19. Population and Human Health

19.1 Introduction

As set out in Chapter 1 of this updated EIAR, this is an update to Chapter 18 of the EIAR submitted to An Bord Pleanála in October 2018 as part of the application for approval of the proposed N6 GCRR pursuant to Section 51 of the Roads Act 1993 (as amended) (the "Section 51 Application"). Population and human health now falls under Chapter 19 of this updated EIAR, as air quality and climate are now considered separately in standalone chapters, both of which precede this chapter. It forms part of the response to the request by ABP for further information in December 2023 where they (in addition to a number of other requests) requested GCC to *"Update the Environmental Impact Assessment Report"*. This chapter provides an appraisal of the Project under the heading of population and human health. This is a broad ranging topic which *"covers the existence, activities and health of people, usually considering people as groups or 'populations'"* (EPA 2015)[1]. The EPA 2022 Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EIAR) states: "*The recitals to the 1985 and 2011 Directives refer to 'Human Health' and include 'Human Beings' as the corresponding environmental factor. The 2014 Directive calls this factor 'Population and Human Health'.* Where there have been any changes to the assessment and or any updates since the 2018 EIAR these have been set out in this updated chapter.

The chapter has also been updated to address the additional guidance given on the A new Standard (PE-ENV-01108) *Population and Human Health Assessment of Proposed National Roads (TII, September 2024)* has recently been published by Transport Infrastructure Ireland. Section 1.5 of this standard states that where projects have already commenced planning and design, the new standard is to be treated as advice and guidance. In this respect, the assessment criteria used for the 2018 EIAR have been retained in this chapter for the population assessment as they already cover the principal areas of assessment introduced in the new standard as shown in Plate 19.1.

Figure 2.2 - Impacts to be considered in population assessment

Plate 19.1 Extract from TII PHH Standard for Population Assessment

However, additional assessment has been added to cover some key impact types addressed in the new standard for the human health.

The chapter has also been updated to include new baseline demographic data from Census 2022 (Central Statistics Office, 2023) which reported a significant increase of 7.3% in the population of Galway City and Suburbs since the previous Census of 2016 from 76,668 to 84,414 persons.

[1] Extracted from the Advice Notes for Preparing Environmental Impact Statements (EPA draft September 2015).

This increase has been accompanied by an increase in traffic flow in parts of the city and consequently the chapter has been updated to include the updated traffic estimates (AADT), although these do not significantly alter the assessment. The chapter also accounts for new developments and planning applications since the 2018 EIAR and for assessing likely significant cumulative impacts between these and the Project in a pairwise comparison of the new development/planning and the Project from a population and human health perspective. This pairwise comparison then informs the overall likely significant cumulative impacts assessment covered in Chapter 21 of this updated EIAR. Consideration has also been given to proposed new infrastructure for public transport and active travel across the city.

This chapter initially sets out the methodology for this update (Section 19.2), describes the receiving environment as it currently whilst noting any significant changes since the 2018 EIAR (Section 19.3) and summarises the main characteristics of the Project which are of relevance for population and human health (Section 19.4). The evaluation of impacts of the Project on population and human health are described (Section 19.5). Measures are proposed to mitigate these impacts (Section 19.6) and residual impacts are described (Section 19.7). The cumulative impacts are assessed (Section 19.8) and the chapter concludes with a summary 19.10and reference section (Section 19.9 and Section respectively).

The key changes to the chapter since the 2018 EIAR involve updating:

- Reviewing and updating elements of the chapter to address points raised from the Brief of Evidence presented to An Bord Pleanala (ABP) at the oral hearing in 2020 and from the ABP Inspector's Report dated June 2021
- Update to the assessment of significance of effects having regard to the EPA 2022 EIAR guidelines, Design Manual for Roads and Bridges (DMRB) Sustainability & Environmental Appraisal LA 111 Noise and Vibration, Revision 2. (UKHE 2020), WHO European Noise Guidelines (2018), the Galway City Council Noise Action Plan 2024 – 2028 and the Galway County Council Noise Action Plan 2024 – 2028
- Updated operational traffic modelling based on the most up to date traffic forecasts for the revised opening and design years of the Project which generated updated noise predictions
- Review of updated noise, air, soils, water, landscape and visual assessments as they relate to the health impact assessment

Aspects examined in this chapter primarily relate to impacts from the Project on the local population, on local journeys, use of community facilities, and the health, social and economic well-being of people at a community level. Aspects related to Population include journey patterns, amenity and community severance, business, tourism and employment, and use of the Irish language. The Irish language is addressed separately in various sections of this chapter. Other aspects relevant to human beings such as natural amenity, built and natural heritage, ecosystem services, material assets and nuisance are dealt with in the following chapters:

- Chapter 7, Construction Activities
- Chapter 8, Biodiversity
- Chapter 9, Soils and Geology
- Chapter 10, Hydrogeology
- Chapter 11, Hydrology
- Chapter 12, Landscape and Visual
- Chapter 13, Archaeological, Architectural and Cultural Heritage
- Chapter 14, Material Assets Agriculture
- Chapter 15, Material Assets Non-Agriculture
- Chapter 16, Air Quality
- Chapter 17, Climate

- Chapter 18, Noise and Vibration

While no specific guidance on the meaning of the term Human Health has been issued in the context of Directive 2014/52/EU, human health impacts are primarily considered through an assessment of the environmental pathways by which health can be affected such as air, noise, water or soil in accordance with EPA 2022 Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EIAR).

> *'The evaluation of effects on these pathways is carried out by reference to accepted standards (usually international) of safety in dose, exposure or risk. These standards are in turn based upon medical and scientific investigation of the direct effects on health of the individual substance, effect or risk. This practice of reliance upon limits, doses and thresholds for environmental pathways, such as air, water or soil, provides robust and reliable health protectors [protection criteria] for analysis relating to the environment.'*
>
> In September 2024 *Population and Human Health Assessment of Proposed National Roads* - Standard PE-ENV-01108 was Published by TII (Transport Infrastructure Ireland). This is subsequently referred to in this Chapter as the TII PHH Standard. This TII PHH Standard includes a definition of human health, on which this update to the human health assessment is based, as follows: *The human health assessment shall be based on the definition of health as set out in the constitution of the World Health Organization (WHO), which defines health as 'a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity'.*

Section 1.5 of the Standard states:

> *'Where projects requiring approval under Section 51, Section 177AE or Part 8 have, at the date of publication of this SD, commenced planning and design and in particular where technical advisor contracts have been executed, this SD shall also be:*
>
> *• Treated as advice and guidance.*
>
> *• Employed to the greatest extent reasonably practicable.*
>
> *• Applied in a proportionate manner, having regard to the characteristics and location of the project/maintenance works and the type and characteristics of potential impacts.'*

In consideration of the above, the TII PHH Standard has been employed to the greatest extent reasonably practicable in this updated EIAR.

The TII PHH Standard sets out the required approach for population and human health assessment in accordance with EIA legislative requirements and relevant TII guidelines and standards.

> *'This Standard (PE-ENV-01108) provides a robust and consistent approach, with a focus on proportionate assessment to protect and support healthy, equitable and cohesive communities'.*

The TII PHH Standard requires consideration of the effect of landscape and visual and climate as potential determinants on human health, and therefore, these are additional considerations included for scoping in this update over and above the 2018 assessment. Therefore, the health assessment in this updated EIAR relies on the assessments in the following chapters as set out in the 2018 EIAR plus the additional assessments to address the new TII PHH Standard which notes as follows:

> *'The assessment scope will be decided by the health assessment practitioner and should be proportional and project-specific, focusing only on those impacts that have the potential to give rise to effects on population health and/or health inequalities.'*

As such the health assessment is informed by the outputs from other topics and draws on the findings as necessary to examine whether the effects arising from any identified impacts may have a health impact and to ensure that the effects which may have a health impact are fully considered. The following topics have been considered:

- Chapter 9, Soils and Geology to identify if there are any areas of contaminated soils
- Chapter 10, Hydrogeology to identify areas with any potential impacts on groundwater

- Chapter 11, Hydrology and Appendix A.11.1 to identify areas with any potential impacts on surface water and areas of flood risk
- Chapter 12, Landscape and Visual to identify areas of potential impacts on the existing landscape
- Chapter 16, Air Quality to identify the predicted air quality values adjacent to the Project
- Chapter 17, Climate to identify the predicted impacts arising from flooding or drought
- Chapter 18, Noise and Vibration to identify the predicted noise levels at properties adjacent to the Project

The health assessment also considers psychological effects, health improvement and improvement to services. Other aspects, such as changes in traffic flows which are dealt with in Chapter 6, Traffic Assessment and Route Cross-Section, have also been considered in this chapter in relation to the assessment of Population and Health impacts to ensure that the effects of these issues on population and human health have been addressed.

To inform the human beings, population and human health impact appraisal, this chapter has utilised the information gathered during the constraints, and route selection studies for the proposed N6 GCRR. Submissions received as part of the extensive public consultation carried out in respect of the proposed N6 GCRR were assessed and design changes made to minimise the potential impacts on human beings and properties as part of the design phase. These submissions also informed the assessment undertaken for this chapter. Sections 4.17, 6.5.11 and 7.6.11 of the Route Selection Report considered the human beings and population constraints within the scheme study area and compared the potential impacts on human beings and population of the proposed route options. These sections of the Route Selection Report contributed to the design of the proposed N6 GCRR.

A review of the changing land use, population centres, employment centres and travel demand since 2018 has been undertaken to inform this updated chapter in 2025.

A number of questions arose at the oral hearing in 2020 specifically in relation to impacts on homes and communities and impacts on well-being and health, and these are specifically referred to and dealt with in the appropriate location throughout this updated chapter. Further the errata/corrigendum handed in during the Oral Hearing in 2020 have also been reflected in this updated chapter and where appropriate the appendices to this updated chapter.

This chapter should be read in conjunction with Figures 19.1.001, 19.1.002 and 19.1.101 to 19.1.115 which illustrate the location of community facilities such as schools, hospitals, hotels, parks, sports and retail facilities relative to the Project.

19.2 Methodology

19.2.1 Introduction

This updated assessment has been prepared in accordance with the relevant guidelines listed in Section 19.2.2.1 below. Data has been collected primarily through a review of relevant documents listed in Section 19.2.2.1 below and information gathered through the extensive public consultation detailed in Chapter 1, Introduction and mapping provided by the design team plus consultation on current standards, guidance and data sources which have been updated since the 2018 EIAR publication. This data was supported by site visits and local discussions with residents, businesses, schools and representatives of other community facilities. Furthermore, a Language Impact Assessment (LIA) for the Project has been undertaken, the results of which are included in Section 19.5.5.

Aspects examined in this updated chapter primarily relate to impacts from the Project on socio-economic activities impacting on Population and on local community health. These two themes are discussed together in some sections of this chapter, but separately in other sections where appropriate.

19.2.2 Relevant Guidelines, Data Sources and Consultations

19.2.2.1 Relevant Guidelines

This updated assessment has been prepared having regard to the following guidelines (all of which remain relevant today to this updated assessment):

- Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022)
- European Commission (EC) Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (EC 2017)
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines for National Roads Unit 13.0 Pedestrian and Cyclist Facilities PE-PAG-02036 (TII, May 2024)
- TII Standard (PE-ENV-01108) for Population and Human Health Assessment of Proposed National Roads (TII, September 2024) (referred to as the TII PHH Standard throughout this chapter)
- Fáilte Ireland. EIAR Guidelines for the consideration of tourism and tourism related projects (Fáilte Ireland, 2023)
- World Health Organisation (WHO) Night time Noise Guidelines for Europe (2018)
- Environmental Protection Agency (US). Health Impact Assessment Resource and Tool Compilation (US EPA 2016)
- World Health Organisation Guidelines for Community Noise (WHO 1999)
- Institute of Environmental Management and Assessment (IEMA) Health in Environmental Impact Assessment - A Primer for a Proportionate Approach (IEMA 2017)
- Institute of Environmental Management and Assessment (IEMA) Guide to Effective Scoping of Human Health in Environmental Impact Assessment (Pyper et al., 2022)
- Institute of Environmental Management and Assessment (IEMA) Guide to Determining Significance for Human Health in Environmental Impact Assessment (Pyper et al., 2022)
- Institute of Environmental Management and Assessment (IEMA) Impact Assessment Outlook Journal (Volume 8: October 2020) - Health Impact Assessment in Planning
- Institute of Public Health Ireland (IPH) Health Impact Assessment (IPHI 2009)
- Institute of Public Health Ireland (IPH) Health Impact Assessment Guidance Manual for Ireland and Northern Ireland (Pyper et al., 2021)
- International Association for Impact Assessment (IAIA) and European Public Health Association (EUPHA) Human Health: Ensuring a High Level of Protection. A reference paper on addressing Human Health in Environmental Impact Assessment (Cave et al., 2020)
- Health Impact Assessment Resource and Tool Compilation (US EPA 2016)

19.2.2.2 Data Sources and Consultations

An assessment of the potential impacts on population and human health requires an understanding of the community which is built up through background research, site visits, and discussions with members of the local community and the assessment of the environmental factors (pathways) through which health could be affected, such as air, noise, water, soils, landscape and visual and traffic volumes. The potential impacts of the Project on population and human health is assessed against this background data.

Background data has been collected for the Project by means of various sources as listed below, with new sources dated post 2018 noted:

- Primary data sources (e.g. demographic data from Census 2022, 2016, Census 2011 and Census 2006 as produced by the Central Statistics Office)
- Maps of the surrounding area, including Ordnance Survey 1:50,000 maps and aerial mapping
- A review of the design of the Project and its potential impacts on material assets non-agriculture
- A review of secondary sources including the Galway County Development Plan 2022-2028 (including Volume 2: Metropolitan Area Strategic Plan), the Northern and Western Regional Spatial and Economic Strategy[2] (NWRSES) 2020-2032, the Galway City Development Plan 2023-2029, and reports by Galway City Council or Galway County Council such as the Galway City Local Economic and Community Plan (LECP) 2015-2021, the Draft Galway County Local Economic and Community Plan 2024-2040, and the various websites relating to economic developments, tourism, amenity and recreation e.g. www.galwaychamber.com and www.galwaytourism.ie
- Galway City Council Noise Action Plan 2019-2023
- Draft Galway City Council Noise Action Plan 2024-2028 and subsequent final version published in November 2024
- Galway County Council Noise Action Plan 2019-2023
- Draft Galway County Council Noise Action Plan 2024-2028 and subsequent final version published in November 2024
- Observation of local settlement and travel patterns and identification of community facilities
- Public consultation process which included discussions with local organisations and residents and with relevant statutory bodies. Over 950 individual property owner meetings, including many home visits, took place between the design team and property owners and the concerns expressed during these meetings were taken on board and fully informed the population and health assessment. Since 2018, liaison with affected property owners has continued to be available via the project website and to the GCC liaison person via the dedicated project email address. The full details of this public consultation process are set out in Chapter 1, Introduction
- A literature review on the potential impacts of roads on human health. This review has focused on reviewing scientific evidence of the potential impacts of roads on human health and is detailed in the relevant sections below
- Collating the results of the assessment of the environmental factors (pathways) through which health could be affected such as air, noise, water, soils, landscape and visual and traffic volumes, which are based upon reference to accepted standards/guidelines/ limits for the protection of human health
- In this chapter, an assessment is performed by considering health in its broader aspects. As well as considering the protection of health, this chapter also considers opportunities for health improvements and access to services. The data used to assess opportunities for health improvements and access to services included information gathering during the extensive public consultations including a meeting with University Hospital Galway and data extracted from the traffic model to identify accessibility to services
- The traffic model was also used to quantify the health impacts in terms of difference in people walking or cycling and the level of accessibility and social inclusion with the Project and the full set of measures identified by the Galway Transport Strategy (GTS) complete
- For the Irish Language assessment, consultation with Údarás na Gaeltachta was undertaken in 2017 and again in 2025, and feedback from the public consultation was utilised
- A ‘human beings, population and health’ workshop also took place on the 8 June 2017 with the design team, soils and geology, hydrogeology, noise, air, landscape and visual, climate, population and health

[2] Regional Spatial and Economic Strategy 2020-2032 (nwra.ie)

experts in attendance. Further workshops were undertaken in 2024 specifically to discuss the latest TII PHH Standard and the update to this population and human health assessment. The purpose of these workshops was to discuss any significant effects of the construction and operation of the Project on human beings, population and health and the findings of this workshop informed this chapter.

- Significant engagement and discussion took place during the 2020 oral hearing with communities along the length of the proposed N6 GCRR and their concerns are considered in this updated EIAR at the relevant topic under discussion

19.2.2.3 Study Area

In accordance with the recently published TII PHH Standard (2024), the study area in relation to the appraisal of population consists of a 500m corridor from the proposed Assessment Boundary. This 500m offset is used as a starting point for defining the ZoI for impacts on private property and housing, community land and assets, Non-motorised users (NMUs), businesses and development land. However, this can be increased or decreased dependant on the receptors within the receiving environment, or effects on the wider road network included in the Assessment Boundary. The study area extends from Na Foraí Maola, west of Bearna Village to the existing N6 to the east at Coolagh and includes a rural/semi suburban landscape populated with individual dwelling and community facilities. This is the same study area for Population as per 2018 except for the addition of the area within the Galway Racecourse infield.

The study area for the Irish language appraisal covers the lands within and adjacent to the proposed Assessment Boundary as for the Population appraisal but also includes the Galway Gaeltacht. Therefore, the only change to the study area for the Irish Language since 2018 is the addition of the area within Galway Racecourse infield.

The study area in relation to the protection of human health appraisal varies depending on the emission type and its extent, for example, impacts arising from noise, air, water, landscape and visual and soil vary with the precise distance depending on the particular emission, its concentration and other dispersion factors. Refer to the Chapter 9, Soils and Geology, Chapter 10, Hydrogeology, Chapter 11, Hydrology, Chapter 12, Landscape and Visual, Chapter 16, Air Quality and Chapter 18, Noise and Vibration for details of the study areas of the particular emission types (soil, water, air and noise).

19.2.3 Impact Assessment Methodology - Population

This section presents the methodology and criteria used in the Population assessment of impacts on population and is followed by the impact assessment methodology used in the Irish language assessment in Section 19.2.4 and health assessment in Section 19.2.5.

The purpose of the Population appraisal is to identify the potential significant impacts as they can affect local people and users of the Project during both the construction and operational phases, along with the likely economic impacts at both local and regional level. Population impacts and effects due to a development of this type were addressed using four key categories below in the 2018 assessment. These four categories were reviewed against the recommended areas for assessment by the new TII PHH Standard, and these existing criteria cover these same areas with the exception of Private Property and Housing which is covered in this updated EIAR by Chapter 15 Material Assets Non-Agriculture. Therefore, the four categories are addressed in the same categories as the 2018 assessment, namely:

1. Journey characteristics: accessibility and connectivity, including potential impacts on journey time, journey time reliability and travel patterns
2. Amenity:
    a. Journey amenity: effects on the pleasantness of journeys and real and perceived safety
    b. General amenity: effects due to any impact that the Project will have on the use of community facilities and residential amenity, including quality of life
3. Community severance: effects with regard to access to community facilities, particularly those used by older people, children or other vulnerable groups

4. Economic: an evaluation of the Project in the context of economic development, tourism and employment

In addition, relative to many other road developments, the Project will involve residential, and some commercial, demolitions and acquisitions, due to the dispersed pattern of development within the study area. These potential impacts are addressed specifically under the category of general amenity.

A comparison is made between the Do-Nothing and the Do-Something scenarios arising from direct, indirect, induced, cumulative and residual impacts or effects on environmental conditions. Impacts are distinguished here as a change to a community resource exerted by a project, and effects as the change in the receptor population resulting from an impact which is as per the latest TII PHH Standard definition and is the same as the 2018 definition. Effect significance is described using seven generalised degrees namely *Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant* or *Profound*. Impacts and effects can be positive, neutral or negative.

19.2.3.1 Significance for Population

The significance of an effect is informed by the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022). It is largely determined by the relationship between the nature of an environmental effect, as it is assessed by the relevant specialism, and the nature of the receiving environment. The environmental effect is represented by its character, magnitude, duration, frequency, probability of occurrence, as it affects the local population. The nature of the existing receiving environment determines the significance of the final effect depending on the approximate numbers of people affected and their sensitivity.

19.2.3.2 Nature of environmental effects and magnitude for Population

As the assessment deals primarily with the social and economic effects of a development, 'type' and 'magnitude' are often determined by the physical nature of environmental effects as they are addressed by other specialist assessments such as noise and vibration, air quality or landscape and visual. The Population assessment takes its lead from these assessments and reference is made to these assessments in the text. A distinction can arise from the nature in which the effect is realised by people as receptors depending on the time they are exposed to an impact, their proximity, their numbers and sensitivity. Other effects fall more exclusively in the realm of Population such as accessibility, severance and economic effects, although projections of traffic movement and volumes may be relevant here too.

In addition, impacts on individual businesses are assessed, including new businesses/enterprises which have commenced since 2018 as outlined in the update to the receiving environment in Section 19.3. In this case, sensitivity will be influenced by the nature of the business and the dependence of its operations on good accessibility or the sensitivity of its operations to environmental impacts such as air quality, noise and vibration, water quality, or landscape in the case of tourism. Significance is influenced by the importance of a business to the local economy and the level or type of employment it provides. Table 19.1 outlines the sensitivity level criteria based on the review of the literature referenced above.

Table 19.1 Sensitivity of Community Facilities

Sensitivity Level	Types of Community Facilities and Similar
High	Hospitals and health centres, schools, colleges, creches, religious facilities, nursing homes, youth or family resource centres, sheltered accommodation, museums/galleries/theatres, parks and playgrounds. Workplaces if production process is sensitive to environmental effects.
Medium	Residences, community centres, playing fields and non-park open space.
Low	Shops, pubs/bars, sports clubs and gyms.

Construction impacts relevant to the Population assessment are, by their nature, brief, temporary or short term in nature, although the effect of demolitions on communities that remain can be prolonged. Operational effects tend to be of medium or long term duration.

The summary of the effects on population is summarised in Table 19.15 and Table 19.16 for construction and operation respectively. The tables include detail on all aspects informing the assessment of effects as follows:

1. The nature of an effect
2. Location and the population subgroup affected
3. The current situation
4. The potential effect due to the Project during construction or operation
5. Effect significance
6. Effect sensitivity
7. Effect duration (i.e. temporary, short, medium or long term)
8. Receptor magnitude
9. Proposed mitigation
10. Residual effect

Receptor magnitude qualifies the preceding assessment of significance by identifying the number of receptor types, i.e. people or businesses, likely to be affected as an approximate proportion of the local population or the total number of businesses. Receptor magnitude is assessed qualitatively as: few; medium; many; or very many. For instance, an effect may be significant for a particular population subset, but the number of people impacted could be few in number. The table also describes the mitigation proposed and the residual significance of the effect.

19.2.3.3 Assessment Criteria for Population

The assessment criteria for Population are unchanged since 2018 and are consistent with the TII PHH Standard as set out below.

Journey Characteristics

This criterion assesses journey time and time reliability, connectivity between transport modes and accessibility to destinations such as community facilities, businesses and places of employment. The assessment is inevitably dependent on where an individual journey originates and ends, when it is undertaken (e.g. within or outside peak hours) and by whom it is undertaken, i.e. by drivers, cyclists, users of public transport or pedestrians, including individuals whose transport options may be restricted. The effect varies for each journey, but typical journeys to popular destinations can often be identified. Potential effects have been assessed in accordance with the significance criteria outlined in Table 19.2 with positive effects resulting from a decrease in journey length or time and negative effects resulting from an increase in journey length or time.

Table 19.2 Criteria used in the Assessment of Changes in Journey Length or Duration

Effect level	Significance criteria
Imperceptible	No noticeable change to present journeys length or duration
Not significant	An effect which can cause noticeable change, but without significantly extending (or shortening) journey length or duration, or changing journey habits
Slight	Slight improvement to journeys length or duration where effect is positive. Some inconvenience where effect is negative. Some likelihood of changes in journey habits
Moderate	Moderate reduction in journey length or durations where effect is positive, moderate increase where effect is negative. Greater likelihood of changes in journey habits
Significant	Much shorter journey length or duration where effect is positive, much longer increase where effect is negative. High likelihood of changes in journey habits

Effect level	Significance criteria
Very significant	Considerably shorter journey length or duration where effect is positive, considerably longer increase where effect is negative. High likelihood of changes in journey habits
Profound	An approximate doubling (or halving) in typical journey length or duration sufficient to cause marked change in behaviour of a sizeable proportion of population

Source: The table provides consistency in the assessment of effects and was originally adapted from the UK DMRB for the Irish context.

Journey length refers to the distance associated with a particular journey, whilst duration is the time taken to make the journey. The average walking speed for pedestrians is taken to be 5km/hr (3km/hr for vulnerable groups). International studies suggest that the average urban cycle speed is between 12-20km/hr. Effects on journey amenity and community severance are addressed separately in the sections below, although there are obvious interactions between each of these categories and with economic effects. In addition, new transport infrastructure can improve the accessibility of places which were formerly awkward to reach or can improve connectivity between home and workplaces, community facilities and parts of a city or region, all of which are addressed in the assessments in Section 19.5.4. This improved connectivity can have implications for choice of transport mode, for land use and economic development.

Amenity

Journey amenity

The assessment of journey amenity uses the same significance categories as in 2018 and is supported by cross-reference where necessary with chapters on traffic, noise, air quality or visual effects. The level of traffic on a road, the proximity and separation of footpaths and cycle-paths, the nature of any crossings/junctions to be negotiated, the legibility of a journey (including signage), visual intrusions (including sightlines) and perceived and actual safety, are amongst the factors relevant to the assessment of journey amenity, as are the number and types of people affected. The principal concern is with pedestrians or cyclists, but journey amenity effects also apply to drivers, for example due to safety anxiety associated with the crossings of major roads. Such journeys could involve sensitive population subgroups such as older drivers or school children as passengers. There are interactions too with the assessment of journey characteristics and community severance.

General amenity

The key criterion in relation to general amenity is community wellbeing, including residential amenity and social sustainability. Direct effects on communities due, for example, to impacts on community facilities such educational, social facilities and amenity spaces, including opportunities to interact with others, can affect community wellbeing or community interaction. This criterion is especially important for sensitive receptors such as children, older people and people with disabilities. Indirect effects may result from changes in environmental quality, for instance, from noise or visual intrusion and are cross-referenced where applicable with relevant chapters of this updated EIAR. Effect levels are defined in Table 19.3 below.

Table 19.3 Criteria used in the Assessment of Amenity

Effect Level	Significance Criteria
Imperceptible	No noticeable change in the character of the environment
Not significant	An effect which can cause noticeable changes in the character of the environment, but without significant consequences for the community's well-being, amenity or health
Slight	A small effect on community wellbeing can be attributed to the Project
Moderate	A moderate effect on the community wellbeing can be attributed to the Project
Significant	An effect which has the potential to affect community wellbeing such as to affect people's behaviour and quality of life

Effect Level	Significance Criteria
Very significant	An effect which has the potential to substantially affect community wellbeing such as to affect most people's behaviour and quality of life
Profound	Effects of a scale to significantly affect community wellbeing to an extent that people's behaviour or quality of life is substantially changed, for example where significant health issues arise or where people may wish to relocate

Source: The table provides consistency in the assessment of effects and was originally adapted from the UK DMRB for the Irish context.

Demolitions and acquisitions

Demolitions or acquisitions of residential properties are subject to financial compensation but can have a significant effect on the householders involved. In addition, there can be significant effect on communities or neighbours left behind, especially where the number of demolitions or acquisitions represents a high proportion of the total number of households. The effect definitions applied to the category of general amenity have been applied to the subject of demolitions and acquisitions in this chapter The potential health effects as a result of demolitions or acquisition is assessed in Section 19.5.6.

Community Severance

Severance is a typical impact of a road development. Its effect is to discourage community interaction and occurs where access to community facilities or between neighbourhoods is impeded by a lengthening of journey time or by the physical barrier of a road (for example, high traffic volumes or perimeter fencing). Social severance can occur due to restrictions on people's accessibility, but also where communities become identified by their containment within road boundaries. This can include the psychological effect of traffic or safety concerns as barriers to social interaction. Social severance can also occur for busy roads such as motorways even where access is available. On the other hand, relief from existing severance may be provided by a new road where traffic volumes or speed are moderated, by the inclusion of crossing facilities in the design, or through the presence of overbridges or underpasses.

The definition of severance is not precise. It depends on the location of community facilities, the level of use of facilities, the time of day or duration when traffic conditions are experienced, the sensitivity of the population affected and the geographical spread of the community. Children, the elderly, the mobility impaired and people without access to a private car would be amongst those most affected by community severance and any corresponding loss of neighbourhood interaction.

Sensitive receptors are identified specifically where they comprise a high proportion of pedestrian journeys or where specific amenities are associated with these groups. Sensitive groups can include young and older population cohorts, the mobility impaired and people at risk of social isolation. Relevant community facilities include schools, surgeries, hospitals, churches, post offices, shops, sports facilities and centres of social activity.

New Severance

New severance is a negative effect and occurs whenever a barrier is created between people and community facilities. The barrier could take the form of a new road, fencing, additional traffic or the need to detour from a current traveling route. Table 19.4 below provides examples of how new severance can be defined. The criteria are specific to pedestrians, although severance will apply also to cyclists and potentially to local vehicle journeys too, particularly for some sensitive population sub-groups. Quantitative criteria have not been included in the table as effect definitions may vary depending on the nature of road trips and crossings (i.e. by car or pedestrian). Similarly, the introduction of crossing facilities could reduce severance even where traffic levels are increased.

Table 19.4 Criteria used in the Assessment of New/Increased Severance

Effect level	Significance criteria
Imperceptible	Journey patterns maintained
Not significant	Noticeable effects on connectivity, but without significant consequences for journey patterns

Effect level	Significance criteria
Slight	Present journey patterns likely to be maintained, albeit with some hindrance to movement
Moderate	Some residents, including children and elderly people, are likely to encounter severance. For others, journeys will be longer or less attractive
Significant	Many residents, including children and elderly people, are likely to encounter significant severance which could discourage them from making particular journeys
Very significant	Most residents, including children and elderly people, are likely to encounter significant severance which will be sufficient to induce a reorganisation of their activities or cause them to make less frequent trips to nearby neighbourhoods or to make less use of particular community facilities
Profound	People are likely to be deterred from making trips to an extent that includes permanent loss of access or a change in the location of centres of activity

Source: The table provides consistency in the assessment of effects and was originally adapted from the UK DMRB for the Irish context.

Relief from Severance

Relief from severance is a positive effect which is defined in relation to existing severance. Relief from severance could follow from a transference of traffic from an existing road, including heavy goods vehicles (HGVs), from improvements in road design or sightlines, or from the introduction of crossing facilities. The Annual Average Daily Traffic (AADT) data was taken from the traffic model for the proposed N6 GCRR. However, the degree of relief from severance depends on the context in which this change occurs including the existing absolute volume of road traffic, but also the speed of traffic and number of crossings by pedestrians, cyclists or others. Table 19.5 provides a guide to criteria used in the assessment of relief from severance. It should be noted that the table reflects the positive effect levels, increasing from imperceptible to profoundly positive. Where the assessment varies from these definitions due to the context in which the relief occurs, the reasons for the variance are discussed. There is also the potential for interactions with Journey Amenity, in that there are implications for real and perceived safety.

Table 19.5 Criteria used in the Assessment of Relief from Severance

Effect level	Significance criteria
Imperceptible	No noticeable consequences for journey patterns
Not significant	Noticeable effects on connectivity, i.e. <10% reduction in daily traffic levels (AADT), but without significant consequences for journey patterns
Slight	10-30% reduction in traffic levels (AADT) or some reduction in severance
Moderate	31-50% reduction in traffic levels (AADT) or a reduction in severance sufficient to encourage some new journeys by foot or bicycle
Significant	51-70% reduction in traffic levels (AADT) or a reduction in severance sufficient to allow residents to make more frequent journeys to community facilities by foot or bicycle
Very significant	71-90% reduction in traffic levels (AADT) or a very significant reduction in severance sufficient to allow most residents to make more frequent journeys to particular community facilities by foot or bicycle
Profound	More than 90% reduction in traffic levels (AADT) or reductions in severance such as to provide new access to community facilities or to cause a very significant increase in pedestrian or cycle journeys

Source: The table provides consistency in the assessment of effects and was originally adapted from the UK DMRB for the Irish context.

Economic effects

General

Economic and employment effects occur at both the local and regional scale and can be either positive or negative. A development can have positive effects for ancillary businesses or for employment or, alternatively, have negative effects for other businesses. Changes in access or connectivity, as discussed under the category of journey characteristics, can have significant effects on business or investment. Effects include changes in turnover or in access to business opportunities. Effects could impact on individual companies or the wider community, for example where a number of businesses are affected or where the retail or business environment of a town is impacted. Effect levels are defined in Table 19.6 below.

Tourism

Tourism makes a significant contribution to the Irish economy, to local economies and to regional development. It provides opportunities for business development, growth and innovation with Small and Medium Sized Enterprises (SMEs) being well-represented in the sector. Consequently, it is also important for employment and is relatively labour intensive compared with other industrial sectors. Interactions between journey characteristics, journey amenity or the nature of destinations used for amenity, can have an impact on tourism and businesses and employment in this sector. Tourist numbers can be affected by either a lengthening or shortening of journeys and reduced or improved connectivity with tourism destinations. Changes in both journey characteristics and amenity can impact on the decision to stop or overnight at particular locations. Changes to sites of cultural or natural heritage value can either discourage or encourage tourists to stop or to continue with their journey or, in extreme cases, to travel at all. Tourists include international visitors as well as visitors from other regions of Ireland.

Table 19.6 Criteria used in the Assessment of Economic Effects

Effect level	Significance criteria
Imperceptible	No noticeable economic effects
Not significant	An effect which causes noticeable changes in the character of the environment, but without noticeable consequences for the local economy, businesses or employment
Slight	A small effect (positive or negative) on the business environment can be attributed to the Project
Moderate	A moderate effect (positive of negative) on the business environment can be identified
Significant	An effect (positive or negative) that has the potential to affect business performance or to influence the location decisions of new business
Very significant	An effect (positive or negative) that has the potential to substantially affect business performance or to influence the location decisions of new business
Profound	Effects of a scale to significantly affect (positively or negatively) the performance of a major business or several businesses. Where these businesses are important local employers there is the possibility of major effects for the general prosperity of the local area or region

Source: The table provides consistency in the assessment of effects and was originally adapted from the UK DMRB for the Irish context.

19.2.4 Impact Assessment Methodology – Irish Language

The purpose of the Irish Language appraisal is to identify the potential significant impacts, if any, of the Project during both the construction and operational phases on the Irish Language. Since 2018, the Galway County Development Plan 2022-2028 incorporates the objectives and aims that were previously set out in the Gaeltacht Local Area Plan, 2002-2018 to protect and enhance the Galway Gaeltacht and Islands. An tÚdarás na Gaeltachta published its Strategic Plan 2021-2025 for the Gaeltacht in June 2021 which aims to cultivate vibrant Gaeltacht communities where Irish is the primary language of communication. A key objective is to establish the Gaeltacht as a hub of entrepreneurship, attracting and nurturing businesses in the region.

The Irish Language appraisal is based on:

- inspection of the associated environmental studies and project documentation

- consideration of national legislation and policy documents and the Galway County and City Development Plans and An tÚdarás na Gaeltachta Strategic Plan 2021-2025
- review of relevant submissions made during the public consultations and consultation with Údarás na Gaeltachta
- consideration of previous case work experience

This assessment has been prepared with due regard to the guidelines on the preparation of environmental impact assessment reports published by the EPA in 2022.

19.2.5 Impact Assessment Methodology – Human Health

This section sets out the methodology that was used in order to assess the impact of the Project on health.

19.2.5.1 Guidance on the methodology for assessing human health in EIA

Since 2018, additional guidance has been published in relation to the assessment of human health in EIA which has informed this updated health assessment as follows:

- IEMA 2022: Guide to Effective Scoping of Human Health in Environmental Impact Assessment (Pyper et al., 2022)
- IEMA 2022: Guide to Determining Significance for Human Health in Environmental Impact Assessment (Pyper et al., 2022)
- TII 2024: Population and Human Health assessments of Proposed National Roads (2024)
- EPA 2022: Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)
- TII Standards for Population and Human Health Assessment of Proposed National Roads (TII, September 2024)
- Health in Environmental Impact Assessment - A Primer for a Proportionate Approach (IEMA 2017)
- International Association for Impact Assessment (IAIA) and European Public Health Association (EUPHA) Human Health: Ensuring a High Level of Protection. A reference paper on addressing Human Health in Environmental Impact Assessment (Cave et al., 2020)

Health Impact Assessment (HIA) is defined by the Institute of Public Health in Ireland, as a combination of procedures, methods and tools that systematically judges the potential, and sometimes unintended, effects of a policy, plan, programme or project on both the health of a population and the distribution of those effects within the population. A Health Assessment in the context of EIA focuses the attention of the assessment on likely significant effects, i.e. on effects that are deemed likely to occur and, if they were to occur, would be expected to be significant (per the requirements of EIA Directive).

