



Uscore2



## Greater Manchester (Salford) Peer Review Feedback Report

Uscore2: City-to-City Peer Review Tool

This document has been prepared as part of the Uscore2 - City-to-city local level peer review on Disaster Risk Reduction project. The sole responsibility for the content of this publication lies with the author(s). This document covers civil protection activities implemented with the financial assistance of the European Union's DG-ECHO **Call for proposals 2016 for prevention and preparedness projects in the field of civil protection** programme under, agreement number: ECHO/SUB/2016/743543/PREV04. The views expressed herein should not be taken, in any way, to reflect the official opinion of the European Union, and the European Commission is not responsible for any use that may be made of the information it contains.



# CONTENTS

I. Executive Summary	3
II. Purpose of Document	4
1. Greater Manchester's Disaster Risk Reduction (DRR) Overview	5
1.1.1. Shock and Stresses	6
1.1.2. A Resilient Region	8
1.1.3. Disaster Risk Governance	10
2. Greater Manchester: Peer Review Process	14
2.1. Module 8a: Increase Infrastructure Resilience [9th / 10th July]	15
2.1.1. Why Module 8a Was Chosen	15
2.1.2. Disaster Resilience Scorecard for Cities Assessment Criteria	16
2.1.3. Methodology	17
2.1.4. Infrastructure Resilience	18
2.1.4.1. Critical Sectors	20
2.1.5. SWOT Analysis / Matrix	28
2.2. Module 10: Expedite Recovery and Build Back Better [11th July]	31
2.2.1. Why Module 10 Was Chosen	31
2.2.2. Disaster Resilience Scorecard for Cities Assessment Criteria	32
2.2.3. Methodology	33
2.2.4. Recovery	34
2.2.4.1. Manchester Arena Attack – Recovery Process	37
2.2.4.2. Salford Flood Risk – Planning, Recovery and Lessons Learned	40
2.2.5. SWOT Analysis / Matrix	44
2.2.6. Recommendations for Peer Review Process	47
Appendix I - Greater Manchester (Salford) Peer Review Agenda	48



The Review Team wish to thank Great Manchester and Salford for their engagement and contributions throughout the peer review process. In particular, to the Uscore2 project staff for their support throughout the process.

All photographs contained within this document were taken by the Uscore2 team during the visit and reproduced with the kind permission of the team. The other figures were taken from interviewees' presentations and online publications.

## 1. EXECUTIVE SUMMARY

Greater Manchester (GM) became the first UK city region to join the UN's Making Cities Resilient Campaign (MCR) and has been recognised as a "Role Model for Total Resilience" because of its focus on implementing the Campaign's entire ten-point checklist for building resilience to disasters.

This recognition for GM further solidifies the UK's reputation as a global leader in the area of building disaster resilience. This has encouraged others to follow suit and boosted discussions on how to measure progress in building resilience. Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan make up GM and all ten boroughs are part of the UNISDR campaign.

As part of its submission to become a member of the Making Cities Resilient Campaign, Greater Manchester provided an impressive range of disaster resilience good practice examples which helped to illustrate how they are implementing the Ten Essentials for Making Cities Resilient. The example of Salford Flood Management is illustrative of this.

The Review Team were particularly impressed by the organisation and coordination links in the city region's approach to disaster risk reduction (DRR) and this is clearly demonstrated through its participation in the Uscore2 project which aims to build a generic city-to-city peer review tool to assess DRR measures based on the UNISDR Ten Essentials.

During three days (9th-11th July 2018) the Review Team (made up of experts from Amadora) used interviews, site visits and workshops (focus group) in order to develop this report which includes the team's findings, good practices, areas that could be strengthened and recommendations.

The host team prepared the detailed agenda for the three days and chose key stakeholders to offer insights into their work to Increase Infrastructure Resilience (Module 8a) and to Expedite Recovery and Build Back Better (Module 10). The work schedule was well balanced which allowed a rigorous and exempt evaluation by the peer review team.



## II. PURPOSE OF DOCUMENT

This report presents the findings, analysis, conclusions and recommendations relating to a city-to-city peer review of Disaster Risk Reduction (DRR) arrangements in Greater Manchester, England. The peer review was carried out between 9th and 11th July 2018 using the Uscore2 city-to-city peer review tool and was one of three pilot peer reviews conducted as part of the Uscore2 project.

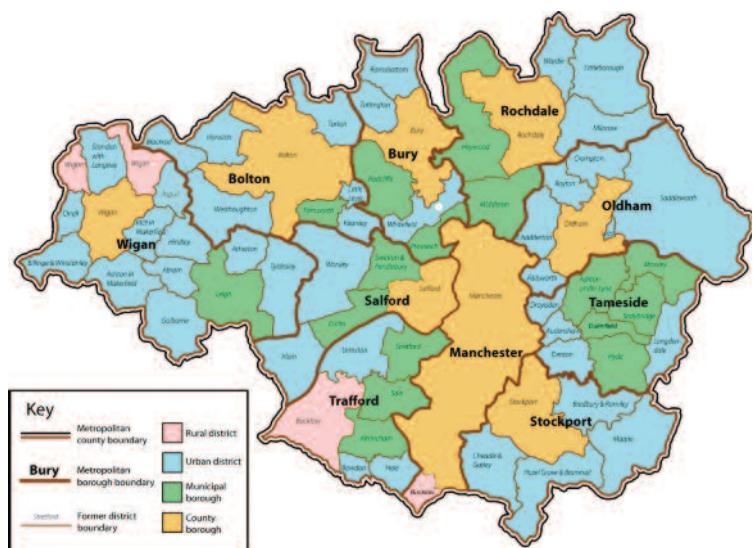
The team conducting the peer review were as follows:

<b>Name</b>	<b>Luís Carvalho</b>
<b>Position</b>	Civil Protection Municipal Commander
<b>Responsibilities</b>	Operational and technical coordination of civil protection National Advocate - Making Cities Resilient UNISDR Campaign
<b>Name</b>	<b>António Manuel Farinha</b>
<b>Position</b>	Senior Expert in Civil Protection
<b>Responsibilities</b>	Logistic, communications and operational planning in civil protection
<b>Name</b>	<b>Carlos Rocha</b>
<b>Position</b>	Technical Assistance in Civil Protection
<b>Responsibilities</b>	Public awareness campaigns, risk communication and resilience community projects

The Uscore2 project are grateful to all of the staff involved, both for their hospitality in hosting the peer review, but also for agreeing to be peer reviewed and thereby piloting the peer review tool developed by the project team.

## 1. GREATER MANCHESTER'S DISASTER RISK REDUCTION (DRR) OVERVIEW

In the history of Greater Manchester (GM) the concept of resilience has had and continues to have a marked presence. In the last two centuries there have been several moments in which GM had to create and recreate mechanisms of prevention, response and recovery in order to ensure the balance of natural and human ecosystems.



Source: [https://en.wikipedia.org/wiki/Greater\\_Manchester#/media/File:Greater\\_Manchester\\_County\\_\(3\).png](https://en.wikipedia.org/wiki/Greater_Manchester#/media/File:Greater_Manchester_County_(3).png)

Currently, GM is a metropolitan area in North West England, with a population of 2,798,800. It encompasses one of the largest metropolitan areas in the United Kingdom and comprises ten metropolitan boroughs: Bolton, Bury, Oldham, Rochdale, Stockport, Tameside, Trafford, Wigan and the two cities of Manchester and Salford. Greater Manchester was created on 1 April 1974 as a result of the Local Government Act 1972 and designated a City Region on 1 April 2011.

GM spans 493 square miles (1,277 km<sup>2</sup>), and is the second most populous urban area in the UK. It is landlocked and borders Cheshire (to the south-west and south), Derbyshire (to the south-east), West Yorkshire (to the north-east), Lancashire (to the north) and Merseyside (to the west).



### 1.1.1. Shock and Stresses

The Community Risk Register is the principal vehicle for understanding the shocks faced by the city region. It is used to:

- Prioritise and coordinate work to mitigate and prepare for civil emergencies
- Ensure multi-agency planning activity is proportionate and effective, making the best use of available resources
- Offer advice and guidance on what members of the public can do to prepare for these events.

To support the development of the Community Risk Register, in addition to drawing on the expertise of the partners, the Greater Manchester Resilience Forum<sup>1</sup> (GMRF) uses national guidance on risks. The alignment of local and national risk assessment processes ensures there is a fully integrated picture of civil risk at all levels of government in the United Kingdom (UK) which underpins a coherent emergency planning framework and enables cross-boundary planning for wide-area emergencies that extend beyond the city region.

Emerging challenges such as climate change, antimicrobial resistance, cyber-crime and changing terrorist activity also inform the efforts that GM has been making in the context of resilience and DRR. In the current context, GM's risks include:

- Rainfall flooding (includes fluvial, pluvial, flash flooding)
- Hazardous materials accident (includes industrial accident with toxic release)
- Terrorism
- Disease outbreaks (includes influenza type disease).

In addition to the risks GM has identified four **shocks** as being the most significant, based on a combination of likelihood and impact:

- Influenza pandemic
- Cold and snow
- Flooding
- Failure of the national electricity infrastructure.

Regarding the **stresses** in this region, they can be related to one of the four dimensions in the City Resilience Framework as indicated below:

- Health and wellbeing
- Economy and society
- Infrastructure and environment
- Leadership and strategy.

These stresses are being addressed through the Greater Manchester Strategy.



Source: Greater Manchester Preliminary Resilience Assessment (publication – page 40)

In order to illustrate the inter-relationship of these two factors, GM identifies in its resilience reports, **chronic stresses**, issues that weaken the fabric of a city on a day-to-day or cyclical basis such as high unemployment, inefficient public transport systems, high crime levels and environmental pollution and **acute shocks**, sharp events that threaten a city such as floods

and disease outbreaks.

All shocks and stresses were discussed during the peer review process (Module 8a<sup>2</sup> and 10<sup>3</sup>), mainly at the level of the recovery of basic services and the different interactions / reactions from the stakeholders in a disaster situation.

<sup>2</sup> Increase Infrastructure Resilience

<sup>3</sup> Expedite Recovery and Build Back Better

## 1.1.2. A Resilient Region

The 21st century brings new risks such as climate change and antimicrobial resistance, together with the capacity for risks to have multiple and unexpected consequences due to globalisation and the interconnectivity of societies across the world.

GM proactively nurtures resilience since it underpins the city region's capacity to generate prosperity within its communities. However, shocks such as the Boxing Day Floods in 2015 tend to be uneven in their impact, hitting the most vulnerable and disadvantaged hardest. Equally, too many residents are still living within some of the most deprived communities in the UK, despite GM's economic growth and resilience should be about building a future in inclusive and integrated ways.

In several documents provided by the host team, it is clear that the importance of resilience is transversal to all areas and sectors of the region. In the GM perspective adopting a resilience lens asks for a deeply informed and connected approach to problems and to preparing for emergencies to guarantee:

- Inward investment and growing competitiveness
- Quality of life and wellbeing
- Socioeconomic stability
- Safeguarding the unique characteristics of the city region
- Opportunities to maximize resilience benefits of new incentives
- Physical, economic and social challenges are seen as opportunities for change
- Crises that may thwart the ambitions of our people are foreseen and planned for wherever possible

- Collaborations and partnerships in the city region co-create innovative and relevant solutions for GM.

For decades agencies have worked together, across different sectors and in partnership, to assess, prepare for, and build capacity to respond to risks. Accordingly, GM is part of two international initiatives that are fostering new approaches to resilience regarding safe communities.

The first one is the United Nations Making Cities Resilient Campaign. In 2014 GM's ten districts became role models in this worldwide movement. The ambition is to deliver the commitment with the Sendai Framework for Disaster Risk Reduction 2015-2030 which is to drive a substantial reduction of disaster risks and loss in lives, livelihoods and health and in the economy, physical, social, cultural and environmental assets of persons, businesses and communities.



In 2016, GM was selected to join the 100 Resilient Cities programme, an initiative pioneered by the Rockefeller Foundation. Cities in this network are provided with the resources necessary to develop a roadmap to resilience along four main pathways:

- Financial and logistical guidance for establishing an innovative new position in city government, a Chief Resilience Officer, who will lead the city's resilience efforts
- Expert support for development of a robust Resilience Strategy
- Access to solutions, service providers, and partners from the private, public and NGO sectors who can help them develop and implement their Resilience Strategies
- Membership of a global network of member cities who can learn from and help each other.

