



RESIN

SUPPORTING DECISION –
MAKING FOR RESILIENT CITIES

Climate Change Adaptation and Resilience Research and Data, Policy and Stakeholders

Baseline Assessment for Greater Manchester – Executive Summaries

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1. Research and Data for Climate Change Adaptation and Resilience: Executive Summary¹

Strengthening capacity to adapt and build resilience to climate change is a key aspect of moving the agenda forwards in Greater Manchester (GM). Climate change related research and data increases adaptive capacity in several ways, including by raising awareness of related issues and providing information to assess climate risk. This can in turn help to generate political commitment, and potentially support the allocation of resources. Allied to this, research and data can help to inform and target adaptation and resilience decisions and actions to generate more effective outcomes.

This baseline assessment has been undertaken for several reasons, not least because an overview of existing research and data relevant to adaptation and resilience in GM is currently unavailable. The aims are:

- To identify resources to inform the GM RESIN case study, particularly the design and implementation of a method to assess weather and climate risks to GMs critical infrastructure.
- To identify gaps in current research and data that the RESIN project (or other future studies) could help to address.

In addition to supporting the RESIN project, this assessment aims to inform ongoing and future activities in GM that are linked, directly or indirectly, to climate change adaptation and resilience.

This assessment has established that no systematic analysis has been undertaken to date of climate risks to the multiple critical infrastructure themes and sectors that serve GM. Given the importance of critical infrastructure to GM, and the potential for negative impacts associated with the changing climate, the RESIN project is filling a gap in the knowledge base. Although GM stakeholders do have access to a range of sources that can support the assessment of weather and climate risks to critical infrastructure, which are summarised in Figure 1, there are several key issues and gaps concerning available research and data that present challenges. They include:

- Although future weather and climate projections do exist, the capacity may not be available within organisations such as local authorities to process and analyse this data in order to better understand related risks.
- GM benefits from a range of locally focused research and data outputs. Some fine scaled hazard data is available, such as flood maps and urban heat island mapping. These are the exceptions, however, and the majority of local data remains at a relatively coarse scale for reasons including the challenges associated with downscaling hazard and projections data.
- Research and data tends to address defined critical infrastructure sectors and spatial scales in isolation and does not consider the implications of climate change risks to infrastructure from a broader systems perspective. However, due to the methodological and data complexities associated with cascading effects between infrastructures, such assessments currently are rare.
- The research and data that is available to support the assessment of climate risk in GM represents what could be described as a ‘first generation’ resource. It is relatively simple, there is little insight into interdependencies and cascading effects, data is often at a coarse spatial scale and hazards such as wind storms are not covered. Further, research and data may not always be in a format that can be readily applied by ‘end users.’
- A ‘second generation’ research and data resource to support extreme weather and climate change strategy and action GM would be less purely research-driven and more closely aligned to the needs of climate change policy makers and practitioners.

¹ The full report underpinning this executive summary, and the two other executive summaries included in this report, is available on the RESIN webpage – www.resin-cities.eu

