



RESIN

SUPPORTING DECISION –
MAKING FOR RESILIENT CITIES

Climate Change Adaptation and Resilience Stakeholders

A Baseline Assessment for Greater Manchester

Work Package	4
Dissemination Level	PU
Lead Partner	GM

Deliverable No.	NA
Work Package	WP4
Dissemination Level	PU
Author(s)	Matt Ellis, Greater Manchester
Co-Author(s)	Jeremy Carter and Angela Connelly, University of Manchester
Date	23/08/2017
File Name	Climate Change Adaptation and Resilience Stakeholders - a Baseline Assessment for Greater Manchester_GM_2017-08-23
Status	Final
Revision	
Reviewed by (if applicable)	Jeremy Carter and Angela Connelly, University of Manchester

This document has been prepared in the framework of the European project RESIN – Climate Resilient Cities and Infrastructures. This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement no. 653522.

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CONTACT:

Email: resin@tno.nl

Website: www.resin-cities.eu



This project is funded by the Horizon 2020 Framework Programme of the European Union.

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1. Executive Summary

1.1. 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.

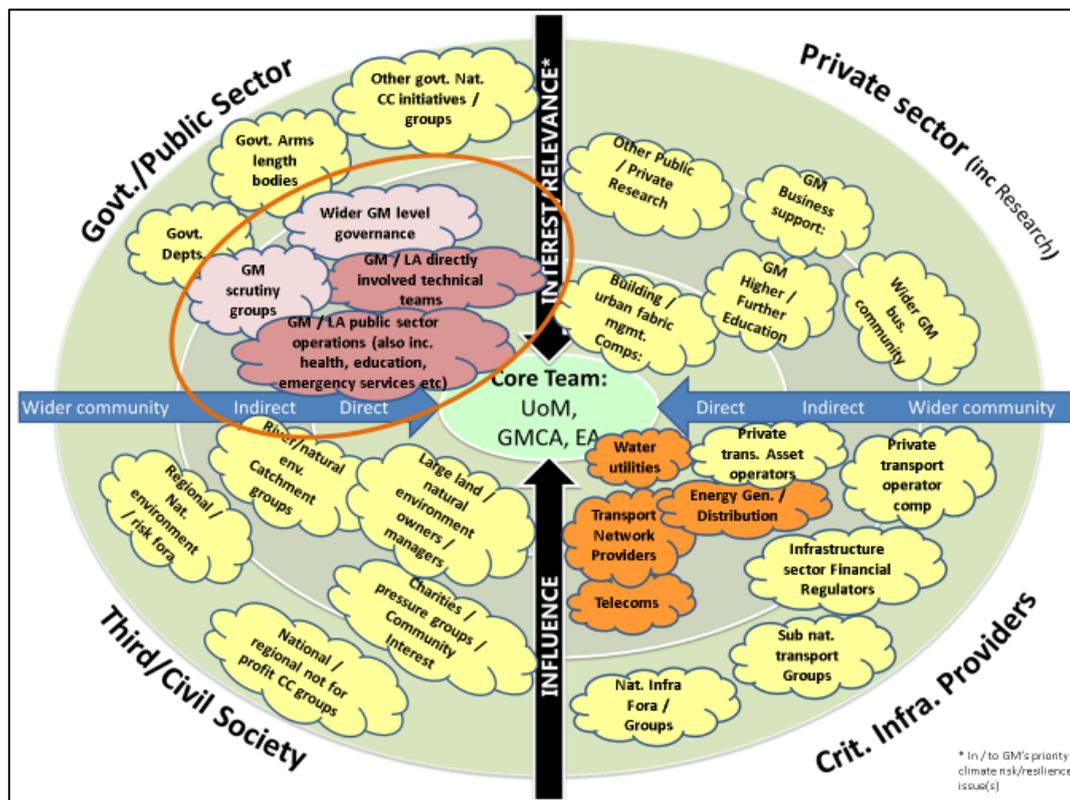
1.2. Mapping and analysis

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 landscape map below (shaded orange). 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.



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 publically doing and sharing on climate adaptation and resilience and has allowed the baseline assessment to make several conclusions and recommendations.

1.3. 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.
- 2. 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.
- 3. 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 adaptation 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.

2. Introduction

2.1. Aims

Climate change adaptation and critical infrastructure protection are complex technical, policy and delivery challenges involving actions of a large range of stakeholders. Therefore, in line with and guided by the RESIN (Climate RESilient Cities and Infrastructures) output [D6.1 – ‘RESIN Actor Analysis for Urban Climate Adaptation: Methods and Tools in support of Stakeholder Analysis and Involvement’](#), this baseline assessment has used the broader definition of stakeholders rather than actors, as actors are stakeholders but not all stakeholders are actors. **Note:** Within this document, stakeholders are defined as individuals or groups that have a stake or interest in a particular issue, affecting a decision or policy or are affected by the situation (André et al. 2012). The IPCC (2007) identifies stakeholders in this context as ‘individuals and groups who have anything of value (both monetary and non-monetary) that may be affected by climate change or by the actions taken to manage anticipated risks¹’. And actors are limited to acting institutions or persons having influence on decisions made.

Therefore, to be effective at climate change adaptation and critical infrastructure protection, stakeholder organisations and individuals 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.) where their own actions and actions of others fundamentally affect how resilient to a changing climate they and those who rely on them are.

Who are Greater Manchester’s (GM’s) key climate adaptation and resilience stakeholders and where are they in the process of identifying and taking action on the climate risks of most relevance to them? Understanding this is essential in understanding where they and the city more broadly are on their journey to becoming more climate resilient.

