Chapter 6:
Population & Human Health

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Chapter 6 Population and Human Health

6.1 Introduction

This chapter addresses the potential population and human health impacts relating to the construction and operational phases of the Trinity Wharf Development, referred to hereafter as the "proposed development". The proposed development will form a new urban quarter in Wexford Town providing opportunities for residential, community/ cultural, business and employment opportunities, contributing to the growth and development of the area. Actual and perceived impacts of the proposed development on the population and human health may arise from various aspects of the proposed development. These impacts are dealt with throughout this Environmental Impact Assessment Report (EIAR). In particular, interactions will occur with effects described in the chapters listed in Table 6.1.

Table 6.1 Population and Human Health Interactions and Specialist Contributions

Relevant Aspects	Chapter & Specialists Contributor
Human Health: Traffic	Chapter 5: Traffic Analysis: Roughan & O'Donovan
Human Health: Contaminated Land	Chapter 8: Soils and Geology: Roughan & O'Donovan
Human Health: Noise and Vibration	Chapter 12: Noise and Vibration: Enfonic
Human Health: Air Quality and Climate	Chapter 13: Air Quality and Climate: AWN Consulting
Human Health: Water Quality and Flooding	Chapter 10: Hydrology: Roughan & O'Donovan
Human Health: Landscape and Visual	Chapter 11: Landscape and Visual Analysis: Cunnane Stratton Reynolds
Human Health: Material Assets	Chapter 16: Material Assets: Roughan & O'Donovan
Human Health: Major Accidents and Disasters	Chapter 17: Interrelationships, Major Accidents and Cumulative Effects: Roughan & O'Donovan

In accordance with the draft Environmental Protection Agency (EPA) Guidelines (2017), the relevant components of this chapter examine the attributes and characteristics associated with:

- Land use and social considerations, including effects on general amenity, journey characteristics, severance, amenity uses of the site or of other areas in the vicinity;
- Economic activity including tourism e.g. employment and population including associated land use; and
- Human health, considered with reference to, and interactions with, other environmental receptors contained in corresponding chapters such as air, noise, traffic and flooding, as appropriate.

This chapter sets out the methodology used for the population assessment and human health assessment (Section 6.2), then describes the receiving environment (Section 6.3) and sets out the predicted impacts of the proposed development on population and human health aspects (Section 6.4). The mitigation measures section (Section

6.5) sets down measures that are recommended to be incorporated into the design of the proposed development. Likely residual impacts are described in Section 6.6. This chapter also outlines any difficulties encountered in compiling information (Section 6.7). A conclusion and a summary of the assessment are provided in Section 6.8 and a list of reference material used to compile this chapter is contained in Section 6.8.

6.2 Methodology

This population and human health impact assessment has been undertaken in accordance with Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU and as transposed into Irish Law through Regulations in 2018 (S.I. No. 296 of 2018).

6.2.1 Relevant Guidelines

The following guidelines have influenced the preparation of this chapter:

- Draft Guidelines on information to be contained in the Environmental Impact Assessment Report, Environmental Protection Agency, August 2017;
- Draft Advice Notes for preparing Environmental Impact Statements Environmental Protection Agency. September, 2015;
- Guidelines on the information to be contained in Environmental Impact Statements. Environmental Protection Agency. 2002;
- Advice notes on current practice in the preparation of Environmental Impact Statements, Environmental Protection Agency. 2003;
- Environmental Impact Assessment of National Road Schemes- A practical Guide, National Roads Authority/ Transport Infrastructure Ireland, Revision 1, November 2008;
- Guidelines on the Treatment of Tourism in an Environmental Impact Assessment, Fáilte Ireland. 2011;
- Additionality Guide, Homes and Communities Agency, United Kingdom. 2014;
- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report. European Commission. 2017;
- Health Impact Assessment Resource and Tool Compilation, United States Environmental Protection Agency. 2016;
- Health Impact Assessment Guidance, Institute of Public Health Ireland. 2009; and
- Framework for Human Health Risk Assessment to Inform Decision Making developed by the United States Environmental Protection Agency (US EPA). 2014.

The description of the quality, significance, extent (magnitude), probability and duration of effects outlined within this assessment are based on the definitions set out within Section 3.7 of the 'Guidelines on information to be contained in Environmental Impact Assessment Reports' (EPA, Draft 2017).

6.2.2 Study Area

There is no national guidance available on an appropriate study area to focus the assessment of population and human health. The study area has been defined with reference to the potential for impact from the proposed development using professional judgement and based on availability of relevant information. The primary study area

is defined by the Electoral Divisions (EDs) that are wholly and/or partially contained within 500m of the proposed development, as presented in Plate 6.1 and Figure 6.1 of Volume 3 of this EIAR. It is recognised that developments such as the one proposed can influence activities across a wider area. For this reason, a study area of 1km is also included. The human health study area is related to the potential impacts of any emissions as a result of the proposed development. Generally, the closer to the works, the greater the potential for impacts. The most significant environmental impacts are likely to be confined within 50-100m of the proposed development. Some impacts such as air quality and traffic may have a wider study area, and these are considered as part of the respective specialist assessments that have informed the assessment as part of this chapter.

Where population or human health information is not specifically available for these defined areas, information relating to the Wexford Town and/ or environs is relied upon. The study area also includes the marine environment of Wexford Harbour in terms of potential for economic impact relating to boating and tourism from the proposed development. The extent of the study area is shown in Plate 6.1.

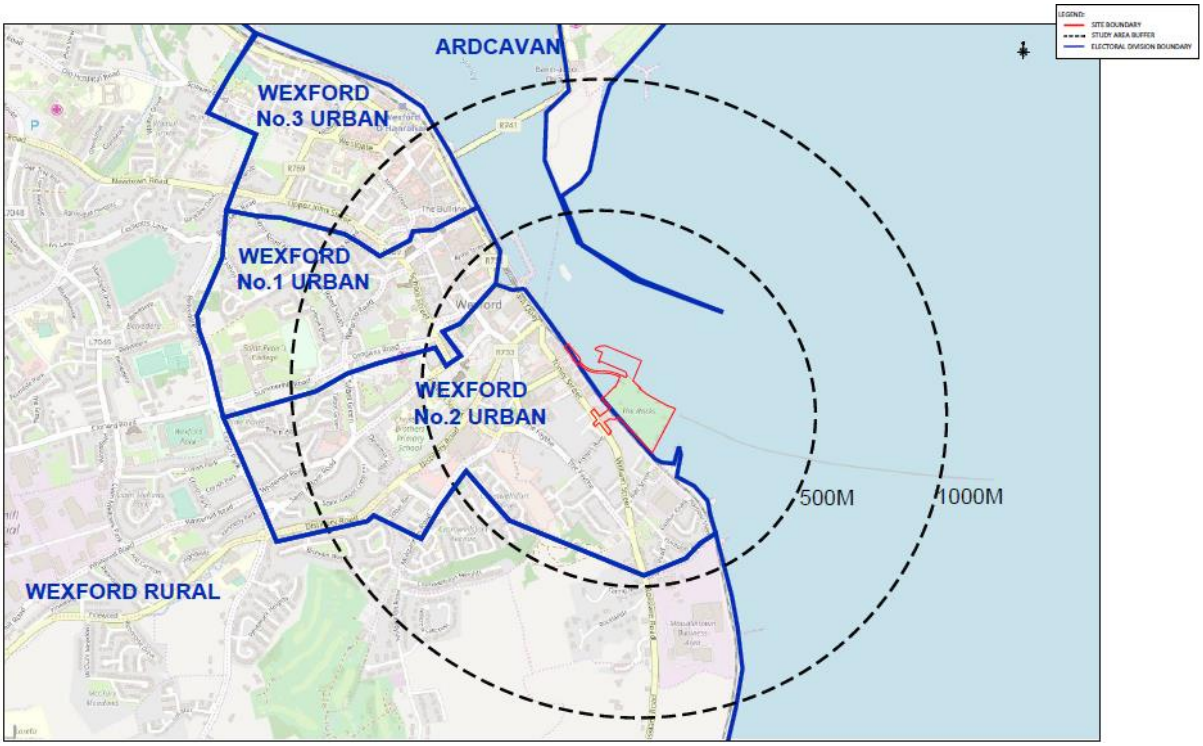

Plate 6.1 Study Area

6.2.3 Data Collection Methods

The data collection methods include primary and secondary data collection. Initially, a desk-based assessment determined the existing receiving environment (in terms of population and human health), including the existing population, economic activity in the area, employment, community infrastructure, tourism and recreation amenities. Topographical maps and Google maps have also been used to inform and validate the baseline description and local knowledge of the area. Analysis of existing demographic and health data to build up a community profile has also been completed.

6.2.4 Data Sources

The population and human health assessment requires an understanding of the community and characteristics of the area. Data sources consulted include:

- Population, demographic and health data from sources to include:
  - Census 2016 and 2011 from by the Central Statistics Office (CSO); GeoDirectory (Q1 2016 data), Map viewer of the Valuation Office of Ireland; Failte Ireland; Planning search of recently submitted and granted planning applications for development in the area; and
  - Pobal, the Institute of Public Health (IPH) and the Health Service Executive (HSE);
- Other relevant environmental data collated during the various environmental assessments, particularly traffic, noise, air and climate, water, land and soil and landscape and visual impacts;
- Ordnance Survey of Ireland aerial photography;
- Observation of local settlement and travel patterns and the location of community facilities and businesses during site visits; and
- Consideration of issues raised during public consultations.

A range of strategic planning guidance documents and technical reports were reviewed as part of the assessment process. The following presents a list of the key documents reviewed:

- Project Ireland 2040 – National Planning Framework (Government of Ireland 2017);
- Project Ireland 2040 National Development Plan 2018-2027;
- Regional Planning Guidelines for the South-East Region 2010-2018;
- South East Economic Development Strategy (SEEDS) 2013-2023;
- South East Action Plan for Jobs 2015-2017;
- Wexford County Development Plan 2013-2019;
- Wexford Town and Environs Development Plan 2009-2015 (as extended);
- Wexford Local Economic and Community Plan 2016-2021;
- Wexford Quay Economic Development and Spatial Implementation Plan; and
- Joint Housing Strategy 2013-2019.

6.2.5 Consultations

A public consultation event was held on Friday 5th September 2018 in the Talbot Hotel, Wexford Town. A total number of Feedback relevant to population and human health assessment was considered as part of this assessment.

A total of 34 submissions were received from the general public during this period, the majority of which were positive. However, some submissions also included concerns. They key issues are summarised in Section 1.6 of this EIAR.

In some cases, the consultation process has resulted in design changes and/ or agreement of appropriate mitigation measures as part of the design of the development. Where relevant, this mitigation has been integrated into this assessment.

6.2.6 Population Impact Assessment Categories

6.2.6.1 Overview

The purpose of the population assessment is to identify the likely significant impacts as they might affect users of the proposed development and the local community. It usually follows that impacts of a population and human health nature are a function of:

- The location and character of the local environment;
- The sensitivity of the local population and its capacity to absorb change;
- The nature of the environmental effect;
- The scale or extent of the effect in terms of area or population affected;
- The duration and frequency of an effect; and,
- The probability of an impact's occurrence and possibility of effectively reducing the effects through mitigation.

Impacts result from direct, indirect, secondary and cumulative effects on existing environmental conditions. Effects can be *positive, neutral* or *negative*. The significance of an effect depends on, among other considerations, the nature of the environmental effect, the timing and duration of an effect and the probability of the occurrence of an effect. The significance of an effect is described as *imperceptible, slight, moderate, significant*, v*ery significant* or *profound*. The impacts may be short-term, medium-term or long-term. The duration of an effect may be *momentary, brief, temporary, short-term, medium-term, long-term, permanent or reversible* in accordance with the timescales detailed in Table 6.2. The frequency of that effect can also influence significance i.e. if the effect will occur once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually. For example, disruption to road for a few hours could be described as having an *imperceptible, negative, brief* impact versus the complete closure of a road for a number of months which could be described as a *very significant, negative*, *temporary* impact.

The population and human health assessment addresses impacts at a community level rather than for individuals or identifiable properties, although impacts for individual properties are discussed where these are significant or located within close proximity to the proposed development, as appropriate.

This EIAR is focused on providing a clear documentary trail of analysis used to arrive at conclusions. The criteria used to describe the predicted effects across land use and social considerations including journey characteristics, journey amenity, general amenity and economic impacts is outlined in Table 6.2 (taken from the EPA Guidelines, 2017).

Table 6.2 Criteria Used to Describe Population Effects (adapted from the EPA, 2017)

Quality of Effects	
Positive	A change which improves the quality of the environment.
Neutral	No effects, or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative	A change which reduces the quality of the environment.
Describing Significance of Effects	
Imperceptible	An effect capable of measurement but without significant consequences on population.

Not Significant	An effect which causes noticeable (*Note 1*) changes in the character of the population environment without affecting its sensitivities.
Slight effects	A small effect which causes noticeable changes in the population and character of the environment without affecting its sensitivities.
Moderate effects	An effect that alters the character of the population environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the population environment.
Very significant Effects	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the population environment.
Profound Effects	An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects	
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Describing the Probability of the Effects	
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measure are properly implemented.
Describing the Duration and Frequency of Effects	
Momentary Effects	Effects lasting from seconds to minutes
Brief Effects	Effects last less than a day
Temporary Effects	Effects lasting less than a year
Short-term Effects	Effects lasting one to seven years
Medium-term Effects	Effects lasting seven to fifteen years
Long-term Effects	Effects lasting fifteen to sixty years.
Permanent Effects	Effects lasting over sixty years
Reversible effects	Effects that can be undone, for example through remediation or restoration.
Frequency of Effects	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hour, daily, weekly, monthly, annually).

Note 1: for the purposes of planning consent procedures

The relevant components of the population aspect of this chapter examines the attributes and characteristics associated with social considerations of the community. These components include land use change, journey characteristics and general amenity, severance, and economic activity including tourism e.g. employment including associated land use change as a result of the proposed development.

6.2.6.2 Land Use Change

Land use changes can affect populations in different ways. Planning policy plays an important role in guiding and facilitating approximate changes in land use which can influence settlement as well as transportation patterns. Planning policy ensures these changes are managed sensitively and are appropriate to the unique existing and emerging social, economic and environmental conditions. The primary consideration relating to land use change is to assess whether the proposed development conforms with land use policy and to identify if the proposed development is likely to change the intensity of patterns, types of activities and land uses. Therefore, a review of planning policy was carried out as part of this assessment as well as an assessment of the existing and emerging baseline and its capacity to absorb predicted changes.

6.2.6.3 Journey Characteristics

Journey length refers to the distance associated with a journey, whilst duration is the time taken to make the journey. Average walking speed for pedestrians is taken to be 5 km/h. Average cycling speed is assumed at 20 km/h. Impacts on journey amenity and community severance are described in Section 6.2.6.4. There are obvious interactions between these categories and with economic impacts and therefore the assessment is combined with positive impacts resulting from a decrease in journey length/ time and negative impacts resulting from an increase in journey length/time. In addition, new transport facilities can improve accessibility or connectivity through the combined effect of reduced journey time and reduced severance.

