

Environmental Impact Assessment Report

Chapter 18

Population and Human Health

Volume 2 Part 5



18 POPULATION AND HUMAN HEALTH

18.1 Introduction

This Environmental Impact Assessment Report (EIAR) chapter applies a broad socio-economic model of health that encompasses conventional health impacts such as disease, accidents and risk, along with wider socio-economic health determinants vital to achieving good health and wellbeing. As such, the chapter combines a public health assessment (which focuses on environmental determinants of health), and a socio-economic assessment; providing additional commentary on how changes to some socio-economic factors have the potential to influence health and wellbeing.

This chapter draws from and builds upon detailed project information and the wider technical disciplines within the EIAR (namely, Chapter 12: Noise and Vibration; Chapter 14: Traffic and Transportation; Chapter 10: Air Quality and Climate) to communicate the potential influence upon population and health. For the sake of brevity, this chapter does not seek to repeat text or replicate data from the wider EIAR chapters.

This chapter is supported by Appendix 18.1: Population and Health Baseline.

18.2 Assessment Methodology

18.2.1 Relevant policy and guidance

18.2.1.1 Guidelines on the information to be contained in EIAR

The Environmental Protection Agency's Guidelines on the Information to be contained in EIAR (Environmental Protection Agency, 2022), highlights the amendments to Article 3(1) of the amended European Union (EU) Environmental Impact Assessment (EIA) Directive which states that:

"The environmental impact assessment shall identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of a project on the following factors: a) population and human health; [...]"

Moreover, Annex IV, paragraph 5(d) requires an EIAR to contain:

"A description of the likely significant effects of the project on the environment resulting from, inter alia, 'the risks to human health'".

18.2.1.2 European Commission's guidance on the preparation of the EIAR

When outlining the scope of environmental factors covered by the EIA Directive within the European Commission's guidance on the preparation of the EIAR (European Commission, 2017), "population and human health" is defined as follows:

"Human health is a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic

noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population.”

Additionally, when describing the likely significant effects of a project, the European Commission’s guidance poses the following questions to consider:

“Have the primary and secondary effects on human health and welfare described and, where appropriate, been quantified? (e.g. health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups).”

18.2.1.3 Institute of Public Health Impact Assessment Technical Guidance

The Institute of Public Health (IPH) launched the fourth edition of HIA Guidance for Ireland and Northern Ireland, incorporating the most recent developments and best practice in the field (Institute of Public Health, 2021). The guidance is split into the following key themes:

- Screening – to determine whether an impact assessment is required.
- Scoping – identifying the determinants of health and the populations to be assessed, as well as the methods by which they will be assessed; health effects that are considered to be ‘likely’ and ‘potentially significant’ require further analysis and are scoped in.
- Analysis – evidence of potential health effects is gathered and considered when conclusions are drawn on the significance of effects.
- Reporting – to document the judgements made on health, with reference to the evidence that informed those judgements.
- Implementation – whereby to be effective, assessment findings must be followed through when implementing the proposal.
- Monitoring – involves data collection and analysis after the assessment report has been issued, however, is resource-intensive so it should be used in a proportionate, preventative and time-limited manner.
- Evaluation – of process, impact or outcome.

18.2.1.4 National Planning Framework

The National Planning Framework (NPF) (Government of Ireland, 2018) is the strategic plan for Ireland’s growth and development until 2040. The NPF comprises 10 National Strategic Outcomes (NSOs) and 75 National Policy Objectives (NPOs) which guide sustainable economic, social and environmental development at both the national and local level. The NSOs include:

1. Compact Growth.
2. Enhanced Regional Accessibility.
3. Strengthened Rural Economies and Communities.
4. Sustainable Mobility.
5. A Strong Economy supported by Enterprise, Innovation and Skills.

6. High-Quality International Connectivity.
7. Enhanced Amenity and Heritage.
8. Transition to a Low Carbon and Climate Resilient Society.
9. Sustainable Management of Water, Waste and other Environmental Resources.
10. Access to Quality Childcare, Education and Health Services.

18.2.1.5 National Development Plan 2021-2030

The National Development Plan (NDP) (Government of Ireland, 2021) provides the accompanying investment strategy which aligns with the NPOs outlined in the NPF. The NDP sets out the Government's over-arching investment strategy and budget for the period 2021–2030, with a spending of €165 billion budget focusing on solutions to strengthen housing, climate ambitions, transport, healthcare, and job growth for the decade.

The NDP with the NFP combine to form Project Ireland 2040 which is the long-term strategy to build a resilient and sustainable future for Ireland.

18.2.1.6 Dublin City Development Plan 2022-2028

Healthy placemaking, ensuring quality architecture, urban design and green spaces to facilitate and promote quality of life and good health and wellbeing for all, is outlined as one of seven strategic principles of the Dublin City Development Plan 2022-2028 (Dublin City Council, 2022).

Policy SC5 (Urban Design and Architectural Principles) is to promote the urban design and architectural principles in order to achieve a climate resilient, quality, compact, well-connected city and to ensure Dublin is a healthy and attractive city to live, work, visit and study in.

Policy SC19 (High Quality Architecture) is to promote development which positively contributes to the city's built and natural environment, promotes healthy placemaking and incorporates exemplar standards of high-quality, sustainable and inclusive urban design and architecture befitting the city's environment and heritage, and its diverse range of locally distinctive neighbourhoods.

Policy QHSN11 (15-Minute City) promotes the delivery of a 15-minute city, which provides for liveable, sustainable urban neighbourhoods and villages throughout the city that deliver healthy placemaking, high quality housing and well-designed, intergenerational and accessible, safe and inclusive public spaces served by local services, amenities, sports facilities and sustainable modes of public and accessible transport where feasible.

Policy QHSN12 (Neighbourhood Development) is to encourage neighbourhood development which protects and enhances the quality of the built environment and supports public health and community wellbeing. Aspects of the Policy specifically of relevance to health include where it:

- promotes the development of healthy, liveable and attractive places through public realm and environmental improvement projects; and
- has regard to the Guiding Principles for 'Healthy Placemaking'.

Policy QHSN13 (Healthy Dublin City Framework and the Healthy Ireland Framework 2019-2025) is to support the Healthy Dublin City Framework and the Healthy Ireland Framework 2019-2025 in promoting a long-term vision of improving the physical and mental health and well-being of the population at all stages of life.

Policy QHSN14 (High Quality Living Environment) is to support the entitlement of all members of the community to enjoy a high quality living environment and to support local communities, healthcare authorities and other bodies involved in the provision of facilities for groups with specific design/planning needs.

Policy CCUV37 (Plan Active and Healthy Streets) is to promote the development of a network of active, healthy, attractive, high quality, green, and safe streets and public spaces which are inviting, pedestrian friendly and easily navigable. The aspiration is to encourage walking as the preferred means of movement between buildings and activities in the city. In the case of pedestrian movement within major developments, the creation of a public street is preferable to an enclosed arcade or other passageway.

Policy CCUV39 (Permeable, Legible and Connected Public Realm) is to deliver a permeable, legible and connected public realm that contributes to the delivery of other key objectives of this development plan, namely active travel and sustainable movement, quality urban design, healthy placemaking and green infrastructure.

