7.0 Climate Change: Mitigation and Adaptation

7.1 Introduction

Through the policies, objectives and actions set out in Chapters 8 and 10 'Green Infrastructure and 'Energy' respectively of the County Development Plan 2016–2022, Climate Adaptation and Mitigation measures are embedded in the plan making process.

The Tallaght Town Centre Local Area Plan has been prepared with the purpose of integrating and implementing these policies and provisions where relevant. The approach to density, land use, design and movement is consistent with broader measures to address climate change in the areas of sustainable travel, sustainable building methods, flood risk adaption and renewable energy sources, amongst others. This chapter focuses on the Plan interactions with climate mitigation and adaption from the perspective of the approach to green infrastructure (the landscape of Tallaght has contributed to and will contribute to the identity of Tallaght into the future, while having the potential to play a major role in climate change) and flood risk measures. Meanwhile, in recent years in response to the challenges presented by climate change, Tallaght Town Centre has become a centre of innovation in the area of energy planning.

The Tallaght Town Centre Local Area Plan has been prepared with the purpose of integrating and implementing these policies and provisions where relevant.

7.2 Climate Adaptation – Green Infrastructure

One of the benefits of green infrastructure is its multi-functionality, performing several layered functions in a single shared space. Green infrastructure provides ecological, economic and social benefits through natural solutions. It complements, and sometimes replaces, conventional built infrastructure through the use of natural solutions to carry, store, absorb and treat water; it provides for pollination, protects against soil erosion, it alleviates flooding, improves habitats for wildlife, provides ecological corridors, enhances biodiversity, creates jobs, more attractive greener cities and better health and human well-being, amongst other benefits.

Figure 2.10 Green Infrastructure illustrates the longer-term town centre concepts. However, it will also be important that as the County Town, the approach taken in Tallaght is integrated into a county and regional wide strategic green infrastructure network. Improving the links between the Town Centre and adjoining areas is a valuable first step in this process.

While the Tallaght area comprises some areas, which perform well in terms of biodiversity, over the past few decades there has been significant loss and fragmentation in areas that have undergone significant development. However, the Plan lands also include and adjoin substantial green spaces. Improving connectivity between these spaces is a particular aspiration of this Plan. Green Infrastructure is also about putting 'green' into 'grey' infrastructure and retrospectively adding green areas where possible. There are significant parts of Tallaght Town Centre where the urban environment and public realm can be 'greened'. For example, there is an opportunity to recognise the key role the Dodder River plays in the County's green infrastructure network as a linear park, greenway and an area of special amenity, recreational, heritage, geology, biodiversity and conservation value.

It is an objective of the Plan to develop strategic and green linkages and corridors between the Dodder Valley and Tallaght Town Centre.

7.2.1 Green Infrastructure – Surface Water Management

Two of the main river systems which form part of the wider regional network are situated within the Local Area Plan lands: the Tallaght Stream flows through Sean Walsh Park, parallel to the N81 before joining the River Dodder to the north east of the Bolbrook Enterprise Centre. The Poddle River rises in the Cookstown area, as the Tymon River and flows east through Bancroft Park and Tymon Park. These water courses are important green infrastructure corridors and habitats in the Tallaght area, providing multi-functional eco-system services such as land drainage, recreational amenity, clean/cool air and wildlife corridors. The Poddle is culverted for much of its journey across Tallaght Town Centre.

In the past, surface water management has tended to focus on intervention with the use of methods such as piping, culverting and installation of underground attenuation tanks. Such measures are largely expensive to put in place, can be costly to maintain and can have a major impact on the natural and built environment. Many streams and their associated biodiversity have been lost as a result of these measures. This has had negative impacts on the quality of the natural environment and recreational space, greatly affecting the quality of life for those living in the Town Centre. The cost to the Council of maintaining these engineering works, combined with having to provide alternative quality places for recreation elsewhere within the County is significant.

Using natural solutions to manage surface water can be cost effective and yield results that improve environmental quality. The use of natural drainage systems at surface level through utilisation of existing drains, natural slopes and existing ponds and natural wetland areas should be considered before more costly and interventionist approaches. Nature can be used in conjunction with and even sometimes instead of hard engineering solutions.

Nature can be used in conjunction with and even sometimes instead of hard engineering solutions.

