5. HUMAN BEINGS, POPULATION & HUMAN HEALTH

5.1 INTRODUCTION

This section of the EIAR describes the assessment of potential impacts, mitigation measures and residual impacts of the proposed Limerick City Greenway (UL to NTP) on population and human health in the environs of the Project. The assessments have been completed in accordance with the guidance set out by the Environmental Protection Agency (EPA) in 'Guidelines on Information to be contained in Environmental Impact Statements' (EPA, 2022) and 'Advice Notes on Current Practice in the preparation of Environmental Impact Statements' (EPA, 2003) and the European Commission Guidance on the Preparation of the Environmental Impact Assessment Report (EC, 2017). A full description of the proposed Project is provided in Chapter 4 of this EIAR.

One of the principal concerns in the development process is that people, as individuals or communities, should experience no diminution in their quality of life from the direct or indirect impacts arising from the construction and operation of any development. Ultimately, all the impacts of a development impinge on human beings, directly and indirectly, positively and negatively. The key issues examined in this section of the EIAR relate to population and human health and incorporate population statistics, employment and economic activity, land-use, residential amenity, community facilities and services, tourism, property values, accidents/natural disasters, health and safety and other environmental hazards such as water contamination, air pollution and traffic.

Reference is also made, in this chapter, to nuisance impacts on human beings that are dealt with in other sections of this EIAR such as dust and noise from Chapter 7- Land use, Soils and Geology, Chapter 9 – Air Quality- Noise and Vibration; traffic from Chapter 13 - Material Assets and other impacts from Chapter 11- Landscape and Visual.

The focus of this chapter is to establish the potential for impacts of the proposed Greenway on population, health and economic activity in the area and on potential impacts to the community, including the resident, working and visiting community in the environs of the Project during construction and operation. The Limerick City Greenway (UL to NTP) has an indefinite operational duration; therefore, the impacts of decommissioning have not been assessed.

5.2 DESCRIPTION OF RECEIVING ENVIRONMENT

5.2.1. Data Sources

The following sources of information and literature pertinent to the area were used in the preparation of this section to establish any likely significant impacts that may occur:

- Central Statistics Office (CSO), Census Data (demographic data from Census 2011, Census 2016, Census 2022);
- Limerick Development Plan 2022-2028
- Clare County Development Plan, 2017 – 2023;
- Fáilte Ireland;
- GeoDirectory; and
- Aerial photography.

The appraisal of potential impacts on population and human beings was undertaken by reviewing the current socio-economic environment in the Study Area. Information regarding human beings and general socio-economic data were sourced from the Central Statistics Office (CSO), Limerick Development Plan 2022-2028, Clare County Development Plan 2017 – 2023, Fáilte Ireland and any other literature pertinent to the area. The study included an examination of the population and employment characteristics of the area. This information was sourced from the most recent census data, the Census of Ireland 2022 and from the CSO website, www.cso.ie. Census information is divided into State, Provincial, County, Major Town and District Electoral Division (DED) level. For the purposes of this section of the EIAR, data for the DED level was used wherever possible.

5.2.2. Human Beings in the Existing Environment

5.2.2.1. Study Area: *Definition of Study Area*

In order to assess the population in the vicinity of the site, the Study Area for the Population section of this EIAR was defined in terms of the District Electoral Divisions (DEDs) where the proposed Greenway is located, as well as nearby DEDs which may be affected by the proposed development. The site of the proposed Greenway lies within three main DEDs, Ballysimon and Ballyvarra located in Co. Limerick, and Cappavilla which is situated in Co. Clare. There are small sections of two other DEDs located to the west of the Study Area corresponding to Limerick South Rural and Abbey B. For the purposes of this chapter, the three main DEDs (Ballysimon, Ballyvarra and Cappavilla) will be referred to as the Study Area. This demographic area best reflects the population distribution of the regions surrounding UL which contains the target group of stakeholders affected by the proposed Project, including town's people and enterprise owners.

The Study Area has a combined population of approximately 1,129 persons, as of 2022 and comprises a total land area of 5.8 square kilometres (Source: CSO Census of the Population 2022). Population estimates were calculated based on DEDs area, total population and population density.

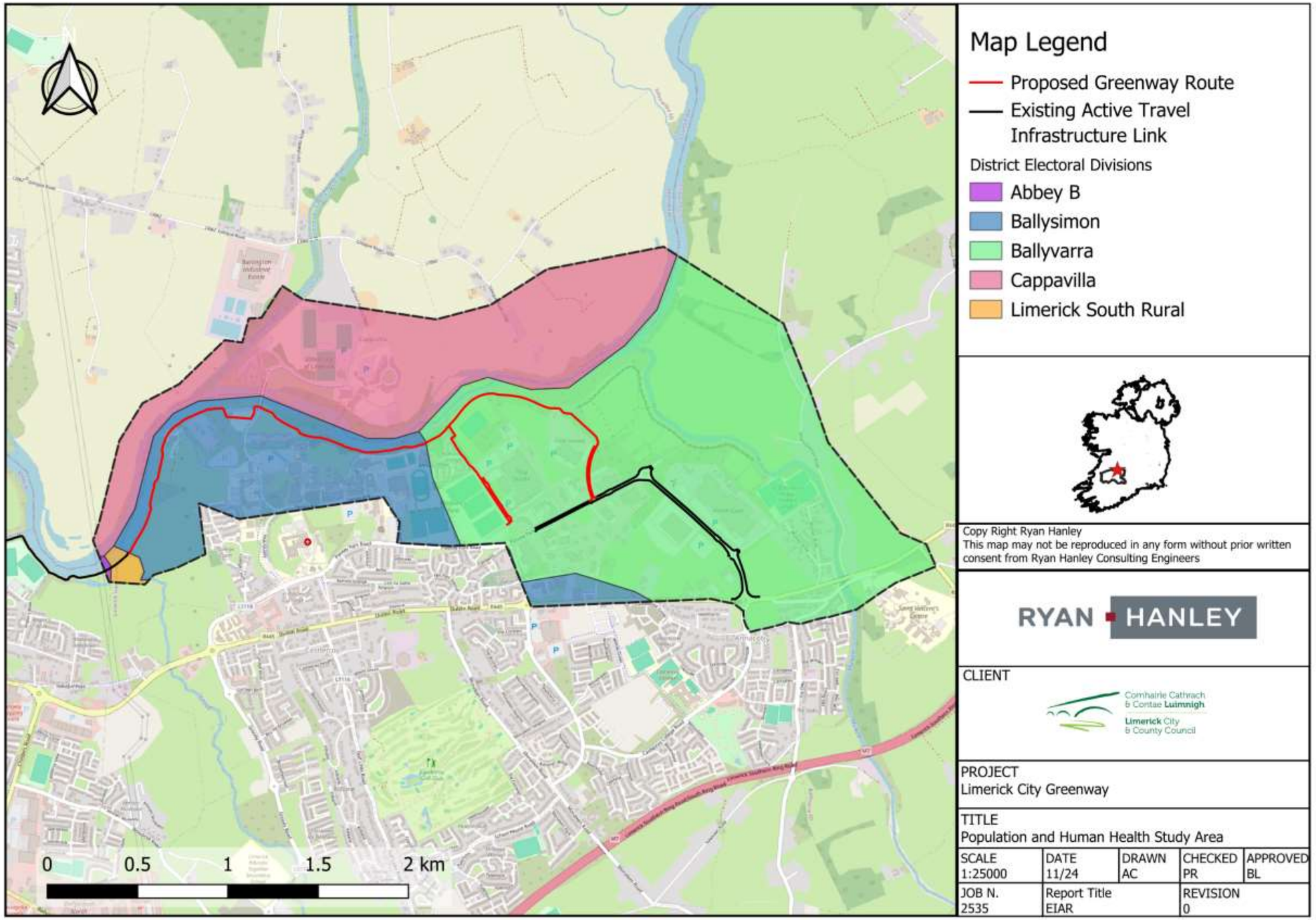

Figure 5. 1 Electoral Districts within the Study Area

5.2.2.2. Settlements and Planning Policy

The Study Area, and associated Limerick County DEDs, encompasses the local area of Castletroy which falls under the settlement structure Tier 1: The City and City Environs. Castletroy is located in the eastern environs of Limerick City, bisected by the R445 Dublin Road with the M7 Dublin to Limerick Motorway to the south and bounded by the River Shannon to the north. Castletroy contains a number of distinct components including the University of Limerick and National Technology Park, with the southern area primarily comprising of residential areas.

The area of Castletroy performs an important trade and service function for the population and surrounding hinterland as evident by the diverse range of services and businesses and its close proximity to Limerick City centre provides an ideal location to reside coupled with the university campus and wide range of sporting and amenity facilities.

