

## 14.0 ROADS AND TRAFFIC

### 14.1 INTRODUCTION

This chapter assesses the potential impact on roads and traffic caused by the proposed development of the Gas Fired Power Plant at Lumcloon, Ferbane, Co. Offaly. The chapter assesses the impact of the proposed development on the local road network during construction of the development, in the opening year of the development (assumed to be 2012) and in the design year for the development, chosen as 15 years after the opening of the power plant. The capacity of the proposed new junction onto the R357 is also assessed.

The scope of the traffic impact assessment was discussed with Offaly County Council Roads Department and the methodology was agreed. As the proposed development does not directly access a National Road, the National Roads Authority (NRA) did not have any comment to make regarding the traffic assessment. Furthermore, a Stage 1 Road Safety Audit has been carried out for the proposed development to assess Road Safety Measures and can be found in the Appendix 14.1.

The proposed development site is approximately 11 acres and located adjacent to the R357. The site is about 5km south of Ferbane, 22km south of Athlone, 20km west of Tullamore and 15km north of Birr. The site is a brownfield site and housed the former ESB owned peat fire power station that ceased operations in 2001 and was decommissioned in 2004. Access to the proposed site will be via a proposed simple priority junction off the R357.

### 14.2 METHODOLOGY

The proposed junction for the development was tested for capacity with determined flows for the existing situation, the year that construction begins, the year of opening and for the design year. The existing adjacent junctions were also tested for capacity with and without development traffic for construction year traffic, opening year traffic and design year traffic. The changes in capacity ratio at the junctions enable us to define impacts on the existing road network.

The contents of this analysis are based on the recommendations of the NRA 'Traffic & Transport Assessment Guidelines' as well as the 'Traffic Management Guidelines' as published by the Stationery Office.

## 14.3 EXISTING ROAD TRAFFIC ASSESSMENT

### 14.3.1 Existing Traffic Patterns

To establish a '*baseline*' for this assessment, a 12-hour traffic count was undertaken at two junction locations adjacent to the proposed site. The first location was at the staggered crossroads junction of the R357 and the R437, west of the proposed site entrance. The second location was at a simple priority t-junction between a local road that borders the site to the west and the R357. The morning peak was identified to be 08:00-09:00 Hrs and the evening peak was 17:00-18:00 Hrs. The 12 Hour counts (refer to Figure A.1 contained in Appendix B to the Traffic Impact Assessment Report, which is attached as Appendix 14.2 to the EIS) have been converted to Average Annual Daily Traffic (AADT) using RT201 expansion factors for 'Rural Intertown Routes' and are shown in Table 14.1 below.

**Table 14.1 Average Annual Daily Traffic Numbers**

Road	AADT
R357 (west)	2052
R357 (east)	2091
R437 (north)	593
R437 (south)	545
Local Road	138

### 14.3.2 R357 Adjacent to the Proposed Development

The R357 at the location of the proposed development is approximately 6m wide. There are no pedestrian facilities or public lighting at the location of the proposed development due to the rural nature of the location. The road is subject to an 80kph speed limit with straight horizontal and vertical profiles. The road surface in the vicinity of the site is in good condition with a broken white line along the centreline. The adjacent lands bounding onto the R357 are agricultural in nature.

### 14.3.3 Collision Analysis

From analysing the Road Safety Authority Collision Database from 1996 to 2007, there were five minor collisions on the R357 and one serious collision within a 1km radius of the proposed site. The collisions occurred near Lumcloon Cross roads, approximately 1.7km west of the proposed site entrance.

## 14.4 PROPOSED DEVELOPMENT

### 14.4.1 Introduction to the Development

The proposed development consists of a 350 MW gas fired power plant. The site will be accessed by construction traffic and after opening, by the power plant staff, through a simple T-junction connected to the R357.

### 14.4.2 Site Operation and Trip Generation

Usually a TRICS (Trip rate Information Computer System) assessment is carried out for proposed development to determine the development generated traffic. However due to the specialised nature of the project it is not feasible to use TRCIS and therefore the information has been provided by the client/design team. For the construction phase of the project it is proposed to have a peak of 400 construction staff on site at any one time. In order to calculate the number of morning and evening trips generated by construction staff, a vehicle occupancy of two was deemed reasonable for a construction site. This assumption results in 200 trips being generated by the construction of the proposed development. It is further assumed that the 200 trips generated will occur during the peak hours. During the morning peak all 200 trips generated enter the site and during the evening peak all 200 trips generated leave the site. There will be a number of HGV deliveries (approximately 15 No.) to site during the course of the working day however it will be assumed that these deliveries will be spread out and not coincide with the peak hours.

For the opening and design year, generated trips have been chosen based on the number of staff at the plant. It is envisaged that 15 staff will operate and maintain the power plant day on a shift basis (3 eight hour shifts). For the purposes of analysis, a vehicle occupancy of one was chosen and it has been assumed that shifts will end and start during the AM and PM peak hours. This results in a generation of 15 vehicles entering and 15 vehicles leaving the proposed development during peak hours.