6.2.6.4 Journey Amenity and General Amenity

The assessment of journey amenity relies on the significance categories given in Table 6.2 and is supported by cross-reference where necessary with the relevant chapters. 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 intrusion (including sightlines) and safety for equestrians, are amongst the factors relevant to the assessment of amenity, as are the number and types of people affected. The principal concern is with pedestrians and cyclists, but journey amenity impacts also apply to drivers; for example, due to safety and anxiety associated with the crossings of major roads. There are interactions, too, with the assessment of journey characteristics and community severance.

6.2.6.5 Severance

The definition of severance is not precise. Severance is an impact of transport infrastructure development such as roads or bridges. Its effect is to discourage community interaction and it occurs where access to community facilities or between neighbourhoods is impeded by a lengthening of journey time or by the physical barrier. For example, construction of a road can result in a physical barrier but can also create further severance affecting communities due to high traffic volumes or perimeter fencing.

The type of severance 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 or social severance and any corresponding loss of neighbourhood interaction or safety concerns caused by barriers such as roads and bridges. On the other hand, relief from existing severance may be provided by a new road or bridge where traffic volumes or speed are moderated, by the inclusion of crossing facilities in the design or through the presence of overbridges

or underpasses. New severance is a negative impact that occurs when a barrier is created between people and community facilities.

Sensitive groups are identified specifically where they comprise a higher 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 facilities include schools, surgeries, hospitals, churches, post offices and shops.

Table 6.3 Criteria Used in the Assessment of Severance

Impact Level	Significance Criteria
Imperceptible	No noticeable consequences for journey patterns
Not significant	Some minor effects on connectivity but present journey patterns are maintained.
Slight	Slight effects on connectivity but journey patterns are maintained with some hinderance to movement.
Moderate	Moderate effects on connectivity. Some moderate hinderance to movement is likely to be experienced by some populations but journey patterns maintained.
Significant	Significant effects on connectivity i.e. changes could dissuade/ promote populations from making particular journeys or result in requirement for alternative route to origin and destination.
Very Significant	Very significant effects on connectivity i.e. dramatic changes could dissuade/ promote populations from making particular journeys or result in requirement for alternative route to/from origin and destination.
Profound	Profound changes to connectivity. Populations are likely to be required to completely alter journey patterns.

Relief from severance is a positive impact which can be defined in relation to existing severance. Relief from severance could follow from a transference of traffic from improvements to road design or sightlines, or from the introduction of crossing facilities, underpasses or bridges. Table 6.3 provides a guide to criteria used in the assessment of relief from severance. Where the assessment varies from these definitions due to the context in which the relief occurs, the reasons for the assessment are discussed in the text. Where there are implications for real and perceived safety, there are also potential interactions with journey amenity.

6.2.6.6 Economic Activity

Economic and employment impacts occur at both the regional and local scale and can be either positive or negative. Transport infrastructure is normally proposed with the intention of improving national competitiveness and economic/social linkages; for instance, in relation to improving access to areas, reducing journey time and improving journey time reliability for commercial goods, or for travel and commuting of tourists and the workforce. However, there can also be negative impacts in relation to loss of passing trade to businesses, car parks and those who rely on vehicular access which may be affected by transport infrastructure.

Economic impacts are assessed at a community level however development may affect identifiable local business. In this case, impacts on individual companies are discussed where relevant. Other economic impacts could affect the wider community, for example where a number of businesses are affected, tourism, or where the retail or business environment of a city or town is impacted.

6.2.7 Human Health Impact Assessment Categories

This section describes the methodology relating to the assessment of human health effects. Health, as defined by the World Health Organization (WHO), is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." The United States Environmental Protection Agency (USEPA) Human Health Risk Assessment is a useful framework for considering potential human health impacts. It includes four basic steps to inform decision making detailed in Table 6.4

Table 6.4 Framework for Considering Potential Human Health Risk / Impacts, (Informed by USEPA)

Step 1 – Hazard Identification	Examines whether a stressor has the potential to cause harm to humans and/or ecological systems, and if so, under what circumstances. For example, in the case of transport infrastructure project one might consider an emission such as noise or air pollutants and examine its potential for harm.
Step 2 – Dose Response Assessment	Examines the numerical relationship (emission standards) between exposure and likely human health response/effects. For example, typically when the dose/emission increases the response/health effect increases. Some individuals may have a different dose response/ health effect than others e.g. vulnerable groups such as the old, very young or sick.
Step 3 – Exposure Assessment	Examines what is known about the frequency, timing, and levels of contact with a stressor (e.g. emission). For example, estimating human exposure to an emission/agent in the environment or estimating future exposure of an agent that has not yet been released/present in the future environment.
Step 4 – Risk Characterisation	Examines how well the data support conclusions about the nature and extent of the risk from exposure to environmental stressors. A risk characterisation conveys the risk assessor's judgement as to the nature and presence or absence of risks, along with information about how the risk was assessed, and where assumptions and uncertainties still exist. (This includes cross-referencing with the other environmental chapters of this EIAR).
Note: Informed by USEPA	

6.2.7.1 Significance of Health Effects

The assessment of significance relates to the identification and assessment of potential human health effects on the community. It does not assess effects on an individual basis. It is recognised that some individuals may have a different response to effects than others, this might include potential vulnerable groups, such as the elderly, very young or the sick.

The EPA Revised Draft Guidelines on the information to be contained in Environmental Impact Statement (August 2017) states, *"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."*

The significance criteria to assess human health effects is defined in Table 6.2 (as per EPA revised Guidelines). The quality of impact (*positive, negative or neutral*), the

probability, duration and timing of effects that are used to qualify the type of human health impact are defined in Table 6.5.

Table 6.5 Criteria Used in the Assessment of Human Health Impacts (adapted from the EPA)

Impact Level	Significance Criteria
Imperceptible	An effect capable of measurement but without significant human health consequences.
Not significant	An effect which causes noticeable changes in the character of the environment without affecting the community human health sensitivities.
Slight	A slight/ small effect which causes noticeable changes in the reported symptoms of the population without affecting the community human health sensitivities (morbidity or mortality).
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging community's human health baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment affecting human health (morbidity or mortality).
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters **most o**f a sensitive aspect of the environment affecting the community's human health (morbidity or mortality).
Profound	An effect which changes a sensitive characteristic of the environment that profoundly affects the human health status of the community.

6.2.7.2 Health Based Standards

Health based standards are set by bodies such as the WHO and the European Union (EU). The standards are environmental health thresholds set for a range of environmental parameters to ensure no adverse health effects on the most vulnerable in society. For example, air quality and noise levels are set at levels to protect the vulnerable, not the robust (see Chapter 12 Noise and Vibration and Chapter 13 Air Quality and Climate of this EIAR for the relevant standards). These standards are set to ensure scientific analysis (i.e. modelling) is undertaken on the baseline environment which includes an analysis of the likely changes in the receiving/baseline environment as a result of the proposed development to predict potential human health effects. This results in a level of certainty in relation to the potential effects (positive or negative) before a project is developed. This scientific analysis provides decision makers with a clear methodology outlining what information was used, data gaps and any assumptions that were made in order to provide a comprehensive assessment of impacts on human health.

Regardless of the methodology, psychological effects or well-being effects are difficult to measure as these effects are more subjective in nature. It must also be recognised that there are uncertainties in relation to assessing impacts on individuals due to availability of health data about individuals and the difficulty in predicting effects on individuals, which could be based on a variety of assumptions. Subsequently, the existing receiving environment and relevant health-based standards assessment are relied upon to arrive at conclusions relating to likely human health effects.

6.2.7.3 Identification of Vulnerable Groups

The population baseline characteristics or the community profile is required to inform the assessment of proposed development on human health and this informs the identification of potential vulnerable groups in the environment. Children and

adolescents constitute a vulnerable group as they lack the experience and judgement displayed by adults. Studies also show that they may be more sensitive than adults to noise and air pollution and other environmental impacts.

Older people also constitute a vulnerable group, but this can vary depending on a number of factors including level of income, education, deprivation and individual preferences or genetics. However, an assumption can be made that older populations move slower than their younger counterparts, particularly when moving around in traffic and public places. Older persons are also more vulnerable to health conditions than their younger counterparts. Ease of access to medical and community facilities become very important in maintaining health and quality of life outcomes for all cohorts. Vulnerable groups in general have greater sensitivity to air pollution and potential effects on the respiratory system and cardiovascular system. There are many reasons for this, including the possible presence of other medical conditions such as respiratory or cardiovascular disease. Some subtle changes in the environment have the potential to have an adverse effect that would not be experienced by a younger more resilient person. Other vulnerable groups also include the mobility impaired or psychologically ill.

6.2.7.4 Hazard Identification

Human health impacts related to new developments can arise as a result of a variety of factors and interactions across environmental receptors e.g. incompatible land use changes, traffic accidents or safety issues, air and noise pollution, impacts on water quality, flooding, etc. which have the potential to cause a threat to the human health of populations and the wider environment. Therefore, all aspects of the environment influence human health to some degree or another.

A literature review was performed by Barton, H. and Grant, M. which identified recognised determinants of health and well-being in our neighbourhoods. The determinants of health and wellbeing are recognised as being complex and can be determined by a variety of social, environmental and economic factors, illustrated in Plate 6.2.

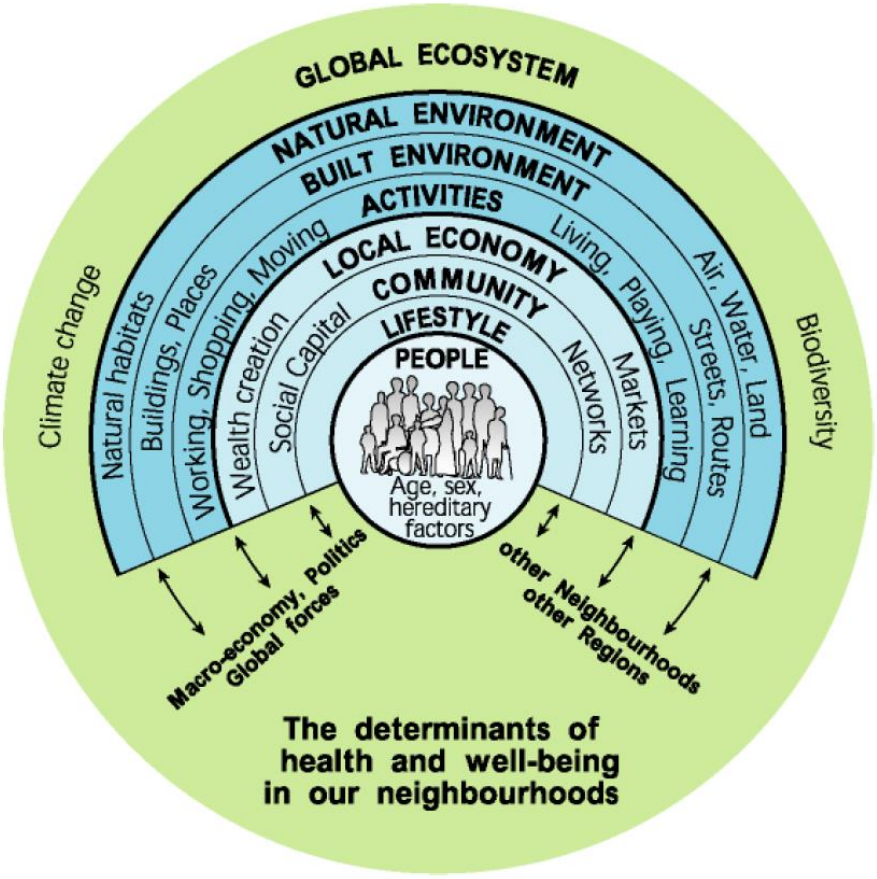

Plate 6.2 **The determinants of Health and well-being in our neighbourhoods (Barton, H. and Grant, M. 2006)**

Plate 6.2 illustrates the various potential influencers on health and well-being of neighbourhoods from a local to global level. It shows the individual or person at the centre whereby health can be influenced by age, sex, hereditary factors. The first three spheres are based around lifestyle factors such as; diet, exercise, social cohesion or community connectedness, availability or access to social services, and the local economy i.e. availability of money, employment etc. that can influence the support and maintenance of health. The next three spheres indicate that health determinants can be influenced by the built and natural environment which includes development process. The planning and design of the natural and built environment can influence how and where patterns of activity occur i.e. where/ how people live, work and recreate, etc. The next sphere is the influence that the global environment can have on our health such as the influence of climate change (flooding, extreme weather events affecting biodiversity or availability of food, etc), the impact of global political instability or war that can also impact on health outcomes.

A review from similar projects elsewhere identifies that there are four main hazards to human health that can be classified under physical, psychosocial, chemical and biological hazards and are summarised in Table 6.6.

Table 6.6 Four Main Hazards to Human Health

Physical Hazards	Psychosocial Hazards	Chemical Hazards	Biological Hazards
The main physical hazards identified are: • Noise (including nuisance/ disturbance, noise induced hearing impairment, interference with speech communication, sleep disturbance, hypertension and cardiovascular disease), • Vibration (including nuisance) • Air quality (including construction dust, carbon monoxide, fine particles, etc.), • Water quality (including effects due to contaminated land); • Soils (contamination of land); • Traffic – including collisions, injuries or worst-case fatalities); • Other physical hazards e.g. radon	The main hazards identified include: • Nuisance • Anti-social behaviour • Suicide	The main hazards identified include: • Heavy metals, • Contaminants.	The main biological hazards identified are: • Surface water and ground water (including water contamination) • Aspergillus (A fungi with potential for human health impacts) • Rodent-borne diseases e.g. Leptospirosis

6.2.7.5 Impact of Emissions to Air

Air quality is generally classified as good in Ireland. However, traffic is a key pressure on air quality and is the main cause of air quality problems in our larger towns and cities (EPA, 2016). Vehicles emit a range of air pollutants including nitrogen oxides (NOx), particulate matter (PM10 and PM2.5), black carbon and volatile organic compounds (VOCs) particularly present in urban areas and areas with high congestion levels. There are significant human health impacts from particulate matter (PM) and nitrogen oxides (NOx) emissions, which include cardiovascular disease, lung disease and heart attacks (EPA, 2015).

National standards for ambient air pollutants in Ireland have generally ensued from Council Directives enacted in the EU. In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Chapter 13, Table 13.1 and Appendix 13.1 Ambient Air Quality Standards of this EIAR). The Institute of Air Quality Management (IAQM) guidelines (IAQM 2014) for assessing the impact of dust emissions from construction and demolition activities based on the scale and nature of the works and the sensitivity of the area to dust impacts have been used in this assessment.

Asbestos

The term "asbestos" designates a group of naturally occurring fibrous serpentine amphibole minerals with current or historical commercial usefulness due to their extraordinary tensile strength, poor heat conduction and relative resistance to chemical attack. The principal varieties of asbestos are chrysotile, a serpentine material, and crocidolite, amosite, anthophyllite, tremolite and actinolite, which are amphiboles. According to the WHO "exposure to asbestos, including chrysotile, causes cancer of

the lung, larynx and ovary, mesothelioma (a cancer of the pleural and peritoneal linings) and asbestosis (fibrosis of the lungs)" (WHO, 2014).

