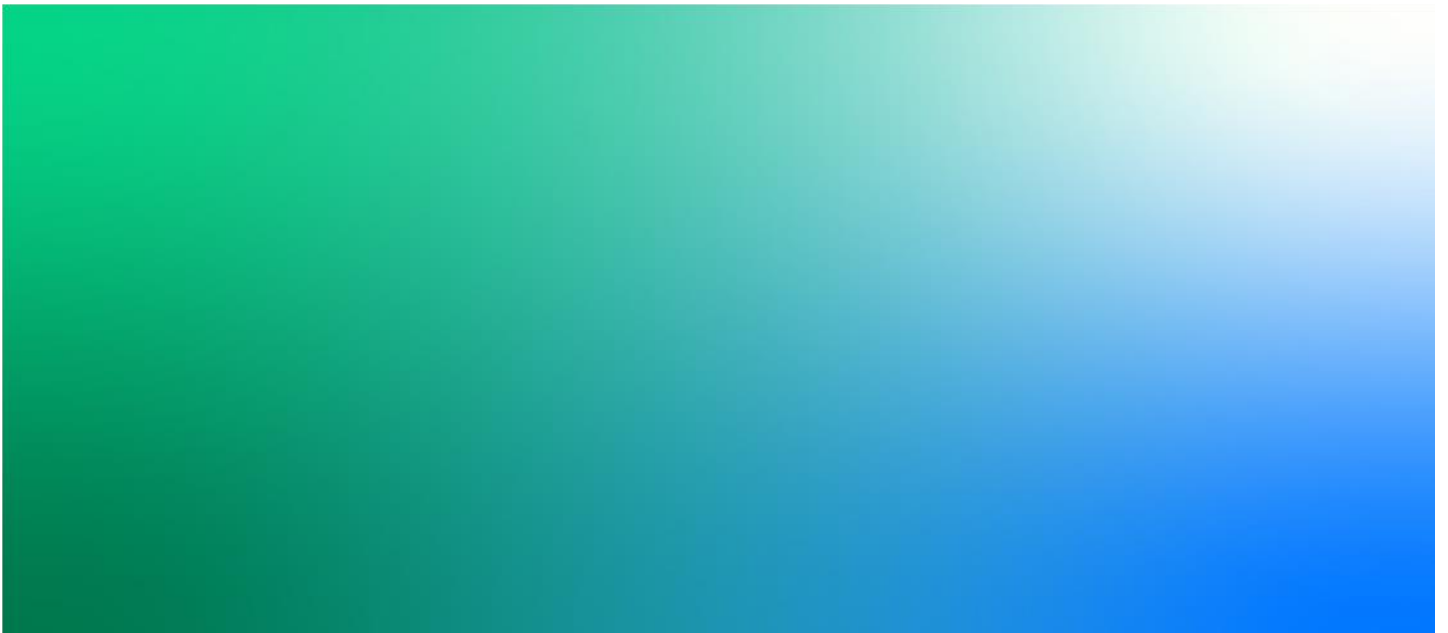


Jacobs

Cork Line Level Crossings
Volume 3, Chapter 11: Traffic & Transport
Iarnród Éireann

March 2021



Cork Line Level Crossings

Project No: 32111000
Document Title: Volume 3, Chapter 11 Traffic & Transport
Document No.: 11
Revision: A04
Date: March 2021
Client Name: Iarnród Éireann
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Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
A01	Dec 2019	For Review	DM	CW	RM	AB
A02	July 2020	Clients Comments Addressed	DM	CW	RM	AB
A03	December 2020	For Legal Comment	HC	RM	RM	AB
A04	March 2021	For Issue to An Bord Pleanála	HC	RM	RM	AB

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Table of Acronyms

Acronym	Meaning
AAWT	Annual Average Weekday Traffic
ABP	An Bord Pleanála
ATC	Automatic Traffic Counter
CA	Competent Authority
CIÉ	Coras Iompair Éireann
CTMP	Construction Traffic Management Plan
EC	European Commission
EEC	European Economic Community
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
HGV	Heavy Goods Vehicle
IÉ	Iarnród Éireann
IEMA	Institute of Environmental Management and Assessment
JTC	Junction Turning Count
LGV	Light Goods Vehicle
LC	Level Crossing
RSA	Road Safety Audit
RSIA	Road Safety Impact Assessment
TII	Transport Infrastructure Ireland
TTA	Traffic and Transport Assessment

11. Traffic and Transport

11.1 Introduction

This chapter considers the traffic and access implications of the proposed Project with reference to the impacts of construction and operational traffic.

The aim of this chapter is to identify the potential effects of increased road traffic expected as a result of the construction of the proposed Project, assess the significance of these effects against identified criteria and, where required, identify appropriate mitigation measures. Any proposed mitigation seeks to minimise the impacts on the road network and its associated infrastructure, the sensitive receptors along the proposed construction traffic routes, and the likely severance impacts to local active travel movements due to construction access arrangements and/or traffic management measures.

On completion of construction, the net increase in traffic movements will be negligible on the network. However, as the proposed Project includes new diversionary routes e.g. at proposed crossing XC215 Shinanagh where the closure of the existing level crossing will result in traffic transferring from its current route to a new route there will be localised increases and decreases in traffic flows. Overall, it is anticipated that the proposed Project will provide beneficial traffic impacts through road upgrades alleviating the delay from the existing level crossings and improving standards of a number of rural roads.

11.2 Consultation

The key issues raised during consultation with prescribed bodies and other consultees in relation to Traffic and Transport are broadly summarised below in Table 11.1.

Table 11.1: Consultee Responses

Consultee	Response
An Bord Pleanála ABP highlighted the need to consider the proposed motorway upgrade of the N20 due to its strategic nature and close proximity to the proposed Project sites.	The N20 upgrade has been considered within this chapter and was also raised by TII with further details provided below.
Cork County Council Comments related to details of alignments and the provision of an offline footway at XC212 Ballycoskery	These comments have been addressed within Volume 5, Appendix 1A
Limerick County Council (LCC) Comments related to the width of carriageway and passing bays at XC201 Thomastown and how redundant road sections would be extinguished	These comments have been addressed within Volume 5, Appendix 1B
Transport Infrastructure Ireland 1) The EIAR should identify the methods/techniques proposed for any works traversing/in proximity to the national road network in order to demonstrate that the development can proceed complementary to safeguarding the capacity, safety and operational efficiency of that network; 2) Consultations were advised with Cork County Council Transportation Department, Cork National Roads Office and the M20 Project Office; 3) A Traffic and Transport Assessment (TTA) should be carried out. TII's TTA Guidelines (2014) should be referred to. It also specifies that regard is had to Section 2.2 of the TII TTA Guidelines;	1) This chapter considers the traffic and access implications of the proposed Project with reference to the impacts of construction and operational traffic. The chapter has also considered the comments made by TII in regard to safeguarding the capacity, safety and operational efficiency of the network. 2) Consultations have been undertaken with Cork County Council Transportation Department and the M20 Project Office (See Volume 3, Chapter 1: Introduction). Cork County Council Transportation Department confirmed that the Cork National Roads Office is staffed by Cork County Council Transportation staff and as such further consultation with this Office would not be required. A teleconference meeting was held between the M20 Cork to Limerick Project and the Cork Line Level Crossings Project Team on the 10th March 2020. Volume 5, Appendix 1G

Consultee	Response
<p>4) TII Standards should be consulted to determine the requirement for Road Safety Audit (RSA) and Road Safety Impact Assessment (RSIA);</p> <p>5) Assessments and design and construction and maintenance standards are available at TII Publications;</p> <p>6) The EIA shall include provision for travel planning/mobility management planning;</p> <p>7) The EIA should have regard to TII Environment Guidelines that deal with assessment and mitigation measures. It goes on to specify that evidence assessment of the protection of the strategic function of the national road in relation to the following matters is required:</p> <ul style="list-style-type: none"> a) TII’s environmental Assessment and Construction Guidelines, including the Guidelines for the Treatment of Air Quality During the Planning and Construction of national Road Schemes (National Roads Authority, 2006); b) The EIAR should consider the Environmental Noise Regulations 2006 (SI 140 of 2006) and, in particular, how the development may need to consider the incorporation of noise barriers to reduce noise impacts (see guidelines for the Treatment of Noise and Vibration in National Road Schemes (1st Rev, National Roads Authority, 2004). 	<p>includes a minute of the meeting. It was noted that in terms of sequencing the Cork Line Level Crossings Project was more likely to be submitted first and the M20 Project Team requested to be kept informed of any major changes to the programme. No significant issues were raised by either project team and it was agreed to keep communications open between the projects.</p> <p>3) The TTA Guidelines 2014 and in particular Section 2.2 have been referred to and the assessment undertaken in this chapter is deemed sufficient to assess the impact of construction traffic. The operational phase has no trip increase and limited rerouting of baseline traffic is not predicted to be significant.</p> <p>4) A Road Safety Audit (RSA) and Road Safety Impact Assessment (RSIA) have been prepared and are at Volume 5, Appendix 1J.</p> <p>5) TII Publications have been considered in this chapter;</p> <p>6) This chapter includes the requirement, and framework, for a Construction Traffic Management Plan (CTMP) with a construction phase travel plan;</p> <p>7) 7a Volume 3, Chapter 15: Air Quality presents the potential air quality effects resulting from the construction and operation of the proposed Project on nearby sensitive receptors and locations. 7b) Volume 3, Chapter 10: Noise and Vibration provides an assessment of the potential noise and vibration impacts associated with the construction and operation of the proposed Project. Chapter 10: Noise and Vibration includes consideration of TII Guidance, the National Roads Authority Guidance and the Environmental Noise Regulations 2006.</p>
<p>Transport Infrastructure Ireland – Further Consultation</p> <p>8) TII provided a further consultation response on 25th June 2020 specifically in regard to proposed changes at XC215 Shinanagh In summary their advice in regard to the proposed Project remains the same and that any modifications should be discussed with Cork County Council and the M20 Project Office.</p>	<p>8) The proposed modifications at XC215 Shinanagh have been discussed and agreed with both Cork County Council and the M20 Project Office as set out at Volume 5, Appendix 1A and 1G.</p>

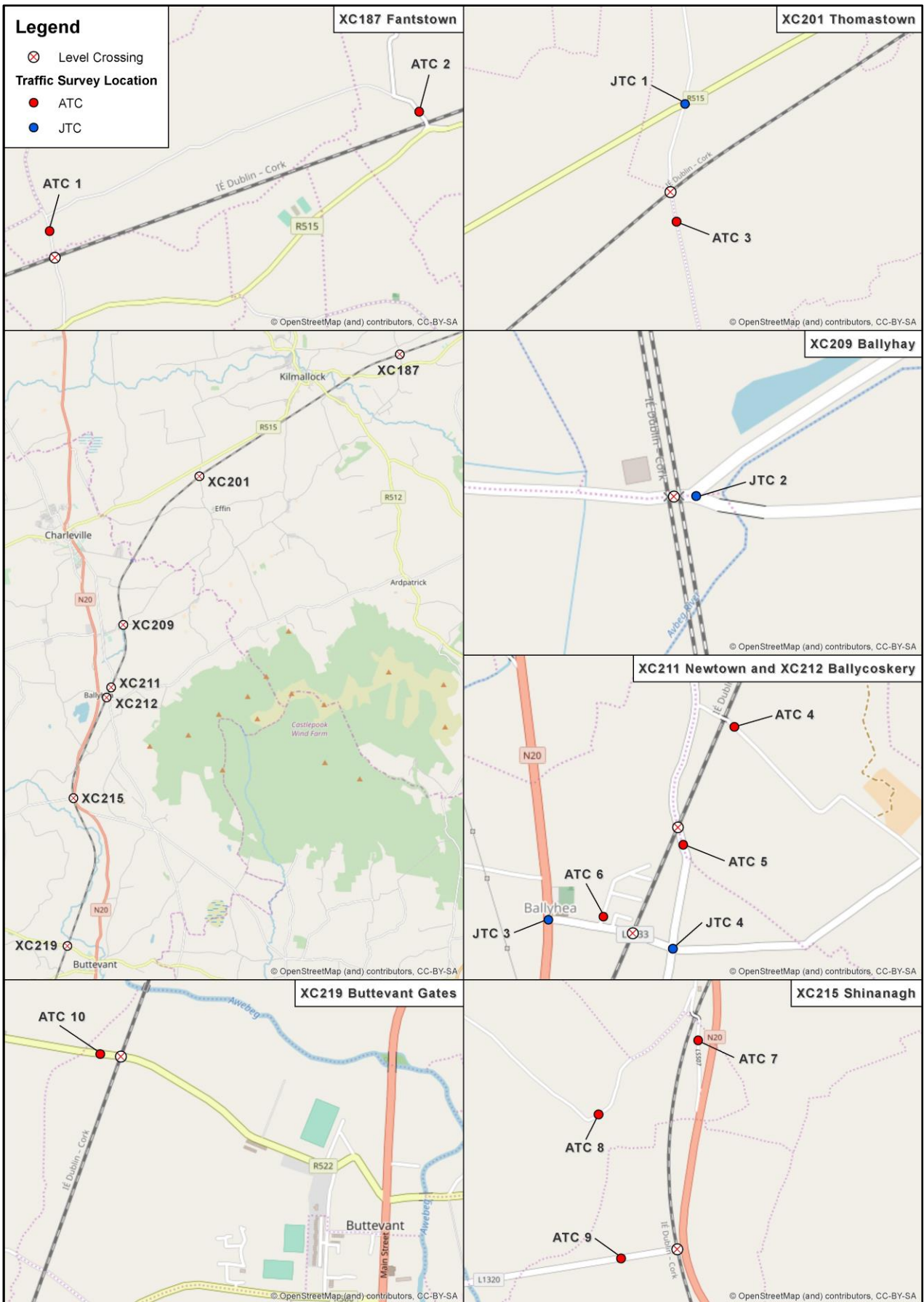
The above consultee responses have been considered within this assessment and are addressed within this chapter.

11.3 Study Area

The study area relates to the areas around each of the proposed crossings and covers the extents likely to be impacted during the construction and operational phases of the proposed Project. Traffic and non-motorised user surveys, outlined in Section 11.3, have been undertaken within each study area in order to determine existing traffic conditions and enable an assessment of the impacts. Inset Figure 11.1 highlights the extent of the study area in relation to each crossing location as well as the survey locations for automatic traffic counts (ATC) and junction turning counts (JTC).

Beyond the study area boundary, it is predicted that the construction and operational traffic would be fully integrated within the wider road network without any significant delay or effects. The proposed Project is in close proximity to the N20 and the strategic road network, providing a good base-level of accessibility for both construction and operational traffic. Heavy Goods Vehicles (HGVs), associated with the Construction Phase, will use the N20 strategic route for the most part and avoid as far as possible routing through residential or employment areas. The proximity of each Project site to the N20 and R class roads is illustrated in Inset Figure 11.1. Route options for cyclists and in particular for pedestrians are currently restricted by the busy N20 and local regional roads which link between the proposed Project sites. Although minimal walking and cycling provision is currently provided in the proposed Project study area any road improvements are likely to be beneficial for safety and current active travel use will be managed and rerouted, as necessary.

Inset Figure 11.1 Study Area and Traffic Count Locations.



11.4 Assessment Methodology

11.4.1 Legislation, Policy & Guidance

Most of the roads considered within this study are rural in their nature and have relatively low existing traffic flows. In undertaking the assessment of the potential traffic and transport impacts on the local road network, the following guidance documents have been considered:

- Guidelines for the Environmental Assessment of Road Traffic, by the Institute of Environmental Management and Assessment (the IEMA Guidelines);
- Design Manual for Roads and Bridges, Traffic Infrastructure Ireland;
- Traffic and Transport Assessment Guidelines, (Traffic Infrastructure Ireland, 2014) (TII Guidelines);
- Design Manual for Urban Roads and Streets (DMURS), Department of Environment, Community and Local Government, 2019;
- EPA Guidelines on the Information to be Contained in Environmental Impact Statements (EPA, 2002) (and revised draft guidelines 2017); and
- EPA Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003a) (and revised draft advice notes 2015).

11.4.2 Impact Assessment Methodology

The approach to assessing the traffic and transport impacts of the proposed Project is based on an industry recognised methodology that has been successfully applied to assessments across Ireland, enhanced with professional judgement where required. The assessment approach is undertaken in line with the policy documents detailed within Section 11.4.1.

The traffic impact of the proposed Project has been assessed utilising the following approach:

Relevant transport policies were reviewed;

- The road sections likely to be affected by the traffic associated with the proposed Project have been identified;
- The existing character of the road network has been determined;
- Existing traffic levels on the road network have been measured;
- The additional traffic generated by all stages of the proposed Project has been estimated;
- The impact of the additional traffic has been assessed; and
- Appropriate mitigation measures have been identified to ensure that any potential traffic impacts are kept to a minimum.

On completion of construction, the net increase in traffic movements will be negligible on the network. However, as the proposed Project includes new diversionary routes e.g. at proposed crossing XC215 Shinanagh where the closure of the existing level crossing will result in traffic transferring from its current route to a new route there will be localised increases and decreases in traffic flows. Overall it is anticipated that the proposed Project will provide beneficial traffic impacts through road upgrades alleviating the delay from existing crossings and improving standards of a number of rural roads. As such, it is considered that the proposed Project will not generate significant traffic impacts on the local road network requiring further assessment in this chapter.

11.4.3 Assessment Guidelines

While the EPA Guidelines provide a qualitative approach to understanding impacts relating to traffic and transport, the IEMA Guidelines provide thresholds upon which impacts associated with increases in traffic can be assessed and in turn ensures that a robust assessment of impacts is undertaken. Consequently, the traffic and transport

related impacts of the proposed Project have been assessed based on the IEMA Guidelines, with any qualitative assessment of impacts based on EPA Guidelines as this is a more robust approach. As detailed in Table 11.1, due consideration has been given to the TII guidelines on Traffic and Transport Assessment (TTA) and given the net increase in operational traffic will be negligible, as described in paragraph 1.3.2, a TTA has not been undertaken as part of this assessment.

11.4.4 Significance of Effects

The IEMA Guidelines identify that the following environmental effects may be considered when assessing the traffic related to developments:

- accidents and safety;
- air pollution;
- driver delay;
- dust and dirt:
- hazardous loads;
- noise;
- pedestrian amenity;
- pedestrian delay;
- severance (of communities);
- heritage and conservation;
- visual effects;
- ecological effects; and
- vibration.

As detailed in Chapter 2: Project Need and Alternatives, the project objective is to reduce the accident risk inherent with road and rail interface at level crossings. The assessment in this chapter is largely based on the changes in traffic volumes due to the proposed Project, however, the benefits of the project through the proposed removal or upgrading of level crossings have been considered within the operational assessment, most notably the reduction in accident risk and driver delay.

Of the above effects, the following have been considered within other Chapters of this EIAR, if the effects are considered to be potentially significant:

- Air pollution, dust and dirt – these are considered within Volume 3, Chapter 15: Air Quality;
- Ecological impacts – these are considered within Volume 3, Chapter 7: Biodiversity;
- Noise and vibration – these are considered within Volume 3, Chapter 10: Noise & Vibration;
- Heritage and conservation – these are considered within Volume 3, Chapter 12: Cultural Heritage; and
- Visual impacts – these are considered within Volume 3, Chapter 13: Landscape & Visual.

11.4.5 Significance Criteria

The TII and IEMA Guidelines suggest that two broad principles are used as a screening process to focus the scale and extent of the assessment. These are:

- *Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road; and*
- *Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists, or the location is sensitive.*

Moreover, criteria for assessing the significance of the increases in traffic volumes as a result of the proposed Project have been derived on this basis as shown in Table 11.2.

Table 11.2: Significance of Impacts in Relation to Traffic Flow Increases

Significance Criteria	Increase in Traffic Flow
Major	Above 90%
Moderate	Between 60% and 90%
Minor	Between 30% and 60%
Negligible	Under 30%

While in the first instance, impacts are assessed against these criteria, an element of professional judgement must also be applied with respect to the carrying capacity of the roads being considered. Where existing traffic levels are exceptionally low (e.g. on some unclassified or local roads), any increase in traffic flow is likely to exceed these thresholds. Where this situation is identified it is important to consider any increase both in terms of its relative increase in respect of existing traffic flows, as well as the overall total flow in respect of the available capacity of the section of road being considered.

For example, a 100% increase in traffic flow on a road which currently only carries 90 vehicles Annual Average Daily Traffic (AAWT) flow, will potentially indicate an impact of major significance if considered simply in terms of the significance criteria presented in Table 11.2. However, a typical 6m wide road is capable of accommodating approximately 5,000 two-way vehicles per day, in accordance with thresholds contained in TII Rural Road Link Design. Therefore, such an increase will be unlikely to create major impacts given the road's overall capacity. Table 11.3 refers to the link capacity of varying rural road types.

Table 11.3: Road capacity of road categories (TII Rural Road Link Design, Recommended Rural Road Layouts)

Description	Capacity (two way per day)
6.0m wide Single Carriageway	5,000
7.0m wide Single Carriageway	8,600
7.3m wide Single Carriageway	11,600
Standard Motorway	52,000

Notwithstanding this, as outlined in Section 11.4.3, while the IEMA Guidelines provide a robust threshold approach in which to assess effects the EPA Guidelines are also considered. The characteristics of the EPA impact assessment are defined below, as per the EPA Guidelines (EPA 2002, EPA 2015).

- **Quality of Effects**

- **Positive Effects:** A change which improves the quality of the environment (for example, by increasing species diversity or improving the reproductive capacity of an ecosystem; or removing nuisances; or improving amenities);
- **Neutral Effects:** A change which does not affect the quality of the environment; and
- **Negative/Adverse Effects:** A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing a nuisance).

- **Significance of Effects**

- **Imperceptible:** An effect capable of measurement but without noticeable consequences;
- **Not significant:** An effect which causes noticeable changes in the character of the environment but without noticeable consequences;

- **Slight Effects:** An effect which causes noticeable changes in the character of the environment without affecting its sensitivities;
 - **Moderate Effects:** An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends;
 - **Significant Effects:** An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment;
 - **Very Significant Effects:** An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment; and
 - **Profound Effects:** An effect which obliterates sensitive characteristics.
- **Duration of Effects**
 - **Momentary Effects:** Effects lasting from seconds to minutes;
 - **Brief Effects:** Effects lasting less than a day;
 - **Temporary Effects:** Effects lasting less than a year;
 - **Short-term Effects:** Effects lasting one to seven years;
 - **Medium-term Effects:** Effects lasting seven to fifteen years;
 - **Long-term Effects:** Effects lasting fifteen to sixty years; and
 - **Permanent Effects:** Effects lasting over sixty years.

