# Cork Line Level Crossings

## Volume 3, Chapter 15: Air Quality

## Iarnród Éireann

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# Cork Line Level Crossings

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## Contents

**15. Air Quality** ..... **1**
15.1 Introduction ..... 1
15.1.1 Emission Sources Scoped Out ..... 1
15.1.2 Emission Sources Considered in this Chapter ..... 2
15.2 Study Area ..... 2
15.2.1 Consultation Responses ..... 3
15.3 Baseline Environment ..... 6
15.3.1 XC187 Fantstown ..... 7
15.3.2 XC201 Thomastown ..... 7
15.3.3 XC209 Ballyhay ..... 7
15.3.4 XC211 & XC212 Newtown and Ballycoskery ..... 8
15.3.5 XC215 Shinanagh ..... 8
15.3.6 XC219 Buttevant ..... 9
15.4 Assessment Methodology ..... 9
15.4.1 Legislation, Policy & Guidance ..... 9
15.4.2 Assessment Methodology ..... 10
15.5 Potential Effects of the proposed Project ..... 11
15.5.1 XC187 Fantstown ..... 11
15.5.2 XC201 Thomastown ..... 11
15.5.3 XC209 Ballyhay ..... 12
15.5.4 XC211 & XC212 Newtown and Ballycoskery ..... 12
15.5.5 XC215 Shinanagh ..... 12
15.5.6 XC219 Buttevant ..... 13
15.5.7 Combined Effects of all Sites ..... 13
15.6 Mitigation Measures ..... 14
15.6.1 Construction Phase ..... 14
15.6.2 Operational Phase ..... 16
15.7 Residual Effects ..... 16
15.8 Interactions ..... 16
15.9 Cumulative Effects ..... 16
15.10 Difficulties Encountered in Compiling Information ..... 16
15.11 References ..... 17
Table 15.1: Consultation Responses ..... 4
Table 15.2: Study areas for construction and operation ..... 5
Table 15.3: Summary of annual mean monitoring data for Zone D monitoring stations, 2018 data ..... 6

# Table of Acronyms

| Acronym | Meaning |
|---|---|
| AADT | Annual Average Daily Traffic Flow |
| CO | Carbon monoxide |
| DMP | Dust Management Plan |
| DMRB | Design Manual for Roads and Bridges |
| EIAR | Environmental Impact Assessment Report |
| EPA | Environmental Protection Agency |
| HDV | Heavy Duty Vehicle |
| IAQM | Institute of Air Quality Management |
| LC | Level Crossing |
| LDVs | Light Duty Vehicles |
| $NO_2$ | Nitrogen Dioxide |
| NRA | National Roads Authority |
| $PM_{10}$ | Particulate Matter 10 micrometres or less in diameter |
| $PM_{2.5}$ | Particulate Matter 2.5 micrometres or less in diameter |
| $SO_2$ | Sulphur Dioxide |
| $\mu g/m^3$ | micrograms (one-millionth of a gram) per cubic meter |

# 15. Air Quality

## 15.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) presents the potential air quality effects resulting from the construction and operation of the proposed Project on nearby sensitive receptors and locations such as places where people live or sensitive plants and ecosystems. The chapter also includes: a summary of the baseline air quality conditions; legislation, policy and guidance; assessment methodologies and criteria and identifies any mitigation required to prevent significant air quality effects.

The construction activities associated with the proposed Project would comprise various activities including earthworks, material stockpiling and the construction of new embankments, road carriageways, road surfaces, culverts and bridge structures. Unless properly controlled, there is the potential for these construction activities to generate dust emissions, which could adversely affect amenity at nearby locations through depositing on surfaces. Dust emissions from the proposed construction activities could also lead to an increase in $PM_{10}$ and $PM_{2.5}$[1] concentrations at nearby locations, which could affect health.

Additional road traffic on the local road network during the construction phase (e.g. construction workers travelling to and from the site and material / plant deliveries etc.) would lead to emissions of nitrogen dioxide ($NO_2$), $PM_{10}$ and $PM_{2.5}$ from vehicle exhausts. There would also be exhaust emissions of these pollutants from diesel-powered construction plant and machinery operating within each level crossing construction site boundary. These could lead to increases in concentrations at locations such as residential properties close to the local road network or the construction sites.

During the operational phase of the proposed Project, changes in the emissions of pollutants ($NO_2$, $PM_{10}$ and $PM_{2.5}$) and resulting concentrations at local receptors could occur due to:

- physical alterations to the horizontal and/or vertical alignment of the road carriageway (e.g. where this leads to the road being closer to existing residential properties than the current situation); or
- changes to the traffic flow, traffic flow composition or vehicle speed on the local road network.

Other pollutants such as sulphur dioxide (SO2) and carbon monoxide (CO) are also emitted from combustion processes. However, these are not relevant for the assessment of this type of scheme given the very low rural background concentrations and low potential for emissions from sources associated with the proposed Project to lead to measurable or significant increases at any nearby sensitive locations. These pollutants are not considered further.

### 15.1.1 Emission Sources Scoped Out

As described in the EIA Screening & Scoping Report published for Public and Statutory Stakeholders on 20th November 2019 and updated in February 2020, emissions of dust during construction were scoped out from the air quality assessment on the basis that the construction activities associated with each of the level crossings are relatively small-scale. Guidance produced by the Institute of Air Quality Management (IAQM) (IAQM, 2016) was used at the scoping stage to identify the likely dust risks for each of the level crossings. This consideration concluded that given the low to medium risks of dust impacts, the application of a suite of appropriate good practice mitigation measures and management techniques, as set out in the IAQM guidance (IAQM, 2016), would ensure significant effects from dust emissions would not occur. The proposed good practice mitigation measures are described in Section 15.6 of this chapter.