The Limerick Development Plan 2022-2028 incorporates the area that was covered by the Southern Environs Local Area Plan and the Castletroy Local Area Plan. Therefore, the village of Annacotty is included in the overall spatial framework plan and zoning objectives. As part of the policies of the Plan it includes the growing of Limerick City and Suburbs, including Annacotty as a key driver for social and economic growth in Limerick. The objective CGR 08 of this policy states the following:

It is an objective of the Council to:

a) *Promote development which incorporates a high quality, sustainable and inclusive approach to proposals in the City and Suburbs (in Limerick), Mungret and Annacotty, which is supported by sustainable means of travel and which creates locally distinctive neighbourhoods and positively contributes to the existing built and natural heritage.*

5.2.2.3. Population

The route of the proposed Limerick City Greenway is predominantly located within the grounds of the University of Limerick along the banks of the River Shannon and diverts through the National Technology Park. Residential settlements are comprised of those associated with the University and the local area of Castletroy. Residential dwellings within the Study Area are quite scattered with the majority of this region being comprised of the University campus buildings and commercial enterprises associated with the National Technology Park.

Population Trends

In the four years between the 2011 and the 2016 Census, the population of Ireland increased by 3.8%, further increasing by 8.1% between 2016 and 2022. The change in the population between successive censuses can be broken down into the combined effect of natural increases and net migration. Between 2011 and 2016, the population of Co. Limerick grew by 1.9% from 191,306 to 194,899 persons. The population of Limerick County continued to grow by 7.5% between 2016 and 2022 from 194,899 to 209,536 persons. Population statistics for the State, County Limerick, County Clare, the Study Area and DEDs have been obtained from the Central Statistics Office (CSO) and are presented in **Table 5. 1.**

Table 5. 1 Population 2011-2022 (Source: CSO)

Area	Population			% Population Change	
	2011	2016	2022	2011-2016	2016-2022
State	4,588,252	4,761,865	5,149,139	3.8%	8.1%
County Limerick	191,306	194,899	209,536	1.9%	7.5%
County Clare	117,194	118,817	127,938	1.4%	7.7%
Study Area	978	967	1,129	-1.05%	16.8%
Ballysimon DED	13,073	13,590	16,560	4%	21.9%
Ballyvarra DED	4,269	4,288	4,513	0.45%	5.2%
Cappavilla DED	1,038	846	1,111	-18.5%	31.3%

It can be seen from **Table 5. 1** above that between the period 2011 to 2016 there was a slight population decrease in the Study Area, contrary to the both county and national levels which had a slight increase during that same period. Overall, the DEDs show population increases, in line with county and State levels, with the exception of Cappavilla DED which has seen a population decrease of 18.5% from 2011 to 2016. In the period 2011– 2016, Ballysimon DED experienced a population increase of 4% while this was slightly lower for Ballyvarra DED with just a 0.45%. The 2016-2022 population trends show a much higher increase in population during those four years for all the District Electoral Divisions. It is worth to note that the DEDs boundaries can change after some censuses' periods which might influence the total population.

Population Density

The population densities recorded within the State, Limerick City, the four DEDs and Study Area during the 2022 Census are shown in **Table 5. 2.**

Table 5. 2 Population Density in 2022 (Source: CSO)

Area	Population Density (Persons per square kilometre)
State	70.0
County Limerick	76.03
County Clare	37.17
Ballysimon DED	541
Ballyvarra DED	118
Cappavilla DED	127
Study Area	194.7

The population density of the Study Area recorded during the 2022 Census was 194.7 persons per square kilometre. In ascending order the district electoral division with lower population density is Ballyvarra with 118 persons per square kilometre, followed by Cappavilla with 127 persons per square kilometre. Ballysimon shows a much higher population density with 541 persons per square kilometre.

Household Statistics

The number of households and average household size recorded within the State, County Limerick, County Clare, the four DEDs and the Study Area during the 2016 and 2022 Censuses are shown in Table 5.3.

Table 5. 3 Number of households and average household size 2016-2022 (Source: CSO)

Area	2016		2022	
	No. of House-holds	Avg. Size (persons)	No. of House-holds	Avg. Size (persons)
State	1,702,289	2.75	1,841,152	2.74
County Limerick	71,224	2.70	76,472	2.70
County Clare	43,469	2.68	46,553	2.67
Ballysimon DED	4,551	2.93	5,566	2.89
Ballyvarra DED	1,415	3.07	1,473	3.08
Cappavilla DED	261	2.76	286	2.74
Study Area	327	2.95	386	2.92

Table 5. 3 shows an overall increase in the number of households across the board at both a state and county level, with a significant increase in the number of households between 2016 – 2022 observed in County Limerick. Average household size recorded Ballysimon and Cappavilla DEDs is in line with that observed at State and County level. However, Ballyvarra DED shows a higher average household size.

Age Structure

Table 5. 4 presents the percentages of the State, Counties Limerick and Clare and the Study Area population (estimations using population density and DEDs) within different age groups as defined by the Central Statistics Office during the 2016 and 2022 Census. The data is also displayed for the Population per Age Category in 2022 in Figure 5. 2.

Table 5. 4 Population per age category in 2022 (Source: CSO)

Area	Age Category				
	0 – 14	15 – 24	25 - 44	45 - 64	65 +
State 2016	21.14%	12.11%	31.45%	21.9%	13.39%
State 2022	19.66%	12.52%	27.62%	25.12%	15.08%
County Limerick 2016	20.32%	13.26%	28.39%	23.97%	14.07%
County Limerick 2022	18.84%	13.06%	27.19%	24.89%	16.03%
County Clare 2016	21.52%	11.50%	26.16%	25.96%	14.86%
County Clare 2022	19.54%	12.41%	24.02%	27.10%	16.93%
Study Area 2016	17.11%	27.63%	27.47%	18.49%	9.25%
Study Area 2022	15.73%	26.36%	27.64%	19.42%	10.83%

Comparisons of county level data from 2016 and 2022 show little change throughout the age categories, with percentages remaining relatively stable throughout counties Clare and Limerick, a similar trend is also observed for the State. For both counties Limerick and Clare, the highest population percentage lies within the 25 – 44 age category, which is similarly observed at State level.

For the study area[1], between 2016 and 2022 there is a slight decrease for population between the younger ages 0-4 and 15-24 and a slight increase for population ages between 25-44 and 45-64. Even though the lowest percentage of the population in the 65+ range, there was an increase of this age category between 2016 and 2022 from 9.25% to 10.83%. However, overall, this shows a relatively young population trend within the study area.

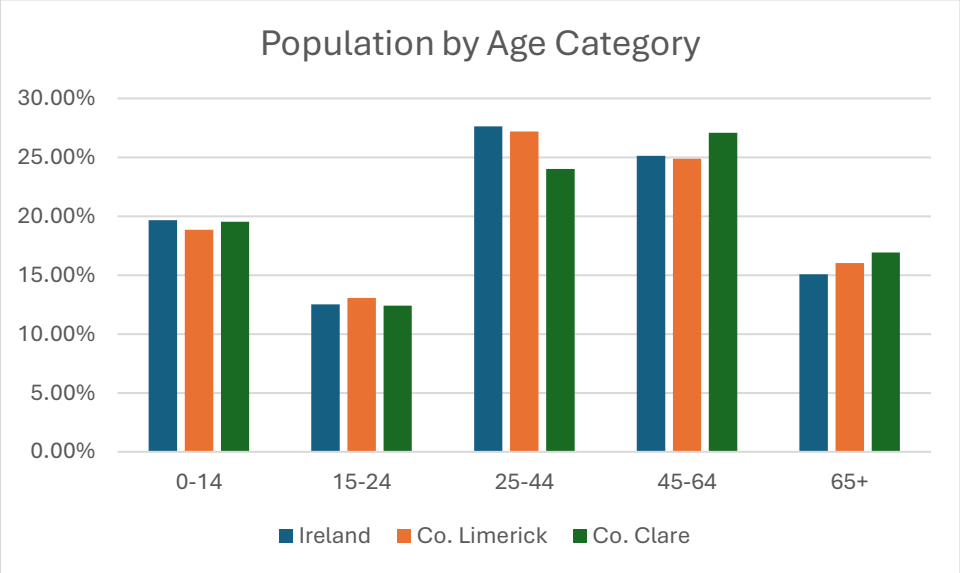

Figure 5. 2 Population per Age Category 2022 (Source: CSO)

5.2.2.4. Economic Activity

Employment

The 2022 Census of Population was examined to determine trends in relation to employment including the number of persons at work and unemployment levels. The total number of persons in the labour force grew by almost 10% from 2016 and 2022 at State level. Limerick County registered a 8.1% increase for that same period while Clare County had a similar growth of 10% of people in the labour force.

