

# 17 Cumulative Impacts and Interaction of Effects

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## 17.1 Introduction

This chapter addresses the cumulative impacts and main interactions between different aspects of the environment likely to be significantly affected by the Proposed Project.

Only topics that could be logically linked to the Proposed Project have been examined in detail. Accordingly, when a topic is not mentioned, it has been concluded that no potential for impacts exists.

## 17.2 Assessment Methodology

## 17.3 Statutory Requirements

The requirement to address interactions of effects and cumulative impacts is set out in Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment. This Directive has been amended by Council Directive 97/11/EC, Directive 2003/35/EC and Directive 2009/31/EC and is now codified in Directive 2011/92/EU.

Article 3 of the EIA Directive outlines the information to be contained in an EIS as follows:

*“The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 12, the direct and indirect effects of a project on the following factors:*

- (a) human beings, fauna and flora;*
- (b) soil, water, air, climate and the landscape;*
- (c) material assets and the cultural heritage;*
- (d) the interaction between the factors referred to in points (a), (b) and (c).”*

In addition, Annex IV of the directive states that the following information should be included in an EIS:

*“3. A description of the aspects of the environment likely to be significantly affected by the proposed project, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.”*

A footnote to Annex IV states that a description of impacts should include:

*“..... the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project.”*

The aforementioned Directives are transposed into Irish legislation through Schedule 6 of the Planning and Development Regulations 2001 , as amended and the Roads Act, 1993 , as amended by Section 14 of the European Communities (Environmental Impact Assessment) (Amendment) Regulations, 1999

### 17.3.1 Guidance

This chapter has been prepared in accordance with the following guidelines:

- EPA (2015) Revised *Guidelines on the Information to be contained in Environmental Impact Statements*, Draft, 2015;
- EPA (2015) *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements*, Draft, 2015; and
- EPA (2002) *Guidelines on the Information to be contained in Environmental Impact Statements*, 2002;
- EPA (2003) *Advice Notes on Current Practise in the Preparation of Environmental Impact Statements*, 2003.
- European Commission *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*.

### 17.3.2 Assessment Methodology

The potential for significant interactions, cumulative impact and indirect impacts was examined at the screening stage in the preparation of this EIS. Where the potential for significant interactions or impacts was identified, such interactions and impacts were included in the scope and addressed in the baseline and impact assessment chapter for each of the relevant environmental media namely Chapters 6 to 16 inclusive.

The matrix and expert opinion approaches, as described and outlined in the aforementioned EU Guidelines were used in the identification of the potential for significant interactions, cumulative impacts, direct and indirect impacts. To facilitate this a workshop attended by specialist sub-consultants, the EIS team and Dublin City Council as well as various communications between the specialist sub-groups and design team took place. Interactions and cumulative impacts are addressed in the following sections. Direct and indirect effects are described in the previous chapters of this EIS which address the different environmental media.

## 17.4 Interaction of Effects

### 17.4.1 Introduction

All environmental factors are inter-related to some extent, and the relationships can range from tenuous to highly complex.

The major interactions between the recorded environmental impacts are assessed within the individual chapters of the EIS.

**Table 17.1** provides a matrix summarising the interactions between the various parameters outlined in this EIS from Chapters 6 to 16, inclusive.

**Table 17.1 - Key Environmental Interaction Matrix**

<b>Key environmental Interaction Matrix</b>	<b>Traffic and Transportation</b>	<b>Air Quality and Climate Factors</b>	<b>Noise and Vibration</b>	<b>Biodiversity</b>	<b>Archaeological, Architectural and Cultural Heritage</b>	<b>Townscape and Visual</b>	<b>Soils, Geology, Hydrogeology and Hydrology</b>	<b>Resource and Waste Management</b>	<b>Material Assets: Utilities</b>	<b>Material Assets: Land Use and Property</b>	<b>Socio-Economics</b>
<b>Traffic and Transportation</b>		CO	CO	-	CO	O	-	C	-	CO	CO
<b>Air Quality and Climate Factors</b>	CO		-	-	-	-	-	-	-	C	C
<b>Noise and Vibration</b>	CO	-		-	CO	-	C	-	-	C	C
<b>Biodiversity</b>	-	-	-		-	CO	C	-	-	-	-
<b>Archaeological, Architectural and Cultural Heritage</b>	CO	-	CO	-		CO	C	C	C	-	-
<b>Townscape and Visual</b>	O	-	-	CO	CO		-	-	-	-	CO
<b>Soils, Geology, Hydrogeology and Hydrology</b>	-	-	C	C	C	-		C	-	-	-
<b>Resource and Waste Management</b>	C	-	-	-	C	-	-C		-	-	-
<b>Material Assets: Utilities</b>	-	-	-	-	C	-	-	-		-	-
<b>Material Assets: Land Use and Property</b>	CO	C	C	-	-	-	-	-	-		CO
<b>Socio-Economics</b>	CO	C	C	-	-	CO	-	-	-	CO	

The effects matrix examines the potential for the topic or issue in the left hand column to have an effect on the environmental media listed in the top row of the matrix.