Any potential environmental impacts including accidents and safety, driver delay, pedestrian amenity, pedestrian delay and severance are considered on a case by case basis using professional judgement and reasoned argument. The significance of any impact, as outlined within Table 11.2, is assessed on the basis of the magnitude of the impact and the likelihood of the impact occurring.

There are no general thresholds for determining the significance of increased traffic on road safety. Professional judgement is therefore required in order to determine any potential detrimental impacts associated with the traffic generated by the proposed Project.

Appropriate mitigation measures have been identified to ensure that any potential traffic impacts are kept to a minimum. The means by which the impacts of the proposed Project, on any such sensitive receptors, are to be mitigated are considered in Section 11.7.

11.4.6 Assumptions and limitations

Until contractors have been appointed and materials sources have been identified, it is not possible to determine exactly how many vehicles would reach the site using the predicted routes. Hence, the assessment has assumed that 100% of the generated construction traffic associated with each crossing would affect all major routes to the specific site. This presents a worst-case-scenario as once contractors have been appointed and materials sourced, it is expected that generated construction traffic will arrive at site using the various routes and would disperse prior to reaching some of the sensitive receptors. Consequently, the information presented in this Chapter is necessarily indicative and the proposed routes, vehicles and other arrangements provided are examples based on Jacobs' and the Applicant's experience of construction and operation of similar schemes.

11.5 Baseline Environment

The identification of appropriate baseline conditions for the traffic, transport and access assessment are defined by the approach adopted in Section 11.4.2, and therefore cover the following aspects of the study area.

- Existing traffic flows on local road network;
- Existing provision of sustainable travel (i.e. walking, cycling and public transport); and
- Potential sensitive receptors.

It is important to assess the likely routes that construction traffic will use during the proposed Project works to highlight and quantify any impacts and highlight those that will potentially be affected. The sensitive receptors

that have been identified regarding the traffic and transport effects associated with the construction traffic include the following:

- Vehicle drivers and cyclists on the road network – potential delay, severance and disruption impacts;
- Pedestrians and cyclists on surrounding carriageways, footways and cycleways – potential delay, severance and disruption impacts;
- Residents – potential disruption due to local intrusion, dust and dirt;
- Local businesses and employees – potential disruption due to potential temporary road closures, local intrusion, dust and dirt; and
- Construction vehicle drivers – potential safety concerns.

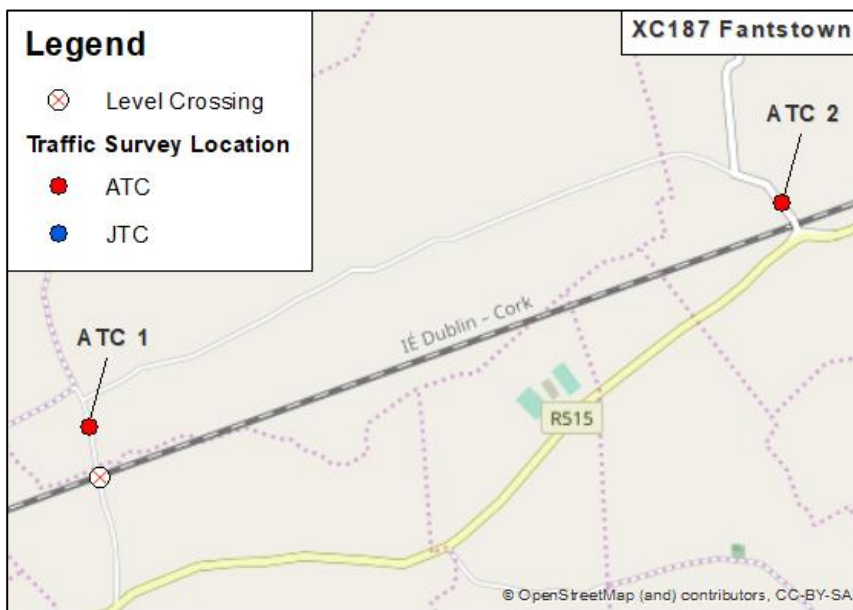
11.5.1 XC187 Fantstown

Desk Top Study

Road Network

The XC187 Fantstown Level Crossing (shown in Inset Figure 11.2) is located on local road LS8514, to the east of Kilmallock. The road is single-track along its length, running north from the R515. South of Bantard an unnamed single-track road, that passes through Kilmaculla, connects to a wider single carriageway road to the north east with an existing rail bridge connected to the R515. All roads within this area are subject to a speed limit of 80km/h.

Inset Figure 11.2 XC187 Fantstown Level Crossing.



Current Operation of the Level Crossing

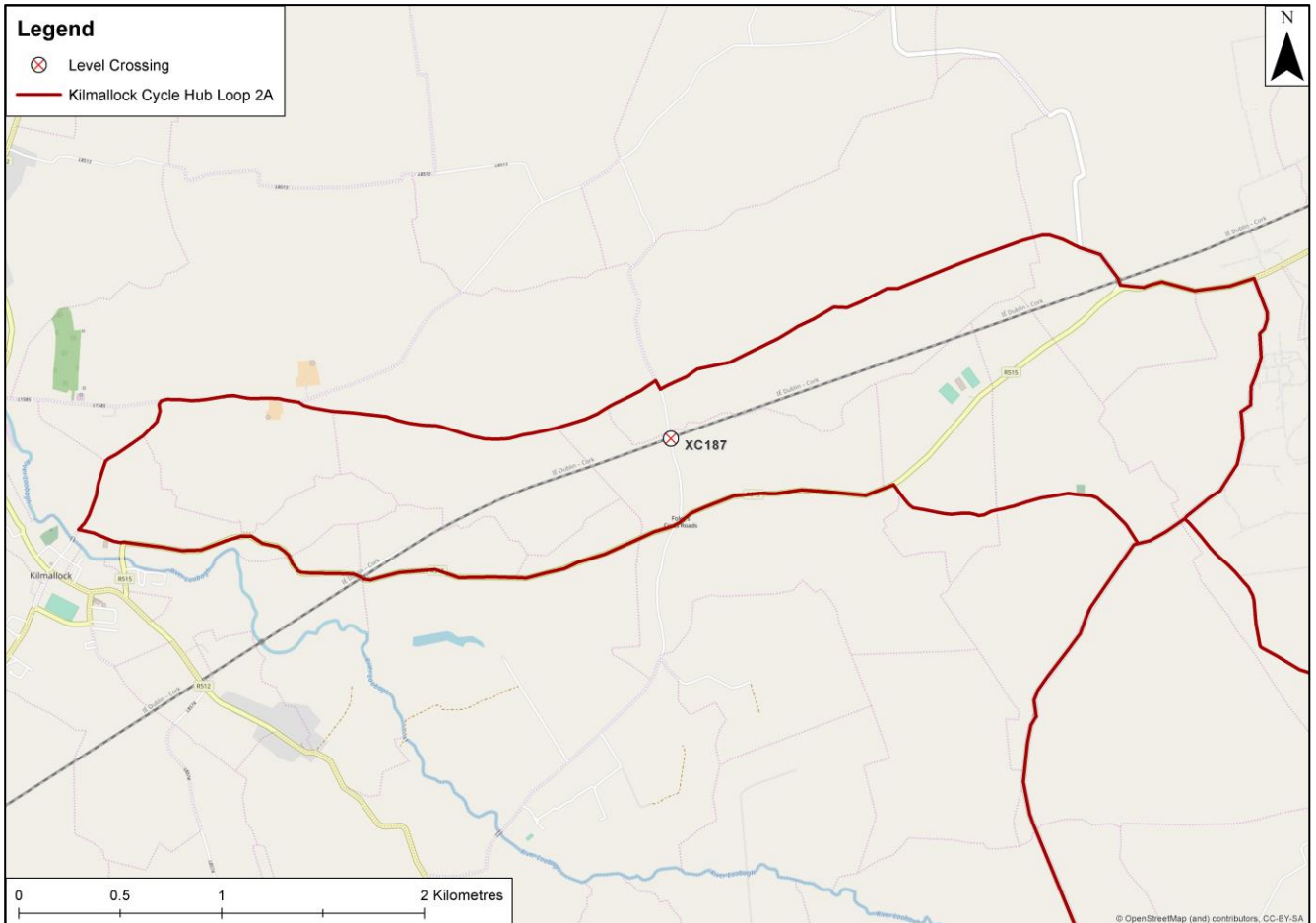
The level crossing is manned 07.30hrs-23.30hrs and the gates are normally closed to road traffic, with the gate keeper opening the gates as required. The crossings are closed to road traffic from 23.30hrs until 07.30hrs. The length of time that the road user is waiting depends on when they arrive at the gate and if a train has left Limerick Junction or Charleville. The road user has to wait until they pass.

Active Travel Provision

As the surrounding roads are single-track rural roads there is no dedicated footpath or cycling provision. There is however a local cycling hub within Kilmallock that was established following a National Cycle Network Scoping

Study in 2010 with the aim of creating a strong Irish cycling culture. The Kilmallock Hub is the largest of 12 hubs around the country with four cycling routes of varying distances. Specifically, it is the advertised Loop 2A route (shown in Inset Figure 11.3) that navigates roads which will be impacted by resulting operational diversions from the proposed Project.

Inset Figure 11.3 Fantstown Cycle Network.

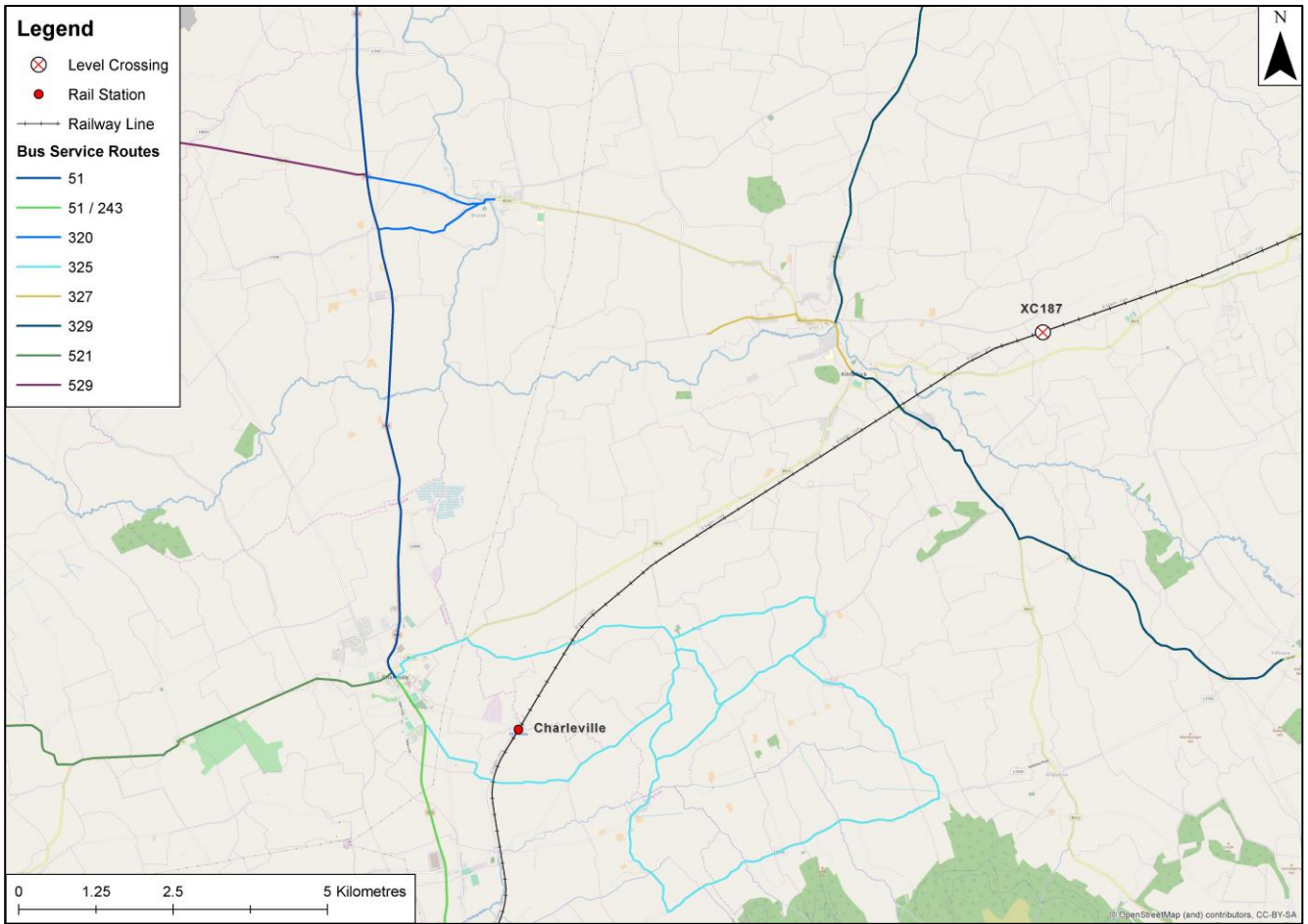


Public Transport Provision

There are no public transport services within the immediate vicinity of the level crossing XC187 Fantstown (as shown in Inset Figure 11.4). As only minor construction activities are associated with this location there will be a negligible impact on the R515 and N20 in terms of delay and no severance or issues in terms of access and provision of the services should be expected as a result of any construction.

Access routes to Charleville Train Station, which provides links to both Dublin and Cork, will be considered in terms of any potential delay resulting from construction activities, slow moving HGVs and associated traffic management requirements at other existing crossing sites within the proposed Project.

Inset Figure 11.4 Public Transport Network.



Sensitive Receptors

There are several dwellings within this local area that have direct frontage or drive access to the roads surrounding the existing crossing. Although these receptors will not be impacted by construction activities, they are likely to be impacted during the operational phase of the proposed Project.

Pedestrians and cyclists who use these normally quiet rural roads may face potential delays and severance from their normal routes due to an increase in traffic flows.

Survey Work

Two classified volumetric ATC traffic surveys were carried out at this location; one at the XC187 Fantstown crossing (ATC 1) and the other at the existing rail bridge to the north east (ATC 2). See Volume 5, Appendix 11A. The traffic flows were recorded for seven days, commencing on Tuesday 15th October 2019.

The results from the traffic surveys are shown in Table 11.4 below.

Table 11.4: Fantstown Baseline ATC AAWT

Traffic Counter	Road	Northbound/ Eastbound	Southbound/ Westbound	Directions Combined	Directions Combined	Directions Combined
		All Vehicles	All Vehicles	All Vehicles	Heavies	% Heavies
ATC 1	LS8514	12	11	22	0	0.0

Traffic Counter	Road	Northbound/ Eastbound	Southbound/ Westbound	Directions Combined	Directions Combined	Directions Combined
		All Vehicles	All Vehicles	All Vehicles	Heavies	% Heavies
ATC 2	Unnamed Road	239	242	481	23	4.7

Non-motorised user (NMU) surveys were also carried out at each crossing location between 0700-2100 for seven days, commencing on Tuesday 21st January 2020. The results from this survey are shown in Table 11.5.

Table 11.5: Fantstown Baseline NMU 5-day and 7-day averages.

Site	Location	Pedestrians				Cyclists		Livestock	
		Adults		Children		5-day	7-day	5-day	7-day
		5-day	7-day	5-day	7-day				
1	Fantstown	0	0	0	0	0	0	0	
2	East of Fantstown	2	4	0	0	2	2	0	0

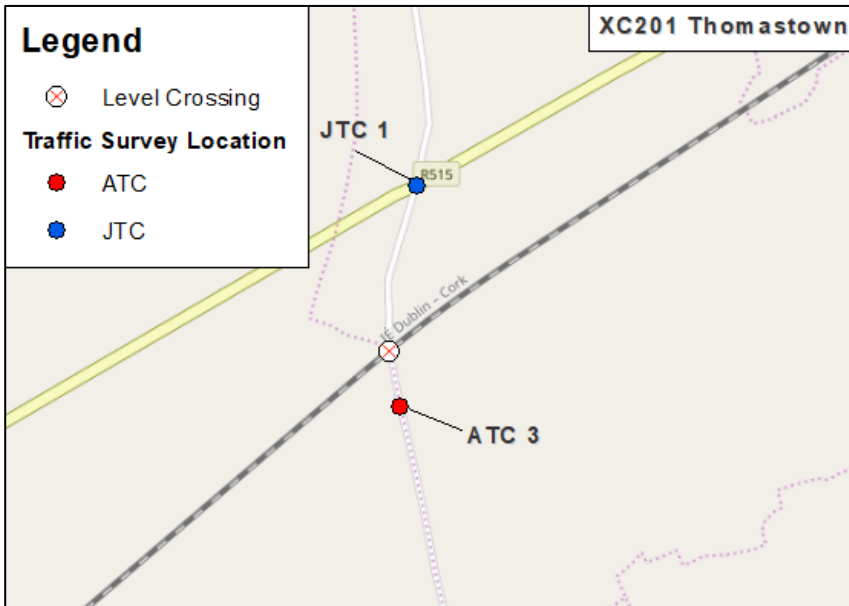
11.5.2 XC201 Thomastown

Desk Top Study

Road Network

The existing XC201 Thomastown Level Crossing (shown in Inset Figure 11.5) is situated on an unnamed road, west of Kilmallock, running north to south between the R515 and Effin Road. This road is single-track and subject to an 80km/h speed limit. Effin Road is a single carriageway road, also subject to a speed limit of 80km/h, connecting the R515, further to the west, to the Gortnacrank area south of the XC201 Thomastown crossing. The R515 links to the N20 at Charleville in the west and passes through Kilmallock in the east, stretching as far Tipperary. The road is subject to varying speed limits along its length, with a limit of 80km/h in the immediate area surrounding the level crossing.

Inset Figure 11.5 XC201 Thomastown Level Crossing.



Current Operation of the Level Crossing

The crossing is manned 07.30hrs-23.30hrs and the gates are normally closed to road traffic, with the gate keeper opening the gates as required. The crossing is closed to road traffic from 23.30hrs until 07.30hrs. The length of time that the road user is waiting depends on when they arrive at the gate and if a train has left Limerick Junction or Charleville. The road user has to wait until they pass.

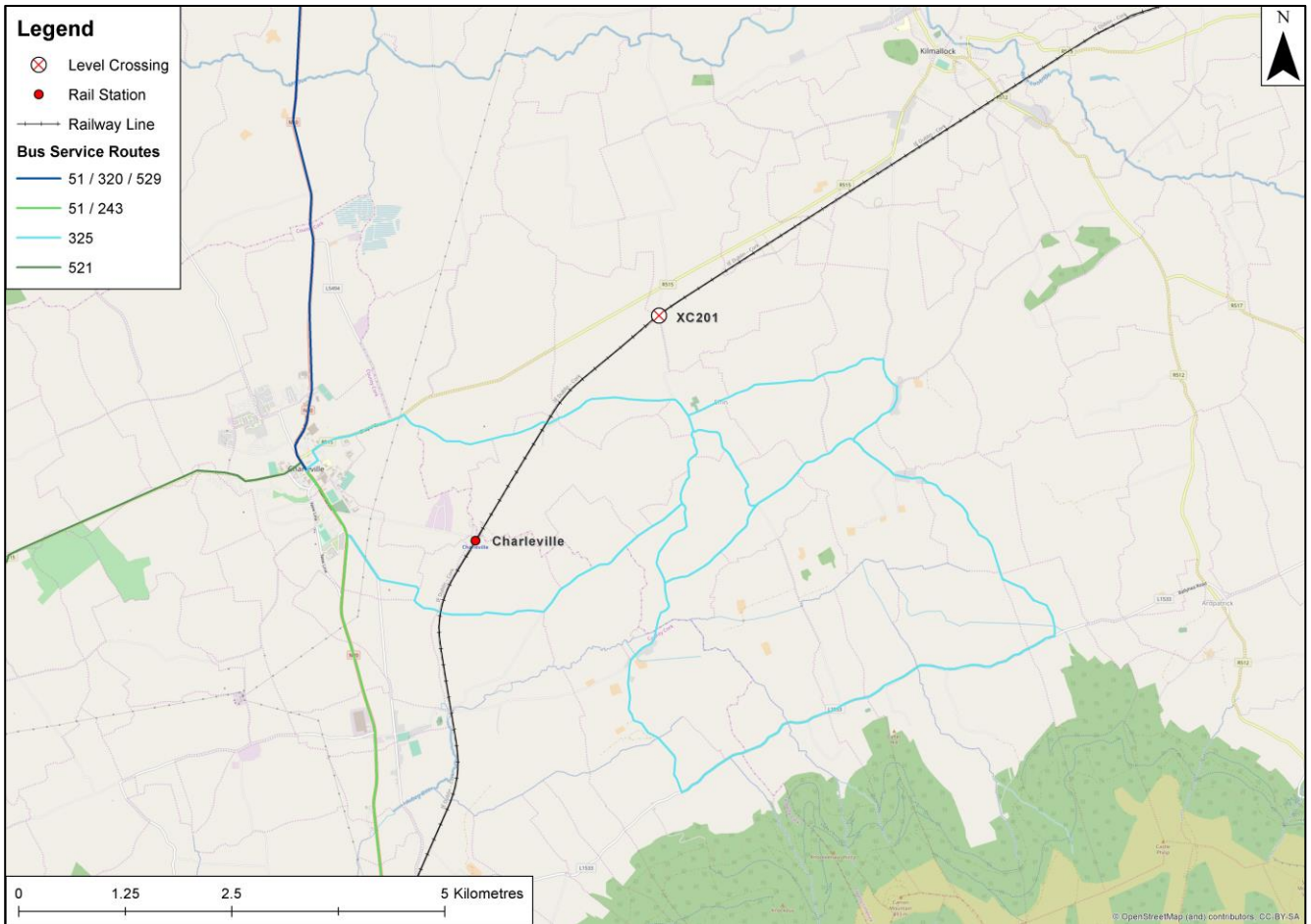
Active Travel Provision

With a mixture of single-track and narrow single carriageway rural roads surrounding the proposed crossing XC201 Thomastown there is no footpath or cycling provision however many locals may still use these roads for local commuting and recreation due to the rural nature and relatively low traffic flows. Public Transport Provision

There are no public transport services within the immediate vicinity of the proposed Project construction activities for existing crossing XC201 Thomastown (as shown in Inset Figure 11.6). There is however the potential for temporary short-term issues to arise on the R515 and N20 due to construction vehicles causing delays however no severance or major issues in terms of access and provision of the services should be expected. Although access to the site is not expected to be by Effin Road it is still important to note this however the 325 service does only operate two services on a Friday.

Access to Charleville train station, which provides links to both Dublin and Cork, will need to be considered in terms of any potential delay resulting from construction activities, slow moving HGVs and associated traffic management requirements.

Inset Figure 11.6 Public Transport Network.