The manufacturing industry represents a strong economic industry at State and County levels. It adds to 14.10% for Clare, 12.63% for Limerick and 9.59% at State level. Human health and social work activities also represent an important industrial group with Limerick City and County Council with the highest percentage of 11.61% of the total workforce, followed by the State with 10.65% and Clare County with 9.7%. Other industrial groups with hight representation at both State and County levels include Retail, Professional, scientific and technical activities. Less represented groups include Mining, energy supply, waste management, household employers, among others. **Figure 5. 3** displays the percentage of total employment

[1] Estimates calculated considering the percentage distribution in the electoral divisions and the total population within the study area.

for each industry type utilising 2022 Census data for Counties Limerick and Clare and comparing them to the State figures.

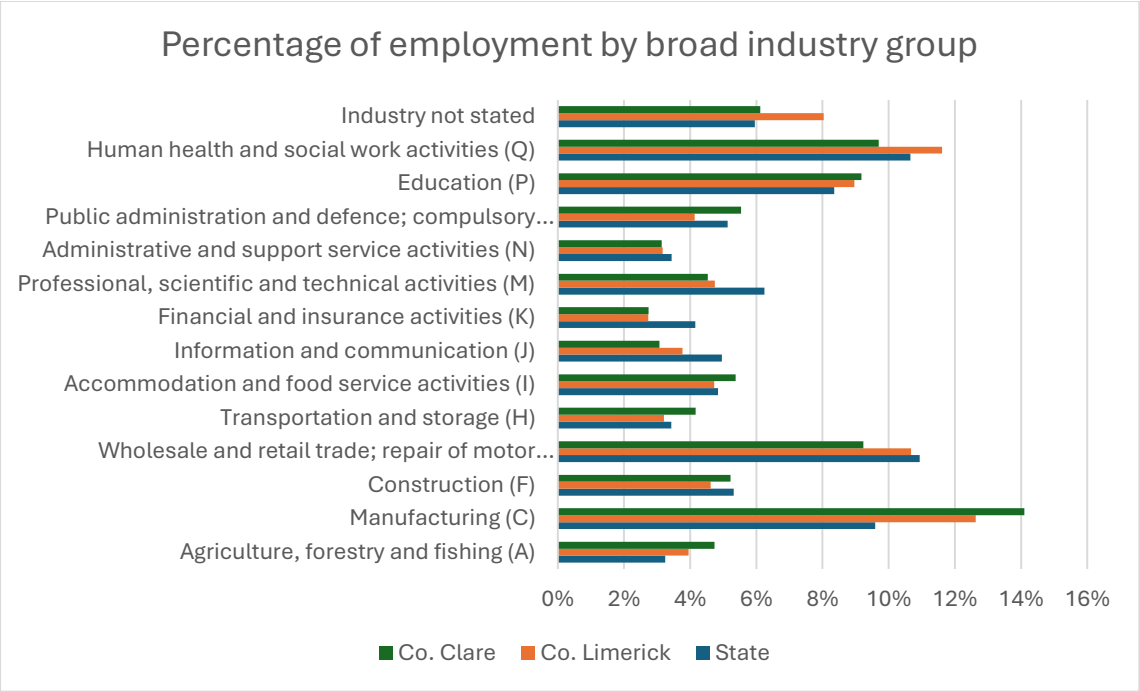

Figure 5. 3 Employment per broad industry group in 2022 (Source: CSO)

When compared to County level, employment trends within the study area show very similar percentages regarding employment categories. Following the County level trend, the study area has a high proportion of the workforce employed in Professional services (27.3%), followed by commerce and trade (21.1%).

Table 5. 5 Estimate employment type in the Study Area in 2022[2] (Source: CSO)

Industry	Total	%
Agriculture, Forestry and Fishing	7	1.5
Building and Construction	15	3.4
Manufacturing Industries	67	15.1
Commerce and Trade	94	21.1
Transport and communications	38	8.6
Public administration	19	4.4
Professional services	121	27.3
Other	83	18.7

[2] Estimates based on DEDs CSO data, total surface area and study area

The primary type of employment provided in the Study Area is professional service based employment, in addition to employment generated by commerce and trade as well as other types.

The 2022 CSO data from the DEDs which are intersected by the Study Area, illustrate most of respondents have a journey time of less than 30 minutes to their work or education, which indicates that a high percentage of employment and educational facilities are located relatively close by.

Unemployment

The labour force consists of people aged 16[3] or over, out of full-time education and not performing duties that prevent them from working. In 2022, there were 2,528,251 persons in the labour force in Ireland. **Table 5. 6** shows the percentage of the total population who were in the labour force during the 2022 Census. This figure is further broken down into the percentages that were at work, seeking first time employment or unemployed. It also shows the percentage of the total population who were not in the labour force, i.e. those who were students, retired, unable to work or performing home duties.

Table 5. 6 Economic status of the total population aged 15+ in 2022 (Source: CSO)

	Status	State	County Limerick	County Clare	Study Area
% of population aged 15+ who are in the labour force	Total % population in labour force	61.1%	58.2%	59.3%	50.1%
	At work	91.6%	91.3%	92.0%	93.2%
	First time job seeker	1.4%	1.4%	1.3%	1.5%
	Unemployed	7.0%	7.3%	7.0%	5.5%
% of population aged 15+ who are not in the labour force	Total % population not in labour force	38.9%	41.2%	40.7%	49.9%
	Student	28.6%	29.2%	28.0%	62.9%
	Family	17.0%	15.5%	15.7%	7.6%
	Retired	40.9%	40.2%	43.7%	22.5%
	Unable to work	11.8%	13.8%	10.6%	6.5%
	Other	1.7%	1.2%	2.0%	0.6%

In comparing the data in **Table 5. 6**, it is evident that the percentage of the population within and not within the labour force for Counties Limerick and Clare is comparable to the figures observed at State level. For counties Limerick and Clare, the greatest percentage of the population in the labour force are At Work,. The highest percentage of the population within the Counties Limerick and Clare that are not in the labour force, lie within the Retired category.

As for the study area, the percentage of population that is not within the labour force is slightly higher than the percentages shown at State and County levels, adding to 49.9% with a high percentage of the population being a student or pupil which matches that the study area is occupied mainly by university grounds.

[3] Minimum legal age for full time employment

Employment by Socio-Economic Group

Socio-economic grouping divides the population into categories depending on the level of skill or educational attainment required. These range from higher professional to unskilled. The 'Higher Professional' category includes scientists, engineers, solicitors, town planners and psychologists. The 'Lower Professional' category includes teachers, lab technicians, nurses, journalists, actors and driving instructors. Skilled occupations are divided into manual skilled, such as bricklayers and building contractors; semi-skilled, e.g. roofers and gardeners; and unskilled, which includes construction labourers, refuse collectors and window cleaners. **Figure 5. 4** shows the percentages of those employed in each socio-economic group in the State and Counties Limerick and Clare during 2022.

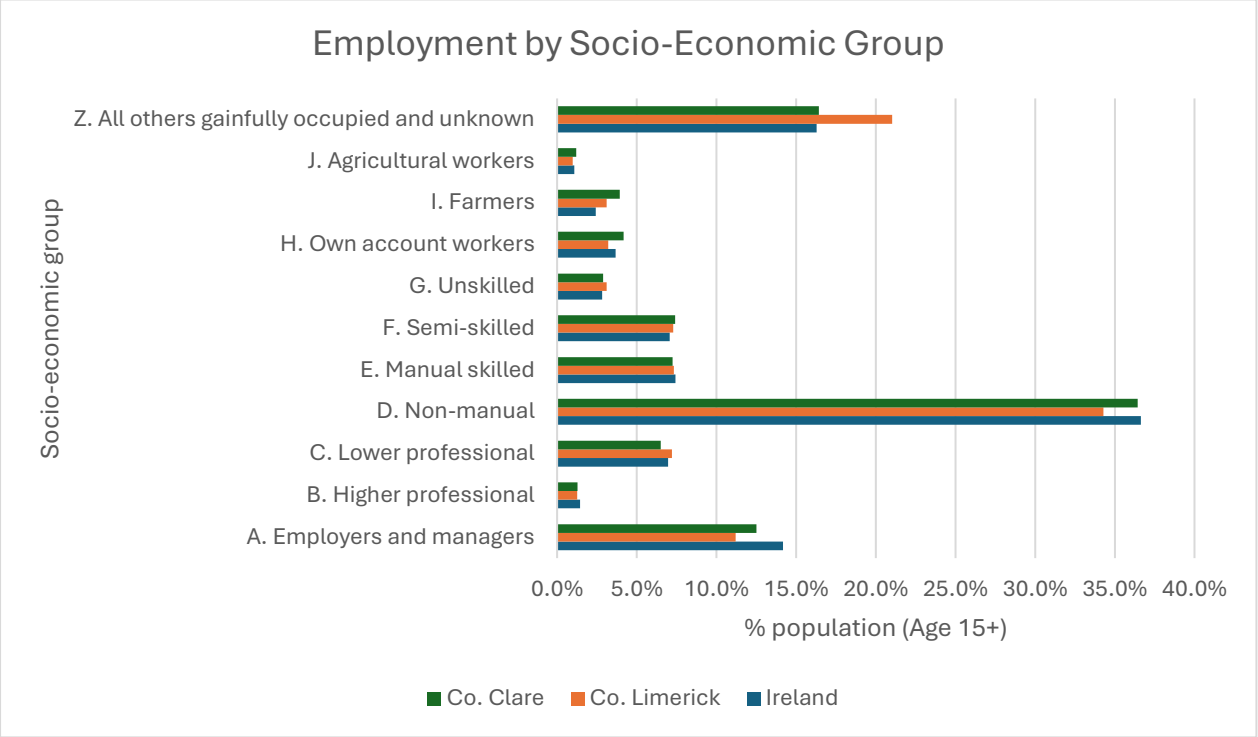

Figure 5. 4 Employment by socio-economic group in 2022 (Source: CSO)