The construction works associated with any development would not normally proceed without the adoption of standard good practice dust mitigation measures and controls such as those set out in Section 15.6. Any

1 $PM_{10}$ and $PM_{2.5}$ is particulate matter with an aerodynamic diameter of 10 microns or less and 2.5 microns or less, respectively.

significant adverse environmental effects are either avoided or reduced through design and management before the proposal is finalised, and thus the pre-mitigation effects are not applicable. Therefore, in line with the IAQM guidance, the mitigation measures set out in Section 15.6 which would be taken forward for implementation on site through an appropriate management plan are considered to represent the good practice mitigation (i.e. mitigation that would be expected to be implemented as standard good practice). The significance of effects is only assigned to the construction dust emissions after considering the construction activities with the implementation of the good practice mitigation (i.e. the residual effects would be not significant and there is no requirement to make a judgement on significance in Section 15.7).

Similarly, for emissions of pollutants from construction plant and machinery, it was also concluded in the scoping report that, given the relatively low number of diesel plant items anticipated to be in operation simultaneously on each of the construction sites, an assessment of the emissions was not required and scoped out from the air quality assessment. This is in accordance Section 4.1 of the IAQM guidance (IAQM, 2016) as follows:

*"Experience of assessing the exhaust emissions from on-site plant (also known as Non-Road Mobile Machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed."*

In addition, good practice mitigation measures are proposed to control emissions from plant and machinery as described in Section 15.6 of this chapter, and the residual effects of these emissions are described as not significant in Section 15.7.

It is anticipated that the proposed good practice mitigation measures and management techniques to control dust and construction plant emissions would be taken forward for inclusion in an appropriate management plan to be implemented by the contractor during the construction phase. The management plan and mitigation measures would be appropriately secured through the Railway Order Application process following approval by the relevant stakeholders prior to construction works commencing.

### 15.1.2 Emission Sources Considered in this Chapter

A review of the proposed Project and traffic flow information for the different level crossings was undertaken as part of the EIA Screening & Scoping Report process. The additional road traffic movements on the local road network associated with the construction activities at each level crossing (i.e. construction staff and visitors, material and consumables deliveries and plant deliveries) were considered unlikely to be large enough to result in a non-negligible change in concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ at roadside locations. However, this was based on limited data on traffic flows for the construction phase and, therefore, this aspect was not scoped out of the air quality assessment and is assessed within this chapter.

With regard to the operational phase of the proposed Project, some consideration was given to the likely changes to alignment and proximity of the proposed Project at each level crossing to understand the likelihood of significant adverse effects to arise. This also took into consideration the relatively low traffic flows on the local roads upon which the existing crossings are located and low existing concentration of pollutants. In summary, this concluded that quantitative assessment of road traffic emissions for the operational phase of the proposed Project is unlikely to be required and air quality effects are likely to be negligible. However, the EIA Screening & Scoping Reports concluded that road traffic emissions for the operational phase would be assessed as part of EIAR to confirm this view using relevant information generated for the assessment of traffic and transport (see Volume 3, Chapter 11: Traffic & Transport).

## 15.2 Study Area

The study area for the assessment of road traffic emissions on the local road network is based on a distance of up to 200m from those road links that are affected by the proposed Project. In order to identify the 'affected road network', certain criteria are used against which the traffic data and proposed Project designs are screened against.

National Roads Authority (NRA) guidance (NRA, 2011) recommends a quantitative assessment of road traffic emissions should be undertaken when the proposed Project leads to a 5 – 10% increase in the annual average daily traffic flow (AADT). In other words, the affected road network would comprise all those road links which exceed this criterion and the study area would include all locations within 200m of each of the affected road links. However, this criterion is designed for construction of National Primary Roads and National Secondary Roads where the AADT would be expected to be much higher than local or regional roads affected by the proposed Project e.g. a minimum of around 10,000 AADT and is not directly applicable to the proposed Project. Using this criterion for regional and local roads would not be appropriate as the traffic flows are considerably lower than would be expected on national roads and a 10% increase in AADT would represent a negligible change (e.g. a change of 25 – 50 vehicle movements on a road with an AADT of only 500 would be a negligible change).

The Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3 Part 1 HA207/07 Air Quality (DMRB HA207/07) (Highways Agency et al, 2007) identifies affected road links as those which the following traffic flow criteria (i.e. where there is the potential for changes in traffic flows to lead to non-negligible increases in pollutant concentrations and which should be taken forward for assessment):

- Daily traffic flows (two-way) will change by more than 1,000 AADT or more; and
- Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more.

The DMRB guidance also includes criteria for identifying an affected road link based on whether there is a road carriageway alignment change of greater than 5m or where the average and peak hour speed would change by more than 10km/h and 20km/h, respectively. These criteria would be more relevant for the operational phase to identify where the preferred solutions, which require new or amended routes to cross the Dublin – Cork Railway Line moving closer to sensitive receptors and the traffic flows on the new roads or road alignments, would be sufficient to lead to non-negligible changes in air quality. The above flow change criteria have been used to identify if the traffic flows are high enough to potentially lead to a non-negligible change (i.e. the total traffic flow on the amended or new route is 1,000 AADT or higher or the AADT of HDVs is 200 or more). In other words, a new route or alignment change greater than 5m for some of the level crossing options is not automatically an appropriate pre-cursor for requiring a quantitative air quality assessment given the low traffic flows currently on these level crossings. If the total traffic flows or HDVs on the new or amended route to cross the Dublin – Cork Railway Line are less than these criteria any changes would be negligible, regardless of whether the scheme resulted in the route moving closer to nearby sensitive properties or locations. In some cases, it may be appropriate to undertake a qualitative assessment rather than a quantitative assessment if the traffic flows on road links associated with the changes are above these criteria, but below a level which could potentially have a direct influence on local air quality (e.g. an AADT of around 5,000).

