

Appendix 5 - Standalone Traffic and Transport Impact Assessment

Laurclavagh Renewable
Energy Development



Laurclavagh Renewable Energy Development

N83 / L61461 / L6146 JUNCTION

County Galway

Traffic and Transport Assessment

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N83 / L-61461 / L-6146 junction, 07:00 to 19:00, Tuesday 21st November, year 2023
(Traffinomics Ltd)

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1 Introduction

1.1 Purpose of report

The planning application for the Proposed Project is currently being considered by An Coimisiún Pleanála (the Commission), who subsequently made a request for further information on 5th of March 2025. Item 1.8 of the further information request reads as follows.

“A Traffic and Transport Impact Assessment for the N83 / L-61461 junction encompassing the N83, L61461 and L6146 should be submitted as a standalone document.”

The purpose of this report is to address this request made by the Commission. The scope of the assessment is taken to be an assessment of the traffic impact on the N83 / L-61461 / L-6146 junction during the construction and operational stages of the Proposed Project. Much of the information presented in this report is set out in Chapter 15 of the EIAR prepared for the Proposed Project with information from that document referenced. This report should be read in conjunction with the overall EIAR. This report also addresses any changes that have been made to the N83 / L-61461 / L-6146 junction in the interim period, and tests alternative trip generation scenarios.

The report adopts the guidance for such assessments set out by Transport Infrastructure Ireland (TII) in the document “Guidelines for Traffic and Transport Assessments” May 2014, and is set out as follows:

- A brief review of the Proposed Project, the surrounding road network and the N83 / L-61461 / L-6146 junction. ***(Section 2 - Receiving Environment)***,
- A summary of the base year (2023) and peak construction year (2028) traffic flows through the N83 / L-61461 / L-6146 junction. ***(Section 3 - Base Year 2023 and Peak Construction Year 2028 Traffic Volumes at the N83 / L-61461 / L-6146 junction)***,
- A summary of the additional traffic volumes that will be generated through the N83 / L-61461 / L-6146 junction during the construction and operational phases of the Proposed Development ***(Section 4 – Proposed Project Traffic Generation and Assignment at the N83 / L-61461 / L-6146 junction)***,
- A review of the impact of the Proposed Project on the N83 / L-61461 / L-6146 junction ***(Section 5 – Impact of the Proposed Project on the N83 / L-61461 / L-6146 junction)***,
- A review of conditions for sustainable modes of travel ***(Section 6 – Provision for sustainable modes of travel)***.

The key findings of the assessment are summarised in the concluding Section 7.

2 Receiving Environment

2.1 Location and junction summary

The location of the Proposed Project and the N83 / L-61461 / L-6146 junction are shown in Figure 1a. The N83 / L-61461 / L-6146 junction is located approximately 22.5km north of Galway City Centre.

The existing layout of the N83 / L-61461 / L-6146 junction is shown in Figure 1b. The layout includes a recent modification made to the junction by TII, which involved re-locating the stop line of the L-61461 arm of the junction from the carriageway edge to the nearside edge of the hard shoulder. This has the effect of limiting the visibility splays available for traffic exiting the L-61461 onto the N83, as shown in Figure 1c. In the proximity of the junction the N83 has a carriageway width of 7.5m and a speed limit of 100 kph.

During the construction phase of the Proposed Project a series of temporary traffic management measures are proposed in order to provide a safe environment for background traffic and the additional traffic movements generated during the construction phase of the Proposed Project. These measures are set out in Section 15.1.12.5.2 of the EIAR and the same Section of the EIAR Addendum Report.

