12 Health and wellbeing

12.1 Introduction

12.1.1 This chapter sets out the assessment of likely significant effects relating to health and wellbeing arising from the construction and operation of the proposed Hendre Lakes development.

12.1.2 The health and wellbeing assessment applies a broad definition of health, encompassing physical and mental wellbeing and quality of life. This understanding of health is captured in the World Health Organisation (WHO) definition:

"*Health is a state of complete physical, mental and social wellbeing and not merely an absence of disease or infirmity".*

12.1.3 The health and wellbeing assessment is based on the identification of 'health determinants' i.e. the social, economic and environmental factors that can influence the health and wellbeing of the population. It assess the beneficial and adverse health and wellbeing effects associated with changes to health determinants resulting from the proposed development.

12.1.4 The assessment predominantly focuses on the population and local communities in areas surrounding the site and follows the study areas of other relevant topics, including air quality (Chapter 8), noise (Chapter 9), and socio-economics (Chapter 11).

12.2 Review of proposed development

12.2.1 The aspects of the proposed development relevant to the health assessment will be similar to other topics the ES is informed by, including air quality (Chapter 8), transport (Chapter 4), noise (Chapter 9), socio-economic (Chapter 11) and landscape and visual impact assessment (LVIA) (Chapter 13). Further detail is provided in these chapters, but notable aspects of the design relevant to health include:

- Active travel routes connecting the site from Hendre Lakes Park, Cypress Drive, the existing business parks and St Mellons Road;
- Enhancement of the existing Public Right of Way (PRoW);
- Improvements to the A48/Cypress Drive/Newport roundabout;
- Provision of employment opportunities during construction and operation; and
- The provision of public spaces, cafes and restaurants, such as the new Station Square which would be lined by cafes and restaurants.

12.3 Legislation, policy context and guidance

Policy context

Wellbeing of Future Generations (Wales) Act 2015[1]

12.3.1 This legislation sets a requirement for public bodies to consider improving social, economic, environmental and cultural well-being of Wales. There are seven well-being goals in relation to these objectives, including 'a healthier Wales'. This aims to create a society which maximises people's physical and mental wellbeing. It seeks to create:

- a compassionate nation;
- an active nation;
- place making and designing-in community health and wellbeing that supports health communities; and
- seamless, preventative organisations and services that benefit health.

Planning policy Wales (2018)[2]

12.3.2 The Planning Policy for Wales aims to deliver the vision set out in the Wellbeing of Future Generations Act. A key planning principle as part of this document is to facilitate accessible and healthy environments, which includes creating high quality and inclusive environments in which people can live, work, travel and play.

Cardiff Local Development Plan (2006-2026)[3]

12.3.3 Policy KP14 Healthy Living: supports the creation of a healthier place to live in, reducing health inequalities by encouraging healthy lifestyles, addressing the social determinants of health and providing accessible health care facilities. The policy supports developments which provide active travel and accessible green spaces.

12.3.4 Policy C6 Health: supports reducing health inequalities and encouraging healthy lifestyles. It ensures the physical and built environment supports active travel choices, promotes healthy lifestyles, supports interconnectivity and enhances road safety. The Community section of the Plan also includes a number of other

[1] Commissioner for Wales. Wellbeing of Future Generations (Wales) Act, 2015. Available at: https://futuregenerations.wales/about-us/future-generations-act/
[2] Welsh Government. Planning Policy Wales, 2018. Available at: https://gov.wales/planning-policy-wales
[3] Cardiff Council, 2016. Cardiff Adopted Local Development Plan 2006-2026. Available at: https://www.cardiff.gov.uk/ENG/resident/Planning/Local-Development-Plan/Pages/default.aspx

relevant policies relating to the provision and protection of open space, the creation of safe environments and the provision of recreation, sport and play opportunities.

Newport Local Development Plan 2011-2026[4]

12.3.5 Policy SP2 Health: development proposals should seek to maximise their positive contribution to health and wellbeing and minimise any negative effects. Developments should be in the most sustainable locations, close to public transport and providing walking and cycling routes as part of the scheme.

Cardiff and Vale University Health Board – Shaping out Future Wellbeing Strategy 2015-2025[5]

12.3.6 This strategy sets out the Cardiff and Vale University Health Board's approach to healthcare in the region. It seeks to deliver healthy lifestyles for people across the region and sets a number of objectives including reducing health inequalities; improving health and wellbeing; reducing harm, waste and variation sustainability and supporting people in choosing healthy behaviours.

Relevant guidance

Rapid Health Impact Assessment Tool, National Health Service (NHS) London Healthy Urban Development (Unit) (2017)[6]

12.3.7 HUDU work with local and national organisations across the UK on behalf of the NHS to enable health and planning sectors to work together. The HUDU tool is designed to assess the likely health impacts of development plans and proposals and identifies those determinants of health which are likely to be influenced by a specific development proposal.

