Belfast Net Zero Neighbourhood Framework

Belfast's Inner South Pilot: Creating liveable, low-carbon places through retrofit, greening and active travel

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Innovate UK
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KEY TERMS

To support clarity and consistency throughout this document, this section outlines key terms that are frequently used. While not an exhaustive glossary, these definitions are intended to help readers better understand the concepts and language central to the discussion.

Climate change	The long-term shifts in the temperatures and weather patterns of our world, primarily caused and accelerated by human behaviour.
Climate action	The steps we take to address the activities and behaviour that contributes to climate change such as reducing emissions, as well as preparing for the impacts of climate change.
Carbon emissions	Greenhouse gases (including carbon dioxide, methane, nitrous oxide etc.) released into the atmosphere from activities like burning coal, oil, and gas for energy, transportation and manufacturing. These emissions contribute to the greenhouse effect, trapping heat and causing the climate to change.
Sustainable	Balancing present need with environmental protection, economic development and social equity to create a healthy, equitable and prosperous world, now and in the future.
Net zero	Achieving a balance between the amount of greenhouse gases produced and the amount offset or removed from the atmosphere, so the net effect is zero additional emissions.
Climate adaptation	Helps us to deal with the unavoidable effects of climate change: Adjusting systems, communities and economies to cope with the current and future effects of climate change e.g. flood defences.
Climate mitigation	Addresses the cause of climate change: actions taken to reduce or avoid greenhouse gas emissions and enhance carbon sinks to limit the severity of future climate change e.g. switching to renewable energy, planting trees.
Climate justice	The principle that climate change solutions should be fair and equitable, recognising that vulnerable communities are disproportionately affected by climate change despite contributing least to the problem, and often having the least resources to reduce the impact.
Placemaking	The collaborative process of shaping public spaces to maximise their shared value, focusing on community needs, local identity and creating a vibrant, liveable environment that people want to use and be in.
Climate-led placemaking	Putting climate considerations at the centre of placemaking, ensuring that new developments and urban improvements are designed with climate in mind, helping to address environmental challenges, reduce emissions, improve resilience, while still creating great places for people to live and thrive.
Blue and green infrastructure	Planned networks of natural and semi-natural green (land) and blue (water) features. Green infrastructure includes parks, woodlands and street trees. Blue infrastructure includes rivers and wetlands. Together, they manage flood control, support biodiversity, provide recreation and improve overall quality of life.

FOREWORD

Belfast's Net Zero Neighbourhood Framework establishes a foundation for decision making, policy development, engagement and future placemaking to support Belfast's transition to net zero.

The purpose of the Framework is both a strategic guide and a call to action, connecting communities, urban practitioners, and decision-makers to climate priorities through a lens of lived experience, cost of living, and quality of life at the local level.

It is designed to support a wide range of audiences, both locally in Belfast and internationally, and offers transferable insights for those who are working toward more sustainable, inclusive urban futures and the approach, engagement process, and insights offer transferable lessons for those exploring place-based pathways to net zero.

The Framework builds on Belfast's Resilience Strategy, Net Zero Carbon Roadmap, Local Area Energy Plan, the Local Development Plan and A Bolder Vision for Belfast to deliver place-based interventions in the pilot area. To ensure a fair and just transition, the UP2030 pilot focused on a diverse part of the city centre in the Linen Quarter business district and the surrounding residential communities of the Market, Donegall Pass, Sandy Row and Barrack Street.

This enabled a holistic exploration of interrelated issues: severance caused by road infrastructure, lack of green open space, poor air quality, and the cumulative impact of these on residents and businesses. By focusing on retrofit, active travel, and greening, the Framework identifies low-carbon approaches that will contribute to liveable, sustainable neighbourhoods that act as catalysts for climate action.

Developed in partnership with city stakeholders, communities, and global peers, the Framework aims to create scalable approaches that can be adapted anywhere. A crucial part of this task is helping people understand why action is necessary, and how climate change is already impacting the health, wellbeing, and the economic realities of our lives.

Belfast Net Zero Neighbourhood Framework 2025

We can no longer justify public investment in projects that lack resilience or fail to decarbonise. Every intervention must deliver dual benefits: advancing climate action while creating flourishing communities for today that endure for tomorrow. This is our moment to reimagine how we build, move, live, and thrive in a net zero Belfast.

Let this Framework be a standard-bearer that places climate action, equity, and future readiness at the heart of every decision. Advancing to net zero can no longer be an afterthought and must be embedded in the foundations of placemaking and regeneration, permeating every aspect of community building and future planning. The responsibility belongs to us all.

Councillor Ian McLaughlin, Chair of the City Growth and Regeneration Committee

Councillor Micheal Donnelly, Chair of the Climate and City Resilience Committee

EXECUTIVE SUMMARY

Belfast declared a climate emergency in October 2019 and has since committed to becoming net zero by 2050, this means taking action to balance the amount of carbon emissions we add to the atmosphere with the amount we remove. The action required is urgent, and the call to address this action will become more pressing as policy, social, economic and environmental drivers put increasing pressure on our 'business as usual' system.

Introduction and purpose of the Framework

Through Horizon Europe's UP2030 project, Belfast explored what a transition to net zero would look like at the neighbourhood level with the aim of producing a framework that would support the application of learnings at scale across the city and beyond. To enable a local focus, a pilot area was selected which includes the Linen Quarter and surrounding communities of the Market, Donegall Pass, Sandy Row and Barrack Street. Working with communities and cross-sector stakeholders in a contained geographic area offered an exploration of the challenges and opportunities to achieving net zero across a range of typical city uses and spatial typologies.

This framework is designed for placemakers both locally and internationally. It offers practical guidance on co-designing with communities, embedding climate priorities into area planning and delivering healthier, more liveable neighbourhoods.

In Belfast, buildings contribute towards 50% of our emissions and transport accounts for 20%. As the economic driver for the region with ambitious targets to significantly increase the residential and employment population in the coming years, the city's projected growth could add 100,000 daily vehicle trips. At the same time, resources and infrastructure are under growing pressure from extreme weather events like flooding, as well as from cold, inefficient homes. There's also an increasing risk of 'stranded assets' as commercial properties fail to meet tightening energy performance standards. This is why the project focused on three themes that could achieve the greatest impact: Retrofit (upgrading buildings to become energy efficient), active travel (walking, wheeling and cycling), and greening (nature-based climate solutions).

This diverse pilot area, which is home to approximately 10,000 residents and over 1,200 non-domestic buildings, including offices, retail units and hospitality venues, faces unique challenges. It's location within a heavily trafficked part of the city centre, as well as its proximity to and segregation by major road networks, creates barriers to connectivity and accessibility. This also contributes to the area's exposure to environmental stressors, such as flood risk, air pollution and urban heat island effect, with vulnerabilities further exacerbated by the lack of green space and low canopy coverage within the area. These pressures are compounded by social inequalities and all together, make the area a valuable pilot for exploring a fair and just transition to becoming a net zero neighbourhood.

Our approach:

Community co-design to shape solutions was central to both the process and our core learning from the project. Our methodology involved three phases:

Belfast Net Zero Neighbourhood Framework 2025

(1) Visioning Phase – an analysis of needs and geospatial data, combined with engagement to understand the lived experience of those in the area, barriers and priorities through visioning workshops with communities and stakeholders to imagine a net zero neighbourhood (2) Action Phase – further analysis, action workshops and testing of ideas (3) Upscale Phase – reflecting on learnings, identifying opportunities for scaled approaches and sense checking our conclusions.

What we learned:

Section 1: We first set out to explore the relationships between climate action in urban design and the role of cities in achieving net zero, specifically in the Belfast context. This included reviewing the unique challenges for the city and the policy ambitions in place to support sustainability and resilience in the urban and built environment.

Section 2: We then sought to gain a more detailed picture of the UP2030 pilot area and considered a range of data including an analysis of demographics, behaviours, climate vulnerabilities and projected risks, carbon emissions and the energy efficiency of building stock within the area.

Section 3: As part of the vision phase, we reflected on the engagement and learning from the geospatial analysis and through extensive stakeholder engagement, developed the overarching vision for the framework: "To create a net zero neighbourhood that adapts and mitigates climate risks through increased greening, better active and sustainable transport and more energy efficient low carbon buildings and to act as a beacon of success for other neighbourhoods".

The thematic sections of retrofit, active travel and greening present learning from the project, including further insights gained from case studies where we tested a selection of concepts developed in the vision phase, and concludes with process tables showing how to move from understanding needs, co-designing visions and establishing resources to implementing and sustaining interventions. The reflections in this section emphasise that strong cross-sector collaboration, shared resources and sustained commitment will be required to transition to net zero.

Section 4: A critical piece of this work both in the project and for success going forward is addressing the challenge of engaging and communicating with people on the concept of net zero and the relationship between climate change and the economic, social and environmental impacts it will have on our lives. A co-design engagement process was fundamental to an impactful exploration of these issues and the development of community-led and owned climate interventions. Our findings highlight the importance of shaping communication and engagement that responds to identified community needs and ensures that net zero approaches do not add burden but achieve co-benefits that improve quality of life through climate action.

Section 5: To build our understanding of the carbon emissions data in the neighbourhood we worked with the University of Cambridge to estimate the carbon footprint of the area to see what it would take to make it carbon neutral.

Section 6: Net zero enablers outline the supporting infrastructure that will mobilise change at a strategic level, including governance,

data, area planning and the requirement for knowledge sharing and upskilling.

Section 7: To support momentum and scalability, we provide Opportunities for the Way Forward, a menu of lessons learned and targeted thematic interventions designed to guide and inspire other communities. These options are multiple problem solvers that could bring co-benefits across climate and quality of life issues.

Taking a place-based approach to the transition means that the approaches and learning from this pilot could be adapted to unlock climate action at a local level. Through the project, five interconnected actions emerged as essential for scaling and achieving net zero at a neighbourhood level:

Engage – Understand the lived experience and identify opportunities for climate solutions to address social challenges by meeting people where they are at.

Educate – Raise the awareness and profile of the importance of this work through knowledge sharing.

Elevate –Disseminate the learning; upskill and upgrade placemaking approaches.

Enable – Build capacity and enable communities to bring forward climate priorities in area planning.

Embed – Upgrade existing governance systems and partnerships, as well as current and future work streams and projects.

Appendices: We provide supporting materials or 'tools' developed through the project, including 'Safe Routes Healthy Places' resources, emissions data analysis from University of Cambridge, engagement resources and retrofit data mapping, all freely accessible for further learning and dissemination.

In conclusion, the UP2030 process has enabled us to envision what a Net Zero Neighbourhood in Belfast could look like by 2050 and to identify the barriers, opportunities, and systemic shifts required to get there. Climate action at the local level has multiple entry points and must draw upon the diverse skills, powers, finances, and resources of a wide range of stakeholders and partners. Framing climate action as a cross-cutting, horizontal priority - embedded across all plans, policies, and projects - is essential to shifting from business as usual to transformative change.

The Northern Ireland Executive holds ultimate strategic responsibility for ensuring that Northern Ireland meets its climate obligations under the Climate Change Act (NI) 2022. The forthcoming Climate Action Plan will outline the policies, proposals, and sectoral pathways required to reduce emissions and meet statutory targets. As a local authority, Belfast City Council will align its climate plans and priorities with these pathways, ensuring that local action contributes meaningfully to regional outcomes. While some constraints (such as legislation and funding) lie beyond our control, we are committed to leading by example through robust governance structures, innovative approaches, cross-sectoral partnerships, and embedding climate action through Area Planning to accelerate change on the ground and deliver a low-carbon, healthier, and more equitable city.

Belfast Net Zero Neighbourhood Framework 2025

Image: Belfast looking towards the cranes, David Blaikie

Image: Belfast from above

Introduction

UP2030 PROJECT

UP2030 is a European initiative that empowers cities to achieve climate neutrality by 2030 through innovative urban planning and design strategies. It focuses on shaping neighbourhoods, influencing everyday behaviours, and guiding long-term decisions that embed climate action into placemaking. Central to its approach are inclusive, community-driven strategies that ensure spatial justice and citizen engagement.

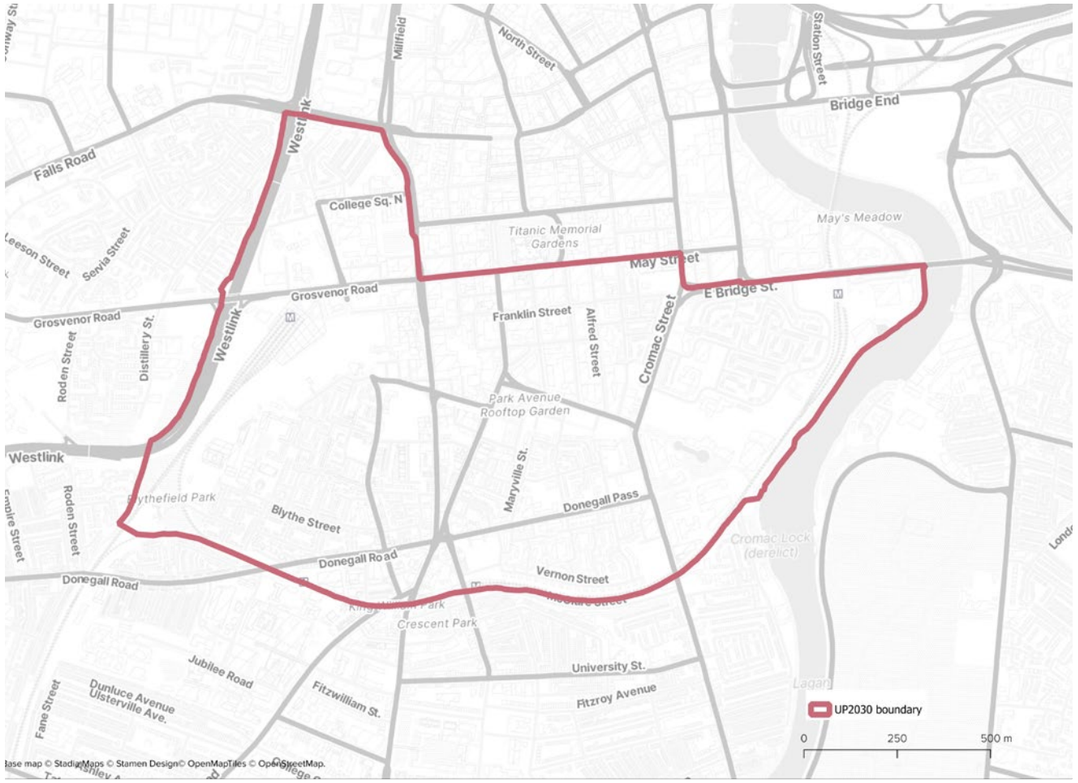

Fig 1: UP2030 Boundary Area

To speed up climate action and scale effective solutions, UP2030 proposes a place-based methodology using the 5UP-approach which supports cities and stakeholders through interconnected steps, unlike traditional models that test single innovations.

5UP Approach:

UPDATE:
Planning and design approaches, standards, codes and policies for urban transformations.

UPSKILL:
The city's stakeholder ecosystem to co-develop urban planning and design enabled transformation pathways.

UPGRADE:
Our neighbourhoods using built and natural environment prototypes, supportive models & tools for planning and design.

UPSCALE:
Governance arrangements, financial mechanisms, policy development & decision-making for urban planning.

UPTAKE:
Activities to raise awareness and transfer knowledge across European cities and beyond.

By focusing on neighbourhood-scale prototyping, UP2030 encourages cities to enhance liveability and spatial justice while empowering citizens to adopt sustainable behaviours. Belfast was one of eleven participating pilot cities and through the project, had access to 'tool providers'. Tool providers are a range of business, research, academic and other organisations that are developing cross-cutting solutions that enable cities to plan, implement, and scale their climate neutrality efforts, across critical drivers including data governance and digital planning, emissions reduction, spatial justice and replication. The project also supports cities in building policy frameworks, governance models, and institutional capacity to scale climate innovation city-wide, guided by the core values of equity, resilience, neutrality, and sustainability.

> Belfast set out to develop a net zero neighbourhood framework that would help place-makers and communities to further their understanding of how the design and development of our neighbourhoods can help us achieve our climate ambitions and be more informed in our approach.

For the purpose of the project, a pilot study area (otherwise referred to as the 'UP2030 project area', 'pilot area' or 'neighbourhood'), within the city was agreed by Elected Members which includes the Linen Quarter and surrounding communities of the Market, Donegall Pass, Sandy Row, Barrack Street.

Belfast City Council's City Regeneration and Development and Climate Teams joined together to develop an integrated approach that links urban planning and placemaking with the goals of achieving net zero, climate resilience, and environmental sustainability. This approach is shaped through engagement with key stakeholders, including young people, families, and businesses.

Project Aim:

To develop a framework for creating a net zero neighbourhood that can be scaled across the city and beyond. The framework considers the transition to net zero through the themes of greening, active travel and retrofit and is underpinned by the pillars of decarbonisation, resilience and supporting a fair and just transition to net zero. The project methodology involved engagement with communities, city partners and expert advisors to review challenges and opportunities for climate-led placemaking, with the aim of creating a place-based approach for the project area that can inform approaches to a city wide transition to net zero and beyond, based on the steps outlined below: The core approach involved three phases:

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01

Vision Phase

Conducted a needs analysis to identify priorities and barriers to achieving net zero from the perspective of communities as well as key strategic stakeholders.

Undertook geospatial analysis to assess the area's infrastructure, demographics, and both existing and projected climate impact risks.

Held visioning workshops to imagine what a net zero neighbourhood could look like, and to identify the actions and pathways required to achieve it.

02

Action Phase

Facilitated action workshops to unpick specific challenges.

Tested concepts in partnership with local stakeholders and partners within the wider UP2030 cohort. The latter contributed knowledge and transitional tools for cities to test against their specific challenges.

03

Upscaling Phase

Evaluated learning and assessed the scalability of approaches.

Carried out sense-checking with communities.

Developed a framework and supporting resources to guide future action.

Who is this document for?

This framework is designed to support a wide range of audiences, both locally in Belfast and internationally, who are working toward more sustainable, inclusive urban futures. While we recognise the complexity of creating a resource that speaks to everyone, this document will be made publicly available online, accompanied by accessible materials, to spark climate conversations and action in community spaces.

This framework will be particularly valuable for urban practitioners, policymakers, and city and regional stakeholders, and community organisations. While rooted in Belfast's unique post-conflict context and spatial divisions, the approach, engagement process, and insights offer transferable lessons for UP2030 and other global partners exploring place-based pathways to net zero.

This framework aims to act as a guide to connect communities, placemakers and decision makers to strategic climate priorities through exploration of the transition to net zero at a local level. To support and guide the next steps, the framework sets out the process based on each theme and 'Opportunities for the Way Forward' that will encourage a multi-stakeholder, place-based approach.

How the net zero neighbourhood framework should be used:

- Educate and shape policy and interventions regarding climate action in shaping the urban environment.
- Inform strategic planning, placemaking and community engagement processes.
- Support decision-making in urban development and placemaking projects.
- Spark climate conversations in communities and workplaces to elevate and embed carbon neutrality into everyday life and professional practices.

It offers:

- Insights for placemakers on how to co-design with communities and embed climate priorities into area planning.
- Guidance for shaping initiatives around engagement, retrofit, greening, and active travel to build healthier, more liveable neighbourhoods.
- Takeaways and reflections based on case studies and real-world learning from Belfast's unique context, with lessons and interventions set out as Opportunities for the Way Forward that can be adapted and scaled by other cities.
- Free access to tools developed with project partners supporting practical initiatives and data-driven insights that can be scaled and applied across Belfast and beyond.

01

CLIMATE CHANGE IN BELFAST

The effects of climate change present the greatest economic, social and environmental risks to the city of Belfast in our lifetimes and requires focused immediate attention to protect future generations. **The city's future growth must therefore be inclusive, sustainable and low-carbon.**

1.1 Context

> "The economic cost of flooding could be profound. Belfast is predicted to be the most economically impacted, with aggregated average damages of approximately £16m"
>
> Belfast Resilience Ambitions: A Climate Plan for Belfast 2020

Belfast must be 'climate ready' i.e. prepared for changes to the city's weather patterns, hydrology systems and biodiversity arising from climate change. As a harbour city, its proximity to water leaves it exposed to rising sea levels and patterns of more extreme weather. Pockets of poor air quality, high dependence on cars as a form of transport, and the dominance of hard infrastructure throughout the city highlight a series of interconnected challenges which, if left unaddressed, will leave the city exposed. To prevent economic shocks, and to avoid a widening of inequality, the city must build community resilience and ultimately, transition to a net zero emissions economy.

The ability to respond to a changing climate will directly shape Belfast's future prosperity. The prevalence of extreme weather events demands additional resources; the design, development and siting of future developments will be influenced by climate risks; and the city's attractiveness as a place to live, work and enjoy will depend on how well it prepares for, responds to, and recovers from climate related shocks and stresses.

The Climate Challenge and Opportunities

> "Belfast is emitting **1.5 million** tonnes of carbon a year. At this rate, we will have used up our budget by 2030"
>
> Net Zero Carbon Roadmap for Belfast 2020

The Intergovernmental Panel on Climate Change (IPCC) warned in 2018 that cities have twelve years to make rapid, far-reaching and unprecedented changes in all aspects of society to limit global warming to 1.5°C.
The Net Zero Roadmap, Belfast's Mini Stern report, which was produced

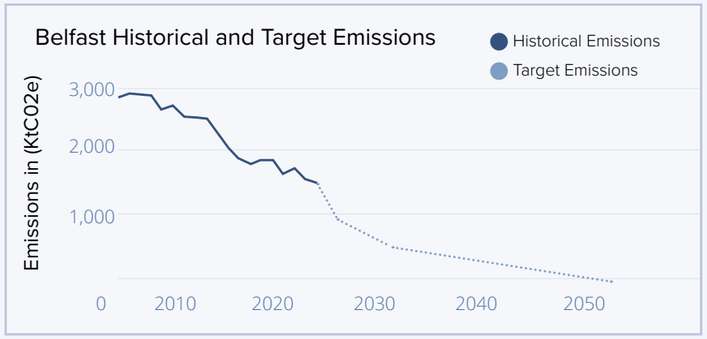
in 2020 demonstrated the scale of the city's long-term economic dependence on fossil fuels, estimating that Belfast will spend **c.£466 million** per year by 2050. The city therefore needs to rapidly decarbonise by reducing energy demand and by moving to low carbon energy sources, challenges which offer significant security and long-term economic benefits. According to the Net Zero Carbon Road Map for Belfast, cost-effective low carbon options around housing and transport could close the 2030 carbon emissions gap by 35%. In terms of financial returns, these measures would reduce Belfast's energy bill by **£263m** per year and would create nearly 4,779 years of extra employment. Opportunities also lie within resilience, with the UK National Audit Office estimating that every **£1 spent on protecting communities from flooding can prevent around £8 in property damage and wider impacts can be avoided.**

Fig 2: Belfast City Council's Emission data. Source: UK local authority and regional greenhouse gas emissions statistics - GOV.UK

Latest Emissions	Total Emissions Change from Baseline	Percentage Change in Emissions	Emissions Reduction Per Year
1,561 ktCo2e in 2023	-1,347 ktCo2e in 2023	-46% From 2005 to 2023	-75 ktCo2e to 2023

	2025	2030	2050
Emission Reduction Targets	-66%	-80%	-100%
Remaining emissions reduction required* kt CO2e	573	980	1,561
Emissions reduction per year required* kt CO2e	286	81	29

*Linear reduction – Annually reduction based on previous targets being achieved

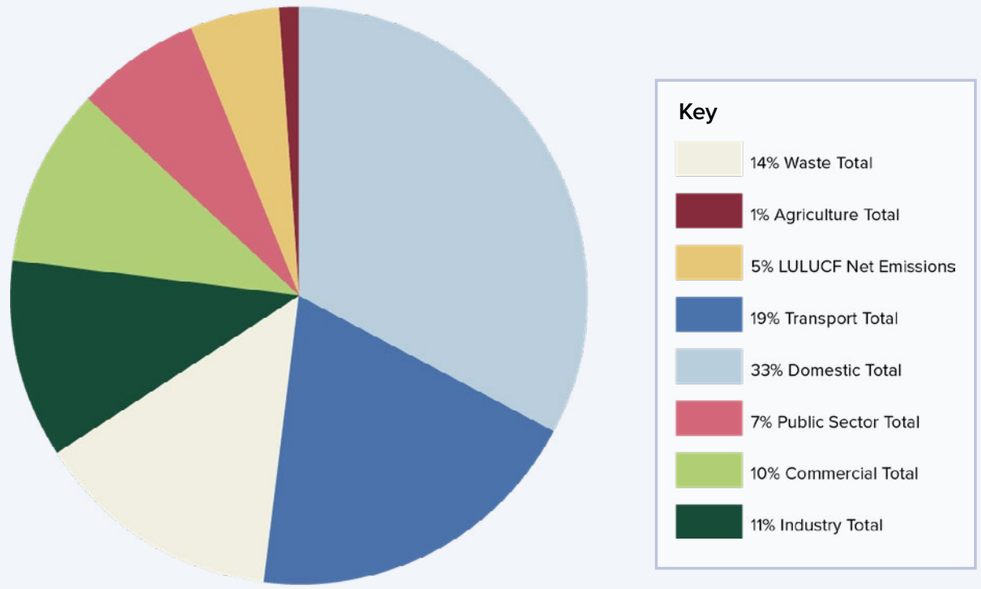


Belfast's Carbon Reduction Targets

Belfast declared a climate emergency in October 2019, setting an ambitious target for the city to become net zero by 2050. Achieving this means that, by 2050, the city must remove the same amount of greenhouse gases (GHG) that it releases into the atmosphere, balancing carbon emissions with natural absorption (carbon sequestration) and reduction measures. The extract below from Belfast City Council's Local Government District (LGD) Emissions overview illustrates how city-wide emissions have reduced by **46%** since the baseline year of 2005, with challenging targets in place to achieve a 100% reduction (net zero) by 2050.

The two highest GHG emission sectors in Belfast are buildings and transport, with domestic, public and commercial buildings collectively accounting for 50% of the city's emissions whilst transport across all of these sectors accounts for 19%. This pattern informed the choice of low carbon retrofit and active travel as two of the themes of the UP2030 programme.

Fig 3: Belfast's emissions by sector. Source: UK local authority and regional greenhouse gas emissions statistics - GOV.UK

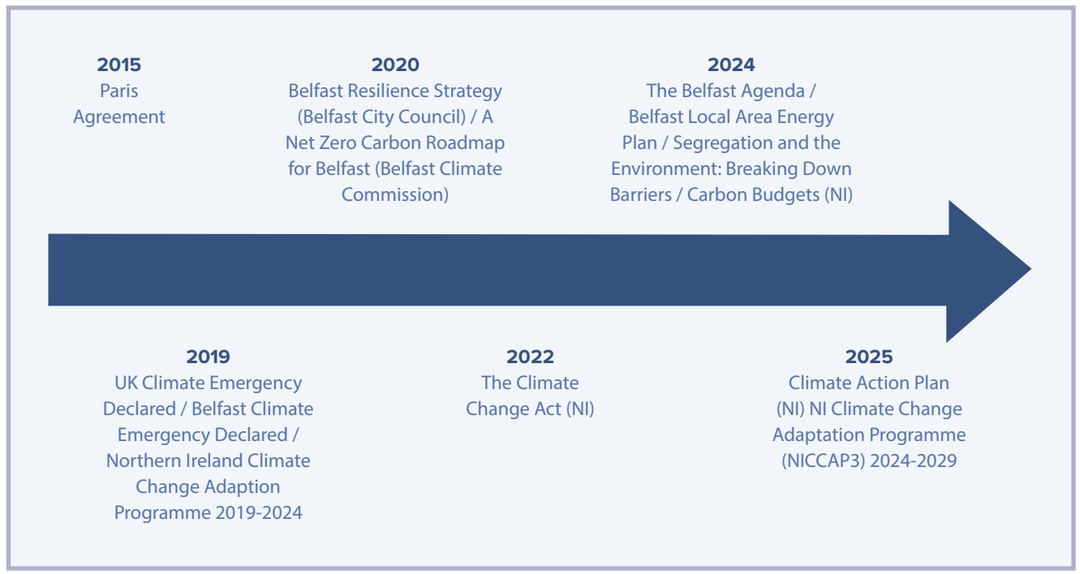


City Resilience and Impacts on Communities

Climate resilience and adaption are embedded in key regional, and city plans and policies such as the Northern Ireland Climate Change Adaptation Programme 2019-2024, the Belfast Local Development Plan 2020-2035, the Belfast Agenda 2024 and the Green and Blue Infrastructure Plan. Climate change is not a single, isolated issue for the city and should never be reduced to one strand within a wider body of work. Instead, climate adaptation and resilience must be integrated into every aspect of development and regeneration, to protect communities, safeguard the investment of public money, and secure a cleaner, greener, safer and healthier quality of life for generations to come.