Sensitive Receptors

There are several dwellings within this local area that have direct frontage or drive access to roads that will be directly impacted by the construction vehicles. This includes a concentration of several homes in close proximity to the existing crossing location and proposed road-over-rail bridge alignment. Impacts may range from delays due to increased traffic, particularly on the single-track roads, to vibrations, noise and dust caused by HGVs, construction vehicles and construction activities.

Although much of the construction will be performed offline there is still the prospect that pedestrians and cyclists who use these normally quiet rural roads may also face potential delays and severance from their normal routes due to construction traffic.

Survey Work

One classified volumetric ATC (24 hours) traffic survey was commissioned for seven days commencing on Tuesday 15th October 2019 at the existing rail crossing (ATC 3). See Volume 5, Appendix 11A.

One classified JTC (0700-1000 and 1600-1900) was also installed at the crossroads on the R515 to the north (JTC 1) for one day on Tuesday 15th October 2019. See Volume 5, Appendix 11A.

The results from the survey work are shown in Table 11.6 and Table 11.7 below.

Table 11.6: Thomastown Baseline ATC AAWT

Traffic Counter	Road	Northbound/ Eastbound	Southbound/ Westbound	Directions Combined	Directions Combined	Directions Combined
		All Vehicles	All Vehicles	All Vehicles	Heavies	% Heavies
ATC 3	Unnamed Road	16	11	27	1	3.0

Table 11.7: Thomastown Baseline JTC AAWT

Traffic Counter	Junction Arm	Northbound/ Eastbound	Southbound/ Westbound	Directions Combined	Directions Combined	Directions Combined
		All Vehicles	All Vehicles	All Vehicles	Heavies	% Heavies
JTC 1	Unnamed (N)	182	218	400	17	4.3
	R515 (E)	2,102	1,920	4,022	258	6.4
	Unnamed (S)	29	23	52	6	11.1
	R515 (W)	2,191	2,053	4,244	264	6.2

A non-motorised user (NMU) survey was also carried out at each crossing location between 0700-2100 for seven days, commencing on Tuesday 21st January 2020. The results from this survey are shown in Table 11.8.

Table 11.8: Thomastown Baseline NMU 5-day and 7-day averages.

Site	Location	Pedestrians				Cyclists		Livestock	
		Adults		Children		5-day	7-day	5-day	7-day
		5-day	7-day	5-day	7-day				
3	Thomastown	8	10	1	1	0	0	0	0

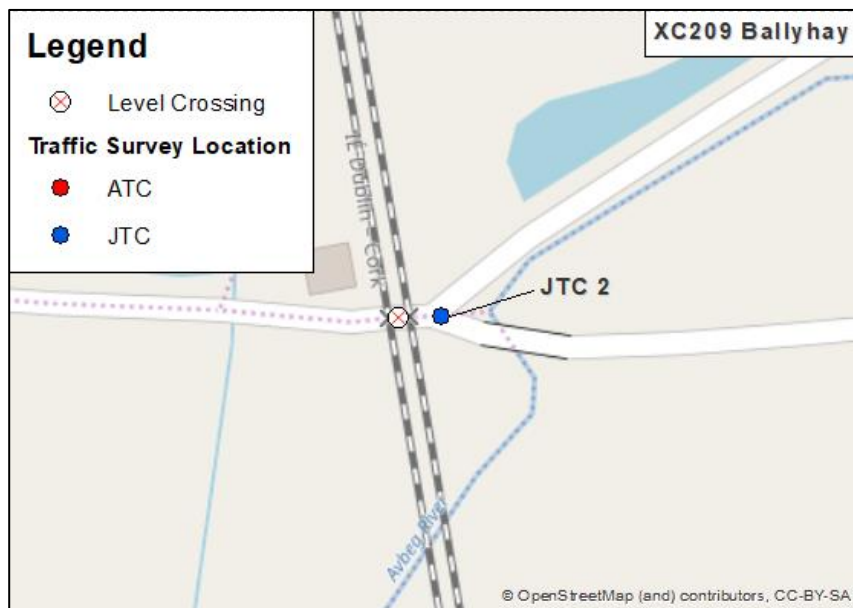
11.5.3 XC209 Ballyhay

Desk Top Study

Road Network

The existing XC209 Ballyhay Level Crossing (shown in Inset Figure 11.7) is situated on the L5531 single carriageway local road, north of Ballyhea, that connects to the N20 in the west. The level crossing is manned 07.30hrs-23.30hrs and the gates are normally closed to road traffic, with the gate keeper opening the gates as required. The crossings are closed to road traffic from 23.30hrs until 07.30hrs. On the eastern side of the existing level crossing the road meets a fork; while the single carriageway road continues east, passing to the north of Gortagarry, a single-track road splits off in a north east direction towards Ballyshonakin. All local roads are subject to an 80km/h speed limit.

Inset Figure 11.7: XC209 Ballyhay Level Crossing.



Current Operation of the Level Crossing

The crossing is usually open to road traffic during the day, with the gatekeeper closing the gates to facilitate train movements. It is manned 07.30hrs-23.30hrs; at night the crossing is closed to road traffic.

Active Travel Provision

With a mixture of single-track and narrow single carriageway rural roads surrounding the proposed crossing XC209 Ballyhay there is no footpath or cycling provision however many locals may still use these roads for commuting and recreation due to the rural nature and relatively low traffic flows.

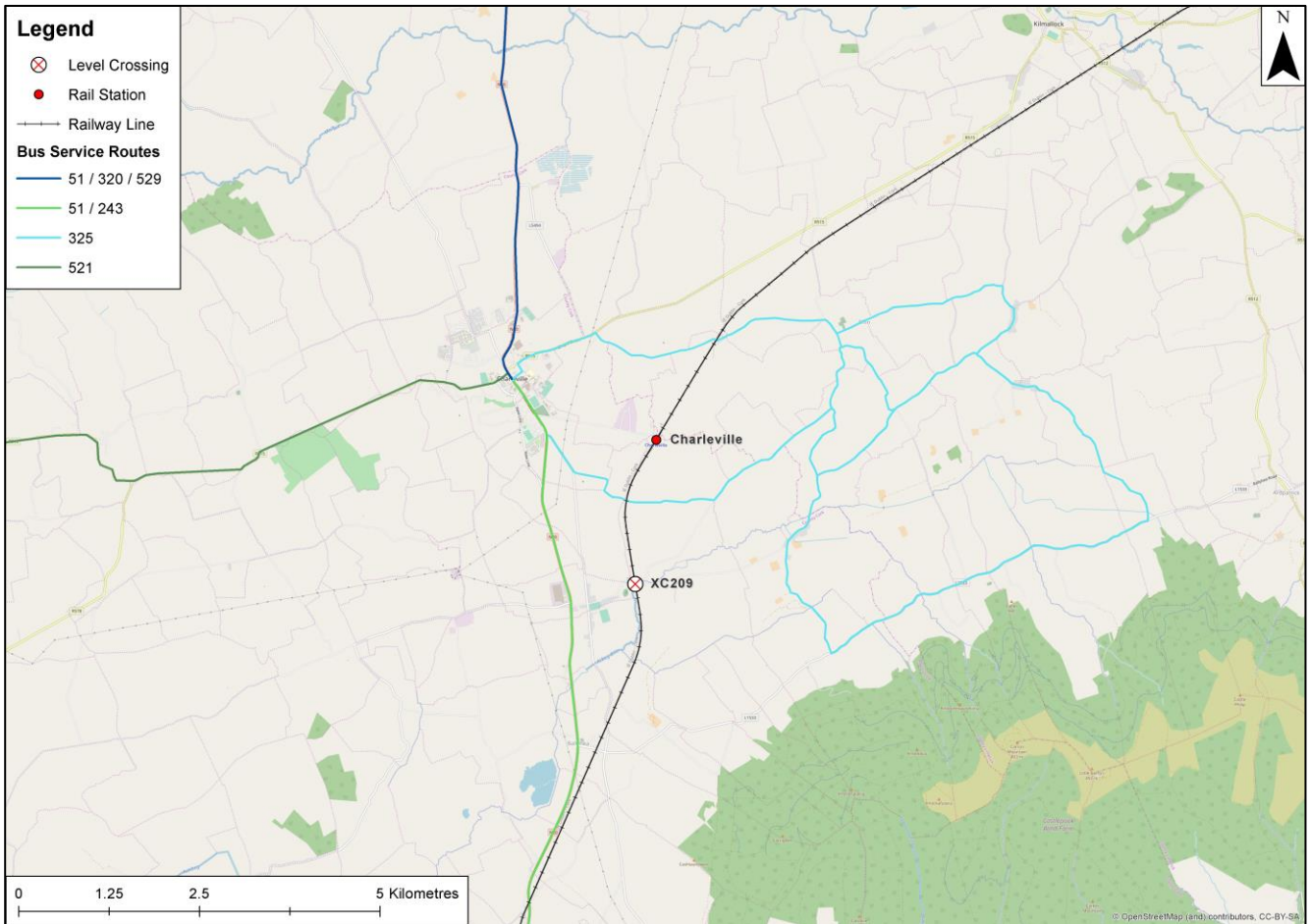
Public Transport Provision

There are no public transport services within the immediate vicinity of the existing crossing XC209 Ballyhay (as shown in Inset Figure 11.8).

Although there is minimal construction associated with this existing crossing there may still be issues that arise on the N20 due to construction vehicle routes associated with other existing crossings within the proposed Project. This could cause potential delays however no severance or major issues in terms of access and provision of the services should be expected with effective transport management in place.

Access to Charleville Train Station, which provides links to both Dublin and Cork, will need to be considered in terms of any potential delay along the L5531 and N20 resulting from construction activities, slow moving HGVs and associated traffic management requirements.

Inset Figure 11.8: Public Transport Network.



Sensitive Receptors

There are several dwellings, commercial properties and the Ballyhea GAA Club sportsground between the N20 junction and west of the existing crossing that have direct access onto this previously described unnamed road. There is a property directly next to the existing crossing and a few sporadic properties on the eastern side.

Although there is minimal construction associated with converting the current manned crossing to CCTV operated there is still the prospect that vehicles, cyclists and pedestrians who use these normally quiet rural roads may face potential delays and severance from their normal routes due to this work albeit it will be for a very short period of time

Survey Work

One classified JTC (0700-1000 and 1600-1900) traffic survey, installed at the junction on the eastern side of the existing rail crossing (JTC 2), was commissioned for one day on Tuesday 15th October 2019. See Volume 5, Appendix 11A.

The results from the survey work are shown in Table 11.9 below.

Table 11.9: Ballyhay Baseline JTC AAWT

Traffic Counter	Junction Arm	Northbound/ Eastbound	Southbound/ Westbound	Directions Combined	Directions Combined	Directions Combined
		All Vehicles	All Vehicles	All Vehicles	Heavies	% Heavies
JTC 2	Unnamed (N)	20	16	36	2	7.0
	R515 (E)	83	106	190	17	9.2
	R515 (W)	99	117	216	15	6.9

A non-motorised user (NMU) survey was also carried out at each crossing location between 0700-2100 for seven days, commencing on Tuesday 21st January 2020. The results from this survey are shown in Table 11.10.

Table 11.10: Ballyhay Baseline NMU 5-day and 7-days averages.

Site	Location	Pedestrians				Cyclists		Livestock	
		Adults		Children		5-day	7-day	5-day	7-day
		5-day	7-day	5-day	7-day				
4	Ballyhay	13	11	0	0	1	2	6	5

11.5.4 XC211 & XC212 Newtown and Ballycoskery

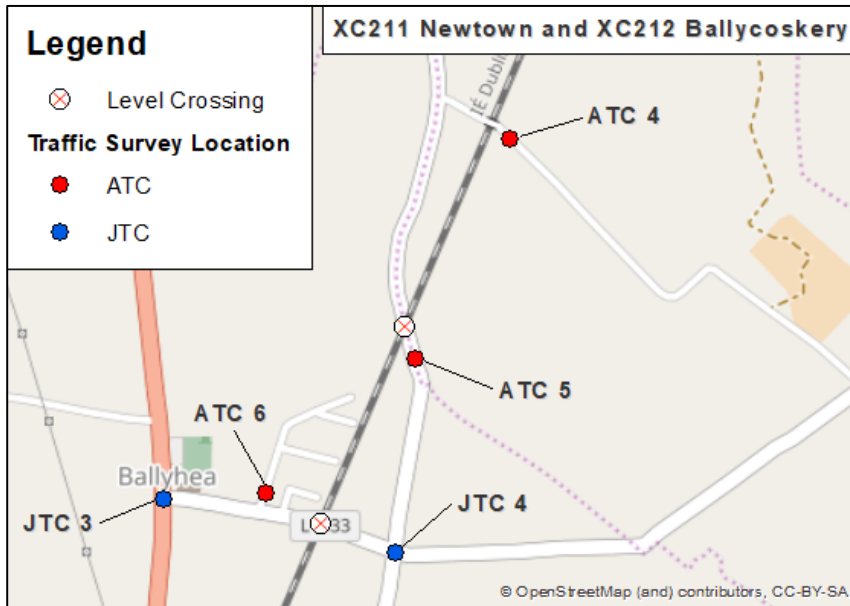
Desk Top Study

Road Network

The existing XC211 Newtown Level Crossing (shown in Inset Figure 11.9) is situated on an unnamed local single-track road, subject to an 80km/h speed limit, that connects to the L1533 at Dooley's Cross Roads in Ballyhea with the L5531 in the north. The level crossing is manned 07.30hrs-23.30hrs and the gates are normally open to road traffic during the day when not required to close to facilitate the movement of trains. During night-time, the crossing is closed to road traffic.

The existing crossing XC212 (shown in Inset Figure 11.9) is located on the L1533, a single carriageway road that runs east to west from the N20 to Ardpatrick. The section of road within Ballyhea is subject to a 50km/h speed limit as is Beechwood Dive which directly accesses off this, on the west side of the existing crossing, into a local housing estate. The N20 national road is links between Cork to the south and Limerick to the north. Within the boundaries of the study area it is single carriageway and subject to a speed limit of 60km/h.

Inset Figure 11.9 XC211 Newtown and XC212 Ballycoskery Level Crossings.



Current Operation of the Level Crossing

XC211 Newtown is manned 07.30hrs-23.30hrs and the gates are normally open to road traffic during the day when not required to close to facilitate the movement of trains. During night-time, the crossing is closed to road traffic.

XC212 Ballycoskery is designated as a 'CD-Type' level crossing which should mean gates normally open to road traffic by day and night and only closed to road traffic to facilitate the movement of trains. It is operated as a 'CX-Type' level crossing and is therefore manned on a 24-hour basis. There are also pedestrian wicket gates at the crossing, but these are permanently locked.

Active Travel Provision

There is no footpath or cycling provision within the immediate vicinity of existing crossing XC211 Newtown however there is a narrow footway on one side of the L1533 between Beechwood Drive and Dooley's Cross Roads as well as on Beechwood Drive itself.

Despite the lack of dedicated walking and cycling provision, with a mixture of single-track and narrow single carriageway rural roads surrounding the proposed crossings XC211 Newtown and X212 Ballycoskery some locals may still use these roads for commuting and recreation due to the rural nature and relatively low traffic flows.

The Kilmallock Cycle Hub Loop 1 (shown in Inset Figure 11.10) does in fact use roads in this area which construction vehicles and works will likely impact over the course of the proposed Project. The route uses the L5133 east and south from Dooley's Cross Roads.

It was highlighted during the November 2019 public consultations that local residents often use a local walking loop of approximately 2.5km (shown in Inset Figure 11.10) recreationally. This route will definitely be impacted directly during the Construction Phase by construction activities as well as HGV routing. Once the proposed Project works are completed this route will no longer be possible, however, a similar route would be. The route will need Traffic Management consideration during the construction works before the new diversionary route is opened.

Inset Figure 11.10 Newtown and Ballycoskery Active Travel Network.



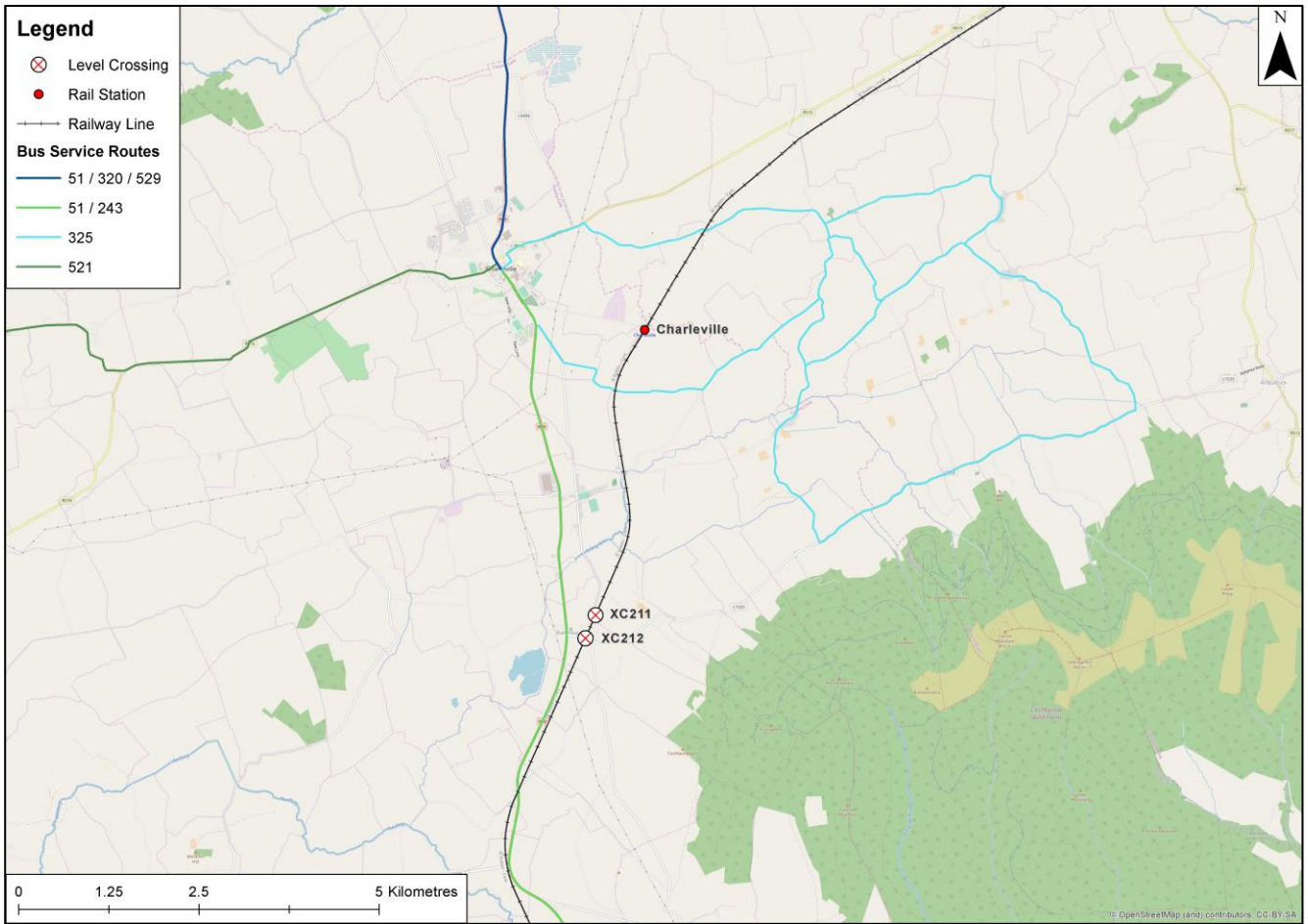
Public Transport Provision

The are no public transport services within the immediate vicinity of the proposed Project construction activities for existing crossings XC211 Newtown and XC212 Ballycoskery (shown in Inset Figure 11.11).

With regards to construction vehicle routes, there is however potential for issues to arise on the N20 in terms of delay however no severance or major issues in terms of access and provision of the services should be expected with effective transport management in place.

Access to Charleville Train Station, which provides links to both Dublin and Cork, will need to be considered in terms of any potential delay along the N20 resulting from construction activities, slow moving HGVs and associated traffic management requirements.

Inset Figure 11.11 Public Transport Network.



Sensitive Receptors

There are several dwellings scattered along the unnamed road using existing crossing XC211 Newtown and numerous residential properties as well as Ballyhea National School (Primary School) within the village of Ballyhea itself.

Not only will there be will there be construction traffic on these roads but some of these receptors will also likely be directly impacted by the construction of a new road-over-rail bridge crossing to the south and the proposed road which will extend from the direction of existing road over rail bridge further to the north (adjacent to an existing dwelling) to tie in with the existing road to the south east of the existing XC211 Newtown Level Crossing (adjacent to a cluster of three residential properties).

Impacts will range from delays due to increased traffic, vibrations, noise and dust caused by HGVs, construction vehicles and construction activities. Although much of the construction will be performed offline there is still the prospect that pedestrians and cyclists who use these normally quiet rural roads may also face potential delays and severance from their normal routes due to construction traffic and temporary diversions or closures.

Survey Work

Three classified volumetric ATC (24 hours) surveys were commissioned for seven days commencing on Tuesday 15th October 2019. One ATC was located at each of the existing two rail crossings to the north of Ballyhea (ATC 4 and ATC 5) while the third was situated on Beechwood Drive (ATC 6). See Volume 5, Appendix 11A.

Two classified JTC (0700-1000 and 1600-1900) surveys were also commissioned. One JTC captured the N20/L1533 junction to the west (JTC 3) for one day on Wednesday 23rd October 2019 while the other was located at Dooley's Cross Roads (JTC 4) for one day on Tuesday 15th October 2019. JTC 3 was resurveyed due to an issue with the camera during the initial one-day survey on Tuesday 15th October 2019. See Volume 5, Appendix 11A.

The results from the survey work are shown in Table 11.11 and Table 11.12 below.

Table 11.11: Newtown and Ballycoskery Baseline ATC AAWT

Traffic Counter	Road	Northbound/ Eastbound	Southbound/ Westbound	Directions Combined	Directions Combined	Directions Combined
		All Vehicles	All Vehicles	All Vehicles	Heavies	% Heavies
ATC 4	Unnamed Road	72	73	145	5	3.4
ATC 5	Unnamed Road	60	47	107	3	2.8
ATC 6	Beechwood Drive	137	161	298	6	1.9

Table 11.12: Newtown and Ballycoskery Baseline JTC AAWT

Traffic Counter	Junction Arm	Northbound/ Eastbound	Southbound/ Westbound	Directions Combined	Directions Combined	Directions Combined
		All Vehicles	All Vehicles	All Vehicles	Heavies	% Heavies
JTC 3	N20 (N)	6,228	5,935	12,163	1,234	10.1
	L1533 (E)	716	699	1,415	53	3.8
	N20 (S)	5,944	5,658	11,603	1,205	10.4
JTC 4	Unnamed (N)	90	59	149	5	3.3
	L1533 (E)	317	358	676	40	5.9
	Unnamed (S)	184	152	336	20	5.9
	L1533 (W)	484	521	1,005	60	5.9

Non-motorised user (NMU) surveys were also carried out at each crossing location between 0000-2400 for seven days, commencing on Tuesday 21st January 2020. The results from this survey are shown in Table 11.13.