IMPACT Urban Health Impact Assessment methodology, Liverpool University (2015)[7]

12.3.8 The IMPACT methodology sets out a process for assessing health effects and improving health outcomes.

Wales Health Impact Assessment Support Unit (WHIASU) Health Impact Assessment – A practical guide (2011)[8]

12.3.9 The WHIASU Guidance describes the process and methods used to undertake a health assessment and provides resources to support the assessment. It includes

[4] Newport Local Development Plan 2011-2026. Available at: https://www.newport.gov.uk/en/Planning-Housing/Planning/Planning-policy/Local-Development-Plan/Local-Development-Plan.aspx
[5] Cardiff and Vale University Health Board, 2015. Shaping out future wellbeing strategy 2015-2025. Available at: http://www.cardiffandvaleuhb.wales.nhs.uk/sfw-strategy-2015-2025
[6] NHS, 2019. Health Impact Assessment Tool, Healthy Urban Design Unit (HUDU). Available online at: https://www.healthyurbandevelopment.nhs.uk/our-services/delivering-healthy-urban-development/health-impact-assessment/
[7] Liverpool University, 2015. Urban Health Impact Assessment Methodology. Available online at: https://livrepository.liverpool.ac.uk/2018902/
[8] Wales Health Impact Assessment Support Unit, 2011. Health Impact Assessment, a Practical Guide. Available online at: https://whiasu.publichealthnetwork.cymru/files/1415/0710/5107/HIA_Tool_Kit_V2_WEB.pdf

checklists for identifying the health determinants and vulnerable groups relevant to the health assessment being undertaken.

12.4 Scoping and consultation

Scoping

12.4.1 A Scoping Report set out the approach that would be taken for the health and wellbeing assessment. This was submitted to Cardiff Council (CC) on 5th July 2018 and a scoping opinion received on 25th September 2018.

12.4.2 The assessment follows a bespoke methodology based on the NHS HUDU Rapid HIA Tool. It comprises a qualitative assessment of the likely significant health effects based on the level of exposure of the population to changes in health determinants.

12.4.3 As part of the Scoping Report, a rapid appraisal using the NHS HUDU methodology was undertaken to identify which health determinants are relevant to the construction and operation stages of the proposed development. Health determinants considered within the assessment include:

- Access to healthcare services and other social infrastructure;
- Access to open space and nature;
- Air quality, noise and neighbourhood quality;
- Accessibility and active travel;
- Crime reduction and community safety;
- Access to work and training; and
- Climate change

12.4.4 No formal comments on the health assessment were received within Scoping Opinion although comments were received in relation to a number of other assessment topics which relate to health including air quality (Chapter 8), noise (Chapter 9), socio-economic (Chapter 11) and landscape (Chapter 13). These comments have been related to the health and well-being assessment.

Consultation

12.4.5 No further consultation comments were received during the preparation of the health assessment.

12.5 Methodology

Overview

12.5.1 The health and wellbeing assessment is based on the identification of 'health determinants', i.e. the social, economic and environmental factors that can influence the health and wellbeing of a population. The assessment assesses the beneficial and adverse health effects associated with changes to health determinants resulting from the proposed development.

12.5.2 The study area for the health and wellbeing assessment is based on the spatial distribution of the environmental and socio-economic impacts of the proposed development and the location of sensitive receptors. It predominantly focuses on local communities surrounding the site and also follows the study areas of other topics, such as transport, noise and socio-economics. Baseline data is generally assessed at ward level (Trowbridge) and from the wider Cardiff local authority area, to align with the socio-economic assessment (Chapter 11).

12.5.3 There is no established or widely accepted framework for assessing the significant health effects of a development proposal. The health assessment methodology is however based on a review of evidence, linking changes in health determinants to potential health outcomes. The health determinants to be assessed are agreed at the scoping stage. This is a tried and tested approach, typical of most health assessments.

Baseline methodology

12.5.4 The baseline consists of a community profile of the area surrounding the site. This is set out in Appendix J1 and summarised in Section 12.7.

12.5.5 Using publicly available data, the community profile presents a summary of the demographic, social and health characteristics of the population. Sources include Office of National Statistics (ONS) census and mid-year data, Public Health the Welsh Index of Multiple Deprivation 2019, StatsWales, NHS Wales Informatic Services and the Public Health Wales Observatory.

12.5.6 The community profile provides an overview of the population's resilience to health effects, and the prevalence and distribution of vulnerable sub-groups who may be more sensitive to changes in health determinants (e.g. deprived communities, people with existing health problems or disabilities, older people and children).

Evidence review

12.5.7 Publicly available literature has been reviewed to identify evidence linking health determinants with health outcomes, including government publications, research

papers and peer-reviewed journal articles. The full evidence review is set out in Appendix J2 and forms the basis of the qualitative assessment of health effects of the proposed development that is set out in Section 12.9.

Assessment methodology

12.5.8 Once the community profile has been established, the assessment is undertaken in the following stages:

Assessment of effects

12.5.9 A qualitative assessment of the likely significant health effects was carried out, based on the level of exposure of the population to changes in health determinants. The assessment identifies potential impacts related to the different stages of development (i.e. construction and operation) and identifies whether these would result in changes to health determinants that would be beneficial or adverse, direct or indirect and long-term or temporary. It also takes into account any mitigation measures embedded into the design of the proposed development. The approach for defining significance considers:

- the magnitude of the impact on a health determinant; and
- the size and sensitivity of the population exposed to the impact.

12.5.10 Most potential health effects cannot be reliably quantified because there are currently no robust or scientifically widely agreed upon methods for quantifying them, or because the types of data required cannot realistically be obtained. It is possible in theory to quantify health effects from increased exposure of a large population to noise and air emissions. However, given the relatively short duration of impacts and small number of people likely to be exposed, it would not be possible to identify a statistically significant effect. Therefore, a quantitative assessment of health effects was scoped out.

