



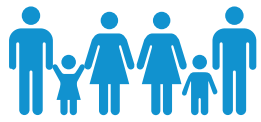
FUTURE PROOFED CITY **BELFAST** **RESILIENCE** **ASSESSMENT**

December 2020

www.belfastcity.gov.uk/resilience



CITY FACTS: BELFAST



**BELFAST
POPULATION**

343,542
2019 MID-YEAR ESTIMATE

33% AGED 25
OR UNDER

BELFAST
ACCOUNTS
FOR

18%

OF THE
POPULATION

AND ALMOST

30%

OF ALL JOBS IN NI



103

RESIDENTIAL
UNITS
COMPLETED
IN CITY

2019/20

£575

FULLTIME
MEDIAN GROSS
WEEKLY PAY
2019



44%

HOUSEHOLD WASTE
RECYCLED AND
COMPOSTED



11,500 STREET
TREES



77.3% OF THE POPULATION LIVE
WITHIN WALKING DISTANCE
OF A PARK OR PLAY AREA

9.2°C

AVERAGE
ANNUAL
TEMPERATURE



68%



OF HOUSEHOLDS HAVE ACCESS TO ONE OR MORE CARS

BEFORE COVID-19...



53%

OF ALL JOURNEYS
TAKEN BY CAR



29%

OF ALL JOURNEYS
TAKEN BY FOOT

2%



JOURNEYS PER PERSON BY BIKE

18.2%

OF POPULATION
AGED 16-64
HAVE NO
QUALIFICATIONS

35.6%

OF THE WORKING
AGE POPULATION IS
EDUCATED TO NVQ
LEVEL 4 AND ABOVE



80%

OF BUSINESSES ARE
MICRO (0-9 EMPLOYEES)



21%

OF THOSE CLAIMING
UNEMPLOYMENT
BENEFITS ARE AGED
18-24



DURING

COVID-19

**3,737 POSITIVE CASES
PER 100,000 OF POPULATION**
IN BELFAST AS OF 14 NOVEMBER 2020 (HIGHEST IN NI)

270

DEATHS
IN BELFAST

FUTURE PROOFED CITY
BELFAST
RESILIENCE
ASSESSMENT

December 2020





Belfast is a flood prone city and sea levels are rising so the potential for flooding and extreme weather events is growing. Being a resilient city means planning and developing for these risks.

FOREWORD FROM THE COMMISSIONER FOR RESILIENCE

Finalising the first Resilience Strategy for Belfast, while the city endures the effects of a global pandemic, is a poignant reminder of why cities need to prepare for risk, no matter how unlikely they appear to be. COVID-19 has taught us many things about how cities respond to crises, of the value of community networks, and the importance of good connectivity.

Put simply, the pandemic has exposed our weaknesses. Our lives have changed immeasurably as a result of a global shock, but the impact will be felt differently nationally, and locally, and those impacts will be determined by the scale and nature of existing vulnerabilities. Put simply, the pandemic has exposed our weaknesses. We now face the challenge and opportunity to put resilience at the heart of our re-build.

The draft Resilience Strategy, published in January 2020, presented a series of potential shocks and stresses for the city of Belfast. It is not an exhaustive list. Each one by itself represents a risk to the city. However, it is the relationship between these risks, and the scenarios that may emerge if several occur at once, that presents the greatest challenge for Belfast. I made several conclusions about Belfast's exposure to risks. In particular, the potential impacts of climate change on the city. I highlighted the city's lack of preparedness and the lack of a coherent city-wide approach to climate change. I suggested the identification and development of 'multiple problem solvers' - levers which can respond to and resolve several risks at once.

The arrival of the pandemic resulted in an extension of the public consultation on the strategy. The passage of time has enabled us to start work on many of the priorities identified in the draft document. We have therefore, made excellent progress this year in developing a series of measures on climate adaptation, climate mitigation and levers to support a green economy. We have established two important city-wide structures to take this work forward; a Resilience and Sustainability Board to drive delivery of this strategy and the Belfast Climate Commission, to act as a think-tank and advisor for the city's climate action. I am extremely grateful to my co-Chairs and to the members of both boards for their commitment and dedication during such a difficult year. We have managed to accelerate our work in this area, and as a result our final Resilience Strategy looks markedly different from the draft- because so many programmes and priorities have commenced and begun to deliver outcomes for the people of Belfast.

I am also very grateful to the Resilient Cities Network for their generous support to Belfast through this process; to our strategic partner ARUP for their advice throughout and to Urban Scale Interventions (USI) for coordinating our conversations at community level.

"Belfast is emitting 1.5 million tonnes of carbon a year. At this rate, we will have used up our carbon by 2030."

Belfast Mini Stern

This strategy has two distinct parts: (1) a Resilience Assessment, an analysis of the strategic risks to Belfast, taking account of the views of city-wide stakeholders and (2) an Ambitions Document, setting out the vision and priorities being delivered by the Resilience and Sustainability Board. I am delighted that we now have a strategy and a set of city partners now working with a singular focus on the transition to a net zero-emissions economy.

In a relatively short period of time, the city has moved from lack of preparedness for climate change to one of proactivity, partnership working and ambition. The challenges set out in the draft strategy have been embraced by city-partners. It is to their credit that Belfast is now better prepared for the future, and over time, its people will increasingly be better protected. This is the essence of resilience work.

This final strategy has been amended and improved based on the contribution of residents from across Belfast. Communities have demonstrated their interest in, and understanding of the importance of a long-term focus on risks, and have shown their commitment to projects and programmes that will future-proof their city. I have personally benefited from listening to people from across Belfast, and have no doubt that the ambitions in this document are much more likely to succeed because of them.



A handwritten signature in black ink that reads "Grainia Long".

Grainia Long
Commissioner for Resilience
December 2020

FOREWORD FROM THE CHAIR OF STRATEGIC POLICY AND RESOURCES COMMITTEE

Welcome to Belfast's draft Resilience Strategy. For the first time, partner organisations across the city have worked together to identify the strategic risks that we face, today and into the future. Furthermore, we have collectively agreed an ambitious goal **to transition to an inclusive, zero- emissions economy in a generation.** Achieving this will require urgent action, and I am delighted that our city partners have committed to thirty programmes, to be delivered collaboratively to future proof our city, and make us climate resilient.

There has rarely been a more important time for Belfast to build its resilience. A major public health crisis, and a combination of economic pressures, climate related events, and social change are taking globally and impacting locally. To improve our readiness and ultimately ensure our recovery, we must have a sophisticated understanding of the risks we face.

The strategy has been informed by more than a thousand conversations, and many hours of data crunching- we are grateful to everyone who has contributed.

Only by working together across the city- communities, schools, nursing homes, businesses and agencies- can we really be ready to face complex challenges, from pandemics to economic shocks and climate change. I am grateful to members of the city's Resilience and Sustainability Board for the leadership they have shown in developing this strategy, and I look forward to seeing the positive effects arising from delivery.



Christina Black

Councillor Christina Black
Chair
Strategic Policy and
Resources Committee



**Belfast
City Council**



CONTENTS

EXECUTIVE SUMMARY

9

1



CONTEXT

11

Delivering the Belfast Agenda	11
What is urban resilience?	12
Characteristics of a resilient Belfast	13
Resilience challenges in this decade	14
Methodology	16
Case Study in Urban Resilience: Fire at Bank Buildings	18

2



SHOCKS AND STRESSES FOR BELFAST IN 2020

20

Infrastructure capacity	22	Population change	44
Condition of existing housing stock	26	Carbon intensive systems	46
Public health	28	Climate change	50
Flooding and extreme weather events	30	Housing supply in the city	54
Cyber resilience	32	Segregation and division	56
UK Exit from the EU	34	Mental ill-health	58
Economic recovery capacity	36	Use of prescription drugs	59
Poverty and inequality	42	Governance and financing of risk	60

3

NEXT STEPS

63

How we will deliver this strategy	63
-----------------------------------	----



SOURCES OF INSPIRATION

64

Bibliography	64
--------------	----

APPENDICES

70



EXECUTIVE SUMMARY

- Urban resilience is the capacity of cities to survive, adapt, and develop no matter what kinds of chronic stresses and acute shocks they experience.
- The Belfast Agenda, the city's community plan, included a commitment to take a targetted approach to issues which pose the greatest risk to the city, its economy and its people.
- In doing so, Belfast has been an active member of the Resilient Cities Network, working globally to reduce vulnerabilities, and making cities better prepared for the future.
- This strategy delivers on the Belfast Agenda commitment. It includes an overview of the major risks facing the city. The 'Resilience Assessment' outlines the shocks and stresses that could make the city more vulnerable and could weaken our capacity to resist and to recover from future challenges.
- It is the intention of the Resilience and Sustainability Board that the Resilience Assessment be reviewed and refreshed every two years to ensure a proactive approach to the management of strategic risks.
- The second half of the document outlines our ambitions: one goal, three 'multiple problem solvers', and 30 programmes for delivery.
- A genuine collaboration between city partners and residents, this strategy will drive progress to deliver the city's goal to transition to an inclusive, zero-emissions, climate-resilient economy, in a generation. It commits Belfast to a step-change in this decade, reflecting the scale of climate breakdown and its implications for Belfast.

OUR GOAL

To transition to an inclusive, net zero-emissions, climate-resilient economy in a generation.



SHOCKS



STRESSES



We have identified three 'multiple problem solvers' - where we tackle several shocks or stresses at once. A strategic focus on each of these areas will build the city's resilience, over time. They are:



AREAS OF FOCUS



The strategy contains 30 transformational programmes, agreed by city partners, to prepare the city for this century. This includes an important focus on how we fund and manage risk.

A child is wearing a VR headset. The headset's display shows a cityscape at night with the Statue of Liberty in the background. The child is looking up and slightly to the side. The background of the image is a solid blue color with a subtle geometric pattern of lines and shapes.

1

CONTEXT

DELIVERING THE BELFAST AGENDA

The Belfast Agenda vision for 2035

"Belfast will be a city re-imagined and resurgent. A great place to live and work for everyone. Beautiful, well connected and culturally vibrant, it will be a sustainable city shared and loved by its citizens, free from the legacy of conflict. A compassionate city offering opportunities for everyone. A confident and successful city energising a dynamic and prosperous city region. A magnet for talent and business and admired around the world. A city people dream to visit."

The Belfast Agenda commits the city to the appointment of a Commissioner for Resilience to work with partners to develop a strategy to take a targeted approach to addressing those issues which pose the greatest risk to the city, its economy and its people.

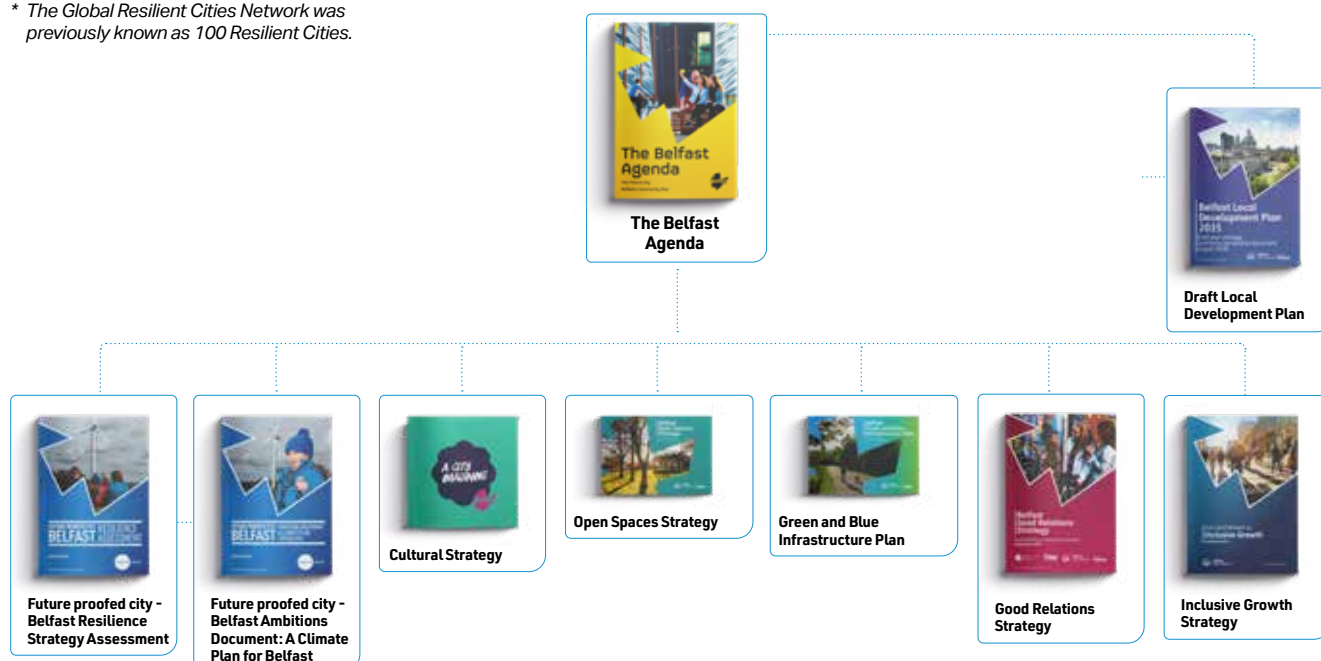
Since 2018, Belfast has been a member of 100 Resilient Cities, funded by the Rockefeller Foundation. GRCN* is

* The Global Resilient Cities Network was previously known as 100 Resilient Cities.



global network of cities, all focused on identifying and reducing urban threats - either immediate shocks or systemic vulnerabilities. It comprises Belfast's biggest global network to date. Since the establishment of the 'Resilient Belfast' team, Belfast is working alongside cities like Barcelona, Sydney, Cape Town and San Francisco to solve urban problems, and strengthen the fabric of the city. This work has culminated in the production of this Resilience Strategy, which includes a range of commitments to de-risk the city, making us more adaptable, prepared for the unpredictable and increasingly our capacity to thrive. This Strategy will help the city to mitigate risks to deliver the Belfast Agenda.

This Resilience Strategy is one of several documents that aim to deliver the Belfast Agenda and its core objective of inclusive growth.



WHAT IS URBAN RESILIENCE?

Urban resilience is the capacity of cities to survive, adapt, and develop no matter what kinds of chronic stresses and acute shocks they experience.

Being a resilient city does not mean the city is without risk - urban resilience refers to cities that are exceptional at predicting, managing and responding to risk. Resilient cities are highly adaptive.

Working alongside one hundred cities globally, Belfast has been learning the benefits of a focus on preparing for immediate and longer term risks.

"Belfast's capacity to withstand and embrace disruption and change in the coming decades is critical to its economic, social and environmental future."

Our vision in the Belfast Agenda could be undermined, if we do not learn to adapt to and cope with shocks, such as floods or cyber attacks. COVID-19 has highlighted the city's existing vulnerabilities, and the impact of the pandemic puts the achievement of our Belfast Agenda priorities at risk, unless we take coordinated action, as a city. Furthermore, some stresses such as climate change can be 'risk multipliers', exacerbating existing weaknesses.

Belfast's economic resilience is a good case in point. The capacity of a city to respond to economic shocks is a strong indicator of its resilience.

"Building Belfast's economic resilience - its ability to adapt to and cope with economic shocks - is essential."

Resilience thinking is not a luxury but a necessity for cities. It is about putting in place holistic and integrated measures to enable cities to adapt, survive, and thrive regardless of the stresses or shocks they face.

Singapore Resilience Strategy

Belfast's capacity to respond to the recession of 2008-10 has been weak - demonstrated by its low levels of productivity since 2007 and when compared with other cities, it has shown weak levels of 'good growth' since the financial crash.

Furthermore, the impact of economic growth has traditionally been unevenly spread throughout the city, prompting a city-wide focus on 'inclusive growth' in the Belfast Agenda. Building Belfast's economic resilience - its ability to adapt to and cope with economic shocks - is essential.

This may mean building new forms of capacity to take on different types of pressures, to withstand them and recover from them.

Whether impacted by an adverse weather event or an economic recession, the following systems all determine how a city bounces back. However, evidence would suggest that the number and diversity of local community and voluntary groups in the city, and their inter-connectedness, has been a highly valuable social asset in the initial response to COVID-19 and has arguably strengthened the city's capacity to cope with the effects of the pandemic. This resilience strategy emphasises the city's assets as well as its vulnerabilities, and evidence in relation to both has informed the document throughout.

The seven qualities of a resilient city



Reflective

Using past experiences to inform future decisions



Resourceful

Recognising alternative ways to use resources



Inclusive

Prioritise broad consultation to create a sense of shared ownership in decision making



Integrated

Bring together a range of distinct systems and institutions



Robust

Well-conceived, constructed and managed systems



Redundant

Spare capacity purposefully created to accommodate disruption



Flexible

Willingness, ability to adopt alternative strategies in response to changing circumstances

CHARACTERISTICS OF A RESILIENT BELFAST



We will be **risk aware** - with a strong understanding of exposures that (1) make us vulnerable (2) could knock us off course



We will ensure there is **capacity 'in the system'** to respond to shocks



We will **de-risk investment** by improving our management of risks at a city level



We will have **collective agreement at a policy level** on the 'top risks' and coherence around a plan!



We will **integrate networks** so we are better able to withstand shocks



We will include resilience indicators in how we **measure the performance of our city**



We will demonstrate **strong resistance to shock** - often through resilient infrastructure - i.e. integrated into all capital projects



We will **demonstrate improved learning** from shocks



We will develop **multiple problem solvers** - approaches that solve several problems at once



RESILIENCE CHALLENGES IN THIS DECADE



2020 COVID-19

The global pandemic struck the people of Belfast in the Spring of 2020. As of 14 November 2020, 223 people had lost their lives due to COVID-19.

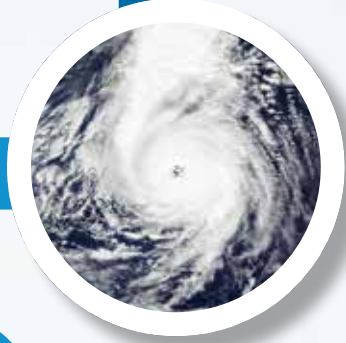


2017/18

Major storms

Ex-Hurricane Ophelia in 2017, Storms Ali and Calum in 2018

There were a range of storms bringing high winds in 2017 and 2018 and causing electricity outages and damage to infrastructure. Schools, businesses and public services were affected.



2018

Fire at Bank Buildings

On 28 August a fire destroyed Bank Buildings, a listed building in the heart of Belfast city centre and its retail district. 14 businesses within the cordon were unable to reopen for over four months. Pedestrian and vehicle access across the city centre was affected causing a significant drop in footfall in the area.

2014

Coastal flooding

The threat of tidal inundation to Belfast city centre and over 4000 homes across the city led to the deployment of 45,000 sandbags and the pre-planned closure of basements and businesses in the Harbour area. Millions of pounds of damage was caused to infrastructure around the coastline of NI.



2012

Flooding

Flooding occurs on an annual basis affecting properties and infrastructure. There was significant flooding in 2012, 2009, 2008 and 2005 with thousands of homes being internally flooded.



2012/13

Flag protests and civil unrest

Following a vote to change the number of days the Union Flag is flown at Belfast City Hall, there followed a period of almost daily protests. There were resulting impacts for the performance of the local economy.



2010/11

The big freeze

Five weeks of extremely low temperatures led to widespread impacts on infrastructure including homes, schools and businesses. Frozen pipes cracked during the thaw causing so many leaks that mains water supplies were significantly depleted. 40,000 premises lost water supplies and over 60,000 premises became subject to rotational supplies.



METHODOLOGY

A well-established methodology - adopted by 100 cities globally - was used to develop this strategy, and build the city's resilience capacity.

The City Resilience Framework (CRF) was developed by our strategic partner ARUP and helps identify the complex and interdependent issues that contribute to a resilient city. The CRF is used by all partners in the 100RC network and facilitates cooperation between cities. Our relationship with ARUP has led to the development of a city risk and asset audit, a climate change risk assessment and a study that will help us to develop our strategy for child friendly neighbourhoods.

A number of steps in working towards our goals and vision were put in place. Each step carefully considered and carried out as we:

Mapped our city's vulnerability and risk against potential actions.



Engaged with partners citywide in Belfast to gather evidence and formulate possible solutions.



Commissioned a city risk and asset audit by ARUP to quantify and identify shocks and stresses.



Assessed and analysed multiple data sources to inform decisions, test assumptions and steer our initial conclusions. This also involved commissioning our own studies.



Informed our thinking by requesting from ARUP a Climate Change Risk Assessment and a study on developing our strategy for child friendly neighbourhoods.



Engaged across our city for over three months on our strategic areas of focus to engage and attract feedback.