Policy GI45 (National Physical Activity Plan 2016) is to improve the health and well-being of communities by increasing access to participation in sports, recreation and healthy activity in line with the National Physical Activity Plan 2016, the Healthy Ireland Framework 2019 – 2025 and the Sport Ireland Participation Plan 2021 – 2024.

18.2.1.7 Policy and guidance review summary

A consistent theme throughout the policy and guidance referenced is the positive health legacy that more health conscientious planning and development can deliver, and why projects must consider public health to not only design out health hazards and risks, but build in and optimise health improvement and promotion opportunities. The national policy prompt projects to broadly consider public health (health protection, health promotion and healthcare) the relevant guidance provides a broad structure to consider the site and project through a public health lens; and local policy helps to frame local health circumstance, priority and need. The review sets the basis to defining the scope, approach, process, methods and assessment criteria applied in the Population and Health EIAR chapter, and have further informed and influenced the application, healthy urban design features and community support initiatives.

18.2.2 Approach

18.2.2.1 Scoping exercise

As detailed in the IPH HIA guidance, health effects (both adverse and beneficial) that are considered to be 'likely' and 'potentially significant' require further analysis and are scoped in. A health effect is considered 'likely' when, based on the scientific literature, where there is a plausible theoretical link between a hazard or benefit and a credible pathway of exposure to a receptor. A health effect is considered 'potentially significant' when they are important (a positive or negative effect), highly desirable (a positive effect) or unacceptable (a negative effect) for population health.

As such, the assessment methodology follows a source-pathway-receptor model to identify and assess population and health effects that are plausible and directly attributable to the proposed development.

As shown in Table 18.1, a hazard source by itself does not constitute a health risk. It is only when there is a hazard source, a receptor and a pathway of exposure that there is any potential risk to human health. The same is true for potential health benefits, where a positive influence must be present alongside a pathway of exposure and a receptor for there to be a potential health improvement.

Where a source-pathway-receptor linkage exists, it is then the nature of the specific hazard source or positive influence; the magnitude of impact via the pathway of exposure; and the sensitivity of the receptor that will determine what level of health risk or benefit is predicted, if any.

Table 18.1 Source-pathway-receptor model

Source	Pathway	Receptor	Plausible health impact	Explanation
X	✓	✓	No	There is not a clear source from where a potential health impact could originate.
✓	X	✓	No	The source of a potential health impact lacks a means of transmission to a population.
✓	✓	X	No	Receptors that would be sensitive or vulnerable to the health outcome are not present.
✓	✓	✓	Yes	Identifying a source, pathway and receptor does not mean a health outcome is a likely significant effect; health impacts should be assessed (describing what effect will occur and its likelihood) and likely health effects are then evaluated for significance.

Scoping relating to the population and human health chapter has been iterative in this instance. This included multiple reviews of the project description, technical chapters and any pertinent consultee responses. The results of the scoping exercise are provided in Table 18.2, and present the relevant population and health determinants that have been assessed within this chapter.

Table 18.2 Scoping exercise results

Population and health determinant	Potential direction of impact	Distribution	Duration
Construction (including demolition and excavation)			
Air quality (including impacts on amenity)	Adverse	Local	Temporary
Noise and vibration (including impacts on amenity)	Adverse	Local	Temporary
Transport	Adverse	Local/regional	Temporary
Socio-economic factors	Beneficial	Regional/national	Temporary
Operation			
Air quality	Adverse	Local	Long-term
Noise and vibration	Adverse	Local	Long-term
Transport	Adverse	Local/regional	Long-term
Socio-economic factors	Beneficial	Regional/national	Long-term

18.2.2.2 Baseline

Different communities have varying susceptibility to population and human health effects (both adverse and beneficial) as a result of social and demographic structure, behaviour and relative economic circumstance.

As detailed in the IPH HIA guidance, building a population profile helps to develop a better understanding of those affected by the proposal, identifying potentially vulnerable groups and establishing a baseline against which possible future health effects can be assessed.

The approach to defining the baseline involves the collation and interpretation of published demographic, socio-economic and existing public health data. From this, potential changes due to the proposed development can be investigated and their significance of effect assessed. While this sets the basis to any assessment, it also provides greater insight into local health priorities and needs, which can further inform healthy urban design and community support initiatives.

18.2.2.3 Appraisal

The appraisal in Section 18.4 of this chapter uses the baseline information provided in Section 18.3 and key outputs from inter-related technical disciplines to establish receptor sensitivity, magnitude of impact and resultant significance of effect (whether adverse or beneficial) that would be directly attributed to the proposed development during construction and operational phases, and further considers any cumulative impact.

The majority of population and health determinants use qualitative analysis to establish magnitude of impact and resultant significance of effect. For changes in local air quality, quantitative methods have been used to establish magnitude of impact and resultant significance of effect.

18.2.3 Study area

Environmental health determinants (such as changes to air quality and noise exposure) are likely to have a local impact where potential change in hazard exposure is limited by physical dispersion characteristics. As a result, and where available, the study area for health-specific baseline statistics relating to population and health effects focus on the electoral divisions (EDs) immediately adjacent to the 3FM Project and the EDs where the 3FM Project is visible (i.e. Pembroke East A, Pembroke East B, Pembroke West A, South Dock, North Dock B); using the Dublin City and Ireland averages as comparators. Where data for EDs are not available, statistics relating to Dublin City are collected using the Ireland average as a comparator.

Socio-economic health determinants (such as employment and related income generation) have a wider geographic scope of influence than environmental health determinants due to the willingness to commute significant distances to work. While data at ED level is reported where available, the focus for socio-economic baseline statistics is for Dublin City, using the Ireland average as a comparator.

18.2.4 Assessment criteria and assignment of significance

18.2.4.1 Sensitivity

As detailed in the IPH HIA guidance, sensitivity is the relative sensitivity of a receptor to change. It includes consideration of that receptor's capacity to accommodate changes brought about by the proposal. There are several components of sensitivity, which include:

- Life stage – typically, children and older people are particularly sensitive to change, including due to being dependants; in addition, particular age groups are likely to experience effects more strongly, e.g. pregnant

women and their unborn children; the very young; the very old; or working-age people (benefiting from jobs).

- Deprivation – deprivation reflects an increased sensitivity due to lack of ownership of or access to assets, including those that support good health; the potential for localised high deprivation within wider areas showing average or low deprivation should always be considered.
- Health status – areas with a poor health status are typically of higher sensitivity.
- Daily activities – people’s ability to perform day-to-day activities is relevant, particularly where there are changes in access to services or community amenities.
- Inequalities – descriptive measures of difference in exposure to health risk factors, and to differences in health status between groups of people; where inequalities between areas or populations are wide (or at risk of widening), this indicates greater sensitivity.
- Capacity to adapt (resilience) – the ability of the population or service to absorb change or voluntarily (consciously or unconsciously) make small changes to their behaviour that lessen the effects of the proposal.
- Resource sharing with the proposal – Where a proposal affects a resource (service, power supply, water supply, highway capacity, school places etc.), the effects may extend a great distance from the development boundary; where there is high resource sharing and a lack of easily accessible alternatives, the population that is sharing the resource may be more sensitive.