"Exposure to asbestos occurs through inhalation of fibres in air in the working environment, ambient air in the vicinity of point sources such as factories handling asbestos, or indoor air in housing and buildings containing friable (crumbly) asbestos materials (WHO, 2014)". The WHO go on to state that "*Exposure to asbestos, including chrysotile, causes cancer of the lung, larynx and ovary, mesothelioma (a cancer of the pleural and peritoneal linings) and asbestosis (fibrosis of the lungs)."*

The Health and Safety Authority (HSA, 2013) states that there are a number of determining factors to individuals developing an asbestos related disease, these include:

- **Asbestos type** (blue, brown or white);
- **Age** at first exposure (likelihood increases if exposure start young). The younger people are when they inhale asbestos, the more likely they are to develop mesothelioma;
- **Dose** (or number of fibres inhaled) **and duration of each exposure**, i.e. the more you are exposed to asbestos and the more fibres that enter your body, the more likely you are to develop asbestos related problems. While there is no "safe level" of asbestos exposure, people who are exposed more frequently over a long period of time are more at risk; and
- **Smoking** The Health and Safety Authority state, *"a smoker who inhales asbestos is fifty times more likely to develop lung cancer than a non-smoker who has not been exposed to asbestos."*

Bernstein et al (2013) report that studies have shown that *"low exposures to chrysotile do not present a detectable risk to health. Since total dose over time decides the likelihood of disease occurrence and progression, they also suggest that the risk of an adverse outcome may be low with even high exposures experienced over a short duration."*

6.2.7.6 Impact of Noise and Vibration Emissions

Noise

Noise is measured using the standard decibel scale (dB). An increase in 3dB means a doubling of the sound intensity in energy terms. However, the human ear does not normally perceive this degree of increase in volume. Normally, a 10dB increase in noise levels equates to a subjective doubling in audible sound.

According to the WHO, noise is the second greatest environmental cause of health problems, after air quality. Excessive noise can seriously harm human health, affect mental health and people's daily activities including in sensitive receptors such as residential properties, schools, workplace and during amenity or leisure time. EPA, 2016 states that "*noise can disturb sleep, cause cardiovascular and psychophysiological effects, reduce performance and provoke annoyance responses and changes in social behaviour".*

EPA, 2016 also states that "*a study commissioned by the European Commission on the health implications of road, railway and aircraft noise in the European Union (RIVM, 2014) found that exposure to noise in Europe contributes to:*

- *about 910,000 additional prevalent cases of hypertension;*
- *43,000 hospital admissions per year;*

- *at least 10,000 premature deaths per year related to coronary heart disease and stroke*."

The assessment and management of noise from the infrastructural transport sources (roads, rail, and airports) are governed by the Environmental Noise Directive and associated 2006 Environmental Noise Regulations (S.I. 140 of 2006). A detailed methodology relating to the assessment of noise and vibration impacts is set out in Chapter 12 Noise and Vibration of this EIAR. There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project.

In lieu of statutory guidance, an assessment of significance has been undertaken as per Transport Infrastructure Ireland (TII), *Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes* – 2014 and British Standard *BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Noise.*

The approach adopted calls for the designation of a noise sensitive location into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a significant noise impact is associated with the construction activities.

BS 5228-1:2009+A1:2014 sets out guidance on permissible noise levels relative to the existing noise environment. Table 6.7 is replicated from Chapter 12 Noise and Vibration of this EIAR and sets out the values which, when exceeded, signify a significant effect at the façades of residential receptors.

Table 6.7 Example Threshold of Potential Significant Effect at Dwellings

Assessment category and threshold value period	Threshold value, in decibels (dB) ($L_{Aeq, T}$)		
	Category A[A]	Category B[B]	Category C[C]
Night-time (23:00 to 07:00hrs)	45	50	55
Evenings and weekends [D]	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
NOTE 1 A significant effect has been deemed to occur if the total L_{Aeq} noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level. *NOTE 2 If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L_{Aeq} noise level for the period increases by more than 3 dB due to construction activity.* *NOTE 3 Applied to residential receptors only.*			
A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values. B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values. C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values. D) 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.			

During the assessment period (i.e. daytime in this instance) the ambient noise level is determined through a logarithmic averaging of the measurements for each location and then rounded to the nearest 5dB. If the construction noise exceeds the appropriate category value, then a significant effect is deemed to occur.

Table 6.8 presents the Design Manual Roads Bridges (2011) likely impacts associated with change in traffic noise level. The corresponding significance of impact presented in the '*EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EIAR)' Draft, August 2017 is presented alongside this for consistency in wording and terminology for the assessment of impact significance.

Table 6.8 Likely Impact Associated with Change in Traffic Noise Level

Change in Sound Level DMRB, 2011 (dB L_{A10})	Subjective Reaction DMRB, 2011	Impact Guidelines for Noise Impact Assessment Significance (Institute of Acoustics)	Impact Guidelines on the Information to be contained in EIAR (EPA)
0	No change	None	Imperceptible
0.1 – 2.9	Barely perceptible	Minor	Not Significant
3.0 – 4.9	Noticeable	Moderate	Slight, Moderate
5.0 – 9.9	Up to a doubling or halving of loudness	Substantial	Significant
10.0 or more	More than a doubling or halving of loudness	Major	Very Significant

The criteria in Table 6.8 above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.
What determines the noise level significance is the amount of the exceedance. The other factor that needs to be considered is the baseline. If the change from the current baseline is 3dB or less, even if the absolute levels are above 55dB the change is likely to be imperceptible.

It is assumed that average noise levels in a building with windows open will be at least an estimated 15dB less than outside. Average sound inside a building with the windows closed can be greater than 35dB, depending on the building fabric. Accordingly, the attenuation can vary depending on the size of windows, building type and other factors. The potential health impacts due to noise include:

- Noise-induced hearing impairment;
- Interference with speech communication;
- Disturbance at schools;
- Sleep disturbance; and
- Hypertension and cardiovascular disease.

In terms of the health effects of environmental noise, there is some limited evidence of effects on blood pressure, cardiovascular risk, school performance and in relation to sleep disturbance. Any effects demonstrated are more likely at higher noise levels. Many effects are only demonstrated with ambient noise in excess of 70dB. Whilst noise levels are often quoted with respect to potential effects on health and they are used in the significance assessment, it should be noted that the differences in significance between the different levels are relative rather than absolute.

Vibration

People can generally perceive vibration at levels which are substantially lower than those required to cause building damage. The human body is most sensitive to vibration in the vertical direction. The effect of vibration on humans is guided *by BS 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings.* This standard does not give guidance on the limit of perceptibility, but it is generally accepted that vibration becomes perceptible at levels of approximately 0.15 to 0.3 mms^{-1}.

Vibration has the potential to have health effects when perceptible. These could include, for example, sleep disturbance. Another issue which is sometimes described is infrasound. The latter is sound but at a frequency so low that it is not audible to the human ear. If at high levels it may be perceived as vibration. These effects, in relation to vibration and infrasound, however, only occur when the levels are high and perceptible to human beings for example an underground train.

6.2.7.7 Impact of Emissions to Hydrology and Hydrogeology

Emissions standards and pathways that affect human health relating to hydrology and hydrogeology include water quality and flood risk. From a human health perspective these pathways are discussed below.

Water quality

Construction and operational (fuel spillages, etc) activities pose a risk to watercourses, particularly contaminated surface water runoff from construction activities entering the watercourse. Impacts to sources of drinking water are also sensitive and should be considered as part a human health issue in this context.

Flood Risk

Hydraulic structures such as bridges, culverts, channel diversions and outfalls can, if not appropriately designed, impact negatively on upstream water levels and downstream flows.

6.2.7.8 Psychosocial Impacts

Consideration of likely negative psychosocial hazards relating to new developments include nuisance, anti-social behaviour and suicide. On the contrary, there could also be positive psychosocial impacts on the community due to improved connectivity, particularly for pedestrians and cyclists and as a result of regeneration associated with land use changes and increased economic prosperity.

Demolition and property acquisition can also have impact on both the occupants themselves but also at community level due to impact on community ties and amenity of residents, local economy, etc.

6.3 Description of Receiving Environment

6.3.1 Introduction

The proposed development comprises a mixed-use development that will provide office, hotel, residential, car parking, cultural centre and small-scale retail uses in Wexford Town. The development will comprise a number of buildings, with an internal shared access route for cars, pedestrians and cyclists. A footbridge / cycleway will connect the northern corner of the site to Paul Quay, providing pedestrian and cycleway access to Wexford Town. A new marina, located to the north of Trinity Wharf, will provide space for approximately 64 berths.

The development is proposed to be undertaken in a number of phases as outlined in Chapter 4 Description of the Proposed Development of this EIAR and will be constructed over the course of approximately 80 months. An accurate assessment of the receiving environment is necessary to predict the likely significance of the impacts of the proposed development. The following paragraphs present an overview of the context, character, significance and identifies the types of population and human health receptors that could be sensitive to the proposed development within the study area.

Context

The proposed development is located on lands known as Trinity Wharf in Wexford Town, adjoining Wexford Harbour. The brownfield site is situated at the southern end of Wexford's Quays and comprises 3.6 ha. Wexford Town is identified as a 'key town' in the Draft South East Regional Spatial and Economic Plans (Draft SE RSES (2018)). The strategic location of Wexford Town in relation to Rosslare Europort has been identified as one part of the Wexford - Rosslare Europort change location, where the development of Rosslare and access routes to the port will be of national strategic importance for the state, particularly post Brexit.

Character

Wexford Town itself has a rich, historical and maritime past with an attractive coastal influence. The site of the proposed development and wider area was historically used for a mix of commercial uses, factories and as a fishing harbour interspersed with a network of residential streets which were home to local workers. It was a colourful and vibrant area where people lived and worked. When these traditional industries closed (including the harbour and factory on the proposed subject site), service related businesses gravitated towards more central areas and larger commercial developments towards greenfield sites and outer business parks. The relative vibrancy of the area was diminished, and the beginnings of dereliction and vacancy became apparent.

At the same time there was a movement of young families to the newly developed suburbs facilitated by increased car ownership. Residential vacancy has become an issue in the area 95 of the 549 housing units in the five Small Areas (SA) in and adjoining the site are vacant. The area also suffers from disadvantage. The haase-pratschke (HP) Deprivation Index for the SA within which the site is located is -10 (compared to the State 0.06). The SA adjoining the site SA to the south has a score of -26. The site itself, since its dereliction, has been subject to a level of anti-social activity and environmental degradation.

Significance

Wexford is the principal town in County Wexford and is identified as a 'key town' in the Draft South East RSES in the South East region. In the 2016 Census, Wexford Town had a population of 20,188 which represented a very small increase (116 persons) since the 2011 census period. It is a regional centre of focus for education, retail, health and public services. Wexford is an important base for tourists and is located in 'Ireland's Ancient East'. The town has a vibrant arts and cultural sector with the National Opera House and Wexford Arts Centre located in the town. It also hosts various annual festivals. It has many attractive and extensive beaches and unparalleled coastal landscapes.

The National Spatial Strategy designated Wexford town and Kilkenny town as 'hub' towns to support Waterford City 'Gateway', forming a national 'growth triangle' in the

South East region. The continued development of Wexford Town will, in turn, seek to energise smaller towns and rural areas within its influence and is of strategic importance to the development of the South East region. This site of the proposed development is recognised as a strategic opportunity site in Wexford Town Development Plan 2013-2019. Therefore, the site is deemed to be a significant and important site in the development and regeneration of the town.

Sensitivity

The proposed development is located on a brownfield site in an existing urban environment with a long history of industrial and manufacturing development. The surrounding land uses are mainly retail warehousing deemed to have a low sensitivity to land use change. There are also low-density residential properties located on Trinity Street. Furthermore, these properties are influenced by traffic, air and noise emissions due to their urban location. Therefore, they are deemed to have a moderate sensitivity to change and would be capable of absorbing changes due to their urban location. The neighbouring residential and economic operators are likely to be the most sensitive receptors in the area together with Wexford Harbour's marine environment which is a sensitive ecological and amenity area. It is considered that due to the location of the site, previous land uses and current urban forces acting on the area i.e. traffic consistent with an urban environment the site has a low sensitivity to change.

6.3.2 Land Use and Social Considerations

The proposed development is comprised of two distinct land use areas:

- Wexford Harbour marine environment, which is a navigational channel and source of recreational, ecological, amenity and economic value; and
- 3.6 ha of a brownfield site known as Trinity Wharf.

The 3.6 ha reclaimed land site was the location of a range of industrial/ manufacturing related land uses dating back from the 1800s. It has been disused since 2001 following the closure of a manufacturing business and is now a vacant site, partly overgrown with most of the former structures demolished.

The land uses adjoining the site include Wexford Harbour marine environment along the west, north and eastern boundaries. The northern and eastern boundary of the site is Wexford Harbour marina environment which is primarily used as a navigational channel. Goodtide Harbour is located approximately 50m south of the site and is an area where small leisure craft can moor haphazardly along the coast. Wexford Harbour itself is located approximately north west of the site.

The southwestern boundary is bounded by the Dublin to Rosslare railway line running in a north-south direction along the site's south-western boundary. Retail warehousing adjoins the site and a number of residential dwellings which line Trinity Street also run in a north-south direction.

There is currently no permissible pedestrian access into the site and no public rights of way. However, there have been reports of anti-social behaviour occurring within the site of the proposed development. The site is currently fenced off from all access.

The need for the development is in order to revitalise Wexford Town, support the growing need for high-quality mixed-use development, particularly in the growing office, commercial, residential and tourism sectors and provide a stimulus to the existing and future economic development in Wexford Town.

There is an existing wayleave between Trinity Street and the Trinity Wharf site at the existing level crossing.

6.3.3 Planning Policy Overview

The policy review in Chapter 2 of this EIAR has shown that the proposed development aligns with national, regional and local planning policy. This section provides an overview of the key planning and land use considerations and how planning policy is likely to influence existing and future land use and social considerations in the area.

At a strategic level national planning policy is directed by the National Planning Framework which was published in 2018. The National Planning Framework aims to regenerate existing cities and towns and encourage sustainable development and job creation across the regions. The Draft South Eastern RSES identifies Wexford Town as a "key town" in the hierarchy of settlements and recognises that it has a wide zone of influence. It also states that "key infrastructure requirements" include "investment to support development of Trinity Wharf as a Strategic Employment Location."

The development land use zoning map is included in Figure 2.1 in Volume 3 of this EIAR. The site is included within a large area zoned for 'town centre' uses of which the proposed land uses are consistent. The area is also adjoining an ecological designated and sensitive area; the Wexford Harbour and Slobs Special Protection Area (SPA) and Slaney River Valley Special Area of Conservation (SAC).

6.3.4 Population

The CSO census 2016 reported that the total population of County Wexford has increased by 3% from 145,320 in 2011 to 149,722 in 2016. In 2016, Wexford Town had 20,188 persons representing only an increase of 113 persons since the 2011 census. The total population in the ED of Wexford No. 2 Urban, the location of the proposed development was 4,087, of which males numbered 2,025 and females were 2,062.