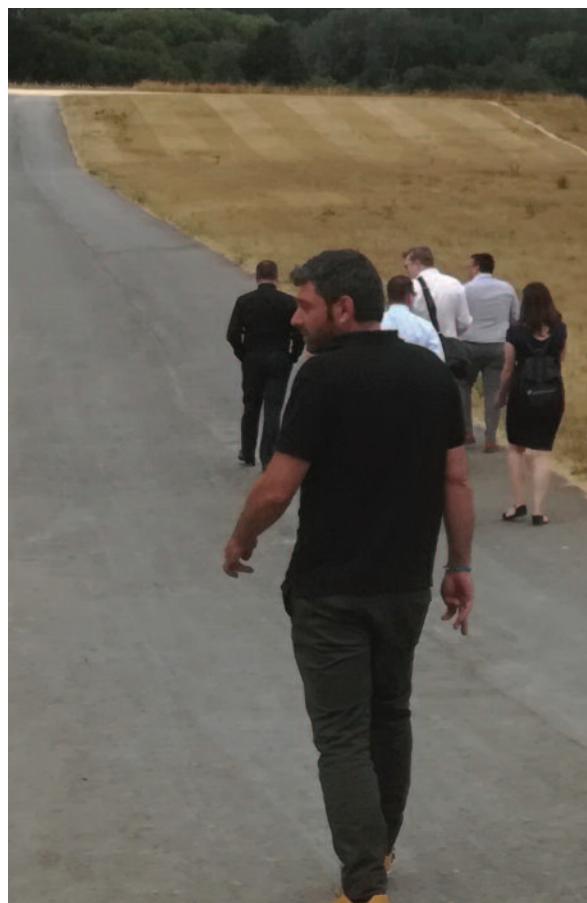
These initiatives have introduced GM to international perspectives about self-assessment to measure resilience; work on statistics that illustrate shocks and stresses; emergency risks; perceptions of communities and stakeholders on resilience issues. The LGSAT and the participation in the EU-funded project "Managing Urban Risks in Europe: Implementation of the City Resilience Scorecard (USCORE)" are examples of that.

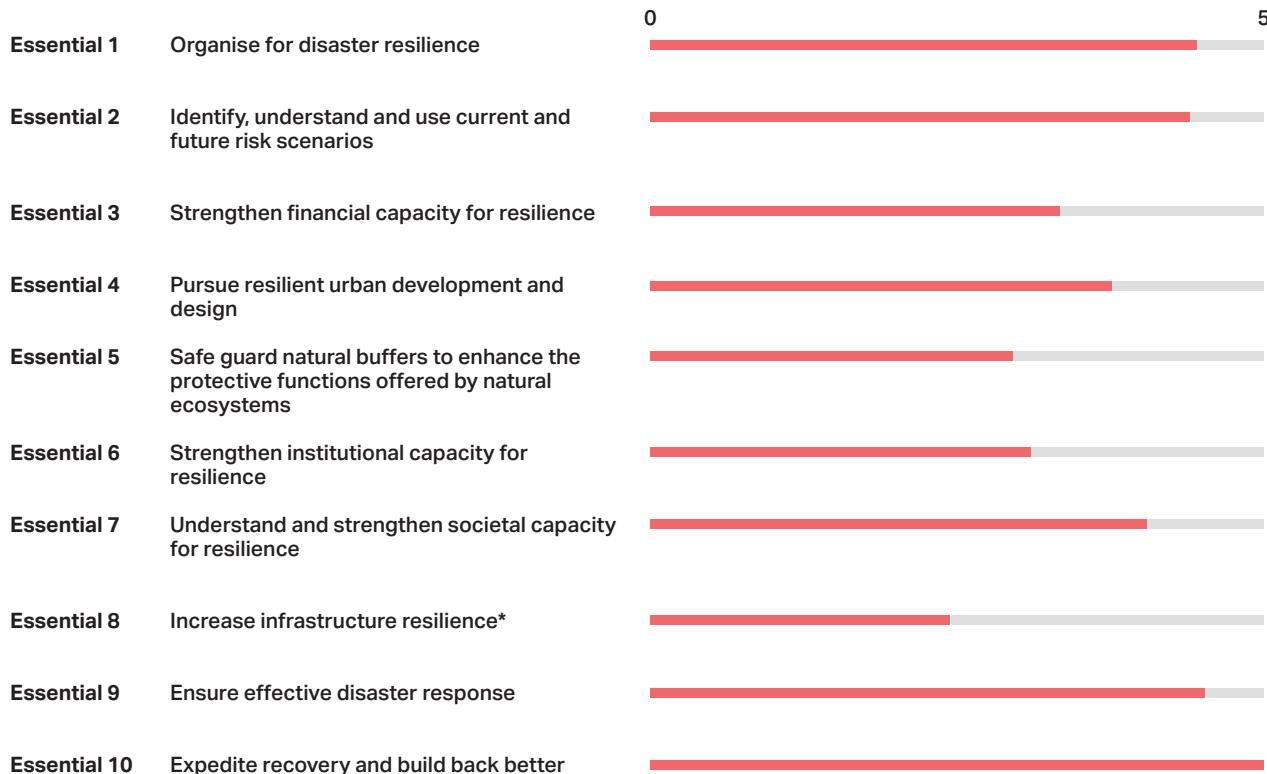
The Disaster Resilience Scorecard when completed for GM highlighted:

- A need to focus on the security of electricity supplies and other forms of energy supply
- The importance of addressing transport issues including connectivity
- A requirement to review infrastructure resilience

- Continuing requirements to communicate with and educate the public about how to stay safe, with an emphasis on vulnerable people and communities
- Ongoing priorities to understand the protective nature of the natural environment in protecting communities and economic assets against risks, including the changing nature of climate-related risk.

The final score for Essential 8, was the lowest of all essentials, which shows the complexity of the relationships between the different sectors of critical infrastructures.





Source: Greater Manchester Preliminary Resilience Assessment (publication – page 24)

### 1.1.3. Disaster Risk Governance

In the UK there are three tiers of disaster risk governance, national level, metropolitan / GM level and district / local level.

The national / UK government tier has strong liaison with the metropolitan and local tiers through regionally-based resilience teams in the Ministry of Housing, Communities and Local Government, Resilience and Emergencies Division. The local tier (comprised of ten individual local authorities) has a long history of partnership and collaborative working, through the Association of Greater Manchester Authorities (AGMA) and now (as a result of the devolution of GM) through the Greater Manchester Combined Authority (GMCA).

The Civil Contingencies Act (2004) and accompanying non-legislative measures, deliver a single framework for civil protection in the UK. The Act is separated into 2 substantive

parts: local arrangements for civil protection (Part 1); and emergency powers (Part 2).

- **Part 1 of the Act** and supporting Regulations and statutory guidance 'Emergency Preparedness' establish a clear set of roles and responsibilities for those involved in emergency preparation and response at the local level. The Act divides local responders into 2 categories, imposing a different set of duties on each:
  - **Category 1** are organisations at the core of the response to most emergencies (the emergency services, local authorities, National Health Service (NHS) bodies). Category 1 responders are subject to the full set of civil protection duties. They will be required to:

- Assess the risk of emergencies occurring and use this to inform contingency planning
- Put in place emergency plans
- Put in place business continuity management arrangements
- Put in place arrangements to make information available to the public about civil protection matters and maintain arrangements to warn, inform and advise the public in the event of an emergency
- Share information with other local responders to enhance coordination
- Cooperate with other local responders to enhance coordination and efficiency
- Provide advice and assistance to businesses and voluntary organisations about business continuity management (local authorities only).

o **Category 2 organisations** (the Health and Safety Executive, transport and utility companies) are 'cooperating bodies'. They are less likely to be involved in the heart of planning work, but will be heavily involved in incidents that affect their own sector. Category 2 responders have a lesser set of duties - cooperating and sharing relevant information with other Category 1 and 2 responders.

Category 1 and 2 organisations come together to form 'local resilience forums' (based on police areas) which help coordination and cooperation between responders at the local level.

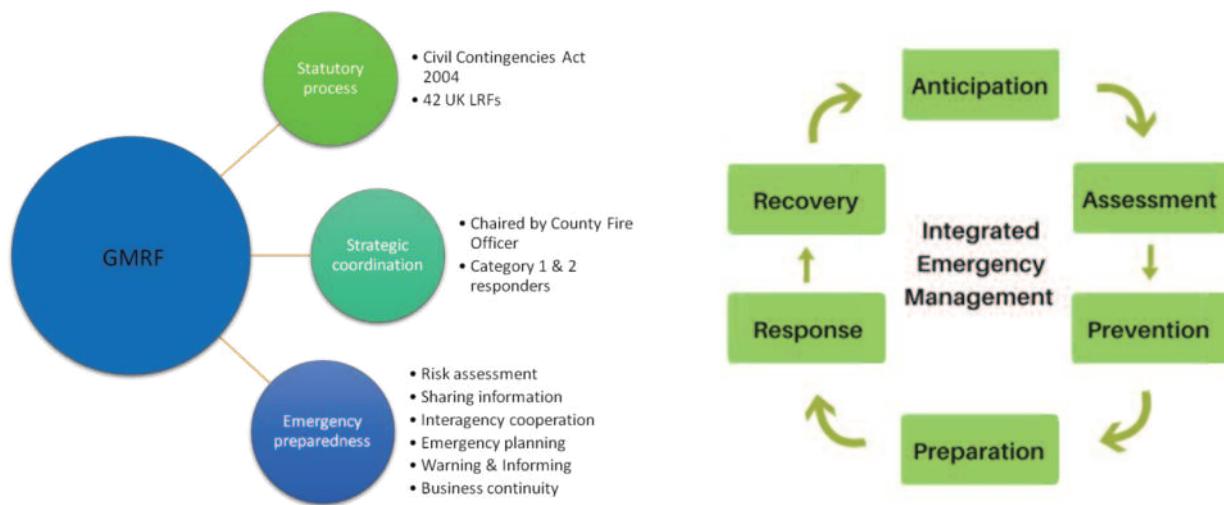
- **Part 2 of the Act** allows for the making of temporary special legislation (emergency regulations) to help deal with the most serious of emergencies. The use of emergency powers is a last resort option and

planning arrangements at the local level should not assume that emergency powers will be made available. Their use is subject to a robust set of safeguards - they can only be deployed in exceptional circumstances.

The national Ministry of Housing, Communities and Local Government Resilience and Emergencies Division (RED) provides a key conduit between national and sub-national tiers.

The Greater Manchester Resilience Forum (GMRF) sits at the heart of civil protection arrangements in Greater Manchester. As a multi-agency partnership it brings together a wide range of stakeholders from different agencies to drive forward an integrated emergency management approach as shown in the figure below:





Source: "Greater Manchester overview of Disaster Governance and Risk" | Kate Green

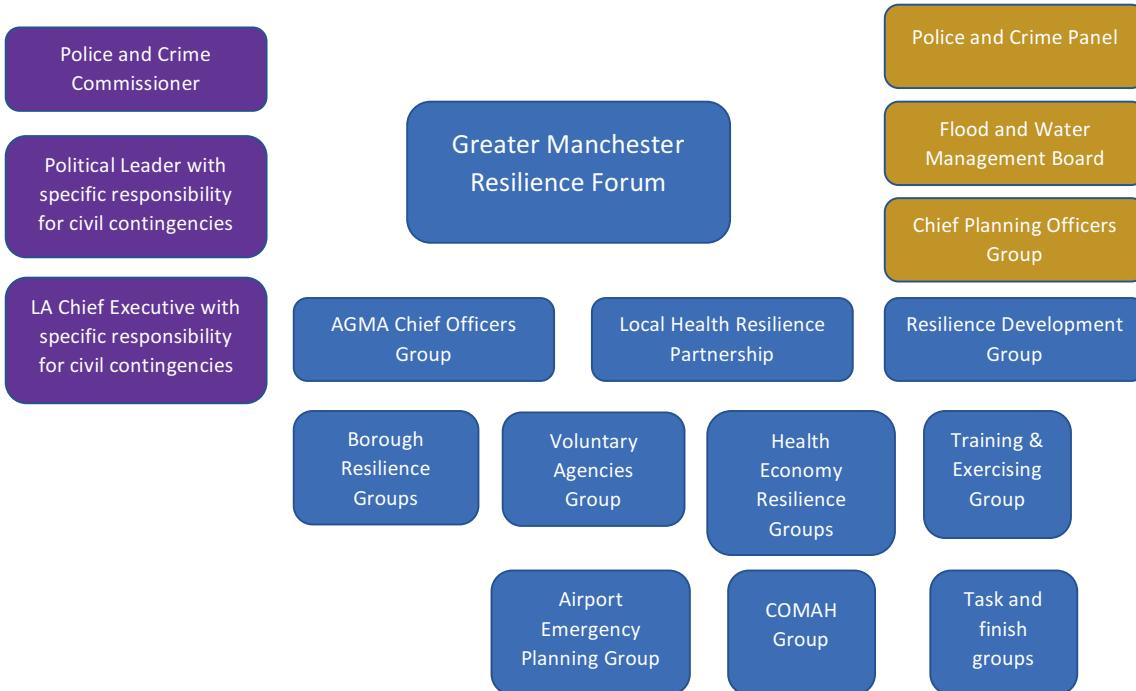
The GMRF provides a strong foundation for civil protection activities with collaboration and coordination of activity across different stakeholders.