Figure 1a – Proposed Project location and location of N83 / L-61461 / L-6146 junction

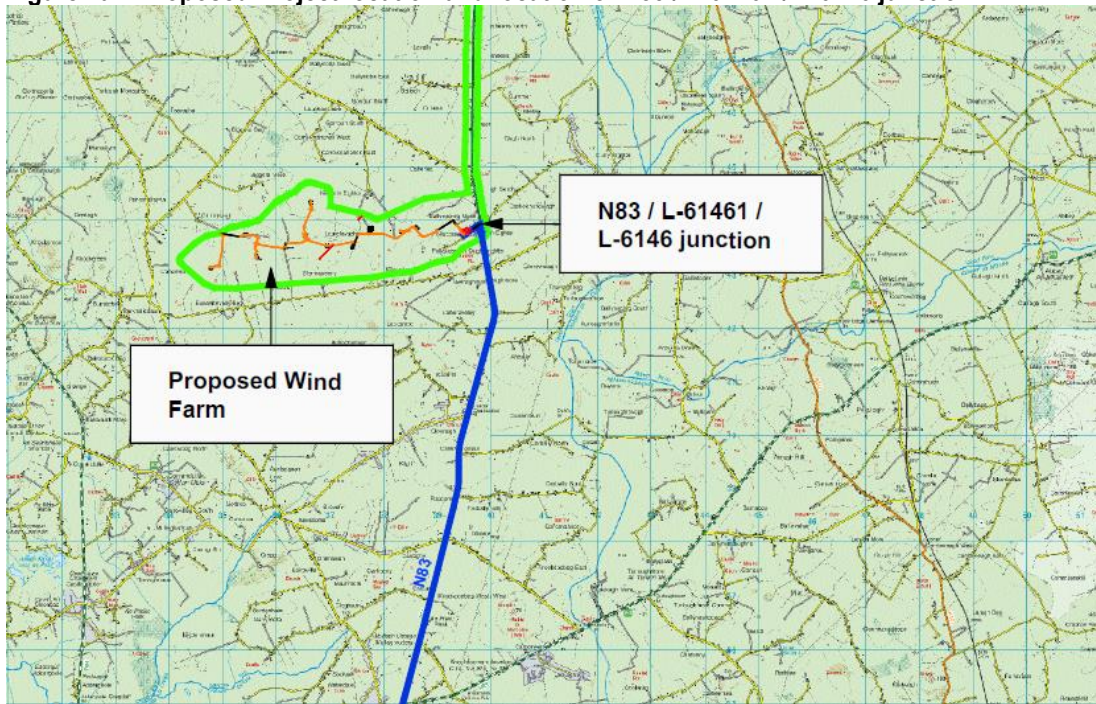


Figure 1b – Existing layout of N83 / L-61461 / L-6146 junction