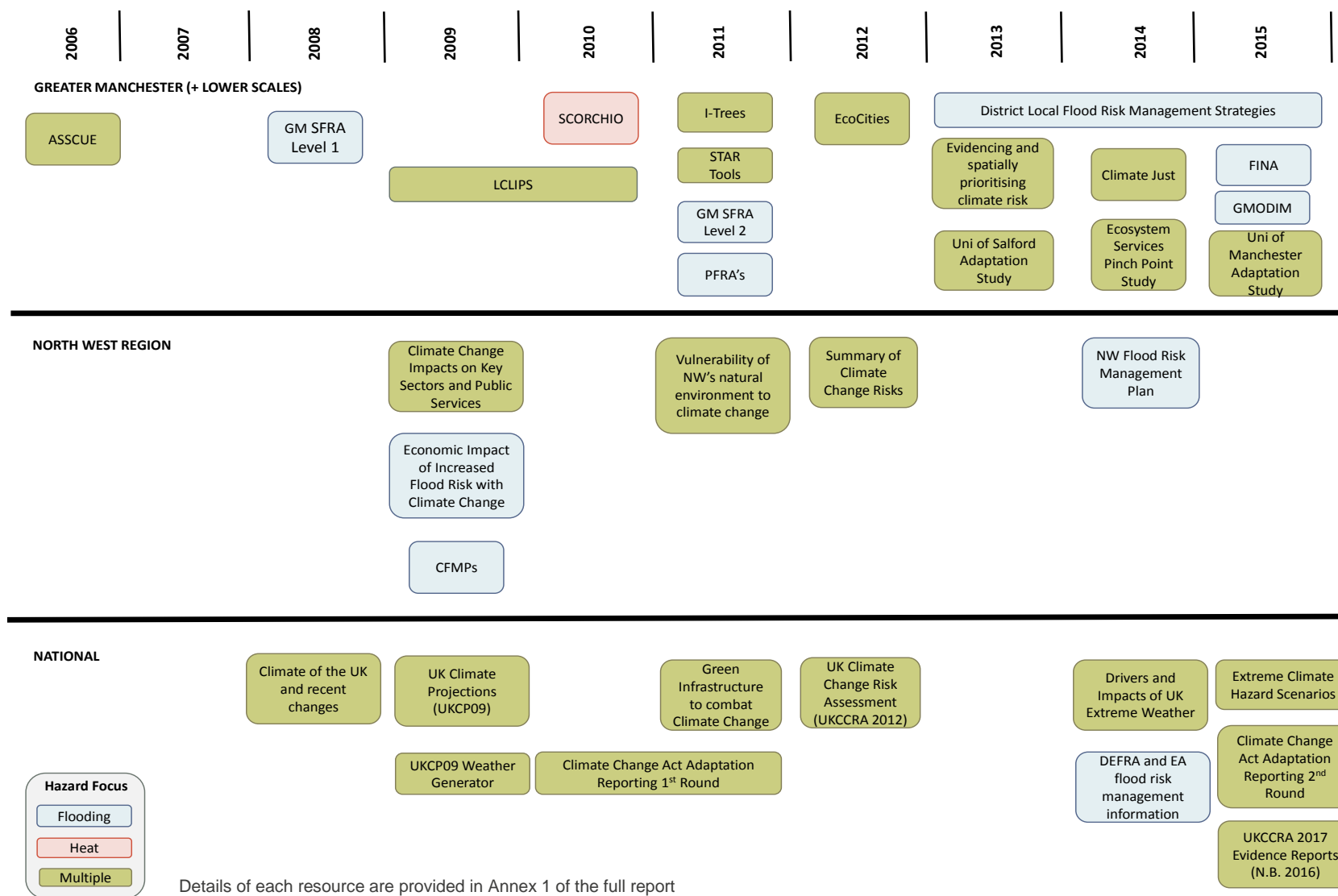


Figure 1: Greater Manchester's climate change research and data 'landscape' (Source: Authors)

2. Policy for Climate Change Adaptation and Resilience: Executive Summary

Background

Climate change is happening now with average temperatures are around 1°C higher than 100 years ago, and extreme events seem to becoming more frequent and more intense. A robust policy framework is needed in order to support adaptation and to make GM's people, infrastructure and built environment more resilient to the changing climate. The EcoCities Project (2009 – 2012) identified three themes for adapting GM to the changing climate and focussed on 'safeguarding our future prosperity', 'protecting the most vulnerable in our society', and 'building the resilience of our essential infrastructure' (Carter et al. 2015²). This current report focuses on the latter of these themes and provides an overview of relevant policies and legislation at national and GM level that relate to climate change adaptation and resilience with a focus on infrastructure. The policy review covers three main areas including climate change and flood risk management, spatial planning and economic development, and civil contingencies and resilience.

