



# Mellow Village: A Health Impact Assessment (HIA) Case Study

Practical guidance on how to undertake a HIA



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**Setting the scene:  
introducing the case study**

## Setting the scene: introducing the case study

In November 2021, the Institute launched the fourth edition of [HIA Guidance](#)<sup>1</sup> for Ireland and Northern Ireland, incorporating the most recent developments and best practice in the field. The updated HIA Guidance<sup>1</sup> is endorsed by the [International Association for Impact Assessment](#) and by the [European Public Health Association](#).

HIA can be used by policy and decision-makers in government, statutory agencies, community groups and voluntary organisations to ensure new proposals reduce any health risks and promote health opportunities for specific groups as well as the wider community.

At national level, government departments or statutory agencies can use HIA to assess proposed laws or policies. At local level, HIA may be used by local councils and the community and voluntary sector organisations to 'health proof' new and future programmes or projects.

### How to use this case study

This case study demonstrates how to prepare a HIA by following the HIA guidelines<sup>1</sup> outlined by the Institute of Public Health. It presents important excerpts from the HIA report for a fictional proposed development called Mellow Village. This development is situated in Tulip Park, a fictional location within Butterfly City and Butterfly County.

You can use this case study as a template and example of how to structure your own HIA reports. To aid your understanding of the report's development process, links are provided throughout to relevant sections of the HIA Guidance.

As well as extracts from the final report of the HIA, you also have some powerpoint slides which show the workings behind the assessment. These slides highlight key considerations and processes involved in developing the case study report. Relevant links between the case study and other supporting documents are included for easy reference.



## The fictional context

The developer, New Horizons Ltd, has submitted a planning application to Butterfly City Council (BCC). This is for the redevelopment of a site which used to house a large factory. There are some old sheds on one part of the site that are now used by small businesses. Much of the site is currently overgrown but it is open space which is used by dogwalkers and children and young people. Mellow Village will consist of residential housing, offices and other commercial buildings, a village square and a park.

This is a fictional example of a HIA carried out for a local project. We present it as a standalone HIA but it could also be a health chapter within an Environmental Impact Assessment (EIA). As such, the case study is written as though it has been prepared by an expert HIA team, on behalf of a developer. It thus assumes that the developer will submit this HIA, along with its planning application, to Butterfly City Council.

Please read, and use, this case study with these assumptions in mind.

The method encourages transparency. Please feel free to critique this case study. Do you agree with it? What do you think should change?

HIA is about investigating and then setting out a strong case for action to protect and improve public health. It should be a dialogue between all parties. The screening and scoping stages show how the analysis is conducted for a single determinant of health.

## The HIA's conclusions

The HIA's conclusions are based on information about the development and the population who live in Tulip Park. They are based on the policy context, on what the residents of Tulip Park said and on what the scientific evidence tells us about the links between the environment and health.

This information is presented in different parts of the report.

These are pieces of a jigsaw puzzle.

The analysis stage is where the pieces of the jigsaw are assembled and a picture emerges.

**The purpose of this case study** is to set out an example of how the tools and resources in the IPH guidance on HIA help you to assess a proposed development and to present the analysis. It shows how the findings in a HIA are based on evidence and how they are judgements. It shows how the different types of information, eg baseline information, public consultation, scientific evidence etc, all contribute to making this judgement.

**A disclaimer:** the text below is illustrative and based on a fictional development. Please do not take them as best practice examples.

# The HIA process


[See Guidance](#)

<b>Screening</b>	<p>Early in the design process, New Horizons Ltd consulted the Health Authority in Butterfly City.</p> <p>New Horizons Ltd decided to conduct a HIA.</p>									
<b>Commissioning</b>	<p>New Horizons Ltd employed consultants to lead the HIA. They joined the design team.</p>									
<b>Scoping</b>	<p>The HIA consultants for New Horizons Ltd prepared a scoping report. When this was agreed with New Horizons it was issued to Butterfly City Council (BCC) and the Health Authority for comment.</p> <p>This took account of IPH HIA guidance<sup>1</sup> to identify topics (health determinants), population groups and methods for the analysis.</p> <p>The policy context was reviewed to identify local and national health priorities.</p> <p>An outline population profile was prepared based on data from:</p> <ul style="list-style-type: none"> <li>• Public Health Outcomes Framework</li> <li>• National Statistics</li> <li>• Deprivation mapping</li> </ul> <p>The scope was agreed after consultation between all parties and included:</p> <table border="1" data-bbox="470 1489 1324 1915"> <tr> <td data-bbox="470 1489 901 1556">Healthy lifestyles</td> <td data-bbox="901 1489 1324 1556">Open space</td> </tr> <tr> <td data-bbox="470 1556 901 1691">Safe and cohesive communities: Built environment</td> <td data-bbox="901 1556 1324 1691">Community safety</td> </tr> <tr> <td data-bbox="470 1691 901 1825">Safe and cohesive communities: Built environment</td> <td data-bbox="901 1691 1324 1825">Community identity and society</td> </tr> <tr> <td data-bbox="470 1825 901 1915">Safe and cohesive communities: Transport</td> <td data-bbox="901 1825 1324 1915">Active travel</td> </tr> </table>		Healthy lifestyles	Open space	Safe and cohesive communities: Built environment	Community safety	Safe and cohesive communities: Built environment	Community identity and society	Safe and cohesive communities: Transport	Active travel
Healthy lifestyles	Open space									
Safe and cohesive communities: Built environment	Community safety									
Safe and cohesive communities: Built environment	Community identity and society									
Safe and cohesive communities: Transport	Active travel									

	Safe and cohesive communities: Transport	Severance
	Socioeconomic conditions: Socioeconomic status	Employment (including quality and income)
	Health and social care services	Access to services
	The following determinants were scoped out	
	Environmental conditions	Noise
	Environmental conditions	Air quality
	It was agreed that the HIA would focus on the likely significant effects of the proposed development.	
<b>Analysis</b>	<p>Areas covered by policies and programmes linked to social deprivation were noted.</p> <p>The baseline for the local population used health data.</p> <p>A HIA report was prepared considering construction and operation.</p> <p>New Horizons Ltd consulted with BCC throughout.</p> <p>The description of the development was used to identify potential changes to the wider determinants of health.</p> <p>The HIA identified the potential for likely significant health effects due to:</p>	
	Active travel	physical activity and infrastructure for active travel
	Open space	the amount and quality of greenspace within the development
	Community identity and society	gentrification and displacement of lower income families
	Employment (including quality and income)	site access arrangements and continuity of employment for vulnerable groups;

	Community safety	local perceptions of crime in unlit areas of the existing site
	Community safety	community safety and design in the new development including self-harm
	Access to services	impact of new residents on health and social care services
	Through consultation and negotiation, changes to design were agreed and funding for mitigation was identified. This was secured by planning condition.	
<b>Reporting</b>	<p>Formal reporting was at the scoping stage and at the submission of the application.</p> <p>Communication between all parties took place throughout.</p> <p>The final HIA was submitted to BCC as part of the planning application. Due to the design changes and committed mitigation the HIA reported no likely significant adverse impacts.</p>	
<b>Mitigation</b>	The health & wellbeing aspects of the planning condition included:	
	Active travel	cycle hire docking stations and spaces to securely store bicycles across the development
	Open space	good quality outdoor play space with mobility and sensory considerations
	Employment (including quality and income)	assistance to displaced businesses providing supported employment and to their employees through the construction and into the new development
	Community safety	provisions for community safety and connectivity with the existing community
	Access to services	integration with plans for health and social care services