The GMRF is coterminous with the GM Local Health Resilience Partnership (LHRP) and also has strong links to the UK Government Resilience and Emergencies Division.

The GMRF has facilitated co-located services enabling Greater Manchester Police (GMP), Greater Manchester Fire and Rescue Service (GMFRS), AGMA, North West Ambulance Service (NWAS NHS Trust) and the National Health Service (NHS) to work from a shared location in both planning and response.

As of April 2015, the GMRF partnership had commissioned the following working arrangements, with specific task and finish groups established to deliver specialist projects.





Source: "Greater Manchester overview of Disaster Governance and Risk": Great Manchester Resilience Forum

At the local level GM is comprised of ten district local authorities (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan), each individually a Category 1 under legislation and the GMCA.

The GMCA is made up of the ten GM local authorities and an elected GM Mayor, who work with other local services, businesses, communities and other partners to improve the city-region.

The GMCA is run jointly by the leaders of the ten councils and the Mayor of GM and gives local people more control over issues that affect their area. It means the region speaks with one voice and can make a strong case for resources and investment. It helps the entire North of England achieve its full potential.

To understand civil protection risks, the GMRF must have appropriate and effective leadership, structures and processes in place in order to prepare and maintain a collective Community Risk Register (CRR) to:

- Enable a proportionate and evidence based approach
- Provide a rational basis for development and prioritisation of work programmes and allocation of resources
- Develop shared and consistent planning assumptions
- Facilitate joined-up planning and validation of plans and capabilities
- Publish accessible content both for partner agencies and the public.

The GMRF commissioned a full review of the CRR methodology in 2014, good practice was reviewed from other areas and incorporated with findings from completion of the UNISDR City Resilience Scorecard.

The CRR is used to inform the work programme for GMRF. There is also a Threats Working Group in place to work with the NW Counter Terrorism Unit around how to assess / present these risks in the register. The outcome of the risk assessment process drives the multi-agency planning process.

## 2. GREATER MANCHESTER: PEER REVIEW PROCESS

GM identified the following areas for assessment through the peer review process:

Uscore2 Peer Review Modules	Making Cities Resilient 10 Essentials
<b>8a.</b> Increase Infrastructure Resilience	<b>Essential Eight:</b> Increase Infrastructure Resilience
<b>10.</b> Expedite Recovery and Build Back Better	<b>Essential Ten:</b> Expedite Recovery and Build Back Better

During a project workshop held in Salford (November 2017) as part of the work to design the peer review tool, based on the experience of the peer review in Viggiano of October 2017, it was suggested that, for the Review Team to better understand the DRR issues of the city under review, Amadora and GM would also provide information relevant to Module 2 (Identify, Understand and Use Current and Future Risk Scenarios).

GM also defined the specific objectives for the peer review. These were related to:

### Module 8a:

- What infrastructure supports the functioning of the city?
- The condition and vulnerability of the infrastructure and whether it lies in areas at risk from hazards
- The design codes and maintenance standards that ensure resilience is considered throughout an asset's lifecycle
- The stakeholders that own and operate the infrastructure, together with the availability of data for use in disaster risk mitigation, prevention, response and recovery.

### Module 10:

- Understanding the mechanisms through which government financial, material and technical resources are provided in support of disaster-impacted communities and the need for any local management and disbursement of rebuilding money and disaster funds
- Based on previous events (e.g. Arena Attack 2017 and Boxing Day Floods 2015) what is the integration of DRR in all investment decisions for recovery and reconstruction?

Over the course of the peer review, GM fielded 17 stakeholders to meet with the Review Team who would like to express their gratitude to all those who participated. Salford also provided an excellent translation service during the peer review.

The review was conducted according to the timetable in Appendix 1.

## 2.1 MODULE 8A: INCREASE INFRASTRUCTURE RESILIENCE [9TH / 10TH JULY]

### 2.1.1. Why Module 8a Was Chosen

Critical infrastructure includes facilities that are required for the operation of the city and, where different, those that are required specifically for emergency response. As such, special attention must be paid to preserving their function and risk reduction efforts must focus on ensuring they can continue providing services when most needed. Critical infrastructure required for city operation may include but is not limited to: transport (roads, rail, airports and other ports), vehicle and heating fuel suppliers, telecommunication systems, utilities systems, hospitals and healthcare facilities, educational institutes and school facilities, food supply chains, police and fire services, etc. They also carry out essential functions during and after a disaster, where they are likely to provide recovery and relief.



## 2.1.2 DISASTER RESILIENCE SCORECARD FOR CITIES ASSESSMENT CRITERIA

The following table describes the preliminary, high level indicators for this Essential. These were used in the peer review as indicators against which to gather evidence and make recommendations.

### Essential Eight: Increase Infrastructure Resilience

Assess the capacity and adequacy of critical infrastructure

- Consider possible damage to parallel infrastructure. For example, impact on evacuation capacity if one of two roads out of a city is blocked
- Take into account linkages between different systems. For example, impact when a hospital loses its power or water supply.

Strengthen / retrofit the vulnerable infrastructure

- Start systematic triaged processes for prioritisation of retrofit or replacement of unsafe infrastructure
- Liaise with and build connections between infrastructure agencies (including those that may be in the private sector) to ensure resilience is considered appropriately in project prioritisation, planning, design, implementation and maintenance cycles
- Carry out procurement processes that include resilience criteria agreed upon by the city and stakeholders and is consistent throughout.

Establish alliances with environmental managers and the private sector

- Build capacity with partners to carry out risk and vulnerability assessments, environmental assessments and scientific monitoring, expanding governance capacities for ecosystem-based disaster risk management through multi-sector, multidisciplinary platforms, involving local stakeholders in decision making
- Build partnerships with the private sector to leverage technical and financial resources and ensure that private investments follow environmental and risk reduction norms.

Recognise the relevance of priority services and operations during and after a disaster

- For emergency management infrastructure, assess “surge” capacity – ability to deal with suddenly increased loadings from law and order issues, casualties, evacuees, and so on;
- Protect or support the protection of cultural and collecting institutions, and other sites of historical, cultural heritage and religious interest.

## 2.1.3 METHODOLOGY

To understand and assess GM's approach to Infrastructure Resilience the Review Team:

- a) Analysed documentation provided by GM ahead of the Review Team visit
- b) Analysed the guidelines and recommendations contained in Modules 8 and 10
- c) Analysed the publication "Disaster Resilience Scorecard for Cities" and bibliography about critical infrastructure and disaster recovery
- d) Participated in several site visits at infrastructure crisis rooms where it was possible to see different operational dynamics

e) Held interviews with public and private stakeholders. The different perspectives of the interviewees were fundamental for the Review Team to understand the key success factors, results achieved and aspects to improve.

The data gathered from these processes has been analysed by the Review Team and provides the evidence base for the assessment made in this section.



## 2.1.4 INFRASTRUCTURE RESILIENCE

After joining the UNISDR MCR campaign and 100 Resilient Cities initiative, GM has developed a set of documents to guide the path towards a more resilient community, better able to deal with natural and technological disasters. In this context, emphasis should be placed on the GM's Preliminary Resilience Assessment as an initial scan across the city region, looking at both stresses and shocks, as well as identifying areas which will be looked at in more detail ahead of the publication of GM's Resilience Strategy.

One of the main reflections on the morning of the first day (July 9th) from **Kate Green** (AGMA CCRU) when she said “(...) maintaining critical services are the biggest challenge in GM (...).” In fact, the perception that maintaining basic community services is a common vulnerability has led GM to a broad engagement with stakeholders in the region: The GMRF is a practical example of strong foundation collaboration and coordination of activity across different sectors.

According to **Andy Jackson** (ARUP) there is a vast web of networks and services in the region, due to the economic and social requirements: water, electricity, gas, communications and transportation. It was possible to understand the multiplicity of entities that manage the different networks and the GM Infrastructure Advisory Group that meets regularly is an important point for the sharing of synergies and concerns. However, some issues remained unclear for the Review Team:

- Sharing of documentation (business continuity plans / emergency plans) between the different entities
- Whether joint drills are carried out
- The process for the setting of priorities for the maintenance of critical services in a disaster situation.

### Infrastructure providers

- Water supply and waste water: United Utilities
- Electricity distribution: Electricity North West
- Gas distribution: Cadent
- Transport:
  - Transport for Greater Manchester
  - Highways England
  - Network Rail
- Telecommunications:
  - BT Openreach
  - Virgin Media
  - Other fibre providers

Mobile Telecoms



ARUP

Source: ARUP GM Infrastructure | ARUP Presentation

**Andy Jackson** mentioned that all networks have their own autonomy. He noted that if a natural or technological disaster affects the London region, supply to GM will not be compromised.

Incident response involving critical infrastructure is defined in the Civil Contingencies Act 2004 (CCA). The CCA itself:

- Sets out clear roles and responsibilities and a duty on bodies to plan and work together
- Provides structure for cooperation across agencies (locally through Local Resilience Forums as the principle mechanism for multi-agency coordination, and nationally, through government departments coordinated by COBR (Cabinet Office Briefing Room)
- Provides for risk assessments at national and local levels which in turn drives the National Resilience Capability Programme.



## 2.1.4.1. CRITICAL SECTORS

Christine Gough (MHCLG) pointed out that, in this context, the priorities for the next 5 years are:

1. Tackle terrorism at home and abroad, counter extremism and challenge the ideologies that feed it
2. Remain a world leader in cyber security
3. Deter state-based threats
4. Respond to crises rapidly and effectively
5. Build resilience at home and abroad.

The UK Government defines critical national infrastructure as “those critical elements of infrastructure (namely assets, facilities, systems, networks or processes and the essential workers that operate and facilitate them), the loss or compromise of which could result in either:

- Major detrimental impact on the availability, integrity or delivery of essential services – including those services whose integrity, if compromised, could result in significant loss of life or casualties – taking into account significant economic or social impacts; and / or
- Significant impact on national security, national defence, or the functioning of the state.”

Sector(s)	Lead Government Department (LGD)
Chemicals	Department for Business, Energy and Industrial Strategy (BEIS)
Civil Nuclear	Department for Business, Energy and Industrial Strategy (BEIS)
Energy (Oil, Gas and Electricity), Post	Department for Business, Energy and Industrial Strategy (BEIS)
Government	Cabinet Office (CO)
Telecoms and the Internet, Broadcast	Department for Culture, Media and Sport (DCMS)
Food	Department for the Environment, Farming and Rural Affairs (Defra)
Water & Sewerage	Department for the Environment, Farming and Rural Affairs (Defra)
Transport (Aviation, Rail, Road, Maritime) and HM Coastguard	Department for Transport (DfT)
Health and Ambulance Services	Department of Health (DH)
Finance	Her Majesty's Treasury (HMT)
Police, Fire & Rescue Services	Home Office (HO)
Defence	Ministry of Defence (MoD)
Space	UK Space Agency (UKSA)

Source: National civil protection governance and UK approach to protecting critical infrastructure | MHCLG Presentation

The definition of critical national infrastructure is applied to 13 critical sectors where government departments and agencies promote:

- Identification and, where appropriate, organise the critical assets by importance
- Prioritisation of the vulnerabilities, hazards and threats across the UK's 13 critical sectors
- Mitigation of unacceptable vulnerabilities.

In most sectors, regulators are responsible for ensuring relevant legislation and regulations are observed. In some cases, this extends to security and resilience obligations. Some regulators can intervene and require organisations to meet particular security and resilience obligations or standards, as conditions for their continued operation. The primary responsibility of infrastructure owners / operators is to implement mitigation measures. According to **Christine Gough**, in most sectors, infrastructure owners and operators make calculated decisions on maintenance, training and investment to improve organisational and asset-level security and resilience.