Magnitude

12.5.11 The magnitude of an impact relates to its severity and/or scale. Magnitude is determined by professional judgement, based on defined assessment criteria (Table 12.1). The characteristics of an impact (i.e. whether direct or indirect, secondary or cumulative, short, medium or long-term, permanent or temporary, reversible or irreversible) is assessed and the magnitude classified as high, medium, low or very low. The assessment of magnitude also considers the nature of potential health outcomes associated with the change, e.g. effects on physical or mental health conditions, quality of life, or comfort.

Table 12.1: Methodology for assessing magnitude of impact

Magnitude	Guidelines
High	A substantial change to a health determinant, with two or more of the following characteristics: • assessed as 'major' by relevant environmental topics (where applicable[9]); • likely to be perceived by the population as a major change; • has the potential to affect the occurrence of acute or chronic mental or physical illness; • long term duration or permanent.
Medium	A moderate change to a health determinant, with two or more of the following characteristics: • assessed as 'moderate' by relevant environmental topics (where applicable[9]); • likely to be perceived by the population as a moderate change; • has the potential to improve / reduce mental wellbeing or quality of life, exacerbate / alleviate symptoms of existing illness, or cause nuisance impacts; • medium to long-term duration.
Low	A minor change to a health determinant, with two or more of the following characteristics: • assessed as 'minor' by relevant environmental topics (where applicable[9]); • likely to be perceived by the population as a minor change; • has the potential to lower or raise wellbeing in terms of levels of comfort and contentment (for example in relation to noise, odour, or visual amenity); • short to medium term duration.
Very low	A 'very low' magnitude of impact is likely to be perceptible and localised. It may have the potential to lower or raise wellbeing in terms of levels of comfort and contentment.

Population exposure

12.5.12 The level of population exposure is defined by a combination of two factors: the size of the population exposed to an impact and its vulnerability to health effects. The size of the exposed population is judged on a scale of high, medium, low and very low, dependent on geographical area and number of people exposed. The vulnerability of the population is also judged on a scale of high, medium, low and very low based on indicators of the health and social status of the population (Table 12.2). More vulnerable populations include those with higher levels of social deprivation or relatively poor health status.

Table 12.2: Guidelines for the assessment of population exposure and vulnerability

Rating	Guidelines	
	Population exposure	**Population vulnerability**
High	A high level of exposure would occur over a wide geographical area and/or be likely to affect a large number of people (e.g. over 500).	Affected population includes a higher than national average proportion of vulnerable or disadvantaged groups (such as children or older people) who are more likely to experience adverse health effects as a result of the impact in question.

[9] Other EIA topics' assessment results are not always relevant to the health assessment. For example, a 'major' effect on an individual receptor would not necessarily constitute a major change to a health determinant that would affect the population as a whole. Professional judgement is required when using information from other topics in the health assessment.

Medium	A medium level of exposure would occur over a relatively localised area and/or be likely to affect a moderate-large number of people (e.g. 100-500).	Affected population includes an average or close to average proportion of vulnerable or disadvantaged groups who are more likely to experience adverse health effects as a result of the impact in question.
Low	A low level of exposure would over a small, local area and/or affect a small number of people (e.g. fewer than 100).	Affected population includes a below average proportion of vulnerable or disadvantaged groups who are more likely to experience adverse health effects as a result of the impact in question.
Very low	A very low level of exposure would affect a small number of individuals.	Not applicable (no population is considered

12.5.13 Population exposure and population vulnerability are then combined to give an overall judgement on population sensitivity, on a scale of high, medium, low or very low (Table 12.3).

Table 12.3: Population sensitivity matrix

Population exposure	**Population vulnerability**			
	High	**Medium**	**Low**	**Very low**
High	High	High	Medium	Low
Medium	High	Medium	Low	Low
Low	Medium	Low	Low	Very low
Very low	Low	Low	Very low	Very low

Significance Criteria

12.5.14 To determine overall significance of impact, the assessment matrix provided in Table 12.4 was used. This classifies significance of health impacts as major, moderate, minor or negligible. For the purpose of the EIA, a significant impact is defined as any health impacts identified as moderate and above.

Table 12.4: Significance of impact

Magnitude of impact	**Population sensitivity**			
	High	**Medium**	**Low**	**Very low**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Minor
Low	Moderate	Minor	Minor	Minor
Very low	Minor	Minor	Negligible	Negligible

Mitigation

12.5.15 If required, a description of further measures to be incorporated to reduce the adverse and/or enhance the beneficial effects of the proposed development on health determinants is described.

12.6 Limitations and assumptions

12.6.1 The assessment draws on the assessment outputs from other disciplines within the ES (socio-economics (Chapter 11), air quality (Chapter 8), noise and vibration (Chapter 9), traffic and transport (Chapter 4) and landscape and visual(Chapter 13)) that are relevant to the health determinants scoped in to the health assessment.

12.6.2 The assessment considers the residual impacts identified by the above disciplines, that is, after mitigation measures, such as landscape planting, have been taken into account. It also assumes that any mitigation outlined by these topics would be effective. The findings from these assessments inform the judgements made within the assessment.

12.6.3 Literature and baseline data used in the health assessment is limited to readily available public and published sources.

12.6.4 The health assessment identifies the impacts on the determinants of health, but there is less certainty regarding the resulting health effects of that impact as it is often dependent on a range of other factors. For example, the proposed development may improve opportunities for active travel, but the uptake of those opportunities by the population is less certain due to the individual choices people make.

12.7 Baseline Environment

12.7.1 A detailed analysis of the community profile is set out in Appendix J1, the key findings of which are set out in this section.