As is the case globally, in Belfast, climate change disproportionately impacts vulnerable communities. Lower income households, the elderly, those with poor health and those living in privately or socially rented homes are likely to be more susceptible to the impacts and risks of climate change. Lower income households, particularly those living within flood risk areas, will find it more difficult to get home insurance and deal with the impacts of flood damage, whilst those with poorer health will be more affected by poor air quality, increased damp, flooding of homes and local areas, and more severe fluctuations in weather such as heatwaves.

Fig 4: Key climate milestones



Belfast Net Zero Neighbourhood Framework 2025

Sea levels around the UK have risen by **16.5cm** since 1901. For Belfast Harbour, the 5 highest tidal surges on record have been recorded since 1994. Large portions of Belfast city centre are situated between 1 and 2 metres below extreme tide level, and **6,000** properties are currently considered at significant coastal flood risk.

The International, National and Regional response

The COP21 Paris Agreement aims to limit global warming to less than 2°C above pre-industrial levels, pursue efforts to limit increases to 1.5°C, build resilience and increase the world's ability to mitigate the impacts of climate change.

The Climate Change Act (Northern Ireland) 2022 sets targets for Northern Ireland (NI) to reduce its GHG emissions. The Act sets out a carbon budgeting framework, provisions for reporting against emissions targets and carbon budgets, and the appointment of a Climate Commissioner. It sets an interim target of at least **48%** reduction in net emissions by 2030 alongside sectoral targets that include sourcing at least 80% of electricity consumption from renewables, recycling 70% of waste, and allocating a minimum spend of 10% of overall transport budgets to active travel by 2030. The Carbon Budget (2023-2037) Regulations (2024) set the first three carbon budgets, requiring average annual reductions of 33% for 2023-2027; 48% 2028-2032; and 62% for 2033-2037.

In 2022, Belfast adopted carbon reduction targets of 66% reduction by 2025, 80% reduction by 2030 and 100% reduction by 2050 (compared to 2000). Belfast's community plan, the Belfast Agenda (2024-2028) outlines priorities of action over the next four years including a programme of work under one of its key themes 'Our Planet' which aims to create a sustainable, nature-positive city.

The 2024 Belfast Local Area Energy Plan outlines a series of priority projects to transition the city to clean, renewable energy sources to reach net zero by 2050. The plan provides a strategic case for investment that will enable a transition to an affordable and decarbonised energy system as well as supporting wider socio-economic goals.

Fig 5: Climate policy overview

Global	• Paris Agreement (COP21) • UN Sustainable Development Goals (UN SDGs)
United Kingdom	• UK Climate Change Act 2008
Northern Ireland	• The Climate Change Act (Northern Ireland) 2022 • Carbon budgets • Third Northern Ireland Climate Change Adaptation Programme (NICCAP3) • Energy Strategy – The Path to Net Zero Energy • Draft Green Growth Strategy • Programme for Government • Second Cycle NI Flood Risk Management Plan 2021-2027 • Strategic Planning Policy Statement • Draft Architecture and Built Environment Policy
Belfast	• Belfast Local Development Plan • The Belfast Agenda • Belfast Local Area Energy Plan • Segregation and the Environment: Breaking Down Barriers • Belfast Resilience Strategy • A Net Zero Carbon Roadmap for Belfast • Green and Blue Infrastructure Plan • A Bolder Vision for Belfast

1.2 Achieving net zero: what is it?

Net zero means balancing the amount of carbon emissions we add to the atmosphere with the amount we remove.

Gases such as carbon dioxide (CO_2) and methane act like a thick, heat-trapping blanket on the earth. The more greenhouse gases we produce and emit, the more heat becomes trapped, driving climate change. Experts warn that rising global temperatures will disrupt weather patterns and put food and water systems under increasing strain.

Carbon dioxide (CO_2) is the largest single contributor to climate change, making up most of global greenhouse gas emissions.

The main sources of carbon emissions worldwide are energy production (burning coal, oil and gas for electricity and heating), transport (cars, planes and shipping), industry (manufacturing, construction and chemical processes), buildings (heating, cooling and electricity use in homes and businesses), and agriculture and land use (deforestation and livestock).

Carbon is like water filling a Belfast sink:

- Things like cars and factories act like a tap, pouring carbon into the air.
- Nature, like plants, trees and oceans, acts like a drain, soaking up that carbon.
- But right now, the tap is running too fast, and the drain can't keep up.

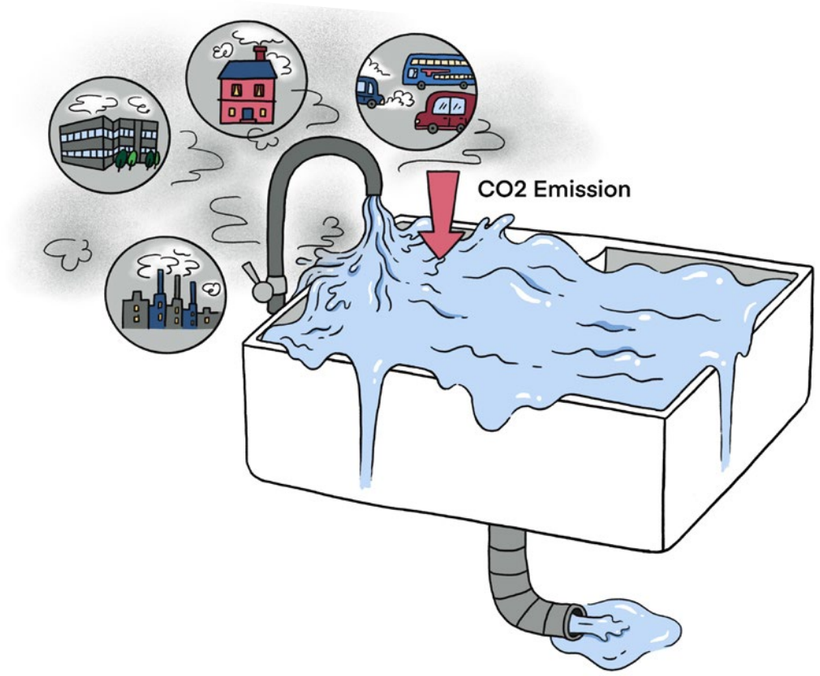


Fig 6: Belfast sink illustration

Cutting our emissions is a key focus for Belfast and tackling major sources like buildings and transport is essential for making meaningful progress towards net zero.

1.3 The role of cities in achieving net zero

Cities have a major role to play in achieving net zero and are central to both the climate challenge and solution.

As of 2023, approximately 55% of the world's population resided in urban areas, a proportion projected to reach 68% by 2050. Despite covering less than 2% of the earth's surface, cities consume about **75%** of global energy and are responsible for approximately **70%** of global greenhouse gas emissions.

The high concentration of people and activity in cities increases their vulnerability to climate risks like water scarcity, flooding, and heat stress, while also contributing to pollution, congestion, and waste.

Yet, their density and status as centres of innovation and governance position them as powerful drivers of transformative climate action. The New Climate Economy project (commissioned by the Global Commission on the Economy and Climate New Climate Economy), found that compact, connected and coordinated cities are more productive, inclusive, safer and resilient. They enable the efficient distribution of resources and foster the learning and innovation to drive the large-scale behavioural and infrastructural shifts required to reach net zero.

Image : Belfast city scape

Belfast demonstrates this dual role. As a compact but fast growing post-industrial mercantile city, it is already experiencing the realities of a changing climate through extreme weather events such as flooding, storms, and heatwaves. At the same time, the Local Development Plan aims to grow the city's population by **66,000** people by 2035 and to do this, it has growth figures of **31,600** new homes citywide with approximately **8,000** new housing units in the city centre.

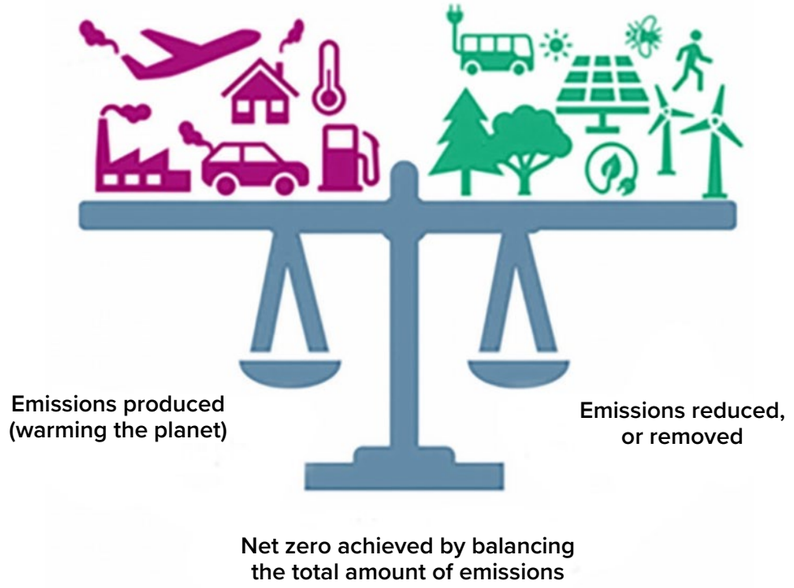
This growth presents a critical opportunity to avoid locking in high-carbon infrastructure and instead to build a city that is both economically dynamic and environmentally sustainable. How the city designs and connects to its neighbourhoods, and public spaces will be fundamental to achieving net zero and creating a resilient, attractive place to live, work and invest.

1.4 Segregation and the challenge of achieving net zero

Belfast's urban landscape continues to bear the imprint of decades of sectarian division with physical barriers, often called "peace walls" or "interfaces" that separate communities along lines of identity and community affiliation. In this context, segregation can be understood as "those institutions, structures, behaviours, policies and decisions that divide local communities or perpetuate the division of those communities" and results in "single identity" communities that are separated by physical barriers or hidden boundaries.

Due to the historic nature of segregation within the city, to address conflict, the built environment was developed with social division

Fig 7: Achieving net zero



as a proactive security measure. The Segregation and the Environment report outlines how there are an extensive range of "hidden barriers" in Belfast that were embedded during a "process of security planning" of inner-city Belfast between 1976 and 1985, where everyday elements of the built environment were used to reinforce separation. Today, many of these barriers remain embedded and normalised and continue to affect how people live and move through the city and are particularly evident in transport, education, and leisure activities, which is demonstrated in:

- The fragmented nature of the city's road and transport network, which increases journey times and requires additional transport navigation as residents may not necessarily feel comfortable using their closest geographical resource or are unable to do so due to physical or social barriers, thus generating additional transport emissions.
- The duplication of buildings, services and resources such as schools, leisure amenities and community infrastructure, thus requiring additional energy and financial resources to operate and maintain.

This means that achieving net zero in Belfast will be more difficult. The current model of division and duplication only deepens Belfast's challenge to decarbonise and tackle the wider resilience issues facing the city. Meaningful action towards achieving net zero will require confronting the spatial legacies of division that continue to shape how people move, live, and access opportunities and amenities.

Belfast Net Zero Neighbourhood Framework 2025

These patterns have shaped the city in lasting ways, with the greatest disadvantages felt by people living closest to peace barriers and produced uneven environmental conditions across the city where some communities face higher exposure to pollution, limited access to green space, and poor connectivity, while others benefit from investment and infrastructure. These disparities complicate efforts to deliver citywide climate resilience, as trust, participation, and shared ownership of net zero goals are harder to build across divided geographies.

Environmental justice recognises that pollution, climate risk, and poor access to nature fall most heavily on disadvantaged communities and in Belfast, this pattern overlaps with segregation. Areas nearest to peace barriers have the lowest access to green space in the UK, with only 10% of land publicly accessible compared with 12% in Derry and 17% in Edinburgh. Without greenery, residents lose both everyday amenity and essential environmental benefits such as cooling, carbon storage, and wildlife habitat. In the city centre, biodiversity is particularly limited by the lack of greenery, and this reflects and reinforces wider inequalities in health and wellbeing.

Today, 86% of residents living within 400 metres of a peace barrier fall within the most deprived sections of greater Belfast. Disadvantage manifests here in persistent poverty, poor health, high unemployment, and low educational achievement. These pressures are compounded by environmental challenges: high air and noise pollution, greater risks from flooding and extreme heat, and a shortage of accessible green space.

1.5 Climate and health

Climate change has significant impacts on human health, creating a complex web of direct and indirect effects that influence both physical and mental well-being. Belfast is experiencing increased frequency and intensity of extreme weather events, which can cause a rise in heat-and-cold related deaths, can increase the spread of infectious diseases as well as impacting on mental health. The impacts can be wider ranging, resulting in disruptions to health and social care systems, exacerbating health inequalities, as well as affecting wider determinants of health like food security and air quality.

Physical health impacts

- **Extreme heat / cold:** Increased frequency and intensity of heatwaves lead to a rise in heat-related illnesses and deaths, with figures from the Office for National Statistics (ONS) identifying 3,271 excess deaths in England and Wales in 2022. These periods of extreme temperature change, particularly affect the most vulnerable, such as the elderly and those with pre-existing cardiovascular and respiratory conditions.
- **Flooding and storms:** Increased rainfall leads to more frequent and severe flooding, which can cause injuries and fatalities. Contaminated floodwaters can also cause skin and gastrointestinal infections.
- **Infectious diseases:** Milder winters and warmer temperatures can allow vector-borne diseases to spread more easily. Ticks carrying Lyme disease, for example, have a longer active season, and non-native mosquito species that can transmit diseases like dengue may establish themselves in the UK.
- **Air quality:** Climate change can worsen air pollution, which is a significant driver of respiratory conditions like asthma and chronic obstructive pulmonary disease (COPD). It is also linked to cardiovascular diseases and cancer. A report by the Royal College of Physicians in 2025 estimated that around 30,000 deaths per year in the UK are estimated to be attributed to air pollution, with an economic cost of £27 billion in the UK due to healthcare costs, productivity losses and reduced quality of life.

Mental health impacts

Anxiety and stress: Those affected by extreme weather, such as floods, are at a significantly higher risk of developing mental health problems. A report by the British Red Cross on climate resilience and vulnerability found that **40%** of people living in the UK who have been flooded report severe or moderate mental health impacts. The increasing frequency of extreme weather events and the growing awareness of environmental threats can cause anxiety, distress, isolation and hopelessness, particularly among the young and the elderly.

1.6 Climate and urban design

The design of our physical environment is a critical tool for addressing climate change. To future-proof the city, design, governance, finance, and planning systems we must pursue a holistic and integrated, collaborative approach to address the changing climate and deliver climate action.

Well-designed, compact urban growth and high-quality public spaces can address multiple challenges simultaneously, including climate resilience. Public spaces that are welcoming, attractive, and well-connected by public transport, that incorporates green infrastructure, can:

- Enable walkable neighbourhoods that support healthier lifestyles and reduce transport emissions.
- Improve urban drainage and water quality.
- Increase biodiversity.
- Provide shade and reduce the urban heat island effect.
- Create social hubs vital for community cohesion and collective responses during extreme weather.

Investment in the built environment is essential, both in retrofitting buildings to improve energy efficiency and providing infrastructure that supports active travel.

For Belfast, this means adopting adaptive, sustainable, and climate-led urban design solutions at a local level to reduce the city's carbon footprint while ensuring communities are prepared for, and able to recover from extreme weather.

Climate-led urban design protects Belfast's infrastructure, ecosystems, and communities, while also delivering health, economic, and ecological benefits. Done well, it embeds spatial justice, ensuring that no one is left behind.

Climate mitigation tackles the root cause of climate change by reducing emissions and limiting the extent of future climate impacts. Urban design contributes by creating walkable, well-connected streets that allow people to access daily needs, such as schools, health services, shops, and social opportunities locally and sustainably. Increasing tree cover and improving the quality of our soils and green spaces helps absorb carbon dioxide (CO_2) while also making neighbourhoods more liveable.

Climate adaptation is about coping with the consequences of climate change that are already unfolding. It involves adjusting infrastructure, policies, ecosystems, and behaviours to reduce risks and build resilience. Adaptation requires collective planning across government, organisations and communities.

Belfast's key climate risks include:

Flooding: tidal, river, surface water (pluvial), and reservoir risks, often occurring in combination (for example, high tide coinciding with heavy rainfall).

Sea level rise: new tidal barriers will reduce but cannot eliminate risk entirely.

Storms and wind damage: leading to power outages, transport disruption, fallen trees, and pressure on emergency services.

Heat exposure: rising summer temperatures, with the most vulnerable residents at greatest risk.

Urban Heat Island Effect: dense, built-up areas trapping and intensifying heat; with increased air conditioning use can add further heat to streets and public spaces.

Ecosystem and biodiversity stress: species loss and reduced biodiversity and green connectivity, degrades ecosystems which become less effective at absorbing carbon, further accelerating climate change.

Belfast Net Zero Neighbourhood Framework 2025

Urban design can respond using both climate mitigation and adaptation solutions, such as:

- **Flood risk management:** green infrastructure and Sustainable Drainage Systems (SuDS) slow runoff, improve water quality and reduce pressure on combined sewers.
- **Blue infrastructure:** using the River Lagan and other water bodies to regulate temperature, and restoring buried rivers to manage both flooding and heat, as well as increase biodiversity.
- **Green Infrastructure and tree planting:** Introducing green space around homes and planting street trees reduces surface and air temperatures, improves walkability, and provides habitats for biodiversity.
- **Building design:** Promoting effective ventilation and avoiding materials that exacerbate overheating to protect residents from extreme heat.

By combining these measures, Belfast can address its vulnerabilities while delivering both mitigation and adaptation in practice. Well-designed places not only reduce emissions but also protect and prepare communities, embedding resilience into the fabric of the city and ensuring the achievement of its net zero targets.

1.7 Local Development Plan and climate measures

Belfast's response to these climate risks is already underpinned by a strong framework of policies and plans that support climate mitigation and adaptation. Together they provide the tools to translate urban design principles and climate responses into coordinated action across the city.

The Belfast Agenda prioritises collaboration across service providers, breaking down siloed working to deliver climate mitigation and adaptation for communities and planning collectively for people and places. It sets out programmes for expanding nature and urban growing, improving soils, increasing access to nutritious food, planting the right trees in the right places, upgrading the quality of homes, reducing carbon emissions from our buildings, and transitioning to cleaner, greener transport.

The Planning system has an important role to play in seeking to address climate change, insofar as it regulates land use and delivers sustainable development and provides a foundation for societal/behavioural change. Sustainable and inclusive development is at the heart of the Local Development Plan (LDP); as the statutory land use plan for the city, it has specific policies for new developments in terms of climate mitigation and adaptation on urban design and placemaking.

Key measures include:

- Better integration between transport and land use planning
- Increased urban densities
- Reuse of brownfield land and repurposing existing buildings
- Energy efficiency and green design
- Avoiding flood risk areas
- Sustainable Drainage Systems (SuDS)
- Green & Blue Infrastructure
- Promotion of active/sustainable travel
- Protection of existing trees and increased planting of new trees

Image: Cycling in Botanic Gardens

A wide range of LDP policies aim to mitigate and adapt to the climate emergency across housing, urban design, environmental protection and natural heritage. Strategic Policies (SP) define the city's long-term goals and priorities and guide all development and planning decisions and are supported through a wide range of "detailed policies", some of which aim to mitigate and adapt to the changing climate across housing, urban design, environmental protection and natural heritage.

Strategic Policy 6 (SP6) – Environmental Resilience is of particular relevance as it specifically refers to a changing climate: Strategic Policy SP6 - Environmental Resilience: The council will support development where it helps to reduce greenhouse gas emissions and is adaptable in a changing climate to build environmental resilience.

To support SP6, a number of detailed policies focus on specific environmental themes under Environmental Resilience (ENV)

- **ENV1 – Environmental Quality:** Protect against contamination, poor air/water quality, noise, and light pollution.
- **ENV2 – Mitigating Environmental Change:** Encourage reuse of buildings, sustainable design, renewable energy, and nearly zero-carbon standards.
- **ENV3 – Adapting to Environmental Change:** Require resilience measures such as SuDS, green roofs, biodiversity enhancement, and flood adaptation.
- **ENV4 – Flood Risk: Flood Risk Assessments required:** precautionary approach in flood-prone areas.
- **ENV5 – Sustainable Drainage Systems (SuDS):** All new development to incorporate SuDS (e.g., green roofs, permeable paving, swales, wetlands).

Together, these ENV policies translate SP6's strategic goals into actionable priorities for planning and development. In addition, Supplementary Planning Guidance (SPG) provides non-statutory planning advice and guidance that supports and clarifies policies, some relevant thematic examples include:

Greening:

- **Strategic Policy 8 – Green & Blue Infrastructure Network:** Protects and expands connected green/blue corridors.
- **Policy GB1 – Green & Blue Infrastructure Network:** Requires integration of greenways, open spaces, and ecological corridors in new development.
- **TRE1 – Trees:** Presumption in favour of retaining significant trees and requiring net gain in planting.
- **LC1 – Landscape:** Protects and enhances landscape character, ensuring nature-based solutions are embedded in development.
- **Trees and development SPG:** Provides detailed guidance on tree protection and biodiversity-friendly planting.
- **Sustainable Drainage Systems (SuDS) :** Encourages green roofs, wetlands, and permeable surfaces, which double as greening and climate resilience measures.

Active Travel:

- **TRAN1 – Active travel walking and cycle:** Requires safe, convenient walking and cycling routes, secure cycle parking, and facilities.
- **TRAN8 – Car parking and servicing arrangements:** Reduces reliance on private cars, promotes EV charging, and prioritises sustainable modes.
- **DES1 – Principles of urban design principles:** Promotes permeability, active frontages, and walkable neighbourhoods.
- **RD1 – New residential development:** Requires safe access to public transport, cycling, and walking networks.

Retrofit:

- **DES2 – Masterplanning approach for major development:** Requires adaptive reuse of buildings, higher densities along corridors, and BREEAM 'Excellent' standards.
- **ENV2 – Mitigating environmental change:** Promotes reuse of existing buildings, renewable energy integration, and nearly zero-carbon standards.

Belfast Net Zero Neighbourhood Framework 2025

- **ENV3 – Adapting to environmental change:** Encourages green roofs, biodiversity enhancements, and energy-efficient design.
- **Masterplanning approach for major development SPG:** Embeds retrofit, district heating, and sustainable design into large-scale schemes.

Together, these policies are the backbone for delivering climate mitigation and adaptation in Belfast, while ensuring that interventions are place-based, community-focused, and aligned with wider resilience goals. The LDP is subject to a five-year statutory review cycle that ensures policies remain up to date.

Climate Adaptation in Action: Belfast Examples

Connswater Community Greenway:

The **£40 million** urban regeneration project in East Belfast exemplifies a holistic approach to city planning, integrating flood protection, biodiversity restoration, and community cohesion. Delivered through a strong partnership model, the initiative has transformed the area with **13** new or improved bridges, **16 hectares** of accessible green space, and **16 kms** of integrated pedestrian and cycle paths. The enhanced flood protection measures now safeguard 1,700 residents directly and benefits up to **40,000** people across the region.

The project has also delivered impressive economic returns, generating £4 in benefits for every **£1** invested. These include increased tourism, employment, and higher property values. Furthermore, if just 2% of East Belfast residents become more physically active as a result of the greenway, the long-term economic impact could reach an estimated **£500 million** over the next 40 years.

Image: Walking to school

The greening and growing potential in Belfast's neighbourhood Alleyways

Small-scale, low-cost interventions can transform neighbourhoods by tackling issues such as dumping, littering, and unsafe public spaces. Community-led initiatives to reclaim and green alleyways create inclusive environments where residents can come together to learn about growing, cooking, eating, and sharing. These spaces strengthen social bonds, reduce isolation and foster a sense of local pride and stewardship.

Alongside their social value, alleyways projects deliver important environmental benefits. They provide opportunities for sustainable drainage that slows surface water runoff and enhance biodiversity through stronger ecological connections. For residents without access to private gardens or public green space, alleyways offer relief during heatwaves, improving health and wellbeing. Crucially, these community spaces also act as hubs for sharing knowledge and skills, helping residents build resilience and adapt together to future climate challenges.

Building on the success of initiatives such as the Connswater Community Greenway project, communities across Belfast can be inspired and empowered to take forward their own local greening, growing and placemaking projects that generate multiple co-benefits.

Image: Alleyway in Belfast

Image: Growing

02

THE NEIGHBOURHOOD

The geographical focus of the project boundary includes the **neighbourhoods of the city centre Linen Quarter, the Market, Barrack Street, Donegall Pass and Sandy Row**. These areas have a mix of functions and land uses including residential, tourism, commercial, office, hospitality and transport.

This diverse geographical context enables us to consider inter-related issues such as the severance and climate challenges created by the road infrastructure and other factors such as poor public realm/open space, play provision, air quality and connectivity. Specifically, it looks at the impacts and mitigation measures on existing local communities and city centre residents.

2.1 The Neighbourhood: People, demographics & travel behaviour

To better understand the pilot neighbourhood and ensure any proposed interventions regarding climate action reflect the needs and realities of the local communities, we drew on census data to provide insights on those living and working in the area, as well as social dynamics and everyday behaviours.

The pilot area has a resident population of approximately **10,000,** encompassing several long-established and newer more diverse communities.

According to the 2021 Census, the UP2030 pilot area has a very diverse population, with around **22%** of residents having a second language to English, which is about three times the average in Belfast and almost five times the NI average.

Image: Map of the UP2030 Neighbourhood which includes Linen Quarter, the Market, Barrack Street, Donegall Pass and Sandy Row

In addition, the UP2030 pilot area has a significant proportion of young people. This is largely indicative of the fact that (1) there are two universities located close to the pilot area and (2) many jobs are located within the city centre.

Modes of travel to work

Whilst the 2021 census data was collected during a period of home working due to COVID19, many residents in the area reported walking or cycling to their place of full-time work or study, due to being located less than 5km away. In the UP2030 pilot area, around **42%** of those commuting to work did so on foot, which is a significantly higher rate than for the wider Belfast and Northern Ireland rates. The second largest mode of travelling to work was either by car or van, accounting for over a quarter of commuters within the pilot area.