The Cabinet Office provides guidance for consistency and best practice, but Local Government Departments (LGD) are responsible for their further development and maintaining them. They provide respective Ministers with an assessment of the security and resilience of the sector's Critical National Infrastructure (CNI) and an action plan for achieving security and resilience priorities in the coming financial year. There is, in fact, a government concern to focus on the responsibilities of the critical sectors.

The 13 critical sectors are managed by 10 agencies, which means the need for continuous sharing of information and integration. It is common for government agencies to operate from a standpoint of autonomous management and not to promote exchange of experiences or

to discuss weaknesses. The national government focus on this issue is resistance, reliability, redundancy, response and recovery.

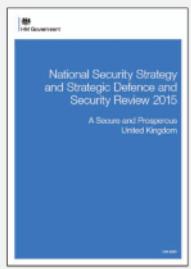
One of the critical sectors is defence. **Lieutenant Ray Carolin** gave a vision of military capability in different scenarios of risk and disaster. It was also clear that the military are involved in operational planning at regional and local level with their participation in drills and the ability to allocate resources to complex situations.

**UK OPERATIONS**

**UK GOVERNMENT DEFENCE POLICY**

**8 Defence Tasks:**

- Defend and contribute to the security and resilience of the UK and Overseas Territories. This includes deterring attacks; defending our airspace, territorial waters and cyber space; countering terrorism at home and abroad; supporting the UK civil authorities in strengthening resilience; and protecting our people overseas.
- Provide the nuclear deterrent.
- Provide strategic intelligence.
- Reinforce international security through conflict prevention, capacity building and counter proliferation.
- Support humanitarian assistance and disaster response, and conduct rescue missions.
- Conduct strike operations.
- Conduct operations to restore peace and stability.
- Conduct major combat operations if required.





Source: "Military Aid & Infrastructure Brief" | MOD

However, he mentioned the importance of investing in institutional relations between all entities with responsibility for safety and rescue. Infrastructure resilience can only be achieved by sharing information and identifying weaknesses.

During a crisis or contingency situation, ensuring continuity of communications and operational electronic systems helps civil society and the authorities to increase their levels of confidence and resilience. **Michael Jagger**, Specialist Consultant - Voice Solutions for KCOM, highlighted the legal obligations of communications operators in a disaster situation and the capacity they have to overcome possible disruptions.

It was possible to find out that:

- There is an updated mapping of communication networks
- There is a capacity for operators to inform the population about possible situations of danger
- There are regular communications resilience test
- Lessons learned from past events are important to improve operational and logistical procedures at the level of failures in communication networks. After the impact of the 2015 winter storms the national government decided to review the security and resilience of UK infrastructure to flooding
- Industry will develop longer term plans for improving the resilience of service to local communities.

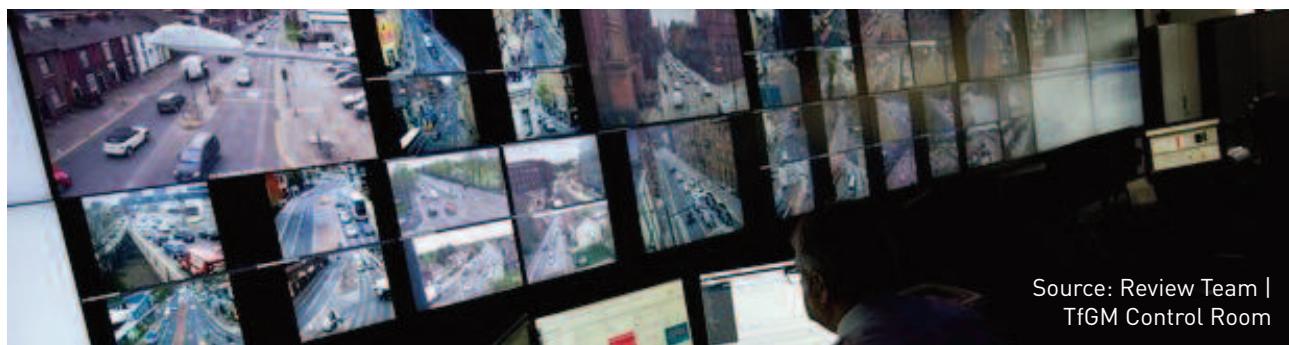
In this topic some questions were not clarified, such as:

- The impact on communications of a worst case scenario event
- Challenges for the communications on a major incident.

The afternoon of the first day of the peer review, was dedicated to GM transport system (Transport for Greater Manchester – TfGM). **Chris Thorpe, Lucy Kennon and Katie Price** presented the policy and objectives of the entity, where the concept of resilience has a prominent place.

There is a concern to ensure the comfort, convenience and well-being of network users, as well as the sustainability of the entire circuit construction and maintenance process. The interviewees explained that the expansion of the network is planned according to the territory and the risks that it faces. It is a joint planning process in which all scenarios are evaluated: environmental, shocks and stresses, economic and social impacts.

The daily pressure to ensure the best service in the transport sector is a decisive factor in working towards robustness and overcoming vulnerabilities. An example of this is the priorities set in case of incidents in the region: support for any evacuation process; flexing services to minimise disruption; facilitating movements.



Source: Review Team | TfGM Control Room

In addition, it should be noted:

- Existence of a risk matrix with different scenarios that may lead to a disruption in the operation of the network. Power supply was identified as one of the most difficult vulnerabilities to overcome
- Existence of a control room with the various entities (rail; Metrolink; highways; bus)
- Existence of an internal command and response structure linked to the authorities
- Periodic exercises to test weaknesses.

### Multi-Agency Incident Response

In the event of a Major Incident TfGM can support the multi-agency response through:

1. Prioritising transport provision to support evacuation priorities;
2. Enhancing / flexing services to minimise disruption;
3. Maintaining an overview of the 'Transport Network';
4. Making alterations to traffic light signal timings to facilitate movements of traffic;
5. Providing and publicising advice around alternative travel options; and
6. Liaising with key transport partners



Source: Infrastructure Resilience | TfGM Presentation

The terrorist attack (May 2017) was a true test of the structural and physical resilience of TfGM. The sharing of information, quick reaction and the collaboration with the responders were plainly positive aspects that enabled a demanding response and recovery.

On the second day of the peer review (10th July), Phil Stockford and Simon Thain described the impacts of recent extreme weather events on road infrastructures (Highways England). In fact, the last days of 2018 winter (28 February to 1 March) were the longest sustained period of cold days since December 2010:

- The most severely impacted roads were A66, M62, A628, A1, A69, A31, A30, A303 and A46
- The longest road closure was on the A66 which was closed for 3 days and 14 hours
- Incident numbers rose over the period from an average of 900 to 1200 incidents – a 33% increase

### Testing our capabilities

#### Well tested.....for real!

- 'Major Incidents' e.g. Boxing Day Floods (2015) and Arena Attack (2017)
- During 2018 alone:
  - 19 Feb – Metrolink Disruption
  - 1 March – Severe weather (snow)
  - 11 March – Protest at Piccadilly
  - 17 March – Severe weather (snow and low temperatures)
  - 19 March – Ray Mill fire
  - 21 May – IS outage (internal)



- 82.9% of incidents cleared in 1 hour against an 85% target
- At the peak over 200 traffic officer units were active each day over the period
- Operation traction was implemented throughout the period, with recovery vehicles pre-positioned at strategic locations across the network.



Source: Severe Weather 26th February-04th March | Highways England



Source: Severe Weather 26th February-04th March |  
 Highways England

During this period Highways England allocated several resources for the operational / logistic response:

- At peak over 200 traffic officer units were active each day over the period
- Operation Traction was implemented throughout the period, with recovery vehicles pre-positioned at strategic locations across the network
- 8 forces declared a major incident - West Yorkshire Police; Northumbria Police; Greater Manchester Police; Hampshire Police; Devon & Cornwall Police; Avon & Somerset Police; Wiltshire Police and Dorset Police
- Police and traffic officers welfare checked stranded vehicles
- 4 rest centres were opened in the North West
- Parking charges were suspended at motorway service areas
- Highways England worked with Local Authorities to agree priority diversions routes
- The military provided support in the North West, South East and East to assist with stranded vehicles / motorists on local cross-border routes.

The economic impacts of some extreme events are one of the concerns in the management of incidents, which identifies snow, floods, high winds and moorland fires as the main risks that may affect the normal operation of the entire network. The unpredictability of extreme events and user behaviour have led to additional measures being introduced to reduce the number of accidents and enhance relations with all organisations (e.g. MetOffice).



Source: Review Team | Highways England Depot

Electricity is very important in today's world, because it provides comfort, well-being, safety and leisure for society. Energy allows the operation of banks, hospitals, industries, schools, traffic lights and the communications network.

Electricity North West Limited (ENWL) is responsible for maintaining and upgrading 13,000 km of overhead power lines and more than 44,000 km of underground electricity cables and much more. This covers the diverse communities between the beautiful Lake District landscapes to the bustling city of Manchester and all towns and villages located in-between.

In the last five years ENWL have won £42m of competitive funding to ensure that network is fit for the future: maximising the use of the existing networks and introducing new technology and creative thinking to provide real solutions to real problems. ENWL develop ground-breaking smart and flexible solutions to provide customers with a reliable, affordable and sustainable service.

**Dan Randles and Mandy Ingham (ENWL)**, stated that the commitment to the efficiency of the service provided yields significant results:

- 90% of complaints are resolved in one day
- Compensation as a result of storm damage is paid after 18 hours
- Carbon footprint reduced by 10%
- Mitigate fuel poverty – 20% price reduction
- Improved services for vulnerable and Priority Service Register customers
- Resilient supplies to vulnerable locations.

Furthermore, it is clear the notion of addressing network vulnerabilities is acted upon as evidenced through the numerous investments that are being made:

- Network reliability (>£18m): continuing to invest to reduce the number of customers impacted by faults. Improved automation including at 132kV and 33kV voltage levels (TRS) to restore supplies quickly in the event of loss; industry frontier on interruption volumes for mixed topology network DNO; considering further investments to improve supply restoration performance
- Flood protection (~£14m): 47 sites targeted for flood defence (2015 – 2023); 20 completed to-date; Flood Risk Assessment surveys are being carried out for 1:1000 flood risk at 20 primary substations which supply more than 10,000 customers in line National Flood Resilience Report recommendation
- Black start capability (£4m): grid Supply Points and Bulk Supply Points all batteries to have a full 72 hour capacity; at Primary Substations with 33kV mounted switchgear, battery saver will be installed (this device will automatically disconnect the protection and control batteries in the event of a black start event and reconnect when supply resumes or from control room instruction).

The Review Team had the opportunity to visit the Rochdale Electricity Sub-Station, a facility that is currently undergoing improvements. Regarding the flood risk on the site, the importance of the station to the electric supply system required a large investment to ensure the structure's resilience:

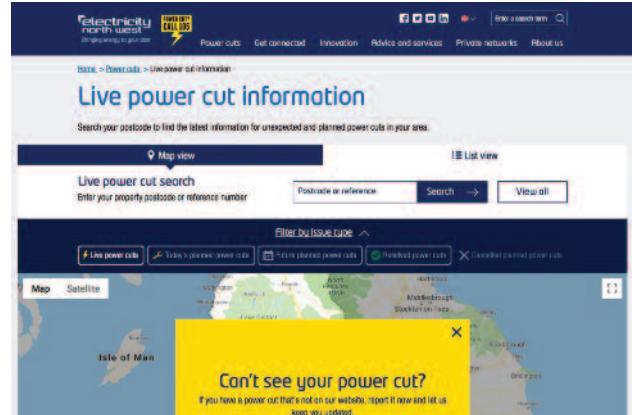
- Fill ~200 cable entry ducts to stop ingress of water particularly into 33kV cable basement
- Install pumps in basement with float switches and alarms
- Install CCTV to monitor water level on site and river
- Fit flood doors to all buildings

- Build concrete panel deflection walls to give first line flood defence against running water
- Construct high walls around distribution sub to maintain critical supplies for pumps
- Spray apply Adeline polyurea to brick walls to increase flood height protection
- Lay new 33kV interconnector to Belfield 132Kv.



Source: Review Team | Rochdale ESS

The vulnerabilities identified by **Dan Randles and Mandy Ingham (ENWL)**, were related to extreme events (especially storms with high winds and rain) and the difficulty in maintaining a continuous supply. ENWL's website supplies real-time and detailed information, which provides important support for users. It does not eliminate the sector incapacities to respond in disaster situations, but provides community information, which the Review Team identified as good practice in terms of helping people to manage the impact of service interruptions.