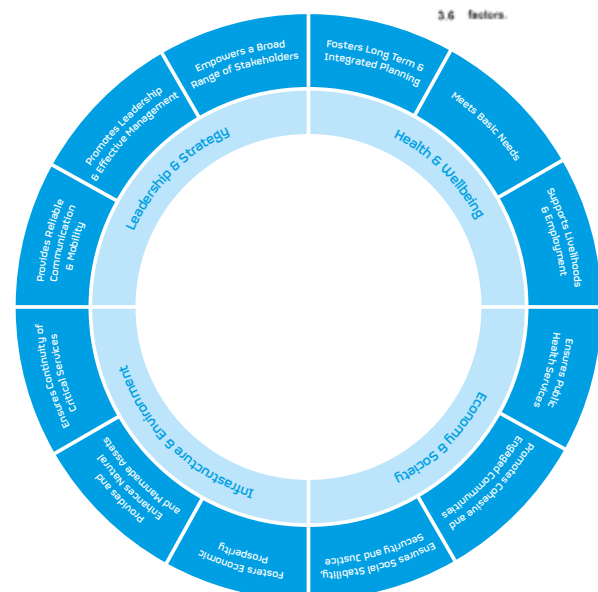


Working in partnership with Urban Scale interventions we engaged with more than 1,000 people across the city. This included public area based events, focused workshops, on street engagement through the tea kiosks in the city centre and online thematic workshops with youth and older people. The online public consultation also created 62 responses and we received 12 written submissions.

With these seven steps, we have embarked on the next stage of the journey towards a resilient Belfast.

STEP 1

City Resilience Framework identified areas of city resilience



*Enlarged version available on pg86

STEP

2

Citywide engagement

18 workshops involving
547 people35 focus groups
involving 480 people140 people interviewed
on a one-to-one basis

STEP

3

Review of city assets
and risks

City assets



Perceptions



City risks



Strengths

STEP

4

Data analysis

Spaces to play
for childrenPopulation
changeEconomic
Vulnerabilities,
cyber, exclusion,
inequalities,
automation of
industry, business
start-upsPoverty
Children and young
peopleConnectivity
Economic corridor,
digital, physicalTransport
Cheaper, cleaner,
integrated, greener

Housing

Climate change
Extreme weather
and air qualitySegregation
Housing, education
system, divisionCivic pride
One city, city story

Cyber threat

Health
Dependence on
prescription drugs,
mental health,
nutrition, obesityRisk of
returning
to violencePrevalence
of carsInfrastructure
Investment and
capacityCity centre
Retail, housing,
derelictionUK Exit
Impact on BelfastFinancing
the city
City revenuePolitics
Leadership, decision
making structuresFossil fuel
dependency

STEP

7

Citywide consultation
on a draft strategyDirect engagement with 1,223 people through our
consultation partnership with Urban Scale Interventions
and receipt of more than 80 written responses.

STEP

6

Identified multiple problem
solversThese shocks and stresses make the city more
vulnerable and could weaken our capacity to
resist and recover from future challenges.Climate
adaptation
and
mitigation¹Participation
of children
and young
peopleConnected,
net zero-
emissions
economy

STEP

5



Agreed our resilience goal

Transition Belfast to an inclusive, net zero-emissions,
climate resilient economy in a generation.

CASE STUDY IN URBAN RESILIENCE

1



Fire at Bank Buildings, August 2018

Belfast experienced an acute shock in 2018 when a culturally historic building, known as Bank Buildings which housed Primark, a global retail chain, was severely damaged by a fire that started on 28 August 2018 and continued to burn for three days. Located right in the heart of the city centre on a major junction, the fire tested multiple aspects of the city's resilience.

One hundred firefighters successfully prevented the fire from spreading to nearby businesses, shops and restaurants, and no one was killed or injured. However, a significant proportion of the building's internal structure was burnt away, either collapsed or was severely damaged with the external facades subject to further damage. In the immediate weeks following the fire, the building's physical fabric remained very vulnerable and posed a threat to public health and safety.

On engineering advice, a safety cordon was established to protect the public. While the cordon closed 22 business in close proximity, the impact was felt much further across the city centre. The cordon effectively created four cul-de-sacs in the heart of the central retail district in which footfall significantly reduced. Anecdotal evidence from local traders reported decreases in sales levels between 20% and 70% amongst the hardest hit areas. There

was considerable concern that the continuation of the situation would lead to fundamental long-term changes in consumer habits within the city centre.

Pedestrians, buses and vehicles had to be rerouted in response to the cordon. This significantly added to the impact on footfall, and to pressures already being felt by the retail sector during a challenging year. The cordon acted as a barrier and restricted pedestrian and vehicular access through Castle Place junction, and as a result pedestrians were required to undertake significant diversions using alternative, longer routes to navigate the city centre. In addition, buses were unable to penetrate into the centre of the city and were subject to significant delays and revised timetabling.

The building was a Category B1 Listed Building located within the city centre conservation area. Immense in size, it was within metres of other buildings close by. Major challenges existed for the owner to assess the damage to the building and make decisions regarding the building's future. In late October, Primark successfully applied to Belfast City Council for listed building consent to take down, record and assess for restoration purposes the uppermost parts of the building. By the following April, a series of ballast-filled shipping containers had been erected around the building to enable the commencement of a long-term restoration project.

For Belfast City Council, the immediate primary concern from the beginning was the safety of people in the city, and to reduce as much as possible the impact on businesses and trade. It established a City Recovery Group made up of partners across the city to coordinate the city's recovery efforts. It held clinics with businesses directly affected, and held ongoing conversations with businesses through the Business Improvement Districts (BIDs) in the city. A #YourBelfast media campaign in the immediate weeks following the fire aimed to remind people that Belfast was open for business.

A 'Rewards App' was developed to encourage people to spend in the local area and a 'yellow dot' trail guided pedestrians around the cordon to sustain footfall in the city. A major revitalization programme was undertaken to 'light up' the city at Christmas via a series of installations to encourage people to spend time in the city. A combination of cultural events and playful installations, dressing up city streets impacted by pedestrianisation worked in combination to give the city centre an energized feel in the busy retail period.

In the New Year, the ongoing pedestrianisation of the area was taken as an opportunity to provide a pop-up play park for children, with seating areas, planters and art to help make the area attractive.



Conclusion

A fire in a building of its size and central proximity amounted to a major shock for the city. It posed significant challenges to the city's resilience. It tested the city's economic resilience and emphasised the importance of strong and supportive citywide networks. It prompted a debate on the role of heritage in the city. Poignantly, the sight of a burnt-out building in the city centre reminded many people of a time when Belfast experienced regular security alerts and fires. It highlighted the city's exposure to retail risks, and reminded decision makers in the city of the importance of an 'experience economy' and how critical it is that we build a vibrant city centre where people work, live and play. Perhaps most tellingly of all, the sight of children playing in a pop-up park next to the Bank Buildings appeared to inspire the public of the importance of play in the city. The park's removal, following the reduction of the cordon has prompted important debate about the importance of play in our city.

A satellite image of a coastline, showing a mix of land and water. The land is dark and textured, while the water is lighter and more uniform. The coastline is jagged and irregular. The image is partially obscured by a large blue diagonal shape that covers the right side of the page.

2

SHOCKS AND STRESSES FOR BELFAST: 2020

This strategy does not attempt to comprise a final comprehensive list of all the risks that Belfast faces. Like other global cities, it represents the starting point to build our resilience and will be updated to reflect new challenges and opportunities.

What is a shock?

A shock is a sudden, sharp event that can immediately disrupt a city.

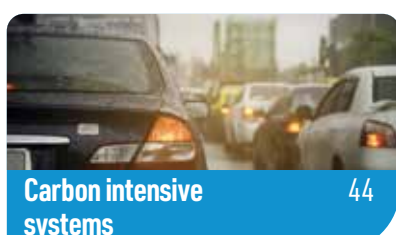
What is a stress?

A stress is a slowly moving phenomenon that weakens the fabric of a city.

SHOCKS



STRESSES



INFRASTRUCTURE CAPACITY



The issue of the city's infrastructure emerged as a major theme in the workshops, focus groups and data analysis undertaken to develop this strategy. Existing infrastructure has been adversely impacted by a period of underinvestment, which is having a negative impact on the city's economic and climate resilience.

In October 2020, an independent Ministerial Advisory Panel on Infrastructure produced a report which summarised the views of over 100 individuals and organisations on current infrastructure planning and delivery in Northern Ireland. The conclusions strongly mirror those expressed in the development of this document:

- Strategic infrastructure projects frequently suffer time delay and cost overruns.
- Over-reliance on the Barnett funding allocation to fund our public infrastructure is stifling growth and innovation.
- Crucial parts of our infrastructure are at a critical point and there is clear evidence that this is having a negative impact on other major investment decisions.
- We struggle to see beyond our political and financial timeframes which, by their nature, are too short term for effective infrastructure planning.
- Our neighbours on these islands have ambitious infrastructure plans for the next 20-30 years.
- Lack of longer-term planning and appropriate market management often results in legal challenges which cause major delays.
- The population of NI is projected to increase by 8% by 2041, with the 65+ age brackets increasing to 25% of the population. There is little evidence that we are planning sufficiently for this demographic change. Northern Ireland Statistics and Research Agency (NISRA).
- The current system operates in silos with limited co-operation between central and local government, and with the private sector.
- There is a general failure to identify potential synergies to collaborate or secure economies of scale by working more closely together within NI, or with other bodies outside NI facing up to these very same challenges.
- We are lagging behind in terms of our environmental performance, and urgently need a step change to address climate change and meet our ambitions in respect of the wider UK 2050 net zero targets.

- There is a regional imbalance and urban-rural divide in terms of infrastructure provision. This needs to be addressed to ensure inclusive growth and to improve the quality of life and wellbeing for everyone in NI.
- External factors such as COVID-19, Climate Change and Brexit are dramatically impacting the economic landscape of NI (and will continue to do so for years to come); we must ensure we are nimble, able to capitalise on the growth opportunities that will arise

To inform the development of this strategy, our strategic partner ARUP undertook a high level assessment of the city's assets.

The study identified key areas for intervention to improve infrastructure provision within the local authority area, and these findings were borne out in our consultation and engagement sessions with stakeholders:

- The importance of enhanced connectivity across the River Lagan through a series of bridges.
- The need for extended public transport network, particularly through BRT Phase 2 and improved walking and cycling networks.
- Significant pressure on drainage and wastewater infrastructure' in the city and implications for the city's economy.
- Targeted enhanced digital connectivity, particularly in locations of target growth sector investments.

Separately, Belfast City Council commissioned the Belfast Infrastructure Study to identify the range of infrastructure challenges in the city. The outcome of the study will continue to inform this strategy, both in terms of future versions and implementation.

This strategy has also been informed by a number of relevant reports from the National Infrastructure Commission which advises the UK government; and reports from the UK Committee on Climate Change, on the risks associated with a range of climate scenarios for NI infrastructure.

It should also be noted that the 'New Decade New Approach' document recognises several infrastructure classes requiring intervention, and commits to prioritised investment. The Ministerial Advisory Panel on Infrastructure recommended to the Minister the establishment of an independent Infrastructure Commission for Northern Ireland. Properly established and resourced, such a Commission would resolve many of the issues associated with infrastructure planning and delivery in the city, and across the region.



Drainage Infrastructure Capacity

A fit for purpose wastewater and drainage system is a critical asset to any city. It mitigates the effects of flooding, enables climate resilience and contributes to public health and the economy.

Connection to drainage and wastewater infrastructure is a condition of planning consent for development and therefore underpins sustainable economic development in every city. Furthermore, the capacity of a city's drainage system has a direct impact on prevalence of flooding. Put simply, a fit-for-purpose drainage and wastewater system with sustainable levels of investment is critical for a city's economic, social and climate resilience.

Significant investment has been necessary for several years to improve the drainage and wastewater assets that serve Belfast. In 2015, the Living with Water Programme Board was initiated to develop a Strategic Drainage Infrastructure Plan for Belfast. This aims to provide integrated sustainable solutions which will alleviate the risk of flooding, enhance the living environment and sustain economic growth. The board, which operates as a collaboration between organisations, has been working to set out:

- The scale of flood risk to Belfast.
- The deterioration of Belfast Lough's water quality due to pollution from diffused sources, including agriculture, and from sewerage system overflows and wastewater treatment works discharges.
- The scale of investment needed.
- The potential wider benefits of the proposed approach to investment planning.

Belfast's wastewater treatment system faces a number of significant issues, which could impact on the city's resilience - in particular its ability to adapt to, and mitigate climate change. Capacity risks can also impact on economic resilience, given the relationship between infrastructure and the health of the economy.

Northern Ireland Water publishes information on wastewater systems which are operating at or near capacity. Its August 2019 online report stated that Belfast wastewater treatment works is predicted to reach capacity in 2021. Furthermore, it reported that 'In addition to the wastewater treatment works, wastewater network capacity issues are emerging due to sewer network modelling activities being undertaken at Belfast (Glenmachan sub catchment), Kinnegar (Sydenham sub catchment), Newtownbreda, Whitehouse, Dunmurry. As a result of this, new connections are being declined in parts of the catchment.' The issue was further emphasised by the Chair of Northern Ireland Water in the

company's 2018/19 Annual Report which referred to the potential adverse impact of underfunding for economic development across NI.

The 'New Decade, New Approach' document also recognises that wastewater infrastructure is at or nearing capacity in many places in NI.

The capacity issues identified above represent a substantial risk to the city's resilience. Out of sewer flooding, inadequate capacity of the existing system and treatment works with inadequate storm storage capacity all present challenges to the operation of the city and could inhibit the scale and nature of future development, at a time when housebuilding at scale is required. These risks are heightened over time as the system continues to deteriorate and as our climate changes.

On 11 November 2020, 'Living With Water in Belfast' was published for consultation, a 12 year, £1.4 billion investment plan for drainage and wastewater management in Greater Belfast. Implementation of the plan in the coming years would significantly alleviate a key resilience challenge for the city.



How a resilient city values water

Belfast currently has ready access to a plentiful supply of drinking water. However, all cities building their climate resilience should be aware of the potential for water shortages. The Climate Change Risk Assessment for Northern Ireland has identified the potential risks to humans and to agriculture and wildlife from drought. These factors, combined with the lack of capacity in our wastewater treatment system, suggests a strong case for a city-wide focus on valuing our water supply and on water conservation.

Sustainable Drainage Systems (SuDS)

Infrastructure integrated into urban places which provide a drainage function, are widely recognised as playing a crucial role in ensuring water resilience at a city-level. The Belfast Green and Blue Infrastructure Strategy is a helpful document in setting out guidance for city partners to drive a proactive approach to SuDS. At the time of writing, the Department for Infrastructure is finalising a substantial set of proposals for sustainable drainage across the city. Investment in sustainable drainage of this kind, over this decade, is essential to meeting the city's climate ambitions and boosting its resilience.

Conclusion

Belfast is one of hundreds of cities globally that face the competing challenges of driving sustainable economic development and population growth, delivering city centre densification while preparing for a changing climate and rapid decarbonisation. The UK National Infrastructure Commission has rightly recognised these significant challenges, as have global institutions such as the World Bank and the World Economic Forum. Infrastructure is increasingly understood as a key growth driver in cities. This can sometimes result in perceived tensions between infrastructure planning and economic growth strategy. It should not be the case. Competitive, resilient cities have shown that sustainable and inclusive economic growth is possible when infrastructure planning enables growth. Lack of infrastructure capacity should not hinder or dictate economic strategy - to do so would expose a city to a range of risks, and ultimately weaken its resilience. On this basis, investment in Belfast's infrastructure capacity will be a major determinant of the city's resilience, and its capacity to transition to a low carbon economy. This will require reconsideration of how infrastructure is funded in the future. It is almost certain to necessitate new funding models to better plan for growth capacity and climate resilience in the coming years.

CONDITION OF EXISTING HOUSING STOCK



Conditions in existing NIHE social housing

The Northern Ireland Housing Executive (NIHE) is the strategic housing authority for NI and its housing stock in Belfast numbers almost 26,000 units. Investment in, and maintenance of existing stock is a core priority for any landlord, however it has wider impacts for the city. A well maintained social housing stock ensures the long-term health and wellbeing of its population. It enhances social capital and if well planned, can have a significant positive impact on reduction of carbon emissions in a city.

“Well maintained social housing stock ensures the long-term health and wellbeing of its population.”

Northern Ireland Housing Executive stock in Belfast has traditionally benefited from significant ongoing investment, and therefore until relatively recently has been able to maintain its stock condition. However, a number of studies have recently shown that the condition of NIHE stock has deteriorated, arguably to a point where it represents a risk to the wider city.

In 2014, the then Department for Social Development and the NIHE jointly commissioned Savills to undertake an Asset Commission to understand the scale and nature of investment required in the NIHE stock. Savills carried out a comprehensive exercise to assess the current and future repairs and maintenance liabilities of NIHE's properties and related assets. Savills found:

- The stock has deteriorated during the last 5 years... projections of costs moving forward have therefore increased and will continue to do so without sufficient investment.
- Just under 44% of the stock (37,974 units) is in asset groups with an average net present value (“NPV”) per unit which is negative [i.e. the rental income collected from these properties is not sufficient to maintain the properties and service residents over the next 30 years].
- The total cost at today's prices [of the investment required in the NIHE stock] is £6.7bn.
- There is significant investment [circa £1.5bn] required during the next 5 years. In addition to the financial challenge this presents, there is also

a significant practical challenge in terms of the capacity of the market to deliver such a large programme...a 3 year lead in time is likely to be required before the levels of investment identified can be delivered on the ground and current investment programmes are concluded’. This “delay” will result in an increase in liability [from £1.5bn] in the 5 years that follow...’.

Worryingly, the 2014 report predicted that ‘The situation has worsened since 2009, and is likely to worsen again in the next five years in the absence of increased investment (made at the right time in the right place) combined with the application of modern asset management principles.’

Six years on, it appears that these warnings were prescient – the step change required to improve stock conditions has not occurred, so much so that the NIHE has publicly acknowledged that it may have to de-invest in homes. This would amount to a significant and adverse challenge to the city of Belfast, which requires a continual and ongoing supply of good quality social housing to meet its social and economic needs. Furthermore, the current condition of NIHE properties could make decarbonisation a much more significant challenge for the city.

A recent statement by the Minister for Communities acknowledged the scale of investment needed, and that two years have passed since the previous analysis of the scale of the investment challenge.

In her words, ‘the current situation is most certainly worse and the scale of the investment even greater. New investment requirements have materialised since 2018: the consequence of the Grenfell Tower disaster and the ambition to reach a position of carbon neutralisation in our homes by 2050.’ In response, the Minister has announced her intention to change the status of the NIHE to enable it to borrow to fund investment, and with proposals to come forward in 2021/22.

Housing conditions and health outcomes

Housing conditions have a profound impact on health outcomes. Belfast's aging population, the condition of its housing stock- across all tenures, and projected patterns of extreme weather (warmer summers and colder, wetter winters) present key health challenges across the city. Older people and those with chronic health conditions are more at risk from cold weather and tend to live in greater fuel poverty. A sustained, collaborative and targeted approach is necessary.

The Health and Social Care Board is leading the Belfast Warm and Well Initiative, bringing together partners to take an evidence based approach to prevention, risk identification, data sharing, service coordination training. However, a strategic approach to improving energy efficiency and housing conditions, e.g. ensuring high standards of ventilation and insulation across all tenures in the city is also necessary in this decade, to avoid exacerbating existing health conditions and prevent avoidable deaths each year.

Housing conditions in the private sector

Poor housing conditions, and in particular energy inefficient housing, exist across all tenures and can fundamentally impact health and wellbeing of residents, as well as wider society goals. Importantly, the UK Climate Change Committee has referred to UK homes as 'not fit for the future' given their levels of energy inefficiency. Health research has proven the negative impact that poor housing conditions can have on health- particularly for those with underlying conditions. Belfast's housing stock - particularly in the private rented sector- requires retrofit and modernisation to eradicate fuel poverty and meet the city's climate ambitions. Future legislative change is required to set a target on energy efficiency of our buildings, and implementation 'Belfast's Net Zero Carbon Roadmap' will be a critical driver towards these ambitions. The Northern Ireland Executive's future economic strategy - which will require a jobs-led approach to growth will be a critical lever. Belfast's Innovation and Inclusive Growth Commission has produced a 'thinkpiece' recommending investment, at scale, in community based retrofit programmes, to improve the energy efficiency of homes, reduce fuel poverty and sustain local employment. This strategy has continually stressed the integration of climate and economic strategy to meet the city's Belfast Agenda priorities- retrofitting of homes is an excellent opportunity to achieve several outcomes at once.

Conclusion

The Northern Ireland Housing Executive has commented publicly on the risks associated with its investment requirements- and the need for £3bn of investment across its entire stock in the next five years. The consequences of not meeting these requirements could include de-investment

in homes. The implications of de-investment in social housing at a time of existing housing stress, income deprivation and climate related challenges represent a significant and urgent risk to the city.

PUBLIC HEALTH



Belfast's experience of the COVID-19 pandemic, which first affected the city's residents during the public consultation on the strategy, has given a unique insight into the city's systemic vulnerabilities. While pandemics were not previously identified as a likely shock to the city, community planning partners had noted global research (World Economic Forum, 2019) which found that environmental degradation across the world makes viral pandemics more likely in future.

At the time of writing, there remains a substantial public health risk, and therefore we are far from understanding the long-term social, economic and environmental impacts of COVID-19 for Belfast.

Nevertheless, the pandemic has reminded cities such as Belfast of two important principles; firstly, that good health is a central element of a city's resilience to shocks and stresses of all kinds, and secondly, that cities must take a number of steps to be resilient to public health crises. We have taken account of both of these lessons, and improved the strategy on this basis.

Evidence from Belfast suggests a number of key characteristics that are important to note, when considering the health of the population, and its resilience to shocks and stresses:

Health inequalities remain a significant concern

The Department of Health's 'Health Inequalities Annual Report 2020' highlighted that Belfast's health outcomes were worse than the NI average in 32 out of 41 outcomes measured; most notably in relation to male life expectancy, drug related mortality and alcohol specific mortality.