When comparing the socio-economic groupings between the two Counties and State a similar trend can be seen throughout with Non-manual, Employers and managers and All others gainfully occupied and unknown workers comprising the greatest percentage of the socio-economic groupings. Similarly, the lowest percentage between the two Counties and State displays a similar trend throughout with Agricultural workers, Unskilled and Higher professional workers can be seen.

The CSO figures for socio-economic grouping have a limitation of including the entire population, rather than just those who are in the labour force. It is likely that this is what gives rise to the high proportion of the population shown to be in the All others gainfully occupied and unknown category in Figure 5.4.

5.2.2.5. Services

The proposed Greenway is situated within the local area of Castletroy, which as previously stated, contains a number of distinct components including the University of Limerick and National Technology Park and plays an important trade and service function for the population and surrounding area. Additionally, due to its

close proximity to Limerick City Centre it provides an ideal location to reside coupled with the University campus, diverse range of services and businesses and wide range of sporting and amenity facilities available.

Education

A majority of the proposed Greenway route is situated within the grounds of the University of Limerick which has a student population of 16,500, including more than 2,000 international students each year. Within the National Technology Park, Limerick City College is present which provides evening courses/classes.

Primary and secondary schools within the Study Area include Milford National School which is located within Castletroy and has a combined student population of 489. No pupils in addition to a secondary school, Castletroy College which has a student population of 1,218. No pupils.

Two childcare facilities are located within the Study Area, Unikids located in proximity to Troy Studios and Silver Apples Creche located adjacent to Glucksman Library.

The proposed Greenway will continue the existing City Centre to University of Limerick Riverbank Walk (a 3.25km shared walkway/cycleway which ends at the UL Boathouse) further providing a safe route for travel via walking or cycling from Limerick City and surrounding environs to the University Campus, Milford National School and Castletroy College which are present adjacent to the grounds of the University. The Greenway will provide a positive enhancement to the region, giving a safe and environmentally friendly means of travelling to the University and schools.

Access and Public Transport

The proposed development area lies along the banks of the River Shannon, with smaller sections connecting into the National Technology Park via University Road and McLoughlan Road. The Greenway can be accessed via several routes including Plassey Park Road (L1118) which runs in a west to east direction, and several internal roads associated with the University and Technology Park. An existing active travel link which runs from Dublin Road to Plassey Park Road also provides further connectivity to the proposed greenway.

The area surrounding the Study Area is serviced by public transport with several bus stops located along the Dublin Road and Plassey Park Road which are serviced by Limerick City Bus Éireann services 304 (Ballycummin to UL) and 304A (Raheen UHL to UL). These bus services run frequently on weekdays at 15- and 30-minute intervals, respectively, and every 15 to 30 minutes on Saturdays and Sundays.

The ease of access through regional and local roads and public transport provides a simple and straightforward means to access the Greenway from various locations outside of Castletroy region ensuring the use of the Greenway amenity for the wider community and population.

Amenities and Community Facilities

There are numerous amenities and community facilities within the Study Area, owing primarily to the University campus, including Munster Rugby HQ, UL Bohemian Rugby Club, the UL Sports Arena which has numerous outdoor facilities including all weather pitches, athletics track, tennis courts, hockey pitch and indoor facilities including a National 50m swimming pool, sports hall, climbing wall, gym, National Strength and Conditioning Centre and group fitness classes.

Walking routes along the River Shannon and throughout the University campus provide amenity within the Study Area.

Several personal services are present within the Study Area, primarily within the grounds of the University, including numerous cafés (i.e. Cube Café, Plaza Café, Starbucks, Café Sportif and No. 13 The Factory).

Restaurants including Eden Restaurant (UL campus), Neligan's Bar & Restaurant and Brew Boys are also situated within the Study Area.

The proposed Greenway amenity contributes further to existing facilities within the area and will provide greater custom to facilities such as cafés and restaurants. The proposed Greenway will provide a positive addition for the surrounding community.

Tourism in the Study Area

Tourist attractions in the region includes 7. No golf clubs in Co. Limerick and 13. No in Co. Clare, none of which are located within the Study Area. The closest golf club is Castletroy Golf Club which is located c. 1.0km south of the Study Area.

A desktop review of the angling amenities within the Study Area has been carried out and did not identify any angling clubs within the Study Area although the Shannon Mulkear Anglers and Limerick & District Angling Associations are active along the Rivers Shannon, Mulkear and their tributaries.

Fáilte Ireland accommodation listings dataset identifies Kilmurray Lodge Hotel within the Study Area, with Troy Holiday Village and Castletroy Park Hotel and Suites located to the south of the Study Area.

The surrounding area of Counties Limerick and Clare has numerous tourist attractions, with both counties forming part of the Wild Atlantic Way; a 2,500km route along the west coast of Ireland from Donegal to Cork. The wider regions of Limerick and Clare provide many opportunities for general indoor and outdoor recreation. Some local attractions of the surrounding area is listed below.

Co. Limerick:

- St. John's Castle: One of Limerick's most iconic landmarks is a 13th century fortress in the heart of medieval Limerick and is one of the best-preserved Norman castles in Europe and a fantastic visitor experience. St. Johns Castle is located within Limerick City Centre approximately 2.4km west of the Study Area.
- Saint Mary's Cathedral: Founded in 1168 A.D. the Cathedral is said to be built on the site of a Viking Thingmote, and later became the palace of Donal Mór O'Brien, the King of Munster. This 12th Century cathedral has evolved into a stunning architectural treasure over the years. Saint Mary's Cathedral is located within Limerick City Centre approximately 2.35km west of the Study Area.
- Hunt Museum: Located within Limerick City Centre on the banks of the River Shannon, the Hunt Museum displays an internationally important collection of 2,000 original works of art and antiquity and Ireland's greatest private collections dating from the Neolithic to the 20th Century. The Hunt Museum is located within Limerick City Centre approximately 2.4km west of the Study Area.
- University Concert Hall: The 1,000 seat venue located within the Study Area on the grounds of the University of Limerick hosts a variety of live entertainment events including concerts, recitals, drama and comedy.

Co. Clare:

- The Cliffs of Moher: Located along the coastline of Liscannor, Co. Clare, the Cliffs of Moher is one of Ireland's top visitor attractions and were awarded a UNESCO Global Geo Park status in 2011.

The Cliffs stretch for 8km providing a scenic walking route. The Cliff's are located approximately 65km north-west of the Study Area.

- The Burren: The 1,500 ha Burren National Park is a distinctive region with a unique ecosystem of rare native Irish plants and flowers and is open all year round. The Burren National Park is located approximately 42.7km north-west of the Study Area.
- Lahinch Beach: Situated within the head of Liscannor Bay, Lahinch is a popular resort town with many restaurants and accommodation, and a popular location for surfing with several surf schools located along the beach in addition to sea kayaking and kite surfing. The 2 km long beach of golden sands provides a walking amenity for visitors. Lahinch village is located approximately 58.7km north-west of the Study Area.

The proposed Greenway will assist in providing a positive impact on tourism in the region, creating an accessible walking and cycling route from Limerick City Centre to the University of Limerick and vice-versa, enabling access to various attractions, local accommodation and hospitality businesses.

5.2.2.6. Human Health

The health benefits of walking and cycling have been well documented and include improved mental wellbeing, strengthening of the immune system, improved muscle tone, maintenance of a healthy weight, improved cardiovascular fitness and reduction in the risk of cancer and heart disease. The Greenway offers a means in which the health benefits of walking and cycling outdoors can be obtained.