The criteria for defining sensitivity in this chapter are outlined in Table 18.3.

Table 18.3 Sensitivity descriptors

Sensitivity	Description
High	High levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the project); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependants; people with very poor health status; and/or people with a very low capacity to adapt.
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt.
Low	Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt.
Very low	Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt.

Baseline data pertinent to the project and area has been collated to interpret local health circumstance, and consequent population sensitivity. This information is detailed in Appendix 18.1 and summarised in Section 18.3. Overall, it is concluded that local health circumstance in the study area is generally good. Exceptions to

this include alcohol consumption and some specific causes of mortality (although all-cause mortality in the study area is lower than the national average).

As such, when looking at the population in general, the existing burden of poor health is typically low and the sensitivity of the population within the study area is considered to be “low”.

18.2.4.2 Magnitude of impact

As detailed in the IPH HIA guidance, magnitude considers the characteristics of the change which would affect the receptor as a result of the proposal. There are several components of magnitude, which include:

- Exposure – exposure tends to vary with proximity of the population to the source, but also has an important time dimension relevant to health, e.g. low concentrations over a long period, or high concentrations over a short period.
- Scale – the scale of change is a useful characterisation, particularly when exposure is not a relevant descriptive for the type of effect. For example, the scale of change in open space that is available for physical activity.
- Duration – effects that continue for a long duration are of greater magnitude (including inter-generational effects). Where effects are best characterised as short term, other factors such as scale or exposure may still indicate that the change is of high magnitude.
- Frequency – effects that are frequent or continuous are likely to indicate greater magnitude; however, even where the effect would be occasional, other factors such as scale or exposure may still indicate that the change is of high magnitude.
- Severity – health severity relates to the type of health outcome affected, such as changes predominantly related to mortality, disease, nuisance or wellbeing.
- Population extent – the proportion of the population (defined by the assessment) that is affected informs the decision on magnitude.
- Outcome reversibility – some changes in health outcomes rapidly reverse once the source is removed. In other cases, health effects may reverse at a slower rate. Where health effects are considered permanent, this indicates a higher magnitude.
- Service quality implication – there may be an associated or independent change in the quality of services that support or facilitate good health (including health services, schools, social care, etc.).

The criteria for defining magnitude of impact in this chapter are outlined in Table 18.4.

Table 18.4 Magnitude descriptors

Magnitude of impact	Description
High	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.
Low	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications
Negligible	Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication.

18.2.4.3 Significance of effect

As detailed in the IPH HIA guidance, significance relies on informed, expert judgement about what is important, desirable or acceptable. In addition to the components on sensitivity and magnitude contributing to significance conclusions, the following components should also contribute to the significance conclusion and provide context relating to the importance/acceptability/desirability of a change to population health:

- Scientific literature – the literature can indicate if there is evidence to support an association between the proposal-related change, a relevant determinant of health and a relevant health outcome.
- Health priorities – these can identify if relevant determinants of health or health outcomes have been identified as particularly important locally, regionally or nationally.
- Baseline conditions – these can establish if relevant sensitivities or inequalities identified in the scientific literature are present.
- Health policy context – this can identify published local or national government position statements that raise particular expectations for the relevant proposal change, determinant of health or health outcome.
- Regulatory standards – such standards (if applicable) can identify where there would be formal monitoring by regulators. Discussion may include modelling results on the extent to which regulatory or statutory limit values would be met.

For simplicity, a significance matrix (which takes into consideration sensitivity and magnitude) is provided in Table 18.5. As outlined above, a range of other components contribute to the determination of significance. For the purpose of this assessment, any effects with a significance level of minor or less are not considered to be significant in terms of the EIA Regulations.

Table 18.5 Significance of effect matrix

		Magnitude of impact			
		Negligible	Low	Medium	High
Sensitivity	Very low	Negligible	Negligible	Minor/negligible	Minor/negligible
	Low	Negligible	Minor	Minor	Moderate/minor
	Medium	Minor/negligible	Minor	Moderate	Major/moderate
	High	Minor/negligible	Moderate/minor	Major/moderate	Major

18.2.5 Limitations to the assessment

Where the population and health assessment draws from and builds upon the technical outputs from inter-related technical disciplines, the same limitations and assumptions therein apply.

18.3 Receiving Environment

18.3.1 Existing baseline conditions

Individuals and communities vary in their susceptibility to adverse and/or beneficial population and health impacts associated with changes in environmental and socio-economic conditions as a result of demographic structure (i.e. age); existing burden of poor health; behaviours (i.e. lifestyle choices that constitute risk factors); and socioeconomic circumstance.

The following information, which makes up this demographic and human health baseline, is intended to summarise the local health circumstance of the communities surrounding Dublin Port using publicly available statistics. Where feasible, data has been collected for the ED (i.e. Pembroke East A, Pembroke East B, Pembroke West A, South Dock and North Dock B) and were compared to the national average. Data for Local Administrative Unit (NUTS4) (i.e. Dublin City) or Regional data (NUTS3) (i.e. Dublin) were utilised in instances where ED data were not available. In terms of socio-economic indicators, income and work prospects are likely to have a broader impact and are therefore more relevant for Dublin region than for individual ED's.

Overall, the population living within the Port Study Area have higher levels of employment, education, and income compared to the national average. Four out of the five ED's which make up the Port Study Area (Pembroke East B, Pembroke West A, North Dock B and South Dock) are classified as 'Affluent', while one ED (Pembroke East A) is classified as 'Marginally above average'. The Port Study Area comprises a higher proportion of young adults aged 25 to 39 in comparison to the national average, and its population has increased by 5% between 2011 and 2016.

Regarding physical health, all-cause mortality in Dublin is lower than the national average. While this is the case, mortality relating to certain specific causes (cardiovascular diseases, respiratory diseases and cancer) is higher in Dublin compared to the national average. Regarding mental health, levels of depression in Dublin are comparable to the national average and suicide rate is consistently lower than the national average.

In terms of lifestyle and behavioural risk factors, Dublin has greater levels of alcohol consumption and comparable smoking prevalence. The proportion of the population living within Dublin who are overweight/obese is similar to the national average.

18.3.2 Future baseline conditions

Consistent with recent local and national trends, the health of the study area population is likely to improve over the masterplan period. This would be the case with or without the proposed development.

While this is the case, any improvement is challenging to predict with high degree of confidence. On this basis, it is considered appropriate to use present-day statistics for the purpose of this assessment, offering a precautionary approach (ignoring the improving health trend).

18.4 Appraisal of Significance

18.4.1 Construction phase

18.4.1.1 Health effects from changes to local air quality

As stated in Chapter 10: Air Quality, there is potential for the generation and dispersion of nuisance dust associated with demolition and general construction activities. There is limited potential for dust to be generated from dredging activities due to the high moisture content of dredged material which curtails the potential for dispersion and exposure. However, dredged material does have the potential to cause odour impacts due to the presence and dispersion of H₂S. Furthermore, there is potential for plant emissions from diesel use on mobile and fixed plant engaged in the construction phase.