The County has already moved towards implementing Sustainable Urban Drainage Systems (SUDS) guided by the *Greater Dublin Strategic Drainage Study, 2005*, the *Greater Dublin Regional Code of Practice for Drainage, (2006)* and further to the requirements of the *Eastern River Basin District – River Basin Management Plan, 2009–2015.*

Examples of SUDS features in the County can be found within public parks, for example Corkagh Park, Griffeen Valley Park, Tymon Park and in some private

GI corridors can provide important local and amenity routes

Swale incorporated into a GI hub

developments, such as Citywest where these systems are complemented by other measures for example permeable paving. To date, while there is no overall integrated SUDS network within the County, there are opportunities to increase the implementation of SUDS in the Tallaght Town Centre area on both Council lands and in private developments. Such SUDS features would also make a significant contribution to the promotion and development of green infrastructure in the Tallaght Town Centre area.

7.2.2 Green Infrastructure – Parks and Recreation

There are significant areas of publicly owned parkland located within the Tallaght Town Centre area including the neighbourhood park at Sean Walsh Park and the local park at Bancroft Park. These parks contain river system and numerous eco-system services benefiting wildlife protection and enhancing human activity for example through the provision of cool/clean air corridors, ecological corridors and recreational amenities. The parks contain recreational facilities such as playing fields, ponds, walking routes as well as biodiversity rich areas. There are also substantial sections of parkland located in close proximity to the Town Centre area and the surrounding neighbourhoods such as the Dodder Greenway.

It is an objective of the LAP to enhance existing green infrastructure and facilitate the development of new green infrastructure corridors within and connecting to lands adjoining the Plan.

7.2.3 Green Infrastructure – Biodiversity

There is a wealth of biodiversity within the Plan lands. However, in some parts of the Plan lands habitats have been so fragmented that it may be difficult for biodiversity to thrive or be reinstated.

The policies and objectives of the LAP and County Development Plan, particularly relating to Green/Blue Infrastructure, open space and green linkages are important in facilitating the establishment and enhancement of biodiversity.

7.2.4 Green Infrastructure – Climate Change

The development of urban areas, in the absence of mitigation measures against climate change has contributed to the heat island affect (the warming of the

urban environment) as well as increasing the volume of pollutants in the air and increased flooding potential.

The impacts of climate change are expensive and complicated to manage and will become even more so in the future. Green infrastructure can be used as a tool within this County, and beyond, to alleviate some of the negative impacts of climate change and in some ways contribute to the prevention or slowing down of this change.

Mitigation measures include planting of trees, hedgerows and woodlands as clean/cool air corridors and to assist with carbon sequestration, and the construction of surface water retention features such as ponds, lakes, or swales.

The Plan can help mitigate further impact on the environment through ensuring that future development takes cognisance of the natural elements of sites and incorporates them within design of building and neighbourhoods connecting them into the wider green infrastructure network. In some instances, where there are no site features present the potential for an enhancement strategy to re-establish green features and infrastructure can be explored.

Green infrastructure can be used as a tool within this County, and beyond, to alleviate some of the negative impacts of climate change and in some ways contribute to the prevention or slowing down of this change.

7.2.5 Green Infrastructure – within New Development Areas

In the past, the 'greening' of residential areas concentrated on the requirement to provide a percentage of open space, back gardens/balconies, privacy strips and street planting. Quantity took precedence over quality and function. Levelled areas of grasslands – for ease of maintenance – with no eco-system benefits were often provided in place of established quality features.

Open spaces and residential developments can be enriched by retaining and enhancing existing natural features, as well as introducing new features. The retention and enhancement of existing natural features, such as hedgerows and associated ditches and streams in zoned lands offers the potential to introduce SUDS measures and to retain wildlife corridors through new developments.

Passive recreation – sitting, socialising and picnic

Active recreation in a GI hub – passively overlooked by housing

The addition of surface attenuation ponds, green roofs and living walls in these developments has the potential to transform an environment, which would normally be perceived to be devoid of biodiversity into one that offers significant opportunities for wildlife while providing a high quality working environment for its workers.

The future regeneration and rejuvenation of REGEN zoned lands provides an opportunity to incorporate green infrastructure measures through these developments and connect corridors through the Town Centre area.

