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**RTPI
Research
Paper**

APRIL 2020

STRATEGIC PLANNING FOR CLIMATE RESILIENCE

**Recommendations to the Liverpool
City Region Combined Authority**

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Registered charity number: 262865
Scottish registered charity number: SC 037841

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This report

This report is intended to inform Liverpool City Region Combined Authority's creation of their Spatial Development Strategy, which is likely to be the first city regional strategic plan of its kind in England. This 'action research' was conducted as part of the RTPI's Strategic Planning for Climate Resilience Project, which aims to assist planners in helping local authorities to adapt to and mitigate against climate change

The rationale and overall approach of this novel 'action research' project are described in an article published in PBC Today¹. Further outputs will emerge through 2020.

This report was authored by Dr Daniel Slade and Oliver Charlton, with support from John Sturzaker FRTPI of The University of Liverpool and Malachy Buck of The University of Manchester. For more information about this project or the RTPI's wider work on climate change, please visit rtpi.org.uk/climatechange or email research@rtpi.org.uk.

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¹ pbctoday.co.uk/news/planning-construction-news/climate-resilience-planning/56554

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Introduction

Climate resilience and cities

'Climate resilience' refers to the ability of cities, as ecological, social, and economic systems, to resist, recover from, and continue to develop despite climate-related shocks.

The concept has recently superseded climate adaptation in cutting-edge planning research and policy because it better reflects the need to think of cities in holistic terms, as interconnected and dynamic systems. When considered alongside climate change risk, this means that policy makers need to consider how social and economic factors which make their communities vulnerable to a wide range of different climatic hazards, as well as the probability of particular phenomena occurring over time, all intersect.

Sometimes, the most effective way of increasing a community or place's resilience to the impacts of climate change can be focusing on these social factors (for example, developing support networks, information availability, or overall levels of wealth), rather than 'hard' technical interventions, such as building flood barriers.

Climate justice?

The concept of climate justice is also crucial to effective planning for climate change. It draws attention to the fact that climate change mitigation and resilience challenges are largely tied up with economic and social circumstances that must be regarded when developing solutions to the challenges of climate change.

The RTPi's recent publication '5 reasons for climate justice in spatial planning' contains more evidence on why climate justice is important and practically valuable concept³.

Strategic planning and climate resilience

Spatial planning is a crucial tool for building the resilience of city regions to climate change. Strategic spatial planning – spatial planning across local authority boundaries and with the view of achieving defined, long-term, objectives – is particularly important. However, the current landscape of strategic planning often fails to consider the implications of planning for climate resilience, which make up a large part of the process of planning for resilience.

The IPCC's definition of 'climate resilience'

'Climate resilience' refers to the 'capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding, or reorganizing in ways that maintain their essential function, identify and structure, while also maintaining the capacity for adaptation, learning and transformation.'

IPCC, Climate Change Summary for Policymakers

Some key definitions:

Climate adaptation: The process of adjusting to new (climate) conditions in order to reduce risks to valued assets

Climate resilience: The capacity of a community, business or natural environment to prevent, withstand to, and recover from a disruption

Climate risk: The increased risk of climate related extremes resulting from the changing climate

Climate vulnerability: The susceptibility to harm and lack of capacity to cope and adapt to climate change

IPCC, Climate Change Summary for Policymakers

³ See rtpi.org.uk/climatechange

This report

This report makes recommendations to Liverpool City Region's Combined Authority (LCRCA) on how it can ensure that its emerging Spatial Development Strategy (SDS) effectively builds resilience to climate change across the city region.

It draws on the RTPI's work with Liverpool City Region (LCR), the RTPI's in-house expertise, a survey and desk-based analysis of local plan policy, and a series of best practice case studies commissioned from researchers at the Universities of Liverpool and Manchester. It comprises three main parts:

- **Chapter One** reviews current climate resilience-related local plan policy in the city region. It assesses its strengths and weaknesses, and provides recommendations on how the SDS can build on these (a full list of relevant local plan policies are provided in Appendix A).
- **Chapter Two** provides recommendations based on discussions with LCRCA's analysis and evidence team on a number of potential ways of forming an evidence base for the SDS
- **Chapters Three to Five** present an extensive set of best practice case studies on strategic planning for climate resilience. These include both 'long-form' analyses of the process in different local and combined authorities across the UK (Chapter Four), and 'short form' technical summaries of particular policies (Chapter Five).

1. Local policy analysis

Introduction

This chapter provides a very high-level assessment of current climate resilience-related spatial planning policy in the LCR area⁴. It examines:

- The strengths of local climate resilience planning policy in the city region, in order to make recommendations on how LCR might capitalise on, and take advantage of, these through the sustainable development strategy.
- Weaknesses in local climate resilience planning policy, in order to make recommendations on how LCR might address these issues through the SDS.

These local aspects are considered in terms of how addressing the SDS may benefit the whole city region's overall level of climate resilience.

Below we have presented an overview of current local planning policy on resilience for the region, outlining the key themes existing in climate resilience policy across the board and the key messages that the combined authority should take when developing resilience policy for the SDS.

This review analysed the most recent version of each local planning authority's local plan (i.e. core development plan documents), alongside other guidance and policy were relevant. The local plans covered by this review are:

- Halton: Delivery and Allocations Local Plan (Adopted, January 2018)
- Knowsley: Local Plan Core Strategy (Adopted, January 2016)
- Liverpool: Liverpool Local Plan (Submitted, January 2018)
- Sefton: A local plan for Sefton (Adopted, April 2017)
- St. Helens: St. Helens Local Plan Core Strategy (Adopted, October 2012), St. Helens Borough Local Plan 2020-2035 (Draft, January 2019)
- Wirral: Unitary Development Plan (Adopted, February 2000), Climate Change Strategy (Non-statutory, 2014-2019)

Given our definition of climate resilience, this analysis focuses on planning policy which:

- Explicitly mentions the terms 'resilience' or 'adaptation'.
- Generally focuses on responding to climatic hazards and longer-term changes in the natural environment, whether or not climate change has been explicitly identified as a driver of these changes.

⁴ The Liverpool City Region comprises the City of Liverpool and the Boroughs of Halton, Knowsley, Sefton and the Wirral

Key themes

Treatment of climate justice and resilience

There are no specific climate justice policies within the adopted Local Plans of the 6 constituent authorities, which is not surprising as Climate Justice is such a new policy area. However there are elements of policies within their Local Plans which do cover elements of climate justice and resilience, the SDS has potential to create a City Region wide approach to this relatively new issue.

There is a particular focus in local plans in the City Region on reducing flood risk for new and existing developments. These references concern the management of water resources in general, alongside flood adaptation, using aspects such as sustainable urban drainage systems to couple adaptation with other issues such as water pollution.

There is rather less policy content on other climatic hazards which are very likely to be worsened by climate change, have at least some impact on the city region, and for which spatial planning will be a key measure. Such hazards include urban heat island (this was mentioned alongside *climate change mitigation* in Knowsley), changing degrees and patterns of coastal erosion, potential forest fires, the death of green infrastructure, and a number of other different challenges facing urban water supply such as water borne disease, water consumption pressure and drought. All of these can be expected to have at least some impact on the city region as global warming continues.

Existing flooding resilience policy says little about how climate change will change flooding in the future, or how it might bring new threats into play

The probability of flood risk in the city region is likely to worsen as a result of climate change. While the threat of Climate Change was mentioned in a large amount of Local Plans, this policy was underdeveloped in terms of the impact climate change would have on resilience. Figures in the planning documents suggest that local planning policy doesn't consider to what extent climate change would increase the frequency of these currently rare flood events, and didn't specify what allowances need to be considered when using quantitative modelling and planning for climate change.

Strategies to understand risks such as measuring flood risk using quantitative probability by year methods need to consider how wetter winters and dryer summers will impact on water absorption and runoff rates, leading to increased likelihoods of rare flood events beyond the current predictions. There are a number of local plans that use these probability based methods in Liverpool (Sefton, Halton & St. Helens use this strategy) but none of these plans consider how flood risk will evolve if these risks dramatically change as a result of global temperature rises.

There's also the potential for new risks to emerge that aren't currently considered by local planning policy due to the ability of climate change to create transformative changes. Threats such as forest fires, not often seen in the UK and currently considered a risk to only to warmer nations, are more likely to emerge as a relevant risk to the British climate as global temperatures increase.

Most local green infrastructure policy in the city region is delivered as an intrinsic good, without a firm grounding in evidence and analysis, potentially leading to a range of issues

Local Plans for councils in the region have strong green and blue infrastructure policy, something which is clearly important to climate resilience. However, this green and blue infrastructure policy is generally presented as a good in itself (perhaps because of national policy emphasis on these types of intervention), rather than a way of addressing particular, locally specific, climatic change-related risks, as part of a wider, holistic, climate resilience or adaptation strategy.

Plans supported green/blue infrastructure and then listed a number of ways in which it could be beneficial at a very high level, rather than specific, evidence-based threats being identified, quantified/mapped, and then addressed through measures including (but not limited to) green/blue infrastructure. Failure to ground green and blue infrastructure schemes in evidence supporting their development may lead to issues with both viability and subsequent enforcement to ensure the development of these schemes as an essential part of developments.

Evidence to support green/blue infrastructure needs a grounding in the specific spatial challenges of areas in the region, backed by sufficient evidence outlining the challenges that are likely to need green infrastructure provision. The evidence bases for green/blue infrastructure must make up parts of strategies that aim to tackle these challenges in order to ground beneficial infrastructure into the local planning process.

It should also be considered that LPAs may not have the resources to generate an evidence base requiring a large level of modelling in some areas of risk and support will be needed to ensure that LPAs are able to assess these risks in their local area, using either their own evidence bases or ones generated for them.

There is limited consideration of factors determining vulnerability, whether related to flooding or otherwise

There is limited consideration of the social, institutional and physical determinants of vulnerability to flooding and other climatic hazards in any of the local plans. Adaptation to climate change must consider holistic approaches that consider what determines disproportionate risks facing vulnerable groups.

Some examples of possible risk determinants include:

- Multiple indices of deprivation
- Average age and percentage of young children and older people
- Employment and education levels
- Percentage of homeowners, private renters and social renters
- Service provision in the area of flood risk (e.g. number of care homes, doctors, schools)

These determinants highlight how flood vulnerability exists beyond flood risk itself and can help expand understanding of how these risks should be managed to ensure an equitable approach to tackling them. ClimateJust's Flood Vulnerability Index identifies 5 characteristics that determine

vulnerability, such as an area's ability to prepare, ability to respond and the community support offered. The index also looks at factors such as the provision of services and existing social networks in order to determine risk in an area. Taking an equitable approach to building resilience also highlights measures which can improve long-term resilience which are not as immediately obvious as measures like green/blue infrastructure that may emerge in environmental assessments, including factors such as internet access or transport infrastructure.

Considering vulnerability factors highlights the wider social impacts of flooding, not just economic damage and how mitigation measures can adversely impact on some groups more than others. Issues such as deprivation in an area impact on all the listed determinants such as recovery and preparation time. (For example bus provision in areas predominantly full of either young children or the elderly can be disrupted by flooding and worsen the area's ability to recover from these events.)

Focusing efforts on alleviating flood risk should understand the potential impacts on each area beyond short-term economic impacts that look at building value above all else, often failing to consider the social impacts of flood events and linking building resilience to flood risk beyond the risks as they're currently understood. Local authorities not considering such aspects often underestimate the efforts they must take in terms of adaptation and might end up providing insufficient support to vulnerable communities while recovering from such events. This can go hand in hand with understanding of risks and also protecting against the long term economic impacts of flooding.

The RTPI's work on Climate Justice demonstrates how climate change can impact different communities differently and highlights the need for planning authorities to view climate vulnerability through the climate justice lens.

Key messages

The evidence base and analysis underpinning the SDS can play a crucial role in helping LPAs in the area to think about climate resilience holistically, and consider climate vulnerability and/or risk, beyond flooding, in their local plans.

The changing climate is not given much material consideration in the local plans of the LCR beyond the base level of understanding. Evidence in the LCR's SDS should form a crucial and practical starting point to inform planning for climate resilience and mitigation in each and every council across the region.

Local authorities often lack the resources to develop a wide reaching evidence base that tackles local and cross boundary issues and gives them the evidence to support bold plan making. A combined authority would be far better placed to provide local authorities in their region with the evidence base they need to tackle resilience issues holistically.

Evidence bases must include a variety of risk factors that will allow LPAs to think more holistically about climate vulnerability. LPAs should be able to think in terms of social impacts and vulnerability ingrained into urban systems, rather than purely on 'hard' solutions to climatic hazards.

Alongside these risk factors, a Liverpool wide evidence base must:

- Consider different scenarios and probabilities. Temperature rises will cause risks to change

and develop and the way in which we address risk should also adapt to these changes.

- Support climate-justice based approaches that tackle the challenges associated with climate change while ensuring an equitable approach that tackles climate change for everyone.
- Support targeted policy interventions through evidence of strategies that specifically reduce risk factors and set out management priorities, either through soft or hard infrastructure.
- Generate evidence bases for both small scale local issues and also issues that might impact the region as a whole, such as management of the Mersey basin. Such evidence could also help support cross border collaboration between LPAs on common regional issues

The SDS can help the LPAs to address these local and city-regional challenges through adoptable standards. The scope of the combined authority to develop a region-wide SDS alongside a robust evidence base will be the most effective way of building climate resilience across the Liverpool City Region.

2. Local workshop findings

A workshop was held on 12 December 2019 with spatial planners from the LCRCA and officers responsible for climate change and evidence/analysis to discuss collaboration in shaping the objectives of the SDS. The questions put to participants are set out below and the findings from the discussion are summarised.

The aim of this discussion was to begin thinking about how the evidence base underpinning the SDS can go beyond a two-dimensional consideration of the climatic hazards likely to impact the LCR, and include data on the relative climate vulnerability of different communities and places.

Issue 1: The range of possible risks in the LCR

Participants were asked to consider Climate Ready Clyde's 'Risks by Hazard' pull-out from their Risk and Opportunity Assessment for Glasgow City Region. They were then asked:

Q. Given existing data, which risks might be most relevant to the LCR?

Climate Ready Clyde highlights a large number of risks facing Glasgow in the coming decades and doesn't specifically consider datasets in all of the risks mentioned. Looking specifically at the themes of each risk mentioned, there is a good level of overlap between each of the themes. Both the LCR and Glasgow are urbanised areas on the banks of rivers and therefore face fairly similar challenges owing to factors such as population density and the strength of transport infrastructure provision. Liverpool does experience far less rainfall than Glasgow but it is vital that Liverpool considers the wide range of risks posed by climate change.