The Institute of Environmental Management and Assessment's (IEMA) *Health in Environmental Impact Assessment – A Primer for a Proportionate Approach (IEMA, 2017)* (hereafter referred to as the IEMA discussion document) notes that HIA and EIA are separate processes and that, whilst a HIA can inform EIA practice in relation to human health, a HIA alone will not necessarily meet the EIA human health requirement. HIAs are not routinely carried out for major infrastructure projects in Ireland, nor are they required to be.

The recitals to the 1985 and 2011 EIA Directives refer to 'human health' and the operative texts refers to 'human beings' as the corresponding environmental factor. The most recent amendment of the EIA Directive in 2014 changed this factor to 'Population and Human Health'.

The Environmental Protection Agency (EPA) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022) note that this health assessment approach is consistent with the approach set out previously in the 2002 EPA Guidelines, where health was considered through assessment of the environmental pathways through which it could be affected, such as air, water or soil. The current 2022 Guidelines state:

'The evaluation of effects on these pathways is carried out by reference to accepted standards (usually international) of safety in dose, exposure or risk. These standards are in turn based upon medical and scientific investigation of the direct effects on health of the individual substance, effect or risk. This practice of reliance upon limits, doses and thresholds for environmental pathways, such as air, water or soil, provides robust and reliable health protectors [protection criteria] for analysis relating to the environment'.

In terms of human health protection, emissions during the Construction or Operational Phase of the proposed Project will need to be identified and compared against reliable Health Based Standards. Reliable sources of the standards may be regulatory such as the EU, such as Air Quality Standards, or based on expert opinion, such as is provided by the WHO (as in the case with noise guidelines).

The EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022) also note that in an EIAR:

'the assessment of impacts on population & human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g. under the environmental factors of air, water, soil etc.', and that,

'assessment of other health & safety issues are carried out under other EU Directives, as relevant. These may include reports prepared under the Integrated Pollution Prevention and Control, Industrial Emissions, Waste Framework, Landfill, Strategic Environmental Assessment [SEA], Seveso III, Floods or Nuclear Safety Directives. In keeping with the requirement of the amended Directive, an EIAR should take account of the results of such assessments without duplicating them'.

The IEMA 2022 documents, Guide to Effective Scoping of Human Health in Environmental Impact Assessment (Pyper et al., 2022) and Guide to Determining Significance for Human Health in Environmental Impact Assessment (Pyper et al., 2022), which are identified to be relevant in the UK and Ireland, describe what is required for a proportionate assessment of the impacts on health that should be included in an EIA and are useful documents when considering what can and should be assessed. Regard has been given to the general approach advocated in these documents when completing the human health impact assessment for this Project. The IEMA documents state that there should be a greater emphasis on health outcomes, as opposed simply to the health determinants or the agents or emissions (e.g. dust) which could have the potential to have health effects, which has previously been the focus of EIA. This change in emphasis does not mean a complete change in practice. IEMA 2022 document, *Guide to Effective Scoping of Human Health in Environmental Impact Assessment*, sets out a wide range of determinants of health associated with the WHP definition of health and states that:

Health pathways are complex and outcomes are affected by multiple determinants. Judgement should be used to cross-reference such overlaps in scoping decisions and only scope in the most relevant wider health determinant.

Thereafter, the decision to scope-out, a potential health impact should be supported by a brief statement, including reference to issues that are scoped out due to their coverage elsewhere. Therefore, as per the EPA 2022 guidelines and the IEMA 2022 documents, the results of other assessments are considered in the health assessment without duplicating them.

The recommendations of the IEMA discussion document, Health in Environmental Impact Assessment A Primer for a Proportionate Approach (2017), are entirely consistent with the EPA guidelines (EPA, 2022) on what should be contained in an Environmental Impact Assessment Report.

This 2017 IEMA document notes that public health has three domains of practice that should be considered in the assessment of health in EIA.

i. Health protection (including chemical and radiation exposure, health hazards, emergency response and infectious diseases)

ii. Health improvement (including lifestyle, inequalities, housing, community and employment)

iii. Improving services (including service planning, equity and efficiencies)

The WHO defined health in its broader sense in its 1948 constitution (WHO, 1948) as:

'a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.'

Therefore, whilst the EPA guidance is useful in terms of health protection, for a more holistic assessment the IEMA 2017 discussion document is helpful, it is also worthwhile to look at broader health effects in terms of also assessing the opportunities for improvement of health and for improvement of access to services.

While it is important to do this, it is also important not to attribute every conceivable event as being a health effect. To further rely on the WHO definition, a health effect would be something that would have a material impact on somebody's physical mental and social well-being be that positive or negative.

As outlined in the International Association on Impact Assessment IAIA Document of 2020 human health within EIA (IAIA, 2019), the Public Health perspective is underpinned by five principles:

1. A comprehensive approach to health: Physical, psychological and social wellbeing is determined by a wide range of factors across society and consideration of these wider determinants and their interrelationships will inform the assessment of human health. Inter-sectoral collaboration, between public health and other sectors, should be a feature of coherent coverage of health in EIA
2. Equity: The distribution of health impacts across the population must be considered, paying specific attention to vulnerable groups. Where impacts that are unfair and avoidable are identified, appropriate measures must be included to avoid or reduce adverse health outcomes, or to improve health outcomes for affected groups
3. Transparency: A transparent EIA process facilitates cooperation and communication, external to the organisation conducting the EIA. It enhances the process and improves effectiveness. The reporting of the EIA must demonstrate a clear and consistent method and reasoned conclusions
4. Proportionality: The scoping of human health issues into EIA will focus on whether the potential impacts are likely to be significant. Effort is then focused on identifying and gaining commitment to avoiding or reducing adverse effects and to enhancing beneficial effects. The assessment findings should be presented clearly and aim to be concise and precise and to give appropriate weight to health as a material consideration
5. Consistency: The assessment should be based on evidence and on sound judgment. The assessment process should follow an acceptable, explicit logic path and retain common sense in applying relevant guidance

Divergence from accepted practice should be explained. The assessment, its process and conclusions, should be in accordance with up-to-date policy, guidance and scientific consensus. This acknowledges the potential for conflict between policy and emerging evidence.

19.2.5.2 Scoping of Determinants

The above guidance was considered in the development of the current TII PHH Standard and gives examples of types of determinants considered in human health assessment as shown in Plate 19.2.

Plate 19.2 Examples of Types of Determinants considered in Human Health Assessment (extract from TII PHH Standard)

Under community and lifestyle, the assessment of human health for the project includes an assessment on how the project would impact on the socio-economics of the community including the potential impacts on amenity resources, road safety, opportunities for physical activity and the subsequent effects on well-being are covered under health improvement.

Under socio-economic factors, employment and income are among the most significant determinants of long-term health, influencing a range of factors including the quality of housing, education, diet, lifestyle, coping skills, access to services and social networks. These are assessed under the health improvement criterion.

Improving access to recreational activities and to medical services, as well as educational facilities, will also have added benefits to a person's health, and the health of the community. Therefore, the assessment of human health for the project includes an assessment on whether or not the project will improve accesses to these services.

Environmental conditions are covered under health protection, with each pathway which potentially poses a risk to health identified and the results of those individual assessments elsewhere in this updated EIAR used to inform the health assessment. Air, noise, water, soils, landscape and visual and biodiversity are listed above as potential considerations and scoping of them is outlined below in Section 19.2.5.3 under *Health Protection*.

Climate resilience seeks to ensure adequate resilience of major projects to the adverse impacts of climate change, such as increased flooding or droughts. This is assessed under Section 17.5.4 Climate Change Vulnerability in Chapter 17, Climate of this updated EIAR.

This assessment concluded that there would not be a significant effect in EIA terms should a rare flood event occur or should an extreme heat event occur. Therefore, based on this assessment of *not significant* and to avoid duplication of such assessments, Climate resilience is not assessed further for potential impacts on human health. Furthermore, the risk of flooding is dealt with under Chapter 11, Hydrology and also under the pathway of water below under health protection.

Therefore, the assessment of potential impacts resulting in health effects on the population is undertaken by way of the following assessments as detailed further below:

- Health Protection - Risk Assessment to identify the potential risk to human health in response to identified hazards including potential psychological effects
- Health Improvement and Improvement of access to services - Socio-economic impacts on human health including impacts on amenity resources and subsequent effects on human health

Therefore, *health protection, health improvement and improving access to services* are all considered in this chapter of this updated EIAR which is as per the 2018 EIAR. This is consistent with the latest EPA guidance of 2022, IEMA guidance of 2022 and the current TII PHH Standard.

19.2.5.3 Human Health Assessment Criteria

Psychological Health Effects

In the planning process, potential adverse effects on psychological health are often mentioned, for example, anxiety and stress experienced by those whose homes are to be unfortunately compulsory acquired or those who will experience a change in the environment in which they live.

The community will also experience annoyance from the temporary impacts of traffic management and other effects during the construction phase. There may be changes in the landscape and visual environment which could affect psychological health adversely or indeed positively depending on the impacts.

As against this there is the potential reduction in annoyance amongst road users in the operational phase where there are reduced journey times. Annoyance, however, is not in itself a health effect.

For virtually every proposal for any road development there are concerns about potential adverse effects on a person's overall psychological well-being. This is somewhat a more difficult matter to assess as there are no direct measurements one can use. While one can give great detail in predicting for example noise emissions one cannot use the same scientific certainty in predicting psychological impacts. It is not possible to use a standards-based approach for example.

There are various degrees of psychological impact, and these can be both positive and negative. There can be a positive impact, whereby people may look forward to better transport. There can also be adverse effects of varying degrees. At the lower end of this impact might be annoyance where somebody is annoyed by for example, outside noise, dust depositing or temporary traffic delays associated with construction of the roads. This is not a medical impact as such. If someone develops a psychological illness such as anxiety or depression this would be a medical impact.

Although identifying the potential impacts is possible, quantifying them is difficult as there are no direct measurements available, and the same impacts may have different effects on different people. For example, for some individuals demolishing an old building could be viewed as removing an eyesore or making way for something better but alternatively for others, it can be seen as a loss of heritage or in some instances their homes.

Construction by its very nature is transient but it is expected that construction activities will cause some annoyance such as from road diversions and temporary road closures. The potential effects are minimised by use of appropriate traffic management and avoidance of extended night time closures. There has been a considerable amount of road construction in Ireland over the last few decades. However, there is no documented evidence from these projects to link adverse outcomes with psychological health in Ireland.

Therefore, psychological issues are covered under Health Protection in the human health assessment as it is among the issues that can give rise to an effect.

Health Protection

The assessment of human health for the Project, in terms of health protection, follows the approach set out in the EPA guidelines, in the European Commission's SEA Implementation Guidance and recently published TII PHH Standard (2024). It is also similar in nature to the US EPA guidance. It is unchanged since 2018 whilst also having considered the latest TII PHH Standard.

Human Health protection is considered through the assessment of the environmental factors (pathways) through which health could be affected such as air, noise, water, soils, landscape and visual and biodiversity. This process identifies a hazard and assesses the potential effects on human health. A hazard is something that has the potential to cause harm and the risk is the likelihood that harm will occur. A risk assessment therefore determines the likelihood of harm occurring. The likelihood of harm occurring is, in most instances, related to the amount or dose to which a human being may be exposed. The US EPA guidance is represented graphically in Plate 19.3 below.

Plate 19.3 Human Risk Assessment

Using this risk assessment process, biodiversity does not generate pollutants in itself, but the other pathways listed as air, noise, water and soils could have the potential to damage biodiversity which could have a resultant impact on the landscape which could impact a person's well-being and enjoyment of clean air and clean water. To avoid duplication, impacts on biodiversity are not reassessed in this chapter, but the other pathways are considered under health protection. The beneficial effects afforded from landscape and visual to a person's well-being are not assessed in Chapter 12 of this updated EIAR, therefore, landscape and visual are retained in this health assessment.

The potential noise, air, soils, water and landscape and visual impacts which could affect human health were identified (Hazard Identification), the scale of these potential impacts (Dose-Response Assessment) and their duration (Exposure Assessment) were assessed and the significance of the potential impact on human health determined (Risk Characterisation).

When using a recognised Health Based Standard, the dose-response assessment is actually included in the standard. In other words, the authorities or expert committees which recommended the level of the standard will have taken into account the health problems at the different exposure levels and set the level within the standard to prevent these problems from occurring.

Health Improvement

As noted above, employment and income are among the most significant determinants of long-term health, influencing a range of factors including the quality of housing, education, diet, lifestyle, coping skills, access to services and social networks. Many epidemiological studies consistently show better health outcomes are associated with higher socio-economic status.

Consequently, poor economic circumstances can influence health throughout life, where communities subject to socio-economic deprivation are more likely to suffer from morbidity, injury, mental anxiety,

depression and tend to suffer from higher rates of premature death than those less deprived. One of the most reliable methods to improve health within a community is to raise it socio-economic status.

Projects that have the potential to support regeneration, reduce unemployment and improve socio-economic circumstance, could contribute to improving the health and wellbeing of socio-economically deprived communities.

In social health terms, economic development also brings the opportunity for reducing inequities in society. Long-term unemployment for example is detrimental to the individual, family and society. It has potential to transfer across generations so that families where the head of household is long term unemployed are themselves far more likely to become or stay unemployed. This has potential to create and sustain social inequities. The economic development opportunities provided by a transport project have the potential to create more employment and reduce the risk of long-term unemployment, make an area more attractive for investment, increase tourism and facilitate sustainable travel. This in turn can lead to greater opportunities for equity in society.

The link between socio-economic conditions and positive health outcomes is so strong that improving socio-economic situations can be used as a surrogate for human health effects. In other words, by predicting an improving socio-economic situation, one can anticipate an improvement in health outcomes.

Improved socio-economic status is associated with improved health measures such as longevity. People who work, live longer and enjoy better health than the unemployed, who generally suffer poorer physical and psychological health outcomes. Indeed, providing and encouraging employment and with it improved financial means, is one of the most important contributors to public health. Whilst socio-economic gains may be worthwhile in themselves, it is important to realise that they are also associated with an improvement in health status.

This was reinforced by the 2019 publication by the HSE, Population Health and Demographics, the following observations were made:

> *'There is a strong link between poverty, socio-economic status and health'.*

The assessment of human health for the project, in terms of health improvement, includes an assessment on how the project would impact on the socio-economics of the community. It also includes an assessment of the potential impacts on amenity resources and the subsequent effects on human health.

Amenity can be described as a desirable or useful feature of a place. It is something that helps provide comfort, convenience or enjoyment for people. In human health terms amenity can relate to factors such as the ability to exercise using sporting facilities, parks, pathways and roads. Amenity also extends to the ability for individuals to relax, which has definite human health benefits.

The human health assessment of impacts on amenity primarily relate to opportunities for exercise for all including able bodied and disabled individuals. The assessment covers potential loss and gains of amenity.

The key criterion in relation to general amenity is community wellbeing. Direct effects on communities due to loss of facilities, amenity space and natural areas can impact on community wellbeing and interaction. Indirect effects may result from changes in environmental quality, for instance, from noise or visual intrusion.

Studies show that recreational activities can have a positive impact on a person's wellbeing and their health.

Improvement of access to services

A study by Lyon et Al[3] from 2004 showed a much-improved survival rate from out-of-hospital cardiac arrests was strongly influenced by reduced response times for emergency services. The ability for emergency services such as ambulances to rapidly access emergency situations therefore has the ability to save lives.

[3] Emerg Med J. 2004 Sep;21(5):619-24| Lyon RM1, Cobbe SM, Bradley JM, Grubb NR

Improving access to cinemas, parks, retail and other recreational activities will therefore make it easier for people to undertake recreational activities. Improved access to medical services will also have added benefits to a person's health as will access to education facilities.

Improving access to services such as hospitals or recreational facilities will have an impact on the health of a community. Therefore, the assessment of human health for the project includes an assessment on whether or not the project will improve accesses to these services.

Sensitivity of Receptors for Human Health

In practice, some human beings are more sensitive than others, by reason of their age, health status or other reasons. However patient confidentiality and General Data Protection Regulations (GDPR) prevents doctors and healthcare practitioners from divulging information about their patients. Even if it were possible, it still would not aid the assessment of human health impacts. The humans that are vulnerable today, will not necessarily be those who are vulnerable during the construction and / or operational of the Project. In order to be conservative, and in keeping with the reasonably foreseeable worst-case approach described above it has been assumed that there are vulnerable individuals at every receptor. In addition, the health-based standards are derived to protect the vulnerable. Therefore, it was not necessary to identify individual sensitive or vulnerable receptors for this assessment. Instead all receptors are assumed to be vulnerable.

For reasons of consistency, sensitive or vulnerable receptors, are looked at in terms of their 1) importance and 2) sensitivity. In terms of human health however there is considerable overlap between both.

Importance

In terms of Human Health, all human beings are considered to be equally important and as such there is only one level of importance. The use of the term "importance" in this assessment refers to areas or buildings occupied by people. Their importance is considered to increase as the number of people increases and the duration of time spent there increases.

The EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (May 2022) indicates that neighbouring occupied premises and land uses that should be considered include the following:

- Homes
- Hospitals
- Healthcare facilities
- Hotels and hotel accommodation
- Schools and rehabilitation workshops
- Tourism and recreational facilities
- Visitor attractions

Residential areas, public and private health facilities, workplaces, commercial areas and educational facilities are considered to be 'very important' areas because a number of persons usually spend significant time at these locations.

Places of worship and recreational areas are considered to be 'important' areas of the baseline environment because they are used in a more transient way and people usually spend less time in these places.

Agricultural areas are considered of 'medium importance' in human health terms because of the limited numbers of persons present and limited time spent in these areas. The farm residences themselves are however considered to be 'very important'.

Sensitivity

The sensitivity of an area or building in this context refers to the vulnerability of the population, such as the very young or old. Locations where there are higher numbers of vulnerable individuals such as hospitals and nursing homes are considered to be 'very highly sensitive' and require special consideration where potential effects are possible. Where it is clear however that very highly sensitive receptors experience negligible effects, perhaps because of their distance from the Project and potential effect, they are scoped out.

Residences, schools, workplaces, commercial areas and places of worship are considered 'highly sensitive', because these areas will include populations of elderly, young people and people with health conditions. However, the majority of the population in these locations are likely to be less vulnerable than those in the 'very highly sensitive' locations.

Areas where recreational activities are carried out are considered to be 'sensitive' as these locations are typically only occupied during the day, and not necessarily continually. They will be used by children and the elderly but usually only for limited periods of time.

Sensitivity is also considered to increase with increased duration of exposure to emissions. For example, it is true that those indoors are less sensitive to emissions than those outdoors, as potential exposures are less. However, this is balanced by the fact that people tend to spend much more time indoors. Therefore, no major distinction has been made between indoors and outdoors.

19.2.5.4 Significance of Health Impacts

There is a difficulty in assigning levels of significance to human health impacts. In medicine, as in all science, the concept of statistical significance is used. This involves attaching a value to significance, often expressed as a percentage level of confidence in the data. Confidence measures of 95% or even 99% are often used to measure levels of certainty or changes that are not due to chance alone.

This is a valid approach for the study of the impacts on a *population*, but does not absolutely exclude a response on an *individual*. However, it is difficult to assign levels of significance to individual human health impacts without detailed information about that individual. Thus, the significance of health effects are assessed on a group or community basis rather than on an individual basis. There is such a variability in human response that one could never identify all possible individual effects and so, in accordance with the guidance referred to above, it is considered to be more appropriate to assess the significance of health effects at a population level. The significance criteria for the assessment of the health of communities are therefore as outlined in Table 19.7 below.

Table 19.7 Criteria used in the Assessment of Community Health Protection Effect

Effect Level	Significance Criteria
Imperceptible	No significant human health impacts are apparent
Slight	A small impact on reported symptoms but no change in health status can be attributed to the Project
Moderate	A moderate impact on health status but no change in morbidity or mortality can be attributed to the Project
Significant	The Project has the potential to impact on health status with an associated change in morbidity
Very Significant	The Project has the potential to impact on the health status of groups of people
Profound	The Project has the potential to impact on the health status of communities

Source: The table provides consistency in the assessment of effects and was originally adapted from the UK DMRB for the Irish context.

Asthma can be used as an example when using these criteria:

- An Imperceptible impact would be one with no measurable effect on asthma
- A Slight impact might be a temporary increase in symptoms but no change in the severity of the underlying condition or treatment required

- A Moderate impact might be an increasing use of inhalers attributable to the Project but no change in underlying condition and no effect on the vast majority of asthmatics
- A Significant effect might be an individual becoming asthmatic or an individual's asthma becoming measurably more severe as a result of the Project
- A Very significant effect might be a group of individuals becoming asthmatic or their asthma becoming measurably more severe as a result of the Project
- A Profound effect might be a measurable increase in the incidence or severity of asthma in a community as a result of the Project

19.3 Receiving Environment

19.3.1 Context

The proposed N6 GCRR follows the alignment as submitted as part of the Section 51 Application in 2018 for the majority of its length but also takes account of the modifications outlined in Section 5.2 of Chapter 5 and described therein. The National Planning Framework (NPF) and Northern and Western Regional Spatial and Economic Strategy[4] (NWRSES) 2020-2032 were published since 2018, both of which are targeting compact growth. The receiving environment is broadly similar too with the exception of recent residential infill, employment and retail development in the city in line with the City Development Plan, RSES and NPF and new road infrastructure such as the N59 Moycullen Bypass and the M18 along with county and junction upgrades and improvements in the city which have been reflected in the updated traffic model (refer to Section 6.3.1 of Chapter 6).

Galway City and its environs sit within the 4.5km[5] distance between the Lough Corrib and Galway Bay and are divided by the River Corrib with the built and natural environment and residential areas located on both sides of the river. The proposed N6 GCRR skirts the city and majority of lands zoned for development. The baseline environment is represented by the semi-rural/urban fringe of Galway City and, for the most part, the landscape is dominated by low intensity grazing and uncultivated, undulating lands and bog, and contains areas zoned for residential, commercial, and industrial and amenity development. However, given the pattern of the built environment in the urban periphery, with housing radiating along every road radiating out of the city and the unavoidable proximity to residential areas, the proposed N6 GCRR will unfortunately and unavoidably result in a number of property demolitions and community impacts.

Demographic data is available from Census 2022 (Central Statistics Office, 2023) on the population of Galway City and its environs and is used in this updated EIAR. The Galway City Development Plan 2023-2029 draws on the population projections prepared for the NWRSES 2020-2032 which was adopted on 24 January 2020. In line with the RSES, it aims to concentrate population in the city with sufficient zoned land capacity to meet the needs of a population increase. Table 19.8 shows a population of 84,414 for Galway City, representing an increase of 7.3% on the preceding figure for 2016 and 11.8% on 2011. Population projections in the Galway County Development Plan 2022-2028 also rely on the RSES. The population of County Galway excluding the city was 193,323 in the 2022 Census, representing an increase of 7.8% on 2016 and 11.7% on 2011. The figures demonstrate that the population has increased significantly in recent years

Table 19.8 Population Galway City and County

	2022	2016	2011	2006
Galway City	84,414	78,668	75,529	72,414
County Galway	193,323	179,390	175124	159,256
Total County Galway	277,737	258,058	250,653	231,670

[4] Regional Spatial and Economic Strategy 2020-2032 (nwra.ie)

[5] Distance measured from south shore of Lough Corrib to Spanish Arch at Galway Docks

The County Development Plan proposes concentrating new development in the hub town of Tuam, the Galway Gateway and the Strategic Economic Corridor to the east of Galway City between Oranmore and Attymon. Both the current Galway City Development Plan and the Galway County Development Plan envisage an eastward extension of the city towards Ardaun, Briarhill and the proposed new neighbourhood of Barraun between the city and Oranmore. The development plans acknowledge the potential pressure that this new growth will place on existing transport infrastructure into the city and the need to integrate land use and transportation. A need for consolidation or regeneration within selected neighbourhoods is identified in the plans.

For Galway City and its suburban environs, Census 2022 showed the number of households in this area to have grown by 7.2% since 2016. Residential development is more scattered within the urban fringe, often along minor roads and especially north of Bearna. There are distinct and established communities in addition to those listed in the data from the CSO below. Amongst others, these include Bearna, Na Foraí Maola, Troscaigh, An Chloch Scoilte, Cappagh, Ballymoneen, Keeraun, Mincloon, Dangan, Menlough, Ballindooley, Ballinfoyle, Castlegar, Parkmore, Doughiska and Coolagh.

Table 19.9 shows the population of each Electoral Division (ED) in the wider Galway area as recorded at the time of the 2022 Census. The more central areas of the city are lightly shaded. The table reveals significant percentage increases in population with evidence of some resurgence in growth in suburban districts such as Dangan, Rahoon and Mervue, but also more outlying areas such as Castlegar and Bearna.

The extents of the Galway Gaeltacht area can be seen in Figures 19.1.01 and 19.1.02 of Volume 3 of this updated EIAR. Population figures for the Galway Gaeltacht to the west and north of the city are included in Table 19.9 as these areas will be better connected by the Project. The recent population increase in the Gaeltacht west of the city along the R336 as far as Rossaveel (Ros an Mhil) is comparable to that of the suburban and urban/rural fringe EDs following a period of smaller increases prior to 2016. Some EDs closer to Galway, such as An Spideal and Na Forbacha experienced significant increases. The Gaeltacht is an area that is currently rather difficult to access from the east side of Galway City and the rest of the country, although growth potential further west is somewhat confined to a narrow strip of land between the sea and blanket bog to the immediate north. Population growth has also been high in the Gaeltacht area along the N59 Moycullen Road between the city and Oughterard.

Table 19.9 Population Electoral Divisions

Electoral Division	Population 2022	Population 2016	Population 2011	Percent change 2016-2022	Percent change 2011-2016	Population Density (per km^2)
Route of proposed N6 GCRR						
27052 Galway Rural (part)[6]	211	149	126	41.6%	18.3%	12
27044 Bearna (Barna Rural)	3866	3727	3630	3.7%	2.7%	167
26003 Bearna (Barna)	16551	15185	14384	9.0%	5.6%	2452
26015 Rahoon	3486	3076	3009	13.3%	2.2%	713
26006 Dangan	4621	4132	3608	11.8%	14.5%	3060
26013 Newcastle	2017	1900	1820	6.2%	2.2%	280
26011 Mervue	2278	1831	1796	24.3%	1.9%	2501
26022 Wellpark	1848	1668	1843	10.8%	-9.5%	2282
26018 St. Nicholas	3232	2394	2598	35.0%	-7.9%	3758
26010 Menlough (Mionlach)	5407	5118	4990	6.5%	5.6%	662

[6] Galway Rural (part) is a small ED (#27052) on the south-west shore of Lough Corrib

Electoral Division	Population 2022	Population 2016	Population 2011	Percent change 2016-2022	Percent change 2011-2016	Population Density (per km²)
26004 Castlegar (An Caisleán Gearr)	4315	4053	4135	6.5%	-2.0%	1127
26002 Ballybrit (Baile an Bhriotaigh)	943	949	898	-0.6%	5.7%	385
26001 Ballybaan	13217	13019	12298	1.5%	5.9%	1838
Galway Conamara/Connemara						
27054 Cil Chuimin (Kilcummin)	1403	1314	1315	6.8%	-0.1%	26
27061 Saileama	1503	1453	1448	3.4%	0.3%	22
27055 Cill Aithnin	1108	1044	1000	6.1%	4.4%	16
27063 An Spidéal	1842	1443	1450	27.7%	-0.5%	52
27051 Na Forbacha	1634	1415	1312	15.5%	7.9%	59
27159 Oughterard	2819	2636	2604	6.9%	1.2%	24
27162 Wormhole	2602	2376	2315	9.5%	2.6%	43
27062 Sliabh an Aonaigh	797	763	763	4.5%	0.0%	14
27065 Tulaigh Mhic Aodhain	2303	2075	1985	11.0%	4.5%	79
27059 Maigh Cuillinn	2459	2142	2008	14.8%	6.7%	91

Table 19.10 further illustrates the finding for population growth in the preceding table. Once again, more central areas are lightly shaded and are characterised by early residential development. The table indicates how, since 2016, infill development in Mervue and new development in outlying areas of Rahoon have, since 2016, caused a partial reversal of previous trends of lower growth in these locations, while demonstrating how new development has begun to return to the levels of growth experienced before the 2008-2011 Financial Crisis in locations such as Bearna and Ballintemple. Recent increases in Bearna (Barna) are aligned with proposed public transport corridors in BusConnects and with significant new residential development at Gort na Bró, Clybaun Road, Ballymoneen Road and Cappagh Road.

Table 19.10 Houses by Year Built (CSO 2022)

	Pre 1980	1981-1990	1991-2000	2001-2010	2011-2015	Post 2016	Not Stated	Total
Galway Rural (part)	17.7%	9.6%	19.7%	41.0%	3.6%	6.9%	1.3%	3862
Bearna (Barna Part Rural)	6.0%	15.0%	34.6%	32.3%	2.7%	7.4%	2.0%	16681
Bearna (Barna)	6.9%	16.0%	34.7%	31.7%	2.7%	6.4%	1.8%	6043
Rahoon	13.6%	13.3%	26.5%	30.7%	2.3%	11.3%	2.1%	3533
Dangan	35.4%	31.4%	17.6%	5.9%	1.0%	3.8%	5.1%	4251
Newcastle	70.8%	12.2%	4.7%	3.8%	0.2%	1.3%	7.1%	2058

	Pre 1980	1981-1990	1991-2000	2001-2010	2011-2015	Post 2016	Not Stated	Total
Mervue	68.5%	9.2%	3.7%	0.4%	0.2%	13.8%	4.2%	13444
Wellpark	53.8%	9.6%	18.6%	12.0%	1.4%	0.6%	3.9%	2227
St. Nicolas	41.9%	5.5%	23.8%	14.7%	0.8%	0.7%	12.5%	1448
Menlough	28.3%	23.3%	16.6%	27.1%	1.7%	1.0%	1.9%	5412
Castlegar	21.3%	9.5%	17.5%	41.2%	2.0%	5.4%	3.0%	4237
Ballybrit	14.5%	21.0%	37.0%	22.7%	1.3%	1.6%	1.9%	891
Ballintemple	20.3%	13.7%	16.6%	34.9%	5.7%	8.4%	0.4%	14531
Ballybaan	9.9%	7.1%	15.3%	56.5%	3.1%	5.4%	2.7%	1624
Average	**29.3%**	**14.0%**	**20.5%**	**25.3%**	**2.0%**	**5.3%**	**3.6%**	-

In addition to residential development, areas are zoned for major retail and light industrial development in Rahoon, along Seamus Quirke Road and east of the River Corrib in the vicinity of the Bodkin and Kirwan Junctions. The University of Galway (UoG) occupies a corridor of land beside the western bank of the River Corrib with teaching and research facilities located north and south of the Quincentenary Bridge, as well as extensive recreation facilities comprising the UoG Sporting Campus to the north in Dangan.

Large light industrial and commercial estates are found to the east of the N83, particularly in the suburbs of Ballybrit, Parkmore and Briarhill and include the Ballybrit Industrial Park, the City East Business Park, Oldenway Business Park, Briarhill Business Park, the Galway Technology Park and the Parkmore Business Park. Commercial business parks are fewer in number, to the west of the River Corrib, the Galway West Business Park and the Gateway Retail Park are located in the vicinity of Rahoon and Clybaun. A large area is zoned for enterprise and commercial activity between Bóthar Stiofán in Knocknacarra/Clybaun across to the Western Distributor Road with significant new retail opportunities available here since 2018 to serve the increased population. Similarly, additional retail opportunities are becoming available on the corner of Ballymoneen Road/Western Distributor Road. One business park, Galway Business Park, is situated off the N59 Moycullen Road and benefits from proximity to the UoG Campus. Since 2018, the Parkmore West Business Park, located on Racecourse Avenue to the north of Galway Racecourse, (also referred to as Racecourse Technology Park in submissions on the 2018 application) obtained temporary permission to upgrade and occupy one of the unfinished buildings for a period of three years (Ref. 20/194). A subsequent planning application was made to Galway City Council to extend the temporary planning permission in 2024 but was deemed invalid (Ref. 24/31). Another application for retention was approved by Galway City Council to retain the modifications to two other buildings (Ref. 21/155). A further planning application to Galway City Council, Ref. 21/246, was refused and then refused on appeal to ABP, ref. ABP-312452-22, due to the conflict with the plans for the delivery of the proposed N6 GCRR.

Schools and colleges, industrial and business parks represent major destinations for peak hour journeys. Table 19.11 presents the figures for mode of journey to work, college or school and reveals high proportions of journeys by foot in the central or established neighbourhoods such as Dangan, Newcastle and St. Nicholas, but also in outlying Menlough. Levels of cycling are also in excess of 5% in Rahoon and more central areas. However, vehicle use (drivers and passengers combined) exceeds 50% in eight of the EDs and is over 75% in Galway Rural, Bearna Rural and Bearna.

Once only journeys to work are considered in Table 19.12, those by public transport average 7.1% of which bus journeys account for 6.7%. The proportion of work journeys by car averages 51.7% for adults, but passengers now average just 3.8% once children and students are taken out of the numbers.

Journeys by foot or bicycle average 12.8% and 4.2% respectively, but are 20.5% and 5.1% in the central areas lightly shared in the table. In all locations the proportion of people working from home has increased significantly from an average of 1.5% in the urban EDs at the time of the previous Census to 10.1% in 2022 or 11.0% overall.

Table 19.11 Journey Mode to Work, College and School (CSO 2022)

	On Foot	Bicycle	Public Transport	Car / Van Driver / Lorry / Motorcycle	Car Passenger	Working at Home	Not Stated
Galway Rural (part)	1.5%	2.2%	2.9%	58.8%	22.1%	11.0%	1.5%
Bearna (Rural)	5.8%	1.7%	3.7%	44.9%	30.1%	10.5%	3.2%
Bearna (Barna)	7.4%	5.6%	9.4%	38.9%	24.4%	8.1%	6.3%
Rahoon	12.9%	6.2%	5.6%	35.9%	21.5%	7.0%	10.9%
Dangan	36.1%	6.5%	5.7%	22.5%	10.5%	5.5%	13.2%
Newcastle	38.8%	5.7%	5.8%	21.9%	9.0%	5.6%	13.4%
Mervue	18.1%	4.3%	14.7%	33.2%	16.7%	6.7%	6.2%
Wellpark	19.4%	4.4%	14.1%	30.0%	8.4%	6.3%	17.4%
St. Nicholas	34.3%	3.2%	9.7%	15.3%	3.5%	7.4%	26.6%
Menlough	30.6%	5.6%	7.0%	32.0%	13.3%	5.8%	5.7%
Castlegar	15.1%	5.1%	13.7%	34.5%	15.8%	6.5%	9.2%
Ballybrit	11.7%	2.3%	14.1%	40.6%	13.8%	8.7%	8.8%
Ballybaan	12.3%	2.3%	13.4%	34.8%	17.9%	5.7%	13.5%
Ballintemple	3.5%	1.5%	6.0%	54.2%	25.8%	7.6%	1.5%
Average	**16.4%**	**4.1%**	**9.1%**	**37.2%**	**17.6%**	**7.3%**	**8.5%**

Table 19.12 Journey Mode to Work Only (CSO 2022)

	On foot	Bicycle	Public Transport	Car / Van Driver / Lorry / Motorcycle	Car Passenger	Working at Home	Not Stated
Galway rural (part)	2.0%	2.0%	2.0%	76.5%	1.0%	15.3%	1.0%
Bearna rural	2.3%	1.7%	1.3%	70.6%	3.0%	17.7%	3.2%
Bearna	4.6%	4.7%	7.4%	60.0%	4.2%	12.6%	6.4%
Rahoon	9.1%	6.1%	5.1%	54.1%	4.4%	10.4%	10.7%
Dangan	17.5%	6.6%	6.4%	40.5%	4.3%	10.6%	14.0%
Newcastle	26.8%	5.5%	5.5%	34.3%	3.5%	8.8%	15.7%
Mervue	16.1%	5.5%	9.1%	49.7%	4.1%	10.4%	5.0%
Wellpark	18.0%	4.5%	12.9%	37.1%	2.3%	8.0%	16.2%
St. Nicholas	30.5%	3.4%	10.3%	19.5%	2.3%	10.0%	24.2%

	On foot	Bicycle	Public Transport	Car / Van Driver / Lorry / Motorcycle	Car Passenger	Working at Home	Not Stated
Monlach	18.8%	5.4%	4.7%	50.6%	5.9%	9.9%	4.7%
Castlegar	14.0%	5.4%	9.5%	48.5%	5.9%	9.2%	7.5%
Ballybrit	11.0%	2.6%	11.7%	52.1%	3.7%	11.2%	7.6%
Ballybaan	6.9%	2.7%	10.3%	53.0%	5.2%	8.8%	13.0%
Ballintemple	2.2%	2.0%	3.6%	76.4%	3.2%	11.0%	1.6%
Average	**12.8%**	**4.2%**	**7.1%**	**51.7%**	**3.8%**	**11.0%**	**9.3%**

Table 19.13 shows journey times to work, college or school. These conform to expectations in that journey times are less in the more central neighbourhoods of Newcastle and Dangan and are extended in the urban/rural fringe. Most journeys are completed in less than 30 minutes in all EDs, although the ratio of <30 minute journeys to <15 minute likely indicates the availability of easier vehicle access to places on employment for those living in the inner suburbs compared with central areas. A further 15% of journeys on average take between approximately 30 minutes and three-quarters of an hour or 18% in the urban/rural fringe. Only 6.4% of journeys exceed three-quarters of an hour. However, given that some urban roads are near to capacity, and that most people travel to work or college by car, journey time is vulnerable to increases in traffic volumes and to incidents giving rise to congestion.