12.7.2 In summary, Cardiff has a population of 364,200 people, with the largest age group between 20-24 year olds[10]. In Trowbridge and Pontprennau/Old St Mellons there is a relatively high population of children (aged 0-15 years). Additionally, in Marshfield there is a high population of those aged 65+ compared with the other wards and Cardiff, but in line with the Welsh Average.

12.7.3 In the wards of Trowbridge, Pontprennau/Old St Mellons and Marshfield (See Figure 12.1), the majority of the population (89%) describe themselves as white

[10] Nomis (ONS) Labour Market Profile for Cardiff, 2018. Available at: https://www.nomisweb.co.uk/reports/lmp/la/1946157397/report.aspx#tabrespop

ethnicity[11]. The next largest ethnic group is Asian (4%). This is similar to the ethnic group split across Cardiff.

12.7.4 The Welsh Index of Multiple Deprivation (WIMD) uses eight domains (types) to measure deprivation in small areas across Wales. This data is measured at the Lower Super Output Area (LSOA) with the proposed development located in the 'Trowbridge 6' LSOA. **Table 12.5** shows the overall deprivation rank for the LSOAs in proximity to the proposed development (also see Figure 12.2). It indicates that in general, the areas around the site are not very deprived, but areas of deprivation do exist locally, most notably in Trowbridge 4.

Table 12.5: WIMD deprivation scores

	WIMD – overall deprivation		**WIMD – health deprivation**	
LSOA	**WIMD rank[1]**	**WIMD score[2]**	**WIMD rank[1]**	**WIMD score[2]**
Marshfield 2	1563	5	1813	5
Marshfield 3	1522	5	1283	5
Marshfield 4	1131	5	1014	5
Trowbridge 1	1342	5	1040	5
Trowbridge 4	61	1	28	1
Trowbridge 6	1232	5	1117	5
Trowbridge 9	402	2	591	4

[1] Where 1 is most deprived and 1909 is the least deprived
[2] Where 1 is most deprived 10% of LSOAs and 5 is the least deprived 50%

12.7.5 Table 12.5 also shows that generally the LSOAs in proximity to the site are not very deprived in terms of health, with exception to Trowbridge 4 which is within the 10% most deprived areas of Wales for health and wellbeing.

12.7.6 In terms of health lifestyles, 54% of adults in in the Cardiff and Vale University Health Board region are overweight or obese, lower than the Welsh average of 58.6%[12]. Additionally, 41.6% of adults in the region drank levels of alcohol above national guidelines, slight above the national average (40.1%). Public Health Wales identifies that mortality and hospital admissions associated with alcohol are significantly higher in the most deprived areas[13]. In terms of smoking, 18.4% of adults in this region smoke, lower than the national average of 20%. Similar to alcohol consumption, smoking rates tend to be the greatest in the most deprived areas of Wales.

12.7.7 Considering other determinants of health, the WIMD community safety domain provides an indication of safety levels at a local level, taking into account police records for various crimes. Across the LSOAs in proximity to the site, the majority

[11] ONS, 2011 Census.
[12] Statistics for Wales (2018). National Survey for Wales 2017-2018. Population health – Lifestyle
[13] Public Health Wales Observatory (2014), Alcohol and health in Wales 2014: Wales profile.

are within the 50% least deprived areas for community safety in Wales. Trowbridge 9 notably is within the 20% most deprived areas.

12.7.8 The socio-economic baseline (Chapter 11) has also been used to inform this assessment in terms of education, employment and income. It identifies that in the 2011 Census, within the local area 82.6% of the work-day population aged 16-74 are considered economically active, above the Cardiff (71.5%) and Newport (70.1%) levels. However, the local area also has a higher percentage of unemployment compared to Cardiff, Newport and nationally. It also notes that in the local area, the key industries (with over 10% of the local population employed in these sectors) include: manufacturing; business; administration and support services; and public administration defences.

12.8 Design mitigation

12.8.1 One of the design concepts for the proposed development centres on healthy living and includes provision for active transport and open space (including wildlife areas, play space and open access park areas). These encourage people to be more active as well as offering opportunities for social interaction and high-quality spaces for occupiers of the business park to utilise during breaks from work. The design of the proposed development has therefore evolved to maximise opportunities for healthy living.

12.8.2 The proposed development has two main elements, the railway station and the business district, both of which contribute to the direct enhancement of some health determinants, i.e. employment opportunities and connectivity. Whilst this is not mitigation of itself, these elements have been designed to maximise both employment opportunities and the rail transport links within the region. Further detail is provided in the description of the proposed development in Chapter 3.

12.9 Assessment of effects

Assessment of effects from construction

Access to healthcare services and other social infrastructure

12.9.1 The proposed development does not currently include any healthcare services or social infrastructure which would be affected as construction progresses. The local community surrounding the site would also not have their access to existing services and infrastructure affected during the construction period. As a result, there would be no health and wellbeing effects in regards to this determinant of health.

Access to open space

12.9.2 The proposed development site currently has one public right of way (PRoW) that crosses the site, the St Mellons No. 4A. Due to a network of reens and hedgerow, this PRoW is currently not accessible and therefore the path in its current state is not considered to be sensitive to this impact. As the rest of the site is currently

inaccessible, there would be no health and wellbeing effects during the construction phase.

Air quality, noise and neighbourhood quality

12.9.3 Construction activities and increased Heavy Goods Vehicles (HGV) traffic on roads could result in adverse changes to the outdoor neighbourhood amenity. This is due to increased noise, dust and changes in visual amenity from construction activities and from construction traffic on the local road network. This could impact residents off Cypress Drive and in south-west Blacktown, closest to the proposed development.