Q. How do these different risks relate to current policy priorities in the LCR? What about 'climate justice' particularly?

Investment in infrastructure and overall wellbeing make up a large part of the focus of the LCR and the risk climate change poses to infrastructure is largely relevant to this. Investing in resilient infrastructure is something that must be informed by the potential risks of a changing climate in order to future proof systems for a resilient future.

As it currently stands, LCR doesn't focus particularly on many issues regarding inequality and social justice and therefore climate justice isn't integrated into the authority's approach to climate change and doesn't relate to the policy priorities in the LCR beyond planning, however, the climate justice scope also promotes tackling a number of issues alongside climate resilience.

Q. Which risks are relevant to planning, and are in the scope of, or can be influenced by, the SDS

Risks such as flooding and urban heat islands are largely influenced by the planning system, with flooding very much being regarded as the most relevant to planning authorities currently. Risks such as urban heat island are potential risks with less clear evidence and may only be able to be included in the evidence base by utilising specific new resources that can map the risk posed.

The SDS can influence planning by creating a strong evidence base demonstrating the potential for these risks to manifest themselves across the LCR, allowing local planning authorities to develop their planning policies based on effective and proportionate evidence from the strategy.

Issue 2: The ClimateJust map tool as a starting point for understanding vulnerability to climate change in the LCR

The ClimateJust tool⁵ was developed with support from the Joseph Rowntree Foundation, and combines social spatial data on socio-spatial attributes which make communities vulnerable to climatic hazards, with data about those hazards. While it considers a number of climatic hazards, it is particularly effective on flooding. The tool may be useful to LCR, and the SDS, for three reasons:

- Flooding is likely to be a key concern for the LCR, and this tool considers a wide range of factors which can increase communities' vulnerability to it;
- It is an 'off the shelf' tool and data source which could directly inform the development of the SDS, with little need for further in-house analysis; and
- It was developed to support 'climate justice'-based approaches to climate change adaptation ('equitable adaptation'). This fits neatly with the mayor's social justice agenda.

Participants were asked:

Q. Do you think this tool/data is robust enough to be part of the evidence base? If it isn't, could it be reproduced or updated?

The Climate Just tool has the potential to inform the evidence base or form a key part of it. The neighbourhood flood vulnerability index applies the 'climate justice' lens to flood risk and showcases how vulnerable communities can be impacted beyond the flood itself, using the determinants of risk itself. The usefulness of the index depends on how useful LCR believes the data from the tool is.

Some evidence used in the map is fairly broad but also largely suitable, made up with data from government datasets. Local data from the LCR could be more useful depending on the priorities of the LCR (more localised/large datasets) but the basis for the map remains a starting point to inform specific spatial strategies in the SDS.

Q. How might this tool inform planning policy through the wider evidence base process?

The way this tool could be used depends on the needs and resources of the LCRCA. It could simply act as a small pointer for the LCR to build upon using their own data or the data itself could be utilised to inform specific strategies for each area of the LCR if the mapping tool is deemed useful enough. The LCR can decide which indexes and layers from the tool are potentially useful to strategic planning priorities.

⁵ climatejust.org.uk/mapping/#data

Issue 3: In-depth assessment of potential data sources on vulnerability and risk via RESIN's climate risk typology

The RESIN European Climate Risk Typology⁶ provides a means of visualising, describing, comparing and analysing climate risk in European cities and regions.

Alongside the mapping tool linked above, the website provides a vast amount of supporting information. This includes a large index of tools⁷ and supporting information, which provides background on all of the indicators used.

This background document is valuable because it provides insights into the data sources the authors used to develop a comprehensive European-wide map of climate risk, complete with links and relevant academic references. These can be easily cross-referenced and compared to data sources currently available to the Combined Authority.

As such, it provides:

- An overview of possible 'best practice' data sources for more complex indicators (for example, transport nodes exposed to coastal hazards), which can be easily compared to data sets that are already available to the combined authority
- The relative benefits to the LCR of focusing on the concepts of either risk or vulnerability, and the value of the concepts of hazard, exposure, and vulnerability/adaptive capacity.

Participants were asked the following questions:

Q. Which of the indicators listed are of interest to the LCR?

The ability to benchmark Liverpool against other cities in both the UK and Europe allows the LCR to develop their strategies based on what is considered best practice in regard to building resilience in cities of similar spatial circumstances and informs what challenges could be most relevant in the coming decades. Indicators such as the changing number of extreme wet and dry days are useful tools to suggest what might happen to the region in the future and other indicators of more specific risks such as fluvial risk, coastal risk and wildfire risks.

Liverpool's categorisation places them alongside other cities with dense transport infrastructure but also current low risk to people from fluvial flooding but higher potential risks facing dense infrastructure provision. These cities are also expected to experience demographic and population changes that will largely change risk and utilisation of infrastructure. There is also the potential for further collaboration and partnerships with cities along these lines of classification if seen as appropriate by stakeholders in these urban areas.

Q. Which of these indicators are based on data which is realistically available to the LCR?

Indicators such as population, transport infrastructure density and fluvial flood risk are currently easily available to the LCR. Other indicators such as suggested population changes over time

⁶ european-crt.org

⁷ resin-cities.eu/resources/tools

might require assessments into economic circumstances for the region but are likely readily available to the Combined Authority, which can be adapted to economic scenarios deemed more relevant to those closer to local decision-making.

Data involving analysis of climate trends would likely be the most difficult data for the Combined Authority to collect themselves and therefore would be the most useful data to the Combined Authority, allowing them to explore exposure to hazards as a potential factor through specific climate modelling. The combined authority would need to commit to a large amount of modelling to be able to estimate climatic hazard potential specific to their region for the coming decades.

3. Findings from practice elsewhere

We have created a catalogue of best practice case studies of strategic planning policy for improving climate resilience, which Combined Authorities (and other strategic-level planning bodies) in England – and potentially elsewhere - can draw on to develop their own strategic planning policy on the subject. The studies have been chosen on the following basis:

- Most effective scale
- Strategic bodies well placed to act relatively quickly on climate resilience
- Timely: Looks likely that they're getting the powers; very little evidence or guidance on how to use them, major commitments and interest in the subject

We have identified five strategic areas – Greater Manchester, Glasgow City Region, Greater London, the West of England (which covers the Bristol urban area) and the West Midlands (which covers the Birmingham urban area) – for 'narrative studies'. Glasgow was included because while in a different country with a different planning system, its long tradition of strategic planning and its progress on climate thinking merited a closer look.

For these cases, interviews were arranged with planning, climate resilience and green infrastructure officers and were undertaken during summer 2019. These interviews primarily focused on the practical challenges and key lessons in relation to developing and implementing climate resilience policy at a strategic scale, including institutional barriers and local political contexts.

These five detailed narrative studies are set out in Chapter 4.

However in order to supplement our learning from detailed narrative case studies of strategic planning we also expanded our search to Local Plans . This produced a long list of policies to which we applied a series of 'tests':

- Had the policy been subjected to robust viability testing;
- Could the policy be re-scaled to a strategic level;
- Could the policy be included in a statutory planning document within England?

These tests, led to the selection of nine policies to be examined as detailed case studies. These met each of the above tests, were suitability novel, and included responses to a range of climate impacts. Evidence to produce case studies was drawn from a range of sources including strategy and policy documents, accompanying assessments and analyses produced by the policy makers in question (e.g. sustainability appraisals and viability assessments), and records such as cabinet and committee reports.

These nine detailed technical studies are outlined in tabular form in Chapter 5.

The (re)-introduction of strategic planning in England has not been straightforward, and two of the case studies (the West of England and Greater Manchester) saw their strategic plans delayed, through in the first instance the recommendation of examiners of the Joint Spatial Plan; and the

latter political contention over the Greater Manchester Spatial Framework.

The relatively recent introduction of strategic planning powers to only a small number of places has restricted the number of identifiable cases of 'best practice' in climate resilience; so any pioneers who are including such policy in their plans are on the frontiers on planning policy. This is reflected in the response of the constituent authorities of the West of England Joint Spatial Plan to Inspectors: "we expect to be challenged as part of this process".

This in itself fed into our approach, through the widening of our focus from strategic to local policy; and through the tenor of our discussions with officers in our five narrative studies. It was clear through the latter that whilst the content of policies was of course an important transferable lesson to other places, of equal relevance was a range of "softer" issues which we might collectively refer to as institutional learning. This includes factors such as the need to ensure alignment between tiers of government (local and city-regional); the vital process of building support for activity on climate resilience over the long-term and between sectors; the role which can be played by planning officers in local authorities and elsewhere.

Through our research we have identified several overarching themes and "take-home" action points which cut across the case studies presented in this report.

Appropriate scale: natural processes

Natural processes do not follow administrative boundaries, therefore setting policy at a strategic scale means policy maps more closely onto the boundaries of natural processes. For example, the management of the "Urban Heat Island" is best managed across a built-up urban area; effective management of water resources requires a catchment-scale approach, for which a combined authority wide approach can effectively support; and strategic policy is best placed to maximise the opportunities of cross-boundary Green Infrastructure networks, implementing the principles of 'bigger, better and more joined-up' in the management of ecological networks.

The action point here is to make use of this perspective in policy design and justification, part of the wider effort of building support for strategic planning intervention.

Flexibility and consistency

Policy set at a strategic scale can provide flexibility for constituent authorities, whilst also facilitating consistency. Several cases illustrate how strategic policy can be used to set out broad principles or quantitative targets to manage the impacts of climate change. This ensures that a single local authority is unable to set lower standards to 'under-cut' neighbouring authorities.

However, it is also important to retain a degree of autonomy for local authorities, which would allow a bespoke response to localised risk. A strategic approach allows additional guidance or policy to be set within Local Plans or SPDs, so long as this complies with standards set at the level of strategic policy. There is a difficult balance to be struck between being sufficiently flexible yet offering a robust environmental framework to achieve consistency – examples in the report which may be helpful include the ClydePlan strategic plan for the Clyde Valley City Region.

Non-controversial resilience policy as a starting point for wider strategic planning

Public support and increasing demand for action to mitigate and adapt to the effects of climate change has been increasing for public bodies of all kinds. One consequence has been the many declarations of a 'climate emergency' and the consequent raising of the profile of environmental issues. Furthermore, evidence of the impacts of climate change such as flooding, overheating and biodiversity loss, and the impacts of extreme weather events are seen frequently within the UK. The research also makes clear the extent to which climate resilience policy has a range of social, economic and environmental benefits beyond adaptation to climate impacts, making it easier to achieve buy-in to climate resilience policy. Overall, this means that many benefits of joint working regarding climate resilience means that this can act as a 'starting-point' for collaboration, which may then provide the formal and informal institutional frameworks for strategic policy in other areas of spatial planning.

Planners are central and capturing agency is crucial

The role played by planners, specifically planning officers in local and combined authorities, is key to the leading and enabling of positive change in relation to climate resilience.

Beyond their formal/statutory roles in plan-making, the drive and enthusiasm of individuals and groups of planners is essential to maintaining a focus on climate resilience across political boundaries and changes in political leadership. Through continuity of knowledge exchange, collaboration and policy development, long-term support for climate resilience approaches is being built. Planning is therefore a central part of the solution to the challenges of climate change.

However in practice, this can highlight how plan making must be supported with resources at both a local and regional scale, as often the success and failure of plan making for resilience can depend on specific individuals. The departure of a planner can occasionally derail the process of considering resilience, a product of how stretched local planning authorities are. Combined Authorities should work towards building networks with individuals through the likes of chief planner groups and potentially support local planning authorities with resources if needed.

Strong evidence bases

While these case studies are presented as ambitious, they are far less ambitious when accompanied by evidence bases that support their implementation. Supporting evidence bases are a key part of viability assessments and must be presented for the risks posed by climate change in order to ensure that developers and local authorities are aware of the risks and the ease with which strategies to manage such risk can be implemented. Local authorities may lack the in-house expertise to produce evidence bases on the risks posed beyond some government data sets that are available for all.

A strong SDS must include an evidence base that not only demonstrates the risks of climate change, but also accounts for implementation challenges such as viability and legislation. There must also be evidence bases for specific local challenges that understand the different risks threatening the LCR as a result of climate change.

Incorporating mitigation and adaptation

Local Plans often focus on the mitigation aspect of climate change rather than how climate change will potentially alter weather conditions across the country. A cohesive Local Plan must consider policy that not only mitigates against climate change but also support communities to adapt to the changes and build resilience. The case studies given demonstrate how strategic planning documents can support developments such as green infrastructure by bringing together proposals that build resilience to and mitigate against climate change.

Strategic planning must work with a strong evidence base to demonstrate the risks of failing to adapt and support policies that allow communities to build their resilience to climate change.

Supporting collaboration across borders

Strength in infrastructure planning comes from a joined up approach, as demonstrated in the studies of similar local authorities. Climate risks don't confine themselves to administrative boundaries and a successful strategy from the LCRCA will address risks as dynamic and cross-boundary, akin to the approach taken in case studies of already existing city regional authorities such as in Glasgow.

A successful SDS will propose resilience strategies that work in each council area and also tackle specific spatial challenges regarding the likes of flood risk and the risk of urban heat islands that exist not only in one council area but also across council boundaries. The LCRCA can also build upon the SDS by support collaboration between local planning authorities.

4. Narrative strategic case studies

Birmingham and West Midlands Combined Authority⁸

Summary and key lessons

Birmingham City Council (BCC) has worked extensively to build on its legacy of environmental project work and evidence collection, i.e. as part of the Buccaneer project. This experience has given it the capacity to work with alternative actors and develop new partnerships. The data they have collected has provided them with a baseline of information that can be used to structure decision-making, lobby on specific political/environmental causes, and to market the Combined Authority area as a location for investment.

BCC on its own, however, does not necessarily have the capacity to effectively deliver its ambitious climate change programme. Instead, BCC has worked through strategic partnerships with the West Midlands Combined Authority (and others) to increase capacity in the area, and gain political buy-in to address issues of climate justice and environmental sustainability.

BCCs position within the WMCA has been positive in terms of promoting a climate resilience agenda, however, the evidence base and political support they developed has not necessarily led to comparable practices in the other six LPAs. Further communication and/or engagement with senior political actors may be required to install climate as a political priority across the WMCA.

Areas of particular interest (policy or otherwise)

Birmingham City Council, and more recently the West Midlands Combined Authority (BCC, City of Wolverhampton Council, Coventry City Council, Dudley Metropolitan Borough Council, Sandwell Metropolitan Borough Council, Solihull Metropolitan Borough Council and Walsall Council), have taken a leading role in using spatial planning to improve urban climate resilience (and responding to related issues such as poor air quality and the urban heat island effect) through the development of Green Infrastructure (GI). This work was at the centre of a unsuccessful bid to be named one of the 100 Resilient Cities by the Rockefeller Foundation.