The National Physical Activity Plan (NPAP) was launched in 2016 with the aim to increase physical activity levels across the entire population thereby improving the health and wellbeing of people living in Ireland. The Implementation Summary 2019 of this Plan outlines 60 Actions as part of the NPAP of which Action 32 of the NAPA details the development and promotion of walking and cycling strategies in each local Authority area. Action 36 also highlights the National Planning Framework (NPF) which includes National Policy Objective 27; 'to ensure the integration of safe and convenient alternatives to the car into the design of our communities, by prioritising walking and cycling accessibility to both existing and proposed developments and integrating physical activity facilities for all ages'.

The NAPA outlines that walking or cycling for transport or leisure is a form of physical activity that can be easily incorporated into daily activities for many people. Having supportive environments, such as that as the proposed Greenway, for walking, cycling, recreational and outdoor physical activity has many benefits other than the immediate physical activity gains. Walking and cycling as a means of travel, improves air quality through the reduction of CO2 emissions, assisting in reducing traffic congestion and noise pollution. In turn, this supports the Government policies such as 'Smarter Travel: A Sustainable Transport Future", the 'National Cycle Policy Framework' and the National Strategy on Education for Sustainable Development.

Get Ireland Cycling initiative was launched through the NPAP as supported by the Health Service Executive and Cycling Ireland. Cycling Ireland published their Strategic Plan 2020 – 2024 with key actions including, the development of cycling participation opportunities through enhanced programming of access activities from schools to community rides and to support the development of participation opportunities to enable people of all ages and abilities to access cycling. Both actions are supported by the proposed Greenway.

Get Ireland Walking is a national initiative by Sport Ireland that aims to maximise the number of people participating in walking for health, wellbeing and fitness throughout Ireland.

Overall, the proposed Limerick City Greenway (UL to NTP) supports both the NPAP and NPF objectives providing a positive attribute and health benefit to the nearby community and population.

5.3 LIKELY SIGNIFICANT IMPACTS

This section deals with the impacts of the proposed Greenway in the Study Area with regard to population, employment and economic activity, land use, services and tourism. As well as these the impact on human beings is discussed. Noise, air quality, visual and traffic impacts will be dealt with in more detail in Chapters 9, 11 and 13 respectively.

5.3.1. 'Do-Nothing' Scenario

If the proposed Limerick City Greenway (UL to NTP) were not undertaken, the existing environment would remain as it is, with the loss of the opportunity and benefit to expand the amenity and recreation facilities in the region and the provision of a safe and accessible path into the University campus and Technology Park grounds.

The 'Do-Nothing' scenario would result in a lost opportunity in the improvement of facilities to support human health and wellbeing in the surroundings and wider community, the opportunity to extend the existing City Centre to University of Limerick Riverbank Walk further into the University and Technology Park grounds, and the opportunity to support the NPAP actions and objectives.

5.3.2. Construction Phase

5.3.2.1. Population Impacts

It is expected that the construction of the proposed sectional Greenway will take approximately 30-60 months and the construction cost of the project will be in the region of €15 million. Those working on the construction phase of the proposed development will travel daily to the site from the wider area. A smaller number of specialist construction workers may move into the area on a temporary basis for the duration of the construction phase. The construction phase will have no impact on the population of the Study Area in terms of changes to population trends or density, household size or age structure. There will be no perceptible impact on population demographics during construction phase.

5.3.2.2. Economic Impacts

There is potential for the proposed Project to influence commercial activity and existing businesses in a positive means within the region of Castletroy during the construction phase of the proposed project, primarily resulting from an increase of construction workers on site who might utilise existing hospitality facilities. Furthermore, construction workers could support existing employment through local spending and the demand for goods and services in the wider area, e.g., on fuel, food, building supplies, haulage services, etc. This could result in a slight short-term positive impact for local businesses.

Disruption and disturbance arising from temporary working areas and access routes in proximity to business premises may arise. These effects will occur for a temporary period only and no significant impacts such as job losses due to the construction are likely. Noise and dust from the works can also add to these temporary impacts.

Overall, in the absence of mitigation, during the construction phase the impacts to economic activity within the Study Area are likely to be short term slight negative for the majority of commercial activities and businesses but with the considered and applied measures, these impacts will not be significant.

5.3.2.3. Land-Use

Construction works may affect land use within the Study Area through temporary land take for construction purposes. The route of the Greenway has been chosen with regard to several factors including the goal to minimise impact on residential properties, University buildings and Technology Park businesses. In terms of the overall Study Area, predicted land use impacts will have both positive (utilisation of existing land for amenity and recreation purposes) and negative (for land requisitioned and related access) effects. Chapters 7 and 13 also assess these impacts in the context of land take and material assets.

The majority of the proposed Greenway will be constructed along existing pathways, amenity grassland, woodland areas and greenfield sites associated with the banks of the River Shannon, in addition to more urbanised land within the University and Technology Park grounds. Potential impacts during construction in respect of land use within the Study Area include:

- Temporary loss of amenity grassland and access to existing pathways during construction. During construction operations access to certain areas along the riverbank will be prohibited for a temporary period only. This will result in a temporary disruption to users;
- On completion of the Greenway, reinstatement of areas utilised as compounds or for other construction purposes will be completed;
- Interference to existing tracks on the University grounds which are used by maintenance vehicles;
- Dust - The activity of earth moving equipment, spoil transport and other ancillary vehicles could generate significant dust in the immediate vicinity of the proposed Project. The proliferation of dust can create a nuisance to individuals utilising the nearby areas;
- Traffic - There will be an increase in worker and material related traffic during the construction phase of the proposed Project.

Construction activities may potentially negatively impact on other sensitive land uses including commercial, educational, social and community land uses. More impacts can be found in Chapter 7- Land use, Soils and Geology.

5.3.2.4. Services

Construction works have the potential to impact on service network infrastructure (drainage, water, electricity, broadband and telecommunications) within the Study Area through accidental damage during excavation.

Chapter 13 gives further details on the predicted impacts on services for drainage networks, water, electricity, broadband and telecommunications distribution networks. Locations where potential impacts are predicted are discussed in Chapter 13. Potential impacts on each service will vary, but overall, the proposed Project will have a potential temporary moderate to significant negative impact on services in the absence of mitigation.

5.3.2.5. Tourism

In general, construction of the proposed Project will not impact on regional or local tourism activities or providers as the majority of these are outside of the Study Area and will not be influenced by construction activities.

The University Concert Hall was listed as a tourist attraction in Section 5.2.2.5; however, the Hall is located c. 215m south of the proposed route and will not be directly impacted by the construction works. Sections of

an existing walking track along the banks of the River Shannon which the proposed Greenway follows will be inaccessible at times during the construction phase, however this disruption will be temporary. The walking track will be incorporated into the route & design layout of the Greenway making for a safer travel experience.

Potential increases in noise and dust levels and temporary impacts on visual amenity related to the works may also deter and/or disturb visitors during the construction phase. These impacts will be short-term in duration. However, it should be noted that there are no significant tourist attractions pertaining to the site of the proposed Project and its immediate surroundings.

5.3.2.6. Noise

WHO published community noise guidelines (CNG) and night noise guidelines (NNG) for Europe in 1999 and 2009, respectively (WHO, 1999; WHO Regional Office for Europe, 2009). Since then, significant new evidence has accumulated on the health effects of environmental noise. Exposure to noise can lead to auditory and nonauditory effects on health. Through direct injury to the auditory system, noise leads to auditory effects such as hearing loss and tinnitus. Noise is also a nonspecific stressor that has been shown to have an adverse effect on human health, especially following long-term exposure.

There will be an increase in noise levels in the vicinity of the proposed Project during the construction phase, as a result of machinery and construction work. Works associated with the proposed development may contribute to noise impact are as follows:

- Site compound set up;
- Site clearance, surface stripping and construction of temporary haulage and access roads;
- Removal of existing infrastructure;
- Drainage, platforms and bridges;
- Greenway construction and laying of surface materials;
- Development or enhancement of amenity areas.

Construction noise at any given noise sensitive locations will be variable throughout the construction project, depending on the activities underway and the distance from the main construction activities to the receiving properties. The potential noise impacts that will occur during the construction phase of the proposed development are further described in Chapter 9 of this EIAR. In the absence of mitigation, these will have a potential temporary slight to significant negative impact depending on the location of the receptor, and the works being carried out. Construction related traffic is anticipated to have a potential short term negligible impact during the construction phase of the Project.

5.3.2.7. Dust

Dust is a concern from a health perspective. EU ambient air quality standards (Council Directive 2008/50/EC transposed into Irish law as S.I. 180 of 2011) centres on PM10 (particles less than 10 microns) as it is these particles which have the potential to be inhaled into the lungs and cause some adverse health impact.

Potential dust emission sources during the construction phase of the proposed Project include excavation and earth moving activities and resurfacing works. These activities will mainly produce particles of dust greater than 10 microns; these particles are considered a nuisance but do not have the potential to cause significant health impacts. Dust emissions may cause nuisance to residents and local businesses as well as road users.