Table 11.13: Newtown and Ballycoskery Baseline NMU 5-day and 7-day averages.

Site	Location	Pedestrians				Cyclists		Livestock	
		Adults		Children		5-day	7-day	5-day	7-day
		5-day	7-day	5-day	7-day				
5	Newtown	15	15	0	0	1	1	0	1
6	North of Newton	11	12	0	0	1	1	0	1
7	Ballycoskery	41	32	25	18	1	3	0	0

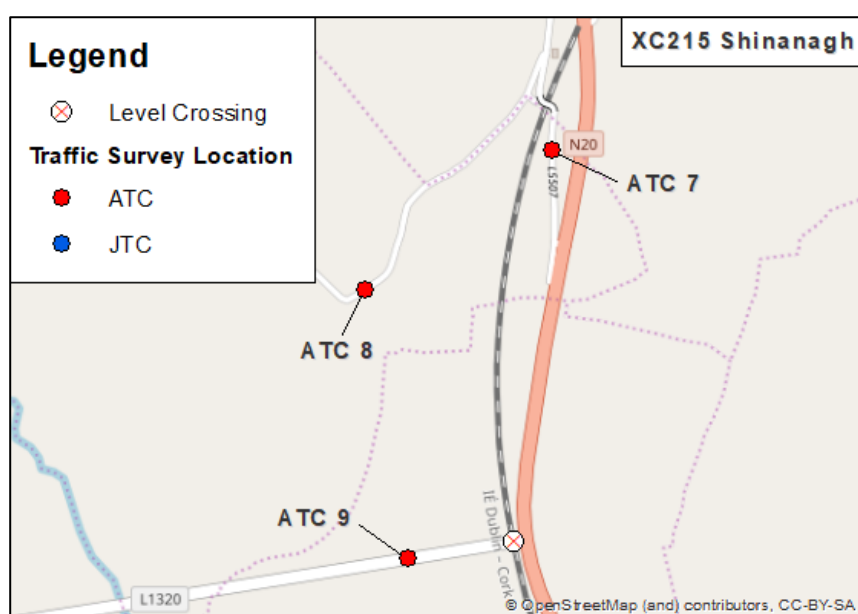
11.5.5 XC215 Shinanagh

Desk Top Study

Road Network

The existing XC215 Shinanagh Level Crossing (shown in Inset Figure 11.12) is situated on the L1320, a single carriageway road linking the N20 to the east and Churchtown to the west. An unnamed single-track road links the L1320 to the L5507, a single carriageway road to the north providing a link to the N20. Each of these local rural roads are subject to a speed limit of 80km/h, although the L5507 does display the rural speed limit sign designed to suggest a lower speed is more appropriate.

Inset Figure 11.12: XC215 Shinanagh Level Crossing.



Current Operation of the Level Crossing

XC215 Shinanagh is designated a 'CD-Type' level crossing but it has been operated as a 'CX-Type' level crossing for over 25 years and similar to XC212 Ballycoskery is manned on a 24-hour basis. Its operation as a 'CX-Type' crossing results in the gates being normally open to road traffic with the gate keeper closing the gates as required for rail traffic.

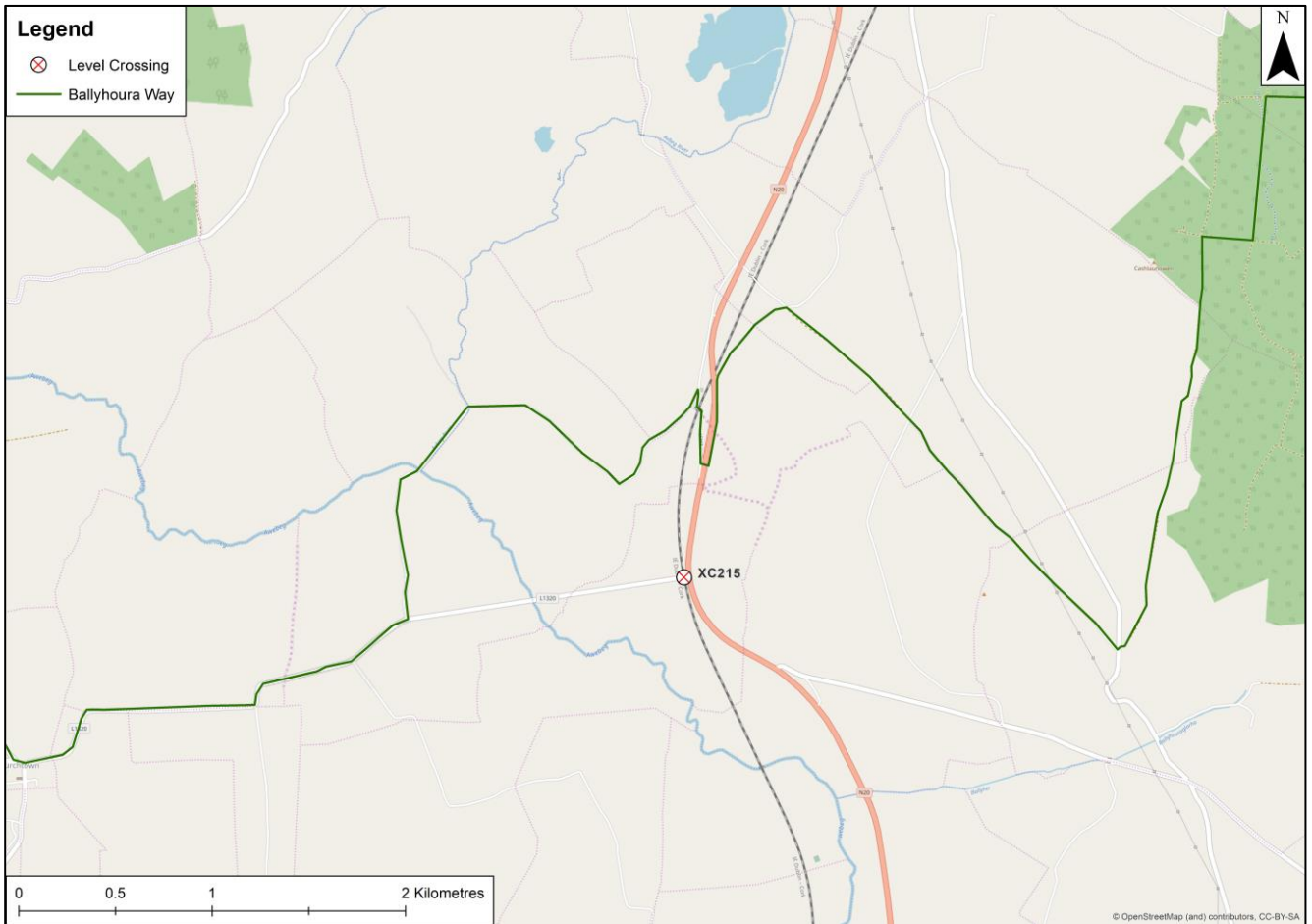
Active Travel Provision

With a mixture of single-track and narrow single carriageway rural roads surrounding the proposed crossing XC215 Shinanagh there is no footpath or cycling provision however many local people may still use these roads for commuting and recreation due to their rural nature and relatively low traffic flows.

The Ballyhoura Way (shown in Inset Figure 11.13), a national walking route marketed by Sport Ireland, does in fact follow roads in this area which construction vehicles and works will impact over the course of the proposed Project. The route follows the unnamed road to the north from the L1320, west of the existing crossing, before meeting the L5507 to access the N20 before heading north to the next junction and following the unnamed road there.

This route will be impacted directly during the Construction Phase by construction activities as well as HGV routing. Once the proposed Project works are completed this route will also be impacted by heavier traffic flows as they divert from the L1320 to access the N20 from the L5507.

Inset Figure 11.13 Shinanagh Active Travel Network.

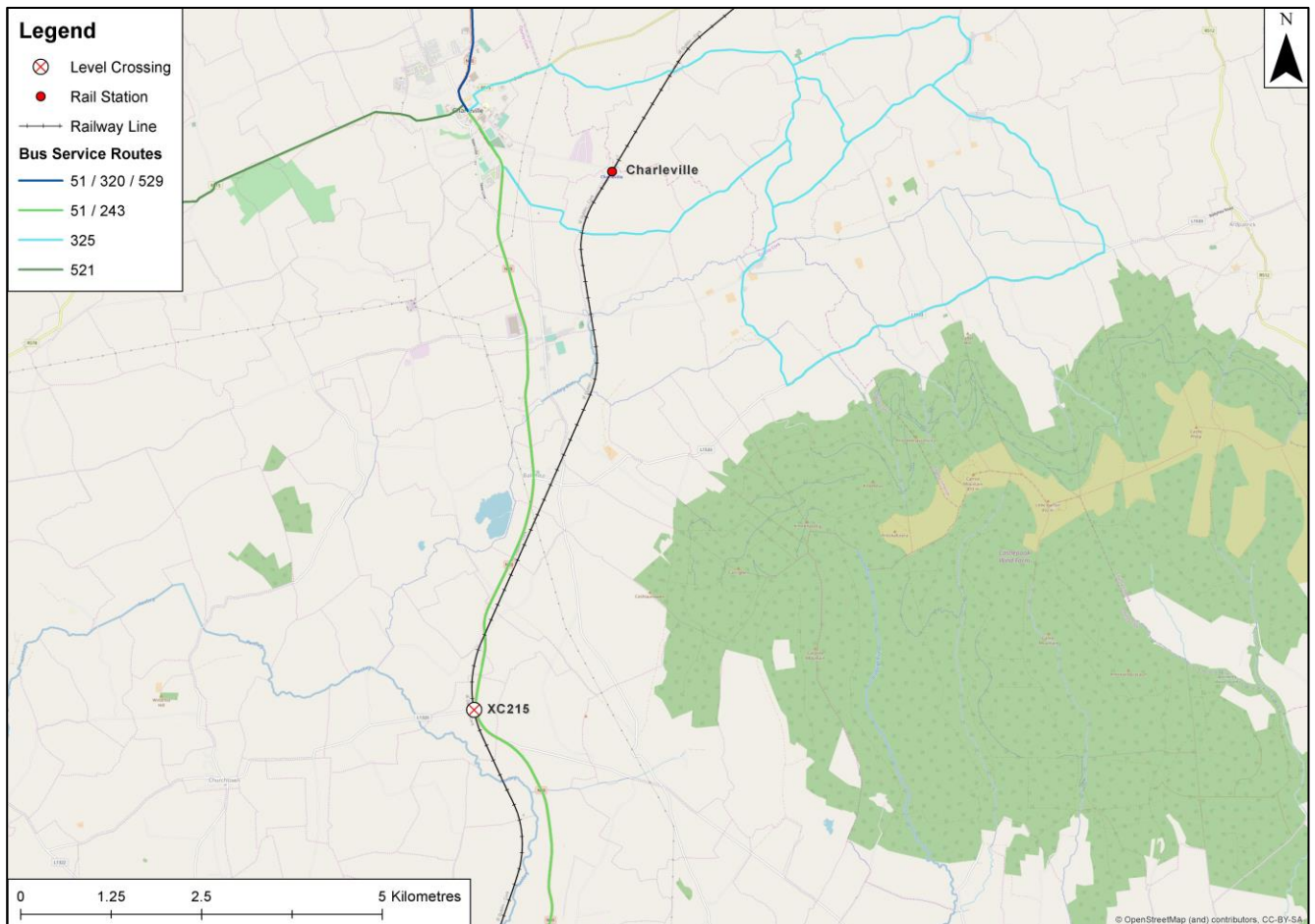


Public Transport Provision

There are no public transport services within the immediate vicinity of the proposed Project construction activities for existing crossing XC215 Shinanagh (as shown in Inset Figure 11.14). With regards to construction vehicle routes, there is, however, potential for issues to arise on the N20 in terms of delay however no severance or major issues in terms of access and provision of the services is expected with effective transport management in place.

Access to Charleville Train Station, which provides links to both Dublin and Cork, will need to be considered in terms of any potential delay along the L1320, L5507 and N20 resulting from construction activities, slow moving HGVs and associated traffic management requirements.

Inset Figure 11.14 Public Transport Network.



Sensitive Receptors

It is predominantly farming and farm dwellings surrounding this proposed Project area along with a few sporadic residential dwellings. Not only will there be construction traffic on these roads but some of these receptors may also be impacted by the construction of the proposed road diversion due to the closure of the existing XC215 Shinanagh.

Impacts will range from delays due to increased traffic, vibrations, noise and dust caused by HGVs, construction vehicles and construction activities. Although much of the construction will be performed offline there is still the prospect that pedestrians and cyclists who use these normally quiet rural roads may also face potential delays and severance from their normal routes due to construction traffic.

Once completed, vehicles who use the existing crossing will be faced with a longer route to access the N20, particularly those wanting to head south, however, the roads will be wider and safer as a result with any level crossing delay also removed.

Survey Work

Three classified volumetric ATC (24 hours) traffic surveys were commissioned for seven days commencing on Tuesday 15th October 2019. The ATCs were located on the L5507 north of the N20 junction (ATC 7), on the unnamed road to the north of the existing junction (ATC 8), and on the L1320 to west of the existing crossing (ATC 9). See Volume 5, Appendix 11A.

The results from the survey work are shown in Table 11.14 below.

Table 11.14: Shinanagh Baseline ATC AAWT

Traffic Counter	Road	Northbound/ Eastbound	Southbound/ Westbound	Directions Combined	Directions Combined	Directions Combined
		All Vehicles	All Vehicles	All Vehicles	Heavies	% Heavies
ATC 7	L5507	52	69	121	11	9.1
ATC 8	Unnamed Road	57	57	114	8	6.7
ATC 9	L1320	509	520	1,029	53	5.2

Non-motorised user (NMU) surveys were also carried out at each crossing location between 0000-2400 for seven days. Due to technical issues at this site, surveys were undertaken on several days between Tuesday 21st January and Saturday 15th February 2020 in order to capture a full week of survey data. The results from these surveys are shown in Table 11.15.

Table 11.15: Shinanagh Baseline NMU 5-day and 7-day averages.

Site	Location	Pedestrians				Cyclists		Livestock	
		Adults		Children		5-day	7-day	5-day	7-day
		5-day	7-day	5-day	7-day				
8	Shinanagh	2	2	0	0	0	1	0	0
9	North of Shinanagh	2	3	0	0	2	1	0	0

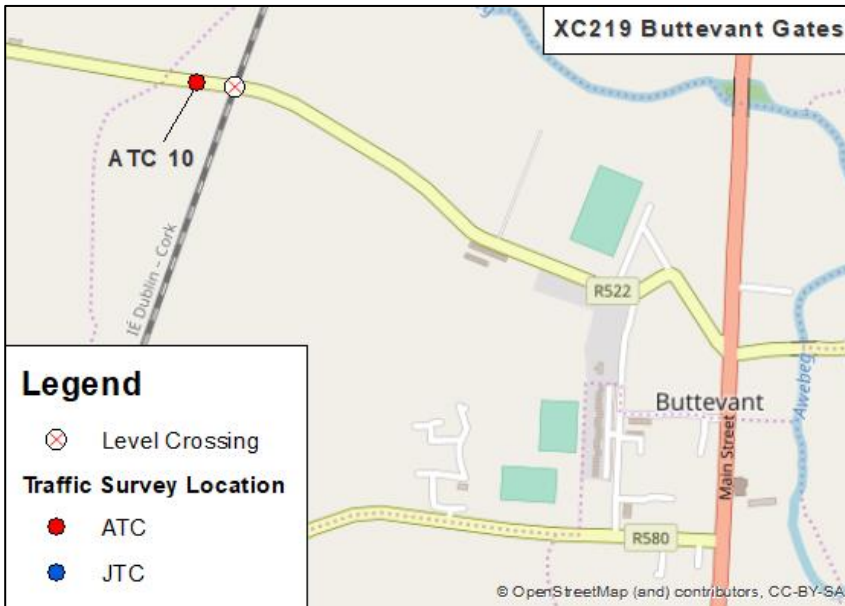
11.5.6 XC219 Buttevant

Desk Top Study

Road Network

The existing XC219 Buttevant Level Crossing (shown in Inset Figure 11.15) is situated on the R522 single carriageway regional road which links Buttevant and the N20 with Doneraile to the east and Lisscarroll to the west. The road is subject to an 80km/h speed limit for the most part within the vicinity of the existing crossing however this reduces to 50km/h within the Buttevant town extents.

Inset Figure 11.15 XC219 Buttevant Level Crossing.



Current Operation of the Level Crossing

The level crossing is a CX type, it is manned on a 24-hour basis and the gates are normally open to road traffic with the gate keeper closing the gates as required for rail traffic.

Active Travel Provision

East of the existing level crossing a footpath runs the entire length of the R522; however, to the west of the crossing there is no provision. There is also no dedicated cycle provision within this area.

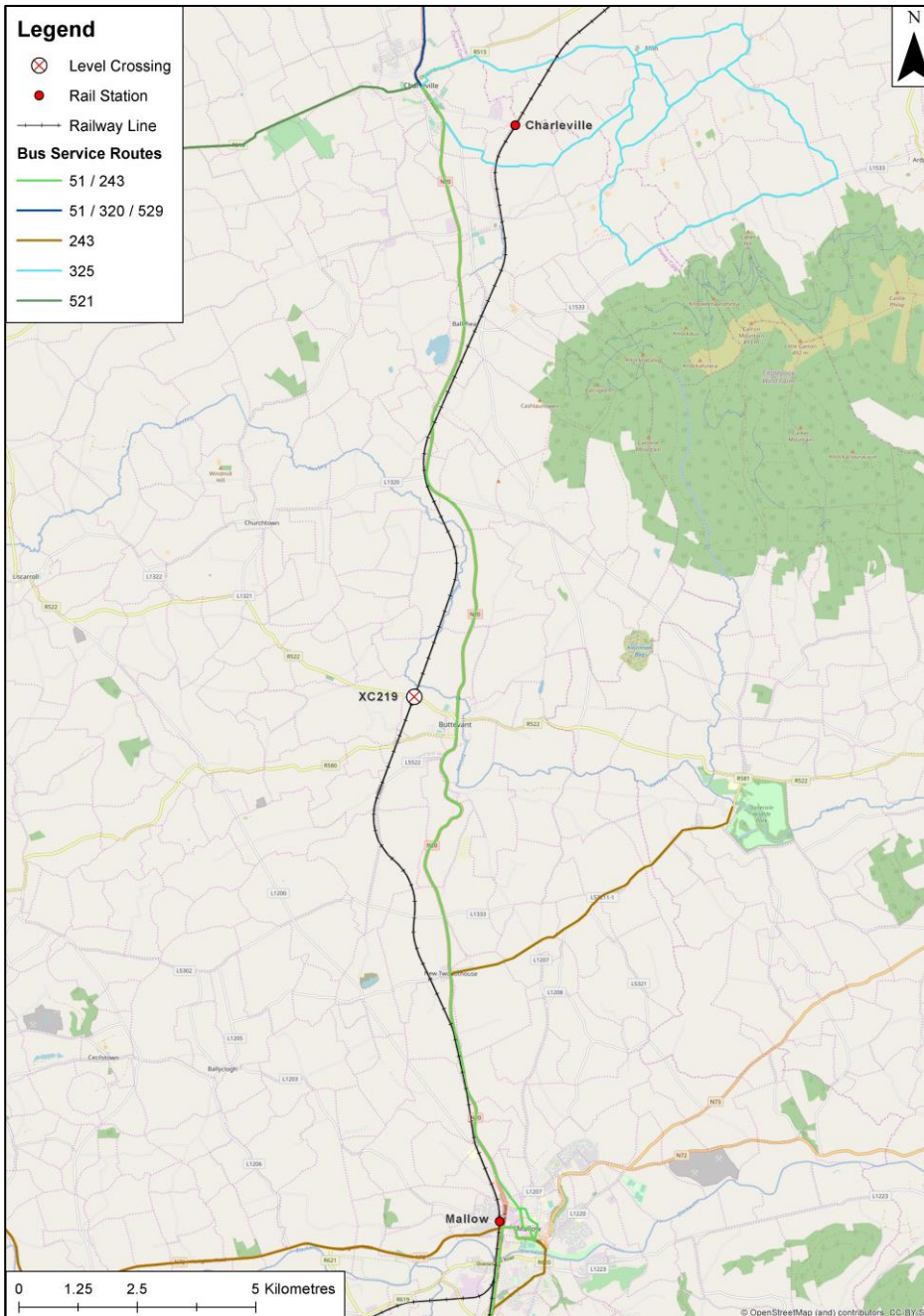
With the footpath provision providing access to the local town there are likely to be residents using this route for both commuting and recreation purposes. Even despite the lack of cycle provision some locals may also use this route to commute by bicycle.

Public Transport Provision

There are no public transport services within the immediate vicinity of the proposed Project construction activities for existing crossing XC219 Buttevant (as shown in Inset Figure 11.16). With regards to construction vehicle routes, there is, however, potential for issues to arise on the N20 in terms of delay, however, no severance or major issues in terms of access and provision of the services should be expected with effective transport management in place.

Access to Charleville and Mallow train stations, which provide links to Dublin, Cork and Tralee, will need to be considered in terms of any potential delay along the R522 and N20 resulting from construction activities, slow moving HGVs and associated traffic management requirements.

Inset Figure 11.16 Public Transport Network.



Sensitive Receptors

There are a number of residential, leisure and commercial properties with direct frontage or junction access onto the R522, particularly within Buttevant. Outside of the town extents there are also some sporadic residential and farm dwellings with direct access.

Not only will there be will there be construction traffic on this road but some of these receptors will also likely be directly impacted by the construction of the proposed road-over-rail bridge to the south of the existing crossing.

Impacts will range from delays due to increased traffic, vibrations, noise and dust caused by HGVs, construction vehicles and construction activities. Although much of the construction will be performed offline there is still the prospect that pedestrians and cyclists who use this road may also face potential delays and severance from their normal routes due to construction traffic.

The Awebeg River and its tributary pass near the location of the existing crossing and will be bridged by the newly proposed rail crossing. This must be considered during construction activities and by construction traffic.