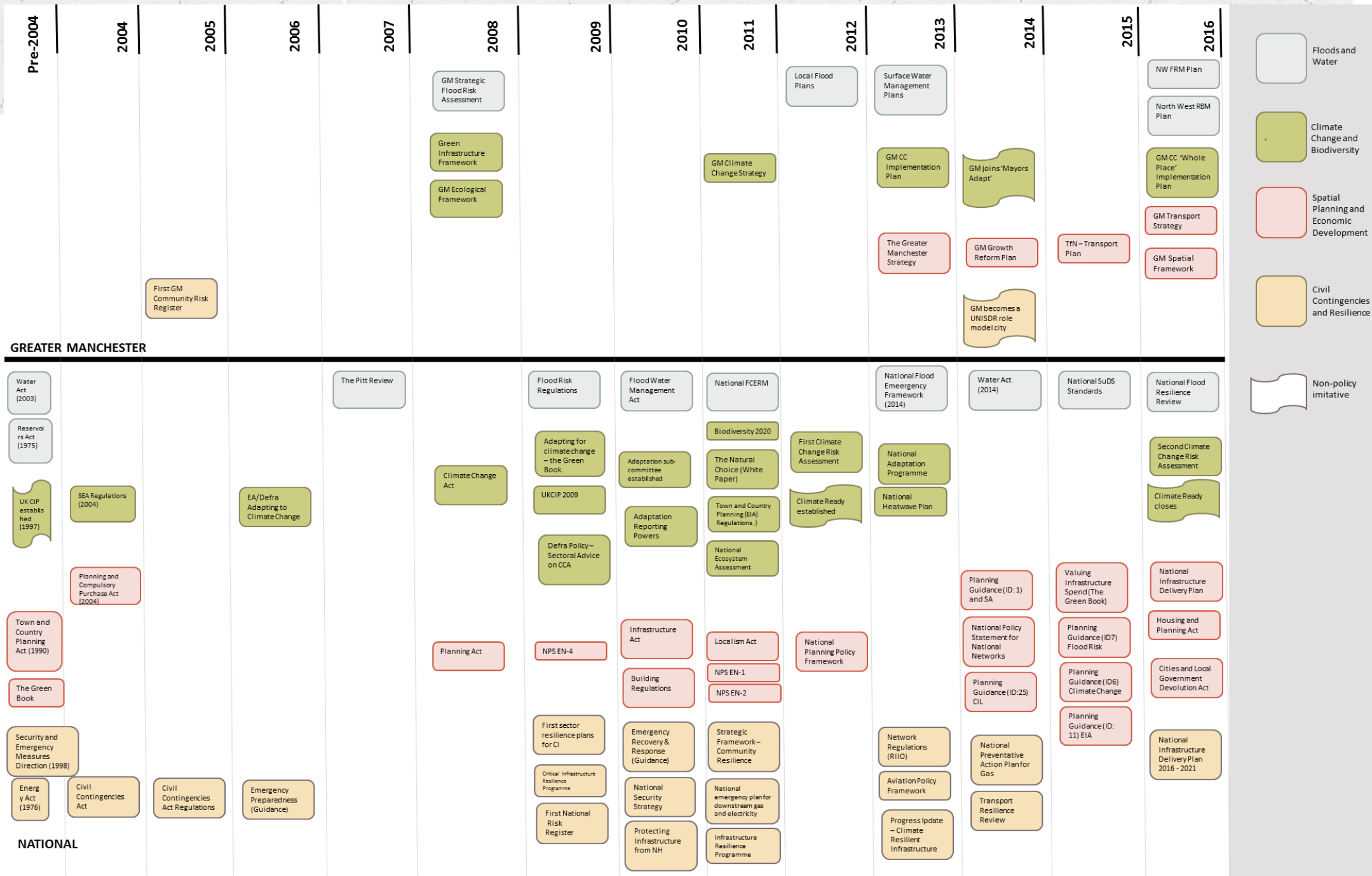
Key Issues

The review shows that, at a national level, the UK is one of the front-runners in terms of climate change adaptation policy in Europe. Within a multi-level governance framework, GM has increasingly obtained greater powers from central government and aspires to be a world-leading digital and green city. GM also has stated goals of 'rapidly adapting to the changing climate'. GM is also a signatory to Mayors Adapt and is one of the Rockefeller Foundation's 100 Resilient Cities. Therefore, there are high-level commitments to ensuring that GM is well-adapted and resilient to climate change.