The entry and exit of construction vehicles from the site may result in the transfer of mud to public roads, particularly if the weather is wet which may cause nuisance to residents and other road users.

As detailed in Chapter 9, given that background levels of fine particulate matter (PM10 and PM2.5) are likely to be below the ambient air quality limit values and as the construction phase of the Project is short term, the potential for dust nuisance and significant levels of PM10 and PM2.5 will be short term and will vary spatially during the construction phase, constituting a short term slight negative impact.

5.3.2.8. Traffic and Transport Infrastructure

A draft Traffic Management Plan (TMP) has been developed and a Contractor's TMP will be in place during the construction phase of the Project.

Works will primarily take place within the grounds of the University and Technology Park predominantly focussed on the banks of the River Shannon and regions inaccessible by vehicles. It is anticipated that the impact of the construction phase will have a short term slight negative impact on traffic volumes in the area.

The surrounding Plassey Park Road (L1118) and the Dublin Road (R445) will be utilised by construction vehicles prior to the entrance to work areas and construction compounds i.e., haulage of excavated material, delivery of materials and work force traffic. Encountering such vehicles could result in delays to non-project related journeys as a result of slow-moving vehicles.

Access routes within the Study Area to be utilised as part of the proposed Project include:

- Private road to Castletroy Wastewater Treatment Plant;
- Dromroe Village road in the UL campus between Co Limerick and Co. Clare;
- University Road;
- Mc Laughlan Road;
- Plassey Park Road;

Full details of potential effects regarding traffic and transport infrastructure are detailed in Chapter 13. Construction related traffic will originate from the delivery of materials to site, removal of surplus excavated material from site and transport of employees to, from and throughout the site. The estimated daily peak number of round trips is anticipated to be approximately, 28 No. assuming worst case scenario.

Traffic generated during the construction phase of the proposed Project is not anticipated to have a significant impact on traffic flow in the Castletroy area. Chapter 13 compares the predicted construction traffic volumes across the main road network leading into the Study Area.

Localised traffic disruption is also likely to occur at locations of proposed works on, or in the immediate vicinity of the road network in UL and the NTP. Detailed site investigation works and location of utilities and services will also be carried in the vicinity of all proposed works.

Temporary road closure details during construction can be found in Chapter 13. Diversion routes will be put in place during any proposed road closures and detailed in Traffic Management Plan.

In addition, construction traffic and machinery may lead to an increase in nitrogen dioxide, sulphur dioxide, benzene and carbon monoxide, as well as levels of fine particulate matter (PM10 and PM2.5) from diesel exhaust emissions, which has the potential to impact on health and the environment as discussed in Chapter 9. Given that background levels of nitrogen dioxide, sulphur dioxide, benzene and carbon monoxide in the vicinity of the proposed Project are likely to be below ambient air quality limit values, based on extensive

long-term data from the EPA (Chapter 9) and emissions will be short term in nature, this constitutes a potential short term slight negative impact in terms of air quality and effects on human health due to emissions from construction vehicles.

The localised disruptions due to lane and road closures also have the potential to cause temporary nuisance to local road users. Overall, the construction phase of the project will have a potential temporary slight negative impact on existing road users due to an increase in traffic associated with construction vehicle movements.

5.3.2.9. Amenity (including Visual Amenity)

During the construction phase of the Project a short-term negative impact will occur due to the loss of amenity walking areas as sections of the current track along the River Shannon will be closed at times. There will also likely be some impact on the visual amenity of the area due to the presence of site compounds, machinery and construction materials. The impact on visual amenity of the construction phase is assessed in full in Chapter 11 - Landscape and Visual of this EIAR. The areas with the most significant works will have the greatest impact. Overall, this has the potential to have a short-term slight to significant negative impact.

5.3.2.10. Human Health and Safety Impacts

Construction of the proposed development will necessitate the presence of construction sites. Construction sites and the machinery used on them pose a potential health and safety hazard to construction workers if site rules are not properly implemented. This will have a short-term potential significant negative impact.

5.3.3. Operational Phase

5.3.3.1. Population Impacts

There will be a significant positive impact afforded to the nearby and wider community as a result of the Project through the provision of improved amenity and recreation resources which will thus aim to benefit and improve human health and wellbeing, providing a safe and accessible walking and cycling route which will promote outdoor activity. This will result in a positive contribution to the population in the Study Area and greater surroundings. The Project will aim to enhance amenity areas along the route through the provision of rest areas for Greenway users at areas of interest. Furthermore, significant tree planting with a 5:1 ratio, is proposed along the route, which will improve the visual aesthetic of the area and assist in air quality improvements.

Predicted impacts are predominantly positive and long-term. For the residential and working populations of the Study Area, no mitigation is required provided reinstatement of lands, public road and pedestrian access damaged or disturbed during the construction phase are implemented in a timely manner following the conduction of the works.

5.3.3.2. Human Health and Safety

The proposed Project will be constructed and maintained in accordance with the relevant standards. No mitigation measures relating to health and safety are required in this regard.

The proposed Project will have a positive impact on human health for those who utilise the Greenway as it will improve overall health, fitness and wellbeing. The Greenway will be constructed to ensure a safe and easily accessible route with appropriate lighting, seating, bike racks, and information boards. Safety barriers will also be included where the Greenway crosses or merges onto existing roads. A raised table will also be installed nearby Troy Studios to prioritize path users.

The route includes new amenity spaces at the following locations:

- Plassey Mill; and
- Plassey Beach.

These areas will serve as rest and amenity areas for users and will be equipped with bicycle racks, park benches and information boards. These areas will also be well illuminated.

Overall, the proposed Greenway will have a long-term significant positive impact on the surrounding population and those who utilise it.

5.3.3.3. Economic Impacts

An increase in the volume of Greenway users to the area from the surrounding community may assist in supporting local businesses such as cafés and restaurants which will have a positive economic benefit.

The Greenway will provide an easy and environmentally friendly means of accessing the University grounds, and Technology Park which may help to support businesses located in this region through a new means of accessing the region from the City Centre and thus providing a positive economic impact. This is likely to encourage future inward investment in the area, creating further employment and a stronger local economy.

5.3.3.4. Land-use

The proposed Greenway is described in detail in Chapter 4 and will connect to the Limerick Smarter Travel, Route 2, between University of Limerick and the Kevin Hannan footbridge along the bank of the River Shannon and connects directly into the City Centre. The Greenway will provide a safe transport route connecting the National Technology Park to the city whilst also enhancing amenity value of the area.

The majority of the existing route follows an existing walking track along the bank of the River Shannon with additional sections of the route taking place in greenfield sites and built environments.

Chapter 7 gives further details on the predicted impacts on land-use in relation to residential and commercial properties in the area. Overall, the impact of the proposed Project on land use in the Study Area is imperceptible on a national and county level. In the absence of mitigation, the potential impact on land use in the Study Area ranges from imperceptible to slight negative impact during the operation phase of the path. Mitigation measures are presented in Section 5.4.

5.3.3.5. Tourism

The operational phase of the proposed Project will have no negative impact on tourism in the area, the Greenway may provide a positive impact in the creation of amenity and recreation resources for tourism through the extension of a safe transport route from Limerick City Centre to the University campus. The Project will have a long-term positive impact on the tourism and local amenities of the area.

5.3.3.6. Amenity (including Visual Amenity)

The operational phase of the proposed Project will have a strong positive impact on amenity in the area, including a positive impact on visual amenity whereby the views, wildlife and heritage of the area can be enjoyed. Significant tree planting is also proposed along the route. This is further discussed in full in Chapter 11- Landscape and Visual of this EIAR.

5.4 MITIGATION MEASURES

The mitigation measures proposed in the section below relate to the construction and operational period of the proposed Greenway project. Such measures relate only to the avoidance, reduction or remedy of impacts, which affect human beings in particular those which relate to the local population and human health

in relation to Noise and Vibration, Air Quality, and Landscape character and Visual amenity, and traffic and transport. The potential impact in relation to Noise and Vibration, Air Quality, and Landscape character and Visual amenity, and traffic and transport and the related mitigation measures are discussed within the corresponding chapters of this EIAR.

5.4.1. Construction Phase

Many of the impacts during the construction phase can be addressed through appropriate planning. A Project specific Construction Environmental Management Plan (CEMP) for the development will be prepared prior to construction and will identify a variety of measures that will be incorporated to mitigate against nuisance including provisions in relation to traffic, noise and dust on the site. A draft CEMP is provided in Appendix 4C of this EIAR.

5.4.1.1. Economic impacts

Impacts to economic activity within the Study Area were identified to be short-term slight negative. These impacts will be mitigated by the adoption of good construction and traffic management measures which will be identified in the Construction and Environmental Management Plan (CEMP) and draft Traffic Management Plan (TMP).