Survey Work

One classified volumetric ATC (24 hours) traffic survey was commissioned for seven days commencing on Tuesday 15th October 2019. The ATC was located on the R522 to the west of the existing crossing (ATC 10). See Volume 5, Appendix 11A.

The results from the survey work are shown in Table 11.16 below.

Table 11.16: Buttevant Baseline ATC AAWT

Traffic Counter	Road	Northbound/ Eastbound	Southbound/ Westbound	Directions Combined	Directions Combined	Directions Combined
		All Vehicles	All Vehicles	All Vehicles	Heavies	% Heavies
ATC 10	R522	1,137	1,137	2,275	117	5.2

A non-motorised user (NMU) survey was also carried out at each crossing location between 0700-2100 for seven days, commencing on Tuesday 21st January 2020. The results from this survey are shown in Table 11.17.

Table 11.17: Buttevant Baseline NMU 5-day and 7-day averages.

Site	Location	Pedestrians				Cyclists		Livestock	
		Adults		Children		5-day	7-day	5-day	7-day
		5-day	7-day	5-day	7-day				
10	Buttevant	7	9	0	0	2	6	0	0

11.6 Potential Effects of the proposed Project

Traffic growth for the surrounding road network is based on the low-growth rates for South-West Ireland obtained from TII Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections. By using a low-growth factor it will maximise the effects of the proposed Project traffic and in essence present a worst-case scenario.

The commencement of the Construction Phase is intended to be February 2021 and so the baseline 2019 traffic data will be initially growthed to 2021. Furthermore, with the proposed Construction Phase estimated to last 18 months, the Construction Phase will last until late 2022 with the Operational Phase set to commence at this point. As a result, and in a similar approach to that above, baseline traffic has been growthed to this year for the purposes of the Operational Phase assessment. Although the proposed Project operational traffic is considered negligible there will be diversions where existing traffic will increase beyond that of the projected growth. As such, this represents a robust approach to determining the impacts of Operational Phase traffic.

The following low growth rates, from the TII Project Appraisal Guidelines, have been applied to the base flows for the following scenarios:

- Low growth rate of 1.014 (Lights) and 1.0442 (Heavies) for Construction year of 2021 (worst-case); and
- Low growth rate of 1.021 (Lights) and 1.0663 (Heavies) for Construction/Operational Phase year of 2022.

The traffic impact of the additional vehicles associated with the Construction Phase of the proposed Project can be categorised as:

- Additional traffic volumes associated with the Construction Phase activities, primarily HGV's for the proposed Project travelling on the existing road network; and

- Delays to non-proposed Project related journeys as a result of slow-moving vehicles i.e. HGVs.

For the purposes of the EIAR, the construction works are grouped into each proposed crossing site, taking place over an 18-month period. The traffic movements associated with all phases of the Construction Phase have been estimated based on approximate volumes of materials to be imported to support the construction. In order to ensure that a robust assessment is undertaken, the assessment focuses on the traffic impacts of the busiest phase of construction.

The baseline and potential effects of each proposed crossing site within the proposed Project have been described and assessed respectively in the following sections.

11.6.1 XC187 Fantstown Assessment

Do Nothing

Growthed 2019 baseline traffic flows to future years 2021 and 2022, as shown in Table 11.18, indicate that there would be very little change in overall numbers over the construction period.

Table 11.18: Fantstown Baseline and Projected AAWT.

Traffic Counter	Road	Directions Combined (2019)			Directions Combined (2021)		Directions Combined (2022)	
		AAWT	Heavies	%Heavies	AAWT	Heavies	AAWT	Heavies
ATC1	LS8514	22	0	0.0	23	0	23	0
ATC2	Unnamed Road	481	23	4.7	488	24	492	24

Construction Phase

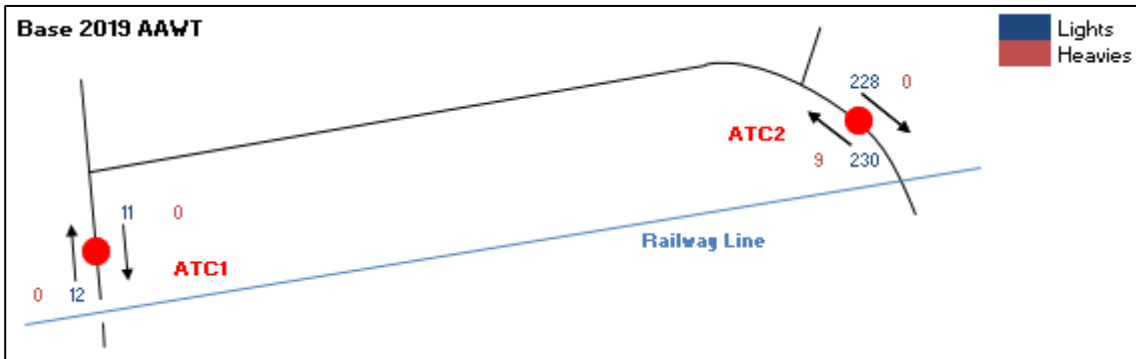
As there is minimal construction associated with the closure of this existing crossing there will be negligible impact to existing traffic as a result.

Operational Phase

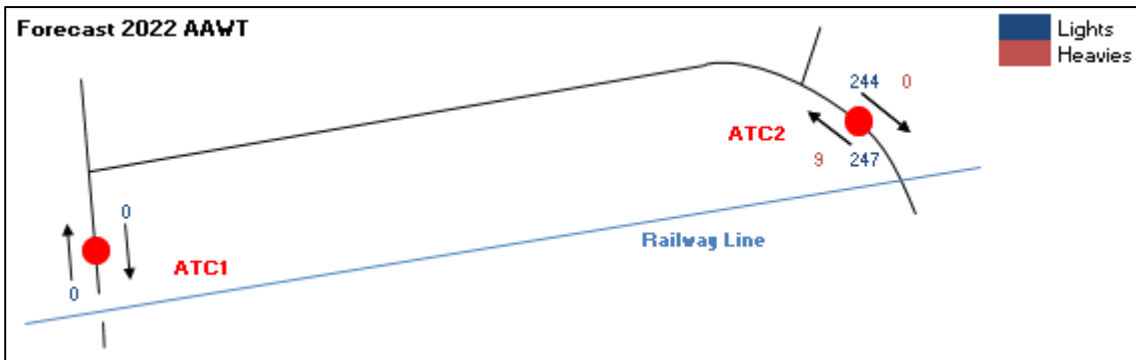
Although there is no additional traffic generated during the Operational Phase, other than for occasional routine maintenance, the AAWT two-way flow of 22 that currently traverses the XC187 Fantstown and routes onto the R515 will be diverted eastwards to the existing road-over-rail bridge and junction of the R515. This existing road-over-rail bridge currently has two-way flows of 481 and the proposed Project will result in 503 vehicles on the road. Given the low level of flows using the existing crossing XC187 Fantstown this rerouting is not predicted to have a material impact on the operation of the local road network and as such no TTA will be required. Table 11.2 shows that there are very few non-motorised users using either crossing and so the diversion will not have much of an impact on the local population.

Between January 2016 and June 2019 there was one crossing equipment failure and one level crossing incident. Although the new diversion could lead to an increased journey time depending on the route the better safety as a result of the level crossing closure should be preferable. Inset Figure 11.17 and Inset Figure 11.18 show the comparison of the 2019 traffic flows and forecast 2022 traffic flows with predicted new distribution.

Inset Figure 11.17: 2019 Baseline Traffic Distribution.



Inset Figure 11.18: 2022 Forecast Traffic Distribution.



11.6.2 XC201 Thomastown Assessment

Do Nothing

Growthed 2019 baseline traffic flows to future years 2021 and 2022, as shown in Table 11.19 and Table 11.20, indicate that there would be very little change in overall numbers over the construction period. These increases suggest a negligible operational impact over this period if no works were carried out.

Table 11.19: Thomastown ATC Baseline and Projected AAWT.

Traffic Counter	Road	Directions Combined (2019)			Directions Combined (2021)		Directions Combined (2022)	
		AAWT	Heavies	%Heavies	AAWT	Heavies	AAWT	Heavies
ATC3	Unnamed Road	27	1	3.0	27	1	28	1

Table 11.20: Thomastown JTC Baseline and Projected AAWT

Traffic Counter	Junction Arm	Directions Combined (2019)			Directions Combined (2021)		Directions Combined (2022)	
		AAWT	Heavies	%Heavies	AAWT	Heavies	AAWT	Heavies
JTC1	Unnamed (N)	400	17	4.3	406	18	409	19
	R515 (E)	4,022	258	6.4	4,086	269	4,118	275
	Unnamed (S)	52	6	11.1	53	6	53	6
	R515 (W)	4,244	264	6.2	4,311	275	4,345	281

Construction Phase

Assessment of Construction Phase Traffic Generation

A total of 54 two-way vehicle trips per day are predicted during the worst-case Construction Phase, comprising 17 two-way HGV movements and 20 two-way car / Light Goods Vehicles (LGV) movements. The trip generation has been added to the projected 2021 AAWT, detailed in Table 11.19 and Table 11.20, in order to confirm the percentage increase in traffic associated with the proposed Project Construction Phase. In order to assess the worst-case impact, robust assumptions have been made regarding the proportion of construction related traffic passing any particular traffic counter, notably that 100% of traffic will pass all traffic counter locations with the exception of any junction arms that will obviously not be used by construction traffic. This is an extremely robust approach as the volumes of traffic passing certain ATC locations will in reality be significantly lower and therefore the assessment of construction related traffic is very much worst-case.

Table 11.21 and Table 11.22 details the percentage increases in total traffic. Table 11.23 and Table 11. 24 details the percentage increases in HGV traffic. The following paragraphs discuss the impacts on key sections of the road network (based on strategic ATC/JTC locations) and sensitive receptors as a result of the increase in traffic associated with the Construction Phase of the proposed Project.

Table 11.21: Thomastown Worst-case Construction Phase Percentage Increase in ATC Total Traffic

Traffic Counter	Road	% Split at each ATC	Projected Base AAWT (2021)	Worst-case Daily Construction Total Vehicles (Two Way)	% Increase in Total Vehicles
ATC3	Unnamed Road	100%	27	54	197.1%

Table 11.22: Thomastown Worst-case Construction Phase Percentage Increase in JTC Total Traffic

Traffic Counter	Junction Arm	% Split at each JTC	Projected Base AAWT (2021)	Worst-case Daily Construction Total Vehicles (Two Way)	% Increase in Total Vehicles
JTC1	Unnamed (N)	0%	406	0	0%
	R515 (E)	100%	4,086	54	1.3%
	Unnamed (S)	100%	53	54	101.9%
	R515 (W)	100%	4,311	54	1.3%

Table 11.23: Thomastown Worst-case Remediation Percentage Increase in HGV ATC Traffic

Traffic Counter	Road	% Split at each ATC	Projected Base HGVs (2021)	Worst-case Daily Construction HGVs (Two Way)	% Increase in HGVs
ATC3	Unnamed Road	100%	1	32	3200%

Table 11. 24: Thomastown Worst-case Remediation Percentage Increase in HGV JTC Traffic

Traffic Counter	Junction Arm	% Split at each JTC	Projected Base HGVs (2021)	Worst-case Daily Construction Total Vehicles (Two Way)	% Increase in HGVs
JTC1	Unnamed (N)	0%	18	0	0%
	R515 (E)	100%	269	32	11.9%
	Unnamed (S)	100%	6	32	533.3%

Traffic Counter	Junction Arm	% Split at each JTC	Projected Base HGVs (2021)	Worst-case Daily Construction Total Vehicles (Two Way)	% Increase in HGVs
	R515 (W)	100%	275	32	11.6%

In terms of the percentage increase of total vehicles (HGVs + Cars) shown in Table 11.21 and Table 11.22, the proposed Project will have a major impact on the unnamed road leading to the existing crossing and proposed Project site based on the criteria outlined in Table 11.2, where a major impact is predicted on percentage increases of greater than 90%.

While the increase in total construction related traffic exceeds both the TII and IEMA thresholds detailed within Section 11.4.5, it is important to consider the increases in traffic in relation to actual vehicles. As detailed above, an increase of 54 two-way movements per day (total vehicles) are predicted during the worst-case phase in terms of traffic increases which equates an average less than 8 two-way movements per hour (4 arrivals and 4 departures).

Furthermore, it is important to consider the increase on the unnamed road (JTC1 south arm and ATC3) in the context of the existing low levels of baseline traffic and the carrying capacity of the road. During the busiest stage of the Construction Phase, the total vehicles per day on this road (including baseline traffic) will be 107 per day (53 projected 2021 AAWT + 54 construction traffic). As such, it is considered that this road is currently operating below its capacity and will continue to do so with the addition of the construction traffic flows. Subsequently, despite undertaking a robust assessment of Construction Phase impacts, the actual increases in traffic numbers will be minimal.

With regards to HGV movements, the percentage increases for the same road section outlined in Table 11.22 and Table 11.23 suggests a major impact on the road network in accordance with the IEMA criteria as detailed in Table 11.2. However, this high percentage is a result of the low levels of baseline HGV traffic at this location. It has been confirmed that during the busiest Construction Phase, the total two-way HGV movements per day will be on average only 32. Therefore, despite the high percentage increases, the numerical increase in HGVs is low. Moreover, the impacts of worst-case construction traffic will occur over a relatively short period and the existing road infrastructure is currently operating well below capacity, therefore reducing the overall impact. Consequently, no significant impacts are predicted to arise from Construction Phase related traffic generated by the proposed Project and as such no TTA will be required due to the temporary nature of the works and low flows involved.

Accidents and Safety

A review of Road Safety Authority Collision Statistics was undertaken, which provided details of all collisions on the roads surrounding the proposed Project, between 2012 and 2016, identified no accidents within the immediate vicinity of the existing crossing XC201 Thomastown. Considering the local construction traffic route, one serious and seven minor accidents were identified on the R515 between the construction area and N20 regional road:

- Minor accident east of Charleville in 2016 (Car);
- Minor accident east of Charleville in 2015 (Car);
- Minor accident east of Charleville in 2014 (Goods vehicle);
- Minor accident east of Charleville in 2013 (Car);
- Serious accident east of Charleville in 2013 (Bus);
- Minor accident east of Charleville in 2013 (Motorcycle);
- Minor accident east of Charleville in 2012 (Car); and
- Minor accident east of Charleville in 2012 (Car);

On Effin Road, which connects the R515 with the south of the existing crossing, one serious and one minor accident were identified:

- Serious accident south of R515 junction in 2016 (Motorcycle); and
- Minor accident west of railway overbridge in 2014 (Car);

It is clear from the observed data that only a small number of accidents have occurred in the vicinity of the proposed Project, none of which are on the roads where construction will take place and as such it is clear that there are no existing accident or safety issues based on these statistics. However, given the identified need for significant volumes of material import via HGV there is a perceived increase in risk of accidents due to the road widths and speeds.

Driver Delay

Traffic delays as a result of Construction Phase traffic could occur along the local rural routes outlined in Section 11.5.2. The IEMA Guidelines note that *“these delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system”*.

The road network surrounding the proposed Project is currently operating comfortably within capacity, with projections showing that this will still be the case with the addition of Construction Phase related traffic flows, taken as the worst-case scenario. The increases in flow are therefore anticipated to have a not significant impact on driver delay. Notwithstanding this, mitigation will be provided as described in Section 11.7.

Fear, Intimidation and Pedestrian Amenity / Delay

Traffic volume, composition and speeds, in combination with pedestrian footways and crossings, contribute to the level of general unpleasantness, fear, intimidation and delay experienced by pedestrians and other vulnerable road users.

There are no footways or dedicated cycling infrastructure in this area as previously outlined in Section 11.5.2 and so numbers of pedestrians and cyclists are low particularly due to the rural nature of the location. Table 11.5 shows that an average of only 11 pedestrians use the existing crossing each week.

During the worst-case Construction Phase, it is predicted that 54 two-way movements per day will access the proposed Project area, which equates to an average of less than 8 two-way movements per hour. It is clear when comparing the worst-case traffic impact during Construction Phase that there is ample available capacity in order to accommodate the increases in traffic associated with all parts of the Construction Phase of the proposed Project. As such, the Construction Phase of the proposed Project will have a not significant impact on fear, intimidation and delay. Notwithstanding this, mitigation measures outlined within Section 11.7 will ensure that any impacts are kept at a minimum.

Severance

The IEMA Guidelines note that *“Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery”*.

During the worst-case of Construction Phase, it is predicted that 54 two-way movements per day, the majority of which are HGVs, will access the proposed Project, which equates to an average of less than 8 two-way movements per hour. This is not likely to lead to any severance issues due to existing low traffic levels accessing the several properties on this existing road. The low levels of additional traffic generated by the proposed project coupled by the strategic routeing of HGVs ensure that the issues of severance are not significant. Notwithstanding this, mitigation measures outlined within Section 11.7 will ensure that any impacts are kept at a minimum.

Summary of Environmental Impacts (Construction Phase)

In terms of the above outlined Environmental Impacts the performance of the Construction Phase for the proposed Project in relation to the EPA Guidelines (as detailed in Section 11.4.5) is summarised in Table 11.25 below.

Table 11.25: Thomastown Summary of Environmental Impacts (Construction Phase)

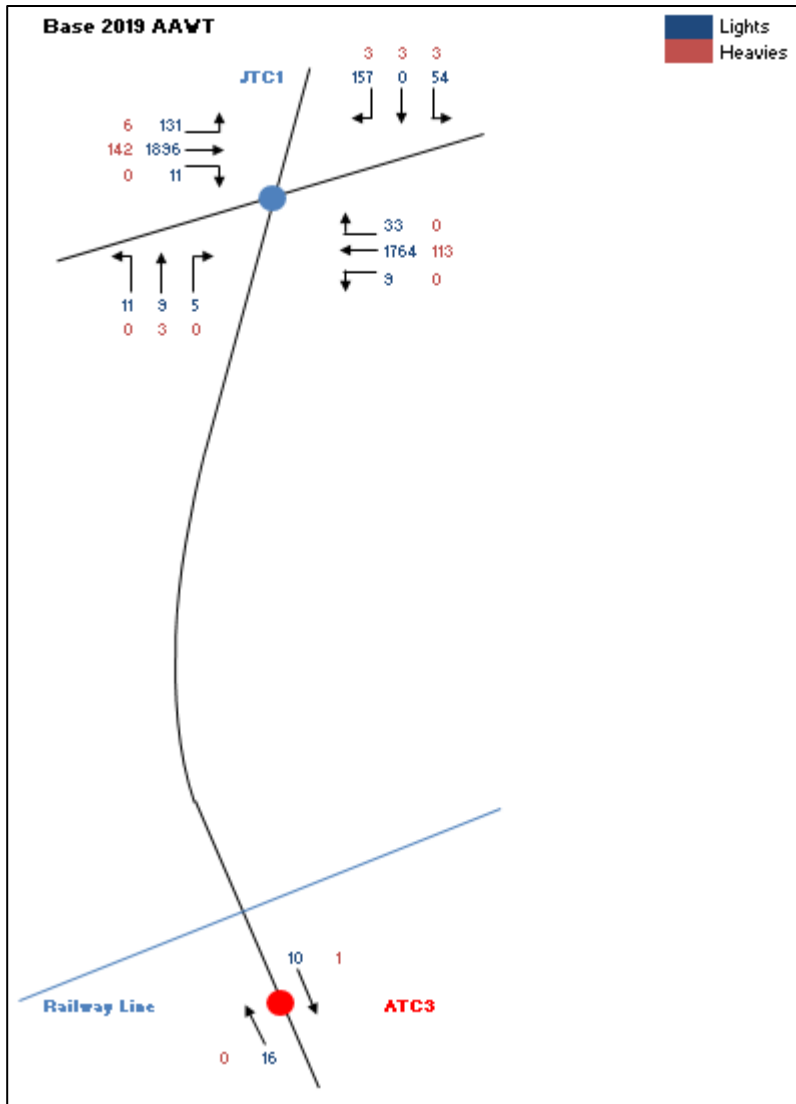
Environmental Impact	Environmental Impact description	Quality of Effects	Significance	Duration	Comments
Accidents and Safety	Increases in traffic, most notably HGVs.	Adverse	Not Significant	Temporary	The proposed mitigation measures will assist in managing and reducing these effects.
Driver Delay	Increases in traffic on the road network as a result of Construction Phase activities, most notably slow-moving HGVs.	Adverse	Not Significant	Temporary	The proposed mitigation measures, most notably the timing and routing of Construction Phase traffic, will assist in minimising these effects.
Fear, Intimidation and Pedestrian Amenity / Delay	Increases in traffic on the road network as a result of Construction Phase activities, most notably HGVs.	Adverse	Not Significant	Temporary	The proposed mitigation measures, most notably the timing and routing of Construction Phase traffic, will assist in minimising these effects.
	The potential for HGVs moving to / from the site in platoons.	Adverse	Significant	Temporary	
Severance	Increases in traffic on the road network as a result of Construction Phase activities, most notably HGVs.	Adverse	Not Significant	Temporary	The proposed mitigation measures, most notably the timing and routing of Construction Phase traffic, will assist in minimising these effects.
	The potential for HGVs moving to / from the site in platoons.	Adverse	Significant	Temporary	

Operational Phase

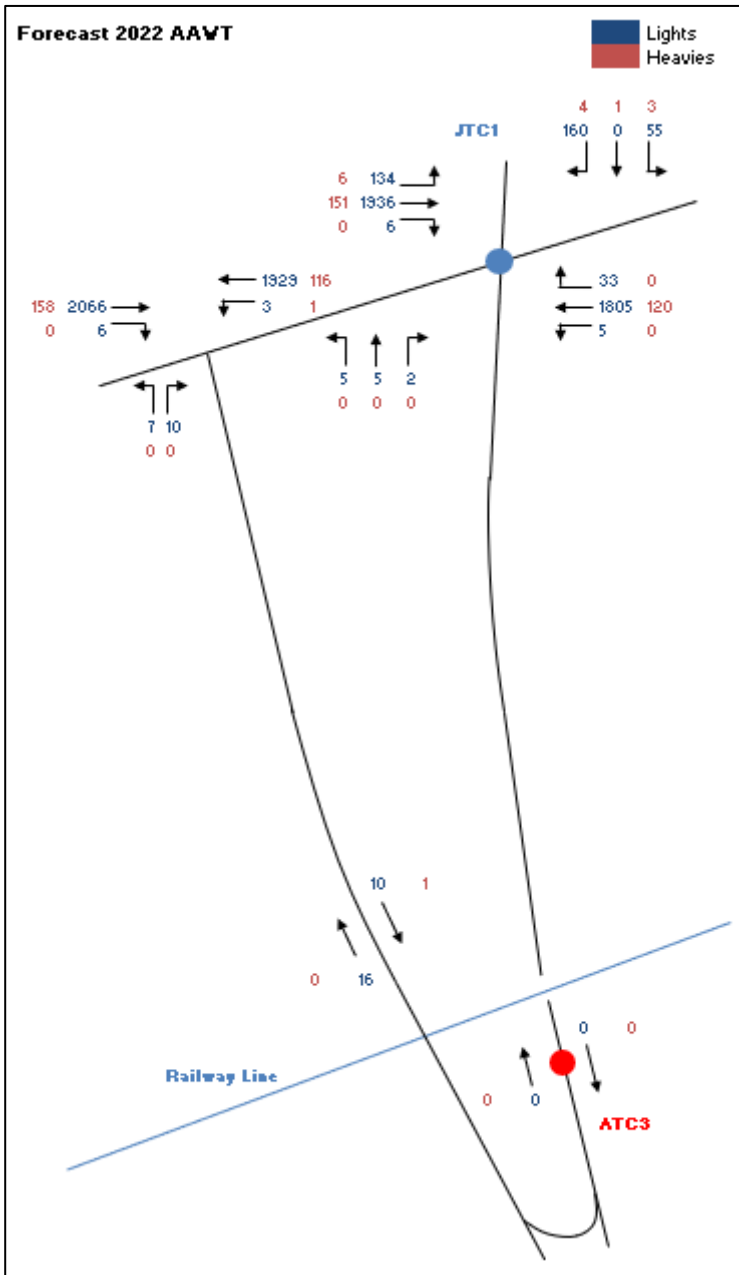
During the operational phase of the proposed Project there will be no additional traffic generated by the works other than the very occasional inspection or maintenance of the new road-over-rail bridge which is negligible. Between January 2016 and June 2019 there was one recorded incident of a vehicle striking the level crossing gate/barrier which the proposed Project works will remove. As the proposals involve the creation of a new junction access and realignment of the railway crossing there is an element of traffic redistribution although this is anticipated to be beneficial due to road improvements and better safety for both vehicle and non-motorised users as a result of the road-over-rail bridge replacing the existing crossing and as a result no TTA will be required due to the low traffic flows involved. Currently, delays at the level crossing can be anything up to 20 minutes depending on train movements and so operationally the road network will be far more efficient. In addition, the existing railway crossing does not operate between 2300 and 0700 therefore the proposed Project will provide

benefits of unconstrained access over the railway line. Inset Figure 11.19 and Inset Figure 11.20 show the comparison of the 2019 traffic flows and forecast 2022 traffic flows with predicted new distribution.