12.9.4 The health evidence review (Appendix J2) demonstrates that changes in air quality can affect respiratory health, and air quality is considered a major environmental health problem by the WHO. Additionally, excessive noise can interfere with people's daily activities, disturb sleep, cause cardiovascular and psychophysiological effects, reduce performance and provoke annoyance responses and changes in social behaviour.

12.9.5 The noise assessment (Chapter 9) has not identified any significant noise effects from construction traffic due to the limited number of sensitive receptors adjacent to the roads. The main routes assessed have no residential receptors close to the roads, with the closest buildings being office or light industry. The average noise levels are therefore not anticipated to increase significantly to effect local receptors. Nevertheless, the physical presence of additional construction traffic on Cypress Drive, whilst a main road, may give rise to perceptions of additional road safety risks, particularly for children, older people and disabled people in the local and wider area.

12.9.6 Although air quality can affect respiratory health, the scale of impact from changes in air quality is too small to give rise to any measurable effects on the health of the population (see Chapter 8, Air Quality). Nevertheless, it is likely the local community will be concerned about the health effects of construction emissions, particularly with regards to children's health and those with existing respiratory conditions. Additionally, dust from construction sites has the potential to cause nuisance and irritation. To reduce the impact from construction activity and HGV traffic in the local area, a number of measures are set out in the outline CEMP (Appendix A2) as described in the Air Quality assessment (Chapter 8) and Traffic and Transport assessment (Chapter 4).

12.9.7 Views of the site from Cypress Drive are partially filtered by vegetation. Although vegetation clearance of the site may be more open, the visual assessment does not identify a significant impact on local residents as any visible activity will be temporary, short-term and reversible (see Chapter 13, Townscape and Visual). Construction activities may be visible in the distance in a small portion of the views from local PRoW, but this is unlikely stop users from using them.

12.9.8 The combination of impacts on environmental amenity has the potential to give rise to negative feelings in relation to quality of life and the local environment.

This could change behaviours, such as deterring the use of outdoor space during the construction phase.

12.9.9 This impact is expected to result in a medium magnitude health effect due to temporarily reduced mental wellbeing and quality of life. The population sensitivity is assessed as low based on:

- Low population exposure: due to residential developments being set back from the dual carriageway of Cypress Drive, which is also an existing source of baseline noise. Additionally, existing vegetation shields the site from residential receptors and construction activity is temporary in nature, substantially reducing after the two year peak construction period; and
- Medium population vulnerability: due to the presence of vulnerable groups, such as children and the elderly.

12.9.10 Therefore, this is likely to result in a temporary **minor adverse** effect, which is **not significant.**

Accessibility and active travel

12.9.11 There is a potential for construction traffic to increase concerns around road safety relating to the presence of HGVs. This could deter people from using active forms of travel to access the site (and to move around it), particularly cyclists, during the eight-year construction period. The health evidence clearly shows that all groups benefit from regular exercise, and that it is children and older people who would be more vulnerable to increases in HGVs, potentially being discouraged (or prevented by concerned parents in the case of children) from active travel during this construction period as a result.

12.9.12 The transport chapter (Chapter 4) identifies that Cypress drive is not currently used for cycling and walking due to the lack of cycling and pedestrian infrastructure and high speed-limits along the route, and therefore identifies a negligible impact during construction as a result of increased HGVs and construction traffic in general. Whilst this is the existing case, the presence of increased HGVs during construction may deter people who would otherwise access the existing business district using active travel from doing so. This would be particularly the case during periods when the site is only partially occupied.

12.9.13 The transport assessment (Chapter 4) however also notes that part of Route 88 of the National Cycle Network is along Fortran Road and there may be a large impact on cyclists who could be deterred from using this route due to increased numbers of HGVs during construction. This impact would be significantly reduced when the primary site access becomes operational in 2023. The outline CEMP (Appendix A2) would set out measures to manage traffic during the construction

period, such as the use of banksmen and avoiding HGV movement during peak times as far as reasonably practicable.

12.9.14 This is expected to result in a low magnitude health effect as the scheme may deter cyclists from using the local road networks and national routes during construction. The population sensitivity is assessed as low based on:

- Low population exposure: the impact is largely limited to cyclists in the local area and will be temporary in nature, confined to the two year peak construction period; and
- Low population vulnerability: the impact is largely limited to cyclists, not a specific vulnerable group.

12.9.15 Therefore, this is likely to result in a temporary **minor adverse** effect**,** which is **not significant.**

Crime reduction and community safety

12.9.16 The proposed development site is not currently publicly accessible. However, during construction there is a chance that crime related to the site may increase as a result of potential theft of construction materials. The outline CEMP (Appendix A2) includes details of how the site would be secured during construction to prevent unauthorised access and potential theft or criminal damage.

12.9.17 Public safety would also be managed through the CEMP (Appendix A2) which would include details of public access during construction and managing safety during times when only part of the site is occupied.

12.9.18 As a result of the mitigation measures to prevent crime and maintain community safety, it is unlikely that there would be any health and well-being effects during construction.

Access to work and training

12.9.19 The construction of the proposed development is estimated to support an average of 306 Full Time Equivalent (FTE) construction jobs (See Chapter 11, Socio-economics). This would provide employment opportunities for local and regional communities.

