



29

Interactions between the various environmental aspects

Contents

- 29. Interactions Between the Various Environmental Aspects..... 1**
- 29.1 Introduction 1**
- 29.2 Analysis of Interactions2**
- 29.3 Discussion of Interactions4**
- 29.4 Conclusion..... 11**
- 29.5 Glossary 11**
- 29.6 References..... 12**

List of Abbreviations

Acronym	Meaning
AZ	Assessment Zone
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
FRA	Flood Risk Assessment
GDA	Greater Dublin Area
GHG	Greenhouse Gases

29. Interactions Between the Various Environmental Aspects

29.1 Introduction

The potential interactions between environmental aspects arising from the MetroLink Project (hereafter referred to as the proposed Project) have been considered and are addressed in more detail in the applicable chapters of the Environmental Impact Assessment Report (EIAR). This EIAR has been prepared to address the requirements of the following:

- Sections 39 (1) and (2) and Section 2(1) of the Transport (Railway Infrastructure) Act, 2001 (as amended by the European Union (Railway Orders) (Environmental Impact Assessment) (Amendment) Regulations 2021), hereafter referred to as the '2001 Act'.

The 2001 Act states that the EIAR should identify, describe and assess the interaction between the other environmental factors. An interaction of impacts can occur when two or more types of environmental impact associated with a proposed development arise at a particular location or act upon an environmental resource. For example, a residential property may be subject to air quality and noise impacts, an area may experience temporary severance of local rights of way as well as increased construction vehicle movements on local roads, and a watercourse may be subject to alterations in flow regime, geomorphology and water quality, which would interact with the aquatic ecology of the watercourse.

For each environmental topic there will be certain interactions or interdependencies with other environmental topics, whereby impacts may interact to create a greater effect or different type of effect. An assessment of these interactions has been undertaken as required by Sections 39 (1) and (2) of the 2001 Act. Section 2(1) of the 2001 Act interprets Environmental Impact Assessment (EIA), in relation to proposed railway works, as a process:

'(b) including an examination, analysis and evaluation by the Board under sections 42B and 43 in order to identify, describe and assess, in the light of each individual case, the direct and indirect significant effects of the proposed railway works, including significant effects derived from the vulnerability of the activity to risks of major accidents and disasters relevant to it, on -

(i) population and human health,

(ii) biodiversity, with particular attention to species and habitats protected under Council Directive 92/43/EEC of 21 May 1992 and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009,

(iii) land, soil, water, air and climate,

(iv) material assets, cultural heritage and the landscape, and

(v) the interaction between the factors referred to in subparagraphs (i) to (iv).'

Throughout the EIA process and the preparation of the EIAR Chapters, impact interactions have been considered.

Some of the environmental topic assessments within this EIAR already address impact interactions. For example, Chapter 11 (Population & Land Use) provides an assessment of effects on community amenity, which relates to the interaction of impacts on air quality; visual amenity; traffic and transport; and noise and vibration. Furthermore, Chapter 10 (Human Health) describes and assesses how a combination of impacts on health determinants (air quality; noise and vibration; community amenity; traffic and transport) can interact and influence health outcomes.

Limits of deviation have been set for the proposed Project and this is addressed in the Wider Effects Report annexed at Appendix A5.19

29.2 Analysis of Interactions

A summary of the general interactions is presented in Table 29-1 and a more detailed description of the interactions is included in Section 29.3. The assessment has considered both the Construction and Operational Phase of the proposed Project. Table 29.1 presents environmental interactions in the format of a simple matrix as advised in the Guidelines on the information to be contained in EIARs (Environmental Protection Agency (EPA), 2022). Only significant interactions have been presented. Where an interaction would occur between one or more environmental factors, these are described in Section 29.3.