If there is the potential for an effect during the construction phase, this is indicated by a 'C'. An 'O' indicates the potential for an effect during the operational phase and 'CO' indicates the potential for an effect during both phases. If there is considered to be no potential for an effect, this is indicated by '-'.

The purpose of the effects matrix is to identify potential effects in different media. Actual effects and their significance are dealt with in the most relevant chapter.

This assessment was based on information contained within this EIS, the outcome of workshops and consultation with the relevant sub-consultants.

The main environmental interactions anticipated as they relate to the Proposed Project are also summarised in the following sections.

#### **17.4.2 Traffic and Transportation and Air Quality and Climate**

The generation of traffic during the construction phase and the re-organisation of city centre traffic during the operational phase of the Proposed Project has the potential to impact on air quality and climate.

#### **17.4.3 Traffic and Transportation and Noise and Vibration**

The generation of traffic during the construction phase and the re-organisation of city centre traffic during the operational phase of the Proposed Project has the potential to impact on noise and vibration.

#### **17.4.4 Traffic and Transportation and Archaeology, Architectural and Cultural Heritage**

The generation of traffic during the construction phase and re-organisation of traffic during the operational phase of the Proposed Project has the potential to impact architectural heritage.

Vibration from traffic has the potential to impact on buildings and features of architectural and cultural significance. In addition, the re-routing of buses away from College Green has the potential to visually impact buildings and features of architectural heritage.

#### **17.4.5 Traffic and Transportation and Townscape and Visual**

The re-organisation of city centre traffic including the re-routing of buses away from College Green has the potential to result in a visual impact to buildings and features of architectural and cultural heritage.

#### **17.4.6 Traffic and Transportation and Resource and Waste Management**

During the construction phase, there is the potential for interaction between traffic and transportation and resource and waste management. Excavated material that cannot be re-used on site will be removed from site, adding to construction traffic.

### **17.4.7 Traffic and Transportation and Socio-Economics**

The generation of traffic during the construction phase and re-organisation of traffic during the operational phase of the Proposed Project has the potential to impact the socio-economics of the area by means of access to economic, commercial, tourism, educational and social facilities in the area.

### **17.4.8 Air Quality and Climate and Material Assets: Land Use and Property**

A potential interaction between air quality and climate and material assets: land use and property during the construction phase of the Proposed Project is identified.

Dust generated during construction works has the potential to impact economic, commercial, tourism, educational and social facilities at College Green and the employees, visitors and customers who frequent the area.

### **17.4.9 Air Quality and Climate and Socio-Economics**

A potential interaction between air quality and climate and socio-economics during the construction phase of the Proposed Project is identified.

Dust generated during construction works has the potential to impact economic, commercial, tourism, educational and social facilities at College Green and the employees, visitors and customers who frequent the area.

### **17.4.10 Noise and Vibration and Archaeology, Architectural and Cultural Heritage**

A potential interaction between noise and vibration and archaeology, architectural and cultural heritage during both the construction and operational phase of the Proposed Project is identified.

Vibration generated from construction activities has the potential to impact buildings and features of architectural and cultural significance at College Green. In addition, vibration from traffic has the potential to impact buildings and features of architectural and cultural significance.

### **17.4.11 Noise and Vibration and Soils, Geology, Hydrogeology and Hydrology**

A potential interaction between noise and vibration and soils, geology, hydrogeology and hydrology during the construction phase of the Proposed Project is identified. There is the potential for noise and vibration to be generated during the excavation phase of the Proposed Project.

### **17.4.12 Noise and Vibration and Material Assets: Land Use and Property**

A potential interaction between noise and vibration and material assets: land use and property during the construction phase of the Proposed Project is identified.

Noise and vibration generated during construction works has the potential to impact economic, commercial, tourism, educational and social facilities at College Green and the employees, visitors and customers who frequent the area.

#### **17.4.13 Noise and Vibration and Socio-Economics**

A potential interaction between noise and vibration and socio-economics during the construction phase of the Proposed Project is identified.

Noise and vibration generated during construction works has the potential to impact economic, commercial, tourism, educational and social facilities at College Green- and the employees, visitors and customers who frequent the area.

#### **17.4.14 Biodiversity and Townscape and Visual**

A potential interaction between biodiversity and landscape and visual during both the construction and operational phase of the Proposed Project is identified.

Trees will be removed from the College Green area during the construction phase, potentially impacting on the landscape. The replanting of trees has the potential to impact on architectural heritage.