Planning for adaptation is relatively well-developed, particularly in the area of infrastructure development, but there are question marks over the implementation of policy initiatives and the ability to retrofit existing infrastructure. The funding mechanisms to support implementation are also opaque and, given that adaptation to climate change is not mandated for at local authority level, unlike countries such as Germany and Austria, there is little incentive for local authorities to take the lead on delivering adaptation projects.

Even so, climate change adaptation and resilience has a number of policy hooks at national and GM level (as summarised in Figure 2 and explained in more detail within the full report) which means that, with the right support, attention can and should turn to implementation of measures and the development of robust indicators to monitor progress.

² Carter, J.G., Cavan, G., Connelly, A., Guy, S., Handley, J., Kazmierczak, A., 2015. Climate change and the city: Building capacity for urban adaptation. *Progress in Planning* 95: 1 – 66.



- Floods and Water
- Climate Change and Biodiversity
- Spatial Planning and Economic Development
- Civil Contingencies and Resilience
- Non-policy initiative

Figure 2: Timeline of climate change and resilience related policies. Source: Authors

3. Stakeholder Analysis for Climate Change Adaptation and Resilience: Executive Summary

Introduction

Climate change adaptation and critical infrastructure protection are complex technical, policy and delivery challenges involving actions of a large range of stakeholders. And to adapt effectively, stakeholders need to understand relevant climate hazards and impacts and the frameworks within which they and others need to take action to manage related risks. Further, this must be done in a complex landscape of responsibilities and overlapping boundaries (geographic, administrative etc.).

Mapping the climate change adaptation and critical infrastructure community is a critical first step in understanding GM's stakeholder landscape in this context. It is also essential to understand what action is being taken by those GM stakeholders whose actions are particularly important in increasing the resilience of the City Region's critical infrastructure to climate change. This baseline assessment therefore:

1. Maps GM's wider climate change adaptation / resilience stakeholder community;
2. Identifies a defined sub-set of key stakeholders from this community whose role and activities more closely relate to urban and critical infrastructure protection;
3. Considers the extent to which the assessment of risk and approaches to manage risk are being actively and positively embedded within the work of these key stakeholders.
4. Makes a range of conclusions and recommendations around emerging best practice approaches for consideration later in the RESIN project or within GM generally.

Mapping and analysis

This baseline assessment was desk based, and the initial stakeholder landscape map was produced purely from within the RESIN project. It was developed via a series of brainstorming sessions combined with influence and interest matrices mapping processes.

Then, to inform the later stages of analysis, the initial map was filtered (against the priority critical infrastructure areas as set out in the Greater Manchester Spatial Framework) to identify smaller groupings of stakeholders considered key to GM's climate resilience, particularly concerning critical infrastructure. This led to the identification of following groups and stakeholders within them:

- **Transport infrastructure** – Transport for Greater Manchester, Highways England, Network Rail, Peel Holdings limited (Port Salford and Ship Canal), Manchester Airport
- **Utilities infrastructure** – United Utilities, National Grid, Electricity North West

These are shown in the stakeholder landscape map below (shaded orange) (see Figure 3). In addition, a wider social infrastructure stakeholder sector (which includes, amongst others, local government, schools and education, health services, community facilities) was clearly visible (highlighted pink). However, the complexity of this group and the breadth of both its activity and plans/strategies, meant it was decided to be out of scope for the analysis stage of the baseline assessment process.