Table 1: Age range in the UP2030 area, Census data 2021

Geography	Age	Population	%
UP2030	0-15 years	1355	13.8%
	16-39 years	5033	51.3%
	40-64 years	2460	25.1%
	65+ years	965	9.8%
	Total	9813	
Belfast	0-15 years	66,112	19.1%
	16-39 years	124,487	36.0%
	40-64 years	103,974	30.1%
	65+ years	50,846	14.7%
	Total	345,419	
NI	0-15 years	388,433	20.4%
	16-39 years	571,141	30.0%
	40-64 years	617,125	32.4%
	65+ years	326,476	17.2%
	Total	1,903,175	

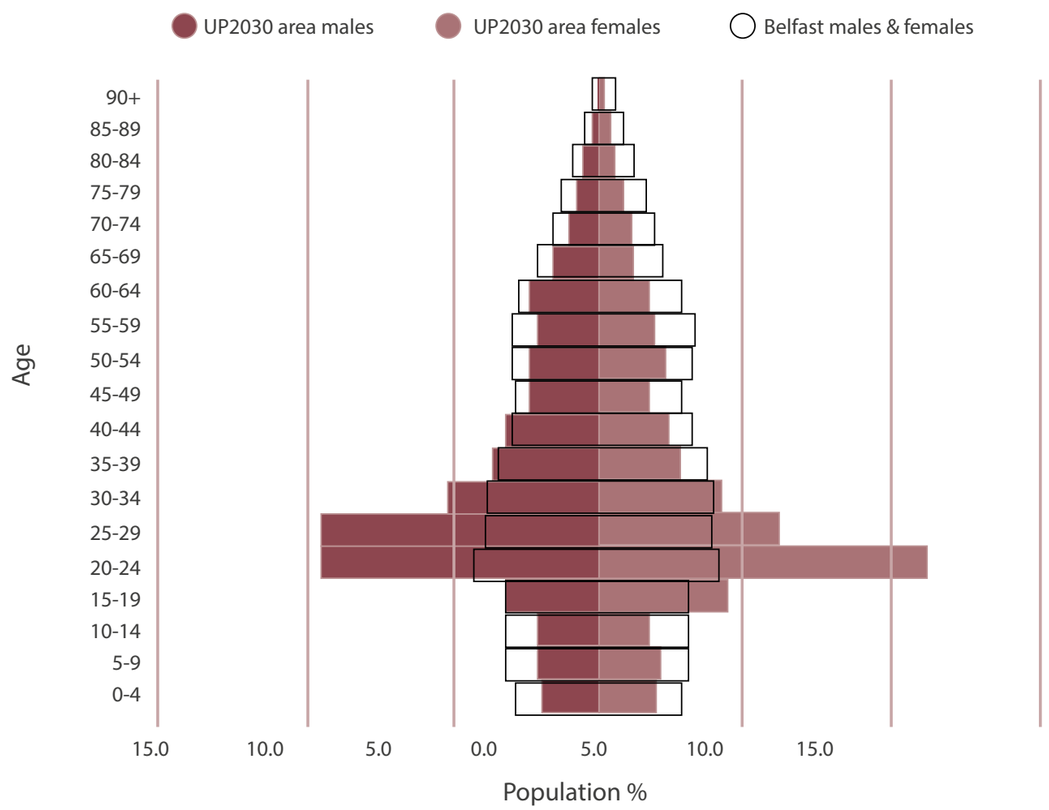
Table 2: Housing stock in the UP2030 area, Census data 2021

Geography	House type	People	%
UP2030	Whole house or bungalow	4,616	47.1%
	Flat, maisonette or apartment etc	3,775	38.5%
	Not coded	1,418	14.5%
	Total	9,809	
Belfast	Whole house or bungalow	289,832	83.9%
	Flat, maisonette or apartment etc	46,189	13.4%
	Not coded	9,396	2.7%
	Total	345,417	
NI	Whole house or bungalow	1,758,545	92.4%
	Flat, maisonette or apartment etc	118,282	6.2%
	Not coded	26,348	1.4%
	Total	1,903,175	

Table 3: Language in the UP2030 area, Census data 2021

Geography	Language	People	%
UP2030	English	7,428	75.7%
	Other Language	2,143	21.9%
	Not coded	235	2.4%
	Total	9,806	
Belfast	English	310,386	89.9%
	Other Language	23,363	6.8%
	Not coded	11,669	3.4%
	Total	345,418	
NI	English	1,751,510	92.0%
	Other Language	85,106	4.5%
	Not coded	66,559	3.5%
	Total	1,903,175	

Fig 8: Gender and age in the UP2030 area, Census data 2021



Tenure

The tenure profile of the UP2030 area differs significantly from the wider city. While the proportion of privately rented homes is similar, the share of owner-occupied housing is around one-third lower than the Belfast average. Almost half of households rent from social housing providers, nearly double the citywide figure.

This distinctive pattern reflects the area's redevelopment during the 1970s and 1980s, when major public housing programmes were introduced alongside road infrastructure improvements. These interventions left a legacy in the form of a much higher concentration of social housing compared with other parts of Belfast.

Tenure Type	UP2030 Area (no. of properties)	UP2030 %	Belfast (no. of properties)	Belfast %
Owner occupier	872	23%	60,377	37%
Privately rented	398	10%	15,568	10%
Socially rented	1,852	48%	40,718	25%
Unknown	708	18%	45,490	28%
Total	3,830	100%	162,153	100%

Table 4: Tenure type in the UP2030 area, Belfast LAEP 2024

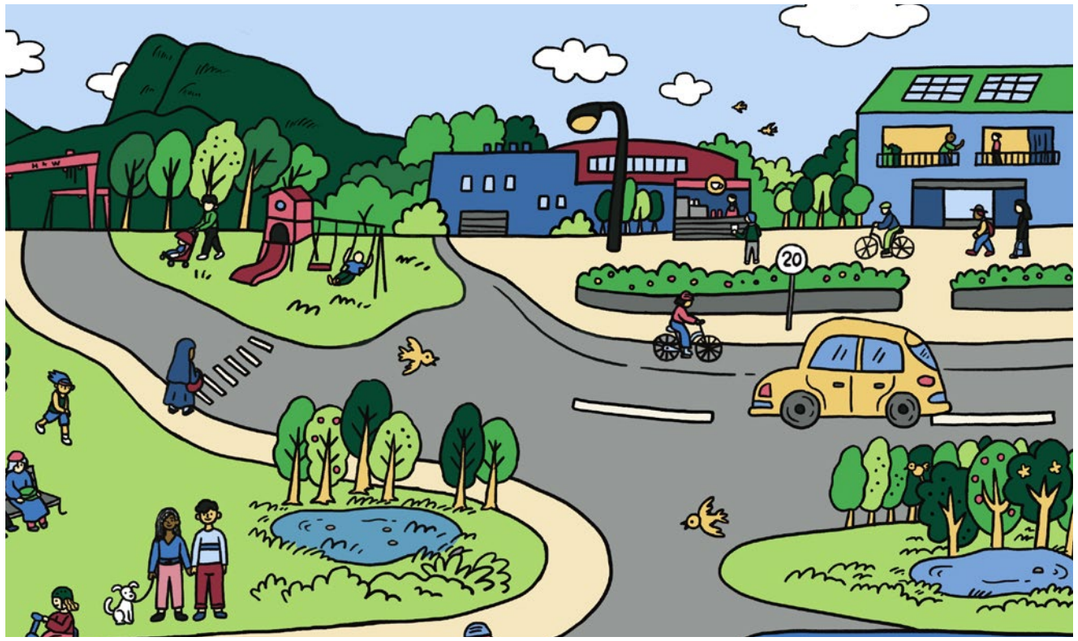
Image: Traffic on Hamilton Street, Belfast

2.2 The Neighbourhood: Residential, commercial & public buildings

Residential

The UP2030 area covers around **3,830** domestic properties. Situated adjacent to the River Lagan, it is largely flat with much of the area lying at or just under sea level. This makes it potentially vulnerable to flooding from the river, with a tidal barrage system and substantial flood protection walls installed. Most of the residential building stock in the area is low density terraced housing or purpose-built flats, built in the period between 1980 and the present day, with an additional estimated **2,500** planned to be built between now and 2035.

The area is unusual in having clusters of homes immediately adjacent to the central business district, with concentrations of typical Belfast post-war homes standing beside 1960s office buildings. More than half of the homes are relatively modern flats with the majority of the rest made up of streets of the iconic red brick, post war terraced houses. The older, solid wall buildings are challenging and expensive to retrofit whilst the majority of modern buildings can benefit from cavity wall insulation as a relatively easy win. This results in a combination of relatively poorly insulated



EPC rating	UP2030 area (no. of properties)	UP2030 %	Belfast (no. of properties)	Belfast %
A	0	0.0%	117	0.1%
B	532	14%	10733	7%
C	2,214	58%	49073	30%
D	925	24%	56707	35%
E	134	3%	29450	18%
F	24	1%	13560	8%
G	1	0%	2513	2%
Total	**3830**	**100%**	**162153**	**100%**

Table 5: EPC rating of domestic properties in the UP2030 area, Belfast LAEP 2024

EPC rating	UP2030 area (no. of properties)	UP2030 %	Belfast (no. of properties)	Belfast %
D-G (low energy efficiency performance)	1084	28%	102230	63%

Table 6: D-G EPC rating of domestic properties in UP2030 area, Belfast LAEP 2024

older homes that starkly contrast with social housing properties built since the 1980s. It is this concentration of social housing that raises the energy performance of homes, with only 28% of homes having an Energy Performance Certificate rating of D-G compared with the wider city where **63%** of homes fall below the generally accepted standard C.

Commercial

The pilot area includes a section of the city centre and includes the central business district for the city which means it is well populated with a mix of non-domestic buildings such as offices, retail and hospitality. These use types have significant energy demands.

- The estimated number of non-domestic buildings in the project area is **1,248.**
- Around 66% of non-domestic buildings in the project area are commercial buildings (i.e. offices), and around 20% are retail.
- Hospitality buildings make up around 1/2 of the project area's non-domestic heat demand (i.e. large hotels).
- Around **70%** of the project area's non-domestic electricity demand comes from commercial buildings.

- Some of the non-domestic buildings with the largest heat demands in the project area include hotels.
- Some of the non-domestic buildings with the largest floor areas and electricity demands in the project area include call centres and banks.

Public

The area includes a variety of buildings owned by the public sector including schools and community centres most of which are relatively modern. It also ranges from the newly opened Grand Central Station, as well as publicly owned 1970s and 80s office buildings through to legacy stock such as St George's Market.

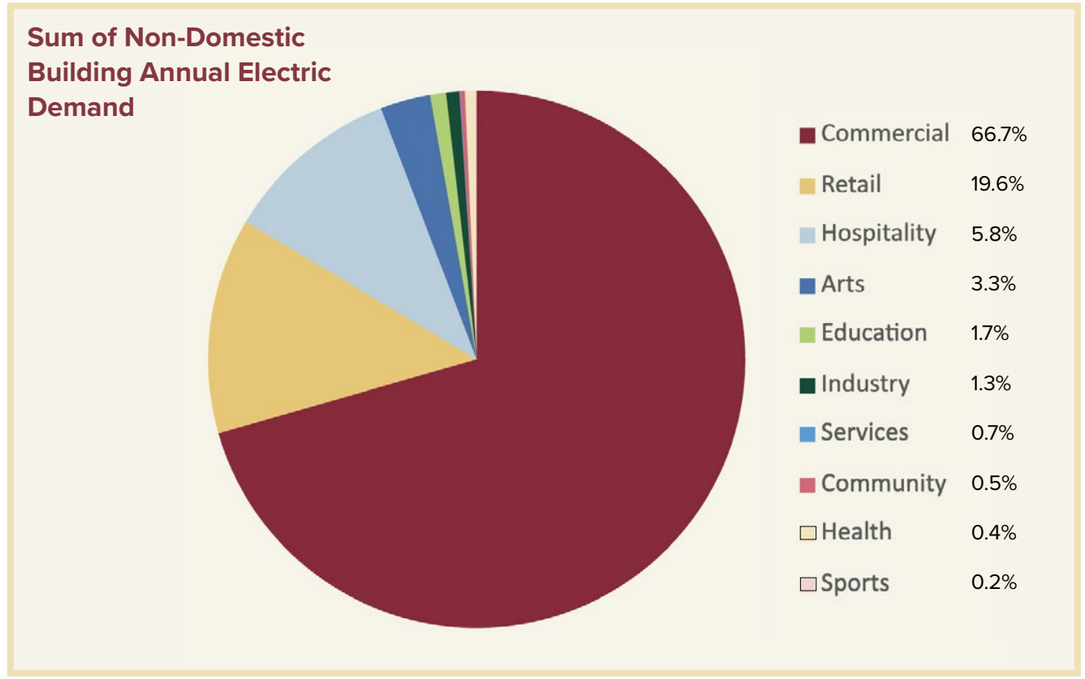
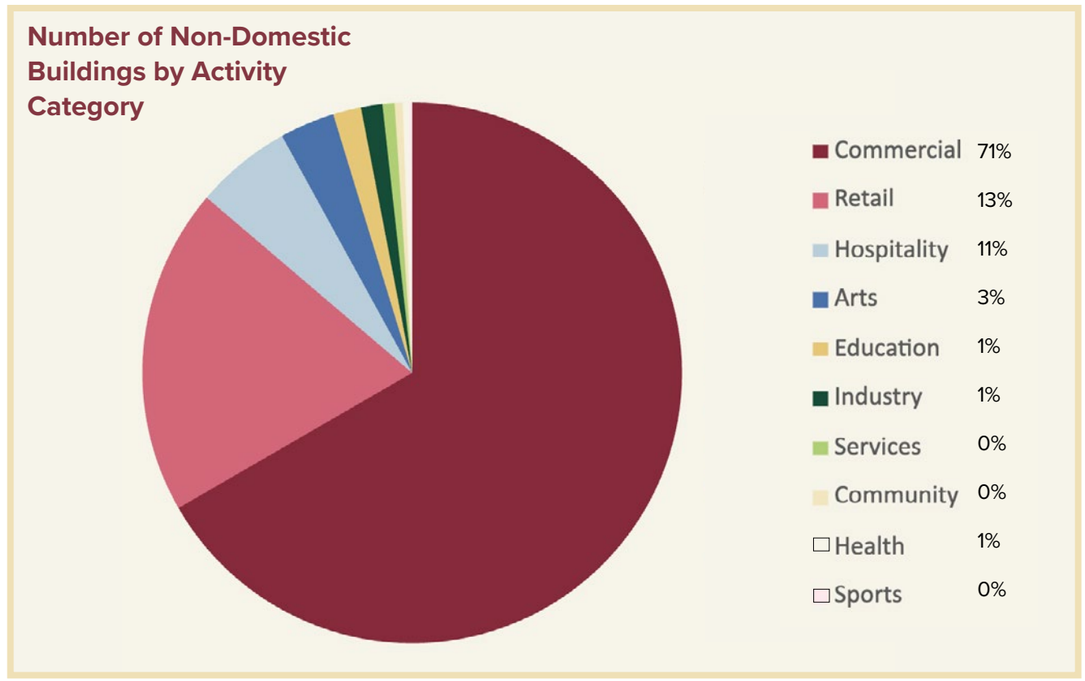


Fig 9: Non-domestic building annual electric demand in the UP2030 area, Belfast LAEP 2024

Image: St George's Market

Fig 10: Non-domestic buildings by activity category in the UP2030 area, Belfast LAEP 2024



2.3 The Neighbourhood: Transport links, blue and green infrastructure

Flanked by the Westlink and home to Belfast's central business district, the area suffers from heavy congestion, air pollution, and parking pressures. Three of Belfast's four Air Quality Management Areas (AQMAs) fall within the UP2030 area, where vehicle emissions regularly exceed legal limits. It is also an area with a number of culverted rivers running under it that flow into the Lagan, and pressure on the combined sewage system presents challenges for rainwater discharge into the Lagan Basin, particularly after a significant rainfall event and during a high tide.

The project area contains two major train stations: Belfast Lanyon Place train station and Belfast Grand Central Station (opened 2024), a railway and bus station which is part of the Weavers Cross development, a multi-million-pound transport-led regeneration project which will link a new high-capacity transport hub with mixed-use development site. Both stations serve as the main destinations for those wishing to access Belfast city centre, including those travelling to Belfast to live, work or visit, from around the region and the south of Ireland, critically connecting Dublin and Belfast.

Blue and Green:

The area also has direct access to the River Lagan, however, access to open, green space in the immediate area is limited. Due to the central nature of the area, competition for land use is high with an estimated **2,514** number of planned domestic buildings and **160** planned non-domestic buildings in the project area between now and 2035.

Sustainable transport

The new Eastern Transport Plan (ETP), led by the Department for Infrastructure sets the framework for transport policy and investment decisions up to 2035 and is guided by principles that recognises the dual functions and interrelated nature of place and movement underpinned by a vision that was developed collaboratively with key stakeholders to "deliver an integrated and re-balanced transport network in favour of sustainable, efficient modes, which connects communities creating an accessible, inclusive, safe and prosperous economic region by delivering carbon reduction, improving air quality, enhancing the built and natural environment and facilitating healthy and sustainable travel choice over unnecessary private car travel." The approach in the ETP focuses on creating places for people, built around a healthy, safe and carbon neutral vision for the future and continues to promote active travel and a shift to more sustainable modes, while deprioritising single-occupancy car use.

Belfast Grand Central Station: A Flagship for Sustainable Transport

Belfast Grand Central Station sets a new benchmark for sustainable infrastructure, aligning with Translink's Climate Positive Strategy to halve emissions by 2030, reach net zero by 2040, and become Climate Positive by 2050. Sustainability is embedded throughout, from low-carbon construction using recycled steel, GGBS (Ground Granulated Blast-Furnace Slag)

Image: Translink

concrete, and responsibly sourced timber, to advanced water recycling and rainwater harvesting systems that reduce resource consumption.

The station's passive design maximises solar gain and natural ventilation, minimising energy demand for heating and cooling. Solar PV panels, high-performance glazing, LED lighting, and a smart Building Management System further enhance energy efficiency. These innovations support the station's pursuit of BREEAM 'Excellent' and BREEAM Infrastructure 'Excellent' ratings. Designed for climate resilience, the site incorporates flood mitigation measures and insulation that adapts to seasonal extremes. Active travel is a core focus, with over **200** cycle parking spaces, improved pedestrian access, and plans for a Belfast Bike Scheme docking station at Weavers Cross. Integrated with zero-emission buses and low-impact construction methods, the station exemplifies Northern Ireland's commitment to a greener, more connected future.

2.4 The Neighbourhood: The Linen Quarter

The Linen Quarter Business Improvement District (LQ BID) is an independent, not-for-profit organisation, democratically elected by local stakeholders to drive positive change in the area. Situated within the UP2030 pilot boundary, the LQ BID has become a leading force for sustainability-led urban transformation. Since 2021, its vision has been to establish Northern Ireland's first sustainable business district, and potentially the UK's first sustainability-focused BID.

Its priorities align closely with UP2030's core themes: greening the city, promoting active travel, and enabling retrofit and energy efficiency. Through strategic partnerships and business-led initiatives, the LQ BID demonstrates how the private sector can catalyse climate action and deliver meaningful change at the neighbourhood level.

Image: Adelaide Street

Greening:

Over the past few years, they have made significant progress in realising their vision of a healthier, more sustainable Linen Quarter. Through their Investment and Regeneration initiatives, they've partnered with Department for Infrastructure (DfI), Department for Communities (DfC), and Belfast City Council to install parklets, create greener social spaces, and support urban biodiversity. This work has included pedestrianising part of a street to install a social space deck, converting parking bays and derelict sites into vibrant green areas, in partnership with DfI. They have also collaborated with private landowners to transform vacant lots into gardens and installed bird boxes to enhance the urban ecosystem.

Their members, businesses and organisations within the district, have also led their own sustainability initiatives, including the installation of rooftop beehives to support pollination across the district. Several sites now feature herb gardens on their rooftops, while one location has developed a thriving vegetable and herb garden, supplying fresh, homegrown produce directly to their hotel bars.

Active Travel:

Another key focus has been on expanding their co-funding support for levy-paying organisations, enabling them to achieve Cycling Friendly Employer Accreditation, reinforcing their commitment to health and climate action through active travel.

Linen Quarter BID is now firmly established as a regional leader in Cycling Friendly Accreditation, with 60% (projected to be **70%** by end of 2025) of all accredited locations/organisations in Northern Ireland based within the district.

Image: Beehive on the rooftop of the Maldron Hotel Belfast City (courtesy of Lawrence Tingson)

This includes the first Cycling Friendly Building, achieved through their co-funding and guidance support scheme.

The BID also offers financial assistance to landlords and property developers or owners within the district who wish to have their buildings audited which can help to identify opportunities to improve energy efficiency, enhance waste management practices, and reduce carbon emissions.

Example of business in the area leading the way in terms of greening, growing and reducing their carbon footprint are: Maldron Hotel, Hampton by Hilton and Killutagh Estates Limited.

Retrofit:

LQ BID commissioned a short illustrative report on one of Belfast's landmark office blocks - Bedford House, to illustrate in a very practical way the environmental, social and commercial benefits of a green built environment, for businesses themselves as well as the communities in which they are situated. The report illustrates how similar buildings across Belfast can be retrofitted to help create a more sustainable city and considers related issues such as tenant requirements, circular fit out, and supply chains. It provides landlords, developers and facility managers with a template that helps them on their own journey towards achieving more sustainable, efficient, and profitable office premises.

2.5 The Neighbourhood: Public realm

The public realm is comprised of streets, squares, parks, open spaces, waterfronts, and the spaces between buildings and is vital to how people move, interact, and experience their neighbourhood. It shapes identity, fosters community, and supports cultural life. However, in this area, the public realm is underperforming.

Insights from walkabouts, stakeholder engagement, and analysis reveal a range of challenges and aspirations. While the neighbourhood is well-connected via sustainable transport links, including Grand Central Station, Lanyon Station, Metro bus routes, and Belfast Bike docking stations, the dominance of vehicle infrastructure fragments the area. Roads, junctions, and crossings are designed primarily for cars, not people. This disconnects communities, discourages walking and cycling, and undermines the potential for inclusive, liveable streets.

There is a clear opportunity to reimagine the public realm as people-focused, accessible, and climate-resilient. As highlighted, the area suffers from a lack of green and open space, poor pedestrian infrastructure, and limited mobility for disabled users, older people, and children. Narrow pavements, uneven surfaces, and complex crossings compound these issues, alongside environmental stressors such as air pollution, surface flooding, and urban heat, all of which disproportionately affect vulnerable groups and deepen inequalities.

Improving the public realm requires a co-design approach that brings together residents, business owners, public sector partners, urban designers, landscape architects, disability advocates, and critically, children and young people. Working together, they can create spaces that are inclusive, easy to maintain, and aligned with best practice, such as green infrastructure which include street trees and rain gardens that can enhance climate resilience and comfort, but are also carefully considered in terms of location, to avoid obstructing footways, reducing sightlines, or creating hazards like slippery surfaces. Similarly, planters and other interventions must be designed with accessibility at their core, avoiding the clutter of bins, signage, junction boxes, and ad hoc seating that currently disrupts movement for wheelchair users and pushchairs.

Case Study - Blackstaff Square

A live example of this approach is the Blackstaff Square project, which is part of the Department for Communities' Climate Action Plan. The project includes a new requirement to undertake a Climate Change Risk and Vulnerability Assessment, ensuring that future interventions are both inclusive and resilient.

Blackstaff Square is a key public space located in the Linen Quarter area that consists of hard surfacing and semi-mature trees surrounding the perimeter. There are several hospitality businesses around the Square that spill out into the space but given the lack of public seating and poor design, it mainly serves as a thoroughfare for pedestrians coming from the Grand Central Station and into the city centre.

Blackstaff Square is owned by the Department for Communities (DfC) and there are plans to upgrade it as part of a public realm project. As part of DfC's Climate Action Plan 2024-25, Blackstaff Square and surrounding streets were selected as a pilot for a risk and vulnerability assessment.

A climate risk and vulnerability assessment is used to determine the nature and extent of risks posed by climate change and by analysing potential climate hazards and evaluating existing vulnerabilities understand the potential impacts on people, assets, services, livelihoods and the environment. The Department recommends that the Risk and Vulnerability Assessment is fully embedded in the project lifecycle at the pre-design stage of all public realm schemes i.e. it should form part of the Outline Business Case.

A risk and vulnerability assessment was carried out to determine key climate-related risks relevant to the scheme, such as flooding, air quality and heat and a higher prevalence of storms. While mitigating approaches were proposed including Sustainable Urban Drainage (SuDS), water retention features, surfacing, street furniture, shelter and greenery, no decisions have yet been made regarding implementation. It was also noted that the integration of active travel into placemaking would bring benefits by reducing emissions and improving air quality that helps create a more pleasant environment. The identified issues and potential adaptation and mitigation measures from the risk and vulnerability assessment are now being considered as part of the ongoing design development process.

Belfast Net Zero Neighbourhood Framework 2025

Environmental Justice and Segregation

The Belfast Environmental Justice Index (EJI), developed by Useful Projects for Northern Ireland Environment Link, maps inequalities across fifty-one wards. Factors include access to green space, urban heat island effect, flood risk, poor health outcomes, and deprivation.

Image: Blackstaff Square

The wards with the highest EJI scores cluster in central Belfast, including the UP2030 area, where segregation, poverty, and environmental disadvantage intersect most sharply. The Tree Establishment Strategy identifies these communities as priority areas for tree planting, noting their low canopy cover and limited biodiversity. The lack of greenery not only reduces visual and recreational amenity but also limits the environmental benefits trees provide, such as shade, cooling, carbon storage, and wildlife habitat. This absence of biodiversity is both a symptom and a driver of wider social and health inequalities.

This evidence underlines the urgency of joined-up, cross-community environmental action. Tackling biodiversity loss, climate risk, and access to nature cannot be separated from addressing the structural inequalities rooted in segregation. This enduring “segregation handicap” creates duplication, inefficiency, and division that weigh heavily on both the city’s environment and its people.

Image: Adelaide street

03

VISION, THEMES AND PILLARS

The UP2030 process unfolds across three key stages: **the vision phase, the action phase, and the upscaling phase.**

Visioning and Adaptive Pathways Process

During the vision phase, we convened a series of workshops with city stakeholders and project partners to collectively imagine what a net zero neighbourhood could look like, and to identify the actions and pathways needed to get there.

We used a range of creative tools to support this process, including the 'Future Newspaper' exercise, where teams collaborated to craft headlines and front-page stories in 2050, celebrating the city's success in achieving its net zero goals. These stories then served as a springboard for mapping out long-, medium-, and short-term actions across project themes and the overarching vision. By sequencing these actions, stakeholders gained a clearer understanding of the urgency involved and the importance of a robust, cross-sector implementation plan to bring the vision to life.

To build on these conversations, we held a concluding workshop focused on adaptive pathways, an approach that acknowledges the complexity and uncertainty we face in planning for the future. Adaptive pathways allow for practical, low-risk investments today while remaining flexible enough to accommodate change. This method offers a dynamic roadmap for identifying, evaluating, prioritising, and sequencing multiple strategies over time. Importantly, it leaves room for unchosen strategies to be activated later, enabling ongoing adjustment and adaptation.

The adaptive pathways process surfaced several cross-cutting cluster activities relevant to all project themes. These included:

- Capacity building at both the community level and within the public workforce.
- Collaborative working and inclusive engagement, particularly in communities affected by conflict, ensuring sensitivity to legacy issues.
- Education, up-skilling, and employment opportunities aligned with local schemes.
- Knowledge sharing, with emphasis on programmes tailored to different contexts, such as community ownership, carbon literacy, shared space management, and allotment gardens, to help stakeholders grasp the broader net zero agenda.

Innovation emerged as a key theme, especially around public-private collaboration to deliver creative mixed-use land solutions in high-value city centre areas. Data scarcity and management were also highlighted as critical, underscoring the need for transferable data that can support diverse projects, demonstrate impact, and attract further investment.

Finally, sustainable financing was a core focus, exploring how to unlock large-scale strategic transformation while also enabling smaller-scale interventions that build cumulative change and secure long-term buy-in.

The 2050 Vision

The outcome of the visioning work resulted in the image and an overarching vision statement with supporting vision statements for each of the three UP2030 pillars, as an amalgamation of the discussions:

'To create a net zero neighbourhood that adapts and mitigates climate risks through increased greening, better active and sustainable transport and more energy efficient low carbon buildings and to act as a beacon of success for other neighbourhoods.'