A critical first step in understanding where GM and its stakeholders are in this process is an initial identification or mapping of the wider stakeholder landscape connected to climate adaptation and resilience in Greater Manchester.

This then needs to be refined to identify different sectors or groupings of stakeholders who have a more direct involvement in both urban climate resilience and critical infrastructure protection (which is the focus of the RESIN project). It will be these stakeholder organisations whose activities, both within and outside of Greater Manchester, have the greatest role in increasing the resilience of the City Region’s critical infrastructure to climate change.

And, finally, we need to start to directly analyse these more closely defined sets of stakeholder sector groupings to better understand how they are starting to take action on those climate change risks that are most relevant to them and GM.

This final stage will allow the drawing out of an initial set of findings and conclusions. So for example, are certain sectors demonstrating real visible activity around climate resilience and why? And again, if there are sectors where climate resilience issues are less visible and/or

¹ Carter et al., 2007, pp141-142

embedded, why is this and how might these sectors learn from others or benefit from later stages of the RESIN project itself? And do any conclusions we can draw allow us to identify any gaps and recommendations around addressing these, either at a later stage of the RESIN project or within GM more generally? Therefore the main aims of this baseline assessment are to:

5. Produce an initial map of the wider climate change adaptation and resilience stakeholder community in GM;
6. Identify, from within this wider community, definable sector groupings of stakeholders whose role and activities more closely relate to the urban and critical infrastructure protection focus of the RESIN project;
7. Consider, from across the organisations which make up these direct sector groupings, the extent to which the assessment of risk and the identification of approaches to manage risk are being actively positively embedded within the work of these key stakeholders.
8. Draw out a range of conclusions and recommendations around emerging approaches and best practice for consideration later in the RESIN project or within GM more generally.

2.2. Approach

2.2.1. Mapping of wider GM Climate Resilience and Critical Infrastructure Protection Stakeholders

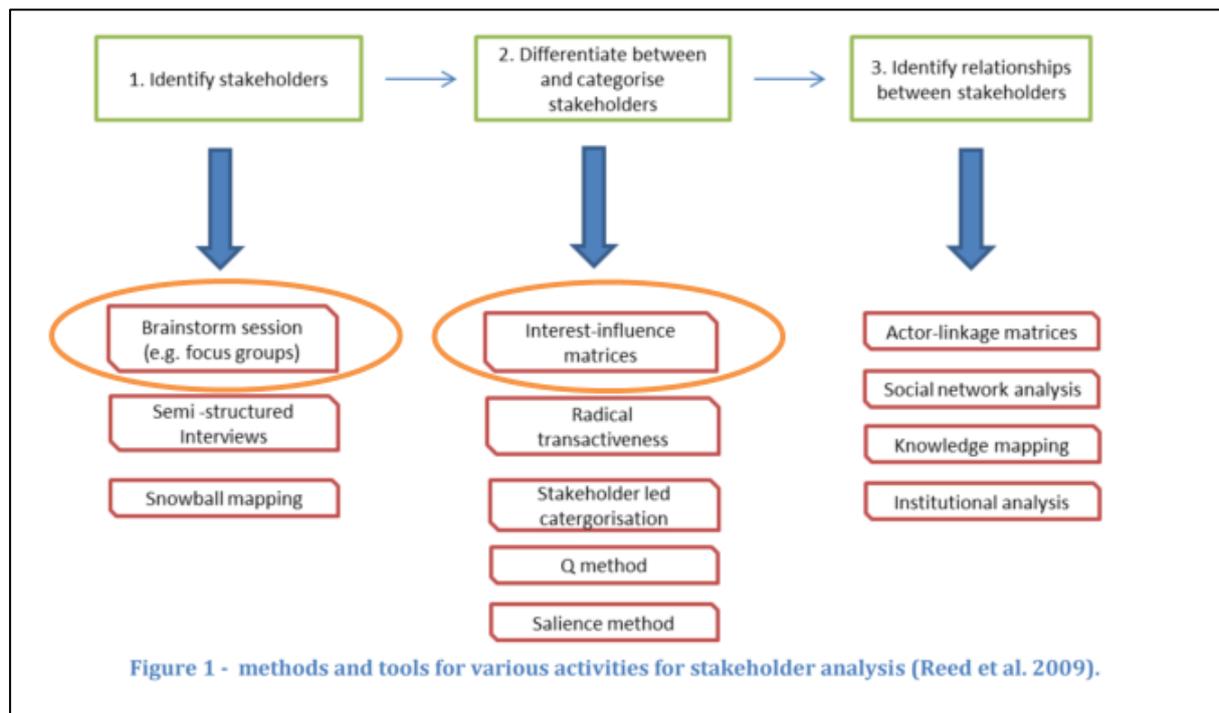
This element of stakeholder mapping and analysis (aim 1 above) built on a process which was instigated as part of the first RESIN process management workshop in Bratislava in November 2015.

Subsequent to the exercise in Bratislava, the GM RESIN core team re-visited and refined this process. The approach to this was in line with the particular approaches to stakeholder analysis² outlined within [RESIN deliverable D6.1](#) (see fig 1 below) and included:

- Stakeholder landscape mapping via brainstorming sessions
- Influence and interest matrices mapping

A more collaborative or complex analysis techniques to identify relationships and linkages between stakeholders (stage 3 of figure 1 below) was not applied due to the desk based nature and technical capacity and the resources available to this element of the baseline assessment.

² All stakeholder mapping undertaken internally by GM RESIN project team.



2.2.2. Initial stakeholder filtering- further defining GM’s climate change resilience and critical infrastructure protection stakeholders

To inform the later stages of analysis, the initial map required filtering and refining in line with aim 2 above.