### 14.4.3 Traffic Generation

Assessment has been made of the likely affects of development on the capacity of adjacent junctions and of the R357 at the location of the proposed junction from the development.

Both traffic generated during construction and operation of the plant have been assessed. Volumes of generated traffic were based on proposed construction staff figures of 400 and proposed operational and maintenance staff figures of 15. A vehicle occupancy of 2 was

assumed for the construction phase and a vehicle occupancy of 1 was assumed after opening. It was further assumed that all construction traffic would arrive during the morning peak hour and leave during the evening peak hour. Likewise, it was assumed that shifts would start and end during the peak hour resulting in 15 trips to the development and 15 trips from the development during peak. Predictions on traffic distribution are made based on existing traffic patterns, local knowledge and population information. Total traffic generated across each of the junctions is the same for AM and PM although directional splits differ. Table 14.2 shows the calculated traffic generated during construction and operational phases of the development across each junction.

**Table 14.2 Development Generated Traffic for Construction & Operation Phases**

Location	Development Generated Traffic			
	AM In	AM Out	PM In	PM Out
2009 (Construction)	200	15	0	200
2012 (Operational)	15	15	15	15
2027 (Operational)	15	15	15	15

#### 14.4.4 Development Generated Traffic Distribution

It is difficult to predict precisely where vehicles will be attracted from. The key operators of the development will usually define any trends relating to distribution. Traffic distribution from a new development is always subjective. Predictions on traffic behaviour are made based on existing traffic patterns, local knowledge and population information.

For the Traffic Impact Assessment, it is proposed to use the following distribution patterns for the traffic generated by the proposed development:

- It will be assumed that 30% of the generated traffic leaving the development will turn right out of the proposed development and travel towards Tullamore.
- It will be assumed that 70% of the generated traffic leaving the development will turn left towards the staggered cross-roads without turning left down the adjacent local road.
- At the crossroads it will be assumed that 30% of the total traffic generated will turn right in the direction of Ferbane and Athlone, 30% will turn left in the direction of Kilcormac and Birr and 10% will travel straight through the cross-roads.
- The same proportional splits will be used for the generated traffic entering the development.

### 14.4.5 Traffic Growth

The Traffic Impact Assessment will assess the impacts of the proposed development for the opening year traffic volumes. For the purposes of this report it is assumed that the opening year will be 2012. The report will also assess the likely impacts in the 'Design Year' which is usually taken as 15 Years after opening. For this reason it is necessary to expand the current year traffic volumes to 2012 and 2026 values. The traffic growth predictions in the '*National Road Authority Future Traffic Forecasts 2002-2040*' for 'national primary roads' are used for this purpose. A factor of 1.07 was calculated to convert 2009 traffic flows into 2012 traffic flows and a factor of 1.33 was calculated to convert the 2009 traffic flows into 2027 traffic flows. These factors will be used to determine the peak hour movements for the opening year and the design year of 2027. Traffic growths will be applied to existing traffic patterns to model the opening year 2012 and the design year 2027. Growth factors are not normally applied to developments of fixed capacity. It is not the intention to apply growth factors to this development generated traffic.

Figures A.2 to A.7, contained in Appendix B to the Traffic Impact Assessment Report (refer to Appendix 14.2 of the EIS), show the traffic growth for the junctions with and without the proposed development generated traffic in place.

## 14.5 TRAFFIC ASSESSMENT

### 14.5.1 Peak Hour Flows

To assess the capacity of the junctions and the impact likely to be generated by the proposed development, the software package PICADY was used. The junction capacities for 2009, 2012 and 2027 with and without the development generated traffic have been used to determine the ratio of demand flow to capacity (RFC) for each arm of each junction. An RFC of 0.75 or less is desirable in rural areas, and 0.85 in urban areas, for a junction to be working efficiently.

### 14.5.2 Effect of Generated Traffic on R357/R437 Staggered Junction

The critical cases of the AM and PM peak flows for the staggered junction of the R357 and R437 for all scenarios have been assessed in PICADY. A detailed breakdown of the flows used in the analysis and how they were derived can be found in Appendix 14.2 of the EIS (Appendix B of the Traffic Impact Assessment Report). The results of the analysis are indicated in Table 14.3 below.

**Table 14.3 R357/R437 Staggered Junction**

Junction	AM Peak Max RFC	PM Peak Max RFC
2009 Peak	0.06	0.05
2009 Peak with Construction Traffic	0.17	0.15
2012 Peak Without Proposed Development	0.06	0.05
2012 Peak With Proposed Development	0.07	0.06
2027 Peak Without Proposed Development	0.08	0.06
2027 Peak With Proposed Development	0.09	0.07

As can be seen from the Table 14.3, the RFC levels for the junction are well below the 0.75 threshold. The maximum RFC of 0.17 occurs during construction phase in 2009 on the northern arm of the R437. This indicates that the junction will operate well within its capacity during construction, in the opening year of the development with the development in place and in the design year.