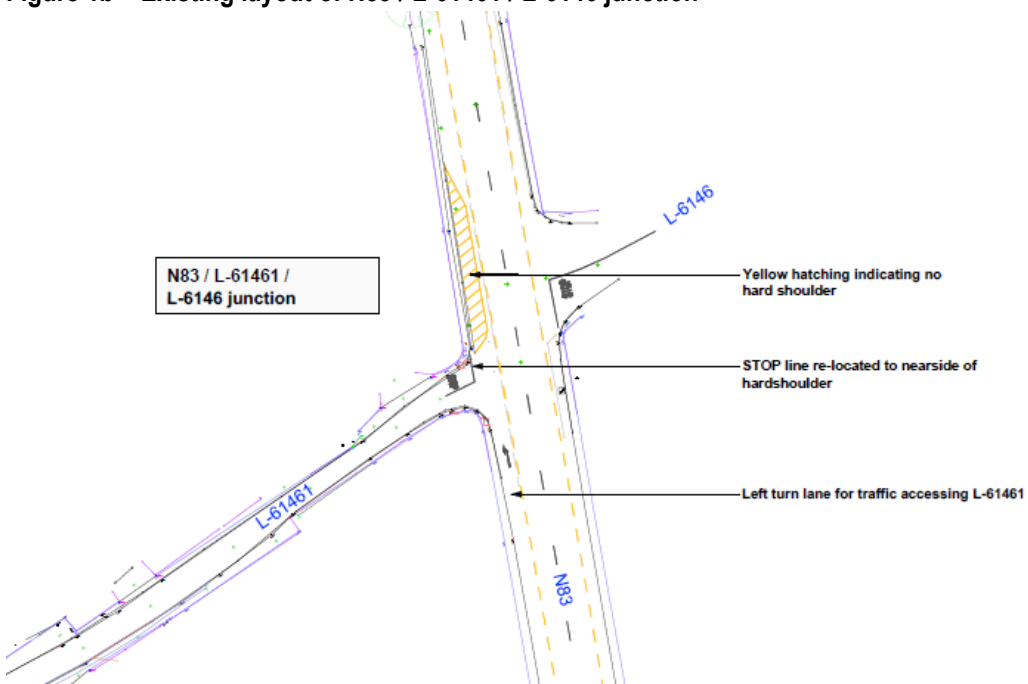
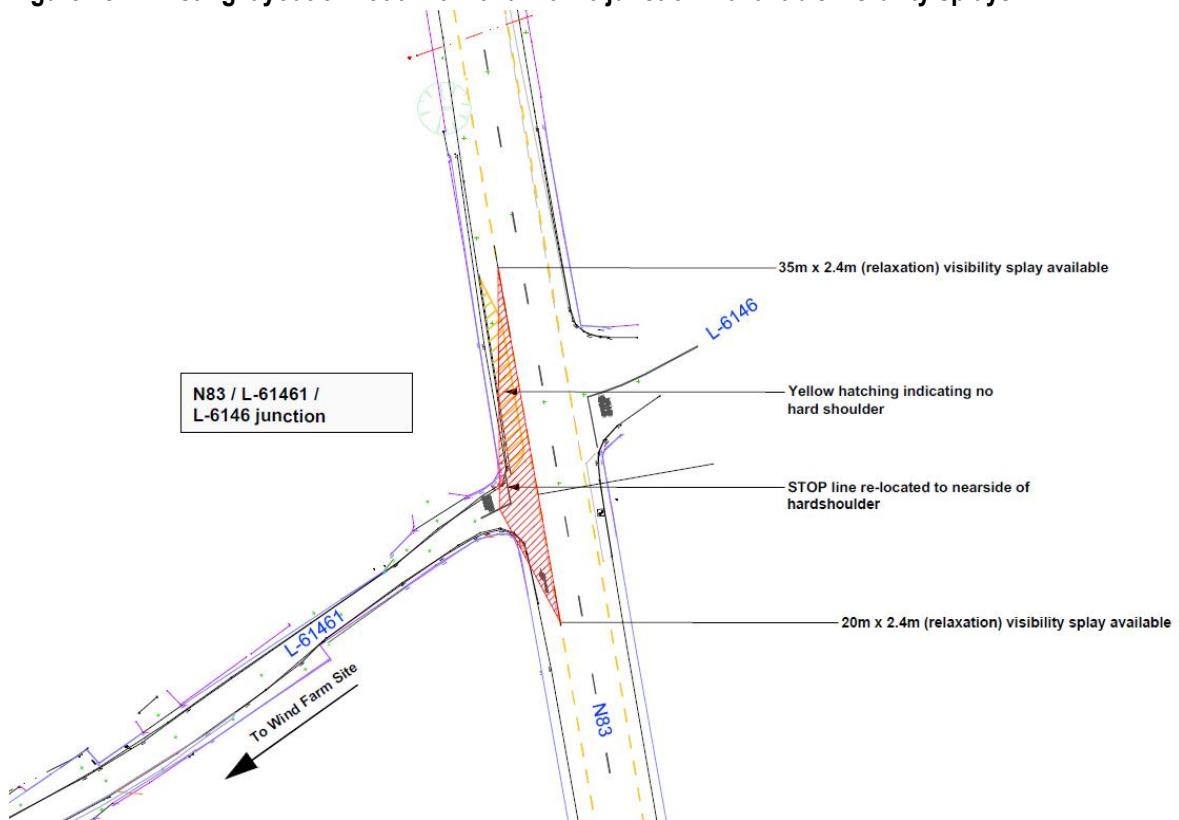


Figure 1c – Existing layout of N83 / L-61461 / L-6146 junction – available visibility splays