Table 19.13 Journey Time to Work, College and School (CSO 2022)

	< 15 mins	1/4 - 1/2 hour	1/2 - 3/4 hour	3/4 hour - 1 hour	1 hour - 1½ hours	> 1 ½ hours	Not Stated
Galway Rural	20.0%	46.1%	20.0%	3.5%	5.2%	0.9%	4.3%
Bearna Rural	23.1%	41.1%	21.2%	4.1%	3.2%	1.7%	5.5%
Bearna	21.7%	41.5%	19.5%	3.7%	2.9%	1.4%	9.3%
Rahoon	26.1%	36.9%	15.3%	3.1%	2.7%	0.8%	15.2%
Dangan	26.4%	42.6%	10.5%	2.0%	1.6%	0.5%	16.5%
Newcastle	39.5%	31.8%	7.6%	1.9%	1.7%	0.4%	17.1%
Mervue	36.3%	34.4%	13.3%	3.2%	2.4%	0.9%	9.6%
Wellpark	28.8%	31.3%	11.8%	2.3%	2.5%	1.0%	22.3%
St. Nicolas	24.8%	30.3%	9.9%	2.1%	1.6%	0.6%	30.7%
Menlough	23.4%	47.1%	14.7%	2.7%	2.3%	0.9%	8.8%
Castlegar	25.0%	36.6%	18.4%	3.4%	2.5%	0.7%	13.3%
Ballybrit	34.2%	31.8%	16.1%	2.0%	2.1%	1.1%	12.6%
Ballybaan	30.8%	30.7%	14.1%	3.0%	2.4%	1.0%	18.1%
Ballintemple	35.6%	33.4%	19.2%	3.4%	2.2%	1.9%	4.3%
Average	**28.3%**	**36.8%**	**15.1%**	**2.9%**	**2.5%**	**1.0%**	**13.4%**

19.3.2 Character

The study area commences in the rural area to the west and north of Bearna Village. Although the landscape retains elements of a wild and rocky vista, there has been a renewal in individual residential development since 2016 following a hiatus in the aftermath of the 2008-2011 financial crisis, see Table 19.10. This development is adjacent to the few minor roads traversing the study area between which land use is largely low intensity agricultural. The Project follows a corridor just outside of the built up residential areas of Clybaun and Letteragh on the edge of Galway City, but also crosses the Dangan townland of established residential development and areas of amenity use to the east. Since 2018, new developments have been built on Ballymoneen Road and Clybaun Road beside the Project, and others are proposed for nearby areas off Letteragh Road.

The same pattern applies east of the River Corrib where the corridor for the Project traverses parts of Ballindooley and Castlegar. Further to the east, the area around Ballybrit includes extensive areas of commercial development and also the Galway Racecourse.

Landscape is also relevant to the human health assessment since the introduction of the TII PHH Standard. Landscape within the study area is distinctly different and can be delineated to east and west of the River Corrib. To the west is characterised by a pattern of irregular shaped, undulating enclosed fields delineated by drystone granite walls. Stretches of Blanket bog are also common and many fields, particularly in the vicinity of Bearna, are increasingly overgrown with scrub and bramble.

The landscape to the east is characterised by a pattern of larger, usually rectangular fields of improved grassland. The notable exceptions to this are the overgrown and wooded demesne landscape of Menlo Castle, the areas of bare Limestone pavement with surrounding dense hazel scrub, and the presence of large limestone quarries at Coolough (Lackagh Quarry) and at Ballygarraun / Pollkeen (Roadstone Quarry, off the N83 at Twomileditch).

Within Galway City there are expanses of residential, commercial and mixed developments.

From a Human Health perspective, the health of the population in Galway is broadly similar to other areas within Ireland. In its most recent publication on Health Status and Health Service Utilisation 2022, the CSO provides information of a number of health statuses. The statistics are reflective of the region, in this case, the West of Ireland. It shows, for example, in terms of self-perception of Health Status, 83% of adults perceive their health as being either Very Good or Good. This compares to 89%in Dublin, 87% in the South West and 84% in the Midlands. There are also statistics on doctor diagnosed medical conditions including for example, asthma, chronic bronchitis, diabetes and mental health problems, as well as others. In all cases, prevalence of these conditions is similar to other areas of the country. In general, therefore, the statistics suggest a health status broadly consistent with the Irish population as a whole.

19.3.3 Significance

The Project will provide improved connectivity to the national road network for communities on the western side of the River Corrib which is only possible at present by using one of the four city centre bridge crossings. Since 2018, the BusConnects Scheme Cross City Link was granted permission in September 2024 which will limit access for general traffic to the Salmon Weir Bridge in favour of a public transport corridor, thus reducing capacity to cross the river. This is subject to judicial review proceedings following the grant of permission. The introduction of the proposed N6 GCRR will take traffic from the city centre and suburbs, leading to improved journey time reliability and facilitating the reallocation of the road space to public transport.

It will also provide for an improved city centre environment for all due to reduced congestion and improved journey amenity, allowing walking and cycling to become safer, more practical transport modes. At present, bus patronage is just 10%. Current journey times for both private vehicles and public transport are extended significantly by regular congestion particularly in the vicinity of the Bodkin Junction and Kirwan Junction, but also at the Browne Roundabout and along Seamus Quirke Road. Significant community severance is currently experienced along Seamus Quirke Road, the Western Distributor Road and along every section of the existing N6, including areas with important community and retail facilities. Although there are signalised crossings, wait times can be lengthy due to the volume of traffic. In the eastern half of the city at Briarhill, there is a pedestrian underpass, but crossings of any sorts are necessarily prevented along much of the existing N6 in Ballybrit by a central barrier. While there are few community facilities in this area, the

commercial and industrial estates to the north are important places of employment to which most access occurs by private vehicle.

The economy of Galway City has a strong representation of software, pharmaceuticals, medical devices and engineering businesses. Tourism is also an important economic sector and the city is the gateway to Connemara and the Aran Islands. As well as the economic benefit of the tourism sector, the city's historic heritage, cultural and arts scene attract large numbers of visitors and provides city residents with a vibrant environment. Galway City itself has various well-known sites and holds numerous events and festivals throughout the year including the Galway Arts Festival, the Galway Food Festival, the Cúirt International Festival of Literature, the Oyster Festival and the Galway Races. In addition, the UoG Sporting Campus, the River Corrib, Lough Corrib and Galway Bay are also used for walking, fishing, and a variety of water-based activities throughout the year.

High quality transportation access in and out of the city is essential to the sustainability of the city's growth, the capacity of the tourism sector to drive regional development, and to the city's ability to stimulate economic development across the county, including more economically peripheral areas to the west. To date, which is reflective of 2024 and 2025, most industrial development has occurred in the east of the city where the best connections are to be found via roads to Dublin, Limerick, Cork and the east of the country. However, there are several large industrial or commercial estates which currently have very restricted access, in some cases only to the existing N6. The increasing volume of traffic in these areas impacts significantly on average journey times, especially at peak hours, and presents a threat to continued economic investment.

The route of the proposed N6 GCRR generally avoids nucleated settlements with the exception of areas such as Dangan, Ballindooley/Ballinfoyle and Castlegar. There are areas of concentrated or linear residential development and also scattered development. Local community identities have emerged, often associated with historical townlands, local crossroads, schools or sports clubs. Indeed, sports facilities, together with the UoG Sporting Campus, are well used, including by people living outside of the study area. There are also small family business premises and some equine activity.

19.3.4 Sensitivity

The 2022 CSO data records, rather high levels of disability (all types) in Rahoon (20.7% of total population), Dangan (24.7%), and Newcastle (28.4%) and St. Nicholas (22.8%) relative to an average for the other EDs in the study area. The figures for Rahoon and Dangan have almost doubled since 2016 but CSO acknowledge that the two Census results cannot be compared due to the changed nature of the questions asked in the latest Census. Newcastle, Shantalla and Mervue also have relatively high representations of social disadvantage as indicated by the Pobal HP Deprivation Index (see also Section 19.3.5).

Road crossings present a particular severance obstacle for people with disabilities. In the current baseline environment, there are limited opportunities for pedestrian crossings along the existing N6 away from dedicated crossing facilities. Combined with long wait times where these facilities are present, this imposes a particularly significant impact on sensitive or vulnerable population subsets including also young people and the elderly. The Galway Metropolitan Area Walking and Cycling Index (2023) finds that 41% of people with a disability feel able to walk or wheel (wheelchair or mobility scooter) at least five days per week, compared with 62% without a disability.

Heavy traffic volumes, together with severance, noise and air quality impacts, reduce local quality of life, have potential implications for health and inhibit the ease of movement of people of all ages and social groups to schools, shops, medical centres and other community facilities. Road crossings can be awkward for those whose mobility is impaired. Away from crossing facilities, they can entail an accident risk for all pedestrians. It can also be difficult for drivers too to gain safe access to and from busy roundabout junctions. In addition, whilst there are some cycle lanes along the existing N6, these often terminate at junctions without onward facilities, including for pedestrian/cycle crossings. While the level of cycling in Galway City is comparable to other regional cities, the figures are low by an international comparison. Inadequate cycling facilities, poor journey amenity and safety hazards, greatly discourage cycle journeys from the suburbs into the city. There have, however, been some recent improvements in active travel infrastructure since 2018 such as the new Salmon Weir Pedestrian and Cycle Bridge which was completed in 2023. An investment of €17 million by the National Transport Authority has been announced for active travel schemes in County Galway this year, with projects proposed around the University Road area and in Rahoon.

Galway City is an important national tourist destination. The attractiveness of the city to visitors partly depends on city centre traffic volumes remaining manageable and on vehicle access to the centre and the west not being subject to poor journey amenity, delay or congestion. Such factors impact negatively on the visitors' experience and their willingness to recommend Galway as a destination to others.

The Project will also pass through the Galway Gaeltacht as shown in Figure 19.1.001 and 19.1.002 of Volume 3 of this updated EIAR. The Galway Gaeltacht is an area of cultural distinctiveness that is an important part of the county's identity and an attraction to visitors. This identity could be strengthened by the economic stimulus of the improved accessibility provided by the Project.

In addition, some of the landscape in the west and central parts of the study area is of amenity interest or value. The corridor of the River Corrib is a sensitive landscape feature which is well used for walking, rowing and angling and which links the city to its wider hinterland. Much of this corridor is occupied by lands managed by UoG. These lands are accessible to the general public and are used by both university and non-university sports clubs and as an amenity. The university highlighted the role of these lands in providing for a unified campus and their importance in terms of providing sports and amenity facilities for attracting students and high-calibre staff. The concept of a unified campus has already been impacted by the partial physical severance incurred due to the Quincentenary Bridge on existing N6. Similarly, there are quiet roads and boithríns in the study area which are used for walking locally, including a historic mass paths. In particular, minor roads in the west of the study area are much used for walking, jogging and cycling. The study area is largely free of built development north of the existing N6, although there is much scattered residential development.

Residents consulted in the local community in the study area during the course of the assessment over the past 10 years to 2025 have often acknowledged the potential positive impacts of shorter travel times due to reduced urban congestion. People have also referred to the prospect for transport investments to provide for improved connectivity between parts of the city and the benefit this will have both socially and for employment. Concerns were simultaneously expressed regarding the perceived environmental and community impacts of the Project, many of which mirror those received during the earlier public consultation. Such anxieties can sometimes impact on individuals' health and well-being prior to the commencement of works. Where possible, these concerns have been addressed during the design process or by the proposed mitigation with the net impact discussed in the relevant section of this and other chapters.

19.3.4.1 Identification of vulnerable groups

While every human being should be considered a sensitive receptor, as per the 2018 assessment, vulnerable subsets such as younger and older people and people with disabilities can be considered to be among the most sensitive. These vulnerable groups may be more susceptible to impacts associated with the Project.

Children and adolescents constitute a vulnerable group partly due to their need to be able to move around freely to and from school and recreational activities. They lack the experience and judgement displayed by adults when moving around traffic in public spaces. Studies[7] show that they may also be more sensitive than adults to air pollution and other environmental factors.

Elderly people constitute a very variable group when it comes to their needs and scope for moving around the community. Generally speaking, elderly people are slower in their movements and more susceptible to health conditions. Elderly people in general have greater sensitivity to air pollution and potential effects on the respiratory system and cardiovascular system and more likely to express anxieties in relation to potential air quality or noise impacts due to the Project. There are many reasons for this sensitivity, including the possible presence of other medical condition such as respiratory or cardiovascular disease. Subtle changes in the environment have the potential to have an adverse effect that would not be experienced by younger more resilient persons. There are other vulnerable groups too, for example, persons with disabilities or persons with mental illness. It is important to note that, in this assessment, it is assumed that all areas contain highly vulnerable individuals including the old, the very young, disabled and persons with disabilities, as well as people who are sick today or who may be sick at the time the Project is being constructed or operational.

[7] http://www.who.int/ceh/risks/en/

However, as noted above, there are some particular areas with higher levels of sensitive population subsets than others.

Vulnerable groups of people occur throughout the receiving environment for the Project and include among others, a crèche, schools, a nursing home on School Road and areas with a higher number of older family groups.

19.3.5 Community Profile

Evidence shows that different communities have varying susceptibilities to health impacts both positive and negative as a result of social and demographic structure, behaviour and relative economic circumstance. The profile has been updated to reflect the changes since 2018.

Whilst specific health data for individuals in the vicinity of the Project is confidential and difficult to establish, a community profile has been used to establish the baseline and identify unequal distributions in existing factors such as deprivation or burden of poor health, in order that changes in community exposure to certain health pathways and their degree of impact on the population or community can be assessed.

The most recent health profile for the area based on the 2022 Census was published in 2023 and has been used to establish a community health profile for the Project.

The 2023 Health Profile identified that Galway City:

- *"has the lowest dependency ratio in Ireland of 33.9% (i.e. the number of those aged between 0-14 and 65 and over, as a percentage of the number of persons aged between 15 and 64). The national rate is 34.7%*
- *has the second most ethnically diverse population with 22.7% being non-white Irish. It also has the highest proportion of Travellers nationally of 1.3% (national 0.6%)*
- has a higher proportion of people obtaining education beyond secondary school 47.0% (national rate 42.8%). The proportion of those with primary education only is 4.8% (national rate 6.1%)
- has slightly above general health compared to the national rate
- *has the highest incidence of male malignant melanoma, and slightly above average for male prostate and colorectal cancers (Galway City and County data)*
- *is average or below average for the four main causes of mortality, all-cause mortality and suicides (Galway City and County data)*
- in terms of the age breakdown of the population it shows that Galway City, has a relatively higher percentage of the population in the young adult ages from 20-35 and a relatively smaller percentage in the very young and older age groups than the national population. However, this demographic is not unusual for an urban setting in Ireland

The Health Profile identified that Galway County:

- *Is the tenth most affluent local authority area nationally*
- *The Traveller population of 1.4% is above the national rate of 0.7%*
- *Has a low lone parent rate of 9.3% (national 10.9%)*
- *Has a low birth rate for mothers under 20 years of age at 7.0% (national 12.3%)*
- *Has the highest incidence rate of male malignant melanoma nationally, but is below average for female malignant melanoma, breast cancer, female colorectal cancer and male and female lung cancer (City and County data)*
- *Has average or below average mortality for the four main causes of mortality and for all mortalities (City and County data)*
- *Is below average for male and female deliberate self-harm*

In terms of deprivation, the health profile report includes a map which shows deprivation levels as a percentage of population compared to national levels, see Plate 19.4 for a copy of this map. It should be noted that the data shown on the map are averages and the scale of the map covers a relatively large area and does not give a true reflection of what is happening on a smaller more local scale. Areas which are categorised as affluent will contain small areas which are disadvantaged and similarly areas shown as disadvantaged will contain individuals or groups of considerable advantage. This shows geographically Galway City has relatively large areas which are marginally above average in terms of affluence or defined as affluent. However, there are parts of Galway City which score relatively highly on the Pobal Deprivation Index including the ED which contains the neighbourhood of Newcastle and areas close to the city centre.

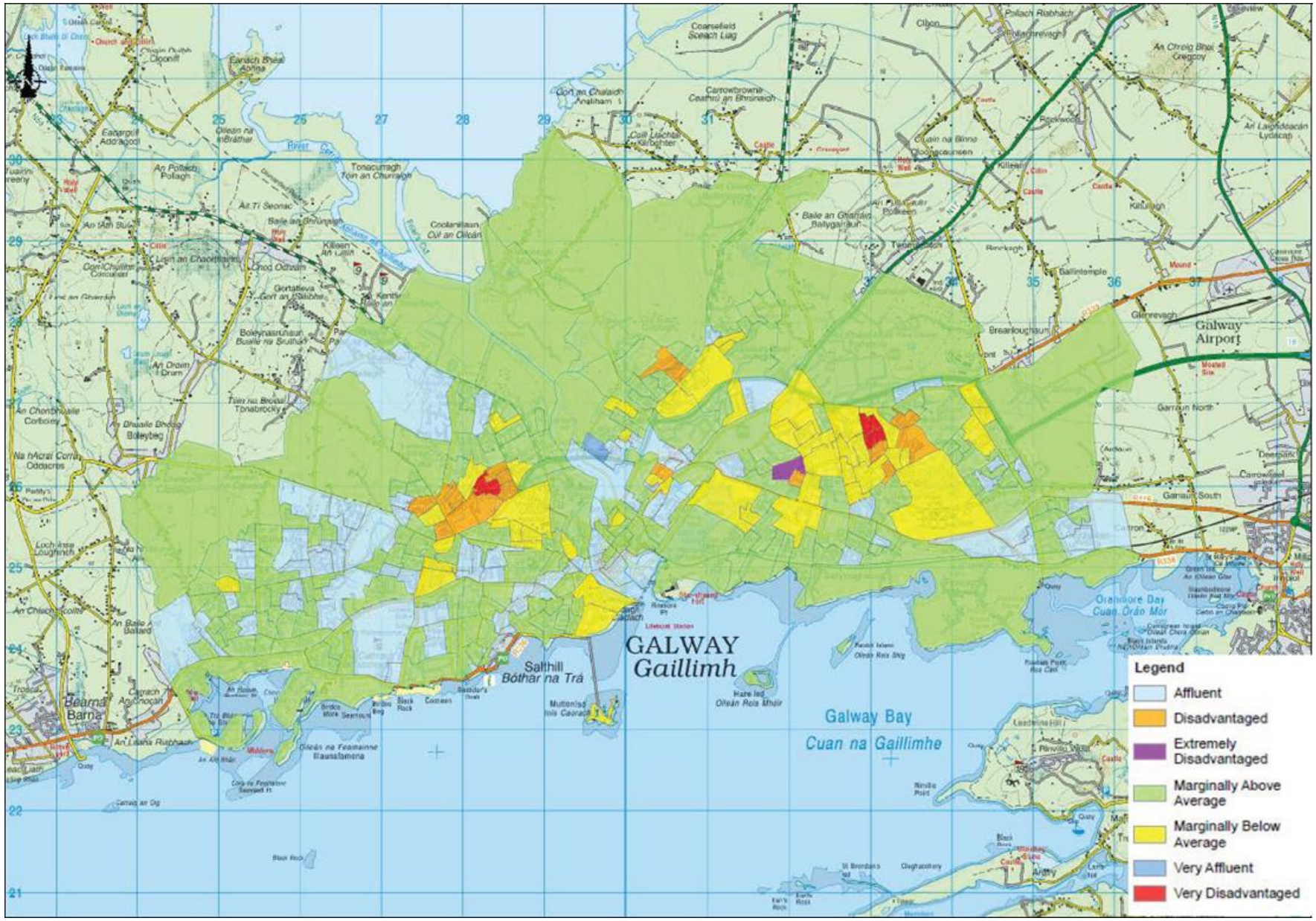

Plate 19.4 Deprivation Map for Galway City *(Extract from Health Profile 2022 Galway City)*

When one looks at the deprivation map for Galway County, see Plate 19.5 below, one can see an area described as affluent, immediately to the north and west of Galway City. Again as noted above, the data shown on the map are averages and the scale of the map covers a relatively large area and does not give a true reflection of what is happening on a smaller more local scale. Areas which are categorised as affluent will contain small areas which are disadvantaged and similarly areas shown as disadvantaged will contain individuals or groups of considerable advantage.

A copy of the Health Profile reports for Central Galway & East Galway City and West Galway City are included in Appendix A.19.1 and A.19.2 respectively.

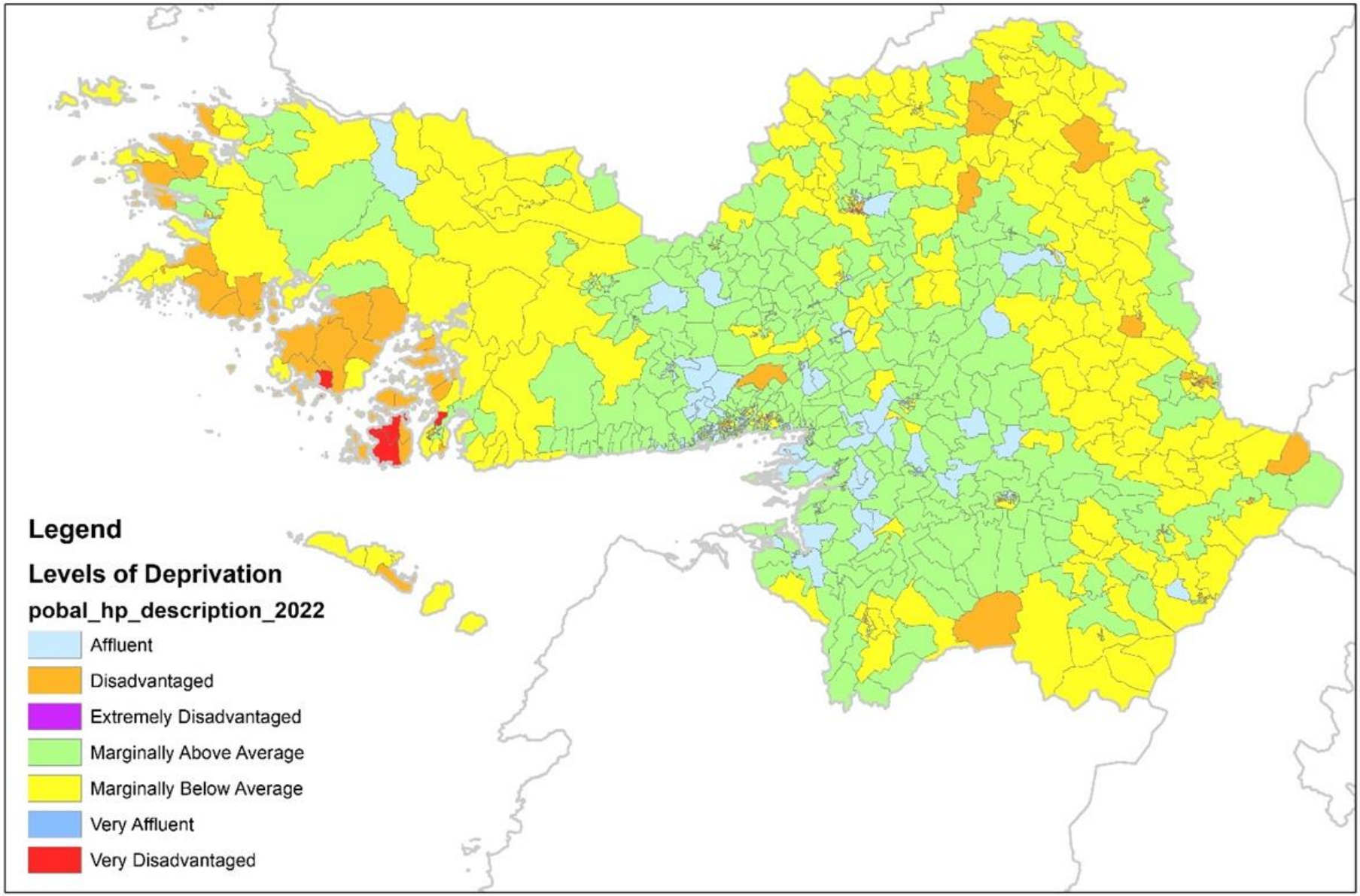

Plate 19.5 Deprivation Map for Galway County

19.3.6 Irish Language

19.3.6.1 Context

Irish (or Gaelic) is the national and first official language of the Republic of Ireland and it is among the official languages of the European Union. Despite its official status, the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 2009 declared the Irish language as "definitely endangered" and stated that it may be on its way to disuse. The Census of 2022 provides an update on the status of use since 2018 and recorded that of 1.87 million people in the Republic of Ireland who indicated they could speak Irish, 71,968 said they speak it daily outside the education system, a fall of 1,835 on the 2016 figure and 3,382 on the 2011 figure.[8] A further 115,065 said they spoke it weekly, while 614,727 said they spoke it less often. Over one in four (473,000) who can speak Irish said they never spoke the language. Of the 71,288 daily Irish speakers (outside the education system), 20,261 (31.2%) live in Gaeltacht areas.

Irish was the predominant language of the Irish people for most of our recorded history. By the tenth century Middle Irish was spoken throughout Ireland, Scotland and the Isle of Man; indeed, a common Gaelic literary language was used in Ireland and Scotland until the 15th century. Though Gaelic power and culture suffered in the century after the Anglo-Norman invasion, by the end of the thirteenth century "confidence had returned and the educated families of Gaelic Ireland embarked on a 300-year period of tremendous energy in the production of poetry, legal commentaries, translations of European medical treatises and works of genealogy and Irish history."[9] However by the seventeenth century, the language had lost its ascendancy and the dominant land-owning, merchant and professional classes were English.[10] As a result of economic pressures and British government prohibition of the use of Irish in public life, by the eighteenth and early nineteenth century, Irish was largely the language of the poorest sections of society. The Great Famine (1845 – 1849), and the socio-economic upheaval that followed, decimated the language. However, by the end of the nineteenth century, a vibrant language revival movement emerged in the form of the Gaelic League (Conradh na Gaelige). The creation of the Irish Free State institutionalised the language and

… government efforts to promote Irish, especially by maintaining the viability of the Gaeltacht, the remaining Irish-speaking areas, and insisting on compulsory instruction in schools, have thus far attained only limited success.[11]

The term "Gaeltacht" describes areas where the Irish language is considered the vernacular language. Ireland's Gaeltacht's were defined by a Government-appointed commission in 1926 and the boundaries were redrawn in 1956. It amounts to a total of 155 District Electoral Divisions, covering extensive parts of counties Donegal, Mayo, Galway and Kerry, all of which are on the western seaboard, together with parts of counties Cork, Meath and Waterford.

Consolidated figures for numbers of speakers and volume of Irish use in the Gaeltacht, have been available since the mid-1920s with the government-appointed "Coimisiún na Gaeltachta" report of 1926 and the population census of the same year. The former recommended that the Gaeltacht, which until then had no administrative existence, be defined on a two-tier basis – what came to be known as *Fíor Ghaeltacht* (above 80% Irish-speaking) and *Breac-Ghaeltacht* (between 25% and 80% Irish-speaking).

The *Comprehensive Linguistic Study of the use of Irish in the Gaeltacht* (2007)[12] conducted on behalf of the Department of Community, Rural and Gaeltacht Affairs (now the department of Art, Culture and Gaeltacht) updated these definitions into categories based on percentage of daily Irish speakers and sociolinguistic profiles for each type of community:

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[8] CSO 2017, 65

[9] Duffy, 2000, 44

[10] Duffy, Atlas of Irish History, 2000, 94

[11] Duffy, Atlas of Irish History, 2000, 94

[12] Comprehensive Linguistic Study of the use of Irish in the Gaeltacht – Principle Findings and Recommendations – 2007: Research Report prepared for the Department of Community, Gaeltacht and Rural Affairs (http://www.pobail.ie/en/AnGhaeltacht/LinguisticStudyoftheGaeltacht/)

- Category A (over 67% Irish-speaking)
- Category B (between 44% and 66%)
- Category C (less than 40%)

The position of the Irish language in the Gaeltacht is very fragile as a result of continuous erosion by a wide array of forces including the mass media, the provision of State services through English, popular culture and the historical and contemporary dominant status of the English language in Irish society. Furthermore, there has been a weakening of the language as a result of people coming to live in the Gaeltacht from elsewhere who have little or no Irish. While there is evidence that there is a high level of awareness of the importance of Irish in the community life of the Gaeltacht, there has been a major reduction in the numbers of parents using Irish as the first language of the household and in the use of Irish among young people in the Gaeltacht. With respect to the education system, primary schools contribute greatly in supporting and fostering the language as a community language, but post-primary education is frequently provided outside the Gaeltacht area and/or within a local town where English usage is more prevalent. For a multitude of reasons, Irish has almost ceased to be, and in some cases no longer is, the community language in a number of Gaeltacht areas.

The Government's *20-Year Strategy for the Irish Language 2010 - 2030*[13], has the principal objective of increasing on an incremental basis the use and knowledge of Irish as a community language. Specifically, the Government's aim is to ensure that as many citizens as possible are bilingual in both Irish and English. It is an integral component of the Government's Irish language policy that close attention be given to its place in the Gaeltacht, particularly in light of research which indicates that the language's viability as a household and community language in the Gaeltacht is under threat.

The total population of all Gaeltacht areas in 2022 was 106,220[14], up 10.5% from 2016. Of those people aged over three years, 65,156, or 63.3%, indicated they could speak Irish, while 20,261 (31.1% of the total) indicated they spoke Irish daily outside the education system. This represents a fall of 1.6% on the 2016 daily Irish speakers figure of 20,586, although this is a much smaller fall than the figure of 11.2% recorded between 2011 and 2016. The number of people in Gaeltacht areas who indicated they spoke Irish less often than weekly increased by 0.4 per cent from 16,137 to 16,844. People who never spoke Irish outside of the education system total 5,898 or 9.05%.

There are a large number of pre-school, educational, arts, sports, entertainment and employment organisations working on the ground throughout the Gaeltacht. These include community-based companies supported by Udarás na Gaeltachta. There are also a sizeable number of language-based enterprises operating through Irish. The following important organisations are based in the Galway Gaeltacht: Acadamh na hOllscolaíochta, TG4, RTÉ Raidió na Gaeltachta and An Coimisinéir Teanga.

19.3.6.2 The Galway Gaeltacht

The Galway Gaeltacht is the most populous of the country's Gaeltacht areas. It includes both the Galway City and Galway County Gaeltacht and stretches for approximately 100km from Baile Clár, east of Galway City to Cloch na Rois in West Connemara. According to the 2022 Census, there were 54,183 people living in the Galway Gaeltacht. Of those aged three or over (a figure of 31,989), or 60.9%, indicated an ability to speak some level of Irish. A total of 10,023 stated that they spoke some level of Irish every day (representing 31.3% of the Irish-speaking population over the age of three, or 18.5% of the population of the Galway Gaeltacht). The figures is a slight reduction on the 18.8% proportion for 2016. Approximately 17,496 of the Galway Gaeltacht population resides within the suburbs of city, an increase of 14.4% on the figure of 15,300 in 2016.[15]

[13] http://www.ahrrga.gov.ie/app/uploads/2015/07/20-Year-Strategy-English-version.pdf

[14] CSO 2023, 69

[15] Galway City Council (2023, 99)

In 1926, the rural districts with the highest proportion of Irish-speakers were situated in the western half of the country. In 1956, the official Gaeltacht boundaries were officially revised. While the total Gaeltacht population in the state fell by nearly one fifth, the Galway Gaeltacht had an overall loss of just 1%; however, the Fíor–Ghaeltacht areas declined by 12%. The larger Breac-Ghaeltacht areas, which included Galway City, maintained their 1926 level.

The patterns of language usage in the Galway Gaeltacht during the period closely resemble those of 1926. Again, only three rural districts – Galway, Oughterard and Clifden – contained significant proportions of households in which Irish was the sole or main language in normal use. However, in all districts, there is evidence of a shift towards English. The revision of the Gaeltacht boundaries was designed to positively impact on Irish language use in both Breac- and Fíor–Ghaeltacht areas. It redefined the Galway Gaeltacht almost entirely within the boundaries of the three most western and rural districts – Galway, Oughterard and Clifden, omitting English-speaking pockets in these areas, and the Breac-Ghaeltacht areas in the eastern rural districts of Galway. Within the 1926 boundaries, the Gaeltacht in 1956 contained a population of 104,896, but the revised boundaries had a population 28,878.

Between 1956 and 1971, overall population levels in the Galway Gaeltacht declined, but then showed a sharp increase in the 1970s; however, patterns were different between the Galway rural districts and remaining areas. In the 1956-71 period, population levels in this district were stable, while in the 1971-81 period, they increased by 45%. By contrast, Clifden and Oughterard experienced significant population loss until 1971; after which only slight gains were seen up to 1981. Many of these changes are clearly related to the growth of Galway City, with the areas closest to the city experiencing the strongest population growth – in the region of 43%. As the population increased, the ratio of Irish speakers decreased. In the coastal zone between Galway City and Indreabhán (Inverin), population increased by 24%, but there was a language shift to English, particularly close to the city. In Bearna, for example, only 60% of the population were classed as Irish speakers, however this ratio increased to 92% towards the west of the county. Very high levels of Irish speaking (+90%) in the Galway islands were maintained.

Both the demographic and linguistic trends in the country's Gaeltacht areas forced a major reappraisal of government policy in the late 1950s and 1960s. This reappraisal included the abandonment of the policy of relying on agriculture for a sound economic base, and in the provision of a Government department dedicated to the Gaeltacht. As late as 1966, 72% of the workforce of the Galway Gaeltacht was still employed in agriculture. Over the following 15 years, this decreased to 41%. The establishment of Údarás na Gaeltachta in 1980 saw a greater emphasis on industrial development within Gaeltacht areas. From the 1970s onwards, Galway City grew increasingly important as a centre of third-level education and employment. In the recent 2022 Census, amongst the cities in the state, Galway City and its suburbs had the highest proportion of population who spoke Irish on a daily basis (3%).[16]

19.3.6.3 Planning context

The Planning and Development Act 2000 (as amended) outlined the principle that all Local Authority County Development Plans should set out objectives in relation to the linguistic heritage of Gaeltacht areas within the county in question, these should include:

> *The protection of the linguistic and cultural heritage of the Gaeltacht including the promotion of Irish as the community language, where there is a Gaeltacht area in the area of the development plan*[17]

Subsequent Planning and Development Regulations 2001 (as amended) from the Department of the Environment, Heritage and Local Government contain, within Article 28[18], the basis for the requirement that a Language Impact Assessment be prepared for a planning application within a Gaeltacht area. Article 28 (n) states that the Minister for Community, Rural and Gaeltacht Affairs and Údarás na Gaeltacht shall be notified of any development in a Gaeltacht area as '*it might materially affect the linguistic and cultural heritage of the Gaeltacht, including the promotion of Irish as the community language*'.

[16] http://www.cso.ie/en/releasesandpublications/ep/p-cp10esil/p10esil/gag/

[17] Planning and Development Act 2000 (as amended), Section 10(2)(m)

[18] https://www.irishstatutebook.ie/eli/2001/si/600/made/en/print

Significant further requirements for public bodies to ensure better availability and a higher standard of public services, including the planning process, through Irish were enforced under the Official Languages Act, 2003 (as amended).

The Gaeltacht Act 2012, which provides a statutory footing for the ongoing implementation of the language planning process, was enacted with two primary objectives: (a) to provide for a new definition for the Gaeltacht and (b) to make amendments to the structure and functions of Údarás na Gaeltachta. The Act envisages that the Gaeltacht will in future be based on linguistic criteria instead of on geographic areas which has been the position to date. Language planning at community level will be central to the new definition of the Gaeltacht.