7.2.6 Green Infrastructure Strategy

The green infrastructure strategy for the Plan incorporates the following aspects:

Surface Water Management

Protection of existing watercourses and the reopening (re-lifting) of covered or culverted watercourses as opportunities arise e.g. Whitestown Stream and River Poddle. It is proposed that the stretch of the Whitestown Stream, which passes through Whitestown will be opened up and will accommodate a strategic cycling route. The River Poddle rises in Cookstown, however, the river is culverted through this area. It is proposed that the river would be reopened where possible in Cookstown, which will bring a tangible link between new development and the history of this area. It is proposed that the source of the Poddle be uncovered and incorporated into open space. Flood defences in the wider area have been integrated into the watercourses, for example, the network of pools, ponds and lakes that were constructed along the Poddle. A similar approach could be taken where feasible and suitable, for example, in Bancroft Park, the Tallaght Technological University Dublin lands and Cookstown. The proposals to widen the corridor associated with the Whitestream Stream as it passes through Whitestown will facilitate adaptation and mitigation measures to be incorporated into that area, in addition to active and passive recreation and sustainable transport.

It is the policy of the council that all development shall comply fully with Policy IE1 (Objectives 1 and 2) and IE2 (Objectives 1–11) of the South Dublin County Development Plan 2016–2022 relating to protection of existing water and drainage infrastructure.

Constructed wetland as part of a GI hublocal and amenity routes

Social and play spaces

Large urban square/civic space

Small local pocket park

Any future developments within Regeneration zones that have been identified as having the potential to result in a deterioration to surface or groundwater quality will be required to undertake an assessment to determine the effect of the development on surface water and groundwater quality. Such an assessment will be required to identify the materials and activities associated with the development that could result in pollution to surface waters, the pathways that could convey surface water from the development site to European Sites and the qualifying features of interest of European Sites that could be at risk of experiencing adverse effects in the event of the release of polluted surface water from the development site.
During the construction phase of developments within the LAP area, where applicable all relevant best practice guidelines shall be adhered to. Examples of these guidelines include:

- Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (Inland Fisheries Ireland, 2016);
- Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (National Roads Authority, 2008);
- CIRIAC648: Control of water pollution from linear construction projects: Technical Guidance; and
- CIRIAC649: Control of water pollution from linear construction projects: Site guide.

A Pollution Prevention Plan (PPP) and Construction and Environmental Management Plan (CEMP) will be required to accompany future Regeneration developments in zones that have been identified as presenting a risk of likely significant effects to European Sites. Larger developments within all other areas will be required to submit an Outline Construction Environmental Plan (OCEMP) in order to demonstrate the safeguarding of the immediate receiving environment.

Measures will be required to be included in the design of a proposed development that will safeguard water quality from operation phase surface water emissions and wastewater emissions. These design elements will include the inclusion of adequate wastewater treatment facilities/ connection to wastewater treatment plants, the implementation of surface water management measures such as swales, interceptors, hydrobrakes and attenuation tanks etc.

New urban square/civic space

Planting
New edge or buffer treatment will be facilitated between contrasting land uses as part of new developments, for example, at established industrial areas and surrounding residential areas at Broomhill and Greenhills. These areas will emphasise enhancement of local biodiversity and local surface water management. They may also provide a visual, screening function.

Spaces and Corridors
A range of open spaces and corridors will form the structure of the green infrastructure in the Plan area. Figure 2.10 Green Infrastructure refers.

It is an objective of the LAP to provide new areas of public space and to upgrade existing parks so they provide highly amenable spaces for existing and future residents.

It is an objective of the LAP to ensure access to all areas of public space and institutional lands is maximised, and major spaces are linked via amenable pedestrian routes.

Policy G2 Objective 12 of the County Development Plan relating to the management of non-invasive species shall be implemented.

7.3 Climate Adaptation – Flood Risk Management

The publication of 'The Planning System and Flood Risk Management Guidelines for Planning Authorities' (2009) has seen the introduction of an integrated and standardised approach to flood risk management within the planning system. The Guidelines support a sequential approach to flood risk management where the first option is to avoid flood risk where possible, followed by substituting less vulnerable uses where avoidance is not possible and finally, mitigating and managing the risk, where avoidance and substitution are also not possible.

The Guidelines require an examination of flood risk as part of the preparation of spatial plans. Therefore, a Strategic Flood Risk Assessment (SFRA) was carried out for the Tallaght Town Centre LAP. It has identified the areas of the Plan subject to flood risk. For sites within identified flood risk zones, a site specific flood risk assessment will be required. The SFRA also examines key sites where flood risk is an issue and provides recommendations for the development of these sites. Applications for development on these sites must adhere to these recommendations.