This was achieved through comparing the urban systems approach (see figure 2 below) against GM’s established set of priority critical infrastructure areas as set out in the Greater Manchester Spatial Framework³ which includes:

- Transport infrastructure – air (Manchester), rail, port (Salford) tram (metrolink), road, walking and cycling
- Utilities infrastructure – gas, electricity, heat, digital connectivity, water and waste water
- Social infrastructure – schools and education, health services, community facilities, recreation provision and green infrastructure (and the wider local government/public sector organisational system these sit or operate within).

³ Note – these include the physical aspects of the sectors that are covered in the National Infrastructure Plan produced annually by HM Treasury with the addition of social infrastructure

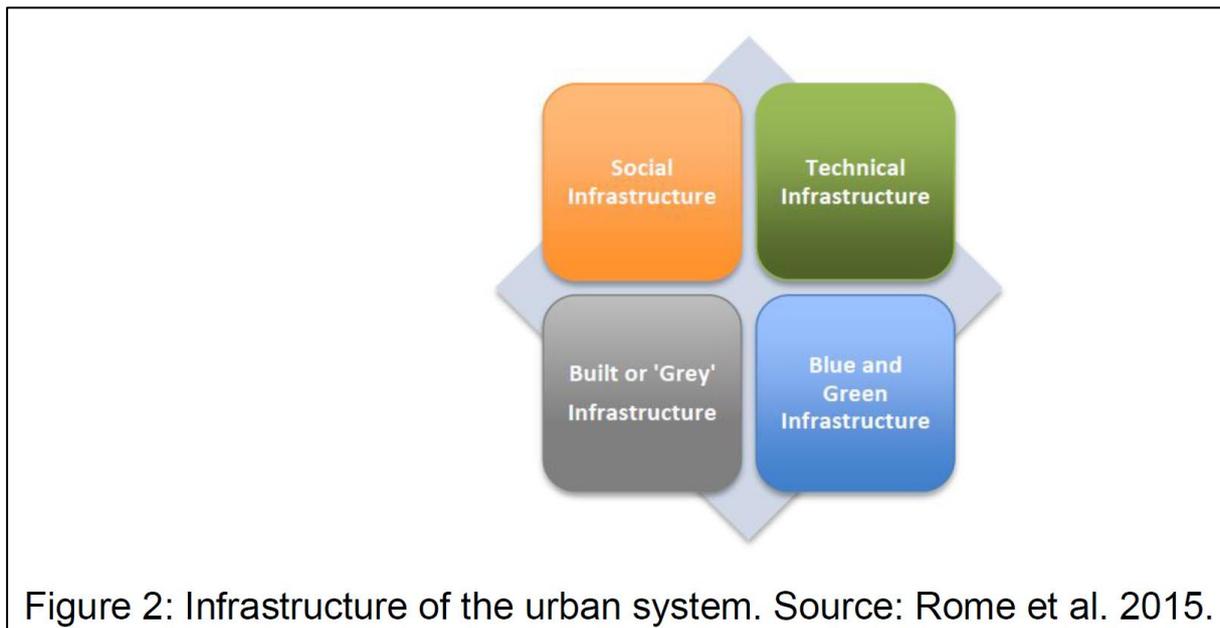


Figure 2: Infrastructure of the urban system. Source: Rome et al. 2015.

2.2.3. Stakeholder sector assessment

For the critical infrastructure areas outlined above, this stage of the process involved carrying out an initial assessment into how climate change adaptation and resilience issues featured in the various plans and strategies of the stakeholders identified within these areas. Here there are several important caveats to note:

- This was a desk based exercise, applied to easily and publically downloadable plans and strategies from websites of the organisations making up these more specific stakeholder groups.
- There will be a range of other documents or areas of activity not available to be included in the assessment process, primarily because they are not easily or publically available and because the desk based / arm's length nature of this assessment precluded direct one to one stakeholder contact at this point
- Some organisations, particularly local government and public sector organisations at a GM/District level are extremely large, with complex and wide ranging remits (including housing, adult social care, estate management). The complexity and scale of potentially relevant operational areas (within which plans and activities may not routinely be presented publically), meant the resource available to the baseline assessment process did not allow an assessment of these organisations themselves, precluding direct one-to-one stakeholder contact at this point.

It must also be noted (and this is explored further in section 2.2 below), that the sheer scale, complexity and interconnected nature of the social infrastructure sector (which will also include a wide range of GM local government activity), meant that it was not possible to realistically identify, collect and assess information on stakeholder activity related to this sector group (as per the process in below) from the individual organisations within this baseline process. As a result, this grouping was deliberately left out of this assessment.

Therefore, the analysis has not assessed all stakeholders and all potential plans and activities which may cover climate resilience and critical infrastructure protection. And, from

the various stakeholders (and their plans and strategies) which were assessed, there was not necessarily a full, consistent and/or publically available evidence base to assess. It was also not possible (and was never the intention) to present findings on a stakeholder by stakeholder basis. Indeed, a decision was taken not to consider individual stakeholders in this report. Rather, in presenting the analysis we have drawn out findings and messages around broad capacity and progress on climate adaptation and provided commentary at the sectoral group level.

This baseline therefore provides an initial snapshot of emerging visible adaptation and resilience activity within groups of stakeholders linked to critical infrastructure. By doing this it helps us broadly understand what these stakeholder groups are publically doing and sharing around identifying, planning for and taking action on a range of climate risks. It is not intended represent a definitive assessment of any individual organisations activity and capacity around urban climate resilience and critical infrastructure. It does however allow a level of comparison between stakeholder groups and also identify areas of interest (visible activity, strategy and policy or apparent gaps) for consideration and further discussion and assessment as the RESIN project progresses. By doing this, it has started the process of identifying strengths, weaknesses and lessons/key messages from this analysis for use within and beyond the RESIN project.