To mitigate the potential for dust emissions, a Dust Management Plan will be prepared by the appointed contractor and submitted to the Council for written agreement prior to commencement of construction. A list of measures to be implemented as a minimum are provided in Chapter 10: Air Quality. With the implementation of these measures, fugitive dust emissions from the site would not be of a nature, magnitude or exposure sufficient to pose a nuisance or quantify any change in human health outcomes at the population level.

Sources of H₂S have the potential to cause odour emissions during dredging operations. However, low levels of organic solvents are predicted in the dredged material and any vapour released will quickly condense into the liquid phase and either dissolve in the water, or form a residue on the water surface. As a result, the odour impact is considered to be negligible in air quality terms; while this is the case, the CEMP includes a draft Odour Management Plan which considers sources, releases and impacts of odour in order to identify opportunities for odour management.

There is also potential for short term changes in local air quality from construction phase transport movements. However, as stated in Chapter 10: Air Quality, significant changes in air quality are only likely where traffic volumes change by 5-10% or more. On the basis that traffic analysis shows that construction related traffic would equate to a circa 1% increase in traffic movements (occurring on East Wall Road), the associated change in NO₂ and PM is considered negligible in air quality terms.

Regarding the potential for plant diesel emissions, of relevance to population and health are NO_x and PM₁₀. Total NO_x and PM₁₀ emissions (in tonnes) estimated to be emitted during the entire construction phase is 60.99 and 3.93, respectively. Such emissions would be limited to within the port area and would be temporary and transient in nature. Due to the dispersion characteristics of NO_x and PM₁₀, the potential impact on health and wellbeing is limited.

In summary, changes in air quality during the construction phase (dust, odour and plant/transport emissions) are temporary, intermittent, transient and not of a nature or magnitude to result in any measurable health impact. The proposed mitigation seeks to address environmental precursors to any adverse health outcome and manage nuisance (e.g. H₂S and dust). As a result, the magnitude of impact on population and health is considered to be negligible, where in an area of low sensitivity, would result in a negligible significance of effect, which is not considered significant in EIA terms.

18.4.1.2 Health effects from changes in noise/vibration exposure

Noise

As detailed in Chapter 12: Noise and Vibration, construction activities associated with the 3FM Project will take place over a period of approximately 15 years between the hours of 7am – 7pm (weekdays) and 8am-1pm (Saturday). However, on the basis that construction activity would be located in different areas of the site, the potential for noise impacts at nearby receptors would vary depending on the nature and location of construction activities taking place at any one time.

As outlined in Chapter 12: Noise and Vibration, worst-case construction noise levels in the direction of Clontarf, Sandymount, and to the west of the port in the absence of mitigation would be below 50dB(A). This is below the most onerous construction phase noise threshold limit of 65dB(A) which is set to be protective of the environment and human health and considered negligible in noise terms.

Prior to mitigation the largest construction noise impacts from the 3FM Project would occur in the areas around Pigeon House Road and Coastguard Cottages. During construction years 4-8, there is potential for noise levels greater than 65dB(A) associated with the dredging/piling/road building/marina berth construction works that will be taking place in this area. This exceeds the noise threshold limit of 65dB(A) at two properties in Year 4 along Pigeon House Road / Coastguard Cottages (Receptor 10 and Receptor 12 in Table 12.1.14) and at a further eight properties in Year 6 (Receptors 3-10 in Table 12.1.15).

To mitigate the impacts at properties exceeding the noise threshold limit of 65dB(A) during the construction phase, it is proposed that a temporary 4m noise barrier is placed between the construction activities in this area and the nearest noise sensitive properties. As demonstrated in Chapter 12: Noise and Vibration, the implementation of the barrier reduces noise levels to below the relevant noise threshold limit of 65dB(A) which is set to be protective of the environment and health.

Regarding traffic noise, the highest concentration of construction traffic during construction will be in the second half of 2038, and primarily related to construction vehicles movements to the works at areas K, L and O. It is estimated 17,088 construction vehicles (two-way movements) will take place during this 6-month period, which equates to less than 140 construction vehicles (two-way movements) per day. As stated in Chapter 12: Noise and Vibration, it is anticipated that any change in exposure to noise levels associated with changes in traffic nature and flow rate during the construction phase would be <1dB(A). On the basis that this is lower than what is considered perceptible to the average person (3dB(A)), there would be no impact on health and/or wellbeing.

Overall, following the implementation of mitigation measures, the magnitude of impact on population and health from changes in noise exposure is considered to be negligible, where in an area of low sensitivity, would result in a negligible significance of effect, which is not considered significant in EIA terms.

Vibration

As stated in Chapter 12: Noise and Vibration, there is potential for vibration impacts from piling, and to a lesser extent, rock armour activities and dredging if sufficiently close to sensitive receptors.

The nearest properties on Pigeon House Road are approximately 40m from the nearest construction piling activity associated with SPAR construction. Data shows that bored piling on loose rock over weathered rock,

gives a measured Peak Particle Velocity (PPV) of 1.2mm/s at 30m. With reference to this, vibration levels from piling activities at the closest sensitive receptors would be less than 1mm/s, where vibration might be just perceptible in residential environments.

On this basis, vibration impacts are reported to be minor in Chapter 12: Noise and Vibration where it states that it will be prudent for monitoring to be completed during the worst-case phase of piling in this area.

While the potential for actual health impacts from intermittent vibration is unlikely, experiencing vibration impacts can be unpleasant and may affect wellbeing through being perceived as a risk. While not of a level to impact health, the proposed vibration monitoring will aid in further identifying, addressing and disseminating the actions taken to address any residual / perceptible impact with interested parties and the neighbouring community.

Overall, the magnitude of impact on population and health is considered to be low, where in an area of low sensitivity, would result in a minor adverse significance of effect, which is not considered significant in EIA terms.

18.4.1.3 Health effects from changes in transport nature and flow rate

Over the entire 15-year construction phase, the average HGV generation would be 55 two-way daily movements. The peak HGV generation would be 177 two-way daily movements, occurring in the second half of 2038 where there would be concurrent construction of the Maritime Village (Phase 2), Ro-Ro terminal, SPAR, and Lo-Lo terminal.

With regards to staff traffic movements, there would be an average generation of 92 two-way daily movements. Staff traffic movements would peak at 215 two-way daily movements, also occurring in the second half of 2038.

As stated in Chapter 14: Traffic & Transportation, all construction traffic will arrive and depart Dublin Port via the national road network and will be controlled by a Construction Traffic Management Plan (CTMP). Furthermore, all HGV movements will be in compliance with the Dublin City Council HGV Management Strategy which provides for a ban on 5+ axle vehicles during the hours of 07.00 - 19.00 seven days a week from a designated cordon area and provides a limited permit scheme for 5+ axle vehicles that need to load/unload within the city centre area; the purpose of the strategy is to encourage maximum use of the Port Tunnel by port-related traffic and to enhance the city centre environment.

Due to the location of Dublin Port in proximity to the national road network and requirement to adhere to the HGV Management Strategy, the impact during construction of the 3FM Project on the external road network would be minimal. Furthermore, the proximity to the national road network would result in an inherent lack of interaction with the local population. As a result, the magnitude of impact on population and health is considered to be negligible, where in an area of low sensitivity, would result in a negligible significance of effect, which is not considered significant in EIA terms.