12.9.20 As described in the socio-economic baseline, 5.45% of the working population in the local area (Trowbridge, Pontprennau/Old St Mellons and Marshfield) work in the construction industry. Additionally, the baseline identifies a large population of construction workers on the wider region. Therefore, the construction of the proposed development is likely to provide a range of suitable employment opportunities for local residents and workers in the wider region. The health evidence review (Appendix J2) describes how good employment is known to have

psychological benefits, improve life expectancy and enable healthier lifestyle choices (as a result of reliable income).

12.9.21 The proposed development is also likely to support a wider supply chain and service industries in the local vicinity of the proposed development, including food outlets and convenience stores. Any new employment or increase in profit generated by the construction works is likely to bring positive effects to the local economy and be beneficial to the wellbeing of the local communities within these supply chain and service industries.

12.9.22 Where possible, employees will be sourced locally for civil engineering, earthwork/construction workforce requirements, as well as for posts such as site security and cleaning.

12.9.23 The impact on work and training is therefore expected to result in a very low magnitude health effect due to the relatively low number of construction jobs predicted for the duration of works. The population sensitivity is assessed as high based on:

- Medium population exposure: due to a relatively high construction workforce in the local and wider area; and
- High population vulnerability: due to the presence of some areas of income and employment deprivation.

12.9.24 Therefore, this is likely to result in a **minor beneficial** health impact, which is **not significant**.

Climate change

12.9.25 The construction period for the proposed development is eight years and it is not considered that there would be significant changes in the local climate over this time period which would affect health.

12.9.26 The construction works themselves have the potential to contribute to climate change and it is estimated that they would result in 86.6 ktCO2e of GHG emissions which represents 1% of the total emissions for the Cardiff region (Chapter 14). Whilst this would be a significant effect from a climate change perspective, this change in emissions would not be perceptible by local residents and therefore there would be no effects from a health and wellbeing perspective.

Assessment of effects from operation

Access to healthcare services and social infrastructure

12.9.27 The provision of a new station with up to eight trains an hour, in addition to the enhanced bus links would improve access to the existing range of healthcare, services, community facilities and other social infrastructure for the local population. This would be particularly important for residents of Trowbridge and Blacktown in proximity to the proposed development. Direct active travel routes

and the reconfiguration of the bus routes to serve the site would allow access for local residents.

12.9.28 As described in the health evidence review (Appendix J2), access to services and community facilities can affect health and wellbeing directly, through access to health treatment and care, and indirectly through access to broader social networks, such as community groups. This is particularly important for more vulnerable groups, such as elderly people.

12.9.29 As a parkway station (and therefore not directly in a town centre), the site would be more readily accessible for local residents and especially for those with cars who would be able to make use of the park and ride facility. However, the design (See Chapter 3, Proposed Development) also encourages accessibility and connectivity through active travel, with a number of active travel options and routes proposed. The potential rerouting of busses into the development site would also improve access to the station. This provision of active travel and bus routes would therefore support those less-dependent on cars, who may currently be confined to services and infrastructure in their local area.

12.9.30 The impact on access to services would result in a medium magnitude health effect as the railway station and associated bus route improvements would provide significant improvements for local movement both to Newport and Cardiff, where services are more widely available than in the immediate community. The population sensitivity is assessed as medium based on:

- High population exposure: due to the large number of residents who would access the site itself and use the improved public transport network to access the services and infrastructure in the wider area; and
- Low population vulnerability: access to service is not expected to exacerbate vulnerabilities.

12.9.31 Therefore, this is likely to result in a **moderate beneficial health** effect, which is **significant**.

Access to open space and nature

12.9.32 The proposed development site is largely poor quality agricultural land which is not publicly accessible. Therefore, new active travel routes connecting to Hendre Lakes and the improvements to the PRoW (which is currently inaccessible) would facilitate an increase in access to open spaces. Pockets of open space and improved nature areas within the development would also provide an opportunity to access more natural environments. However, whilst open space would be more accessible,

the development of a new business park and car park would also change the rural characteristic of the local area.

12.9.33 The health evidence review (Appendix J2) outlines that access to nature and green spaces can have positive effects on mental health, alleviating symptoms of anxiety and depression, and restoring capacity for concentration and attention.

12.9.34 Therefore, this is expected to result in a low magnitude health effect as it would provide a minor beneficial effect on mental health and wellbeing for local residents by increasing access to open space. It is only considered low as the rural setting of the area would also be altered. The population sensitivity is assessed as medium based on:

- Medium population exposure: benefits would be largely confined to the local population;
- Medium population exposure: the local population includes a number of vulnerable groups who would benefit from improved access to nature, such as the elderly and young families.

12.9.35 Therefore, this is likely to result in a **minor beneficial health** effect, which is **not significant**.

Air quality, noise and neighbourhood quality

12.9.36 The proposed development would change the characteristic of the area by creating a more urban setting in replacement of the existing greenspace. The design of the proposed development includes the creation of small public spaces throughout the site including the Nature park and Faendre Reen Edge, both of which provided areas of connected habitat and natural landscapes which can be accessed by the public.

12.9.37 Tall buildings, up to a maximum of 15 storeys, would be clustered around the station minimising visual impacts on existing receptors. Building heights would reduce with distance from the station with buildings up to seven storeys in the north east corner of the site. The visual assessment (Chapter 13) identifies moderate adverse significant effects for residential properties on Heol Las and the southeast edge of Cypress Drive. Additionally, views from PRoW and recreational areas, such as Hendre Lakes, would experience a change in visual amenity due to the proximity of new buildings and infrastructure in the skyline. The impact is reduced however due to the presence of existing infrastructure, buildings, trees and hedges.