In addition, the Planning and Development Act 2000 as amended, (the Act) sets out mandatory objectives for local authorities, which must be addressed in the drafting of their statutory County Development Plan which governs local development policies. Section 10(2) of the Act includes a requirement that, where there is a Gaeltacht area within the planning authority's territory, the development plan must include provisions and objectives for "*the protection of the linguistic and cultural heritage of the Gaeltacht including the promotion of Irish as the community language*". Both Galway City and County Councils have policy goals and objectives in relation to the Gaeltacht and the Irish Language. Since 2018, both the city and county development plans have been updated. As set out in Chapter 2 of this updated EIAR, the Gaeltacht Local Area Plan, 2008-2018 identified Gaeltacht Na Gaillimhe as the most populous of the country's Gaeltacht areas. It stretches from Claregalway, which is east of the city of Galway to Cloch na Rón in west Connemara, a distance of approximately 100km, and from Oileáin Árainn northwards to the Mayo border. The Gaeltacht Local Area Plan, 2008–2018 was prepared and adopted in February 2008 and amended and extended in 2013 and informed the 2018 EIAR. Since 2018, Chapter 13 of the new Galway County Development Plan 2022-2028, incorporates the objectives and aims that were previously set out in the Gaeltacht Local Area Plan, 2002-2018. This chapter sets out the strategic aims of Galway County Council to protect and enhance the Galway Gaeltacht and Islands. These aims include provision of improved transport networks as well as promoting and facilitating sustainable development.

In accordance with Section 7 of the Gaeltacht Act 2012, a number of statutory instruments have been made in 2022 designating areas within the Assessment Boundary as Gaeltacht Language Planning Areas including:-

1. S.I. 433/2022 designating Bearna and Cnoc na Cathrach (Knocknacarra)
2. S.I. 250/2022 designating Galway City

The Bearna and Cnoc na Cathrach Gaeltacht Language Planning Area (LPT) is located to the west of Galway city. It has the largest population of all the LPTs in the country. According to the 2016 Census, there were 11,696 people living in this LPT, and 5.9% of the population over 3 years of age spoke Irish on a daily basis.

Údarás na Gaeltachta is responsible for selecting the organisation in the LPT that is the most capable of preparing an Irish Language Plan. The purpose of this plan is provide for and encourage the increased use of the Irish language in the family, educational, public, social, recreational and commercial life of the area concerned. The Language Plan for Bearna and Cnoc na Cathrach 2020-2027 was published in September 2020 and in March 2020 for East Galway City.

Further, under Section 9 of the Gaeltacht Act 2012, Galway City has been designated as a Gaeltacht Service Town under S.I. 580/2021 and again this is designated on the basis of promoting the Irish language.

An tÚdarás na Gaeltachta published its Strategic Plan 2021-2025 for the Gaeltacht in June 2021. This Plan aims to cultivate vibrant Gaeltacht communities where Irish is the primary language of communication. A key objective is to establish the Gaeltacht as a hub of entrepreneurship, attracting and nurturing businesses in the region.

19.3.6.4 Language Profile

The Project traverses the following Electoral Divisions (EDs):

- Bearna (part) (County Galway) (CSO Area Code ED 27044)
- Bearna (Galway City) (CSO Area Code ED 26003)

- Rahoon (CSO Area Code ED 26015)
- Dangan (Galway City) CSO Area Code ED 26006
- Galway Rural (Part Rural) (CSO Area Code ED 27052)
- Mionlach (CSO Area Code ED 26010)
- An Caisleán Gearr (CSO Area Code ED 26004)
- Baile An Teampaill (Part Rural) (CSO Area Code ED 27042)
- Baile An Bhriotaihg (CSO Area Code ED 26002)
- Ballybaan (CSO Area Code ED 26001)

Of these, the EDs of Rahoon, Dangan, Galway Rural (Part Rural) and Ballybaan are not within Gaeltacht district, while the western portion of Baile an Teampaill (Ballintemple) is within the Gaeltacht. The Project extends through an area of the Galway Gaeltacht which abuts and surrounds Galway City. Since the 1980s, this area has experienced rapid population growth and urban expansion. Critically the majority of the population is not of Gaeltacht origin and the use of Irish as the "family" language has continued to decline.

Table 19.14 below presents the percentage Irish speaking population (aged 3 years and over) in the District Electoral Divisions through which the Project passes, and percentage of daily Irish use in 2016 and 2022. For this study, daily usage is defined by the number of people (a) speaking Irish daily within and outside the education system and (b) those speaking Irish daily outside the education system only.

Table 19.14 Language Usage within the District Electoral Divisions through which the Project will pass *(based on CSO Small Area Population Statistics 2022 and 2016)*

District Electoral Division	Total Population aged 3 or over		% Irish-Speaking		% Daily Irish Use outside the Education System	
	2022	2016	2022	2016	2022	2016
27052 Galway Rural (Part)	209	146	51.2%	49.3%	2.9%	5.4%
26003 Bearna (Galway City)	16033	14461	66.9%	50.0%	4.9%	3.5%
27044 Bearna (part) (County Galway)	3767	3586	50.0%	65.8%	3.3%	5.3%
26015 Rahoon	3347	2946	39.0%	42.8%	1.9%	2.3%
26006 Dangan (Galway City)	4521	4021	42.3%	47.3%	1.6%	1.9%
26010 Mionlach	707	4960	35.7%	43.3%	3.7%	2.4%
26004 An Caisleán Gearr	5267	3894	46.0%	35.8%	2.7%	2.1%
26002 Baile An Bhriotaihg	912	915	34.6%	36.9%	2.3%	1.9%
26001 Ballybaan	13004	12271	30.7%	31.6%	1.0%	1.5%
26011 Mervue	2220	1793	37.3%	32.7	2.0%	1.8%
27042 Ballintemple	1537	1424	49.6%	50.1%	1.4%	2.0%
26022 Wellpark	1796	1629	28.5%	32.7%	1.2%	1.2%
St. Nicolas	3181	2362	28.1%	32.9%	2.0%	2.5%

These figures indicate that the daily usage of Irish (outside of the education system) within the environs of the Project varies from just less than 2% to less than 8% (though the highest percentage was recorded within the least populated Electoral Division (Galway Rural ED 27052)). It is fair to say that while Irish is a community language within the study area for the Project, it is far from being a dominant or significant one.

19.4 Characteristics of the Project

A detailed description of the Project and construction activities are provided in Chapter 5, Description of Project and Chapter 7, Construction Activities. This section outlines the characteristics and activities of the Project of relevance to population and human health.

19.4.1 Construction phases

19.4.1.1 Phase 1

Phase 1 of the Project will take 12 months to complete. During this time the works required for the construction of temporary stables, a machinery shed and new parade ring at Galway Racecourse (described in detail in Chapter 5) and which is the subject of a separate planning permission will remove lands currently used by Galway Racecourse for parking during race days. At the beginning of the construction of Phase 1, the construction site will be fenced with restricted access. (Approval for these works was granted by Galway City Council in December 2024 Planning Ref. No.:24/60279).

19.4.1.2 Phase 2

Works undertaken as part of Phase 2 for the proposed N6 GCRR follows the phasing as submitted as part of the Section 51 Application in 2018, but also takes account of the modifications outlined in Section 5.2 of Chapter 5 of this updated EIAR, excludes the works in Phases 1, 3 & 4, and will include the following:

- Stage A – N6 Coolagh to N59 Letteragh Junction – 9.9km (Including the N59 Link Road North and South)
- Stage B – N59 Letteragh Junction to R336 Coast Road west of Bearna - 7.5km

It is estimated that the main construction period in Phase 2 will last for approximately 36 months. A variety of construction activities will occur simultaneously at a number of locations along the proposed N6 GCRR, but will be phased at any particular location.

Construction of the proposed N6 GCRR will include activities such as excavation, embankment and structural construction, tunnelling, piling, rock breaking and movement of materials within the fenced off working area. This will generate noise, dust and movement of machinery which will impact on people's well-being (population) and human health. The duration of these works will vary. Construction will be undertaken using internationally accepted methods, for example working hours and noise and screens and in a manner which will minimise, as much as possible, any disturbance to the local residents and road users. Refer to Chapter 7, Construction Activities for further details of construction activities. Refer to Chapter 16, Air Quality and Chapter 18, Noise and Vibration for details on potential air and noise impacts during construction.

The proposed N6 GCRR has been designed to avoid as many residential properties as possible, but given the built environment and the linear development of the city, with housing extending along most roads radiating out of the city, its construction will unfortunately and unavoidably result in property demolitions or acquisitions in particular areas. At some locations, a high proportion of the total number of properties in a cluster will be acquired as part of the proposed N6 GCRR. As well as the direct adverse impact on the householders themselves, this will present a varying negative effect on remaining residents depending on the strength of community interaction that has evolved at each location and the sustainability of community facilities such as schools.

Commencing with the description of the construction phase at Bearna, much of the work here will occur in a rural setting. However, the high number of one-off dwellings in this area will result in the demolition of some properties. Other residents will be in close proximity to construction works and associated impacts. To the north of Bearna, an overbridge is proposed between the Foraí Maola Road (Na Foraí Maola Junction) and

the L5387 Troscaigh Road (Troscaigh Junction) to provide continued access in a north-south direction along both roads. At Ch. 2+500 the proposed N6 GCRR will sever the L-13215 Ann Gibbons Road with access to the north provided instead by the L1321 Bearna to Moycullen Road which will meet the proposed N6 GCRR at the Bearna East Roundabout. Temporary realignments will be required on the Aille Road to allow for bridge construction and traffic management at other locations where local roads cross the construction works.

A signalised junction (Cappagh Road Junction) is proposed between the proposed N6 GCRR and Cappagh Road. This junction will facilitate access to the proposed N6 GCRR for the community of Boleybeg to the north and for the Western Distributor Road to the south, enabling use of the proposed N6 GCRR as an alternative to the R336 through Bearna for many journeys. The junction will also permit access to a crèche which is located on Cappagh Road just to the north of the proposed N6 GCRR.

Another signalised junction with the Ballymoneen Road (Ballymoneen Road Junction) provides for access to the Rahoon Road and the hinterland around it including Ballyburke, as well for journeys to the communities of Boleybeg and Keeraun to the north-west and Mincloon to the south. To the east, Rahoon Road will be allowed to pass below the proposed N6 GCRR. A temporary night-time closure of Rahoon Road will be required to facilitate overbridge construction.

The N59 Link Road North and South will be constructed in a largely rural area. Six local access roads will be constructed on the southern section as required, including a realigned entrance to the Rosán Glas Estate. However, there will be a minimum impact on local traffic as most of this section is offline of the current road network. New link road access will be provided to the Gateway Retail Park, replacing the existing access from the Gort na Bró roundabout with a signalised junction. The N59 Letteragh Junction itself will entail large-scale construction works including the excavation of cuttings. A temporary night-time closure of Letteragh Road will be required to facilitate overbridge construction.

The proposed N6 GCRR then crosses the N59 Moycullen Road in Dangan in the vicinity of the Ard na Locha and Augnacurra estates north of the junction with Circular Road. Night-time closures of the N59 Moycullen Road will be required along with temporary traffic management for diversions. The construction of the River Corrib Bridge will occur through an area of high recreational value at the UoG Sporting Campus.

East of the River Corrib, a temporary diversion of Coolough Road may be required during the construction phase. The proposed N6 GCRR will be elevated on a viaduct structure (Menlough Viaduct) east of the Coolough Road before entering the proposed Lackagh Tunnel from where it proceeds to connect with the N84 Headford Road at a grade separated junction. Temporary night-time closure of existing roads may be required at locations such as the Menlo Castle Bóithrín, Bóthar Nua and An Seanbóthar where overbridges are to be constructed.

A temporary diversion of School Road will also be necessary to allow for bridge construction. Major construction works will be required in the vicinity of the N84 Headford Road and N83 Tuam Road and temporary night time closures and diversions may be required. A grade separated junction is proposed with the N83 Tuam Road. An access road connecting with the N83 Tuam Road will provide a connection to six residential properties within the established community of Cappanabornia. Major excavation works will be required on the hill on the eastern side of N83 Tuam Road and for the Galway Racecourse Tunnel. The Parkmore Link Road and City North Business Park Link will be constructed in advance to maintain access. Further east, temporary night time closures of the R339 Monivea Road and Briarhill Business Park Road may be necessary. The existing junction with R339 Monivea Road is regularly congested by commuting traffic heading to the nearby office parks and construction traffic management will be required to minimise construction impacts.

19.4.1.3 Phase 3

During this phase, which will take 9 months, the new permanent stables which are critical to ensure the continued operation of Galway Racecourse will be constructed at the Brooks builders providers. Galway County Council has entered into a binding contract for the purchase of this property with the owner and tenant of this property respectively. This will generate noise, dust and the movement of machinery which will potentially impact on adjoining lands. The direct impacts will be confined mainly to the racecourse land

parcel (Ref. No. 691) with potential effects from noise dust and traffic affecting Ref. No. 701. (Approval for these works was granted by Galway City Council in December 2024 Planning Ref. No.:24/60279).

19.4.1.4 Phase 4

The proposed temporary stables in the infield of Galway Racecourse will be demolished during a 3-month period once Phase 3 is complete and operational. All demolition activities will be carried out within the Assessment Boundary. (Approval for these works was granted by Galway City Council in December 2024 Planning Ref. No.:24/60279).

19.4.2 Operational phase

At Phase 5, the proposed N6 GCRR and the permanent stables will be operational. Once operational, the proposed N6 GCRR will enable the reallocation of existing road space within the city to public transport and smart mobility measures and provide an additional crossing of the River Corrib. This will alleviate congestion within Galway City which will result in reduced air and noise pollution. It will facilitate a more efficient public transport system and the provision of a multi-modal choice of travel including walking and cycling. Should this result in a modal transfer from private vehicle use, there will be benefits too for carbon emissions and climate in the city centre. The transfer of traffic will provide for improved journey times and journey amenity for all road users as well as reduced community severance along existing roads and a reduction in traffic noise along sections of these roads. There will also be positive effects on general amenity and potentially the well-being and health of the local population due to the transfer of a proportion of the current high volume of traffic from existing busy urban streets. The proposed N6 GCRR itself will facilitate the crossing of the River Corrib without vehicles having to negotiate the city and will improve connectivity for the city either side of the River Corrib. It will also provide essential city street links to better distribute traffic.

19.5 Evaluation of effect of the Project

19.5.1 Introduction

This section of the chapter evaluates the potential effects for the 'Do-Nothing' scenario followed by an assessment of effects for the 'Do-Something' scenario during the construction phase and then the operational phase under the headings of journey characteristics, amenity, community severance, economics and tourism, Irish Language and human health.

19.5.2 'Do-Nothing' Effect

19.5.2.1 Journey characteristics

The 'Do-Nothing' scenario assumes that the Project is not built. As congestion in the city has worsened since 2018 there is no change to this assessment other than it is likely to be worse under all criteria.

There is likely to be a continuation and worsening of the poor journey characteristics experienced at present due to traffic congestion. In line with traffic growth factors, traffic volumes will continue to increase along existing routes accessing Galway City. Over half of Galway's working population commutes from surrounding areas and must enter the city via one of the main radial arteries, often connecting to the congested existing N6 to reach employment destinations in the east or west. Regular delays, especially at peak hours, will continue as a characteristic of poor journey time reliability. Rat-runs on local roads which are not designed for such traffic volumes will continue to increase along with an associated safety risk.

Such congestion would also undermine the potential to fully realise future development objectives such as the Ardaun LAP. Opportunities for improved public transport and the promotion of sustainable modes of transport such as walking and cycling will be restricted by the need to accommodate vehicle traffic flow.

19.5.2.2 Amenity

The high volume of private and commercial vehicle traffic within the city will also continue to result in poor journey amenity and discourage walking and cycling together with the associated health benefits. The continuing need to accommodate traffic flow in response to a rising trend in traffic volumes will restrict

opportunities to dedicate extra space to pedestrians, cycling and public transport, and make it more difficult for the city to realise its objective of concentrating new development within the city boundary. In addition, the general amenity of people living alongside the existing N6 and other major access roads will continue to be effected by traffic noise and poor air quality.

19.5.2.3 Community severance

The need to accommodate traffic flow restricts opportunities to provide crossing facilities. Combined with the poor journey amenity noted above, this will maintain the high levels of community severance that are currently experienced along major roads such as the existing N6 and could confine some vulnerable groups such as elderly people and children within particular communities surrounded by busy roads. The preceding demographic analysis highlights the presence of relatively high levels of disability in neighbourhoods surrounding the existing N6.

19.5.2.4 Economic and tourism

High traffic volumes combined with congestion will stifle economic development and limit the ability of Galway City and its environs to realise its status as a Gateway City. The city's ability to attract new business and investment will be greatly constrained by regular traffic congestion and poor journey time reliability. A 'Do-Nothing' scenario will also remove the opportunity for improved connectivity to economically peripheral communities in the west of County Galway. Although Galway City is already a major destination for tourism, the potential for tourism development will be inhibited by a continuation of the high level of traffic volumes and congestion. The experience of visitors may be diminished by delays experienced traversing the city and by the experience of heavy congestion on city streets. In particular, high traffic volumes and congestion experienced in an unfamiliar city will reduce the willingness of tourists travelling by car to enter the city centre to visit key destinations and to contribute to the local economy.

19.5.2.5 Irish Language

In the 'Do-Nothing scenario, the Project is not built, the Irish language usage profile of Galway City and its suburban periphery is likely to be unchanged. However, settlements and industrial activity located within the Gaeltacht areas further west of the city will continue to experience peripherality and disadvantage in terms of long commuting times and transportation delays. The lack of adequate connectivity has been identified as a significant barrier to the long-term sustainable economic development of the Gaeltacht by agencies such as Údarás na Gaeltachta.

19.5.2.6 Human Health

Traffic demands in Galway City and its environs will continue to grow whether the Project proceeds or not (Chapter 6, Traffic Assessment and Route Cross-Section). The number of people living in Galway City and its environs has increased and is likely to continue do so as set out in the zoned areas in the City Development Plans. The most recent Census 2022 shows that the population of Galway City has increased by 7.3% since 2016 to 84,414.

Negative impacts (dust, noise, nuisance, etc.) currently experienced by people from traffic congestion on existing routes will continue and potentially increase as traffic increases.

From a noise point of view, the increase in traffic demands on the existing road network will result in increased noise levels over and above the current scenario at properties located along the main national and regional roads.

Noise levels at properties identified as 'hot spots' and areas for noise management within the Draft Galway City Noise Action Plan (2024 – 2028), Draft Galway County Council Noise Action Plan 2024 - 2028 will remain above the threshold noise levels for noise management and are likely to be further increased as a result of increased traffic volumes. Refer to Chapter 18, Noise and Vibration for further details on noise impacts in the 'Do-Nothing' scenario.

In the 'Do-Nothing' scenario, traffic congestion will persist within Galway City and its environs with vehicles continuing to go through congested city centre routes with slow average speeds giving the potential for greater particulate emissions. Particulate emissions have received particular attention in recent years given increasing evidence of their health effects.

In the 'Do-Nothing' scenario, there would also be potential adverse impacts on social interaction and inclusion due to a persistence of high levels of severance along existing roads and the potential that this has for containing populations within particular neighbourhoods combined with the direct discouragement to the movement of sensitive groups. The risk of road accidents will continue, particularly for pedestrians and cyclists, due to the need to ensure traffic movements which may restrict opportunities for new dedicated crossing facilities and a reduced availability of road space for footpaths or cycle lanes.

19.5.3 'Do-something' - Potential Construction Effects – Population

19.5.3.1 Introduction

As discussed in Section 19.4.1, the Project will entail a significant level of construction works over a period of approximately 60 months, with the bulk of the construction works occurring in the 36 months of Phase 2, although works in individual locations may continue for a few days to a few months. For the most part, construction work will occur in a rural setting, but in some locations there are concentrations of houses, distinct communities or a high density of individual properties. There are potential effects in relation to residential property demolitions, temporary road closures or diversions, construction traffic and general amenity. Refer to Chapter 7, Construction Activities for further details of construction activities.

19.5.3.2 Journey characteristics

Temporary realignments, temporary night-time closures and stop-go arrangements will be required where minor roads meet construction works. Most effects associated with these arrangements are likely to be imperceptible to slight negative in extent. The temporary diversion of Aille Road will not impact significantly on accesses or use of the road. Temporary night-time closures will present a slight negative effect at Rahoon Road and Letteragh Road.

Construction works in the area of the N59 Link Road South will present only temporary, slight negative effects on local vehicle, cyclist or pedestrian movement. The Link Road is located on the edge of a rural area, although the area to the east is zoned for residential and there has been recent residential development and applications for further housing and apartment development (see Section 19.8 Cumulative Effects). To the east, along the mainline of the proposed N6 GCRR, only temporary night-time closures of the N59 Moycullen Road are anticipated during which diversions will be provided. During the oral hearing, a particular query was raised in respect of this proposed temporary closure of the N59 and the impact on access for University Hospital Galway critical care service providers living immediately adjacent to the proposed bridge structure. A commitment was added to the Schedule of Commitments to accommodate this family elsewhere during the construction period of this work. The temporary diversion of Coolough Road (Bóthar Nua) will not impact significantly on access or use of the road by vehicles, cyclists or pedestrians. Likewise, a temporary diversion of School Road, Castlegar will not impact significantly on access to Castlegar National School (which includes Beoga pre-school), the nursing home i.e. Caiseal Geal Residential Care Centre or residential properties, as it is a diversion which is immediately off-line of the existing road within the Project. This diversion will also cater for cyclists and pedestrians.

Major construction works will be required in the vicinity of the N84 Headford Road and N83 Tuam Road. Temporary night time closures and diversions may be required on the N84 Headford Road, N83 Tuam Road, Briarhill Business Park Road and R339 Monivea Road and this will present some slight to moderate negative effects on the journey duration for people using the road at this time.

Refer also to Table 19.15 and Table 19.16 which summarises Population effects, mitigation measures and residual effects in relation to journey characteristics during construction.

19.5.3.3 Amenity

General amenity

<u>West of River Corrib</u>

Effects under this criterion have the capacity to impact on the amenity of private residents and on users of community facilities land and assets. In some cases, residential properties will be in close proximity to construction works with consequent implications for noise emissions, air emissions and visual impacts. During the construction phase noise monitoring will be undertaken at the nearest sensitive locations to ensure

construction noise limits are not exceeded. The selection of monitoring locations will be based on the nearest sensitive buildings to the working area as detailed in Chapter 18, Noise and Vibration. Refer to Chapter 18, Noise and Vibration, Chapter 16, Air Quality, and Chapter 12, Landscape and Visual for details on specific respective effects.

For example, at Na Foraí Maola and the Troscaigh Road, there are over 30 properties that are located close to the route of the Project and which could experience noise or air quality effects due to construction works. The same observation applies to the signalised junction with Cappagh Road where a crèche is located and to the vicinity of the proposed Ballymoneen Road Junction where the proposed N6 GCRR will pass immediately to the north of the Maelchnoc residential estate which was constructed after 2018. Measures will be undertaken as part of the Construction and Environmental Management Plan (CEMP) to minimise any adverse effects. The single carriageway scale of the proposed N6 GCRR at these locations means that environmental impacts are moderated. Material excavation, including the likely use of blasting, will be required at Ballard and at Letteragh. There is a cluster of properties in the community of An Chloch Scoilte close to the first of these blasting locations. See also Chapter 18, Noise and Vibration and Chapter 16, Air Quality for more details on construction noise and air impacts. Refer to Chapter 9, Soils and Geology for details on the blasting locations. Refer to Chapter 12, Landscape and Visual for details on visual effects during construction at this location and other locations across the length of the Project.

During the construction of the N59 Link Road North, there is a likelihood of short-term negative effects due to visual intrusion in the vicinity of Barnacranny, including St. James' Church, Bushypark and for visitors to its cemetery (see also Chapter 12, Landscape and Visual and Chapter 18, Noise and Vibration). To the south, works will be of a moderate scale, including for residential areas located beside connecting access roads from the N59 Link Road South. Slight to moderate negative short-term environmental effects on general amenity prior to mitigation would be anticipated, for example where the link road will be constructed along the edge of the Rosán Glas estate in Rahoon, including realignment works at the entrance to the estate, and similarly slight negative effects due to realignment of Gort na Bró Road where this provides access to Gort na Bró estate. By comparison, the N59 Letteragh Junction itself will entail large-scale construction works including the extensive excavation of cuttings. Although in a largely rural area, these excavation works will present short-term negative amenity effects on the nearby small communities at An Chloch Scoilte and Knocknabrona. See also Chapter 18, Noise and Vibration. Similarly, construction works on the N59 Link Road North will entail the excavation of a cutting before its connection with the N59 Moycullen Road. St. James' National School, Bushypark is a sensitive community facility located close to the construction works for the Project, but neither the school nor its playing fields are located within the proposed development boundary. The route of the mainline of the proposed N6 GCRR crosses the N59 Moycullen Road at Ard an Locha and Aughnacurra where negative amenity effects can also be expected. Again, refer to the relevant chapters noted above for specific details on potential air, noise and visual effects at specific locations.

To the east of the N59 Moycullen Road, the design of the proposed N6 GCRR includes a viaduct across the UoG Sporting Campus rather than an embankment and therefore provides for permeability beneath the road development, reducing the potential impacts on the campus. The construction of this viaduct will, however, have a very significant negative short-term effect on local amenity, including the use of playing fields during the pre-mitigation phase. During the construction phase, the central part of the Sporting Campus will become a construction site for a period of approximately 18 months. Access across the construction site will be maintained, but restricted for safety purposes. Construction traffic and works for the River Corrib Bridge will be managed to minimise interference with sporting activities and spectators.

The sporting campus covers a large area and consists of a number of playing pitches for hockey, GAA and rugby, a sports pavilion and a running track, and can be considered an important community facility of moderate sensitivity.

There will be a direct impact on the western part of the sports pavilion, although it will remain operational throughout the construction period. Submissions by Galway City Harriers during the 2020 oral hearing stated that access to the sports pavilion throughout the construction period is essential to retaining athletes, and two commitments are included in the Schedule of Commitments as follows:

> *The modifications to the Sports Pavilion at UoG Sporting Campus will be undertaken as enabling works during the summer period prior to commencement of the construction of the proposed road development.*

Welfare facilities at the Sports Pavilion at UoG Sporting Campus will be maintained throughout the construction works.

There will also be a direct impact on two playing pitches, the large GAA pitch adjacent to the River Corrib and the grass pitch in front of the sports pavilion. As set out in Chapter 5, the Section 51 Application for the proposed N6 GCRR submitted in 2018 included the provision of an all-weather full size GAA pitch and a training pitch at the location of the existing GAA pitches at UoG Sporting Campus due to the loss of the two number grass-based GAA sized playing pitches. However, UoG confirmed at the oral hearing in February 2020 that they did not want the mitigation measures proposed in the 2018 EIAR and subsequently obtained planning permission for replacement pitches. These pitches are at an alternative location on UoG lands in line with their strategy and allows UoG to mitigate the impacts of the proposed N6 GCRR on their sports campus to ensure its continued operation to its requirements and in accordance with its masterplan and strategy. Once these facilities are constructed they will be available for use within approximately one month, and can be operational in advance of commencement of the proposed N6 GCRR.

The viaduct will extend to a bridge crossing of the River Corrib. Access to the bank of the River Corrib, which is used as a local amenity, and to the river itself will be maintained during construction but restricted at times to controlled crossings. Local clubs utilising these facilities such as Galway City Harriers, Parkrun, local schools will continue to have access. Full details are provided in Appendix A.15.1. The elevated works will have a negative effect on amenity (see also Chapter 12, Landscape and Visual, and Chapter 18, Noise and Vibration), although the scale of the construction works on the bridge could also attract other temporary interest from members of the public wishing to view the bridge construction.

East of River Corrib

East of the River Corrib there will be a slight negative short-term amenity effect resulting from the location of a proposed construction compound off Menlough Castle Bóithrín. The proposed N6 GCRR will be elevated on a viaduct structure (Menlough Viaduct) east of the Coolough Road. This will introduce construction noise and visual effects (see Chapter 12, Landscape and Visual, and Chapter 18, Noise and Vibration). The existing An Seanbóthar unsurfaced road provides a loop connection for occasional walking between the communities of Coolagh and Menlough. It will be used by some construction traffic to access the works and this will impact on local amenity use. Upgrading of the bóithrín will be required to allow for this construction traffic and a subsequent connection to an emergency exit road for eastbound traffic entering the proposed tunnel. Given that the lane is currently free of motorised traffic with the exception of farm access, its use for construction traffic will present a moderate negative short-term effect for some local people who use the Bóithrín for amenity.

The Lackagh Tunnel is located away from residential or amenity use. At the N84 Headford Road, a large proportion of the total number of residential properties will be acquired within the vicinity of the proposed N84 Headford Road Junction. Noise effects are likely for adjacent properties which remain. The same observation applies in Castlegar in the vicinity of Hynes Bóithrín and School Road. Castlegar National School and Caiseal Geal Residential Care Centre are located north and south of the proposed N6 GCRR on School Road. Whilst there is no direct impact on Castlegar National School, the sensitivity of the school as a community facility is elevated by it autistic facility which would be sensitive to construction noise which is assessed below in Section 19.5.4. While there is no direct impact to the nursing home either, it is also a highly sensitive community facility given that it accommodates residents requiring personal and palliative care. As such, it will be sensitive to construction noise and air quality effects.

Works on the temporary realignment of School Road, including the foul sewer and gas main diversion, will generate construction noise in the vicinity of both the school and nursing home.

The Caiseal Geal Residential Care Centre made a submission at the oral hearing claiming that they would have to close as a result of the proposed N6 GCRR. The Inspector concluded as follows:

I fully accept that there will be potential serious impacts on the Nursing Home during construction. However, I am satisfied that mitigation measures as outlined and detailed in the EIAR and assessed below in section 11.11 and 11.12 will reduce the impacts to an acceptable level. I have also addressed the home during the operation of the road and I have concluded that there will not be a seriously negative impact.

These mitigation measures are retained in this updated EIAR and are as outlined and detailed in the relevant chapters.

Chapter 12, Landscape and Visual, Chapter 15, Material Assets Non-Agriculture, Chapter 16, Air Quality and Chapter 18, Noise and Vibration provide specific details on air, noise, visual and material asset impacts at specific locations and details of the mitigation proposed to deal with the effects identified.

An impact on general amenity will apply for at least six households at Cappanabornia which are located beside the N83 Tuam Road. This impact arises from the construction of a new access road in the vicinity of the N83 Tuam Junction and the visibility of construction works on the hill facing these properties on eastern side of the N83 Tuam Road, refer to Chapter 12, Landscape and Visual.

A construction works programme has been included in Appendix A.7.4 to Chapter 7 of this updated EIAR as compiled in conjunction with Galway Racecourse for the proposed 230m cut and cover tunnel. The programme will involve the cessation of construction works during the summer/autumn racing schedule to avoid disruption to participants and spectators of the racing events. Refer also to economic effects in Section 19.5.3.5 - Economic below. Given that the temporary stables and permanent stables sequence of construction are not interlinked with the construction sequence of the Galway Racecourse Tunnel, the interaction is less complicated than previously presented in the 2018 EIAR, and there is even less risk to interruption to the racing schedule.

Environmental impacts associated with construction traffic using Racecourse Road during Phase 1, Phase 3 and Phase 4 of the Project have the potential to affect the amenity of office workers and the occupants of the few residential properties on this road. Pedestrian access to Ballybrit Graveyard will be maintained throughout construction. Although new pedestrian access will be provided, continued access to Lisheen (Ballybrit) Graveyard will be maintained throughout construction. The graveyard is of heritage value, but is also in current use. Visits to the graveyard would fall into the sensitive category, but the magnitude of use is very light. Temporary, but slight negative environmental effects on the community facility are likely during construction.

Residential demolitions and acquisitions

From the outset of the design of the proposed N6 GCRR in Phase 2, efforts have been made to avoid property demolitions where possible. However, there would still unfortunately and unavoidably be property demolitions to allow the construction of the proposed N6 GCRR. A total of 44 residential properties will require demolition with an additional 10 residential properties to be fully acquired. This is as presented in the 2018 EIAR with no change to the totals outlined in West of River Corrib and East of River Corrib below.

Submissions and presentations were made at the 2020 oral hearing which outlined the impact on residential amenities as a result of the residential demolitions and acquisitions. The Inspector noted in his report that '*the loss of homes is the most significant negative impact of the project' (extract below):*

> *At the oral hearing many of the individual property owners who will lose their homes spoke at length about the impact this project has had on their lives to date and into the future. Many objectors very clearly articulated how they have been 'living in limbo' since the preferred emerging route was published and how this has impacted on their health and wellbeing and will continue to do so well after a decision on the project is made by the Board.*

The Inspector went on to conclude as follows:

> *I am of the view that the Board must be satisfied that the 'need' for this road and the 'greater good' this road will serve outweighs the impact on the immediately affected residents and the communities. For the residents that will unwillingly lose their homes and their communities, no amount of compensation or mitigation will suffice. However, I am also mindful of the fact that this road is grounded in policy at all levels of the planning hierarchy and is considered necessary to enable Galway to function and continue to grow as a driver of the western region. As stated above, I am satisfied that the need for the road has been established; sufficient examination of alternatives has been carried out; and the number of dwellings to be demolished, albeit high, has been minimised*

Refer to Chapter 15, Material Assets Non-Agriculture for the precise nature of these potential impacts.

The demolition or acquisition of these properties will be a significant negative effect of the proposed N6 GCRR, both for the occupants and at a community level. There is a need to acknowledge this fact. The significant effects of demolition must be considered against the overall positive effects of the Project to the wider population and economy of Galway City which are set out in Chapter 3 of this updated EIAR. It must be acknowledged that there will be a clear and very significant effect on the occupants themselves despite the availability of financial compensation associated with the CPO process, noting also the restricted housing supply in the current housing market, including within the environs of Galway City. The negative effect of their awareness of these potential impacts over many years must also be acknowledged. In addition, where neighbouring or nearby properties remain, there is likely to be a negative effect on the amenity of remaining residents due to the loss of neighbours and, where numerous properties are impacted at the same location, from the loss of some aspects of the community's relationship to place. These effects will be of varying significance depending on the number of local demolitions or acquisitions and the strength of local community ties and the amenity of remaining residents.

West of River Corrib

Five residential properties will be demolished at Na Foraí Maola and two residential properties will be acquired. The geographical boundary of the community is ill-defined and most of these properties are of relatively recent construction. Nevertheless, there are just over 20 residential properties at this location which includes a cul-de-sac off the local road. Consequently, the impact of the loss of five properties is likely to have a significant negative impact for this small community. Two further properties are being acquired in the community of Ballard where residential development stretches along two minor roads to the north.

One residential property will be demolished at Ballyburke, one off the L-1323 Letteragh, and two will be demolished and one acquired at Letteragh. Approaching the N59 Moycullen Road, one property will be acquired and one property demolished at Bushypark beside the N59 Link Road North. Near Dangan, two properties will be demolished and one acquired at Ard na Locha, an estate of four houses and two sites for dwellings, and five properties will be demolished and one acquired in Aughnacurra Crescent, an estate of only 14 residential properties, refer to Chapter 15, Material Assets Non-Agriculture. These estates function as small communities which are separated from other residential development along the N59 Moycullen Road. Given the size, the level of impact will have an effect at a community level. The high proportion of premises impacted presents a very significant negative effect on the amenity of the remaining residents.

East of River Corrib

East of the River Corrib, two properties will be demolished in Menlough. Construction of the proposed N84 Headford Road Junction will require the demolition of 14 residential properties at this location out of a total of 22. The loss of a high proportion of established properties in this area represents a major impact for the occupants of the neighbouring houses that are directly affected. While there have been changes in occupancy in recent years and neighbourhood interaction is deterred by the heavy traffic on the road, the demolitions will nevertheless present a significant negative community effect on remaining occupants. It is possible that some current occupants may return to live in the immediate area or north of the proposed N6 GCRR where there are pockets zoned for residential development, although most land to the north is not currently zoned for this purpose.

To the east, nine residential properties are proposed for either acquisition or demolition in Castlegar, along Hynes Bóithrín (two demolitions) and on School Road (four demolitions and two acquisitions). A strong sense of community exists here, noting also the community focus on the school. While the number of demolitions is fewer than at the N84 Headford Road, a similar scale of negative impact can be expected on both those directly affected and on those who remain.

Three residential properties are due for demolition in Cappananbornia on the east side of the N83 Tuam Road. One further property is proposed for demolition in Ballybrit and two in Briarhill.

Refer also to Table 19.15 and Table 19.16 which summarises Population effects, mitigation measures and residual effects in relation to severance during construction.