18.4.1.4 Health effects from changes in socio-economic factors

Introduction

Socio-economic factors make up a collection of wider determinants of health which refer to social, cultural, political, economic and commercial factors, which in combination with environmental factors, shape the conditions in which people are born, grow, live, work and age – ultimately affecting population and health.

Construction employment

Construction activities associated with the 3FM Project are anticipated to span 15 years, beginning in 2026 and ending in 2040. The construction of the 3FM Project would generate an annual average of 92 direct Full Time Equivalent (FTE) jobs to deliver the project. Direct employment is expected to peak at 203 FTE in Year 13 of construction (2038).

On the basis that the construction of the MP2 Project is ongoing and due to end in 2032 (Year 7 of 3FM Project construction), there is potential for the 3FM Project to provide job retention for MP2 construction workers as direct FTE construction employment for the 3FM Project generally ramps up from 2032 (Year 7) to 2038 (Year 13) – refer to Figure 18.1.

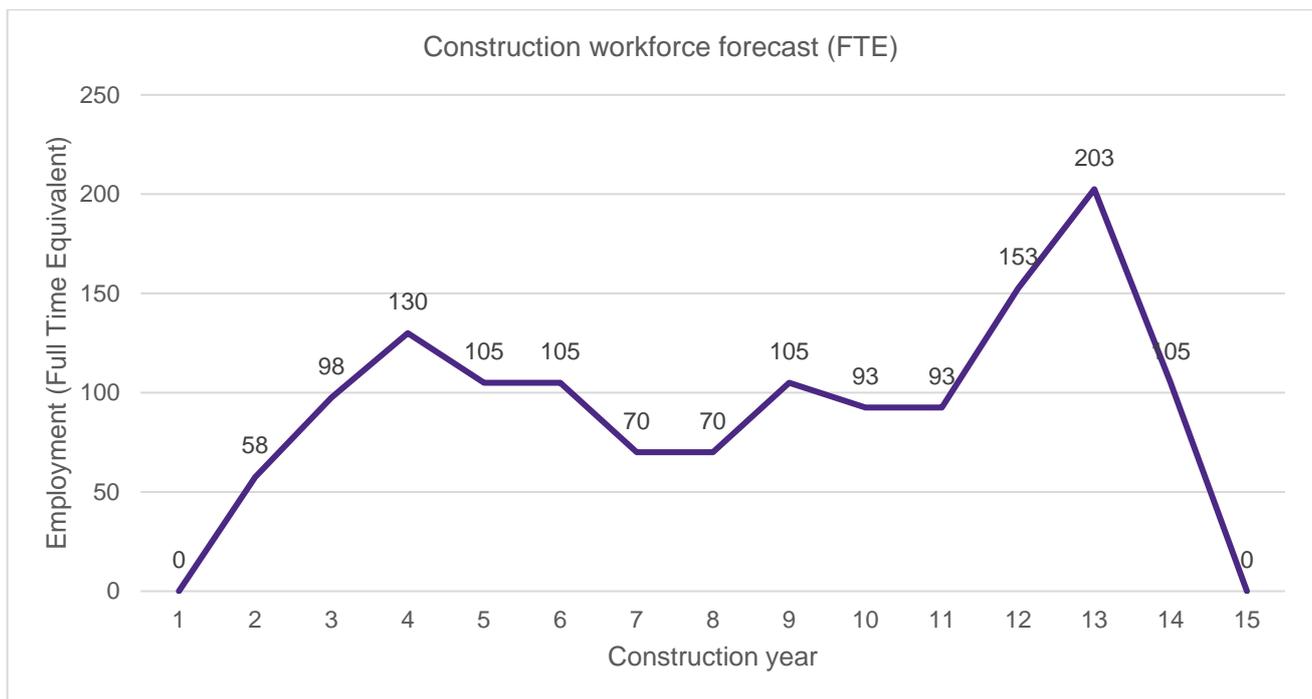


Figure 18.1 Construction employment forecast (FTE)

As set out in the baseline section, there is a total of 338 residents living in the Port Study Area who “building and construction”; this increases to 7,995 residents living within the wider Dublin City area. As such, it can be concluded that there is a sufficient pool of local labour to meet the construction demands of the 3FM Project. However, it should be noted that the uptake of employment locally would depend on the specific procurement strategy.

In addition, expenditure by DPC on the 3FM Project would result in increased employment in the wider supply chain, this is classified as indirect employment effects. The additional construction employees would be expected to spend some of their increased income, and thereby increase employment in local shops and services, this is classified as induced employment effects.

Overall, the relatively low number of direct employment opportunities generated during the construction phase are only likely to benefit population and health at the individual level, rather than having a measurable population-level effect. While the number of indirect and induced job opportunities would contribute to such benefits, these opportunities would be more diffuse across the region and therefore unlikely to contribute to a measurable population-level effect.

As a result, the magnitude of impact on population and health from construction-related employment would be low, where in an area of low sensitivity, would result in a minor beneficial significance of effect, which is not considered significant in EIA terms.

Construction GVA

GVA measures the contribution to an economy of an individual producer, industry, sector or region. In this instance, this contribution is from a proposed development, and is calculated by output minus intermediate consumption.

The capital cost of the 3FM Project is expected to be approximately €1.1 billion. Based on data provided by CSO Ireland (CSO Ireland, 2019), it is estimated that 34% of turnover within the construction industry would be GVA. As such, it is estimated that approximately €374 million of total construction costs over the 15-year construction period would be GVA, which would equate to approximately €25 million per annum.

Most recent regional statistics (2021) show that Dublin's GVA was valued at approximately €187 billion and since 2017 has increased by approximately €13 billion per year (CSO Ireland, 2021).

The annual GVA associated with construction of the 3FM Project (€25 million) would increase Dublin's annual GVA by approximately 0.2% per annum for a long-term duration of 15 years. Such a sustained contribution to regional GVA would result in population and health benefits regionally.

As a result, the magnitude of impact on population and health from construction-related GVA would be medium, where in an area of low sensitivity, would result in a minor beneficial significance of effect, which is not considered significant in EIA terms.

18.4.2 Operational phase

18.4.2.1 Health effects from changes to local air quality

There is potential for changes in local air quality (NO₂ and PM) associated with changes in traffic movements associated with the 3FM Project. Shipping emissions are excluded from the population and human health assessment on the basis that these would primarily impact offshore air quality, and therefore, there is no credible means of exposure.

As stated in Chapter 10: Air Quality, the change in local air quality associated with the proposed development would not result in exceedance of the relevant air quality standards, which are set to be protective of the environment and human health. Appendix 10.2 provides detailed dispersion model inputs and outputs, showing that every receptor assessed in the operational year of 2030 would see an improvement in NO₂, PM₁₀ and PM_{2.5} concentrations. The air quality improvements are associated with the closure of businesses within the Port area to make room for the 3FM Project; due to dispersion characteristics of traffic pollutants, such improvements are likely to benefit the population in the immediate surrounding area only.