The Draft SE RSES (2018) population projections for County Wexford indicate that the county will increase from 149,000 persons in 2016 to between 169,000-172,500 persons to 2031, a projected increase of between 20,000-31,000 persons over a 15 year period in 2031. Wexford Town is identified as a key settlement that has substantial existing supporting infrastructure and as such is well placed to attract additional population in a sustainable manner. The proposed development is aimed at making Wexford Town and this area of Wexford Town more attractive to investors and as a place to live, work and visit.

Wexford Town urban area is made up of three EDs, namely; Wexford No. 1 Urban; Wexford No. 2 Urban and Wexford No. 3 Urban (Refer to Figure 6.1 Volume 3 of this EIAR). The proposed development is located in Wexford No.2 Urban, census 2016 report that this area had a population of 4,126 persons in 2016 and a deprivation score of -11.3. This was the highest deprivation rate of the three Wexford Town EDs in 2016.

Table 6.9 Population Change in the Study Area (Census, 2016, 2011)

Electoral Division in Study Area	Population 2016	Population 2011	% change 2011-2016
EDs within 500m			
Wexford No.2 Urban	4,079	4,126	-0.01%
Wexford No.1 Urban	1,613	1,581	0.04%

Electoral Division in Study Area	Population 2016	Population 2011	% change 2011-2016
Wexford Rural (pt.)	12,505	12,085	0.04%
Wexford No.3 Urban	1,243	1,321	0.01%
EDs within 1km			
Ardcavan	2,841	2,758	0.06%
County			
Wexford Town	20,188	20,072	0.06%
Wexford County	149,722	145,320	3%

Table 6.9 above demonstrates that significant population increases have primarily been experienced in the rural ED outside of Wexford Town's urban areas. Wexford No.2 Urban (site of the proposed development) declined by -0.01% with Wexford No.1 Urban only increasing by 0.04%. Consistent and significant population increases have occurred in areas outside Wexford Town such as in Ardcavan ED. This a trend that is representative of the national situation, with declining populations in existing urban areas. It also emphasises the need to support the regeneration of existing urban environments in order to capitalise on existing infrastructure costs and create attractive environments for people to live and work.

6.3.4.1 Age Profile and Dependency Ratio

Wexford Town has a relatively equal age distribution across the age bands from the ages 0 to 65 years of age. 13% of the population is between the age of 0-9, 12% is between 10 to 19 years of age, 20% is between 20-34 years of age, 22% are aged between 35-39 years of age and 18% are aged between 50 and 64. 15% are aged 65 to 84 years, with only 2% aged 85 or over. This illustrates that 65% of the population (19 – 65 years of age) are of working age according to census 2016.

The average age in Wexford was 38.1 in 2016 which is up from 36.5 in 2011. The average age of the population of the State in 2016 was 37.4 which is up from 36.1 in 2011. This is a rise of 1.3 years. People in Ireland and western society in general are living longer lives.

The age dependency ratio is the age population ratio of those typically not in the labour force (0-14 and 65+) and those typically in the labour force (15-64). It indicates the pressure on the productive population to support services for younger and older age cohorts. Wexford County Council's demographic profile, based on census 2016 and AIRO data, reports that the youth dependency ratio is 28.9 lower than the national average of 32.3. The old dependency ratio is 25.1 significantly higher than the state average of 20.4. This indicates that there is a significant proportion of the population dependant of all ages (young and old).

Pobal data from census 2016 indicates that the age dependency ratio for the Wexford Urban No.2 is high at 33.41 (for all ages) in 2016. This is an increase from the 2011 census figure of 32.84. This indicates that there is currently pressure, and a higher potential for pressure to occur, on the productive population to support the younger and older age groups both now and in the future. It also suggests that there will be increased need for, and pressure on, a range of services including medical, educational and amenity services that will be required to serve the needs of the population.

6.3.5 Households and Household Formation, Vacancy

Census 2016 revealed that the national average number of persons per household recorded an increase for the first time since 1966 with an average of 2.75 persons per household in 2016. This is an increase from the average 2.73 persons per households in 2011.

In 2016, the total number of housing stock was 8,030 private households, of which vacant households (excluding holiday homes) was 990 (CSO, 2016b) in Wexford Town. Of this, 1,757 houses are in Wexford No. 2 Urban of which vacant households (excluding holiday homes) numbered 346 (CSO, 2016a).

The majority of the housing stock in Wexford Town are houses/ bungalows (7,002 units). The next largest type are flat/ apartments (917 units) according to CSO, 2016b. Most of the housing stock ranges between 4 rooms and 6 room properties (total of 4,922 households), indicating that there is likely to be a need to accommodate the smaller households' sizes (2.75) such as what is proposed in the proposed development (1, 2 and 3 bed apartments). There were 167 unoccupied holiday homes in Wexford Town on census night 2016. Holiday homes make up 9.7% (6,629) of the total housing stock in County Wexford.

The number of households built in the years 2001 to 2010 in Wexford Town was 1,810. Over the same period, 17,414 units were built across County Wexford which represents 32.2% of the total households. This rate is higher than the State (25.4%), the Southern RA (25.7%) and South-East SPA (28.6%) averages according to AIRO, 2018. A significant portion of the housing stock in Wexford Town was built between 1980 and 2010 (3,999 units), with only 91 housing units built between 2011 or later (Census, 2016). This signifies that there is likely to be a demand for modern housing stock that caters to the needs of the changing populations needs i.e. smaller household sizes.

However, in contrast there is a high vacancy rate in Wexford Town with 35% of the stock in long-term vacancy in 2016. 37.3% of these were detached houses (AIRO, 2018). County Wexford had a vacancy rate of 8.7% which is marginally below the State average of 9.1% (Census 2016).

Wexford Town has 2,806 households with no mortgage, 1,104 households are private rented local authority housing. Approximately 36% of the households (2,929) are rented accommodation, either rented from a private landlord and local authority or voluntary body (Census, 2016b).

The Wexford County Development Plan 2013-209 states there is a requirement of 6,609 households during the lifetime of the County Development Plan 2013-2019. The Draft RSES indicated that there will be continued population increases in the South East region up to 2031 and developments such as the one proposed are aimed at regenerating existing settlements and ensuring Wexford Town receives investment and the appropriate employment opportunities that would attract people to live and work in existing urban centres such as Wexford Town.

6.3.6 Education

Wexford Town has 14,106 persons aged 15 years and over whose education has ceased. The majority of this cohort have attained primary and secondary education, 880 persons in Wexford Town have attained postgraduate Diploma or Degree with a further 69 persons attaining a Doctorate (Ph.D) or higher form of education (CSO, 2016b). There were 1,381 persons aged 15 years and over still at school or college

and 916 persons in some other form of education in Wexford Town (CSO, 2016b). Within the Wexford Urban No. 2 ED, 2,992 of the population aged 15 years education has ceased. 287 people (aged 15 years and over) are still in school or college and 210 persons are in some other form of education. The most common level of education is that of lower secondary level (23%), whilst a further 20% have attained upper secondary level of education. 5% of Wexford Urban No. 2 ED have attained an ordinary bachelor's degree or national diploma whilst 6% have attained an honours bachelor degree (CSO, 2016a).

6.3.7 Community Infrastructure

Community infrastructure can include a range of physical, social and economic infrastructure. It can comprise of places where people can relax and enjoy public spaces such as parks or walking paths. There are a wide range of community and social services available in Wexford Town and its environs. These include educational and religious facilities as well other community facilities such as medical centres, youth clubs and sport centres.

Within close proximity to the site includes: Abacus Montessori School which is located approximately 300m west of the site. St. John of God School, Curran medical centre and South End Family Resource Centre are located approximately 200m west of the site. There are also a range of hotels, B&Bs and guesthouses located in the area. Wexford Garda Station is located approximately 500m west. Wexford Opera House, Wexford Harbour and Paul Quay car park are also located north west within 500m of the site and are deemed to be significant community infrastructure. Other notable land uses in the area include Tesco and Aldi retail services and various carparks in the area including Paul Quay car park. Significant social and community facilities are illustrated in Plate 6.3 below and Figure 6.2 of Volume 3 of this EIAR.

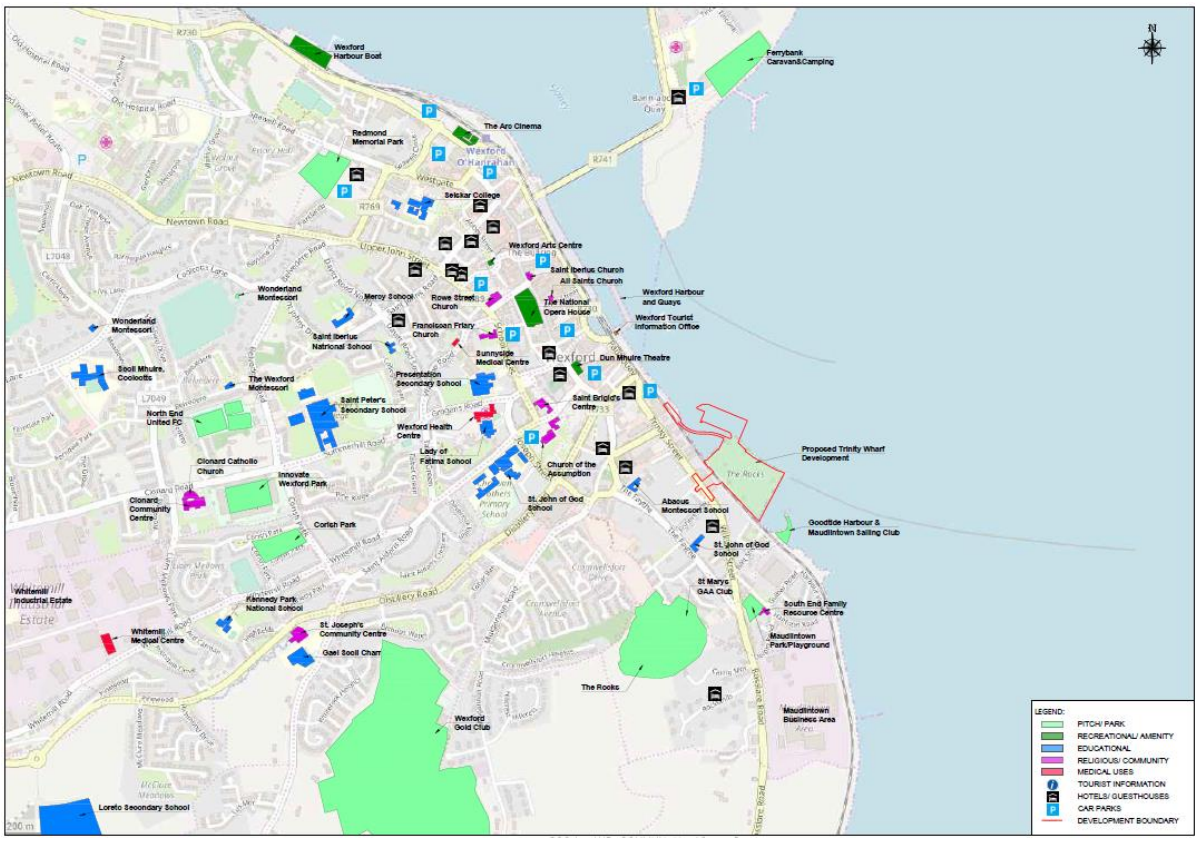

Plate 6.3 Social and Community Facilities within Study Area

Educational Facilities

A significant part of the local community infrastructure is educational facilities. These vary in Wexford Town from early education to third level education i.e. IT Carlow's Wexford Campus is located approximately 1.6km away from the proposed development. The following educational facilities exist within 500m of the proposed development:

- St John of God School; and
- Abacus Montessori School.

The following education facilities exist within the wider study area:

- St Brigid's Community Playgroup (500m);
- Naionra Irish Pre School (1km);
- Lady of Fatima School (700m);
- CBS Primary School (770m);
- Wexford CBS Secondary School (500m); and
- Presentation Secondary School (790m).

Outside of the study area:

- County Wexford School of Music (1.2km)
- Wexford Campus IT Carlow (1.2km)
- Mercy school (1.2km)
- Saint Peter's College Secondary School (1.3km)
- Kennedy Park National School (1.7km) Loreto Secondary School (2km)
- Educate together (2km)

Transport Infrastructure

Transport facilities are also considered important community infrastructure. The Fisher's Row bus stop is located 55m south of the proposed access on Trinity Street and is served by the WX1 bus route, servicing Clonard Village to Drinagh Business Park. The Trinity Street bus stop is located 270m north of the proposed site access and is served by a number of bus routes locally and regionally detailed in Chapter 5 Traffic Analysis of this EIAR. Within 1.5km or an 18 minute walk is Wexford (O'Hanrahan) Train Station and Wexford bus station which services Rosslare Europort and Dublin among other routes. Although there are cycle lanes provided on both sides of the Rosslare Road for 2.5km, there are no dedicated cycle facilities along Trinity Street (refer to Chapter 5 of this EIAR). There are two existing marinas to the north of Wexford in Arklow and Greystones and two existing marinas to the west of Wexford in Kilmore Quay and New Ross. Wexford Harbour is also considered to be a significant transport infrastructure and is used on a commercial basis by local fishing vessels. It is also considered to be a key public amenity for residents and visitors to Wexford Town.

There is a wide variety and availability of existing transport infrastructure and services located within close proximity to the proposed development (walking, cycling, bus and rail services) as described in this section and Chapter 5 of this EIAR. The availability and choice of transport modes supports the principles of sustainable land use and travel patterns. The proposed development will also facilitate improvements in

transport infrastructure, particularly for walking, cycling and mariners as a result of the integrated nature of the site layout, construction of a new boardwalk structure and the marina development and connectivity to wider infrastructure across the area.

6.3.8 Economic Activity

According to Census 2016, County Wexford is home to 3.1% of the population of the State but 4.5% of those are on the Live Register. Census 2016 shows that Wexford had the fifth highest rate of unemployment in the country. The South East Economic Monitor (Waterford Institute of Technology (WIT) July 2018) states that Wexford receives less than its fair share of Industrial Development Agency (IDA) jobs. "*From 2011-16 the IDA created 51,793 net jobs. Wexford accounted for a mere 0.47% of these net additional jobs despite being home to 3.14% of the Irish population and Wexford currently accounts for a mere 1.31% of IDA jobs*." It goes on to state that "*there is also evidence of low job quality as the returns for taxes on work (PAYE, USC, and self-employed taxes) in Wexford are 41% of what one would expect based on population share"* (WIT, 2018)

Census 2016 indicates that the distribution of socio-economic groups in Wexford Town is dominated by Managerial and Technical (4,605 persons) and "non-manual workers" (4091 persons). There is also nearly equal level of skilled manual workers and semi-skilled workers in the study area at; 2,833 and 2,760 respectively.

6.3.8.1 Employment

The labour force consists of those who are able to work i.e. those aged 15 and over and out of full-time education and performing duties that prevent them from working (e.g. carers). According to 2016 Census results, Wexford Town had a 58.5% labour force participation rate or 9,602 persons (AIRO,2018). 2016 Census reports the unemployment rate in County Wexford was 16.6% (11,478 persons out of a labour force of 69,237). The national average unemployment rate was 12.9%. In 2016, County Wexford had the fifth highest rate of unemployment in the country with 4.5% of those being on the Live Register.