Belfast Net Zero Neighbourhood Framework 2025

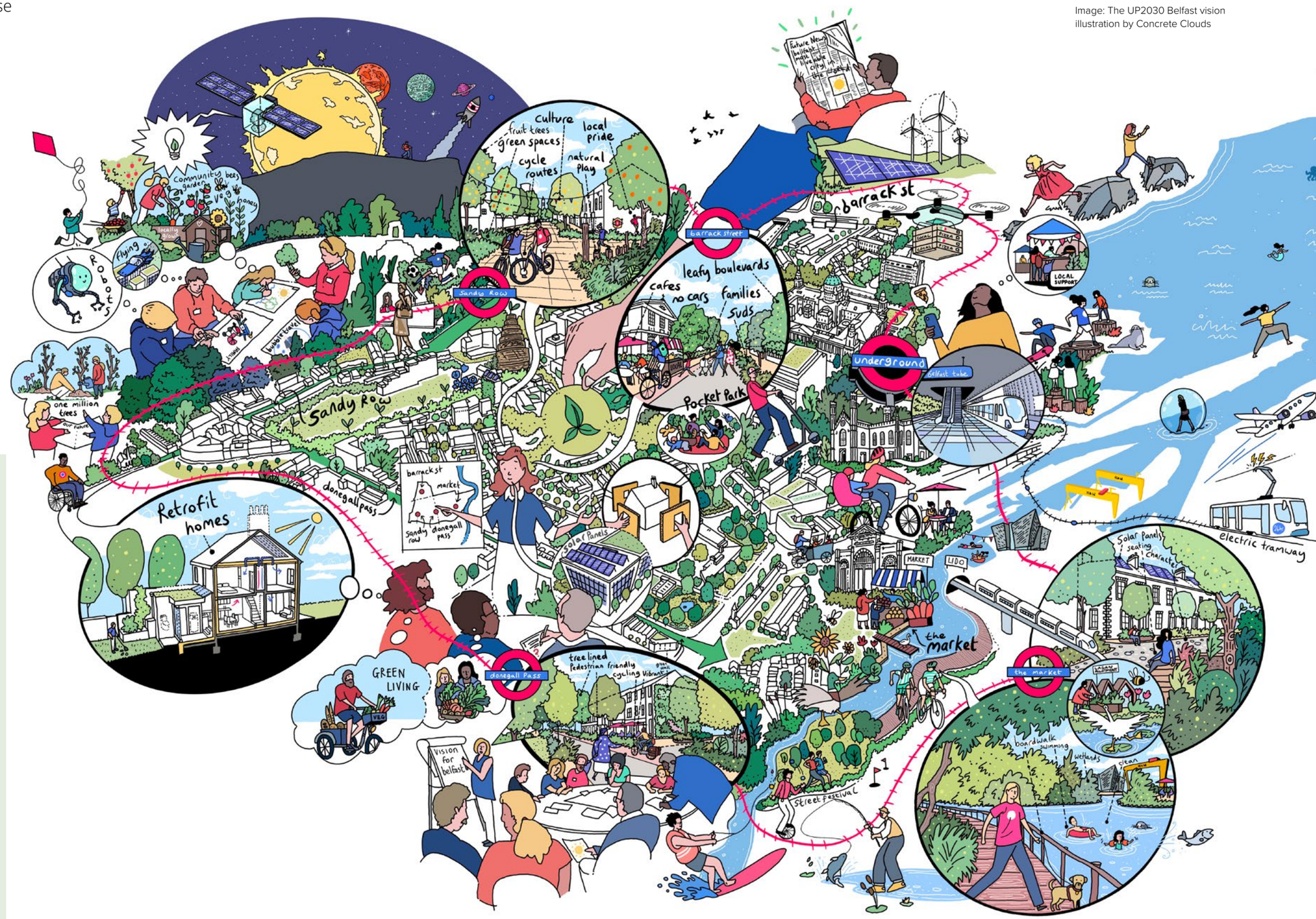


Image: The UP2030 Belfast vision illustration by Concrete Clouds

Themes of UP2030: Greening, Active Travel and Retrofit

Belfast, like cities around the world, is tackling the challenge of reducing carbon emissions to reach net zero. The Net Zero Carbon Roadmap for Belfast shows that the best ways to reduce the city's carbon footprint are by making our buildings more energy efficient and changing how we travel. But it is not just about cutting emissions, it is about making sure these changes work for everyone in our communities. These challenges have shaped the three themes of UP2030 that are underpinned by the need to ensure meaningful engagement and accessible communications.

Retrofit

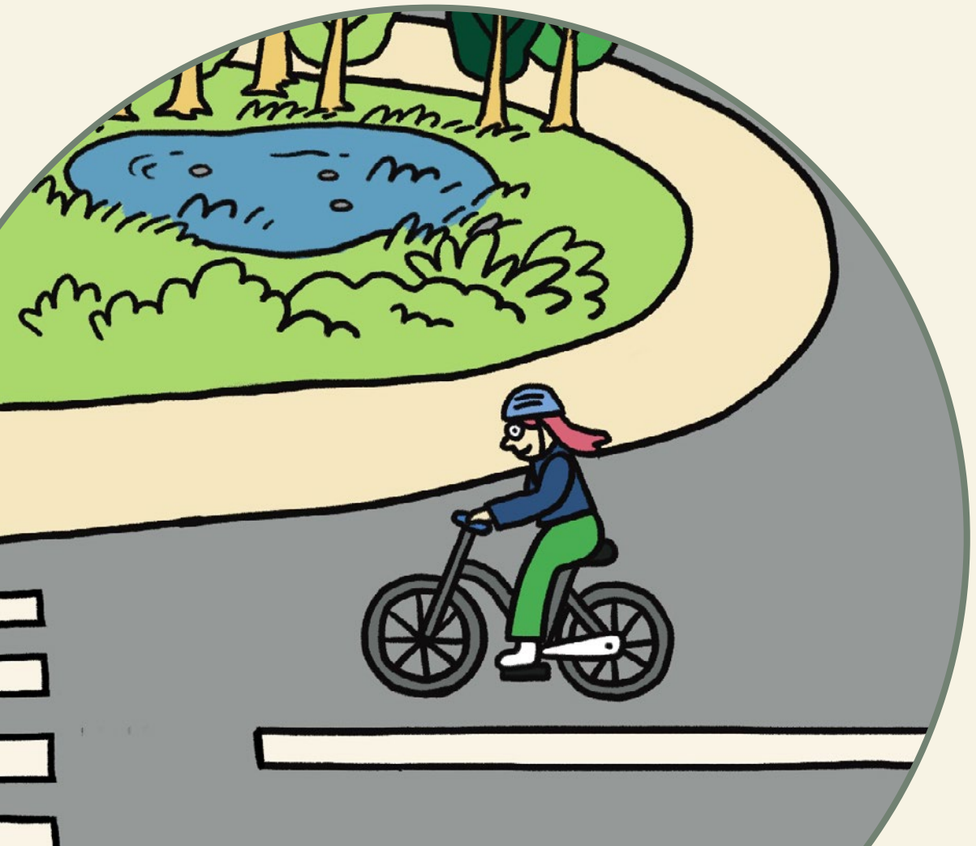
What it means: Retrofit involves upgrading buildings to make them more energy-efficient, reducing the energy needed for heating, cooling, and lighting. This includes using a fabric first approach to improve elements of the existing building fabric such as insulation to prevent the loss of heat unintendedly and build on this by replacing fossil-fuel heating systems with more efficient energy sources such as renewable technologies like solar panels and heat pumps, or hybrid approaches.

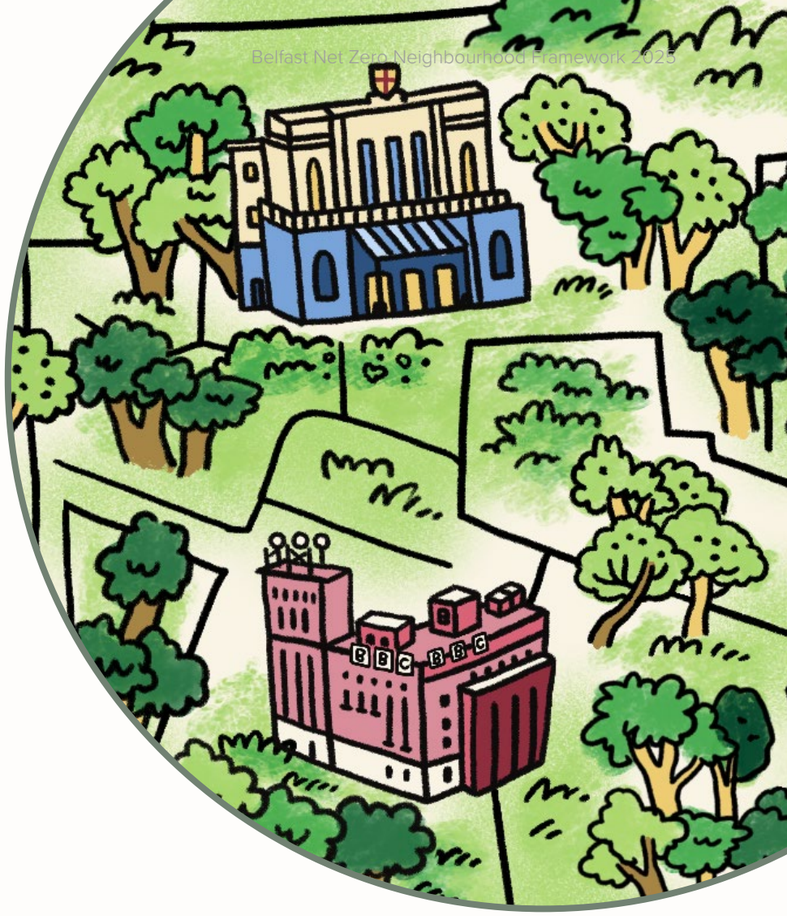
Why it matters: Buildings currently account for **50%** of Belfast's carbon emissions. Buildings that are not energy efficient (i.e. poorly insulated) are harder to heat and keep warm which creates energy waste and over time can become costly to run. Retrofitting reduces energy waste and replaces fossil fuels with renewable energy, significantly lowering emissions.

Active Travel

What it means: Active travel refers to making journeys by walking, wheeling, scooting, or cycling. It is often used for short trips, such as walking to the shops or cycling to work.

Why it matters: Transport accounts for **20%** of Belfast's emissions, and Northern Ireland has been the slowest in the UK to reduce its carbon emissions. Shifting from private cars to sustainable transport options such as walking, cycling, and public transport is one of the most effective ways to lower urban emissions.





Greening the City

What it means: Greening is about adding more nature to our city. This includes parks, wetlands, ponds, trees, gardens, and even green roofs. These spaces help wildlife thrive, clean the air, and make our city more resilient to climate change, like flooding and heatwaves.

Why it matters: Trees and vegetation absorb carbon dioxide (CO_2) through their leaves and improve air quality by capturing pollutants on their surfaces. In Belfast, green spaces with trees provide shade and cool the environment by releasing water through leaves and soil evaporation, helping to reduce the urban heat island effect and lower energy demand for cooling during heatwaves. Green spaces help manage flooding by reducing rainwater runoff and mitigate flooding in vulnerable areas of Belfast.

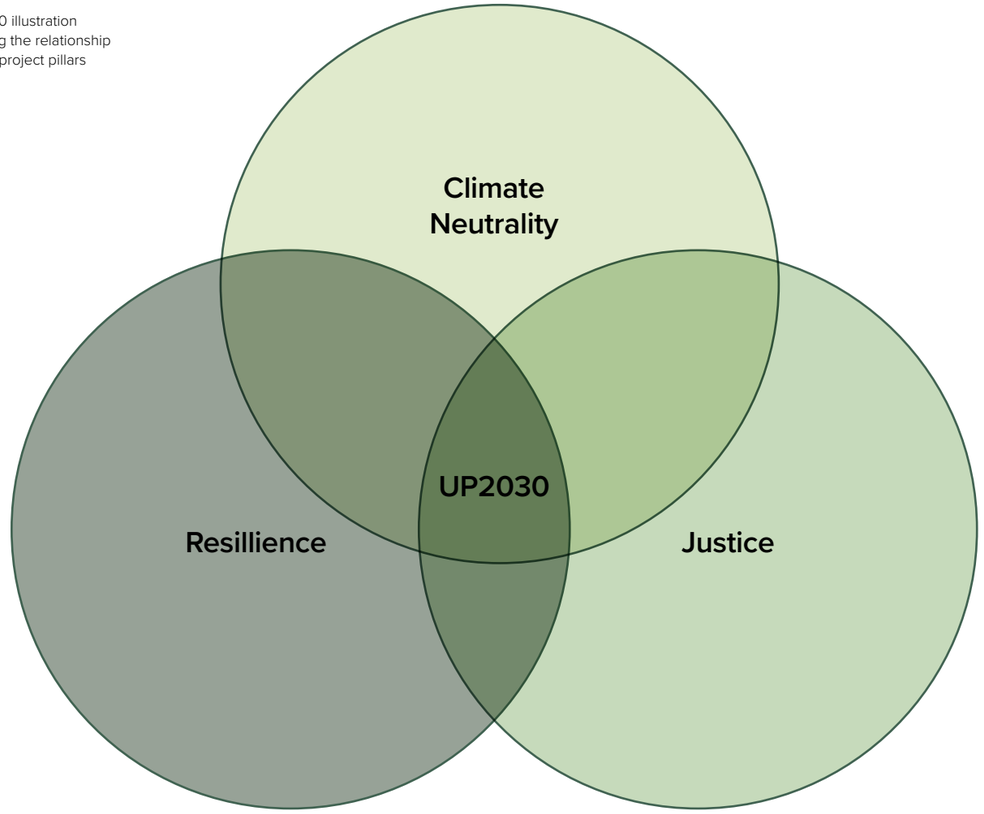
The themes are underpinned by three core pillar visions that support the city's transformation:

Just transition: Co-create an inclusive, more equitable and fair society where all communities are aware and included in a democratic, accessible and transparent way to take ownership and benefit from the actions to support carbon neutrality, including new jobs, better homes and affordable sustainable transport.

Carbon Neutrality: Take an ambitious approach to the challenge of carbon neutrality through greening, active and sustainable travel, green energy and better buildings to provide clean air, green space and a healthy environment for all to live.

Resilience: Take a democratic and sustainable approach to be prepared, adapt to and mitigate climate risks and shocks including flooding to create a safe, thriving and future proofed neighbourhood.

Fig 11: UP2030 illustration demonstrating the relationship between the project pillars



.3.1 Retrofit

What Do We Mean by Retrofit?

In this context, retrofit means the process of upgrading or improving existing buildings, primarily to enhance their energy efficiency and reduce energy consumption. It results in warmer, healthier and more comfortable homes and buildings.

The Belfast Retrofit Hub

Convened by Belfast City Council, the Belfast Retrofit Delivery Hub is a collaborative initiative established to accelerate the decarbonisation of buildings in Belfast by promoting energy efficiency and the adoption of low-carbon heating solutions. With over 70 member organisations, it brings together key stakeholders from various sectors to identify opportunities, develop projects, and overcome barriers to retrofit activity within the city. Work spans residential, public and commercial buildings but focuses largely on residential. The Hub works with stakeholders to explore potential approaches, programmes and knowledge exchange with efforts focused largely on the development of a cross tenure, place based domestic retrofit pilot project.

Retrofit Challenge for Belfast's Building Stock

Across Belfast, buildings account for half of the greenhouse gas emissions, residential buildings alone account for **33%**, with **7%** coming from public and **10%** from commercial stock.

It has been estimated by the UK Green Building Council that 80% of homes that will be in existence in 2050 have already been built and their relatively poor energy performance needs to be addressed. The alternative to retrofitting these buildings would be to demolish older, under-performing properties and rebuild

Image: Retrofit Hub Workshop June 2024

Image: Community training retrofit event April 2024

as new, however this form of action would be very costly and time-consuming. Such a strategy would not be economically viable or environmentally sustainable given the costs and embodied carbon associated with re-construction.

In 2024, the commercial real estate company, CBRE NI, warned that up to **75%** of Belfast's office stock could become unusable by 2030 due to upcoming Energy Performance Certificate (EPC) legislation, highlighting the need for the low carbon retrofit of all building types.

Failure to take action could result in increased fuel poverty, incidents of climate related respiratory illness, the stranding of built assets and could push Northern Ireland further away from its net zero carbon emission goals.

Exploring Retrofit Challenges and Solutions

What we set out to do - with retrofit identified as one of the three main project themes, we set out to explore the issues across all sectors, identifying barriers and opportunities at local level that could result in scalable solutions for the city. A series of tools would be tested as part of this process.

How we did it - the information that we sought lay with industry professionals who understood the technical and strategic issues, whilst communities and residents brought lived experience and consumer insights. Using a series of workshops and events, we worked closely with both, sense checking findings as they emerged with community groups. As we identified challenges, we tested a series of tools to help understand them and identify potential solutions.

In June 2024 the Belfast Retrofit Delivery Hub and the Council's UP2030 team ran a joint mapping exercise event to help visualise the need and opportunities for a neighbourhood retrofit programme across all building types. Drawing on retrofit experts and key stakeholders and working in sectoral groups, they focused on the UP2030 pilot area to answer a series of questions about what a climate-ready net zero neighbourhood might look like, actions to make this happen, the barriers and opportunities as well as what might happen if no climate action were taken. The following questions were posed:

1. Consider a range of retrofit solutions to the property/typical properties of the street, including their costs and the impact to the owner, as well as associated barriers and opportunities.

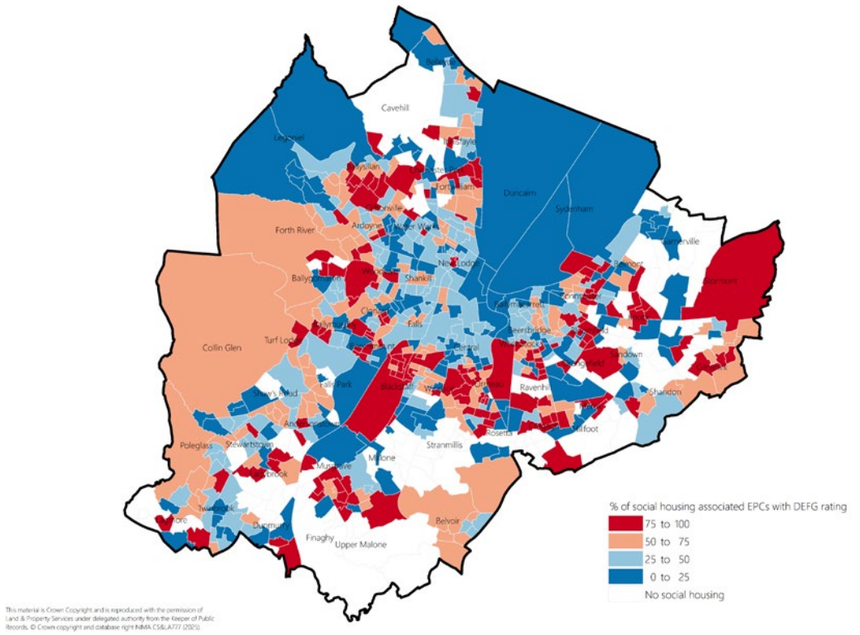
2. Consider a financial and delivery model for each tenure type as well as any additional policies, incentives or disincentives that would support uptake at pace.

3. Propose an aggregated plan for the area and the sequence of actions that would support efficient delivery/roll out and encourage uptake.

Retrofit opportunity mapping

Data from the Local Area Energy Plan (LAEP) was originally produced in spreadsheet format, spanning the whole of Belfast. To explore the UP2030 area, maps were commissioned based on the LAEP data, visualising a selection of small neighbourhoods with every home indicating energy efficiency performance and tenure.

Image: Map example used in retrofit mapping workshop, June 2024



Fabric first prioritises optimising the outside fabric of the building before considering heating or energy generation systems.

At the stakeholder event in June 2024, expert members of the Belfast Retrofit Hub were invited to explore the maps to see if they could be used to identify subsets of homes that might be suited to a retrofit solution, based on the 'worst first' and 'fabric first' approaches. This newly compiled and unique data set took discussion from theoretical to a potential practical application position, where it might be used to develop potential pilot projects.

Image: Map example used in retrofit mapping workshop, June 2024

Retrofit mapping workshop finding:

Residential retrofit challenges:

- Access to funding - householders in NI have limited access to grant funding compared with other areas of the UK and the Republic of Ireland. Private and social landlords face similar challenges with limited access to major funding streams available to their counterparts in other regions.
- Lack of capacity – many householders have limited awareness and understanding of the benefits and opportunities around retrofitting their homes. In the absence of independent one stop shops, they may not have the information needed to access the limited grants available, make decisions and commission work.
- Disruption/change – social housing providers find this to be a major barrier, often finding up to 50% of potential recipients of retrofit programmes unwilling to participate due to personal circumstances and/or inability to deal with the inconvenience associated with the proposed works.
- Energy, resilience and comfort – consideration must be given to fuel poverty, healthy and comfortable homes and community informed approaches with the risk and resilience to severe weather events woven in.

Public and commercial retrofit challenges:

- Policy – Northern Ireland's Climate Change Act is relatively new (2022), with national and corporate policies and targets still emerging. Clarity on future policy is required to drive public and commercial organisations to set targets and policies that will lead to gathering data and commissioning energy efficiency programmes. Political commitment and clear policy are critical to facilitate long-term, large-scale investment in retrofit.
- Capacity and expertise – as demand for energy efficient practice and stock increases, organisations are trying to improve understanding of their stock, baselining energy demand to assess its potential for improvement to avoid the

A stranded asset can be a building that loses its economic value prematurely due to external factors, such as changes in technology or legislation, increasing the level of risk, making it unviable.

risk of future stranding of assets. There is limited expertise to identify and implement projects.

- Access to finance – retrofit-related funding streams available in Northern Ireland are significantly less than elsewhere in the UK.
- Return on investment – there is a complex series of risks associated with investing in low carbon retrofit measures with long term paybacks and no savings guarantees.

Follow up action taken:

As a direct result of the workshop, a public/commercial event was held in October 2024 where energy and facilities management staff across Belfast were invited to share best practice and concerns around large scale approaches to retrofitting their stock.

The retrofit maps showed building energy efficiency patterns not previously identified. They subsequently stimulated a series of more detailed questions to help identify the areas with greatest need for energy efficiency improvement and the value at stake across the project area.

Questions included:

- How many homes are in the area, broken down by tenure?
- What is the energy performance of that housing stock?
- What are the primary heat sources in homes across the area?
- What is the geographical spread of homes rated by energy performance?
- What proportion of homes are in fuel poverty and what is the distribution?
- Which tenures and building types have the highest levels of fuel poverty?
- Provide a baseline of CO_2 emissions associated with housing stock.
- Identify the main carbon efficiency measures that could be retrofitted to homes.

- What is the geographical distribution of homes with low efficiency building envelope (walls and windows)?
- Calculate the potential number of interventions for each type of measure.
- Calculate the potential CO_2 savings associated with the measures
- Calculate potential costs for installation.

The Belfast Retrofit Hub is currently exploring options for an area basis, cross tenure domestic retrofit pilot project. The approach that is likely to follow will draw on data and discussion findings such as that gathered through the UP2030 project, with steps likely to include:

- Identify homes with EPC ratings of D-G, using LAEP data and working with housing professional Retrofit Hub partners to sense check/validate.
- Construction sector, social housing providers and landlord bodies scrutinise LAEP maps to identify prioritised clusters of homes in need of retrofit work.
- Develop an outline business case using data provided by hub partners.

In order to answer these questions, further data gathering and analysis was commissioned:

Quantification of carbon reduction opportunities – University of Cambridge is one of the UP2030 project partners and to assist with this work, they completed a detailed analysis of the UP2030 area, scrutinising the current condition of homes, exploring the area-wide potential and value at stake related to carrying out measures to improve the fabric of the buildings and also by installing photovoltaic panels. The data modelling system, believed to be the first of its kind in Northern Ireland, will allow the calculation of the potential installation costs, carbon and energy cost savings once analysis of the data is complete.

Data zone mapping – building on the initial mapping exercise and the series of questions posed, Belfast City Council used the Power BI data visualisation system to depict retrofit related data from the LAEP, applied to data zones (clusters of approx. **200** homes). Initially developed to

help elected Members to visualise the need and potential for retrofit in their electoral areas, the tool was subsequently tailored to focus on the UP2030 area. The result was a powerful visual and numerical depiction of the need and potential for warmer home interventions, with the mapping highlighting potential areas for priority action.

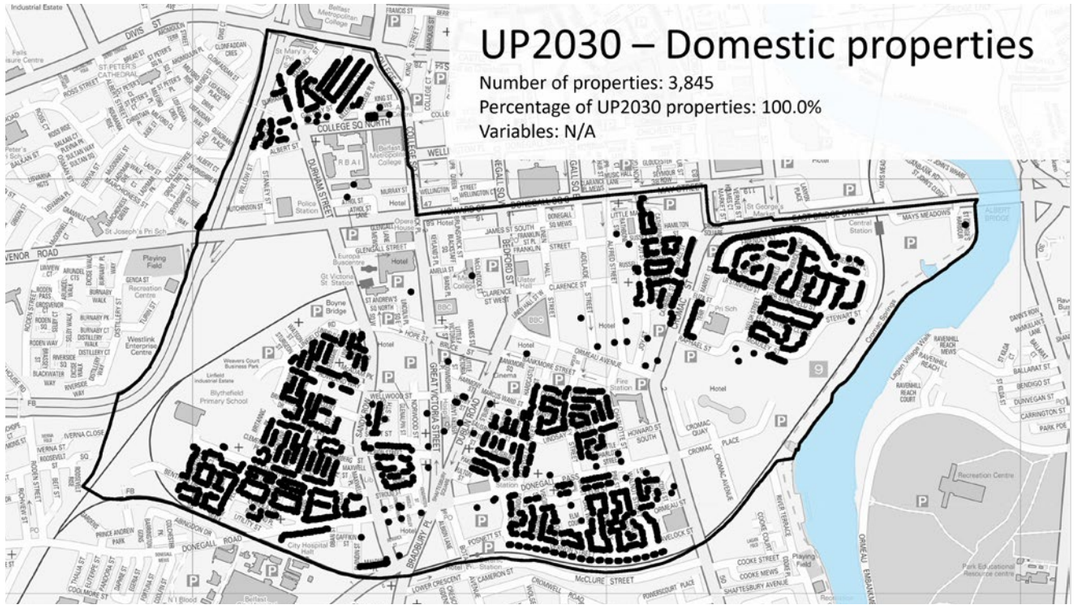


Fig 12: Map of residential properties in the UP2030 project area, Belfast LAEP 2024

Next steps in data – development of the Power BI tool has been challenging as developers explored new data visualising and mapping approaches, however, if combined with a heat mapping approach and socio-economic data layer, it could help to identify priority locations for area based retrofit pilot projects. This data combined with the analysis outputs of the University of Cambridge work, could be used to identify the value at stake, informing the development of business cases for funding applications.

Finance and Governance Workshop Findings

The July 2025, the UP2030 team conducted a workshop with a select internal team within Belfast City Council to explore the finance and governance considerations of retrofit schemes. The group acknowledged the value of emerging residential data and its potential for informing the development of area-based pilot retrofit projects across the city.

The group also highlighted a lack of city-wide data on the energy

performance of both public and commercial stock, reflecting the lack of a strategic approach. Much of this data is privately held and potentially sensitive, with no group or body having the remit or oversight of the carbon and energy performance of the city's built estate. There may be opportunities to learn from cities in Great Britain and the Republic of Ireland where climate change legislation is more mature. There is keen interest in using the LAEP data and other sources to plan joined up public and commercial programmes such as low carbon district heating. Several research projects are coming to fruition that offer opportunities for rollout, including work led by Belfast City Council on the potential for solar PV energy generation in the city centre.

Joint working and knowledge exchange is critical – a public/commercial approach is needed targeting those leading on energy across the city, sharing case studies of approaches already being successfully used to retrofit buildings and reduce emissions. Discussions are required with Belfast City Council planning and regeneration teams along with university experts on institutional investment to identify local policy blockages and potential solutions. Work is required to establish a baseline of energy demand, carbon footprint, occupancy and vacancy levels in commercial (as well as public sector) stock.

The finance and governance workshop identified the following conditions required for upscaling of retrofit:

Residential

- Clarity and commitment on policy (such as Minimum Energy Efficiency Standards) - this will inform and direct stockholders' retrofit plans and investor ambitions.
- Access to government grants similar to those in Great Britian and the Republic of Ireland to help fund retrofit work across all tenures and stock types.
- Access to funds from energy companies such as the Energy Company Obligation in Great Britain.
- Ring-fencing by NI Executive of retrofit related funds to ensure relevant allocation.
- Development of a pipeline of significant large scale retrofit programmes to encourage stakeholders to invest in relevant skills and staff.

- Instigation of independent one stop shop and/or portal to support householders.
- Development and delivery of an area based cross tenure domestic retrofit project with low cost, low disruption and high carbon impact, with a view to replication.

Public

- Obligation for public bodies to provide carbon baselines, regular reporting, set corporate reduction targets and commit to action.
- Normalising of best practice such as energy auditing, Building Energy Management Systems, data monitoring and mitigation, use of invest to save programmes.

Commercial

- A group exists with the remit to oversee and drive a city-wide approach to decarbonising the office and other commercial stock of Belfast to ensure future viability.

Community Sense Checking Workshop Findings

The opportunities for ways forward in domestic retrofit were sense checked with the community for final feedback. Fundamentally, the community envisions a future of well-designed, energy-efficient, and family-friendly homes, supported by:

- Immediate action on damp, insulation, and communication.
- Long-term investment in renewable energy and housing redesign.
- Trustworthy, local delivery of services and information.
- Practical help now and bold community-led transformation in the future.

What Works

- Tailored solutions: One-size-fits-all doesn't work, homes and needs vary.
- Energy efficiency upgrades (e.g., insulation, boilers, solar) are welcomed.
- Clear communication is essential: residents want trusted, accessible information.

Concerns

- Trust issues: Fear of scams, poor workmanship, and lack of follow-up.
- Disruption: Retrofitting can be intrusive, especially for older or vulnerable residents.
- Affordability: High costs without grants are a major barrier.