A summary of the process adopted to determine the study area for assessing each level crossing or the combined effect of the construction / operation of all level crossings is set out in Table 15.2. The traffic flow data were based on the traffic flow estimates for 2021 (construction) and 2022 (operation) as described in Volume 3, Chapter 11: Traffic & Transport. The table shows that, based on the anticipated changes to traffic flows being less than the relevant flow criteria, no specific assessment is required for the construction phase and a specific study area was not required. A qualitative assessment was required for the operational phase at one of the level crossings (XC215 Shinanagh). The study area for the assessment of air quality at this crossing was defined as 200m from the new road sections.

### 15.2.1 Consultation Responses

The key issues raised during consultation with prescribed bodies and other consultees in relation to Air Quality are broadly summarised below in Table 15.1.

Table 15.1: Consultation Responses

| Consultee Comments | Response |
|---|---|
| **Transport Infrastructure Ireland (TII) (updated response 17th September 2019)**<br>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 is required.<br>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). | This chapter includes consideration of the TII Guidance, the Guidelines for the Treatment of Air Quality During the Planning and Construction of national Road Schemes (see section 15.2 (Study Area) and section 15.4 (Assessment Methodology). |

Table 15.2: Study areas for construction and operation

| Level Crossing | Construction | | | Operation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Exceed flow change criteria on any road link (1000 total or 200 HDVs as AADT)? | Assessment type? | Specific study area required? | Preferred solution | Requires diversion, new road or bridge? | Route alignment change >5m? | New/diverted route closer to any receptors within 200m? | Total traffic flows on new/diverted route in 2022 (AADT) (HDVs shown in brackets) | Assessment type? | Specific study area required? |
| XC187 Fantstown | No | **None required** | **No** | Closure, diversion to existing alternative route | Yes | N/A | Yes (~50 properties) | 19 (0) | **None required** | **No** |
| XC201 Thomastown | No | **None required** | **No** | Closure, alternative access (new road and bridge) | Yes | Yes | Yes (4 properties) | 25 (1) | **None required** | **No** |
| XC209 Ballyhay | No | **None required** | **No** | Remains open, upgrade to CCTV | No | No | N/A | N/A | **None required** | **No** |
| XC211 Newtown | No | **None required** | **No** | Closure, alternative access (new road to connect to existing road) | Yes | Yes | Yes (1 property) | 98 (3) | **None required** | **No** |
| XC212 Ballycoskery | No | **None required** | **No** | Closure, alternative access (new road and bridge) | Yes | Yes | Yes (1 property) | 771 (40) [1] | **None required** | **No** |
| XC215 Shinanagh | No | **None required** | **No** | Closure, alternative access (new road to connect to existing road and bridge) | Yes | Yes | Yes (~6 properties) | 1027 (48) to 1140 (58) | **Qualitative / simple-quantitative** | **Yes** |
| XC219 Buttevant | No | **None required** | **No** | Closure, alternative access (new road and bridge) | Yes | Yes | No | 2135 (97) | **None required** | **No** |
| Combined effect on wider road network | No | **None required** | **No** | N/A | | | | | | |

Note 1: based on the combined movements at the junction of the L1533 and the unnamed road connected to the new road associated with the XC211 development to the north. Other sections of the L1533 to the west of this junction are greater than 200m from the relevant property.

## 15.3 Baseline Environment

As part of an initial desktop study undertaken to inform this assessment, the following data sources were reviewed:

- mapping of the local area supplied by Ordnance Survey Ireland;
- preliminary design drawings for the level crossing including closure and diversion proposals, over and under bridge proposals;
- traffic flow information at the level crossings; and
- air quality data and reports produced by the Environmental Protection Agency (EPA).

The Air Quality in Ireland Report 2018 (EPA, 2019) and associated supplementary data tables provides a summary of the measurements of pollutants undertaken at 57 monitoring locations across Ireland that formed the National Ambient Air Quality Monitoring Network in 2018. The monitoring data are split into four different zones based on monitoring location, with Zone D representing Rural Ireland (i.e. locations that are not located in Dublin, Cork or other urban areas including cities and towns).

There are no national or local monitoring stations close to any of the level crossings, therefore the measurements at other rural locations in Ireland were assumed to be representative of the existing rural baseline conditions at all of the level crossings. The Air Quality in Ireland Report 2018 and associated supplementary data appendix were reviewed to obtain the data for rural (i.e. Zone D) measurements of $NO_2$, $PM_{10}$ and $PM_{2.5}$ across Ireland. The data for these pollutants are summarised in Table 15.3The air quality limit values as specified in the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) are also included in Table 15.3.