Air quality is seen as a critical policy area in promoting socio-cultural resilience to climate change due to the negative impacts poor quality environmental resources have on health and well-being. Through their project work BCC have been able to facilitate a dialogue between planners, the development industry and the environment sector that looks at pollution as both a technical and mechanical issues to be dealt with via regulation but also as a behavioral problem that needs to take into account how various bodies, organisations and the public engage with and adapt their lifestyles to reduce their negative impacts on the environment. BCC has also argued that air quality is an issue that transcends local authority boundaries and demographic classification, and as a consequence should be classified as a strategic climate issue.

This requires the capturing and understanding of complexity within environmental and development policy, and needs to be linked to the broader investment context of the area. Examples of which include the promotion of spatial connectivity as a key policy agenda using the city's waterways and connective routes for cycling and walking. However, there are issues related

⁸ Interview undertaken in July 2019 with Climate Change and Sustainability Manager from Birmingham City Council

to access and functionality that need to be addressed. Investment in a more connected city though is proposed as a mechanism to improve climate equity via improved access, as well as addressing flood risk, biodiversity loss and promoting health and well-being. BCC also see an integration of more effective mains drainage and flood management, via deculverting and daylighting through NBS and ecological re-engineering as a significant part of this process.

BCC has also worked with the Ecosystem Services (ES) and economic development agendas to develop tools to assess the marketisation of ES via Ecosystems Market Taskforce to support ecological investment in Birmingham. Working with the UK Business Council for Sustainable Development (UKBCSD), BCC took it forward an innovative ecological development tool which was subsequently engaged with the Zero Emissions Cities contest (with 18 months pro-bono development of a SD checklist by the UKBCSD). Moreover, the development of HS2 and the reconfiguration of urban infrastructure in Birmingham and the West Midlands areas has required the development of larger cross-boundary collaboration/cooperation to build a better understanding of what development and the environment could be/do, and how ecological sustainability can be built into investment practices. The approach of using a key, extremely significant, project to coalesce interests is one which can be adopted by others.

What type of plan is this?

Given the current, and likely ongoing, lack of strategic planning powers for the West Midlands, we focus on other activities at the city-region scale and the role played by local authorities. In the case of Birmingham, as the largest local authority in the country in terms of population, its scale is not dissimilar to some city-regions, so such a role is relevant in terms of strategic planning.

Policy history

Birmingham and the wider BCC/WMCA area has a legacy of environmental policy/practice that has been used to structure the current articulations of landscape quality, value and justice in the region. These policies include:

- Green Living Spaces Plan (2013);
- Birmingham's Green Commission Carbon Roadmap (2013) which proposed a 60% reduction in emissions via changes in transport, built form, GI, and other infrastructure;
- Birmingham Development Plan 2031 (2017) included specific discussions of how BCC could work with HS2 to promote more sustainable forms of development including the relocation of the city's wholesale market from city centre to the periphery to promote the development of a new comprehensive regeneration masterplan for the city centre focusing on promoting better air quality, accessibility and mobility, and quality of life;
- West Midlands Local Industrial Strategy (2019) which included references to the Natural Capital Accounting being developed by BCC as part of their engagement with the Natural Capital Partnership;
- Liveable Cities Research Programme (<https://liveablecities.org.uk/>) which led to reflections on climate and environmental capacity for Birmingham, and has subsequently been used to promote the value of landscape within decision-making;

- Parks accelerator funding (2019) has enabled BCC to move forward with its environmental equity mandate as a response to austerity politics

Planning policy in the BCC area has a historical engagement with climate change and environmental issues. They have promoted a city-wide analysis of climate change, water management and air quality assessing the legacy of environmental change across Birmingham. More recently this has been combined with the public health agenda through projects such as “Buccaneer” that investigated how climate justice could be address through better planning.

BCC has also engaged in GI network and biodiversity/habitat mapping that has been complimented with ES analysis for the city of Birmingham. Using 10 different ES BCC composed a ‘Multiple Challenge map’ that captured ES (UHI, education, recreation, flood risk, biodiversity and climate change) within GIS to access the value, accessibility and functionality of green space as one of a series of proxies to health agenda. This was the first analysis of its kind in the UK and produced guidance on areas of greatest risk/need identified via their “risk framework”.

In addition, BCC has promoted the use of Natural Capital Accounting (NCA) in the city and its development policy as a mechanism to “unlock of mindset” of corporate finance, decision- makers and planners to promote a step change in the business as usual mandate. NCA is now being scaled up beyond the single local authority locally and across the UK, as its strategic nature provides scope for local government to integrate environmental and economic thinking at the multi-authority scale. This required additional thinking and reflection on how investment, development and urban management reflected the evolving understanding of environmental and climatic issues. It also used the BCC component of EU project/initiative looking at urban adaptation, i.e. EU Cities Adapt (with 13 other EU cities) to help to shape the planning process. Initially this was viewed as being academic in focus but has subsequently been discussed to form a fundamental evidence base for the Birmingham Development Plan. Moreover, BCC developed their SPD but following the changes in policy/government and the rise of the NPPF they had to reframe their strategic thinking via the development plan, which along with calls for GB release and the plan being called in for scrutiny by the Secretary of State for Planning led to delays in adoption.

The policy arena of BCC offers a roadmap for other LPAs in the CA illustrating the time needed to generate a robust evidence base, political buy-in, and to generate funding for and the delivery of projects. BCCs approach can be viewed as best practice in terms of the continuity of approach to investment in climate change, which although localised to Birmingham can potentially be rolled out in the other LPAs.

Policy implementation

Implementation of climate related policies in the BCC and WMCA area has been subject to a number of interacting and complex factors that reflect the nature of policy formation and actualisation. These include but were not limited to the following:

- Climate change and environmental quality resonated with politicians and planners and was supported through the National Ecosystem Assessment (NEA) using the work carried out by BCC as a national exemplar for Defra. In addition, Farrell Review for future proofing the planning profession as a best practice example;
- New roles were integrated into the policy and delivery process that promoted public health

and well-being as key components of the GI and the change agenda. This helped to create a set of policy mechanisms that could identify and work with the variable approaches to climate in policy;

- The internal political structure of BCC has changed leading to changes in approach, support and diversification of projects, programmes and policies. This includes changes in portfolio and cabinet members which has impacted on the engagement with climate related policy mandates. Moreover, changes in the strategic leadership of BCC has led to variation in the position of climate as a key development issue in Birmingham. Overall though support for climate change work has been relatively constant;
- However, not all elected members of BCC or its officers see the value or joined-up nature of supporting climate adaptation processes, thus differences in how and what the process goes forward remain evident.

Moreover, BCC has had to contend with the strategic planning for 150,000 more people and 50,000 homes as part of its development plan. This has meant that climate risk and the reactions of BCC have to take this significant growth agenda into consideration when it structures investment strategies. Thus, there have been ongoing issues within the development plan process as it attempts to address the scope and focus of the former core strategy and housing developments, and the impacts of the delays in signing off the Birmingham Development Plan. In part this was due to the focus that housing would have on UHI/biodiversity, significant issues of strategic importance, although BCC appeared to have less authority to limit development that had negative environmental consequences.

To address these issues BCC has worked extensively with strategic partnerships in the CA area and across the public/environmental sector to structure its policies and implementation processes towards a more climate ready and urban resilient focus.

Part of this process has been the support of the WMCA “Inclusive Growth Unit”, which has now been replicated at BCC. This provides guidance on how to structure development via an outer boundary that identifies thematic investment opportunities whilst the inner boundary is focused on societal needs/changes. The boundaries are conceptual rather than spatial and provide the structure for a broader assessment of the links between strategic policy mandates (the outer ring) and the alignment with specific local contexts and/or needs (the inner ring). Innovative thinking of this kind has been promoted as it helps to drive joined up working and minimise the risk in moving towards a more climate ready form of policy. It also enables the WMCA to stretch the parameters of decision-making beyond the normal regulatory framework, and to think more broadly about planning for climate/environmental change. Moreover, as the process issue situates discussions at a more strategic scale it removes some of the pressures to think specifically about local contexts in all discussions.

Although these local concerns and priorities can and are integrated into decision-making they are framed more directly with a strategic approach to planning.

Political/cross-boundary issues

Due to the history of landscape change via industrial growth and decline of the West Midlands and Birmingham area, the delivery of policy is complex and requires extensive cross-boundary and

multi-partner discussion. However, due to the long-term promotion of climate change adaptation and environmental sustainability promoted by BCC there has been a buy-in within strategic thinking to support policy/practice that looks at the everyday lived experience of green and open space, and its value to liveability and access to nature. This has been used to maximise the value of the Birmingham's ES and natural environment, and is embedded within the social, economic and political framing of policy in the area. BCC has stated though that they are aware of their spatial limitation in terms of land use/expansion, and therefore look to a wide range of stakeholders to scope and deliver projects, programmes and policies across the built, natural and socio-economic environment sectors.

The city centre regeneration following the decision to move forward with HS2 is one example. Initially the city centre rebuild generated conflict between the design and the response of citizens to it due to the lack of apparent awareness of GI or climate adaptive design. Within this debate the role of environmental policy appears to have been initially downplayed but has consequently had a more significant influence on the ongoing development strategy and application of climate ready investment. Furthermore, although HS2 is viewed as a strategic development the discussions about its implementation have been centred on Birmingham and not the WMCA region as a whole.

BCC have also worked with a range of industry partners including developers and construction organisations to develop a climate adaptation "benchmark" that makes use of three specific investment/management scenarios: (1) business as usual, (2) best practice and (3) globally aspirational and CBA to structure investment in environmental sensitive design. This includes a scoring system based on 67 indicators, which BCC promoted to politicians/planners and helped move investment in the area from a West Midlands focused project to a global agenda and brand. The consequence of which was that businesses wanted to be scored against this criterion, as they saw the benefit to their global branding, that in turn started to modify business mindsets and behaviour. Thus, growth in Birmingham and the WMCA has shifted towards a global perspective as investors care about their return, the product and the publicity they gain from being more environmentally minded. It was also stated that this promotes the view that business can be classified as investing "patient money" in terms of investment that helps to address BCC and long-term resilience, as part of their development and they want to be part of the solution. It is not clear whether the same process is occurring or being promoted at a wider CA scale, partially due to the pull of investing in Birmingham as the core hub/development centre of the region.

Development though in the WMCA has been restricted by the broad agendas of the 7 metropolitan areas who are somewhat uncomfortable with the structure and oversight of the CA. However, this facilitates a process of joined up thinking and helps to reassess regional priorities, thus breaking down silos and promoting collective development/growth. This is led by the Lead for Economic Growth in Solihull and thus counters the 'Birmingham or Wolverhampton first' mentality of LPAs in the city region. The WMCA also promotes the adoption of Natural Capital as the third key development priority for the West Midlands. What is apparent is that the evidence base developed by BCC has helped to both promote and shape the dialogue regarding climate in the wider CA area. Moreover, it has provided signposts to options, opportunities, funding and practices that have been successful in supporting the climate change/adaptation agenda, which may subsequently cascade to other LPAs. This, however, has proved to be a protracted process as the other LPAs in the CA are not all as progressive in their approach to climate resilience policies or practices.

Climate justice

Climate justice, the climate emergency and the promotion of environmental equity have been integrated into policy in BCC for a number of years. As the level of engagement has increased so too has the level of knowledge of officers and decision-makers. However, there are concerns that politicians are conversant in the language of environment but not the nuances of delivery of management of the environment. Thus, targets such as zero carbon cities may be almost impossible to calculate and achieve. Moreover, there is a perceived lack of equitability between LPAs in the West Midlands, as development and investment is viewed to not have been managed fairly. As a consequence there is ongoing variability in how each of the seven LPAs in the CA area present their local and strategic approaches to climate justice. Thus, the distribution of wealth and employment remains unequitable within the West Midlands, with Birmingham and Wolverhampton as key economic centres. Though the WMCA and BCC are attempting to reframe climate and investment priorities to ensure everyone has sufficient prosperity and targets but doesn't replace the previous economic growth agenda.

Glasgow and the Clyde Valley⁹

Summary and key lessons

This is an area with a long and strong history of joint working in both strategic planning and “green” activity. The strategic planning approach is to facilitate and empower local authorities to take action in relation to climate resilience, through the development of a broad policy framework upon which local policy can “hang” upon.

The approach local authorities in the Clyde Valley have taken to gathering, analysing and presenting data is exemplary, done through an independent body, Climate Ready Clyde. This independence builds the credibility of the data, and the presentation of this data (with a traffic light system) is excellent in terms of communication.

What type of plan is this?

A Strategic Development Plan (SDP), currently part of the statutory development plan in Scotland, hence carrying statutory weight in decision-making. The Planning (Scotland) Act 2019 abolishes SDPs, but secondary legislation has yet to be introduced to do so. The Glasgow and the Clyde Valley Strategic Development Planning Authority (ClydePlan) comprises eight local authorities. It is not a Combined Authority as exists in England, but interviewees commented upon a strong history of joint working, both voluntary and on statutory strategic planning.

Areas of particular interest (policy or otherwise)

The ClydePlan 2017 SDP contains various policies of interest. Policy 12 on Green Network and Green Infrastructure required that Local Authorities should place strong emphasis on the Glasgow and the Clyde Valley Green Network, ensuring that it is integrated into development proposals and “prioritise green infrastructure from the outset, based upon an analysis of the context within which the development will be located”. Policy 16 on Improving the Water Quality Environment and Managing Flood Risk and Drainage likewise emphasises the Green Network, further requiring Local Authorities to adopt “a precautionary approach to the reduction of flood risk”.

⁹ Interview undertaken in July 2019 with senior officers of Glasgow City Council and the Clyde Valley Green Network Partnership.

The *Clyde Valley Green Network Partnership* is undertaking mapping work to assess demands vs. resource of Green Infrastructure, to support local authority work on establishing GI factors and climate change adaptation.

In relation to data, Climate Ready Clyde, a “cross-sector initiative funded by the Scottish Government and 12 member organisations” has published a Climate Change Risk and Opportunity Assessment (CCROA)¹⁰ which will “be used to guide the development of the first Adaptation Strategy and Action Plan for the Glasgow City Region”. The CCROA “assesses gaps in Glasgow City Region’s current approach to managing climate risk, in order to manage those risks effectively to the end of the century”. In parallel an economic assessment was undertaken, identifying the baseline costs of “doing nothing”. It draws on a very large quantity of data and is an example of good practice in baselining climate resilience, because it is comprehensive, draws in third parties (for example the local universities), builds on the specialist expertise offered by the various partners, is seen as impartial and raises awareness of climate justice issues – there is a clear climate justice focus to some of the indicators of climate vulnerability used in the assessment.