19.5.3.4 Community Severance

Physical severance has the capacity to impact on the movement of pedestrians and cyclists and their accessibility to family or work destinations and community facilities. Physical severance due to construction works and traffic will be temporary in duration. There are, however, instances where construction work will introduce a sense of social severance, for example between properties in the west of the study area at Na Foraí Maola and Cappagh, for the duration of the works and between areas north and south of the proposed N6 GCRR even though physical connectivity is maintained. Social severance is likely to be felt most acutely by local residents where family members or friends are located on the far side of the proposed N6 GCRR. However, given that the scale of construction works here will be less than for locations to the east of the River Corrib, the severance impact will be slight negative in degree. The L13215 Ann Gibbons Road will be permanently severed by the Project and this is discussed further under operational impacts in Section 19.5.4.

As discussed in Section 19.5.3.3, while restrictions will apply for reasons of safety, continuous access will be maintained to the Corrib riverbank walk (or temporary diversion of same) and to the current small number of pitches to the north of the proposed River Corrib crossing at the UoG Sporting Campus. The more significant effect will be a temporary impact on the amenity of users rather than any physical severance. More significant construction related social severance will occur in Castlegar where the effect will be of moderate significance despite the maintenance of connectivity.

It is proposed that construction traffic will travel from the Western Distributor Road north along the Cappagh Road to gain site access at this location. Most residential development is to the east of the Cappagh Road and crossing facilities are provided at the Cappagh Park sports complex. Similarly, it is proposed that construction traffic will travel north along the Coolough Road (Bóthar Nua) to gain site access. Construction traffic along the N84 Headford Road south of the proposed junction will present a slight negative severance impact, although new pedestrian crossing facilities are included in the design of the proposed N6 GCRR along the N84 Headford Road.

In Ballybrit, a degree of existing severance for pedestrians is present at the signalised crossings at the R339 Monivea Road and Parkmore Junction and at the R339 junction with the existing N6. The volume of traffic here means that most pedestrian crossings occur at the signalised junctions, but crossing waiting times are extended by this same volume of traffic. Wait times at the signalised crossings will not be impacted further by construction vehicles connected with all phases of the Project, but informal crossings will entail longer wait elsewhere along the R339 for the temporary duration of construction.

During Phases 1, 3 and 4 of the Project during works on the racecourse stables, existing slight community severance will be further negatively impacted along sections of Parkmore Road in the vicinity of residential housing, including near the entrance to Racecourse Avenue. However, this section of Parkmore Road has a footpath on both sides and does not include any community facilities aside from a small supermarket. No impact on Ábalta Special School or a nearby creche to the north on Parkmore Road is anticipated as construction traffic will use the road to the south to connect with the existing N6 to the west also of Briarhill National School on Monivea Road.

19.5.3.5 Economic

Construction works along the corridor will have potential impacts on land zoned for enterprise, industrial or related uses. The construction will also generate demand for inputs and services. CSO data (2020) indicates a gross construction multiplier of 1.59.

As this value encompasses all forms of construction including house building, an equivalent figure for infrastructure works could be somewhat lower given the more intensive use of machinery and import content associated with a transport development. On the other hand, the bulky nature of many construction inputs should ensure that much of the income is retained within the State. Many of these inputs will be purchased across Ireland and will therefore contribute to the national economy, although some purchases, of services in particular, will likely to be made from the local businesses providing an economic benefit to these and to local employment.

Through the construction phase there will be some variation in the numbers of staff working on site as set out in Chapter 7 of this updated EIAR. It is anticipated there will be 250-270 staff directly employed on site, rising to 300 staff at peak construction during Phase 2 of the Project. Staff numbers on site during Phases 1, 3 and 4 vary from 10 in Phase 4 to 50 people in Phases 1 and 3. This level of employment will provide a

positive economic impact to the local economy in terms of spending on food and accommodation, although a proportion of workers are likely to already reside in Galway. The employment multiplier implies the creation of one additional full-time equivalent jobs for every two people employed full-time on the project.

West of River Corrib

Impacts on the UoG Sporting Campus are as described above under Section 19.5.3.3 – Amenity. The sports pitches and the sports pavilion are located in an area zoned for Community, Cultural and Institutional use, but the construction can also be expected to have a slight socio-economic impact due to loss of income from use by non-university clubs during the construction period.

East of River Corrib

A very significant impact is anticipated on a business located on the N84 Headford Road which bottles water and distributes fruit and vegetables. The impact arises from the effect of landtake on one warehouse and an impact on the company's raw material supply.

The Project will cross Lackagh Quarry which is currently inactive. Whilst the quarry is currently inactive there are rock reserves in the upper bench of the quarry. Refer to Chapter 9, Soils and Geology for details on potential impacts on future quarry reserves.

Where the proposed N6 GCRR crosses the N83 Tuam Road it enters into an area zoned for Enterprise, Light Industry and Commercial followed by areas zoned for Enterprise, Industry and Related Uses. The alignment of the proposed N6 GCRR between here and the eastern end of the Galway Racecourse Tunnel requires the permanent acquisition of a builders providers store on the Tuam Road and the permanent demolition of a timber and builders supplier on Racecourse Avenue in Ballybrit to permit tunnel works to proceed. Galway County Council has entered into binding agreements for the purchase of this property at Racecourse Avenue with the owners and lessees of this property. Further, Galway Race Committee Trust obtained planning permission from Galway City Council (application 24/60279), to construct the permanent stables in the same location as presented in the 2018 EIAR, post completion of Phase 2 of the Project which is at the builders providers at Racecourse Avenue as well as for the temporary stables and other works at Galway Racecourse. In addition, there will be partial land acquisitions from commercial premises along with portions of industrial zoned lands elsewhere on Racecourse.

Businesses accessible from the N83, including a car dealership and the An Post sorting centre, will be affected by the need for traffic management during construction. The extensive nature of the works associated with the N83 Tuam Road Junction is likely to have a temporary negative impact on the visibility for customers of the car dealership (refer Property 668), although this can be mitigated with temporary signage. There is also potential for environmental impacts on businesses adjacent to the racecourse in the Parkmore Business Park, some of which are engaged in activities that are potentially sensitive to vibration and air quality such as technological companies involved in delicate operations, companies involved in food distribution or other small businesses such as cafes. Some of these businesses have begun operating from structures which were partially built as of 2018. A few residential properties are also located beside the eastern end of Racecourse Avenue. It is intended that this road be used only by construction vehicles delivering materials and not for the removal of soil and rock excavated from the tunnel. Consequently, the effects of construction traffic will be temporary and of slight to moderate significance. See Chapter 16, Air Quality and Chapter 18, Noise and Vibration. Refer also to commitment no. 17.20 for specific commitment with respect to these sensitive receptors.

The proposed Galway Racecourse Tunnel will entail the acquisition of lands and the demolition of the existing racecourse stables at Galway Racecourse. It is proposed that the stables will be replaced with temporary stables prior to the commencement of the construction of the proposed tunnel as per Phase 1 described above and more particularly in Chapter 5 of this updated EIAR. As mentioned above, a separate planning application and associated EIAR was submitted for the temporary stables and replacement permanent stables. It is proposed that both temporary and permanent stables will be of at least equivalent quality to the existing stables, but given the more stringent design standards and regulations in animal welfare the proposed stables present an improvement on facilities for the racecourse. Wells used for watering of the track will also be impacted but replacement wells will be constructed in Phase 1 in advance of impacting the existing wells. Works on the tunnel itself will be timed for periods outside of the racing calendar so as to avoid amenity and economic impacts on the functioning of the racecourse. See Chapter 16,

Air Quality, Chapter 18, Noise and Vibration and Chapter 15, Material Assets Non-Agriculture for further detail on these impacts and how they will be mitigated and minimised so as not to interfere significantly with business activities.

Approaching the existing Lynch Junction at Briarhill, the construction phase will have an impact on a car dealership located on the edge of the Briarhill Business Park. This will involve landtake mainly from an area that is currently used for customer parking. There will also be a need to reconfigure existing services such as the car wash, fuel pump and underground fuel tanks, parts store and waste facilities and to mitigate impacts during construction. In principle, these measures can be undertaken within the residual lands.

The modification to the Parkmore Link Road as presented at the commencement of the 2020 oral hearing avoids any severance of the Boston Scientific Campus or impact on the implementation of their masterplan. A net positive economic impact can be expected due to the direct transport link that will be provided between the Parkmore and Ballybrit Business Parks, and between the N83 Tuam Road and the proposed N6 GCRR, together with the provision of a footpath, cycle lane and public transport route.

19.5.3.6 Tourism

The construction phase will not have a significant impact on tourism as the construction works are, for the most part, located away from areas visited by tourists. The alignment of the proposed N6 GCRR means that evidence of construction works will be largely outside of the city centre and would not, for the most part, be visible to tourist traffic. Tie-ins with the existing N6 will not impact significantly on traffic flow and the attraction of the city for tourism. Traffic diversions on the N59 Moycullen Road, N84 Headford Road or N83 Tuam Road are only proposed to occur at night and as such should not affect tourist traffic. The main potential issue would be racing events at the Galway Racecourse, but as noted above, construction of the cut-and-cover tunnel will proceed intermittently over a three year period to avoid disruption of racing events, see Appendix A.7.4 for details of the construction sequence of this tunnel. New improved stables will be provided in the context of the Project, although are subject to separate planning application. These stables will contribute to the international reputation of the racecourse as a tourism destination. Other tourist destinations include the River Corrib corridor and the UoG Sporting Campus. In this respect, construction of the River Corrib Bridge will have a slight temporary negative amenity impact due to works affecting the impact on the natural setting.

Refer also to Table 19.15 and Table 19.16 which summarise Population effects, mitigation measures and residual effects in relation to economic activity during construction.

19.5.3.7 Ecosystem Services

Ecosystem services provide many varied benefits that humans freely gain from the natural environment. A properly functioning ecosystem has the capacity to regulate and support the natural environment that contributes to human well-being under the categories below (having regard to the Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (2013)):

- provisioning services e.g. wild foods, crops, forage and fresh water
- regulating services e.g. filtration of pollutants by wetlands, climate regulation through carbon storage, water cycling, pollination and protection from erosion
- cultural services e.g. recreation, spiritual and aesthetic values, education
- supporting services e.g. soil formation, photosynthesis and nutrient cycling

The environmental assessment of the Project has considered potential impacts on ecosystem services through the assessment of the environmental factors (pathways) through which these could be affected such as water, soils, air, noise and general amenity and relied on the assessment detailed in Chapter 8, Biodiversity in terms of potential impacts to biodiversity and indirectly to ecosystem services. As per the 2018 EIAR, there are no impacts identified in those assessments which would result in a significant residual impact on ecosystem services during the construction of the Project.

19.5.3.8 Summary

In summary, there is no change to the assessment of the Do-Something construction impacts since 2018 and the construction phase will have mostly slight negative impacts on journey characteristics due to local traffic diversions. More major works will be necessary for the N84 Headford Road and N83 Tuam Road, but any diversions are proposed to occur at night when traffic levels are lowest. There will be visual, air quality and noise impacts on properties closest to the works which are addressed in Chapter 12, Landscape and Visual, Chapter 16, Air Quality and Chapter 18, Noise and Vibration, but the principal impact relates the residential demolitions and acquisitions required at various locations within the study area (ref Chapter 15, Material Assets Non-Agriculture). In three cases, the demolitions represent a high proportion of the total number of properties at a specific location. While subject to financial compensation as part of the compulsory purchase process, this negative impact will be realised most notably by the occupants, but significant impacts can also be expected at the community level addressed in this chapter due to impacts on local identity and community interactions. Very significant construction impacts still apply to the UoG Sporting Campus, albeit that they have the capacity to have replacement pitches in place prior to commencement of the proposed N6 GCRR. These significant construction impacts will be addressed through mitigation measures during the construction phase and further mitigation measures to maintain the integrity of the complex in the following operational phase (see Section 19.6 below for the proposed mitigation measures).

19.5.4 'Do-Something' Potential Operational Impacts – Population

19.5.4.1 Overview

Once operational, the proposed N6 GCRR will attract traffic from the city centre and this in itself will provide for improved journey times and journey amenity along existing roads. The transfer of traffic will also facilitate the reallocation of road space to public transport and the provision of new walking and cycling facilities in the city. The proposed N6 GCRR itself also includes extensive new pedestrian and cycle facilities where it interacts with local roads, and along the N59 Link Road. As a result, there will be positive effects on general and journey amenity and the health of the local population. The proposed N6 GCRR will facilitate vehicle crossings of the River Corrib without having to negotiate the city centre and will provide essential links with city arteries to better distribute traffic. This new River Corrib crossing will also provide connectivity back to the city on both the east and west side of the river. There will be positive effects for Galway City's economy due to improved accessibility and connectivity for commerce, goods movement, tourism and commuting, including through the option to use active travel. There will also be positive effects for areas in the west of the county, including the Galway Gaeltacht, for which there will be improved connectivity to the east of Ireland and further potential for economic growth and tourism.

The provision of temporary and permanent stables ensures that the Galway Racecourse can continue to operate during and post the completion of the proposed N6 GCRR. This is a positive benefit as Galway Racecourse is of key importance to the economy of Galway City, local tourism and cultural experience of Galway.

The operational phase of the Project will introduce some negative impacts too, for example noise and visual intrusion along the proposed N6 GCRR alignment, to areas that are currently quiet and semi-rural. It will also introduce an element of social severance between people living north and south of the proposed N6 GCRR, who, in principle, will remain part of the same wider community. Physical severance will, though, be minimal due to the presence of overbridges and signalised crossing facilities with local roads and the transference to single lane traffic west of the Ballymoneen Road.

19.5.4.2 Journey characteristics

The proposed N6 GCRR will improve connectivity for Galway City and its environs and also areas in the west of Galway County, including access to the N59 Moycullen Road (for Moycullen, Oughterard and Clifden) and the R366 Coast Road (for Rossaveal and Connemara). Connectivity will be improved with the M6 east of Galway, the M17, the N83 Tuam Road, N84 Headford Road and N59 Moycullen Road. The transfer of a proportion of traffic to the proposed N6 GCRR will help to relieve the level of traffic currently experienced on the existing N6. It will also provide opportunities for new facilities for new active travel facilities for pedestrians and cyclists as detailed in the Galway Transport Strategy (GTS). Pedestrian and cycle facilities have been included in the design of the Project. These include bus lanes on sections of the N83 Tuam Road, footpaths along the N59 Link Road and footpaths and cycleways along the Parkmore Link

Road. As well as providing benefits in terms of accessibility, health and amenity, the Project is a key component of the GTS through which any modal transfer from private vehicle to active travel will have a positive effect from a climate perspective. Refer to Figures 5.

Refer also to Table 19.15 and Table 19.16 which summarise Population effects, mitigation measures and residual effects in relation to journey characteristics during operation.

West of River Corrib

As the proposed N6 GCRR commences to the west of Bearna, it is expected to have a significant positive effect by attracting much of the current vehicle traffic flow away from the village of Bearna and the western suburbs of Galway City. This will be particularly significant during the morning and evening peak periods when congestion can occur from the 'Twelve Pins' junction in Bearna all the way into the city or due to vehicles accessing shops in the centre of the village. A reduction in traffic and a significant positive effect is anticipated in the village as a reduced level of traffic is predicted to remain on this section of the existing R336, see Chapter 6, Traffic Assessment and Route Cross-Section. The Settlement Plan of the Galway County Development Plan 2022-2028 proposes a traffic management plan for Bearna and supports the completion of an inner relief road such that some of this positive effect could be expected to occur in the future even in a 'Do-Minimum' scenario. While a relief road on its own would involve through traffic being directed through built-up parts of Bearna, the proposed N6 GCRR has the benefit of moving this traffic out of Bearna altogether, making for a much improved environment for pedestrians and cyclists and for business and social activity in the village, with potential benefits too from an air quality perspective.

The Bearna East Roundabout will facilitate access to the proposed N6 GCRR for the numerous residential households in the vicinity and to community facilities to the north of Bearna including the Bearna GAA Club and the Barna Golf and Country Club. This improved connectivity represents a net moderate positive effect, although some local residents could experience slight delays in accessing community facilities due to the longer journey needed to cross the proposed N6 GCRR where currently there is direct access via a single local road. The Bearna East Roundabout will also provide a link to the N59 Moycullen Road although the narrow width of parts of the connecting L1321 means that most drivers wishing to make this connection are more likely to use the N59 Letteragh Junction. A footpath is proposed to link each arm of the proposed roundabout.

A signalised junction (Cappagh Road Junction) will provide access from the proposed N6 GCRR to the communities of Cappagh and Boleybeg to the north and to the Western Distributor Road and wider Knocknacarra area to the south. A lot of single residential development has occurred in the 1990s and 2000s in the area to the north of this proposed junction, whereas compact denser residential developments have been constructed to the south of this proposed junction around Cappagh Park since the publication of the 2018 EIAR. This junction, along with others in this section, will provide a net moderate positive effect in terms of improved local connectivity and vehicle journey amenity while also reducing vehicle pressure on unsuitable minor roads which are used for walking, jogging and cycling. Pedestrian footpaths are proposed for each junction and crossings will be facilitated by the signalisation. These interventions will improve journey amenity for all road users, including pedestrians and cyclists, and contribute to the positive long term effect of traffic reductions in Bearna. The Cappagh Road Junction also provides connectivity to a crèche which is located to the north of the proposed N6 GCRR. A proposed footpath from the junction will provide a link to nearby residential properties to the south.

Overall, the traffic projections indicate that there is likely to be a modest transfer of traffic from the Western Distributor Road to the proposed N6 GCRR. The Ballymoneen Road Junction will have a moderate positive effect by providing connectivity to Ballyburke and the Western Distributor Road. The connection north to Rahoon Road via Ballymoneen Road is narrow so most other traffic is expected to use the proposed N59 Link Road South from Letteragh Junction.

The proposed N59 Letteragh Junction itself will be a grade separated junction connecting the proposed N6 GCRR with link roads to Rahoon Road and the N59 Moycullen Road and will provide a very significant positive improvement in connectivity between the western suburbs of Galway and regional destinations. The N59 Link Road South will also provide a connection with the Letteragh Road and thereby also with the dispersed residential communities of Drum and Tonabrocky. As with the above connections to local communities, this will provide for positive effects on connectivity and journey amenity given the narrow and sub-standard design characteristics of some local roads. The proposed N59 Link Road South will distribute

traffic from the proposed N6 GCRR within the suburban area via its connections with several existing local roads to connect with residential areas, retail parks and community facilities. This will provide a degree of relief from traffic pressure in an area which is currently subject to regular congestion.

The connection provided in the other direction by the N59 Link Road North will relieve the congestion currently experienced by traffic attempting to access the N59 Moycullen Road from the city, including tourist and other traffic heading towards Clifden. Compared with a 'Do-Nothing' scenario, relief from congestion would apply especially at the Browne Roundabout given that right hand turns are prohibited from the preceding junction between the existing N6 and Newcastle Road Upper. The connection would provide a very significant positive effect for journey characteristics. Based on traffic predictions, it would reduce slightly the volume of vehicles on the N59 Moycullen Road into Galway City including Circular Road, Thomas Hynes Road and Newcastle Road Upper where educational and other community facilities are located.

Connectivity for pedestrians and cyclists is provided by active travel facilities included in the design of the Project. Crossing facilities for pedestrians are proposed for the junctions at Bearna East, Cappagh and Ballymoneen. A pedestrian footpath is included along the N59 Link Road North and South and a pedestrian crossing sequence will be included in the signalised junction proposed where the N59 Link Road North meets the N59 Moycullen Road. The Link Road North and South will also include public lighting and pedestrian refuge islands at junctions.

Cyclists will be encouraged to use the shorter existing urban routes which in most cases will provide more appropriate connections between origins and destinations. Traffic will have been reduced on many of these roads as a consequence of the proposed N6 GCRR. However, a short stretch of cycleway will be included on the N59 Link Road just before and between the junctions with access ramps with the proposed N6 GCRR. A cycle path is also included along the N59 Link Road South below the junction with Letteragh Road. Refer to Figures 5.3.01 to 5.3.21.

East of River Corrib

The N84 Headford Road Junction will permit vehicles using the proposed N6 GCRR to access Ballindooley, Ballinfoyle, Headford, Ballinrobe and other communities such as Cong to the north of Galway City. As with the N59 Letteragh Junction, it will also permit direct access to the proposed N6 GCRR without the need to enter Galway City. As such, the junction will provide for a significant positive effect on journey time and amenity to regional locations. The improved connection will also provide people living in Ballinrobe with the option of using the proposed N6 GCRR for journeys to Dublin and the east as an alternative to the N5 or the lower capacity R661 and N60 roads through Claremorris.

The new accessibility provided by N83 Tuam Road Junction and the Parkmore Link Road to the City North, City East and Parkmore Business Parks in Ballybrit represents a profoundly positive effect on journey characteristics and for the city's economy given the number of companies located here (see Section 19.5.4.5 below). The Parkmore and City North Business Park Link Roads will provide accessibility to the Parkmore Industrial Estate to the north and to the Ballybrit and City East Business Parks and Morris Junction to the south. The improved accessibility will significantly reduce peak time congestion at the junction between Ballybrit Crescent, the R339 Monivea Road and the existing N6 at the Lynch Junction. The same observation applies at the Morris Junction with the existing N6.

On-road cyclepaths and footpaths are proposed for the Parkmore Link Road and the City North Business Park Link Road. These facilities for active travel, together with the connections to Ballybrit, will greatly enhance options to access local business parks and other destinations, including for prospective employees whilst also contributing a positive effect from an air quality perspective. Lands to the south are zoned for new development and will also benefit from the improved accessibility for all road users. The connectivity provided by the Coolagh Junction represents no change with the existing baseline situation, but the transfer of much traffic to the proposed N6 GCRR will relieve traffic pressure relative to the existing junction and reduce delays at the existing Lynch Junction.

19.5.4.3 Amenity

Journey amenity

The combination of new connectivity and transference of traffic provided by the proposed N6 GCRR and discussed under journey characteristics will have the effect of reducing journey duration in many cases, but also of relieving congestion along the existing N6.

Refer also to Table 19.15 and Table 19.16 which summarise Population effects, mitigation measures and residual effects in relation to amenity during operation.

West of River Corrib

A slight negative effect will arise from the increase in traffic predicted to occur along the R336 between the centre of Bearna Village and the Bearna West Roundabout on the Project, although there are no community facilities on this stretch of road.

The transfer of traffic to the proposed N6 GCRR will reduce the level of traffic currently using the local road network elsewhere to the north of Bearna and linking onto the Rahoon Road and Letteragh Road to avoid the congestion on the R336 and the Western Distributor Road. Although footpaths are not currently available on most of the local minor road network, grass verges are proposed to accompany any new road alignments in the Project and will provide for good visibility space. Furthermore, there will be significantly less traffic rat running on the local road network to the north of Bearna once the proposed N6 GCRR is in place and this will have a positive effect on local pedestrian and cycle journeys including amenity use.

In the city, the transfer of traffic to the proposed N6 GCRR will result in significant traffic reductions in the Opening Year of 2031 and the Design Year of 2046 compared with the Do-Minimum, including on the R336 Bearna Road (up to -53%) by 2046) and the R338 (-30%) Seamus Quirke Road together with the prospect of congestion on these roads and at the Browne Junction, providing at least a moderate positive effect. This will also provide a significant positive effect for pedestrians and cyclists and present an opportunity to provide continuous urban cycle lane facilities and more pedestrian and cycling crossing facilities in line with the GTS with a lesser risk of such facilities adding to congestion as might occur with the current level of traffic (see Section 19.8 Cumulative Effects). The contribution to a modal shift from private vehicles will be a positive benefit from a climate perspective.

East of River Corrib

The proposed N6 GCRR will reduce traffic on the existing N6 western approach to the Kirwan signalised junction, also reducing the prospect of congestion at this location. This will provide a slight to moderate positive journey amenity effect, although higher traffic volumes (47% by 2046) are predicted for the N84 Headford Road south of Ballindooly. Elsewhere, the more general reduction in traffic volumes will present an opportunity to provide improved cycle lane and pedestrian facilities in line with the GTS and the Climate Action Plan (CAP 24).

The transfer of traffic to the proposed N6 GCRR will reduce the level of traffic currently using the local road network between the N84 Headford Road and the N83 Tuam Road, along School Road, Castlegar, to avoid the congestion on the existing N6. Given the access to the city provided by the proposed N6 GCRR, traffic volumes at the junction between the N83 Tuam Road and the existing N6 are predicted to be slightly lower (-12%) by the Design Year (2046). Consequently, there is a slight improvement in journey amenity for drivers wishing to use the existing junction between School Road or Bothar an Chóiste to Castlegar and the N83 Tuam Road, although peak time use by commuters of this minor road will be reduced by the availability of the proposed N6GCRR itself and by reduced traffic on the existing N6 west of the N83 Tuam Road Junction. A 20% reduction in AADT is predicted on the existing N6 in Ballybrit in the Design Year compared with the 'Do-Minimum' scenario, along with reduced traffic at the Lynch Junction and Ballybrit Crescent Junction in Briarhill, and at the junction between the existing N6 and the R446 at Doughiska. At all these locations, there will be at moderate-significant positive effect on journey amenity. There will also be opportunities to provide improved facilities for the safety and journey amenity of pedestrians and cyclists.

For users of the proposed N6 GCRR itself, the journey amenity of drivers and passengers using the River Corrib Bridge will be enhanced by the view north and south along the river, including of the ruins of Menlo Castle. This represents a slight positive effect on journey amenity, but one realised by the large number of people using the bridge including tourists travelling west to Connemara.

General amenity

West of the Corrib

Traffic volumes on the section of the proposed N6 GCRR to the north of Bearna are expected to be over 10,000 AADT towards the western terminus of the proposed N6 GCRR by the Design Year of 2046 compared with over 46,000 AADT at Parkmore in the east, but will vary seasonally given summer tourism traffic. General amenity effects relating to environment impacts such as visual intrusion and noise are likely where residential properties are located close to the Project, for example at the Cappagh Road Junction where private properties are located to the immediate north and south. These impacts are addressed in Chapter 12, Landscape and Visual and Chapter 18, Noise and Vibration. A large increase of 92% in traffic volumes will occur on the Cappagh Road albeit from a low baseline level. This will affect the amenity of a small number of properties to the south towards the suburban residential area where the road is necessarily wider. A large increase in traffic volumes is also predicted for the Ballymoneen Road, north and south of the proposed junction.

No significant amenity effect at a community level is presented by the proposed N59 Link Road North and South from the proposed N59 Letteragh Junction. On the southern link, traffic is distributed onto several minor roads and the road itself is largely separated from residential development. The northern link connects with the N59 Moycullen Road immediately to the north of Bushypark Church.

St. James' School in Bushypark is located a short distance to the south of the proposed N6 GCRR. The school is a sensitive community facility that is located within 100m of the alignment. There will be a slight residual negative general amenity impact on use of the playing ground due to the traffic noise, although this will be mitigated by screening. The remaining houses in the estates at Ard na Locha and Aughnacurra will incur a negative amenity effect due to the proximity of the proposed N6 GCRR, see Chapter 18, Noise and Vibration.

There is a negative general amenity operational effect to the east of the N59 Moycullen Road where the proposed N6 GCRR will be elevated above the UoG Sporting Campus on a viaduct prior to the crossing of the River Corrib. The provision of a viaduct structure will provide access to the north and south of the Sporting Campus and the River Corrib during the operational phase, maintaining connectivity and permeability beneath the road development. New proposals put forward by the UoG as part of their masterplan for the site for two replacement pitches will maintain the capacity and attraction of the Sports Campus which is an improvement on the situation in respect of UoG Sporting Campus since 2018.

Other sporting and community groups use the UoG Sporting Campus, with the latest addition being the Parkrun every Saturday morning around the tracks and trails to the south of existing GAA pitches and south of the proposed N6 GCRR. Many written and oral submission were made on the 2018 application highlighting the importance of the amenity for a variety of groups. The connection to the N59 via the N59 Link Road will have a positive effect on access to both the playing fields and university.

The Inspector's Report concluded as follows:

> *As noted elsewhere NUIG decided to pursue their own development of replacement pitches. During construction noise and visual impacts, loss of use of pitches and modification to the sports pavilion will occur. Mitigation measures are detailed in the CEMP including managing construction traffic, providing welfare facilities for the sports clubs and maintaining access at all times. During operation and following the completion of these works, as well as the right of way and access to lands under the viaduct, I am satisfied that the impact on the facilities will be reduced somewhat, but there will continue to be a long-term moderate impact on the sports campus.*

East of River Corrib

From an amenity perspective there is a negative effect due to the overhead traffic on the River Corrib bridge on visitors to Menlo Castle on the east bank of the river. The aforementioned positive effect on journey amenity for drivers on the road development where it crosses the river must also be acknowledged in this context.

The increase in traffic noted previously to the south of the N84 Headford Road junction will have a moderate negative amenity effect, noting also the presence of two sensitive community facilities on this road, namely Saint Francis National School and Ballinfoyle Church. Both schools are set back from the N84 Headford Road and pedestrian crossings are provided.

Whilst there is no direct impact on Castlegar National School, the school does have an autistic facility which would be sensitive to traffic noise, see (Chapter 18, Noise and Vibration and Section 19.5.5 below). There is no direct impact to Caiseal Geal Residential Care Centre on School Road during operation, but the facility would also be sensitive to traffic noise. The proposed N6 GCRR will have a positive long-term effect by reducing traffic volumes on School Road, Castlegar, in front of the school and the nursing home. Any reduction in traffic at this location will have a significant positive effect by encouraging active travel, including potentially by school children. School Road along with Bóthar an Chóiste, is currently used by morning and evening commuters as a rat-run (see Section 19.5.4.4 below). Spellman's Boithrín is currently unsurfaced and in poor condition, but forms part of a circular walk that is used daily for access to the school. The nearby Hynes' Boithrín will be severed, but mainly provides only farm access to fields. Alternative access will be provided from School Road, Castlegar to these farm lands. (see Chapter 14, Material Assets Agriculture).

At the Parkmore Link Road, east of the N83 Tuam Road, a crossing point is included in the design to allow for an historic mass path connecting Castlegar and the small community of Parkmore and a historic graveyard to a mass rock beside Galway Racecourse (see Chapter 13, Cultural Heritage). Only light use is made of the path, but it is well maintained by the local community. There will be a significant negative residual effect on amenity use of the path compared with the existing environment due to the extensive new road network.

The proposed location of the Galway Racecourse Tunnel means that there will be no direct amenity impacts on the racecourse racing events during operation. New permanent access will be available to the N83 Tuam Road via the Parkmore Link Road and much improved access will be possible from the existing N6 such that the net effect will be positive.

19.5.4.4 Community severance

Distinct physical severance is presented by two permanent road closures proposed along the length of the Project. The first of these is at the northern end of Anne Gibbons Road in the western section of the study area. For most local residents, the severance effect is only slight, especially as pedestrian use of the road is very light, but occupants of properties closest to the proposed N6 GCRR would entail a diversion to the south before returning north on the Bearna to Moycullen Road. Hynes Boithrín will also be severed, but currently provides access solely to fields and very slight amenity use.

West of River Corrib

The Project will result in a projected reduction in traffic volumes in the east of Bearna Village by over 52% in the Design Year (2046) when compared with the 'Do-Minimum' Scenario. This will have a significant positive long-term effect in terms of relief from severance especially away from crossing facilities during peak periods. This significant positive effect applies especially to access to community facilities. For example, a positive effect will apply to the Church of Mary Immaculate and to Bearna Primary School, both sensitive community facilities on the R336 to the east of the village. Although there are tentative plans for the school to transfer to a new location at some time in the future, most parents must currently drop off their children at the roadside.

To the north, there will be a negative long-term effect on neighbourhood or social severance as the proposed N6 GCRR runs between residences at Na Foraí Maola. A similar effect can be anticipated on the Troscaigh Road where there is another cluster of residential properties. A degree of physical severance will arise from the additional distance required to reach the proposed overbridge at Ch. 1+375 from either location, particularly for local residents walking to nearby friends or family. However, the new connectivity provided between the two settlements also provides for relief from severance as currently there is no physical connection between the two communities. A significant negative effect will arise from the severance of Ann Gibbon's Road. This will require residents at the northern end of the road to access locations to the north by detouring 800 metres south to the junction with the Bearna Moycullen Road. Most traffic on this road heads

south into Bearna Village, but some of residents also travel north to enter the city via Paddy's Cross and Rahoon Road.

Elsewhere in this area, to mitigate physical severance, crossing facilities for pedestrians have been included in the design of the proposed N6 GCRR where junctions exist. There will be a residual level of new social severance for scattered communities and housing to the north of the proposed N6 GCRR as many people express a sense of attachment to Bearna Village.

At Cappagh Road there are properties on either side of the proposed junction, but physical severance will be slight as crossing facilities are available. However, traffic volumes are expected to increase to the south of the junction, meaning that traffic accessing to pitches located to the west of the Cappagh will be combined with traffic leaving the proposed N6 GCRR. However, the existing on-road cycle tracks on the Western Distributor Road are due to be converted to segregated cycle tracks by Galway City Council which will improve access to the Cappagh Park complex for cyclists.

The N59 South Link Road will connect to the Western Distributor Road via Millers Lane in Gort na Bró Road. As a result, there will be additional traffic on this road, but this represents only a slight new severance effect on the Gaelscoil Mhic Amhlaigh and Millers Lane soccer pitches, both of which are already well-serviced with pedestrian crossing facilities. A cycle path will be provided between the pedestrian crossing and Rahoon Road continuing north along the Link Road to Letteragh Road. Considerable new residential development is also proposed for this location. The N59 Link Road North will provide for connectivity with the N59 Moycullen Road just north of St. James' Church in Bushypark. Most access to the church is by car and traffic volumes are only predicted to increase slightly, although a footpath does run along the western side of the N59 Moycullen Road and signalised crossing facilities are proposed for the junction between the N59 Link Road North and the N59 Moycullen Road.

The elevation of the proposed N6 GCRR above playing fields at the UoG Sporting Campus provides no direct physical severance impact, but rather an effect on amenity. Traffic volumes are predicted to reduce slightly by the Design Year compared with a 'Do-Nothing' scenario on Thomas Hynes Road and Newcastle Road, but no significant change in existing severance is anticipated.

East of River Corrib

The proposed N6 GCRR will introduce a degree of social severance between the small historic community of Coolagh and Menlough to the north. To the east, at the N84 Headford Road Junction, there will be moderate new physical and social severance due to the presence of the junction. Physical severance along the N83 is already high due to current traffic volumes, although any new severance is minimised by the inclusion of signalised crossings at the slip roads to the road development. Some new severance can be expected on the Headford Road south due to the increased traffic volumes that are predicted into the city.

No significant severance will be experienced in Castlegar, including for students at Castlegar National School, local residents or for visitors to the nursing home, Caiseal Geal Residential Care Centre. Commuting traffic using School Road as a 'rat run' is expected to be reduced due to the availability of the proposed N6 GCRR. To the east at the proposed N83 Tuam Road Junction there is social severance between a line of private properties in Two-Mile-Ditch on the road to the north of the junction and the community of Castlegar. Current pedestrian journey amenity is poor in this area and will be slightly improved by the inclusion of a footpath in the design. Any severance of the Lisheen (fort) at Parkmore east of Galway Racecourse during the construction phase will be mitigated in the operational phase by the new access road and parking provided to the south of the proposed N6 GCRR.

Refer also to Table 19.15 and Table 19.16 which summarises Population effects, mitigation measures and residual effects in relation to severance during operation.

19.5.4.5 Economic

The proposed N6 GCRR will deliver a profoundly positive effect for the Galway economy due to improved accessibility and connectivity for commerce, goods movement and commuters. There will also be positive effects for communities in the west of the county for whom there will be improved connectivity to the east of Country Galway. There will be improved accessibility for very many businesses, but also direct and indirect negative effects on others due to the route of the proposed N6 GCRR.

West of River Corrib

Some loss of passing trade can be expected for a few businesses in Bearna and on the R336, including a small service station due to the transfer of traffic from the R336 to the proposed N6 GCRR. As local traffic is expected to remain on the existing road these impacts will be slight.

The N59 Link Road North and South will provide much improved access for both customers and deliveries to the Gateway Retail Park and to business parks located off the N59 Moycullen Road and Newcastle Road Upper. An area to the north of the Gateway Retail Park is zoned for Enterprise, Industry and Related Uses. Some of the congestion in the vicinity of Browne Roundabout and along Seamus Quirke Road will be relieved benefitting retail and other businesses in these locations. This improved access represents a significant positive effect.

East of River Corrib

Lackagh Quarry is no longer an active quarry. However, there are quarry reserves in the upper benches, some of which will be sterilised as a result of the Project (refer also to Chapter 9, Soils and Geology). On the east side of the N84 Headford Road, improved new access will be provided to one commercial business property, although construction works will impact on part of the business' raw material source (see Section 19.5.3.5). This impact will be addressed as part of the land acquisition process and financial compensation.