Table 15.3: Summary of annual mean monitoring data for Zone D monitoring stations, 2018 data

| Pollutant | Zone D Monitoring Stations | Annual mean Concentration range in 2018 (µg/m$^3$) | Annual mean limit value (µg/m$^3$) | Other limit values |
|---|---|---|---|---|
| $NO_2$ | Emo Court, Castlebar and Kilkitt | 3 – 8 | 40 | No exceedances of the one-hour mean limit value of 200µg/m$^3$ recorded (18 exceedances are permitted per year). |
| $PM_{10}$ | Castlebar, Claremorris, Cobh, Roscommon Town and Kilkitt | 9 – 15 | 40 | No exceedances of the 24-hour mean limit value of 50µg/m$^3$ (35 exceedances are permitted per year). |
| $PM_{2.5}$ | Cobh, Claremorris, Enniscorthy, Roscommon Town and Longford | 6 – 13 | 20 | N/A |

There were no exceedances of the one-hour mean limit value of 200µg/m3 for $NO_2$ or exceedances of the 24-hour mean $PM_{10}$ limit value of 50µg/m3 in 2018.

Concentrations of other pollutants in Zone D (Zone C for CO) associated with combustion of fuels such as SO2 and CO were also reported to be well below the relevant limit values.

As noted above, construction activities may generate emissions of dust, which could deposit on surfaces causing annoyance. Although there are no specific measurements of dust deposition in the vicinity of the level crossings, it is anticipated that existing dust deposition levels would be typical of rural levels (i.e. generally relatively low and well below the level which could affect amenity). Exceptions could be during windy periods in summer or during a prolonged dry spell which coincides with agricultural activities when elevated dust deposition could be experienced at sensitive locations such as residential properties.

Based on the information presented above, there is sufficient existing air quality data to demonstrate that air quality in the vicinity of the proposed level crossing schemes is likely to be good and concentrations of pollutants are well within the relevant air quality standards. Therefore, a specific baseline air quality survey in the vicinity of the proposed Project was not required. With regard to dust deposition, this could be undertaken prior to construction activities commencing if baseline data are considered to be required.

### 15.3.1 XC187 Fantstown

**Desk Top Study**

The XC187 Fantstown Level Crossing is located approximately 3km to the east of Kilmallock in the townland of Fantstown, County Limerick. The level crossing is in a rural setting with a small number of individual residential properties located nearby. The nearest property is approximately 20m to the west of the level crossing and, as presented in Volume 3, Chapter 10: Noise and Vibration, there are a total of six residential properties within 300m of the level crossing. The nearest non-local road is the R515, which is approximately 400m to the south of the level crossing.

The available traffic flow information indicates a very low number of vehicles crossing the Dublin to Cork Railway Line via the XC187 Fantstown Level Crossing. A survey in June 2011 recorded a total of 17 light duty vehicles (LDVs) (i.e. motorcycles, cars and light goods vehicles) using the level crossing over the period of 24 hours. The 2019 survey recorded an AADT of 19 LDVs.

**Survey Work**

No specific air quality surveys were required to inform the assessment, which relied on existing data or data produced from surveys undertaken by other disciplines (e.g. traffic and transport surveys).

### 15.3.2 XC201 Thomastown

**Desk Top Study**

The XC201 Thomastown Level Crossing is located approximately 4.6km west southwest of Kilmallock and approximately 4.5km east southeast of Charleville in the townland of Thomastown, County Limerick. The level crossing is in a rural setting with a small number of individual residential properties located nearby, the nearest of which is within 5m of the level crossing. As presented in Volume 3, Chapter 10: Noise and Vibration, there are a total of 13 residential properties within 300m of the level crossing. The nearest non-local road is the R515, which is approximately 270m to the north of the level crossing.

The available traffic flow information indicates a very low number of vehicles crossing the Dublin to Cork Railway Line via the XC201 Thomastown Level Crossing. The survey in June 2011 recorded a total of 31 LDVs using the level crossing over the period of 24 hours. The 2019 survey recorded an AADT of up to 25 travelling on the road towards the crossing (24 LDVs and 1 HDVs).

**Survey Work**

No specific air quality surveys were required to inform the assessment, which relied on existing data or data produced from surveys undertaken by other disciplines (e.g. traffic and transport surveys).

### 15.3.3 XC209 Ballyhay

**Desk Top Study**

The XC209 Ballyhay Level Crossing is located approximately 9.7km southwest of Kilmallock and approximately 3.4km south southeast of Charleville in the townland of Ballyhay, County Cork. The level crossing is in a rural setting with a small number of individual residential properties located nearby, the nearest of which is within 5m of the level crossing. As presented in Volume 3, Chapter 10: Noise and Vibration, there are a total of three residential properties within 300m of the level crossing.

The nearest non-local road is the N20 and L1322 junction, which is approximately 930m to the west of the level crossing.

The available traffic flow information indicates a very low number of vehicles crossing the Dublin to Cork rail line via the XC209 Ballyhay Level Crossing. The survey in June 2011 recorded a total of 303 LDVs and 23 HDVs using the level crossing over the period of 24 hours. The 2019 survey recorded an AADT of up to 204 travelling on the road towards the crossing (191 LDVs and 13 HDVs).

**Survey Work**

No specific air quality surveys were required to inform the assessment, which relied on existing data or data produced from surveys undertaken by other disciplines (e.g. traffic and transport surveys).

### 15.3.4 XC211 & XC212 Newtown and Ballycoskery

**Desk Top Study**

The XC211 Newtown Level Crossing is located approximately 11.6km southwest of Kilmallock and approximately 5km south of Charleville and 8.8km north of Buttevant in the townland of Newtown, County Cork. The level crossing is in a rural setting with a small number of individual residential properties located nearby, the nearest of which is approximately 10m to the south of the level crossing. The nearest non-local road is the N20, which is approximately 0.4km to the west of the level crossing. At its closest point (Beechwood Housing Estate), the small settlement of Ballyhea, which contains a school, a pre-school and a church, as well as residential properties, is located approximately 200m south of XC211 Newtown.