3 Base Year 2023 and Construction Year 2028 Traffic Flows at the N83 / L-61461 / L-6146 Junction

3.1 Observed 2023 traffic flows

A 24 hour classified traffic count was undertaken at the N83 / L-61461 / L-6146 junction by Traffinomics Ltd, a specialist traffic survey company. The survey was undertaken on Tuesday 21st November 2023. The observed counts are shown in terms of passenger equivalent car units (pcus) in Figure 2, with the main points to note as follows;

- The AM peak hour was observed to be 07:00 to 08:00, and the PM peak hour 16:00 to 17:00.
- On the N83 a maximum 2-way hourly flow of 880 pcus was observed to the south of the L-61461 during the AM peak hour.
- Existing traffic volumes on the L61461 which leads to the site were observed to be very light with a 2-way flow of 4 pcus observed during both the AM and PM peak hours.
- Existing traffic volumes on the L6146 which forms the 4th arm of the junction are slightly heavier with a 2-way flow of 34 pcus observed during the AM peak hour and 50 pcus during the PM peak hour.

These traffic counts were adopted as base flows for the purpose of the junction capacity tests discussed in Section 5 of this report. A full listing of the traffic counts is provided in Appendix A.

3.2 Forecast background construction year 2028 traffic flows

A proposed construction year for the Proposed Project is 2028. Construction year 2028 traffic volumes travelling through the N83 / L-61461 / L-6146 junction were derived by applying a growth factor to the observed traffic counts of 2023. Annual growth indices were updated in October 2021 by TII¹, with annual indices and cumulative growth forecasts shown for the County Galway Area in Table 1. The derived growth factors applied to 2023 traffic counts to determine background traffic flows for the construction year 2028 is shown in Table 2. Based on TII growth factors for cars and light vehicles for the medium growth scenario, traffic is forecast to grow by 13.6% between 2023

¹ *Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, October 2021*

and 2028. This growth estimate was adopted for the purpose of this assessment. Background traffic forecasts for the year 2028 is shown for the AM and PM peak hours in Figure 3.

Table 1 TII Traffic growth rates, cars and lgvs (County Galway)

Year	Cars and lgvs - Annual factor			Cars and lgvs - Cumulative index		
	low	Medium	High	low	Medium	High
2023	1.0243	1.0259	1.0294	1.000	1.000	1.000
2024	1.0243	1.0259	1.0294	1.024	1.026	1.029
2025	1.0243	1.0259	1.0294	1.049	1.052	1.060
2026	1.0243	1.0259	1.0294	1.075	1.080	1.091
2027	1.0243	1.0259	1.0294	1.101	1.108	1.123
2028	1.0243	1.0259	1.0294	1.128	1.136	1.156
2029	1.0243	1.0259	1.0294	1.155	1.166	1.190
2030	1.0243	1.0259	1.0294	1.183	1.196	1.225

Source: TII Project Appraisal Guidelines - Unit 5.3, October 2021

Table 2 TII derived growth rates for construction year

Vehicle type	Period	Factor		
		low	Medium	High
Cars / lgvs	2023 - 2028	1.128	1.136	1.156

3.3 Future environment

Following a recent minor amendment to the location of the stop line on the L-61461 arm of the junction, it is confirmed by Galway County Councils National Project Design Office that there are no additional amendments proposed for the N83 / L61461 / L6146 junction.

4 Proposed Project Traffic Generation and Assignment at the N83 / L-61461 / L-6146 junction

A detailed breakdown of the trip generations during the various construction periods and once the Proposed Project is operational is provided in Sections 15.1.4.2 of the EIAR and the EIAR Addendum Report. While these details are not restated in this report, the maximum number of additional traffic movements that may be generated by the Proposed Project through the N83 / L61461 / L6146 junction are as follows;

4.1 During Construction

Construction staff travelling to and from the site – As set out in the EIAR it is estimated that a maximum of 70 site staff will be employed on the wind farms site, although it is likely that approximately 20 will be on site at anyone time. Site staff will typically arrive on-site before deliveries are made to site and leave the site once deliveries are complete. A maximum staff trip generation is based on the following;

- All 70 staff arrive on site during the AM peak hour and all leave the site during the PM peak hour,
- All staff drive on their own generating one car trip per staff member.