At the N83 Tuam Road, whilst the proposed N6 GCRR will present some temporary visibility impacts on a car dealership during construction (see Section 19.5.3.5), it will be provided with improved and safer access to the business from the City North Business Park Link in the operational phase. The proximity of the business to the proposed N6 GCRR will also be a positive factor for familiarity and accessibility. The improved access to the An Post sorting centre located here represents a significant positive effect for this business. The area is zoned for Enterprise, Light Industry and Commercial use.

The proposed Parkmore Link Road will provide new access between the proposed N6 GCRR and N83, and also onwards to the existing N6 at the Morris Junction. The area around and to the west of the Galway Racecourse is zoned for Enterprise, Industry and Related Uses, but currently the only access to the numerous business parks is from the existing N6 and as a result there is major congestion occurring on a daily basis, particularly during peak hour traffic. Consequently, the new link road will provide a profoundly positive economic effect by facilitating connectivity and accessibility for deliveries to numerous businesses and for employees. This link road will also facilitate the provision of the walking, cycling and bus routes as set out in the GTS for the Ballybrit, City East and Parkmore Industrial estates, with the added health benefits of being able to walk or cycle to work.

As noted in Chapter 5, the southern portion of the Parkmore Link Road was originally routed along an existing IDA road passing through the expanded Boston Scientific campus in the Section 51 Application for the proposed N6 GCRR submitted in 2018. Galway County Council took cognisance of the masterplan for the expanded Boston Scientific campus and sought a modification to the route for the section of the Parkmore Link Road within the Boston Scientific lands at the commencement of the oral hearing in 2020. This new route served the transport functionality of the original proposal at this location and achieved the objectives of the original alignment Since 2018, Boston Scientific have renovated and expanded the campus significantly without the risk of future severance caused by the Parkmore Link Road. Instead the Parkmore Link Road will traverse around the perimeter of the campus and will have a net positive effect by providing a direct transport link, which will be well serviced by public transport between the Parkmore and Ballybrit Business Parks, the N83 Tuam Road, the existing N6 and the proposed N6 GCRR.

The proposed N6 GCRR will pass beneath the Galway Racecourse in a dedicated tunnel. Some modest net loss of car parking is likely, but new permanent stables and facilities will replace those demolished during construction. These stables and facilities will be of an equal or higher standard to the existing buildings. Event day access is already available to the N83 Tuam Road, but this access will be much improved due to the Parkmore Link Road. When all measures are realised, a net positive economic effect is anticipated.

By improving access between the existing N6 and the business parks in this area, the Project will reduce congestion at Ballybrit Crescent Junction and Lynch Junction and this will have a positive effect on access to businesses at this location. This improved accessibility will apply also to a car dealership on the edge of Briarhill Business Park, although this may be accompanied by some loss of customer parking space and the

presence of an elevated section of the proposed N6 GCRR which will affect visibility from Ballybrit Crescent. The dealership's visibility to the east will be reduced, but it will remain very visible from the existing N6 and highly visible from the proposed N6 GCRR. A positive impact will derive from the effect of reduced congestion at the Ballybrit Crescent Junction.

19.5.4.6 Tourism

Once operational the proposed N6 GCRR will provide for improved connectivity between the important tourism destinations of Connemara and West County Galway and points of arrival to the east. This will help to sustain tourist numbers which contribute to the economic development in a peripheral economic region. The proposed N6 GCRR will enter an attractive rocky area west of the River Corrib that is typical of Connemara. This landscape represents a gateway to the West. Visitors will quickly experience this setting following the elevated vista of the river. At present, this landscape is only encountered west of Bearna. Overall, the Project's contribution to tourism represents a very significant positive effect.

A significant positive effect also arises from the reduction in congestion along the existing N6 and other roads into Galway City due to the transfer of a proportion of traffic to the proposed N6 GCRR. This will also contribute to making the city more accessible, encouraging visitors to County Galway and the West to travel into the centre of the city to see attractions with less anxiety over traffic conditions. Combined with the potential for the reallocation of road space to pedestrians and cyclists as proposed by the GTS, this will contribute positively to the tourism experience in Galway. A positive introduction to Galway will also be provided by the new crossing of the River Corrib which will enhance journey amenity and could encourage people to visit this part of the city's fringe. Improved access to the Galway Racecourse, including from the north, could also help to stimulate event attendance.

19.5.4.7 Ecosystem Services

There are no impacts identified which would result in a significant residual effect on ecosystem services during the operation of the Project.

19.5.4.8 Summary

The operational phase will provide for significant, and in some cases very significant or profound, positive effects on journey duration, connectivity and journey amenity affecting journeys for all purposes and benefitting people living in the city or in its outskirts, businesses and visitors or tourist traffic. Particular positive effects apply to the new connectivity between the existing N6 and N83 Tuam Road, improved connectivity for people living in rural areas in the west of the study area, and to reduced congestion along urban parts of the existing N6. The improved connectivity to West County Galway will stimulate economic development in this region, strengthening the integrity of the Galway Gaeltacht and the Irish language. The transfer of a proportion of through traffic will benefit people living in the vicinity of the existing N6 and provide an opportunity to improve additional public transport and facilities for pedestrians and cyclists under the Galway Transport Strategy. There are some negative effects in terms of social severance (but less so physical severance) and the general amenity of people living in rural areas near the proposed N6 GCRR to which they might have been attracted by the prevailing peacefulness of the surroundings. There will be a very significant negative short-term effect on the UoG Sporting Campus as a result of the proposed N6 GCRR. Overall, the net effect of Population aspects relating to Human Beings is assessed to be a distinct positive effect.

19.5.5 Irish Language - Potential Construction and Operational Impacts

There is a low-level of daily Irish usage among the population of the area directly affected by the Project, and where it exists, the use of Irish is particularly concentrated in an education context. While population is increasing; the use of Irish-language is not growing in parallel. The Project will not have any significant impact on the use of Irish into the future. However, it is noted that an improved transport network would facilitate further migration and economic growth into the wider Galway Gaeltacht and as the west of County Galway have higher levels of unemployment and deprivation than the areas around Galway City, the proposed N6 GCRR, by improving access to employment opportunities to the east of the city, will facilitate Irish speakers to commute more easily from their own communities and lessen the need to re-locate for economic reasons. Equally the proposed N6 GCRR will make Gaeltacht areas to the west of Galway City more attractive for residential and commercial development as a result of a greatly improved road network.

In this context, it will be the responsibility of Galway County Council, Galway City Council and Údarás na Gaeltachta among others to ensure that the use of the Irish language is promoted and encouraged among new residents.

The Strategic Plan 2021-2025 for the Gaeltacht published by An tÚdarás na Gaeltachta in June 2021 aims to cultivate vibrant Gaeltacht communities where Irish is the primary language of communication. A key objective is to establish the Gaeltacht as a hub of entrepreneurship, attracting and nurturing businesses in the region. The Strategic Plan sets out an ambitious theme-based approach, *Enable, Strengthen, Sustain* as follows:

- Empower communities to engage in entrepreneurship and development (Enable)
- Build on what has been achieved so far (Strengthen)
- Ensure that all actions support the sustainability of Gaeltacht communities and the Gaeltacht itself (Sustain)

In the course of consultation undertaken for this assessment, Údarás na Gaeltachta have indicated that they are in favour of the development of the N6 Galway City Ring Road (GCRR) around Galway City as it will "give more efficient access to the Gaeltacht area and the Connemara area west of the city". Údarás na Gaeltachta[19] stated that the new road would have a "very beneficial impact effect" on attracting new industries to the Gaeltacht and Connemara area, encouraging existing business to expand and would support existing businesses to have a more efficient access to their markets and personnel. Overall, it is considered that the Project will have a positive impact on the economic and social viability of the entire Gaeltacht area. Údarás na Gaeltachta reaffirmed their support for the proposed N6 GCRR in 2025[20].

In conclusion, the Project will have a *Moderate Positive Impact* on the status of Irish as a community language within the Galway Gaeltacht area.

19.5.6 Human Health - Potential Construction and Operational Impacts

This section addresses health impacts under three main headings as per the methodology discussed in Section 19.2.5 for Health Protection, Health Improvements and Improving Services.

19.5.6.1 Health Protection

Health protection covers the health effects of the proposed development arising from noise, vibration, air quality, water, landscape and visual, soil contamination and psychological issues. These are all discussed further below.

Noise

It is noted that despite the extents of the Project and the overall construction period, the potential noise impact on any individual receptor during construction will be limited as the activity in any one location will be limited in scale and time. Thus, the potential for human health effects will be similarly limited.

The potential noise impacts are assessed in Chapter 18, Noise and Vibration in accordance with the relevant TII Guidelines. The results of the baseline noise monitoring and potential impacts which are described in full in Chapter 18, Noise and Vibration have been compared against the relevant noise guidelines to determine if any human health effect is likely.

The potential health effects of noise can include

- Noise-Induced Hearing Impairment
- Interference with Speech Communication

[19] Correspondence from Tadhg Ó Conghaile, Stiúrthóir Forbatha Réúigiunach Pobail & Pleanála Teanga, Údarás na Gaeltachta, dated 21 December 2017 in Appendix A.19.4

[20] Correspondence from Údarás na Gaeltachta, dated 18 March 2025 in Appendix A.19.4

- Disturbance at schools
- Sleep Disturbance
- Hypertension and Cardiovascular Disease

Any effects demonstrated are more likely at higher noise levels. Many effects are only demonstrated with ambient noise in excess of 70dB. The results of the noise assessment detailed in Chapter 18, Noise and Vibration indicate that there is no receptor which will receive this volume of noise for any sustained period therefore health effects of noise from the Project will not be significant.

This is discussed further below.

Construction Phase

The noise assessment detailed in Chapter 18, Noise and Vibration identified that during the construction phase of the Project there is potential for some temporary negative, slight to very significant, impacts on nearby residential and business properties due to noise emissions from certain construction activities. The application of binding noise limits and hours of operation, along with implementation of appropriate noise control measures, will ensure that potential noise impacts are kept to a minimum. As detailed in Chapter 18, Noise and Vibration the construction contract documents will clearly specify the construction noise criteria which the construction works must operate within which align with the Schedule of Commitments included in the CEMP in Appendix A.7.5. The Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of *BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Noise* and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001 (as amended) and the TII (NRA) *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes* 2014. There will be significant noise impacts in areas within 55m of blasting during construction, but as these construction works are temporary and short in nature, no adverse health effects are predicted during construction.

During the oral hearing, concerns were raised in relation to the nursing home on School Road. However, the assessment is that at all times the relevant HIQA standards will be met and there are no concerns in this regard. The Inspector's report concluded as follows:

> *While I consider the construction phase mitigation and monitoring proposals to be generally acceptable, having regard to the particular potential vulnerability of the residents of Castlegar Nursing Home and the proximity of the construction site, I consider it appropriate that a specific dust monitoring location be installed at or adjacent to this receptor for the duration of the construction phase. Should any issues with regard to dust emissions be identified, then in accordance with the CEMP, any identified issues can be addressed through additional mitigation or changes to work practices.*

The updated Schedule of Environmental Commitments in Chapter 23 of this updated EIAR includes the provision of a specific dust monitoring location at this location for the duration of the construction phase.

Operational Phase

The noise assessment for the operational phase of the Project indicates that without mitigation measures the potential noise levels at a number of receptors exceeded the specified noise mitigation criteria and necessary mitigation measures have been specified. Once such measures are implemented, it was shown that the vast majority of locations comply with the adopted criterion. For those areas which do not meet the design goal, the predicted noise level for the operational phase is within 3dB of the design goal or less than the predicted noise level in the Do-Minimum scenario.

Many properties along the existing roads that currently experience high levels of traffic will experience a notable reduction in noise levels depending on the distance from the road, traffic volume changes and speed reductions.

Baseline noise levels are important to consider when assessing human health impacts. Human perceptions of sound intensity are such that changes of less than 3dB are usually not perceived. If noise levels do not increase by at least 3dB there will be no adverse outcome over than experienced prior to the change. In this

regard a threshold of 3dB is appropriate to identify a change in noise levels which can be reliably perceived by humans.

As mentioned earlier the WHO night time noise guidelines are for communities rather than individual residences and in addition it is important to remember that the levels are not thresholds. Nevertheless, individuals will always be concerned with the potential effects on them and therefore, it is useful to use these levels in attempting to attribute significance to changes in noise levels.

The significance of human health impacts as per the criteria referred to above in Table 19.7 are as follows:

- If the L_{night} immediately outside a residence is below 55dB the Human Health impact is Imperceptible
- If the existing L_{night} immediately outside a residence is below 55dB and it increases by more than 3dB but remains below 60dB the Human Health impact is Slight Negative
- If the existing L_{night} immediately outside a residence is below 55dB and it increases by more than 3dB and to a level above 60dB the Human Health impact is Moderately Negative
- As mentioned above the proposed N6 GCRR, by diverting traffic away from heavily populated areas overall has benefits in terms of community night-time noise. Therefore, the overall health effect would be positive. However, this is of little comfort to individuals who actually experience an increase in noise and the potential noise impacts on individual properties have been assessed and mitigation measures proposed in Chapter 18, Noise and Vibration.

<u>Site Specific Operational Noise Impacts</u>

Ch. 0+000 to 2+800 (R336 to Bearna East Roundabout)

The vast majority of receptors are below 55dB L_{den} in this area. Between the R336 and the Bearna East Roundabout there are predicted increases of 1dB over the 'Do-Minimum' scenario at levels of 55dB L_{den} at one location. It is predicted that there will be an increase of 3dB of at one location. There will be an increase of 4dB at two locations. At no location is the predicted noise levels to exceed 60dB L_{den} therefore, the predicted impact is imperceptible to slight negative within this section.

Ch. 2+800 to 7+600 (Bearna East Roundabout to N59 Letteragh Junction)

The majority of receptors are below 55dB L_{den} in this area. However, the predicted noise level for a number of properties will increase, for eleven properties the noise levels will increase above 55dB L_{den} or more but remain below 60dB L_{den}. Noise levels will increase above 60dB L_{den} for five properties, however at these locations the existing noise levels at these locations is above 55dB L_{den}. One of these locations is set to be acquired as part of the Project and at one location the predicted Do-Something is 1dB lower than the predicted Do-Minimum. Therefore, impacts on human health impacts are predicted to range from slight to moderate negative.

Ch. 7+600 to 9+300 (N59 Letteragh Junction to River Corrib Bridge)

The vast majority of receptors are below 55dB L_{den} in this area. There are eighteen locations that the current noise levels are below 55dB L_{den} and will increase by 3dB but remain below 60dB L_{den}. There are two locations where the existing noise levels are below 55dB L_{den} and will increase above 60dB L_{den}. At both locations, substantially mitigation is in place and the maximum predicted noise levels will be 62dB L_{den}.

Therefore, impacts in this section range from negative slight to negative moderate. *Ch. 9+300 to 12+100 (River Corrib Bridge to N84 Headford Road Junction)*

The vast majority of receptors are below 55dB L_{den} in this area. There are seven locations where the noise levels will increase from below 55dB L_{den} by 3 dB but remain below 60dB $L_{den.}$ There are five locations that will increase above 60dB $L_{den,}$ however at three of these locations the predicted Do-minimum will be in excess of 60dB $L_{den,}$ and at one location the predicted Do-minimum will be the same as the Do-Something. The maximum predicted noise levels in this section is 64dB $L_{den,}$ however, this is in line with the do-minimum scenario.

Therefore, impacts on human health impacts are predicted to range from slight to moderate negative.

Ch. 12+100 to 14+000 (N84 Headford Rd Junction to N83 Tuam Road Junction)

The vast majority of receptors are below 55dB $L_{den.}$ At fourteen locations the predicted noise levels will increase from below 55dB L_{den} by 3dB but remain below 60dB L_{den}. At six locations the predicted noise levels will increase above 60dB L_{den}, however at these locations the existing noise levels are in excess of 55dB L_{den}. At one location, the predicted noise levels will increase from below 55dB to a maximum of 62dB L_{den}. This property is to be acquired as part of the Project, so no negative impacts are predicted.

Therefore, impacts on human health impacts are predicted to range from slight to moderate negative. Castlegar National School and the associated Beoga Pre-school are not identified as having any significant negative impact. This is of particular significance given the specific facilities at Castlegar School for children suffering from Autistic Spectrum Disorder.

Ch. 14+000 to 17+500 (N83 Tuam Road Junction to Coolagh Junction)

The vast majority of receptors are below 55dB L_{Night} in this area. There are five locations predicted to increase by 3dB from below 55dB L_{den} in the Do-minimum to Do-Something, however these locations will not exceed 60dB L_{den}. Therefore, impacts on human health impacts are predicted to range from slight negative.

The Galway Clinic does go above 55dB L_{Night} but as mentioned the change is only 3dB. This is less than the more than 3dB threshold mentioned above so the impact on the Galway Clinic is assessed as Imperceptible. Therefore, no negative human health impacts are predicted.

Overall using the criteria for the significance of human health impact detailed in Table 19.7 the impact rating in relation to noise is slight and no negative human health impacts are predicted.

Vibration

The potential vibration impacts as a result of the Project both during construction and operation have been assessed in Chapter 18, Noise and Vibration. Overall the predicted impact from vibration is very low and characterised as not significant. While there may be some degree of local vibration transmitted during some aspects of construction, such as blasting or drilling, these will typically be of short duration and very localised and occur only during construction hours. Given the short duration it will not have any negative health impacts.

The potential vibration impact during the operational phase as detailed assessed in Chapter 18, Noise and Vibration is predicted as being not significant. Therefore there will be no negative health impacts.

Using the criteria for the significance of human health impact detailed in Table 19.7 above the potential impact caused by vibration is assessed as Imperceptible.

Air Quality

Provided the air quality standards are not exceeded one can be confident that there will be no adverse effect on human health due to air emissions. This is discussed further below.

As is detailed in Chapter 16, Air Quality, sensitive receptors namely humans and ecological receptors have been identified in the study area for the Project and dusts that are likely to be generated during the construction phase are normally heavier and larger particles. As these are heavier, they tend to fall rapidly to the ground and have a very limited level outside the actual construction site. There are potential occupational health issues for the works which would require for example the use of respiratory protection equipment in certain phases. However, as also pointed out in Chapter 16, Air Quality, in the event of such large dust leaving the site, by nature of its' relatively large size, that is greater than 10 microns, it is not respirable and will not have significant human health effects.

It is also noted that despite the extents of the Project, the potential air quality impact on any individual receptor will be limited as the activity in any one location will be limited in scale and time. Thus, the potential for human health effect will be similarly limited.

The potential air quality impacts are assessed in Chapter 16, Air Quality in accordance with the relevant TII Guidelines. The results of the baseline air quality monitoring and potential impacts which are described in full in Chapter 16, Air Quality have been compared against the air quality standards both during the construction and operational phases to determine if any health effect is likely.

Following the implementation of monitoring and mitigation the Project is predicted to have a negative, slight impact and short-term on air quality, as defined in Chapter 16, Air Quality[21], in proximity to the works during the construction phase and as such an imperceptible impact on human health. All air quality levels will comply with air quality standards for human protection and as such there will be an imperceptible impact on human health.

Water

As is identified in Chapter 10, Hydrogeology and Chapter 11, Hydrology no negative impact from either surface water, or groundwater is anticipated. In this regard human health effects will not occur.

The hydrogeology assessment concluded that given the mitigation proposed there is a slight residual impact from the Project with respect to groundwater quality as a resource. In terms of the quantity of groundwater available within the aquifer (the yield of the resource) there will be an imperceptible effect at the regional scale. It did state that some individual wells will be affected in terms of flow or water quality, however there will be no impact in potable water quality as alternative supplies will be utilised if necessary. At all times water quality standards will be observed to ensure public health.

In addition, the River Corrib is the main source of water for the city of Galway. Abstraction of the water is located 1.7km downstream from the proposed River Corrib Bridge and therefore at risk to pollution from the Project, particularly during the construction phase. Stringent mitigation and control of potential polluting activities associated with construction activities will be implemented which will significantly reduce the risk of impact.

The operational phase also presents a pollution risk to this supply both from accidental spillages and from routine road run-off discharges. Design pollution control measures have been put in place to reduce the risk.

Given that all residual water supplies will comply with water quality standards the potential impacts on human health are assessed as Imperceptible.

In addition, in the broader context, the flood risk assessment has demonstrated that there is no significant flooding impact arising from the proposed development and hence no potential impact on human health.

Water quality

As detailed in Chapter 10, Hydrogeology and Chapter 11, Hydrology, there has been considerable attention given to ensuring that there will be no adverse effect on water quality. Where necessary mitigation measures are put in place to ensure continued supply of high quality and safe drinking water. The vast majority of residences in the area receive their water by mains which will continue to be monitored in the normal way.

No adverse effect on water quality is predicted and therefore there will be no health effect.

Flooding

The design of the construction and operational phase of the Project has considered the risk of flooding at every step. This applies particularly of course to the area in the immediate vicinity of the River Corrib. The design of the construction of the River Corrib Bridge and ancillary works will ensure that there is no increased risk of flooding and indeed flood protection measures have been included and therefore there will be no health effect.

[21] Where the impact magnitude of the changes in concertation of PM_{10} is imperceptible, then the impact description is negligible

Landscape and Visual

The impacts have been extensively assessed in Chapter 12 of this updated EIAR. This concluded that:

> *In landscape and visual terms, proposed mitigation measures will have limited effect during the construction stage, and relate more to the orderly development, protection of landscape on and external to the land take and to minimisation of visual disruption and impact, where possible. For this reason, it is considered that the potential negative landscape and visual impacts, as outlined in Chapter 12 of this updated EIAR, will continue to arise, even with mitigation, during the temporary and short-term construction phase of the Project.*

Given that these effects are temporary the impact on human health and particularly psychological health is considered imperceptible and temporary.

In the operational phase the impact is assessed in Chapter 12 that in the initial operational stage of the Project it will give rise to a range of significant, very significant and profound landscape and visual impacts, at least until such stage as the extensive landscape mitigation proposals establish and become effective. With the development of mitigation planting, the significance and severity of landscape and visual impacts will gradually abate.

Even with the development of mitigation planting, negative visual impact will continue to arise for residential and other properties located close to or adjoining the boundary of the Project and where the proposed N6 GCRR including the major River Corrib Bridge, crosses sensitive landscape areas.

Therefore, the impact on health and in particular psychological health associated with landscape change is assessed as slight negative and long term. In reality, people tend to get accustomed to the new visual landscape. The impacts therefore are not assessed as significant.

Soils

<u>Soil Contamination</u>

As detailed in Chapter 9, Soils and Geology there are no known areas of contaminated lands crossed by the Project. While it is not anticipated that any of the construction or operational works would lead to soil contamination the contractor will be obliged to monitor the construction at all stages. In the event that any source of contamination is identified, in excavation or other means, this would have to be addressed at that time in consultation with statutory bodies such as the EPA. This will ensure that even in the unlikely event a source of contamination is discovered that appropriate mitigation measures will be put in place to ensure no adverse effect on human health.

<u>Radon</u>

The area of Galway which the Project traverses is in a high radon area. It is only when radon builds up in buildings that are inhabited by human beings that the health risk occurs. During construction, there will be excavations and tunnelling activities. This will have the potential to cause some release of radon. However, this will almost instantaneously be dissipated and will be harmless.

Radon escape from rock will take the path of least resistance. Radon is escaping all the time but when it escapes to the open air there are no health effects.

The excavation and tunnelling activities will, if it has any effect at all on radon, and it is most likely that it will have none, actually divert radon away from residences rather than towards them as the radon may find an easier route to surface via the excavations rather than its current route. That is people which may be at risk because they live and work in a high radon area, will be not be at a higher risk because of the proposed construction or indeed operation of the Project.

The potential human health impact of the construction and operational phases of the Project with regards to radon are assessed as imperceptible.

Psychological

As set out in Chapter 15, Material Assets Non-Agriculture, the proposed N6 GCRR has been designed to avoid as many properties as possible but given the built environment and the linear development of the city with housing along every road radiating out of the city its construction will unfortunately and unavoidably result in a number of property acquisitions or demolitions. The provision of temporary and permanent stables for the continued operation of Galway Racecourse are on lands owned by Galway Race Committee Trust or on lands for which Galway County Council have entered into binding contracts to purchase and so do not contribute to this number.

Numerous alternatives have been considered for the transport solution as detailed in Chapter 4, Alternatives Considered, however the conclusion of the consideration of the alternatives is that the proposed N6 GCRR represents the optimum transport solution and has avoided the greatest number of known and immovable constraints and is the option that overall has the least environmental impact taking all other potential environmental impacts into account. The people living in these homes have genuine concerns that their lives will be adversely affected. Many have lived in the area many years or indeed all of their lives. In the event of an approval of the Protected Road Scheme and Motorway Scheme and approval under Section 51 of the Roads Act 1993 (as amended), by An Bord Pleanála and subject to the availability of funding, Notice to Treat will be served firstly on owners, lessees and occupiers of the dwelling houses and commercial properties to be acquired, within six months of the scheme becoming operative, unless an application has been made for Judicial Review, in which case the Notice to Treat[22] will be served in accordance with the provisions of Section 217 (6A) of the Planning and Development Act 2000 as inserted by the Compulsory Purchase Orders (Extension of Time Limits) Act 2010. Compensation will be agreed or determined by the property arbitrator as soon as possible after service of Notice to Treat. After compensation has been agreed or determined and satisfactory title has been produced, part payment can be made while the claimant remains for an agreed period in the property to be acquired. This will facilitate the claimant in removing uncertainty and will facilitate arrangements being made, as early as possible, to secure a replacement property.

The community will also experience annoyance from the temporary impacts of traffic management and other effects during the construction phase. As against this there is the potential reduction in annoyance amongst road users in the operational phase where there are reduced journey times.

Whilst individual annoyance cannot be discounted, annoyance in itself is not a health effect. There is no evidence that there are any significant effects on human health from simply transient levels of annoyance. In these circumstances the negative impacts are assessed at Slight. In addition, while there may be positive impacts of reduced annoyance for those not stuck in traffic there is little evidence of positive impacts on human health and the positive impact is assessed also as Slight.

It is worth noting that the proposed N6 GCRR will remove a lot of congestion from the city centre and the potential for conflict between vehicular traffic and pedestrians and cyclists, thereby reducing the potential number of collisions and possible fatalities. Not only would the avoidance of fatalities and serious injuries have a very significant positive impact on an individual basis, any such injury or fatality would have a huge adverse impact on the individual's family, friends and colleagues such as that there can be a wider impact on the psychological health of the community.

The Do-Minimum scenario has potential for adverse psychological impacts. Progressively longer journey times and uncertainty will be associated with increased annoyance at least and at worst impact on psychological health.

As detailed in Section 19.5.3 and 19.5.4 the proposed N6 GCRR will cause a degree of physical and social severance. Where severance does occur there is potential for psychological impact. Loneliness can occur if someone feels cut off for example. As against this there may be positive psychological effects where improved connectivity permits greater ease of movement around the city. This would potentially facilitate closer connections with friends or relatives which might be deterred if journeys were perceived to be lengthy or difficult.

[22] This notice requests landowners to submit their claim for compensation for lands being taken under the Protected Road Scheme or Motorway Scheme. This is the initial step in the acquisition of property and lands

Overall, therefore, the assessment of the psychological impact on a population of community basis will be overall positive. However, one cannot escape the fact that certain individuals particularly those whose homes are to be compulsory acquired will not experience the community benefit.

19.5.6.2 Health Improvement

As detailed in Section 19.5.3 and 19.5.4, the Project has the potential to bring with it, significant socio-economic benefits for the Population. It will facilitate transport of goods and people in a timely, reliable and efficient manner. The full economic benefit will be realised once the Project is completed. Accessibility to businesses and community facilities in Galway City and its environs and the Business Parks in Parkmore and Ballybrit will be better facilitated by the proposed N6 GCRR and the resulting reduction in congestion. It will also bring with it benefits to business and public facilities in Galway City centre by reducing noise and air pollution. This all translates into an increased potential for economic prosperity for the Western Region, with Galway City as a thriving city at the core, which in turn will play a part in strengthening the Irish economy.

Whilst the benefits are applicable to Galway City and County, it may be particularly felt in the West of Galway. As was identified earlier in this chapter, the deprivation map detailed in the HSE Health Profile for County Galway identifies many of the most deprived areas of Galway County as being to the west of the city in Connemara. These areas are amongst those most likely to get a socio-economic benefit from the Project. As set out in Section 19.2.5 an improvement in socio-economic circumstances can contribute to improving the health and wellbeing of socio-economically deprived communities. It therefore follows that the socio-economic benefits of the Project felt by the Population will also contribute to health benefits.

The provision of an additional crossing of the River Corrib will facilitate the reduction of congestion on city centre roads, and allow the reallocation of road space in the city network to non-motorised modes of transport, thereby facilitating the effective implementation of all the elements contained in the Galway Transport Strategy, namely the improvement of public transport, cycling and walking measures and provides the opportunity for health improvements.

As detailed in Chapter 3 of this updated EIAR, the proposed N6 GCRR will enable the reallocation of existing road space within the city to public transport and smart mobility measures and as such facilitate the full implementation of the GTS. It will facilitate a more efficient public transport system and provide for of a multi-modal choice of travel including walking and cycling. Analysis of the traffic model shows an increase in cycling with the full implementation of the GTS with a small decrease in walking largely due to people switching from walking to cycling or public transport, however, there will be an overall benefit in terms of opportunities to exercise and the associated health benefits. The increased opportunities to exercise due to an environment more amenable to walking and cycling, will also facilitate the social interaction among neighbours which may currently be inhibited by excessive traffic, all of which provide significant opportunities for health improvement.

Increased opportunities for exercise also has the potential to bring benefits in terms of human health. Exercise is a well-recognised method of reducing risk in terms of obesity, diabetes, hypertension, cardiovascular disease and osteoporosis amongst other conditions. There are also significant psychological benefits and studies have consistently shown self-reported well-being is significantly higher in those who frequently exercise.

One of the project objectives as set out in Chapter 3 of this updated EIAR GCRR is safety. The Project is designed to optimal safety levels, both the proposed N6 GCRR and the stables. It is well established that roads which are designed to safe standards are associated with reduced accident levels. The proposed N6 GCRR also has the added benefit of moving the traffic away from pedestrian traffic reducing the opportunities for pedestrian injury or death. It introduces opportunities for safer travel for cyclists with the introduction of cycle measures included in the GTS.

The proposed N6 GCRR would further improve access to health care through enhanced public and private transport connectivity, and may facilitate faster and safer emergency response through improved road capacity and resilience. Ambulances being able to get to an emergency situation in minutes as opposed to being delayed in heavy traffic has obvious benefits for health and could potentially be lifesaving. The study

by Lyon et Al[23], reinforces this point by showing that there is an improved survival rate with out-of-hospital cardiac arrests with more rapid response times from the emergency services. This improvement is equally important in relation to the heading below under improving services.

19.5.6.3 Improvement of Access to Services

For vehicle drivers the ability to access services will be improved by the proposed N6 GCRR. The diversion of traffic away from busy city centre streets will mean that people will be able to access shops, restaurants, cinemas and other services easier with less delays.

Similarly, for people needing to cross the city centre to access services, they will be facilitated by the proposed N6 GCRR. This will be particularly so for those living on the west of the River Corrib. There will also be a more efficient and reliable connectivity to the national road network. This is particularly important in an Irish context as many major health services are situated in Dublin for example, the new National Children's Hospital.

There is also the potential for the proposed N6 GCRR to improve access to services for non-motorised transport users to reach key services. As previously mentioned the diversion of traffic away from the city centre will facilitate public transport both in the form of buses and taxis. Reduction in traffic will also facilitate cycling and pedestrian access to services particularly around currently heavily used city streets.

It is clear therefore that with regards to access to services the proposed N6 GCRR impact is overwhelmingly positive. That being said, certain individuals albeit very few, who are living or accessing areas in the immediate vicinity of the proposed N6 GCRR, would for reasons of severance or road closures have to detour somewhat from their current routes. Once they do access the transport links, however, they too will benefit from improved access to services.

19.5.6.4 Summary

In summary, health protection covers the health effects of the proposed Project arising from noise, vibration, air emissions, water and soil contamination and psychological issues. The risk assessment of climate change vulnerability concluded that there would not be a significant effect in EIA terms should a rare flood event occur or should an extreme heat event occur and it was not assessed further for potential impacts on human health. Furthermore the risk of flooding is dealt with under the pathway of water in the health assessment above.

The results of the baseline noise monitoring and potential impacts set out in Chapter 18, Noise and Vibration have been assessed and no significant negative human health impacts are predicted as a result of noise emissions. The predicted impact from vibration is very low and characterised as not significant. Therefore, the potential impact caused by vibration is assessed as Imperceptible.

The Project is predicted to have a slight negative impact on air quality across the study area during the construction phases and as such an imperceptible impact on human health. Whilst some areas of the study area will experience a neutral impact on air quality during the operational phase all air quality levels will remain well within air quality standards and as such there will be an imperceptible impact on human health.

Given that all residual water supplies will comply with water quality standards the potential impacts on human health are assessed as Imperceptible. No adverse effect on water quality is predicted and therefore there will be no health effect. In addition, in the broader context, the flood risk assessment has demonstrated that there is no significant flooding impact arising from the Project and hence no potential impact on human health. There are no predicted impacts on human health as a result of soil contamination or radon.

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[23] Lyon RM, Cobbe SM, Bradley JM, *et al*

Appendix ASurviving out of hospital cardiac arrest at home: a postcode lottery?

Appendix B*Emergency Medicine Journal* 2004;**21:**619-624

The people living in homes to be acquired or demolished for the construction of the proposed N6 GCRR have genuine concerns that their lives will be adversely affected. Many have lived in the area many years or indeed all of their lives.

The proposed N6 GCRR will remove a lot of congestion from the city centre and the potential for conflict between vehicular traffic and pedestrians and cyclists, thereby reducing the potential number of collisions and possible fatalities. The proposed N6 GCRR will cause a degree of physical and social severance. Where severance does occur there is potential for psychological impact. Loneliness can occur if someone feels cut off for example. As against this there may be positive psychological effects where improved connectivity permits greater ease of movement around the city. This would potentially facilitate closer connections with friends or relatives which might be deterred if journeys were perceived to be lengthy or difficult.

Overall, therefore, the assessment of the psychological impact on a population of community basis will be overall positive. However, one cannot escape the fact that certain individuals particularly those whose homes are to be compulsory acquired may not experience the community benefit.

The potential impacts of the proposed N6 GCRR in the operational phase will be largely positive with significant opportunities for health improvements. These include, but are not limited, to improved access to services including emergency services, the potential for socio-economic development with the associated health improvements. The provision of an additional crossing of the River Corrib will facilitate the reduction of congestion on city centre roads, and allow the reallocation of road space in the city network to non-motorised modes of transport, thereby facilitating the effective implementation of all the elements contained in the Galway Transport Strategy, namely the improvement of public transport, cycling and walking measures and provides the opportunity for health improvements with the increased opportunities for exercise. The proposed N6 GCRR would further improve access to health care through enhanced public and private transport connectivity, and may facilitate faster and safer emergency response through improved road capacity and resilience.

19.6 Mitigation Measures

19.6.1 Population

Specific proposed mitigation measures for potential Population impacts are listed in Table 19.15 and Table 19.16, many of which have been included in the design of the Project, both the design of the proposed N6 GCRR and the stables. These include the provision of crossing facilities at the Foraí Maola Road, Troscaigh Road, Bearna to Moycullen Road L1321, Cappagh Road and Ballymoneen Road junctions to facilitate pedestrian and/or cyclist crossings of the road development. Pedestrian crossing facilities are also proposed at the terminus of the N59 Link Road North Junction at the N59 Moycullen Road (Bushypark Junction) and at the slip road connections with the N84 Headford Road Junction. Cycle lanes are proposed to facilitate access to the Miller's Lane pitches and Gort na Bró and at the N84 Headford Road Junction. Some commitments were given during the 2020 oral hearing and there are included below and identified with an **asterix**.