The screenshot shows the Electricity North West website with a search bar for "Postcode or reference" and a "Search" button. Below the search bar, there are filter options: "Live power cuts" (selected), "Takes & delivery issues", "Extra planned power cuts", "Standby power cuts", and "General network power cuts". A map of the North West region shows several yellow markers indicating power cuts. A yellow callout box in the center of the map says "Can't see your power cut? If you have a power cut that's not on our website, report it now and let us keep you updated."

GM is a region with its own ~~economic and social~~ dynamics. All systems are integrated, as in most technologically developed societies, through the dependence on energy supply. The questions about “significant loss of service expected for a significant proportion of the city in the ‘worst case’ scenario event?”, or, “in the event of failure would energy infrastructure corridors remain safe (i.e. free from risk of leaks, electrocution hazards, etc.)?” were answered with the investments that have been made to improve the response of the structures. However, it all depends on the magnitude and severity of the extreme event.

The last critical sector evaluated in Module 8a was the water and sewerage. **Suzanne Halligan, from United Utilities**, presented the key issues about the sector:

- Balancing the needs of all customers
- Planning for future uncertainty and climate change
- Providing evidence based plans to enable people to make informed decisions
- Carrying out statutory duty to protect the water environment
- Protecting the landscape and amenities of the areas where people live, work and play in.

For the peer review process it was important to better understand planning for future uncertainties and climate change. United Utilities summarised their main actions:

- Total demand for water in the region has reduced in 18 out of the last 20 years. This was achieved by monitoring the network for leaks, replacing old pipes, finding and fixing leaks
- Right now, it's possible to find and fix leaks that are breaking out at a rate of more than 7,500 leaks per year on United Utilities own pipes and those found on customer's properties. Leakage in North West England is currently below the 'sustainable economic level', this means that the cost of finding and fixing the leak, including costs to society (e.g. additional traffic disruption) and the environment (carbon emissions), are more expensive than the cost of taking the water from water sources
- Since 2010 United Utilities have increased efforts to assist customers in becoming more water efficient in their homes and businesses. They offer primary schools in the North West a free water efficiency education programme

- On the other hand, climate change may be worse than predicted or pollution may mean that some water sources can't be used for periods of time. They have assessed the uncertainty forecasts and have allowed sufficient tolerance between supply and demand forecasts. They have also considered scenarios with more extreme outcomes and identified sufficient options in the plan to meet any potential deficit.

**Suzanne Halligan**, identified the major risks as water quality, supply disruption and drought. These concerns are set out in the document "Final Water Resources Management Plan" which reveals a special focus on the flexibility of the sector and potential contingencies:

- Contingency is based around the local sources alternative plan
- Working with the Environment Agency to improve collective understanding of resource availability
- Different pathways depend on the level of resource
- Contingency plans are updated on an annual basis as a minimum.



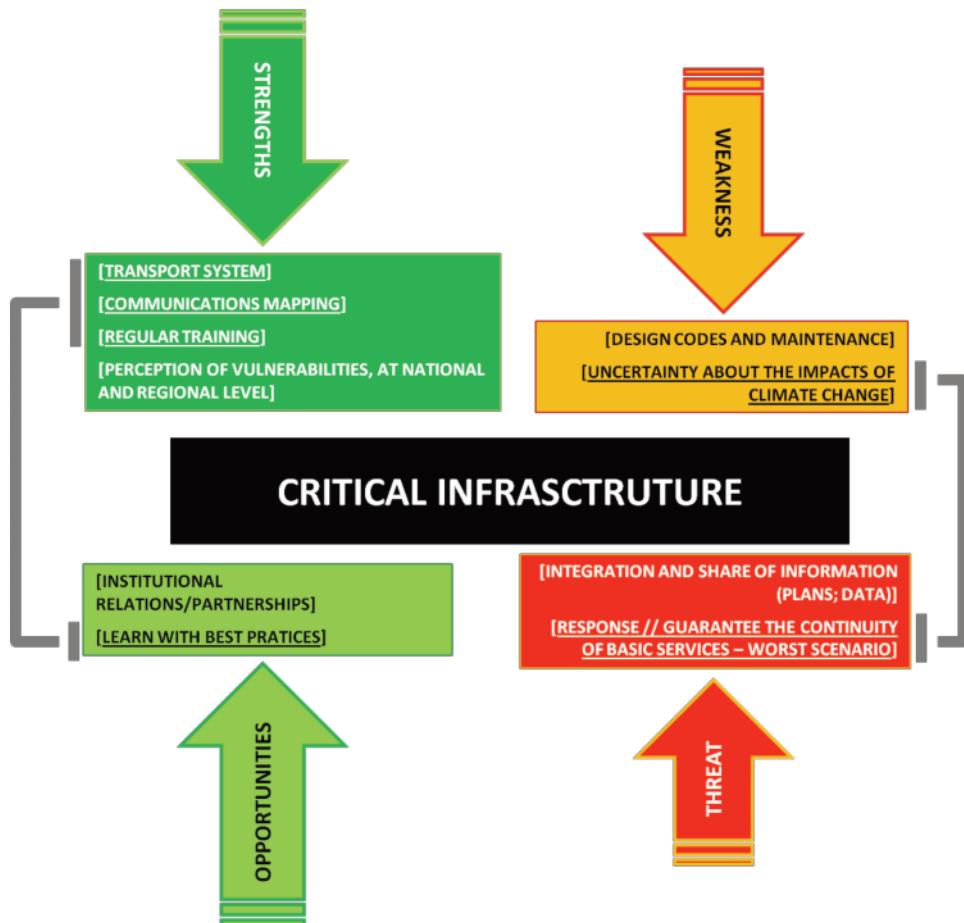
Source: Review Team | United Utilities facilities

## 2.1.5. SWOT ANALYSIS / MATRIX

SWOT MATRIX	
<b>Strengths</b>	<ul style="list-style-type: none"> <li>(1) There is clear concern about the prevention, relief and recovery of critical infrastructures by the national government and the GMCA. It means the region speaks with one voice and makes a strong case for resources and investment in the infrastructures resilience;</li> <li>(2) The internal organisation of each critical sector evaluated during interviews (energy; government; communications; water and sewerage; transport; defense). The concept of resilience is a concern about the need to maintain the operation supply of services;</li> <li>(3) The demands of the community to have the main basic services at their disposal (water, electricity, transport, sewerage) obliges the operators to guarantee a dynamic planning and operational network;</li> <li>(4) Disaster response planning with regular training is a common practice across all sectors and organisations that own and manage critical infrastructures;</li> <li>(5) There is clear interaction of the military in the operational planning of the region and local level, their participation in drills and the ability to allocate resources to complex situations;</li> <li>(6) There is mapping of communications networks and capacity of the operators to inform the population about possible disruptions. Lessons learned were important to improve operational and logistical procedures in communications failure;</li> <li>(7) The transport system in the region illustrates many of the different aspects of resilience: physics, systems and procedural. An example of this is the existence of a risk matrix with different scenarios that may lead to disruption in the operation of the network; existence of a control room incorporating various entities (rail; Metrolink; highways; bus); existence of an internal command and response structure linked to the authorities; periodic exercises to test weaknesses;</li> <li>(8) There is a commitment to addressing power supply network vulnerabilities through the numerous investments that are being made.</li> </ul>
<b>Weaknesses</b>	<ul style="list-style-type: none"> <li>(1) Non-sharing of relevant information between the critical sectors: existing policies, business continuity, operational and communications plans, plus reports that outline the risks that each organisation faces;</li> <li>(2) One of the main emerging challenges is the response of critical infrastructures to high impact events. Regarding the vulnerability of these sectors, it has not been clear what the alternative responses are in place against the collapse of their infrastructure;</li> </ul>

## SWOT MATRIX

<b>Weaknesses</b>	<ul style="list-style-type: none"> <li>(3) The 13 critical sectors are managed by 10 agencies, which means the need for continuous sharing of information and integration of plans and approaches. The government agencies should promote an exchange of experiences and / or a cross-sector discussion of weaknesses;</li> <li>(4) The entities did not always have the understanding of the worst scenario impact built into their facilities or networks;</li> <li>(5) The vulnerability of some infrastructures, due to their location, is an aspect to consider. Despite investments made to maintain structures for a possible impact (return period acceptable), this may not be enough.</li> </ul>
<b>Opportunities</b>	<ul style="list-style-type: none"> <li>(1) The low score of Essential 8 - Increase Infrastructure Resilience, in the Disaster Resilience Scorecard for Cities, which measures infrastructure resilience levels, despite being in part due to the indicators being used in the scorecard at the time, should be seen as an opportunity to improve collaboration and integration across sectors to achieve a single vision of resilience;</li> <li>(2) It is evident, through the various publications presented during the peer review, that GM has a strong understanding of resilience. The work produced can and should be disclosed.</li> <li>(3) Partnerships with the private sector can be further developed to leverage technical and financial resources and ensure investments follow environmental and risk reduction guidelines;</li> <li>(4) Investing in institutional relations between all entities with responsibility for safety and rescue. Infrastructure resilience can only be achieved by sharing information and identifying weaknesses.</li> </ul>
<b>Threats</b>	<ul style="list-style-type: none"> <li>(1) The ongoing maintenance of critical infrastructures at acceptable levels of response and recovery. The design codes and maintenance standards that ensure resilience needs to be considered throughout an asset's lifecycle;</li> <li>(2) One of the main emerging challenges is the response of critical infrastructures to a high impact event. The losses and damages according to the possible scenarios were not mentioned by most sectors. The weaknesses that each sector presents should be the starting point for improving the process of prevention, response and recovery.</li> </ul>



Source: Review Team

## 2.2. MODULE 10: EXPEDITE RECOVERY AND BUILD BACK BETTER [11TH JULY]

### 2.2.1. Why Module 10 Was Chosen

Recovery is the most complex of the disaster management functions. In post-disaster recovery, it is critical to prevent and reduce disaster risk by Building Back Better. This includes increasing public education and awareness of disaster risk. Effective recovery can help to reduce future risk by increasing resilience through mandating risk-aware, climate-adaptive and development-focused recovery goals. Recovery is most successful when the wide-ranging needs of communities, organisations and individuals are addressed in a coordinated manner.

However, cities are built by many entities over decades or centuries and hence are difficult to rebuild in a short period of time. There is continual tension between the need to rebuild quickly and to rebuild as safely and sustainably as possible. An affordable, well-planned and participatory recovery and reconstruction process helps the city reactivate itself, restore and rebuild its damaged infrastructure and ecosystems, recover its economy and empower citizens to rebuild their lives, housing and livelihoods. Effective recovery can also limit losses, avoid ongoing disruption and loss of confidence in city leadership and prevent cascading failures or an escalation in the disaster through failure to address its initial consequences.

In the aftermath of a disaster time is a valuable, yet extremely limited resource. Reconstruction must begin as soon as possible – in fact, cities can foresee needs, establish operational mechanisms and pre-assign resources before a disaster. Assessments have highlighted that many initial intentions to Build Back Better following disasters can be quickly overtaken by a need to rapidly get back to a perception of economic and social normality, yet research also suggests cities which are institutionally and

financially prepared to recover tend to perform better post-disaster. Preparing ahead of a disaster can support the integration of DRR into development measures, including updating of infrastructure, changing land use planning and embedding climate change adaptation, making cities and their communities resilient to disasters. Preplanning, leadership, coordination and financing are key.



## 2.2.2. DISASTER RESILIENCE SCORECARD FOR CITIES ASSESSMENT CRITERIA

The following table describes the preliminary, high level indicators for this Essential. These were used in the peer review as indicators against which to gather evidence and make recommendations.

### Essential Ten: Expedite Recover And Build Back Better

Recovery must be addressed in various aspects

- Provide shelter, food, water, communication, addressing psychological needs, etc. post-event
- Limit and plan for any use of schools as temporary shelters
- Identify the dead and notify next of kin
- Conduct debris clearing and management
- Take over abandoned property.

Include the affected population in the definition of needs and recovery plans

- Build systems to help communities integrate disaster risk reduction into decisions they take to recover from the disaster, to reduce future vulnerabilities
- Take specific actions for recovery of sectors including livelihoods, health, education, critical infrastructure, environment and ecosystem, psycho-social support, cultural heritage and governance issues such as accountability, roles and responsibilities and corruption control
- Manage local, national and international aid and funding. Coordinate efforts and prioritise and manage resources for maximum efficiency, benefit and transparency.

Recovery is an opportunity to build back better and improve development

- Undertake retrospective / post-disaster assessments to assess potential new vulnerabilities and build learning into future planning and response activities
- Promote business continuity and economic reboot.