Table 29-1 Environmental Interactions Matrix

Inter-Relationship Matrix – Environmental Elements	Traffic and Transport		Human Health		Population and Land Use		Electromagnetic Compatibility and Stray Current		Airborne Noise and Vibration		Ground-borne Noise and Vibration		Biodiversity		Air Quality		Climate		Hydrology		Hydrogeology		Soils and Geology		Land Take		Infrastructure and Utilities		Agronomy		Materials and Waste Management		Archaeology and Cultural Heritage		Architectural Heritage		Landscape and Visual		
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.			
Traffic and Transport																																							
Human Health	✓	✓																																					
Population and Land Use	✓	✓	✓	✓																																			
Electromagnetic Compatibility and Stray Current			✓	✓	✓	✓																																	
Airborne Noise and Vibration	✓	✓	✓	✓	✓	✓																																	
Ground-borne Noise and Vibration			✓	✓	✓	✓			✓	✓																													
Biodiversity	✓								✓	✓																													
Air Quality	✓	✓	✓	✓	✓	✓							✓	✓																									
Climate	✓	✓	✓	✓	✓	✓							✓	✓																									
Hydrology	✓		✓		✓								✓	✓																									
Hydrogeology	✓		✓		✓								✓	✓																									
Soils and Geology			✓		✓								✓		✓																								
Land Take					✓	✓							✓	✓																									
Infrastructure and Utilities	✓			✓	✓		✓	✓					✓	✓			✓	✓	✓					✓	✓														
Agronomy	✓				✓	✓			✓				✓		✓									✓	✓	✓													
Materials and Waste Management	✓		✓		✓								✓		✓								✓	✓															
Archaeology and Cultural Heritage					✓	✓							✓										✓	✓															
Architectural Heritage					✓	✓			✓		✓												✓	✓															
Landscape and Visual			✓	✓	✓	✓							✓	✓											✓	✓	✓	✓											

Notes: This matrix should be read down, starting with each topic identified across the top ✓ = significant interaction between topics. Blank cells indicate no or weak interaction. Con. = Construction Phase. Op. = Operational Phase.

29.3 Discussion of Interactions

29.3.1 Interactions Between Population and Land Use and Human Health

The topics of population and land use and human health are inextricably linked. Chapter 10 (Human Health) has considered how the wider determinants of health such as the social conditions, community networks and economic conditions within the proposed Project study area have an important influence on human health. Chapter 11 (Population & Land Use) has focused on how the proposed Project could have impacts on communities and the local economy.

29.3.1.1 Construction Phase

The population assessment has identified areas of community and commercial land take, some of which is permanent. These impacts would be felt at a local, individual level and at the community level. It is considered that the impacts would be strongly linked with impacts on amenity and general disruption from construction activities as well as the requirement to acquire and in some cases demolish private property. Similarly, both the population and human health assessments identify that accessibility to community and health care facilities may be temporarily disrupted during the Construction Phase. In the absence of mitigation measures, health impacts associated with these construction impacts are related to emissions to air, noise and vibration and other emissions as well as psychosocial impacts, such as stress and anxiety.

29.3.1.2 Operational Phase

The population and human health assessments identify positive impacts on accessibility. While the population assessment looks at this in relation to community and commercial receptors, the human health assessment considers the health outcomes which may be associated with this improved accessibility. This could include improved and more equitable access to health, education and other services. This is also a social impact, improving the wider determinant of health in relation to transport and opportunities to access services.

29.3.2 Interactions Between Population and Land Use, Human Health, Traffic and Transport, Air Quality, Climate, Airborne Noise and Vibration, and Ground-borne and Noise and Vibration

There is significant interaction between these topics during both the Construction and Operational Phases. The traffic and transport assessment has informed the assessments of population and land use, human health, air quality, climate and airborne noise and vibration. The population assessment has considered effects on accessibility which directly interacts with traffic and transport. The population assessment has also assessed effects on amenity which relate to traffic emissions to air and noise. The human health assessment has considered health outcomes from exposure to air pollution, traffic noise as well as changes to wider determinants of health such as traffic and transport, and access. The proposed Project is assessed as having a positive impact on access to sustainable travel within the Greater Dublin Area (GDA) and a positive effect on climate through reduction of carbon emissions during the Operational Phase. It is considered that the key interactions for both the Construction and Operational Phases, are inherently captured across Chapter 9 (Traffic & Transport), Chapter 10 (Human Health), Chapter 11 (Population & Land Use), Chapter 13 (Airborne Noise & Vibration), Chapter 14 (Groundborne Noise & Vibration), Chapter 16 (Air Quality) and Chapter 17 (Climate).