Relationship to relevant national government policy

The Scottish National Planning Framework 3 (NPF) designates the Central Scotland Green Network as one of its National Developments, and the Glasgow and Clyde Valley Green Network is “an integral part” of that National Development.

Policy implementation

The Glasgow and Clyde Valley City Deal (signed in 2014) establishes “a £1.13 billion Glasgow and Clyde Valley Infrastructure Fund”. One of the key projects funded through this fund is the “Avenues”, through which £115 million is invested to introduce “an integrated network of continuous pedestrian and cycle routes across the city centre”.

At the local authority level, Glasgow City Council’s City Deal team focuses upon five key projects, one of which is resilience. This builds upon activity including the City’s Resilience Strategy which was funded by the 100 Resilient Cities programme. That resilience strategy is now being taken forward by the Glasgow Community Planning Partnership. The *Glasgow City Development Plan 2017* contains policies which “hang from” ClydePlan, including in relation to resource management (reducing energy use and making more use of renewable energy). Whilst these policies are useful examples for others, in Glasgow as in many places there remains a challenge in successful implementation with compliance, with the policies just one factor in decision-making on development proposals. Therefore much implementation activity in Glasgow City is being led by the City Council itself, including for example through implementing District Heating schemes. More broadly, there are issues relating to a lack of capacity for enforcement of development plan policies.

Political/cross-boundary issues

ClydePlan *Policy 12* includes the requirement that “cross-boundary links with adjoining Local Authorities” are considered in relation to development proposals. There are differences across the Glasgow City Region regarding the priority given to climate resilience. It was perceived that some more deprived local authorities may prioritise development over climate resilience.

¹⁰ See: crc-assessment.org.uk

Climate justice

Climate justice was identified by our interviewees as a priority at both the Clyde Valley and Glasgow City scales. For example, there is a recognition that there is a relationship between deprivation and under-provision of GI; and the CCROA explicitly states that:

“There are strong social and health inequalities with greater psychological impact of flooding being experienced by poorer communities... socially vulnerable neighbourhoods are over-represented in areas prone to flooding”.

It was felt that there was “political traction” around climate change at present and therefore there was a window of opportunity for more radical policy. The CCROA is a very new part of the decision-making process but it is expected in due course to play a significant role.

Greater London¹¹

Summary and key lessons

The Greater London Authority is the strategic planning body for Greater London (roughly within the M25). It uses its political influence to lead investment in climate change mitigation and adaptation, and has shown leadership in funding, setting policy and helping to deliver projects that address a wide range of environmental issues. The GLA’s positive track record on planning for climate change (particularly through landscape management) has provided it with a high level of authority on policy on the subject. This is being developed further through the application of defined standards, such as an ‘Urban Green Space Factor’, which is showing what can be done at a local scale by LPAs and developers to deliver environmental targets.

Overall, the GLA has used its strategic position to promote a clear sense of understanding and expectation across LPAs in London regarding what actions they should be taking to address climate change and promote environmental justice. This is multi-sector and is not solely focused on the environment. Indeed, the GLA has used economic uplift associated with environmental quality in terms of promoting real estate financing and reduced revenue costs to support engagement with climate change and environmental justice issues by the private sector. This has successfully drawn upon corporate social responsibility (CSR) to promote changes of mind-sets towards a more sustainable form of “business” production and consumption, which go beyond planning *per se*.

Areas of particular interest (policy or otherwise)

The Draft London Plan (both the 2017 and 2019 iterations) sets out a comprehensive development plan for the Greater London area until 2041. The plan focuses on a small number of key target policy areas, which it uses to structure its more detailed discussion of investment and management within the thematic chapters. These key policy drivers are centred on the GLA’s “Planning for good growth” agenda, which is supported by the promotion of *building strong and inclusive communities* (GG1); *making the best use of land* (GG2); *creating a healthy city* (GG3); *housing development* (GG4); *growing a good economy* (GG5); and *increasing efficiency and resilience* (GG6), which are to be achieved through the promotion of sustainable development opportunities across the city.

¹¹ Interview undertaken in July 2019 with Senior Policy & Programme Officer (Climate Adaptation & Green Infrastructure) at the Greater London Authority (GLA)

'Conflict resolution' can be interpreted as a key theme of the London Plan - particularly in how it seeks to align infrastructure provision with the protection of the natural landscape (namely Green Belt, the city's green and blue infrastructure, and Metropolitan Open Land). This raises a clear policy dilemma, as tackling climate change and leading London towards being a carbon-neutral city by 2050 do not necessarily easily align with the scale of development aspired to. Attempts to build in resilience into this process are therefore dependent on a more effective alignment of climate policy, understanding and action. The current articulation of the plan aims to promote a more responsible city with regards to climate change actions and reactions, i.e. to flooding, air quality and Urban Heat Island (UHI) reductions through a process of behavioural change. Policy GC6 *Increasing efficiency and resilience* attempts to do this through a combination of policy, technology and changing industrial, commercial and individual/communal behaviour to achieve a more resilient city (i.e. 'Careful planning of strategic and local infrastructure in all its forms can make the city smarter, more efficient and more resilient, preparing it for all that the future may bring'), and talks about smart approaches to planning as a mechanism to achieve this.

To ensure that these strategic policy directives are cascaded to each borough, a consolidation of information and approaches is needed to try and instigate continuity/circulation of knowledge for environmental management across the GLA and each of the Greater London LPAs. If this can be achieved then the delivery of Policy CG6 and the wider Mayoral agenda of delivering 50% green space by 2050 may be possible. However, questions remain as to how this can be maintained within all development to ensure no net loss in green infrastructure via the development of many smaller sites. Currently a potential conflict exists relating to the promotion of a housing policy focused on density and infill rather than the continuity of urban green space protection. There is an assumption that the Urban Green Space Factor may be able to address this issue.

What type of plan is this?

The London Plan is a Spatial Development Strategy (SDS) that sets out an integrated economic, environmental, transport and social framework for the development of Greater London over the next 20-25 years. The plan aims to deliver effective and sustainable growth and uses an Opportunity Areas Planning Frameworks (OAPF) approach to identify strategic locations for development which are promoted as signposts for London's Borough to lead their more localised delivery. Within the London Plan OAPFs are noted as potentially being able to:

"...represent the first stage in a plan-led approach to providing significant quantities of additional jobs and homes, improvements to transport and other infrastructure, and Draft London Plan - consolidated changes version July 2019 better access to local services. The Mayor recognises that there are different models for taking these forward depending on the circumstances and development needs of each Opportunity Area, and for translating these frameworks into policy in Development Plan documents and Supplementary Planning Documents. Whatever model is used, frameworks must be prepared in a collaborative way with local communities and stakeholders."

The London Plan, and its environmental focus, should be read as an influencing and strategic document for London Boroughs to structure their investment in climate adaptation. This is of specific interest in terms of urban heating and cooling, the ability to mitigate surface flooding, and help promote health & well-being across Greater London. This does however require a level of modelling from boroughs that not all LPAs have the capacity to deliver.

Policy history

The current version of the London Plan replaces those of 2004 and 2011 and continues to promote more effective climate change adaptation through the delivery of green infrastructure, sustainable drainage systems (SUDS), and interventions in urban greening at local, district and city scales. The plan is being updated in line with the Greater London Authority Act 1999 (as amended) and the Town and Country Planning (London Spatial Development Strategy) Regulations 2000.

The development of the London Plan has been influenced by officer-level advocacy promoting policy focused on climate change alleviation and adaptation. Due to the strategic nature of GLA policy and practice, officers have been able to embed themselves in environmental discussions that cover multi-spatial and multi-sectoral areas. Officers from the GLA therefore have a legacy of working with LPAs, environment and development sectors and the public to promote a more knowledgeable populace regarding environmental issues. This has focused on issues that occur locally, e.g. personal and communal mobility and at a more strategic level, e.g. Green Belts and Metropolitan Open Land protection. This advocacy role has been used to brief decision-makers in the GLA and embed the need to think strategically and locally about climate change in all aspects of GLA policy. This is reflected in the development of partnerships between the GLA, other environment organisations and public and private bodies to deliver EU and UK funding projects. For examples, see PERFECT¹² and CLEVER¹³.

Moreover, the London Plan is promoted as an agenda for stakeholders to promote more effective environmental governance within and outside of the GLA to establish more proactive discussions of climate resilience within policy and practice. It responds directly to the historical reactivity of policy for climate change, and promotes a political platform for non-GLA stakeholders to think about how this addresses the vulnerability and risks associated with environmental change. It also illustrates how community resilience and economic growth can be aligned more effectively through GLA officer (and member) advocacy to promote more effective evidencing, funding, delivery and management of urban systems. The role of GLA officers/members has been significant in supporting the development of these processes by offering technical advice.

The London Plan also challenges LPAs to be more effective in meeting their environmental obligations towards future proofing their areas (and assets). The framing of its policy directives provides guidance on how climate should be discussed at a LPA scale, how this feeds into London-wide practices, and illustrates the strategic links between policy areas that boroughs can use to frame their activities. This can be done through the promotion of climate centric policy, and a greater understanding of human-environmental interactions, and their subsequent influence on socio-economic and political development.

Policy implementation

The delivery of the London Plan's strategic goals is multi-faceted. It requires the GLA, London Boroughs, public and private bodies, and communities to work together to structure, influence and deliver more climate change centric praxis. Partially, this is promoted using metric driven assessments, i.e. the Green Space Audits and the developing use of the Urban Green Space Factor, but also looks to Boroughs to align their planning agendas with that of the London Plan.

¹² See: interregeurope.eu/perfect

¹³ See: clevercities.eu

Moreover, key policy areas such as air pollution, water quality and flooding, and the protection of Metropolitan Open Land (MOL) have been embedded in local policies in Hammersmith, Hillingdon, Fulham, Camden, Islington, Enfield (links to highways- based SuDS). Although such actions may have been forthcoming without the strategic oversight of the London Plan, the advocacy of the GLA has facilitated thinking and action in these areas due to the ongoing process of knowledge exchange, project development and technical guidance offered by the GLA to each borough. This has led to direct action being taken by LPAs to deliver the strategic targets of the GLA.

The London Plan offers an opportunity for the GLA and boroughs to integrate the high- level/top-down mandates with bottom-up understanding of local context to better align variation in practice, including for climate adaptation policy. The development of the All London Green Infrastructure Partnership aids this process as it rationalises the variation seen between boroughs and improves the dialogue and continuity of approach between them and the GLA.

In addition, the London Plan influences the inclusion of green infrastructure into borough- level Local Plans thus helping to shape investment/management of the natural and built environment. Through the provision of evidence via strategic policy directives LPAs are able to use the information generated by the GLA to support decision-making. Green infrastructure, and to a lesser extent climate change, have both been used as themes that promote a more holistic approach to development (although there remain variations, and separate approaches to climate adaptation//urban resilience in terms of policy areas/action).

With the adoption of the revised London Plan there is scope to establish greater buy-in across London with a climate resilience agenda. However, there remains a need to ensure clarity between the GLA, LPAs and development corporations to ensure that climate thinking is integrated into local, as well as large-scale or landmark investment projects. As London's development continues the inclusion of environment within large-scale projects could become an increasingly prominent feature of investment, especially if the Urban Green Space factor is actioned across Greater London by LPAs. This, the GLA hope, will promote a process of best practice reflection and push the climate change/environmental justice mandate. There is also scope to develop a more holistic approach to climate resilience in urban planning through a more effective and coordinated use of s106, CIL and other funding mechanisms.

The GLA's intention is to make investment in green infrastructure and climate adaptation a requirement of all new development. The use of the Urban Green Space Factor, which is being rolled out via the London Plan, is seen as holding a key role in enforcing this, as it provides a quantitative mechanism to hold developers accountable to meeting the green infrastructure and climate change obligations, which is enforceable. Thus, a significant level of evidence is being developed for SuDS, UHI and reductions in air pollution linked to the increased delivery of green space that can be used to structure/inform policy. The role of the Urban Green Space Factor is therefore to provide a delivery mechanism that can be used to ensure that the evidence base collected to date is utilised effectively to support investment in London's environment.

Political/cross-boundary issues

The London Plan promotes a multi-faceted approach to delivery coordinated by the GLA. Due to the complexity of development in London, the GLA recognise the need to integrate expertise from within and outside of the government/local authority sector to ensure timely and sustainable development. This includes working with local boroughs, Local Enterprise Partnerships, the

environment and third sector, transport and utilities authorities, and communities to effectively manage growth. Such partnerships focus on the alignment of strategic investment in housing, transport and employment opportunities with a more nuanced understanding of local needs to identify how climate resilience can be strengthened. This includes generating political support for the “value” of existing green infrastructure and urban nature within wider development debates to promote the prominence of climate change, adaptation and mitigation within London’s development agenda.

Potential problems remain in terms of the terminology used to promote climate justice, as variability of language can limit the understanding and uptake of new policies. Currently people, and in particular decision-makers, are receptive to the language of the climate emergency but strategy/policy lags behind in terms of focus, speed of adoption and delivery. Thus, the London Plan, and its influence on boroughs requires further support to embed the value of ‘climate resilience or justice’ within broader discussions with individuals, communities, public/private organisations sectors, and local government to ensure that they become actions at the local level. How climate vulnerability and climate justice, who benefits and what interventions can be done is open to variability at a borough level.

Environmental resource management and the creation/management of sustainable infrastructure to reduce negative climatic impacts/effects is integral to this process, and a scaled approach to local and city-scale investment is proposed in the London Plan.

How Boroughs manage the small-scale green infrastructure when sites are being converted essentially to grey infrastructure remains open to question. Decision-makers at the borough level, and within the GLA, therefore need to consider how they align development/viability needs with the maintenance of urban green and blue space. Smaller boroughs may find this easier, as they have a lower proportion of green space, and thus conversion is more limited. Boroughs with a greater proportion of green space may have to address more significant conflicts where the amount of green or brownfield is being converted. The use of the Urban Green Space Factor and regulations pertaining to MOL may offer some support in this process, but LPAs will need to think carefully about how they align strategic and localised development objectives. The GLA may therefore have an advisory role to play in guiding development objectives and thinking regarding the protection of environmental resources to meet local grey infrastructure and city-wide green infrastructure needs.

This may require the formation and/or the support of existing partnerships, as well as a change in philosophical and organisational ethos (in many cases) to promote more climate friendly approaches. However, having enough officers and sufficient capacity/knowledge to deliver and manage environmental management at the Borough level is not guaranteed across London. Thus, there is a question regarding how the London Plan will cascade to Boroughs, and who will take responsibility: is it a person who drives it, or an established policy process within the Borough that will deliver climate adaptation? The GLA therefore has a role in upskilling officers at the borough level to act as leaders/drivers of the CC and environmental planning agenda. The establishment of the London Green Space Commission (2019-2020, a one-year commission formed to assess the more effective ways to fund and manage urban green and blues spaces across London within and outside of the GLA) as a strategic partner in the development of strategic actions (and associated funding), is one mechanism that may aid this process.

