

## Chapter 19 Interrelationships and Interactions

In accordance with Section 50 of the Roads Act 1993 as amended, the interrelationships and interactions between the aspects of the environment likely to be affected by the scheme have been considered.

Inter-relationships relate to the interactions between impacts within a project and the interaction between impacts identified under one topic with impacts identified under another topic. For example interactions exist between traffic and noise and vibration; visual impact and a requirement for noise barriers, etc. Undertaking this systematic review of the main interactions between impacts ensures that the main effects of the scheme are assessed cumulatively rather than in isolation.

Each of the various environmental and related topics has been discussed separately in the preceding chapters of this Environmental Impact Statement (EIS) and the major interactions between the recorded environmental impacts are assessed within the individual chapters of the EIS.

Table 19.1 is a matrix table indicating the significant interactions that are likely to occur between the various environmental disciplines with regard to the construction and operation of the M7 Naas to Newbridge Bypass Upgrade Scheme. The purpose of the table is to allow the interaction between the various disciplines to be recognised, although the level of interaction will vary in each case. The principal interactions are discussed in more detail in the following sections.

**Table 19.1: Matrix to Summarise Inter-relation of Environmental Factors**

Interaction Discipline	Traffic	Human Beings	Ecology	Noise and Vibration	Air Quality & Climate	Soils and Geology	Hydrology	Hydrogeology	Landscape and Visual	Material Assets	Archaeology, Architecture & Cultural Heritage
Traffic			.			.	.	.	.	.	.
Human Beings	.		.	.	.	.	.		.	.	.
Ecology	.	.		.	.			.		.	.
Noise & Vibration			.		.		.	.		.	.
Air Quality & Climate			.	.			.	.	.		.
Soils & Geology	.	.	.	.			.	.		.	.
Hydrology		.		.	.			.	.	.	.
Hydrogeology	.	.	.	.	.				.	.	.
Landscape & Visual					.	.	.	.		.	.
Material Assets		.	.		.	.	.	.	.		.
Archaeology etc	.	.	.	.	.		.	.	.	.	

## Traffic

Chapter 6 Traffic Analysis addresses the impact of the scheme on traffic using the M7 motorway and the wider road network. Traffic interacts with a wide range of environmental parameters creating a number of environmental impacts, for example Noise and Vibration and Air Quality and Climate impacts are directly related to traffic flows. There will be a negative impact for human beings due to increased traffic where the proposed scheme is in proximity to noise sensitive locations. Mitigation measures including low noise road surface and noise barriers are proposed to alleviate this.

All the interactions with traffic have been identified in each of the relevant chapters of the EIS and where necessary the appropriate mitigation has been applied.

- The impact of traffic noise is addressed in Chapter 15;
- The impact of traffic on air quality is addressed in Chapter 16;
- The potential impact of traffic on water quality is addressed in Chapter 9 Hydrology;
- The potential effect of traffic on Visual Impact is considered in Chapter 14;
- The potential impact of traffic, both at operation and during construction, on human beings is addressed in Chapter 12.

## Human Beings

Impacts on the human beings environment are addressed throughout the chapters of this EIS (Noise and Vibration, Air Quality and Climate, Hydrogeology (groundwater aquifers and groundwater wells), Landscape and Visual Impact, Material Assets, Archaeology, Architecture and Cultural Heritage). Impacts with respect to journey times, amenity, community severance and economy are addressed in Chapter 12 Human Beings.

As a discipline as per the description in Chapter 12 (journey characteristics, community severance, amenity, economy), '*Human Beings*' don't create interactions with the other environmental parameters and there are therefore no unforeseen interactions or cumulative impacts in this regard.

At operation the rerouting of traffic back to the motorway and the creation of a more efficient and less congested motorway network will result in a positive impact on Human Beings overall in terms of amenity for local residents and beneficial economic impact.

## Ecology

Chapter 7 addresses the impact of the scheme on ecology and applies a number of mitigation measures to avoid and ameliorate potential impacts. As the M7 Naas to Newbridge Bypass Upgrade Scheme is primarily an online widening into an existing motorway median, which is of no ecological interest in itself, the primary ecological impact identified relates to potential downstream water quality impacts within the watercourses which pass under the M7 and R445. The potential for water quality impact is reflected in the hydrology assessment and the ecologist and the hydrologist liaised in the development of the proposed mitigation measures.

For this particular scheme ecology does not interact significantly with any of the other environmental disciplines; for example the noise levels on the motorway are already sufficiently high that the local fauna are acclimatised to traffic noise and as such it is

considered that no additional ecological disturbance will accrue as a result of the increase in traffic on the M7 or R445.