29.3.3 Interactions Between Human Health, Population and Land Use, Air Quality, Climate and Landscape and Visual

The assessment of human health has an indirect interaction with the landscape via the assessment of amenity in Chapter 11 (Population & Land Use). The quality of the landscape and built environment can influence how people feel about a place and is therefore connected with mental wellbeing. Impacts to the public realm have a possible pathway to health outcomes.

29.3.3.1 Construction Phase

Negative effects on the landscape resulting in the loss of valuable landscape features during construction have the potential to have an impact on community amenity and subsequently on wellbeing. In addition, the removal of trees and hedgerow and other habitat types considered as carbon sinks can have a small-scale negative impact on air quality during the Construction Phase and subsequently on climate. Removal of trees and other vegetation during the Construction Phase can be detrimental and have an impact on climate. Impacts to landscape during construction are outlined in Chapter 27 (Landscape & Visual), and Chapter 16 (Air Quality) and Chapter 17 (Climate) consider the impacts of the removal of trees, hedgerows and other habitat in terms of air quality and climate.

29.3.3.2 Operational Phase

The landscape will undergo change for the Operational Phase, as outlined in Chapter 27 (Landscape & Visual). This will include improvements to the accessibility, attractiveness and the experience of recreational provision, which has proven benefits in respect of human health. The provision of new/replacement planting will have a positive impact on air quality and climate.

29.3.4 Interactions Between Electromagnetic Compatibility and Stray Current, Population and Land Use, Human Health and Infrastructure and Utilities

Chapter 12 (Electromagnetic Compatibility & Stray Current) assesses electromagnetic emissions. Electromagnetic emissions can have direct interactions with the population and land use, and human health, as high levels of electromagnetic radiation can cause adverse health effects in human beings and can interfere with specialised sensitive equipment at research facilities and some healthcare facilities.

29.3.4.1 Construction Phase

During construction, electromagnetic emissions can arise from on-site generators required to power construction activities and construction compounds. Chapter 12 (Electromagnetic Compatibility & Stray Current) considers the likely levels of emissions and receptors in the study area and does not anticipate any impacts on population and human health.

29.3.4.2 Operational Phase

During operation, the power supply and distribution system and new tractions systems required to operate the proposed Project could interfere with identified land uses at specialised research facilities (such as at Trinity College Dublin) and other sensitive land uses such as Dublin Airport. Chapter 12 (Electromagnetic Compatibility & Stray Current) considers the likely levels of emissions and receptors and outlined that levels would be below guideline exposure levels with appropriate mitigation measures.

29.3.5 Interactions Between Airborne Noise and Vibration and Ground-Borne Noise and Vibration

29.3.5.1 Construction Phase

Ground-borne and airborne effects from construction activities may be experienced simultaneously in some buildings. Information on degree of impacts are set out in Chapter 13 (Airborne Noise & Vibration) and Chapter 14 (Groundborne Noise & Vibration). The human response to the potential interaction of both airborne and groundborne noise and vibration types is dependent on the sensitivity of those exposed. Disturbance is more likely from multiple sources of noise or vibration than a single type of noise or vibration in isolation. The interaction would not affect buildings or other structures.

Chapters 13 and 14 set out how airborne noise and vibration and ground-borne noise and vibration impacts would be mitigated, and therefore how potential interaction would also be mitigated.

29.3.5.2 Operational Phase

Where the proposed Project track is in open cut or at grade, ground-borne and airborne effects may be experienced simultaneously. Interactions between ground-borne and airborne noise assessments have been directly linked in Chapter 13 (Airborne Noise & Vibration) and Chapter 14 (Groundborne Noise & Vibration) to ensure all potential acoustic impacts are identified and described.

29.3.6 Interactions Between Biodiversity, Traffic and Transport, Airborne Noise and Vibration, Climate, Soils and Geology, Hydrology, Hydrogeology, Air Quality, Land Take, Infrastructure and Utilities and Landscape and Visual

There will be interactions between biodiversity and other specialist topics across both the Construction and Operational Phase of the proposed Project.