Community Ideas

- Financial incentives for retrofit measures such as solar panel grants and heat pumps.
- Holistic approach to intervention delivery to address concerns e.g., fear of disruption alleviated by provision of loft clearing service.
- One-stop advice hubs for retrofit guidance and grant access.
- Train local workers to deliver retrofits and build trust.
- More social housing and better home design (light, space, family-friendly).
- Green space is valued but must be planned to avoid structural issues.

Retrofit for Net Zero: A Collaborative Process

This framework sets out a practical, cross-sector process for delivering net zero buildings across domestic, public, and commercial spaces. Informed by learning throughout the project, it proposes targeted actions to overcome barriers, co-design retrofit solutions and build capacity for long-term delivery. Achieving this vision will require strong collaboration, shared resources, and sustained commitment to create healthier, more resilient and energy-efficient places to live and work.

Retrofit

VISION STATEMENT: All buildings (homes, public and commercial) will have net zero emissions through a combination of insulation, ventilation, low carbon heating and renewable energy generation, providing weather-resilient, healthy and commercially viable spaces to live and work.

Key Framework Action	Impact	How
Understand needs/barriers to bringing forward retrofit delivery	Residents and project stakeholders have an increased understanding of retrofit challenges and opportunities to making their building stock more energy efficient and resilient to the changing climate. Baselines relating to energy and climate impacts are created to help set targets, policies and action programmes. Audit of energy efficiency and carbon risk of the city enables strategic assessment of risk and opportunities.	**Domestic:** - Engage residents through household surveys and retrofit workshops to understand lived experience, priorities, and barriers such as affordability, disruption, and trust. - Sense check retrofit priorities with the community, highlighting immediate needs (e.g. comfort, health, dampness, insulation) and long-term aspirations (e.g. renewables, better home design). - Building on the Department for the Economy (one stop shop) commitments and plans, explore needs and opportunities for community embedded, wrap-around warm homes support services. - Use LAEP and socio-economic data to identify homes with EPC ratings D–G, and other fuel poverty indicators to produce heat maps of retrofit potential and priority. **Public** - Work with public sector organisations to collate data on the energy ratings of buildings (Display Energy Certificates) to map energy performance and retrofit potential of public buildings across Belfast. - Identify barriers to implementing best practice such as lack of expert knowledge, supply of suitably qualified and experience staff and funding programmes. - Facilitate public sector knowledge exchange events. **Commercial** - Engage with local commercial retrofit stakeholders to understand sector-specific barriers and opportunities. - Establish a baseline of energy performance of commercial buildings. - Scrutinise LAEP maps with commercial stakeholders to identify clusters of office and retail buildings in need of retrofit. - Explore carbon audit support and incentives to encourage uptake of retrofit measures.

Co-design vision for retrofit development in the area	Retrofit plans for the area are informed by those living and working in the area, resulting in relevant ambitions that have high levels of partner engagement. By working strategically and collaboratively, commercial and public sector stakeholders will work identify city scale threats and opportunities. This will enable city scale solutions and investment opportunities.	**Domestic** - Identify communities and community groups already engaged on retrofit across the city to learn from experience and peers. - Using a social license approach, co-design a retrofit vision with communities that reflects their needs: energy-efficient, family-friendly homes with trusted local delivery. - Test survey methodology to scale understanding of household needs. - Incorporate community ideas such as solar panel grants, heat pumps, loft clearing services, and training for local retrofit workers. - Promote tailored solutions over one-size-fits-all approaches, and ensure clear, accessible communication. - Create an open data/map resource to support knowledge sharing and transparency. **Public** - Map the existing energy and carbon performance of city public building stock, future economic viability and options to optimise. - Collaborate with public sector partners to shape retrofit goals aligned with climate resilience and service delivery. - Explore funding models to inform the process drawing on examples elsewhere. - Promote the normalisation of best practice across public buildings, including energy monitoring and mitigation strategies. - Encourage co-design of retrofit pilots that demonstrate leadership and replicability. **Commercial** - Work with commercial stakeholders to map the existing energy and carbon performance of city commercial building stock, future economic viability, potential impacts of policy change and options to optimise the stock value. - Use findings combined with those of public sector buildings to strategic approach to energy and carbon management and investment for the city. - Promote shared learning and co-investment in retrofit delivery.

Establish resources available and potential synergies for implementation	- Opportunities identified for collaboration in the short and long term. - A map of connected projects in the pilot area and city-wide. - Resources established for the implementation and maintenance of interventions.	**Domestic** - Map existing, recent and planned retrofit programmes across Belfast along with the agencies that facilitated them to establish good practice and expertise. - Build on Department for the Economy plans for the development of a one-stop advice hub, exploring potential for locally based support to support householders in accessing grants and trusted information. - Explore opportunities to support able to pay market similar to services provided by People Powered Manchester and through collective buying schemes. **Public** - Use data and workshops to assess retrofit measures and costs across public buildings. - Share commissioning and procurement expertise through Retrofit Hub members. - Promote invest-to-save models and energy performance contracting to unlock funding. **Commercial** - Emergence of financial assistance for building audits to identify energy efficiency and carbon reduction opportunities. - Encourage co-funding and alignment with city-wide decarbonisation strategies. - Support commercial property owners in accessing retrofit expertise and resources. - Identify synergies with Northern Ireland Electricity's Green Energy Delivery Group and professional bodies offering training on whole-life costing.
Implement co-designed vision	- Locations and interventions secured approved. - Interventions begin roll out. - Delivery/ maintenance group established.	**Domestic** - Pilot area-based retrofit schemes with low disruption and high carbon impact are delivered, informed by community feedback. - Develop an outline business case using data from hub partners. - Improve information delivery, grant access, and quality control to build trust and uptake. -Test supply chain capacity and delivery models through live retrofit projects.

		Public - Review current standards and enforcement mechanisms; identify opportunities to upscale successful pilots. - Implement retrofit schemes in public buildings with strong monitoring and reporting frameworks. **Commercial** - Strategic and co-ordinated programme of building assessment and improvement is rolled out. - Promote uptake of retrofit standards and ESG-aligned practices across the sector.
Long term vision	- Agreed and refined framework.	**Cross cutting** - Promote policy clarity and incentives to develop a pipeline of projects which encourages investment in retrofit across all sectors. **Domestic** - Review local and regional policies to embed retrofit into housing a nd climate strategies. - Promote long-term investment in renewables, better home design, and social housing expansion. - Train local workers to build capacity and trust in retrofit delivery. - Explore developer contributions (Section 76) to support retrofit uplift in priority areas. **Public** - Institutionalise carbon reporting and retrofit planning across public bodies. - Align retrofit with broader climate resilience and service delivery goals. **Commercial** - Ensure commercial retrofit aligns with long-term viability and city-wide decarbonisation goals.

3.2 Active Travel

Transport is Northern Ireland's second-largest source of emissions, with private cars as a primary contributor. In Belfast, over **60%** of journeys under two miles are made by car, representing a significant opportunity for emissions reduction. The reliance on cars is unsustainable; without alternatives, planned growth in Belfast could add a further **100,000** vehicle trips to peak hours.

Shifting these short journeys to active and sustainable travel (walking, wheeling, cycling and public transport) is one of the most effective ways to lower urban emissions and can reduce emissions by up to **75%**. This shift is urgent, as current mobility patterns are incompatible with 2030 interim emission targets. Electrification and fuel efficiency improvements alone are insufficient, a challenge compounded by the fact that Northern Ireland is lagging in electric vehicle facilitation, with just **470** charging points representing only 2.8% of the overall UK number.

This transition also delivers crucial co-benefits; reduced congestion, improved public health, better air quality, and more vibrant public spaces. Conversely, without large-scale behaviour change, health service costs from air pollution-related illnesses affecting vulnerable people will continue to rise.

Action at Scale

Recognising this need, there is a growing framework of policy and investment to enable this shift. Under the Climate Act 2022, the Department for Infrastructure has a legal obligation to reach a target spend of at least 10% of its transport budget on active travel projects by 2030,

Belfast Net Zero Neighbourhood Framework 2025

which equates to more than £80m a year. This aligns with wider UK policies, such as the ban on new petrol and diesel car sales by 2030 and grants for electric vehicles.

In Belfast, this strategic direction is reflected by the Connectivity, Active and Sustainable Travel (CAST) workstream, a key priority in the Belfast Agenda. CAST contains high-level 'strategic intents' agreed by cross-sector stakeholders designed to encourage modal shift, including:

- Supporting projects that encourage people to use forms of sustainable travel.
- Supporting behavioural change projects that replace car journeys with walking, wheeling and cycling.
- Addressing transport poverty, delivering active travel infrastructure, and co-designing place-based active travel initiatives.

The Challenges: Systemic Barriers to Uptake

Many residents in the UP2030 pilot area reported walking or cycling to their place of full-time work or study, due to being located less than 5km away. Around **42%** of those commuting to work done so by foot. Despite the clear benefits, significant barriers impede progress:

The School Transport Paradox:

A 2025 report by DfI highlights a critical issue: while **51%** of primary school pupils in Northern Ireland live within one mile of their school and of these, **48%** are driven by car and **46%** walked to school. This indicates a substantial, addressable pool of journeys where car use is habitual rather than necessary.

Safety Concerns:

Residents report fear from traffic conflict at major junctions, a reluctance to cycle alongside cars, and perceptions of anti-social behaviour, which deter walking, especially among older people and children.

Fragmented & Intimidating Infrastructure:

The city's cycle network is often disconnected and confusing, particularly for new users. This forces cyclists to choose between unsafe, busy roads or inappropriate footpaths, creating conflict and discouraging uptake.

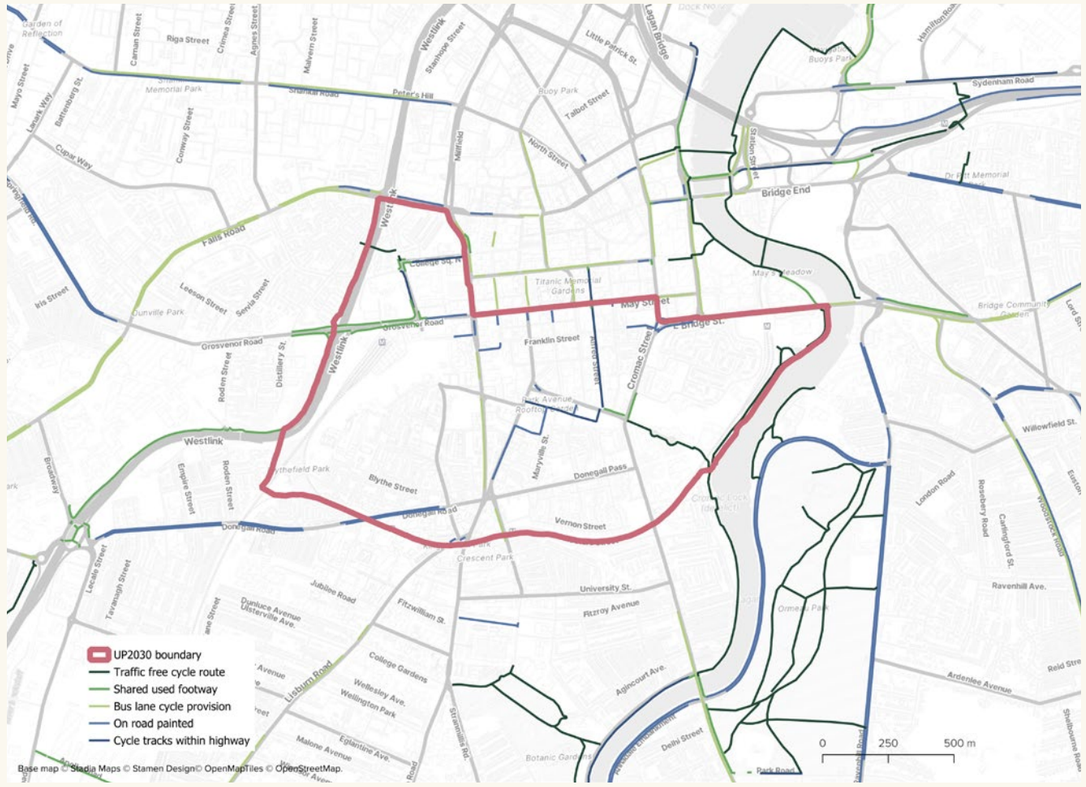


Fig13: DfI Northern Ireland Cycling Infrastructure Map in the UP2030 project area, DFI 2025

Accessibility & Connectivity:

Public transport routes can require long walks to stops, especially for older residents, and segregation at significant road junctions can stifle pedestrian movement, exacerbating a feeling of disconnect.

Resource & Capacity Constraints:

Schools and communities often lack the capacity to coordinate new initiatives, with stretched teaching staff and limited parental volunteer time creating a fundamental barrier.

Equity Gap:

There is a clear risk of "selective uptake," where only well-resourced communities with active volunteer networks can implement programmes, potentially worsening transport poverty.

What Communities Told Us

Through engagement, residents expressed some concerns and reservations about the prospect of modal change, and making more journeys through active and sustainable forms of travel. Concerns focused on frustrations towards the limitations of bus coverage in some parts of the city, conflict between road users (i.e. cars, bikes and pedestrians) making cycling an off-putting prospect, as well as fears of safety. Convenience and cost were cited as the main incentives for making more journeys by bus or train.

Residents were clear about what active travel enabling measures would be most beneficial in their area:

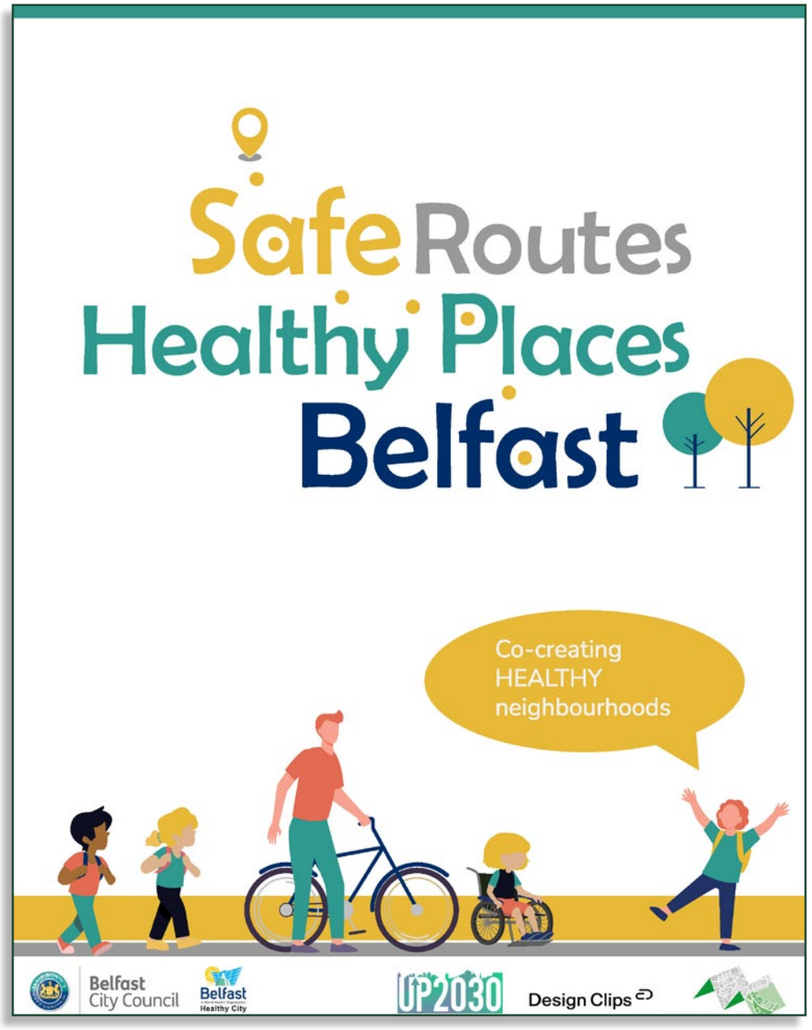
- Roads made safer for cycling, to enable people to convert some of their weekly car journeys into bike journeys and improve the attractiveness of that option.
- Planting trees along streets, with emphasis on planting the right type of tree for the environment.
- Improving bus transport with a more reliable service that covers more routes and is free.
- Some residents remarked that pedestrianisation and creating more people focussed spaces in our neighbourhoods could help alleviate social isolation.

What we tested: Safe Routes Healthy Places

To test a community-led solution, a walking bus was proposed as part of the UP2030 project. This initiative involved children walking to school together along a set route, accompanied by adult volunteers.

Identified as an opportunity to increase active travel in the pilot area, the development of walking buses also aligns with an ambition set out in the Connectivity, Active and Sustainable Travel priority of the Belfast Agenda. As the lead for this element within the Belfast Agenda, Belfast Healthy Cities partnered with Belfast City Council to explore the initiative further.

Image: Front cover of 'Safe Routes, Healthy Places Belfast' - full resource available in Appendix 2



Through the project, the team were able to engage the resources and expertise of Design Clips, an urban design studio focusing on participatory planning approaches, to actively engage children and youth in the design of strategic small scale urban interventions that aim to improve the spatial and environmental quality of the space.

It was considered that engaging children to participate in walking buses could not only provide an opportunity for physical and social activity, but it also provides a chance to engage children to think about the quality of their walking route and wider environment, and how we can adapt our neighbourhoods to become more climate resilient.

Target Outcomes:

- Create modal shift from car dependency to active travel for school journeys.
- Integrate education with practical climate action through Key Stage 2 teaching resources.
- Encourage children to evaluate their neighbourhood and identify opportunities to improve their enjoyment of the walking route.
- Address local challenges including air pollution, traffic congestion, and road safety concerns.
- Facilitate increased physical activity contributing to improved physical and mental health.
- Build community connections through parent-led sustainable transport solutions.

Walking Bus Programme: Pilot implementation across six primary schools in pilot areas and surrounding communities (St Malachy's, Donegall Road, Blythefield, St Joseph's, Fane Street, and St Mary's Primary Schools).

Resource Package: A comprehensive suite of materials was developed by Design Clips, Belfast Healthy Cities and Belfast City Council, including a toolkit and teaching resources in alignment with Key Stage 2 curriculum: Safe Routes Healthy Places Belfast. To compliment the pilot, a digital mapping platform was created by **Mapping for Change** to facilitate engagement, enabling groups to plot the parts of their route that they liked or disliked. In addition to the resources, promotional posters and leaflets were developed to engage the school community.

Engagement Approach: The Safe Routes Healthy Places resources along with a free walking bus pilot was offered to schools in the UP2030 and surrounding area. The offer was adapted and simplified to a "mini taster programme" when the initial approach showed limited uptake.

What we learned from the Walking Bus pilot:

Overall, the pilot developed a high-quality, flexible toolkit for schools which was child-focused in its design. The pilot paved a strong foundation which

can be built upon further by those interested in pursuing initiatives of this nature. It involved good collaboration across partners and was well received and encouraged by elected members.

The pilot provided a valuable insight into the reality of bringing forward active travel initiatives with schools, and the barriers to accessing and delivering activities outside of the normal work plan.

However, the pilot highlighted the realities of bringing forward active travel initiatives with schools, as well as the barriers to delivering these activities, outside of the normal work plan. Even with free resources and support available, establishing a walking bus proved challenging.

Critical Insights for Future Policy and Practice: The Walking Bus pilot provided practical lessons for how to successfully implement active travel initiatives. Future efforts must be built on the following insights:

1. Resource and Capacity Constraints

Resource-constrained schools face major barriers: stretched teaching staff, limited capacity to take on new coordination roles, parents unable to step in, timetable clashes, and competing priorities. These schools may struggle to even review proposals, especially if they do not clearly fit existing work plans or ease current pressures.

Resource-rich schools, by contrast, tend to have active Parent Teacher Associations, staff time allocated to climate and sustainability initiatives, established volunteer networks, and often existing green accreditations.

Providing toolkits alone assumes all schools have the same capacity, however, in practice this could risk widening inequalities rather than tackling transport poverty.

2. Coordination Challenges

Schools report confusion over multiple disconnected active travel, environmental, and climate initiatives from different organisations. It is unclear how programmes connect or which should take priority.

Engagement must fit school planning cycles. Approaches in April for September implementation work best, while mid-year starts clash with set curriculum.

Schools often lack the project capacity to make use of existing networks (e.g., Walk, Wheel and Cycle Trust (formerly Sustrans), Keep Northern Ireland Beautiful) that already have relationships in place.

3. Incremental Change Requirement

Rather than immediate rollout, walking buses should be framed as something to work towards. Smaller steps can build capacity and confidence over time. To support this, Design Clips developed a matrix showing the input needed for a walking bus, alongside other interventions at different scales.

Before launching programmes, schools should be assessed for capacity, resources, existing interest, activities, and community support. This helps identify schools most ready to participate, those needing extra support, and opportunities to reduce silo working by aligning stakeholder efforts.

Greatest success comes when initiatives link to existing goals such as Green Flag accreditation, health campaigns, or curriculum themes.

Schools with stronger PTAs and more resources are more likely to engage, leaving behind those with fewer supports and reinforcing existing inequalities.

4. Sustainability Dependencies

Unless programmes are encouraged at a strategic level, schools may view them as unnecessary burdens. Their wider value in teaching children about climate, environment, and place should be recognised as part of Northern Ireland's climate ambitions.

Sustained parental input is crucial but may be limited in communities where economic pressures restrict volunteer time.

Teachers cannot absorb extra coordination work on top of the curriculum without dedicated support or funding.

A one-off toolkit with short timelines is not enough. Lasting change requires ongoing support, funding, and dedicated coordination roles.

Conclusion:

The Safe Routes Healthy Places walking bus programme revealed the challenges and opportunities of community led active travel programmes and their potential if rolled out at scale. Despite the barriers to delivering the programme, it provided insights into the difficulties schools face regarding adopting extra-curricular activities and the lack of awareness of how schemes of this nature could address multiple challenges including reducing traffic and congestion at peak times and improving air quality as a result of reduced road traffic.

Future active travel initiatives should be informed by a capacity assessment to seek equitable balance in delivery to ensure no one is left behind and that all communities are supported in the transition to net zero.

Active Travel for Net Zero: A Collaborative Process

The following guidance outlines a practical, community-informed process for embedding active travel into everyday life. Developed through learning across the project, it sets out actions to improve walking, wheeling, and cycling infrastructure, alongside behaviour change initiatives. Delivering active travel will require cross-sector collaboration, shared resources including data and finance with long-term commitment to ensure safe, inclusive, and sustainable mobility for all.

Active Travel

VISION STATEMENT Streets and public spaces will support safe, inclusive, and well-connected active travel through high-quality walking, wheeling, and cycling infrastructure designed with fairness, clarity, and community, alongside targeted behaviour change initiatives, make active travel the preferred and accessible choice for all.

Key Framework Action	Impact	How
Understand needs/barriers to support modal shift towards active and sustainable travel	Clear view of barriers and co-benefits; residents and stakeholders more aware of how to shift behaviour.	Engage to understand the area needs: Hold workshops and surveys to capture lived experience on safety, accessibility, and affordability barriers. Data baseline: Review census data, travel surveys, and local emissions reports. Gap analysis: Audit existing studies to identify where evidence is missing.
		Spatial mapping: Map current transport networks, canopy cover, and flood risk to identify inequalities. School focus: Use Safe Routes Healthy Places Toolkit to run school audits from a child's perspective.
Co-design vision for active travel development in the area	Agreed set of short- and long-term actions; inclusive and locally relevant solutions.	Strategic alignment: Convene CAST partners and Translink for joined-up planning. Community- led design: Facilitate design sessions with residents to plan pedestrian zones, school streets, one-way systems, and green corridors. Inclusive testing: Engage children, older people, and vulnerable groups to test inclusivity. Make it local: Connect routes directly to shops, schools, services, and parks. Behaviour change and communication: Deliver local campaigns linking health, affordability, and climate resilience with targeted messaging to promote uptake and behaviour change.
Establish resources available and potential synergies for implementation	Integrated delivery. Reduced duplication. Clear pathways for funding and maintenance.	Project Mapping: Map active travel and greening projects already in delivery to find overlaps and synergies. Funding Plan: Create a funding plan with phased delivery and clear evaluation milestones. Synergies: Link with green and blue infrastructure programmes to maximise investment impact. Partnership and Collaboration: - Work with landowners, housing providers, and utilities to unlock sites. - Formulise partnerships with community groups, businesses and transport providers.

Belfast Net Zero Neighbourhood Framework 2025

Implement co-designed vision	- Locations and interventions secured approved. - Interventions begin roll out. - Delivery/maintenance group established.	Delivery of safe, segregated infrastructure: - Roll out safe, segregated cycle lanes through the Belfast Cycle Network. School pilots: - Pilot walking and cycling buses in schools to normalise low-carbon commutes. Shared schemes: - Expand Belfast Bikes with new bike types (non-standard and adapted cycles) and secure parking. Public transport: - Upgrade bus shelters with lighting, seating, and real-time information. - Re-design large junctions with extra crossings and traffic calming. Placemaking: - Plant street trees and pocket greenery to make active routes more pleasant.
Long term vision	- Sustained modal shift. - Measurable reductions in emissions and improved health. - Agreed and refined framework.	Monitoring: - Monitor modal share, air quality, and carbon savings across neighbourhoods. Education: - Embed active travel into the school curriculum and public campaigns (Eco Schools, Green Flag). Maintenance: - Establish ring-fenced budgets for long-term maintenance of paths, cycleways, and greening. Policy: - Make walking and cycling the default through planning guidance, developer obligations, and incentives. Accountability: -Use annual reporting to track delivery against 2030 targets.

Image: Cycling in Belfast

Image: Cycling in Belfast

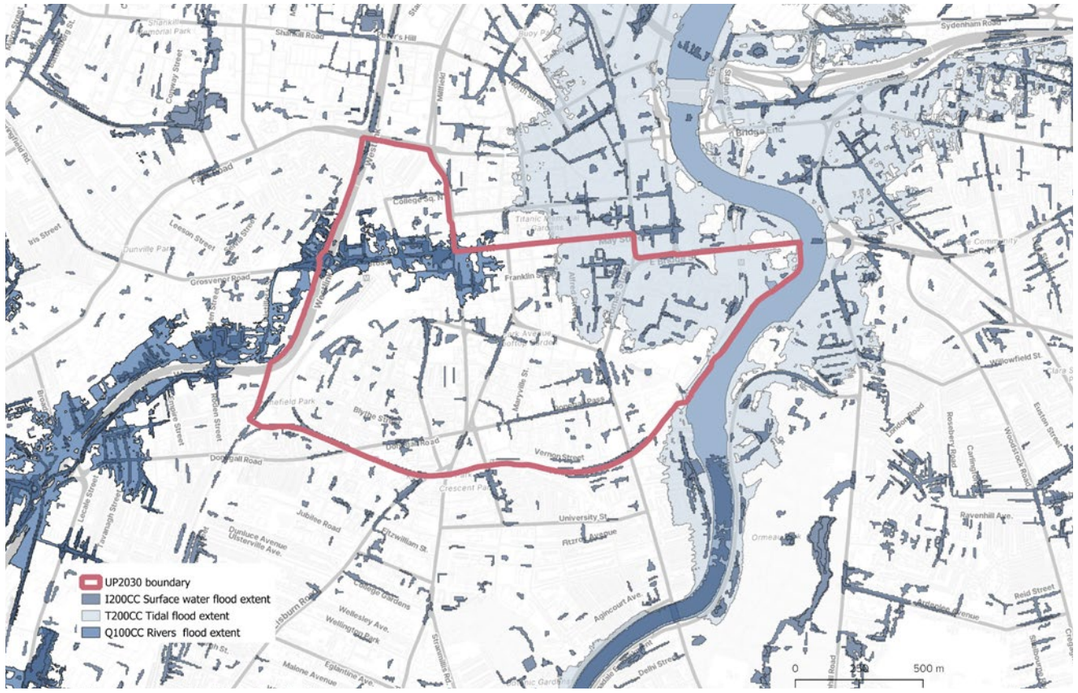
3.3 Greening

Challenges and Current Picture

The UP2030 Pilot Project Area highlights how exposed Belfast is to climate change. The River Lagan, which borders this area, has a history of significant flooding and increasingly wet winters which places homes and businesses at greater risk.