Based on the above and an assumption that 50% of staff will travel from the direction of Tuam and 50% from the direction of Galway, the additional trips that will be generated through the junction are shown in Figure 4. For this scenario an additional 75 pcus will travel through the junction during the AM and PM peak hours.

AM peak hour	To site = 70 pcus, From site = 0 pcus, 2-way = 70 pcus
PM peak hour	To site = 0 pcus, From site = 70 pcus, 2-way = 70 pcus

Deliveries during the 8 days of concrete foundation pours – Again, as set out in the EIAR the maximum number of HGV that will travel to and from the site will occur on the 8 days that the concrete foundations are poured, when 7 concrete mixers or (based on a pcu value of 2.4) 17 pcus will travel to and from the site per hour. As described in the EIAR, all HGV trips will travel to and from the site from the direction of Galway, with and total of 34 pcus travelling through the junction, as shown in Figure 5.

AM peak hour	To site = 17 pcus, From site = 17 pcus, 2-way = 34 pcus
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PM peak hour To site = 17 pcus, From site = 17 pcus, 2-way = 34 pcus

4.2 During operation

It is estimated that the Proposed Project will be unmanned once operational and will be remotely monitored. The only traffic associated with the operational phase of the Proposed Project will be from maintenance personnel.

It is estimated that the traffic volumes that will be generated by the Proposed Project once it is operational will be minimal, with an estimated 1-2 staff visiting the Proposed Wind Farm site at any time. The impact on the network of these trips during the operational stage will therefore be negligible.

4.3 Trip generation scenarios for junction capacity test

Peak hour construction staff - The scenario above that generates the most additional traffic through the N83 / L61461 / L6146 junction are the AM and PM peak hour when the site staff travel to and from the Proposed Wind Farm site. This scenario was therefore the basis for the first round of junction capacity tests discussed in Section 5 of this report.

Peak hour construction staff and concrete deliveries - In order to test an absolute worst case scenario with respect to trip generation, a sensitivity test based on the AM peak hours with all construction staff trips and with the 7 concrete deliveries per hour travelling to and from the site.

5 Impact of the Proposed Project at the N83 / L61461 / L6146 Junction

5.1 Impact on link flows

The impact that the Proposed Project construction traffic is forecast to have on link flows on the junction during the AM peak hour and PM peak hour is shown in terms of pcus for the construction year 2028 in Table 4. The main points to note are as follows;

Peak construction staff

- During both the AM and PM peak hours, the maximum increase in traffic 2-way traffic volumes on the N83 is an additional 35 pcus, which is forecast to result in a maximum temporary increase in traffic flows on the N83 of +4%,
- The 2-way background traffic flow on the L61461 leading to the site was observed to be just 5 pcus in both the AM and PM peak hours. With a maximum of an additional 70 pcus the traffic flows on this link road would increase by a factor of 15, due to the very low volumes of base traffic.

Peak construction staff and concrete pours

- For this unlikely precautionary scenario during both the AM and PM peak hours, the maximum increase in traffic 2-way traffic volumes on the N83 will be an additional 69 pcus, which would result in a maximum temporary increase in traffic flows on the N83 of +7%,
- For this scenario the maximum increase in traffic on the L61461 leading to the site would be an additional 104 pcus in both the AM and PM peak hours, resulting in a temporary 2 fold increase during the AM and PM peak hours on these 8 days only.

TII guidelines suggest that a detailed capacity assessment should be undertaken at junctions where the proposed development is forecast to result in an increase in traffic volumes of +10%, or +5% at locations where conditions are already congested. Based on this, the capacity of the N83 / L-61461 / L-6146 junction is included in the junction capacity assessment presented in the remainder of this section of the report.