29.3.6.1 Construction Phase

The biodiversity assessment has considered interactions between key ecological receptors (i.e., species and habitats) and various other environmental factors. Specifically, there is an interaction between traffic and transport and mortality risk for species. Airborne noise can interact with biodiversity as any increase in noise levels has the potential to impact on sensitive ecological receptors. There is an interaction between hydrology, air quality and biodiversity, as any reduction in the quality of surface water or in air quality can contribute to habitat degradation. In addition, there is an interaction between soils and geology and biodiversity, as non-native invasive plant species can be spread through soils and can also contribute to habitat degradation. As part of construction, some trees and other planting/habitat will be required to be removed, as outlined in Chapter 27 (Landscape & Visual) and this has the potential to result in habitat loss and fragmentation.

29.3.6.2 Operational Phase

During the Operational Phase, there will be an interaction between the landscape and biodiversity. As outlined in Chapter 27 (Landscape & Visual), the proposed Project will include replanting, where possible, and this will include the planting of more diverse species (and orientation to native species), plus the use of pollinator friendly species which offer an opportunity for enhancement of local biodiversity. In addition, there will be amended landscape management, involving reduced maintenance (including reduced reliance on inorganic chemicals).

Chapter 15 (Biodiversity) describes and assesses how different impacts of the proposed Project on traffic, water, soils, air quality, climate, airborne noise and landscape may interact with biodiversity. Reference should be made to Chapter 15 (Biodiversity) to understand those interactions.

29.3.7 Interactions Between Climate, Hydrology and Hydrogeology

29.3.7.1 Operational Phase

The impact of climate change is considered in the Flood Risk Assessment (FRA) (Appendix A18.5 of the EIAR) which is summarised in Chapter 18 (Hydrology) and Chapter 17 (Climate). The interaction between climate change and flood risk is therefore captured in these assessments.

29.3.8 Interactions Between Climate, Traffic and Transport, Population and Land Use, Human Health and Air Quality

Chapter 17 (Climate) provides an assessment of the effects of the proposed Project on greenhouse gas emissions (GHGs).

29.3.8.1 Construction Phase

During construction, increases in traffic on the road network have the potential to directly impact air quality which can indirectly impact communities and health and climate.

29.3.8.2 Operational Phase

Operational Phase traffic and transport is intrinsic to the assessment of climate impacts reported in Chapter 17 (Climate). This interaction is therefore captured within that Chapter. The proposed Project will provide a more sustainable mode of transport, and therefore, will have a positive impact on communities and health through better accessibility and on climate.

29.3.9 Interactions Between Hydrology, Hydrogeology, and Soils and Geology, Traffic and Transport, Population and Land Use and Human Health

29.3.9.1 Construction Phase

There is the potential for impacts on surface water and subsequently groundwater from construction activities such as dewatering of deep excavations, increased volume of traffic on roads and runoff from construction activities, including dewatering, soil stripping and stockpiling of soils. This can then have an indirect impact on communities and human health, particularly for those using domestic well supplies.

Chapter 18 (Hydrology) and Chapter 19 (Hydrogeology) consider the potential impacts to surface water and groundwater as a result of the construction of the proposed Project, which is informed by construction traffic modelling in Chapter 9 (Traffic & Transport), soil management measures outlined in Chapter 20 (Soils & Geology) and the construction activities outlined in Chapter 5 (MetroLink Construction Phase). Chapter 11 (Population & Land Use) and Chapter 10 (Human Health) consider the potential indirect impacts from construction activities on communities and health.

29.3.9.2 Operational

There is the potential for impacts on surface water and subsequently groundwater from operational activities. The drainage outfalls to rivers and streams will be point discharges and have the potential, if not adequately designed and mitigated, to change the current flow regime and water quality in the existing surface watercourses. This can indirectly impact on health and communities. Chapter 18 (Hydrology) considers the drainage requirements of the Operational Phase and how this will be managed.

29.3.10 Interactions Between Materials and Waste, Land Take, Infrastructure and Utilities, Hydrology, Hydrogeology and Soils and Geology

The main interaction between these topics will be during the Construction Phase.