It is an objective of the Council to manage flood risk in Tallaght Town Centre in accordance with the requirements of The Planning System and Flood Risk Management Guidelines for Planning Authorities, DECLG and OPW (2009) and Circular PL02/2014 (August 2014). For lands identified as being at risk of flooding in (but not limited to) the Strategic Flood Risk Assessment, a site-specific Flood Risk Assessment to an appropriate level of detail, addressing all potential sources of flood risk, is required, demonstrating compliance with the aforementioned Guidelines or any updated version of these Guidelines, paying particular attention to residual flood risks and any proposed site specific flood management measures.

The Guidelines require an examination of flood risk as part of the preparation of spatial plans.

7.4 Climate Mitigation

7.4.1 Energy Planning in South Dublin

As a result of South Dublin County Council's (SDCC) participation in a number of European Union (EU) funded projects, the objective of which was to facilitate local government involvement in climate change innovation and to upskill staff at local government level to become mentors and leaders in climate change and adaptation, SDCC has taken a proactive role in engaging with energy efficient projects and research. As a result, SDCC completed a Spatial Energy Demand Analysis (SEDA) for the county 2014.

The outputs of the SEDA lead to the inclusion in the South Dublin County Council County Development Plan 2016–2022 of a range of policies and objectives which promote energy efficiency and renewable energy measures across the County. These include objectives relating to the reduction in use of fossil fuels, promotion of low carbon renewable energy alternatives, promotion of use of PV solar panels and green roofs in new buildings both public and private with SDCC leading the way through conversion of its own building stock.

The SEDA also recognises the potential for capturing and utilising waste heat generated, un-used heat in premises. The recovery and utilisation of waste heat, stemming from local kick start projects, may well contribute to the development of a local energy network into the future.

7.4.2 Low Carbon District Heating Networks

The most significant output of the SEDA was the analysis of the potential for use of low carbon district heating networks in the County.

The SDCC SEDA analyses the energy profile of the commercial, residential and municipal sectors and identifies a number of Low Carbon District Heating Areas of Potential across the county. The areas of highest potential was found to be Tallaght Town Centre (6 of the 10 areas of highest heat demand in the County was found in Tallaght) where a number of substantial energy users in public ownership are located in proximity to each other and to substantial energy users and waste heat generators.

Tallaght has since been the focus of the development of the first District Heating scheme in South Dublin. Although district heating is not yet widely used in Ireland, it is gaining prominence in energy policy

Figure 7.1 Commercial Energy

development as Ireland struggles to meet carbon and renewable energy targets, particularly in the heating sector (See section 11.7.3 of the County Development Plan).

7.4.3 Tallaght District Heating Network Project

In partnership with Codema – Dublin's Energy Agency, the SDCC is now leading a project to develop South Dublin County's first district-heating network. With partners across five EU states, the HeatNet project will potentially link waste heat from a local data centre in Tallaght town centre to create a local authority led district-heating network. When operational, the scheme is expected to save almost 1,900 tonnes of CO2 per year after five years. The wider HeatNet project will run until 2020 and receives European Regional Development Funding through the Interreg North West Europe programme.

District heating systems can make use of low-carbon waste-heat from sources such as data centres, thermal generating stations, industrial processes, wastewater systems and waste-to-energy plants, through a network of insulated pipes, typically providing space heating and hot water to residential and commercial buildings more sustainably and economically than traditional methods using individual gas or oil boilers. The development of a district heating scheme in the Tallaght town centre area gives potential for energy savings for other businesses and buildings in the area, as the heating network rolls out and Tallaght becomes a model for community energy and a decarbonised town centre.

The South Dublin district heating pilot will begin the first phase in the Tallaght Town Centre area. This area has been identified as having a high heat demand density, which is a key indicator for district heating viability.

SDCC is in advanced discussions with a local commercial operator to secure the supply of waste heat to feed into the district heating system. The district heating DH pilot project is considered highly innovative, not just at a national level, but at a European level, and will be the first of its kind in Ireland to use this type of low energy waste heat.

7.4.4 County Development Plan Requirements

The design, construction and operation of new buildings has a significant role to play in reducing energy demand and increasing energy efficiency into the future. The integration of energy issues into the life cycle of all new residential and non-residential buildings, from the neighbourhood, street and individual building scale, can result in significant savings at the local level.

With regard to residential dwellings, all new homes constructed in South Dublin County must reach an energy performance rating with The National current Building Energy Rating (BER) Standard's and as subsequently superseded. The following are the overarching policies in relation to energy efficiency:

It is the policy of the Council to ensure that medium to large scale residential and commercial developments are designed to take account of the impacts of climate change, including the installation of rainwater harvesting systems, and that energy efficiency and renewable energy measures are incorporated in accordance with

It is the policy of the Council to support the passive house standard or equivalent for all new build in the County.