- Male life expectancy in Belfast's most deprived areas is 71.7 years; 4.6 years less than the Belfast average (76.3 years). Female life expectancy is 3.6 years less than the average (81.1 years).
- Inequality gaps for suicide remain persistently high with the rate in the most deprived areas of Belfast around two-thirds higher than the Belfast average.
- However, the 2020 report identified a narrowing of inequality gaps in 15 of the 40 outcomes assessed.

Demographic change must be a key feature of health planning for the city

- Belfast was the first Age Friendly City in Northern Ireland and has a reputation as a leader in healthy ageing beyond the UK. This strongly contributes to the resilience of the city. Active Ageing with employment for older groups and opportunities for physical activity and reduced social isolation supported by inclusive transport infrastructure, walkability, green areas will help make an ageing population a positive asset for the city rather than a challenge to its resources. The number of people with dementia will also increase significantly and the work being led by community organisations to develop Dementia Friendly Neighbourhoods will contribute significantly to its resilience by ensuring that those with dementia and their carers have ready access to all the social assets within their communities who understand their needs.
- As set out in the section on 'population change', Belfast's population is ageing. The number aged over 65 will increase by one third with over 20,000 more people in this age group by 2041 (NISRA). People aged 45 now will be over 65 in 2041 requiring a focus on their health as well as those who are older now.



The relationship between housing, transport and infrastructure policy and health outcomes is critical to the city's resilience

- The resilience of the city, as demonstrated during the pandemic, depends on having resilient local neighbourhoods where leadership has been evident. Evidence is also emerging globally of the importance of integration of housing, transport and infrastructure services to build greater resilience into the design of resilient neighbourhoods. Such neighbourhoods should be well-connected with walkable or cycle-friendly routes throughout, with a mix of inter-generational, cross-tenure housing, with a layout offering shared space to create a sense of safety and belonging as well as good relations and social inclusiveness. Lessons should be learned from cities such as Melbourne with its '15 minute neighbourhoods' and Paris and its 15 minute city.
- The Strategy recognises mental health as a systemic stressor in the city which can be amplified if crises are not well-managed. The pandemic is likely to see a sharp rise in mild to moderate conditions arising from social isolation and loneliness as well as economic recession. Isolation and loneliness is recognised as a significant public health issue, affecting as many as 1 in 10 adults. The creation of socially inclusive neighbourhoods through support for social assets and creative physical planning, building on the upsurge of interest in volunteering in response to the pandemic could reduce demand for more specialist services.

Conclusion

Belfast's future resilience to shocks and stresses will depend on the underlying health of its people. This therefore requires a singular focus on ensuring the population is as active and healthy as possible. Opportunities should be proactively considered, through the Community Planning Partnership structures to ensure that housing, health and infrastructure delivery can contribute to, and demonstrate positive health outcomes at a local level.

"The strategy will put the city in a much better position to meet critical threats to the health of our citizens and protect the most vulnerable."

Iain Deboys,
Assistant Director for Contracting and ECRs
and Commissioning Lead, Health and Social Care Board, Belfast



FLOODING AND EXTREME WEATHER EVENTS

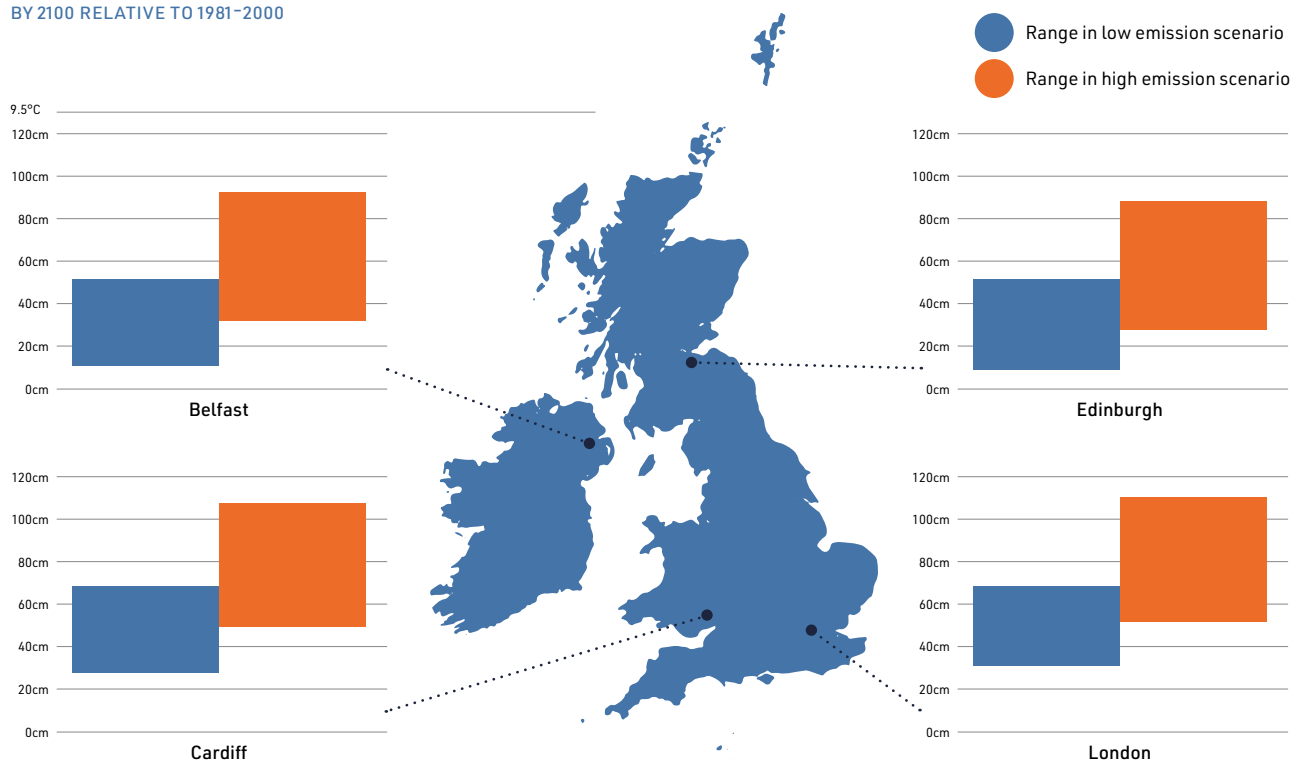


To be a resilient city, Belfast must be able to withstand the impact of flooding and extreme weather events.

The effect of climate change will be profound and with ongoing risk management and risk assessment, Belfast will be resilient in understanding potential impacts, infrastructure preparedness and economic consequences.

Sea level rise

BY 2100 RELATIVE TO 1981-2000



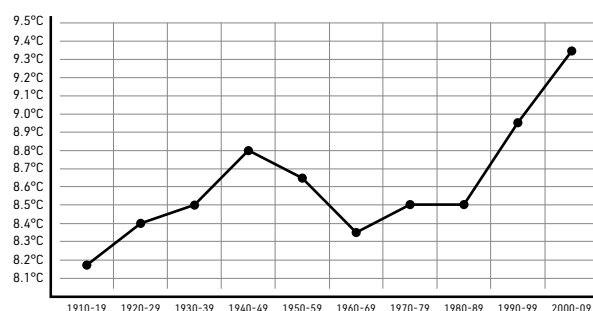
Source: UK Met Office

Changes to our weather

Climate change is causing many extreme weather events to become more intense and frequent, such as heat waves, droughts, and floods. In the summer of 2020 wildfires caused fire fighters to be called to numerous incidences that impacted residents of north Belfast. The image below shows the trend in temperatures in NI since 1910.

Cities are already responding to the financial impact of extreme weather events. The Glasgow City Region has estimated that the cost of four typical weather events between 2012 and 2017 cost the city region £44.5m.

NI mean temperatures



Flood risk in Belfast

Belfast is located within the River Lagan catchment and at the mouth of Belfast Lough. It is a city with very close proximity to water, and where water resilience is critical to the operation of the city. Belfast makes up a large proportion of the geographical area estimated to be at "Significant risk of flooding in NI."

The Northern Ireland Flood Risk Assessment (2018) is a critical source, and identifies Belfast as one of twelve Areas of Potential Significant Flood Risk (APSFR) in Northern Ireland.

Several tributary rivers flow from the hills surrounding Belfast, into the city to the River Lagan and Belfast Lough, all of which have the potential to flood during periods of heavy prolonged rainfall.

Belfast is therefore at risk of flooding from a number of sources including tidal (the sea), fluvial (rivers) and surface water (pluvial) unable to drain away quickly into the combined storm and combined sewerage network, much of which was built in the late 19th and early 20th century.

The fact that Belfast has a mainly combined sewer network means there is additional pressure on the system every time the city experiences heavy downfalls. As the city grows, additional pressure on the capacity of the network could increase the risk of flooding.

Belfast has a history of flood events and major damages are caused by both fluvial and pluvial events. The five highest tidal surges have been recorded since 1994, most recently in early January 2014.

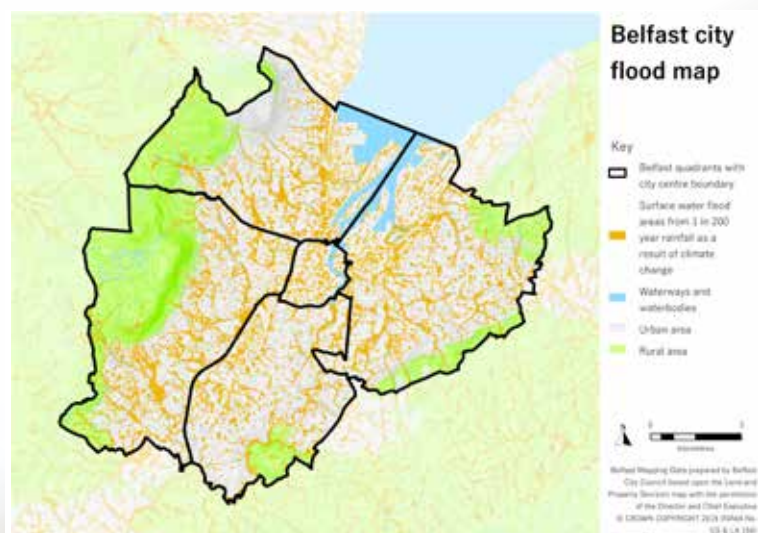
"The economic consequences of flooding for the city are well-known."

"The NI Flood Risk Assessment (2018) predicts that the city is the most economically impacted of all areas of risk in Northern Ireland with Aggregated Annual Average Damages (AAADs) of approximately £16m."

Coastal and pluvial flood risks are both sensitive to climate change. The impact of climate change causing sea level rise will increase the number of properties at risk of tidal flooding in the city to over 3,400 (2,640 Residential and 770 Commercial) by 2065 and over 7,900 (6,050 Residential and 1,860 Commercial) by 2115.

The Belfast Tidal Flood Alleviation Scheme is a landmark project that will provide a long term approach to tidal flood risk management for Belfast. Much of the city centre is between 1m to 2m below extreme tide levels, so a weather event of magnitude would cause serious disruption to the local economy, the transport network, and the social fabric of the city.

To understand the risks associated with climate change, ARUP undertook a high-level risk assessment of existing city infrastructure. The study looked to three points in the future (2040, 2060 and 2080) for four key climate hazards: sea level rise, extreme heat, drought and extreme cold. The two key hazards with the biggest projected impact for Belfast are (1) sea level rise and flooding and (2) extreme heat. ARUP found that many assets in the city are already at risk of flooding which is projected to be exacerbated by sea level rise and an increase in winter rainfall. The planned new flood defences will provide some protection but residual risk is projected to remain.



Conclusion

The forthcoming tidal flood alleviation scheme provides a mitigation against worsening flood levels in the future, therefore it is expected to provide some improvement to the city's overall climate resilience. However, there remains significant work ahead to ensure the city's existing infrastructure is climate resilient. Sea level rises and flood risk, coupled with extreme heat will have significant implications for

the city's infrastructure, as with many other cities. Evidence from cities globally has demonstrated the negative impact this can have on the local economy, the transport network and the social fabric of a city. Belfast must therefore carefully plan the future of its infrastructure to ensure climate resilience is prioritised.

CYBER RESILIENCE



A resilient city is reliant on its digital infrastructure, data and associated cyber security. As cities increase their digital dependency, their exposure to attack grows. A resilient Belfast will be able to deliver its essential services in the event of any breach.

As Belfast grows, and becomes increasingly reliant on a digital eco-system to achieve its ambitions, its ability to mitigate and manage data and cyber security risks will be essential. Experience from other cities with a sophisticated data infrastructure shows that as cities increase their digital dependency, their exposure to attacks also grows (McKinsey, 2018). A Smart Belfast must therefore be a secure and resilient Belfast. Being a cyber-resilient city means more than just being secure- it means being capable of delivering essential services in the event of a breach.

A security breach has the potential to disrupt the city; however, cyber-crime has increasingly affected communities and individual households too. Cyber-crime knows no borders and while authorities have experienced increasing levels of sophistication in mode of attack in recent years, low-level basic opportunistic attacks remain prevalent.

“ Being a cyber-resilient city means more than just being secure - it means being capable of delivering essential services in the event of a breach. ”

A significant cyber incident can affect the functions of the city - organisations and the public need to consider the impact which a major incident will have, what measures are needed and how to recover. Cyber security planning should be part of routine risk management and should be embedded in the structures and objectives of every organisation and business.

The National Cyber Security Centre, which is part of GCHQ, is a well-established source of information regarding escalating volumes and types of threat. While this is extremely valuable at a national level, at a city level more work is required to develop more cross-sector plans to future proof our digital environment.

Development of digital infrastructure and connectivity

Secure digital infrastructure is critical to the fabric of any modern city- to support its social and economic goals. In recent years, Belfast has improved its digital

connectedness - however it must retain this advantage through (1) a strategic approach to the development of a smart/digital city (2) sustained investment in the growth of its digital infrastructure (3) significant focus on the security and resilience of our digital infrastructure assets.

A number of key reports have recently made a similar case. Matrix, the Northern Ireland Science Industry Panel, formed a sub panel of experts in the Digital ICT sector to look at the opportunities within the sector and produce a capability assessment and foresight study into NI's Digital Information and Communications Technology sector. Its 2016 report made a number of significant recommendations that - while focused at a NI level - remain highly relevant to driving Belfast's economic resilience:

- Develop and deliver a coordinated Digital Strategy to bring together the key stakeholders and initiatives required to transform NI into a fully digitized and Smart society and appoint a Chief Digital Officer to build a digital society.
- Develop a 3-5-10 year Skills Investment Plan for the Digital ICT sector.
- Ensure that NI has an exemplar digital infrastructure within and between urban areas to secure NI as an exemplar smart, connected region.
- Provide an integrated, agile platform, based on open standards which expose appropriate data and service APIs to nurture the development of an innovative ecosystem.
- Ensure that the cyber security sector is supported and developed.

Belfast is well placed to build its cyber resilience, in part due to the development of cyber security expertise in the city. CSIT, the Centre for Secure Information Technologies at Queen's University is recognised for its world class research, and its work to enable new value and venture creation and ensure an entrepreneurial approach in the area of cyber security. It facilitates 'NI Cyber' a cluster of companies based in NI that are developing world-leading cyber security technologies for customers worldwide.

Belfast City Council has prioritised a 'smart cities' approach to digitising and connecting the city, to achieve its economic and social ambitions, and in turn contributing to the city's resilience. Smart Belfast brings together our universities, businesses, local government and citizens to collaborate, innovate and experiment using cutting-edge technologies and data science.

The Matrix report was instrumental in informing the

Belfast Region City Deal Innovation and Digital Pillar, which will deliver a number of its recommendations at a city-region level.

- The Regional Innovators Network (RIN) will create a unified environment in which the districts across the Belfast City Region are able to work together to develop and deliver a response to the regional needs for spaces within which entrepreneurs and SMEs can develop new products and services, and work with the larger businesses in the region.
- The Infrastructure Enabling Fund (IEF) will support the deployment of advanced and resilient connectivity infrastructure across the Belfast region.
- The Smart District and Regional Testbed Network consists of key locations across the Belfast region that will act as hubs for development of advanced digital and physical infrastructure and will foster early adoption of new digital products and services at large scale.
- The Digital Innovation Platform and Partnership (DIPP) is a shared physical and digital environment where academic research community, tech entrepreneurs and industrial partners will come together to address key challenges in business and society through the application of the Internet of Things (IoT) and data science.

Consumer protection on cyber security is also critical to cities, like Belfast, that are becoming increasingly digitally connected. The Department for Culture, Media and Sport has produced helpful guidelines for Consumer IoT security that aim to strengthen the security of consumer smart devices sold in the UK and define the security requirements for the Internet of Things (IoT). These standards will allow configured devices for Smart City initiatives to be better protected.



Belfast's objectives to ensure cyber and digital resilience should be:

- To make Belfast unattractive to cyber criminals - through resilience and recovery.
- To build an eco-system of supported city partners.
- To build a pipeline of skills and education.

Belfast Region City Deal is a 'once in an generation' opportunity to build Belfast's resilience by increasing its digital connectivity.

The Infrastructure Enabling Fund (IEF) will:

- Support the deployment of advanced and resilient connectivity infrastructure across the Belfast Region.
- Catalyse digital innovation towards increased productivity and inclusive economic growth.
- Manage the deployment of advanced wireless and fibre network infrastructure over the lifetime of the City Deal comprising of 4G LTE, Wi-Fi, IoT, optical and 5G technologies.
- Develop next-generation infrastructure to support the provision of a range of connectivity services, and will be critical for businesses within the Belfast region to catalyse their growth by having access to the latest communication technologies.
- Provide high value sectors in the city region with the digital infrastructure needed to test the application of new and emerging digital technology and solutions.

This will provide a significant boost to our economic resilience. Critically, the Digital and Innovation Pillar of the City Deal will be implemented in an integrated way- to ensure that the outputs and outcomes arising from the City Deal are directed and driving inclusive economic growth in the City Region. However, it places even greater emphasis on the importance of secure and resilient infrastructure.

Conclusion

There is no single coordinating body for the identification and management of cyber risk at a city level. While some individual organisations have developed cyber resilience plans to varying degrees of sophistication, this remains ad hoc, and with very little support for small organisations, and little focus on business continuity following a potential cyber or digital attack. Furthermore, there has been no single published account of the potential cost implications of a cyber-security threat to the city.

Protecting the city from cyber threats should be considered the collective responsibility of senior leaders across the city. This strategy advocates closer working relationships across organisations in Belfast- with academia and the private sector - sharing threat information and good practice and collaborating to make it more difficult for cyber threats to succeed.

UK EXIT FROM THE EU



On 31 January 2020 the United Kingdom left the European Union and the Withdrawal Agreement concluded with the EU became law. The 'transition period', provided for in the Withdrawal Agreement, comes to an end in December 2020. At the time of writing (October 2020), trade negotiations to establish the UK's future trading relationship with the EU remain ongoing. These negotiations on the UK's trading relationship will have enormous implications for Belfast's economy and for the wider region.

A number of studies have been undertaken to assess the future impact of UK Exit on NI, however there is no published central government assessment of the potential impacts of UK Exit for the city of Belfast or for similar UK cities. Earlier this year, a previously confidential study undertaken by the UK government detailing 142 areas of life in NI that will be impacted by Brexit was published by the House of Commons Exiting the EU Select Committee. The document is instructive in outlining the range of policy and practice areas - beyond trade and customs checks - that would be affected by a managed UK Exit. Furthermore, it highlights the scale and nature of formal and informal cooperation between the two jurisdictions on the island of Ireland, some of which may be impacted by a managed exit, and some adversely impacted by an unmanaged exit (i.e. departure without a deal).

It is extremely likely that unsuccessful trade negotiations between the UK and the EU would represent both a short-term shock to the city of Belfast, and have longer term implications for the operation of the economy.

Conclusion

The UK's decision to leave the EU has long term implications for the city of Belfast. Significant re-framing of our relationship with cities in Europe is required; work to sustain levels of investment in a new trading landscape will also take time; and its funding relationships with key EU bodies requires careful planning into the future. For these reasons, UK Exit from the EU will remain a significant area of focus and of risk management for the city.



ECONOMIC RECOVERY CAPACITY



Economic resilience refers to a city's resistance to and recovery from an economic shock. Improving resilience therefore includes a focus on the vulnerabilities that either make an economic shock more likely, or that exacerbate a crisis.

Following the global financial crash (2008-09), policy makers began to pay greater attention to the cost of crisis in a city- sometimes referred to as 'GDP at Risk', which can profoundly damage long-term economic development. The OECD, for example, has developed a set of indicators to help cities help policy makers detect vulnerabilities early on and monitor country-specific risks. Like several other cities, Belfast has made economic resilience a core priority, committing the city in the Belfast Agenda to take a targeted approach to addressing those issues which pose the greatest risk to the city and its economy.

As a city with important economic relationships globally, Belfast is susceptible to global economic trends and headwinds. Our focus on economic resilience seeks to ensure (1) strong resistance - when economic shocks happen, we are prepared and can ensure the shock has a temporary impact; and (2) have with greater capacity to adapt and recover, and to maintain progress towards our inclusive growth ambitions.