The imbalance between grey and green infrastructure is stark; over **90%** of Belfast's 86.2km² of land is covered by roads, buildings and car parks, and only 10% makes up publicly accessible green space. Tree canopy cover in the pilot area is just **6%**, compared with the city average of 18%. This lack of green infrastructure results in ecosystem and biodiversity stress, limits drainage, intensifies flooding, and traps heat, reduces biodiversity, and undermines public health. The Segregation and the Environment Report highlight how these pressures fall hardest on disadvantaged groups. Limited access to trees and green space is an environmental justice issue, and greening interventions can serve as a shared priority for communities.

Fig 14: Flood projections in the UP2030 project area – Generated by Flood Maps (NI) - Flood Hazard & Risk Maps for NI, 2025



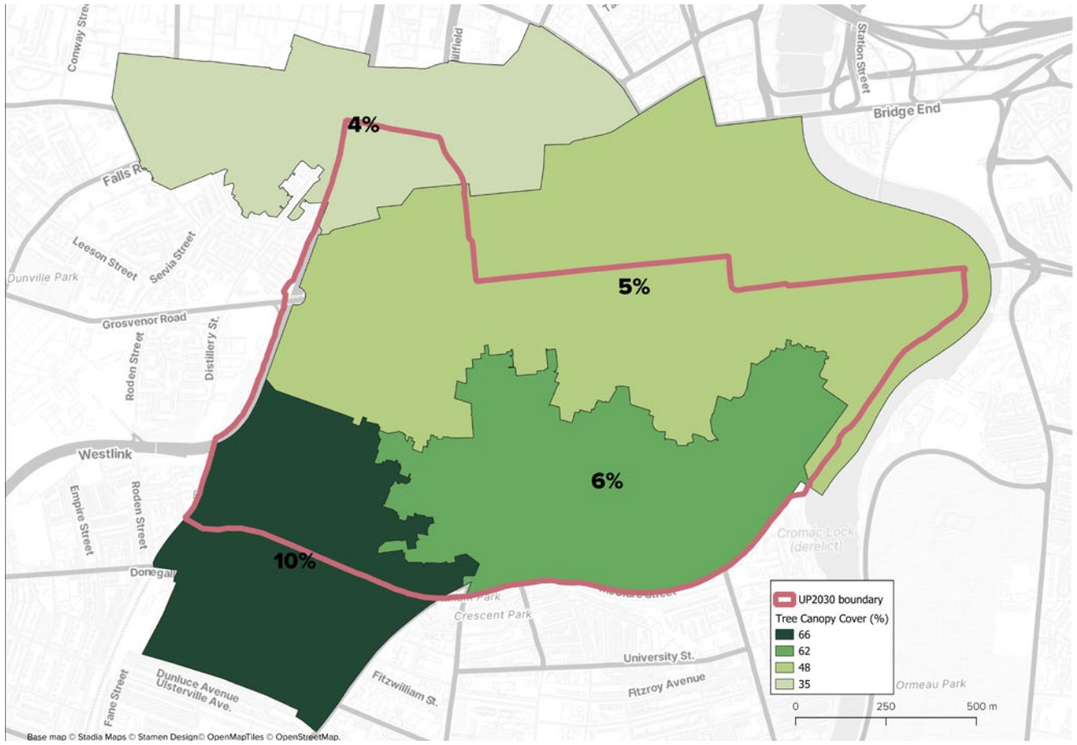


Fig 15:Extract of Tree Equity Score for the UP2030 area, courtesy of Tree Equity Score UK, 2025

The Role of Green Infrastructure

The Landscape Institute defines Green Infrastructure (GI) as a strategically planned and delivered network of natural and semi natural areas, green spaces, rivers and other landscape features, designed and managed to provide a wide range of ecosystem services and benefits for both people and nature.

In Belfast, expanding and enhancing the existing green infrastructure in the city means:

- Cleaner air and reduced heat stress
- Improved flood resilience and drainage
- More space for biodiversity and food growing
- Better physical and mental health
- Stronger community connection and pride of place

Belfast City Council initiatives such as the **1 Million Trees** programme, Grey to Green, and the UPSURGE project are beginning to shift momentum toward a greener, more climate-resilient city. These efforts are complemented by an ambitious city-wide target to increase overall tree canopy coverage to **30%** by 2050. This commitment is not only reflected in on-the-ground interventions but is also embedded in strategic planning policy, including the Local Development Plan and Supplementary Planning Guidance documents such as the Blue and Green Infrastructure Plan, Trees and Development, Placemaking and Urban Design, and Sustainable Urban Drainage Systems (SuDS). Together, this guidance reinforces the role of urban greening as a core priority for environmental justice, biodiversity, and community wellbeing. Aligned to this is the Belfast Tree Strategy, Valuing Belfast's Urban Forest and the Belfast i-Tree Eco Report.

What Communities Told Us

Through engagement, residents were clear about what they want:

- More trees, greener streets, and accessible parks
- Community gardens and allotments to reduce isolation and support food growing
- Nature-based play, wildflower patches, and small-scale greening in underused spaces
- A sense of ownership over local spaces, built through participation and shared action.

These asks underline that green infrastructure is about much more than climate adaptation. It is about social connection, education, and long-term stewardship.

Image: Community event

Case Study: CityTree in Donegall Pass

Donegall Pass sits within one of Belfast's Air Quality Management Zones and heavy congestion and poor air quality have long worried residents. To mitigate this impact, one of the community organisations proposed applying for funding to install a CityTree, an innovative moss-based filter designed to capture particulate matter and cool surrounding air.

Image: Growing in Belfast city centre

Based on residents' concerns about air quality, we saw this as an opportunity to test whether such technology could play a meaningful role in Belfast's wider greening strategy. Using the CityTree Executive Booklet (as of October 2024) which claims that the CityTree product reduces the CO_2 equivalent of **44** trees, and cooling equivalent of **81** trees, we carried out a cost benefit analysis comparing CityTree with 44 real trees, looking at costs, delivery challenges and wider environmental benefits. The aim was not to position one against the other, but to understand how they might complement each other in tackling air pollution and climate impacts in constrained urban environments.

Real Trees Benefits

Air Quality, Noise Pollution & Carbon Sequestration:

Trees help clean the air, store carbon, and make cities quieter and cooler. In Belfast, they remove more than **210** tonnes of harmful pollutants from the air each year, a service worth about **£7.5 million**. They also lock away around **319,000** tonnes of carbon and capture nearly 8,890 tonnes of carbon annually, which is valued at almost **£290 million**. Well-planned planting can also guide air flow and act as a barrier, reducing the amount of pollution people are exposed to.

Cooling & Flood Mitigation:

Trees in Belfast contribute significantly to cooling and flood mitigation through canopy interception and root absorption. Belfast's urban forest intercepts over **1.3 million** litres of rainfall annually, reducing surface runoff and alleviating pressure on drainage infrastructure. This process improves water quality by filtering pollutants and supports climate resilience by regulating urban temperatures and mitigating the urban heat island effect. Sustainable Drainage Systems such as tree pits and vegetated areas are promoted to slow water flow and mimic natural drainage, particularly in flood-prone areas.

Biodiversity & Habitat:

Urban biodiversity restores ecological functions and the ecosystems that supports plants, animals and insects to move, adapt and thrive. Protecting and restoring habitats is vital and Belfast's urban forest encourages physical activity and outdoor recreation, contributing to healthier lifestyles and greater emotional wellbeing among residents.

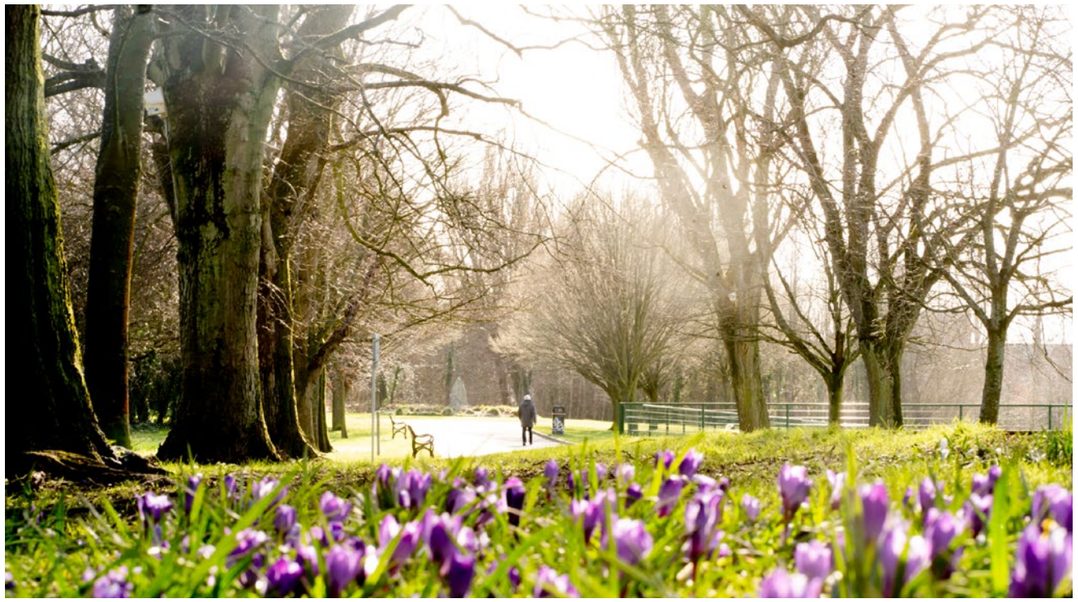


Image: Green space in Belfast

Social & Cultural Value:

Urban trees foster civic pride and strengthen community identity by embedding ecological, cultural, and sensory value into the cityscape. They enhance mental wellbeing and create spaces for reflection, gathering, and cultural expression, reinforcing a sense of place across Belfast's neighbourhoods.

Health and Wellbeing:

Access to trees and green space is linked to reduced stress, lower blood pressure, and improved mental health. Belfast's urban forest encourages physical activity and outdoor recreation, contributing to healthier lifestyles and greater emotional wellbeing among residents.

Longevity:

With proper care, trees can live for 50 to 200 years, delivering increasing environmental, social, and economic benefits over time. Their long lifespan makes them a vital investment in Belfast's climate resilience and public health infrastructure.

Real Tree Costs:

Initial Planting:
Lower than CityTree, especially for standard street trees.

Maintenance:
Pruning, pest control, and replacement every 8–15 years if poorly planted.

Space Requirements:
Need soil volume and canopy clearance to thrive.

CityTree Benefits

Compact & Mobile:
Ideal for dense urban areas with limited soil or canopy space, requiring a compact footprint (9m²), suitable for paved sites

Immediate Air Filtration:
Uses moss cultures and Internet of Things (IoT) sensors to remove pollutants like particle matter (PM2.5) and nitrogen oxide (NOx).

Data & Visibility:
Offers real-time environmental data and can be branded for awareness campaigns.

CityTree Costs

High Initial Investment:
Units can cost up to £50,000 each.

Maintenance & Lifespan:
The product lifespan is 7–10 years, with specialist maintenance required (power, water moss replacement).

Limited Ecosystem Services:
Does not offer shade, biodiversity, or cultural value.

Cost Benefit Analysis Summary

Factor	CityTree	44 Trees*
Initial Cost	£20,000 - £50,000	£62,355 (of planting)
Maintenance	Regular servicing, energy supply, specialist input	£1065 (basic care)
Lifespan	7-10 years	Decades to centuries (species dependent)
Carbon Capture	Limited – mainly air filtration	5438 kg captured long-term (LiDAR data))
Space Require	9m²	Street planting, requires below and above ground space
Additional Benefits	Compact design, immediate performance	Biodiversity, shade/cooling, flood mitigation, improved streetscape, educational and social value

Table 7: Cost benefit analysis summary, April 2025

*Estimated using available cost information as of April 2025. Figures are indicative and subject to change depending on species, planting conditions and long-term maintenance require-ments.

What we learned

- CityTree can complement, but not replace, real trees. It offers a compact and immediate intervention in spaces where traditional tree planting is not possible.
- Real trees take longer to establish but provide far wider benefits: improved air quality, cooler streets, noise reduction, higher property values, active travel, biodiversity and community well-being.
- Over time, trees are more cost-effective and play a vital role in climate resilience.

Challenges to Delivering Green Infrastructure:

- Space in cities is constrained by buildings, services and underground utilities.
- Landowner permissions, liability concerns and cross-agency coordination are often slow and complex.
- Communities cannot act alone: multi-year investment and cooperation across partners are needed.
- Early community engagement reduces resistance (e.g., blocked light, safety, parking) and helps prevent vandalism.

Long-term management must be built in from the start. Short bursts of capital funding are not enough to sustain lasting greening projects.

Image: Community growing in Belfast

Case Study: QUB Social Innovation Challenge: ‘Making Belfast a Green and Playful City’ Queens University Belfast (QUB) and Northern Ireland Housing Executive and Belfast City Council (NIHE)

Through the action phase of the project, the UP2030 team sought opportunities to test ideas and approaches for greening and growing opportunities in the pilot neighbourhood. The team liaised with QUB and NIHE to explore opportunities for sites within area that could most benefit from greening and growing interventions and address multiple challenges beyond improving climate resilience. A large enclosed hard landscaped space between the residential streets of John Street and Hamill Street was chosen as the site. An initial site audit was completed by the UP2030

team, QUB and NIHE, which highlighted issues regarding dumping, clutter, and an inconsistent use of the space, a possible legacy of the demarcated lines from the space’s previous use as a car park. The site had evidence of children’s play equipment and growing initiatives from residents and these indicators of informal use helped to shape the approach to the case study, which sought to build on these elements for improved use and enjoyment of the space.

QUB led a social innovation challenge for post graduate students from a variety of disciplines, which involved the students engaging the community at a consultation fun day to understand current perceptions towards the site and discuss challenges and opportunities to making the area greener and more playful.

The outcomes of the consultation demonstrated that planting and growing initiatives proved popular with residents, as well as visual improvements to the space with the likes of murals and shared resources such as a tool library and bike shared. Challenges including dog fouling were flagged, but overall, there was interest for multiple uses of the shared space which could be brought forward with planting and growing opportunities such as tree nurseries and community food growing, seating and social space and one suggestion even included a running track around the perimeter of the space.

During the project, the site became occupied as a work site to support upgrades to the social housing stock which prohibited further steps towards development and delivery.

Image: John Street and Hamill Street

Beyond the completion of the UP2030 project, the site will continue to be an opportunity to test smaller scale approaches to greening, community co-design as well as an opportunity to engage citizens about the importance and benefits of greening, growing and the wider ambitions of climate resilience for the city, should resources become available to bring this forward.

NIHE arranged to have rubbish removed from the site to restore the space and increase a sense of pride. Residents of the area have already taken steps to make the area greener, being resourceful with discarded materials.

Una and Terry live in the area and told us about how they are fostering greening and growing opportunities within the space:

"This and the other tank were discarded from homes that are being retrofitted in our area. There are a couple of other people who are using discarded water tanks for planters in the area. If we hadn't taken them as planters, they would have ended up in landfill. The majority of the houses here don't have gardens, so we are using what little space we have in our alleyways and at the front of our houses to bring a tiny piece of nature into our lives."

Greening for Net Zero: A process for implementation

This process presents key actions shaped by learning throughout the project to bring forward greening and growing opportunities in neighbourhoods. It offers practical ideas and collaborative mechanisms to build a resilient, biodiverse and inclusive neighbourhoods supporting climate goals, public health, and social equity. It's designed to guide cross-partner efforts and will require strong cross-sector collaboration, shared resources, and long-term commitment from partners and the community.

Image: Residents growing using upcycled bins and oil tanks

Image: Una and Terry's reuse of a discarded water tank as a planter

Greening

VISION STATEMENT The neighbourhood has a resilient green network of routes and spaces that mitigates flooding, cools and protects our neighbourhood, supports biodiversity, improves air quality, and enhances public health, while making active travel and everyday life more enjoyable and sustainable.

Key Framework Action	Impact	How
Understand needs/barriers to supporting greening and growing	- Identified needs and barriers to supporting greening and growing. - Better understanding of residents' perceptions of green spaces. - Ability to identify spaces for greening and growing that support resilience and a fair and just transition to net zero/ tackle inequality.	Engage to understand area needs - Engage communities to establish needs and desires for greening and growing opportunities in the area, including experienced or perceived challenges to bringing these forward. Prioritise planting where the need is greatest - Map areas with poor air quality, high deprivation and low canopy cover. This aligns with the Belfast Tree Establishment Strategy's commitment to tackling inequality and targeting investment.
Co-design vision for greening and growing development in the area	-An agreed common vision including a range of scalable actions and interventions for the short and long term. -Strengthened community cohesion and civic pride. -Better understanding of how smart investments into greening and growing initiatives can provide multiple benefits for the people and place.	Engage to co-design the proposal - Using information from the needs analysis, engage residents and other stakeholders to produce a common vision that seeks opportunities for immediate action as well as longer term ideas for the community and the area to become greener and more resilient. Design with opportunities for co-benefits in mind - Educate residents and other stakeholders on the link between climate action and opportunities to address social issues within the community to help make it relevant. Growing initiatives and food partnerships are an opportunity to address social isolation, improve health and support food justice, which all contribute to community wealth building. Celebrate Community Identity - Involve residents in design and decision-making and encourage the use of greening as a platform for art and community pride. Engage with a broad range of ages and abilities to ensure proposals are robust – the Safe Routes Healthy Places resource includes materials for engaging children to complete a street/area audit which could add another perspective to the design and produce ideas that make the area more enjoyable for everyone.

		Strengthen community involvement - Build capacity for residents to play a role in planting and care. Support the establishment of Tree Wardens, Friends groups and volunteer schemes. Plant more, but plant smart - Focus on putting the right trees and/or growing spaces in the right places (e.g., fruit trees, seasonal hedges) and making use of underutilized spaces (e.g., car park edges, rooftops, streets). Plan for long-term management, not just planting - Consideration for sustainable maintenance, watering, and monitoring must be built into plans, contracts and budgets to protect the investment and ensure long term success. Integrate green infrastructure into all stages of design - Ensure trees and green space are not an afterthought but designed into streets, developments and regeneration schemes from the outset.
Establish resources available and potential synergies for implementation	- Opportunities identified for collaboration in the short and long term. - A map of connected projects in the pilot area. - Resources established for the implementation and maintenance of interventions.	Liaise with strategic partners - Collaborate with community greening and growing organisations and city stakeholders (including BCC, NIHE, local schools etc.) to identify opportunities for partnership working like space/land use, and/or access to resources such as volunteer time, materials or funding opportunities. Educate and Empower - Use creative tools (e.g., posters, QR codes, events) to build awareness of upcoming plans and to encourage participation at planting/growing events. Use these engagement opportunities to highlight the value and benefits of greening and growing for the community as well as teaching people HOW to grow, care for, and appreciate green spaces.
Implement co-designed vision	- Locations and interventions secured approved. - Interventions begin roll out. - Delivery/maintenance group established. - Enhanced greening in the area.	Grow Together - Encourage shared growing and skill-sharing across generations and opportunities to do this in the area such as through the (further) development of community gardens, urban orchards, and small allotments. Make Green Spaces Safe and Welcoming - Consider how to mitigate against and address vandalism and antisocial behaviour as well as improving the experience of the space through things like improved lighting, seating, and accessibility.
Long term vision	- Agreed and refined framework.	Agree a programme of reviewing and monitoring the success of the vision delivery including a regular milestone check in to review progress.

		- Sense check the vision periodically and refine as necessary, particularly in reference to alignment with regional and city ambitions. - Embed an element of flexibility to allow for quick response to funding/resource and partnership opportunities at various levels. - Link in with community greening and growing organisations and city partners to raise the profile of the vision and identifying collaboration and delivery opportunities.

Resources:

- UP2030 engagement recommendations
- Tree Establishment Strategy
- Air Quality Reports
- Flood Maps NI
- Greenspace NI Map
- The Future of Northern Irelan's Urban Green Spaces: Vision and Routemap
- Safe Routes Healthy Places toolkit (Appendix 2)

Image: Community garden with tree

Image: GROW Community Garden, Belfast

04

COMMUNICATION AND ENGAGEMENT IN THE NEIGHBOURHOOD

A critical part of the UP2030 project was built on the principle of co-design, where communities and city stakeholders would shape the net zero neighbourhood framework to **ensure alignment of climate action with local community priorities.**

To do this meaningfully, we first had to explain why we were creating this framework and unpack the core issues driving it. Climate conversations can feel abstract or overwhelming at times and bridging the gap to show that this work is about more than climate, that it's also about shaping resilient thriving places was essential.

From the outset of the UP2030 Project, we recognised that building a net zero neighbourhood in Belfast would require more than technical solutions, it would demand clear, inclusive communication and meaningful engagement with the people who live and work there. It is vital that those impacted by spatial and climate change inequality must shape the solutions. A co-design process helps redistribute power and transforms consultation from tokenism into agency.

Public understanding of climate change and net zero remains limited in Northern Ireland, which can contribute to a general resistance to engage. The Department of Agriculture, Environment and Rural Affairs (DAERA) surveyed residents across Northern Ireland in 2024 to ascertain the public knowledge on climate change policy. 61% of those surveyed are supportive of the executive's aim to reduce emissions produced by industries, transport, food and homes to net zero by 2050 (with 13% opposed).

Image: Open Botanic 2024

When asked about net zero, **47%** of respondents reported that they either do not understand the concept of net zero or understand it only vaguely. This underscores the urgent need for locally tailored and accessible communication strategies that can clarify the concept and make it relevant to people's daily lives.

Between March 2023 April and May 2025, we carried out extensive engagement across the UP2030 pilot area. Our aim was to understand how people perceive climate change and net zero, what barriers they face in engaging with these issues, and what they want from a greener, more sustainable neighbourhood.

We engaged through one-to-one meetings, site walks with community representatives, targeted workshops with government, academic and community partners, a social innovation challenge with QUB students and the local community, and a Neutrality Story Maps at the Open Botanic Festival 2024. We also held sense-checking workshops to test and refine our findings with local communities.

Communication Challenges	Our Engagement Principles
Low public understanding of climate change and net zero, often seen as vague or inaccessible	Use clear, relatable language rooted in everyday life. Support conversations with visual and interactive tools
Wide variation in knowledge and lived experiences	Start where people are, and ground conversations in the local context and everyday priorities
Technical and policy-heavy language alienates people	Reframe conversations around tangible community benefits (e.g., cleaner air, safer streets for walking, wheeling and cycling, and reduced bills)
Climate messaging can feel guilt-driven or disempowering	Focus on achievable actions and celebrate local success stories and progress
Political sensitivity and climate scepticism	Keep conversations focused on shared values and practical solutions, emphasising the need and benefits of making Belfast a more resilient and sustainable city
Lack of time, trust, or access to information	Offer flexible, informal and inclusive formats (e.g., pop-ups, social media, peer-led events) that fit into people's lives

What we heard

Understanding of net zero varied widely. While some participants associated it with sustainability, emissions, and weather changes, others found it abstract, unfamiliar, or even politically charged. A few expressed scepticism, referencing greenwashing or feeling overwhelmed by technical language. Many said climate information feels inaccessible or disconnected from their daily lives.

This variation wasn't just about awareness, it reflected differences in lived experience, priorities, trust in institutions, and capacity to engage. These insights directly shaped our communication approach, leading us to define a set of practical engagement principles.

Key Challenges and Our Engagement Principles

These principles guided the design of every activity we delivered across the UP2030 pilot area. They also helped us adapt when engagement needed to change direction or format.

What we tested

Events, Activities and Tools

Between April 2023 and May 2025, we designed and delivered a series of engagement activities shaped by our core principles. Each was tailored to meet people where they are socially and geographically, and to test inclusive, creative, and locally relevant ways of communicating net zero.

Key activities included:

- Informal conversations in community spaces with food and shared activities, building connection through listening-focused engagement centring residents' own stories and experiences.
- Neighbourhood walkabouts to further our understanding of challenges and opportunities at different scales within the area.
- Attendance at public facing events to capture a range of voices and opinions.
- Workshops with a range of groups and stakeholders dedicated to shaping the framework and project learning.

Whilst the format of the session may have been adapted to different contexts and audiences, we tried to consistently capture information on two main elements:

1) Current understanding of net zero

How: We encouraged people to tell us 'What three words' they would use to describe net zero, collected via interactive tools such as 'Mentimeter', on paper within a session, on flip charts at events and through one-to-one conversations.

Why: We wanted to understand where people are at when they enter the conversation and how terms like net zero are understood both individually and collectively, answers also provided insight into their priorities, interests and feelings towards the topic.

2) Citizen experiences and stories

How: We captured these in survey format and asked participants to complete them at the beginning of sessions.

Why: We wanted to explore people's views and experiences on how they see climate change affecting Belfast and their daily life; whether they have made changes to their home, lifestyle or travel behaviour and what would motivate them to do so, as well as what they envision a net zero neighbourhood would look like in Belfast and the changes needed to make it happen. Apart from generating valuable insights, the survey provided a useful platform to quickly connect with people on issues most relevant to them and explore further discussion and ideas. The outputs from this helped to shape our Neutrality Story Maps and Community Personas.

Image: Open Botanic 2024

Examples of Engagement

1. Open Botanic Festival

Date: 15th September 2024
Audience: General public, families, young people
Approach: We hosted a visually engaging pop-up stall designed to encourage informal, family-friendly engagement. Activities supported intergenerational conversations and used consistent tools to capture insights.

Key activities included:

- Poster with map of area encouraging participants to interact and contribute to the ask: "What's your big idea for a greener neighbourhood?"
- Colouring-in station for children, using poster sections to spark discussion, this activity provision also served to keep children occupied to allow for engagement with accompanying adults.
- Quick survey to capture citizen experiences and stories.

Flip chart asking people to share three words they associate with net zero, generating engagement and discussion.

2. World Cities Day

Date: 29th October 2024
Audience: Belfast City Youth Council
Approach: Held at the Crescent Arts Centre, this evening event marked World Cities Day 2024 (theme: Youth Leading Climate and Local Action for Cities). Attendees included Belfast City Youth Council members, the Lord Mayor, and the Council Climate Commissioner.
Key activities included:

- Presentation on the UP2030 project.
- 'Walking debate' and small group sessions sparked open discussion.

Group discussions responding to thematic questions, encouraging them to share and discuss their ideas and priorities.

3. Sense-Checking Workshops

Date: Spring 2025
Audience: Mixed community participants
Approach: These sessions were designed to validate findings and test resonance of emerging ideas from the project. Feedback confirmed the importance of framing Net Zero through everyday benefits and maintaining an ongoing, two-way conversation.

Key activities included:

- Presentation on the UP2030 project.
- Activity to validate 'community personas'.
- Group discussions responding to thematic questions, encouraging them to share and discuss their ideas and priorities.

Neutrality Story Maps and Community Personas

Storytelling Through the Neutrality Story Maps

The Neutrality Story Maps (NSM) digital tool was developed by Vrije Universiteit Brussel (VUB) in collaboration with Centre for Research and Technology Hellas (CERTH) as part of the UP2030 Project to support communication and engagement around climate issues. It allowed us to gather and synthesise local stories, priorities, concerns, and aspirations, creating a narrative-based bridge between residents and the project's technical goals.

Image: Free colouring in resources created for child engagement

The Belfast Neutrality Story Map platform can be accessed online: https://m4d.services.iti.gr/up2030/app/belfast

We used this tool to listen across a diverse range of voices from community leaders and families to young people and seniors over the course of our engagement sessions and activities. Through workshops, informal conversations, and surveys, these stories were distilled into a series of fictionalised but relatable personas.

These personas became a useful engagement tool creating a starting point for open discussions without judgement.

Community Personas

Each persona reflected real themes and emotions gathered through project engagement. They helped surface perspectives that might otherwise go unheard in formal consultations.

Katie

A busy parent juggling work and family. Katie supports active travel but is concerned about safety. She dreams of a city where bikes, not cars, lead the way.

Mary

A lifelong resident who has noticed more flooding and worsening air quality. Mary's focus is on community health and the cost of living. She believes local education and grassroots solutions are key to climate resilience.

Thomas

Frustrated by climate messaging and sceptical of the movement, Thomas wants less talk and more tangible solutions, better housing, transport, and financial incentives to drive real change.

Zoe

Weighed down by climate anxiety and the pressure to act, Zoe sees barriers to sustainable living, but she's driven by a vision of strong leadership, inclusive spaces, and a community rising together for change.

Max

A tech-savvy teen full of optimism, Max is eager to get involved, he sees climate action as a chance to shape Belfast's future through innovation and youth-led ideas.