The available traffic flow information indicates a very low number of vehicles crossing the Dublin to Cork Railway Line via the XC211 Newtown Level Crossing. The survey in June 2011 recorded a total of 93 vehicles using the level crossing over the period of 24 hours. The 2019 survey recorded an AADT of up to 95 travelling on the road towards the crossing (93 LDVs and 2 HDVs).

The XC212 Ballycoskery Level Crossing is located on the L1533 road within the small settlement of Ballyhea, approximately 350m south of XC211 Newtown. The level crossing is in a rural setting with a small number of individual residential properties located nearby, including those within the Beechwood Housing Estate approximately 50m to the north west. A school is located approximately 50m to the east of the level crossing.

The nearest non-local road is the N20, which is approximately 300m to the west of the level crossing. The available traffic flow information indicates a relatively low number of vehicles on the L1533 crossing the Dublin to Cork Railway Line via the XC212 Ballycoskery Level Crossing. The survey in June 2011 recorded a total of 1054 total vehicles using the level crossing over the period of 24 hours. The 2019 survey recorded an AADT of up to 1319 travelling to and from the village on the L1533 at the junction with the N20 (1275 LDVs and 44 HDVs), although not all of these vehicles would use the crossing. The AADT on the section of the L1533 to the east of the XC212 Ballycoskery Level Crossing which is more likely to represent the traffic flow over the crossing was recorded as 935 (886 LDVs and 50 HDVs).

**Survey Work**

No specific air quality surveys were required to inform the assessment, which relied on existing data or data produced from surveys undertaken by other disciplines (e.g. traffic and transport surveys).

### 15.3.5 XC215 Shinanagh

**Desk Top Study**

The XC215 Shinanagh Level Crossing is on the L1320 located approximately 8.3km south of Charleville and approximately 5.4km north of Buttevant in the townland of Shinanagh, County Cork. The level crossing is in an isolated rural setting with no nearby residential properties. The nearest property is approximately 350m to the north northeast of the level crossing. The nearest non-local road is the N20, which is approximately 20m to the east of the level crossing.

The available traffic flow information indicates a relatively low number of vehicles crossing the Dublin to Cork Railway Line via the XC215 Shinanagh Level Crossing. The survey in June 2011 recorded a total of 1052 vehicles using the level crossing over the period of 24 hours. The 2019 survey recorded an AADT of 1004 travelling on the road towards the crossing (959 LDVs and 45 HDVs).

**Survey Work**

No specific air quality surveys were required to inform the assessment, which relied on existing data or data produced from surveys undertaken by other disciplines (e.g. traffic and transport surveys).

### 15.3.6 XC219 Buttevant

**Desk Top Study**

The XC219 Buttevant Level Crossing is located on the R522 approximately 1km northwest of Buttevant and approximately 13km south of Charleville in the townland of Buttevant, County Cork. The level crossing is in a rural setting with a small number of individual residential properties located nearby, the nearest of which is approximately 90m to the west of the level crossing. The nearest national road is the N20, which is approximately 0.9km to the east of the level crossing.

The available traffic flow information indicates a relatively low number of vehicles crossing the Dublin to Cork Railway Line via the XC219 Buttevant Level Crossing on the R522. The survey in June 2011 recorded a total of 1958 LDVs, 209 HDVs and 18 motorcycle (or pedal cycles) using the level crossing over the period of 24 hours. The 2019 survey recorded an AADT of 2130 travelling on the road towards the crossing (2002 LDVs and 95 HDVs).

**Survey Work**

No specific air quality surveys were required to inform the assessment, which relied on existing data or data produced from surveys undertaken by other disciplines (e.g. traffic and transport surveys).

## 15.4 Assessment Methodology

### 15.4.1 Legislation, Policy & Guidance

The following legislation, policy, guidance and reference documentation were relevant for the consideration and assessment of air quality effects for the proposed Project:

- Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). Transposes the relevant European Union (EU) directives (See Volume 2, Chapter 4: EIA Process and Methodology) which set out the air quality standards in Ireland and other EU member states. This includes standards for the most relevant air pollutants to the proposed Project ($NO_2$, $PM_{10}$ and $PM_{2.5}$). Any changes in air quality considered as part of the assessment took these into account, along with existing background concentrations in the study area, in determining the likely significance of effects of the proposed Project.
- The DMRB Volume 11 Section 3 Part 1 HA207/07 Air Quality (DMRB HA207/07) (Highways Agency et al, 2007). This guidance was used to determine where the proposed Project would lead to changes in traffic flows during the construction and operational phase which could potentially affect air quality. Where the changes were below the relevant criteria set out in the DMRB guidance, it was concluded that air quality changes would be negligible, and no further assessment would be required. As discussed previously, this guidance was used in preference to the NRA guidance (NRA, 2011) as it provided more relevant criteria for identifying the potential for significant effects to occur.
- The IAQM (2016) guidance on the assessment of dust from demolition and construction (version 1.1. June 2016). This guidance was used during the scoping phase to identify the likely risks associated with dust emissions during the construction phase. It was used to identify the broad requirements for dust mitigation across the proposed Project which are presented in this chapter (see Section 15.6). It was also used to confirm that emissions from on-site plant and machinery would be negligible and would not require specific assessment.