Resilience to what?

The World Economic Forum Global Risks Report is a credible and often cited source of information on immediate and longer term risks faced by cities and states globally. Published annually, it allows for tracking of risks over time.

In 2020, its report identified immediate risks emerging globally; a 'synchronised economic slowdown', continued warmer temperatures globally, expected increases in cyberattacks, and growth in protests around the world against systems that exacerbate inequality. The report was published in January 2020, as COVID-19 was confined to a small number of countries and had not yet been declared a 'pandemic'.

Since early 2020, global economic forecasts have worsened, and in the UK economic forecasts suggest a prolonged shock as a result of the pandemic. At the time of writing (October 2020) the Bank of England has warned of an 'unusually uncertain' outlook. HM Treasury comparison of independent forecasts predicts an average GDP drop of 10% for 2020, an average unemployment rate of 7.3% for 2020, and average public sector net borrowing for 2020/21 to sit at £343bn.

An unsettled world, global risks and Belfast

For the first time in the history of the WEF Global Risks Perception Survey, environmental concerns dominate the top long-term risks globally. These risks are set against a worsening macro-economic outlook, which has been emerging for some time, i.e. before the impact of COVID-19. The 2020 report makes a number of observations that are relevant to Belfast; risks to economic stability and social cohesion, climate change and accelerated biodiversity loss, consequences of digital fragmentation, and health systems under pressure.

For Belfast, proactively managing the impact of these global risks locally is challenging, but essential. The impacts for Belfast could be:

- A potential slow-down of growth in investment and Foreign Direct Investment in the city, if property funds look outside of the UK due to uncertainties arising from the impact of UK Exit from the EU.
- Increased costs for businesses and potential major shocks for industry depending on the nature of the UK's future trading relationship with the EU, and particular arrangements for NI.

- Supply chain shocks - in particular costs associated with accessing supplies depending on the nature of the UK withdrawal from the EU.
- Currency volatility and its impact on exports.
- Economic shock arising from COVID-19, followed by a prolonged global slow down could choke off the slow recovery being experienced by the city since the financial crash.
- Slowdown in scale of transition to low carbon technologies thereby reducing potential to take advantage of opportunities to be gained.

As a city with significant exposure to the impact of the UK's exit from the European Union, and with underlying existing economic vulnerabilities, Belfast must prioritise how it builds resistance to economic risks, as quickly as possible.

This strategy and the establishment of an Innovation and Inclusive Growth Commission is aimed at institutionalising an approach to managing long term economic risks thus boosting the city's economic resilience.

Belfast's existing economic resilience

In 2018, the UK Core Cities Network commissioned Cambridge Econometrics to investigate the economic resilience of cities. In preparing this strategy, through our membership of the Core Cities network, we supplemented this study to include an assessment of Belfast's economic resilience, including relative to other core cities. The study concluded that:

"Belfast requires a series of measures to strengthen its resistance to, and recovery from, economic shocks."

Belfast had lower resistance and lower recovery capacity than the Core City average measured against twelve other UK cities. Its recovery capacity has been particularly low, being rated as the weakest of all the cities except Liverpool. This is despite the data showing that Belfast's resistance is strengthened somewhat by the share of public services in the city's economic output.

This finding underscores that the policy levers required for economic resilience are different to those that focus on economic growth. The high dependency on the public sector as a contributor to the city's economy has a positive impact on the city's resistance to shocks;

however, it can also have a negative impact on the city's ability to develop sustainably.

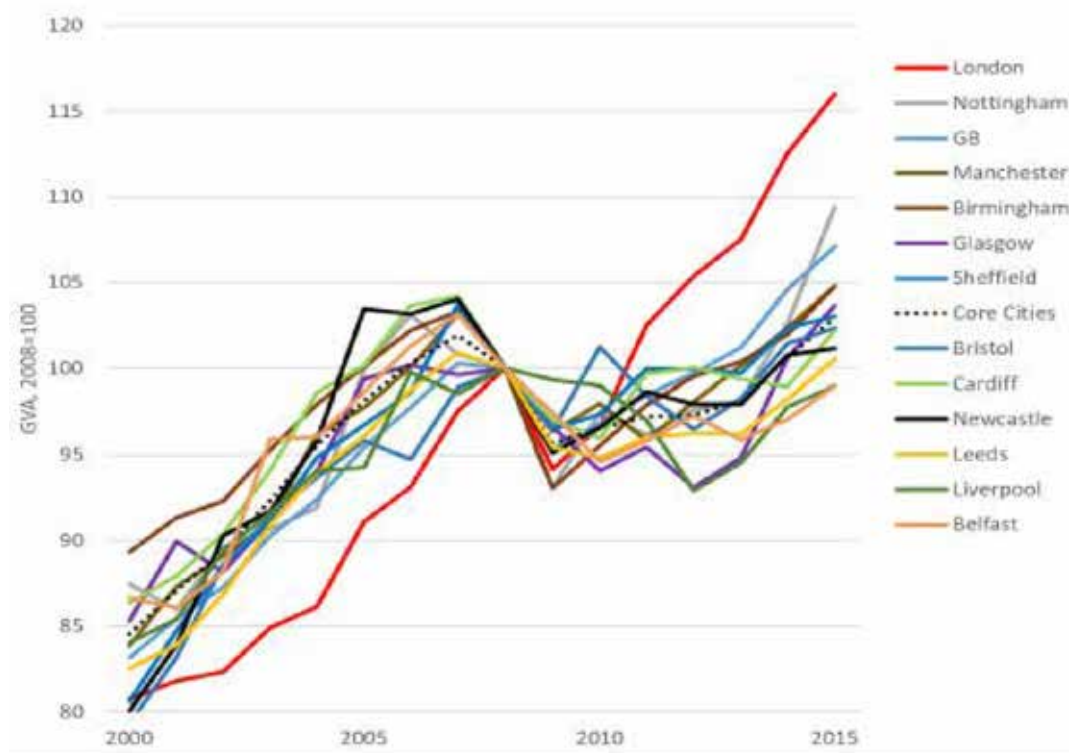
Belfast requires a series of measures to strengthen its resistance and recovery to economic shocks. This is particularly important because the way cities recover from shocks can have permanent impacts on their long term economy. For example, if people who are economically inactive fail to feel the benefits of a return to growth, this can result in a widening of income inequality further reducing resistance to the next shock.

Factors affecting Belfast's economic resilience

Despite its importance, there is no single global standard or set of indicators for measuring economic resilience.






In this section we examine two particular aspects of Belfast's economic resilience - income inequality and competitiveness and recommend the development of a series of indicators to measure the city's economic resilience in the future.

Core cities compare Belfast with the GB average



Belfast city's competitiveness

A recent study of the city's competitiveness (Baker Tilly Mooney Moore 2019) identified a number of areas of vulnerability for the city of Belfast, and summarised them in the graphic below. Importantly, the study found that Belfast's decline relative to other cities is due to their resurgence, i.e. other cities' out-performing Belfast.

Theme	Current average ranking	Three year change	Five year change
 Productivity	4/12	→	→
 Population and demography	9/12	→	↓
 Sustainable and inclusive growth	6/12	→	↓
 Quality of life	6/12	→	↑
 Physical knowledge and infrastructure	5/12	↓	↓

The study concluded the following:

- Belfast's demographic profile is impacting its competitiveness and its ability to achieve its city objectives. Belfast has a smaller labour pool which is growing slower than its competitors. Retaining the city's population and replacing those who leave is a major challenge. These factors may potentially impact the city's attractiveness to investors and is at odds with the performance of other cities.
- Belfast has a significant skills challenge. It has too few highly skilled workers and too many with no qualifications. While the figures are improving, it lags significantly behind other UK and European cities. This is impacting the city's competitiveness and the prosperity of its citizens, creating inequalities within the Belfast economy and making the achievement of inclusive growth more challenging. While a range of initiatives have been delivered to improve the skills base, significant issues remain and while much of the policy responsibility sits with the NI Executive, initiatives such as the Belfast Region City Deal present an opportunity for the City to play a bigger role, over both the short term and the long term.

- Belfast (and NI as a whole) still has the largest proportion of economically inactive population of all UK cities (and regions). As well as the implications for the individuals affected, it also results in a drag on the local economy's performance and competitiveness. To improve Belfast's competitiveness, this is an area which must be addressed.
- While there is a sense of an emerging entrepreneurial ecosystem, supported by a buoyant knowledge economy and a growing private sector, key indicators still highlight that Belfast lags behind its peers in relation to creating and growing successful businesses. Providing a supportive environment which is conducive to business creation will be key to improving Belfast's competitiveness. This is also a key focus of the Belfast Region City Deal, which presents a significant opportunity to provide further foundations to support enterprise, innovation and entrepreneurship
- Belfast has momentum across a range of indicators, it has also dropped down the rankings across others - namely in broadband provision. There is evidence that other cities are seeking to enhance their competitiveness by investing in policy areas that have made Belfast successful. This poses a threat to Belfast and may take away from Belfast's competitive offer. The city should not rest on its laurels and should seek to build on its strengths to maintain and enhance advantages where they exist.

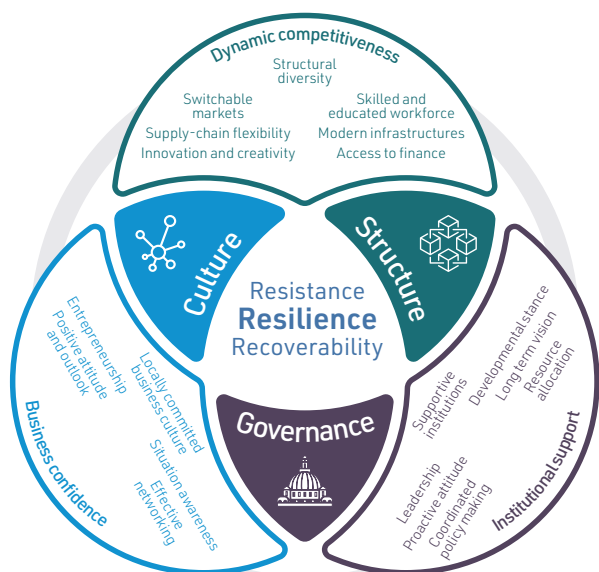
The Belfast Agenda, the city's community plan, sets out a series of measures aimed at reducing and removing some of Belfast's economic challenges- in particular through a sustained focus on population growth, jobs creation and development. This pro-growth approach is underpinned by a focus on inclusive growth, reducing inequality over time. This mirrors the approach taken by a number of global cities with similar challenges, and assuming the right policy levers are applied, could be transformative for the city of Belfast.

Encouragingly, the potential for greater resilience is intrinsic to the ambitions within the Belfast Agenda. Their realisation could address a number of challenges for the city referenced in this document, such as providing critical mass to maintain or support services and infrastructure.



Building our economic resilience

Building economic resilience for sustainable growth requires an integrated and simultaneous focus on several aspects of the city's economy. The Cambridge Econometrics Study produced the following helpful Venn diagram:



Indicators to measure and strengthen economic resilience

This strategy proposes the agreement of a citywide series of indicators to measure Belfast's economic resistance and recovery capacity. These may include the following:

- 1 Levels of private and household debt
- 2 Flexibility of labour market
- 3 Skills among working age population
- 4 Ratio of FDI and indigenous investment
- 5 Public Sector as a contributor to economic output
- 6 Export Intensity
- 7 Income and wealth inequality
- 8 Employment and economic activity
- 9 Integrated local economic networks
- 10 Presence of strong economic strategy and leadership
- 11 Levels of trust
- 12 Dependence on carbon

Building on the city's economic strengths

As set out in the previous pages, Belfast faces a number of challenges associated with its weak recovery capacity. However, its economic resilience has been significantly boosted in the last decade as new growth sectors have emerged, and thrived. These include significant recent growth in the ICT sectors, fintech, life and health sciences, global business services and across emerging sectors such as cyber security, regtech and legal tech. More recently, Belfast has also attracted a significant number of internationally recognised global investors.

Alignment of city partners around a number of growth priorities, has led to the establishment of a number of new city structures. For example, the Belfast Digital Innovation Partnership brings together local government, universities, Belfast Harbour and Catalyst- the city's community of innovators- to harness digital innovation with the objective of achieving a step-change in increasing the city and the region's productivity. The work ensures a strategic focus on commercialising the outputs of the city's research base, weaving digital innovation into every aspect of the city's economy with the goal of creating new and better jobs.

Investment in companies across the city has remained strong throughout the decade. Between 2015/16 and 2019/20 Invest NI, the Economic Development Agency for Northern Ireland, provided £198m of support to businesses based in Belfast (£110m to local companies/ £88m to externally owned companies), securing over £1.144bn of investment and assisting in the promotion of 10,126 jobs.

As a result of this investment and a strategic approach to development of growth sectors, Belfast can now boast of becoming a leading city across a number of key industries. It is currently (2020) Europe's leading FDI destination for new software development*, is ranked as the No 2 'Second Tier' city for Business Friendliness and is one of the top 10 digital economies of the future.

Continuing to improve the city's economic resilience is a critical priority for the city's Innovation and Inclusive Growth Commission, established to develop an economic strategy for Belfast and to ensure continuation of a strategic focus on key growth sectors. The Belfast Region City Deal offers a timely and important lever for the city to invest heavily across those industries to support job creation, skills development and sustainable economic output.



Conclusion

The financial crash and global recession of the previous decade exposed Belfast's weak recovery capacity. This will be further impacted by the economic shock arising from the effects of the COVID-19 pandemic. In many respects, Belfast had only just begun to recover from the previous crash, when COVID-19 hit. To better prepare for future economic cycles, a sustained focus on economic resilience, as part of a wider inclusive

growth strategy is required. Many global cities, are now placing a particular emphasis on economic resilience and Belfast can learn from existing global practice. This strategy recommends that we commence this work by (1) identifying and agreeing a series of city-wide indicators to measure economic resilience (2) making it a core aspect of the work of the Innovation and Inclusive Growth Commission.



POVERTY AND INEQUALITY



High levels of poverty and income inequality can severely reduce a city's resilience. At a household or individual level, lack of access to additional resources in times of unpredictability means much greater vulnerability in a crisis. Substantial research now exists to show the disproportionately adverse impact of climate related shocks on poorer neighbourhoods, for example, following periods of economic shocks, people without jobs and on fixed low incomes often do not benefit from a return to growth as quickly as wealthier households.

A significant proportion of the population will face financial difficulty. The Office for National Statistics (ONS) said that one in four (25%) adults stated that the coronavirus was affecting their household finances, with 75% reporting reduced income. The survey also indicated that an increasing proportion of households have needed to use savings to cover living costs, with evidence of having to borrow money or use credit causing concern for some households.

Initial analysis indicated that those in the lowest earning income deciles are much more likely to be furloughed or laid off compared to those at the top of the income distribution. Therefore, the least well off are more likely to lose their jobs or suffer from reduced income, thus widening inequality. (JUEPC)

COVID-19 makes it clear that cities are only as resilient as they are inclusive. (World Bank Cities).

Belfast's resistance to and recovery from shocks, and its wider resilience will therefore be determined by the success of its achievements to drive inclusive growth.

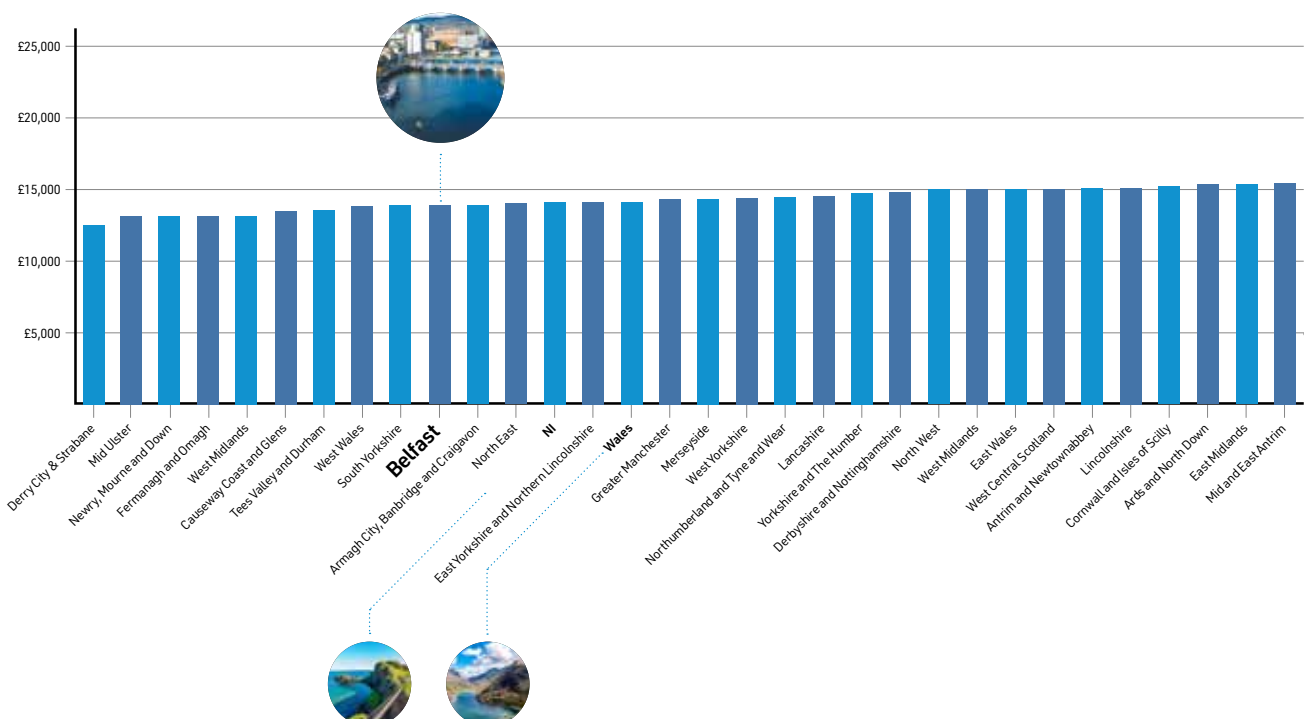
The draft Local Development Plan (LDP) describes the social context in Belfast as 'a tale of two cities'.

"Belfast is home to some of the most affluent communities in NI, however it is also home to some of the most deprived communities."

There is a need for the LDP to increase equality of opportunity and contribute to the breakdown of the physical and psychological aspects of division.

This assertion is based on a range of data sources- including the Income Deprivation Domain (in The Northern Ireland Deprivation Measures), which identifies the proportion of the population living in households whose equivalised income is below 60% of the NI median. Belfast is split into 174 spatial areas known as Super Output Areas (SOAs). Belfast contains two of the ten most deprived SOAs in NI - and 4 out of the 10 least deprived, in terms of income.

Gross disposable household income



A 2016 NICVA study on income inequality found that 'it is possible to say that Belfast is the most unequal part of NI, as it has a high proportion of people in the bottom of the income distribution (25%) and a high proportion at the top (18%).'

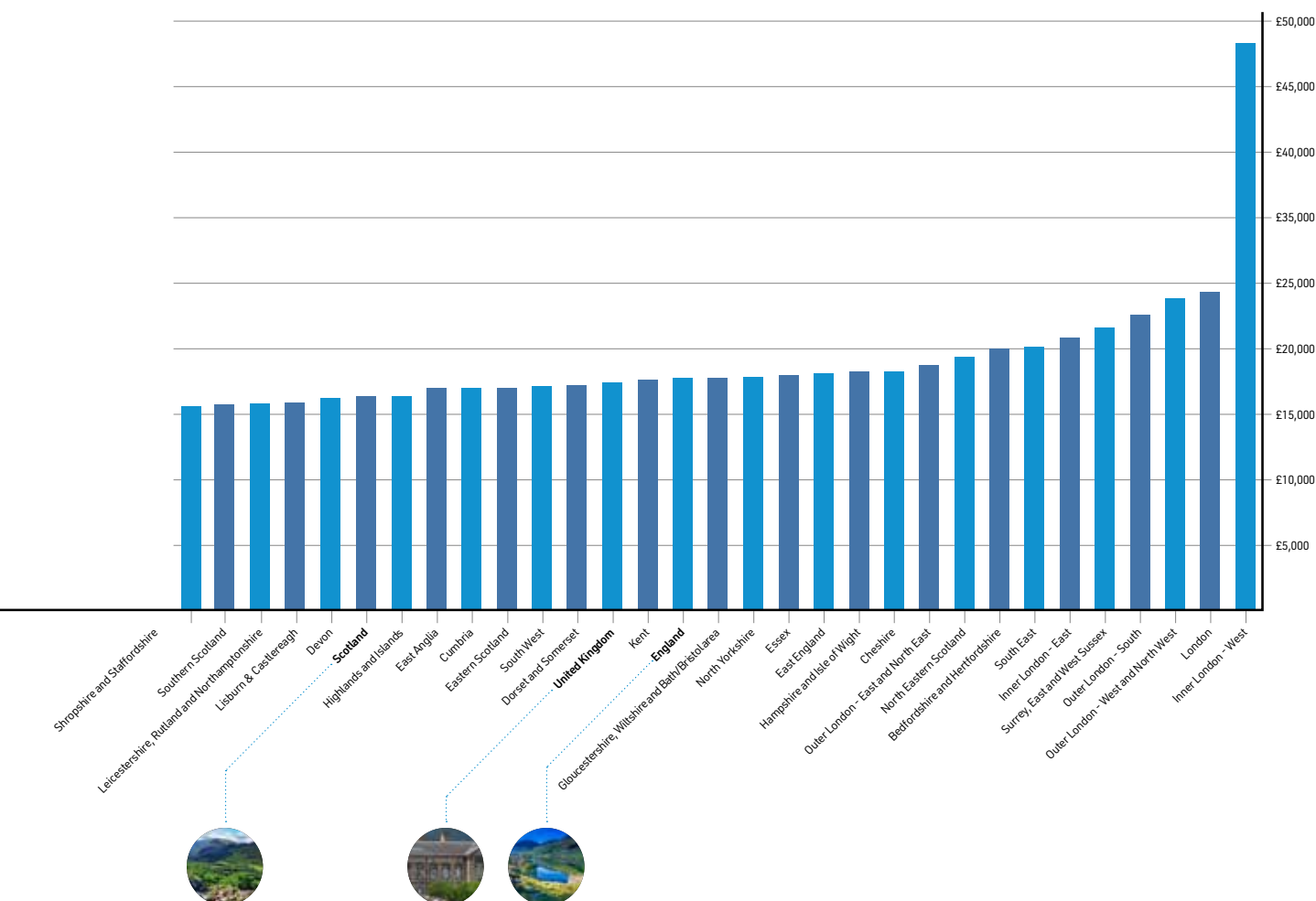
While income and wealth inequality in Belfast is high, the city also compares poorly to others in terms of absolute levels of income. Twenty-one of the top 20% most deprived SOA's in NI are in Belfast. However, 14 of these have remained in the top 20% since 2005. Even more notable is the fact that a number of SOA's moved out of the top 20% in the 2010 measures and then re-entered again in the latest 2017 measures.