# Screening


[See Guidance](#)
[See Slides](#)

Screening tool for case-by-case decisions for health in environmental assessments or a standalone HIA					
<b>Step 1 Record of screening:</b>					
<b>Title of plan, programme, project, policy or legislation</b>	Mellow Village: application from New Horizons Ltd				
<b>Date</b>	10 April 2023				
<b>Organisation(s)/person(s) performing screening</b>	Health Authority, Butterfly City Council				
<b>Step 2</b>					
<b>Broadly, based on available information, does the proposal have the potential to change 'risks to human health'? Will this happen in a way that is judged 'likely' to 'significantly' affect population health?</b>					
<b>Consider the following determinants that can influence physical, mental and social wellbeing:</b>	<b>Judgement Yes/No</b>	<b>Brief justification see notes below</b>			
<b>Health inequalities</b>	Y	Positive due to improvements to the local area and negative due to potential for gentrification. Likely over the medium-term and long-term.  Considered significant.			
		+	L	ST/ MT	T S
<b>Healthy lifestyles</b>	Y	Positive due to improvements to the local area eg housing, park. Likely over the medium-term and long-term.  Considered significant.			
		+	L	ST/ MT	T S
<b>Safe and cohesive communities</b>	Y	Positive due to improvements. Likely over the medium-term and long-term.  Considered significant.			
		+	L	MT/ LT	P S

<b>Socioeconomic conditions</b>	Y	Positive due to employment offer. Likely over the medium-term and long-term.  Considered significant.				
		+	L	MT/ LT	T	S
<b>Environmental conditions</b>	Y	Negative due to potential for emissions to air, noise, water during construction. Likely over the short-term.  Considered significant.				
		+	L	ST	T	S
<b>Health and social care services</b>	Y	Neutral in short-term. Additional population in residential accommodation will require primary care services in medium- to long-term. This is a permanent change.  Considered significant.				
		+	L	ST/ MT	T	S

### Notes

Consider whether effects are

- Positive (+) or negative (-)
- Likely (L) or unlikely (U)
- Short term (ST), medium term (MT) or long term (LT)
- Permanent (P) or temporary (T)
- Significant (S) or non-significant (NS)

A likely effect is 'plausible and probable'.

A significant change is clearly 'important or unacceptable'.

'Yes' would be associated with likely and significant effects, particularly negative, medium- or long-term and permanent effects (also consider the opportunity cost of missed positive effects).

Population health vulnerability includes age (young and old); income (job insecurity or low income); health status (existing poor health and carers); social disadvantage (social isolation or discrimination); and access and geographic (areas of deprivation or barriers to services).

Step 3 Decision	Screened IN or OUT:	Health in environmental assessment (SEA or EIA) or standalone HIA
<p>If one or more answers in step 2 is 'yes', then an SEA or EIA is warranted on human health grounds.</p> <p>If neither an SEA nor an EIA is applicable, then a standalone HIA is warranted.</p>	IN	HIA
<b>Step 4 Notification</b>		
<p>In line with good practice, BCC undertook the screening exercise at an early stage and provided written confirmation of the screening outcome to New Horizons during an early pre-application meeting.</p>		



**Health Impact Assessment Case Study:  
Mellow Village Urban Regeneration  
Project**

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# 1

## Introduction



# 1. Introduction

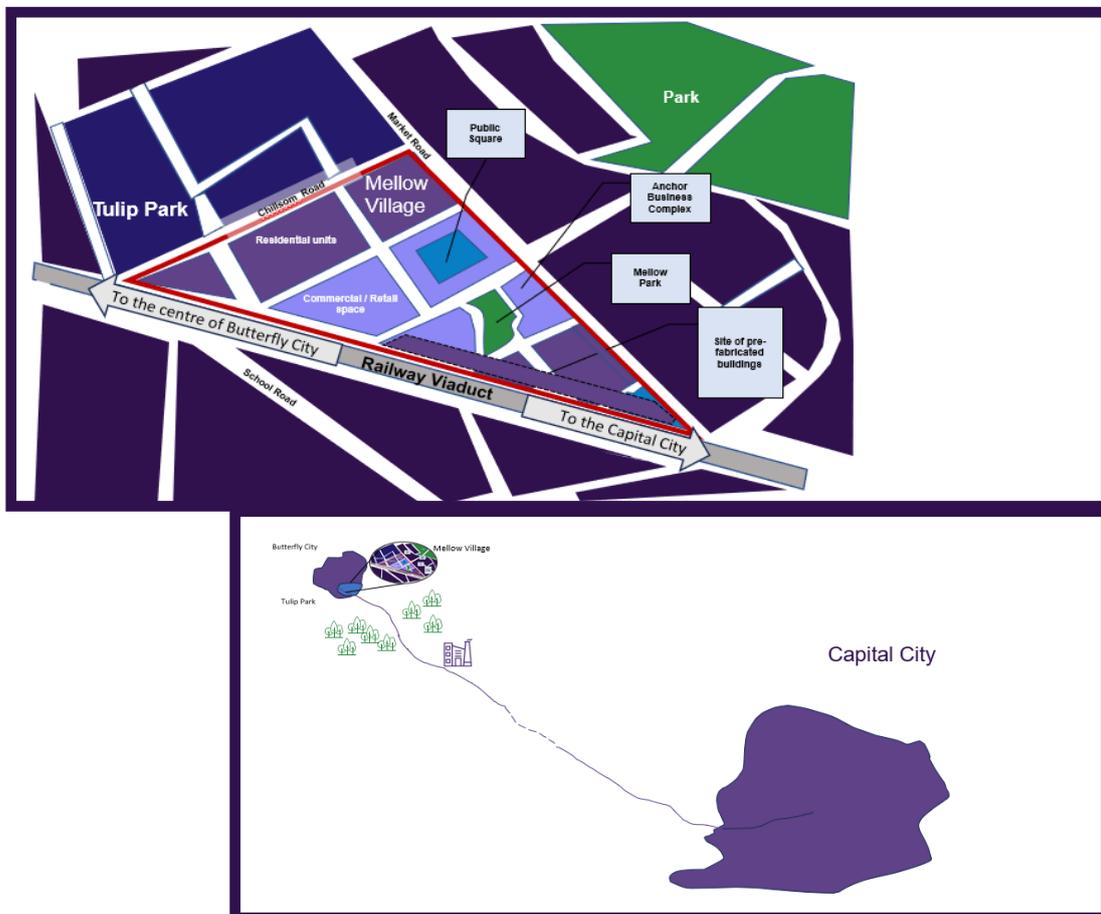
This is a HIA of the proposed Mellow Village by New Horizons Ltd.

## Description of Mellow Village by New Horizons Ltd

The application site is in the suburb of Tulip Park which is in the southeast of Butterfly City. The planning authority is Butterfly City Council. The proposal is a mixed-use urban neighbourhood on the site of the old Acme Refrigeration Factory. It is called Mellow Village to recognise the calm and welcoming character of Tulip Park and to convey how the village will be a rich and welcoming addition to Butterfly City.

### *The suburb of Tulip Park*

Tulip Park is a residential area with a mix of young professionals who commute into Butterfly City, young families and older households many of whom used to work in the Acme Refrigeration Factory. There are two highly rated primary schools within walking distance of the site: one to the north along Market Road and one to the south on School Road. A park is located approximately 130m to the north west. A General Practice is located 200m from the site. It has three GPs and a list size of 4,500 patients.