### 14.5.3 Effect of Generated Traffic on Adjacent R357 T-Junction

The critical cases of the AM and PM peak flows for the T-junction of the local road adjacent to the development onto the R357 have been assessed for all scenarios in PICADY. A detailed breakdown of the flows used in the analysis and how they were derived can be found in Appendix C of the Traffic Impact Assessment Report (refer to Appendix 14.2 of the EIS). The results of the analysis are indicated in Table 14.4 below.

**Table 14.4 Adjacent R357 T-Junction**

Junction	AM Peak Max RFC	PM Peak Max RFC
2009 Peak	0.01	0.02
2009 Peak with Construction Traffic	0.01	0.02
2012 Peak Without Proposed Development	0.01	0.02
2012 Peak With Proposed Development	0.01	0.02
2027 Peak Without Proposed Development	0.01	0.02
2027 Peak With Proposed Development	0.01	0.02

As can be seen from the Table 14.4, the RFC levels for the junction are well below the 0.75 threshold. The maximum RFC of 0.02 occurs in the PM during the design year on the existing local road arm of the junction. This indicates that the junction will operate well within its capacity during construction, in the opening year of the development with the development in place and in the design year of the development.

#### 14.5.4 Effect of Generated Traffic on Proposed R357 T-Junction

The critical cases of the AM and PM peak flows for the proposed T-junction from the development onto the R357 have been assessed for all scenarios in PICADY. The results of the analysis are indicated in Table 14.5 below.

**Table 14.5 Proposed R357 T-Junction**

Junction	AM Peak Max RFC	PM Peak Max RFC
2009 Peak with Construction Traffic	0.25	0.27
2012 Peak With Proposed Development	0.02	0.02
2027 Peak With Proposed Development	0.02	0.02

As can be seen from the Table 14.5, the RFC levels for the junction are well below the 0.75 threshold. The maximum RFC of 0.27 occurs in the PM during the construction phase on the proposed T-junction arm. This indicates that the proposed junction will operate well within its capacity during construction, in the opening year of the development with the development in place and in the design year of the development.

#### 14.5.5 Effect upon the R357

In 2009 with construction ongoing the total two-way flow on the R357 in the vicinity of the proposed development in the PM Peak Hour (larger flow) is 343 vehicles. In the design year, 2027, the total two-way flow is 291 vehicles.

The capacity of this road is tested in accordance with RT180 '*Geometric Design Guidelines*'. In accordance with RT180 a 6m wide road with 0% sight distance greater than 460m with Level of Service C will have a two-way capacity of 600 vehicles per hour. The same road with a Level of Service D will have a two-way capacity of 1075 vehicles per hour. The R357, thus, has adequate capacity for the base plus development generated traffic in 2009 during construction and in the design year, 2027.

The natural growth in traffic (66 vehicles) exceeds the operational development generated traffic (30 vehicles) therefore any deterioration of the surface will be more attributable to the natural growth of traffic. However the construction related traffic will far exceed the natural growth in traffic over the same period. During scoping discussions with Offaly County Council Roads Department, the Council expressed concerns about the possible effect of construction generated traffic on the R357. It was agreed, subject to a successful planning application decision, that prior to construction commencing a structural evaluation be carried out on the

R357. Any defects that arise due to construction traffic will have to be remedied to the satisfaction of Offaly County Council Roads Department.

## 14.6 VULNERABLE ROAD USERS

Given the rural site location and the type of development it would be expected that the proposed development would not generate a pedestrian demand. Car parking will be provided within the boundary of the proposed development to cater for both the construction phase and the operational phase. Drop kerbing and tactile paving will be provided internally at the operational phase at all crossing points to provide for safe access/egress for staff with reduced mobility.

## 14.7 ROAD SAFETY MEASURES

A Stage 1 Road Safety Audit has been carried out for the proposed development. It is recommended that a Stage 2 RSA and a Stage 3 RSA are carried out at detailed design stage and prior to opening respectively. Furthermore, a construction traffic management plan should be carried out by the contractor prior to construction to identify possible traffic routes and mitigation measures.

## 14.8 CONCLUSIONS

The Construction phase of the development will have the largest impact on the R357 in terms of traffic flows; however it will be of a short term nature. The operational phase impacts are much smaller. Both scenarios result in total traffic volumes much less than the capacity of the existing R357.

Analysis was carried out on the proposed development junction with the development in place. It was found to have adequate reserve capacity when tested for the critical cases of the morning and evening peaks during construction, in the opening year and in the Design Year.

This existing R357/R437 staggered junction when tested without the development was found to be operating efficiently. The junction has spare capacity for the natural growth of traffic as well as the development generated traffic for all scenarios.

The existing local road T-Junction with the R357 is shown to have more than adequate spare capacity in the design year with all developments in place.