Census figures for 2016 are provided in Table 6.10 below which provides a breakdown of the population employed in Wexford Urban No. 2 by social class. The majority of the workforce are engaged in 'Non-manual' work (24%), followed closely by those engaged in work under 'gainfully occupied and unknown' (20%).

Table 6.10 Persons in Private Households by Socio-economic Group of Reference Person

Socio-economic Group of Reference Person	Households	Persons	Percentage
A Employers and Managers	154	365	9%
B Higher Professional	48	98	2%
C Lower Professional	129	281	7%
D Non-manual	410	930	24%
E Manual skilled	167	409	10%
F Semi-skilled	237	575	15%
G Unskilled	153	339	9%
H Own account workers	63	133	3%
I Farmers	5	14	0.3%
J Agricultural Workers	5	13	0.3%

Z All others gainfully occupied and unknown	386	799	20%
Total	**1757**	**3956**	

Table 6.11 indicates that the majority of the workforce of Wexford Urban No. 2 are engaged in 'Other' industries (27%). The second largest industry is the 'Commerce and Trade' sector which engages 25% of the population, followed by 'Professional services' which accounts for 22% of the population. Only 4% are employed within the 'Building and construction' industry and it is likely that this number could increase during the construction stages of the proposed development.

According to Census 2016, the majority of Wexford Town's total persons employed was in the 'Commerce and Trade' industry at 25.7%, 'Professional Services' followed at 23.4%, 'Manufacturing Industries' was 10.7%, 'Public Administration' was 6.1%, 'Transport and Communications' was 5%, 'Building and Construction' was 5% with only 1% employed in 'Agriculture, Forestry and Fishing Industry' (AIRO, 2018). In contrast County Wexford has a higher than average dependency on the traditional industrial sectors when compared with the State average, i.e. the 'Agriculture, Forestry and Fishing' industry 7.5%, 'Building and Construction' (6.9%) and 'Manufacturing Industries' (12%) are all higher than the equivalent State average (AIRO,2018). Consequently, these figures would suggest that the population employed in these industries in the study area most likely reside in other settlements or in the town's rural hinterland.

Table 6.11 Persons at Work by Industry and Sex (Wexford Urban No. 2, Census 2016)

Industry	Male	Female	Total	Percentage
Agriculture, forestry and fishing	15	0	15	1%
Building and construction	58	5	63	4%
Manufacturing industries	126	30	156	10%
Commerce and trade	164	205	369	25%
Transport and communications	63	23	86	6%
Public administration	37	43	80	5%
Professional services	105	224	329	22%
Other	201	195	396	27%
Total	**769**	**725**	**1494**	**100%**

6.3.8.2 Unemployment

In 2016, at Social Welfare Office (SWO) level, Wexford Town (3,534) had the highest number of Live Register recipients in the County. Of the recipients aged under 25, Enniscorthy has the highest rate at 13.9% and Wexford had the lowest rate at 10.8%. The State average rate was 12.6%. (AIRO, 2018).

Analysis of Census data indicates that all three of the Wexford Urban EDs have high rates of unemployment. However, the location of the proposed development (Wexford No.2) had the highest levels of unemployment of the three EDs with a rate of 26.75. This figure has decreased significantly since the 2011 Census figure of 39.39% (Pobal, 2016).

6.3.8.3 Retail Activity

In terms of retail activity there are a number of mainly large-scale retail warehousing properties located close to the site on Trinity Street, these include McMahon Building

Suppliers, Trinity Motors (Land Rover and Range Rover motor sales), Meylers Tyres, Maxol Service Station (that sells fuel only by automated pumps) and Aldi. These properties are all located west of the site, within 20m -150m of the proposed development. There are a limited number of other commercial or retail units on Trinity Street with the area mainly characterised by residential uses or vacant properties.

Tesco Extra is located approximately 300m west of the site and the Talbot hotel is located approximately 300m from the site of the proposed development.

Wexford Town centre is located within 300m to 1km of the proposed development. The town centre itself has an attractive townscape of winding streets and a range of quality shops and retail offer with pedestrianised streets.

6.3.8.4 Tourism

Wexford is the geographic cornerstone of Fáilte Ireland's 'Ireland's Ancient East' and tourism is a significant contributor to Wexford's local economy. Failte Ireland (2016) report that Wexford experienced a 27% increase in tourism numbers and a 20% growth in revenue earned from tourism since 2013. Their report relates to 2015 figures and within that year 221,000 overseas tourists visited Wexford leaving an economic impact of €65 million. Additionally, there was a total of 679,000 domestic tourists visiting Wexford which had an economic impact of €140 million for the county.

The South East region attracted a total of 2,194,000 visitors in 2015, with Wexford accounting for 41% of this total number. Total revenue for the South East region in 2015 was €506 million, with Wexford earning 40% of this at €205 million. This highlighted just how important tourism is to the area.

Within Wexford Town, tourist attractions include Selskar Abbey, the National Opera House and Wexford Harbour. There are a number of supporting services within the area including hotels as discussed below, as well as award winning restaurants, a tourism office and public toilets.
There are a number of tourist attractions located further away from the town centre across the county. However, Wexford Town still reaps in the benefits of such attractions, due to the hotels on offer here in a central location facilitating ease of access to the rest of the county. The Talbot Hotel, Clayton White's Hotel and a number of Bed & Breakfasts accommodate tourists who visit elsewhere such as The Hook Lighthouse and Tintern Abbey as well as the numerous beaches such as Curracloe beach. It is likely that tourism will increase with the proposed development including a new hotel, a new marina and arts/ cultural space.

6.3.9 Human Health Profile

In census 2016, the majority of Wexford Town's population reported that they had very good or good health, 55% and 29% respectively. 2% stated that they had bad and/ or very bad health. Census 2016 indicates that there was a total of 3,658 persons with a disability and 796 carers in Wexford Town.

The Lenus profile 2015 for County Wexford was consulted in order to inform a human health profile for the area. The key facts for the area include:

- There was a high birth rate to females aged 20 and under. Rate per 1,000 of the population in Wexford was 16.7 versus nationally 12.3 between 2007-2012;
- Incidence rates for all cancers are lower or close to the national rate, except for female malignant melanoma which is highest nationally;
- Death rates for all causes and all ages are above the national average.

- Suicide rate of 15.9 is higher than the national rate of 11.3 (2007-2013); and
- Immunisation uptake at 24 months and measles mumps rubella (MMR) are higher than the national rates at 97%.

It also confirms that the county is marginally below affluence.

The highest rate of deaths per 100,000 for the four principal causes of death over the period 2007-2012 for all ages compared to Ireland are illustrated in Plate 6.4 below. From this it is clear to see that the highest rate of death is attributed to heart disease and stroke, followed by cancer and respiratory disease, injury and poisoning.

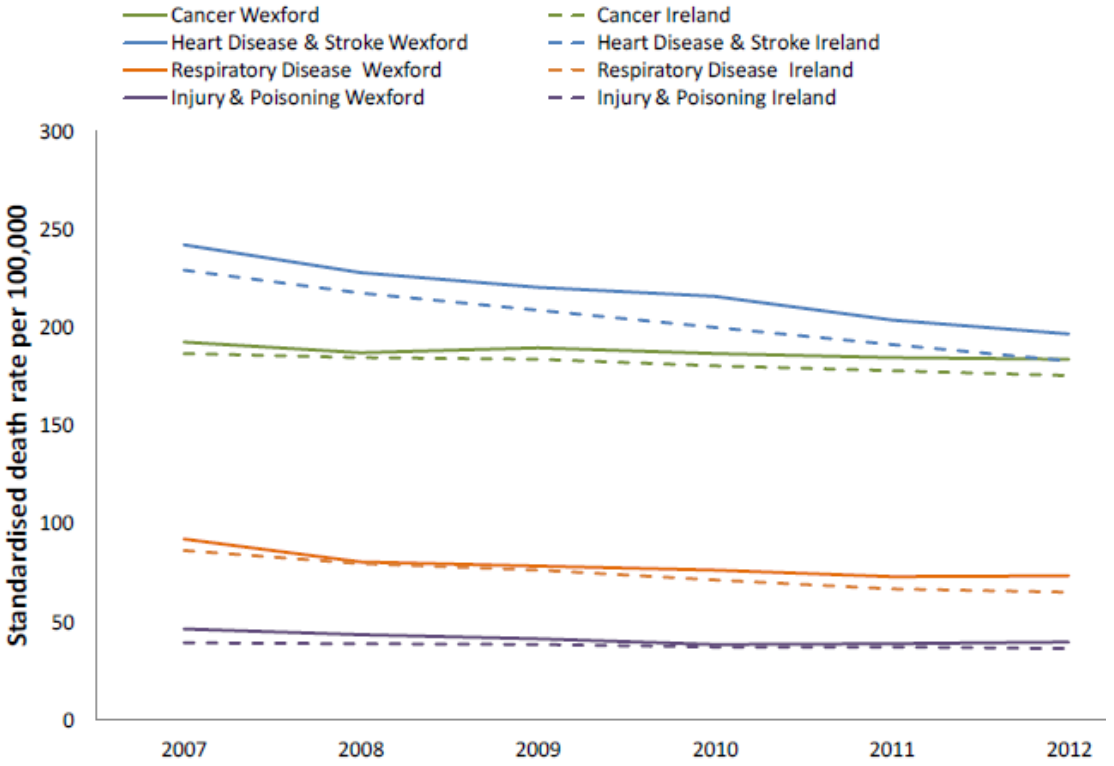

Plate 6.4 **The highest rate of deaths per 100,000 for the four principal causes of death over the period 2007-2012 for all ages compared to Ireland (Lenus, 2015)**

6.3.9.1 Levels of Deprivation

The HP deprivation index looks at geographical areas in order to measure the relative affluence or disadvantage of a particular geographical area. These are compiled from various census under 10 key indicators including the proportion of skilled professionals, education levels, employment levels, and single-parent households found in an area. This data is particularly useful in assessing predicted health outcomes. Overall, the South East region of Ireland is the second most disadvantaged region in the country.

Wexford Town is classified as predominantly 'marginally below average' with 'marginally above average affluence' areas located predominantly outside Wexford Town administrative boundary. As already stated, Wexford Urban No. 2 has a HP deprivation score of -11.29 significantly higher than the average deprivation score for the County which is -4.81. Wexford Urban No. 2 is classified as 'disadvantaged'. Wexford Urban No. 1 has a score of -7.19 and Wexford Urban No. 3 is -5.40.

6.3.9.2 Travel to Work, School or College

The 2016 CSO census Small Area Population Statistics (SAPS) was analysed for the settlement of Wexford to ascertain the modes of travel used when travelling to work. The Census data is detailed in Chapter 5 (*Plate 5.12: Travel Modes Chart – Settlement of Wexford).* This data shows a high dependency of single occupant vehicles as a mode of transport with 63% of people in Wexford Town driving to work by car or van while 5% travel as a passenger. The data shows 17% walk to work, 2% cycle and 2% use public transport. Further analysis of this data shows that journey times for the majority of the population is under 15 minutes. This data could correspond with national trends in high rates of private car use which could also be attributed to increasing sedentary lifestyles which can be attributed to health outcomes such as rising obesity levels nationally. The Road Safety Authority reports on collisions across Ireland. There has been a total of 3 collisions on Trinity Street and William Street Lower between 2005 and 2014, all of which were minor injury rear end collisions.

6.3.9.3 Noise Environment

Day time and evening time noise surveys were undertaken in two locations to inform this assessment and are detailed in Chapter 12 of this EIAR.

The Mean Value of the L_{Aeq} parameter is considered representative of the Ambient noise level under the measurement conditions. Details of the results and modelling are presented in Chapter 12 of this EIAR.

Mean day time ambient noise level (L_{Aeq}) from survey results ranged from between 50dB and to 53.5 L_{Aeq}.

The Value of the LAF90[1] parameter is considered representative of the background noise level under the measurement conditions. Mean LAF90 values ranged from 42.2 and 45.7 LAF90.

The noise level of a passing train event was measured as $L_{Aeq,\ 32sec}$ = 60.6dB.

According to the current Irish Rail schedule, there are 8 trains (arrivals and departures) from Monday to Friday during the day period and one during the night which departs from Rosslare at 05:35. There are 6 trains on Saturdays and Sundays during the day-period.

6.3.9.4 Air Quality

Air quality in the area of the proposed development is considered to be good. Air quality monitoring programmes have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality ("Air Quality Monitoring Annual Report 2016", EPA 2017) details the range and scope of monitoring undertaken throughout Ireland. Long term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions such as natural sources, industry and home heating etc. Chapter 13 of this EIAR details the results from this monitoring.

Contaminated Land

A Preliminary Asbestos Walkover Survey was undertaken by RSK Ireland Limited in October 2018 (refer to Appendix 8.1 of this EIAR). The assessment confirms the

[1] This is the A-weighted sound level that is exceeded for 90% of the sample period. Referred to the "background" noise level in some standards.

presence of Asbestos Containing Materials (ACMs) on the surface and near surface of the site. Seven samples representative of suspected ACMs were taken and five were confirmed by laboratory analysis as containing asbestos. Three of the positive samples were confirmed as asbestos cement (AC) and two were confirmed as asbestos floor tiles including bitumen adhesive, consistent with floor tiles, corrugated profile sheeting and rainwater materials that would have been used in the former buildings on site.

The bulk sample results confirm the presence of chrysotile in tile, bitumen and cement. The Health and Safety Authority state that "if ACMs are in good condition and left undisturbed it is unlikely that airborne asbestos will be released into the air and therefore the risk to health is extremely low. However, if the asbestos or ACM has deteriorated, been disturbed, or if asbestos-contaminated dust is present, the likelihood that airborne asbestos fibres will be released into the air is increased. If left alone and not disturbed, it will not generally pose a human health risk (HSA, 2013).

6.4 Description of Predicted Impacts

In accordance with the EPA Guidelines and the above methodology, the following sections provide an overview of the predicted impacts on:

- Land use and social considerations, including effects on general amenity, journey characteristics, journey amenity, severance;
- Economic activity including tourism e.g. employment and population including associated land use; and
- Human health, considered with reference to and interactions with other environmental receptors contained in corresponding chapters such as air, noise and traffic.

Likely or predicted significant impacts are split based on construction and operational phases under the headings above.

Do-Nothing Scenario

If the proposed development is not developed the site would become overgrown and result in underutilisation of a strategic town centre site. Residential and commercial properties may be adversely impacted due to poor visual impacts and potential for increased anti-social behaviour occurring on the site. Also, the presence of asbestos and remnants of former land uses would result in a continuation of a public health risk.

6.4.1 Construction Phase Impacts

Details of the construction methodology is included as part of Chapter 4 of this EIAR which has been relied on for this impact assessment and is not repeated here.

6.4.1.1 Land Use and Social Considerations

The proposed development has been designed to act as a stimulus to regenerate Wexford Town. The proposed development of the Trinity Wharf lands is consistent with national, regional and local planning policy, with the Wexford County Development Plan 2013-2019 and the Wexford Town and Environs Development Plan 2009-2015 (as extended), to harness the economic potential of the hub of Wexford Town, and in particular the Trinity Wharf site which has been identified as a Key Opportunity Site.

It will also serve to address a number of social issues such as high unemployment levels, and high levels of social deprivation within Wexford Town and particularly, and indirectly, antisocial behaviour through the direct provision of quality employment, by

opening up the area as a new modern quarter and through tailoring a use mix which will make it a more attractive and vibrant place for people to live, work and visit. Such vibrancy and new life will encourage take up of vacant premises in the wider area.

There are a number of residential and economic operators' properties located within close proximity (Trinity Street) to the proposed development. Construction activities may cause nuisance and disruption to these areas for the duration of the construction programme i.e. traffic, noise. While construction activities are likely to be confined to the Trinity Wharf site itself, the duration of the construction phase is an extensive period. To manage these changes and the 80-month construction phase a Stakeholder Management and Communication Plan will be developed by the successful works contractors to communicate planned activities/program and minimise disruption to stakeholders that may be affected by the construction activities.

Land Use

The site of the proposed development will be a substantial construction site for approximately 80 months. Construction activities are detailed in Chapter 4 (Table 4.3 of Chapter 4 includes the envisaged construction program). The large-scale visible land use changes will begin once the construction of the buildings commences. This will be undertaken as part of phases 2 and 3 of the programme. The public realm works and hard and soft landscaping will advance as each phase progress, ensuring an attractive environment and sense of place is created from the outset.

In the marine environment, land use change will include the construction of a 64 berth marina, a boardwalk structure, installation of marina breakwaters and mooring units, construction of a seawall including a sheet piled wall and rock armour revetment along the south east boundary and the north west boundary. The seawall and revetment construction is likely to take place from Trinity Wharf with barges required to deliver some material and other construction elements will require work to be carried out from barge. The design has been developed to maximise the use of a workshop and remote working. As such, the bridge superstructure and the primary components associated with the marine will be fabricated remotely and transported to site. Consultation with the Wexford Harbour Master confirms that the navigation channel in the region of the proposed marina is very wide and can easily accommodate the construction phase barges and marine related traffic associated with the construction of the marine based elements of the project. Therefore, marine traffic and general journey characteristics are not likely to be impacted during the construction stage.

The construction phase is not expected to significantly impact land uses in the area. All transport routes and economic operators in the area will remain open throughout the construction stage. Residential amenity is likely to be impacted during the construction phase particularly along Trinity Street and along haulage routes due to traffic disruption, noise, air and potential visual impacts. It is likely that there will be *slight negative, medium-term* impacts due to the protracted nature of the programme on land uses during the construction stage.

Journey Characteristics, Journey Amenity and Severance

Construction activities have the potential to impact access and journey times during specific periods for road users, rail users and along the navigational channel as part of construction works and installation of the bridge sections. The impacts are likely to be *moderate negative, medium-term* impacts and are discussed below.

Road

Construction traffic will result in an increase in vehicles and HGV movements transporting construction materials/ plant or machinery, including cranes and other general construction traffic on roads and by water. Chapter 5 Traffic Analysis of this EIAR has assessed construction traffic relating to the proposed development and has found that the dominant construction activities include the haulage of plant and materials, and the estimated peak traffic generated during the construction phase of the development.

The peak traffic generated by the development during the construction phase will result in a 2.5% increase in total traffic movements and an increase of 28% in HGV movements over course of a working day. This is considered a worst-case scenario which will be confined to the 6-month period for earthwork activities. While the increase in total traffic movements is not considered environmentally significant, the increase in HGV movements is high and is considered a *temporary moderate negative* impact.

All other construction activities, including the concrete pours, will generate less than 30 HGV movements per working day which is not considered environmentally significant. The traffic assessment in Chapter 5 found that this will result in a *moderate negative* impact from a traffic perspective. Therefore, the construction stage is likely to create a *slight to moderative negative medium-term impact* on journey characteristics and journey amenity during the different phases of the development, particularly close to the construction site, on haulage routes along the R730 and on the N25.

Rail

The principal permanent railway level crossing infrastructure will likely be installed at an early stage of the construction works. During the initial construction of the site infrastructure, the level railway crossing is expected to be operated either under flag man control. CCTV control of the level crossing is likely to be fully implemented towards the latter stages of the site infrastructure construction. At this stage the access road on the approaches to the railway is expected to be completed. The exact arrangements of the crossing will be agreed with Iarnród Éireann at detailed design stage as part of the technical approvals process and the Construction Traffic Management Plan. The level crossing is likely to be operated in its final configuration for construction of the latter phases of the project. Safe access across the railway will be under the control of the Contractor and Iarnód Éireann and the safety of railway traffic will be ensured at all times. The construction of the level crossing is likely to have *imperceptible, negative, brief* – temporary effects on passenger services on the railway with likely daytime work under possession and weekend possession of the railway over a limited period that will be agreed with Iarnód Éireann.

There are no likely significant impacts predicted to rail-based journey times, however journey characteristics may be impacted due to presence of machinery and hoarding associated with the construction site. Traffic movements across the level crossing will be managed as part of the Construction Traffic Management Plan to be developed and agreed with Iarnód Éireann. The presence of a construction site close to the rail line may result in an *imperceptible, negative, medium-term* impact on journey characteristics and journey amenities due to visual presence of the construction compounds during the construction stages.

Marine

Construction plant and machinery will mobilise in the harbour and will include a pile driving rig as described in Chapter 4 of this EIAR. These construction activities may have an impact on marine traffic and journey characteristics as boats may be required to manoeuvre around these areas when the rig and barges are present. This disruption is not likely to be significant as there is sufficient space for boats and leisure craft to manoeuvre around the harbour.

Barges will be required in the navigational channel during the construction period and are likely to change journey characteristics and amenity during the construction period. Noise emissions generated during the construction phase may cause nuisance to marina users. Access will be maintained on the navigational channel throughout the construction phase. All boat users, including search and rescue organisations vessels, will continue to have access as required. Therefore, no significant impact on journey times are likely.

Severance

Up until recently the Trinity Wharf site was accessed, without authorisation, by members of the public for walking, dog walking and anecdotally as a meeting point for typically anti-social behaviour. However, Wexford County Council reinforced the existing perimeter fencing in October 2018 to prevent further unauthorised entry.

During the boardwalk construction phase, a portion of Paul Quay car park will be a construction site and access will not be permitted to this area of the site for health and safety reasons. During the marina construction (approximately 2 months) and the boardwalk construction (approximately 4 months), temporary severance to existing routes is likely to result in *imperceptible, negative, temporary* impacts.

Wexford Harbour has a wide navigational channel in this area and it is not expected that the construction works will create severance on marine activities during the construction phase.

Access will be maintained to all residential and commercial properties in the vicinity of the proposed development throughout the construction phase. Based on above no additional severance is predicted.

6.4.1.2 Economic Activity

Increased direct and indirect employment opportunities will occur as a result of the proposed development over an estimated 80 month construction period. There will be approximately 50 persons employed during each construction phase. Additional indirect employment and economic activity is likely due to provision of goods and services during the construction stages. *Moderate, positive, medium-term* impacts are expected as a result of employment opportunities.

Economic operators within the immediate vicinity of the construction site may be impacted as people may avoid the area due to traffic disruption, noise, air or visual impacts. This assessment has found that there may be *slight negative, medium term* impacts on economic operators as a result of construction activities. This assessment has considered that much of the construction work will take place off the main street, however there will be an increase in HGVs and construction workers' traffic during distinct phases of the development. There is potential for traffic congestion to occur during distinct phases of the construction period, i.e. during the noise intensive works and/ or disruption caused during the construction of the signalised junction on Trinity Street. The Traffic Analysis chapter of this EIAR has predicted that all construction activities will generate less than 30 HGV movements per working day which is not

considered significant in traffic terms (see Chapter 5 of this EIAR). With the implementation of the CEMP and the associated Traffic Management Plan (TMP), the nearby retail warehousing operators are not likely to be significantly impacted as works will be completed on site with limited construction activities impacting on the R730 for the duration of the works.

Hotels, B&Bs and guesthouses within close proximity to the site may be impacted during daytime hours due to disruption i.e. noise, air or visual impacts however these are not considered to be significant. Construction activities may cause nuisance and disruption to tourists' general amenity close to the construction site however these are not expected to be significant.

6.4.1.3 Human Health Impacts

As already stated, environmental health standards are set to protect the vulnerable and not the robust, who are generally more resilient to changes in their environment. In accordance with the methodology outlined in Section 6.2, a summary of likely significant human health impacts/hazards relating to the proposed development have been identified to include:

- Impacts of emissions to air;
- Impacts of noise and vibration emissions;
- Impacts of emissions to hydrology;
- Impacts of collisions/ risks of accidents; and
- Psychosocial impacts.

6.4.1.4 Impacts of Emissions to Air

The greatest potential impact on air quality during the construction phase is from construction dust emissions, the potential for nuisance dust and the release of fibres from asbestos containing materials in the atmosphere.

The proposed development is major in scale (approximately 5.47 ha) and therefore there is potential for significant airborne dust emissions as described in Chapter 13 Air Quality and Climate of this EIAR. Sensitive receptors, such as residential and commercial properties in close proximity to the site, may be impacted by dust generated from construction. The air quality assessment presented in Chapter 13 of this EIAR states that while construction dust tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50m. The assessment found that, provided the dust minimisation measures outlined in the EIAR (see Appendix 13.3) are adhered to, the air quality impacts during the construction phase will not be significant

A primary source of air quality impacts from the proposed development relates to dust emissions / particulate matter (PM_{10}/$PM_{2.5}$) from construction works and emissions from vehicles. A CEMP will be put in place by the contractor to minimise such impacts, including shutting off construction vehicles when not in use, dust suppression and wheel washes to be provided if necessary, in order to prevent mud and dust being brought onto public roads. These mitigation measures will ensure that any impacts comply with all EU ambient air quality legislation and therefore, the impact of air emissions to human health are likely to be imperceptible with respect to human health. A Dust Management Plan is included as mitigation measure as part of Chapter 13 Air Quality and Climate of this EIAR.

Asbestos

An asbestos survey was undertaken in 2018 by RSK (detailed in Appendix 8.1 of this EIAR) and found that asbestos is present on the site. Of seven representative samples taken of suspected ACMs, five were confirmed by laboratory analysis as containing asbestos. Three of the positive samples were confirmed as asbestos cement and two confirmed as asbestos floor tiles. Asbestos cement was identified in numerous locations across the surface of the site whilst asbestos floor tiles were identified in large pieces or in small badly damaged fragments across the majority of the site, including in stockpiles. As reported in the literature review (Section 6.2.7 of this chapter), asbestos is known to cause lung disease and fibrosis of the lungs. In order to avoid risks to human health, a number of recommendations and mitigation measures have been provided during the site clearance and will be implemented prior to the site being redeveloped. These are detailed in Chapter 4 and Chapter 8 of this EIAR. Chapter 4 details the asbestos management strategy for the site (Section 4.4.4) which includes the requirements to undertake site specific surveys and the development of a Remedial Strategy that is taking place at the time of writing this EIAR. Measures for working with asbestos and mitigation measures to protect workers and the general public from exposure to asbestos fibres is detailed in Section 4.4.4.2 of this chapter. These measures include appropriate asbestos training, Personal Protective Equipment (PPE) and site management during the construction stage. As part of this strategy a Remediation Verification Report will also be undertaken to ensure that all mitigation measures proposed by the contractor to prevent the spread of asbestos or risk of fibre release and all associated remedial works implemented will be independently validated prior to proceeding with the redevelopment of the site.

These detailed measures will be informed by further survey and investigation work to inform the site development and will prevent potential release of asbestos fibres during the construction works and potential for human health effects to occur on workers or nearby residents or the general public. Therefore, this assessment has found that once the full and proper implementation of all mitigation measures detailed in Chapter 4 and Chapter 8 of this EIAR is carried out, impacts to human health are likely to be *imperceptible, temporary* human health effects. No additional mitigation is recommended as part of this assessment.

6.4.1.5 Noise and Vibration Impacts

Noise Assessment

Construction noise is temporary in nature and will be experienced over a short to medium-term period, depending on the programme and nature of activities taking place. This characteristic requires it to be considered differently to other longer-term noises. Construction activities on larger-scale construction projects such as this one will inevitably result in noise being generated. Chapter 12 (Noise and Vibration) of this EIAR details the results of the noise and vibration assessment. The impact assessment was undertaken for the daytime period. It was also based on a likely construction phasing and likely equipment that would be required to be on site under a range of assumptions detailed in Chapter 12 of this EIAR. Increased noise levels may result from demolition and site preparation works which will include breakers, excavators, piling operations, dump trucks, compressors and generators as well as general concreting plant, road surfacing and levelling equipment. The assessment found that the predicted noise levels were less than the TII maximum recommended limit and the lowest Category A limit of the BS 5228.

Lower limits of 65dB (TII guidance) / 55dB (BS5228 guidance) apply for weekend works. The sum of the predicted and ambient levels above would therefore be exceeded under such circumstances. The predicted levels above are based on all

plant (detailed in Table 12.6 of Chapter 12 of this EIAR) operating simultaneously, which is unlikely. However, care should be taken that this does not occur during weekends so as not to exceed these reduced limits.

Where predicted noise levels are in excess of adopted criteria, or to control any risks associated with the uncertainty of the results, mitigation measures are proposed in Chapter 12 (Section 12.6) of this EIAR. With the full application of these mitigation measures no further mitigation is proposed as part of this assessment.

The results of the noise assessment in Chapter 12 of this EIAR indicate that construction activities can operate within the adopted noise limits for daytime periods at the nearest properties to the works. Restricted hours of operation along with the appropriate implementation of noise control measures will ensure that the impact of noise emissions is limited and not significant to human health.

Vibration Assessment

The most likely potential vibration effects are associated with the construction phase activities of the development. The vibration assessment in Chapter 12 of this EIAR has been referred to as part of this assessment. The site is located in a urban environment along its western boundary, with Irish Rail (Dublin to Rosslare) rail line located along its western boundary, with a number of commercial and residential properties. commercial and residential are located further west from the site of the proposed development. Vibration is generally only a concern at properties that are located close to the construction site. Therefore, a vibration monitoring programme will be required to be adopted at a select number of the nearest buildings during the most critical phase(s) of construction e.g. pile driving, etc.

6.4.1.6 Impacts of Emissions to Hydrology

Water Quality

Construction activities within and alongside surface waters can contribute to the deterioration of water quality and can physically alter the stream/river bed and bank morphology with the potential to alter erosion and deposition rates locally and downstream. Activities within or close to the watercourse channels can lead to increased turbidity through re-suspension of bed sediments and release of new sediments from earthworks. There are no recorded public groundwater supplies or group water schemes on the Geological Survey of Ireland (GSI) database within the zone of influence. There are abstraction points on the River Slaney, upstream of the development site, that are used for drinking water purposes that are outside of zone of influence. Chapter 10 of this EIAR has been cross-referenced to inform this aspect of the human health assessment. No significant impacts are likely to occur to drinking water supplies as a result of the proposed development. Chapters 9 and 10 of this EIAR include a range of mitigation measures related to hydrology to address potential human health impacts.

Flooding

Chapter 10 of this EIAR also provides an assessment of potential impacts relating to flooding. The assessment found that the proposed construction works will include for the construction of a new sea wall consisting of steel sheet piles to be installed around the perimeter of the site, with a reinforced concrete capping beam to be constructed on top of the sheet piles which will support a handrail. The proposed boardwalk will also consist of driven pile foundations. The volumes of water displaced by the proposed sheet pile wall and boardwalk foundations during the construction phase is extremely small relative to the volumes of the receiving waterbody and will result in an imperceptible impact.

6.4.1.7 Impacts of Collisions/ Risk of accidents

Construction activities may increase the risk of collisions due to an increase in the number of movements of HGVs entering and exiting from the construction compound and haulage routes located in a trafficked urban environment. It is also likely to increase potential risks to vulnerable populations. Construction workers may be at risk of potential accidents from working at heights or close to the sea.

The CEMP will be required to address these risks and detail measures to address health and safety risks for construction workers, neighbouring properties and the general public as appropriate. Overall, the impact is predicted to be *not significant, negative and medium-term* during the construction stage.

Road Safety Audit

A Stage 1 Road Safety Audit has been carried out in accordance with TII's publication 'GE-STY-01024 – Road Safety Audit' and included in Appendix 5.8 Road Safety Audit Report of this EIAR. All issues raised in the Road Safety Audit have been addressed so the proposed development will be satisfactory in terms of traffic operations and safety.

Subject to planning approval, a Stage 2 Road Safety Audit will be carried out on the detailed design and a Stage 3 Road Safety Audit will be carried out on the constructed scheme.

An Accessibility Implementation Plan will be prepared by the organisers if an event held at the cultural performance building coincides with office working hours. The objective of the Accessibility Implementation Plan is to ease transport and parking pressures on the site and on the surrounding network. More details are included as part of Chapter 5 of this EIAR.

6.4.1.8 Psychosocial Impacts on Human Health

Consideration of likely psychosocial hazards relating to the proposed development include nuisance, anti-social behaviour and suicide. During the construction phase, the proposed development has the potential to create nuisance, particularly due to emissions from noise, air and dust that can impact on psychological health. A CEMP will be developed by the Contractor during the pre-construction phase to ensure commitments included in the statutory approvals are adhered to, and that it integrates the requirements of the Construction Erosion and Sediment Control Plan (CESCP), Environmental Operating Plan (EOP) and the Construction & Demolition Waste Management Plan (C&D WMP). The construction activities are limited to specific locations and daytime periods for use of certain plant and machinery in order to reduce impacts to sensitive receptors. The production of the CEMP will also detail areas of concern with regard to health and safety and any environmental issues that require attention during the construction phase. Adoption of good management practices on site during the construction and operation phases will also contribute to reducing environmental impacts.

6.4.1.9 Other Physical Effects

The construction stage is not likely to result in changes or to impact significantly on physical activity during the construction stage.

6.4.2 Operational Phase

6.4.2.1 Land Use and Social Considerations

Land Use

The proposed development supports existing national, regional and local land use and planning policy and will have the opportunity to positively influence and change the nature and intensity of surrounding land uses and Wexford Town as a whole in the long-term. A review of local planning policy identifies that the land use proposed on the site is 'permissible' and/ or 'open for consideration' as part of the Wexford Town Development Plan Zoning matrix, as can be seen in Figure 2.1 in Volume 3 of this EIAR. It is also consistent with the Wexford County Development Plan 2013-2019. The Masterplan developed by Waterford City and County Council (WCC), and subsequently the Wexford Quay Economic Development & Spatial Implementation Plan, have identified the marina as a potential use for this area. The proposed development is also consistent with the Wexford Local Economic and Community Plan (LECP), 2016-2021 with the project seeking to make Wexford an attractive destination for business whilst facilitating the provision of the necessary infrastructure and property solutions in supporting industry and employment within the town.

The proposed development will facilitate urban regeneration of the area. The proposed development will transform a strategically located brownfield site into a new high quality, attractive, commercial, residential and office development along with residential and recreational facilities in Wexford Town. The marina and pedestrian and cycle boardwalk structure across Wexford Harbour will physically integrate with the existing amenities of Wexford's quay front and contribute to a new attractive, connected town centre amenity.

It is hoped that this project will have a transformative effect on the character of the local area and on Wexford Town and will also provide high quality employment and residential and social facilities as well as high quality public realm and amenities.

The construction of the boardwalk will change land use in this area and result in the loss of approximately 21 car parking spaces at the southern end of Paul Quay car park. The removal of car parking spaces will facilitate the link via a boardwalk structure, providing improved connectivity and a safer access for pedestrians and cyclists between Paul Quay and the Trinity Wharf Development. The boardwalk structure is also likely to create a new destination area and will be beneficial from a human health and well-being perspective. The traffic assessment in Chapter 5 of this EIAR found that the loss of these spaces is not considered critical as the nearby Sinnott Place multi-storey long-term car park has adequate capacity to absorb the demand for long-term parking. This is discussed further in Section 5.4.7 Parking Provisions of Chapter 5 of this EIAR.

The boardwalk structure is also expected to improve the amenity value for residents and visitors as well as marina users accessing Wexford Town. The overall development will have a *moderate, positive, long-term effect* on land uses in the area.

The proposed development will result in the loss of 16 parking spaces on Trinity Street. The traffic assessment (Chapter 5 of this EIAR) has found that the loss of on-street parking will have a moderate impact on residents and business in the immediate vicinity of the proposed access junction. A mitigating factor is that 10 of the spaces lost do not directly front houses or business, including 8 spaces which front a vacant

plot and 2 spaces which front a grass area. The traffic assessment also found that the network can adjust and absorb the demand for parking at this location.

Journey Characteristics, Journey Amenity and Severance

Road

The internal road network will be connected to Trinity Street via a new road to be constructed perpendicular to Trinity Street that will cross the railway line by means of a level crossing. This will be the main vehicular access to the site and will also facilitate pedestrian access. The internal road network of the development site is discussed in more detail in Chapters 4 and 5 of this EIAR.

The 180m boardwalk will provide the main link between the current Wexford Harbour promenade and the cycleway facilities provided on the internal road network of Trinity Wharf. This will be the primary pedestrian and bicycle access from Paul Quay car park/ Wexford Town centre over Wexford Harbour. The development of this structure will result in a new transport route for pedestrians and cyclists and is likely to have a *significant*, *positive, long term* effect on journey characteristic, amenity and reduce journey times and severance for pedestrian and cyclists accessing the Trinity Wharf area from the Town Centre in this area. It also provides dedicated shared walking and cycling infrastructure that will connect to existing and future Smarter Travel routes.

Rail

A new level crossing will be developed in conjunction with Iarnród Éireann which will consist of signalised automatic controlled boom barriers. Analysis of the traffic impacts associated with the requirement for the new barriers has been carried out and presented in Chapter 5. It found that it is unlikely that inbound vehicles queueing at the level crossing will stack back onto the Trinity Street access junction as the train services operate outside the AM peak hour traffic.

This is anticipated to result in a queue of 2 inbound vehicles and 10 outbound vehicles based on a predicted traffic flow of 35 vehicles per hour and 187 vehicles per hour arriving and departing the site between 17:00 and 18:00. These outbound vehicles will stack back into the site and will have no external impact for traffic on Trinity Street. Brief traffic queuing resulting from the signalised level crossing is anticipated to dissipate quickly once the barriers are lifted.

Any congestion resulting from the signalised level crossing is anticipated to dissipate quickly once the barriers are lifted, ie. after 3 minutes. Chapter 5 of this EIAR found that no significant traffic impacts are likely to result. There is likely to be an *imperceptible, negative, momentary* impact on journey characteristics for road users including pedestrians and cyclists.

Marine

Wexford Harbour is a large shallow estuary which, up until this development, has lacked proper marine leisure facilities for the numerous vessels within the harbour. As such, the provision of a marina will help alleviate the tidal restrictions for vessel access. It is expected that the marina will consolidate berth activity in the area providing a year-round safe location for vessels to berth. It is expected that the majority of the new 64 berth marina will be occupied by vessels already within the harbour and will not significantly increase the volume of boats or boating activity.

Consultation with the Harbour Master of Wexford Harbour has confirmed that the navigation channel in the region of the proposed marina is very wide and can easily

accommodate such development without impinging on the safety of navigation in the area.

The construction of the brownfield development is expected to improve journey characteristics and amenity value from the perspective of marine based travellers. It is expected that the area around the Goodtide Harbour will also become more visually attractive.

Severance

No new severance is predicted during the operational phase. The proposed boardwalk will provide relief from severance for pedestrians and cyclists accessing the site from Paul Quay.

Social Considerations

The proposed development is a high quality, multi-use scheme and has been designed with an emphasis on place-making and 'liveability'. The development will be physically integrated with the existing amenities of Wexford's award-winning quay front and attractive town centre through the provision of a waterfront pedestrian and cycle route. The proximity of Trinity Wharf to the many existing employers, services and amenities in the town centre supports the high-density development in an existing urban environment while also offering an attractive strong character, public places and spaces and maintaining human scale.

The marina, culture and arts building, hotel and the new public realm areas will create a new destination for the area and will improve the amenity of residents, workers and visitors to the town centre. Trinity Wharf will also stimulate the redevelopment of other underutilised sites and vacant premises in the vicinity, consolidating the pattern of development in the area to help achieve a compact and sustainable urban form.

This mix of business, commercial, cultural, recreational and residential development will position the Trinity Wharf Development to disperse day and night time footfall and vibrancy associated with the proposed uses. The development will seek to encourage the regeneration of the area and stimulate regeneration of vacant dwellings/properties and other under-utilised sites in the surrounding residential streets and commercial areas and beyond to south Main Street.

Community Facilities

The development will regenerate a brownfield site into a social active area during both day and night, due to the mix of uses (commercial, residential, cultural) benefiting existing and future communities in Wexford Town and the region. Access to social and community facilities will not be affected but will be enhanced as a result of the proposed development. An extensive landscape design strategy (Refer to Appendix 4.7 of this EIAR) has been developed. The strategy is aimed at guiding the spatial design of the landscape and public spaces into a coherent design. These spaces include the coastal path, arrival space, central civic area, internal access roads, residential communal spaces, central paths and car park and rail line planting. The coastal path around the site, public park, plaza, play areas and performance spaces together with a comprehensive landscape design will further contribute to the development of both day and night time social facilities/ activities for residents and visitors as well as providing a significant public amenity and community facilities to existing communities. The design of the development ensures that the general amenity and recreational resources in the area are enhanced and accessible to all.

Furthermore, the marina will provide a purpose-built facility for local and visiting mariners and will provide greater opportunities for community events and activities to take place in the town that are associated with marine uses. The boardwalk structure will contribute to improving access and integration between existing and proposed marina facilities as well as sustainable modes of transport (walking and cycling route), a source of recreational and general amenity and community resource.

The proposed development has been designed to address the issues of urban decline, deprivation and stimulate economic activity in Wexford Town. The development will provide high quality employment opportunities and a variety of social and cultural spaces through the development of a new modern mixed-use urban quarter, together with an attractive environment and vibrant urban place for people to live, work and visit. The regeneration of this key site has the potential to have a significant positive spin-off effect and stimulate wider vibrancy, new opportunities for development and encourage increased take up of vacant or other brownfield premises in the local area.

Marine Environment

The proposed marina at Trinity Wharf is located alongside the buoyed navigation channel in the River Slaney which is maintained by Wexford County Council. There is an active group of water sports enthusiasts in Wexford Harbour and the provision of a marina will facilitate greater participation in boating activities within the harbour among the local community. The proposed marina is located within close proximity to the existing marina and, as such, will offer marina users ease of access and provide greater opportunities for recreational, community and economic development.

Wexford County Council's consultation with local stakeholder groups indicates that the proposed marina is broadly supported. It is considered that the proposed development will provide an improvement to the public realm in the Trinity Wharf area, and will lead to greater use and therefore, opportunities for new business, community and recreational activities in the vicinity.

6.4.2.2 Economic Impact

The proposed development is seen as a project that will enhance Wexford Town's attractiveness for international companies seeking to locate in the county or for existing companies looking to expand. Trinity Wharf represents a significant opportunity to expand the economic profile and performance of Wexford Town.

The development has the potential to create approximately 1,200 jobs, many of these are likely to high quality skilled jobs. This is likely to lead to *significant, positive, long-term* impacts to the local economy and associated socio-economic profile of the area. The proposed development supports this regional objective for Trinity Wharf to become a "strategic employment location" as detailed in the Draft SE RSES (2018) . It also states that the site will require key infrastructure requirements and investment to support development of the site which this development supports.

Tourism Activity

The marina, hotel, cultural/arts building, and high-quality public realm will also complement the office development, add vibrancy and diversify use. The marina and hotel will further enrich the high-quality tourism and cultural offering in Wexford and will add to the town's high-end offerings, such as the renowned International Opera Festival. The development is supported by a residential element which will provide much needed modern housing units in the area, rejuvenate this community, reverse trends towards population decline and will ensure that the area is active during the day and evenings, supporting vibrancy and vitality of the area.

Wexford Harbour has a strong maritime and sea faring tradition. The proposed development, and in particular the hotel and marina, will support the development of Fáilte Ireland's value proposition for 'Ireland's Ancient East'. The proposed marina, hotel and cultural space, as well as amenity walks, and public realm improvements will contribute to scaling up the tourism asset base of Wexford Town.

Wexford Harbour is ideally located between a number of existing marinas along the coast (Arklow and Greystone to the north, and Kilmore Quay and New Ross to the west), providing an ideal 'stopping off' location for visiting boats and also attracting new berth holders into the area. The proposed development will offer a step on / step off facility from the marina and as such will be attractive to existing and visiting mariners.

The proposed marina is located in a deep-water section of the channel and will be accessible from the Irish Sea between mid-tide and mid tide. The proposed marina in Wexford Harbour is protected from the Irish Sea by the headlands of Rosslare Point and Raven Point. Wave protection is provided by the training walls in the vicinity of the proposed Trinity Wharf marina and the proposed development. It incorporates floating breakwaters around the proposed marina to provide additional wave protection for the boats in the berths.

6.4.2.3 Human Health Impacts

Urban regeneration has the potential to positively influence population and human health outcomes particularly in areas that are deprived, such as Wexford Town. Furthermore, the high-quality pedestrian and cycle link will be provided from Paul Quay to the north west corner of the site and will provide a direct and safe link to the Town Centre, thereby creating a safer access to and from the site to the town centre for pedestrians, cyclists and mariners.

6.4.2.4 Impacts of Emissions to Air Quality

Chapter 13 Air Quality and Climate of this EIAR includes an assessment which found that there is the potential for increased exposure to emissions during the operational phase of the development, in particular to traffic related air emissions which may generate air pollutants such as NO_2, CO, benzene and PM_{10}. Sensitive receptors close to the proposed development have been assessed in air modelling assessments which found that the impact of the development due to PM_{10}, $PM_{2.5}$, CO, NO_2 and benzene emissions is *negligible, long-term, negative and imperceptible*.

Air dispersion modelling of operational traffic emissions was undertaken to assess the impact of the development with reference to EU ambient air quality standards which are based on the protection of human health. As demonstrated by the modelling results, emissions as a result of the proposed development are compliant with all national and EU ambient air quality limit values and, therefore, will not result in a significant impact on human health.