- Potential adverse impacts on local economic activity will be minimised through ensuring access to local businesses is maintained. A construction TMP will be prepared and implemented for the duration of the works in order to ensure that any impacts on traffic mobility are minimised. This will also result in a minimised potential impact on local businesses, as traffic management will only implement restrictions to local businesses when necessary and only for the shortest possible time.
- A CEMP will be implemented during the construction phase to ensure that environmental nuisances relating to the works are minimised. This will include measures to avoid and reduce noise and dust. Refer to Appendix 4C in this EIA report.

5.4.1.2. Land Use

General access to certain land uses will suffer some unavoidable localised slight temporary negative impacts during construction. Landowner consultation has been carried out during the development of the proposed Project to record the particular mitigation requirements for individual land parcels. Consultation with landowners will continue throughout detailed design and construction of the Project to ensure that appropriate mitigation for individual landowners will be implemented. The following mitigation measures will be implemented in respect of land use in the proposed Study Area:

- Mitigation measures regarding construction traffic, dust and noise are outlined in Chapter 9 and 13 of the EIAR;
- Existing accesses to all properties will, where practicable, be maintained during construction otherwise reasonable temporary access will be provided. The location of temporary access will be at a suitable location and, where possible, with agreement of the landowner;
- Machinery and machinery movement will be minimised as much as possible to avoid unnecessary damage to lands such as tracking and soil compaction;

- Any necessary permanent restoration of fences, walls, drains or land will be completed as soon as practicable after work has concluded;

Further mitigation details from construction activities which are relevant to land use impacts are detailed in Chapter 7 - Land use, Soil & Geology and Chapter 11 - Landscape & Visual.

5.4.1.3. Tourism

Construction phase impacts in respect of tourism will be mitigated in the same way as for the resident and working populations in sections 5.4.1.1 and 5.4.1.2 above, by the adoption of good construction and traffic management measures. Works will be designed to minimise impacts upon the amenity value of the Study Area during the construction period.

5.4.1.4. Human Health and Safety

During construction of the proposed development, all staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan.

Construction works will be carried out in sections. The entire length of each section will be closed to the public so accidental conflicts between construction works and the public will be avoided. Temporary diversion routes for pedestrians and cyclists will be provided. Works in adjacent sections will be prohibited to reduce impact on existing path users during the works.

Harris fencing will be erected around all working areas including any excavations to prevent uncontrolled access to this area. Appropriate health and safety signage will also be erected on this fencing and at locations around the site.

Temporary lighting of works at or near entrances/exits onto public road will be erected for night and dark winter working.

5.4.1.5. Amenity

Works have been designed to minimise impacts upon the amenity value of the Study Area during the construction period; however, the short-term closure of existing walking tracks along the River Shannon will be unavoidable. Mitigation measures to avoid pollution of ground and surface waters as set out in Chapter 8 and measures to avoid impacts on biodiversity are presented in Chapter 6.

Mitigation measures relating to visual amenity impacts are presented in Chapter 11 (Landscape) of this EIAR.

5.4.1.6. Human Health and Noise

In order to sufficiently improve the likely noise and vibration impacts from the proposed works, a schedule of noise control measures has been formulated for the construction phase. Best practice measures for noise control will be adhered to onsite during the construction phase of the proposed Project in order to mitigate the potential temporary slight to significant negative impact associated with this phase of the Project. The measures include:

- All construction operations shall comply with guidelines set out in British Standard documents 'BS 5228-1: 2009: Code of Practice for Noise and Vibration Control on Construction and Open Sites: Noise,' which offers detailed guidance on the control of noise & vibration from demolition and construction activities;

- Construction noise will be limited by prescribing that standard construction work will be restricted to the specified working hours.;
- Materials will be selected taking account of the characteristics for generation of noise and/or vibration emissions from each item. All materials and machinery used on site shall comply with relevant E.U. and Irish legislation in relation to noise emissions. The timing of on- and off-site movements of machinery near occupied properties will be controlled;
- Erection of noise screening (abatement) enclosures as necessary around noisy processes and items such as generators, heavy mechanical machinery or high duty compressors;
- Placing of noisy/vibratory machinery as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary;
- Training and supervision of operatives in proper techniques to reduce site noise, and self-monitoring of noise levels, if appropriate;
- Where, noise levels at noise sensitive locations (NSLs) are anticipated to exceed the daytime noise criteria (Chapter 9), hoarding for noise abatement extending to a height of 2.4 m will be erected between the works area and the NSL. If such measures are installed, the construction operations are expected to meet or be less than the 70 dB LAeq(1hr) criterion in most cases;
- Controlling consaw operations by erecting a hoarding around the cutting areas;
- Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- Establishing channels of communication between the contractor/developer, Local Authority and residents; inform affected residents of time of anticipated noise impact 24 hours in advance;
- Appointing a site representative responsible for matters relating to noise; and
- Monitoring typical levels of noise during critical periods and at sensitive locations.

Further mitigation details regarding noise and vibration from construction activities is detailed in Chapter 9.

5.4.1.7. Human Health and Dust

The generation of dust is dependent on the construction activity being carried out. Environmental factors such as rainfall, wind speed and wind direction will also affect dust emissions. Best practice measures for dust control as outlined in the dust minimisation plan included in the Construction Environmental Management Plan will be adhered to onsite during the construction phase of the proposed Project in order to mitigate the slight short-term negative impact associated with this phase of the Project. A number of measures will be implemented in order to minimise dust impacts including:

- In periods of extended dry weather, dust suppression (localised wetting of surfaces) may be necessary within and around the site to ensure dust does not cause a nuisance;
- All site roads within the construction works boundary shall be regularly inspected, cleaned and maintained during the construction phase;

- Truck wheels will be washed to remove mud and dirt before leaving the site. In the event of dust nuisance occurring outside the site boundary, movement of material must be terminated immediately, and procedures implemented to rectify the problem;
- Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and removal is surplus material off site; and
- The dust mitigation measures put in place will be strictly monitored and assessed throughout the construction phase to ensure their effectiveness.

Further mitigation details regarding dust from construction activities is detailed in Chapter 9.

5.4.1.8. Services

The infrastructure proposed to facilitate alleviation of flood events have been designed to avoid, where possible, any interference with service network infrastructure within the works area. The following measures will be implemented in order to minimise impacts on human health due to services disruptions:

- All possible precautions will be taken to avoid unplanned disruptions to any services during the proposed works. This will include thorough investigations to identify and reconfirm the location of all utility infrastructure within the works area, and the implementation of robust procedures when undertaking works in and around known infrastructure services. Any disruption to service network infrastructure will be reinstated immediately or an alternative source supplied until the original source is reinstated, unless otherwise agreed with the landowner;
- All existing land drains impacted by the Project will be incorporated into the drainage channel system;
- Locations of all underground and over ground services will be identified and considered during project design, in consultation with appropriate service network providers;
- Service disruptions impacting the surrounding residential, social and commercial properties shall be kept to a minimum, only occurring where unavoidable. Prior notification of disruptions shall be given to all impacted properties. This shall include information on when disruptions are scheduled to occur and the duration of the disruption. Consultation with relevant neighbouring parties shall be undertaken prior to any proposed disruptions;
- A CEMP will be prepared and implemented by the nominated contractor in consultation with Limerick City and County Council and their Environmental Clerk of Works.

Further mitigation details regarding impacts on service networks from construction activities is detailed in Chapter 13.

5.4.1.9. Traffic

Localised traffic disruptions during the construction phase of the proposed development will be mitigated through the use of industry standard traffic management measures. These measures will be designed in accordance with the 'Guidance for the Control and Management of Traffic at Roadworks – Second Edition' (Dept. of Transport; Road Safety Authority of Ireland – 2010).

- Construction works will be sequenced so as to avoid unnecessary interruption to road users insofar as is practicable;
- All residents and interested parties shall be consulted when planning these road closures to optimise the timing of same; and
- A complete schedule of road closures will be published in advance of the works commencing to facilitate residents in making alternative arrangements where necessary.
- All road closures will be agreed in advance with Limerick City and County Council and implemented as per conditions set out in Traffic Management Plans and Road Opening Licences.

All excavations on roads will be temporarily reinstated immediately - with a permanent reinstatement to follow after 6 months - as per the following guidance:

- Guidelines for Managing Openings in Public Roads (April 2017) – for Local and Regional Roads.; and
- Requirements for the Reinstatement of Openings in National Roads (TII, May 2019) – for National Roads.

Road signage on the public road network must comply with the Department of the Transport's Traffic Signs Manual "Chapter 8 - Temporary Traffic Measures and Signs for Roadworks".

The following mitigation measure shall be implemented in relation to exhaust emissions during the construction phase:

- Machinery will be switched off when not in use;
- All construction vehicles and plant will be maintained in good operational order; and
- Aggregate materials used in construction shall be sourced locally where possible to reduce potential emissions.