Section 11.7.2 of South Dublin County Council Development Plan 2016–2022 sets out requirements in relation to Energy Performance in New Buildings.

Section 11.7.3 of the South Dublin County Council County Development Plan 2016–2022 sets out requirements where major development is within or adjoining Low Carbon District Heating Potential Character Areas. Tallaght Town Centre being one such area.

7.4.5 Energy Policy – General

All major developments within the Plan area will be encouraged to incorporate space to be safeguarded for future pipework/pipe run, energy centres or other infrastructure. This space can be incorporated into grass/green corridors along footpaths, roads and streets, so that they can be more easily excavated (soft dig) for installing energy (heat) network pipes without significant disturbance. The provision of other infrastructure and service requirements on these sites must have regard to this requirement. Details of future proofing the built fabric of major development proposals on site should also demonstrated. The Planning Authority can attach relevant conditions to planning permissions to secure these policy objectives.

Major development sites within the Plan area which are adjoining/adjacent to any such decentralised energy (heat) network or other significant heat source as identified above, should be designed to be capable of connection to a decentralised energy (heat) network and any land required for the heat network must be protected.

Where connection to an existing or future decentralised energy (heat) network or other significant heat source is deemed possible under the above policy, major developments should detail a preferred energy strategy outlining connection proposals within Energy Statements, to be submitted with planning applications for development. The preferred energy strategy shall be based on connection to the decentralised energy (heat) network and shall be enacted, unless it is technically or otherwise unfeasible to connect to the network, in which case an alternative energy strategy shall be demonstrated and enacted, for example, the use of Combined Heat and Power (CHP).

All major developments within the Plan area will be encouraged to incorporate space to be safeguarded for future pipework/pipe run, energy centres or other infrastructure.

Where an Energy Statement is submitted, it should be informed by a relevant evidence base, it should be provided for assessment by the Planning Authority and it should demonstrate how the proposal will meet the requirements for connecting to the decentralised energy (heat) network or other significant heat source. The statement should assess the technical feasibility and financial viability of the energy network for the site, identifying any available existing or proposed sources of heat (within or outside the site) and other factors, such as where land will be safeguarded for future district heating infrastructure. The statement should also demonstrate full consideration of how the proposed development can contribute towards the Council's climate change mitigation strategy as outlined in the current South Dublin County Council County Development Plan 2016–2022.

Energy Policy	• Reduced energy consumption • Reduced fossil fuel imports • Increased renewable energy • Increased security of supply • Increase data centre efficiency • Reduced national level fines for binding EU targets in renewable energy • Increased public sector energy efficiency
Environmental Policy	• Reduced GHG emissions • Mitigates against climate change • Reduced local air pollution • Indigenous energy sources used
Innovation	• Increased knowledge of DH systems • Creation of new local market for waste heat • Based on leading best-practice in Europe • First of its kind in Ireland • Shared research and development • Proof of concept for other areas (i.e. Grange Castle)
Socio-economic	• Increased local employment • 'Energy Tourism' – site visits to the SDDH system • Decreased energy costs – fuel poverty • Increased building safety – no carbon monoxide or gas leak risks • On-demand hot water • Connection of washing machines & dishwashers – decreased energy costs • No on-site heating fuel storage • Reduced customer exposure to fuel price volatility • Increased local spending power • Increased competitiveness of Tallaght area • Landmark area for de-centralised sustainable energy • Reduced developer costs • Increased property value through improved BERs • New revenue stream for increased Local Authority energy services

Table 7.0 Benefits

7.4.6 Funding Low Carbon Energy Networks

There are a range of delivery models and financing structures that could be used to unlock the investment required for supporting local heat networks in Tallaght. The development level expected suggests that the heat network scheme could be attractive to a private sector investor, for example an Energy Service Company (ESCO) or utility (or consortium) may undertake to design, build, finance and operate the heat network. In this case, SDCC could co-ordinate the partnership of all relevant stakeholders involved. Alternatively, SDCC could act to source project finance or even participate in a joint venture with an ESCO or consortium to deliver the project. In this regard, a Proposal/Business Plan should be submitted for the consideration of the Planning Authority. It may be possible to obtain funding from wider sources; such as the European Regional Development Fund (ERDF).

There are a range of delivery models and financing structures that could be used to unlock the investment required for supporting local heat networks in Tallaght.