Testing the Personas

We tested these personas with individuals and groups across the pilot area, using them as icebreakers to initiate safe, judgment-free conversations. Participants were asked: “Do any of these feel familiar to you?” or “Who do you know that’s a bit like this?”

This prompted honest, sometimes emotional responses. People shared their own frustrations, hopes, and ideas and often recognised themselves in more than one persona.

The persona approach proved especially valuable with groups who might be less likely to speak up in traditional formats. It made the climate conversation feel more personal and grounded in real life experiences.

Persona	Relatability	Key areas of Agreement
Thomas	Highly relatable	Frustration with government messaging, scepticism toward climate change and the climate change movement, concerns about housing quality, transport, infrastructure and waste management, would welcome financial incentives to drive action
Mary	Very relatable	Noticing the increase in extreme weather events such as floods, and the impact on the city. Cost of living and health a key priority for community. Would like to see community engagement and more opportunities to educate and empower at the grassroots level.
Katie	Highly relatable	Support for active travel, concerns about safety, desire for a less car-dominated city
Max	Somewhat relatable	Youth engagement and awareness, excitement about the future and new technologies, desire to act
Zoe	Relatable and representative	Climate anxiety and feeling overwhelmed about personal and social responsibility to act. Barriers to sustainable living, desire for community action, safety and inclusion, and strong leadership

Belfast Net Zero Neighbourhood Framework 2025

What we Learned

Start with lived experience

Engagement was most effective when rooted in daily concerns like car parking and congestion, increased energy bills, and access to green space, not abstract climate goals.

Use language that connects, not confuses.

Technical or policy-heavy terms alienated participants. The use of plain, relatable language and visuals where possible, opened the door to more meaningful conversations and supports engagement across a wide range of abilities and backgrounds.

Education is empowering

Share only the most relevant information with simple definitions and relatable explanations, and incorporate icebreakers, interactive activities and games that help to create shared understanding of the issues leading to more relaxed and productive conversations. This supports a fair and just transition to net zero by making the journey inclusive and accessible to everyone.

Insights highlighted the need for knowledge sharing and capacity building across communities and stakeholders, along with the need to discuss climate action within a broader context, to reduce barriers to engagement.

Image: Engagement at Donegall Pass Community Garden

Storytelling opens doors

Asking people to reflect on how their area has changed, what it used to feel like, how children experience the area, what they'd love to see restored, helped bridge emotion and action. Storytelling sparked nostalgia, pride, and hope, and made space for imagining positive change.

Tailor approaches and activities to audiences

We adapted our engagement styles for the interest of the audience and found that this fostered better connection in the session, e.g. emoji mapping the area with older children as a way to discuss how they feel about their neighbourhoods helped to provide insights into their perspective and spark conversations about what they think Belfast in 2050 could look like.

Connect the co-benefits

Showing how climate action can deliver co-benefits such as improved health, economic opportunity, and social cohesion helps to reduce barriers to engagement and avoids presenting it as a standalone issue. This approach made the conversation more accessible and relevant to people's everyday concerns.

Focus on momentum, not guilt

Empowering, action-based messaging was better received than content framed around sacrifice or fear. Reframing around local success stories, achievable actions, and future potential created a more constructive, optimistic tone.

Flexible formats increase reach

We got the best engagement when we met people in spaces they already use, with formats that didn't demand too much time or prep. Casual chats worked much better than long, structured sessions.

Personas created connection

Presenting relatable characters helped people express their own views, without feeling put on the spot. It turned "what do you think about climate change?" into "do any of these people sound like you?" a much more open, engaging starting point.

Belfast Net Zero Neighbourhood Framework 2025

Recommendations and Resources

Lessons from Tool Testing

Tool	Why We Considered It	Why We Didn't Use It
Climate Fresk card game	Popular EU-wide tool for climate literacy	Requires full-day facilitator training and 3+ hours delivery time – not feasible for casual community formats
Carbon Conversations (Scottish initiative)	Small group sessions in communities, providing supportive, non-judgemental space for people to discuss and learn	The sessions consist of at least 6 regular meetings every fortnight, each 2 hours with a min of 8-10 participants – not feasible for the project timeframe
EN-ROADS Climate Solutions Simulator	Participants take on the roles of different stakeholders and negotiate to meet global climate goals	Relies on access to a computer and the dashboard is not accessible to all

Further Engagement and Resources

Resource	Use Case	Link or Note
The role of deliberative public engagement in climate policy development (University of Lancaster)	Helps shape effective, evidence-based climate imagery	https://www.theccc.org.uk/publication/the-role-of-deliberative-public-engagement-in-climate-policy-development-university-of-lancaster/
Talking Climate Handbook – how to have a climate change conversation	Communication strategies grounded in social research	By Climate Outreach: ideal for local gov staff https://climateoutreach.org/reports/how-to-have-a-climate-change-conversation-talking-climate/#
Keep Northern Ireland Beautiful – Climate Literacy Programmes	Climate and carbon awareness training	Accredited certification from the Carbon Literacy Project funded by DAERA

Business as usual means continuing on a path where buildings waste energy, streets prioritise cars, green space is scarce, and climate considerations remain an afterthought. It means accepting fuel poverty, air pollution, flood risk, and missed economic opportunities.

A net zero neighbourhood means warm homes, safe streets, connected green spaces, and communities empowered to shape their future. It means addressing climate change while improving health, wellbeing, and quality of life for everyone.

05

CARBON EMISSIONS DATA STUDY IN THE NEIGHBOURHOOD

Throughout the UP2030 project, Belfast and the University of Cambridge (UCAM) have been **working together to estimate the carbon footprint of the UP2030 project area** to see what it would take to make it carbon neutral.

Urban Carbon Emission Data Flow Mapping: University of Cambridge

This has focused specifically on the potential for housing retrofit, active travel and urban greening to reduce carbon emissions.

An interesting element of UP2030 is that despite the majority of the cities involved wanting to cut their carbon footprint, they do not have a way to estimate the effectiveness of their approaches to reducing those emissions.

Therefore, UCAM has developed a way to calculate the carbon footprint of the main emission sources of the Linen Quarter (housing and travel) and to estimate the impact of retrofitting household insulation and solar panel installation, as well as active travel.

This was based on using publicly available information about household energy consumption and energy source, to calculate household emissions, and Travel Survey Northern Ireland and census data to estimate travel emissions. This 'activity data' was then multiplied by emission factors – numbers produced by the UK Government to convert

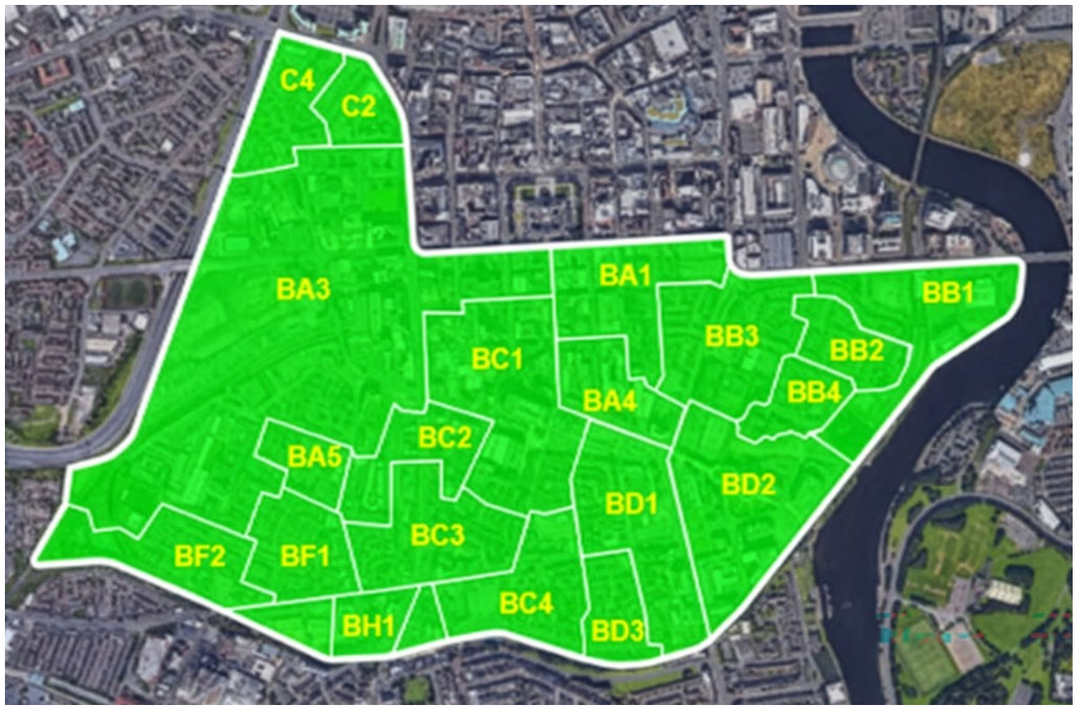


Fig 16: Census data zones within the UP2030 project area (the letters and numbers refer to the different census data zones, with C standing for Court, and B for Botanic), UCAM 2025

activity data into carbon emission estimates.

The results of UCAM's study are not produced through a direct sensing of the carbon emissions of the UP2030 project area but are based on estimations and assumptions which mean they should be used to provide an estimate of emissions rather than a scientific reading.

Findings

In total, household and travel emissions in the UP2030 project area are estimated at **20,081** metric tonnes of CO_2 per year (mt CO_2/yr), with 13,325 mtCO_2/yr from households and 6756 mtCO_2/yr from resident travel. This research also estimated the emission saving impact of trees in the Linen Quarter. However, according to our calculations, this would reduce the area's carbon footprint by only 5.5 mtCO_2/yr. While trees may not significantly reduce overall emissions through carbon absorption, they serve an important purpose for making active travel more enjoyable, through making places nicer to use and move through.

Households

In terms of the effectiveness of household retrofit a total of 1,218 mtCO_2/yr is reduced, a 6% reduction. The most impactful approach was to improve household insulation, which reduced carbon emissions by 1,036 mtCO_2/yr, followed by solar PV with 162 mtCO_2/yr reduced. Based on our calculations, if the electricity grid in Northern Ireland were to become carbon neutral, this would reduce household emissions by 2931 mtCO/yr (14.6%).

Travel

By taking national averages from the Travel Survey Northern Ireland, we estimate that 2202 people may have cycled in the UP2030 project area within the past 12 months. If this number cycled to work every day (rather than taking the car), this would reduce travel CO_2 by 599 mtCO_2/yr, and if every one of those 2202 people chose to exclusively cycle for all activities, then the total travel emissions would fall by 3120 mtCO_2/yr - reducing the travel carbon footprint by 46%.

Beyond the overall figures and estimates, it is interesting to note the differences within the UP2030 project area. By estimating per person carbon footprints, a difference of **55%** between the areas with the smallest and largest carbon footprints per person can be observed. This is determined by a number of factors, but an important element is the age of the houses in each data zone. For example, areas of the UP2030 project area which feature higher levels of older, less well insulated houses also have higher estimated emissions.

This feeds into an interesting element of how to approach building retrofit. Whilst retrofitting houses through improving window, roof and wall insulation is roughly ten times more effective at reducing the carbon footprint of the UP2030 project area households than installing solar panels, this isn't true across the whole area. In fact, mostly in the Markets, but also in parts of Sandy Row (data zones BA5, BB2 and BB4 – marked in blue below), due to the number of households who are suitable for solar power, more CO_2 could be reduced by focusing on solar than on improving insulation. However, in other areas, notable in Court 2 and 4 (C2 & C4) at the top left of the map, very few households are suited for solar, but many are in need of improved insulation.

If the data zone is blue, this means that installing solar panels would reduce more carbon emissions than insulation, however if it is green, then it is more effective to improve the household's insulation. The darker the green, the less effective solar panel installation is.

For more information, see Appendix 3: Belfast UP2030 Project Area: Carbon Accounting Findings.

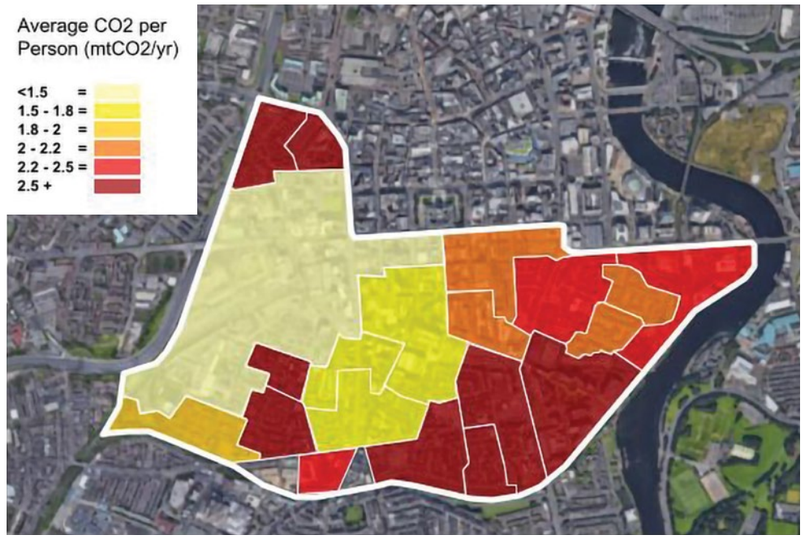


Fig 17: Map of UP2030 area showing the differences between different data zones per person carbon footprint, UCAM 2025

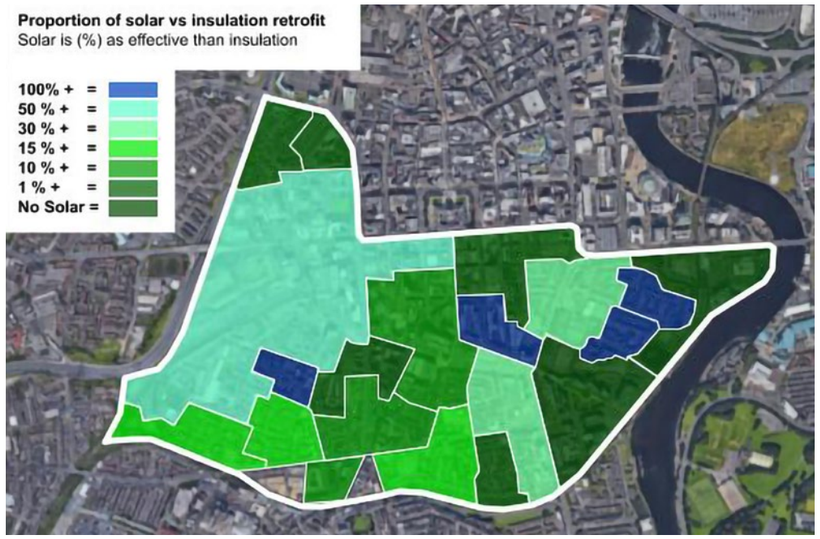


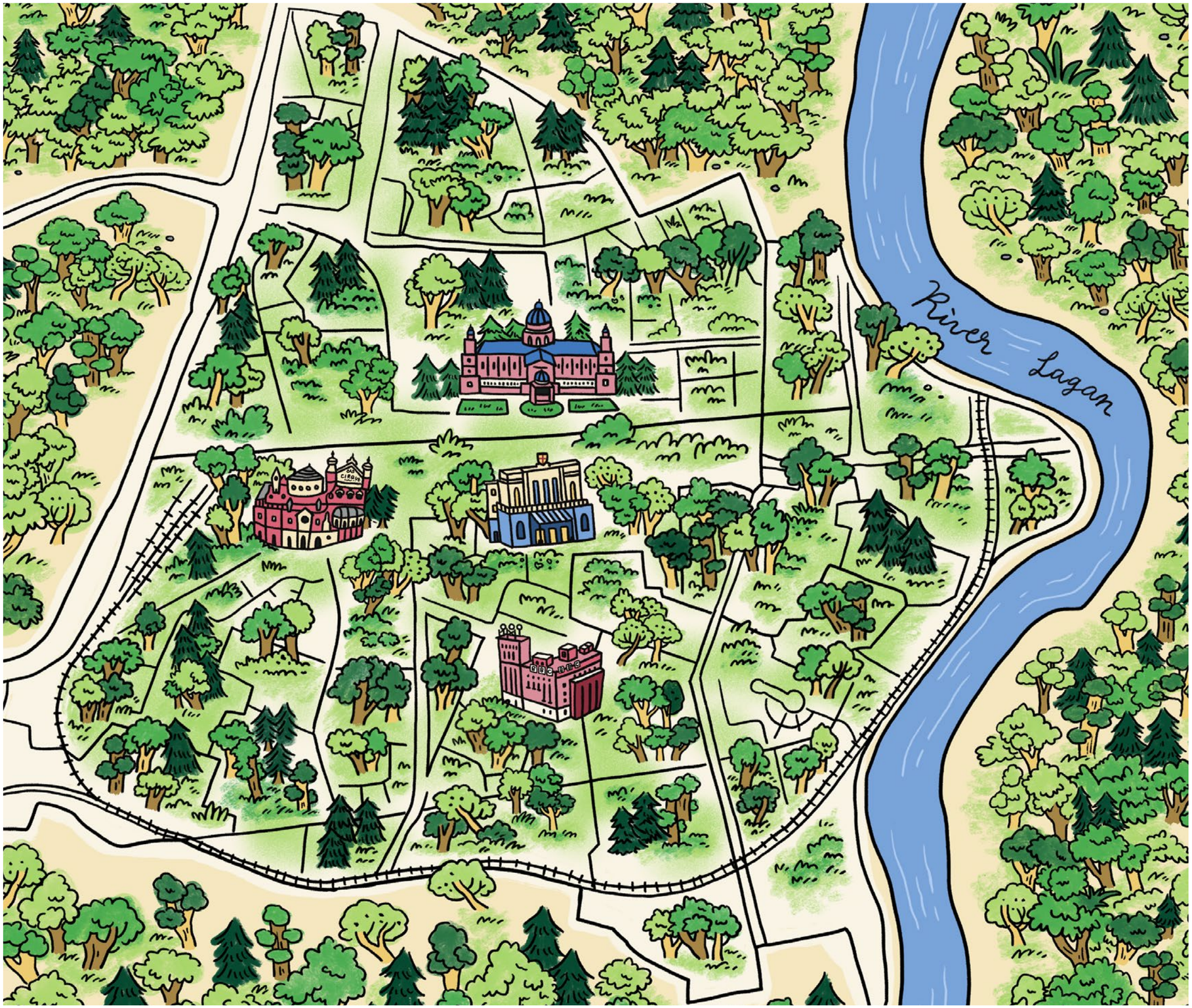
Fig 18: Map showing the proportion of solar energy carbon emission reduction in comparison to insulation, in the UP2030 area, UCAM 2025

Belfast Net Zero Neighbourhood Framework 2025

Conclusion

Even within this small pocket of the city, there are a variety of measures that would be effective in reducing emissions. The study shows that like the rest of the city, the largest proportion of emissions in the area comes from its buildings therefore that should be the first port of call. Some areas within the zone would benefit from retrofit, whereas others would create a bigger impact by having solar PV panels installed. In terms of active travel and greening, the area and its residents will see good reductions in emissions if all residents choose to ditch the car and travel to work more actively. Moreover, tree planting may not necessarily have a huge contribution to a reduction in emissions, however their impact would be more wide-ranging, making the area more attractive, greener, create precipitation interception and provide shade and homes for wildlife.

Calculations using Belfast's public tree database and Forestry Research have been used to estimate the average annual carbon sequestration for a tree in the UP2030 pilot area. Based on the approximate emissions from houses and mobility in the area, it's estimated that over 1m trees would be required to absorb this carbon if we were to attempt to reach net zero through tree planting alone.



06

NET ZERO ENABLERS IN BELFAST

To bring forward net zero at a neighbourhood level, **we must understand how these ambitions sit within the context of city-wide climate efforts** such as major projects, governance, data, strategic partnerships and capacity building.

6.1 Major projects

Belfast City Council is working closely with its community planning partners to help the city to attain net zero by 2050 and help the city to be more resilient to the impacts of climate change. This is guided by the Belfast Local Area Energy Plan (LAEP) – a whole energy system approach, carried out in partnership with key stakeholders, identifying the most cost-effective, integrated plan for the city to contribute to timebound national and local net zero targets whilst maximising co-benefits to society.

Major projects that will help to achieve climate change ambitions include:

- High temperature, low carbon district heat network - using low carbon heat sources, phase 1 would focus on office and commercial in the city centre with potential to extend to residential and other non-central locations in future iterations.
- North Belfast Sustainable Energy Community - a community led approach to achieving a net zero neighbourhood starting with production of a net zero community master plan.
- Belfast Sustainable Food Programme-co-ordination of a cross-sectoral partnership across the food system and delivery of a 3 year strategy and action plan to shape a food system that enables everyone in Belfast to have equitable access to nutrient rich, affordable that promotes human and planetary health.
- Nature Towns and Cities: Breaking through Barriers to Connect People and Nature. Working in partnership with Ulster Wildlife to co-design a blueprint for nature recovery across the city and its surrounding areas, including the Lagan Valley Regional Park and the Belfast Hills.
- Alleyways (new project by Council – funding TBC) – bringing previously unused and unsafe spaces back into use by communities for productive use such as growing and greening.
- Eastside Greenways Climate Programme– empowering people living in areas of disadvantage to connect to conversations on climate change at a local level and shape how climate action could improve their community and the lives of people in it.
- Department for Infrastructure Sustainable Urban Drainage Pilot Project – using nature-based drainage solutions such

as attenuation ponds, raingardens, swales and leaky dams to demonstrate the benefits of managing rainwater naturally on the surface, to slow its flow into rivers and sewers.

- Belfast Tree Strategy – tree, woodland and hedgerow restoration and development of a tree warden programme across the city to increase climate resilience in areas vulnerable to impacts of climate change in Belfast.

6.2 Governance considerations, reporting and monitoring

The Northern Ireland Executive holds ultimate strategic responsibility for ensuring that Northern Ireland (NI) meets its climate responsibilities, as established through the Climate Change Act (NI) 2022. The Act sets out the framework for Northern Ireland to address climate change and establish legally binding emissions targets, including the achievement of net zero emissions by 2050 (i.e. a **100%** reduction in net greenhouse gas emissions compared to a 1990 baseline), with a target for 2030 set in the Act of an at least **48%** reduction in emissions, and a target for 2040 of an at least **77%** reduction in emissions.

Image: Front cover of Local Area Energy Plan, May 2024

The Department for Agriculture, Environment and Rural Affairs (DAERA) is responsible for leading the preparation and publication of the Climate Action Plan on behalf of the Northern Ireland Executive. The Climate Action Plan 2023-2027 (in draft at the time of writing) will include policies and proposals that set out a roadmap of action needed to reduce emissions and are arranged into sectors. However, implementation will rely on coordinated action across government departments and local authorities.

The Plan is structured around sectoral leads, each led by a designated department responsible for delivery and oversight. For example, the Department for Infrastructure will develop a new Transport Strategy for Northern Ireland, which will form the basis for the first Transport Sectoral Plan mandated by the Climate Change Act. This Sectoral Plan will set out the actions required to meet statutory emission reduction targets for 2030, 2040, and 2050, including a commitment to set a minimum spend of **10%** of the overall transport budget for active travel, which will accelerate the development of a connected, low-carbon, active travel network across Northern Ireland.

As regional departments hold the powers, budgets, and levers to drive systemic change, their decisions will shape the operational landscape for local authorities. Belfast City Council will align its own climate ambitions, delivery plans, and investment priorities with the targets and sectoral pathways set out in the Climate Action Plan, ensuring local action contributes meaningfully to regional outcomes.

At the same time, Belfast is committed to playing a leadership role by not only aligning with regional targets but also demonstrating what place-based climate action can look like in practice and this Net Zero Neighbourhood Framework offers an important contribution to our understanding. Through innovation, partnership, and community-led delivery, the Council will continue to promote scalable solutions to retrofitting buildings, champion active travel and nature-based interventions, and through cross-sectoral governance structures support collaboration that accelerates a just transition. In doing so, Belfast aims to shape and inform regional policy from the ground up, ensuring that local insight and ambition are embedded in Northern Ireland's climate future.

City-wide governance levers

There are a number of existing structures at a city-wide level that oversees governance, reporting and monitoring of city projects. Belfast City Council has a Climate and City Resilience Committee that looks specifically at actions that will help the city to be not only resilient but also adapt to and mitigate against the changing climate, whilst reducing emissions to reach agreed net zero targets. Other city-wide groups such as the Our Planet Board, Strategic Oversight Group, Net Zero Delivery Group, Data Group, Retrofit Hub and the Sustainable Food Partnership, all ultimately support the reduction of emissions and the establishment of a sustainable, nature positive, low carbon climate resilient economy for the city.

Committee reporting: Climate and City Resilience

Belfast City Council's Climate and City Resilience Committee provides political oversight for the city's Climate Action Plan and its Resilience Strategy, which aim to safeguard Belfast from climate change impacts and ensure a net zero future. The committee receives reports, discusses climate risks, and makes recommendations to the Council on policies to address the climate crisis and build a low-carbon, climate-resilient economy.

Our Planet Board

The Belfast Our Planet board is part of Belfast City Council's community planning process, working to create a sustainable and nature-positive city by tackling climate change and biodiversity loss. It focuses on key priorities like re-naturing the city, establishing a circular economy, and innovating for a net zero future through initiatives such as developing green technology hubs and improving green spaces. Its membership includes a wide range of partners whose interests and work spans these topics, meeting on a quarterly basis to review the progress of sub-groups who are delivering action plans for agreed priority areas. The Strategic Oversight Group, which oversees delivery across the programme of work, meets bi-monthly or as may be required and agreed through the co-chairs, reporting back to the Board. The Our Planet Board is the overarching group that links all the groups below together, creating a city-wide structure that covers multiple projects.

Strategic Oversight Group

The role of the Strategic Oversight Group is to oversee delivery across the Our Planet programme of work. The Board is responsible for ensuring

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the delivery of strategic city-wide interventions through sub-groups that report into the group, such as the Net Zero Delivery Group and the Belfast Sustainable Food Partnership. It provides oversight and co-ordination of the Our Planet programme of work which aims to create a sustainable, nature-positive city, through three core areas of:

- Re-naturing the city and increasing resilience to climate change.
- Creating a sustainable circular economy.
- Innovating to net zero.

Net Zero Delivery Group

The purpose of the group is to provide collective leadership to promote and support the development of a coordinated series of net zero investments across the city to achieve the emission reduction targets in a cost optimal way whilst creating wider benefits for local communities. The scope of its responsibility includes:

- Co-ordinating emerging net zero investments across the city.
- Prioritising and taking forward specific actions from the Plan identifying strategic objectives and critical success factors for each emerging project.
- Reviewing and updating the LAEP pathways and actions as needed.
- Tracking and communicating progress on delivery to key stakeholders.

Data Group

The creation of the Belfast Local Area Energy Plan resulted in a rich dataset that is unique and provides a new insight to the build environment in the city. The data group members span the members of the Our Planet Board and the Net Zero Delivery group and its purpose is to provide a good strong evidence base for future projects and research in the city. The data has already been linked to social data making it an even richer resource.

Belfast Sustainable Food Partnership

Belfast Sustainable Food Partnership's vision is for Belfast to be a city of good food for all, where healthy, just, sustainable food is available and accessible to everyone. It aims to do this by working with partners in Belfast and across NI to:

- Promote a greater appreciation of the role and importance of healthy, just and sustainable food – fresh, local, seasonal – amongst the public, policymakers and institutions.
- Inspire key organisations to work individually and together to link initiatives around sustainable food to drive positive social, economic and environmental change.
- Develop a broad cross-sector partnership to involve public sector bodies, the community and voluntary sector and local businesses which will work together to attain a silver Sustainable Food Place award for Belfast.

The group's progress is reported regularly to Belfast Healthy Cities Partnership, the Climate and City Resilience Committee and the Our Planet Board.

Belfast Retrofit Delivery Hub

The Hub brings together the Northern Ireland Housing Executive, business leaders, key organisations and the Council to catalyse retrofit activity relating to all domestic, public, commercial and private buildings in Belfast. The Hub's work is guided by a steering group and four co-chairs and is informed by the National Retrofit Strategy which is produced by the Construction Leadership Council. Progress is regularly reported to the Net Zero Delivery Group and the Climate and City Resilience Committee. In the absence of an NI retrofit hub, this Belfast group represents NI at UK and Republic of Ireland events as the group members include many of the national retrofit players.

6.3 Area planning

Achieving net zero is not the responsibility of one organisation or team, its only possible if we help people to understand the necessity and value of adopting a climate lens to everything we do and help communities to bring forward climate priorities through area planning.