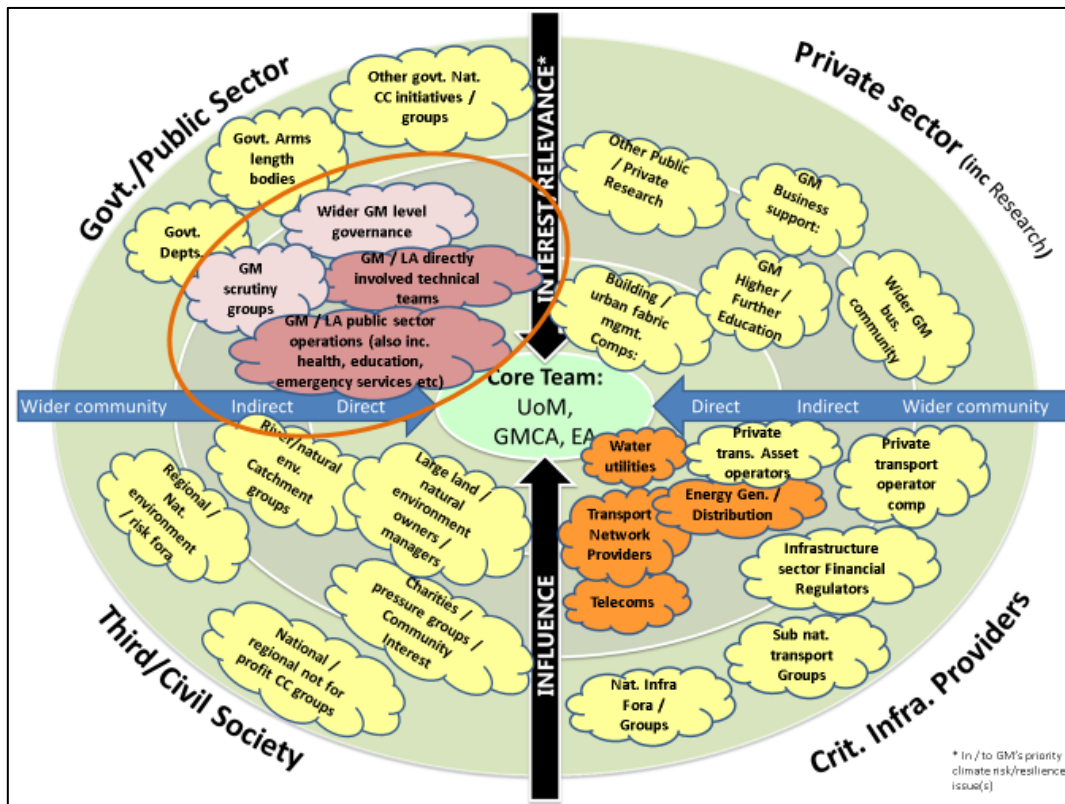


Figure 3: Greater Manchester's stakeholder landscape (Source: Authors).

For the 2 critical infrastructure groups (transport and utilities), an initial assessment was carried out into how climate change adaptation and resilience issues featured in the various plans and strategies of the different organisations.

The analysis of these two groups provided an initial snapshot of emerging visible adaptation and resilience activity within the 2 groups of stakeholders linked to critical infrastructure at a group (not individual stakeholder) level. This has helped us broadly understand what they are publicly doing and sharing on climate adaptation and resilience and has allowed the baseline assessment to make several conclusions and recommendations.