The following specific mitigation measures are proposed to improve journey amenity, amenity and minimise severance:

- Provide pedestrian crossing facilities at junctions with minor roads serving local rural communities
- Provide temporary visual screening from construction works at St. James' Church Cemetery in Bushypark and at St. James' School, Bushypark
- Galway County Council will pay for similar alternative accommodation for the family involved in healthcare (Ard na Locha) to be rehoused during the duration of the 9 months earthworks period at the N59*
- The existing decorative historic gates at the entrance to the Aughnacurra Estate will be removed, stored and erected at the front entrance upon completion, noting that they currently do not close and that they will not close and span the new entrance width*

- Provide pedestrian crossing facility at Bushypark Junction with N59 Link Road North during construction and operation
- A 2m cycle track will be provided from Gort na Bró Roundabout to Gael Scoil Mhic Amhlaigh on both sides*
- A two-way cycle track will be provided from Gael Scoil Mhic Amhlaigh to Rahoon Road on the eastern verge of Gort Na Bró Road*
- Avoid any prolonged severance and minimise duration of use by construction traffic of An Seanbóthar
- Provide for alternative access along the bank of the River Corrib, along with prior advice for walkers, if access restrictions apply due to construction of the overhead bridge crossing. Safe access across the construction site within UoG Sporting Campus will be maintained for the duration of the construction contract*
- The modifications to the Sports Pavilion at UoG Sporting Campus will be undertaken as enabling works during the summer period prior to commencement of the construction of the proposed N6 GCRR*
- Welfare facilities at the Sports Pavilion at UoG Sporting Campus will be maintained throughout the construction works*
- To ensure interconnection for UoG post completion of the construction, GCC will be providing a right of way for UoG to use the lands under the proposed viaduct for sporting/athletic purposes by way of a long lease*
- Phase construction works to minimise impacts on racing events at Galway Racecourse
- Signage will be erected at property 668 during construction to ensure that the entrance location is prominent and easily identifiable. *
- The existing signage at property 668 on the N83 Tuam Road will be removed, stored and erected at the property upon completion*
- Provide pedestrian crossing facilities at N84 Headford Road Junction during construction and operation
- Provide a footpath within the proposed development boundary along School Road, Castlegar
- Provide directional signage for a Briarhill Business Park, including a car dealership located here during both the construction
- Provide directional signage for access to car dealership and An Post sorting centre on N83 during construction.
- Take measures to ensure that cul-de-sacs or adjacent lands are not used for illegal parking in the operational phase
- A pedestrian crossing will be installed at the entrance to Lackagh Quarry prior to the commencement of construction works to maintain the greenway. This pedestrian crossing will be maintained by the contractor for the duration of the works. There will be a speed restriction of 15km/h on the access road into the site compound at Lackagh Quarry for the duration of the works*

The proposed N6 GCRR will facilitate the implementation of the walking, cycling and public transport measures set out in the GTS, all of which align with our climate action targets. The transference of traffic from the existing N6 through Galway City to the proposed N6 GCRR will provide an opportunity for improved pedestrian and cycle paths and crossing facilities, including continuity at major junctions and a modal shift to alternatives to the private car. Improved walking and cycling journey amenity is contingent on these appropriate facilities being provided. When implemented, such facilities will provide a significant improvement to pedestrian and cyclist journey amenity combined with reduced severance.

As discussed in Chapter 15, Material Assets Non-Agriculture, the proposed N6 GCRR traverses the UoG Sporting Campus on a viaduct. During construction, restricted access across the construction area at the UoG Sporting Campus facilities will be maintained. Alternative pitch facilities have been designed by UoG in

accordance with their strategy at an alternative location on their lands and for which they have planning permission (refer to Chapter 5).

The proposed N6 GCRR also intercepts the existing sports pavilion resulting in direct impacts to its western end and the building will be modified as follows:

- the existing western plant room, 1 no. changing room, 1 no. storage area, 1 no. weights area and associated access hallways on both ground floor and upper levels will be demolished
- the western plant room and its associated plant will be relocated
- construction and reconfiguration of the internal and external walls, roof, windows and door locations

The construction of temporary stables for Galway Racecourse will be completed in Phase 1 of the Project, thus providing full operational facilities for Galway Racecourse during the construction of the proposed N6 GCRR. Post completion of the proposed N6 GCRR, Phase 3 of the Project will provide the permanent stables for Galway Racecourse.

19.6.2 Irish Language

Mitigation measures proposed to protect the Irish Language are as follows:

- During construction, all public notifications and all public project updates are to be provided in both Irish and English languages
- While it is expected that day-to-day communications involved in the construction will be through the English language, the Main Contractor for the proposed N6 GCRR shall have the capacity to communicate and correspond through the use of the Irish language and to devote adequate and proportionate staff resources to dealing with any individual wishing to correspond and communicate through the Irish language
- Placenames shall be cited in accordance with the relevant Placename Order issued under the Official Languages Act 2003 (as amended).

19.6.3 Human Health

Mitigation measures proposed for the potential air quality, noise, water, landscape and visual, and soils are specified in Chapter 9, Soils and Geology, Chapter 10, Hydrogeology, Chapter 11, Hydrology, Chapter 12, Landscape and Visual, Chapter 16, Air Quality and Chapter 18, for Noise and Vibration and the key mitigation measures which apply to human health are outlined below and are also in the respective chapters listed above. The implementation of these mitigation measures, emissions, including air and noise will be adequately controlled to ensure no adverse effect on human health.

19.6.3.1 Noise

The key noise mitigation measures include:

- Use of a Low Noise Road Surface
- Use of noise barriers as detailed in Chapter 18, Noise and Vibration
- Control measures for construction works. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, limiting the hours of work and noise monitoring. The contractor will be required to conduct construction noise predictions prior to works taking place and put in place the most appropriate noise control measures depending on the level of noise reduction required at any one location. The Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of *BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Noise* and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001
- Construction hours will mostly take place during daytime hours Monday to Friday. It will be necessary to work overtime (including weekends) and night shifts at certain critical stages during Phase 2 of the

Project. Over the expected 36-month construction phase for the proposed N6 GCRR (Phase 2) there will be up to 10 weeks of night-time working along different sections of the Project primarily to facilitate bridge works over existing roads. It is not expected that night time construction is required during Phase 1, 3 and 4 of the Project.

- During the construction phase noise monitoring will be undertaken at the nearest sensitive locations to ensure construction noise limits outlined in Chapter 18, Noise and Vibration are not exceeded. It is recommended that noise control audits are undertaken at regular intervals throughout the construction programme, as part of the noise and vibration management of the construction of the Project which will be set out in the construction contract requirements
- In terms of blast design control, specific guidance will be obtained from the recommendations contained within *BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Vibration* in relation to blasting operations in addition to experienced blast control techniques used by the contractor. Refer Chapter 18, Noise and Vibration for further details
- In the case of vibration levels giving rise to human discomfort, in order to minimise such impacts, the following measures shall be implemented during the construction period:
  - A clear communication programme will be established to inform adjacent building occupants in advance of any potential intrusive works which may give rise to vibration levels likely to exceed perceptible levels. The nature and duration of the works will be clearly set out in all communication circulars
  - Alternative less intensive working methods and/or plant items shall be employed, where feasible
  - Appropriate vibration isolation shall be applied to plant, where feasible
  - Cut off trenches to isolate the vibration transmission path shall be installed where required
  - In the case of impact piling or demolition works for instance, a reduction in the input energy per blow shall be considered where required
  - Monitoring will be undertaken at identified sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values
- Property condition surveys will be offered for all buildings within 50m of the Assessment Boundary and those within 150m of proposed blasting works along the Project. Property condition surveys will also be carried out at buildings and structures considered appropriate relative to their proximity to the works.

19.6.3.2 Air

The implementation of 'standard mitigation for air' as state in the TII Guidelines include:

- Spraying of exposed earthwork activities and site haul roads during dry weather
- Provision of wheel washes at exit points
- Control of vehicle speeds and speed restrictions. It is proposed that site traffic is restricted to 20km/hr. This will help to minimise the occurrence of dust re-suspension
- Sweeping of hard surface roads

In addition, the following measures will be implemented:

- A public communication strategy will be implemented by the Contractor which will outline procedures to inform members of the community on activities that may be disruptive, further details are contained in Appendix A.7.5 Construction Environmental Management Plan. This appendix also includes details of a complaints register which will be implemented during the construction phase
- Exhaust emissions from vehicles operating within the site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the contractor through regular servicing of machinery

- During dry periods when dust generation is likely or during windy periods, construction areas and vehicles delivering material with dust forming potential will also be sprayed with water, as appropriate
- Areas where materials will be handled and stockpiled will be positioned away from main site access roads. These areas will also be designed to minimise their exposure to wind – all stockpiles shall be kept to the minimum practicable height with gentle slopes
- There shall be no long-term stockpiling on site and storage time will be minimised
- Material drop heights from plant to plant or from plant to stockpile will be minimised
- Water suppression will be used during the demolition of buildings
- Crushing and concrete batching plant will be located as far from sensitive receptors as is reasonably practicable. All storage bins and transfer points will be covered. Silos will be fitted with reverse jet air filters
- Dust screens will be implemented at locations where there is the potential for air quality impacts during the construction phase, i.e. at locations where sensitive receptors are located within 100m of the works
- Employee awareness is also a most important way that dust may be controlled on any site. Staff training and the vigilant management of operations ensure that all dust suppression methods are implemented and continuously inspected
- Dust deposition monitoring will be conducted at a number of locations in the vicinity of the Project. At a minimum, monitoring will be carried out at the two nearest sensitive receptors at locations where works of a 'major' scale is proposed while works are taking place in proximity, refer to Section 16.5.3.1 of Chapter 16, Air Quality.

19.6.3.3 Water and Soil

The key water and soil measures to prevent pollution, flooding and soil contamination include:

- Measures have been incorporated into the design of the Project will protect water quality and soils and also prevent any significant flooding, thus avoiding any potential health impacts
- During construction, the contractor shall implement the Construction Environmental Management Plan as set out in Appendix A.7.5

19.6.3.4 Landscape and Visual

The key mitigation and monitoring measures will be implemented during and following the Construction Phase. Throughout the construction phase mitigation and monitoring measures outlined within Appendix A.7.5 Construction Environmental Management Plan will be implemented to prevent and prevent any potential significant impacts

- General landscaping plans and specific landscaping measures and monitoring have been proposed to mitigate potential impacts during the Operational Phase. Refer to Section 12.6.3.1 of Chapter 12, Landscape and Visual

19.6.3.5 Demolitions and Acquisitions – Psychological Effects

In the event of an approval of the Protected Road Scheme and Motorway Scheme and approval under Section 51 of the Roads Act 1993 (as amended), by An Bord Pleanála and subject to the availability of funding, Notice to Treat will be served firstly on owners, lessees and occupiers of the dwelling houses and commercial properties to be acquired, within six months of the scheme becoming operative, unless an application has been made for Judicial Review, in which case the Notice to Treat[24] will be served in accordance with the provisions of Section 217 (6A) of the Planning and Development Act 2000 as inserted

[24] This notice requests landowners to submit their claim for compensation for lands being taken under the Protected Road Scheme or Motorway Scheme. This is the initial step in the acquisition of property and lands.

by the Compulsory Purchase Orders (Extension of Time Limits) Act 2010. Compensation will be agreed or determined by the property arbitrator as soon as possible after service of Notice to Treat. After compensation has been agreed or determined and satisfactory title has been produced, part payment can be made while the claimant remains for an agreed period in the property to be acquired. This will facilitate the claimant in removing uncertainty and will facilitate arrangements being made, as early as possible, to secure a replacement property.

19.7 Residual Effects

19.7.1 Population

19.7.1.1 Journey characteristics

Once operational, the proposed N6 GCRR will provide a very significant positive residual effect in terms of improved connectivity across and beyond the city, including to national roads via the junctions included as part of the proposed N6 GCRR. This will maximise the transfer of cross-city movements to the new road infrastructure, thus releasing and freeing the existing city centre and inner suburbs from congestion caused by traffic trying to access a city centre bridge to cross the River Corrib. Residual effects respective to each identified impact and impact type are listed in the final column of Table 19.15 and Table 19.16.

19.7.1.2 Amenity

The proposed N6 GCRR will have a positive residual long-term effect on journey amenity on most city roads by encouraging a transfer of through and other traffic, reducing congestion particularly at major junctions. Some transference of traffic will occur to arterial roads connecting with junctions on the proposed N6 GCRR, but overall the reduction in traffic on the major road arteries will provide a residual positive contribution to journey and general amenity in the city. There will be particular benefits for pedestrians and cyclists as the transfer of traffic will allow for an improvement in relevant facilities together with opportunities for more public transport as proposed in the GTS.

The pattern of residential development in the study area means that the construction of the proposed N6 GCRR will impact directly on a high proportion of residential properties at several locations. There will be an inevitable very significant negative effect on most of the householders who are directly impacted by compulsory purchase. As the proportion of properties to be acquired or demolished at three locations is high in relation to the total number of properties in that area, a significant negative residual effect could occur at a community level for some future years for those households that remain.

There will be a significant residual amenity effect on visitors to Menlo Castle on the east bank of the river due to the presence of the River Corrib Bridge. The proposed N6 GCRR will have a negative effect by being elevated above the Sports Campus, removing the two centrally located grass pitches during the construction period. In tandem with this, the context of the existing sporting changing facilities setting and curtilage are now proposed to be altered completely. UoG have undertaken a separate master planning exercise to develop their strategy for the Sporting Campus:

1. Implementation of the Sporting Campus strategy at Dangan will re-accommodate the removed pitches and ancillary Sports Pavilion. This reflects the University's overall strategic sport's vision. UoG obtained planning permission for alternative pitch facilities in accordance with their strategy at an alternative location on their lands.

2. The landscape setting of the existing Campus will need to be developed to screen the visual effects of the proposed River Corrib Bridge from the surrounding pitches

3. Ancillary supporting facilities such as car parking and changing facilities will require remodelling

The UoG proposals to construct additional playing pitches will have a positive cumulative effect. Therefore, while the Project itself will have a negative effect on the UoG Sporting Campus due to the presence of the viaduct, UoG will retain its high quality sports facilities. By virtue of the accessibility provided by the Project, the facilities will be more easily accessible than before to participants and clubs based in Galway and to visitors and so will continue to attract staff, students and investment.

19.7.1.3 Community Severance

The transfer of through and other traffic from more central areas of the city will allow space for improved and new crossing facilities for both pedestrians and cyclists in line with the GTS. Crossing facilities are also included for junctions between national, secondary and local roads and the proposed N6 GCRR. These facilities will have the effect of reducing any residual effect arising from severance due to the road development itself.

19.7.1.4 Economic

The improved connectivity will help to stimulate economic development and the potential for development of the tourism sector in West County Galway. The proposed N6 GCRR will have a significant positive residual effect in this regard. The availability of connections between the proposed N6 GCRR and existing business parks in the west, and especially the east, of the city will also have a very significant, and in some cases, profoundly, positive economic effect due to improved access to these businesses. However, some businesses will be directly impacted by the route of the proposed N6 GCRR and a few of these will be acquired or their current operations modified. These negative impacts will be addressed as part of the land acquisition process and financial compensation.

19.7.2 Irish Language

The Project is expected to have a Moderate Positive residual impact on the status of Irish as a community language within the Galway Gaeltacht area.

19.7.3 Human Health

19.7.3.1 Health Protection

From a community perspective overall, there are potential benefits in terms of human health protection. These arise from overall reductions in noise levels in built-up areas and improvements in air quality in these areas. Unfortunately, there are individuals who have slight negative impacts because of their proximity to the proposed N6 GCRR. The implementation of the mitigation measures will result in a residual slightly positive impact.

Similarly, from a psychological health point of view overall from community perspective the impacts of the Project are assessed as being positive. Again, there are individuals who may be adversely affected and principal among these are likely to be those whose homes are to be compulsorily acquired. The residual impact will be positive.

19.7.3.2 Health Improvements

There is the potential for a very significant opportunity for health improvements associated with the Project. These include the potential for economic development as well as tourism which in itself is associated with an improvement in health status. There is the potential for improvements in social health with a reduction in unemployment and particularly long-term unemployment.

Such a potential if realised will bring with it benefits including reduced inequality in society. There is also potential for increased opportunity to exercise. There is the potential for reduced traffic accidents with a corresponding reduction in mortality and morbidity. Ease of access and egress has the potential to improve social interaction. It also will allow quicker and more reliable access for emergency services such as ambulances. The residual impact will be positive.

19.7.3.3 Improvement of Access to Services

There is potential for significant improvement in access to services. The benefits of this apply to both the residents of Galway City and beyond. Easier access to national road network will allow greater availability of national services such as major hospitals and others. This may be of particular benefit to those living to the west of the city including as far as Connemara. Decreased traffic in built-up areas of Galway City will allow easier access to the services such as retail, cinema, restaurants and other services. It may also encourage people outside of Galway, who are currently deterred from entering the city by traffic concerns to visit and access the services. The residual impact will be very positive.

19.8 Cumulative Impacts

Cumulative effects are defined as the combination of many minor impacts creating one larger, more significant effect (NRA, 2009 and EPA 2022). Cumulative effects consider existing stresses on the natural environment as well as developments that are underway and in planning.

A search for projects with the potential to generate cumulative impacts was carried out within the study area for the proposed N6 GCRR. Projects requiring an EIA up to 15km from the Assessment Boundary were also considered. A 'long list' of projects deemed potentially relevant was identified. While the EIA Directive only requires the consideration of approved projects, there is also potential for several other projects to receive imminent approval, which may give rise to cumulative effects in combination with the Project. Therefore, it was considered appropriate to identify projects which, at the time of assessment, were yet to be approved, but for which a decision and potentially approval is reasonably foreseeable over the likely consenting and construction period anticipated for the Project.

A five-year timeframe was deemed the most appropriate period for planning searches as permissions granted more than five years ago would generally be constructed, partially constructed, or are under construction when the planning sites are viewed.

An initial sift was carried out to exclude applications that were not considered relevant in the 'long list'. This included applications that are either not currently active (i.e. retention, invalid, withdrawn, refused-and not appealed, refused on appeal), and applications of a minor scale.

The final list of Project within 500m of the Assessment Boundary have been assessed in order to predict any cumulative effects (at both construction and operation) from a Human Health and Population perspective. Projects beyond this distance were deemed unlikely to generate significant cumulative impacts with the Project.

The following sources were used to identify plans and projects with the potential to have significant cumulative effects on population and human health:

- The planning registers for Galway City and County Council
- An Bord Pleanála's website
- Project Ireland 2040, which combines the National Development and National Planning Framework.
- Transport Infrastructure Ireland website
- EIA Portal
- Irish Water's website
- Projects identified in Galway City Development Plan 2023 - 2029
- Projects identified in Galway County Development Plan 2022 - 2028

The planned and committed projects identified as potential cumulative effects with the Project are assessed in Appendix A.19.3. Potentially significant effects relevant to Population would occur primarily due to construction traffic or noise and, as such, are addressed in the first instance by the relevant chapters. In all cases, negative effects only arise in the event that the most intense period of construction occurs within the same time period of the more intensive construction works on the proposed N6 GCRR. This observation applies particularly to locations where there is a concentration of proposed projects such as at Letteragh Road and in the vicinity of Gort na Bró. However, most potential negative effects can be mitigated by the Construction and Environmental Management Plan included in Appendix A.7.5 of this updated EIAR, which includes a Construction Traffic Management Plan, such that any final cumulative effect are not significant.

Many projects are dependent on good access, including housing or apartment developments for which the proposed N6 GCRR will have a positive operational effect in terms of either reducing local congestion or by providing for accessibility and reducing the need for residents to use roads into the city for non-local journeys. This particularly applies to residential projects which will be served by the proposed N59 Link Road.

As detailed in Appendix A.19.3 there are no planned or committed projects identified as having additional potential significant cumulative impact with the Project. However, the significant impacts of the Project itself remain as identified above.

19.8.1.1 Population

The proposed N6 GCRR will improve accessibility both within and to/from Galway City and connectivity between areas outside of the city including Connemara, the East and Northwest. As a result, there are significant potential positive effects which will benefit economic and regional development, including tourism.

The improved accessibility and connectivity provided by the Project will also stimulate new physical residential, commercial or tourism development. Such developments as included in Appendix A.19.3, would be subject to planning assessment given the objectives set out in the Galway City and Galway County Development Plans to consolidate development and to provide for balanced sustainable development. They will also be subject to Appropriate Assessment to avoid any adverse impacts on sensitive landscapes and natural habitats. These considerations apply also to the largely rural area surrounding the city, noting that the proposed N6 GCRR will be used for a proportion of commuting journeys as well as for regional journeys. The transfer of some of these journeys to the proposed N6 GCRR, away from the existing N6, is a significant positive effect, but any cumulative effect on stimulating new settlement in the rural hinterland will need to be monitored and addressed in future development and local area plans.

The Project will also provide an opportunity to fully implement the GTS and to provide for improved public transport and facilities for pedestrians and cyclists. For example, the reduced volume of traffic on the existing N6 will present an opportunity to greatly improve the continuity of cycle lanes, including at junctions, and to add more pedestrian crossings, while minimising impacts on traffic flow. Once implemented, this will have a very significant effect on safety and the journey amenity of pedestrians and cyclists, and on general environmental quality and potentially reduce carbon emissions if this contributes to a modal transfer from vehicles. Whilst the cumulative effects of the projects and plans listed in Appendix A.19.3 are significantly positive, and whilst the Project itself does have significant positive residual benefits, there are also significant residual negative impacts of the Project arising from the demolition of property. This is considered in the cumulative impact assessment in Chapter 21 of this updated EIAR.

19.8.1.2 Irish Language

Having considered the Project in tandem with other relevant plans or projects identified in Appendix A.19.3, it is considered that no significant negative cumulative impact upon the status of Irish as a community language will occur.

19.8.1.3 Human Health

It is not considered that there will be any negative cumulative effects on human health. The distances between the projects assessed in Appendix A.19.3 and the Project results in no cumulative noise or air quality impacts. There is potential that reduced journey times and fewer unforeseen delays could have a potential benefit on psychological health. Any projects which make roads safer and reduce the probability of road accidents and fatalities can only be seen in positive terms from a human health perspective. The cumulative health benefits of the Project with the GTS are further assessed below.

Quantification of cumulative health benefits with the GTS

The cumulative health benefits of the Project with the GTS were assessed by using the Western Regional Model to quantitatively measure some of the health, accessibility and social inclusion[25] impacts once the Project and the GTS were fully implemented.

[25] It should be noted that this analysis represents an assessment of those elements of Health, Accessibility and Social inclusion which can be measures using model outputs from the WRM. As such, these outputs are not representative of all the benefits/disbenefits which result from the implementation of the GTS under these categories

Physical Activity Analysis

The assessment indicates that the total number of people cycling, over a 24-hour period in Galway City, will increase by approximately 21% cyclists as a result of the implementation of the GTS and associated cycling infrastructure improvements. This increase in cyclists will result in a reduced risk of premature deaths for those who are new to cycling and currently exercise infrequently. By comparison, results from the assessment indicate that pedestrian trips (trips which use walking only to get from origin to destination) in Galway City are expected to decrease marginally (less than 1% reduction) across the full 24-hour period. The reduction in pedestrian activity in Galway City is mostly as a result of people transferring to cycling or using the improved public transport services implemented as part of the Galway Transport Strategy.

Accessibility Analysis

The changes in accessibility for key locations were determined on a zone by zone basis. This was undertaken using a visual representation of the changes in journey times between the 'Do-Minimum' and 'Do-Something' Scenarios for cycling, public transport and private car. Plate 19.6 represents the changes in journey time (on average) required to access UoG, GMIT, Galway University Hospital, Galway Clinic, Bons Secours and the industrial estates at Ballybrit and Parkmore when the GTS has been implemented for car, cycling and public transport. Plate 19.6 illustrates that, in general, most zones experience a decrease in car journey times. There are however, a small number of zones, mostly in the city centre, which are expected to experience an increase in car journey times to access key sites. This is as a result of the public transport priority measures, such as private vehicle restrictions on Salmon Weir Bridge, which make accessing these areas by car more difficult.

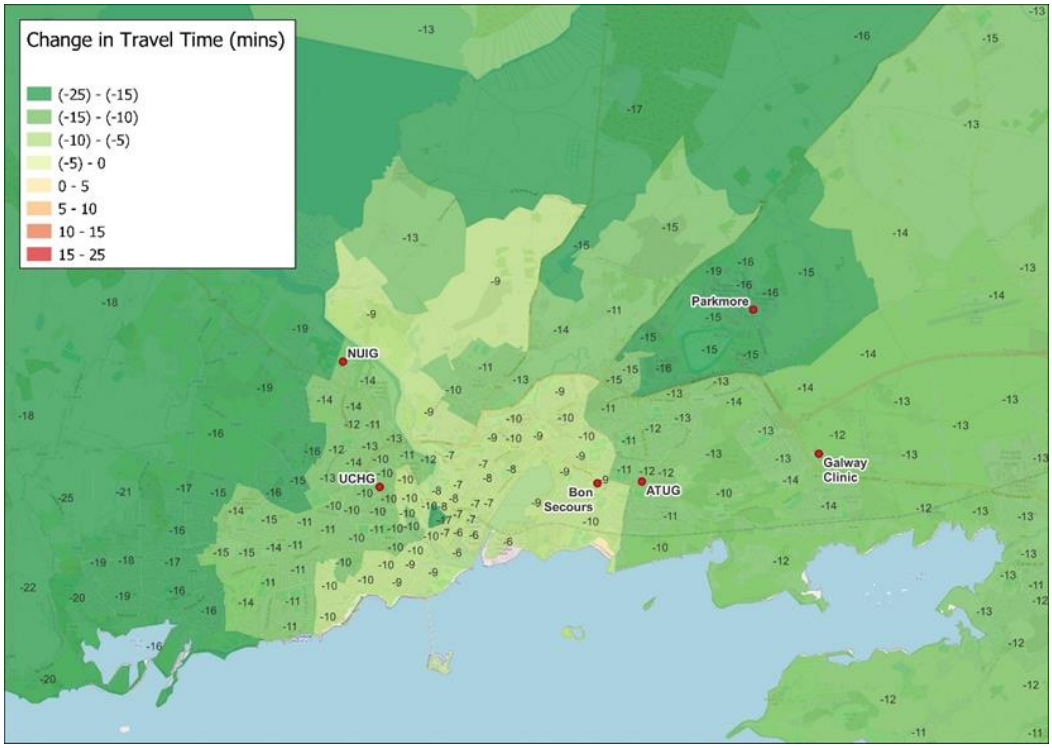

Plate 19.6 Changes in Car Journeys Time

Social Inclusion Analysis

Outputs from the traffic model have also been used to assess the impacts of the Galway Transport Strategy in terms of Social Inclusion. For this assessment, the outputs from the economic module (produced using the software Tuba) were used to visually identify which locations would benefit or suffer disbenefits as a result of the GTS. The benefits in this instance are measures in terms of journey time saving. These benefits/disbenefits were then compared against the deprivation index for the same locations to illustrate graphically how the benefits of the Project are distributed among affluent and less affluent areas.

The map above shows that most zones will experience an improvement in journey times for all trips from those zones. Comparison of these benefits with the deprivation index show that, in general, the benefits of the Project are distributed evenly between disadvantaged and more affluent areas.

19.9 Summary

The key changes to the chapter since the 2018 EIAR involve updating:

- Reviewing and updating elements of the chapter to address points raised from the Brief of Evidence presented to An Bord Pleanala (ABP) at the oral hearing in 2020 and from the ABP Inspector's Report dated June 2021
- Update to the assessment of significance of effects having regard to the EPA 2022 EIAR guidelines, Design Manual for Roads and Bridges (DMRB) Sustainability & Environmental Appraisal LA 111 Noise and Vibration, Revision 2. (UKHE 2020), WHO European Noise Guidelines (2018), the Galway City Council Noise Action Plan 2024 – 2028 and the Galway County Council Noise Action Plan 2024 – 2028
- Updated operational traffic modelling based on the most up to date traffic forecasts for the revised opening and design years of the Project which generated updated noise predictions
- Review of updated noise, air, soils, water, landscape and visual assessments as they relate to the health impact assessment

19.9.1 Population

A Population assessment of the Project was carried out and focused on aspects such as journey patterns, amenity and community severance, business, tourism, employment, ecosystem services and use of the Irish language. Data for the assessment was collected primarily through a review of relevant documents and information gathered through the extensive public consultation to inform the 2018 EIAR, plus further consultation with key stakeholders and ongoing engagement locally in Galway with the population since 2018. This data was supported by site and home visits and local discussions with residents, businesses, schools and representatives of other community facilities. Furthermore, a Language Impact Assessment (LIA) for the Project was undertaken.

A summary of Population impacts, mitigation measures and residual effects is provided in Table 19.15 and Table 19.16 below. Overall, the Project will provide a much needed bypass of Galway City for regional traffic heading to destinations to and from the west of Galway, such as Connemara, to the rest of Ireland. As such, it will provide a very significant reduction in journey times. It will improve the accessibility of Galway City to its main markets by facilitating the crossing of the River Corrib without the need to go through the central suburbs of the city and connect to the national road network.

This will increase the connectivity of key strategic services within Galway, such as UoG and Galway University Hospital, to the national road network. It will improve the accessibility of Gaeltacht areas to the remainder of the county and country, thereby facilitating reductions in the economic and social disadvantages of the Gaeltacht areas. It will also reduce the journey times of traffic heading to various parts of the city from destinations in its rural hinterland, including areas such as that north of Bearna. This will open up new opportunities for residents to access more distant parts of Galway City, for instance for employment.

The transfer of this traffic from more central locations will improve journey amenity for all users of the existing road infrastructure. In particular, it will open up road space for the provision of improved and more continuous pedestrian and cycle facilities and provide opportunities for new public transport in line with the objectives of the GTS. The transfer of traffic will contribute to improve amenity and general well-being of communities living within or beside busy urban roads. Community severance will be reduced through a moderation or reversal of the trend towards increased road traffic and through the opportunity to provide new crossing facilities.

The proposed N6 GCRR has been designed to avoid as many residential properties as possible, but given the distribution of development and the presence of linear development of the city with housing along most roads radiating out of the city, its construction will unfortunately and unavoidably result in a number of

property demolitions or acquisitions with some concentrations in particular areas. At some locations, a high proportion of properties will be acquired as part of the Project. As well as the direct negative impact on the householders themselves, this will present a varying negative effect on remaining residents and at a community level depending on the strength of community interaction that has evolved at each location and the sustainability of community facilities such as schools. There will, also be some loss of amenity for a small number of residents living in the vicinity of the proposed N6 GCRR, particularly in the east of the study area and where major junctions are located. In several locations, and particularly in Na Foraí Maola and the vicinity of the N59 Moycullen Road, the N84 Headford Road and in Castlegar, there will be a significant negative impact on local communities due to the need to acquire or demolish a high proportion of existing properties during construction in these areas. The Project will also have an effect on approximately 6.750ha of lands zoned residential by Galway City and County Council.

The eastern section of the Project impacts several businesses. It will cross Lackagh Quarry which is currently inactive. Whilst the quarry is currently inactive, parts of the upper benches will be sterilised as a result of the Project. At the N84 Headford Road, a very significant impact is anticipated during the construction phase on a company located here which bottles water and distributes fruit and vegetables. The impact arises from the effect of landtake on one warehouse and an impact on the company's raw material supply, albeit that during consultation, it was agreed that access to and around the warehouses will be retained as far as possible to minimise disruption. At the N83 Tuam Road there will be impacts on commercial properties, with the acquisition of a builders' providers store and landtake from other businesses. A car dealership and An Post sorting centre could be affected by the need for traffic management during construction, but will have safe access in the operational phase of the road. There will also be a demolition of a builders' providers store at Ballybrit and some landtake from a car dealership at Briarhill. All of these impacts will be addressed as part of the land acquisition process and through financial compensation, but again these businesses represent the livelihoods of many individuals and so the net effects will be moderate to significant. The Project will have an impact on approximately 8.100ha of lands zoned commercial or industrial by Galway City Council.

The Project will have a significant negative residual effect on the UoG Sporting Campus at Dangan, although this can be reduced to moderate as described in Section 19.7.1.2 due to the fact that UoG advanced their strategy and obtained planning permission to implement it. The sports facility will be permanently impacted by the presence of an overhead viaduct carrying the road towards the crossing of the River Corrib. There will be no physical severance, but the crossing will impact on the amenity of users of the sports facility and amenity use of the riverside.

The proposed location of the Galway Racecourse Tunnel means that there will be no direct amenity effects on the racecourse business or racing events during operation. New permanent access will be available to the N83 Tuam Road via the Parkmore Link Road and much improved access will be possible from the existing N6 such that the net effects will be positive.

Furthermore, the proposed N6 GCRR will have a significant positive effect on the Galway economy by reducing traffic congestion which currently constrains economic growth and competitiveness. The improved connection provided with destinations to the west of Galway City will have a positive effect on the potential for economic development and continued growth in tourism numbers. The transfer of a proportion of traffic from existing urban roads could also help to draw more visitors into the city with consequent benefits for tourism-related businesses and the economy. Similarly, the improved connectivity with Connemara and locations to the west will help to attract tourism investment and related economic development.

Ecosystem services provide many varied benefits that humans freely gain from the natural environment. A properly functioning ecosystem has the capacity to regulate and support the natural environment that contributes to human well-being. The potential impacts on ecosystem services were considered through the assessment of the environmental factors (pathways) through which ecosystem services could be affected such as water, soils, air, noise and general amenity and relied on the biodiversity assessment in terms of potential impacts to biodiversity and indirectly to ecosystem services. There are no impacts identified in those assessments which would result in a significant residual effect on ecosystem services during the construction of the Project.

19.9.2 Irish Language

In relation to the Irish language, there is a low-level of daily Irish usage among the population of the area directly affected by the Project, and where it exists, the use of Irish is particularly concentrated in an education context. While population is increasing, the use of Irish as a community language is not growing in parallel. The Project will not have any significant impact on the use of Irish into the future.

However, it is noted that an improved road network may facilitate further migration and economic growth into the wider Galway Gaeltacht and as the west of County Galway have higher levels of unemployment and deprivation than the areas around Galway City, the proposed N6 GCRR, by improving access to employment opportunities to the east of the city, will facilitate Irish speakers to commute more easily from their own communities and lessen the need to re-locate for economic reasons. Equally, as noted above, the proposed N6 GCRR will make Gaeltacht areas to the west of Galway City more attractive for residential and commercial development. In this context, it will be the responsibility of Galway County Council, Galway City Council and Údarás na Gaeltachta among others to ensure that the use of the Irish language is promoted and encouraged among new residents.

19.9.3 Human Health

The potential health impacts due to the Project were also assessed. The health assessment in the context of EIA focuses the attention of the assessment on likely significant effects, i.e. on effects that are deemed likely to occur and, if they were to occur, would be expected to be significant (as per the requirements of the EIA Directive) and in line with the current TII PHH Standard.

Following scoping of a wide range of determinants, the health assessment focused on three main areas: *health protection, health improvement and improving services*. A review of current and emerging guidance on assessing health in EIA, plus cognisance of the current TII PHH Standard, was undertaken in addition to a literature review on the impacts of health from road developments.

19.9.3.1 Health Protection

The data collected in relation to the protection of human health focused on the results of technical assessments (such as noise, air, soil, landscape and visual and water) dealt with elsewhere in Chapter 9, Soils and Geology, Chapter 10, Hydrogeology, Chapter 11, Hydrology, Chapter 12, Landscape and Visual, Chapter 16, Air Quality and Chapter 18, for Noise and Vibration and their mitigation to establish any potential hazard directly attributed to what is proposed.

These technical assessments provided elsewhere in the EIA Report use standards[26] (such as air quality standards) in order to identify whether significant impacts will arise or not. It is important to point out that health standards do not only exist to protect robust groups within the population, but are primarily intended to protect the vulnerable. The standards are set at levels for which there will be no significant health effects, but do not exclude each and every effect, i.e. slight or moderate health effects are possible even below the levels at which health based standards would apply.

Construction noise is expected to have some negative effects; however it will be short term and limited by work practices and restricted working hours. The results of the noise modelling carried out for the operational phase shows that there may be potential noise impacts on residential properties adjacent to the proposed N6 GCRR, but that the implementation of low noise road surfacing and noise barriers will mitigate these potential impacts. The noise assessment also shows that there will be a benefit for a significant number of people within the city due to a proportion of current traffic being transferred from their current routes. On the basis of WHO night-time noise guidelines, there will be beneficial effects for the community living along existing roads where traffic will be reduced. Those few residences that may exceed the 55dB level do so by only small margins and are not considered to be enough to have significant health impacts.

Air quality has been considered in both the construction and operational phases. Given the proposed mitigation measures with regards to control of dust and other air emissions during the construction phase and the relative limited period of time duration, air quality impacts are not expected to have an adverse effect on human health during the construction phase. Detailed modelling based on worst case traffic scenarios

[26] The term standards in this instance covers guidelines for example noise guidelines as such standard are not currently available

identify that Air Quality Standards will not be breached thereby protecting the vulnerable such as asthmatics, the elderly, the very young or the sick in general.

Adverse effects on soils, water quality or quantity are not predicted either during the construction or the operational phases.

Whilst some annoyance during the construction phase is to be expected, this will be of limited duration and is not usually considered to be a health effect. There are potential psychological benefits in terms of reduced journey times, unforeseen delays etc. as well as movement of traffic away from currently congested and more populated areas. The transfer of a proportion of traffic to inherently safer roads, together with the prospect of reduced traffic accidents and fatalities is also an important potential benefit. This does not take away from the adverse effects on individuals whose homes are to be compulsorily acquired. As noted above, the proposed N6 GCRR has been designed to avoid as many properties as possible, but there remains a significant number of property acquisitions and, although subject to financial compensation[27], it is important to recognise that these individuals may experience stress and anxiety as a result of this process.