While income inequality clearly requires a sustained focus, there is an equally strong argument for a greater understanding of the impact of wealth inequality. Wealth inequality rarely receives as much policy attention as income inequality, yet the gap between public and private capital is a strong driver of divisions in society. It is not clear whether a single city study into wealth inequality has been done in Belfast.

"While overall private wealth has increased in the UK, public wealth has waned and the gap between both has widened."

Data on economic performance confirms the benefits to be gained from reduced wealth and income inequality, and less division generally. Economic activity has close correlations with levels of trust- economies with high levels of trust, have higher levels of trade and activity that adds economic value. There is a case for a focus on community wealth and asset based welfare to find ways to reduce wealth inequalities in the city.

Coupled with political polarization, inequality erodes a country's social fabric in an economically damaging way: as cohesion and trust diminish, economic performance is likely to follow.



POPULATION CHANGE



Resilient cities are those with thriving populations - well planned levels of sustainable development, to match cities' long term ambitions. Belfast's economic resilience is therefore dependent on sustainable levels of population growth, particularly among its younger and its working age populations.

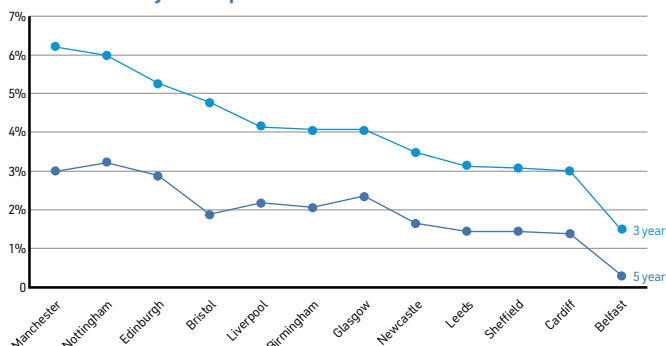
Population projections are important because they give us a perspective on how the future might look, if certain trends continue. However, because they are trend-based, they cannot take account of policy changes which might occur, and the impacts of these interventions. Most cities globally are planned on this basis - population projections are developed centrally based on past trends, however, local planning policies aim to change these trends over time.

This strategy uses population projections because they provide critically important information on how past trends might impact on the future. However, as this section concludes, future policies will determine whether these projections are realised.

In 2019, Belfast had a population of 343,542 (2019 Mid Year Estimate) making it, by this measure, one of the largest cities in the UK overall. It has a lower population than the Scottish capital Edinburgh (518,000) but has a similar population to the Welsh capital Cardiff (364,248), Newcastle (300,196) and Nottingham (331,069) (Office for National Statistics ONS).

As part of Belfast's competitiveness study, the city's projected population growth rates was compared with 12 others. The study found that Belfast had the lowest projected population growth rate for the next three and five years.

Three and five year Population Growth rates



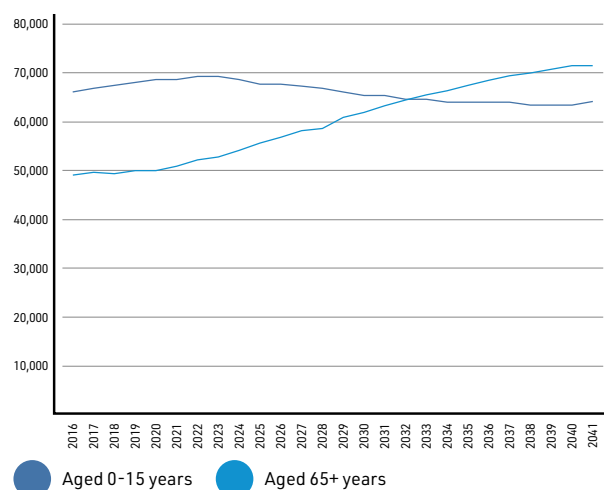
When data on growth in working age population was compared, Belfast has one of the lowest labour pools of the twelve cities. Perhaps most worrying of all, Belfast has seen relatively low growth in its working age population since 2013 (0.8%) and a decline since 2015 (-0.2%) which leaves it ranked lowest of the 12 comparator cities.

An Aging Population

Over the decade mid-2016 to mid-2026, the population of children (i.e. those aged 0 to 15 years) in Belfast is expected to grow by just 2.4%.

Furthermore, over the same decade, the population in Belfast aged over 65 is projected to increase by 15.2%. In 2033, the number of older people aged 65+ in Belfast will surpass the number of children under 15 (NISRA). Each of these trends presents distinct challenges for the city- and for its economic resilience in particular.

Children 0-15 and older people 65+

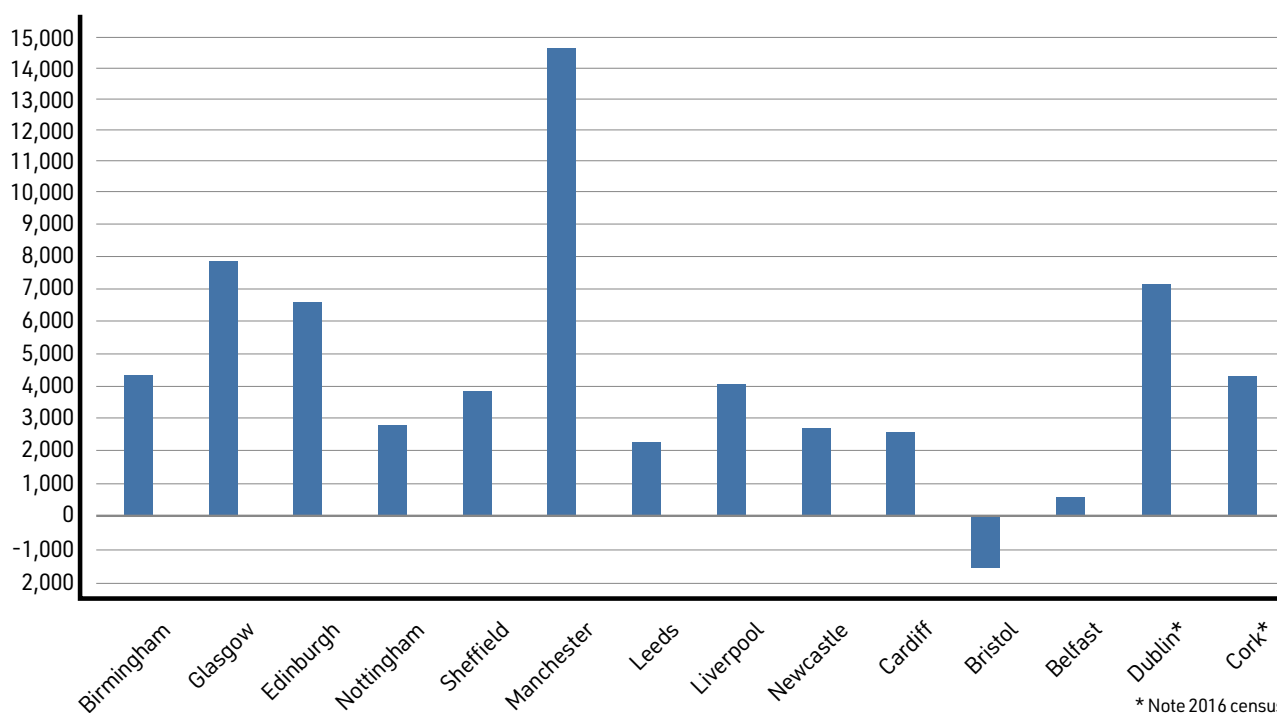


Migration and people leaving our city

Migration flows are a strong indicator of how a city is perceived internationally. Belfast has recently realised negative net migration - i.e. more people leaving than arriving. This is highly unusual. When ranked alongside twelve other UK cities as part of the Competitiveness Study, Belfast was unique in this respect.

Environmental migrants forced to flee their current homes due to rising sea levels, drought and unpredictable weather events around the world is something that may impact UK cities in future years.

Migration due to climate change, 2019 mid-year estimates



Conclusion

Official population projections for Belfast demonstrate the challenges faced by the city. However, it is important to stress that a focus on projections alone can mask the drivers that led us to the present position. Resilient cities are highly reflective and adaptive - they plan for sustainable development based on a sophisticated understanding of the relationship between economic and social trends, on what has succeeded or failed in the past and what has worked elsewhere.

Growing its population - and in particular the number of young people and working age people is critical to

the city's economic resilience. For this reason, the policy goals in the Belfast Agenda - 'to be home to an additional 66,000 people', and underpinned by its draft Local Development Plan are crucial to the city's future economic resilience.

Many other cities globally have demonstrated the capacity of local planning policies to reverse or shift population trends and it is essential that decision makers in Belfast do the same. Given the impact of Belfast for the regional economy, there is a strong case for pursuit of these policies to receive regional priority.

CARBON INTENSIVE SYSTEMS: DEPENDENCY ON FOSSIL FUELS



Belfast is a net importer of energy, relying heavily on traditional coal, gas and oil to heat and power homes and buildings in the city and on petrol and diesel for virtually all of its transport needs. A third of the domestic sector relies exclusively on oil for space heating.

This heavy fossil fuel reliance, generating high levels of demand for what is an expensive form of energy, presents a significant challenge to the city's long-term resilience.

"Balancing security of energy supply for economic growth with a supply of affordable energy so all households can live in healthy warm environments with environmentally sound sources of energy."

Belfast's dependence on energy will increase. The International Energy Agency has previously projected that energy demand in cities globally will increase by 57% by 2030 - energy demand and energy security therefore represent a major challenge for all global cities including Belfast. This makes the transition to low carbon sources of energy an even greater priority for the city.

The so-called 'energy trilemma' is a well-known phenomenon within cities. It relates to balancing security of energy supply for sustainable economic growth with a supply of affordable energy so all households can live in healthy warm environments with environmentally sound sources of energy in response to a changing climate.

A 2017 Northern Ireland Affairs Committee report on the electricity sector was blunt in its assessment that NI has struggled to achieve this balance. It called for an urgent update of the Strategic Energy Framework - the policy framework on energy, to give certainty to investors, and enable long term policy clarity and planning for energy. It also recommended a permanent advisory body on energy.

Belfast is a net importer of electricity. The security of this supply is considered both on a NI basis and an All Island basis. SONI (the Northern Ireland Transmission System Operator) jointly (with the Republic of Ireland Transmission System Operator, Eirgrid) annually published a Generator Capacity Statement and Annual 10 year Transmission Forecast Statement. These consider the expected electricity demand and the level of generation capacity that will be required in NI and on the whole island over the next ten years. Within this they consider a number of realistic scenarios. Their current statement highlights that current capacity needs are met however some scenarios indicate further capacity is needed for 2026 and beyond. The need for a second

North South Interconnector to increase security of supply is also highlighted. Planning approval for the interconnector has now been granted by the Minister for Infrastructure in Northern Ireland enabling this critical project to advance.

Generators are provided with clear information on how they are compensated within the current single electricity market on the island of Ireland. This design includes capacity auctions for generation capacity four years in advance of the need. However generators also require long-term policy clarification from the NI Executive to provide further surety and reduce their risk leading to reduction in costs for consumers going forward.

Belfast is also a net importer of gas. The security of supply for gas is considered on a NI basis by the Gas Market Operator within NI.

Nevertheless, we have a good story to tell when it comes to renewable electricity. From October 2018 to September 2019, 44.9 % of total electricity consumed in Northern Ireland was generated from renewable sources. This exceeded the original target of 40% by 2020. Decarbonisation of the energy system, however, will require a step change in the level of renewable generation if net zero carbon targets are to be met. Demand for electricity may also increase through the electrification of heat and transport. These are dependent on an enabling policy environment, which will not be in place until a new Northern Ireland energy strategy is implemented, expected to be in 2021 or later.

Towards a New Energy Strategy for NI

The Department for the Economy has begun the process of developing a new energy strategy, which it intends 'to decarbonise the Northern Ireland energy sector by 2050 at least cost to the consumer.' Encouragingly the department also recognises that any new strategic direction for energy in Northern Ireland must consider the existing energy mix and how it will be reshaped, as well as considering energy demand reduction. The move to decarbonise our energy systems was given further impetus when the Minister for the Economy announced that 'Clean Energy' is one of four growth sectors for targetted investment in her 'Rebuilding a Stronger Economy' document, published to support economic recovery following the COVID-19 pandemic. Clearly, in a relatively short space of time clean energy has emerged as an area of strategic focus in Northern Ireland, and as the region's capital, Belfast will have a critical role to play



Belfast's big energy bill

The 'Mini Stern' for Belfast, commissioned by the Belfast Climate Commission, and undertaken by Professor Andy Gouldson at Leeds University, found:



- Belfast spent a total of £296m in 2019 on energy across the city. However, Belfast's energy bill is forecast to grow to £466m by 2050.
- If it invested in all of the profitable energy efficiency and low carbon options, total energy bills would be cut by £286m per year in 2050, creating jobs, improving air quality and the liveability of the city.
- Households in the area would save £46m a year from their energy bill.
- Belfast's industry could cut its fuel costs by £9m a year.
- This would mean the area's carbon emissions would fall by 23% over and above what is already expected.

"Cutting the city's carbon footprint makes really sound sense economically and socially as well as environmentally. Belfast could cut its future energy bill in half whilst at the same time reducing fuel poverty, creating jobs, making its homes more comfortable and slashing its carbon emissions. The case for action is so strong that rather than asking why would we do this, people in the city should be asking why wouldn't we."

Andy Gouldson
Professor of Environmental Policy, University of Leeds
Author of Belfast Net Zero Carbon Roadmap (Mini Stern)



Waste and the circular economy

In January 2018, as part of its national climate mitigation and adaptation policy, China banned the import of foreign waste, including almost 9 million tons of plastic scrap, to reduce pollution and strain on its national environmental systems.

This ban exposed poor resilience in the domestic recycling capacity of many states that had traditionally exported to China. Plastic waste built up in the United Kingdom, Canada and several European states. In the first half of 2018 the United States sent 30% of the plastic that would previously have gone to China to landfill. According to the World Economic Forum, 'as the impact of environmental risks increases, it will become increasingly difficult to treat those risks as externalities that can be ignored or shipped out. Domestic and coordinated international action will be needed to internalize and mitigate the impact of human activity on natural systems.'

Successful cities manage the impact of growth sustainably and ensure that it does not limit the quality of life of future generations. Waste management is therefore a key factor in the resilience of the city. Belfast City Council is prioritising the management of urban waste, to create a quality materials product with the aim of supporting jobs via a circular economy.

The council's forthcoming Corporate Plan from 2020 to 2024 will prioritise new waste collection arrangements under the 10 Year Waste Framework Strategy. Through the Resourceful Belfast programme, the council aims to maximise economic potential by creating social enterprises; and will develop a strategy which will ensure waste is managed effectively and investigate the economic potential of the circular economy to increase skills, jobs and inclusive growth.



Risk to health and enjoyment of the city: air quality

The quality of urban air is a critical factor in the quality of life enjoyed by city residents, as well as a key health determinant. The World Health Organisation describes air pollution as 'the largest environmental risk factor for ill health' and estimates that in 2012 around 1 in 8 deaths were attributed to exposure to air pollution, and this is echoed by the UK Clean Air Strategy, published in early 2019.

Cities that have been successful in enhancing air quality have tended to take a multi-faceted approach:

1. Setting evidence-based targets for reduction in harmful levels of pollutants- often exceeding national level targets
2. Dramatic reduction in fossil fuel dependent road transport and in combustion of fossil fuels- a sustained modal shift in travel and transport
3. Providing clear and easy to access public information on air quality levels, to enable informed decision making by the public on their travel routes
4. Well-resourced public education campaigns to help individuals and organisations understand how they could reduce their contribution to air pollution
5. Excellent partnerships between city government, health policy makers and innovators to identify new solutions to a systemic problem.

Belfast Smart Cities Urban Health Programme

The Urban Healthy Living pilot was funded by UK Space Agency's 'Space for Smarter Government Programme' which adapts satellite-enabled air pollution monitoring to support public health programmes and healthcare delivery in an urban setting.



The project demonstrated the use of a space-enabled technology for traffic related air pollution monitoring and aimed to spur innovative interventions in healthy living and disease prevention. Using a blend of technology, the project produced air pollution models that were visualised on 3D maps, making complex information accessible. UHL also prototyped a routing map that could allow clinical patients to better self-manage their respiratory conditions by selecting the routes and modes of transport that limit their exposure to pollutants.

The project's research led to some important conclusions which are highly relevant for policy makers and city planners; that air pollution hovers long after traffic dissipates, and that weather is a determining factor. Those with COPD and asthma are much more severely affected by air pollution levels, and air pollution is increasingly linked with non-respiratory diseases including diabetes and reduced cognitive function.

Conclusion

Belfast's economy is a high-carbon one- which will impact its resilience in the coming decades, as other cities transition to low-carbon futures. The speed and means of Belfast's energy transition will be critical to its economic future. However a timely and well managed transition has the potential to significantly boost inclusive growth in the city, to create jobs and to reduce fuel poverty.

When work commenced to prepare a resilience strategy in 2018, there were no formal citywide structures or plans in place across Belfast with either a focus on climate mitigation or climate adaptation. Data on the potential implications of climate change is still not held centrally (i.e. at a city wide level).



How prevalent is car use in Belfast?

- Belfast remains a car oriented city with 68% of households having access to at least 1 car.
- 53% of journeys made in Belfast between 2015-17 were car journeys, and just 11% were by public transport. This compares poorly to other similar UK and global cities.
- Relatively few households were close to a train station. 60% said it would take them 44 or more minutes or that it was not feasible to walk.
- Belfast's daytime population increases by 25% to accommodate people who travel to Belfast to work.
- Congestion levels in Belfast place the city in the TomTom Traffic Index Top 25 Global Congested Cities.
- 158,237 vehicles registered in Belfast 2019.
- 1,172 electric vehicle registrations in Belfast in the first quarter of 2020 (less than 1% of all registrations in 2019).

Conclusion

The fact that the car remains the predominant feature of Belfast's transport infrastructure and network is a major risk factor for the city, and increasingly inhibits its resilience. While the city's transport infrastructure is functioning successfully in lots of ways, the prevalence of road infrastructure in the city, the numbers of daily car journeys and their impact on movement in the city and the dependency on fossil fuels for car use present major challenges for the city as it transitions to a low carbon economy. The draft LDP Technical Supplement makes the point succinctly, 'Belfast is a city that has historically been dependent on the private car and the streetscape has evolved to cater to these demands, resulting in road infrastructure that is over sized, over complicated and a barrier to non-motorised accessibility'.

The policy framework for transport at the city level, the Belfast Metropolitan Transport Plan was developed in 2004 for implementation to 2015. While many aspects of the plan remain relevant, there is a strong case, as Belfast sets targets for decarbonisation, to refresh the city's policy ambitions for sustainable transport.

Belfast's future resilience is dependent on its transition to a low carbon economy. This will only be possible with a material shift in the balance of its travel choices away from cars and towards sustainable public transport, walking and cycling as advocated in the approach to future growth in the LDP.

There are welcome signs of progress towards reducing the city's dependency on the car. Changes to mobility following COVID-19 may result in longer-term patterns towards sustainable forms of travel. The appointment of a Walking and Cycling Champion by the Department for Infrastructure presents a welcome opportunity to promote active travel across the city.

Research from cities across Europe, where the dominant mode of transport is walking, cycling or public transport demonstrates the health benefits and the transformational impact modal shift can have on peoples' satisfaction with their city. A step change in sustainable forms of transport would deliver two major city objectives at once- making Belfast a city that attracts and retains young people, and encourage them to live in the city centre. It would significantly increase the city's climate resilience and drive decarbonisation, making Belfast a much more attractive city in which to live.