One further aspect of the London Plan which is useful to assess relates to the value it places on

the interdependency of climate risk and responsibility. In short, is the cascading of risk from the GLA to boroughs being effectively understood? The GLA therefore promote a ‘triage of responsibility approach’ to promote more holistic forms of agency/organisational understanding. Reflections on the current level of variability of LPA action suggests that an ongoing process of communication and knowledge exchange is needed by the GLA to ensure an ongoing process of investment with climate change and environmental justice occurs across Greater London. Without such a dialogue we may see a continued diversity in how LPAs approach these concepts which may undermine the policy and practice framework being put into place by the GLA via the London Plan, its project work, and existing advocacy work.

Greater Manchester¹⁴

Summary and key lessons

Strategic planning and cooperation at the city-region scale has been a feature of Greater Manchester for many years, leading to strong relationships and an ethos of cooperation, between both officers and members. The Greater Manchester Combined Authority (GMCA) was established in 2011 and as a Mayoral Combined Authority now has extensive powers by English standards. The GMCA have a climate resilience team with responsibility for implementing much of the strategic policy. A lesson is that whilst this additional capacity is clearly extremely helpful, maintaining a collective focus is harder with climate resilience potentially less near to the centre of strategic plan-making activity.

What type of plan is this?

The Greater Manchester Spatial Framework (GMSF) is currently a joint Development Plan Document being prepared on behalf of the 10 Local Planning Authorities in Greater Manchester. The intention is that the document will become a Spatial Development Strategy, but due to the secondary legislation around the powers for the GMCA not having been implemented, at present (December 2019) it is not possible for an SDS to be produced. The next stage of the production process is contingent on that legislation being passed, or the Government confirming the plan’s status as an SDS. Until either happens, the plan must proceed as a joint Development Plan Document.

Areas of particular interest (policy or otherwise)

Within the revised draft GMSF¹⁵ (January 2019), there are several areas of policy which are particularly innovative. These include *Policy GM-Strat 13* on Strategic Green Infrastructure (GI); *Policy GM-S 4* on Resilience; *Policy GM-S 5* on Flood risk; and *Policy GM-G 2* on a [Strategic] GI Network. These policies respectively state that several types of strategic GI assets will be “protected and enhanced”; the need to plan to reduce on-going stresses and uncertainty as well as “acute shocks”; highlight the need to plan for flood risk strategically given the complex hydrology of GM; and provide an overarching GI policy which identifies GI opportunity areas and standards. Work is currently underway on the preparation of a Green Space Factor, to identify requirements for GI in new developments.

¹⁴ Interviews undertaken in June 2019 with senior climate resilience and strategic planning staff at the Greater Manchester Combined Authority (GMCA)

¹⁵ See: greatermanchester-ca.gov.uk/what-we-do/housing/greater-manchester-spatial-framework

Ex-ante impact analysis

An Integrated Assessment (IA), incorporating the requirements of Sustainability Appraisal, Strategic Environmental Assessment, Equality Impact Assessment and Health Impact Assessment, is being undertaken alongside the production of the GMSF. The version published alongside the January 2019 draft GMSF¹⁶ made minor recommendations to strengthen the policies noted above, but in general endorsed their synergies with the IA framework.

Relationship to relevant national Government policy

The GMSF accords with the NPPF, specifically in relation to climate resilience in that the latter requires local plans to include:

“Policies to support measures to ensure future resilience of communities and infrastructures to climate change impacts (para. 149); provision of safe and accessible green infrastructure (para. 91c); ... taking a strategic approach to green infrastructure (para. 171); and ... planning to avoid inappropriate development in areas at risk of flooding (para. 155)”.

Policy history

The January 2019 iteration of the GMSF is the second full draft, following consultations on the scope of the GMSF in 2014, the vision and strategy in 2015 and a draft plan in 2016. Changes made in response to consultation on the latter include *“More efficient use of land; Building at higher densities; Brownfield preference; [Reducing] Net loss of Green Belt; Stronger protection for important Green Infrastructure”* and the ambition for GM to be a carbon neutral city-region by 2038.

Whilst the GMSF is still under production, there is a long history of spatial planning at the GM scale, initially informal in response to the North West Regional Spatial Strategy. There is also a long history (going back to at least 2005) of planning for a GI network.

Policy implementation

The draft GMSF at this stage commits the GMCA to establish indicators to monitor the success or otherwise of plan policies. Beyond this, the GMCA are placing a strong emphasis on eventual implementation through, for example, the GM Infrastructure Framework and a Housing Delivery Plan. The five year GM Environment Plan (March 2019) is a further related document, committing all new development in GM to being net zero carbon by 2028. Given the issues noted above with the production of the GMSF, alternative delivery mechanisms for climate resilience may be particularly important.

The Climate Resilience team has responsibility for implementation of relevant parts of those documents. Their focus is upon gathering evidence and proposing practical solutions. It was noted that there is a problem with a lack of fine-grained spatial data on climate risk.

A lack of local planning authority capacity to gather and use data; and to ensure implementation of policy in relation to climate resilience, was identified as an issue. This is clearly a recurring problem across locations and points to an “implementation gap” which others should be aware of. *Policy GM-D 2* (Developer Contributions) requires “developments to provide, or contribute towards, the provision of mitigation measures to make the development acceptable in planning terms”, placing

¹⁶ See: greatermanchester-ca.gov.uk/media/1725/gmsf-ia-2019-issue-including-comments-combined-web.pdf

the emphasis on Local Planning Authorities to assess the viability of any contributions in relation to specific developments.

Political/cross-boundary issues

The original draft of the GMSF was very controversial – there were various local protests in a regarding the scale of green belt deletion. This was also an issue in the election campaign for the Metro Mayor. Andy Burnham, who won that election, campaigned on the need to reduce green belt deletions in the plan. The current draft proposes half the quantity of green belt deletion as did the first. Beyond this very significant political/cross-boundary issue, there is apparently broad consensus across the constituent local authorities. Each of the 10 has been allocated housing sites amounting to between 75% and 125% of the established need, with the exception of Stockport which is at 70% due to strong opposition to green belt deletion and a shortage of sites.

Some local authorities' political control changed as a consequence of the 2019 local elections, and others may change in future years. Interviewees suggested these changes had the potential to disrupt the consensus over the GMSF.

West of England and Bristol¹⁷

Summary and key lessons

Bristol is well-known for its green credentials as a city. This now has the status of a virtuous circle, as people move to the city because they support this, which reinforces its importance to political decision-makers. It clearly takes many years to get to this position, but there is potential for the planning process to build popular support for a stronger approach to climate resilience. The motivation of individual officers (and the growing visibility of schools/Extinction Rebellion protests) has raised the visibility of climate change actions and provided a platform for officers to build on their existing work and push is further within policy/implementation debates. Bristol City Council's long standing commitment to and engagement with the more sustainable forms for planning and growth had generated buy-in and political support from across the political spectrum, enabling officers to push for more ambitious and radical change in policy.

Crucially, this has cascaded out into the wider West of England Combined Authority, which covers Bristol, Bath & NE Somerset and South Gloucestershire, and has seen other LPAs start to engage in comparable discussions. The role of officers and the level of communication between them was seen as a critical issue. The officers of BCC and the other LPAs in the Combined Authority have a good relationship meaning they can work and pull together to promote climate change policy that can then be reported to each home authority. It also allows officers to work more effectively in terms of presenting a common view for the Joint Spatial Plan in terms of promoting zero carbon objectives in policy. In some areas of the city there is a strong awareness of communities' vulnerability to weather events (specifically flooding) and this then brings added awareness and participation in planning. Again, using data to raise awareness can help build support.

What type of plan is this?

The West of England Joint Spatial Plan (JSP) claims to be “the first such joint planning approach in the UK, which takes into account the impact that development in one area has across council

¹⁷ Interviews undertaken in July 2019 with officers from Climate Change and Sustainability team at Bristol City Council.

boundaries”. It is intended that strategic policies in the plan will act as “hooks” for local plan policies produced by the four constituent local authorities.

Areas of particular interest (policy or otherwise)

After the initial hearings of the public examination into the Plan, the Inspectors have recommended that it be withdrawn due to significant concerns over whether the Plan can be found sound, based on disputes over the strategic approach to development locations.

Despite this, there are lessons which can be learnt from the West of England and from the constituent local authorities’ approaches to climate resilience, particularly that of Bristol City Council (BCC).

Within the JSP, currently under examination, are several areas of innovative policy. Climate change adaptation/mitigation, improved health and well-being, and responding to the climate emergency via the promotion of a zero-carbon city mandate are all central tenets of the policy. These include *Policy 5* on Place Shaping Principles. Policy 5 identifies key principles to increase the sustainability of development, including that new development should aim to meet “all demands for heat and power without increasing carbon emissions”.

As noted above, policies within the JSP are intended to act as “hooks” for local authority policies. One such example is in BCC’s Local Development Framework Core Strategy, adopted in June 2011. *Policy BCS13* states that “Development should contribute to both mitigating and adapting to climate change, and to meeting targets to reduce carbon dioxide emissions”. A recent planning appeal decision¹⁸ supported this policy as one of the grounds for refusal of an application, in relation to the Local Authority’s concerns over unacceptable heating through solar gain.

Ex-ante impact analysis

An integrated Sustainability Appraisal and Strategic Environmental Assessment¹⁹ was submitted alongside the JSP. This stated that Policy 5 “scores well against the majority of sustainability objectives”, but suggested minor improvements, including by introducing wording related to impact on air quality.

Relationship to relevant national Government policy

The JSP accords with the NPPF, specifically the requirement in the latter for “Policies to support measures to ensure future resilience of communities and infrastructures to climate change impacts (para. 149); to help increase the use and supply of renewable and low carbon energy and heat... provide a positive strategy for energy from these sources (para. 150)”.

There were some critiques of current government uncertainty regarding planning policy – a *constructive ambiguity* – that was seen to undermine the translation of central policy into local practice. The NPPF can be seen as both supportive of efforts to plan for climate resilience and lacking in detail about delivery of this – and how it should be traded off against, for example, housing delivery. The collective efforts of officers of local planning authorities, and the policy in the JSP, can be seen as a reaction to the lack of specific direction from central government.

¹⁸ See decision APP/Z0116/W/18/3198899 at: cornerstonebarristers.com/cmsAdmin/uploads/bdf-appeal-decision-3198899.pdf

¹⁹ See: jointplanningwofe.org.uk/gf2.ti/f/845730/35829797.1/PDF/-/SD9__Sustainability_Appraisal_Report_Sustainability_Appraisal_November_2017.pdf

Policy history

We were told that local authorities have been active in planning for climate resilience since at least 2008, through Performance Indicator NI 188 (Planning to Adapt to Climate Change) as part of the Local Area Agreement process. This work was initially divided into topic areas and primarily functioning at the local authority level, but increasingly their stakeholders are able to work together at the city-region level – illustrated by, for example, being European Green Capital in 2015. The need to consider climate-related activity at the city- region rather than local authority level was a significant driver here – watershed-scale planning, for example, or the travel-to-work areas spanning local authority boundaries.

Policy implementation

Interviewees were confident that the data underpinning the JSP on, for example, climate change, green infrastructure, etc. would be important and useful regardless of the outcome of the JSP examination. A large quantity of data has been gathered and analysed, and this would be useful in strategic land allocations and the determination of planning applications at the local authority scale.

Given the limited resources of the West of England Combined Authority, much responsibility for implementation lies at the local authority level. For example, in July 2019 BCC launched an *Environmental Sustainability Board* with a remit “to help accelerate the city’s progress towards environmental sustainability”. This in turn was intended to help deliver Bristol’s One City Plan “which aims to make Bristol fair, healthy and sustainable with reduced inequality”. BCC are working to produce a *One City Climate Strategy* in response to declaring a climate emergency in November 2018. As officers from BCC engage through the JSP production and other activities at the strategic scale, there are greater opportunities for these approaches to influence the activity of other local authorities in the West of England.

A shortage of funding to implement climate resilience strategy was identified as an issue. There is further a “performance gap” in terms of enforcement of policy on low carbon housing, with a shortage of resources for monitoring compliance with planning conditions. Moreover, a lack of capacity in terms of officer time and expertise has limited the ability of BCC and other members of the Combined Authority to push the boundaries of climate change policy. However, elected members of BCC and the city-region Mayor have asked that policy be more ‘radical’ and push the boundaries to try and achieve the area’s zero- carbon targets. Cuts to the block grant from central government was reported as hindering this process, as it placed additional, and in some places excessive, restrictions on how LPAs could respond to both central and local government objectives.

Political/cross-boundary issues

We were told that the Mayor for the West of England Combined Authority has a strong focus on all actors playing their part in climate resilience, and there is understood to be broad agreement across the constituent local authorities that issues such as flooding are sensibly handled at such a scale. This is being pushed by officer engagement with the Combined Authority to lead the formation of policy hooks and new practices. The role of officers was deemed as being critical in generating a baseline of support and evidence that could be reported to members in order to frame investment and the promotion of a zero-carbon city.

Climate resilience policy in Bristol was described as both a bottom-up and top-down priority, with

the city being identified as a “green” place to live and a concomitant development of organisations such as Triodos and Sustrans. There was however seen to be scope to improve the ways in which the focus and delivery of this was communicated to the public, business and developers. The role of language was thus considered critical in effectively translating strategic messages and policies into appropriate and understandable actions for local communities.

Climate justice

This is a priority for the Mayor of Bristol, and BCC is trying to integrate this approach throughout their activity. The example of using GIS data to map climate vulnerability was an area BCC was developing, to assess the overlaps between deprivation and climate change risk. Interviewees acknowledged that some of the more deprived communities in the city could be more vulnerable, and would need additional resources to adapt to and mitigate such risks. The source of such resources was open to question, however.

The Equalities Impact Assessment ²⁰done on the draft JSP explicitly identified that “Zero carbon and energy positive solutions” in policies would benefit in particular those on low incomes.

²⁰ See: jointplanningwofe.org.uk/gf2.ti/f/845730/35828389.1/PDF/-/SD6_Equality_Impact_Assessment_November_2018_Statement.pdf

5: Technical local-level case studies

Raising water efficiency standards in Cambridge

Policy background

Policy Name	Policy 31: Integrated water management and the water cycle
Policy Document	Cambridge Local Plan
Authority (or planning body)	Cambridge City Council
English Region or UK Nation	East of England
Date of Adoption	2018

This policy is taken from Cambridge Local Plan, despite this planning document (and individual policies) not being a strategic planning policy, the principles introduced within the policy can relatively easily be extended to this scale.