Seek resources, strengthen alliances and ensure sustainability

- Ensure that the recovery programmes are consistent and in line with the long-term priorities and development of the disaster affected areas
- Integrate further DRR in all investment decisions for recovery and reconstruction.

## 2.2.3. METHODOLOGY

---

To understand and assess GM's Salford approach to recovery the Review Team:

- a) Analysed documentation provided by GM ahead of the Review Team visit
- b) Analysed the guidelines and recommendations contained in Module 10
- c) Analysed the publication "Disaster Resilience Scorecard for Cities" and bibliography about disaster recovery

d) Held interviews with public and private sector stakeholders. The different perspectives of the interviewees were fundamental for the Review Team to understand the key success factors, results achieved and aspects to improve.

The data gathered from these processes has been reviewed by the Review Team and provides the evidence base for the assessment made in this section.



## 2.2.4. RECOVERY

Most of the emergency response GM plans develop capabilities to deal with common consequences of emergencies rather than individual risks. Examples of plans and capabilities include:

- GM Generic Response Plan
- Borough evacuation, shelter and humanitarian assistance plans
- Urban Search and Rescue (USAR) assets
- Fatalities and casualties plans
- Site clearance plans
- Recovery guidance.

Aligning the emergency capabilities and plans with consequences allows GM to use the risk assessments to identify where there may be gaps that need to be managed. Risk assessment allows the authorities to change existing plans and capabilities, create new capabilities if they are needed, or even scale back capabilities if they are disproportionate to the expected levels of consequence. A risk treatment plan is agreed by GMRF members and whilst it's never possible to eliminate all risk, or close all gaps, this approach means that residual risks and gaps can be reduced to an acceptable level.



Source: "Greater Manchester overview of Disaster Governance and Risk" | Kate Green

Building the capacity to deal with probable risks is the first step to ensure a more efficient recovery process. Recovery is the final step of integrated emergency management. If GM can guarantee a good balance between prevention and response, the recovery will be a process with better results. Recovery ahead of a disaster can include: creating and strengthening recovery-focused relationships, establishing planning and coordination mechanisms and ensuring procedures and protocols to inform and support recovery activities are in place.

Regarding this **Christine Gough (MHCLG)**, focused on the main UK National Recovery Arrangements:

- Longer term risk assessment at national and local levels
- Plans to ensure the Government is ready to respond to and recover from a variety of disruptive challenges

- Appropriate capabilities and plans are in place supporting recovery
- Departments, communities, businesses and key infrastructure services are encouraged and supported to be more resilient to withstand the impact of events – to ensure effective recovery and to prevent problems becoming crises in the first place.

In the UK perspective recovery is the process of rebuilding, restoring and rehabilitating the community following an emergency and at the same time is a complex and long running process often involving more agencies and participants than in the response phase. The issues can include: humanitarian assistance; economic assistance; support to rebuild infrastructure; support to deal with the environmental impacts.



Local Authorities are the lead agency responsible for planning for the recovery of the community. The local authority will usually lead the recovery process and chair a Recovery Coordinating Group, however, they will need strong support from a wide range of Category 1 and 2 responders.

There are a range of Lead Government Departments (LGDs) including MHCLG for flooding recovery, Grenfell Tower recovery and DEFRA for CBRN incidents. Lead Government Departments have the following pre-designated responsibilities:

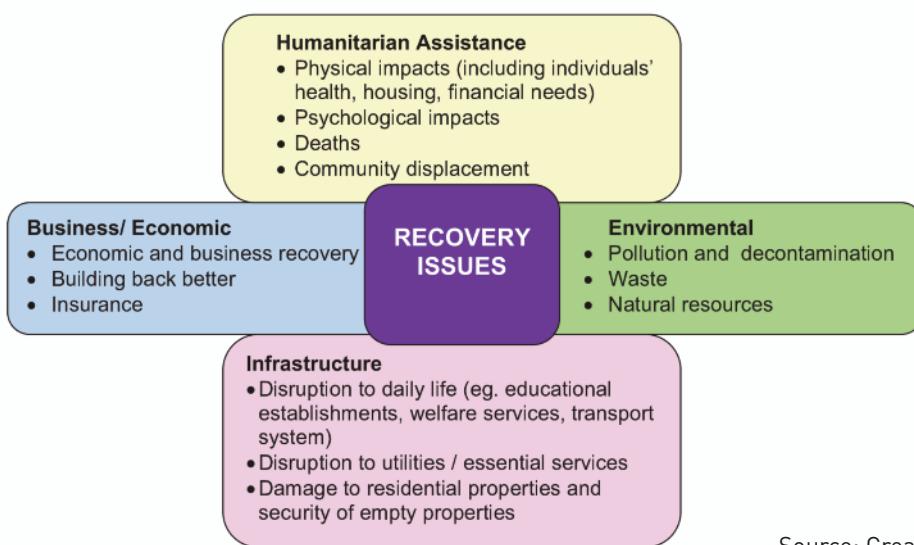
- Planning for (including responding to and recovering from) specific emergencies - normally through local responders, but in some cases directly
- Parliament and media handling
- Ensuring adequate resources are available
- Sharing learning from exercises and emergencies.

The Cabinet Office coordinates and supports planning by LGDs and leads on cross-departmental issues.

**Christine Gough (MHCLG)**, brought to the discussion recent examples of complex recovery:

- **Flooding 2015:** recovery live until April 2018
- **Manchester Arena May 2017:** recovery recently integrated into business as usual
- **Grenfell Tower June 2017:** work will continue for the foreseeable future.

From the Review Team's perspective the examples above are proof that recovery requires strong leadership and a multi-stakeholder approach. The existence of long established formal and informal networks within and across communities and borders can make a difference in the effectiveness of recovery activities, including strong links between different tiers of government. Stakeholders should include vulnerable people who are often significantly impacted in the post-disaster environment and so can be less capable of coping in a disaster. The effort made by GM in the development of its Strategic Recovery Guidance document is very important, with an emphasis on involving key sectors of the community, assigning clear missions and responsibilities to different agencies with terms of reference and protocols agreed. The inclusion of insurers is also a very positive aspect.



Source: Greater Manchester Strategic Recovery Guidance

## 2.2.4.1. MANCHESTER ARENA ATTACK – RECOVERY PROCESS

Terrorist attacks have huge consequences for the people affected. People have lost their lives while others have been wounded. It may also have a profound impact on people who have been confronted by the impact, such as the network around the victims, witnesses to the attack and professionals involved in the response to the situation. In fact, victims and society alike are in shock; giving rise to psychosocial needs.

Taking stock of the concept of different phases after an attack can also help us to better understand the dynamics in society after a terrorist attack. The length of the phases differs from person to person on a micro level and between those directly affected and the rest of society. This explains the discrepancy that may occur between the process of recovery, the needs of victims during this process and the way in which society, including authorities and professional health care workers at large respond to them.

On 22 May 2017 at 22:31 a suicide bomber detonated an improvised explosive device, packed with nuts and bolts to act as shrapnel, in the foyer area of the Manchester Arena. The attack took place after an Ariana Grande concert with 14,200 people attending, composed of mainly a teenage audience accompanied by parents / family members. Many exiting concert-goers and waiting parents were in the foyer at the time of the explosion.

It was with efficiency and in an organised manner that GM prepared an Impact Assessment document to identify and inform:

- The categories and numbers of people known or anticipated to have been affected (and where they reside)
- Their anticipated needs over the coming weeks, months and years
- The likely resource requirements over the next 1 to 36 months
- The leadership to coordinate and deliver an effective service to all people affected, that also ensures clarity in respect of the responsibility and accountability for its delivery
- Potential risks to an effective delivery and measures necessary to mitigate;
- Any other action necessary to ensure a cohesive, comprehensive response that ensures all people affected are identified, appropriately communicated with, and integrated into the recovery process.

**Paul Argyle, Multi-Agency Strategic Advisor to the Mayor and Deputy Mayor (GMCA),** explained to the Review Team that the recovery process for the Arena Attack involves several working groups and authorities to care for people, restore confidence, establish a feeling of security and ensure livelihoods are maintained.

Impact group	Lead workstream	Supporting and enabling workstreams			
<b>Directly affected</b>	Human aspects, welfare & health	Strategic leadership of recovery			1
<b>Responders and other staff</b>	Human aspects, welfare & health				2
<b>Wider community</b>	Community recovery		Communications		3
<b>Business</b>	Business and economic recovery		Learning		4

Source:  
 Manchester  
 Arena Attack  
 Recovery  
 Impact  
 Assessment

Normally after a terrorist attack, cities respond in the same way: by returning to normality as quickly as possible. Such displays of resilience among local residents is often reported in the aftermath of these events. However, scientific evidence of resilience is less abundant, and tends to focus only on people's attitudes and not their actual behaviour.

Resilient victims in a resilient society is an important goal. This also implies meeting the needs of 'non-victims' after an attack, even if these needs are far more limited than those of the immediate victims. As experts through experience, victims can also play a role in making society more resilient, by participating in, or initiating activities that can help to prevent and counter extremism.

When it comes to meeting the needs of the victims, it is not only the support or the offer of support that dictates whether resilience is boosted. Perception also plays a major role. Is support seen by the victim as recognition and acknowledgment? Or do other factors, like previous experiences or tone of voice, affect feelings? Victims of terrorism make a difference here. They can be involved in drafting and executing policy and legislative initiatives and helping to organise support for victims. They can also be brought on board within response teams formed in the immediate aftermath of an attack. Doing so raises the degree of acceptance for support as well as trust levels among victims.

One of the issues under analysis during the peer review was the activation and execution of emergency coordination plans. In an event such as the Arena Attack, the line between the responsibility of the event / concert organisers (private sector) and the interests of the state (city security and safeguarding of human life) are always critical. **Paul Argyle** mentioned that following the terrorist attack the security for these kind of events was improved.



Source: Review Team | Recovery from the Manchester Arena Attack presentation

**Tom Walley (AGMA CCRU)**, during the interview with the Review Team, reported that for many of those affected, recovery will not end. In fact, ensuring that those affected do not feel forgotten is a challenging task. From the psychological and emotional point of view, recovery from a disaster may never be fully achieved. The disaster impact may be for a lifetime, especially for those who have lost a family member or friend.

Not all the impacts of terrorism and even natural disasters are fully known. The strategy for preparing for such disasters should include insuring the ability / training of all stakeholders. All the organisations and people mentioned in the Strategic Recovery Guidance should act based on this principle. In order to ensure continued learning, joint exercises (Command Post Exercise / CPX; Table Top Exercise / TTX; Live Exercise / LIVEEX) to test this strategic document should be a priority.



Although intrinsically personal, people can be encouraged, supported and helped to trust their own mental and emotional strength again. Stimulating resilience by meeting needs and helping individuals address challenges gives back control and supports the recovery process.

Even if victims are not able to regain full independence, it is important to help them take back control of their lives wherever possible, in addition to providing any assistance needed.



## 2.2.4.2. SALFORD FLOOD RISK – PLANNING, RECOVERY AND LESSONS LEARNED

On the last day of the peer review, **Councillor Derek Antrobus** gave a presentation about Salford City Council and their flood risk management. As highlighted during the peer review of Module 8a, the Councillor reiterated the importance of the concept of resilience in GM and how Salford has contributed to it.



Source: [https://en.wikipedia.org/wiki/Greater\\_Manchester#/media/File:Greater\\_Manchester\\_County\\_\(3\).png](https://en.wikipedia.org/wiki/Greater_Manchester#/media/File:Greater_Manchester_County_(3).png)

The City of Salford is bounded to the north by the boroughs of Bolton and Bury, to the south by Trafford, to the west by Wigan and to the east by Manchester. Greenspace accounts for 55.7% of the City of Salford's total area, domestic buildings and gardens comprise 20.0%, and the rest is made up of roads and non-domestic buildings.

To the south of Salford are the docks of Salford Quays, now home to the iconic MediaCityUK – the home of BBC North. MediaCityUK is a large area that crosses the boundary into Trafford Park, Trafford. Although Salford Quays is in the City of Salford, new M50 postcodes were distributed to the area to separate and create new boundaries in the early 2000s.

The River Irwell runs south east through Kearsley, Clifton and Agecroft then meanders around Lower Broughton and Kersal, Salford Crescent and the centre of Manchester, joining

the rivers Irk and Medlock. Turning west, it meets the Mersey south of Irlam, where the route of the river was altered in the late 19th century to form part of the course of the Manchester Ship Canal. The ship canal, opened in 1894, forms part of Salford's southern boundaries with Trafford. The city's climate is generally temperate, like the rest of GM. The nearest weather station is 16 km away at Ringway, in Manchester; the mean highest and lowest temperatures (13.2°C and 6.4°C) are slightly above the national average, while the annual rainfall (806.6 millimetres) and average hours of sunshine (1394.5 hours) are respectively above and below the national averages.