CLIMATE CHANGE



2

Climate change presents a grave risk to the planet, and as such, its effects on cities will be profound, and many will be permanent. How we design cities, how we live in them and enjoy our city lives will change significantly in the decades to come. Work on this strategy had just commenced in 2018, when the IPCC produced its seminal report which concluded that global warming should not go above 1.5 degrees beyond pre-industrial levels. The report recommended significant acceleration in global efforts to reduce carbon, and was instrumental in shaping the UK government's decision to set a net zero carbon target for the UK by 2050.

In preparing this strategy, climate change was the predominant issue raised by stakeholders in our focus groups and workshops. Children and young people across Belfast raised it as a priority issue for them.

Lack of preparation for climate change emerged as a major feature of discussion in our workshops and focus groups. This was echoed in Northern Ireland Climate Change Risk Assessment, which found:

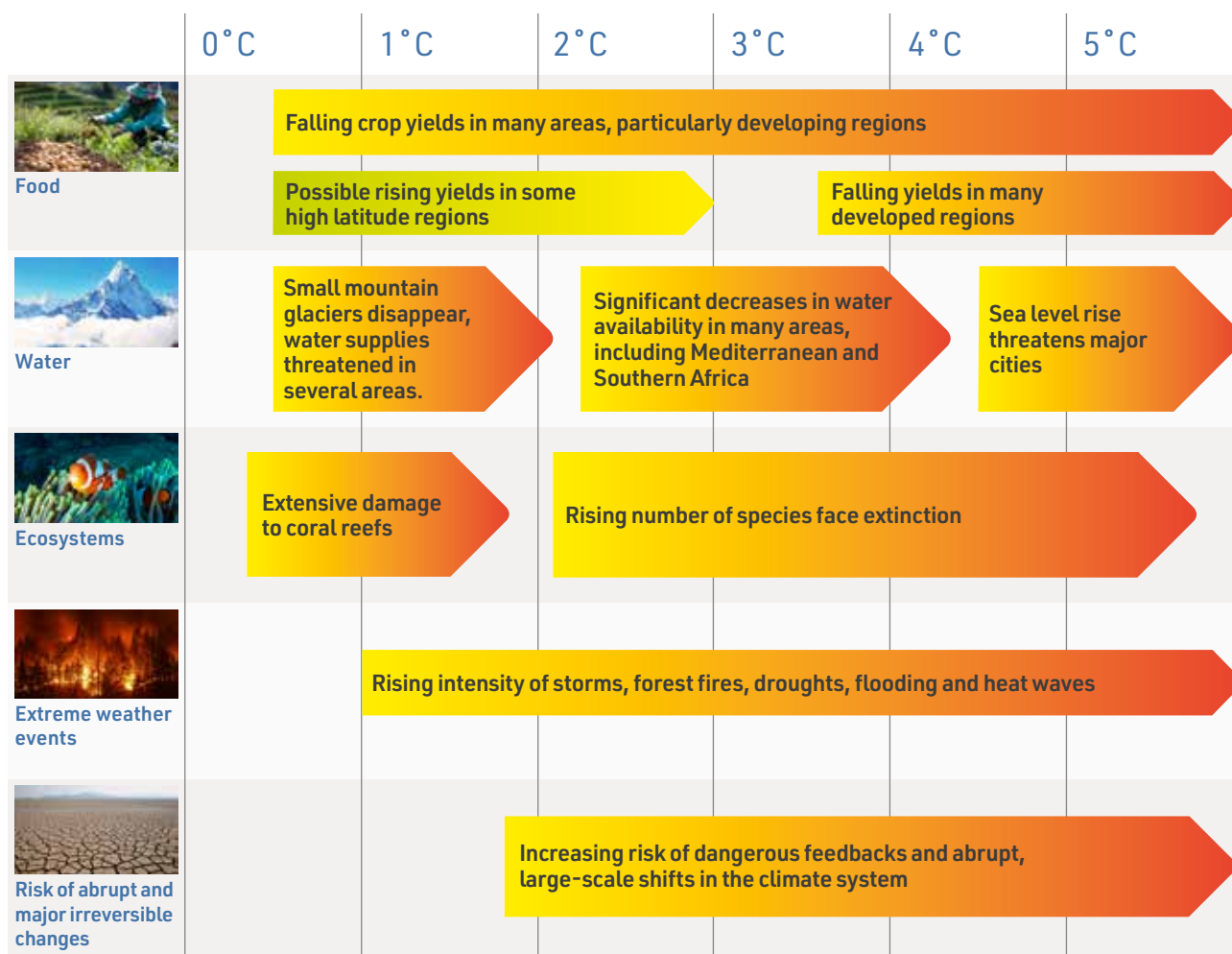
'There is no published account of what has been achieved by efforts in recent years to improve the resilience of infrastructure systems in NI to flood risk.'

Most sectors do not report on the resilience of their assets, networks and services. This is particularly the case with the non-regulated sectors and for local infrastructure, especially minor road networks and highways.

Few sectors systematically describe the disruption that has been caused by flooding, and the actions that have been taken as a result.

Global temperature change

Relative to pre-industrial



Assessing climate risks to Belfast

While no comprehensive city-wide risk assessment has yet to be undertaken, the Climate Change Risk Assessment undertaken at a NI level, is relevant, and we would expect that the risks identified below are likely applicable to Belfast. It found that:

- Climate change poses risks to NI's soils, farming, freshwater resources, natural carbon stores, marine ecosystems, wildlife and habitats. It argued that more action is needed to build resilience to these risks. It also highlighted that more evidence is needed to fully understand other climate change risks that are likely to be important for NI's natural environment, including potential changes in agricultural and forestry productivity and land suitability and impacts on freshwater and marine ecosystems.
- Infrastructure in NI is exposed to a range of climate hazards. Impacts on some assets have the potential to cascade on to others as part of interdependent networks. Flooding poses the greatest long-term risk to infrastructure performance from climate change, but the growing risks from heat, water scarcity and slope instability caused by severe weather could be significant.
- The CCRA Evidence Report suggests that there are potential health benefits from warmer winters in NI, but more action is needed to manage current risks to people from cold temperatures through addressing fuel poverty. There are several risks that might be important for NI but there is not enough evidence to assess to what extent adaptation action is already underway to manage the risks. Such areas include risks to communities from flooding and sea level rise, extreme weather impacts on the healthcare system, risks to building fabric from moisture, risks to culturally valued buildings, and risks to health from overheating buildings, poor air quality and pathogens. For these risks, more research in NI is urgently needed.
- Flooding and extreme weather events which damage assets and disrupt business operations pose the greatest climate change risks to businesses in NI now and in the future. This could be compounded by a lack of adaptive capacity.
- Climate change will impact upon on water security, agricultural production and economic resources around the world. These impacts can in turn exacerbate risks from conflict, migration, and humanitarian crises abroad, with implications for the UK. The main risks arising for the UK from climate change overseas are through impacts on the food system, economic interests abroad, and increased demand for humanitarian aid.

- The high-level climate risk assessment undertaken by ARUP to inform this strategy concluded that Belfast is already suffering as a result of climate hazards- that extreme weather is impacting Belfast's infrastructure and this impact is likely to significantly increase in the future. The vulnerability of existing infrastructure will be exacerbated with changing climate risks and is likely to involve more periods of extreme heat and winter rainfall. It recommended a comprehensive climate risk assessment is undertaken to inform a future Climate Plan for the city.

The importance of science based targets

Assessing climate risks to Belfast comprehensively has been difficult because of lack of available data and analysis. Unsurprisingly therefore, this strategy recommends that considerable work is undertaken swiftly, to understand the scale and nature of climate related risks, to inform how to make Belfast climate resilient. Research is also required to ensure science based targets inform our ambitions for decarbonisation.

Risk assessment is not just important to enable the city to prepare for climate change, it is critical to understanding economic risks. The Glasgow City Region's Risk Assessment identified that the annual economic cost of climate change in Glasgow City Region is estimated to be £400m each year by the 2050s; around 1% of current GVA . Given Belfast's existing level of economic resilience, the city can ill-afford to be unprepared for an equivalent level of GVA at risk.

An inclusive approach to climate planning

As the Committee on Climate Change noted, 'Low income households are particularly susceptible to climate change impacts, though they might also benefit the most from the positive implications of climate change.'

"NI has the highest proportion of properties at risk of flooding that are in deprived areas (27%)."

CCRA 2017, NI Summary Report t

For this reason, it is critical that climate adaptation and mitigation targets are genuinely inclusive and aim to ensure the most vulnerable are protected, and that the economic benefits from decarbonisation are felt by those most impacted by fuel poverty. A core aim of any climate mitigation plan must be a significant reduction, or virtual elimination of fuel poverty.

Furthermore, given the level of interest in the issue of climate change by the city's children and young people, it is critical that city-wide climate planning is participative and includes their voices and opinions on the future of their city.

Effective structures already exist across the city to build and sustain community resilience, and effective resourcing of these partnerships will be critical into the future. The Regional Community Resilience Group (RCRG) was formed in 2013 to help local communities prepare for and respond to weather related emergencies. The group which the Department for Infrastructure co-chairs with local government works collaboratively to bring together Multi-Agency Partner Organisations from government, utilities and the voluntary sector to work for and with Communities at risk of severe weather. Belfast City Council is a key partner on this group through their Emergency Planning Team and have played an essential role in engaging with a number of communities in Belfast in recent years helping them to become more resilient to the impacts of severe weather.

A net zero carbon roadmap for Belfast

The Belfast Climate Commission, a partnership between Belfast City Council and Queen's University Belfast is committed to ensuring a science based approach to climate planning across the city. Working with Leeds and Edinburgh, Belfast's first Net Zero Carbon Roadmap has been produced, to identify the sources of Scope 1 and 2 emissions, and to set out cost effective and innovative stretch measures needed to reach net zero carbon by 2050.

The document concludes the following:

- Belfast's share of the global carbon budget- to keep to 1.5 degrees of warming is 16 million tonnes of CO².
- Belfast is emitting 1.5 million tonnes of carbon a year. At this rate, the city will have used up its carbon budget by 2030.
- Belfast's carbon emissions have declined by 42% since 2000, but this needs to be increased to an 80% reduction by 2030, and a 100% reduction by 2050.
- Targeted measures in transport and housing would make significant progress towards the 2030 target, reducing the city's energy bill by £286m a year, boosting employment in the city. These cost effective measures are set out in detail in the report.
- Innovative stretch options are also outlined, demonstrating the transformation that is required and possible, to achieve net zero emissions by 2050.

"I am delighted that Belfast has a resilience strategy to address global challenges. I commend Belfast City Council for including the voices of local people throughout the consultation phase and look forward to seeing the positive impact the strategy will have on the lives of people in Belfast."

Michele Bryans,
EastSide Greenways Manager, EastSide Partnership, Belfast

Developing a climate plan for Belfast

Cities that are climate resilient- ready for the impact of climate change- are those which have developed a comprehensive approach in an integrated and joined-up way. The Community Planning Partnership model for Belfast is the right model through which to build a city-wide collaboration of agencies and organisations to help plan the city's preparedness for climate change and to drive decarbonisation.

The city's Resilience and Sustainability Board is working collaboratively to ensure the following:

- A single adaptation and mitigation plan is developed, using comprehensive risk assessment and science based targets to ensure robust commitments, including targets for arriving at net zero carbon as a city, and agreeing a carbon budget.
- That adaptation strategies are joined up with emergency planning structures in the city, and with NI wide targets and strategies and with city region strategies
- That future strategic developments in the city are informed by climate adaptation and mitigation targets
- That the recommendations from the Committee on Climate Change regarding NI's emissions are heeded; for example, to significantly improve levels of tree planting; to find ways to incentivise transition to low-carbon heating of homes and retrofit of housing stock; more rapid deployment of electric vehicles, tighter conventional vehicles standards, and transport behaviour change.
- Fundamentally, a city-wide climate adaptation and mitigation plan, developed in partnership with the city's statutory community partners and others should result in a comprehensive series of commitments to prepare for climate change and to decarbonise. This should inform and influence decisions on strategic developments in the city. As the Committee on Climate Change notes 'The cost-effective path to decarbonisation in NI requires action across all sectors of the economy and a joined-up approach.'

Conclusion

The effects of climate change on Belfast will be profound. A comprehensive risk assessment is urgently required to better understand the economic, social and environmental risks expected for Belfast at a local level, to enable effective adaptation planning.

Climate change represents the biggest medium term risk to the city of Belfast - to its people and its economy. Given our levels of economic resilience, the scale and nature of spatial division in the city, levels of fuel poverty and deprivation, Belfast's resilience is dependent on how we prepare. A step change is now required across a range of city partners to develop a comprehensive climate adaptation and mitigation plan, which will include science based targets and aim to achieve an inclusive approach to decarbonisation. While the net effects of climate change are not sufficiently understood, it is highly likely that there will be economic upsides to decarbonisation, and therefore this is a once in a generation opportunity to radically reduce fuel poverty and help drive inclusive growth.

HOUSING SUPPLY IN THE CITY

Economically resilient cities tend to have vibrant city centres, which act as economic drivers for the rest of the city, while also being a focal point for culture, tourism and connectivity. Climate resilient cities are increasingly investing in greater levels of densification within city centres to reduce urban sprawl and remove dependency on carbon intensive forms of travel.

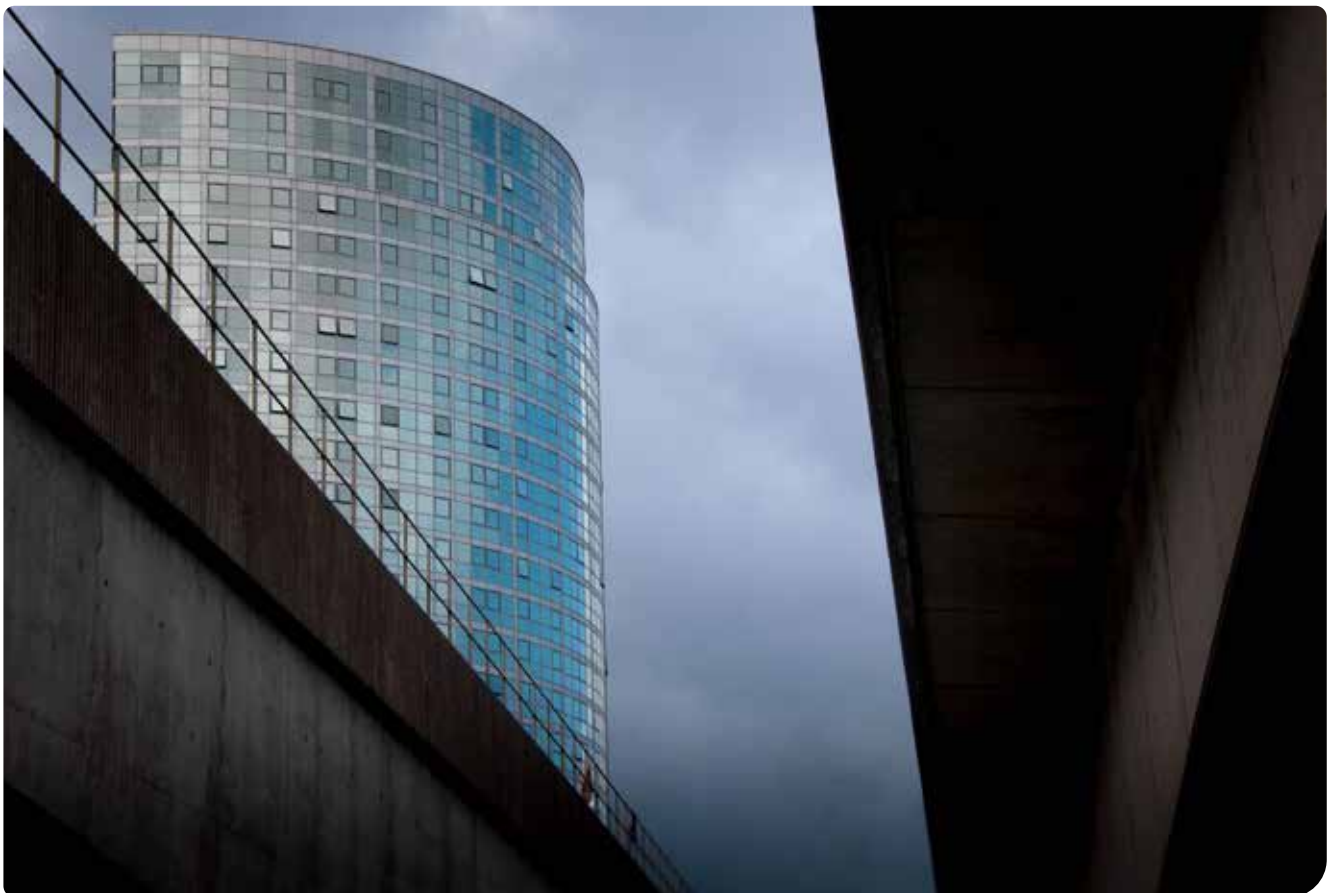
Belfast's city centre has experienced a revival in recent years with increased investment and regeneration. The development of a Regeneration and Investment Strategy has made the city centre an area of strategic focus, and has resulted in masterplanning of strategic sites in the city, e.g. Belfast Inner North West, and the Linen Quarter. Importantly, targets to increase the 'rates base', are intended to enable further investment in the city. Furthermore the city council established a city centre Investment Fund to identify strategic opportunities to develop the city. This has boosted Belfast's economic resilience and made it much more capable of being prepared for shocks in the future.

A step change in the city's resilience would be achieved by the development of residential housing at scale in the city core. Prioritised as an area of focus in the Belfast

Agenda, the city's community plan, a new generation of housebuilding would transform Belfast city centre and complement existing ongoing regeneration and development.

Progress in recent years in this area has been too slow- with just 103 new homes completed in the city in 2019/20. This pace of completions significantly undermines Belfast's competitiveness and reduces opportunities for sustainable economic growth. Thriving cities need a ready supply of people living in the city core to contribute to a mixed economy and to make the city an attractive place to visit and invest.

While the existing economic headwinds for Belfast make large-scale residential development challenging, land values in Belfast are competitive, relative to other UK city centres. The right housing product at the right point in the economic cycle could prove successful. Examples from other cities include creative use of public subsidy (land or finance) through joint ventures with private or social partners to build at scale. Financial models might include borrowing against future receipts to fund a greater number of products, including shared ownership or 'key worker' housing.





Social and affordable housing need

Lack of supply in the city core represents just one of several city-wide housing challenges. Social housing comprises almost 25% of all housing in the city, and therefore plays an important role in the city's economy, and contributes to the health and well-being of the population. However, housing need in Belfast has been consistently high in recent years, impacting the economic resilience of the city, with significant social consequences. Total applicants as at the end of September 2020 for Belfast City Council area is 11,288 with 8,545 applicants in housing stress. The 2019 Northern Ireland Housing Executive Investment Plan proposes a 'new build requirement' of 4,421 social homes from 2018-23 and intermediate housing demand of 550 for the decade from 2019.

Thriving, successful and inclusive cities require effective housing systems, that provide safe, decent and affordable housing for everyone. Belfast has a strong history of high quality, well-managed social housing provision. The city's future economic and climate resilience is therefore dependent on a supply of social and affordable housing, to ensure genuinely inclusive growth.

Conclusion

Significant success has been achieved in making Belfast city centre an attractive investment proposition and this has yielded results for the local economy and the city more generally. However the city's future economic resilience and sustainable levels of growth require a permanent city centre population. Housebuilding at scale, which gives priority to good design and includes family housing is critical to the economic resilience of the city.

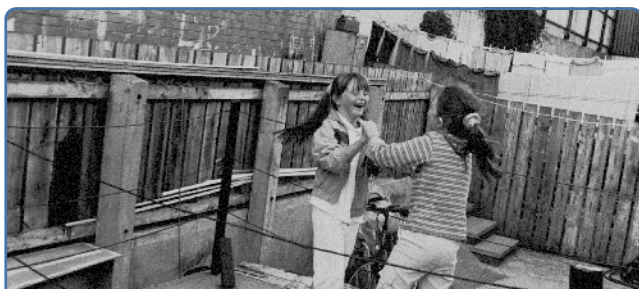
A new generation of homes should include a mix of tenures to accommodate households on a range of incomes. Lessons should be learned from other cities that have successfully applied cross-subsidy models to build social, affordable, shared ownership and key-worker housing alongside market rent and market sale.

Furthermore, smart and low-carbon housing respectful of the city's existing built heritage which encourages and incentivises use of public transport, would have additional benefits to the city including reduced air pollution.

SEGREGATION AND DIVISION



The signing of the Belfast/Good Friday Agreement in 1998 was a milestone in the city's history. Since then, the creation of new institutions, implementation of key aspects of the peace agreement and dramatic reductions in conflict related violence in the city have created the conditions for a more resilient Belfast. As the Belfast City Council Good Relations Strategy for the city sets out, 'we have come a long way as a city over the past 20 years...but there is much more to be done'.



Existing levels of segregation in Belfast

It is important to state that conflict is no longer the overriding risk factor for Belfast. However, the legacy of conflict has manifested in division, which continues to directly impact on the city and to undermine its urban resilience.