#### **17.4.15 Biodiversity and Soils, Geology, Hydrogeology and Hydrology**

A potential interaction between biodiversity and soils, geology, hydrogeology and hydrology during the construction phase of the Proposed Project is identified.

There is potential for contamination of watercourses as a result of construction activities associated with the Proposed Project.

#### **17.4.16 Soils, Geology, Hydrogeology and Hydrology and Resource and Waste Management**

An interaction between soils, geology, hydrogeology and hydrology and resource and waste management during the construction phase of the Proposed Project is identified.

Small quantities of excavated material will be generated during construction and removed from site as a waste material.

#### **17.4.17 Archaeology, Architectural and Cultural Heritage and Townscape and Visual**

A potential interaction between archaeology, architectural and cultural heritage and landscape and visual during both the construction and operational phase of the Proposed Project is identified.

Hoarding present during the construction phase has the potential to result in the visual obstruction of some buildings and features of architectural and cultural significance.

During the operational phase, the replanting of trees along the southern boundary of the study area has the potential to result in a visual impact and impact on features of architectural and cultural significance.

#### **17.4.18 Archaeology, Architectural and Cultural Heritage and Soils, Geology, Hydrogeology and Hydrology**

An interaction between archaeology, architectural and cultural heritage and soils, geology, hydrogeology and hydrology during the construction phase of the Proposed Project is identified. Excavated material will be monitored for features of archaeological significance during the excavation process.

#### **17.4.19 Archaeology, Architectural and Cultural Heritage and Resource and Waste Management**

An interaction between archaeology, architectural and cultural heritage and resource and waste management during the construction phase of the Proposed Project is identified.

A number of architectural heritage features will be temporarily removed from College Green, carefully and appropriately stored during the proposed works and reused within the Proposed Project.

#### **17.4.20 Archaeology, Architectural and Cultural Heritage and Material Assets: Utilities**

Construction works associated with the provision of Material Assets (Utilities), in particular underground works have the potential to interact with Archaeology, Architectural and Cultural Heritage.

#### **17.4.21 Townscape and Visual and Socio-Economics**

An interaction between landscape and visual and socio-economics during both the construction and operational phase of the Proposed Project is identified.

During the construction phase, the accessibility of certain businesses in the vicinity of the Proposed Project may be reduced due to the presence of temporary construction hoarding and pedestrian diversions.

During the operational phase the provision of an aesthetically pleasing civic plaza at College Green has the potential to improve the quality of the experience of visiting Dublin and attract tourists to the area.

#### **17.4.22 Material Assets: Land Use and Property and Socio Economics**

An interaction between material assets: land use and property and socio-economics during both the construction and operational phase of the Proposed Project is identified.

During the construction phase, the accessibility of certain businesses in the vicinity of the Proposed Project may be reduced due to the presence of temporary construction hoarding and pedestrian diversions.

During the operational phase the provision of a new civic plaza at College Green has the potential to improve the quality of the experience of visiting Dublin and attract tourists to the area.

## 17.5 Cumulative Impacts

The EU Guidelines define cumulative impacts as:

*“Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project. For example:*

- *incremental noise from a number of separate developments;*
- *combined effect of individual impacts, e.g. noise, dust and visual, from one development on a particular receptor; and*
- *Several developments with insignificant impacts individually but which together have a cumulative effect.”*

The EPA Guidelines on the Information to be contained in Environmental Impact Statements mirrors this approach and defines cumulative impacts as “The addition of many small impacts to create one larger, more significant, impact”.

Therefore, the assessment of cumulative impacts considers the total impact associated with the Proposed Project when combined with other past, present, and reasonably foreseeable future developments.

An examination of the potential for other projects to contribute cumulatively to the impacts from this Proposed Project was undertaken during the preparation of this EIS. Due to the city centre location of the Proposed Project, development is continually occurring in the area. However, no major projects have been identified that would result in a significant cumulative impact with the Proposed Project.

It is assumed that the Luas Cross City will be operational once construction works commence on the Proposed Project. Therefore, no concurrent construction impacts will occur between the two projects.

The proposed traffic measures outlined in the NTA Transport Strategy for the Greater Dublin Area 2016 – 2035 have been considered cumulatively in this EIS. Particularly, Chapter 6 ‘*Traffic and Transportation*’, Chapter 7, ‘*Air Quality and Climate Factors*’ and Chapter 8 ‘*Noise and Vibration*’.

## 17.6 References

European Commission (1999), Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions. European Commission, Luxembourg.

CAAS (2003), Advice Notes on Current Practice in the Preparation of Environmental Impact Statements. Environmental Protection Agency (EPA), Johnstown Castle Estate, Wexford, Ireland.