Table 3 Link flows at N83 / L61461 / L6146 junction, background traffic, development traffic, % increase due to development, year 2028 - staff travel

Period	Arm	Construction year			
		Background traffic	Development generated traffic	With development traffic	% increase due to development
AM peak hour	N83 north of L61461	995	35	1,030	4%
	N63 south of L61461	1,000	35	1,035	4%
	L61461 leading to site	5	70	75	1400%
	L6146	39	0	39	0%
PM peak hour	N83 north of L61461	986	35	1,021	4%
	N63 south of L61461	977	35	1,012	4%
	L61461 leading to site	5	70	75	1400%
	L6146	57	0	57	0%

Table 4 Link flows at N83 / L61461 / L6146 junction, background traffic, development traffic, % increase due to development, year 2028 - staff travel and concrete pours

Period	Arm	Construction year			
		Background traffic	Development generated traffic	With development traffic	% increase due to development
AM peak hour	N83 north of L61461	995	35	1,030	4%
	N63 south of L61461	1,000	69	1,069	7%
	L61461 leading to site	5	104	109	2080%
	L6146	39	0	39	0%
PM peak hour	N83 north of L61461	986	35	1,021	4%
	N63 south of L61461	977	69	1,046	4%
	L61461 leading to site	5	104	109	2080%
	L6146	57	0	57	0%

5.2 Junction capacity assessment method

Junction capacity tests were undertaken using the industry standard junction simulation software PICADY, which permits the capacity of any junction to be assessed with respect to existing or forecast traffic movements and volumes for a given time period. The capacity for each movement possible at the junction being assessed is determined from geometric data input into the program with the output used in the assessment as follows:

- Queue – This is the average queue forecast for each movement and is useful to ensure that queues will not interfere with adjacent junctions.

- Ratio of flow to capacity (RFC) – As suggested, this offers a measure of the amount of available capacity being utilised for each movement. Ideally each movement should operate at a level of no greater than 0.85, or at 85% of capacity.
- Delay – Output in minutes, this gives an indication of the forecast average delay during the time period modelled for each movement.

5.3 Scenarios modelled

The greatest effect in terms of traffic will be experienced during peak hours when, during peak construction periods, approximately 70 workers (35 cars) will pass through it. It is assumed that deliveries of materials to the Proposed Wind Farm will take place during the day after the workers have arrived, and before they leave at the end of the day and will therefore not occur at the same time. However, as set out in Section 4.3, as a sensitivity test, junction capacity tests were also undertaken for the scenario where the maximum number of HGV trips (7 in and 7 out) that will be generated during a concrete foundation pour, travel to and from the site at the same time. It is noted that both scenarios represent the upper scale of the traffic volumes that will be generated during the construction of the Proposed Project and therefore represents a robust assessment of the potential impacts.

The junction capacity tests were undertaken for the proposed construction year of 2028.

5.4 N83 / L-61461 / L-6146 junction capacity test results

The AM and PM peak hour traffic flows for the base year (2023) and the proposed construction year of 2028 are shown in Figures 2 and 3 respectively. The additional maximum number of traffic movements that are forecast to be generated by construction workers are shown in Figure 4, with the number of HGVs (in pcus) shown for the 8 concrete foundation pour days shown in Figure 5. The additional traffic movements that will travel through the junction if both peak construction staff and peak HGV movements occur at the same time are shown in Figure 6. The “with development traffic flows are shown for both of these development scenarios, that is “peak construction staff” and peak construction staff and peak HGV movements” are shown for the 2028 AM and PM peak hours in Figures 7 and 8 respectively.

The results of the junction capacity tests are shown in Table 5, with the following the main points to note;

- By the year 2028, the maximum ratio of flow to capacity (RFC) for the No Development scenario is forecast to be the right turn from the L6146 arm of the junction, the arm not impacted by the Proposed Project, with an RFC of 5.0% during the AM peak hour.
- With the inclusion of the maximum number of construction staff trips, it is forecast that the maximum RFC will apply to the right turn from the N83 onto the L-61461 during the AM

- peak hour (15.6%), and the right turn from the L-61461 onto the N83 during the PM peak hour (16.8%).
- With the additional inclusion of the maximum number of HGVs generated during one of the 8 concrete construction pour days, the maximum RFC will apply to the right turn from the L-61461 onto the N83 during the PM peak hour (24.7%).