29.3.10.1 Construction Phase

Chapter 24 (Materials & Waste Management) assesses the impact of imported materials and use of site-won materials which can be reused within the proposed Project. The amount of material to be imported will depend on the amount of material which can be recovered and reused on-site. Chapter 20 (Soils & Geology) provides an assessment of impacts on soils, including potentially contaminated land. There is an interaction between this issue and waste because the likelihood of excavated materials being suitable for use on-site will depend on whether or not it is contaminated, and the type of contamination. This is established through detailed ground investigations as set out in Chapter 20 (Soils & Geology) Section 20.2.3.4. The proposed Project will involve excavation of bulk materials, for example as part of the tunnelling activities as well as station construction and the construction of various other components. The likelihood of encountering contaminated materials from various excavation activities is assessed in Chapter 20 (Soils & Geology). There is also the potential for the long-term loss or degradation of soils as a result of activities associated with temporary and permanent land take, which is required for construction works, including the diversion/realignment and installation of infrastructure and utilities. Requirements for infrastructure and utilities and associated land take is considered in Chapter 21 (Land Take) and Chapter 22 (Infrastructure & Utilities) and impacts on soils are considered in Chapter 20 (Soils & Geology).

There will be interactions between land take, hydrology, hydrogeology and infrastructure and utilities as the proposed Project will result in the removal and minor diversion of existing tributaries to main river systems; altering drainage features and flow patterns (e.g., at Dardistown Depot), and the removal of saturated overburden and bedrock during excavation works for new site footprints. Impacts on surface water and groundwater/bedrock are outlined in Chapter 18 (Hydrology) and Chapter 19 (Hydrogeology).

29.3.11 Interactions Between Land Take and Population and Land Use

There is a direct interaction between population and land use, and land take during both the Construction Phase (temporary land take) and the Operational Phase (permanent land take). The loss of residential properties during construction will have an impact on the population of the study area. The loss of temporary and permanent loss of commercial properties during construction and operation will also have an impact on business activity.

Land take requirements (both temporary and permanent) are outlined in Chapter 21 (Land Take). Land use and the land usage in land take areas are outlined in Chapter 11 (Population & Land Use).

29.3.12 Interactions Between Land Take, Infrastructure and Utilities and Landscape and Visual

Impacts associated with the permanent and temporary land take for the proposed Project and associated with the diversion (permanent and/or temporary) of overhead and underground services and utilities is considered under Chapter 27 (Landscape & Visual).

29.3.13 Interactions Between Infrastructure and Utilities, Materials and Waste, Traffic and Transport and Population and Land Use

29.3.13.1 Construction Phase

Roads and traffic are assessed in Chapter 9 (Traffic & Transport). The interactions of traffic and transport and infrastructure and utilities are included as part of the proposed Project with infrastructure and utilities captured in Chapter 22 (Infrastructure & Utilities). Utility diversions and new installations have the potential to impact on the road network as lane closures may be required to facilitate these works. Chapter 24 (Materials & Waste Management) considers the volumes of waste materials that will be required to be transported during the Construction Phase and this will have a direct interaction with traffic, as increases will occur due to the presence of construction vehicles on the road network transporting waste materials off site. Increases in traffic and utility diversions and potential disruptions to utilities can then have an indirect impact on communities, which are outlined in Chapter 11 (Population & Land Use).

29.3.14 Interactions Between Agronomy and Traffic and Transport

29.3.14.1 Construction Phase

There is an interaction between agronomy and traffic and transport, as during the Construction Phase, farming operations may be impacted by construction traffic. Access to construction working widths on agricultural land has the potential to temporarily impact on agricultural land use and result in severance of agricultural land. Chapter 9 (Traffic & Transport) assesses access required for construction vehicles during the Construction Phase and Chapter 23 (Agronomy) assess the potential impact of vehicle access of agricultural lands within the proposed Project boundary.

29.3.15 Interactions Between Agronomy, Population and Land Use, Land Take and Infrastructure and Utilities

29.3.15.1 Construction Phase

There is an interaction between land take, infrastructure and utilities, population and land use and agronomy, as access to agricultural lands and interruptions to utilities such as water and electricity

supplies may temporarily occur during the Construction Phase due land take required to carry out construction activities. Chapter 21 (Land Take) outlines where such land take will be required on agricultural land and Chapter 22 (Infrastructure & Utilities) outlines where temporary impacts to utilities on agricultural land will be required.