### 15.4.2 Assessment Methodology

**Construction Phase – Road Traffic Emissions**

The additional road traffic on the local road network associated with the construction of the proposed Project (i.e. construction staff and visitors, material and consumables deliveries and plant deliveries) were compared to the thresholds set out in the DMRB guidance (Highways Agency et al, 2007) (see Section 15.2 of this chapter). This was undertaken on an individual level crossing basis and also on a cumulative basis to determine the combined effect of constructing all level crossing solutions. The following assumptions were made to undertake the assessment.

- All construction activities at each level crossing were undertaken simultaneously (the phasing of the construction may lead to some activities not being carried out at the same time).
- The duration of construction activities at each level crossing was at least 12 months (the duration of construction activities at the level crossings are all less than 12 months, with some considerably less than 12 months). This meant that the AADTs calculated for each crossing and the combined AADT were overestimated.
- All construction traffic combined together onto a single road link (i.e. the N20 south of XC219 Buttevant for the consideration of the potential cumulative effect of all level crossing works (it is likely that construction traffic will disperse on the local network to different destinations (e.g. Mallow, Limerick, Cork or Tipperary etc) and it is unlikely that all vehicle movements associated with the construction activities will combine at any one location on the N20 (or on any other local, regional or national roads).

Even using the conservative assumptions as set out above, the construction traffic flows were below the criteria for requiring an assessment (see Section 15.4) both on an individual basis and if all vehicle movements were added together on the N20. In accordance with the DMRB guidance (Highways Agency et al, 2007), if none of the roads meet the traffic flow criteria for identifying an affected road, then the impact of the proposed Project can be considered to be neutral in air quality terms, and no further assessment is required. On this basis, the changes to pollutant concentrations at receptor locations close to the local road network would be negligible and the air quality effects would be insignificant. This is classed overall as a 'not significant' effect.

The approach to defining significance of air quality effects does not directly align with the approach to the categorisation of the sensitivity of receptors, magnitude of change or the determination of the significance level set out in Volume 2, Chapter 4: EIA Process & Methodology. This is because the relevant guidance on this subject (Highways Agency et al, 2007; IAQM, 2016) relates to defining whether an air quality effect is 'significant' or 'not significant' across the study area as a whole, rather than at individual receptor locations such as residential properties. As set out in the relevant guidance, it is not appropriate to define a level of significance described in Volume 2, Chapter 4: EIA Process and Methodology (i.e. slight, moderate, significant, very significant and profound) to air quality effects.

**Operational Phase – Road Traffic Emissions**

The consideration of the potential impacts of the operation of the proposed Project was undertaken on a similar basis to the construction road traffic. Although the operation of the proposed crossings subsequent to the completion of the construction phase would not generate additional road traffic, the changes could lead to additional vehicle movements on a new route (either constructed as part of the proposed Project or as a result of a diversion from a closed level crossing). The new route could move the road source closer to nearby receptors such as residential properties compared to the Do Nothing scenario and lead to increases in pollutant concentrations. Where the new route moved closer to any receptors, the scale of potential air quality impacts was initially determined by comparing the vehicle movements to the thresholds set out in the DMRB guidance (Highways Agency et al, 2007) As discussed in Section 15.4, the following approach was used.

- Did the proposed Project lead to a road source moving closer to a receptor? If not, the impact would be neutral in air quality terms, and no further assessment required. On this basis, the changes to pollutant concentrations at receptor locations close to the local road network would be negligible and the air quality effects would be insignificant.

- If the source was moved closer to a receptor, were the vehicle flows on the road source above the DMRB criteria (i.e. total traffic flow on the amended or new route is greater than 1,000 AADT or 200 HDVs). If not, then the changes to pollutant concentrations at receptor locations close to the local road network would be described as negligible and the air quality effects would be insignificant (i.e. not significant).
- If they were above 1,000 AADT but less than a nominal value of 5,000 AADT, then a qualitative / semi quantitative simple-level assessment using appropriate assessment tools and professional judgement was undertaken which considered the factors such as distance of the road source to the receptor, total vehicle flows and existing air quality concentrations to determine the likely significance of air quality effects. As shown in Table 15.2, this was required for one of the level crossings (XC215 Shinanagh). The effect was categorised as either 'significant' or 'not significant.' A further, more detailed, assessment was not required for any of the level crossing solutions as the traffic flows on the relevant road links were well below 5,000 AADT.

## 15.5 Potential Effects of the proposed Project

### 15.5.1 XC187 Fantstown

#### Do Nothing

If the proposed Project does not proceed traffic volumes are predicted to increase in line with natural traffic growth and would remain at around 19 vehicle movements as an AADT across the XC187 Fantstown Level Crossing in 2021. Concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ would remain at the low values representative of the rural location, well below the relevant air quality standards.

#### Construction Phase

It is proposed that the crossing would be closed, and traffic would be diverted along existing roads, so only minimal construction activities would be required at this site (e.g. a small wall or gate to stop up the crossing). Therefore, no construction impacts are expected in relation to road traffic emissions.

#### Operational Phase

As traffic is proposed to be diverted along existing roads there is the potential for an increase in traffic flows along the existing road network to the nearby crossing to the east northeast. However, the increases in flows are in the order of only 19 vehicle movements per day, well below the criteria set out in the DMRB of 1,000 AADT for identifying an affected road. On this basis, there would be no perceptible change from the Do Nothing scenario. Changes to pollutant concentrations at receptor locations close to the local road network would be negligible and the air quality effects would be insignificant.

### 15.5.2 XC201 Thomastown

#### Do Nothing

If the proposed Project does not proceed traffic volumes are predicted to increase in line with natural traffic growth and would remain around 25 vehicle movements as an AADT across the XC201 Thomastown Level Crossing in 2022. Concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ would remain at the low values representative of the rural location, well below the relevant air quality standards.

#### Construction Phase

The vehicle movements associated with the construction activities (20 LDVs and 34 HDVs) are below the criteria set out in the DMRB guidance and are considered to be insignificant.

#### Operational Phase

Although the proposed Project is closer to some residential properties, the projected vehicle movements on the new route are very low (25 AADT) and well below criteria set out in the DMRB of 1,000 AADT for identifying an affected road. On this basis, there would be no perceptible change from the Do Nothing scenario. Changes to

pollutant concentrations at receptor locations close to the local road network would be negligible and the air quality effects would be insignificant.

### 15.5.3 XC209 Ballyhay

**Do Nothing**

If the proposed Project does not proceed traffic volumes are predicted to increase in line with natural traffic growth and would remain at around 180 vehicle movements as an AADT across the XC209 Ballyhay Level Crossing in 2022. Concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ would remain at the low values representative of the rural location, well below the relevant air quality standards.

**Construction Phase**

It is proposed that the crossing will remain open and be upgraded to a CCTV-controlled crossing, so minimal construction activities would be required at this site. Therefore, no construction impacts are expected in relation to road traffic emissions.

**Operational Phase**

There would be no change from the Do Nothing scenario for this level crossing in terms of air quality.

### 15.5.4 XC211 & XC212 Newtown and Ballycoskery

**Do Nothing**

If the proposed Project does not proceed traffic volumes are predicted to increase in line with natural traffic growth and would remain at around 98 vehicle movements as an AADT across the XC211 Newtown Level Crossing in 2022. Concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ at receptors close to the existing level crossing route would remain at the low values representative of the rural location, well below the relevant air quality standards. For XC212 Ballycoskery, the traffic flows over the level crossing would remain at around 957 as an AADT using the level crossing.

Concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ would remain at the low values representative of the rural location, well below the relevant air quality standards.

**Construction Phase**

The vehicle movements associated with the construction activities (20 LDVs and 32 HDVs for XC211 Newtown and 20 LDVs and 34 HDVs for XC212 Ballycoskery) are below the criteria set out in the DMRB guidance and are considered to be insignificant, even if these flows were combined on the local roads.

**Operational Phase**

Although the proposed Project is closer to two residential properties (one associated with XC211 and one with XC212), the projected vehicle movements on the new routes are below the criteria set out in the DMRB of 1,000 AADT for identifying an affected road (see Table 15.2). On this basis, there would be no perceptible change from the Do Nothing scenario. Changes to pollutant concentrations at receptor locations close to the local road network in the vicinity of XC211 and XC212 Newtown and Ballycoskery would be negligible and the air quality effects would be insignificant.

### 15.5.5 XC215 Shinanagh

**Do Nothing**

If the proposed Project does not proceed traffic volumes are predicted to increase in line with natural traffic growth and would be around 1027 vehicle movements as an AADT across the XC215 Shinanagh Level Crossing in 2022 (979 LDVs and 48 HDVs). Concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ at receptors along the route of the existing level crossing would remain at the low values representative of the rural location, well below the relevant air quality standards.

**Construction Phase**

The vehicle movements associated with the construction activities (20 LDVs and 32 HDVs) are below the criteria set out in the DMRB guidance and are considered to be insignificant.

**Operational Phase**

The proposed Project would divert the existing traffic to an existing road-over-rail bridge approximately 900m to the north of the XC215 Shinanagh Level Crossing. As there are approximately eight residential properties within 200m of the new road, and the road is anticipated to accommodate traffic flows of just over 1,000 AADT (1,027 to 1,160 AADT), there is the potential that a measurable change in concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ could occur at nearby receptors. However, the nearest receptor is approximately 50m to the west of the new road, approximately 80m south west of the junction of the new road with the existing road-over-rail bridge. At a distance of 50m, it is highly unlikely that there would be a measurable change in concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ from a flow of vehicles just in excess of 1,000 AADT as the concentrations of pollutants decreases rapidly with distance from the edge of a road (Defra, 2008). This was confirmed by undertaking a simple-level quantitative assessment at the nearest receptor. The emissions of pollutants were calculated for the new road link using Defra's Emissions Factors Toolkit (EFT v9) (Defra, 2019a) for an AADT of 1,140 comprising 58 HDVs. The road traffic contribution to pollutant concentrations at the closest receptor was then calculated using the pollutant concentration drop of with distance equations stated in DMRB HA 207/07 Annex C3.2 (Highways Agency et al, 2007). The calculated oxide of nitrogen (NOx) concentration was converted to $NO_2$ using the Defra NOx to $NO_2$ calculator (Defra, 2019b). The predicted increment in annual mean $NO_2$ concentration was 0.2µg/m3. The predicted increments in $PM_{10}$ and $PM_{2.5}$ concentrations were 0.03 µg/m3 and 0.02 µg/m3, respectively. These increments are less than 1% of the respective air quality standards and would not be measurable by any practicable means. Therefore, the change in air quality at any receptors within 200m of the new route alignment would be described as negligible and the air quality effect would be not significant.

### 15.5.6 XC219 Buttevant

**Do Nothing**

If the proposed Project does not proceed traffic volumes are predicted to increase in line with natural traffic growth and would be around 2146 vehicle movements as an AADT across the XC219 Buttevant Level Crossing in 2022 (2044 LDVs and 101 HDVs). Concentrations of $NO_2$, $PM_{10}$ and $PM_{2.5}$ at receptors along the route of the existing level crossing would remain at the low values representative of the rural location, well below the relevant air quality standards.