12.9.38 The operation of the development would increase traffic associated with the station and the new business park. Residential areas along Cypress Drive, between the B4487 and proposed new link road, will experience increased noise levels (see Chapter 9, Noise and Vibration). This could affect the quality of the outdoor environment for residents on Cypress Drive. However, the impact is limited to a relatively small number of homes, all of which are set back and do not have habitable rooms facing the road. Operation of the new railway would change the noise climate, as trains would now be entering and leaving a station rather than

passing by. However, the noise generated by these activities is lower than the noise generated by the current passing high speed trains.

12.9.39 Increased traffic during operation could also increase concerns about road safety for pedestrians and cyclists using active travel which would reduce the quality of the local amenity in this area. However, the transport chapter (Chapter 4) identifies a negligible change to the number of vehicles on local roads during operation, including Sandbrook Road and Bryn Celyn Road. A number of design considerations also aim to improve pedestrian safety and prioritise pedestrian movement on the site, including the provision of a pedestrian and cycle bridge between the A48 and Newport Road and traffic signals at junctions along Cypress Drive. The A48/Cypress Drive/Newport roundabout would also be upgraded which would improve the amenity of the local area.

12.9.40 The scale of impact from changes in air quality during operation is assessed as negligible and would not give rise to any measurable effects on the health of the population (see Chapter 8 Air quality).

12.9.41 The combined impact on air quality, noise and neighbourhood quality is expected to result in a low magnitude health effect. In consideration of the other assessments, impacts are either assessed as not significant or confined to a very small number of residential receptors. The population sensitivity is assessed as medium based on:

- Medium population exposure: due to significant impacts being limited to a very small number of residential receptors, alongside proposed mitigation measures are incorporated into the design to reduce traffic and improve pedestrian safety; and
- Medium population vulnerability; due to the presence of some vulnerable groups who may be particularly sensitive, such as the elderly.

12.9.42 Therefore, effects on health are assessed a **minor adverse** effect, which is **not significant**

Accessibility and active travel

12.9.43 The proposed development includes the provision of walking and cycling routes which will increase connectivity to the Project site and surroundings. This includes active travel routes and the reopening of the PRoW (which is currently not used due to blockages by hedgerows and a lack of bridge to across the western reen).

12.9.44 The upgrade and provision of walking and cycling routes would potentially facilitate an increase in active travel and increase access to the surrounding area, providing benefits to local residents and employees of the business district and the existing St Mellons business park. Measures within the design which prioritise pedestrian movement (such as limiting speeds to 20mph and installing pedestrian crossings) would further encourage active travel in the local area.

12.9.45 The impact on accessibility and active travel is expected to result in a medium magnitude health effect due to health and wellbeing benefits associated with active

travel and activity. The population sensitivity has been assessed as medium based on:

- Medium population exposure; and
- Medium population vulnerability: due to high levels of obesity and inactivity in the local population.

12.9.46 Therefore, this is likely to result in a **moderate beneficial** health effect, which is **significant**.

Crime reduction and community safety

12.9.47 The proposed development could attract anti-social behaviour, especially due to increase night-time activity as trains operate into the late hours. This could affect levels of safety and perceptions of safety for local residents and users of the station.

12.9.48 However, later operations of trains would also offer an alternative and quicker route home for people during later hours, including those visiting Cardiff, Newport and other places on the train routes, and those working in these areas, particularly shift workers. Ancillary uses, such as the restaurants around station square, could also help to improve feelings of safety by ensuring activity in the local area (and therefore passive surveillance) after dark.

12.9.49 The health evidence base (Appendix J2) shows that reducing fear of crime can have positive effects on mental health and wellbeing and encourages greater use of the public realm and open spaces by more vulnerable groups such as women, older people and people with disabilities.

12.9.50 Passive surveillance mechanisms have been incorporated into the scheme design, such as ensuring public areas are overlooked by buildings and arranging blocks to ensure clear lines of sight. All public spaces would be surrounded by active frontages and public routes and spaces would be appropriately illuminated.

12.9.51 On balance, it is therefore expected to result in a low magnitude health effect due to the provision of well-designed public space and alternative modes of transport late at night, helping to reduce fear of crime. The population sensitivity is assessed as medium based on:

- Medium population exposure; and
- Medium population vulnerability: due to the presence of vulnerable groups in the local area who may be particularly concerned about crime and fear of crime, such as the elderly or young families.

12.9.52 Therefore this is likely to result in a **minor beneficial** effect on health, which is **not significant.**

Access to work and training

Employment

12.9.53 The operation of the proposed development is anticipated to generate 6,000 jobs by 2028 (See Chapter 11, Socio-economics). The employment opportunities generated by the proposed development are likely to provide a range of suitable employment for local residents. Additionally, the proposed development would generate wider economic benefits beyond jobs created on the site by enhancing transport links to major employment hubs including Bristol and London.

12.9.54 As set out in the socio-economic assessment baseline (Chapter 11), a high proportion of residents currently work in industries such as manufacturing (12.9%) and business admin and support services (13.95%). In the 2011 census, the local area had a higher than average rate of economic activity but also a higher percentage of unemployment, compared with Cardiff, Newport and the national averages. Data from 2019 showed that Cardiff and Newport had lower than average unemployment rates.