A key commitment within the Belfast Agenda, the City's Community Plan, is to work with communities and local stakeholders to bring forward area-based community plans. In support of this we will ensure there is a climate 'lens' applied to help communities understand and prepare for the impact of climate change and to bring forward climate related priorities for action, helping to develop resilient, low-carbon communities.

We will continue to engage with communities on issues related to climate change, raise awareness, educate and enable them to make changes that will improve quality of life, support behavioural shifts, enhance climate literacy and importantly identity actions which deliver positive social, co-benefits such as better health and economic opportunities. Examples may include establishing community gardens, promoting active travel and cycling, repair cafes, developing community energy projects, insulating homes, reducing food waste, and creating local sustainability plans. These grassroots efforts are powerful because they are place-based, flexible, build strong local relationships, and give communities a voice in addressing the climate emergency.

6.4 Data

Data and data analytics have emerged as a critical tool in the fight against climate change, enabling researcher, policymakers, and industries to track environmental changes, predict future scenarios, and develop effective solutions. From monitoring deforestation and carbon emissions to optimising renewable energy systems and predicting extreme weather events, the role of data in climate action is undeniable.

This data also has the power to help debate with anti-green and climate-sceptic agendas and countering the scaling back of environmental action.

As climate change continues to pose an existential threat, the importance of data-driven decision-making will only grow. By harnessing the power of data analytics, we can better understand the challenges ahead and take meaningful action to protect our planet for future generations. The future of climate action depends on our ability to leverage data to make informed, impactful decisions.

As we move forward, data analytics will remain at the forefront of global efforts to combat climate change, offering hope that we can address this crisis with the precision, speed, and scale that it demands. However, it must be acknowledged that these data practices, paradoxically, generate carbon emissions. More information on the role of data in net zero and climate change is available in Appendix 4.

Achieving net zero at the neighbourhood level requires robust, actionable data to guide planning, track progress, and unlock investment. As climate priorities become embedded in area plans and commercial strategies, the demand for high-quality data is growing rapidly.

Useful data sources for the development of a net zero neighbourhood:

- Climate and emissions data: localised datasets such as those available through Census, Department for Communities, PowerBI and the Local Area Energy Plan are essential for understanding baseline conditions and identifying high-impact interventions, and can help shape where investment should be directed.
- Geospatial data: Data relating to flood risks, heat risks and climate vulnerabilities can reveal where nature-based solutions would be best placed for maximum benefit.
- Smart city infrastructure: Real-time data from sensors, such as air quality monitoring, supports environmental tracking, traffic flow optimisation, and energy efficiency.
- AI-powered modelling: Artificial intelligence enhances predictive capabilities, enabling cities to simulate outcomes, track carbon performance, optimise smart buildings and infrastructure and predict future patterns of transport and travel in line with policy and behaviour change.

6.5 Knowledge Sharing and Upskilling

An issue that was raised at every stage of the development of this framework by stakeholders was the need for knowledge sharing, empowerment and support.

Knowledge and skills for residents: Discussions with community representatives focused on how to make homes comfortable, warm, healthy and affordable to heat. One of the major barriers (after finance), was a lack confidence in making the right choices and finding quality contractors to do the work. An approach commonly used is provision of one stop shops, sometimes provided by government agencies or community-based groups.

Community groups such as the Warm Home Hub in Galway are well-placed to build local confidence in retrofit as they are likely to be trusted by the people in their area and can provide advice without the pressure of a sales pitch. Support and knowledge sharing might include providing advice about draught-proofing or insulating their homes, running events to show off local examples of successful home retrofit, or starting a project to install a low-carbon heating system in a community building, church or school. The Inner North Belfast Sustainable Energy Community is currently piloting this approach, using the Sustainable Energy Communities model from the Republic of Ireland and training community members to work with local residents to understand how to make their homes more energy efficient

Net Zero Training for Urban Placemakers: Through the project, a need was identified for knowledge sharing among placemakers to ensure the most to date learning was being disseminated and elevated. As such a suite of training resources and materials has been procured to address this, providing upskilling around climate-led placemaking approaches.

Strategy for green skills: The newly published Green Skills Action Plan, by the Department for the Economy, 2025), provides NI's first framework to address the skills gap, recognising the opportunities with an estimated **105,000** jobs in the green economy in Northern Ireland with an additional circa **58,000** predicted by 2025. Green skills will play a vital role in the delivery of reducing Belfast's carbon emissions and offer significant economic opportunities for the city, its businesses and residents. At the same time, however, the UK and Republic of Ireland are facing a significant green skills shortage in the retrofit sector, requiring hundreds of thousands of skilled workers, including installers, assessors, and retrofit coordinators in order to meet net zero targets.

Key challenges include an ageing workforce, lack of an NI pipeline of retrofit projects to provide certainty of work and a lack of funding for cross sectoral retrofit programmes that can be seen in Great Britain and the Republic of Ireland. National retrofit leads in England, Scotland and Wales strongly advise the establishment of skills programmes in advance of any funding programmes as the establishment of labour and material supply chains can take between 5-10 years.

Whilst vocational training providers such as South Eastern Regional College and Belfast MET have offered retrofit skills programmes, the level of uptake has been very limited. With current skills shortages in the construction industry, employers are reluctant to release staff and invest in staff training until government policy and funding programmes can provide assurance on their investment.

Solutions could involve modernising apprenticeships, retraining existing workers, developing specialist retrofit qualifications, and fostering partnerships between training providers, councils, and industry to create clear career pathways into the sector. The development of replacement funding programmes by the Department for Communities to address low carbon heating and energy efficiency, will provide a degree of certainty of demand for retrofit related skills.

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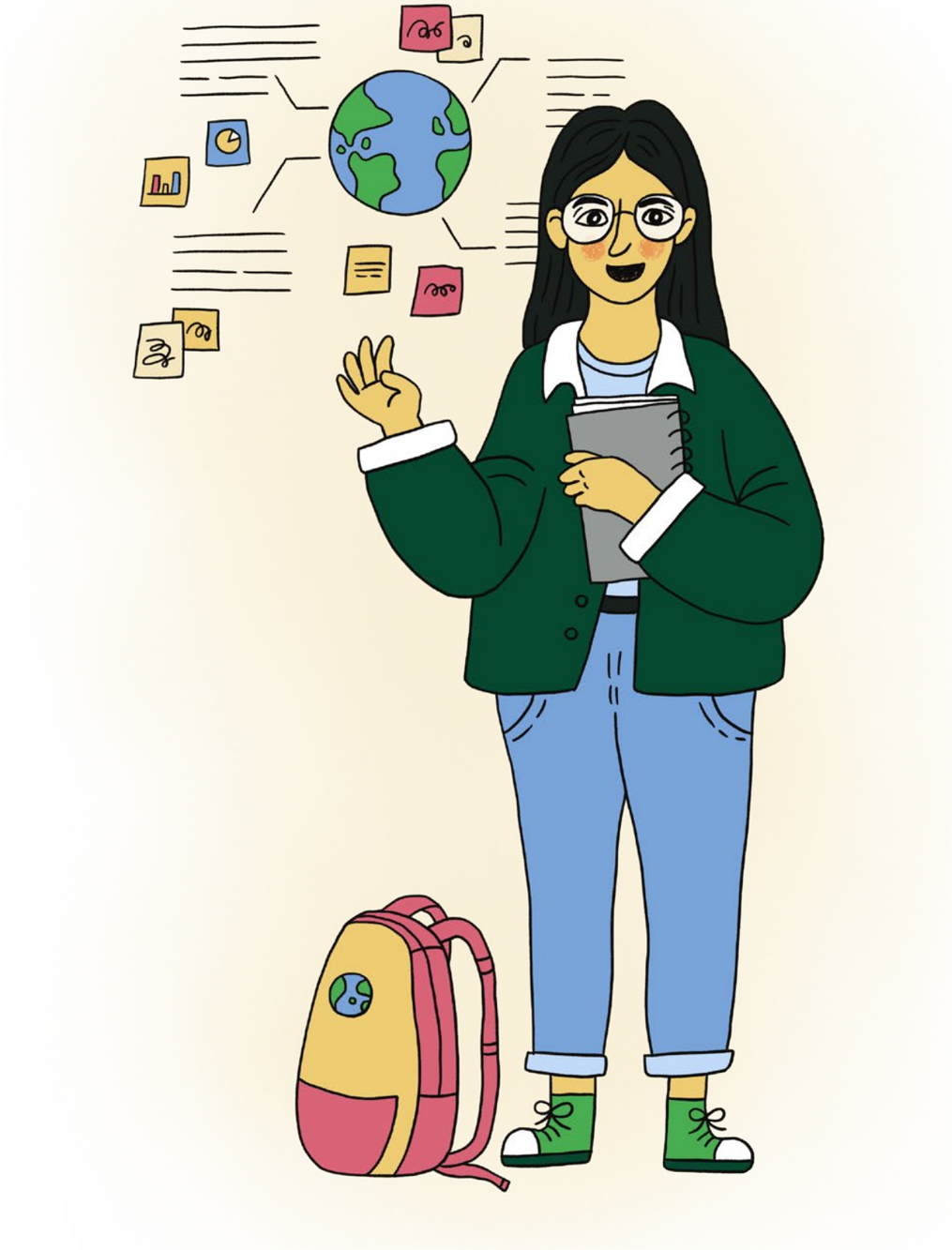

07

OPPORTUNITIES FOR THE WAY FORWARD

The UP2030 Belfast experience and learning from this project highlights five core elements that should guide placemakers and practitioners seeking to better connect communities and climate action as the urgency and expectation to deliver climate and resilience outcomes in placemaking increases: **Engage, Educate, Elevate, Enable, Embed.**

Engage – Understand the lived experience and identify opportunities for climate solutions to address social challenges by meeting people where they are at.

Educate – Raise the awareness and profile of the importance of this work through knowledge sharing.

Elevate –Disseminate the learning; upskill and upgrade placemaking approaches.

Enable – Build capacity and enable communities to bring forward climate priorities in area planning.

Embed – Upgrade existing governance systems and partnerships, as well as current and future work streams and projects.

The thematic chapters are critical to understanding how retrofit, active travel and greening support the transition at a local level. Addressing climate change requires multiple partners and a place-based approach that ensures the interventions are appropriate for the area and are based on engagement and data. To support the scalability of the Framework, there are specific interventions set out as Opportunities for the Way Forward that are designed to guide and support other communities to consider potential options, they are considered to be multiple problem solvers that bring co benefits.

Retrofit: Domestic

- Pilot an area-based retrofit programme with low disruption, high carbon impact, and cross-tenure delivery.
- Scale up household engagement through surveys and workshops to educate, tailor solutions and build trust.
- Seek funding opportunities and unlock external grants to offer financial incentives that will support retrofit measures across all tenures with practical help now and bold community led transformation in the long term.
- Build capacity and mobilise local retrofit workforce to deliver fabric upgrades and strengthen community confidence.
- Use LAEP data to prioritise clusters of homes with poor energy ratings and high retrofit potential.
- Support the development of a community-based, one-stop shop approach for retrofit advice, grant access, and trusted contractor referrals to optimise householder engagement.
- Embed consideration of fuel poverty and housing related health issues through a cost/benefit analysis approach.

Retrofit: Public Sector

- Mandate the setting and publication of carbon baselines and reduction targets for all public bodies, with transparent reporting.
- Normalise best practice in energy auditing, metering, monitoring, and use of Building Energy Management Systems.
- Implement and publicise low carbon retrofit pilots in public buildings to demonstrate leadership and test scalable models.
- Leverage invest-to-save funding to unlock retrofit investment and long-term savings.
- Review and update standards and enforcement to support consistent delivery across public assets.
- Adoption of the NI Climate Action Plan (2023-27) will clarify the setting of climate targets and policies relating to retrofit, helping to provide the certainty needed by all stakeholders to invest in building stock, skills and development programmes, creating a significant pipeline of retrofit related woks and jobs across all sectors.

Retrofit: Commercial Sector

- Support building audits and retrofit planning through co-funding and technical guidance.
- Create a strategic energy and carbon oversight group for the city, focusing on public and commercial buildings to map out energy and carbon risks, retrofit opportunities and scaling emerging projects such as solar PV and low carbon district heating, sharing best practice and exploring opportunities to engage with long term institutional investment in low carbon retrofit programmes.
- Align low carbon retrofit with ESG and viability goals to attract investment and future-proof commercial stock.
- Explore Developer Contributions (Section 76) to fund retrofit uplift in priority areas.
- Promote uptake of retrofit standards and encourage innovation in low-carbon design.

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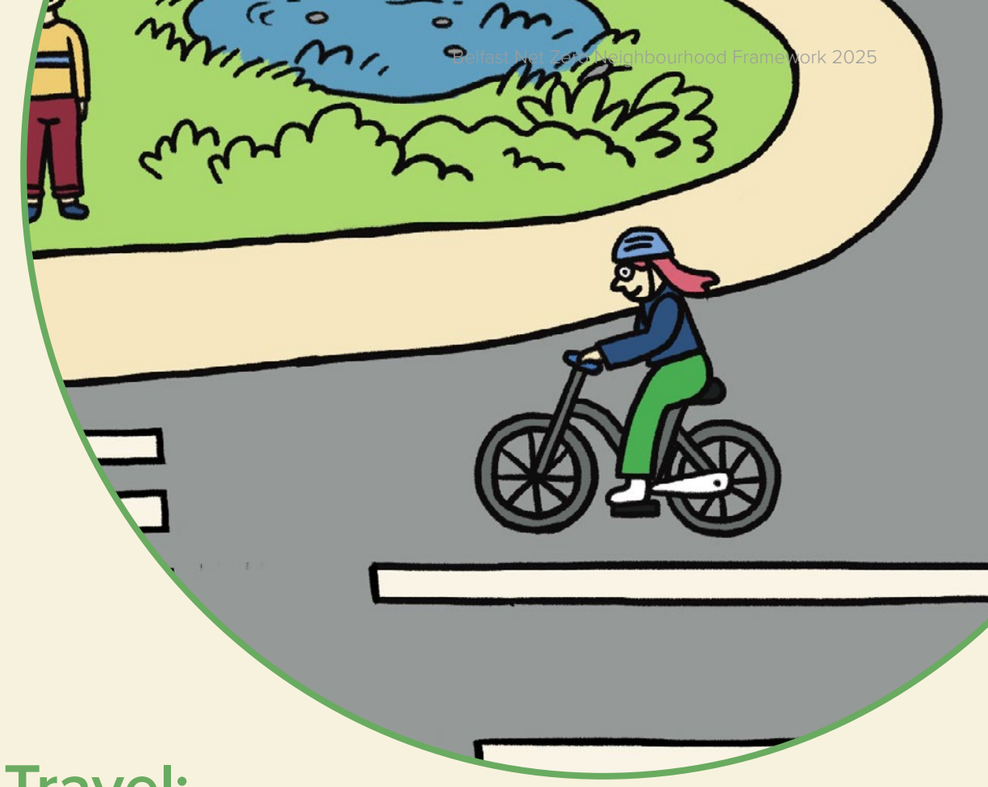

Active Travel:

Supporting behavioural change

- Engage everyone: Particularly vulnerable groups such as children and older people in shaping solutions, such as facilitating design sessions with residents to plan pedestrian zones, school streets, one-way systems, and green corridors.
- Communication: Deliver local campaigns linking health, affordability, and climate resilience with targeted messaging to promote uptake and behavioural change.
- School focus: Embed active travel into the school curriculum through Safe Routes Healthy Places Toolkit and run school audits from a child's perspective and pilot safe cycling and walking initiatives.
- Make it clear: Provide easy to understand information on how to use bikes, buses, and routes through apps, road shows and community outreach.
- Educate: On the co-benefits of active travel and green space on health and well-being, linking to parks and open spaces.

Development and Infrastructure

- Engage: Hold workshops and surveys to capture lived experience on safety, accessibility, and affordability barriers.
- Review data: Including census data, travel surveys, and local emissions reports and map current transport networks, canopy cover, and flood risk to identify inequalities.
- Make it fair: Ensure investment benefits all, supports residents to balance car needs with active travel goals.
- Make it safe: Deliver protected cycle lanes, more pedestrian crossings, speed restrictions and enforcement.
- Expand: Belfast Bikes network with new bike types (non-standard and adapted cycles) and provide inclusive secure cycle parking.
- Public transport: Improve bus routes and reliability, provide upgrades to existing bus shelters with lighting, seating, and real-time information.
- Make it accessible: Re-design large junctions with extra crossings, traffic calming and connect routes directly to local shops, schools, services, and parks.
- Green and blue: Link with green and blue infrastructure programmes to identify potential tree planting and biodiversity projects that improves the active travel experience and connects to local green spaces and services.
- Funding plan: Create a funding plan with phased delivery and clear evaluation milestones, with ring-fenced budgets for long-term maintenance of paths, cycleways, and greening.

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Greening:

- Listen first: Engage residents to identify greening and growing priorities, including barriers like lack of space, maintenance concerns, or safety.
- Use data to guide action: Combine community input with mapping tools (e.g., air quality, canopy cover, deprivation, flood risk) to target areas most in need.
- Create a common agenda and sense check regularly: Use needs analysis to co-design a greening vision that blends immediate action with long-term resilience and periodically review and refine with community feedback, and align with city-wide and regional strategies.
- Make it relevant and design for co-benefits: Integrate green infrastructure early in planning to support climate resilience, biodiversity, and social wellbeing and link to social outcomes, like tackling isolation, improving health, and supporting food justice, to build community wealth.

- Celebrate identity: Use greening as a canvas for art, storytelling, and pride.
- Engage all ages and abilities, including children, through tools like Safe Routes Healthy Places.
- Build local capacity together: Support Tree Wardens, Friends groups, intergenerational skill-sharing and volunteer schemes to maintain and care for green spaces such as community gardens, urban orchards, and small allotments.
- Empower through education: Use creative tools (QR codes, posters, events) to raise awareness and teach residents how to grow, care for, and value green spaces.
- Right tree, right place: Plant fruit trees, seasonal hedges, and edible planting in underused spaces like rooftops, car park edges, and street corners and in high pollution areas, using the Belfast City Council 'Tree Establishment Strategy' to guide decisions on potential planting locations, species selection and aftercare.
- Make it safe and welcoming: Improve lighting, seating, and accessibility to reduce antisocial behaviour and enhance usability.
- Think beyond planting: Embed maintenance, watering, and monitoring into contracts and budgets to protect investment.
- Stay flexible: Allow room to respond quickly to new funding, partnerships, or community ideas.
- Raise the profile to unlock resources: Link with city partners to promote the vision and identify opportunities for joint delivery and advocacy by working with Belfast City Council, NI Housing Executive, schools, and greening organisations to share land, materials, volunteers, and funding.
- Tree Planting in high-pollution areas: Prioritising tree planting in high pollution areas, using the Belfast City Council 'Tree Establishment Strategy' to guide decisions on potential planting locations, species selection and aftercare.

Image: Tree planting

08

APPENDICES

APPENDIX 1 – Power BI visualisation of UP2030 retrofit data from Belfast Local Area Energy Plan

Process – data specific to the UP2030 area was extracted from the Belfast LAEP, focusing on domestic building energy performance and condition. Power BI transformed the data into a visual format, providing maps of the existing EPC of homes as well as the potential EPC if recommendations were implemented.

Map of UP2030 Current EPC

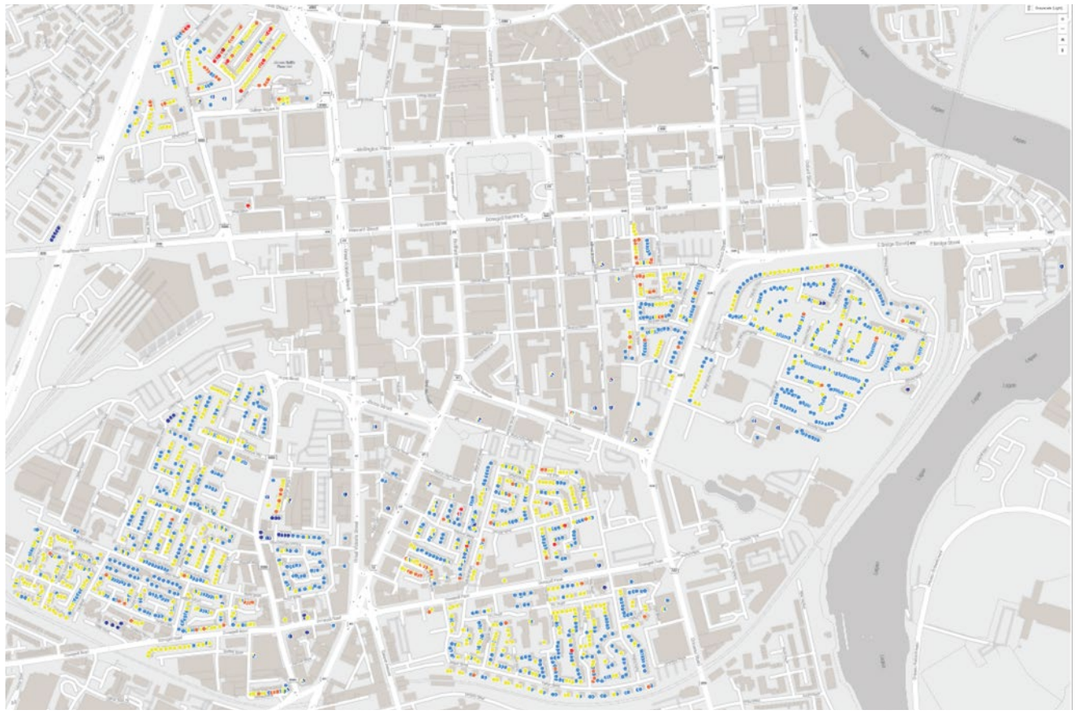

Fig 19: Current EPC rating of domestic buildings in the UP2030 area, Belfast LAEP 2024

Building	Number of Properties	Number D-G current	Number D-G potential
Flat	2,126	56%	
Terraced	1,534	40%	
Semi D	154	4%	
Detached	16	0.5%	
	3,830	100%	

Table 8: Breakdown of Housing Type by EPC rating, Belfast LAEP 2024

Properties by current EPC rating

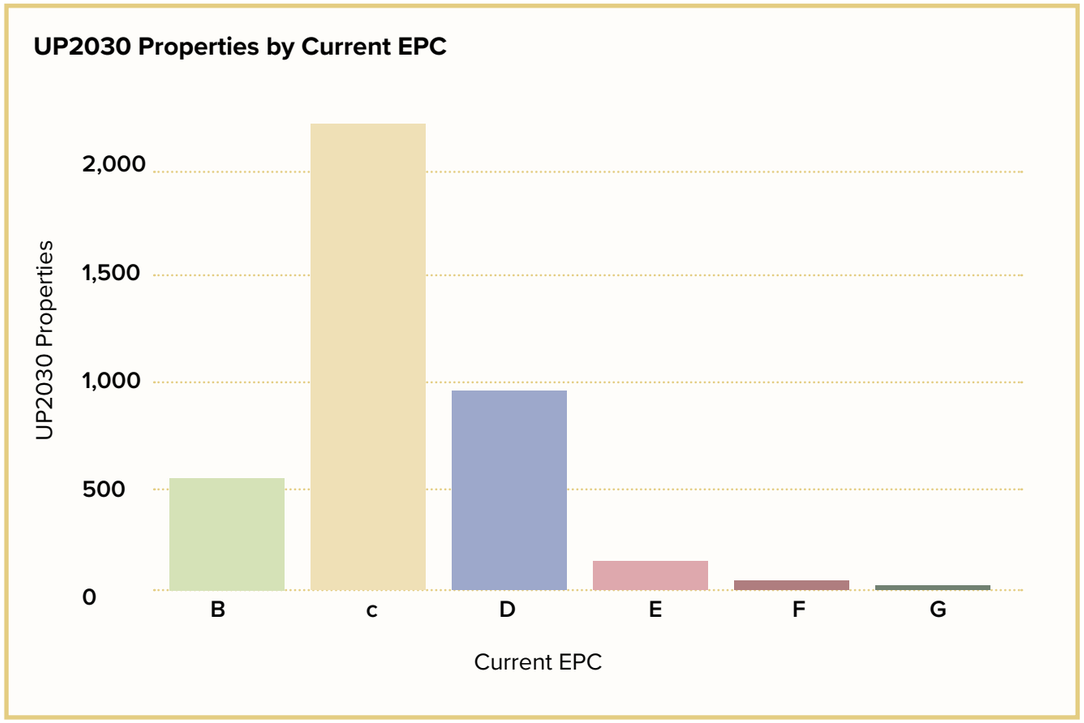

Fig 20: UP2030 area property split by EPC rating, Belfast LAEP 2024

EPC rating	A	B	C	D	E	F	G
No. of properties	0	532 (14%)	2,214 (58%)	925 (24%)	134 (3%)	24 (1%)	1 (0%)

Table 9: UP2030 area property split by EPC rating, Belfast LAEP 2024

Property type	A	B	C	D	E	F	G
Flat		893 (42%)	1,178(55%)				
Terraced		23 (1.5%	1,121 (73%)	376 (25%)			
Semi detached		7 (5%)	118 (77%)	28 (18%)			
Detached		3 (19%)	9 (56%)	4 (25%)			

Table 10: Housing type in UP2030 by EPC rating, Belfast LAEP 2024

Potential EPC rating

EPC rating	Number	%
A	0	0%
B	532	14%
C	2,214	58%
D	925	24%
E	134	3%
F	24	1%
G	1	0%
Sum	3830	100%

Table 11: EPC band split in UP2030 area by percentage, Belfast LAEP 2024

% of homes rated to be energy inefficient with EPC rating D-G	28%
% of homes with EPC rating A-C	72%

APPENDIX 2 – Safe Routes Healthy Places Belfast Toolkit

'Safe Routes, Healthy Places Belfast' is a resource co-designed by Belfast City Council, Belfast Healthy Cities, Design Clips, and Mapping for Change, aimed at helping schools create cleaner, greener, and healthier neighbourhoods through active travel. This resource invites children to actively explore and reflect on their routes to school, promoting the uptake of active travel and encouraging them to consider how climate, urban design, and placemaking can shape healthier communities.

This resource is aligned to our Healthy Transport Teaching Resource and Walking Bus Toolkit. Mapped to the NI curriculum, the Healthy Transport Teaching Resource helps children understand the broader benefits of active travel from personal health to environmental impact. While our Walking Bus Toolkit turns awareness into action, supporting more children to walk or wheel to school together.

To deepen engagement, Design Clips created child-friendly materials that encourage pupils to explore their routes to school through the lens of climate and urban design, while Mapping for Change provided digital mapping tools to help visualise and document these journeys.

All together, these resources form a structured pathway, from learning and exploration to action empowering schools to co-create safer routes and healthier places with their pupils.

For more information about walking buses, please contact info@belfasthealthycities.com

APPENDIX 3 – Belfast UP2030 Project Area: Carbon Accounting Findings

As part of the development of the Belfast Net Zero Neighbourhood Framework, University of Cambridge worked with Belfast to create a carbon accounting methodology for urban regeneration, estimating emission reductions from greening, retrofit, and mobility improvements. The workbooks developed for this study were designed specifically for Belfast using emissions data provided from a number of sources including the Local Area Energy Plan. They have helped further

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our understanding of emissions activity in the area to identify actions and interventions would have the greatest impact.
If you have any queries in relation to this work, please contact: kam71@cam.ac.uk

APPENDIX 4 - The Role of Data in Net Zero and Climate Change

Through the UP2030 project, we looked at the role of data and data analytics in net zero and climate action, considering the most impactful data sources that will inform Belfast's approach and highlighting the importance of data-driven decision-making in placemaking.

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LIST OF FIGURES AND TABLES

Figures:

Tables:

Acknowledgements

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Community
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Belfast South Community Resources
Belfast Youth Climate Commission
Belfast Youth Council
Donegall Pass Community Forum
Donegall Pass Primary School
Donegall Pass Seniors Group
Falls Residents' Association
Market Development Association
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Residents of John Street and Hamill Street
St Malachy's Primary School
Translink Youth Forum

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Belfast Healthy Cities
Belfast Healthy Cities: Greening the City Advisory Group
Belfast Hills Partnership
Belfast Retrofit Delivery Hub
Climate NI
Cycling UK
Department for Agriculture, Environment and Rural Affairs
Department for Communities
Department for Infrastructure
Eastside Partnership
Forward South
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