The assessment shows that the junction is forecast to operate well within the acceptable limit of 85% as specified by TII in the Traffic and Transport Assessment Guidelines.

Table 5 Junction capacity test results – N83 / L61461 / L6146 junction, AM and PM peak hours, by development scenario, year 2028

Development scenario	Arm	AM Peak hour			PM Peak hour		
		RFC	Q	Delay	RFC	Q	Delay
No Development	From L6146 – right turn	5.0%	0.05	0.26	4.4%	0.05	0.23
	From L6146 – left turn	4.0%	0.04	0.14	3.0%	0.03	0.12
	From L61461 – left turn	0.4%	0.00	0.16	0.3%	0.00	0.15
	From L61461 – right turn	1.1%	0.01	0.24	0.0%	0.00	0.00
	From N83 south – right turn into L6146	1.8%	0.02	0.10	3.1%	0.04	0.07
	From N83 north – right turn into L61461	0.0%	0.00	0.00	0.0%	0.00	0.00
With all construction staff traffic	From L6146 – right turn	5.2%	0.05	0.27	4.6%	0.05	0.24
	From L6146 – left turn	4.0%	0.04	0.14	3.0%	0.03	0.12
	From L61461 – left turn	0.5%	0.00	0.17	10.5%	0.12	0.18
	From L61461 – right turn	1.2%	0.01	0.25	16.8%	0.20	0.31
	From N83 south – right turn into L6146	1.8%	0.02	0.10	3.1%	0.04	0.07
	From N83 north – right turn into L61461	15.6%	0.44	0.07	0.0%	0.00	0.00
With all construction staff traffic * concrete deliveries	From L6146 – right turn	5.2%	0.05	0.27	4.6%	0.05	0.24
	From L6146 – left turn	4.0%	0.04	0.14	3.0%	0.03	0.12
	From L61461 – left turn	0.6%	0.01	0.22	11.3%	0.13	0.19
	From L61461 – right turn	8.7%	0.09	0.27	24.7%	0.32	0.34
	From N83 south – right turn into L6146	1.8%	0.02	0.09	3.1%	0.04	0.07
	From N83 north – right turn into L61461	15.7%	0.44	0.07	0.0%	0.00	0.00

6 PROVISION FOR SUSTAINABLE MODES OF TRAVEL

A travel plan will be put in place during the construction of the Proposed Project as set out in Section 15.1.12.5.2 of the EIAR. However, as the purpose of this assessment is to undertake a robust assessment of the impacts of the Proposed Project on the N83 / L-61641 / L-6146 junction, the trip generation estimates set out in this report are based on the precautionary worst case scenario that all construction staff drive to and from the site.

7 SUMMARY AND CONCLUSIONS

7.1 Summary

An assessment of the traffic impact of the Proposed Project was undertaken. The assessment focuses on the N83 / L-61461 / L-6146 junction, as requested by An Coimisiún Pleanála.

Based on traffic count survey data collected in 2023, estimates of peak hour traffic volumes travelling through the junction were made for the proposed construction year of 2028, based on TII growth rates. The maximum number of additional trips that will negotiate the junction during the construction of the Proposed Project included estimates for construction staff and for the busiest HGV delivery days during the concrete foundation pours.

The junction capacity tests undertaken for the N83 / L-61461 / L-6146 junction show that the junction is forecast to operate well within capacity during the construction phase, commencing in 2028, based on a precautionary combination of additional staff and HGVs trips travelling through the junction.

It is forecast that a nominal number of vehicle trip will be generated once the Proposed Project is operation, which will have a negligible impact.

7.2 Conclusions

While a comprehensive range of traffic management measures will be put in place at the N83 / L-61461 / L-6146 junction during the construction of the Proposed Project, in order to provide a safe environment for all road users, the traffic impact assessment presented in this report establishes that the junction will operate well within capacity during construction and operation of the Proposed Project.