### ***The site as it is now***

New Horizons Ltd took ownership of the site six years ago and have refurbished many of the original buildings. They developed the Anchor Business Complex which is for small and medium enterprises and provides employment opportunities for the area's residents. This multi-occupier business accommodation ensures that the site continues to provide an employment use.

Local businesses also currently operate from prefabricated buildings that are situated on the development site. These were erected in the 1960s and back on to the railway track. These include workshops and include manufacturers of design products such as furniture and clothing as well as specialists on e-bikes. These businesses provide apprentice placements for the local colleges. There is a business that provides training and supported employment placements to people with learning disabilities.

The site covers 4.2 Ha and is bound by Market Road to the north east, Chillsom Road to the north west and a viaduct across the south of the site. This carries a trainline connecting Butterfly City with the capital city. This carries freight, intercity trains and local trains. There is a local train station that once serviced the Acme Refrigeration Factory and which now provides twice-hourly services into the centre of Butterfly City as well as a stopping service to the capital city.

The land to the south and east of the Anchor Business Complex is sparsely developed and currently provides access to, and parking for, the prefabricated sheds. The surface of this part of the site is made up of hard covering materials, predominantly asphalt, concrete and paved surfaces. This is in a poor condition and there is scrub and weeds across the site.

### ***Mellow Village***

There will be a mix of circa 700 residential units providing homes for up to 2,500 people. There will be up to 32,000sqm of commercial floorspace. The prefabricated buildings will be replaced by residential buildings. There will be a variety of housing types to provide homes to meet local housing need. New Horizons Ltd will work with existing tenants of the prefabricated buildings to retain them and to relocate them to the new commercial units. Residential parking across the site will be at an overall ratio of 20%, half of which will be suitable for disabled use. No parking will be provided for the retail element. Designated and secure cycle storage will be provided.

The site's location and offsite connections will bring the new residents together with existing communities of Tulip Park around the public square and the park at the centre of the village. A network of routes with foot and cycle connections through the site will provide access for recreation and play and offer links to the wider network.

A public square will form the heart of the development. Mellow Park will provide nearly half a hectare of space devoted to play and relaxation. It will be designed to suit all ages with a biodiverse green spaces, benches and relaxation spaces as well as a skatepark. New Horizons Ltd states that the construction will take three years.

# 2

## Consultation and engagement



## 2. Consultation and engagement

### 2.1 Introduction

[See Guidance](#)

New Horizons Ltd consulted widely with stakeholders as the scheme designs were being drawn up. This is described below, followed by a summary of the consultation undertaken for the HIA. New Horizons Ltd conducted three rounds of public consultation: information leaflets were distributed to the local community, an online consultation hub was set up and in person consultation events were held. The engagement sought to reach a broad and representative sample of the local community for their input.

There was an audit of the political, business and community stakeholders in the local area. Stakeholders were offered individual meetings with the Mellow Village project team, to have a member of the team visit their group meeting and invited to the public consultation events. These were well attended with each round attracting approximately 200 people over four days. They were held in the community rooms in the Anchor Business Complex.

The majority of respondents were positive about the design and welcomed the sensitive approach to redevelopment, as well as improving the site for pedestrians by making the through routes easier to use. Other attendees were interested about the possibilities that could be provided by increasing the availability of community space on site. The HIA team provided questions about public health for the online consultation hub.

### 2.2 Health Authority and Butterfly Council

The HIA team met with the Health Authority and with Butterfly City Council. The following topics were raised as matters of concern:

- Construction traffic with particular reference to younger people and the potential for an increase in the volume of traffic and for older people who may find access to services interrupted during the construction.
- Community groups: there is a strong network of community groups across Tulip Park.
- Employment.
- Health promoting materials (mental health in construction workforce).
- Provision of funding for additional primary care services.

### 2.3 HIA workshops

Two specific workshops were held as consultation events for the HIA. These were held in the community rooms in the Anchor Business Complex. Themes that emerged are listed below:

#### *Active travel*

Many stated that whilst public transport existed much needs to be done to improve the services, including timetables and physical access to the buses and the price of train tickets. Many people expressed concerns about the effect the construction phase would have on the roads - including roadworks, signage, extra volumes of traffic and children's safety.

Another concern highlighted the fact that all schools in Butterfly City recently adopted a policy to open their Breakfast Clubs at 8am, meaning that there is already an increase in pedestrians and traffic at peak times and this is before the construction of Mellow Village begins.

### ***Community identity and society***

Most attending stated that being able to get out and about was one of the most important things for their health and wellbeing. People described how they appreciated Tulip Park and that hearing children playing on the estates and streets was also a pleasant aspect of life. People stated the importance of looking after the next generation, and that both community spirit and caring for the next generation are good for health and well-being. Community-led groups and meeting places were valued.

The proposed development was seen as affecting house prices in different ways. Some participants spoke of an increase in house prices. This may result in private landlords increasing their rent to take advantage of the influx of people looking for somewhere to live, and possibly pushing local people out of the market as they wouldn't be able to afford the increased prices.

### ***Community safety***

People appreciated the ability for informal use of the old factory but also noted that some parts of the factory grounds were used by people taking drugs.

### ***Environmental conditions***

A potential impact on the health of those with pre-existing conditions such as Chronic Obstructive Pulmonary Disease and asthma.

Noise of traffic to and from the site, and actual construction noise. This is linked to wellbeing in terms of the levels of stress that the additional noise may create for people living close to the site. Parallels were drawn with the effects construction noise was having on residents living close to the building site of the new 'Super school' in the north of Butterfly City.

### ***Health and social care services***

Access to GPs and being able to get a Doctor's appointment was a theme of the consultation. There were mixed views. Some people said they were very happy with the local GP, and that they had no pressing need to use primary care but that when they did they found it to be good. Young parents and carers for older people expressed frustration at primary care available at the GP surgery. People explained that it could be difficult to get an appointment and that they considered the surgeries to be full to capacity.

Concern was expressed about traffic congestion and delays to ambulance services. People described how delays that occurred during improvement works to Market Road.

### ***Selected comments***

The HIA uses quotations to illustrate views that have been expressed. Selected comments from workshops and exhibitions include ...

- Don't build over this ground. The space is used every day by dog walkers. Youngsters ride their bikes and kick a ball around. We need this space.
- I have lived here for forty years. My grandchildren are struggling to find a place to stay. We need more affordable homes.
- The buildings are dangerous and should have been closed long ago. Will anything happen this time?
- We need more housing.
- This is good news but don't stop listening once you get planning permission.
- How will you protect the employment during the building?
- More details on internet, no more deception.
- The park will be a welcome addition but we do have a park close by. I'd really like some allotments.
- What decisions have already been made about the build?



# 3

## Planning policy context



## 3. Planning policy context

[See Guidance](#)

### 3.1 Introduction

Planning matters have great regard to the scheme's alignment with relevant policy.

### 3.2 National planning strategy

- Support the objectives of public health policy where appropriate and at the applicable scale, through planning policy.
- Integrate safe and convenient alternatives to the car into design, by prioritising walking and cycling accessibility to both existing and proposed developments, and integrating physical activity facilities for all ages.