29.3.15.2 Operational Phase

There is an interaction between population and land use, land take and agronomy during the Operational Phase as the proposed Project is anticipated to expand economic activity in a range of industries at certain areas near the alignment where the land is zoned for uses other than agricultural use. Chapter 11 (Population & Land Use) considers land zoning within the proposed Project boundary, Chapter 21 (Land Take) outlines where permanent land take will be required, and Chapter 23 (Agronomy) assesses the long-term impact of the removal of agricultural land.

29.3.16 Interactions Between Agronomy, Airborne Noise and Vibration, Air Quality, Climate, Biodiversity and Soils and Geology

29.3.16.1 Construction Phase

The agronomy assessment has assessed the potential indirect impacts on agricultural land which relate to emissions of air pollution and noise, which can result from construction activities and increases in traffic as a result of the Construction Phase. Similarly, soil quality has a direct interaction with agronomy and construction activities can have direct impacts on soil quality through removal or by degradation. In addition, agronomy can be impacted through the spread of non-native invasive plant species and the potential spread of soil-borne diseases. Chapter 13 (Airborne Noise and Vibration), Chapter 15 (Biodiversity), Chapter 16 (Air Quality) and Chapter 20 (Soils & Geology) outline measures that will be employed to minimise disruption and impacts on neighbouring farms during the Construction Phase.

29.3.16.2 Operational Phase

There is an interaction between agronomy and climate as the proposed Project may accelerate the change in land use from agricultural to other uses consistent with the zoning objectives of the land. Changes in land use from agricultural land has the potential to impact climate sinks. Chapter 17 (Climate) considers the likely impacts of the proposed Project on the climate in the Operational Phase.

29.3.17 Interactions Between Materials and Waste, Infrastructure and Utilities, Traffic and Transport, Population and Land Use, Human Health, Air Quality, Climate, Soils and Geology

29.3.17.1 Construction Phase

During the Construction Phase, construction activities will involve excavations and the production of waste from the removal of soils, rock required for tunnelling, foundations and the installation and diversion of utilities. The generation of waste and the stockpiling of materials on-site can have an impact on communities and human health via air quality, due to the increased risk of exposure of construction workers and residents to sub-surface material which may contain contaminants and generate dust, and via increased volumes of traffic on road networks required to transport materials and waste. The generation of waste and the stockpiling of materials on-site can attract vermin if not managed correctly. In addition, construction materials and waste during the Construction Phase will have associated embodied carbon emissions which can impact climate.

There is also an interaction between climate, infrastructure and utilities and material and waste management, as the amount of material to be imported, and waste generated during construction of the proposed Project, will influence the embodied carbon footprint of the proposed Project, which is assessed in Chapter 17 (Climate). The redistribution of traffic associated with the traffic management during construction, will also generate GHGs, which have informed the assessment in Chapter 17 (Climate).

29.3.17.2 Operational Phase

During the Operational Phase, new energy demands from new infrastructure and materials required for the operation of the proposed Project are considered under Chapter 17 (Climate). In addition, during operation, the provision of new railway infrastructure is assessed as a result of a new interchange at Glasnevin Station and will have a positive impact on communities through increased access to sustainable public transport, and the provision of more sustainable travel will also have a positive impact on climate and human health, as assessed in Chapter 10 (Human Health) and Chapter 11 (Population & Land Use).

29.3.18 Interactions Between Materials and Waste, Biodiversity, Hydrology and Hydrogeology

29.3.18.1 Construction Phase

There are potential interactions between materials and waste management and the hydrological and hydrogeological environment which can have a potential impact on key ecological receptors during construction, as outlined in Chapter 15 (Biodiversity).

29.3.19 Interactions Between Archaeology and Cultural Heritage, Architectural Heritage, Hydrogeology and Soils and Geology

29.3.19.1 Construction Phase

Construction activities such as dewatering and tunnelling can result in settlement which can have a direct impact on geological heritage features which can also be of cultural heritage, as well as on adjacent sensitive heritage structures. Chapter 19 (Hydrogeology) and Chapter 20 (Soils & Geology) consider the potential for settlement as a result of construction activities and these assessments are used to inform the assessment of impacts on heritage features and structures in Chapter 25 (Archaeology & Cultural Heritage) and Chapter 26 (Architectural Heritage).