Inset Figure 11.19: 2019 Baseline Traffic Distribution.



Inset Figure 11.20: 2022 Forecast Traffic Distribution.



11.6.3 XC209 Ballyhay Assessment

Growthed 2019 baseline traffic flows to future years 2021 and 2022, as shown in Table 11.26, indicate that there would be very little change in overall numbers over the construction period. These increases suggest a negligible operational impact over this period if no works were carried out.

Table 11.26: Ballyhay Baseline and Projected AAWT.

Traffic Counter	Junction Arm	Directions Combined (2019)			Directions Combined (2021)		Directions Combined (2022)	
		AAWT	Heavies	%Heavies	AAWT	Heavies	AAWT	Heavies
JTC2	Unnamed (N)	36	2	7.0	36	3	37	3
	R515 (E)	190	17	9.2	193	18	194	19

Traffic Counter	Junction Arm	Directions Combined (2019)			Directions Combined (2021)		Directions Combined (2022)	
		AAWT	Heavies	%Heavies	AAWT	Heavies	AAWT	Heavies
	R515 (W)	216	15	6.9	219	16	221	16

Construction Phase

The proposals to convert the existing manned crossing to CCTV controlled will result in construction works incorporating ducting, traffic lights, signage and a relocatable equipment building (REB) including its base. Notwithstanding, the construction traffic associated with the proposals are predicted to be of a quantum such that there will be negligible impact to existing traffic as a result.

Operational Phase

There is no additional traffic generated during the Operational Phase, other than for occasional routine maintenance of the cameras, and so there will be negligible impact to existing traffic as a result. The existing railway crossing does not operate between 2300 and 0700 therefore the proposed Project will provide benefits of unconstrained access (when there are no train movements) over the railway line.

11.6.4 XC211 & XC212 Newtown and Ballycoskery Assessment

As previously mentioned, the existing crossings XC211 Newtown and XC212 Ballycoskery are being considered together within this assessment as they will directly impact upon each other. The proposed construction works involve the diversion of traffic currently using the existing crossing XC211 Newtown to/from the existing road-over-rail bridge to the north by way of a newly constructed road on the eastern side of the railway line and the creation of a new road-over-rail bridge to replace existing crossing XC212 Ballycoskery.

Growthed 2019 baseline traffic flows to future years 2021 and 2022, as shown in Table 11.27 and Table 11.28, indicate that there would be very little change in overall numbers over the construction period.

Table 11.27: Newtown and Ballycoskery ATC Baseline and Projected AAWT.

Traffic Counter	Road	Directions Combined (2019)			Directions Combined (2021)		Directions Combined (2022)	
		AAWT	Heavies	%Heavies	AAWT	Heavies	AAWT	Heavies
ATC4	Unnamed Road	145	5	3.4	147	5	148	5
ATC5	Unnamed Road	107	3	2.8	108	3	109	3
ATC6	Beechwood Drive	298	6	1.9	302	6	304	6

Table 11. 28: Newtown and Ballycoskery JTC Baseline and Projected AAWT

Traffic Counter	Junction Arm	Directions Combined (2019)			Directions Combined (2021)		Directions Combined (2022)	
		AAWT	Heavies	%Heavies	AAWT	Heavies	AAWT	Heavies
JTC3	N20 (N)	12,163	1,234	10.1	12,370	1,288	12,474	1,315
	L1533 (E)	1,415	53	3.8	1,436	55	1,447	57
	N20 (S)	11,603	1,205	10.4	11,802	1,258	11,901	1,284
JTC4	Unnamed (N)	144	5	14	151	5	152	5
	L1533 (E)	676	40	5.9	686	42	692	43

Traffic Counter	Junction Arm	Directions Combined (2019)			Directions Combined (2021)		Directions Combined (2022)	
		AAWT	Heavies	%Heavies	AAWT	Heavies	AAWT	Heavies
	Unnamed (S)	336	20	5.9	342	21	344	21
	L1533 (W)	1,005	60	5.9	1,021	62	1,029	64

Construction Phase

Assessment of Construction Phase Traffic Generation

A total of 106 two-way vehicle trips per day are predicted during the worst-case Construction Phase, comprising 66 two-way HGV movements and 40 two-way car / Light Goods Vehicles (LGV) movements. The trip generation has been added to the projected 2021 AAWT, detailed in Table 11.27 and Table 11.28, in order to confirm the percentage increase in traffic associated with the proposed Project Construction Phase. In order to assess the worst-case impact, robust assumptions have been made regarding the proportion of construction related traffic passing any particular traffic counter, notably that all traffic going to each of the two crossing sites will pass all traffic counter locations on the predicted routes with the exception of any junction arms that will obviously not be used by construction traffic. This is an extremely robust approach as the volumes of traffic passing certain ATC locations will in reality be significantly lower and therefore the assessment of construction related traffic is very much worst-case.

Table 11.29 and Table 11.30 details the percentage increases in total traffic. Table 11.31 and Table 11.32 details the percentage increases in HGV traffic. The following paragraphs discuss the impacts on key sections of the road network (based on strategic ATC/JTC locations) and sensitive receptors as a result of the increase in traffic associated with the Construction Phase of the proposed Project.

Table 11.29: Newtown and Ballycoskery Worst-case Construction Phase Percentage Increase in ATC Total Traffic

Traffic Counter	Road	% Split at each ATC	Projected Base AAWT (2021)	Worst-case Daily Construction Total Vehicles (Two Way)	% Increase in Total Vehicles
ATC4	Unnamed Road	0%	147	0	0%
ATC5	Unnamed Road	49.1%	108	52	48.1%
ATC6	Beechwood Drive	50.9%	302	54	17.9%

Table 11.30: Newtown and Ballycoskery Worst-case Construction Phase Percentage Increase in JTC Total Traffic

Traffic Counter	Junction Arm	% Split at each JTC	Projected Base AAWT (2021)	Worst-case Daily Construction Total Vehicles (Two Way)	% Increase in Total Vehicles
JTC3	N20 (N)	100%	12,370	106	0.9%
	L1533 (E)	100%	1,436	106	7.4%
	N20 (S)	100%	11,802	106	0.9%
JTC4	Unnamed (N)	100%	151	106	70.2%
	L1533 (E)	0%	686	0	0%
	Unnamed (S)	50.9%	342	54	15.8%
	L1533 (W)	100%	1,021	106	10.4%

Table 11.31: Newtown and Ballycoskery Worst-case Remediation Percentage Increase in HGV ATC Traffic

Traffic Counter	Road	% Split at each ATC	Projected Base HGVs (2021)	Worst-case Daily Construction HGVs (Two Way)	% Increase in HGVs
ATC4	Unnamed Road	0%	5	0	0%
ATC5	Unnamed Road	48.5%	3	32	1066.7%
ATC6	Beechwood Drive	51.5%	6	34	566.7%

Table 11.32: Newtown and Ballycoskery Worst-case Construction Phase Percentage Increase in HGV JTC Traffic

Traffic Counter	Junction Arm	% Split at each JTC	Projected Base HGVs (2021)	Worst-case Daily Construction Total Vehicles (Two Way)	% Increase in HGVs
JTC3	N20 (N)	100%	1,288	66	5.1%
	L1533 (E)	100%	55	66	120%
	N20 (S)	100%	1,258	66	5.2%
JTC4	Unnamed (N)	100%	5	66	1,320%
	L1533 (E)	0%	42	0	0%
	Unnamed (S)	51.5%	21	34	161.9%
	L1533 (W)	100%	62	66	106.5%

In terms of the percentage increase of total vehicles (HGVs + Cars) shown in Table 11.29 and Table 11.30, the proposed Project will have a moderate impact on all assessed road sections based on the criteria outlined in Table 11.2, where a moderate impact is predicted on percentage increases of between 60% and 90%.

While the increase in total construction related traffic on the unnamed road north from Dooley's Cross Roads to the existing crossing XC211 Newtown exceeds both the TII and IEMA thresholds detailed within Section 11.4.5, it is important to consider the increases in traffic in relation to actual vehicles. As detailed above, an increase of 106 two-way movements per day (total vehicles) are predicted during the worst-case phase in terms of traffic increases which equates to an average of less than 14 two-way movements per hour (7 arrivals and 7 departures).

Furthermore, it is important to consider the increase on JTC4 north arm and ATC5 in the context of the existing low levels of baseline traffic and the carrying capacity of the road. It is noted that this road is currently operating significantly below its capacity. During the busiest period of the Construction Phase, the total vehicles per day on this road (including baseline traffic) will be 257 per day (151 projected 2021 AAWT + 106 construction traffic). As such, it is considered that this road is currently operating below its capacity and will continue to do so with the addition of the construction traffic flows. Subsequently, despite undertaking a robust assessment of Construction Phase impacts, the actual increases in traffic numbers will be minimal.

With regards to HGV movements, the percentage increases for the L1533 (west of existing crossing XC212 Ballycoskery), Beechwood Drive, and the unnamed roads north and south from Dooley's Cross Roads, outlined in Table 11.31 and Table 11.32, suggests a major impact on the road network in accordance with the IEMA criteria as detailed in Table 11.2. However, this high percentage is a result of the low levels of baseline HGV traffic at these locations. Therefore, despite the high percentage increases, the numerical increase in HGVs is low. Moreover, the impacts of worst-case construction traffic will occur over a relatively short period and the existing road infrastructure is currently operating well below capacity, therefore reducing the overall impact. Consequently, no significant impacts are predicted to arise from Construction Phase related traffic generated by the proposed Project and as such no TTA will be required due to the temporary nature of the works and low flows involved.

Accidents and Safety

A review of Road Safety Authority Collision Statistics was undertaken, which provided details of all collisions on the roads surrounding the proposed Project, between 2012 and 2016, identified no accidents on the local roads within the immediate vicinity of the existing crossings XC211 and XC212 Newtown & Ballycoskery. Two minor accidents were, however, identified on the N20 nearby:

- Minor accident south of N20/L1533 junction in 2016 (Undefined vehicle); and
- Minor accident south of N20/L1533 junction in 2015 (Car);

It is clear from the observed data that only a small number of accidents have occurred in the vicinity of the proposed Project, none of which are on the roads where construction will take place and as such it is clear that there are no existing accident or safety issues based on these statistics. However, given the identified need for significant volumes of material import via HGV there is a perceived increase in risk of accidents due to the road widths and speeds.

Driver Delay

Traffic delays as a result of Construction Phase traffic could occur along the local rural routes outlined in Section 11.3.3. The IEMA Guidelines note that *"these delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system"*.

The road network surrounding the proposed Project is currently operating comfortably within capacity, with projections showing that this will still be the case with the addition of Construction Phase related traffic flows, taken as the worst-case scenario. The increases in flow are therefore anticipated to not have a significant impact on driver delay. Notwithstanding this, mitigation will be provided as described in Section 11.7.

Fear, Intimidation and Pedestrian Amenity / Delay

Traffic volume, composition and speeds, in combination with pedestrian footways and crossings, contribute to the level of general unpleasantness, fear, intimidation and delay experienced by pedestrians and other vulnerable road users.

There is no footpath or cycling provision within the immediate vicinity of existing crossing XC211 Newtown, however, there is a narrow footway on one side of the L1533 between Beechwood Drive and Dooley's Cross Roads as well as on Beechwood Drive itself. Although no dedicated cycling provision is provided here either the Kilmallock Cycle Hub markets its Loop 1 route which uses surrounding roads and navigates the Dooley's Cross Roads (JTC4) junction.

Table 11.13 shows that there is a relatively high number of pedestrians (66), of which 25 were children, using the existing Ballycoskery crossing on weekdays due to the close proximity to the primary school. During the worst-case Construction Phase, it is predicted that 106 two-way movements per day will access the proposed Project area, which equates to an average of less than 14 two-way movements per hour. It is clear that there is ample available capacity in order to accommodate the increases in traffic associated with all parts of the Construction Phase of the proposed Project. However, the Construction Phase of the proposed Project will have a significant impact on fear, intimidation and delay given the proximity to sensitive receptors. Therefore, mitigation measures outlined within Section 11.7 will ensure that any impacts are kept at a minimum.

Severance

The IEMA Guidelines note that *"Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery"*.

During the worst-case of Construction Phase, it is predicted that 106 two-way movements per day, the majority of which are HGVs, will access the proposed Project, which equates to an average of less than 14 two-way movements per hour, which are not likely to lead to any severance issues. The low levels of additional traffic generated by the proposed project coupled by the strategic routing of HGVs ensure that the issues of severance may be perceived

as significant given the proximity to sensitive receptors. Therefore, mitigation measures outlined within Section 11.7 will ensure that any impacts are kept at a minimum.

Summary of Environmental Impacts (Construction Phase)

In terms of the above outlined Environmental Impacts the performance of the Construction Phase for the proposed Project in relation to the EPA Guidelines (as detailed in Section 11.4.5) is summarised in Table 11.33 below.

Table 11.33: Newtown and Ballycoskery Summary of Environmental Impacts (Construction Phase)

Environmental Impact	Environmental Impact description	Quality of Effects	Significance	Duration	Comments
Accidents and Safety	Increases in traffic, most notably HGVs.	Adverse	Significant	Temporary	The proposed mitigation measures will assist in managing and reducing these effects.
Driver Delay	Increases in traffic on the road network as a result of Construction Phase activities, most notably slow-moving HGVs.	Adverse	Not Significant	Temporary	The proposed mitigation measures, most notably the timing and routing of Construction Phase traffic, will assist in minimising these effects.
Fear, Intimidation and Pedestrian Amenity / Delay	Increases in traffic on the road network as a result of Construction Phase activities, most notably HGVs.	Adverse	Significant	Temporary	The proposed mitigation measures, most notably the timing and routing of Construction Phase traffic, will assist in minimising these effects.
	The potential for HGVs moving to / from the site in platoons.	Adverse	Significant	Temporary	
Severance	Increases in traffic on the road network as a result of Construction Phase activities, most notably HGVs.	Adverse	Significant	Temporary	The proposed mitigation measures, most notably the timing and routing of Construction Phase traffic, will assist in minimising these effects.
	The potential for HGVs moving to / from the site in platoons.	Adverse	Significant	Temporary	

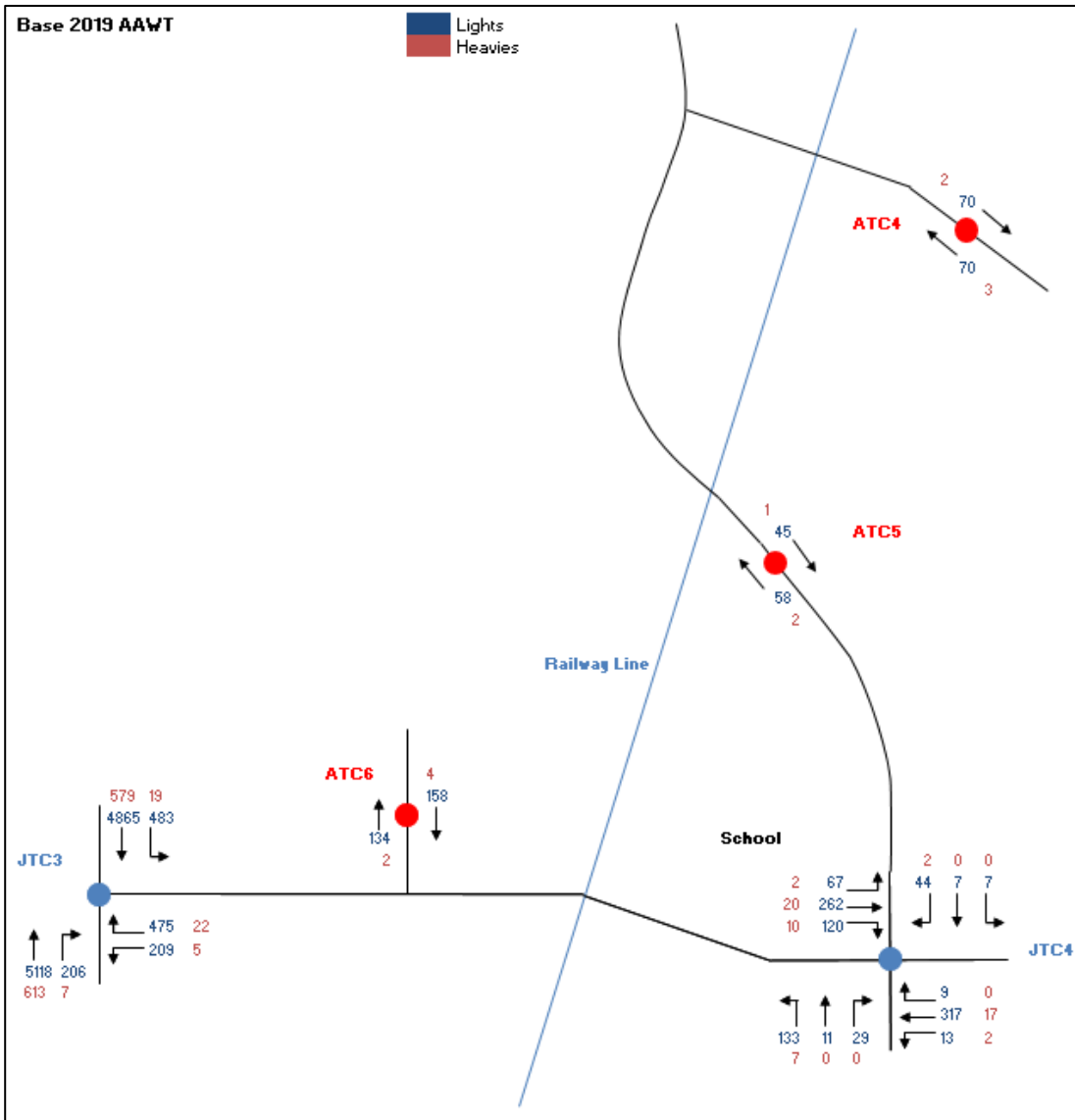
Operational Phase

During the operational phase of the proposed Project there will be no additional traffic generated by the works other than the very occasional inspection or maintenance of the new road-over-rail bridge which is negligible. Additionally, although the works do involve the rerouting of traffic due to the closure of existing crossing XC211 Newtown and realignment of the new road-over-rail bridge replacing the existing crossing XC212 Ballycoskery

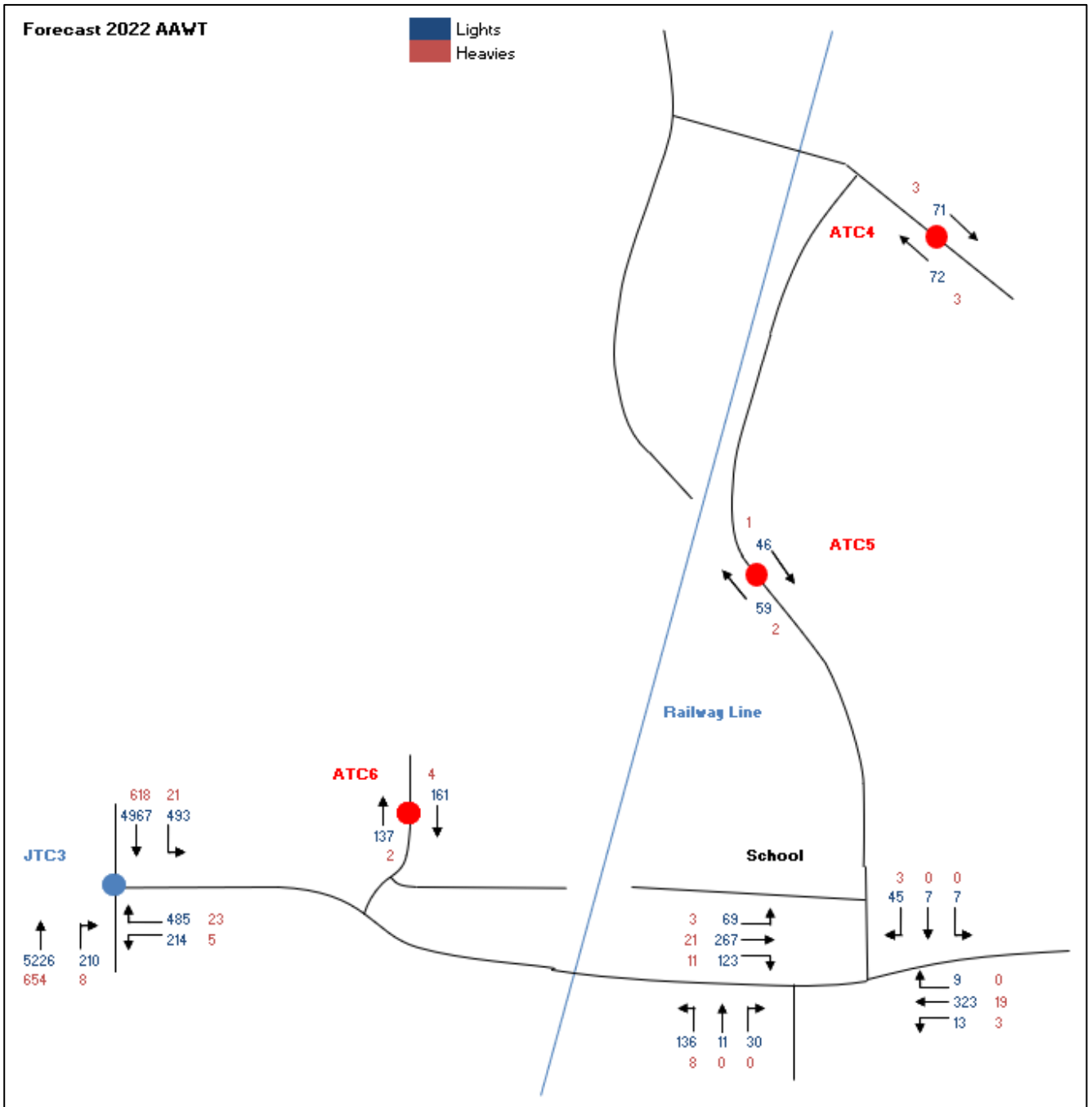
there will be not be any significant traffic redistribution. The rerouting would, in fact, actually reduce the numbers of vehicles passing several houses to the west of existing crossing XC211 Newtown.