Overall, on the basis that all assessed receptors would experience an improvement in air quality in the operational year of 2030 and there would be no exceedance of the relevant air quality standards which are set to be protective of the environment and human health, there would be a benefit to the air quality environment and associated health/wellbeing impacts. While some of the improvements in air quality would be large, as the

population benefitting from this change would be small, the magnitude of impact on population and health would be low, where in an area of low sensitivity, would result in a minor beneficial significance of effect, which is not considered significant in EIA terms.

18.4.2.2 Health effects from changes in noise exposure

SPAR

As outlined in Chapter 12: Noise and Vibration, following the implementation of mitigation measures (a 4m noise barrier in the vicinity of Coastguard Cottages and between the SPAR, and use of a low noise road surface), the vast majority of receptors (27 out of 33) would experience a decrease in noise associated with the operational SPAR, ranging from between -0.4dB L_{den} to -4.3dB(A) L_{den} .

Of the remaining six receptors, one would experience no change in noise from the baseline. While five receptors would experience an increase in noise of between 0.4dB L_{den} and 4.7dB L_{den} , the overall noise level would remain within the design limit of 60dB L_{den} , which is set to be protective of the environment and human health.

Overall, on the basis that the majority of receptors would experience a decrease in noise following the implementation of appropriate mitigation measures, and those experiencing an increase in noise would remain within the design limit which is set to be protective of the environment and human health, there would be a net benefit to the noise environment and associated health/wellbeing impacts from operation of the SPAR. As a result, the magnitude of impact on population and health would be low, where in an area of low sensitivity, would result in a minor beneficial significance of effect, which is not considered significant in EIA terms.

Plant/equipment

As stated in Chapter 12: Noise and Vibration, the primary sources of operational plant/equipment noise will be from the proposed new Ro-Ro and Lo-Lo operations.

Predicted operational noise levels from plant/equipment are outlined in Table 12.1.23 of Chapter 12: Noise and Vibration and show that noise levels at all receptors are below guideline limits for daytime (55dB L_{AeqT}), evening (50dB L_{AeqT}) and night-time (45 L_{AeqT}) periods, which are set to be protective of the environment and human health. Furthermore, all predicted noise levels are below existing ambient noise levels (L_{Aeq}) in all areas and at or below existing background noise levels (L_{A90}) for all periods of day in all areas; as a result, the change in noise exposure is considered negligible/minor in noise terms.

As a result, the magnitude of impact on population and health would be negligible, where in an area of low sensitivity, would result in a negligible significance of effect, which is not considered significant in EIA terms.

18.4.2.3 Health effects from changes in transport nature and flow rate

Once operational, the SPAR will redistribute some traffic (primarily HGVs) away from the external road network. Ultimately, the SPAR is a key piece of infrastructure intended to mitigate the impact on the external road network. Traffic allowed on the SPAR applies to the following:

- Any HGV vehicle that has an origin or destination on the Poolbeg Peninsula. This includes port HGV traffic, Covanta HGVs and any HGV generated by the other users on the Peninsula such as ESB, Irish Water etc.

- All vehicles for Areas K, N and O. This includes cars for staff and visitors.
- Public Transport.
- Traffic with an origin or destination at Harbour Operations Centre situated within the Maritime Village.
- Any HGV traffic generated by the Dublin Port Northern Estate that has an origin or destination south of the Sean Moore Roundabout. (Noting the 24-hour HGV ban on the southern arm of the Sean Moore Roundabout in any case).
- To satisfy the request from NTA, in this assessment it has been considered that non-Port HGVs travelling between Sean Moore Road and the Tunnel can use the SPAR.

Chapter 14: Traffic and Transportation summarises the percentage impact for HGVs by comparing the proposed traffic flows for 2040 with the do-nothing traffic flows for 2040 in Table 14-35. The following road links are assessed:

- East Wall Road;
- Tom Clarke Bridge;
- Pigeon House Road; and
- South Bank Road.

Due to the redistribution of traffic associated with the operational SPAR, all road links analysed would experience a decrease in HGVs ranging from -32% to -99%. The resultant impact on population and health would also be beneficial. Most notably, the largest decrease in HGV movements would occur on Pigeon House Road which comprises several residential properties. The reduction in HGV movements on this road would reduce levels of intimidation and disturbances to amenity.

While there are clear benefits of the scheme on traffic and transport, such benefits would only be realised by a small population, primarily those residing on Pigeon House Road. As a result, the magnitude of impact on population and health would be low, where in an area of low sensitivity, would result in a minor beneficial significance of effect, which is not considered significant in EIA terms.

18.4.2.4 Health effects from changes in socio-economic factors

Operational employment

The employment generated at Dublin Port is an important contributor to the regional economy. While the operational employment figures for Dublin Port for 2022 (Annual Report and Financial Statements) states that there was an average number of 150 operational employees (Dublin Port Company, 2022), the relationship between port throughput and employment is complex, and depends on the composition of trading activity being undertaken.

For example, few jobs are needed to handle liquid bulk, due to loading and unloading by pipelines. However, an increase of one million tonnes of port throughput has the potential to generate up to 300 additional jobs (direct and indirect) (OECD, 2014).

The average throughput between 2018-2022 was 36.9 million tonnes. The Dublin Port Masterplan 2040 (Reviewed 2018) (Dublin Port Company, 2018) references the following year on year growth rates:

- 2017 to 2019 = 5%;
- 2020 to 2029 = 4%; and
- 2030 to 2040 = 3%.

Applying this growth rate to current throughput levels, the future baseline throughput (in 2026, i.e. the commencement of the 3FM Project) is estimated to be 43.2 million tonnes. This is anticipated to increase by 33.8 million tonnes to 77 million tonnes by 2040, 20% of which (approximately 6.8 million tonnes) would be attributed to the infrastructure associated with the 3FM Project (Dublin Port Company, 2021)¹.

Without delivery of the 3FM Project, it would not be possible to maintain current growth levels and Dublin Port would reach its throughput limit closer to 2030 (rather than 2040).

Based on OECD research (OECD, 2014), the 3FM Project's contribution to the growth in throughput from levels in 2026 (approximately 6.8 million tonnes) has the potential to generate an additional 2,027 jobs (direct and indirect). While five Dublin Port tenants will be displaced as a result of the 3FM Project, the majority are likely to remain within Dublin Port itself and therefore, this would not materially alter the direct employment generation.

Data from the 2016 Census (CSO, 2016) shows that Dublin's non-resident workforce travel from County Fingal, County Kildare, County Meath and County Wicklow. Therefore, it is reasonable to assume that the 2,027 direct and indirect jobs generated by the operation of the 3FM Project would attract workers from these areas. While it is possible that regional socio-economic benefits would be diffuse in nature across a range of Counties, it is reasonable to assume that the vast majority of workers would be living within County Dublin and there would be measurable health and wellbeing benefits at the population level.

As a result, the magnitude of impact on population and health from operational employment would be high, where in an area of low sensitivity, would result in a moderate beneficial significance of effect, which is considered significant in EIA terms.

Operational GVA

In 2022, Dublin Port had a turnover of approximately €101.5 million (Dublin Port Company, 2022). Using the Bernard Cox (1979) method of calculating GVA (cited in Hossain, 2017), it is estimated that approximately €79.3 million of this was GVA (direct only).