Policy 31: Integrated water management and the water cycle:

Development will be permitted provided that...a) surface water is managed close to its source and on the surface where reasonably practicable to do so; b) priority is given to the use of nature services; c) water is seen as a resource and is re-used where practicable, offsetting potable water demand, and that a water sensitive approach is taken to the design of the development...

Policy detail

Impacts	
Description of policy, how does it represent best practice?	<p>This policy sets out the approach which developers must take regarding managing water. It ensures that the 'integrated water management' approach is taken, which aims to manage water as close to the property as possible, reduce water consumption and manage flood risk using natural solutions. It also seeks to maximise the benefits of multi-functional surface water management features such as green roofs and ponds.</p> <p>A Strategic Flood Risk Assessment was used to evidence the need for this policy, which indicated that rivers and other watercourses in the Cambridge plan area have little to no additional capacity, and this situation is forecast to worsen due to increased frequency and magnitude of extreme flood events, and therefore any new development cannot exacerbate the situation. Cambridge is also located in an area of severe water stress, taking this approach provides opportunities to re-cycle water and helps meet water requirements during drought conditions. Furthermore, the Cambridge Water</p>

	<p>Cycle Strategy 2 provided evidence to justify "a more aspirational vision for water management" e.g. support an increase in biodiversity and target of "water neutrality". This approach is consistent with DEFRA's shift towards holistic solutions in water management, through 'Natural Flood Management'.</p> <p>Some prescriptive standards that all development must meet are set out, principally that there must be no water discharge off-site following a 5mm rainfall event and restrictions on hard, non- permeable surfaces. In addition there are detailed examples of the design approach and infrastructure to ensure this policy is met and refers developers to national SuDS guidance (C752) from CIRIA.</p>
<p>Key policy impacts</p>	<p>Ensuring that all new development in the plan area considers integrated water management as an early consideration means that development will effectively deal with two key impacts of climate change, drought and flood risk. This means that development is better resilience to both these impacts, with excess water during wetter periods being stored on-site, ready to be re-used in times of water deficit.</p> <p>This approach, when combined with other sustainable features can contribute towards to range of other co-benefits. For example, the use of SuDS and green roofs can increase biodiversity, reducing the effects of urban heat island, whilst also providing outdoor living space. Going further these features can form a central part of the design approach, helping create distinctive and resilient development.</p> <p>Setting water management policy at a strategic scale ensure that planning policy reflects that water resources are shared across a catchment, not local authority boundaries, and is consistent with EA's 'catchment-based approach' to the management of flood and drought risk. An 'integrated water management' approach requires actors to align their objectives and approach across a catchment to succeed, this policy illustrates how strategic planning policy can support meeting these objectives.</p>
<p>Monitoring arrangements</p>	<p>Development proposals have to include a drainage strategy as part of their application which will set out the approach, a supporting Flooding and Drainage SPD this will provide the grounds to refuse an application if it failed to meet the requirement set out. This will be reviewed annually, and no applications will be granted contrary to Environmental Agency advice.</p>
<p>Policy development</p>	
<p>Financial arrangements</p>	<p>The policy expects that the standard is considered as early as possible in the design stage, and therefore meeting such standard means that the policy shouldn't comprise viability. The viability assessment used an additional 5.85% of build costs allowance to account for higher costs of meeting this and other sustainable policy requirements. The viability assessment concluded only site- by-site compromise would be required to meet viability requirements, meaning that a "practical, negotiated approach will need to be acknowledged" [3.1.32]. That said, no viability clause was included in the policy document.</p>

Relevant legal or quasi-legal decisions	Following plan examination only a minor change to Policy 31 was made, which clarified the need for groundwater protection when considering an approach to managing surface water. [209]
Results of ex- ante impact analysis	A sustainability appraisal found the policy was seen to "...not allow for development to increase flood risk and they also seek to improve the baseline situation through infrastructure provision.", concluding that the policy contributes towards a "...significant positive effects in terms of climate change adaptation and flood risk by ensuring that new development is resilient to climate change and contributes towards reducing flood risk across the city." [4.6.33 / 4.6.35]. Therefore no changes to this policy were recommended.
Relationship to relevant national Government policy	NPPF sets out that "plans should take a proactive approach to mitigation and adapting to climate change, taking into account...flood risk and water supply" [149]. The NPPG highlights the importance of SuDs, "Sustainable drainage systems are designed to control surface runoff close to where it falls...they provide opportunities to reduce the causes and impacts of flooding and combine water management with green space with benefits for amenity, recreation and wildlife" [Flood Risk and Coastal Change – 051]

Stakeholders and engagement

Key stakeholders	Cambridge City Council Cambridge Water
Relationship to wider projects and initiatives	Cambridge Water Company Statutory Drought Plan Cambridge Water Cycle Strategy 2 CIRIA SuDs Standards (C752)

Other

Links for additional information	Sustainability Assessment: files.cambridge.gov.uk/public/ldf/coredocs/RD-SUB-C-030.pdf Viability: cambridge.gov.uk/media/2489/cambridge-city-council-small-sites-affordable-housing-viability-incl-appendices.pdf Inspectors: cambridge.gov.uk/media/5930/report-on-the-examination-of-the-cambridge-local-plan-2014.pdf
Relationship to other policy	Policy 28 (Carbon reduction, community energy networks, sustainable design and construction, and water use) sets out the water efficiency and other sustainable design standards which development must meet.

Tests

Viability	Yes, no issues in viability testing.
Scale	Yes, principle based policy which can be re-scaled at a strategic scale
Formalisation	Yes, within Local Plan
Legal	Inside England and based upon established planning law
Contemporary	Adopted 2016

Targeting, coordinating and raising standards of green infrastructure investment across Greater Manchester

Policy background

Policy Name	GM-G 8 - Green Infrastructure Opportunity Areas
Policy Document	Greater Manchester Spatial Framework
Authority (or planning body)	Greater Manchester Combined Authority
English Region or UK Nation	North West
Date of Adoption	Currently adopted.

The completion of the Greater Manchester Spatial Framework (GMSF) in its current status is in doubt due to political disagreements over housing allocations and greenbelt deletions. This means the plan has not yet undergone viability testing nor plan examination. The vast majority of policy relating to Green Infrastructure is unrelated to these issues, and the policy itself did not draw significant criticism during consultation. As such this policy can still be seen as ‘good practice’ despite the wider uncertainty surrounding the GMSF.

GM-G 8 - Green Infrastructure Opportunity Areas

Development within and around Green Infrastructure Opportunity Areas should be consistent with delivering major green infrastructure improvements within them and should contribute to improvements.

Policy detail

Impacts	
Description of policy, how does it represent best practice?	<p>Green infrastructure (GI) are multi-functional natural assets, which provide benefits for a range of policy areas, and in particular, building resilience to climate change impacts. Many areas of the Liverpool City Region have a deficiency in GI and have challenges which can be ameliorated by building and enhancing GI networks.</p> <p>This policy identifies 13 areas, which together covers a significant proportion of the total plan area, these areas are located in all parts of Greater Manchester, in some cases also expand beyond the plan area. These areas where identified as areas which had the greatest potential for biodiversity net gain whilst enhance ecological connectivity with existing natural assets. The GMCA anticipates that additional areas are expected to be added as GI network evolves and expands. Within these opportunity areas, it is expected that any new development contributes towards ‘major’ GI improvements and ensures that any development cannot negatively affect any natural assets</p>

	<p>which already exist, or are planned in these areas.</p> <p>By setting out these expectations it allows developers to integrate such features into their plans at an early stage, reducing viability concerns and creating more coherent and effective GI plans within development areas. This overarching GI policy supports, and is supported by the more detailed GI policy in a number of areas e.g. trees and SuDS, which guides developers on GMCA expectations in relation to a range of GI typologies, this policy should be used in conjunction with opportunities areas to inform the specific measures that are expected to meet planning policy. The inclusion of an overarching policy suits a strategic planning approach, as it provides the opportunity for individual authorities to set out detailed policy whilst retaining a consistent framework at a strategic level.</p>
Key policy impacts	<p>Green infrastructure can enhance resilience to climate impact in many ways, particularly through reducing flood risk and the urban heat island effect. These opportunities areas are where enhancements can increase resilience, both at a strategic scale, but also for individual development proposals within the opportunity areas. A range of co-benefits for climate mitigation, biodiversity enhancement and health can be sought through GI. The policy suggests that development must either contribute directly to GI enhancement through inclusion in their development or contribute financially to related projects through planning obligations.</p> <p>A clear strategic approach to GI is taken in the policy, with opportunity areas not only covering much of the plan-area but also expanding to neighbouring authorities, who are explicitly identified within the policy. This encourages partnership working, beyond the plan area, which is essential for building ecological networks and enhancing the resilience of these networks to climatic changes.</p>
Monitoring arrangements	There is no specific monitoring approach set out as part of the policy.
Policy development	
Financial arrangements	The plan has not yet undergone viability testing. However the policy states that “infrastructure needed to deliver the sites that it allocates should be funded wholly by the developments...” and “Land pooling is likely to be required on some sites, particularly the larger ones, to ensure that individual landowners are not adversely impacted by the need to set aside significant areas for open space and other infrastructure”
Relevant legal or quasi-legal decisions	The plan has not yet undergone examination by the Planning Inspectorate.
Results of ex- ante impact analysis	Impact assessment found that “policy complements objectives and GMSF policy on resilience, highlighting links to flood risk and climate change risks. Similarly, GI will complement other policies and IA objectives relating to flood risk.” [p79]
Relationship to relevant national	NPPF outlines that a policy should “plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.”

Government policy	[171]. PPG sets out that “local planning authorities will want to consider: identifying no or low-cost responses to climate risks that also deliver other benefits, such as green infrastructure that improves adaptation, biodiversity and amenity.” [Climate Change – 005]
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Stakeholders and engagement

Key stakeholders	Greater Manchester Combined Authority Constituent local authorities Contiguous local authorities Natural England City of Trees Community Forest
Relationship to wider projects and initiatives	The overarching GI strategy reflects GMCA’s commitment to the 25 Year Environmental Plan, in addition the authority is testing new tools and method for investment in the natural environment in the Urban Pioneer program, this policy supports this work.

Other

Links for additional information	Integrated Assessment: greatermanchester-ca.gov.uk/media/1725/gmsf-ia-2019-issue-including-comments-combined-web.pdf
Relationship to other policy	This policy falls within the wider ‘Greener Greater Manchester’ theme of the strategy, a number of environmental policies support this theme such as Trees, Urban Green Space and Biodiversity standards.

Tests

Viability	Currently the plan has not been viability tested
Scale	Yes, strategic sale
Formalisation	Currently adopted policy
Legal	Inside England and based upon established planning law
Contemporary	Yes, plan-making process underway

Improving decision making across Kent by building climate change scenarios into infrastructure investment decisions maximising resilience and co-benefits

Policy background

Policy Name	Kent and Medway Growth and Infrastructure Framework
Authority (or planning body)	Kent County Council, 12 Districts within Kent and Medway Unitary Council
English Region or UK Nation	South East
Date of Adoption	2018

The Kent and Medway Growth and Infrastructure Framework (GIF) provides a picture of emerging development and infrastructure requirements, to support growth across Kent and Medway, up to 2031.

Policy detail

Impacts	
Description of policy, how does it represent best practice?	<p>Whilst this document is non-statutory it is a best practice example of long-term co-operation between public and private organisations, which considers the challenges that climate impacts and economic growth may have on infrastructure needs and delivery.</p> <p>The document uses a range of data sources to consider the current and future (up to 2031) infrastructure needs. To do so it sets out two 'critical unknowns' which are economic growth and climate impacts, this creates four scenarios (based on low- high variables). Climate impacts are therefore central to projecting the likely impacts in a range of sectors, and the varying infrastructure requirements to meet these challenges. The interaction between climate and economic growth is a particularly innovative aspect of the framework, for example, it considers that in the event of high climate impact there will be stronger competition between climate adaption and mitigation. However, in the event of low economic growth, there will also be severe competition for investment increasing the likelihood of 'managed decline' of some coastlines. Such scenarios will encourage constituent authorities to consider the difficult decisions that may be forced to make in the event of severe climate impacts, which may also be exacerbated by funding shortages.</p> <p>The framework also provides a basis for public and private sectors partners across the plan area to 'futureproof' their infrastructure plans, by considering climatic risk. This framework provides a platform for data sharing and common resources to do so and facilitates co-operation in infrastructure</p>

	<p>planning and funding bids. For example within the planning and implementation of cost-effective strategic Green Infrastructure networks, ensuring that from investment from private and public partners best supports adaption to climate change and a range of other objectives in the plan area.</p> <p>Won RTPI South East Regional Award 2016, for Excellence in Planning to Deliver Infrastructure</p>
Key policy impacts	<p>The framework sets out the investment that is needed to meet a whole range of challenges, of which climate impacts are central throughout each sector. This means that the plan can accommodate changing circumstances, this can be seen in primarily in two ways; a situation where the greater adaption to climate change is required, and in the situation where the sources of funding could be increasingly limited due to weak economic growth. This means that the 'worse case' scenario is being considered, enhancing the resilience and adaptability of a whole range of plans and strategies in the plan area. This can also be used as a robust, shared evidence base to attract and justify investment and engagement from key stakeholders, including public sector funding bids, private investment and through planning obligations and CIL.</p> <p>Cost-effective infrastructure delivery, particularly measures to increase climatic resilience requires a strategic approach, the GIF provides an effective platform for this occur. This means that this approach to planning necessarily requires setting policy and decision-making to occur at a strategic scale. It also provides an additional mechanism to co-ordinate growth across local authority boundaries in the context of uncertain climate impacts, as well as highlighting funding gaps and infrastructure needs (especially those which are exacerbated by climate change), by doing so it increases the likelihood of these gaps being met. In aggregate this strategic approach ensures that growth is supported, whilst making cost-effective investment decisions to meet even the most extreme climate impacts.</p>
Monitoring arrangements	Regular updates to GIF to reflect the ongoing development of Local Plans, and to refining evidence such as costs, demographics and climatic projections.
Policy development	
Financial arrangements	The framework identifies the current infrastructure funding secured and shortfalls for individual policy areas, it also projects needs into the future based upon the four aforementioned scenarios, with funding shortfalls highlighted. The GIF identifies potential funding streams for these areas, and the data in the report may be used to evidence developer contributions requests.
Relevant legal or quasi-legal decisions	Non-statutory plan, however, the GIF draws information from other statutory documents such as Local Plans and associated evidence bases.
Results of ex- ante impact analysis	The GIF can be seen as an impact analysis document itself, by projecting the needs of the authorities over 4 scenarios, and the likelihood of meeting these requirements until 2050. As such it can be used as part of an evidence base

	for Local Plans and IDPs.
Relationship to relevant national Government policy	<p>NPPF stipulates that “Plans should take a proactive approach to mitigating and adapting to climate change” [149]...and to “...look ahead over a minimum 15 year period from adoption”... [22].</p> <p>The PPG sets out that “addressing climate change is one of the core land-use planning principles...local authorities should co-cooperate to deliver strategic priorities which include climate change” [Climate Change - 001]</p>

Stakeholders and engagement

Key stakeholders	<p>AECOM – Plan Consultants</p> <p>Kent County Council</p> <p>Medway Unitary Authority</p> <p>Kent’s 10 district councils</p> <p>Utility, infrastructure and service providers</p> <p>Environmental Agency.</p> <p>Network Rail</p> <p>Highways England</p> <p>NHS</p> <p>Ebbsfleet Development Corporation</p>
Relationship to wider projects and initiatives	The plan identifies measures to ensure that the Strategic Outcome identified in ‘Increasing Opportunities, Improving Outcomes’ – KCC strategic Statement are met. Data is taken from a range of Local Plans and IDPs and supports on-going updates to said plans.