There were four recorded level crossing incidents between January 2016 and June 2019. Two of these were equipment failures while one involved a vehicle striking the crossing gate/barrier, all at XC212 Ballycoskery; the other is an unspecified crossing incident at XC211 Newtown. As the proposals involve the rerouting of traffic from XC211 Newtown to the existing road-over-rail bridge and the creation of a new junction and realignment of the railway crossing at XC212 Ballycoskery this is anticipated to be beneficial to all road users due to road and junction improvements including new footways. No TTA will be required due to the low traffic flows involved. Currently, delays at the level crossing can be anything up to 10 minutes depending on train movements and so operationally the road network will be far more efficient. Inset Figure 11.21 and Inset Figure 11.22 show the comparison of the 2019 traffic flows and forecast 2022 traffic flows.

Inset Figure 11.21: 2019 Baseline Traffic Distribution.



Inset Figure 11.22: 2022 Forecast Traffic Distribution.



11.6.5 XC215 Shinanagh Assessment

Growthed 2019 baseline traffic flows to future years 2021 and 2022, as shown in and Table 11.34, indicate that there would be very little change in overall numbers over the construction period. These increases suggest a negligible operational impact over this period if no works were carried out.

Table 11.34: Shinanagh Baseline and Projected AAWT.

Traffic Counter	Road	Directions Combined (2019)			Directions Combined (2021)		Directions Combined (2022)	
		AAWT	Heavies	%Heavies	AAWT	Heavies	AAWT	Heavies
ATC7	L5507	121	11	9.1	123	11	124	12
ATC8	Unnamed Road	114	8	6.7	116	8	117	8
ATC9	L1320	1,029	53	5.2	1,045	56	1,053	57

Construction Phase

Assessment of Construction Phase Traffic Generation

A total of 52 two-way vehicle trips per day are predicted during the worst-case Construction Phase, comprising 32 two-way HGV movements and 20 two-way car / Light Goods Vehicles (LGV) movements. The trip generation has been added to the projected 2021 AAWT, detailed in Table 11.34, in order to confirm the percentage increase in traffic associated with the proposed Project Construction Phase. In order to assess the worst-case impact, robust assumptions have been made regarding the proportion of construction related traffic passing any particular traffic counter, notably that 100% of traffic will pass all traffic counter locations on the assumed routes to site. This is an extremely robust approach as the volumes of traffic passing certain ATC locations will in reality be significantly lower and therefore the assessment of construction related traffic is very much worst-case.

Table 11.35 details the percentage increases in total traffic. Table 11.36 details the percentage increases in HGV traffic. The following paragraphs discuss the impacts on key sections of the road network (based on strategic ATC locations) and sensitive receptors as a result of the increase in traffic associated with the Construction Phase of the proposed Project.

Table 11.35: Shinanagh Worst-case Construction Phase Percentage Increase in Total Traffic

Traffic Counter	Road	% Split at each ATC	Projected Base AAWT (2021)	Worst-case Daily Construction Total Vehicles (Two Way)	% Increase in Total Vehicles
ATC7	L5507	100%	123	52	42.3%
ATC8	Unnamed Road	100%	116	52	44.8%
ATC9	L1320	100%	1,045	52	5%

Table 11.36: Shinanagh Worst-case Remediation Percentage Increase in HGV Traffic

Traffic Counter	Road	% Split at each ATC	Projected Base HGVs (2021)	Worst-case Daily Construction HGVs (Two Way)	% Increase in HGVs
ATC7	L5507	100%	11	32	290.9%
ATC8	Unnamed Road	100%	8	32	400%
ATC9	L1320	100%	56	32	57.1%

In terms of the percentage increase of total vehicles (HGVs + Cars) shown in Table 11.35, the proposed Project will have a minor impact on the L5507 (ATC7) based on the criteria outlined in Table 11.2, where a minor impact is predicted on percentage increases of between 30% and 60%.

While the increase in total construction related traffic at ATC7 exceeds both the TII and IEMA thresholds detailed within Section 11.4.5, it is important to consider the increases in traffic in relation to actual vehicles. As detailed above, an increase of 52 two-way movements per day (total vehicles) are predicted during the worst-case phase

in terms of traffic increases which equates an average of less than 8 two-way movements per hour (4 arrivals and 4 departures).

Furthermore, it is important to consider the increase on ATC7 in the context of the existing low levels of baseline traffic and the carrying capacity of the road. It is noted that this road is currently operating significantly below its capacity. Table 11.3 provides typical capacities for a variety of road types and it is estimated that the capacity of a road such as L5507 is a 5,000 two-way flow per day. During the busiest month of the Construction Phase, the total vehicles per day on this road (including baseline traffic) will be 175 per day (123 projected 2021 AAWT + 52 construction traffic). As such, it is considered that the L5507 is currently operating below its capacity and will continue to do so with the addition of the construction traffic flows. Subsequently, despite undertaking a robust assessment of Construction Phase impacts within the EIAR, the actual increases in traffic numbers will be minimal.

With regards to HGV movements, the percentage increases for the L5507 (ATC7) and L1320 (ATC9) outlined in Table 11.36 suggests a major impact and minor impact respectively on the road network in accordance with the IEMA criteria as detailed in Table 11.3. However, this high percentage is a result of the low levels of baseline HGV traffic at this location. It has been confirmed that during the busiest Construction Phase, the total two-way HGV movements per day will be on average only 32. Therefore, despite the high percentage increases, the numerical increase in HGVs is low. Moreover, the impacts of worst-case construction traffic will occur over a relatively short period and the existing road infrastructure is currently operating well below capacity, therefore reducing the overall impact. Consequently, no significant impacts are predicted to arise from Construction Phase related traffic generated by the proposed Project and as such no TTA will be required due to the temporary nature of the works and low flows involved.

Accidents and Safety

At the public consultation events held in November 2019 the project team were made aware of perceived safety issues at crossing XC215 Shinanagh when attempting to turn right off the N20 National Road.

A review of Road Safety Authority Collision Statistics was, however, undertaken, which provided details of all collisions on the roads surrounding the proposed Project, between 2012 and 2016, and identified no accidents within the immediate vicinity of the existing crossing XC215 Shinanagh and road-over-rail bridge to the north.

Although the observed data highlights that there are no existing accident or safety issues in the vicinity of the proposed Project, given the identified need for significant volumes of material import via HGV and the existing local concern there would be a perceived increase in risk of accidents due to the road widths and speeds. It should be stressed, however, that these works are only temporary, and the closure of the existing crossing and road upgrades will lead to improved safety in the long term.

Driver Delay

Traffic delays as a result of Construction Phase traffic could occur along the local rural routes outlined in Section 11.3.3. The IEMA Guidelines note that *"these delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system"*.

The road network surrounding the proposed Project is currently operating comfortably within capacity, which is confirmed by comparing the baseline and projected AAWT flows in Table 11.34 with the anticipated capacity outlined within Table 11.3. Projections show that the road will continue to operate below its capacity with the addition of Construction Phase related traffic flows, taken as the worst-case scenario. With the noted issue with traffic turning right from the N20 the increases in flow are therefore anticipated to have a significant impact on driver delay. Therefore, mitigation will be provided as described in Section 11.7.

Fear, Intimidation and Pedestrian Amenity / Delay

Traffic volume, composition and speeds, in combination with pedestrian footways and crossings, contribute to the level of general unpleasantness, fear, intimidation and delay experienced by pedestrians and other vulnerable road users.

With a mixture of single-track and narrow single carriageway rural roads surrounding the proposed crossing XC215 Shinanagh there are no footways or dedicated cycling infrastructure in this area as previously outlined in Section 11.5.5. Although no dedicated walking or cycling provision is provided here, the Ballyhoura Way follows surrounding roads and navigates to the same N20 junction that construction vehicles are likely to use. Table 11.15 does, however, show that the average numbers of NMUs crossing the existing junction are very low.

During the worst-case Construction Phase, it is predicted that 52 two-way movements per day will access the proposed Project area, which equates to an average of less than 8 two-way movements per hour. It is clear when comparing the worst-case traffic impact during Construction Phase, with the theoretical operating capacity of the local roads (Table 11.3), that there is ample available capacity in order to accommodate the increases in traffic associated with all parts of the Construction Phase of the proposed Project. As such, the Construction Phase of the proposed Project will not have a significant impact on fear, intimidation and delay. Notwithstanding this, mitigation measures outlined within Section 11.7 will ensure that any impacts are kept at a minimum.

Severance

The IEMA Guidelines note that “Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery”.

During the worst-case of Construction Phase, it is predicted that 52 two-way movements per day, the majority of which are HGVs, will access the proposed Project, which equates to an average of 32 two-way movements per hour, which are not likely to lead to any severance issues given the limited receptors in the area. The low levels of additional traffic generated by the proposed Project coupled by the strategic routeing of HGVs ensure that the issues of severance are not significant. Notwithstanding this, mitigation measures outlined within Section 11.7 will ensure that any impacts are kept at a minimum.

Summary of Environmental Impacts (Construction Phase)

In terms of the above outlined Environmental Impacts the performance of the Construction Phase for the proposed Project in relation to the EPA Guidelines (as detailed in Section 11.4.5) is summarised in Table 11.37 below.

Table 11.37: Shinanagh Summary of Environmental Impacts (Construction Phase)

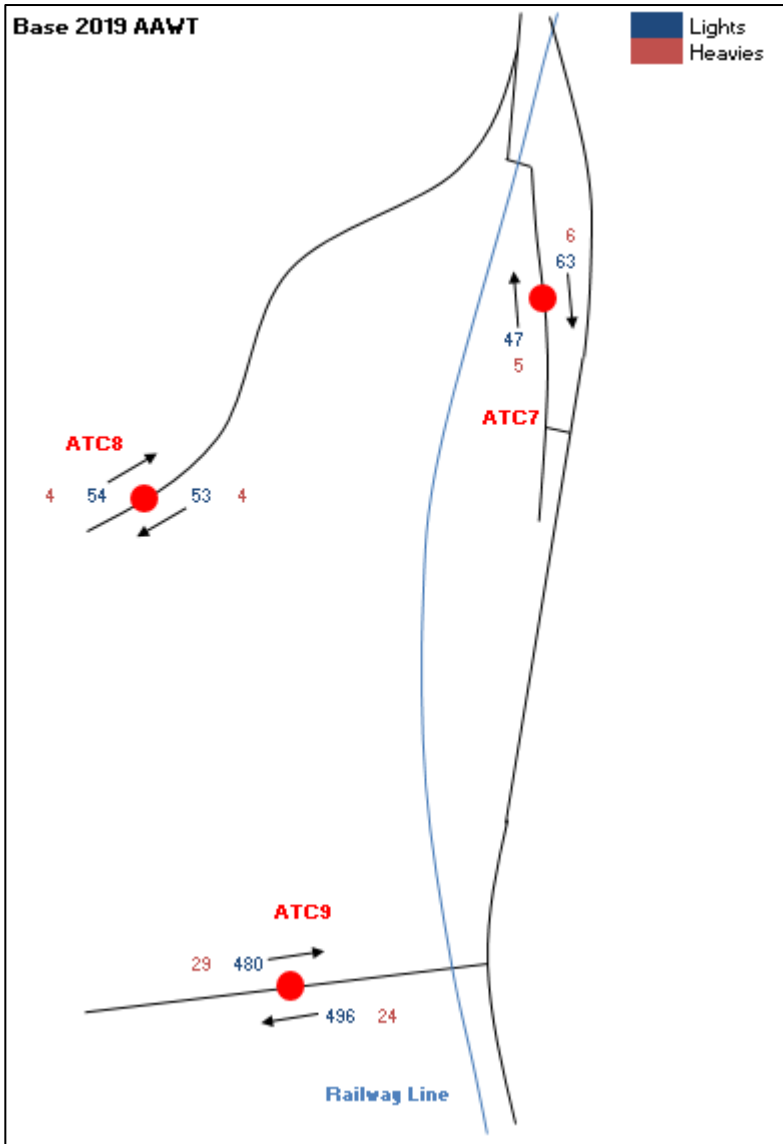
Environmental Impact	Environmental Impact description	Quality of Effects	Significance	Duration	Comments
Accidents and Safety	Increases in traffic, most notably HGVs.	Adverse	Significant	Temporary	The proposed mitigation measures will assist in managing and reducing these effects.
Driver Delay	Increases in traffic on the road network as a result of Construction Phase activities, most notably slow-moving HGVs.	Adverse	Significant	Temporary	The proposed mitigation measures, most notably the timing and routing of Construction Phase traffic, will assist in minimising these effects.
Fear, Intimidation and Pedestrian Amenity / Delay	Increases in traffic on the road network as a result of Construction Phase activities, most notably HGVs.	Adverse	Not Significant	Temporary	The proposed mitigation measures, most notably the timing and routing of Construction Phase traffic, will assist in minimising these effects.
	The potential for HGVs moving to / from the site in platoons.	Adverse	Significant	Temporary	

Environmental Impact	Environmental Impact description	Quality of Effects	Significance	Duration	Comments
Severance	Increases in traffic on the road network as a result of Construction Phase activities, most notably HGVs.	Adverse	Not Significant	Temporary	The proposed mitigation measures, most notably the timing and routing of Construction Phase traffic, will assist in minimising these effects.
	The potential for HGVs moving to / from the site in platoons.	Adverse	Significant	Temporary	

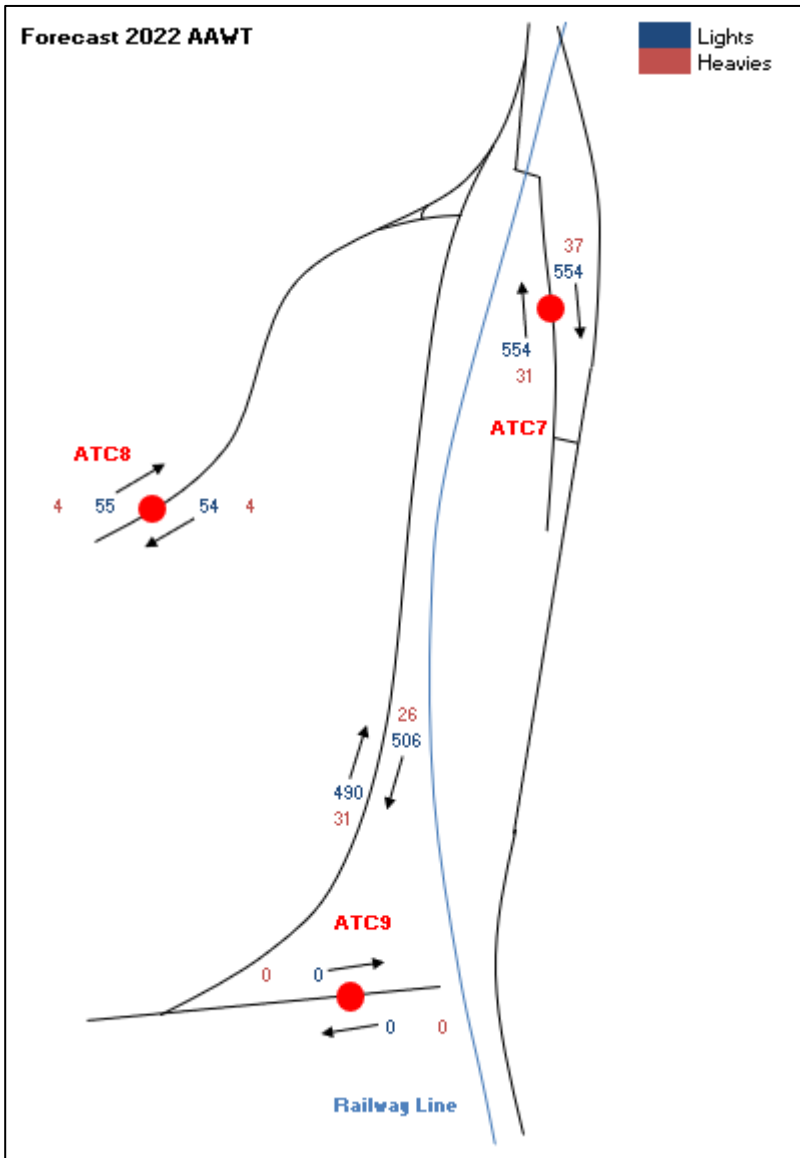
Operational Phase

During the operational phase of the proposed Project there will be no additional traffic generated, however, as the works involve the rerouting of traffic due to the closure of existing crossing XC215 Shinanagh and new road diversion to the existing road-over-rail bridge to the north there will be some significant traffic redistribution. The road upgrades and better safety as a result of the level crossing closure should, however, also be noted. In order to assess the worst-case impact, robust assumptions have been made regarding the proportion of Operational Phase traffic, notably that all traffic will reroute using the constructed diversion. This is an extremely robust approach as the volumes of traffic passing each ATC location will, in reality, be significantly lower and therefore the assessment of Operational Phase traffic can very much be considered as worst case. Inset Figure 11.23 and Inset Figure 11.24 show the comparison of the 2019 traffic flows and forecast 2022 traffic flows with predicted new distribution.

Inset Figure 11.23: 2019 Baseline Traffic Distribution.



Inset Figure 11.24: 2022 Forecast Traffic Distribution.



Assessment of Operational Phase Traffic Redistribution

Table 11.38 details the percentage change to baseline traffic flows on the road network as a result of the Operational Phase of the proposed Project. Table 11.39 details the percentage change in HGV traffic. The following paragraphs discuss the impacts on key sections of the road network (based on strategic ATC/JTC locations) and sensitive receptors as a result of the increase in traffic associated with the Operational Phase of the proposed Project.

Table 11.38: Shinanagh Worst-case Operational Phase Percentage Change in ATC Total Traffic

Traffic Counter	Road	Projected Base AAWT (2022)	Worst Case Daily Operational Phase Total Vehicles (Two Way)	Projected Base + Worst Case Operational Phase	% Increase in Total Vehicles
ATC7	L5507	124	1,036	1,160	835.5%
ATC8	Unnamed Road	117	N/A	N/A	N/A
ATC9	L1320	N/A	N/A	N/A	N/A

Table 11.39: Shinanagh Worst-case Operational Phase Percentage Change in HGV Traffic

Traffic Counter	Road	Projected Base AAWT (2022)	Worst Case Daily Operational Phase Total Vehicles (Two Way)	Projected Base + Worst Case Operational Phase	% Increase in Total Vehicles
ATC7	L5507	12	53	67	441.7%
ATC8	Unnamed Road	8	N/A	N/A	N/A
ATC9	L1320	N/A	N/A	N/A	N/A

In terms of the percentage increase of total vehicles (HGVs + Cars) shown in Table 11.38 and Table 11.39, the proposed Project will have a major impact on the L5507 based on the criteria outlined in Table 11.2, where a major impact is predicted on percentage increases of above 90%.

While the increase in total construction related traffic on the L5507 exceeds both the TII and IEMA thresholds detailed within Section 11.4.5, it is important to consider the increases in traffic in relation to actual vehicles. As detailed above, an increase of 1,036 two-way movements per day (total vehicles) are predicted during the worst-case phase in terms of traffic increases which equates to an average of less than 44 two-way movements per hour.

Furthermore, it is important to consider the increase on the L5507 in the context of the existing low levels of baseline traffic and the carrying capacity of the road. Table 11.3 provides typical capacities for a variety of road types and it is estimated that the capacity of a road such as this and the new diversionary road would be at least 5,000 two-way flow per day. During the Operational Phase, the total vehicles per day on this road will be 1,160 per day. As such, it is considered that the L5507 is currently operating well below its capacity and will continue to do so with the addition of the redistributed traffic. Subsequently, despite undertaking a robust assessment of Operational Phase impacts within the EIAR, the actual increases in traffic numbers will be minimal.

With regards to HGV movements, the percentage increases for the L5507, outlined in Table 11.39, suggests a major impact on the road network in accordance with the IEMA criteria as detailed in Table 11.3. However, this high percentage is a result of the low levels of baseline HGV traffic at this location. Therefore, despite the high percentage increases, the numerical increase in HGVs is only 53 vehicles. Moreover, the existing road infrastructure is currently operating well below capacity, and when the proposed new upgraded route and N20/L5507 junction improvement is implemented it will reduce the overall impact. Consequently, no significant impacts are predicted to arise from Operational Phase related traffic redistribution as a result of the proposed Project and as such no TTA will be required due to the rerouting and relatively low flows involved.

Accidents and Safety

A review of Road Safety Authority Collision Statistics was undertaken, which provided details of all collisions on the roads surrounding the proposed Project, between 2012 and 2016, identified no accidents within the immediate vicinity of the existing crossing XC215 Shinanagh and road-over-rail bridge to the north.

As such it is clear that there are no existing road accident or safety issues based on these statistics. There were however two incidents recorded between January 2016 and June 2019 in relation to crossing equipment issues/failures. As the Operational Phase is only concerned with the redistribution rather than the increase there is no adverse impact anticipated and in fact safety should improve due to the road improvements and rail level crossing closures.