Applying the year-on-year growth rates outlined in the Dublin Port Masterplan 2040 (Reviewed 2018) (Dublin Port Company, 2018), the future baseline direct GVA for all port activities (in 2026, i.e. the commencement of the 3FM Project) is estimated to be €92 million. This is anticipated to gradually increase year on year to €114.4 million by 2040.

¹ Based on the statement that the 3FM Project will deliver 20% of the capacity required by 2040.

On the basis that the 3FM Project will deliver 20% of the capacity required by 2040 (Dublin Port Company, 2021), the total direct GVA which can be attributed to the 3FM Project between 2026 and 2040 equates to €11.1 million (an average of €736,377 per annum).

Applying the multiplier for indirect GVA effects of the shipping & maritime transport sector, which is estimated to be 1.42 (Norton, et al., 2023)², the total indirect GVA which can be attributed to the 3FM Project between 2026 and 2040 equates to a further €15.7 million (an average of €1.05 million per annum).

Overall, a total addition of approximately €26.7 million direct and indirect GVA (an average of €1.8 million per annum) can be attributed to the 3FM Project.

As a result, the magnitude of impact on population and health from operational GVA would be medium, where in an area of low sensitivity, would result in a minor beneficial significance of effect, which is not considered significant in EIA terms.

Operational tax

Between 2018 and 2022, Dublin Port contributed an average of €5.8 million in tax payments to the Irish Government.

Using the same method as above, the future baseline total tax paid by Dublin Port Company (in 2026, i.e. the commencement of the 3FM Project) is estimated to be €6.7 million. This is anticipated to gradually increase year on year to €10.5 million by 2040.

On the basis that the 3FM Project will deliver 20% of the capacity required by 2040 (Dublin Port Company, 2021), the total tax paid by Dublin Port Company which can be attributed to the 3FM Project between 2026 and 2040 equates to approximately €805,000 (an average of approximately €54,000 per annum).

As a result, the magnitude of impact on population and health from tax generated would be low, where in an area of low sensitivity, would result in a minor beneficial significance of effect, which is not considered significant in EIA terms.

Community gain

Introduction

Integrating Dublin Port with Dublin City and its people is a core objective of the Masterplan for Dublin Port. Development of proposed new public amenities on the Poolbeg Peninsula as part of the 3FM Project will provide community gain and contribute towards integrating the port with the city. These include:

- enhanced recreational amenity;
- enhanced public realm; and
- community support.

Each theme is discussed in more detail below.

² Calculated using figures in Table 3: Ocean Economy Multipliers, within Ireland's Ocean Economy (2023)

Enhanced recreational amenity

The following design features seek to enhance recreational amenity:

- 4.6 km of Active Travel Path (cycle, pedestrian, wheelers etc) and 2.6 km of new or upgraded footway for the SPAR and Poolbeg Peninsula, which will link with the 1.4 km Liffey Tolka Greenway in the North Port, and from there to the 4 km Tolka Estuary Greenway currently under construction by Dublin Port. DPC will provide Dublin City Council with a €5million contribution for future upgrading of the existing coastal path along the southern perimeter of the Poolbeg Peninsula.
- Development of a sailing, rowing and maritime campus (Maritime Village) adjacent to the existing Poolbeg Yacht and Boat Club in conjunction with local yacht and boating clubs, including a public slipway and facilities for maritime skills training.
- Provision of open space
 - Port Park and Wildflower Meadow (2.5 ha); and
 - Coastal Park (1.6 ha).
- Provision of 1.1 ha extension to Irishtown Nature Park.

The provision of areas for recreational amenity at the port such as those described above enhances opportunities to engage in physical activity and recreation for the local community, with associated benefits to health and wellbeing. This constitutes a clear and enduring positive health benefit to local amenity provision and supports the delivery of a range of local and national policies which encourage the delivery of spaces which encourage active and healthy lives (e.g. Policies QHSN11 (15-Minute City), QHSN12 (Neighbourhood Development) and CCUV37 (Plan Active and Healthy Streets)).

Enhanced public realm

The following design features seek to enhance the public realm:

- development of a new public plaza as a key part of the Maritime Village; and
- extensive boundary softening works adjacent to the development sites forming part of the 3FM Project.

Similarly to the recreational amenity areas described above, the provision of an enhanced public realm at the port enhances opportunities for social interaction, with associated benefits to health and wellbeing. This constitutes a clear and enduring positive health benefit to local amenity provision, and supports the delivery of a range of local and national policies which have a focus on the public realm and public spaces (e.g. Policies CCUV37 (Plan Active and Healthy Streets) and CCUV39 (Permeable, Legible and Connected Public Realm)).

Community support

To address barriers to income and employment opportunities, and optimise the uptake of health benefits locally, Dublin Port Company would establish a new €2 million Community Benefit Fund for Education, Heritage & Maritime Training Skills projects within the Poolbeg area. The initial capital for the Fund will be administered by DPC in consultation with local stakeholders.

Such investment would benefit the local community, removing barriers, providing social benefits, and associated health and wellbeing benefits to beneficiaries of the fund. However, on the basis that the Community Benefit Fund would impact a small subset of the population, it is only likely to provide health and wellbeing benefits at the individual level.

Significance conclusion

In summary, while the enhanced public realm and recreational amenity would provide clear positive benefits to local amenity provision and would make the Port area a more attractive destination for the local community to enjoy, the presence of reasonable and accessible alternatives limit the measured benefits to health and wellbeing. Similarly, the Community Benefit Fund would clearly benefit local causes, but the limit on outreach would similarly limit the measurable benefits.

Overall, the magnitude of impact on population and health from community gain would be medium, where in an area of low sensitivity, would result in a minor beneficial significance of effect, which is not considered significant in EIA terms.

18.5 Mitigation Measures

Mitigation measures adopted as part of the construction and operation of the 3FM Project focus on precursors to health and wellbeing outcomes, thereby providing an opportunity for intervention to prevent any adverse impacts.

During construction, a CEMP (including a draft Odour Management Plan) will be secured to minimise adverse impacts (e.g. from changes in air quality and noise exposure) to local residential amenity. Similarly, all HGV movements during the construction phase will be in compliance with the Dublin City Council HGV Management Strategy, the purpose of the strategy is to encourage maximum use of the Port Tunnel by port-related traffic and to enhance the city centre environment.

During operation, the 2.2km SPAR will connect the Northern Estate to the Southern Estate. The SPAR will provide a congestion-free route for public transport to and from the Poolbeg Peninsula, contributing towards improved and more reliable services, whilst facilitating access for other industrial traffic, notably for the Covanta Waste-to-Energy plant. Overall, the SPAR would mitigate the impacts of traffic on the external road network, from both the 3FM Project (and all other Dublin Port activities) and other industry within the Poolbeg Peninsula.

On the basis that no significant adverse population and health effects are reported in Section 18.4, that embedded mitigation measures are designed to be protective of health and wellbeing by targeting precursors to health outcomes, and that community support initiatives and community gain are explored to increase the uptake of benefits locally, no additional health-specific mitigation is proposed.