A range of relevant resources were identified from within the refined stakeholder groups for assessment the selection criteria for identifying these and a full list of documents assessed is included in Annex 1.

The assessment itself used a structured process which searched text within these documents, looking for evidence of various climate change adaptation and resilience phrases. Consideration was given as to the level of coverage of certain issues collectively across the sector group against the following areas:

1. Evidence of identification of weather and climate impacts and risks
2. Existence of policy and strategy on climate adaptation and resilience
3. Evidence of adaptation and resilience actions
4. Other activity or commitments which could support wider climate change adaptation and resilience progress

Further details of the assessment process are included in the example assessment sheet in Annex 2. And when assessing documents against the above areas, a broad category reflecting level of coverage was assigned to each section of the assessment for each sector grouping.

This assessment allowed an analysis of progress of the overall stakeholder group against the 4 areas above to be synthesised from the wide range of documents analysed from the individual organisations within it. This process has been reported in section 2.3 below as a broad finding for that sub sector grouping against particular areas of assessment allowing conclusions and observations on progress and activity to be made at that higher level.

Through the provision of a consistent framework for assessing new stakeholders and/or new areas of activity within existing organisations, the process is intended to be flexible and repeatable. The analysis and conclusions drawn from this exercise are intended to provide a consistent and repeatable method of understanding and comparing evidence of climate resilience and critical infrastructure protection activity at a stakeholder group level only.

2.3. Caveats

This report is based on a desk based assessment only and represents a single snapshot in time. As such, this part of the baseline assessment represents an initial stakeholder analysis only. There are several other more specific caveats and points to note relating to the stakeholder analysis element of this baseline assessment:

- The process of collectively assessing the plans from overall stakeholder groups was designed to be applied to public facing documents and may have therefore missed internal documents.
- No attempt was made to identify why any sector stakeholder groupings appear not to be, or not as fully, addressing expected climate resilience issues through their plans and strategies (for instance in line with policy or legislative drivers). The desk based nature of this study means it was not possible or appropriate to provide commentary on the reasons behind this. But the intention is that this may guide future discussions with these stakeholders to understand the gaps, barriers or areas where RESIN or GM's more general resources could increase their adaptive capacity and action.

3. PRESENTATION OF RESULTS

2.1 Mapping of wider GM Climate Resilience and Critical Infrastructure Protection Stakeholders

During the first RESIN Process Management Workshop held in Bratislava in 2015, the Tier 1 Cities started a process of mapping their climate resilience and critical infrastructure projection stakeholders. This used a blend of the techniques identified in RESIN Deliverable 6.1, but particularly brainstorming and influence/interest mapping as well as starting to map relationships between stakeholders. Further work was then undertaken the University of Manchester to refine this. This refined stakeholders active in climate adaptation and resilience and critical infrastructure were grouped into 4 broad sectors (government/Public, Private, Critical/utilities Infrastructure and the Third Sector/Civil Society (note – some do not fit into or cross cut these sectors but a decision was taken as to which key area to assign them to) . Consideration was also given to whether the stakeholders fell into direct, indirect or a wider community of stakeholders defined below⁴ and the resultant map of GM stakeholders is included in figure 3 below.

But as can be seen from figure 3, the wide ranging stakeholders mapped in this landscape start to fall into the 'direct' stakeholder category where their involvement/roles in GM and climate adaptation and resilience are more obvious, either through their roles in critical urban infrastructure, provision of services affected by a changing climate or a dependency on critical infrastructure which itself is affected by climate change.

⁴ For the purposes of this exercise, these groupings were defined by the local RESIN team as:

1. Direct stakeholders are ones active in GM who have a direct role/responsibility in managing climate risk or where their services/operations/infrastructure (and other urban systems which rely on them) are increasingly effected by climate change (for example water or electricity utilities)
2. Indirect stakeholders are those whose interests and operations are affected by the resilience of other stakeholders or the wider urban system and services it provides (for example businesses/buildings managers/operators)
3. Wider community are those which operate across or beyond GM on relevant areas who have interests in climate adaptation in relation to the groups and sectors they represent or guide (for example government departments, national regulators etc.)