Driver Delay

Traffic delays as a result of the Operational Phase could occur along the local rural routes outlined in Section 11.5.5. The IEMA Guidelines note that *“these delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system”*.

The road network surrounding the proposed Project is currently operating comfortably within capacity, which is confirmed by comparing the projected AAWT flows in Table 11.38 with the anticipated capacity outlined within Table 11.3. Projections show that the road will continue to operate below its capacity with the addition of

Operational Phase redistributed traffic, taken as the worst-case scenario. The increases in flow are therefore anticipated to not have a significant impact on driver delay.

Delays as a result of the existing level crossing can be around six minutes for one train to pass but could be up to 10 minutes depending on circumstances and so operationally the road network will be far more efficient with unrestricted access across the railway line.

Fear, Intimidation and Pedestrian Amenity / Delay

Traffic volume, composition and speeds, in combination with pedestrian footways and crossings, contribute to the level of general unpleasantness, fear, intimidation and delay experienced by pedestrians and other vulnerable road users.

With a mixture of single-track and narrow single carriageway rural roads surrounding the proposed crossing XC215 Shinanagh there are no footways or dedicated cycling infrastructure in this area as previously outlined in Section 11.5.5. Although no dedicated walking or cycling provision is provided here, the Ballyhoura Way follows surrounding roads and navigates to the same N20 junction that rerouting vehicles will also access due to operational changes. As the route already follows roads with heavier traffic flows, the increase on this section is unlikely to have much overall impact given the relatively low NMU and traffic volumes.

During the worst-case Operational Phase, it is predicted that 1,036 additional two-way movements per day will access the L5507 at the N20 junction, which equates to an average of less than 44 two-way movements per hour. It is clear when comparing the worst-case traffic impact during the Operational Phase, with the theoretical operating capacity of the local roads (Table 11.3), that there is ample available capacity in order to accommodate the increases in traffic associated with all parts of the Operational Phase of the proposed Project. As such, the Operational Phase of the proposed Project will not have a significant impact on fear, intimidation and delay.

Severance

The IEMA Guidelines note that "*Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery*".

During the worst-case of Operational Phase, it is predicted that 1,036 additional two-way movements per day, only 55 of which are HGVs, will use the L5507, which equates to an average of less than 44 two-way movements per hour, which are not likely to lead to any severance issues. The low levels of additional traffic generated by the proposed Project redistribution coupled by the closure of the level crossing and rerouting to use the existing road-over-rail bridge render the issues of severance as not significant.

Summary of Environmental Impacts (Operational Phase)

In terms of the above outlined Environmental Impacts the performance of the Construction Phase for the proposed Project in relation to the EPA Guidelines (as detailed in Section 11.4.5) is summarised in Table 11.40 below.

Table 11.40: Shinanagh Summary of Environmental Impacts (Operational Phase)

Environmental Impact	Environmental Impact description	Quality of Effects	Significance	Duration	Comments
Accidents and Safety	Improvements to L5507 and diversionary route to/from the north.	Positive	Significant	Permanent	The proposed diversion route and road-over-rail bridge will improve road standards and remove the dangers associated with level crossings.
	Increases in traffic on L5507, mostly light vehicles, as a result of	Adverse	Not Significant	Permanent	

Environmental Impact	Environmental Impact description	Quality of Effects	Significance	Duration	Comments
	the Operational Phase are major.				
Driver Delay	Increases in traffic on L5507, mostly light vehicles, as a result of the Operational Phase are major.	Adverse	Not Significant	Permanent	The proposed diversion route and road-over-rail bridge usage will improve road standards and remove delay associated with the level crossings.
Fear, Intimidation and Pedestrian Amenity / Delay	Increases in traffic on L5507, mostly light vehicles, as a result of the Operational Phase are major.	Adverse	Not Significant	Permanent	Dangers associated with level crossings removed.
Severance	Increases in traffic on L5507, mostly light vehicles, as a result of the Operational Phase are major.	Adverse	Not Significant	Permanent	The proposed diversion route and road-over-rail bridge usage will improve road standards and remove the dangers associated with level crossings.
	Removal of level crossings.	Positive	Significant	Permanent	

11.6.6 XC219 Buttevant Assessment

Growthed 2019 baseline traffic flows to future years 2021 and 2022, as shown in Table 11.41 Table 11.41, indicate that there would be very little change in overall numbers over the construction period. These increases suggest a negligible operational impact over this period if no works were carried out.

Table 11.41: Buttevant Baseline and Projected AAWT.

Traffic Counter	Road	Directions Combined (2019)	Directions Combined (2019)	Directions Combined (2019)	Directions Combined (2021)	Directions Combined (2021)	Directions Combined (2022)	Directions Combined (2022)
		AAWT	Heavies	%Heavies	AAWT	Heavies	AAWT	Heavies
ATC10	R522	2,275	117	5.2	2,310	122	2,328	125

Construction Phase

Assessment of Construction Phase Traffic Generation

A total of 54 two-way vehicle trips per day are predicted during the worst-case Construction Phase, comprising 34 two-way HGV movements and 20 two-way car / Light Goods Vehicles (LGV) movements. The trip generation has been added to the projected 2021 AAWT, detailed in Table 11.41, in order to confirm the percentage increase in traffic associated with the proposed Project Construction Phase. In order to assess the worst-case impact, robust assumptions have been made that all construction related traffic will pass through the traffic counter location. This is an extremely robust approach as the volumes of traffic passing the ATC location could in reality be significantly lower and therefore the assessment of construction related traffic is very much worst-case.

Table 11.42 details the percentage increases in total traffic. Table 11.43 details the percentage increases in HGV traffic. The following paragraphs discuss the impacts on key sections of the road network (based on strategic ATC locations) and sensitive receptors as a result of the increase in traffic associated with the Construction Phase of the proposed Project.

Table 11.42: Buttevant Worst-case Construction Phase Percentage Increase in Total Traffic

Traffic Counter	Road	% Split at each ATC	Projected Base AAWT (2021)	Worst-case Daily Construction Total Vehicles (Two Way)	% Increase in Total Vehicles
ATC10	R522	100%	2,310	54	2.3%

Table 11.43: Buttevant Worst-case Remediation Percentage Increase in HGV Traffic

Traffic Counter	Road	% Split at each ATC	Projected Base HGVs (2021)	Worst-case Daily Construction HGVs (Two Way)	% Increase in HGVs
ATC10	R522	100%	122	34	27.9%

In terms of the percentage increase of total vehicles (HGVs + Cars) shown in Table 11.42 the proposed Project will have a negligible impact on all assessed road sections based on the criteria outlined in Table 11.2, where a negligible impact is predicted on percentage increases of less than 30%. With regards to HGV movements, the percentage increases for the R522 (ATC10) outlined in Table 11.43 also suggests a negligible impact on the road network in accordance with the IEMA criteria as detailed in Table 11.2. Consequently, no significant impacts are predicted to arise from Construction Phase related traffic generated by the proposed Project and as such no TTA will be required due to the temporary nature of the works and low flows involved.

Accidents and Safety

A review of Road Safety Authority Collision Statistics was undertaken, which provided details of all collisions on the roads surrounding the proposed Project, between 2012 and 2016, identified no accidents in the immediate vicinity of the existing crossing XC219 Buttevant. The following two minor accidents were, however, identified on the R522/N20 nearby:

- Minor accident on R522 west of N20 in 2014 (Car); and
- Minor accident at R522/N20 junction in 2014 (Car);

It is clear from the observed data that only a small number of accidents have occurred close to the proposed Project, none of which are where the construction will take place and as such it is clear that there are no existing accident or safety issues based on these statistics. However, given the identified need for significant volumes of material import via HGV there is a perceived increase in risk of accidents due to the road widths and speeds.

Driver Delay

Traffic delays as a result of Construction Phase traffic could occur along the local rural routes outlined in Section 11.5.6. The IEMA Guidelines note that *“these delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system”*.

The road network surrounding the proposed Project is currently operating comfortably within capacity, which is confirmed by comparing the baseline and projected AAWT flows in Table 11.41 with the anticipated capacity outlined within Table 11.3 Projections show that the road will continue to operate below its capacity with the addition of Construction Phase related traffic flows, taken as the worst-case scenario. The increases in flow are therefore anticipated to not have a significant impact on driver delay. Notwithstanding this, mitigation will be provided as described in Section 11.7.

Fear, Intimidation and Pedestrian Amenity / Delay

Traffic volume, composition and speeds, in combination with pedestrian footways and crossings, contribute to the level of general unpleasantness, fear, intimidation and delay experienced by pedestrians and other vulnerable road users.

As previously outlined in Section 11.5.6, east of the existing level crossing a footpath runs the entire length of the R522 providing access to the local town. Even with the lack of cycle provision some locals may also use this route to commute by bicycle, however, Table 11.17 shows the numbers of NMUs using the existing crossing are very low.

During the worst-case Construction Phase, it is predicted that 54 two-way movements per day will access the proposed Project area, which equates to an average of less than 8 two-way movements per hour. It is clear when comparing the worst-case traffic impact during Construction Phase, with the theoretical operating capacity of the local roads (Table 11.3), that there is ample available capacity in order to accommodate the increases in traffic associated with all parts of the Construction Phase of the proposed Project. As such, the Construction Phase of the proposed Project may be perceived to have a significant impact on fear, intimidation and delay. Therefore, mitigation measures outlined within Section 11.7 will ensure that any impacts are kept at a minimum.

Severance

The IEMA Guidelines note that "*Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery*".

During the worst-case of Construction Phase, it is predicted that 54 two-way movements per day, the majority of which are HGVs, will access the proposed Project, which equates to an average of less than 8 two-way movements per hour, which are not likely to lead to any severance issues. The low levels of additional traffic generated by the proposed Project coupled by the strategic routing of HGVs ensure that the issues of severance are not significant. Notwithstanding this, mitigation measures outlined within Section 11.7 will ensure that any impacts are kept at a minimum.

Summary of Environmental Impacts (Construction Phase)

In terms of the above outlined Environmental Impacts the performance of the Construction Phase for the proposed Project in relation to the EPA Guidelines (as detailed in Section 11.4.5) is summarised in Table 11.44 below.

Table 11.44: Buttevant Summary of Environmental Impacts (Construction Phase)

Environmental Impact	Environmental description	Impact	Quality of Effects	Significance	Duration	Comments
Accidents and Safety	Increases in traffic, most notably HGVs.		Adverse	Significant	Temporary	The proposed mitigation measures will assist in managing and reducing these effects.
Driver Delay	Increases in traffic on the road network as a result of Construction Phase activities, most notably slow-moving HGVs.		Adverse	Not Significant	Temporary	The proposed mitigation measures, most notably the timing and routing of Construction Phase traffic, will assist in minimising these effects.
Fear, Intimidation and Pedestrian Amenity / Delay	Increases in traffic on the road network as a result of Construction Phase activities, most notably HGVs.		Adverse	Significant	Temporary	The proposed mitigation measures, most notably the timing and routing of Construction Phase traffic,

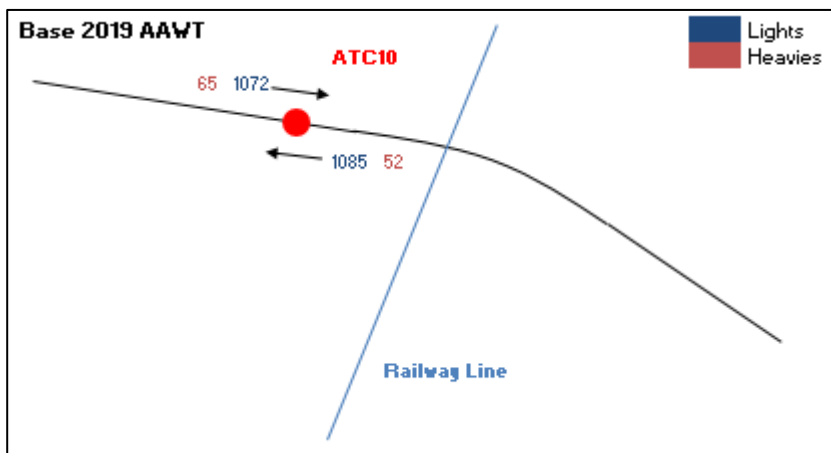
Environmental Impact	Environmental Impact description	Quality of Effects	Significance	Duration	Comments
	The potential for HGVs moving to / from the site in platoons.	Adverse	Significant	Temporary	will assist in minimising these effects.
Severance	Increases in traffic on the road network as a result of Construction Phase activities, most notably HGVs.	Adverse	Not Significant	Temporary	The proposed mitigation measures, most notably the timing and routing of Construction Phase traffic, will assist in minimising these effects.
	The potential for HGVs moving to / from the site in platoons.	Adverse	Significant	Temporary	

Operational Phase

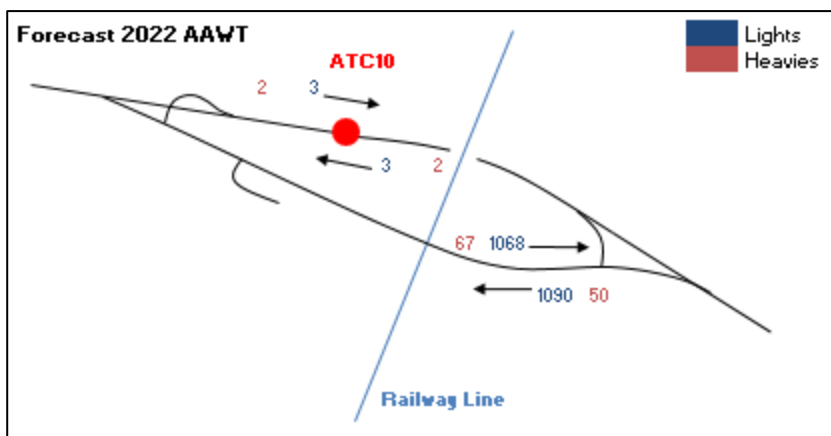
During the operational phase of the proposed Project there will be no additional traffic generated by the works other than the very occasional inspection or maintenance of the new road-over-rail bridge which is negligible. There is minimal rerouting of traffic expected with the new alignment of the road-over-rail bridge reducing the amount of traffic adjacent to the existing XC219 Buttevant crossing and as such no TTA will be required due to the low flows involved.

Between January 2016 and June 2019 there were six crossing incidents; five of these related to crossing equipment issues/failures while the other involved a vehicle strike the crossing gate/barrier. The new road-over-rail bridge will therefore provide improved safety for both vehicle and non-motorised users and unconstrained access across the railway line as a result of the road upgrade and level crossing closure. Delays as a result of the existing level crossing can be around six minutes for one train to pass but could be up to 10 minutes depending on circumstances and so operationally the road network will be far more efficient. Inset Figure 11.25 and Inset Figure 11.26 show the comparison of the 2019 traffic flows and forecast 2022 traffic flows with predicted new distribution.

Inset Figure 11.25: 2019 Baseline Traffic Distribution.



Inset Figure 11.26: 2022 Forecast Traffic Distribution.



11.6.7 Combined Effects of all Proposed Sites

Once completed it is not anticipated that there will be any significant cumulative effects as a result of the proposed Project on traffic in the study area. Although the construction phases at each proposed crossing may overlap, they are far enough apart to have a negligible impact on each other; except for proposed crossings XC211 and XC212 Newtown & Ballycoskery which have been considered together within this chapter for this reason.

Beyond the study area boundary, it is predicted that the construction traffic would be fully integrated within the wider road network without any significant delay or effects.

The Projects will improve the safety and reliability of the Dublin to Cork rail line and the relevant road interfaces which form the proposed Projects detailed within this chapter.

11.7 Mitigation Measures

As a result of the construction and operation of the proposed Project, the following measures aim to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, identify any proposed monitoring arrangements.

This section explains the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and covers both the Construction and Operational Phases.

11.7.1 Construction Phase

Careful consideration of the roads network has been undertaken to develop mitigation measures aimed at minimising the effects of construction traffic, including preferred routes to and from the proposed Project site compounds and routes to/from the individual construction sites.

The recommended routes consider the physical characteristics of the roads network and the number and location of potentially sensitive receptors along the various routes. It is imperative that construction traffic use the N20 national road to the nearest junction where it then must deviate to reach the relevant project construction compound, and where practical uses the R-class roads, with little or no traffic management measures, and only deviating where necessary e.g. to reach individual sites. The route selection will play a significant role in minimising impacts.

Prior to commencement of construction, the appointed contractor shall prepare a Construction Traffic Management Plan (CTMP) for each proposed Project. The purpose of the CTMP is to set out management and mitigation measures to prevent or minimise the transport impacts during the Construction Phase of the proposed Project.

The CTMP shall include details of the following:

- Regulated site working hours i.e. construction traffic will, where practicable, avoid heavy volumes of movement during peak periods, particularly in the morning and evening peak hours when general traffic levels will be higher than normal;
- Identify to all staff and contractors the appropriate and safe routes to and from the proposed Project and will through consultation with Cork County Council and Limerick City and County Council;
- Confirmation of routeing for HGV traffic;
- Timing of HGV movements to take place outside of peak flow hours, where practicable, in order to minimise disruption to general traffic flows on the road network;
- Appropriate warning signs to be erected to warn other road users of the presence of HGV's and general Construction Phase related traffic.
- Where appropriate, additional warning and speed control signs will be installed to warn other road users of the presence of HGV's and general Construction Phase related traffic, whether temporarily or otherwise, with the agreement of the Roads Authority;
- A wheel wash facility and road sweeper shall be provided to minimise any mud and debris on the surrounding public road network and prevent the introduction of non-native or invasive plant material onto the site;
- The temporary closure of public rights of way to facilitate construction activity will be discussed with local council Access Officer(s) at an early stage and suitable diversions agreed. All rights of way will be reinstated to their original state and some will be improved as a result of the proposed Project. Considering the potentially long-term nature of some closures, suitable consideration will be given to providing alternatives, which may necessitate due consideration of suitable crossing facilities, to existing standards, that minimise delay and optimise safety for all users; and
- At some locations the potential for conflict on the road could be easily mitigated by the stationing of a "Stop-Go" banksman with appropriate communications between the two and the construction vehicle drivers.

It is proposed that the CTMP shall provide for regular inspections to be carried out to ensure that agreed mitigation measures, as outlined above, are being undertaken.

To help reassure the local community, it is anticipated that a Traffic Management Plan will be developed detailing ways to reduce the construction traffic effect, including:

- Avoiding transit at school arrival and departure times.

- A communications protocol to avoid delays with emergency vehicle traffic.
- A diary of proposed delivery movements to liaise with the communities to avoid key dates such as festivals etc.
- Notices will be published, and advice given to the public and employers in the area of the likely increased driver delay as a result of the works. Drivers will be encouraged to reduce their need to travel where possible, particularly during the peak periods when delays will be most pronounced.
- Working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic.

A construction specific Travel Plan is also proposed to provide the mechanism to support and promote sustainable travel for staff, contractors and visitors travelling to the proposed Project sites. The Travel Plan would seek to eliminate the barriers preventing users of the site from accessing via sustainable travel modes, improving travel choices and managing single occupancy car use.

In terms of severance beyond that associated with increased traffic flows, it is also necessary to consider the potential effects of temporarily closing existing pedestrian and cycle routes and any related impact on delay.

Any alternative routes will likely have to make use of the surrounding network. It will be paramount that any diversion route minimises delay and optimises safety for users. This will require avoiding/eliminating features that may pose a hazard to visually impaired users e.g. bollards, barriers or restrict access by infirm, disabled or other users e.g. gradients. This will also entail the incorporation of tonal contrast into the design where appropriate, which is particularly important for visually impaired users, as well as providing a suitable temporary signing strategy that is clear and conspicuous.

Nevertheless, to minimise delay, optimise safety and mitigate any pedestrian amenity impact for all people walking and cycling, including disabled users, the level of provision of crossing facilities will have to be assessed taking anticipated traffic volumes into account, and will have to recognise existing good practice e.g. dropped kerbs flush with road surface, double transition kerbs, tactile surfaces etc.

11.7.2 Operational Phase

As identified within this assessment, there would be no additional traffic generated during the Operational Phase, other than occasional routine maintenance, as only a redistribution of the existing traffic will occur and as such no specific mitigation relating to this phase has been identified over and above the high-quality sections of new carriageway. However, the TP would continue through operation of the proposed Project developments and seek ways in which to promote active and sustainable travel to maintenance staff.

11.8 Residual Effects

11.8.1 Construction Effects

Considering that the nature of traffic increase would be short term, the mitigation measures outlined previously would ensure that there would be no significant residual effects. A summary justification is as follows:

- a CTMP will minimise, as far as practicable, traffic impacts during the Construction Phase;
- large sections of the proposed delivery routes are on national roads, which are established HGV routes;
- the maximum traffic increases as a result of the Construction Phase related traffic will be temporary; and
- environmental impacts identified will be managed through the mitigation measures outlined above, thus ensuring the impacts are not significant.

11.8.2 Operational Effects

Although there will be an increase of traffic on some local roads due to rerouting as a result of existing crossing closures this is not considered significant. Generally, there will be negligible residual effects on the existing road

network from the operation of the proposed Project. The Projects will improve the safety and reliability of the Dublin to Cork rail line and the relevant road interfaces which form the proposed Projects detailed within this chapter.

11.9 Monitoring

Inspections of the CTMP and construction Travel Plan would be undertaken on a regular basis by the successful contractor of the Projects to confirm these measures are proving effective at reducing effects. Where necessary, mitigation measures would be reviewed and amended in consultation with the relevant local authority.

11.10 Cumulative Effects

Even if the construction phases at each existing crossing within the proposed Project overlap, they are far enough apart to not have a significant impact on each other; except for proposed crossings XC211 and XC212 Newtown & Ballycoskery which have been considered together within this chapter as a result. It is, however, not anticipated that there will be any significant construction or operational changes.

The N20, running north to south from Limerick to Cork, is proposed to be upgraded to the M20 motorway in its entirety. This scheme is included in the National Development Plan and is currently within the design stage with construction anticipated to commence in 2023 with completion in 2027.

As the proposed Project is projected for completion in October 2022 it is anticipated that there will be no overlap with the M20 construction programme. The N20 and R515 roads that may be impacted by this proposed Project are large enough in capacity to incorporate the construction traffic into the wider network, however, this would be considered within EIA and TTA assessments prepared for the M20 scheme.

11.11 Difficulties Encountered in Compiling Information

Issues in confirming the initial survey dates due to their availability and a technical issue with a camera that meant one counter covered a different time period. A number of Surveys needed to be retaken where PEDs weren't initially considered.

11.12 References

Department of Environment, Community and Local Government (2013), Traffic Infrastructure Ireland. Design Manual for Roads and Bridges.

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