29.3.20 Interactions Between Architectural Heritage, Airborne Noise and Vibration and Ground-borne Noise and Vibration

29.3.20.1 Construction Phase

Vibration can directly impact on the stability of heritage structures. Chapter 13 (Airborne Noise & Vibration) and Chapter 14 (Groundborne Noise & Vibration) consider the potential levels of vibration resulting from the construction of the proposed Project, most notably from tunnelling works below-ground and these assessments are used to inform the assessment of impacts on heritage structures in Chapter 26 (Architectural Heritage).

29.3.21 Interactions Between Archaeology and Cultural Heritage, Architectural Heritage, Population and Land Use, Land Take and Infrastructure and Utilities

29.3.21.1 Construction Phase

During the Construction Phase, there is the potential for direct impacts on heritage features and indirect impacts on the setting of heritage features identified in Chapter 25 (Archaeology & Cultural Heritage) and Chapter 26 (Architectural Heritage), and indirectly on community amenity, as a result of construction activities such as utility installations/diversions and temporary land take. Chapter 21 (Land Take) and Chapter 22 (Infrastructure & Utilities) outline where land take will be required and where utility installation/diversions will be located, and these have informed the assessment of potential impacts on heritage features and their setting.

29.3.21.2 Operational Phase

During the Operational Phase, there is the potential for indirect impacts on heritage features and their setting which are identified in Chapter 25 (Archaeology & Cultural Heritage) and Chapter 26

(Architectural Heritage), due to permanent land take and changes in land use as a result of the proposed Project. Chapter 11 (Population & Land Use) discusses changes in land use and impacts to community amenity, and Chapter 21 (Land Take) outlines permanent land take required to facilitate the operation of the proposed Project, and these have informed the assessment of potential impacts on heritage features and their setting.

29.3.22 Interactions Between Archaeology and Cultural Heritage, Architectural Heritage and Landscape and Visual

Architectural heritage has an influence on the quality of the landscape in urban areas, and therefore, there is an interaction between these topics. Archaeological heritage may also be of architectural interest. Cultural heritage includes tangible heritage such as archaeology, architectural heritage, settlements, buildings and structures, designed landscapes, in addition to placenames and intangible heritage such as folklore, traditions and traditional practices. These issues are therefore interrelated.

29.3.22.1 Construction Phase

Visual impacts and landscape impacts on features/properties of cultural heritage value have been assessed in Chapter 27 (Landscape & Visual). The Construction Phase will have impacts on a number of local features of heritage value. The main impacts on archaeology, cultural heritage and architectural heritage would take place during the Construction Phase. Relevant interactions are captured in Chapter 25 (Archaeology & Cultural Heritage) and Chapter 26 (Architectural Heritage).

29.4 Conclusion

Many of the potential impacts arising from the potential interactions were identified at a very early stage in the design process and in the EIAR preparation. This allowed for these interactions to be addressed in the design of the proposed Project and in the baseline and impact assessment studies undertaken for the EIAR. As a result, the potential impacts were either avoided altogether through design measures or they were addressed through specific mitigation measures, as summarised in Chapter 31 (Summaries of the Route Wide Mitigation & Monitoring Proposed). This early identification process helped to identify and minimise the potential for significant interactions of impacts arising. The mitigation proposals for specific environmental aspects also help to mitigate the potential effects of impact interactions as far as practicable.

29.5 Glossary

Term	Meaning
Alignment	MetroLink route.
Construction Compound	Temporary construction site used for the construction of the proposed Project which may include offices, welfare facilities, materials and waste storage and vehicle parking.
EIA Directive	Directive 2011/92/EU as amended by Directive 2014/52/EU.
Railway Order application	An application for approval under section 43 of the Transport (Railway Infrastructure) Act 2001.
Term	Meaning

29.6 References

EPA (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Transport (Railway Infrastructure) Act (2001) as amended by the European Union (Railway Orders) (Environmental Impact Assessment) (Amendment) Regulations 2021.