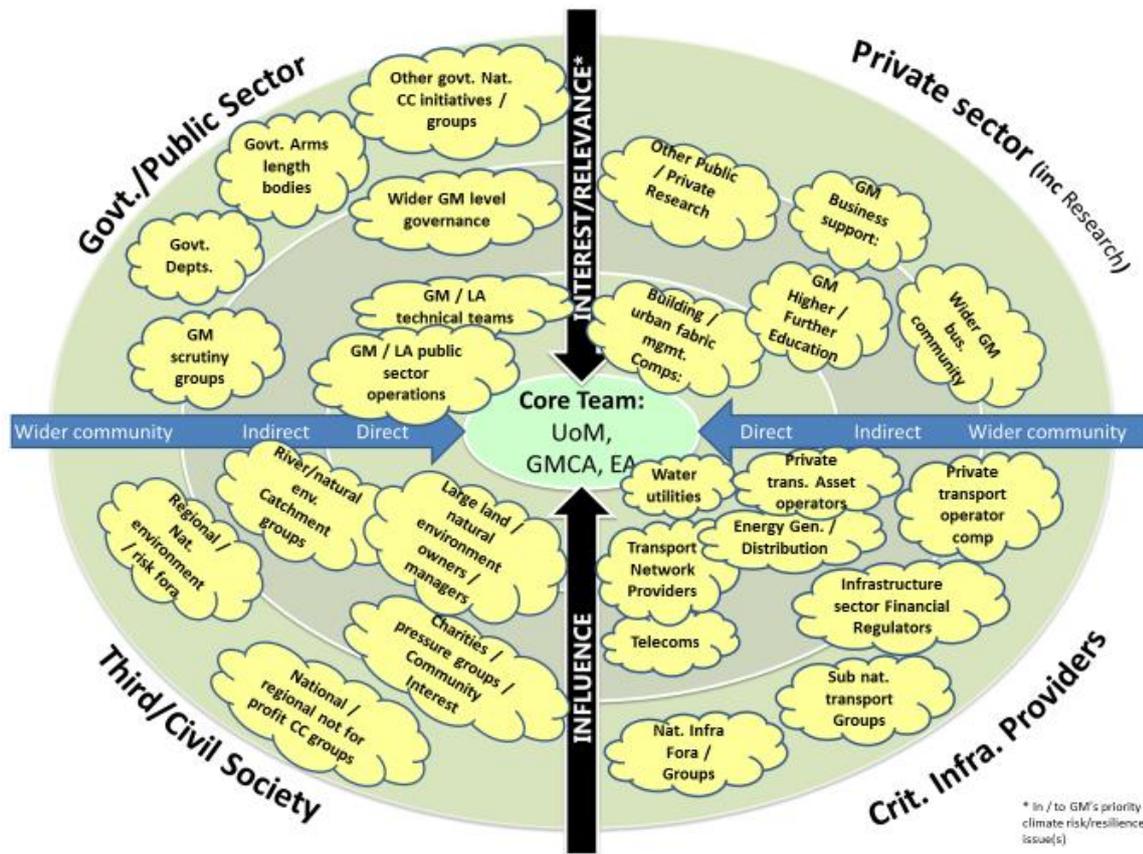


Figure 3 – broad GM Climate Adaptation and resilience stakeholder map

2.2 Initial stakeholder filtering - further defining GM's climate change resilience and critical infrastructure protection stakeholders

The stakeholder map was further analysed in line with the approach set out in section 1.2.2. This attempted to refine and identify a smaller number of key GM stakeholders to include within the remainder of this element of the baseline assessment.

This identified a clear sub-set of the wider stakeholder community (barring individual local authority districts for the reasons outline in 1.2. 2 above) which are shaded orange in Figure 4 below.



Figure 4 – GM Stakeholder landscape refinement

As noted in section 1.2.2 above, within these stakeholder group which were identified, many relevant stakeholders in the public/social infrastructure space are represented. These represent a diverse, but coherent sector grouping around ‘social infrastructure providers’ (shaded pink and highlighted). The services they provide and the urban systems/infrastructures they operate within are clearly impacted upon by climate change and how they consider these issues will affect how adapted and resilient these organisations are. However, as a grouping, the size, complexity, scope of responsibility, ease of access to documents and the scale of likely links/interdependencies with each other and other infrastructures/urban systems precluded their inclusion and analysis under 2.3 below.

2.3 Stakeholder Sector Assessment

As set out in section 1.2.3, a transparent, repeatable process of assessing the publically available documents within several groups of stakeholders was used to synthesise a picture of progress around specific areas of climate change adaptation and resilience activity.

The assessment of documents and strategies (using template in Annex 2. was applied to two sector groups (and a number of organisations within these who had a GM focus/footprint/remit). These included:

1. Utilities infrastructure providers (not telecoms) including:

- a. United Utilities (water supply and sewerage undertaker)
- b. National Grid (UK grid supply of energy/gas into GM)
- c. Electricity Northwest (local distribution operator for electricity in GM)
- 2. Transport infrastructure operators (including Peel Holdings and Manchester Airport, reflecting strategic and significant importance of ship canal, port and airport assets to GM, but excluding local infrastructure operators):
 - a. Transport for Greater Manchester
 - b. Network Rail
 - c. Highways England
 - d. Peel Holdings Limited
 - e. Manchester Airport Group.

Documents and resources for all of the above (listed in annex 1), were sourced using the approach outlined in section 1.2.3 above.

A wide range of documents were analysed as per the ranking/assessment process described under 1.2.3 above. This was firstly considered organisation by organisation. The RESIN GM team then assessed the relative position / rank the wider group achieved against 4 criteria identified as checks of progress and activity around climate adaptation and resilience within the group. These criteria were:

1. Evidence of identification of weather and climate impacts/risks (current and future)
2. Visible policies and strategies on climate change adaptation and resilience
3. Defined climate change adaptation / resilience actions
4. Wider commitments and areas of activity which are potentially supportive to progress on climate adaptation and resilience

This assessment then allowed key findings per sector to be drawn out against the 4 areas above, which are presented in sections 2.3.1 and 2.3.2 below.

2.3.1 Utilities infrastructure providers

1. Identification of weather and climate impacts/risks

- a. All organisations assessed showed evidence of climate change risks and impacts being identified to some extent in relation to one or more areas of their interests.
- b. Few organisations however, seemed to identify a range diverse (beyond flooding) of risks across a wider range of business areas.
- c. It also wasn't always clear if impacts and risks were being identified in a 'future risk from a changing climate' context in all instances over and above the current (or previously experienced) level of climatic impacts and risks
- d. Some areas and some specific utilities (United Utilities for example), on the other hand, were visibly and clearly thinking about future climate change and its impacts on their operations and assets.
- e. However, none of the publically obtained and assessed documents, at either an organisational or sector level, could be said to represent a comprehensive and systemic analysis and identification of future climate change impacts, their scale and the impacts of these on all operations in totality.

2. Visible policy and strategy coverage of climate adaptation and resilience:

- a. The performance of sectors in this area was more mixed. Beyond the statutory climate change adaptation reports, there was nothing which could be classed as a

definable and/or standalone policy or strategy document or thread on adaptation and resilience.

- b. However, most had clear elements of climate change issues and challenges embedded and visible to varying extent across a wide range of documents. These documents were often ones which provided strategic direction to their organisation. In some cases it was a very clear thread, though the approach seemed to be embedding the adaptation/resilience agenda rather than including this theme in standalone or defined parts of other strategies/documents.

3. **Climate change adaptation and resilience actions:**

- a. It was possible to observe general climate change adaptation action within every organisation within this grouping.
- b. However, in the majority of cases this stopped at the level of more generic identification of need for action or areas of action and in others specific actions were defined.
- c. There was no evidence of any clear spatially defined actions which could be identified at a GM scale. However, where there is a clear asset management process and requirements of the CLIMATE CHANGE reporting duty⁵, it was felt that it will have driven, at least on a 5 year investment cycle, some level of activity around CLIMATE CHANGE adaptation and resilience within GM's boundaries. It is possible that this just wasn't visible or apparent from the resources obtained for the assessment.
- d. It wasn't therefore valid to conclude at this point that lesser definition of actions meant nothing or little was happening/was planned to happen in some groups where coverage appeared to be more limited.

4. **Wider activity in support of climate change adaptation and resilience progress:**

- a. Generally all organisations included in this element of the assessment clearly identified or undertook other activities, commitments or processes which could have the potential to support and enable adaptation and resilience action.
- b. This includes a range of commitments around sustainability and associated environmental strategy and policy more generally, wider climate mitigation and or ISO / environmental management and reporting systems/processes which have the capacity to cover climate and other environmental risk areas.

- 5. **Overarching comments** – a range of progress and level of coverage existed across all 4 areas within the organisations in this group. However, it wasn't yet clear that one or more organisations within this group was demonstrating a full, deeply considered and embedded approach to climate adaptation and resilience, corporately, operationally and supported by a wider commitment to progress.

2.3.2 Transport infrastructure operators:

1. **Identification of weather and climate impacts/risks**

- a. The identification and coverage of climate impacts and risks was very varied within this sector ranging from extremely small/current risk coverage to emerging evidence of an organisation taking a truly systemic and future climate risk assessment approach.

⁵ Under the 2008 Climate Change Act, the Secretary of State has the power to direct reporting authorities to produce reports on what they are doing to adapt to climate change. The power is referred to as the 'Adaptation Reporting Power' details can be found [here](#)

- b. However, as a minimum all organisations did identify some risks (even if only current climatic risks) and consider these to some extent (albeit often around flooding rather than a wider more complex basket of climate impacts/risks)
 - c. It was only in one case though that fuller risks, consideration of future change and real impacts on multiple operational areas appeared to be emerging and being taken into account.
- 2. Visible policy and strategy coverage of climate adaptation and resilience:**
- a. As for 1 above, within this sector grouping coverage was varied. Some organisations seemed to have no demonstrable or visible policy or strategy on climate adaptation at all (based on the resources obtained for assessment). Whereas others have a very clear and pervasive policy and strategy approach (up to and including embedding climate change adaptation and resilience in a range of documents and, where appropriate, standalone content).
 - b. However, on average, a broad level of coverage of various issues could be seen, even if only part of wider strategy process/documents for one or two organisations within this group.
- 3. Climate change adaptation and resilience actions:**
- a. Actions were similarly wide ranging. Whilst there may have been instances of actions in documents that had not been available for assessment, there were some organisations where it was very hard to see any direct translation of any impact/risk/strategy wording into actions or even identification of areas of need for action .
 - b. However, one organisation in this sector had extremely clear, considered and spatially defined action information
- 4. Wider activity in support of climate change adaptation and resilience progress:**
- a. There were a range of activities, sustainability/environmental strategy commitments (and even ISO commitments) visible within many (not all) of the sector group which set ambition and direction of travel which could support endeavours to adapt to climate change.
 - b. Within one organisation in the sector, this was visible as a clear thread, both generally and in relation to climate change and could be felt to be a genuine commitment which will support real action from broad level downwards.
 - c. However, the rest of the group was a much more mixed picture through to some areas where almost no visible activity or commitment was apparent.
- 5. Overarching comments** – as for the utilities, grouping a range of progress and level of coverage existed across all 4 areas within the organisations assessed in this group. There was however, a much clear split with one organisation clearly showing real progress and some showing very little apparent or visible coverage of climate adaptation and resilience. However, as a sector group, broadly it demonstrated action and coverage across all areas. It should also be noted that, due to the commercial nature of some organisations and general access to corporate documentation, further dialogue would be needed at an organisational level to further refine this assessment.

3 Conclusions and Recommendations

This baseline assessment has revealed several interesting findings concerning both GM's stakeholder landscape around climate change adaptation and resilience and the emerging picture of activity of two key stakeholder sector groupings, utilities and transport. The conclusions we are starting to see emerging from this stakeholder analysis are discussed in more detail below. This section also includes recommendations for areas of further consideration and development, either as part of the RESIN project directly, or in relation to GM's stated priority to adapt to a rapidly changing climate⁶. These are discussed below in relation to the areas of work covered in this assessment:

4. 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. It will need refining and adding to, particularly by the stakeholders themselves, to ensure better coverage and accuracy.
- b. This baseline processes has confirmed that 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, whilst clearly visible, very wide ranging and hard to capture in a desk based baseline assessment of this type. It is much wider than just GM level government operations, crossing large areas of social infrastructure provision in an 'urban systems' sense. It also has roles, responsibilities and even delivery/operations directly affecting or affected by the other built, technical or natural infrastructure sectors and the stakeholders active in these areas (both within and outside GM's boundaries). Even without assessment as a stakeholder sub-sector in this baseline assessment, 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. And where these activities do exist, they may differ in relation to their coverage of both current and future climate risks. There is likely to also be no consistent approach (even within similar stakeholders in this group) to climate adaptation and resilience, and how this is documented and publicised etc. Therefore, due to the complexity of this group, their extent of linkages with other groups and sectors, and the dependencies or effects of actions within this group on wider adaptation and resilience progress, it is hard to map and analyse at this point.
- d. To add to this complex landscape, it is clear that there is a wider group of stakeholders who also have a range of levels of responsibility and involvement in the adaptation and resilience agenda, both directly and in a 'wider community sense'. Many of these (and their actions and levels of understanding) affect the overall adaptive capacity/resilience of the city region, but again they have limited direct drivers to take action or prioritise issues around this area of activity. They may well also fall within the third and private sector, so in addition to lacking any statutory

⁶ As set out in the GM Climate Strategy 2011-2020 and the Climate Change and Low Emission Strategy Whole Place Implementation for Greater Manchester 2016-2020

legislative/policy driver, they may well also lack technical capacity and resources to respond and take action. It is therefore not at all clear how this group and their activities (or the activities of others they interact with) affect both their resilience the wider resilience of GM going forward.

- 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 stakeholders landscape that they cover, 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 climate adaptation and resilience.

5. Utilities and transport operator sub sector assessment:

- a. The organisations assessed (both within and between sector groupings) demonstrated a wide ranging and varied level 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.

6. Recommendations:

- e. 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 highlight general progress, challenges and opportunities for the critical infrastructure stakeholder community to learn and support each other.
- f. 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.
- g. 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.
- h. 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.

Annex 1 - Stakeholder resource list:

Resources to be assessed were selected based on the following criteria and the full list of resources assessed are identified in the table below:

- Resources selected were limited to those publically available documents from stakeholders own or easily linked to via other public (i.e. government.) websites
- As a general rule, resources before 2013 have been avoided as this is before the publication of first UK Climate Change Risk Assessment and 1st National Adaptation Programme as these would predate the most recent government policy and would have been developed under the previous UK climate impact projections. CLIMATE CHANGE However, if the only documents available pre-dated this (or they were key CLIMATE CHANGE adaptation documents such as formal reports to government under 2008 CLIMATE CHANGE Act), then these were sourced and have been analysed.
- Where multiple/annual documents existed, most up to date version was used - multiple document assessment were not carried out and therefore no attempt was made to track how consideration of climate change risk issues evolved over time
- Primary key specific 'climate risk/adaptation' reports were identified and sourced where possible
- Additional specific reports/documents were also sought out to understand how current and future climate risk flowed through into other areas key policy/strategy/action - where these could be found.
- These additional reports were identified in line with points 1-3 above and a specific key word search on each website alone. Keywords included: strategic direction, strategic plan, business plan, annual report, emergency preparedness, business continuity, emergency planning, climate, global warming, extreme weather, IPCLIMATE CHANGE, UKCIP, Adapt/adaptation, resilience, climate change impacts, risk assessment, climate change risks, flood, heatwave, drought, storm, environment, sustainability, carbon/carbon reduction. when searching, only the first page of search results were interrogated
- Where searches above identified inclusion of these terms in reports, these were sourced for that stakeholder. No attempt has been made to go back through all other stakeholders (generally or in that sector) to then search for that type/title of document. It was felt that this would considerably expand the resource to be analysed (unsustainably), would flag lots of documents with zero relevant content, and these were not obviously available and/or covering CLIMATE CHANGE terms from the other stakeholders in the first instance. A possible secondary exercise would be to map common resources where we'd expect coverage and there were gaps (either in coverage or the resource itself).

Stakeholder Details	Resource assessed
Utilities Stakeholders:	
United Utilities	<ul style="list-style-type: none"> • Playing our Part to support the North West – Our plans for the North West’s Water and Waste Water over the next 25 years 2015-2040 • United Utilities Group PLC – annual report and financial statements 15/16 • Environmental Policy Oct 15 • UU sustainable supply chain charter v4 (Nov 2014) • UU Water Risk and compliance Statement 14/15 (2015) • Report on adaptation under the Climate Change Act 2008 (2011) • Adaptation Progress Report 2015 under the Climate Change Act 2008 (2015) • Final Water Resource Plan (March 2015)
National Grid	<ul style="list-style-type: none"> • National Grid Line of Sight (2013) • National Grid, Our Contribution A framework for environmental sustainability in National Grid • Delivering our environmental future, annual statement (March 2016) • Annual report and accounts 15/16 • Supplier Code of Conduct (Sept 2015) • Climate change adaptation report (Sept 2010)
Electricity North West	<ul style="list-style-type: none"> • Strategic Direction Statement (2013) • Annual Report and Consolidated Financial Statements - For the year ended 31 March 2016 (2016) • Sustainability Report (2014) • Climate Change Adaptation Report (June 2011) • Climate change adaptation report (update) (2015)
Transport Stakeholders:	
Transport for Greater Manchester	<ul style="list-style-type: none"> • Business Plan 2016/17 – Making Travel Easier (April 2016) • Transport for Greater Manchester Environmental Policy (July 2015) • Greater Manchester transport strategy 2040: our vision (2015?) • Greater Manchester’s Third Local Transport Plan (2011) • Greater Manchester Local Transport Plan 3 – capital programme 15/16 – 20/21 (consultation – not sure if published) (Aug 2014) • Greater Manchester Transport Strategy 2040 – consultation draft (July 16)
Network Rail	<ul style="list-style-type: none"> • Environmental Policy (Aug 2015) • Delivering a railway fit for the future - Network Rail sustainable development performance 2014/15 (2014) • <i>Route Weather Resilience and Climate Change Adaptation Plans- London North West (Sept 2014)</i> • Network Rail Climate Change Adaptation Report (April 2011) • Climate change adaptation report (progress report) (2015)
Highways England	<ul style="list-style-type: none"> • Highways England Strategic Business Plan 2015-2020 (2015) • Highways England Annual Report and Accounts (2016) • Highways England Delivery Plan (2015?)

	<ul style="list-style-type: none"> • Highways Agency Environment Strategy - Supporting our vision to be the world's leading road operator (2011?) • Highways Agency Climate Change Risk Assessment (Aug 2011)
Peel Holdings Limited	<ul style="list-style-type: none"> • Mersey Docks and Harbour Company Ltd. Climate Change Adaptation Report - Report to Defra under the Adaptation Reporting Powers (March 2011) • The Peel Group, Living our Values: corporate social responsibility report (2015) • Mersey Ports Master Plan - A 20 year Strategy for Growth (Consultation Draft June 2011)
Manchester Airport Group	<ul style="list-style-type: none"> • Corporate Responsibility Strategy (2015) • Manchester Airport Master Plan (2007?) • Environment Plan (part of the Manchester Airport Masterplan) (May 2007) • Climate Change Adaptation Report for East Midlands Airport and Manchester Airport (May 2011) • Climate adaptation progress report for East Midlands and Manchester Airports (Sept 2015)

Annex 2 - Stakeholder Assessment sheet

Overarching sector grouping assessment sheet – i.e. Utilities	
1. Identification of weather and climate impacts/risks	
Relevant key words: climate, global warming, extreme weather, IPCLIMATE CHANGE, UKCIP, adapt, resilience, climate change impacts, risk assessment, climate change risks, flood, warm, heat, hot, cold, ice, storms, drought, environment, sustainability, temperature, carbon, rainfall	
Here we were looking for general statements (found within the assessed documents) on identification of extreme weather and climate change and related impacts and risks. Including a where available a consideration of how risk altered as a result of future climate change. Also, where available it would be good to see evidence of the assessment of impacts/risks	Position/comment
1. No real substantive evidence of the identification of weather and climate impact/risks from anywhere within the sector grouping and documents assessed	
2. Overall sector grouping routinely <u>only</u> identifies current climate / weather risks, no real or explicit consideration of how change over time as result of climate change within an number of the wider organisations group and resources assessed	
3. Some future weather and climate impacts/risks and issues identified, but not fully and consistently covered within and between the organisations in the group	
4. General full and systematic impact/risk assessment undertaken on climate change issues and reported on to a generally high level within the entire sector group and all relevant documents assessed	
2. Policies and strategies on climate change adaptation and resilience	
Relevant key words: climate change, global warming, weather, extreme weather, climate change adaptation, resilience, climate change impacts, risk assessment, climate change risks, flood, heat, cold, ice, storms, drought.	
Here we were looking for specific policies/strategies (extracted from the document) related to adaptation and resilience, not general information and references to specific climate risk identification as in section 1	Position/comment
1. No real policies/strategies related to climate change adaptation and resilience from anywhere within the	

Overarching sector grouping assessment sheet – i.e. Utilities	
sector group or documents assessed.	
2. Policies/strategies that reference climate change adaptation and resilience embedded amongst other themes within a number of organisations in the wider group and resources assessed.	
3. Policies/strategies specifically about climate change adaptation and resilience clearly and consistently identified (including in standalone documents) to a generally high level within the entire sector group and all relevant documents assessed	
3. Adaptation/resilience actions	
Relevant key words: Climate change adaptation, adaptation, resilience, green roof, green infrastructure, SUDS, sustainable drainage systems, flood defence(s)	
Here we are looking for evidence of specific adaptation and resilience actions (extracted from the document), and if possible case studies linked to the implementation of these actions.	Position/comment
1. No reference to adaptation/resilience actions from anywhere within the sector group or documents assessed.	
2. reference to need for adaptation/resilience actions identified but no specific detail given within a number of organisations in the wider group and resources assessed	
3. General adaptation/resilience actions proposed	
4. Specific adaptation/resilience actions identified within programmes and/or targeted to particular locations etc (i.e. within GM) to a generally high level within the entire sector group and all relevant documents assessed	
4. other indications of corporate activity or priority which, whilst not directly relating to climate adaptation/resilience, nevertheless demonstrate a general commitment and direction of travel around related and complementary areas (i.e. wider sustainability)	
Here we were looking for evidence of specific adaptation and resilience recognised commitments, adherence to relevant reporting/management systems/standards etc	Position/comment

Overarching sector grouping assessment sheet – i.e. Utilities	
<p>1. No visible organisation wide commitment to climate change adaptation or resilience to any <u>consistent</u> degree within publically available documents reviewed</p>	
<p>2. Visible cross organisational commitment to CLIMATE CHANGE adaptation resilience issues seen in a range of documents, including ones specifying adaptation/resilience actions OR evidence of wider organisational commitment to one or more CLIMATE CHANGE adaptation resilience initiatives and/or are signatory to another system of reporting/environmental management which covers consideration of climate risk</p>	
<p>3. In addition to visible cross organisational commitment, evidence of wider organisational commitment to one or more CLIMATE CHANGE adaptation resilience initiatives and/or are signatory to another system of reporting/environmental management which covers consideration of climate risk.</p>	