During recent years there has been an active and integrated flood risk planning approach in the council:

- A better understanding of spatial flows
- Piloting natural flood risk management
- Exploring natural flood risk management in the Natural Course project
- Investment in key infrastructure to reduce risks (Salford Flood Basin)
- Partnership with the Environment Agency, Salford University and the City Council to deliver a second flood basin
- Innovative approaches (tree pits to slow the flow)
- Creation of memorials and reminders in urban settings.

The Salford Strategic Flood Forum was established following discussions with **Councillor Derek Antrobus** (Executive Lead Member for Strategic Planning) regarding the best way to implement recommendations arising from the Pitt Review into the 2007 floods.

The forum is chaired by Councillor Antrobus and is attended by officers with planning, drainage and emergency planning expertise, as well as by external partners such as the Environment Agency, United Utilities and the University of Salford. It plays an important coordinating role in preparing the City Council to deal with new responsibilities emerging from the Flood and Water Management Act 2010.

There is a perception that socially deprived areas are also those where the flooding risk is greater. The efforts of the City Council have been directed to make changes on the ground with regeneration projects aiming to reduce the impact of floods. The main constraints are related to the level of community participation in these areas, which is low. In this context, the use of new technologies (social networks) and

making rivers leisure areas can be a solution to attract the attention of the community.



Source: <http://salfordstar.com/article.asp?id=4049>

On Boxing Day 2015, more than 2,250 homes and 500 businesses in GM were flooded. More than 31,200 properties lost their power supply and damage to infrastructure totalled £11.5m. 2015 was the sixth wettest year on record. December's weather was substantially warmer than normal and this warmer air carried more moisture resulting in twice the long-term average December total rainfall, creating saturated catchment conditions over large parts of the Irwell catchment. The heaviest rain from Storm Eva on Christmas Day and Boxing Day was experienced over Pennine areas, mostly north of GM. In the preceding days, soils in these areas had become saturated and close to capacity. The sudden onset, extent and depth of the flooding was unprecedented and meant that its impacts across GM were devastating. Depths were so great in parts of Bolton, Bury, Salford and Rochdale that some residents were evacuated by boat and tractor. For some areas this was the worst flooding for a generation.

**Jeanette Staley, Bernie Vaudry and Sue Hill (Salford City Council)**, gave a presentation on the economic, social and damage recovery work that lasted for 15 months after the flood. The main outcomes referenced were:

- 210 business premises helped
- Financial support to affected businesses and homes, through the Flood Recovery Grant Process
- Integration and cooperation of several city departments in the recovery procedures
- Mobilisation of human resources to carry out the evaluation of the damage and support the reconstruction.

In recovery, a range of financial incentives may help to drive efforts to Build Back Better such as incentivising tree planting to promote urban greening.

As **Christine Gough** said, about the leadership of the recovery process “(...) local authority is the lead agency responsible for planning for recovery of the community (...)” and Salford, with available resources, delivered a good level of performance.

However, the recovery from an extreme event should include a higher level of community involvement at the stage of prevention and relief:

- The early warning system should be based on an efficient way of sending information, especially through SMS and sirens in the highest flood risk areas
- Campaign to raise awareness about flood insurance. Some of the business and residential areas had no insurance in place
- Prevention teams (City Council) could be deployed to areas covered by warnings ensuring a shorter response time and immediate recovery start

- Ensure the media involvement in prevention measures and existing risks.

The final presentation of the day was from **Chris Wilson (Environment Agency)** which also involved a site visit to the Salford Flood Basin. According to Environment Agency statistics:

- 1 in 10 homes in GM are at risk of flooding
- 55,000 properties are at risk of flooding from rivers
- 70,000 properties are at risk from surface water flooding
- GM has the highest concentration of reservoirs in England.

The Environment Agency is a Category 1 responder alongside Local Authorities and the Emergency Services and their main principle in recovery is to ‘think big and act early’ - that starts when the response is underway and may take many months or even years.

**Chris Wilson** also feels that the unpredictability of extreme events limits the pre-planning of response and recovery capacities. The uncertainties of climate change and failures in critical infrastructure are seen as the worst scenario to face.

The impacts of winter 2015/16 meant that the recovery effort went far beyond the Environment Agency organisation. It tested the national recovery framework at Government Department level and resulted in an additional funding from HM Treasury and a complete reboot of capital investment plans across the country.

As a Category 1 responder the Environment Agency have responded to a number of major flood incidents over the last 15 years. The main lessons learnt are:

1. Communities carry a significant risk if assets have failed. Should additional rain fall, communities are extremely vulnerable
2. Some communities did not feel supported in the immediate aftermath of a flood event
3. The longer term impacts of flooding on mental health are significant.

The Salford Flood Basin is a £10 million investment to reduce flood risk to 1,400 homes and 500 businesses in Lower Kersal and Lower Broughton. The basin is unique in having a dual

purpose. Its main function is to work alongside the original flood basin at Littleton Road, to capture, store and slowly release flood waters back into the River Irwell. That part is now fully functional. During the site visit to the Salford Flood Basin **Chris Wilson** explained that community groups were involved in the design of the basin and the plans include wetland habitat for a range of birds, including the Little Egret and Little Ringed Plover that have already been spotted in the area.

Balancing community participation, a multi-stakeholder approach and communication between private and public entities in the project management has paid dividends in the flood basin investment.



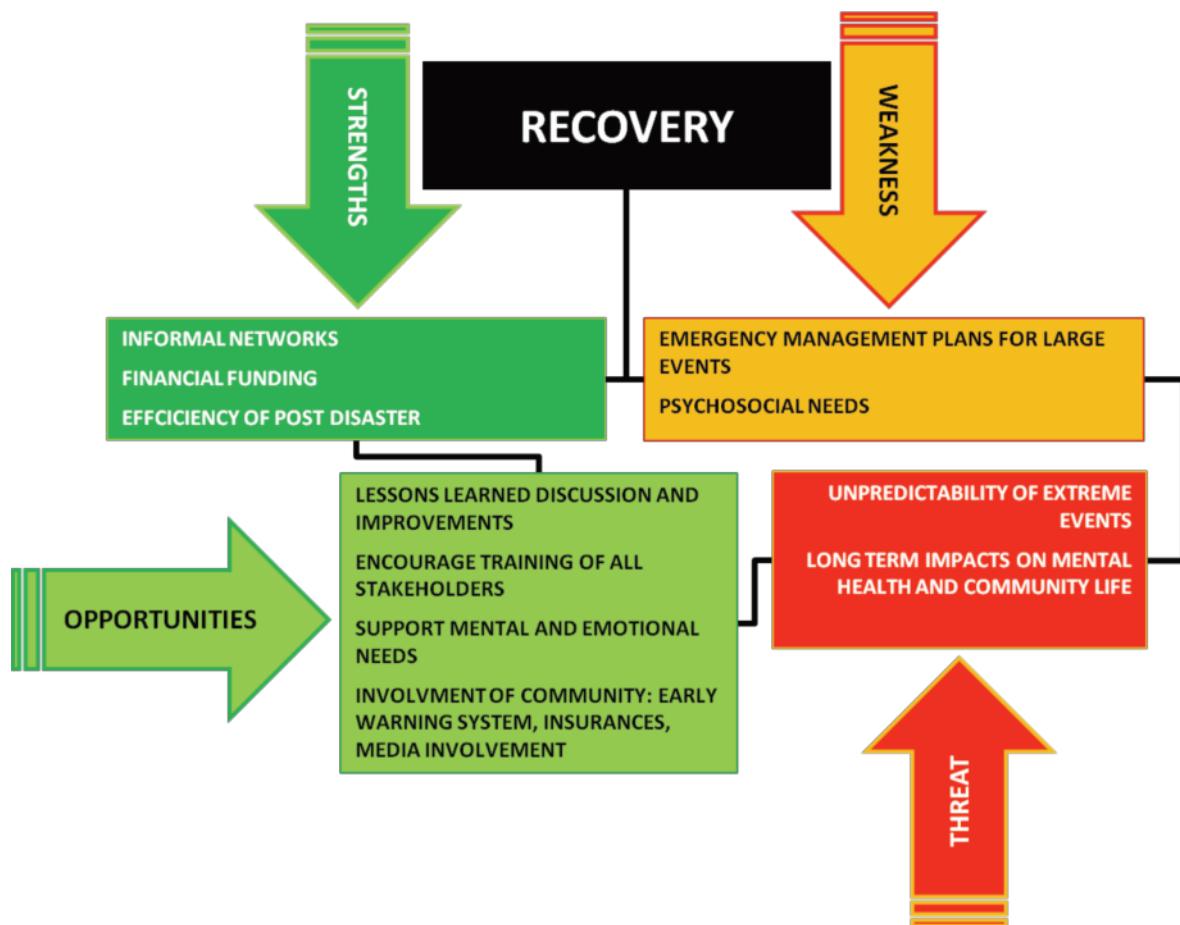
Source: Review Team | Salford Flood Basin site visit

## 2.2.5. SWOT ANALYSIS / MATRIX

SWOT MATRIX	
<b>Strengths</b>	<ul style="list-style-type: none"> <li>(1) The existence of long established formal and informal networks within and across communities and borders make a difference in the effectiveness of recovery activities, including strong links between different tiers of government;</li> <li>(2) The effort made by GM in the Strategic Recovery Guidance document is very important, involving key sectors of the community and assigning those with roles and responsibilities with terms of reference and protocols. The inclusion of insurers is also a very positive aspect;</li> <li>(3) The recovery process in the Arena Attack involves several working groups and authorities in order to support those affected restore confidence, increase security and maintain economic investment.</li> <li>(4) The efforts of the Salford City Council on the ground through regeneration projects in flood risk areas (to give more conditions to the people) to reduce the impacts of floods.</li> <li>(5) Financial issues were considered in the recovery from the Boxing Day Floods. That included support of disaster-impacted communities and the need for any local management and disbursement of rebuilding money and disaster funds;</li> <li>(6) The community participation, multi-stakeholder approach and communication between private and public entities to deliver many benefits in the Salford Flood Basin (River Irwell). Its main function is to work alongside the original flood basin at Littleton Road, to capture, store and slowly release flood waters back into the River Irwell.</li> </ul>
<b>Weaknesses</b>	<ul style="list-style-type: none"> <li>(1) Responsibility for and execution of emergency management plans for large events. The line between the responsibility of the organisers (private sector) and the interests of the state (city security and safeguarding of human life) are always critical;</li> <li>(2) Normally after terrorist attack cities respond in the same way: by returning to normality as quickly as possible. Such displays of resilience among local residents is often reported in the aftermath of these events. However, scientific evidence of the impact of this resilience is less abundant.</li> </ul>
<b>Opportunities</b>	<ul style="list-style-type: none"> <li>(1) Lessons learned from the Arena Attack should be discussed at different levels: political, operational and technical. Issues like putting people first, staff welfare and support, event security, health service provision, utilising existing partnerships and accessing expertise could be discussed;</li> </ul>

## SWOT MATRIX

<b>Opportunities</b>	<ul style="list-style-type: none"> <li>(2) Not all the impacts of terrorism and even natural disasters are fully known. The strategy should encourage training of all stakeholders mentioned in the Strategic Recovery Guidance. In order to ensure continued learning, joint exercises (Command Post Exercise / CPX; Table Top Exercise / TTX; Live Exercise / LIVEX) should be a priority;</li> <li>(3) People can be encouraged, supported and helped to trust their own mental and emotional strength again. Stimulating resilience by meeting needs and helping individuals address challenges gives back control and supports the recovery process;</li> <li>(4) The main constraints to encouraging communities to prepare for flooding are related to the low level of community participation. In this context, the use of new technologies (social networks) and making rivers as leisure areas can be a solution to attract the attention of the community;</li> <li>(5) The recovery from an extreme event should include a higher level of community involvement at the stage of prevention and relief (efficient early warning system; raise awareness about flood insurance; prevention teams deployed to areas subject to flood risk warnings; media involvement).</li> </ul>
<b>Threats</b>	<ul style="list-style-type: none"> <li>(1) The unpredictability of extreme events limits response and recovery capacities. The uncertainties of climate change and failures in critical infrastructure are seen as the worst scenario to face;</li> <li>(2) Some communities do not feel supported in the immediate aftermath of a flood event. The longer term impacts of flooding on mental health are usually significant.</li> </ul>



Source: Review Team

## 2.2.6. RECOMMENDATIONS FOR PEER REVIEW PROCESS

---

### RECOMMENDATIONS

- (1) A peer review of such a large module as Module 8a (Increase Infrastructure Resilience) is a complex task. It is desirable that the review of this module be done by experts from relevant critical sectors. Salford's approach was correct in selecting the review of only a few sectors.
- (2) The Review Team felt that an overview about the capacity of all critical sectors (infrastructure resilience as a whole) to an extreme event or disaster was missing. To achieve this would require more than 2 days of peer review.