### 3.3 Local: Butterfly City and Council Spatial Plan

#### *The vision*

- Create a better quality of life for city residents.
- Identify and support greater recreational amenities in the city, including integrated walking and cycling links and local parks, through the review of the Butterfly City Study (2018).
- Support the delivery of appropriate air monitoring procedures in the city to help achieve better air quality.

#### **Advance and support the development and well-being of people with disabilities through participation in all creative and recreational activities.**

- Continue to establish new and innovative ways of working with people with disabilities, by working with local and national partners.
- Work with local partners in developing a network of arts and disability practitioners.

#### **Support the implementation of the National Physical Activity Plan**

Support projects and initiatives that promote active travel as an everyday mode of transport by people across their lifespan and of all abilities.

#### **Site specific: The Acme Refrigeration Factory and the Anchor Business Complex**

The site of the Acme Refrigeration Factory is a highly visible block on Chillsom Road and Market Road, backing onto the railway line. It is located in the suburb of Tulip Park and being sited on the perimeter of the city is a critically important site for employment and housing.

It is easily accessed by public transport and there is a protected cycle route along Chillsom Road. Although largely underused, the site includes a number of active uses, mainly employment and the Anchor Business Complex building fronting onto Chillsom Road.

There are vacant ground and upper floor frontages on all sides, as well as obsolete service yards and sheds in the interior. This site has been the subject of numerous redevelopment proposals. There is an urgent need to bring this key site back to full and productive use, making a major contribution to strengthening the Tulip Park suburb and to increasing housing and employment provision in Butterfly City.



# 4

## Public health policy context



## 4. Public health policy context [See Guidance](#)

### 4.1 National Public Health Strategy

- Address health inequalities by attaining Universal Healthcare.
- Increase healthy life expectancy at age 65 years by: reducing morbidity; overall and premature mortality for four major noncommunicable diseases.
- Increase the number of adults and children with a healthy weight.
- Increase the proportion of adults eating the recommended five or more servings of fruit and vegetables per day.
- Decrease levels of self-harm across all life stages.
- Reduce suicide rate across all population groups.
- Increase the wellbeing of the population and increase levels of wellbeing among vulnerable groups.
- Increase the proportion of population undertaking regular physical activity – across each life stage.
- Increase self-reported happiness and wellbeing across socioeconomic groups.
- Compliance with environmental (air, water, noise) and food indicators.

### 4.2 Butterfly County Council Public Health Strategy

#### *Partnership & Collaboration*

- Collaborate with Butterfly County Council Planning Department to implement the Pillars of the National Public Health Strategy within all Development Plans.
- Collaborate with other organisations to promote mental health and wellbeing
- Evidence-based approaches to training and facilitation of employment for people with mental health problems should be explored and supported through enterprise offices.

#### *Resilience and positive mental health*

- Implement uniform, multiagency suicide prevention action plans and align them with Health Authority, Community Health Organisations and City Plans and services for children and young people.
- Consider, develop and implement measures where practical to restrict access to those locations and settings that have been identified where people are at risk of engaging in suicidal behaviour, and assist generally in reducing risk factors in public locations.

#### *Physical environment*

- Physical space - explore opportunities to provide an appropriate provision of: outdoor seating, other street furniture such as picnic areas, bike parking and bike storage and locking docks.

- Explore any opportunities for community gardens, pocket parks along with more elaborate developments with a dedicated support section such as allotments and support establishment where possible.
- Prioritise the planning and development of walking and cycling and general recreational/ physical activity infrastructure.

### **Workplaces**

- Explore collaborations with individual or clusters of employers: Physical activities opportunities.



# 5 Baseline



## 5. Baseline

[See Guidance](#)

### 5.1 Study areas

The study areas are defined as follows:

- Site-specific: Tulip Park
- Local: Butterfly City
- Regional: Butterfly County
- National and international

The population groups relevant to this assessment, due to either proximity or another sensitivity are the population close to Mellow Village and the wider community of Tulip Park (site-specific population). Road users are included.

Populations that are considered vulnerable are:

- young-age (children and young people as potentially more vulnerable road users).
- old-age (older people as potentially more vulnerable road users).
- low-income (people living in deprivation, including those on low incomes for whom travel costs or alternatives may be limiting).
- health status (people with existing poor physical and mental health in relation to health trip journey times).
- access and geographical factors (people who experience existing access barriers or for whom close proximity to project change increases sensitivity).

### 5.2 Age profile

There are 18,430 people (23%) aged 0-15 living in Butterfly City, 52,100 people aged 16-64 (65%) and 9,620 people aged 65+ (12%). The average age of persons in Butterfly City is 37.2 years. This has increased by a year over the last decade. The state-wide average age is 36.1 years. Butterfly City has an ageing population, with the number of people aged 65 and older projected to be one in four of the total resident population in 2050.

At 18.5%, the Old Age Dependency Ratio of Butterfly City is lower than the national average (20.4%). Thirty-two percent (c3,100 people) of those aged 65+ in Butterfly City live alone.

The Young Age Dependency Ratio is 35.4% which is higher than the national average (31.9%).

Butterfly City has the same proportion of persons aged 65+ (12% of the total population) as the State (12%). The south east of the city, including the Tulip Park suburb, have higher levels (14% of total population).

#### **Occupation**

Almost 10% (c.6,100 people) of those aged 15 or older are 'Looking after the Home/Family' in the city. This is highly gendered, with 18% of the total female population occupying this group compared with 1% of males.

Thirteen percent (c.8,000 people) of people aged 15 or older gave their principal economic status as 'Retired From The Workforce'.

### 5.3 Deprivation

The National Deprivation Index<sup>2</sup> shows that the proportion of the economically inactive population (15 years or older), unemployed or seeking a first time job is lower in Tulip Park than in both Butterfly City and the national level; the proportion of the population (social classes 1 to 6 only) in social class 5 or 6 is lower in Tulip Park than in both Butterfly City and the national level; and the proportion of persons living in permanent private households rented from the local authority is higher in Tulip Park than in Butterfly City.

Analysis of national data shows the following:

- Those experiencing income poverty were less likely to report good or very good health and those experiencing consistent poverty were even less likely to do so.
- Self-rating of general health varied with level of educational attainment. People with no formal, or just primary education, rated their general health as poorer.
- Quality of life varied with income and housing tenure. A lower quality of life was reported by those with the lowest incomes and those renting in the public sector.
- Poor general mental health and long-term illnesses were more likely in those who were unemployed.
- Tenure of accommodation (renting) was related to feelings of depression.
- Health declined uniformly as income, class, and education decreased.

### 5.4 Health status

#### *Life expectancy*

In 2023, the life expectancy for persons living in the city was 74.3 years for males and 80.1 years for females. This compares unfavourably to the state averages of 76.9 years for males and 81.7 years for females.

#### *Self-rated health*

The proportion of adults that rates their own health as good or very good is lower in Tulip Park than in Butterfly City and at the national level. In Butterfly City almost 40% of adults (41% women, 36% men) reported at least one health condition, most commonly hypertension (11%), back pain (9%), and high cholesterol (9%). For most conditions, a higher prevalence of the condition was reported among older adults. Almost 90% of children (88% boys, 87% girls) rated their health as 'excellent' or 'good', with a small increase on previous years in those reporting 'excellent' health.

#### *Physical activity*

The proportion of adults that report no, or low, levels of physical activity is higher in Tulip Park than in Butterfly City.

## **Disability**

The total population classed as having a 'Disability' within Butterfly City is 10,015. This equates to a rate of 12.5%. This is higher than all other local authorities in the region, with the exception of the capital city. The most common disabilities are:

- Other disability, including chronic illness (18.5%)
- Conditions that substantially limit one or more basic physical condition (13.9%)
- Difficulty in partaking in other activities (13.2%)
- Difficulty in working or attending school/college (12.4%).

## **5.5 Access to services**

Access to primary care is close to the national target in Butterfly City and Tulip Park and there is good coverage of cessation programmes for smokers and vaccination coverage for children.

Access to older persons' services is below, but close to, the national targets in Butterfly City and Tulip Park. Inpatient, day case and outpatient waiting lists are below national targets. Ambulance Response Times in Butterfly County are below the national average.

## **5.6 Ethnicity**

The population is multi-ethnic and multi-national with 86.5% of the population of Butterfly City and County (87% nationally) ethnically diverse. The local population comprises of 4.5% from continental Europe (2.6% nationally) and 3.4% from other ethnic groups (2.2% nationally). Irish Travellers account for 0.75% of the population of Butterfly City and County and 0.7% nationally.



# 6 Potential impacts



## 6 Potential impacts


[See Slides](#)

### Transport


[See Slide](#)

The construction transport from the Project, including the health implications of changes in road traffic and road works affecting: road safety; travel times; accessibility; and active/sustainable travel (health issues).

Source of change  
(draw on Table 08)


[See Guidance](#)

The residents of Tulip Park would be affected. Emergency services may also be affected. The population groups relevant to this assessment, due to either proximity or another sensitivity are the population close to Mellow Village (site-specific population); and the wider community of Tulip Park (local population). Populations that are vulnerable are:

Population(s) affected, including vulnerabilities (draw on Table 09)


[See Guidance](#)

- young-age (children and young people as potentially more vulnerable road users).
- old-age (older people as potentially more vulnerable road users).
- low-income (people living in deprivation, including those on low incomes for whom travel costs or alternatives may be limiting).
- health status (people with existing poor physical and mental health in relation to health trip journey times).
- access and geographical factors (people who experience existing access barriers or for whom close proximity to project change increases sensitivity).

For road safety, health outcomes are associated with the severity or frequency of road traffic incidents and include physical injury and longer-term psychological effects for the person who is injured, the driver and their respective families and social networks.

Main population health outcome(s) or measure(s) (draw on column 6 of Table 10)


[See Guidance](#)

For accessibility, health effects may be associated with emergency response times or non-emergency treatment outcomes associated with delays or non-attendance.

For active/sustainable travel, health effects may relate to physical health (e.g. cardiovascular health) and mental health conditions (e.g. stress, anxiety or depression) associated with reduced levels of physical activity.

<p><b>N/A. Transport air quality and noise effects and their relevant thresholds are assessed separately.</b></p>	<p>Any known thresholds for effect</p>
<p><b>The potential effect is considered likely because there is a plausible relationship between source-pathway-receptor:</b></p> <p><b>Source:</b> vehicles on the road network or changes in routes that link community residential, commercial or amenity services</p> <p><b>Pathway:</b> changes in driver delay, severance, pedestrian delay, pedestrian amenity and accidents and safety. This links with physical activity and active travel. It also links with emergency response times</p> <p><b>Receptors:</b> local road users, including drivers in, and passengers of, motor vehicles; pedestrians; cyclists; public transport; emergency services</p> <p>Furthermore, the potential effect is probable as no highly unusual conditions are required for the source-pathway-receptor linkage.</p>	<p>Likelihood/ Causal pathway</p> <p>(draw on sections 1-3 of Figure T06)</p> <p> <b>See Guidance</b></p>
<p><b>The scientific literature shows an association between the types of changes that will be caused by the construction transport and road safety, travel times, accessibility and active/sustainable travel. The literature does not identify thresholds for effects.</b></p> <p><b>The assessment has had regard to the population groups identified in the literature that may be particularly sensitive. For example, children, pregnant women and cyclists (particularly older cyclists) are vulnerable in terms of road safety. The whole population benefits from a physically active lifestyle and this includes using active modes of travel. People with lower socioeconomic status and older people typically face greater barriers in accessing healthcare due to poor transport.</b></p> <p><b>The baseline indicates the distribution of relevant sensitivities and inequalities in the site-specific area around Mellow Village and across Tulip Park (local area). It also shows how the proportion of the population age 65+ of Tulip Park is higher than Butterfly City (local) and the national average. The baseline does not identify any geographic or population features that suggest effects could be unusually amplified.</b></p>	

 **See Slides**

 **See Slides**

 **See Slides**

 **See Slides**

**Health priorities as set out by Butterfly County Council in its Public Health Strategy identify health challenges for this area and are relevant for transport and for planning. These include the following priorities for the physical environment:**

- exploring opportunities to provide an appropriate provision of outdoor seating, other street furniture such as picnic areas, bike parking and bike storage and locking docks;
- exploring opportunities for community gardens, pocket parks along with more elaborate developments with a dedicated support section such as allotments and support establishment where possible; and
- prioritise the planning and development of walking and cycling and general recreational /physical activity infrastructure

**National policy sets expectations for travel including:**

- improving pedestrian and cycle links and opportunities
- keeping local health facilities accessible to all
- promoting cycling as a major mode of transport; connecting people to higher earning jobs
- providing reliable public transportation services that are accessible to all, including those with long-term health conditions, impairments or disabilities; and ensuring affordable, reliable transport so everyone can access work, education and leisure

**The Butterfly City Spatial Plan has policies to create a better quality of life for city residents including integrated walking and cycling links and local parks and continuing to establish new and innovative ways of working with people with disabilities.**

**The following mitigation forms part of the project and has been taken into account as part of the assessment of construction transport health effects:**

- Design of the road environment
- Measures set out in the Construction Environmental Management Plan and Construction Logistics Plan that limit and manage the timing and routes of construction-related transport.

Context in which professional judgement is reached



[See Slides](#)

Mitigation secured

... and/or ...

enhancements secured

The sensitivity of the general population is considered to be low. This reflects that routine statistics for Tulip Park show that the health status of most people is good, and their daily activities are not limited. Furthermore, in terms of resource sharing, most people would only make occasional use of the roads affected by the construction, with many alternative routes. The score also reflects that the general population would have a high capacity to adapt to changes in traffic conditions (e.g. during the works on the junction).

The sensitivity of vulnerable groups is considered high. It is estimated that, from a life stage perspective, a high proportion of pedestrians and cyclists in Tulip Park are young people and older people (dependants) who, in terms of resource sharing, make frequent use of services where access is reliant on affected sections of the highway network (e.g. traveling to/from school or day care). Furthermore, the population has moderate levels of deprivation. Deprived populations face greater barriers compared to the general population and are therefore more sensitive to changes in access to care. Low incomes may compound barriers to access resulting in a limited capacity to adapt. Ambulance services (and the recipients of their care) are particularly sensitive to delays in response times (time taken to arrive and stabilise the patient). This is an issue of concern to the public, whose outlook was gauged through consultation.

During construction, the magnitude of the change to access to services due to the development is low.

The Project's separate Transport Assessment concluded there would be residual minor effects on travel times for all affected routes. In relation to access to services, the scale of change is small.

The construction transport activities will continue for three years and so the duration of this change is medium term. The frequency of delays to accessing services depends on the level of health. There would be a minor change in risk factors for morbidity related to time-critical ambulance response times. This would apply to a very few people. There may also be a minor change in quality of life for a small minority of the population related to slightly longer travel times for routine (non-emergency) health related journeys.

There would be slight, implications for healthcare services during the construction stage.

Residual baseline change 

[See Slides](#)

Sensitivity to proposal change (draw on Figure T09)



[See Guidance](#)

Magnitude of change due to the proposal 

[See Slides](#)

... and/or ...

Magnitude of health change (draw on Figure T11)



[See Guidance](#)

**[Repeat for other health issues: travel times, accessibility and active/sustainable travel.]**

**The population health baseline change is expected to be very limited as a result of the development for the general population and slight for vulnerable groups. The assessment acknowledges that there is a causal pathway established in the scientific literature, relevant health priorities are of specific relevance and there would potentially be an marginal effect on delivery of local health policy expectations.**

**The assessment considers the mitigation that has been developed and is secured by planning conditions. This mitigation is the design of the road environment.**

**There would be a differential effect between the general population and vulnerable groups, but the construction activities will have limited potential to widen inequalities due to the targeted use of mitigation. The conclusion is that the residual significance of the effect would be negligible for the general population and up to minor adverse (not significant) for vulnerable groups.**

**The monitoring will ensure that the mitigation described above is being implemented. This is set out in detail in the Construction and Environmental Management Plan. The Community Liaison Officer will receive and note any complaints about construction and traffic congestion.**

Professional judgement on significance, including any differences between the general population and vulnerable group population and how these may change over time (draw on Figure T12).



[See Guidance](#)

[See Slides](#)

Describe any monitoring and adaptive management of likely significant adverse effects.

# 7 Further mitigation



## 7 Further mitigation

[See Guidance](#)

Further mitigation has been agreed. This is early notice to emergency services of any roadworks, diversions or road closures and the promotion of active travel through traffic diversions and the maintenance of pedestrian and cycle routes during roadworks.

This changes the significance of the effect on vulnerable groups to negligible.

### Some closing thoughts

We have seen how the IPH HIA guidance can be applied to an urban regeneration project - the fictional Mellow Village.

We have focused on a single determinant of health (transport) and seen how the likely and significant effects are identified and shown. This examines the effects on the general population and on vulnerable populations. The analysis uses a range of information sources, including what people say about the site.

The project has taken many aspects of human health into account in the way it has been designed.

In many ways, it is good that there are very few significant effects to show at the end of the assessment. The design process has worked to reduce adverse effects and capture beneficial effects through consultation and rigorous analysis.



# 8

## Appendices



## 8. Appendices

### A. Scope

The scoping stage is conducted before the assessment. The scoping tables can be shown in the assessment report and may be included as an appendix to show what has been scoped in, and what has been scoped out.

#### A.1.Determinants

Table 1: Scoping health determinants



See Guidance

Scoped In/Out <sup>1</sup>	Determinant of health: and health issues, including risk factors, within each determinant of health	Relevance of individual issue to the assessment <sup>1</sup>	Rationale: summary
In	<b>Healthy lifestyles:</b>		Demolition and Construction: The site is currently used informally by young and old for recreational activity.  Completed development: The development will provide green space, Mellow Park, which will be accessible for all age groups with recreational amenities and facilities.  There will be a high standard of design across the development.
	Open space (green and blue) and physical activity (including in natural habitats)	✓	
	Sports, leisure and recreational amenities and facilities (including play)	✓	
	Sports, leisure and recreational connectivity and access (including safety)	✓	
	Sports, leisure and recreational age, sensory and mobility considerations	✓	
	Health promotion (including smoking cessation)	X	
	Substance misuse (including alcohol)	✓	
	Problem gambling	X	
	Communicable illness (including STIs and other infections)	✓	
	Diet (including production and access to affordable healthy food options)	✓	

<b>In</b>	<b>Safe and cohesive communities: Housing:</b>	✓	Completed development: The development will provide 700 residential units providing homes for up to 2,500 people. There will be a variety of housing types to provide homes to meet local housing need. Health outcomes associated with the provision of high quality housing and an environment finished to a high specification. No existing housing will be lost. The site's location and the offsite connections will bring the new residents together with the existing communities of Tulip Park around a green core at the heart of the scheme.
	Dwelling mix for community needs (supply)	✓	
	Community cohesion and social isolation	✓	
	Indoor environment (indoor air quality, safety, hygiene and level of crowding)	✓	
	Residential segregation	✓	
	Outdoor environment (safety, green and blue spaces and proximity to disease vector habitats)	✓	
	Affordability	✓	
	Connectivity and access	✓	
	Community services (including childcare and social services) accessibility and quality	✓	
	Social housing	✓	
	Specialist adaptations (e.g. age or disability)	✓	
	Flood risk	X	
	Loss of existing housing	X	

<b>Out</b>	<b>Safe and cohesive communities: Built environment:</b>	X	Demolition and Construction: Limited opportunity to influence non-obesogenic environment during construction.  Completed development: the Applicant would have limited control over the type of food and beverage floorspace that is ultimately provided
	Spatial planning, use classes, zoning and land allocations (including streets and routes, places, urban green space, parks, landscape)	X	
	Injury risk (including drowning and falls)	X	
	Waste management (including sanitation systems and wastewater reuse)	X	
	Access to shops, retail food resources, financial and commercial services	X	
	Susceptibility to major accidents and/or disasters (including earthquake, water surge, wildfire, landslide, pandemic etc.)	X	
<b>In</b>	<b>Safe and cohesive communities: Transport:</b>		
	Road or route safety	✓	Demolition and Construction: Traffic management plans will be in place throughout the three year construction period.  Completed development: Designated and secure cycle storage will be provided. A network of routes with foot and cycle connections through the site will provide access for recreation and play and offer links to the wider network. The net impact of the development's Trip Generation shows an increase in Active Travel modes.
	Active travel (pedestrians and cyclists)	✓	
	Public transport (access, connectivity and quality)	✓	
	Health, education and social care journey times	✓	
	Emergency response times	✓	
	Community severance	✓	
	Age, sensory and mobility considerations	✓	

<b>In</b>	<b>Safe and cohesive communities: Community safety:</b>		Demolition and Construction: The site is currently used informally by young and old for recreational activity. There is a history of substance misuse in some areas of the site.
	Police/security and emergency response	✓	
	Actual and perceived crime	✓	
	Safeguarding and modern slavery	✓	
<b>In</b>	<b>Safe and cohesive communities: Community identity and society:</b>		Demolition and Construction: no effect.  Completed development: The site's location and the offsite connections will bring the new residents together with the existing communities of Tulip Park around a green core at the heart of the scheme.
	Population in-migration (including effects on minorities, community cohesion and social isolation)	✓	
	Population out-migration (including effects on minorities, community cohesion and social isolation)	✓	
	Visual landscape/townscape change	✓	
	Visual lighting change (night lighting, overshadowing or reflections)	X	
	Social networks and culture (including meeting spaces for voluntary, social, cultural or spiritual participation or sites of cultural significance)	✓	
<b>Out</b>	<b>Socioeconomic conditions: Education:</b>		Demolition and Construction and Completed development: The development will not directly provide opportunities for education and training. Tenants of the office space can be expected to provide these opportunities, but this is not in the control of New Horizons Ltd.
	School accessibility, capacity and quality	X	
	Adult skills development	✓	
	Transitional arrangements (e.g. during construction)	✓	

<b>Out</b>	<b>Socioeconomic conditions: Socioeconomic status:</b>		Demolition and Construction and Completed development: There is good evidence of the health benefits that follow from high quality employment. New Horizons Ltd has committed to ongoing support for employment. Tenants of the office space can be expected to provide these opportunities, but this is not in the control of New Horizons Ltd.
	Employment (including quality and income)	✓	
	Unemployment (including job insecurity)	✓	
	Procurement and investment	X	
	Working conditions (rewards, controls and occupational hazards)	X	
	Family structure and relationships	✓	
	Health inequalities, social exclusion and poverty	✓	
<b>Out</b>	<b>Environmental conditions: Climate change:</b>		Demolition and Construction and Completed development: Climate change is a global phenomenon and so an effect is considered likely. It is not established that there will be significant implications for population health from climate change arising from the proposed development. Flooding and heat island effects have informed the design.
	Extreme weather, heat stress and flood risk and fire injury risk	X	
	Exacerbation of chronic cardiovascular and respiratory conditions	✓	
	Exposure to food-, water- and vector-borne infection or toxins	X	
	Food production and malnutrition	✓	
	Population displacement, labour productivity and economic loss	X	

<b>In</b>	<b>Environmental conditions:</b>		<p>Demolition and Construction: The Construction and Environmental Management Plan will set out the good practice mitigation to manage dust, particulates and aerosols and emissions from plant, processes and vehicles. Air quality is an important determinant of health with an increasing amount of scientific evidence and coverage in wider society. There is no threshold for effects on health from emissions to air. Air quality is assessed as part of this application. This HIA will conduct a qualitative assessment using the outputs from the Air Quality assessment. Particular regard will be given to sensitive receptors, the existing tenants and the residential communities near the site.</p> <p>Completed development: the increase in Active Travel modes and the improved design and energy efficiency of the buildings will reduce emissions to air.</p>
	<b>Air quality:</b>		
	Dust, particulates and aerosols (indoor and outdoor)	X	
	Plant, processes and vehicle emissions	X	
	Odour	X	

<b>Out</b>	<b>Environmental conditions:</b> <b>Water:</b>		Demolition and Construction: the risk of the release of biological or chemical agents in the water supply will be minimised through good practice mitigation. There will be no effect on quantity of, or access to, drinking water nor will there be any effect on bathing water. The good practice and measures will be outlined in the Construction Environmental Management Plan (CEMP).
	Drinking water quality (including biological and chemical agents)	X	
	Drinking water – quantity or access	X	
	Bathing water quality (including biological and chemical agents, disease vectors)	X	
<b>In</b>	<b>Environmental conditions:</b> <b>Soil:</b>		Demolition and Construction: Mobilisation of historic pollutants could have an effect on health but any source-pathway-receptor linkage that may lead to human exposure to pollution, or other hazard, will be mitigated by good practice and measures outlined within the CEMP.
	Mobilisation of historic pollution	✓	
	Risk of new ground pollution (e.g. industrial agents or accidental spills)	✓	
	Food resources and safety (e.g. agricultural land availability and quality)	X	

<b>In</b>	<b>Environmental conditions:</b> <b>Noise:</b>		Demolition and Construction: Any source-pathway-receptor linkage that may lead to human exposure to noise pollution will be mitigated by good practice and measures outlined within the CEMP.  Given that there is some uncertainty at this scoping stage, i.e. the assessment has not been completed and any measures for mitigation that may be required have not been set out, the human health assessment will cross-refer to the separate noise chapter and report the findings. A qualitative assessment of the implications for vulnerable groups will be made.
	Plant, processes and vehicle disturbance	✓	
	Vibration	✓	
<b>Out</b>	<b>Environmental conditions:</b> <b>Radiation:</b>		Demolition and Construction and Completed Development: The proposed development's electrical infrastructure will be built to comply with current, best practice standards and will pose no risk to human health. Accordingly, assessment is not proposed.
	Electro-magnetic fields, actual risk	X	
	Electro-magnetic fields, understanding of risk (risk perception)	X	
	Ionising, actual risk	X	
	Ionising, understanding of risk (risk perception)	X	

In	Health and social care services:		Demolition and Construction:
	Primary care accessibility, capacity and quality	✓	<p>Provision of continued access (via vehicle, public transport, bicycle or foot) to health services. There is possibility of change to accessibility of services as a result of the construction of the proposed development.</p> <p>Completed Development: Introduction of a new resident population and change in demand for health services.</p>
	Secondary care (including hospitals) accessibility, capacity and quality	✓	
	Ambulance service accessibility, capacity and quality	✓	
	Social services accessibility, capacity and quality (including use of community centres)	✓	
	Health protection (including screening and epidemic response) accessibility, capacity and quality	✓	
	Occupational health services accessibility, capacity and quality	✓	
	Dental service accessibility, capacity and quality	✓	
	Pharmacy accessibility, capacity and quality	✓	
	Sexual health services accessibility, capacity and quality	✓	
	Mental health services accessibility, capacity and quality	✓	
	Transitional arrangements (e.g. during construction)	✓	
	Recruitment and retention of staff	✓	
	Preparedness for emergency scenarios (major accidents and/or disasters)	X	

Out	Wider societal benefits:		
	Energy infrastructure	X	The effects associated with the contribution that the proposed development makes to wider societal infrastructure and resources will be assessed separately to the health assessment.
	Transport infrastructure	X	
	Waste management infrastructure	X	
	Water infrastructure	X	
	Communication and IT infrastructure	X	
	Economic	X	
	Climate change (including improved air quality and preparedness for extreme weather events such as heat, storms and/or flooding)	✓	
	Natural environment (including biodiversity, natural spaces and habitats)	✓	will be significant implications for population health from climate change arising from the proposed development.

## A.2. Population groups

The population groups relevant to this assessment, due to either proximity or another sensitivity are the population close to Mellow Village and the wider community of Tulip Park (site-specific population). Road users are included.

Populations that are considered vulnerable are:

- young-age (children and young people as potentially more vulnerable road users).
- old-age (older people as potentially more vulnerable road users).
- low-income (people living in deprivation, including those on low incomes for whom travel costs or alternatives may be limiting).
- health status (people with existing poor physical and mental health in relation to health trip journey times).
- access and geographical factors (people who experience existing access barriers or for whom close proximity to project change increases sensitivity).



## **B. Literature review**

### **B.1. Introduction**

An evidence base of publicly available information has been used to support this HIA. Evidence statements have been extracted from a review of abstracts and full articles published in English on PubMed, predominantly from the past five years. The review is not exhaustive and aims to provide a summary only of the key issues relevant to the scope of this report.

The evidence summary contextualises the links between developments and health. These summaries are useful in underpinning the professional judgements of the HIA. The evidence statements are from the international published literature and therefore not specific to the proposed development.

### **B.2. Noise**

Noise is pervasive in everyday life and can cause both auditory and non-auditory health effects. Although people tend to habituate to noise exposure, the degree of habituation differs for individuals and is rarely complete. If exposure to noise is chronic and exceeds certain levels, then negative health outcomes can be seen<sup>3</sup>.

Persistent long-term exposure to environmental noise, such as traffic noise (road, rail and air traffic) is the second biggest environmental threat to public health in Western Europe. Exposure to environmental noise cause an estimated 12,000 premature deaths and contributes to 48,000 new cases of ischaemic heart disease annually in the European territory. Other estimates include 22 million people suffering from chronic high annoyance and 6.5 million people suffering from chronic high sleep disturbance<sup>4</sup>.

Environmental noise (e.g. noise from road, rail, and air traffic, and industrial construction) has been linked to a range of non-auditory health effects including annoyance, sleep disturbance, cardiovascular disease, and impairment of cognitive performance in children<sup>3</sup>.

Annoyance is the most prevalent community response in a population exposed to environmental noise. Noise annoyance can result from noise interfering with daily activities, feelings, thoughts, sleep, or rest, and might be accompanied by negative responses, such as anger, displeasure, exhaustion, and by stress-related symptoms. In severe forms, it could be thought to affect wellbeing and health, and because of the high number of people affected, annoyance substantially contributes to the burden of disease from environmental noise. Although the overall community response depends on societal values, several personal (e.g. age and noise sensitivity) and situational characteristics (e.g. dwelling insulation) might affect the individual degree of annoyance<sup>3</sup>.

Sleep disturbance is thought to be the most deleterious non-auditory effect of environmental noise exposure, because undisturbed sleep of a sufficient length is needed for daytime alertness and performance, quality of life, and health. Human beings perceive, evaluate, and react to environmental sounds, even while asleep. Elderly people, children, shift-workers, and people with a pre-existing (sleep) disorder are thought of as at-risk groups for noise-induced sleep disturbance<sup>3</sup>.

Regarding noise and health, groups at risk most often mentioned in the literature are children, the elderly, the chronically ill and people with a hearing impairment. Other categories encountered are those of sensitive persons, shift-workers, people with mental illness (e.g., schizophrenia or autism), people suffering from tinnitus, and fetuses and neonates<sup>5</sup>.

### **B.3. Air quality**

Air pollution is a heterogeneous and a complex mixture of dust, particulate matter (PM), fumes, gases, carbon monoxide, nitrogen dioxide, sulphur dioxide and ozone. Environmental air pollution is associated with increased risk of cardiovascular diseases<sup>6</sup> and with moderate or severe asthma exacerbation<sup>7</sup>.

The main anthropogenic sources of PM are traffic and transportation, and combustion processes. Nitrogen dioxide and carbon monoxide are principally emitted from fossil fuel combustion in urban environments. Ozone is a secondary pollutant formed by photochemical reactions between sunlight and pollutant precursors, such as nitrogen oxides and volatile organic compounds<sup>7</sup>.

Increased pollution exposures have been associated with increased numbers of hospital admissions and emergency-room visits, mainly due to exacerbations of chronic obstructive pulmonary disease and asthma<sup>7</sup>. People with underlying conditions or of lower socioeconomic status are more vulnerable to long-term exposure to air pollution in terms of developing myocardial infarctions<sup>8</sup>.

In the atmosphere, different PM sizes can be found. The coarse fraction (PM<sub>10</sub>–PM<sub>2.5</sub>) can penetrate into the upper airways, but the fine fraction (PM<sub>2.5</sub>–PM<sub>1</sub>) can be deposited in the lung, especially in the alveoli, although it could pass to the systemic circulation. Besides the size of PM, the chemical composition is very important to understand the health effects<sup>7</sup>.

### **B.4. Physical activity, green space and leisure/play amenities**

There is strong evidence that active travel can result in substantial health benefits<sup>9</sup>. Engagement in leisure activities is also associated with increased well-being<sup>10</sup> and decreased risk of type 2 diabetes<sup>31</sup>.

Natural environments such as green or open spaces, but also attractive views of nature integrated within the urban landscape, are important environmental factors sustaining physical activity in the population<sup>12</sup>.

An activity friendly neighbourhood that is walkable, dense, accessible, equipped with walk/cycle facilities and safe from traffic is associated with more active transportation to school in children<sup>13</sup>. Access to active play in nature and outdoors, even with its risks, is essential for healthy child development<sup>14</sup>.

Physical activity can improve mental health, the strongest evidence indicates that this is through improvements in physical self-perceptions that accompany enhanced self-esteem<sup>15</sup>.

Anxiety symptoms (below the threshold of anxiety disorders) are common in older adults. Regular physical activity may be effective for improving anxiety symptoms in older adults<sup>16</sup>.

### **B.5. Community identity**

Places and locations hold meanings and memories for people. The ways in which people are able to relate to, access and enjoy these places and locations are important for mental health and well-being<sup>17</sup>.

Cognitive social capital (shared norms, values, attitudes, and beliefs, predisposes people towards mutually beneficial collective action) is protective, at the individual and community level, against developing common mental disorders<sup>18</sup>. Cognitive social capital improves prevention and control of chronic non-communicable disease (e.g. cardiovascular diseases, cancers and diabetes)<sup>19</sup>.

Neighbourhood context contributes to help-seeking intentions for mental illness. Living in a neighbourhood with a communicative atmosphere and having adequate health literacy facilitate informal and formal help-seeking for mental illness<sup>20</sup>.

Community engagement can reduce health inequalities, empower community members, improve health behaviours, improve public health planning and build social capital<sup>21</sup>. Poor community cohesion and integration are contributing factors to loneliness, which is a direct threat to health. However, people who feel they belong in their surrounding neighbourhood generally experience higher well-being through reduced loneliness<sup>22</sup>.

## **B.6. Neighbourhood design**

More accessible neighbourhood design (including well laid out good quality walking surfaces) is important for older adults' health and functioning, as a majority of older adults are inactive and physical inactivity is linked to quality of life, morbidity, and mortality<sup>23</sup>.

Access to nearby parks and natural settings is associated with improved mental health and reduced anxiety<sup>24</sup>. Whilst high levels of neighbourhood social disorder are linked to depression<sup>25</sup>.

Access to goods and services within one's community also promote and sustain health<sup>26</sup>. Specifically:

- The presence of pavements and crossings, bike paths, playing fields, parks, shopping accessible on foot, and public transportation, along with the perception that it is safe to be outside, contribute substantially to the average amount of regular physical activity that residents of a neighbourhood achieve.
- Education and employment opportunities influence health by providing the means to achieve an adequate standard of living now and in the future.
- Neighbourhoods with better access to supermarkets and other retail outlets with minimally processed foods tend to eat a healthier diet than their counterparts in neighbourhoods with less access to these goods.

## **B.7. Diet**

Socio-economically disadvantaged children are at higher risk of consuming poor diets, in particular less fruit and vegetable and more non-core foods and sweetened beverages. Socioeconomic position is associated with children's nutrition knowledge, home healthy food availability and accessibility<sup>27</sup>.

The built environment has a direct influence on healthy food access. For example, access to quality and affordable fruit and vegetables is influenced by food production, food transport, retail mix and retail pricing policies. A high prevalence of fast food outlets near schools and workplaces has been shown to negatively impact on people's food choices<sup>28</sup>. Increased exposure to fast food restaurants, along with the intensive marketing of such foods, has been shown to negatively influence children's eating habits<sup>29</sup>.

Areas where food access is limited or constrained, called 'food deserts', are associated with higher rates of diabetes, heart disease, and other obesity related health problems<sup>30</sup>.

### **B.8. Access to services**

Delays to treatment are a considerable concern for patients when first accessing health services. Common barriers in accessing healthcare include waiting lists and appointment delays; poor service availability; difficulties with parking; poor transport options; and distance to the outpatient clinic<sup>31</sup>.

People with multiple chronic conditions have greater reliance on health care providers, but convenient access to providers is often limited both for urgent and non-urgent concerns<sup>32</sup>.

# 9

## References



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