12.9.55 This is expected to result in a medium magnitude health effect due to the health benefits associated with increased income and employment. The population sensitivity is assessed as high based on:

- High population exposure: due to the high number of jobs, range of different job types and wider economic benefits generated by the proposed development; and
- Medium population vulnerability: due to the presence of some areas of income and employment deprivation locally.

12.9.56 Therefore, this is likely to result in a **major beneficial** effect on the local population, which is **significant**.

Education

12.9.57 The health evidence review (Appendix J2) identifies how low levels of education are linked with poor health, more stress and lower self-confidence. As described in Paragraph 12.9.4, increased noise can also result in distraction and disturbance.

12.9.58 The transport chapter (Chapter 4) identifies minimal changes to the traffic levels during operation on Sandbrook Road and Bryn Celyn Road which are close to existing schools. It also notes that existing pedestrian crossings ensure pedestrian movement is prioritised in these areas and traffic speeds controlled. The assessment therefore concludes a negligible change to the traffic levels on these two roads.

12.9.59 This is likely to result in a low magnitude health effect as traffic levels are not anticipated to significantly change in the areas surrounding the schools. The population sensitivity is assessed as medium based on:

- Low population exposure: as traffic levels are not anticipated to significantly change in proximity to the schools; and
- Medium population vulnerability: as the impact mainly effects children and young people.

12.9.60 Therefore, this is likely to result in a **minor adverse** effect**,** which is **not significant.**

Climate change

12.9.61 The creation of a new railway station is likely to facilitate a modal shift away from single occupancy car trips towards rail travel which is a more sustainable form of transport than the private car. Additionally, the provision of new footpaths and cycle routes could encourage active travel which would be both incidental (just passing through the site) and also intentional (to travel to the rail station or business district). Although this would contribute towards increased uptake of sustainable transport, the operation of the proposed development would still generate greenhouse gas emissions and within the climate assessment (Chapter 13) all emissions are considered significant.

12.9.62 However, this is likely to result in a very low magnitude effect on health as the change in emissions is unlikely to be perceptible to the local population. The sensitivity is assessed as low based on:

- Low population exposure; and
- Low population vulnerability: the effect would not exacerbate vulnerabilities.

12.9.63 Therefore, this is anticipated to have a **negligible** effect on health, which is **not significant**.

12.10 Mitigation and enhancement

12.10.1 The health assessment takes into account mitigation measures incorporated by traffic and transport (Chapter 4), air quality (Chapter 8), noise and vibration, socio-economics (Chapter 11) (Chapter 9) and LVIA (Chapter 13) to reduce the adverse effects of the proposed development on people and the environment. As no other significant adverse health effects have been identified, no further mitigation is proposed.

12.11 Residual effects

12.11.1 The residual effects predicted as part of the assessment are consistent with those reported above and summarised below in Section 12.12.

12.12 Assessment summary matrix

Potential Effect	Receptor (s)	Sensitivity of Receptor	Magnitude (prior to mitigation)	Significance (prior to mitigation)	Mitigation	Magnitude (following mitigation)	Significance (following mitigation)	Comments
Effects from construction activities and traffic on neighbourhood quality (including air quality, noise and visual amenity).	Local residents (including young people and the elderly)	Low	Medium	Not significant (minor adverse)	N/A	N/A	Not significant (minor adverse)	None
Effects from construction traffic on road safety.	Active travellers, particularly cyclists	Low	Low	Not significant (minor adverse)	N/A	N/A	Not significant (minor adverse)	None
Increased access to employment opportunities during construction.	Job seekers, particularly those in the construction industry	Low	Low	Not significant (minor beneficial)	N/A	N/A	Not significant (minor beneficial)	None
Improved access to health services and social infrastructure as a result of the proposed development.	Local residents (including young people and the elderly).	Medium	Medium	Significant (moderate beneficial)	N/A	N/A	Significant (moderate beneficial)	A significant beneficial effect is anticipated due to improvements to local transport networks allowing the local population to access a wider range of services, infrastructure and opportunities.
Improved access to open space and nature as a result of improvements to local PRoWs and footpaths.	Local residents (including young people and the elderly).	Low	Medium	Not significant (minor beneficial)	N/A	N/A	Not significant (minor beneficial)	None
Effects from operation of the proposed development on	Local residents (including young people and the elderly)	Low	Medium	Not significant	N/A	N/A	Not significant (minor adverse)	None

neighbourhood quality (including air quality, noise and visual amenity).				(minor adverse)				
Effects from operation of the proposed development, including the construction and improvements to PRoW and other footpaths, on accessibility and active travel.	Active travellers, including walkers and cyclists.	Medium	Medium	Significant (moderate beneficial)	N/A	N/A	Significant (moderate beneficial)	A significant beneficial effect is anticipated due to upgrades to, and the provision of, walking and cycling routes. This would facilitate increased active travel resulting in health and wellbeing benefits.
Effects from operation on local crime and community safety.	Local residents, shift workers, users of the night-time economy	Low	Medium	Not significant (minor beneficial)	N/A	N/A	Not significant (minor beneficial)	None
Increased access to employment opportunities during operation.	Job seekers and local residents	Medium	High	Significant (major beneficial)	N/A	N/A	Significant (major beneficial)	A significant beneficial effect is anticipated due to high number of jobs directly generated by the operation of the proposed development and provision of transport links to increase access to other employment opportunities. This would result in health benefits associated with improved income and employment provision.
Impacts on climate change associated with operation of the proposed development	Local and wider community	Very low	Low	Not significant (Negligible)	N/A	N/A	Not significant (Negligible)	None