18.6 Residual Impacts

On the basis that no health-specific additional mitigation measures are proposed, the residual effects remain the same as those reported in Section 18.4.

18.7 Cumulative Impact

Construction of the 3FM Project will extend over a period of approximately 15 years, whereby construction works would be transient (across both the northern and southern portions of the site) and intermittent in nature. While it is possible that nearby receptors may experience changes in air quality and noise concurrently, the implementation of mitigation measures which reduce these environmental factors would limit the potential for additive or synergistic in-combination effects on population and health.

There would be some overlap in construction of the 3FM Project and ongoing MP2 Project (due to end in 2032). This corresponds with Year 7 of the 3FM Project construction. As a result, there would be cumulative benefits associated with the construction of both in parallel; firstly in Years 1-7 of 3FM Project construction, there would be a larger magnitude of total construction jobs being generated by Dublin Port. Then in Year 7-13 of 3FM Project construction, there is the potential for construction job retention for MP2 construction workers as direct FTE construction employment for the 3FM Project generally ramps up from 2032 (Year 7) to 2038 (Year 13). In both instances, there would be population and health benefits associated with employment generation and retention.

The operational SPAR is able to be used by any HGV vehicle that has an origin or destination on the Poolbeg Peninsula and non-Port HGVs travelling between Sean Moore Road and the Tunnel in addition to all Port traffic and public transport. As a result, the SPAR will redistribute traffic away from the external road network for any project coming forward where this is the case. For example, there are a number of planning applications within the Dublin Port area on the Poolbeg Peninsula, including 4057/23, 3417/23 and PWSZ3074/23; by redistributing this traffic away from the external road network, there would be cumulative operational benefits to the air quality and noise environment, with associated cumulative population and health benefits where this occurs.

18.8 Monitoring

As previously stated, public health is by definition preventative in nature. Therefore, any monitoring should focus on environmental precursors to health outcomes (such as changes in air quality and noise) rather than health/wellbeing outcomes themselves which in some circumstances are not immediate and can take years to manifest.

It is proposed to undertake dust monitoring during the construction phase at a minimum of four locations at each active working area and further monitoring locations at sensitive receptors around the proposed works. Where dust levels exceed the guideline limits, mitigation measures would be reviewed and modified where necessary to ensure the guideline limits are met.

It is also proposed to undertake noise and vibration monitoring during the construction phase to ensure noise threshold limits, which are set to be protective of the environment and health, are not exceeded at potentially affected noise sensitive receptors (e.g. those on York Road / Pigeon House Road / Coastguard Cottages). Operational noise monitoring is also proposed to ensure that the noise predictions and the proposed mitigation measures included in the EIAR accurately reflect a worst-case scenario for the operating scheme. Both the construction and operational noise monitoring will contribute to protecting public health.

18.9 Interactions

Health is influenced directly or indirectly by a substantial range of environmental and socio-economic determinants. The most relevant health determinants (with the potential for significant effects and therefore included within the population and health assessment) have been determined through an iterative scoping exercise.

The population and health assessment draws from and build upon technical outputs from inter-related topics, comprising: Chapter 12: Noise and Vibration; Chapter 14: Traffic and Transportation; Chapter 10: Air Quality and Climate. A summary of these inter-relationships is provided below:

- Health and traffic/transport – a change in transport nature (i.e. increasing presence of HGVs) and a low rate can cause negative mental and social health and wellbeing impacts through increasing perceptions of severance, reducing pedestrian amenity (and potentially causing fear/intimidation effects) and increasing risk of accident and injury
- Health and air quality – there is a linear relationship between exposure to air pollutants and attributed health outcomes such as hospital admission/mortality rate from respiratory and cardiovascular diseases; and
- Health and noise – there is a complex relationship between noise and attributed health outcomes such as hospital admission/mortality rate from cardiovascular disease and mental health conditions (e.g. depression, anxiety and dementia). Noise can affect health both directly (in extreme circumstances, which is less common), and indirectly (through annoyance or sleep disturbance). However, the health effects from noise/vibration can also be affected by tonality and type of noise (e.g. low frequency noise, infrasound and amplitude modulation).

This does not negate the fact that other inter-relationships between topics exist. For example, there is potential for health and wellbeing impacts from changes in the visual environment, water quality, flood risk, coastal processes and climate change (the primary impacts of which influences several environmental functions that could plausibly alter the prevalence of a range of population and health outcomes).

18.10 Conclusion

This chapter analyses the changes in environmental and socio-economic conditions from the construction and operation of the 3FM Project, and the associated population and human health impacts that would occur as a result.

Mitigation and monitoring measures adopted as part of the construction and operation of the 3FM Project focus on precursors to health and wellbeing outcomes, thereby providing an opportunity for intervention to prevent any adverse impacts. Monitoring of environmental factors which may influence health and wellbeing is also proposed in order to ensure relevant thresholds which are set to be protective of the environment and human health are being met throughout construction and operation.

While the construction phase is long-term in nature, any changes in environmental determinants would be temporary, intermittent and transient in nature. Following the implementation of such measures during the construction phase, changes in air quality and noise would not result in any significant adverse population and

health impacts. Similarly, due to the location of Dublin Port in proximity to the national road network and requirement to adhere to the HGV Management Strategy, the impact on the external road network and associated potential for population and health effects would not be significant.

The long-term construction phase has the potential to result in benefits to population and health from changes in socio-economic determinants. An annual average of 92 construction jobs would be required to deliver the project, with a peak of 203 construction jobs required in Year 13 of construction (2038). It is worth noting that there is potential for cumulative population and health benefits via means of job retention for port construction workers as the MP2 Project is due to finish being constructed in 2032 and the construction employment for the 3FM Project generally ramps up from 2032 (Year 7) to 2038 (Year 13).

During the operation phase, changes in air quality would be positive at every modelled receptor, resulting in population and health benefits at the local level; while some of the improvements in air quality would be large, as the population benefitting from this change would be small and therefore the benefit is not considered to be significant.

Changes in noise exposure during operation is also shown to be largely positive, where there would be a reduction in noise at most receptors. Of the receptors experiencing an increase in noise, the overall level of noise remains within limits which are set to be protective of the environment and human health.

Due to the redistribution of traffic associated with the operational SPAR, all road links analysed would experience a decrease in HGVs. Most notably, the large reduction in HGV movements on Pigeon House Road would reduce levels of intimidation and disturbances to amenity. The resultant impact on population and health would also be beneficial, albeit due to the relatively small population benefitting from the decreases, not significant.

Socio-economic benefits associated with the operational 3FM Project would be generated through employment, GVA, tax and community gain. The increase in throughput associated with the 3FM Project would deliver 2,027 direct and indirect jobs in Dublin and into some of the surrounding counties, which is considered to be significant from a population and health perspective. GVA and tax would see a comparable increase.

In terms of community gain, integrating Dublin Port with Dublin City and its people is a core objective of the Masterplan. The 3FM Project seeks to deliver an active travel path, maritime village, new open space, new open space, extension of Irishtown Nature Park and public realm enhancements in addition to setting up a Community Benefit Fund for Education, Heritage & Maritime Training Skills projects within the Poolbeg area.