19.9.3.2 Health Improvement and Improvement of Access to Services

The data used to assess opportunities for health improvements and access to services included information gathering during the extensive public consultations including a meeting with University Hospital Galway and data extracted from the traffic model to identify accessibility to services.

There is potential for socio-economic gain including economic growth and development of tourism as a result of the Project and it is well recognised that improved socio-economic status will have a positive impact on health outcomes. There is potential for increased employment and reduced unemployment particularly long-term unemployment. If this is achieved, there will also be benefits in terms of social health including decreased social inequality.

Other opportunities for health improvements associated with the proposed N6 GCRR include a potential decrease in road traffic accidents, the potential for creating opportunities for improved public transport and an improved environment for cycling and walking within the city centre roads previously occupied by heavy traffic.

The cycling measures of the GTS, which can be fully implemented once the proposed N6 GCRR is operational, will lead to a considerable increase in cyclists within Galway City. This increase in cycling will lead to an overall increase in the health benefits for those who currently do not cycle. The substantial improvements in cycling and public transport infrastructure due to the GTS will result in a marginal decrease in pedestrian activity (less than 1%) as some existing pedestrians are expected to switch from walking to public transport and cycling. This modal shift is a positive gain for our climate goals also.

A quantification of some of the accessibility and social inclusion benefits of the proposed N6 GCRR and all the GTS measures demonstrate that there will be improvements in accessibility and social inclusion for almost all parts of Galway City. In general, the measures will lead to reduced journey times by all modes and will improve accessibility to key locations within the city and more importantly none of the more disadvantaged areas experience any disbenefits.

There is potential for more efficient access to emergency services including ambulances as a result of the proposed N6 GCRR. There is also the potential for increased opportunities to exercise with the associated health benefits.

There are significant opportunities for improved access to services. This will include those living within Galway City and its environs and those in the west of Galway. For those within Galway City and its environs, reduced traffic along city streets will facilitate access to services including health centres. For those living outside of Galway City there is the potential for improved access to the national road network and thereby access to other services including national hospitals. For those who require to cross the city centre to

[27] Compensatory measures for the loss of land, buildings and other injurious affection will form part of the land acquisition process and will be agreed at a later date with a valuer. Compensation does not form part of the EIA process and is therefore not considered further

access services the proposed N6 GCRR offers particular benefits. While this would be of benefit to all, it will be of particular benefit those living to the west of the River Corrib.

Overall, therefore the impacts of the Project on human health are primarily positive. From a community perspective, there are clear benefits in terms of health protection, opportunities for health improvements and access to services. There are however a limited number of individuals, primarily those living close to the proposed N6 GCRR for whom there may be slight adverse outcomes in terms of noise and air quality. These will be minimised through the use of mitigation measures.

19.9.3.3 Summary

In summary from a human health perspective, the Project will have no significant adverse effects on human health and the Project with the full implementation of the GTS will have positive impacts on human health.

Table 19.15 Summary of Construction Effects - Population

Nature of Effect	Location / Population Sub-Group	Current Situation	Construction Impact	Significance	Sensitivity	Duration	Receptor Magnitude	Proposed Mitigation	Residual Effect
Journey Characteristics									
Journey characteristics	Major roads: N59 Moycullen Road, N84 Headford Road, N83 Tuam Road, R339 Monivea Road	N/A	Temporary night time closures and diversions of these roads which carry significant traffic including at night	Slight to Moderate negative	N/A	Short term	Medium	Traffic management to minimise delays	Slight negative
Journey characteristics	Where minor roads meet construction works	N/A	Slight diversions or Stop / Go arrangements	Imperceptible to slight negative	N/A	Short term	Medium	Traffic management to minimise delays	Imperceptible
Journey characteristics	Rahoon Road & Letteragh Road	N/A	Temporary night time closures	Slight negative	N/A	Short term	Few	Avoid extended night time closures	Imperceptible to Slight negative
General Amenity									
General amenity	Rosán Glas estate	N/A	Construction of link road beside estate and new access connection	Slight to moderate negative	Low	Short term	Medium	Minimise access disruption to estate. Temporary visual screening	Slight negative
General amenity	Gort na Bró estate	N/A	Realignment of Gort na Bró Road which provides access to estate	Slight negative	Medium	Short term	Medium	Minimise access disruption to estate and gaelscoil.	Imperceptible to Slight negative
General amenity	Bushypark Church	Local community facilities	Construction traffic movements impacting on use of church and adjacent cemetery	Slight negative	High	Short term	Medium	Traffic management and temporary visual screening from construction works	Imperceptible to Slight negative
General amenity	UoG Sporting Campus	Sports and amenity use	Noise and visual impacts, loss of use of playing pitches and modification of the sports	Very significant negative	Medium	Short term	Many	Construction traffic and works for the River Corrib Bridge	Significant negative

General Amenity									
			pavilion, as the central part of the sporting campus will become a construction site					will be managed to minimise interference with sporting activities and spectators. Provision of a floodlit 3G GAA pitch, a floodlit 3G training area and associated site infrastructure such as drainage of these pitches and ball-stop netting and modification of the sports pavilion	
General amenity	River Corrib crossing	Amenity use	Noise and visual impacts	Mix of positive and significant negative for different receptors	Medium	Short term	Medium	Minimise duration of any restrictions on access below the bridge works and advice of alternative routes	Moderate negative – positive on balance.
General amenity	An Seanbóthar	Amenity use	Construction vehicle movement	Moderate negative	Low	Short term	Few	Avoid severance and minimise duration of use by construction traffic	Slight to Moderate negative
General amenity	Cappanabornia (beside N83 Tuam Road)	Residential area of 6 houses with direct access to the N83 Tuam Road	Construction of new access road to dwellings and removal of direct access to the N83 Tuam Road. Visual impacts due to the construction of the proposed N83 Tuam Road Junction	Significant negative	Medium	Short term	Few	Minimise disruption to access. Visual and noise barriers. Refer also to Chapter 12, Landscape and Visual and Chapter 17, Noise and Vibration	Moderate negative (access)

General Amenity									
General amenity	Ballybrit Graveyard	Quiet location beside racecourse	Construction noise, pedestrian access	Slight negative	Medium	Short term	Low	Maintain access	Imperceptible to slight
General amenity – property demolition and acquisition (private level)	Route of Project	Rural area with a high number of one-off dwellings and semi-urban areas	Demolitions of 44 and acquisition of 10 dwellings	Significant to Profound negative (owners & occupants)	Low-Medium	Short term	Many	In the event of an approval of the Protected Road Scheme and Motorway Scheme and approval under Section 51 of the Roads Act 1993 (as amended), by An Bord Pleanála and subject to the availability of funding, Notice to Treat will be served firstly on owners, lessees and occupiers of the dwelling houses and commercial properties to be acquired, within six months of the scheme becoming operative, unless an application has been made for Judicial Review, in which case the Notice to Treat[28] will be served in accordance with the provisions of Section 217 (6A) of the Planning and	Subject to financial compensation as part of the compulsory purchase process

[28] This notice requests landowners to submit their claim for compensation for lands being taken under the Protected Road Scheme or Motorway Scheme. This is the initial step in the acquisition of property and lands

General Amenity									
								Development Act 2000 as inserted by the Compulsory Purchase Orders (Extension of Time Limits) Act 2010. Compensation will be agreed or determined by the property arbitrator as soon as possible after service of Notice to Treat. After compensation has been agreed or determined and satisfactory title has been produced, part payment can be made while the claimant remains for an agreed period in the property to be acquired. This will facilitate the claimant in removing uncertainty and will facilitate arrangements being made, as early as possible, to secure a replacement property. Refer Chapter 15, (community level) Material Assets	
General Amenity - demolitions (community level)	Na Foraí Maola / Troscaigh	Semi-dispersed community	Acquisition or demolition of 7 properties (+1 residential site) with impact on local community	Significant negative (wider community)	High	Short term	Medium	Public Communications Strategy as set out in the CEMP which will include	Significant to Moderate negative

General Amenity									
								procedures to inform members of the community who will be directly affected by the construction phase on schedules for any activity of a particularly disruptive nature which is likely to impinge on their property.	
General Amenity - demolitions (community level)	Ard an Locha	Small residential estate	Acquisition or demolition of 3 properties (+2 site with planning for a dwelling) with impact on wider community	Very significant negative (wider community)	High	Short term	Few	Consult and liaise with residents in local community	Significant negative
General amenity – demolitions (community level)	Aughnacurra, Bushypark	Small residential estate	Acquisition or demolition of 6 properties representing a high proportion of the wider community	Very significant negative (wider community)	High	Short term	Medium	Consult and liaise with residents in local community	Significant negative
General amenity – demolitions (community level)	N84 Headford Road	Linear residential developme nt, mainly on one side of road	Demolition of 14 properties representing a high proportion of the wider community	Very significant negative (wider community)	High	Short term	Medium	Consult and liaise with residents in local community	Significant to negative
General amenity – demolitions (community level)	Castlegar	Residential area including school and other community facilities	Acquisition or demolition of 7 properties representing a high proportion of the wider community	Very significant negative (wider community)	High	Short term	Medium	Consult and liaise with residents in local community	Significant negative

Community Severance									
Severance	No Foraí Maola	Small community with no existing severance	Social severance during construction	Slight negative	Low-Medium	Short term	Low	No mitigation proposed	Slight negative
Severance	Locations north and south of the Project in west of study area, School Road, N59 Moycullen Road, N84 Headford Road & N83 Tuam Road	No north-south severance, but high traffic volumes on some roads	Physical and social severance during construction phase	Moderate to slight negative	Low-Medium	Short term	Few-medium	Allow for vehicle, pedestrian / cycle crossing	Slight negative
Severance	N84 Headford Road	High volume of existing traffic	Road to be used by construction traffic	Slight negative	Low	Short term	High	Minimise vehicle movements during peak traffic hours	Imperceptible to Slight negative
Severance	UoG Sporting Campus	N/A	Construction of proposed bridge over River Corrib	Significant negative	Medium	Short term	Medium	Maintain continuous, if restricted access	Slight negative (physical severance)

Economic									
General economic	UoG Sporting Campus	Rental of sports pitches and facilities and some related use of accommodation.	Some loss of this income due to unavailability during construction.	Slight negative	Low	Short term	Medium	-	Slight negative
Economic	Business on the N84 Headford Road	Business which bottles water and distributes fruit and vegetables	Landtake on one warehouse and an impact on the company's raw material supply and potential business impact	Very significant negative	Medium	Long term	1 Business	Subject to financial compensation as part of the compulsory purchase process	Subject to financial compensation as part of the compulsory purchase process

Economic									
Economic	Business on the N83 Tuam Road	Hardware / builders providers	Full acquisition of business	Very significant negative	Low	Permanent	1 Business	Subject to financial compensation as part of the compulsory purchase process	Subject to financial compensation as part of the compulsory purchase process
Economic	Business on the N83 Tuam Road	Car dealership	Dust and noise impacts during construction. Partial landtake and possible effect on visibility of business during construction	Moderate negative	Medium	Short term	1 Business	Noise and dust control measure during construction. Signage to direct accessibility	Slight-moderate negative
Economic	Business on the N83 Tuam Road	Postal business	Partial landtake. Traffic management and access	Slight to moderate negative	Low	Short term	1 Business	Signage to direct accessibility	Slight negative
Economic	Businesses in Parkmore Business Park	Business park	Potential impact from noise, dust or vibration during tunnel works	Slight to Significant negative	Low to High	Short term	Medium (approx. 6 businesses)	Noise and dust control measure during construction. Tunnel works will be undertaken in compliance with the CEMP in Appendix A.7.5	Imperceptible to slight negative
Economic	Business on Racecourse Road	Hardware / builders providers	Full acquisition of business	Very significant negative	Low	Permanent	1 Business	Subject to financial compensation as part of the compulsory purchase process	Subject to financial compensation as part of the compulsory purchase process
Economic	Galway Racecourse	Galway Racing Festival and tourism venue	Partial landtake, construction of a cut-and-cover tunnel, removal of stables,	Significant negative	High	Short term	Principally one business	Works phased to minimise racing events. Replacement of stables and well	Slight negative during construction.

Economic									
			temporary loss of some car parking and some other facilities						
General amenity (trainers & spectators)	Galway Racecourse	Major community and tourism facility	Cut-and-cover tunnel construction. Temporary loss of car parking	Potentially significant negative	High	Short term	Many	Construction works phased to minimise impacts on racing events	Slight negative during construction
Economic	Car dealership Briarhill Business Park	Business visible from existing N6 and Ballybrit Crescent	Dust and noise impacts during construction. Partial landtake requiring a reconfiguration of services on the residual lands and possible effect on visibility of business during construction	Very significant negative	Low	Short and long term	1 Business	Noise and dust control measure during construction. Signage to direct accessibility	Significant negative
Economic	Tourism	Attraction of city as a tourist destination significantly affected by traffic congestion	Construction work located away from city centre and existing through routes. Possible impact on traffic movements on N59 Moycullen Road, N84 Headford Road & N83 Tuam Road	Slight negative	Medium-High	Short term	Many businesses dependent on tourism	Minimise road closures or diversions	Imperceptible (during construction)

Table 19.16 Summary of Operational Effects - Population

Nature of Effect	Location / Population Sub-Group	Current Situation	Operational Impact	Significance	Sensitivity	Duration	Receptor Magnitude	Proposed Mitigation	Residual Effect
Journey Characteristics									
Journey time and connectivity	Regional	Long and congested connection between M6 east of Galway and N83 Tuam Road, N59 Moycullen Road and R336 west	Much reduced travel time and avoidance of regular congestion	Profound positive	N/A	Long term	Very many	-	Profound positive
Journey time	Mainly local Galway City	Prolonged journey time on existing N6 through Galway City and regular congestion.	Reduced incidence or scale of congestion due to transference of much traffic	Very significant positive	N/A	Long term	Very many	-	Very significant positive
Journey time	Bearna and western Galway suburbs	Regular delays in Bearna Village particularly during morning and peak hours including the holiday season	Transference of high proportion of traffic from Bearna Village and reduced incidence of congestion	Significant positive	N/A	Long term	Many	-	Significant positive
Connectivity	Small communities and residential development north of Bearna Village	Access to the city and east only via minor roads with light traffic	Direct access to Project via Bearna East Roundabout	Significant positive	N/A	Long term	Medium	-	Significant positive
Connectivity	Between Project and Boleybeg / Western Distributor Road	Access to the city and east via minor roads with light traffic or Western Distributor Road	More direct access to the Project via Cappagh Road Junction	Moderate positive	N/A	Long term	Many	-	Moderate positive

Nature of Effect	Location / Population Sub-Group	Current Situation	Operational Impact	Significance	Sensitivity	Duration	Receptor Magnitude	Proposed Mitigation	Residual Effect
Connectivity	Ballymoneen and Western suburbs	Dependence on Western Distributor Road for access	Direct access to the Project via Ballymoneen Junction	Moderate positive	N/A	Long term	Many	-	Moderate positive
Connectivity	N59 Moycullen Road	Poor access between N59 Moycullen Road north of Galway and Rahoon or the busy existing N6 to the south	Alternative access via links road north and south of N59 Letteragh Junction to the Project. Relief from congestion at Browne Junction.	Very significant positive	N/A	Long term	Very many	-	Very significant positive
Connectivity	N84 Headford Road	Access between N84 Headford Road and Kirwan Roundabout	Alternative access from the N84 to the Project	Significant positive	N/A	Long term	Many	-	Significant positive
Connectivity	N83 Tuam Road	Access between N83 Tuam Road and Connemara or local business parks	Access to Project from the N83 Tuam Road Junction	Very significant positive	N/A	Long term	Very many	-	Very significant positive
Connectivity	Parkmore Link Road	Limited access between the Parkmore Business Park, the N83 Tuam Road and the existing N6	Access to Parkmore, City East and Ballybrit Industrial Estates	Profound positive	N/A	Long term	Very many	-	Profound positive
Connectivity	Cyclists	Extremely limited connectivity	New cycle lanes west of Letteragh Junction	Profound positive	High	Long term	Many	-	Profound positive
Connectivity	Pedestrians	Extremely limited connectivity	Pedestrian footpath on Link Road and across bridges and at junctions	Significant positive	High	Long term	Many	-	Significant positive

Nature of Effect	Location / Population Sub-Group	Current Situation	Operational Impact	Significance	Sensitivity	Duration	Receptor Magnitude	Proposed Mitigation	Residual Effect
Journey time	Ballybrit Crescent and Lynch Junctions	Frequent congestion and delay at these junctions and with existing N6 traffic	Transference of traffic to Project and Parkmore Link Road providing for reduced traffic delays and congestion	Very significant positive	N/A	Long term	Very many	-	Very significant positive

Nature of Impact	Location / Sub-Group	Current Situation	Operational Impact	Significance	Sensitivity	Duration	Receptor Magnitude	Proposed Mitigation	Residual Effect
Journey Amenity									
Journey amenity	R336 between centre of Bearna Village and Bearna West Roundabout	Existing R336 can be busy, especially at weekend and during holiday season	Increase in traffic on this section, but mainly during week days	Slight negative	N/A	Long term	Medium	None proposed	Slight negative
Journey amenity (traffic-related)	Browne Roundabout & Seamus Quirke Road	Regular congestion at these locations particularly during peak hours and weekends	Transfer of a proportion of traffic to the Project and reduced risk of congestion	Moderate positive	N/A	Long term	Very many	Implementation of GTS measures to improve journey amenity for pedestrian and cyclists	Significant positive
Journey amenity (traffic-related)	Kirwan Roundabout	Regular congestion at this location and at the Bodkin Roundabout	Transfer of a proportion of traffic to the Project and reduced risk of congestion	Slight-Moderate positive	N/A	Medium – long term	Very many	Opportunity to improve journey amenity for pedestrian and cyclists	Significant positive

Nature of Impact	Location / Sub-Group	Current Situation	Operational Impact	Significance	Sensitivity	Duration	Receptor Magnitude	Proposed Mitigation	Residual Effect
Journey amenity (traffic-related)	N83 Tuam Road / existing N6 junction	Regular congestion at this location	Transfer of a proportion of traffic to the Project, but also facilitating traffic on the Project to the city centre via the N83 Tuam Road	Slight negative to Slight positive	N/A	Medium – long term	Very many	None proposed	Slight negative to Slight positive
Journey amenity (traffic-related)	Lynch Junction and Doughiska Junction	Regular congestion at these locations	Transfer of a proportion of traffic to the Project and reduced risk of congestion	Moderate-significant positive	N/A	Medium – long term	Very many	Opportunity to improve journey amenity for pedestrian and cyclists	Moderate positive
Journey amenity (traffic-related)	Existing N6 and many connecting roads	Poor pedestrian and cyclist journey amenity due to volume of traffic and associated environment impacts	Transfer of a proportion of traffic to the Project	Significant positive	High	Medium – long term	Very many	Opportunity to further improve journey amenity for pedestrian and cyclists	Significant positive
Journey amenity (views)	River Corrib Bridge	N/A	Elevated view for drivers north and south of the River Corrib Corridor including of Menlo Castle	Moderate positive	N/A	Long term	Very many	-	Moderate positive-

Nature of Impact	Location / Sub-Group	Current situation	Operational Impact	Significance	Sensitivity	Duration	Receptor Magnitude	Proposed Mitigation	Residual Effect
General Amenity									
General amenity (environmental)	Cappagh Road and Ballymoneen Road	Quiet rural area. Scattered residential development with suburban development to south	Impacts on general amenity due to increased traffic volumes	Significant negative	Medium	Long term	Medium	Screen planting and noise mitigation where required. Refer also to Chapter 12, Landscape and Visual and Chapter 17, Noise and Vibration	Moderate negative
General amenity (environmental)	Northern link from Letteragh Junction	Scattered residential development	Impacts on general amenity due to noise or visual intrusion	Significant negative	Low	Long term	Few	Screen planting and noise mitigation where required. Refer also to Chapter 12 Landscape and Visual and Chapter 17, Noise and Vibration	Moderate to Significant negative
General amenity (environmental)	Bushypark & Aughnacurra	Residential development	Impacts on general amenity due to noise or visual intrusion	Significant negative chapters	High	Long term	Medium	Screen planting and noise mitigation where required. Refer also to Chapter 12, Landscape and Visual and	Moderate to Significant negative

Nature of Impact	Location / Sub-Group	Current situation	Operational Impact	Significance	Sensitivity	Duration	Receptor Magnitude	Proposed Mitigation	Residual Effect
General Amenity									
								Chapter 17, Noise and Vibration	
General amenity (environmental)	St. James' National School, Bushypark	School and playing grounds	Impacts on general amenity due to noise or visual intrusion	Significant negative	High	Long term	Medium	Screen planting and noise mitigation where required. Refer also to Chapter 12, Landscape and Visual and Chapter 17, Noise and Vibration	Moderate negative
General amenity (environmental)	UoG Sporting Campus	Sports pitches	Project on a viaduct splitting the sporting campus in two requiring a reconfiguration of pitches, the modification of the sports pavilion and a new Sporting Campus Plan and Strategy	Very Significant negative	Medium	Long term	Many	Provision of two replacement pitches at an alternative location and associated infrastructure for such as drainage of these pitches, as ball-stop netting and modification of the sports pavilion.	Moderate following completion of appropriate master planning. Subject also to financial compensation as part of the compulsory purchase process

Nature of Impact	Location / Sub-Group	Current situation	Operational Impact	Significance	Sensitivity	Duration	Receptor Magnitude	Proposed Mitigation	Residual Effect
General Amenity									
General amenity (environmental)	River Corrib and river banks	Riverside walk and Menlo Castle	Noise and visual impacts from proposed river bridge	Significant negative	Medium	Long term	Medium	Retain existing vegetation. Noise barriers. Refer also to Chapter 12, Landscape and Visual and Chapter 17, Noise and Vibration	Significant negative
General amenity	School Road, Castlegar	Narrow road used partly as a commuting rat-run and with discontinuous roadside footpaths.	Transfer of 'rat run' traffic from School Road to the Project	Slight positive	High	Long term	Medium	Overbridge on School Road to include footpath and extend to at least to tie-in with existing road	Moderate positive
General amenity	Mass path Parkmore	Quiet and well-maintained footpath elevated above surrounding area	Severance of path, but with new connectivity and informal crossing facility, but also loss of amenity value	Significant negative. (Positive on connectivity)	Medium	Long term	Few	Screen planting	Significant negative (Positive on connectivity)
General amenity (environmental)	Galway Racecourse	Horse racing	Project placed in tunnel beside racecourse. Improved access and reduced congestion.	Slight positive	High	N/A	Very many	N/A	Slight positive

Nature of Impact	Location / Sub-Group	Current situation	Operational Impact	Significance	Sensitivity	Short / Long Term / Perm.	Receptor Magnitude	Proposed Mitigation	Residual Effect
Community Severance									
Relief from severance	Bearna Village	Some severance in the centre of the village especially at peak times	Transfer of much traffic to the Project	Significant positive	High	Long term	Medium	-	Significant positive
New severance and relief from severance	Na Foraí Maola and Troscaigh	Rural area with scattered linear residential development	Social and physical severance. Foraí Maola road diverted to Troscaigh Junction. But also positive impact of new connection with Troscaigh	Moderate negative. Moderate positive	Medium	Long term	Few	Diversion of local road included in design	Moderate negative. Moderate positive
New severance	L13215 Ann Gibbons Road	Rural area with scattered linear residential development	Road severed. Most community facilities to south, but north bound traffic will now have to divert south and to the Bearna Moycullen Road	Significant negative for householders on northern end of the Ann Gibbons Road	Low	Long term	Few	-	Significant negative
New severance	North of Bearna Village	Rural area with scattered linear residential development	Crossing facilities mitigate physical severance, but psychological severance created between areas to north and south	Moderate negative	Low	Long term	Many	Include pedestrian crossing facilities at junctions	Slight negative
New severance	Cappagh Road	Low traffic volumes	Higher traffic volumes presenting new severance at sports pitches to south	Moderate negative	Low	Long term	Medium	Crossing facilities in place, but impact outside of area of Project	Moderate negative

Nature of Impact	Location / Sub-Group	Current situation	Operational Impact	Significance	Sensitivity	Short / Long Term / Perm.	Receptor Magnitude	Proposed Mitigation	Residual Effect
New severance	Gort na Bró Miller's Lane	Light traffic	Some additional traffic	Slight negative	High	Long term	Medium	None proposed	Slight negative
New severance	Coolagh and Menlough	Narrow rural roads	Degree of new social severance due to presence of Project	Slight negative	Low	Long term	Medium	-	Slight negative
New severance	N84 Headford Road to existing N6	Moderate traffic volumes	Increase in traffic accessing proposed N84 Headford Road Junction and physical presence of junction	Moderate negative	Low	Long term	Medium	Provide pedestrian crossing facilities at community facilities.	Slight negative

Nature of Impact	Location / Sub-Group	Current situation	Operational Impact	Significance	Sensitivity	Short / Long Term	Receptor Magnitude	Proposed Mitigation	Residual Effect
Passing trade	R336 and Bearna	Some passing trade including for service stations on R336 Coast Road / Tuam Road	Reduction in passing traffic but improved access to premises	Slight negative	Medium	Long term	Few	None proposed	Slight negative
Access	Gateway Business Park	Access via Seamus Quirke Road subject to regular congestion	Alternative of more direct access to Project	Significant positive	Low	Long term	Medium	-	Significant positive
Access	N59 Moycullen Road & Newcastle Road Upper	Business park access via N59 Moycullen Road subject to congestion and indirect access to existing N6.	Alternative of access to Project via link road	Significant positive	Low	Long term	Medium	-	Significant positive
Access	Car dealership and postal centre on the N83 Tuam Road	Direct access on to busy N83 Tuam Road	Improved access to N83 Tuam Road from start of City North Business Park	Moderate positive	Low	Long term	2 businesses	-	Moderate positive

Nature of Impact	Location / Sub-Group	Current situation	Operational Impact	Significance	Sensitivity	Short / Long Term	Receptor Magnitude	Proposed Mitigation	Residual Effect
			Link. Good visibility of businesses maintained						
Access	Parkmore Business Park, City East and Ballybrit Industrial Estates	Limited access between the Parkmore Business Park, the N83 Tuam Road and the existing N6.	Much improved access to N83 Tuam Road and Project	Profound positive	Low	Long term	Very many	-	Profound positive
General economic	Galway Racecourse	Access via existing N6 and event day access to N83 Tuam Road	Requirement to replace stables and other facilities. Proposed tunnel to the north of the racetrack. Improved general access, including to the N83 Tuam Road	Net moderate positive	High	Long term	One major business and ancillary businesses, including during events	-	Net moderate positive
Access	Briarhill Business Park	Access to existing N6	Reduced congestion expected at Ballybrit Crescent and Lynch Junction. New access north to N83 Tuam Road via Parkmore Link Road	Significant positive	Low	Long term	Medium	-	Significant positive
Access, land take	Car dealership, Briarhill Business Park	Access to existing N6	Reconfiguration of services on the residual lands are required with improved access with the reduced congestion on the	Negative impact from landtake combined with some positive impact from improved access	Low	Long term	1 business	Provide directional signage	Subject to financial compensation as part of the compulsory

Nature of Impact	Location / Sub-Group	Current situation	Operational Impact	Significance	Sensitivity	Short / Long Term	Receptor Magnitude	Proposed Mitigation	Residual Effect
			existing road network						purchase process
Tourism	Galway City and locations to west	High congestion in city and poor connectivity to Connemara	Reduced congestion and improved connectivity	Very significant positive	Medium	Long term	Very many	-	Very significant positive

19.10 References

Central Statistics Office. (2023) *Census 2022*.

Central Statistics Office. (2016) *Census 2016*.

Central Statistics Office. (2012) *Census 2011*.

Central Statistics Office. (2007*) Census 2006*.

Environmental Protection Agency. (2015) *Advice Notes for Preparing Environmental Impact Statements. Draft, September 2015.*

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

European Commission (2017) *Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report*.

Failte Ireland (2023) EIAR (July 2023) *Guidelines for the consideration of tourism and tourism related projects*.

Galway City Council. (2023) *Galway City Development Plan 2023-2029.*

Galway City Council. (2015) *Galway City Local Economic and Community Plan 2015-2021*.

Galway County Council. (2022) *Galway County Development Plan 2022 - 2028.*

Galway County Council. (2015) *Socio Economic Statement of County Galway*

Galway County Council. (2017) Proposed Variation No.2(b) Galway County Development Plan 2015 - 2021: Gaeltacht Plan (Including settlements of An Cheathrú Rua, An Spidéal and Baile Chláir)". Galway County Council. (2008, revised 2013) *Gaeltacht Local Area Plan 2008 - 2018.*

Galway County Council. (2023) *Draft Galway County Local Economic and Community Plan 2024-2040.*

Ad-Hoc Expert Group on Noise and Health, 2010. *Environmental Noise and Health in the UK*, Didcot: Health Protection Agency UK.

Babisch, W., 2002. *The noise/stress concept, risk assessment and research needs*. Noise Health, 30(8), pp. 1-29.

Babisch, W., 2008. *Road traffic noise and cardiovascular risk*. Noise Health, Volume 10, pp. 27-33.

Babisch, W., 2014. *Updated exposure-response relationship between road traffic noise and coronary heart diseases: a meta-analysis*. Noise and Health, 16(68), pp. 1-9.

Basner, M. et al., 2014. *Auditory and non-auditory effects of noise on health.* Lancet, Volume 383, pp. 1325-1332.

Berglund, B., Lindvall, T., Schwela, D. & Goh, K.-T., 2000. *Guidelines for Community Noise*, Geneva: WHO.

Burnett, R. et al., 2014. *An Integrated Risk Function for Estimating the Global Burden of Disease Attributable to Ambient Fine Particulate Matter Exposure. Environmental Health Perspectives*, 22(4), pp. 397-403.

Chen, H. et al., *Living near major roads and the incidence of dementia, Parkinsons Disease and multiple sclerosis:* a population Based cohort study Lancet Volume 389 No 10070 pp. 718-736.

Cohen, A. et al., 2005. *The global burden of disease due to outdoor air pollution*. Journal of Toxicology and Environmental Health, Part A, Volume 68, pp. 1-7.

COMEAP, 2009. *Long-Term Exposure to Air Pollution*: Effect on Mortality, London:

COMEAP, 2010. *The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom*, London: COMEAP, Health Protection Agency.

Defra and IGCB(N), 2014. *Environmental Noise: Valuing impacts on: sleep disturbance, annoyance, hypertension, productivity and quiet*, London

Dora, C. & Phillips, M., 2000. *Transport, environment and health*, Copenhagen: WHO Regional Office for Europe.

EPA. *Health Impact Assessment* https://www.epa.gov/healthresearch/health-impact-assessments

Expert Panel on Noise, 2010. EEA Technical Report No 11/2010. *Good practice guide on noise exposure and potential health effects*, Copenhagen: European Environment Agency.

Faustini, A., Rapp, R. & Forastiere, F., 2014. *Nitrogen dioxide and mortality: review and meta-analysis of long-term studies*. European Respiratory Journal, 44(3), pp. 744-753.

European Environmental Agency: *Noise in Europe* 2014.

Halonen, J. et al., 2015. *Road traffic noise is associated with increased cardiovascular morbidity and mortality and all-cause mortality in London*. European Heart Journal, Volume 36, pp. 2653-2661.

HEI Panel on the Effects of Traffic-Related Air Pollution, 2010. *Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions*, Exposure, and Health Effects.

HEI Special Report 17., Boston: Health Effects Institute.

HEI Review Panel on Ultrafine Particles, 2013. *Understanding the Health Effects of Ambient Ultrafine Particles*. HEI Perspectives 3., Boston: Health Effects Institute.

Hoek, G. et al., 2013. *Long-term air pollution exposure and cardio-respiratory mortality*: a review. Environmental Health, 12(43), pp. 12-13.

Houthuijis, D., van Beek, A., Swart, W. & van Kempen, E., 2014. *Health implication of road, railway and aircraft noise in the European Union.* Provisional results based on the 2nd round of noise mapping. RIVM Report 2014-0130., Bilthoven: National Institute for Public Health and the Environment.

Hume, K., Brink, M. & Basner, M., 2012. *Effects of environmental noise on sleep*. Noise and Health, 14(61), pp. 297-302.

HSE: https://www.hse.ie/eng/about/who/healthwellbeing/knowledge-management/health-intelligence-files/chn-west-galway-city-profile-census-2022.pdf

HSE/https://www.hse.ie/eng/about/who/healthwellbeing/knowledge-management/health-intelligence-files/chn-central-galway-and-east-galway-city-profile-census-2023.pdf

IARC Working Group on the Evaluation of Carcinogenic Risks to Humans, 2013. Diesel and Gasoline Engine Exhausts and Some Nitroarenes. IARC Monographs, vol. 105, Lyons and Geneva: IARC and WHO.

Kavanagh, P., Doyle, C. & Metcalfe, O., 2005. *Health Impacts of Transport: a review, Dublin and Belfast*: Institute of Public Health in Ireland:

Klatte, M., Bergström, K. & Lachmann, T., 2013. *Does noise affect learning? A short review on noise effects on cognitive performance in children.* Frontiers in psychology, 4(578).

Lee, B.-J., Kim, B. & Lee, K., 2014. *Air Pollution Exposure and Cardiovascular Disease.* Toxicological Research, 30(2), pp. 71-75.

Münzel, T., Gori, T., Babisch, W. & Basner, M., 2014. *Cardiovascular effects of environmental noise exposure*. European Heart Journal, Volume 35, pp. 829-836.

Global association of air pollution and heart failure: *a systematic review and meta-analysis.* Lancet, Volume 382, pp. 1039-48.

Sørensen, M. et al., 2014. *Combined effects of road traffic noise and ambient air pollution in relation to risk for stroke?* Environmental Research, Volume 133, pp. 49-55.

Stansfeld, S. et al., 2005. *Aircraft and road traffic noise and children's cognition and health: a cross-national study*. Lancet, Volume 365, pp. 1942-1949. (RANCH)

van Kempen, E. & Babisch, W., 2012. *The quantitative relationship between road traffic noise and hypertension:* a meta-analysis. Journal of Hypertension, 30(6), pp. 1075-1086.

van Lenthe, F. et al., 2005. *Neighbourhood unemployment and all-cause mortality: a comparison of six countries*. Journal of Epidemiology and Community Health, 59(3), pp. 231-237.

WHO Working Group, 2009. *Night Noise Guidelines for Europe*, Copenhagen, Denmark:

WHO Regional Office for Europe.

WHO, 1946. *Preamble to the Constitution of the World Health Organization* as adopted by the International Health Conference, New York, 19-22 June, 1946, New York: Official Records of the World Health Organization, no. 2, pp. 100.

WHO, 2000. *Air Quality Guidelines*: Second Edition, Copenhagen: WHO Regional Office for Europe.

WHO, 2003. *Climate Change and Human Health - Risks and Responses*. Summary., Geneva: WHO.

WHO, 2006. *Air Quality Guidelines*: Global Update 2005, Copenhagen: WHO Regional Office for Europe.

WHO, 2007. *Health relevance of particulate matter from various sources*. Report on a WHO workshop, Bonn, Copenhagen: WHO Europe.

WHO, 2010 *The Burden of Disease Environmental Noise* Practical Guidance Bonn Hellmuth.

WHO, 2011 *The Burden of Environmental Noise* Fritschi Et Al

WHO, 2013. *Health risks of air pollution in Europe* - HRAPIE project. Recommendations for concentration-response functions for cost-benefit analysis of particulate matter, ozone and nitrogen dioxide., Copenhagen: WHO Regional Office for Europe.

WHO, 2013. *Review of evidence on health aspects of air pollution* - REVIHAAP Project: Technical Report, Copenhagen: WHO Regional Office for Europe.

WHO *Children's Environmental Health* http://www.who.int/ceh/risks/en/

Duff, S. (ed.) (2000) *Atlas of Irish History*. 2nd edition. Gill & MacMillan, Dublin Government of Ireland, 2010, 20-Year Strategy for the Irish Language 2010 – 2030. Stationery Office, Dublin

Ó Giollagáin, C; & Charlton, M. (2015) *Nuashonrú ar an Staidéar Cuimsitheach Teangeolaíoch ar Úsáid na Gaeilge sa Ghaeltacht*: 2006–2011, Údarás na Gaeltachta

Ó Giollagáin, Mac Donnacha, [et al.] (2007) *Comprehensive Linguistic Study of the Use of Irish in the Gaeltacht: Principal findings and Recommendations* - A Research Report prepared for the Department of Community, Rural and Gaeltacht Affairs. Stationery Office, Dublin

Web sources (accessed on various dates in December 2017 and January 2018)

www.cso.ie

www.galway.ie

www.galwaycity.ie

www.pobail.ie