**Construction Phase**

The vehicle movements associated with the construction activities (20 LDVs and 34 HDVs) are below the criteria set out in the DMRB guidance of 1,000 AADT or 200 HDVs and are considered to be insignificant.

**Operational Phase**

The proposed Project does not lead to road traffic emissions being any closer to receptors than the Do Nothing scenario. Therefore, no changes to pollutant concentrations at receptor locations close to the local road network are expected and the air quality effects would be insignificant.

### 15.5.7 Combined Effects of all Sites

**Do Nothing**

If the proposed Project does not proceed traffic volumes on the road network connecting the level crossings where combined effects could occur (i.e. R515 and N20) are predicted to increase in line with natural traffic growth. Concentrations of pollutants would remain similar to the current situation (i.e. likely to be representative of the upper range of the concentrations for rural locations across Zone D reported in Table 15.3).

**Construction Phase**

Even if the vehicle movements associated with the construction activities at all level crossings were to occur simultaneously, and combined on any one single road link, the combined movements would be below the criteria for identifying an affected road set out in the DMRB guidance of 1,000 AADT or 200 HDVs (i.e. a total flow of 266 AADT, which includes 166 HDVs). On this basis, there would be no perceptible change from the Do Nothing scenario. Changes to pollutant concentrations at receptor locations close to the local and wider road network would be negligible and the combined air quality effects would be insignificant.

**Operational Phase**

The proposed Project would not materially alter the road traffic flows on a wider scale and therefore any combined effects would be negligible, and insignificant. For example, the changes to do materially alter the traffic flows on the road links where combined effects from road traffic emissions could occur (i.e. on those roads which are connected to the level crossings or facilitate access to them such as the N20 or R515).

## 15.6 Mitigation Measures

### 15.6.1 Construction Phase

Good practice mitigation would be required to control the effects of dust emissions and pollutant emissions from construction plant and machinery during construction at those crossings where construction activities, other than minimal works to stop up or convert a crossing, are required (i.e. XC201 Thomastown, XC211 Newtown, XC212 Ballycoskery, XC215 Shinanagh and XC219 Buttevant). These measures are considered as mitigation that would be expected to be implemented as standard good practice rather than being additional mitigation required to avoid significant effects identified during the impact assessment process (although the end result is similar). A suite of good practice mitigation measures recommended by the IAQM guidance (IAQM, 2016) is set out below, and includes those relevant for controlling dust from the types of activities associated with the construction of new roads and bridges. These are based on the highest risk level identified in the EIA Screening & Scoping Reports (i.e. 'medium risk') and those which were specified as 'Highly Recommended' in the IAQM guidance for medium risk sites. The risk levels at some of the proposed Project construction sites (e.g. XC201) or on sections of new roads which are remote from receptors, are likely to represent a lower risk and the mitigation for low risks sites as set out in the IAQM guidance may be more appropriate, and applied on a site by site basis.

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on the site.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information.
- Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the local authority. The level of detail will depend on the risk, and should include, as a minimum, the highly recommended measures in this assessment, where these are appropriate to the type of construction works. .
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on-site or off-site, and the action taken to resolve the situation in the log book.
- Carry out regular site inspections to monitor compliance with the DMP (or equivalent), record inspection results and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust (e.g. earthworks or construction activities in close

proximity to nearby residential properties) are being carried out and during prolonged dry or windy conditions.

- Where considered necessary, agree dust deposition/dust flux monitoring locations with the local authority.
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Where practicable, erect solid screens or barriers around dusty activities or operations.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods (where these have been installed for the construction activities).
- Remove materials that have a potential to produce dust from the site as soon as possible, unless being re-used on site. If they are being re-used on-site, cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.
- Ensure all vehicles switch off engines when stationary – no idling vehicles.
- Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
- Where required or practicable, produce a Construction Logistics Plan, or equivalent plan, to manage the sustainable delivery of goods and materials.
- Where applicable, only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. "suitable local exhaust ventilation systems".
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Where applicable, use covered skips for storage or dusty wastes or materials.
- Minimise drop heights from loading shovels and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
- Avoid dry sweeping of large areas.
- Inspect any on-site haul routes for integrity and instigate any necessary repairs to the surface as soon as reasonably practicable.
- Where required, record all inspections of haul routes and any subsequent action in a site log book.
- Avoid bonfires and burning of waste materials.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Use water-assisted dust sweeper(s) on the access and local roads to remove, as necessary, any material tracked out of the site(s).
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- If applicable, implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud) or other suitable washing system prior to leaving the site(s) where reasonably practicable.
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.

- Where practicable, access gates to be located at least 10m from receptors where possible.

### 15.6.2 Operational Phase

No mitigation is required or proposed for the operational phase.

## 15.7 Residual Effects

There are no significant residual effects in relation to the construction or operation of the proposed Project in relation to air quality.

## 15.8 Interactions

There main interaction with any of the other topics was with the traffic and transport assessment as reported in Volume 3, Chapter 11: Traffic & Transport. The source of all the baseline traffic flow data and proposed Project traffic flows during construction and operation were provided as part of the traffic and transport assessment process.

## 15.9 Cumulative Effects

Given the low level of residual impacts associated with this proposed Project in relation to air quality, no significant cumulative effects are expected with other proposed developments.

## 15.10 Difficulties Encountered in Compiling Information

There were no national or local monitoring stations close to any of the level crossings. Therefore, the measurements at other rural locations in Ireland were assumed to be representative of the existing rural baseline conditions at the level crossings.

## 15.11 References

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