5.4.2. Operational Phase

When the Project is operational, a maintenance and monitoring schedule will be put in place by LCCC to ensure that the proposed Greenway is operating to the appropriate design standard. Repairs will be made as necessary. This will ensure that there is no risk to human health as the Project ages.

During operation, no predicted adverse impacts on population, economic, tourism and amenities are identified. Accordingly, no mitigation measures are considered necessary.

5.5 RESIDUAL IMPACTS

5.5.1. Population

The implementation of a TMP and CEMP to reduce traffic and environmental nuisance impacts on the receiving environment during the construction phase will minimise the impact on local businesses. There will be a significant positive impact with the operation of the Project on the population within the Study Area.

5.5.2. Economic Activity

The improvement of amenity resources in the area will have a long-term significant positive impact on the local and wider community, and those who visit the region for tourism purposes.

Provided mitigation measures will be put in place during construction, impacts will be minimised to slight to moderate negative impacts, short-term in the context of the resident and working community. These will be unavoidable given the nature of the works required and should be considered in the context of the positive operation impacts.

5.5.3. Land use

The proposed Project will improve land use in the area via the upgrade of the existing walking track along the River Shannon and the development of greenfield sites. This will provide and enhancement to land use in the area and overall, the residual impact will be significant, long-term and positive.

The implementation of the mitigation measures listed in Section 5.4 will reduce the potential construction phase impacts on land use.

The route has been chosen with regard to several factors including the goal to enhance existing walking tracks currently in place along the banks of the River Shannon and to minimise the division of existing greenfield sites and land holdings where possible. Provided appropriate mitigation is agreed with landowners, significant adverse long-term impacts can be avoided, or the significance of these impacts reduced to slight or even imperceptible levels.

The impact of the proposed Project on land use is imperceptible on a national and county level and provides a significant positive impact in the long-term. The overriding benefits to the area are considered to outweigh any localised negative impacts incurred.

5.5.4. Services

With mitigation measures in place during the construction phase of the Project, no residual negative effects on the water distribution, drainage, electricity and telecommunications networks within the Castletroy area are anticipated.

5.5.5. Tourism

The implementation of a TMP and CEMP to reduce traffic and environmental nuisance impacts on the receiving environment during the construction phase will minimise the impact on tourism. Whilst the existing walking track along the riverbanks are used for amenity, the closure of these areas will be short-term with the long-term goal of the Project to improve and enhance amenity in the area. Additionally, the majority of the primary tourist attractions within the county are located outside of the Study Area.

Overall, the Project will have a long-term positive impact on the tourism and local amenities of the area.

5.5.6. Noise

During the construction phase, noise impacts at all receptors will be temporary and localised. At most of these, impacts will be imperceptible. At a number of dwellings and business premises, particularly those immediately adjacent to construction works, impacts will range from temporary slight negative to moderate negative. The application of noise control measures specified in Chapter 9, including implementing binding noise limits and hours of operation and the provision of screening will ensure that noise impact is kept to a minimum. The residual impact during the construction phase will be a temporary imperceptible to moderate negative impact. There will be no significant noise impacts during the operation phase of the Project.

5.5.7. Dust

Dust is a concern from a health perspective as well as potentially causing nuisance to residents, local businesses and road users. The implementation of the mitigation measures set out above will minimise impacts associated with dust generation during construction and will constitute a residual short-term negligible impact during the construction phase and a negligible impact once operational.

5.5.8. Traffic and Transport

Localised traffic disruption is likely to occur at locations of proposed works on, or in the immediate vicinity of the road network due to construction traffic entering and exiting the works areas as well as along the proposed haulage routes. With mitigation measures in place, a residual short term slight negative impact is anticipated during the construction phase and there will be no residual impact on completion of the proposed works.

With mitigation measures in place, the proposed lane and road closures as detailed in Chapter 13, are likely to cause a moderate temporary impact to the flow of traffic in the vicinity of the works. In the case of road closures, alternative diversion routes have been identified. There will be no residual impact once the proposed Project is completed.

The residual impact of the proposed Project on transport infrastructure will be a permanent slight to moderate positive impact during operational phase due to an alternative means of accessing the University campus and Technology Park via walking or cycling.

5.5.9. Amenity

The residual impact on visual amenity and the closure of existing amenity walking tracks along the riverbanks during the construction phase will be a short-term slight to moderate negative impact. Residual impacts during the operation phase are anticipated to be long term significant positive impacts.

5.5.10. Human Health and Safety

The implementation of the Health and Safety Plan and measures set out in Section 5.4 will ensure any potential risks to human health and safety are minimised. Based on the assessment above there will be no significant effects.

5.6 Vulnerability of the Project to Natural Disaster

The proposed Greenway is not a recognised source of pollution, and it is not an activity that falls within any thresholds requiring Environmental Protection Agency licensing under the Environmental Protection Agency Licensing Act 1992, as amended. As such, the proposed Project is not considered to have ongoing significant emissions to environmental media and the subsequent potential for impacts on the environment or human health effects. The Greenway promotes the use of a cleaner more environmentally friendly means of transport helping to decrease the use of vehicles and encouraging walking and cycling thus decreasing emissions from combustion engines.

Should a natural disaster occur the potential sources of pollution onsite during the construction and operational phases are limited. Sources of pollution that could possibly cause significant environmental pollution and associated negative effects on the environment and human health such as bulk storage of hazardous materials or wastes does not arise.

There is therefore limited potential for significant effects due to natural disasters to occur at the proposed development site. Ireland is a geologically stable country with a mild temperate climate. The potential natural disasters that may occur are therefore limited to flooding and fire.

It is considered that the risk of significant fire occurring, affecting the development and causing the Project to have significant environmental effects will not arise.

The development area will have a flooding risk, and this was considered in the preliminary design of the route and its links. Refer to Chapter 8 Water of the EIAr, and to the Planning Report.

Major industrial accidents involving dangerous substances pose a significant threat to humans and the environment; such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. The Project is not regulated or connected to or close to any site regulated under the Control of Major Accident Hazards Involving Dangerous Substances Regulations i.e. SEVESO sites and so there is no potential effects from this source.

5.7 CUMULATIVE IMPACT ASSESSMENT

All elements of the proposed Project were assessed in order to identify any cumulative effects.

Potential impacts on the receiving biodiversity could result in associated population and human health impacts in the context of a loss of ecosystem services. However, the mitigation measures described in this EIAR will ensure that these are suitability mitigated.

Potential impacts on the receiving land, soils and geology could also result in associated population and human health impacts due to changes in land use. However, the mitigation measures described in this chapter and Chapter 7: Land Use, Soils and Geology will ensure that these are suitably mitigated.

Potential impacts on the receiving air quality and climate could also result in associated population and human health impacts as a result of change to air quality in the local area during operational phase. There is potential for air quality impact on the local community during construction phase as a result of increased dust emissions. However, the mitigation measures described in the EIAR will ensure that these are suitably mitigated.

Traffic – Potential impacts on the receiving transport environment could also result in associated population and human health impacts due to nuisance and disturbance during construction. However, the mitigation measures described in the EIAR will ensure that these are suitably mitigated.

Potential impacts on the receiving environment due to noise and vibration could also result in associated population and human health impacts such as nuisance and noise disturbance during the construction phase. However, the mitigation measures described in the EIAR ensure that these are suitably mitigated.

Landscape and Visual Impact – Potential impacts on the receiving landscape and visual amenity could also result in associated population and human health impacts during the construction phase. However, the mitigation measures described in the EIAR will ensure that these are suitably mitigated.

Potential impacts on material assets including traffic, services (electricity, water, telecoms) and waste management may be disrupted during construction phase of the development and could result in human health impacts. However, the mitigation measures described in the EIAR will ensure that these are suitably mitigated.

For the assessment of cumulative in combination impacts, any other existing, permitted or proposed developments have been considered where they had the potential to generate a significant in-combination or cumulative impact with the proposed Greenway. These plans and projects are listed in Chapter 1.

The Limerick Development Plan 2022-2028 emphasises the promotion and facilitation of such Projects including an objective of the Plan to 'Seek the provision of appropriate, inclusive and accessible, safe amenity, recreational open space and community facilities that are available for all sectors of the community, both urban and rural at a convenient distance from their homes and places of work'. Limerick City and County Council also recognises the importance of cycling and walking as a mode of transport and recreational activity and supports the provision of provision of designated cycle routes, walking trails/ pathways and improved road surfaces.

Projects that were included in the Cumulative Impact Assessment for Population and Human Health included numerous small scale proposed, permitted and existing developments (e.g. dwelling house, commercial units, etc.).

Following a detailed assessment of the receiving environment and potential impacts of the proposed Project in combination with the potential impacts of the plans and projects set out in Chapter 3, no potential for significant in-combination cumulative effects on population and human health in the area are anticipated.

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