- Division between communities remains prevalent with low levels of trust and high levels of residential, educational, physical and social segregation in many areas.
- Belfast contains the highest number of interface areas in the region where segregation remains high. Inter-community tensions are reducing but continuing. There are estimated to be around 97 security barriers and forms of defensive architecture across residential areas in Belfast.
- Many people within our society still think of Belfast in binary terms - of a society made up of two communities; Catholic and Protestant. In many ways this binary view and its influence on public service decision making has accentuated division in our society by duplicating services and hampering the connectivity between people and communities. (GR Strategy).
- Physical and psychological barriers between communities make travel around parts of the city difficult. This has resulted in people avoiding certain areas perceived to be unsafe.

In developing this strategy, the issue of division emerged repeatedly as a perceived inhibitor to the city's resilience. In our stakeholder engagement, many individuals contended that until Belfast was truly a connected city, we would continue to be vulnerable to many risks.

"We have come a long way as a city over the past 20 years...but there is much more to be done."

The data bears this out. Several studies exist that demonstrate that conflict in cities significantly lowers their overall resilience to key risks- such as climate-related impacts, or food security. The existence of conflict or the threat of conflict exacerbates shocks and stresses, often making them more complex or expensive to solve.

If the residents of Belfast continue to think, travel and live in a binary way- the city's ability to respond to significant risks is weakened considerably.

The provision of parallel services adds to the cost of public services, reducing capacity in the system to respond to unexpected shocks.

Crisis management tends to be less effective when systems are disjointed or separate. Resilience requires integrated systems and cities, where a single decision is rolled out universally and speedily.

When cities are well networked, capacity can be shared - sometimes human capacity- e.g. moving people across cities during times of extreme weather events.

This is made more difficult and sometimes more expensive in cities where residential segregation is prevalent.

Lack of trust between communities, particularly those living in close proximity, means they are less likely to support each other - this adds to a city's vulnerability in times of crisis.

Conclusion

Belfast's resilience is weakened because unlike other cities, it is not a socially cohesive unit. Yet cohesion and integration are critical in a crisis. Furthermore, separation reduces efficiency and wastes resources. For example, thousands of additional journeys are taken in Belfast each day because of its separate education system. In such a carbon intensive and car oriented city, this significantly adds to our CO2 emissions and makes responding to climate change more difficult, and potentially more expensive.

Climate change will present profound risks to all cities globally, during this century. Cities that can build their capacity to maintain essential services, recover from shocks and continually adapt are more likely to survive. Divided cities will be much more exposed to risk.

It is not a coincidence that Belfast's Resilience Strategy and its Good Relations Strategy have both prioritised 'connectedness' as a major problem to be solved. If Belfast is to thrive in the face of unexpected challenges, it must do so as a united, socially cohesive city.

MENTAL ILL-HEALTH



A healthy city is a resilient city. An abundance of data now exists that proves that cities that invest heavily and consistently in health and wellbeing of their populations - particularly in their children and young people - feel the benefits beyond social impacts, but also on their economic performance over the longer term. The Belfast Agenda rightly prioritises the reduction in health inequalities and encouragingly, the city's community planning structures are focusing attention on a range of health related urban 'problems' for example on reducing avoidable winter deaths.

We have identified the issue of mental ill-health and use of prescription drugs as a major challenge for Belfast because of the regularity in which it emerged in our discussions with city partners.

In fact, the issue of mental ill-health was one of the most talked-about issues by stakeholders across the entire development of this strategy. It was just as likely to emerge in discussions on the economy as it was in discussions on societal challenges. Perhaps this should not be a surprise.

There is now a growing body of research examining the impact of cities on levels of anxiety and mental health. In 2019, Europe's first 'Urban Psychology Summit' was held to explore the links between urban renewal policy choices and serious mental and physical health impacts.

Four key findings emerged:

- Experience of place determines much of our development and wellbeing, and we should not separate the policies for one from the other.
- The discipline of psychology is missing from public policy debates and decisions at a city level.
- Cities have the unique potential to support the development of a positive shared identity for its population.
- Given rapidly rising urbanisation and worsening mental health, a stronger focus should be urgently placed on understanding more about the psychological impact of place upon people, and people upon place.

This emerging research suggests that Belfast is not alone in experiencing increased levels of anxiety and mental-ill health among its population. In developing this strategy, stakeholders repeatedly emphasised their perception of a prevalence of mental illness across all age groups.

Prescription drugs are also playing a role in making some people less healthy, rather than more so.

"A growing number of young children presenting with anxiety, stress and in some cases trauma."

These two areas of focus featured overwhelmingly in our conversations with health and social care professionals.

Belfast's mental health challenges



Data on mental health points to a significant challenge for the city and its people.

- NI has a suicide rate of 24.8 for men and 7.6 for women (2014-18). For Belfast LGD rates were 39.6 for men and 11.2 for women (all per 100,000 population).
- Since the 1990's the absolute number of deaths from suicide in NI have increased from around 151 to 197 (2019 Provisional). In Scotland, they have decreased by a quarter from 912 in 1993 to 680 now.
- Belfast LGD has the highest overall suicide rate of any of the LGD's in NI (Source: NI Health & Social Care Inequalities Monitoring System)
- Anecdotal evidence from our conversations with practitioners across the city would suggest that people are presenting to health and social care services with anxiety, stress or more serious forms of mental-ill health at an increasingly younger age.
- One organisation reported that a recent review of their case files demonstrated a growing number of young children presenting with anxiety, stress and in some cases trauma.
- One-to-one conversations with mental health practitioners confirmed their view that Belfast is experiencing growing levels of mental ill-health, and a small number suggested further work is required to understand the relationship between today's presentations and the conflict.

USE OF PRESCRIPTION DRUGS



2

Data on dispensing of medical prescriptions paints a worrying picture of the health and well-being of the population.

In 2018, for a city with a population of 341,900 people, 8 million prescriptions were dispensed - an average of 23 prescriptions per person across the city. This figure is 9% higher than in 2012.

Drugs related deaths are also on the increase. In 2017, 136 people died as a result of drug taking, an increase of 60% on the decade before. Men are much more likely than women to die as a result of drug taking.

Health outcomes for drug-related mortality, male life expectancy at birth and teenage births were much worse than the NI average. The gap is also widening between the most deprived and least deprived areas of Belfast in relation to drug related mortality, smoking during pregnancy and respiratory admissions.

The NI Outcomes Framework monitors the self-efficacy scores of the population as a measure of confidence. Self-efficacy is a person's beliefs about their capability to produce results or effects. Those with high self-efficacy have confidence in their abilities and produce sustained efforts to achieve goals. Those with low self-efficacy often doubt their capabilities, are less ambitious and give up on their aims when challenged.

In Belfast, half of our Year 9-12 pupils have low self-efficacy but are satisfied with their life (2019). This is significantly larger than it was in 2016 and worrying that so many children are lacking in confidence.

Conclusion

Belfast is already a World Health Organisation Healthy City and considerable progress continues to be made to improve health outcomes for its population. Because of the dominance of the issue of mental ill-health and prescription drug use in our workshops, and what the data suggests, we have highlighted the issue as a major challenge. Furthermore, there is a strong case for better understanding the impact of cities and indeed of place on our mental health, and greater involvement of the discipline of psychology in how we design, plan and manage our city.

THE GOVERNANCE AND FINANCING OF RISK



Stable governance is an essential prerequisite for any resilient city. Compared to some global cities where decision-making is marred by conflict or corruption, Belfast has well-defined political and administrative structures, underpinned by law, and with modern modes of accountability.

However, the complexity of challenges faced by cities demands governance in which comprehensive policy reform, supported by strategic long-term financing is the norm, and whereby the relationship between central and local government is mature and collaborative. These characteristics are not sufficiently in place in NI, which leads to significant implications for its regional capital.

The 2019 Competitiveness Study commissioned by Belfast City Council made a number of prescient comments regarding growth in the city. 'It is difficult to quantify the impact that NI's governance structures (and indeed lack thereof) have on Belfast's competitiveness but it is evident that other competitor cities, with a larger arsenal of policy levers, have delivered faster growth across key competitiveness areas.

This section examines the particular characteristics of governance in Belfast and makes some observations intended to improve the governance and financing of risk.

- Governance in NI is more regionally centralised than other parts of the UK. From a city perspective, this is particularly relevant, as resilient cities require robust urban policy- with clear strategic objectives and the levers to deliver them. In NI, a much greater range of responsibilities sits at central government level when compared with powers of local authorities in England, Scotland and Wales. Strategy and delivery is spread across a range of arm's length bodies, usually working to a regional remit. Further devolution of powers from central government to local government has been slow, and inhibits real partnership and collaboration between central and local government, which is often necessary to unlock external investment at a city level. The draft Programme for Government (2016-2021) contains just one proactive 'city policy' - an ambition to strengthen Belfast as the regional economic driver but is not accompanied by a tangible plan. The draft PfG outcomes framework are lacking indicators at a city level, and no single government department or body has responsibility for cities. Furthermore, the 'New Decade, New Approach' document, agreed by the political parties as part of the re-establishment of the Northern Ireland

Executive in 2020, made no specific references to distinct governance arrangements for cities. However, it did contain several welcome references to City Deals, which in some parts of the UK have led to significant additional powers being devolved to city level structures. Nevertheless, urban policy in NI is immature and ill-developed. This, coupled with a highly centralised system of governance, and a fragmented spread of powers and obligations across arm's length bodies, makes the building of Belfast's long term resilience more challenging.

- Lack of urban policy was, for some time, compounded by the long-term absence of Executive government in NI. A recent report by the Institute of Government examined some of the implications for NI of governing without ministers. It noted the work of the Northern Ireland Civil Service in carrying out departmental functions and running public services on a day-to-day basis. However, it was definitive in its assessment that long term public sector reform is virtually impossible without Ministers, pointed to a growing list of outstanding policy decisions and concluded that it is the people of NI who suffer the consequences of a lack of political leadership.
- The return of Executive government in January 2020 has enabled several major policy programmes to be reconsidered by ministers. However, at the time of writing, several of immediate priorities agreed for 2020 remain unimplemented. Nevertheless, the response of the NI Executive to COVID-19 has demonstrated what can be achieved through coherent, cross-Executive planning and implementation.
- The length of the suspension hampered long term reform, and NI is likely to be impacted by this, for several years to come, when it was needed. Several of the 'shocks and stresses' identified in this strategy have emerged or been accelerated due to lack of public service reform in NI or due to how services and infrastructure are financed (see below). Tackling these issues will require long term vision, collaboration between central and local government and the private and NGO sectors, and a shift in risk appetite to enable untried policy reform to commence. Ensuring a resilient recovery from the economic and social impacts of COVID-19, coupled with the effects of the UK's decision to leave the EU requires systemic, cross government planning of the long-term implications of a reformed relationship with the European Union and the long-term trading relationship between NI and the rest of the world. Without ministers, substantive decisions on how NI transitions to a low-

carbon economy have not commenced, whereas regions and cities elsewhere are gaining competitive advantage from large scale investment in innovation.

- However, it should be noted that policy reform, even when ministers are in place, is often difficult. As the IoG notes, 'the politics of NI and its distinctive constitutional arrangements militate against effective policy making on long-term issues.' These particular characteristics of NI's governance potentially weaken our resilience to stresses over the long term and may incentivise 'shorttermism'. There is therefore a strong case for reviewing and reforming how difficult, complex and contentious decisions are made - at a regional and a city level. Some regions and cities have identified new structures, such as citizens assemblies to make recommendations to government on contentious issues. In other instances, independent commissions are established to focus on a particular complex issue. In the long term, when ministers are returned, new structures to aid and advise them through difficult policy decisions, and preferably with a strong civic voice, are needed. Lessons should be learned from other countries that have prioritised the development of a vibrant policy community and strong civic participation.
- Despite the difficulties associated with power sharing and during the suspension of the Northern Ireland Executive, political parties continued to work together effectively at local government level. Councils across NI have been developing and delivering community plans - critical documents to inspire and drive cross agency collaboration at a city-wide level. In Belfast, the Community Planning Partnership has taken strong ownership of the Belfast Agenda, and meaningful collaboration is taking place across agencies on issues relevant to the city. For example, the Living Here Board is currently progressing a cross-agency project to reduce winter deaths in the city. This sharing of risk and reward has also been seen working very effectively across local councils in the Belfast city region, working collaboratively with universities and colleges to successfully bid for a Belfast Region City Deal, which could leverage £1bn in funding across the city region.
- The affordability of building resilience is a major challenge for the city, though Belfast is not alone in struggling to finance future risks. In its 2019 Risk Report, the World Economic Forum warned that 'Robust risk financing strategies will be required, both to fund investment in adaptation and to pay for recovery when floods occur'.

However, as has been documented, some of the risks to the city of Belfast are not currently solvable at a city-level, because governance and finance is centrally held. The city is reliant on NI central government to develop funding models for infrastructure. If Belfast is to succeed

in meeting those highly complex challenges, the city and the NI Executive must work in partnership to find new forms and models of finance as other cities have done. Councils are increasingly reliant on the district rate for their funding, and this fact should be reflected in the decisions taken on future financial structures.

The 'New Decade, New Approach' document makes a welcome commitment to a multi-year budget to underpin a multi-year Programme for Government. However, whether this results in the kind of reformed approach to long term planning necessary, remains to be seen.

- Improvements to how government is financed should include reform of the existing 'short-termism' applied to financing at a regional level. Unlike in the UK where three-to-five year spending rounds are the norm, NI departmental allocations are chiefly managed on an annual basis. This has obvious implications for how major programmes are designed and delivered.
- Perhaps most challenging and importantly of all are the decisions to be made in how major long term infrastructure is funded. This must be a major area of priority for the Executive and must include local government as a partner in the process. The Institute of Government report makes an interesting, if controversial, point regarding the level of regard shown to value for money in NI. It points to examples of where NI has continually extracted finance from the UK taxpayer or the EU and suggests this readiness to accept external funding disincentivises difficult decisions from being taken. Whatever the reasons for not having well planned financial models in place, as levels of infrastructure investment increasingly become a chronic risk for the city, decisions must be taken on how best to make up the shortfall, while also building in resilience for the future. This is a major risk for the future, and must be tackled urgently.
- The development of this strategy has identified a number of areas of risk which could be dealt with effectively at a city level. Stronger city-wide economic levers would be beneficial in enabling the city to plan for its future. The RSA's City Growth Commission concluded that 'innovative, competitive and resilient economies are built on stable institutions that engender trust between trading partners, encourage investment in infrastructure and public services, and build socially productive communities'. This is a complex area and will require collaboration across central and local government and agencies, e.g. the Department for Infrastructure, Belfast City Council, Northern Ireland Water, Translink etc. At the very least, agencies and organisations in Belfast should work together to arrive at a single figure for the cost of building the necessary infrastructure to make the city resilient for this century, and identify the 'GDP at Risk' figure of not funding it

effectively. They should then work together with the NI Civil Service to explore and identify new financial models that would encourage investment in long term infrastructure and other necessary capital projects, in a coordinated and joined up way.

- Thinking beyond NI's internal partnerships, the decision of the UK to leave the EU re-emphasises the importance of 'city to city diplomacy' for Belfast. The quality of its relationships with other cities in Europe and globally will be a key determinant of its potential to attract investment, encourage trade and build partnerships. Its membership of Eurocities, and of the Resilient Cities network is important, and so too is its 'sister cities' programme, however this work must be brought to the fore as a core driver of its growth strategy. There is sufficient global research, from the OECD and elsewhere to make the case for a focus on cities to be driven by central government. The Northern Ireland Executive should take greater responsibility for the future of its cities and design a new form of governance to drive collaboration between NICS, Belfast City Council and agencies across the city. This should inspire a renewed focus on how cities have enormous potential to be engines of sustainable growth and places for innovation, creativity and well-being.

Conclusion

Governing a post-conflict city with continued high levels of segregation is a daily challenge, and therefore continuity of stable local government in this context should be considered a success. However, Belfast's governance needs to be increasingly designed for future challenges- and for dealing with complex challenges that are taxing all cities, such as sustainable recovery from the effects of the COVID-19 pandemic, climate change, energy transition and creating a low-carbon economy. There is a strong case for reviewing and enhancing the powers and obligations of local government to ensure they are fit for purpose given the complex challenges ahead.

Robust urban policy is needed at Northern Ireland Executive level if Belfast is genuinely to be a driver for sustainable economic growth not just at city level, but at city region level.

Long term financial planning and new financial models for funding city infrastructure are critical if Belfast is to be genuinely resilient to climate change and to future economic cycles. A review of investment opportunities should be undertaken to explore opportunities for funding infrastructure at a city level, potential partnering with local government and new accountability frameworks.

Agencies and organisations in Belfast should work together to arrive at a single figure for the cost of building the necessary infrastructure to make the city resilient for this century, and identify the 'GDP at Risk' figure of not funding it effectively. They should then work together to explore and identify new financial models that would encourage investment in long term infrastructure and other necessary capital projects, in a coordinated and joined up way.

NEXT STEPS

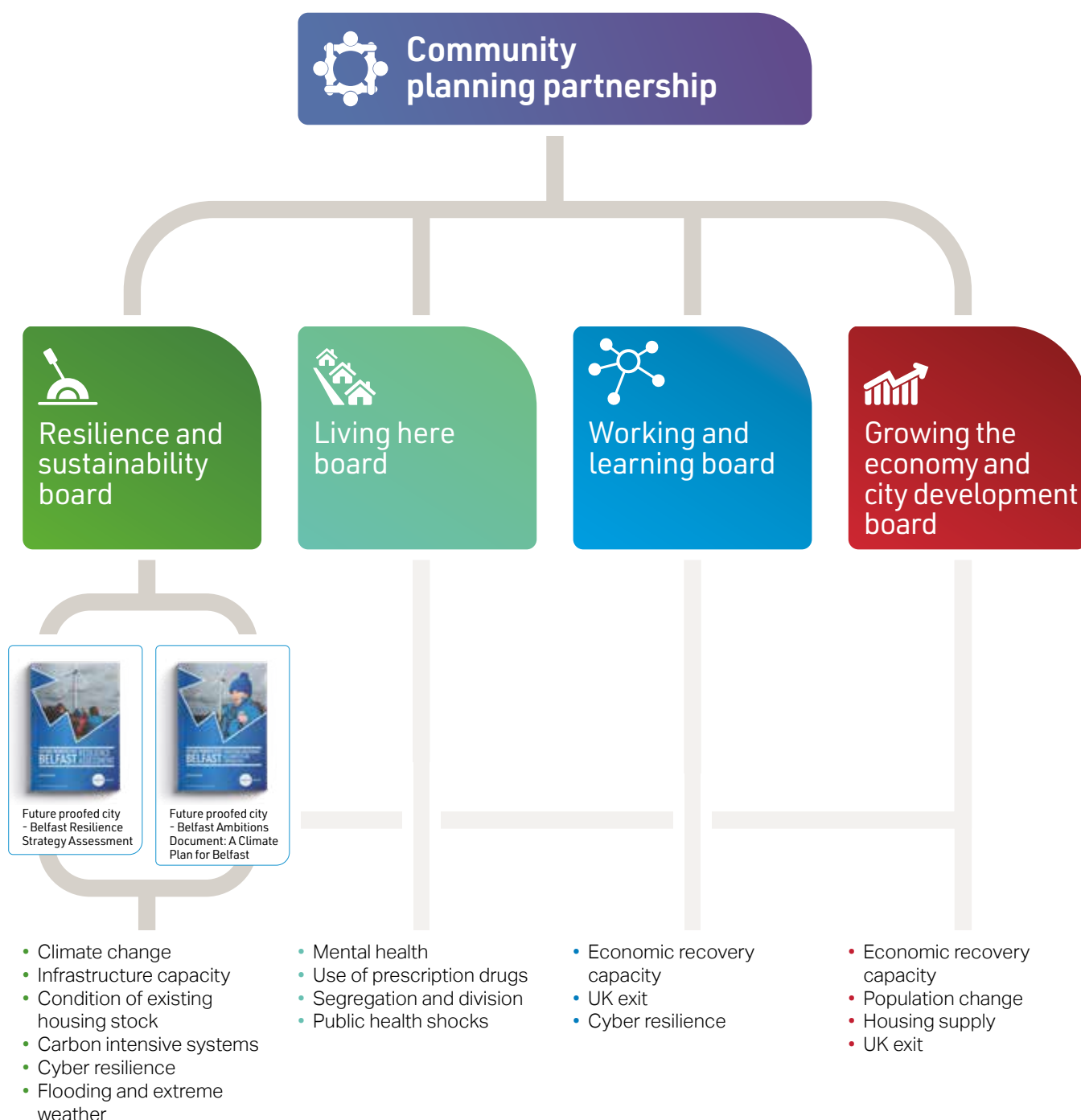
The shocks and stresses outlined in the Resilience Assessment identify a range of risks to the city of Belfast. The Community Planning Partnership Board will oversee how these risks are managed, collaboratively, into the future.

This document will be reviewed and revised every two years, based on available official data and inclusive engagement across city partners. The process will be overseen by the Resilience and Sustainability Board, with support from officers in Belfast City Council. Each board

will take forward the management of specific 'shocks and stresses' as set out below. In a small number of cases, responsibility sits across both boards.

The issue of 'Poverty and Inequality' being central to the Inclusive Growth ambition within the Belfast Agenda, will remain a core responsibility of the Community Planning Partnership Board.

To make contact with the team at Belfast City Council, email resilient@belfastcity.gov.uk



SOURCES OF INSPIRATION



SOURCES OF INSPIRATION: BIBLIOGRAPHY

EU Exit, Long-term Economic Analysis (November 2018).

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/760484/28_November_EU_Exit_-_Long-term_economic_analysis__1_.pdf

The Economics of Low Carbon Cities, A Mini-Stern Review for the Leeds City Region (2019). Andy Gouldson, Niall Kerr, Corrado Topi, Ellie Dawkins, Johan Kuylensstierna, Richard Pearce.

<https://www.sei.org/publications/the-economics-of-low-carbon-cities-a-mini-stern-review-for-the-leeds-city-region/>

Matrix Digital ICT Report Foresight and Horizon Scanning (2016).

<https://matrixni.org/wp-content/uploads/2016/03/2016-Matrix-Digital-ICT-Report.pdf>

Using a Resilience Lens to make a more Resilient Economy, Greater Manchester (2019). Tom Lindsay, John White, Alex Ryan Reviewer: Braulio Eduardo Morera.

Analysing Baseline Data Around Peace Walls (4): Who are the people? (2017) Cathy Gormley-Heenan, Duncan Morrow, Jonny Byrne, Michael Rosato and Sally Cook.

<https://www.community-relations.org.uk/publications/analysing-baseline-data-around-peace-walls-4-who-are-people-0>

Analysing Baseline Data on Peace Walls (5): Exploring the Socio-economic, education and employment factors Institute for Research in Social Sciences (IRiSS) (2017). Jonny Byrne, Cathy Gormley-Heenan, Duncan Morrow, Michael Rosato and Sally Cook.

<https://www.community-relations.org.uk/publications/analysing-baseline-data-peace-walls-5-exploring-socio-economic-education-and-employment>

Analysing Baseline Data on Peace Walls (6): Implications for policy (2017). Duncan Morrow, Cathy Gormley-Heenan, Jonny Byrne, Michael Rosato and Sally Cook

<https://www.community-relations.org.uk/publications/analysing-baseline-data-peace-walls-6-implications-policy>

Belfast Region City Deal - Industrial Strategic Framework (2018).

https://minutes3.belfastcity.gov.uk/documents/s72693/Appendix%20%20BRCD_Industrial%20Strategic%20Framework.pdf

Sectarianism in Northern Ireland: A Review (2018).

https://www.ulster.ac.uk/_data/assets/pdf_file/0016/410227/A-Review-Addressing-Sectarianism-in-Northern-Ireland_FINAL.pdf

AI in the UK: ready, willing and able? Select Committee on Artificial Intelligence, House of Lords (2018).

<https://publications.parliament.uk/pa/ld201719/ldselect/ldai/100/10002.htm>

DSD/NIHE Asset Commission Summary Report (2015). Department for Social Development and the Northern Ireland Housing Executive.

Attitudes to Peace Walls, Research Report to the Office of the First and Deputy First Minister (2012).

<https://www.ark.ac.uk/peacewalls2012/peacewalls2012.pdf>

Carbon Accounts and the Scope for Low Carbon Development Belfast, Can Do Cities (2019).

<http://www.candocities.org/sites/default/files/Belfast.pdf>

Belfast Infrastructure Study, Belfast City Council, ARUP (2018).

The UK's EU Withdrawal Agreement, Briefing Paper 08453 (2018).

<https://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-8453>

Business on a Connected Island (2018).

<https://www.bl.uk/collection-items/cbisc-business-on-a-connected-island-2018>

Child Centred Resilience Framework (2016).

<https://www.arup.com/perspectives/publications/research/section/child-centred-urban-resilience-framework>

Cities, Prosperity and Influence. The role of city diplomacy in shaping soft power in the 21st century, Jo Beall and David Adam (2017).

https://www.britishcouncil.org/sites/default/files/g229_cities_paper.pdf

Cities Alive, Designing for Urban Childhoods (2017).

<https://www.arup.com/perspectives/publications/research/section/cities-alive-designing-for-urban-childhoods>

Powers to Grow: City Finance and Governance (2014).

<https://www.thersa.org/discover/publications-and-articles/reports/powers-to-grow-city-finance-and-governance>

People Powered Money, Designing, Developing & Delivering Community Currencies (2015).

<https://neweconomics.org/2015/05/people-powered-money>

Cost to make Dwellings in Northern Ireland more Energy Efficient (2019).

https://www.nihe.gov.uk/index/corporate/housing_research/house_condition_survey.htm

City Resilience Profiling Tool, UN Habitat (2018).

<http://urbanresiliencehub.org/wp-content/uploads/2018/02/CRPT-Guide.pdf>

Do councils have a duty to consider climate change? Ends report 530 (2019).

Domestic Consumer Insight Tracker 2018/19. Utility Regulator (2019).

<https://www.uregni.gov.uk/sites/uregni/files/media-files/Domestic%20Consumer%20Insight%20Tracker%202018%20Summary%20Final.pdf>

Draft Good Relations Strategy (2018).

Draft Northern Ireland Children and Young people Strategic Partnership, Plan 2019-2021 (2019).

Economic Resilience: A new set of vulnerability indicators for OECD countries (2015).

https://www.oecd-ilibrary.org/economics/economic-resilience-a-new-set-of-vulnerability-indicators-for-oecd-countries_5jrxhgjw54r8-en

Why Local Authorities should Prepare Food Brexit Plans, Tim Langa, Erik Millstoneb, Tony Lewisc & Gary McFarlaned (2018).

<https://www.reading.ac.uk/foodlaw/pdf/2018-Food-Research-Brexit-LAs.pdf>

Our Resilient Glasgow, A City Strategy (2016).

https://www.understandingglasgow.com/assets/0003/7198/Our_Resilient_Glasgow_Strategy.pdf

Electricity Sector in Northern Ireland, third report of session 2016-17 (2017).

<https://publications.parliament.uk/pa/cm201617/cmselect/cmniaf/51/51.pdf>

House Conditioning Survey, main report, Northern Ireland Housing Executive (2016).

<https://www.nihe.gov.uk/Working-With-Us/Research/House-Condition-Survey>

The Rise of Innovation Districts: A New Geography of Innovation in America, Bruce Katz and Julie Wagner, Introducing Innovation Districts (2014).

<https://www.brookings.edu/wp-content/uploads/2016/07/InnovationDistricts1.pdf>

This is a Crisis Facing up to the Age of Environmental Breakdown, Laurie Laybourn-Langton, Lesley Rankin and Darren Baxter (2019).

<https://www.ippr.org/files/2019-02/this-is-a-crisis-feb19.pdf>

Next Generation Northern Ireland, British Council (2018).

https://www.britishcouncil.org/sites/default/files/next_generation_ireland_northern_ireland_2018_report_final_web_v2.pdf

Removing Peace Walls and Public Policy Brief (1): the challenge of definition and design Cathy Gormley-Heenan, Duncan Morrow and Jonny Byrne (2015).

[http://uir.ulster.ac.uk/32566/1/Policy_Brief_1_\(2015\).pdf](http://uir.ulster.ac.uk/32566/1/Policy_Brief_1_(2015).pdf)

Local Development Plan, Belfast, technical supplement 9, flood risk (2018).

<https://www.belfastcity.gov.uk/buildingcontrol-environment/Planning/ldp-plan-strategy.aspx>

Leading Cities, global review of city leadership, Elizabeth Rapoport, Michele Acuito, Leonora Grcheva (2019).

<http://discovery.ucl.ac.uk/10069076/1/Leading-Cities.pdf>

Manchester City Council's Climate Change Delivery Plan 2010 - 2020, The Council's contribution to Manchester - A Certain Future.

https://secure.manchester.gov.uk/info/500002/council_policies_and_strategies/3833/climate_change/3

Resilient Medellin, a strategy for our future (2017).

<https://www.100resilientcities.org/wp-content/uploads/2017/07/Medellin-English-PDF.pdf>

National Climate Projections, UKCP18, Jason A. Lowe, Dan Bernie, Philip Bett, Lucy Bricheno, Simon Brown, Daley Calvert, Robin Clark, Karen Eagle, Tamsin Edwards, Giorgia Fosser, Fai Fung, Laila Gohar, Peter Good, Jonathan Gregory, Glen Harris, Tom Howard, Neil Kaye, Elizabeth Kendon, Justin Krijnen, Paul Maisey, Ruth McDonald, Rachel McInnes, Carol McSweeney, John F.B. Mitchell, James Murphy, Matthew Palmer, Chris Roberts, Jon Rostron, David Sexton, Hazel Thornton, Jon Tinker, Simon Tucker, Kuniko Yamazaki, and Stephen Belcher, (2018).

<https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index>

Mission-Oriented Innovation Policy, Challenges and Opportunities, Mariana Mazzucato (2017).

<https://www.ucl.ac.uk/bartlett/public-purpose/publications/2018/jan/mission-oriented-innovation-policy-challenges-and-opportunities>

Northern Ireland Climate Change Adaptation Programme (2014).

<https://www.daera-ni.gov.uk/sites/default/files/publications/daera/Northern%20Ireland%20Climate%20Change%20Adaptation%20Programme.pdf>

2019 Energy Across the Authority, more examples of how local authorities are taking advantage of energy opportunities (2019).

<https://www.apse.org.uk/apse/index.cfm/local-authority-energy-collaboration/apse-energy-publications/energy-across-the-authority-2019/>

Making Cities in Conflict Areas more Resilient, A conceptual iteration using climate resilience and security for policies in practice, Michel Rademaker, Karlijn Jans, Paul Verhagen, Aster Boeschoten, Hannes Rõds & Stephan Slingerland (2018).

https://www.clingendael.org/sites/default/files/2018-05/Paper_Making_cities_in_conflict_areas_more_resilient_0.pdf

The Paris Agreement (2018).

<https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

New Decade, New Approach document (2020).

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/856998/2020-01-08_a_new_decade__a_new_approach.pdf

Northern Ireland Peace Monitoring Report, number four, Robin Wilson (2016).

<https://www.community-relations.org.uk/sites/crc/files/media-files/NIPMR-Final-2016.pdf>

The Challenge of Peace Building and Conflict Transformation: A Case Study of Northern Ireland, Kyiv-Mohyla Law and Politics Journal., (2), 117-128 (2016).

https://pure.qub.ac.uk/portal/files/112387464/Peace_Building_and_Conflict_Transformation.pdf

The Political Declaration on the Framework for Future EU-UK Relations, briefing paper 08454, (2018).

<https://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-8454#fullreport>

CEOs' Curbed Confidence Spells Caution, 22nd annual global CEO survey (2019).

<https://www.pwc.com/gx/en/ceo-agenda/ceosurvey/2019/gx.html>

Planning for Spatial Reconciliation, Civic place-making in a divided society, draft one, Sterrett, K., Morrissey, M, Gaffikin, F, Karelse, C, Mulholland, C, (2015).

Reducing Emissions in Northern Ireland, committee on climate change (2019).

<https://www.theccc.org.uk/publication/reducing-emissions-in-northern-ireland/>

NS Live Case Series 2017, the Vejle resilience strategy, Jonas Kroustrup, Rachel Calleja (2017).

<https://www.pgionline.com/wp-content/uploads/2017/08/Vejle-2017.pdf>

The Resilience of a London Great Estate: urban development, adaptive capacity and the politics of Stewardship, Juliet Patricia Davis (2018).

<https://www.tandfonline.com/doi/full/10.1080/17549175.2017.1360378>

Resilient DC, A Strategy to Thrive in the Face of Change (2019).

<https://resilient.dc.gov/>

Resilient Cities Research Project, a Grosvenor report (2014).

<https://www.resiliencefirst.co.uk/our-work/resources/resilient-cities-grosvenor-research-report>

Rethinking the Smart City, Democratizing Urban Technology (2018).

<https://www.urenio.org/2018/10/04/rethinking-smart-city-democratizing-technology/>

National Development Plan, project Ireland 2040 (2018).

<https://www.gov.ie/en/policy-information/07e507-national-development-plan-2018-2027/>

Impacts, the Future of Global Real Estate, Savills (2019).

https://www.savills.com/impacts/Savills_Impacts_2019_download.pdf

Smart City Resilience: Digitally empowering cities to survive, adapt, and thrive (2017).

<https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/smart-city-resilience-digitally-empowering-cities-to-survive-adapt-and-thrive>

The State of Ireland 2019, A review of housing and infrastructure in Ireland (2019).

<http://engineersireland.ie/communications/state-of-ireland-2019.aspx#>

The Rise of Innovation Districts: A New Geography of Innovation in America, Bruce Katz and Julie Wagner

(2014).

<https://www.brookings.edu/essay/rise-of-innovation-districts/>

The Global Outlook, Speech given by Mark Carney Governor of the Bank of England (2019).

<https://www.bankofengland.co.uk/-/media/boe/files/speech/2019/the-global-outlook-speech-by-mark-carney.pdf?la=en&hash=6725EA590D46F11FBFDFF4744E4E90158D4BCECE>

Electrifying Montréal, Transportation electrification strategy 2016-2020 (2016).

http://ville.montreal.qc.ca/pls/portal/docs/PAGE/PROJ_URBAINS_FR/MEDIA/DOCUMENTS/TRANSPORTATION_ELECTRIFICATION_STRATEGY_2016_2020_PDF

Visit Belfast business plan 2019/2020 (2019).

Waking up in a Different Country: Brexit and Northern Ireland Cathy Gormley-Heenan, Arthur Aughey and Paula Devine (2017).

<https://www.ark.ac.uk/publications/updates/update116.pdf>

The Global Risks Report 2019, 14th Edition, World Economic Forum (2019).

http://www3.weforum.org/docs/WEF_Global_Risks_Report_2019.pdf

The Global Risks Report 2020, 15th Edition, World Economic Forum (2019).

<https://www.weforum.org/reports/the-global-risks-report-2020>

Supporting Wellbeing and Resilience in Belfast 2018-2021, making life better together (2018).

<https://www.makinglifebettertogether.com/wellbeing-resilience/>

World Happiness Report, John Helliwell, Richard Layard and Jeffrey Sachs (2017).

<https://s3.amazonaws.com/happiness-report/2017/HR17.pdf>

Agile Cities, preparing for the Fourth Industrial Revolution, World Economic Forum (2018).

http://www3.weforum.org/docs/WP_Global_Future_Council_Cities_Urbanization_report_2018.pdf

Governing without Ministers: Northern Ireland Since the Fall of the Power Sharing Executive, Institute for Government, (September 2019).

<https://www.instituteforgovernment.org.uk/publications/governing-without-ministers-northern-ireland>

EirGrid Group All-Island Generation Capacity Statement (2019-2028).

<http://www.soni.ltd.uk/media/documents/EirGrid-Group-All-Island-Generation-Capacity-Statement-2019-2028.pdf>

Northern Ireland Gas Capacity Statement (2019-20 to 2028-29).

<http://gmo-ni.com/assets/documents/Transparency/NI-Gas-Capacity-Statement/Northern-Ireland-Gas-Capacity-Statement-2019-20-to-2028-29.pdf>

Forecasts for the UK economy (October 2020)

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/928008/Forecomp_October_2020.pdf

World Energy Outlook 2020, International Energy Agency (IEA)

<https://www.iea.org/reports/world-energy-outlook-2020#executive-summary>

New Decade New Approach, January 2020

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/856998/2020-01-08_a_new_decade__a_new_approach.pdf

World Economic Forum, Global Risks Report 15th Edition, 2020

<https://www.weforum.org/reports/the-global-risks-report-2020>

DCMS Guidance on Consumer Protection and IoT, October 2018

<https://www.gov.uk/government/publications/code-of-practice-for-consumer-iot-security/code-of-practice-for-consumer-iot-security>

Northern Ireland Climate Change Adaptation Programme (NICCAP2), Sept 2019

<https://www.daera-ni.gov.uk/publications/northern-ireland-climate-change-adaptation-programme-2019-2024>

Urban Trees, Benefits and Planting Strategies, Belfast Million Trees Report, Perla Mansour, QUB, 2020

All-Island Generation Capacity Statement, 2019-2028, EIRGRID, SONI (transmission system operator for Ireland and Northern Ireland respectively)

<http://www.eirgridgroup.com/site-files/library/EirGrid/EirGrid-Group-All-Island-Generation-Capacity-Statement-2019-2028.pdf>

UK housing: Fit for the Future? Committee on Climate Change, Feb 2019

<https://www.theccc.org.uk/publication/uk-housing-fit-for-the-future/>

UK Climate Change Risk Assessment 2017 Evidence Report

<https://www.theccc.org.uk/uk-climate-change-risk-assessment-2017/national-summaries/northern-ireland-2/>

Ministerial Advisory Panel on Infrastructure (MAPI) – Report, October 2020

<https://www.infrastructure-ni.gov.uk/publications/ministerial-advisory-panel-infrastructure-mapi-report>

Housing Statement from Communities Minister Carál Ní Chuilín 3 November 2020

<https://www.communities-ni.gov.uk/news/housing-statement-communities-minister-caral-ni-chuilin-3-november-2020>

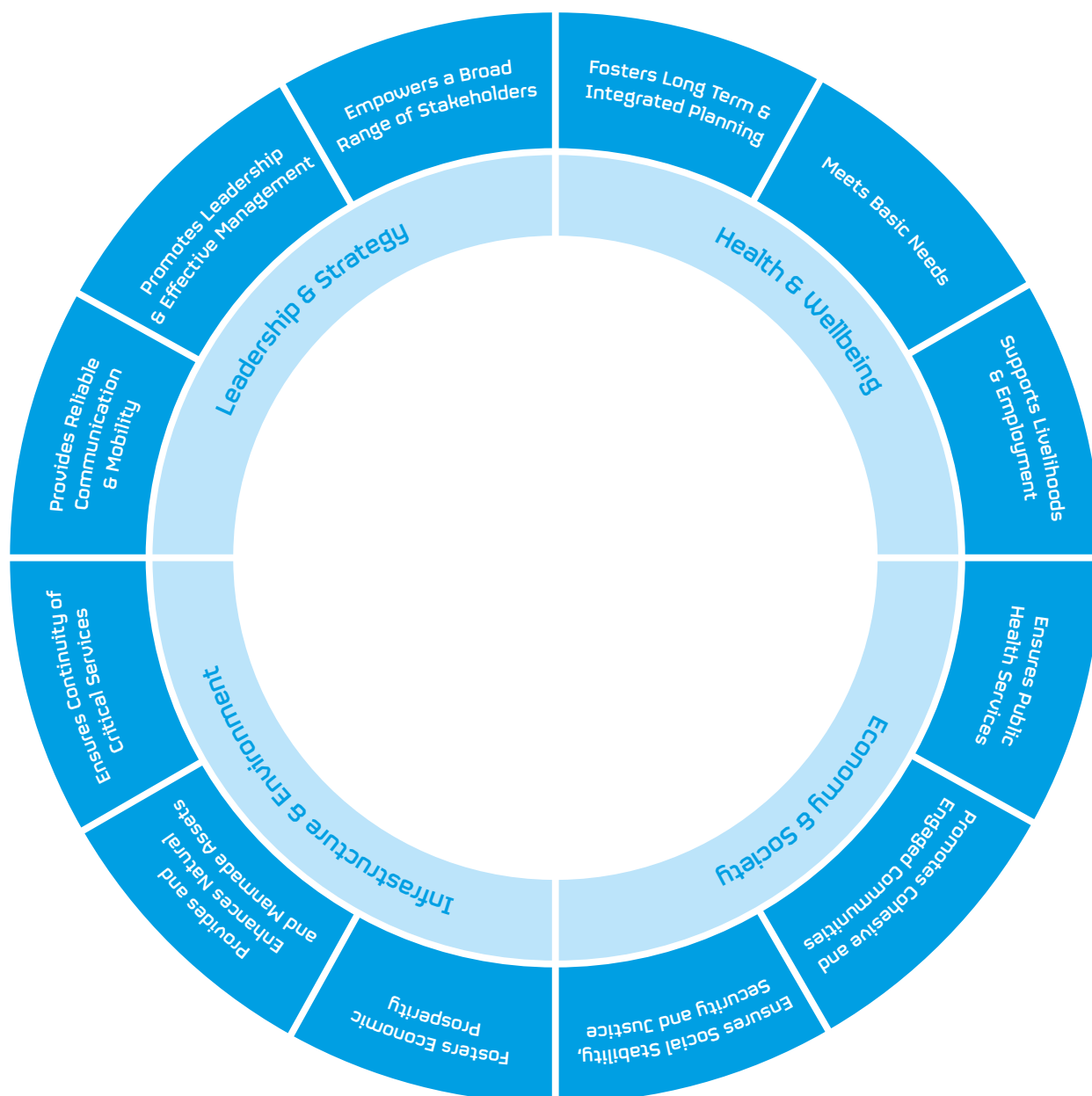


APPENDICES

City Resilience Framework identified areas of city resilience



City Resilience Framework identified areas of city resilience



As part of our commitment to promoting equality of opportunity and good relations, we want to ensure that everyone is able to access the documents we produce. This document is available in different languages and formats and we can provide others on request, please contact: Richard McLernon, Project Coordinator, Commissioner for Resilience on 028 9050 2091.



Belfast City Council
City Hall
Donegall Square South
Belfast
BT1 5GS

 www.belfastcity.gov.uk/resilientbelfast

 resilient@belfastcity.gov.uk

 028 9050 2091

 @belfastcc

 @belfastcitycouncil

 Belfast City Council



Belfast
City Council