Remedial measures will be undertaken during the construction phase of the proposed development, as detailed in Chapter 4 and Chapter 8 of this EIAR, to remove ACMs and therefore there is no impact to human health predicted for the operational phase.

Chapter 13 of this EIAR states that the "likely overall magnitude of the changes on air quality in the operational stage is *imperceptible, long-term and not significant*."

6.4.2.5 Impacts of Noise and Vibration Emissions

Noise levels from operations associated with the development have been estimated and their impact has been assessed in Chapter 12 of this EIAR. Sources of operational

noise from the proposed development include traffic (road, rail and boating activities), Arts & Cultural Centre operations and items of industrial plant associated with the hotel and office buildings. Chapter 12 of this EIAR found that almost all locations will experience an increase in noise level as a result of the proposed development. The operations of the marina and on-site café/restaurant are likely to have no significant impact on any existing residence. Therefore, no human health impacts are likely as a result of the proposed development.

Chapter 12 of this EIAR found that this development falls within the Lowest Observed Adverse Effect Level (LOAEL) i.e. that some impact is likely to be detectable but is not considered significant. This is supported by the results of the BS4142 assessment. Chapter 12 recommends a vibration monitoring programme should be adopted at the nearest residential properties during the most critical phase(s) of construction e.g. rock-breaking, pile driving (if applicable) etc.

6.4.2.6 *Impacts of Collisions/ Risk of Accidents*

Boardwalk

Currently people access the Trinity Wharf site (without authorisation) from Paul Quay, walking alongside a live railway track to access the area from the north-west and south-west corners of the site. A requirement of the regeneration of the site is to provide a safer link between Paul Quay and the site. The proposed development creates a direct link via a shared pedestrian and cycleway boardwalk across Wexford Harbour. This new structure is expected to enhance journey characteristics, amenity and reduce journey times while also providing a safer access into the site. This is a *significant positive long-term* impact.

Marina

The marina has been designed and developed to ensure safety is integrated into the design of the proposed development. This includes service pedestal, lifesaving stations, emergency ladder, service areas and floating breakwater units. The access stairway will ensure access is suitably controlled and risk of accidents reduced. No significant impacts are predicted.

Traffic

The cultural and performance centre will generate a concentrated traffic demand on the Trinity Street junction when events are being held. Traffic analysis in Chapter 5 of this EIAR indicates that the peak traffic generated by the cultural and performance centre is estimated to be 200 vehicles per hour based on a venue capacity of 400 people, and these events are likely to be held during evening times. This peak traffic demand of 200 vehicles is significantly less than the number of trips generated by the development during regular daily peak hour traffic and therefore does not prove to be a significant problem in terms of a potential increase in risk of accidents.

Building Development

All buildings are designed to comply with Building Regulations TGD Part B – Fire Safety (2006). Buildings have been considered in terms of vertical and horizontal compartmentation, internal travel distances, stair core locations, etc. Consideration has also been given to B4: 'External Fire Spread' in terms of building separation distances and materials.

Residential buildings are designed to comply with BS5588 Part 1. Office buildings are required to comply with BS5588 Part II. and the cultural/performance centre is designed to comply with BS5588 Part 6.

Buildings can be provided with either wet or dry risers. However, hydrants are to be located around the site and building heights are limited with top floor levels under 20m above ground level. Therefore, no significant human health impacts are likely as a result of the proposed development.

6.4.2.7 Psychosocial Impacts on Human Health

Consideration of the negative psychosocial hazards relating to the proposed development include potential for nuisance and anti-social behaviour. The proposed development is located in a town centre marine environment, close to a heavily trafficked urban environment which is active during both the day and night. As a result of the design of buildings, spaces and integration with existing and proposed transportation modes, together with the exposed nature and opportunities for constant overlooking, it is unlikely that the proposed development will promote negative psychosocial hazards. On the contrary, this development will transform the existing area from a location prone to anti-social behaviour into a lively mixed-use development.

Wexford Town, and particularly Wexford Urban No.2, has a high deprivation rate. It is likely that the regeneration of Trinity Wharf site will provide new social and economic opportunities for the people in this area and in the region through the provision of a mixture of high quality and also service industry jobs once the development is completed. The development will therefore provide a source of direct and indirect employment. It will improve the general amenity areas available to the town's population, including new playgrounds and walking trails and increasing opportunities for social connections

Furthermore, the development of the boardwalk structure will improve connectivity, particularly along the harbour for communities travelling north and south along the coast. Positive community outcomes are likely as a result of the urban regeneration of the area. Positive land use changes are expected which have the potential to increase social and economic activity and promote physical activity that can contribute to positively influencing psychosocial factors of a population.

Overall, the regeneration of the site has the potential to impact positively on the wider local and regional economy over time which could in turn result in reducing social inequality and the high deprivation rates in the town, which in turn have been found to positively influence health outcomes of populations.

No acquisition of private property is required as a result of the proposed development. Therefore, no psychosocial impacts are likely in this regard.

6.4.2.8 Other Physical Effects

It is widely recognised that land use planning and transport patterns can influence physical activity and/ or inactivity of populations which in turn can influence lifestyle factors and human health outcomes. The benefits of physical activity are widely reported and include benefits such as improved fitness, mood and can improve the potential for social interaction and social cohesion. From a human health perspective, this can translate into improved cardiovascular 'fitness', help reduce chronic disease and even premature death which are the leading causes of death for Wexford's population.

Census 2016 statistics reveal Wexford Town is similar to the national trends with a high reliance on the private car. The majority of those traveling to work, school or college travel by car with the majority of trips less than 15 minutes. Transport patterns

that promote walking, cycling and sustainable modes of travel can reduce sedentary lifestyle, thereby increasing activity and improving health outcomes and reducing car use. Obesity in Ireland is a significant health issue and can be linked to travel mode as well as lifestyle factors. The operational phase of the proposed development has the potential to positively impact transport mode choices or general physical activity by providing improved walking and cycling infrastructure, providing real alternatives to using the private car and supporting wider investment in the sustainable transport network and links with public transport infrastructure in Wexford over the long-term. Smarter travel and compact sustainable developments have the potential to have positive lifestyle, health and environmental benefits i.e. reduction in noise, air and Greenhouse House Gas (GHG) emissions over the long-term operational phase. The proposed mixed-use development has the opportunity to result in *significant, positive, long-term* physical health effects.

6.5 Mitigation and Monitoring Measures

This assessment has allowed for the inclusion of a number of mitigation measures as part of the design of the proposed development to address the likely significant predicted population and human health impacts.

6.5.1 Construction Stage Mitigation Measures

- All mitigation measures detailed in Chapter 4 Description of the Proposed Development of this EIAR will be required to be implemented. A CEMP and an associated Construction Traffic Management Plan will be developed and implemented by the contractor to address all modes of transport and will be agreed with Wexford County Council prior to the construction stage.
    - The Construction Traffic Management Plan will be required to maximise the safety of the workforce and the public and to minimise traffic delays, disruption and maintain access to properties;
    - The Construction Traffic Management Plan will also address temporary disruption to traffic signals, footpath access and the management of pedestrian crossing points;
    - The Construction Traffic Management Plan will be developed and agreed with Irish Rail;
    - The contractor will provide an appropriate information campaign for the duration of the construction works; and
    - The Construction Traffic Management Plan will be required to minimise disruption to economic amenities, marine users and residential amenities. The Plan will be approved by Wexford County Council prior to construction and will ensure access is maintained along Trinity Street for vehicles, pedestrians, cyclists and economic operators at all times.
- Appropriate measures relating to working at heights and near water will be included as part of the EOP. Ringbuoys will be installed and maintained as part of construction design stage in consultation with search and rescue organisations in the area;
- The CEMP will be prepared by the Contractor during the pre-construction phase to ensure commitments included in the statutory approvals are adhered to, and that it integrates the requirements of the CESCP, EOP and the CDWMP;
- A Transportation Mobility Management Plan will be developed and will address all modes of transport required as part of the construction stages i.e. road and

Wexford Harbour. This will include details regarding haulage routes and construction compounds;

- The contractor will be required to develop and implement a Stakeholder Management and Communication Plan which will be agreed with Wexford County Council prior to the construction stage.
    - All stakeholders will be required to be agreed with Wexford County Council prior to construction commencing; and
    - Details of the general construction process/phasing will be communicated to the relevant stakeholders prior to implementation to ensure local residents and businesses are fully informed of the nature and duration of construction works;
- In order to minimise air quality impacts within the community, a Dust Management Plan will be implemented. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of this plan, as detailed in Chapter 13 Air Quality and Climate in this EIAR;
- Noise and vibration mitigation measures are discussed in detail in Chapter 12 Noise and Vibration of this EIAR. A comprehensive Construction Management Plan, which includes adopting appropriate mitigation measures, will manage the risk of noise impacting the local community. The contractor will work within stringent construction limits and guidelines to protect residential and commercial amenities, including the application of binding noise limits and hours of operation. These measures will ensure that noise and vibration impacts will be reduced as far as possible; and
- The contractor will be required to implement a vibration monitoring programme at a select number of the nearest residential properties during the most critical phase(s) of construction e.g. pile driving.

All construction works will be short to medium term in nature and will be carried out in line with best practice guidelines, thereby minimising the likely significant impacts to the community and human health. The contractor will work within stringent construction limits and guidelines to protect surrounding populations and amenities.

With the application of the mitigation measures identified in this section, along with those specific mitigation measures related to Population and Human Health described in Chapter 4 Description of Development, 5 Traffic and Transport, Chapter 8 Soils and Geology, Chapter 11 Landscape and Visual Analysis, Chapter 12 Noise and Vibration and Chapter 13 Air Quality and Climate, Chapter 16 Material Assets and Land of this EIAR, no likely significant impacts are predicted during construction stage. All mitigation measures are summarised in Chapter 18 of this EIAR.

6.5.2 Operational Stage Mitigation Measures

This assessment has found that operational stage of the proposed development will result in *significant positive, long-term* impacts to the population and human health of the area.

Mitigation measures required to address likely impacts relating to population and human health during the operational stage of the proposed development include:

- An Accessibility Implementation Plan (AIP) will be prepared by the organisers if an event is held at the cultural performance building which coincides with office working hours. The objective of the AIP is to ease transport and parking pressures on the site and on the surrounding network. The AIP will involve a Variable Message Sign (VMS) system which can provide real time information

on the availability of parking within the site and provide details of alternative car parks elsewhere. The plan will be required to ensure adequate public transport is scheduled to service the event;

- A Transportation Mobility Management Plan will be developed in order to identify the measures that will be implemented to promote sustainable modes of transport and reduce the use of the private car in accordance with Smarter Travel Policy. This should include details of Workplace Travel Plans to encourage employers and employees to take steps to reduce dependency on the car and to take alternative transport options; and
- The recommended mitigation measures detailed in Chapter 10 Hydrology of this EIAR will be implemented to address the potential risk of flooding.

With the application of the mitigation measures identified in this section, along with those specific mitigation measures related to Population and Human Health described in Chapter 5 Traffic Analysis, Chapter 11 Landscape and Visual Analysis, Chapter 12 Noise and Vibration, Chapter 13 Air Quality and Climate and Chapter 16 Material Assets of this EIAR, no likely significant impacts are predicted during operational stage. All mitigation measures are summarised in Chapter 18 of this EIAR.

6.6 Residual Impacts

During the construction phase of the proposed development, residual impacts include disruption to traffic, noise and air quality which have been discussed above and in the relevant chapters of this EIAR.

Urban regeneration projects of this nature and scale have the potential to act as a stimulus and create wider investment opportunities resulting in *significant, positive, long-term* residual effects for the local and regional community and economy. It may also encourage continued investment in high quality urban regeneration projects elsewhere in Wexford, resulting in higher tenancy rates in the town and improvements in the general amenity of Wexford Town.

Positive social and health outcomes are likely as a result of the urban regeneration of the site through indirect positive land use changes, increased social and economic activity in the area and expansion of walking and cycling facilities with the wider area over time.

6.7 Difficulties Encountered

No particular difficulties were encountered in preparing the population assessment. In terms of the human health assessment, there are uncertainties in relation to assessing impacts on individuals or communities due to the lack of available health data and the difficulty in predicting effects, which could be based on a variety of assumptions.

6.8 Conclusion

The construction phase is temporary in nature and impacts on population and human health were found to be mainly *slight to moderate, negative, medium-term* impacts, primarily due to construction activities and construction traffic. A summary of the key construction impacts found as part of this assessment include:

- Land use changes due to temporary construction activities and construction works in both the terrestrial and marine environment that may impact on the

environment, businesses and residential amenity within proximity to the construction site. The assessment found that these impacts are not expected to be significant as most construction work will take place within the Trinity Wharf site itself;

- It is likely there will be *moderate, negative, medium-term* impacts due to construction traffic which may impact on journey characteristics, general amenity, residential amenity and economic operators close to the site (Trinity Street) and along haulage routes (R730 and N25);
- During the boardwalk construction phase, a portion of Paul Quay car park will be a construction site and access will not be permitted to this area of the site for health and safety reasons. Temporary severance to existing routes in this area is likely during this period which will result in an *imperceptible, negative, temporary* impact;
- Increased direct and indirect employment opportunities will occur as a result of the proposed development over an estimated 80-month construction period. There will be approximately 50 persons employed during each construction phase. This is likely to result in *moderate, positive, medium term* impact to the local economy through direct and indirect employment and through local expenditure by construction workers, purchases of local materials and services, etc.;
- With the full and proper implementation of asbestos mitigation measures (asbestos surveys, development of a Remedial Strategy and verification report by a suitably qualified, experienced and licenced asbestos contractor, as detailed in Chapter 4 and Chapter 8 of this EIAR) it was found that there are no likely significant impacts to human health as a result of ACMs present on the site.

Overall the operation of the proposed development is expected to have a *moderate, positive, long-term* impact on the population and human health of the Wexford Town and the south east region.

- The proposed development facilitates urban regeneration of a brownfield site and will facilitate the consolidation of existing land uses in the Town. The development is expected to improve the general amenity, journey characteristics and local economy for residents, visitors as well as marina users that will result in a *moderate, positive, long-term* impact on land uses, social considerations and economic activity in the area;
- The construction of the brownfield development that includes public paths, a boardwalk structure and a 64 berth marina is expected to improve journey characteristics and reduce severance of the site that will result in *positive long-term* impacts;
- Due to the development of the various elements of the proposed development, there are likely to be an additional 1,200 jobs leading to *significant, positive long-term* impacts to the local economy and the associated socio-economic profile of the area;
- The proposed marina, hotel and cultural/ performance space, as well as amenity walks, and public realm improvements, will contribute to scaling up the tourism asset base of Wexford Town and providing recreational amenities to local populations of the area;
- The development will facilitate improvements in sustainable transport infrastructure through the provision of safe, affordable sustainable travel modes (walking and cycling facilities), leading to the promotion of physical activity which can positively influence human health determinants; and

- Sustainable modes of travel (walking, cycling and integration with public transport (rail and bus services) have the potential to reduce emissions to the air and noise environment and provide associated benefits to the environment and human health.

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