Other

Links for additional information	Kent and Medway GIF: kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/growth-and-infrastructure-framework-gif
Relationship to other policy	Data is taken from a range of Local Plans and IDPs and supports on-going updates to these plans.

Tests

Viability	The GIF provides a basis of the viability of meeting current and future needs of the GIF area.
Scale	Yes, strategic sale
Formalisation	Not statutory, but links to Local Plan and IDPs
Legal	Inside England, based upon established planning law but not policy
Contemporary	Adopted 2018.

Tackling the effects of climate change - worsened diffuse flooding across Kent

Policy background

Policy Name	SuDs Policy 5: Drainage Sustainability and Resilience
Policy Document	Kent Drainage and Planning Policy Statement
Authority (or planning body)	Kent County Council
English Region or UK Nation	South East
Date of Adoption	June 2017

SuDs Policy 5: Drainage Sustainability and Resilience

The proposed drainage system must consider life-time sustainability of the drainage measures and components. The design of the drainage system must account for the likely impacts of climate change and changes in the impermeable area over the design life of the development. Appropriate allowances should be applied in each case.

Policy detail

Impacts	
<p>Description of policy, how does it represent best practice?</p>	<p>There are numerous sites within the Liverpool City Region which face flood risk, with these issues expected to be exacerbated by climatic changes through more frequent and severe rainfall events.</p> <p>As a lead flood authority, Kent County Council (KCC) are a statutory consultee, therefore this document can set out policy grounds for refusal of an application, despite not being a statutory document in itself. The statement as a whole guides the County Council approach in managing flood risk, there is a particular focus on SuDs policy, which sets out an overarching drainage hierarchy, and additional guidance on design. Policy 5 ensures that developers take long-term, climatic change into the design of development and SuDs, including within maintenance considerations. The policy sets out specific criteria of the drainage systems accommodating a 1 in 100 storm, with an additional 20% allowance on this figure, to account for uncertainty in impacts and timing of rainfall patterns. This figure follows guidance released by the Environmental Agency in February 2019 for 'upper-end' allowance for the 2050s, and the central allowance for 2080s, for peak rainfall intensities in small and urban catchments. It therefore responds to the need for development and infrastructure planning to anticipate 'worst-case' climate change scenarios. A further requirement extends this analysis through consideration of the implications of climate change allowance of 40%.</p> <p>These additional policy requirements are justified through the findings of the</p>

	<p>Strategic Flood Risk Assessment, which found there was diffuse risk of flooding throughout the County with 76,800 properties at risk from a 1 in 200 year rainfall event.</p> <p>This ensures that all planning applications have undertaken rigorous analysis to understand future flood risk resulting from varying scenarios of climate impacts, and assesses whether flood mitigation through SuDs is strong enough to withstand these projections. This means that individual developments within Kent will better cope under extreme climatic impacts, as well as boosting resilience to flooding in the plan area as a whole.</p>
Key policy impacts	<p>The policy sets out expectations for Flood Risk management, and gives extensive guidance on SuDs, which helps developers consider detail of appropriate measures early in the design process, thereby maximizes benefits as well as reducing viability concerns. The requirement for applications take upper-end climate change allowance into account when designing a development will ensure the impacts of even more extreme conditions are appropriately addressed.</p> <p>Whilst KCC does not have the power to enforce developers to implement more extensive SuDs (and other flood risk management measures) it can use its statutory consultee status to recommend changes to the drainage design. The additional analysis required through this policy may encourage developers to voluntarily implement measures, to avoid the costs of repair and retro-fitting following flood damage.</p> <p>A strategic approach to managing flood risk ensures that flood risk is tackled across catchments which, in almost all cases, cross local authority boundaries. This means that policy supports a consistent approach across at catchment-wide scale, which is crucial when flood risk is diffuse (as is the case in Kent), as this kind of risk cannot be effectively tackled through a piece-meal approach by single LPAs.</p>
Monitoring arrangements	<p>Kent County Council is the lead flood authority, therefore they are a statutory consultee on major applications and LPAs local development plans. They therefore have the powers to ensure this policy is implemented and also can utilise it within their advice when requested.</p>
Policy development	
Financial arrangements	<p>Since this policy document is non-statutory there has been no formal viability testing of the policy requirement, however several constituent Local Plan viability testing indicates the SuDs policy will increase the costs of development and may require "a flexible implementation of policies, where appropriate, to ensure scheme viability and site delivery", however, "none of the policies are considered to threaten scheme viability". [p39,40 – Folkestone and Hythe Local Plan]</p>
Relevant legal or quasi-legal decisions	<p>Given the policies non-statutory status it did not have to undergo an examination.</p>
Results of ex- ante	<p>No analysis was required given the policies non-statutory status, however, it</p>

impact analysis	was informed by the Strategy Flood Risk Assessment, which found that 75,800 properties are currently at risk in a 1 in 200 year flood event. The risk was evenly spread so requires long-term strategic management in many localities.
Relationship to relevant national Government policy	<p>NPPF indicates that development in areas of risk should “incorporate sustainable drainage systems” and that all major development “should incorporate sustainable drainage...and systems should “take account of advice from the lead local flood authority” [163 / 165].</p> <p>PPG sets out that “sustainable drainage systems should be provided unless demonstrated to be inappropriate”, and refers developers to DEFRA technical standards, and highlights “expecting compliance with the technical standards is unlikely to be reasonably practicable” [Flood Risk – 079/083].</p>

Stakeholders and engagement

Key stakeholders	<p>Kent County Council</p> <p>10 District Counties</p> <p>Environment Agency</p> <p>Multiple Internal Drainage</p>
Relationship to wider projects and initiatives	The policy forms part of the delivery of the objectives of Kent Environmental Strategy and Kent Surface Water Management Plan (SWMPs).

Other

Links for additional information	<p>Drainage and Planning Policy Statement:</p> <p>kent.gov.uk/data/assets/pdf_file/0003/49665/Drainage-and-Planning-policy-statement.pdf</p>
Relationship to other policy	The policy should be read in conjunction with flood risk guidance in the NPPF and LPAs in their Local Plans.

Tests

Viability	Likely to increase costs of development, though it is not expected to threaten scheme viability.
Scale	Yes, principle-based and strategic scale.
Formalisation	Yes, lead flood authority, policy provides guidance as a statutory consultee
Legal	Non-statutory, but KCC is statutory consultee. Inside England and based upon established planning law.
Contemporary	Adopted 2017, so based on NPPF.

Raising standards and harmonising green infrastructure standards across West Yorkshire City Region

Policy background

Policy Name	Priority 2: Build GBI into physical development and housing
Policy Document	Green and Blue Infrastructure Strategy
Authority (or planning body)	West Yorkshire Combined Authority
English Region or UK Nation	Yorkshire and Humber
Date of Adoption	2018

Whilst this strategy is not a formal planning document many of the priorities set out within seek to directly influence and align green and blue infrastructure policies of constituent local authorities of the combined authorities. As such the priorities could be adapted for use in the formal planning system.

Priority 2: Build GBI into physical development and housing

Alongside maintaining and enhancing existing GBI, our ambition is to fully embed GBI in the multibillion pound pipeline of planned new construction across West Yorkshire, through development of strong and consistent planning policies to embed high quality GBI into new development.

Policy detail

Impacts	
Description of policy, how does it represent best practice?	<p>Green and Blue Infrastructure (GBI) is central to building resilience to climate change, and can also be a key driver to meet other economic, social and environmental goals. Whilst this strategy is non-statutory it sets out the principles and expectations of Combined Authority (CA) in the development of GBI, guiding the expectation of planning policy of its constituent Local Authority, and therefore setting expectation of development proposals.</p> <p>This policy emphasizes the need to fully embody GBI in the development process across West Yorkshire by highlighting the value it can play in building resilience to climate impacts, along with a range of co-benefits in many policy areas. Meeting this priority is essential to delivering the wider GBI strategy, as well as being central to achieving the CA principles of 'good growth' and resilience building.</p> <p>Whilst the strategy highlights the progress made by some local authorities,</p>

	<p>with ‘excellent examples’ of GBI policy in protects existing natural assets as well as maximising the implementation of GBI within new development it also notes the inconsistency in policy across the City Region, and the challenges this creates.</p> <p>To address this, the key objective of the priority is to create ‘consistent, robust and ambitious’ GBI standards across the City-Region. The combined authority will facilitate policy transfer, and will identify gaps and opportunities to develop the cross-boundary GBI network. Furthermore the CA will explore the development of funding mechanisms within the planning system (S106 and CIL) to support the implementation of the goals of the GBI strategy.</p>
<p>Key policy impacts</p>	<p>Despite the policy’s non-statutory status, it is an exemplary case of the role that a strategic policy can play in setting out the expectations of the CA in terms of development as well as facilitating policy learning. Setting strong GBI standards within planning policy at a local authority level ensures implementation of GBI through development in each of the local authorities This will ensure that resilience to a range of climate-related impacts such as flooding and overheating is enhanced, whilst also meeting several other key policy challenges such as health inequalities and biodiversity loss.</p> <p>The policy does so by ensuring each local authority has a consistent and robust framework. To meet this objective local authorities which already have a strong policy in this area are encouraged to provide opportunities for policy transfer and collaboration in the development of GBI policy, which should ultimately result in strongly integrated natural networks.</p> <p>Setting such policy at a strategic level has two key benefits, firstly a landscape-wide approach to GBI is required to make significant improvements to biodiversity and resilience to climatic impacts, the CA are committed to supporting this objective through identifying and facilities opportunity to develop a cross-boundary GBI network. Secondly following a strategic approach reduces the risk of single authorities setting weaker GBI policy in a bid to attract development, potentially at the expense of other constituent authorities.</p>
<p>Monitoring arrangements</p>	<p>The monitoring arrangements will ensure that “Local Plans and associated document ensure good quality GBI in incorporated into all development with robust enforcement and visible result” it will do so through a number of metrics such as increasing investment in GBI measured as the proportion of overall investment, and increases in high quality urban green space. Each of these targets has a ‘tailored monitoring approach’ with the target to be determined within the Infrastructure Delivery Plan.</p>
<p>Policy development</p>	
<p>Financial arrangements</p>	<p>The CA will contribute towards shared resources for the delivery of projects, in additional multiple, varied investments schemes (both existing and aspirational). “An initial contribution from the Combined Authority for a shared resource has been included in the 2019/20 budget planning process. This will be further refined as more details are developed around the shared resource”. Other funding sources include developer contributions, utility and</p>

	infrastructure providers, E.A. schemes and other private and third sector investment.
Relevant legal or quasi-legal decisions	Whilst the plan is non-statutory, it does form part of the delivery plan of Strategic Economic Plan and aligns to the Local Industrial Strategy.
Results of ex- ante impact analysis	Since the plan is non-statutory, there was no requirement for specific ex-ante impact analysis.

Tackling overheating at multiple scales in Greater London

Policy background

Policy Name	Policy SI4 - Managing heat risk
Policy Document	The London Plan
Authority (or planning body)	Greater London Authority
English Region or UK Nation	London
Date of Adoption	Not yet adopted

Policy SI4 Managing heat risk

Development proposals should minimise internal heat gain and the impacts of the urban heat island through design, layout, orientation and materials. Major development proposals should demonstrate through an energy strategy how they will reduce the potential for overheating and reliance on air conditioning systems following the following cooling hierarchy.

Policy detail

Impacts	
<p>Description of policy, how does it represent best practice?</p>	<p>Overheating is already a considerable risk in many parts of UK, whilst the Liverpool City Region currently rarely experiences temperatures which have major health risks, these conditions are predicted to increase with climate change, with more frequent and extreme heatwaves, which has particular risks for vulnerable populations.</p> <p>This policy manages heat risk through a cooling hierarchy, which seeks to tackle the site scale issue of internal overheating and the strategic issue of urban heat island simultaneously. The policy highlights that certain populations such as the elderly, those with health conditions and children are particularly vulnerable to heat risk. This means that developers should carefully consider the potential to exacerbate overheating through their cooling strategy if proposals are located near to these populations e.g. schools and care homes.</p> <p>The policy stipulates that development must first consider design principles such as orientation, shading, albedo and use of natural approaches such as green walls and roofs to reduce their reliance upon mechanical air conditioning systems. Following this approach to managing heat risk can also have several co-benefits such as supporting biodiversity and improving air quality. Managing heat through mechanical cooling systems should be considered last, as they expel hot air out of the building, exacerbating the urban heat island effect.</p>

	<p>Guidance on managing heat risk from the Chartered Institution of Building Services Engineers (CIBSE) is cited, with a supplementary GLA guidance on Energy Planning Guidance setting how the GLA expects this guidance to be interpreted.</p>
Key policy impacts	<p>This policy represents a carefully managed approach which ensures that in the process of managing the site scale issue of internal overheating, development does not create exacerbate the strategic issue of urban heat island effect. All built up areas contribute towards to the urban heat island effect, regardless of local authority boundaries. This means to effectivity manage heat risk a strategy approach must be taken, with a consistent policy applied across the built-up area.</p> <p>A clear hierarchy ensures this issue is also not neglected at a site level scale, ensuring that the risk of overheating is reduced within new development. This also enhances the resilience of individual developments as well as the greater plan area to extreme temperatures. Going further, highlighting the particular risk to certain groups it creates an obligation for development proposals to consider the impacts of heat risk on local vulnerable users of the site as well as within the immediate locality of the development.</p> <p>Further co-benefits of the approach are reduced carbon dioxide emissions, due to discouraging the use of active cooling systems, and through encouraging the use of green walls and roofs it provides opportunities for biodiversity, recreation enhancements and improving air quality. Heat risk is a particular risk for certain vulnerable populations, and by highlighting the health risks which poor response to urban heat island represents the policy addresses climate justice, by protecting these populations at a strategic and localised level. The inclusion of guidance from industry bodies provides developers with the necessary information to comply with the policy, ensuring it is integrating into the design at an early stage, reducing viability concerns.</p>
Monitoring arrangements	<p>Heat controls measures will be assessed and monitored through a wider energy assessment of the development.</p>
Policy development	
Financial arrangements	<p>Viability testing indicated that there was “Cost of implementing measures however saving from energy/ lower cooling costs. Heat control measures are assessed as part of the energy assessment.” [Technical Report - p38]. Overall these measures were seen to have “represent modest costs as a proportion of development value and typically have limited impact on overall viability.” [14.2.9]</p>
Relevant legal or quasi-legal decisions	<p>Though the plan is not yet fully adopted it is considered a material consideration and has undergone several examinations. There were no comments by the inspector, apart from supporting design principles (highlighting that such principles are supported in NPPF), in spite of criticism from respondents during the current examination process [20]. Following a review of consultee responses, minor changes were made to strengthening language in the policy [p462].</p>

Results of ex- ante impact analysis	The integrated impact assessment found that the policy “would minimise the urban heat island effect and overheating, which can have adverse health effect, particularly on higher risk groups” [9.8.4]
Relationship to relevant national Government policy	The NPPF advises that plans should take into account “...risk of overheating from rising temperatures” and recommends the use of “...suitable adaptation measures, including through the planning of green infrastructure” [149/150]. NPPG sets out that Local Plans should pay attention to opportunities for “...provision of multi- functional green infrastructure, which can reduce urban heat islands” [004].
Stakeholders and engagement	
Key stakeholders	Greater London Authority London boroughs
Relationship to wider projects and initiatives	The policy forms part of the wider London Environmental Strategy, as well as the London Energy Planning Guidance.
Other	
Links for additional information	Viability Report and Technical Report: bit.ly/2ISx7dA and bit.ly/2INfDzs Suggested Changes: london.gov.uk/sites/default/files/table_of_changes_-_minor_suggested_changes_to_london_plan_1.pdf Inspector Report: london.gov.uk/sites/default/files/md1587_annex_a_-_malp_eip_inspectors_report.pdf Impact Assessment: bit.ly/2kzyuhl
Relationship to other policy	This policy links to wider design principles set out in Good Design (D2), whilst further principles are found in Green Infrastructure (GI1) and Urban Greening (G5), policy relating to energy usage is found in Energy Infrastructure (SI3).

Tests

Viability	Undergone viability testing, which indicated policy would not adversely affect viability
Scale	Yes, strategic sale
Formalisation	Not fully adopted, but material consideration
Legal	Inside England and based upon established planning law
Contemporary	Yes, currently undergoing the adoption process

Spurring sustainable construction in Nottinghamshire through design principles

Policy background

Policy Name	Policy 1: Climate Change “Sustainable Design and Adaption”
Policy Document	Nottingham City Aligned Core Strategy
Authority (or planning body)	Greater Nottingham
English Region or UK Nation	East Midlands
Date of Adoption	September 2014

This policy is taken from Part 1 of Nottingham City Local Plan, which is part of an aligned core strategy, shared between Broxtowe, Gedling and Nottingham City Therefore it can be seen as a strategic level policy despite not being adopted within a planning strategy of a combined authority.

Policy 1: Climate Change “Sustainable Design and Adaptation”

All development proposals will be expected to mitigate against and adapt to climate change, to comply with national and contribute to local targets on reducing carbon emissions and energy use unless it can be demonstrated that compliance with the policy is not viable or feasible...

Policy detail

Impacts	
Description of policy, how does it represent best practice?	<p>Development in the Liverpool City Region should account for the multiple impacts of climate change, through necessary adaption measures. This sub-policy represents part of the ‘high-level’ Climate Change policy, specifically this addresses a number of key design principles to maximise the resilience of development, whilst also maximising opportunities to also mitigate the impact of climate change.</p> <p>The policy ensures that any development must account for short and long term changes resulting from climatic changes through development design, location, form, materials and construction. The policy highlights the need to consider more frequent and sustained periods of high temperatures as well as increased frequency and intensity of rainfall.</p> <p>Measures highlighted within the policy include making use of natural ventilation, which will help protect vulnerable populations (e.g. the elderly and those in poor health) against heat stress during heatwave events. Going further, the policy ensures that development has the provision to integrate</p>

	<p>future adaption measures to address the longer-term, uncertain climatic changes as well as further providing opportunities for further reductions in development’s carbon footprint. Additionally, it explicitly states that this policy includes refurbishment when it requires planning permission. Given that new development only accounts for a small proportion of development in the plan area it is vital to maximising the opportunity that planning policy can have in enhancing the resilience of existing development.</p> <p>Also, such a policy can set out the broad principle of sustainable design, whilst leaving flexibility for individual authorities to set out detailed expectations in their Local Plan or SPDs.</p>
<p>Key policy impacts</p>	<p>The policy ensures that developers not only address the more immediate climate risk but also give consideration to the more uncertain long-term impacts in the event of extreme climatic change, thereby ‘future-proofing’ development. Ensuring that development is flexible enough to respond to these impacts in the short and long term means that development accounts for uncertainty in climatic effects.</p> <p>It also accommodates opportunities to implement new, more effective or cheaper technologies as they become available in the future. This ‘futureproofing’ will have the effect of boosting the resilience of both new development and the wider resilience of the plan area.</p> <p>The policy also addresses climate justice, by highlighting the particular need to consider the impacts of climate change on vulnerable populations (e.g. in care homes and schools) and respond accordingly to these risks. This policy also has a significant co-benefit of reducing the carbon emissions required for heating and cooling building, thereby aiding the plan’s contribution to climate mitigation.</p> <p>By setting these requirements at a strategic level it prevents the risk of single constituent authorities ‘under-cutting’ each other standards.</p> <p>This kind of a policy can be used by a strategic authority to set out the broad principles and standards that development must meet, and leave constituent local authorities to develop their bespoke approach within Local Plans and SPDs.</p>
<p>Monitoring arrangements</p>	<p>No specific targets for the policy exist, however, two indicators indirectly monitoring this policy, one is to ensure that zero planning permissions are granted contrary to Environmental Agency advice, the second is to increase the numbers of developments incorporating SuDs.</p>
<p>Policy development</p>	
<p>Financial arrangements</p>	<p>The policy is likely to increase the build costs of development, and therefore have a negative effect on viability, however, there is likely to be long-term savings through energy efficiency measures as well as reduce costs of retro-fitting to adapt to climate impacts. However the whole-plan viability assessment makes no mention of the policy, and the policy does not apply if “it can be demonstrated that compliance with the policy is not viable or</p>

	feasible.” [p.38]
Relevant legal or quasi-legal decisions	Inspector deemed the whole plan to be sound, with a minor modification, one of which applied to this policy, which inserted a clause, ensuring there was provision for developers to demonstrate they cannot comply with the policy due to viability issues. However, it should be noted that revisions to regulations on viability since the adoption of this plan, may mean there is a more limited ability for non-compliance on viability grounds.
Results of ex- ante impact analysis	The whole plan was examined through a sustainability appraisal, the policy was deemed to have “moderately positive” outcomes in the Natural Resources and Flooding objectives, however, it was noted this policy “is likely to increase costs and affect the viability of schemes, resulting in a minor negative effect on the Housing objective.” [p116]
Relationship to relevant national Government policy	The NPPF states the planning system "...should help to shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience." [148] Whilst PPG indicates that "planning authorities should pay particular attention to integrating adaptation and mitigation approaches...for example, maximising summer cooling...and the provision of multi-functional green infrastructure" [Climate Change - 004]
Stakeholders and engagement	
Key stakeholders	Broxtowe Borough Council Gedling Borough Council Nottingham City Council Greater Nottingham Growth Point Team
Relationship to wider projects and initiatives	All three constituent local authorities have signed the Nottingham Declaration on climate change, which is a statement of intent to work with local community and business to mitigate and respond to the impacts of climate change.
Other	
Links for additional information	Sustainability Appraisal: broxtowe.gov.uk/media/2166/sustainability-appraisal-of-cs.pdf Inspectors report: broxtowe.gov.uk/media/2173/inspectors-report.pdf Viability Assessment: nottinghaminsight.org.uk/d/157686
Relationship to other policy	Spatial Strategy, Green Infrastructure, Parks and Open Space, Design and Enhancing Local Identify and Historic Environment policy each guide on-site locations, design and adaption measures, including within sensitive environments.

Tests

Viability	May increase development costs however the policy allows developers to demonstrate were complying with the policy is not viable.
Scale	Yes, principle-based and 3 local authorities so strategic level.
Formalisation	Yes, within Local Plan
Legal	Inside England and based upon established planning law.
Contemporary	Adopted 2014, so based upon NPPF1, not NPPF2.

Making the case for Zero Carbon developments in Reading

Policy background

Policy Name	Policy 5: Standards for new Housing
Policy Document	Reading Local Plan
Authority (or planning body)	Reading Borough Council
English Region or UK Nation	South East
Date of Adoption	November 2019

This policy is taken from Reading Local Plan, despite this planning document (and individual policies) not being a strategic planning policy, the principles introduced within the policy could be applied within an area with similar a house market e.g. a Housing Market Area across a City Region.

H5: Standards for New Housing

New build housing should be built to the following standards: C: All major new-build residential development should be designed to achieve zero carbon homes.

Policy detail

Impacts	
Description of policy, how does it represent best practice?	<p>In 2018 the residential sector made up 18% of UK carbon dioxide emission, therefore improving energy efficiency within residential development is an effective way to reduce total emissions within a plan area.</p> <p>The policy sets out that all major residential development must be designed to achieve the zero-carbon home standard, the policy does not give details on how this should be achieved but instead sets this out in a forthcoming Sustainable Design and Construction SPD. However, the standard means a minimum of 35% improvement over the 2013 Building Regulations standards with an additional carbon offset fee of £1,800 per tonne (equivalent to £60 per year over 30 years). However, the policy gives full flexibility in how zero carbon requirement is met, only stipulating that clear evidence of the method used to meet the aforementioned standards must be submitted as part of planning application. For minor residential development, a less ambitious target of 19% improvement on 2013 standards is set.</p> <p>The language in the policy avoids the opportunity for development to be non-compliant on viability or technical grounds, and the standards clearly outline</p>

	<p>the expectations of residential development. By highlighting that standards were due to be introduced at a national level before the necessary legislation was withdrawn, indicates they are achievable in the vast majority of cases. Furthermore, the evidence-base used through the viability testing estimates that the requirement will represent a maximum of 1% of the total revenue of development.</p>
Key policy impacts	<p>In Reading Council's Climate Change strategy document there is a commitment to reduce carbon emissions by 34% by 2020 (compared to 2005 level). The policy notes the scale of residential development planned in Reading to 2036 would mean that without significant intervention in the residential development sector, this target would be unachievable. Therefore this policy forms a central part of Reading's approach to meeting commitments to reducing carbon emissions.</p> <p>By ensuring these standards are set out it means that they are taken into account as early as possible in design stages, thereby leading to better design, lower lifetime costs and enhanced ability to identify options to achieve zero carbon standards. The approach taken means that developers are free to take a locally tailored approach to meeting the standards, potentially driving innovation in the sector.</p> <p>Whilst this policy is set within a single local authority, it is feasible for these standards to be set at a strategic scale. Viability testing found the policy would not adversely affect housing delivery within a local authority, this means it would be suitable to apply at the level of a Housing Market Area (HMA), given consistency in economics of housing across these areas. This means such a policy could be set at a strategic level of a HMA, preventing 'under-cutting' of standards to attract development in a single local authority.</p>
Monitoring arrangements	<p>All major residential development proposals must provide evidence that they meet a number of sustainability requirements (including this policy), if they fail to meet any the application will be refused. The rate of refused will be published within the Authority Monitoring Report. In addition, Reading has a commitment to reducing total emissions by 34% by 2020, and a target for the remainder of the plan period will be published next year.</p>
Policy development	
Financial arrangements	<p>Industry research and specific case studies undertaken for viability testing indicated that the costs of compliance would not exceed 1% of the total revenue of a development. The policies flexibility in how a development achieves the standard also reduces viability concerns. Overall viability conclusions found "there is scope to meet the policy targets on our unambitious appraisal inputs." [7.2]</p>
Relevant legal or quasi-legal decisions	<p>Though the full inspectors report is not yet published, the plan was found sound with some recommend modification in early October 2019. There were no comments made on this policy, it therefore can be considered sound.</p>
Results of ex- ante impact analysis	<p>The policy choice was seen to "...bring the most significant positive effects in terms of CO2 emissions, and positive effects with regard to climate change,</p>

	natural resource use...” however it was noted that “...less housing may be built if significant additional costs are placed on developers.” [p.94]. As a result of the appraisal the policy was chosen, with no reduction in the proposed standards.
Relationship to relevant national Government policy	The NPPF set out that “the planning system should...shape places in ways that contribute to radical reductions in greenhouse gas emissions” [148], and that “New development should be planned for in way that... can help to reduce greenhouse gas emissions” [150] The PPG outs that “planning authorities...set local requirement following robust and credible evidence and pay careful attention to viability” [Climate Change – 009].
Stakeholders and engagement	
Key stakeholders	Reading Borough Council Reading Climate Change Partnership
Relationship to wider projects and initiatives	Climate Change Strategy (Reading Means Business on Climate Change (2013-2020).
Other	
Links for additional information	Sustainability Assessment: reading.gov.uk/media/7159/Sustainability-Appraisal-of-the-Draft-Local-Plan-0517/pdf/Sustainability Appraisal of the Draft Local Plan 0517.pdf Viability: bit.ly/35q7aEz Inspectors post-hearing advice: reading.gov.uk/media/10054/EI014-Post-Hearing-Advice--Additional-Main-Modifications-and-Related-Matters/pdf/EI014 Post Hearing Advice Note March 2019.pdf
Relationship to other policy	The policy is of the wider approach to sustainable development, as set out within the “Cross-Cutting policies” section, this outline the role that new development can play to reducing natural resource use and reduce carbon emission to meet Reading existing commitments.

Tests

Viability	Expected to not impact the viability of development
Scale	Yes, scalable standards
Formalisation	Statutory and within Local Plan
Legal	Inside England and based upon established planning law
Contemporary	Yes, adopted in 2019



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**For more information about this research,
and the three appendixes, visit:**

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