### **Noise and Vibration**

Chapter 15 addresses the impact on noise and vibration experienced by receptors adjacent to the scheme. As discussed above, these noise levels are directly related to traffic flows. Noise mitigation measures including low noise road surface and noise barriers adjacent to the scheme. The placement of the noise barriers has a visual impact. This has been identified and is addressed in Chapter 14 Landscape and Visual Impact. Construction noise is related to the requirement for import and export of material and as such is related to Soils and Geology. Construction Noise mitigation measures are proposed to minimise this impact.

### **Air Quality and Climate**

Chapter 16 addresses the impact on air quality and climate experienced by receptors adjacent to the scheme. The air quality assessment is significantly impacted by traffic and traffic flows. As with the noise, the air quality assessment is based on the traffic figures presented in Chapter 6. During construction the air quality assessment highlights the possibility of nuisance dust arising. A construction dust management plan is proposed to minimise and control this issue. The construction air quality relates to construction traffic movements and also to the qualities and types of material being exported and imported. The proposal to re-use material on site where possible minimises the import and export quantities and is thus related to the minimisation of construction dust management. These issues have all been identified in the relevant chapters of the EIS.

### **Soils and Geology**

Chapter 10 addresses the impact on the underlying soils and geology. As a consequence of the online widening nature of the scheme the assessment concludes that there will be an imperceptible impact on soils and geology and as such there are no operational interactions between this environmental discipline and the other disciplines.

As highlighted above the volume of import and export of material impact has a potential impact on air quality during construction. This is addressed in Chapter 16 Air Quality and Climate. No construction interactions with any of the other disciplines are anticipated.

### **Hydrology**

Chapter 9 addresses the impact on the hydrological environment potentially affected by the proposed scheme. As stated under *Ecology* potential construction and operational water quality impacts have been addressed in both the hydrology assessment and the ecology assessment and the ecologist and the hydrologist liaised in the development of the proposed mitigation measures.

Hydrology and hence water quality and ecology is also directly influenced by traffic levels with regard to the degree of potential pollutant which requires treatment and attenuation. This has been recognised in the hydrology and ecology assessments and addressed in the design of the scheme.

Construction mitigation measures have also been proposed to avoid water quality impacts. The primary impact relates to silt laden water entering the watercourses.

This is influenced by the degree of excavation required and hence by Soils And Geology.

### **Hydrogeology**

Chapter 8 addresses the impact on the underlying hydro-geological environment. As a consequence of the online widening nature of the scheme and the additional attenuation being provided, the chapter concludes that the impacts on groundwater quality and aquifer vulnerability are minor beneficial. There is therefore limited opportunity for interactions to occur and it is considered that all the potential interactions with hydrogeology have been considered within the EIS. Chapter 8 notes that there is no impact on any ground water wells and that there is no impact on ground water dependent ecosystems; there is hence no interaction with Human Beings or Ecology in this instance.

### **Landscape and Visual**

Landscape and Visual Impact is addressed in Chapter 14. The principal interaction occurs in relation to Noise and the placement of the noise barriers. This has been addressed in Chapter 14. Visual Impact is also influenced by traffic with regard views of the road and passing headlights. These issues have also been discussed in Chapter 14. Ecology may benefit from the proposed landscape planting mitigation; however this is not a significant interaction or benefit in this instance.

### **Material Assets**

Material Assets (Agricultural and Non-Agricultural) are addressed in Chapter 11. There is a potential interaction between Agriculture and Noise on an agricultural property (No. 5 in Table 11.6, refer **Figure 11.5, EIS Volume 3**). This impact has been recognised in Chapter 15 Noise and Vibration and a noise barrier has been proposed.

There is also a temporary interaction between Non agricultural (commercial and residential) property and construction traffic. This may arise due to impacts on traffic movement during the construction phase. Traffic management measures to minimise and alleviate this have been outlined in Chapter 4 Description of the Scheme.

### **Archaeology, Architecture and Cultural Heritage**

The impacts on Archaeology, Architecture and the Cultural Heritage are addressed in Chapter 13. In many cases Architectural Heritage and Visual Impact interact where the scheme has an impact on the setting of a protected structure. This possibility is identified for Osberstown House in both Chapter 13 and Chapter 14, however the impact is considered negligible in both cases.

Advanced archaeological testing is recommended over the Greenfield elements of the scheme. Due to the minor extent of these proposed works, this does not have a significant interaction with soils and geology or any other environmental discipline in this instance.

### **Conclusion**

Based on this systematic review of the potential interactions between the identified impacts and mitigation measures it is considered that all the potential interactions have been addressed in the relevant chapters of this EIS and no unforeseen cumulative impacts are likely to arise as a result of interactions.