proposed road pavements on public roads, including at vehicle turning, accelerating and decelerating locations. Road pavements would be regularly monitored and reinstated in accordance with the requirements of the planning authority.

12.4.12 EPA Guidelines

On the basis of the EPA Guidelines, the proposed construction works would have slight to moderate temporary to short-term negative effects.

12.4.13 Cumulative Impacts and Effects

The permitted Dernacart Wind Farm EIAR Traffic and Transportation Chapter assessment included the permitted substation and underground grid connection to the Bracklone substation.

Access for the permitted Dernacart Wind Farm is via the N80, north of Mountmellick, and the L2092 Local Road on the east side of the N80. The expected haul routes for construction materials for the permitted Dernacart Wind Farm identified in its EIAR are located west of the subject proposed substation and underground grid connection route, via the N80. The proposed turbine haul route is via the M6 Motorway, located to the north, and the N80.

The permitted Dernacart Wind Farm EIAR indicated an increase in AADT volumes of 97 vehicles during the 12 months construction period, with a peak daily increase of 192 vehicles, occurring during construction month four. The permitted Dernacart Wind Farm EIAR identified increased traffic volumes during construction on the N80 and L2092 roads, with predicted increases in AADT volumes on the N80 of 1.12% at Dernacart and 0.93% at Tullamore. There would be no additional cumulative increase in these predicted traffic volumes, with the subject proposed development, as the Dernacart Wind Farm EIAR included the permitted substation and underground grid connection to the Bracklone substation.

The permitted Bracklone Substation planning RFI response indicates a maximum of 30 HGV deliveries to site per day during construction, and an average of 30 construction staff. The existing access road and its R420 junction will be upgraded as part of the permitted works. A Traffic Management Plan will be developed and implemented by the appointed construction contractor.

It is envisaged that the predicted highest increase in daily vehicle volumes generated by the permitted Bracklone Substation on the R420, during peak construction, would be up to 1.4%, with 100% of all vehicles generated in one direction on the R420. The predicted increase in peak daily vehicle volumes on the R420 with the subject proposed development peak construction is 0.6%. Therefore, the peak highest cumulative development increase in daily vehicle volumes on the R420, with the subject proposed development construction and the permitted Bracklone Substation peak construction, is 2.0%.

The R420 would continue to operate well within its estimated urban/suburban road link capacity, with this cumulative development. As detailed in the foregoing assessment, the R420 would continue to operate well within its estimated urban/suburban road link capacity, with the predicted 2026 peak hour traffic volumes on the basis of the TII predicted traffic growth plus the proposed development construction, with a highest volume/capacity ratio during the peak hour of 51%, compared to a ratio of 50%, without the proposed development construction.

The foregoing assessment includes TII's predicted traffic growth, which includes traffic generated by proposed other developments.

On the basis of the EPA EIAR Guidelines, the cumulative impacts with other proposed developments will be slight to moderate negative effects and temporary to short term.

12.5 Assessment of Operational Phase Impacts and Effects

A detailed description of the proposed operational phase is provided in Chapter 2 Description of the Proposed Development of this EIAR.

The proposed development will have up to two operational staff and will generate negligible operational traffic volumes. Occasional traffic will be generated by routine inspection and maintenance.

On the basis of the EPA EIAR Guidelines, the proposed development will have imperceptible to not significant long term to permanent neutral effects.

12.6 Decommissioning

The grid cable and substation will remain a permanent part of the national grid infrastructure and, therefore, decommissioning is not expected. Traffic and transportation effects would be similar to construction phase albeit at a lesser extent should decommissioning occur.

On the basis of the EPA EIAR Guidelines, decommissioning of the proposed development will have slight temporary short term negative effects.

Table 12.16: Summary of the Potential Effects: Traffic and Transportation

Phase	Impact	Quality of Effect	Significance	Spatial Extent	Duration
Construction Phase	Increased traffic volumes on local road networks	Negative	Slight-moderate	local	Temporary-short-term
Operational Phase	Operational traffic	Neutral	Imperceptible – not significant	local	Long-term - permanent
Decommissioning Phase	Increased traffic volumes on local road networks	Negative	Slight	local	Temporary-short-term

12.7 Mitigation Measures

12.7.1 Construction Phase

All traffic management and road signage will be in accordance with the Department of Transport (DoT) Traffic Signs Manual Chapter 8: Temporary Traffic Measures and Signs for Road Works; and in agreement with Laois County Council and Offaly County Council.

A Traffic Management Plan (TMP) outlining the required traffic management procedures to be implemented on the public roads during the construction of the proposed development is included as Appendix 3 in EIAR Volume 3. The Traffic Management Plan will be updated, as appropriate, following the proposed project detailed design/tendering stage, and submitted for the approval of Laois County Council and Offaly County Council, prior to construction.

The proposed grid connection will require a Road Opening License (ROL) prior to the commencement of any grid connection works on the public road. The road surface of the public roads will be reinstated to the standards set out by the Department of Transport (DoT) Guidelines on the Opening, Backfilling and Reinstatement of Trenches on Public Roads (April 2017). All road permanent reinstatement works will be in accordance with the requirements of Laois County Council and Offaly County Council.

A construction wheel wash facility will be provided at the construction compound to wash truck tyres leaving the construction site.

12.7.2 Operational Phase

The proposed development will not generate regular operational traffic and no mitigation measures are required.

12.8 Residual Impacts and Effects

On the basis of the EPA EIAR Guidelines, the proposed development construction phase will have slight to moderate temporary to short term negative residual effects.

On the basis of the EPA EIAR Guidelines, the proposed development operational phase will have imperceptible to not significant long term to permanent negative effects.

Table 12.17 Residual Effects: Traffic and Transport

Phase	Quality	Significance	Spatial Extent	Duration
Construction	Negative	Slight to Moderate	Local	Temporary to Short Term
Operational	Negative	Imperceptible	Local	Long Term to Permanent

12.9 Risk of Major Accidents and Disasters

Road traffic accidents on public roads used by traffic volumes generated by the proposed construction works, could result in delays to traffic generated by the proposed works and to other traffic. Traffic generated by the proposed works could be involved in road traffic collisions. Traffic subject to the proposed temporary traffic management measures along the grid connection construction works could be involved in road traffic collisions.