Conclusions and Recommendations

This baseline assessment has revealed several interesting findings concerning both GMs stakeholder landscape around climate change adaptation and resilience and the emerging picture of activity of two key stakeholder sector groupings, utilities and transport. These are summarised in turn below:

- **Mapping and defining the GM Stakeholder landscape**
 - a. This baseline assessment has identified a wide ranging community of stakeholders with greater or lesser links and responsibilities for climate adaptation/resilience in GM. And even though this was a desk based exercise (which does not claim to be

- fully comprehensive), it represents a good starting point for further analysis and activity.
- b. There is a clear emerging picture of 3 definable (although linked/interdependent) sub-sets of stakeholders with particular relevance and importance to climate adaptation and critical infrastructure protection (the focus of the RESIN project). These are utilities, transport operators and social / public sector infrastructure groups.
 - c. The local government public service infrastructure stakeholder group is very wide ranging and was hard to capture in this assessment. It is much wider than just GM level government operations, crossing large areas of social infrastructure provision in an 'urban systems' sense. But even without assessment, as a stakeholder sub-sector, this group sees a large variance (or even lack) of policy or other statutory drivers and requirements to take action in the climate adaptation and resilience field. This is expected to lead to an inconsistency in approach and progress.
 - d. It is also clear that there is a wider group or 'community' of stakeholders with varying levels of responsibility and involvement in the adaptation and resilience agenda. Many of these (and their actions and levels of understanding) affect the overall adaptive capacity/resilience of GM. They may well fall into the third or private sector but again they have limited direct drivers to take action or prioritise issues around this area of activity. They may well also lack technical capacity and resources to respond and take action.
 - e. As a result of points 'c' and 'd' above and, due to the sheer complexity of the social / public infrastructure' sub sector grouping and the wider community of stakeholders they exist within, there is a real gap in knowledge and understanding of the level of action, priority afforded to and progress being made by a significant number of identified stakeholders around GM's climate adaptation and resilience.
- **Utilities and transport operator sub sector assessment:**
 - a. The organisations assessed (both within and between sector groupings) demonstrated wide ranging and varied levels of apparent progress, coverage, visibility and action around climate adaptation and resilience.
 - b. There will be a range of reasons for this, including the fact that some were privatised and activity may be less publically visible if it has commercial implications. Very positively though, there are no organisations included in this assessment who are not undertaking at least some level of publically visible activity against the adaptation and resilience areas assessed. No one is starting from a zero base, even if some are more focussed on current rather than future climate impacts and risks.
 - c. However, within each sub-sector grouping assessed, there are a range of organisations who are clearly demonstrating real progress, visible coverage and leadership in this space. For some this is being demonstrated in relation to particular parts of the challenge, such as assessing risks or developing adaptation strategies. And others are showing a wider cross cutting and embedded consideration of adaptation and resilience, which this baseline has identified as being at a level where it genuinely has the potential to drive real action on climate adaptation and resilience going forward.
 - d. There are a number of stakeholders who are: a) both active/directly important to the adaptation and resilience of GM; and b) can also be seen to be leaders within a wider peer group providing opportunities to share and transfer knowledge and learning to their wider group and beyond.
 - **Recommendations:**
 - a. This stakeholder analysis (and the complementary research and policy reports also prepared within the RESIN project) should be reported to the GM infrastructure Advisory Group's next meeting. This will help to highlight general progress,

challenges and opportunities for the critical infrastructure stakeholder community to learn and support each other.

- b. The findings could be explored with central Government in order to support a wider national conversation on climate resilience with key critical infrastructure sectors, primarily to inform the next National Adaptation Programme and/or the reporting authority process, particularly with regard to sharing learning.
- c. Given the GM RESIN focus on supporting TFGM, explore an opportunity to more fully map and assess coverage of climate change risks and adaption actions at an internal level. This could help to assess their current adaptive capacity and commitment in light of GM and national-level policy drivers. A useful output could outline a route map to how, corporately, TfGM could learn from other peer organisations and/or research to move forward.
- d. Reflecting the complexity and difficulty of the public sector/social infrastructure sector, investigate how this might be best mapped and investigated within GM. Other forums/initiatives within GM could be utilised to raise adaptation and resilience issues and to share stakeholder experiences and support a wider conversation on climate resilience. Such activities should engage with the stakeholders involved in the Rockefeller 100 Resilient Cities process and the GM Mayors Green Summit initiative.