## APPENDIX I - GREATER MANCHESTER (SALFORD) PEER REVIEW AGENDA

### MODULE 8a: INCREASE INFRASTRUCTURE RESILIENCE // 1st Day // Monday 9th July

<b>Time</b>	09:00 - 09:10
<b>Location</b>	Greater Manchester Police Force Headquarters (GMPFHQ) Room 436, Northampton Road, M40 5BP
<b>Lead</b>	Paul Argyle, Multi-Agency Strategic Advisor to the Mayor and Deputy Mayor (Policing & Crime), GMCA
<b>Activity</b>	Opening remarks
<b>Theme of Session</b>	Welcome to Greater Manchester
<b>Time</b>	09:10 - 09:40
<b>Location</b>	GMPFHQ Room 436
<b>Lead</b>	Kate Green, Strategic Resilience Lead
<b>Activity</b>	15 Minute presentation followed by interview
<b>Theme of Session</b>	GM risk and governance
<b>Time</b>	09:40 - 10:15
<b>Location</b>	GMPFHQ Room 436
<b>Lead</b>	Andy Jackson, ARUP
<b>Activity</b>	10 Minute presentation followed by interview
<b>Theme of Session</b>	GM infrastructure
10:15 - 10:25 Write up previous session	
<b>Time</b>	10:25 - 11:00
<b>Location</b>	GMPFHQ Room 436
<b>Lead</b>	Christine Gough, Ministry of Housing, Communities and Local Government (MHCLG)
<b>Activity</b>	10 Minute presentation followed by interview
<b>Theme of Session</b>	National civil protection governance and UK approach to protecting critical infrastructure
11:00 - 11:10 Write up previous session	

## MODULE 8a: INCREASE INFRASTRUCTURE RESILIENCE // 1st Day // Monday 9th July

<b>Time</b>	11:10 - 11:50
<b>Location</b>	GMPFHQ Room 436
<b>Lead</b>	Ray Carolin, JRLO, MoD
<b>Activity</b>	15 Minute presentation followed by interview
<b>Theme of Session</b>	Military support to protecting infrastructure
11:50- 12:00 Write up previous session	
12:00- 13:00 GMPFHQ Room 436 - Lunch	
<b>Time</b>	13:00 - 13:35
<b>Location</b>	GMPFHQ Room 436
<b>Lead</b>	Michael Jagger, Specialist Consultant – Voice Solutions, KCOM
<b>Activity</b>	10 Minute presentation followed by interview
<b>Theme of Session</b>	Resilience of the UK telecoms network
13:35- 13:45 Write up previous session	
<b>Time</b>	13:45 - 14:15
<b>Location</b>	GMPFHQ to TfGM
<b>Lead</b>	Anthony Dempsey
<b>Activity</b>	Travel to Transport for Greater Manchester 2 Piccadilly Place, Manchester, M1 3BG
<b>Time</b>	14:15 - 14:30
<b>Location</b>	TfGM, 2PP
<b>Lead</b>	Chris Thorpe / Lucy Kennon, Transport for Greater Manchester
<b>Activity</b>	Presentation on Resilience of Transport Network
<b>Theme of Session</b>	TfGM contribution to the infrastructure resilience of GM transport network

### MODULE 8a: INCREASE INFRASTRUCTURE RESILIENCE // 1st Day // Monday 9th July

<b>Time</b>	14:30 - 15:00
<b>Location</b>	TfGM, 2PP
<b>Lead</b>	Lucy Kennon
<b>Activity</b>	TfGM Interview
<b>Time</b>	15:00 - 15:30
<b>Location</b>	TfGM, 2PP
<b>Lead</b>	Lucy Kennon
<b>Activity</b>	Site visit TfGM Control Room
<b>Time</b>	15:30 - 17:00
<b>Location</b>	TfGM, 2PP
<b>Lead</b>	Review Team
<b>Activity</b>	End of Day Review
<b>Theme of Session</b>	Review Team wrap up session for day 1 of the peer review
<b>Time</b>	19:00 - 21:30
<b>Location</b>	The Same Yet Inn, 145 Simister Lane, Simister, Prestwich, M25 2SF
<b>Lead</b>	The Same Yet Inn
<b>Activity</b>	Networking event

## MODULE 8a: INCREASE INFRASTRUCTURE RESILIENCE // 2nd Day // Tuesday 10th July

<b>Time</b>	08:30 - 09:30
<b>Location</b>	Central Manchester to Highways England (HE) Depot
<b>Lead</b>	Jon Percival / Anthony Dempsey
<b>Activity</b>	Travel to HE Depot, M62 Milnrow Rochdale OL16 4EH
<b>Time</b>	09:30 - 09:55
<b>Location</b>	HE Depot, Milnrow
<b>Lead</b>	Phil Stockford, Highways England
<b>Activity</b>	Site visit Highways England Depot
<b>Theme of Session</b>	PPE hi-vis only (walkways, no salt barn access)
<b>Time</b>	09:55 - 10:30
<b>Location</b>	HE Depot
<b>Lead</b>	Phil Stockford & Simon Thain Highways England
<b>Activity</b>	10 Minute presentation followed by interview
<b>Theme of Session</b>	GM highways infrastructure
10:30 - 10:40 Write up previous session	
<b>Time</b>	10:40 - 11:15
<b>Location</b>	HE Depot, Milnrow
<b>Lead</b>	Mandy Ingham / Dan Randles, Electricity North West (ENWL)
<b>Activity</b>	10 Minute presentation followed by interview
<b>Theme of Session</b>	GM electricity infrastructure resilience
11:15 - 11:25 Write up previous session	

**MODULE 8a: INCREASE INFRASTRUCTURE RESILIENCE // 2nd Day // Tuesday 10th July**

<b>Time</b>	11:25 - 12:00
<b>Location</b>	HE Depot, Milnrow to Rochdale Town Hall
<b>Lead</b>	Jon Percival / Anthony Dempsey
<b>Activity</b>	Travel to Rochdale Town Hall Committee Room 3, Rochdale Town Hall, OL16 1AB
12:00 - 12:30 Rochdale Town Hall Committee Room 3 - Lunch	
<b>Time</b>	12:30 - 13:00
<b>Location</b>	Travel from Rochdale Town Hall to Rochdale ESS
<b>Lead</b>	Jon Percival / Anthony Dempsey
<b>Activity</b>	Travel to electricity substation Dane Street, Rochdale, OL12 6UN
<b>Time</b>	13:00 - 13:30
<b>Location</b>	Rochdale ESS
<b>Lead</b>	Dan Randles, Engineering Strategy Manager, Dave Talbot, Electricity North West (ENWL)
<b>Activity</b>	Site visit Rochdale ESS
<b>Theme of Session</b>	ENWL retrofit resilience measures PPE coveralls, boots
<b>Time</b>	13:30 - 14:15
<b>Location</b>	Travel from Rochdale ESS to Davyhulme
<b>Lead</b>	Jon Percival / Anthony Dempsey
<b>Activity</b>	Travel to Davyhulme WWTW - Trafford Way, Manchester, M17 8DD
<b>Time</b>	14:15 - 14:50
<b>Location</b>	Admin Building Davyhulme WWTW
<b>Lead</b>	Suzanne Halligan, United Utilities
<b>Activity</b>	10 Minute presentation followed by interview
<b>Theme of Session</b>	GM water infrastructure resilience

## MODULE 8a: INCREASE INFRASTRUCTURE RESILIENCE // 2nd Day // Tuesday 10th July

14:50- 15:00 Write up previous session

<b>Time</b>	15:00 - 16:00
<b>Location</b>	Davyhulme WWTW
<b>Lead</b>	Suzanne Halligan, United Utilities
<b>Activity</b>	Site Visit Davyhulme WWTW
<b>Theme of Session</b>	PPE gloves, hard hat and hi-vis, boots
<b>Time</b>	16:00 - 16:30
<b>Location</b>	Davyhulme WWTW to Central Manchester
<b>Lead</b>	Anthony Dempsey
<b>Activity</b>	Review Team return to hotel

**MODULE 10: EXPEDITE RECOVERY AND BUILD BACK BETTER // 3rd Day // Wednesday 11th July**

<b>Time</b>	09:00 - 09:20
<b>Location</b>	Think Lab, The University of Salford Maxwell Building, 43 Crescent, Salford M5 4WT
<b>Lead</b>	Cllr Antrobus
<b>Activity</b>	Welcome from Salford City Council and Q&A
<b>Time</b>	09:20 - 09:55
<b>Location</b>	Think Lab, Maxwell Building
<b>Lead</b>	Christine Gough, Ministry of Housing, Communities and Local Government (MHCLG)
<b>Activity</b>	10 Minute presentation followed by interview
<b>Theme of Session</b>	Overview of UK national recovery arrangements
09:55 - 10:05 Write up previous session	
<b>Time</b>	10:05 - 10:40
<b>Location</b>	Think Lab, Maxwell Building
<b>Lead</b>	Tom Walley, Senior Business Partner, AGMA CCRU
<b>Activity</b>	10 Minute presentation followed by interview
<b>Theme of Session</b>	GM approach to recovery
10:40 - 10:50 Write up previous session	
<b>Time</b>	10:50 - 11:25
<b>Location</b>	Think Lab, Maxwell Building
<b>Lead</b>	Paul Argyle, Multi-Agency Strategic Advisor to the Mayor and Deputy Mayor (Policing & Crime), GMCA
<b>Activity</b>	10 Minute presentation followed by interview
<b>Theme of Session</b>	Learning Lessons / Greater Manchester Resilience Forum (GMRF)
11:25 - 11:35 Write up previous session	

**MODULE 10: EXPEDITE RECOVERY AND BUILD BACK BETTER // 3rd Day // Wednesday 11th July**

<b>Time</b>	11:35 - 12:10
<b>Location</b>	Think Lab, Maxwell Building
<b>Lead</b>	Jeanette Staley, Bernie Vaudry, Sue Hill, Salford City Council
<b>Activity</b>	Focus Group
<b>Theme of Session</b>	Salford – recovering from the 2015 floods
12:10 - 12:20 Write up previous session	
12:20 - 13:00 Think Lab, Maxwell Building - Lunch	
<b>Time</b>	13:00 - 13:35
<b>Location</b>	Think Lab, Maxwell Building
<b>Lead</b>	Chris Wilson, Environment Agency
<b>Activity</b>	10 Minute presentation followed by interview
<b>Theme of Session</b>	EA approach to post incident recovery
13:35 - 13:45 Write up previous session	
<b>Time</b>	13:45 - 14:05
<b>Location</b>	Travel from Think Lab to flood basin
<b>Lead</b>	Jon Percival / Anthony Dempsey
<b>Activity</b>	Travel to Second Salford Flood Basin
<b>Time</b>	14:05 - 15:35
<b>Location</b>	Lower Broughton, Salford
<b>Lead</b>	Matt Ryan, Urban Vision, Chris Wilson, Environment Agency
<b>Activity</b>	Site visit Guided walk through of flood basin
<b>Theme of Session</b>	Second Salford Flood Basin

**MODULE 10: EXPEDITE RECOVERY AND BUILD BACK BETTER // 3rd Day // Wednesday 11th July**

<b>Time</b>	15:35 - 16:00
<b>Location</b>	Travel from flood basin to Think Lab, Maxwell Building
<b>Lead</b>	Jon Percival / Anthony Dempsey
<b>Activity</b>	Travel to Think Lab, The University of Salford Maxwell Building, 43 Crescent, Salford M5 4WT
<b>Time</b>	16:00 - 16:45
<b>Location</b>	Think Lab, Maxwell Building
<b>Lead</b>	Chris Findley, Salford City Council, Matt Ryan, Urban Vision, Chris Wilson, Environment Agency
<b>Activity</b>	Focus Group
<b>Theme of Session</b>	Protective infrastructure / build back better
<b>Time</b>	16:45 - 17:30
<b>Location</b>	Think Lab, Maxwell Building
<b>Lead</b>	Review Team
<b>Activity</b>	End of day review



## NOTES:

